

Alberta Environment and Parks (AEP)
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October 11, 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 August 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
VOC Canister	Maxxam Analytics	InnoTech Alberta Inc	InnoTech Alberta Inc	Not Applicable

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems, with the exception of PM2.5, were above the 90% requirement.

The CH4/NMHC channel operational uptime was 30.8%. Monitoring activity for these two channels commenced on August 22 at hour 9. The monthly data completeness criteria was not applicable in the August monitoring period.

All data collected in August 2018, with the exception of PM2.5, was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

Non-Conformance:

- Seventy-two 1-Hour and ten 24-Hour contraventions were recorded for PM2.5 this month. AEP reference number 341965, 342278, 342304, 342506, 342507, 342735, 342800 and 343012 for 1-Hour contraventions recorded on August 8, August 10, August 11, August 14, August 15, August 17, August 18 and August 22-23, respectively. AEP reference number 341965, 342179, 342278, 342304, 342056, 342057, 342735 and 342800 for 24-Hour contraventions recorded on August 8, August 9, August 10, August 11, August 14, August 15, August 17 and August 18, respectively. High concentration of PM2.5 was resulted from a forest fire event.
- Due to equipment failure, 107 hours of downtime were recorded for PM2.5 this month. Operational time did not meet the AMD's 90% requirement AEP reference number: 344348.

THC/CH4/NMHC: An analyzer upgrade was implemented this month. The Maxxam-supplied analyzer, Thermo 51i analyzer (s/n: 1118249035), was replaced with a LICA-owned analyzer, Thermo 55i (s/n: 1180320044) on August 21.

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 VOC canister 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,



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

JOB #: 2833-2018-08-01-C

August 2018

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

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SUMMARY

In August 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, with the exception of PM_{2.5}, was compliant with the requirements outlined in the AMD, 2016.

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems, with the exception of PM_{2.5}, were above the 90% requirement. This was reported under AEP reference number: 344348.

The CH₄/NMHC channel operational uptime was 30.8%. Monitoring activity for these two channels commenced on August 22 at hour 9. The monthly data completeness criteria was not applicable in the August monitoring period.

Non-Conformance:

- Seventy-two 1-hr and ten 24-hr contraventions were recorded for PM_{2.5} this month. Details of the exceedances are recorded in Appendix IV.
- Due to equipment failure, 107 hours of downtime were recorded for PM_{2.5} this month. Operational time did not meet the AMD's 90% requirement. This was reported under AEP reference number: 344348.

Power Failure: A power failure occurred on August 31, at hours 09:00 - 13:00, incurring 5 hours of downtime for all parameters. Due to the power failure, the automated daily zero-span check for gas parameters, scheduled for hour 13:00 on August 31, was not executed. A successful zero-span check was completed on September 1.

TRS: Two hours of downtime were recorded on August 2 at hour 06:00 and August 10 at hour 12:00, due to additional zero-span checks performed to assess a biased low drift in span response, and to provide an expected span value reference, respectively.

THC/CH₄/NMHC: A total of 25 hours of downtime were recorded this month.

- The span gas cylinder was replaced on August 9. An additional zero-span check was performed afterwards to obtain the reference value for the new span gas, incurring one hour of downtime.
- An analyzer upgrade was implemented this month. The Maxxam-owned Thermo 51i analyzer (s/n: 1118249035), was replaced with a LICA analyzer, Thermo 55i (s/n: 1180320044). Three hours of downtime were incurred due to this event.
- Fourteen hours of downtime were recorded from hour 19:00 on August 21 to hour 08:00 on August 22, due to corrective actions performed to address a leak in the line that connects the carrier gas (N₂) cylinder to its purifier.
- CH₄/NMHC minute data at hour 20:00 on August 22 were missing and could not be recovered despite several attempts, incurring one hour of downtime.
- One hour of downtime was incurred on August 31 at hour 14:00 as the analyzer recovered from a power failure.

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						MAXIMUM VALUES							OPERATIONAL TIME (%)
Cold Lake South Continuous Monitoring Station						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO ₂ (ppb)	172	48	0	0	0	1	6	9	8.1	SW	0	1	99.3
TRS (ppb)	-	-	-	-	0	2	9	1	0.7	W	1	8	99.1
THC (ppm)	-	-	-	-	2.34	4.05	10	5	0.6	SE	3.18	21	96.6
CH ₄ (ppm)	-	-	-	-	2.09	2.86	29	5	1.1	SW	2.25	22	30.8
NMHC (ppm)	-	-	-	-	0.00	0.04	23	18	6.1	E	0.00	22	30.8
NO ₂ (ppb)	159	-	0	-	2	7	15	8	5.8	W	4	15	99.3
NO (ppb)	-	-	-	-	0	12	17	17	0.1	W	2	17	99.3
NO _x (ppb)	-	-	-	-	2	14	10	6	1.0	NE	5	17	99.3
O ₃ (ppb)	82	-	0	-	18.4	58.7	10	14	8.3	SW	28.3	14	99.3
PM _{2.5} (µg/m ³)	80	30	72	10	28	225	18	5	6.7	W	99	15	85.6
RELATIVE HUMIDITY (%)	-	-	-	-	75	111	2	2	1	SW	90	26	99.3
AMBIENT TEMPERATURE (°C)	-	-	-	-	15.3	29.8	10	16	5.9	SW	22.4	10	99.3
VECTOR WS (kph)	-	-	-	-	1.8	17.2	12	16	-	NE	8.2	12	99.3
VECTOR WD (sec)	-	-	-	-	264	-	-	-	-	-	-	-	99.3

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

PM_{2.5} 1-Hour Exceedances

Seventy-two 1-hour exceedances were recorded this month.

PM_{2.5} 24-Hour Exceedances

Ten 24-hour exceedances were recorded this month.

O₃ 1-Hour Exceedances

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

In accordance with EPEA and the Substance Release Regulation.

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

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Total Reduced Sulphur (TRS), Total Hydrocarbon (THC), Methane (CH₄), Non-Methane Hydrocarbon (NMHC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), 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 (SO₂)

- Operational time for the monitoring period was 99.3%, equivalent to 5 hours of downtime.
- The routine monthly calibration was performed on August 9.
- A power failure occurred on August 31, at hours 09:00 - 13:00, incurring 5 hours of downtime.
- Due to the power failure, the automated daily zero-span check, scheduled for hour 13:00 on August 31, was not executed. A successful zero-span check was completed on September 1. Baseline corrections for August 31 were performed incrementally using the daily zero results for August 30 and September 1, which were both valid.

TOTAL REDUCED SULPHUR (TRS)

- Operational time for the monitoring period was 99.1%, equivalent to 7 hours of downtime.
- The analyzer spanned close to the lower acceptance limit on August 1. An additional zero-span check was performed on August 2 at hour 06:00 to assess span response, yielding results that were much closer to the mean. No further issues were identified. The probable cause of the span drift could not be determined. One hour of downtime was, however, incurred due to the additional quality check.
- The routine monthly calibration was performed on August 9.
- An additional zero-span check was performed on August 10 at hour 12:00 to obtain a more representative span reference concentration. The expected span value was then updated based on this result. One hour of downtime was incurred due to the additional quality check.
- A power failure occurred on August 31, at hours 09:00 - 13:00, incurring 5 hours of downtime.
- Due to the power failure, the automated daily zero-span check, scheduled for hour 13:00 on August 31, was not executed. A successful zero-span check was completed on September 1. Baseline corrections for August 31 were performed incrementally using the daily zero results for August 30 and September 1, which were both valid.

TOTAL HYDROCARBONS (THC), METHANE (CH₄) and NON-METHANE HYDROCARBONS (NMHC)

- Operational time for the monitoring period for THC was 96.6%, equivalent to 25 hours of downtime. The CH₄/NMHC channel operational uptime was 30.8%. Monitoring activity for these two channels commenced on August 22 at hour 09:00. The monthly data completeness criteria was not applicable in the August monitoring period.
- The span gas cylinder was replaced on August 9. An additional zero-span check was performed afterwards to obtain the reference for the new span gas. The expected span value was subsequently updated. One hour of downtime was incurred due to the additional quality check.
- An analyzer upgrade was implemented this month. Following a successful shut-down calibration on August 21, the Maxxam-owned analyzer, Thermo 51i analyzer (s/n: 1118249035), was replaced with a LICA analyzer, Thermo 55i (s/n: 1180320044), which monitors CH₄ and NMHC in addition to THC. A successful installation calibration was subsequently completed. Three hours of downtime were incurred due to this event.
- On August 22, a leak was found in the line that connects the carrier gas (N₂) cylinder to its purifier, and was fixed at hour 08:00. To err on the side of caution, data collected between the calibration on August 21 and when the leak was fixed on August 22 was deemed unreliable and therefore discarded. Fourteen hours of downtime were recorded for THC as a result.
- Recordable data monitoring for the CH₄ and NMHC channels commenced on August 22 at hour 09:00 (August 22 at hour 21:00 for maximum instantaneous channels). The monthly data completeness criteria was not applicable to these channels in the August monitoring period.
- Due to a data logger configuration issue, the expected span value could not be updated for the CH₄ and NMHC components immediately after the calibration on August 21. All troubleshooting/corrective actions, including an additional zero-span check, proved abortive. The expected span value was subsequently updated successfully on August 24.
- CH₄/NMHC minute data at hour 20:00 on August 22 were missing and could not be recovered despite several attempts, incurring one hour of downtime.
- Six hours of downtime were recorded due to a power failure and subsequent analyzer recovery that occurred on August 31 from hour 09:00 to 14:00.
- Due to the power failure, the automated daily zero-span check, scheduled for hour 13:00 on August 31, was not executed. A successful zero-span check was completed on September 1. Baseline corrections for August 31 were performed using the daily zero results for August 30 and September 1, which were both valid.

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

- Operational time for the monitoring period was 99.3%, equivalent to 5 hours of downtime.
- The routine monthly calibration was performed on August 9.
- A power failure occurred on August 31, at hours 09:00 - 13:00, incurring 5 hours of downtime.
- Due the power failure, the automated daily zero-span check, scheduled for hour 13:00 on August 31, was not executed. A successful zero-span check was completed on September 1. Baseline corrections for August 31 were performed incrementally using the daily zero results for August 30 and September 1, which were both valid.

OZONE (O₃)

- Operational time for the monitoring period was 99.3%, equivalent to 5 hours of downtime.
- The routine monthly calibration was performed on August 10.
- A power failure occurred on August 31, at hours 09:00 - 13:00, incurring 5 hours of downtime.
- Due the power failure, the automated daily zero-span check, scheduled for hour 13:00 on August 31, was not executed. A successful zero-span check was completed on September 1. Baseline corrections for August 31 were performed incrementally using the daily zero results for August 30 and September 1, which were both valid.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time for the monitoring period was 85.6%, equivalent to 107 hours of downtime. Equipment uptime did not meet the AMD's 90% requirement this month. This was reported under AEP reference number: 344348.
- The quarterly audit/calibration was performed on August 27. The results met AMD requirements.
- Equipment diagnostics and alarms revealed anomaly in the performance of the Sharp unit, prompting a site visit on September 4. Troubleshooting activities were coordinated with the manufacturer and it was determined that the detector had failed. Data analysis determined the point of failed performance as hour 13:00 on August 27. Data collected from this point onward was therefore invalidated. The equipment was subsequently sent for manufacturer repairs. 107 hours of downtime were incurred, in the August monitoring period, due to this event.
- There were seventy-two 1-hr and ten 24-hr contraventions recorded this month. Details of the exceedances are recorded in Appendix IV.

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

- Operational time for the monitoring period was 99.3%, equivalent to 5 hours of downtime. These were incurred due to a power failure that occurred on August 31, at hours 09:00 - 13:00.
- 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 99.3%, equivalent to 5 hours of downtime. These were incurred due to a power failure that occurred on August 31, at hours 09:00 - 13:00.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time for the monitoring period was 99.3%, equivalent to 5 hours of downtime. These were incurred due to a power failure that occurred on August 31, at hours 09:00 - 13:00.

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, with the exception of $PM_{2.5}$, was compliant with the requirements outlined in the AMD, 2016.

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems, with the exception of $PM_{2.5}$, were above the 90% requirement. This was reported under AEP reference number: 344348. The CH_4 /NMHC channel operational uptime was 30.8%. Monitoring activity for these two channels commenced on August 22 at hour 9. The monthly data completeness criteria was not applicable in the August monitoring period.

Non-Conformance:

- Seventy-two 1-hr and ten 24-hr contraventions were recorded for $PM_{2.5}$ this month. Details of the exceedances are recorded in Appendix IV.
- Equipment uptime for $PM_{2.5}$ did not meet the AMD's 90% requirement this month. This was reported under AEP reference number: 344348.

4.0 Calculations and Results

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

A valid daily zero-span check was not recorded on August 31. The subsequent response check was performed on September 1. When a valid daily zero-span test is not performed within 25 hours of the previous one, it is Maxxam's standard practice to report this as an AMD contravention. In this circumstance, LICA requested adherence to the guidance provided in the Air Monitoring Directive FAQs – Chapter 7: Ambient Calibration, which qualifies this instance as acceptable.

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 O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) 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
- Total Hydrocarbons - Thermo 51i & Thermo 55i FID Analyzer
- Methane, Non-Methane Hydrocarbon - Thermo 51i & 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 - 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

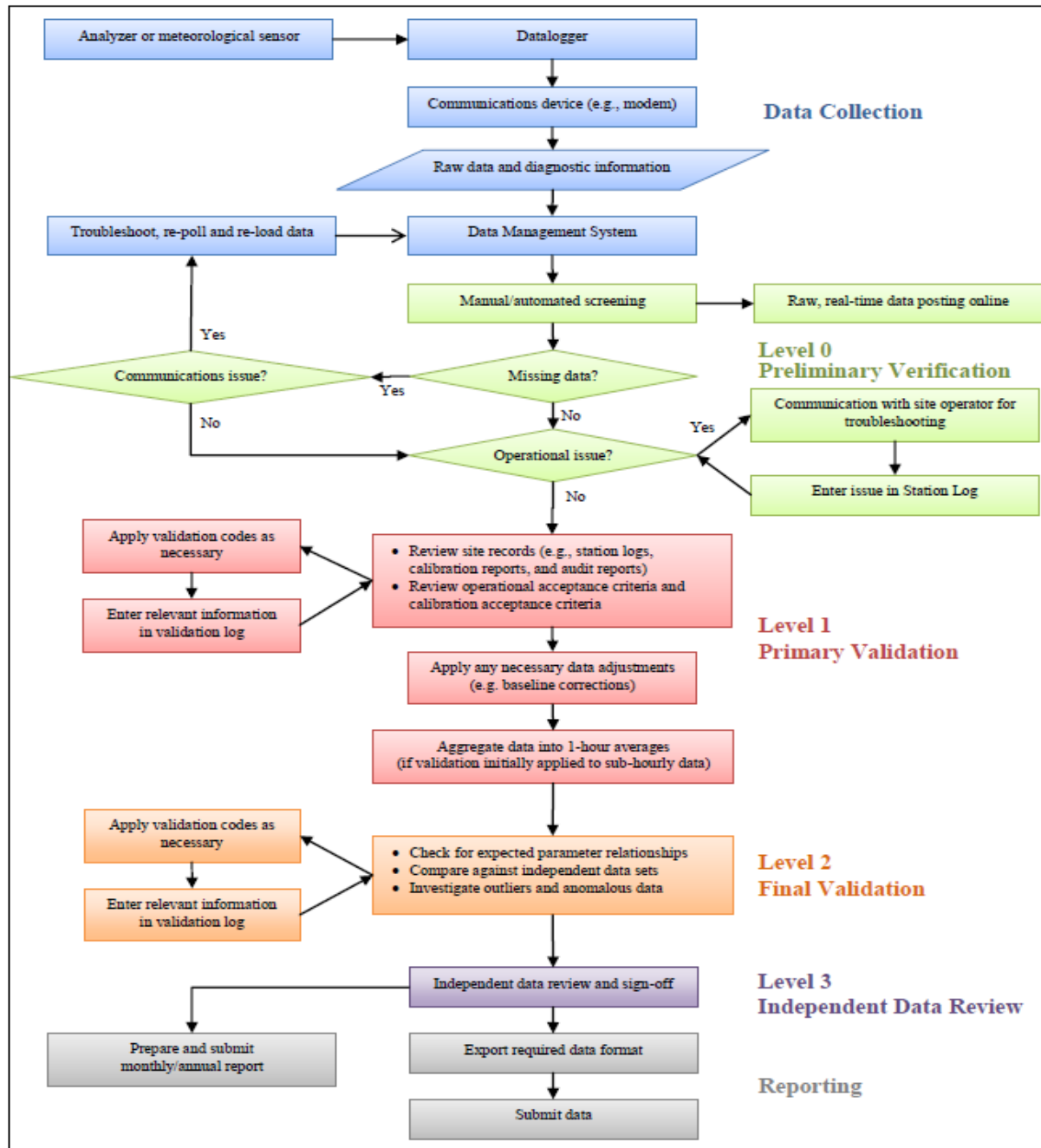
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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 (SO₂ ppb)

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

STATUS FLAG CODES

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

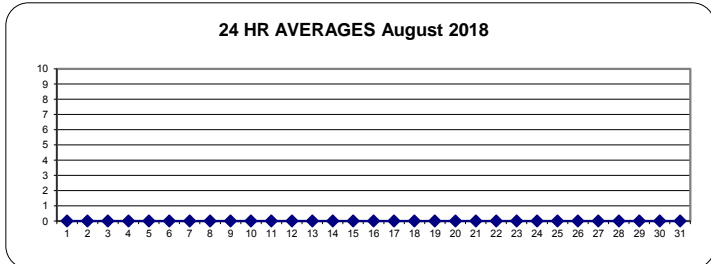
OBJECTIVE LIMIT:

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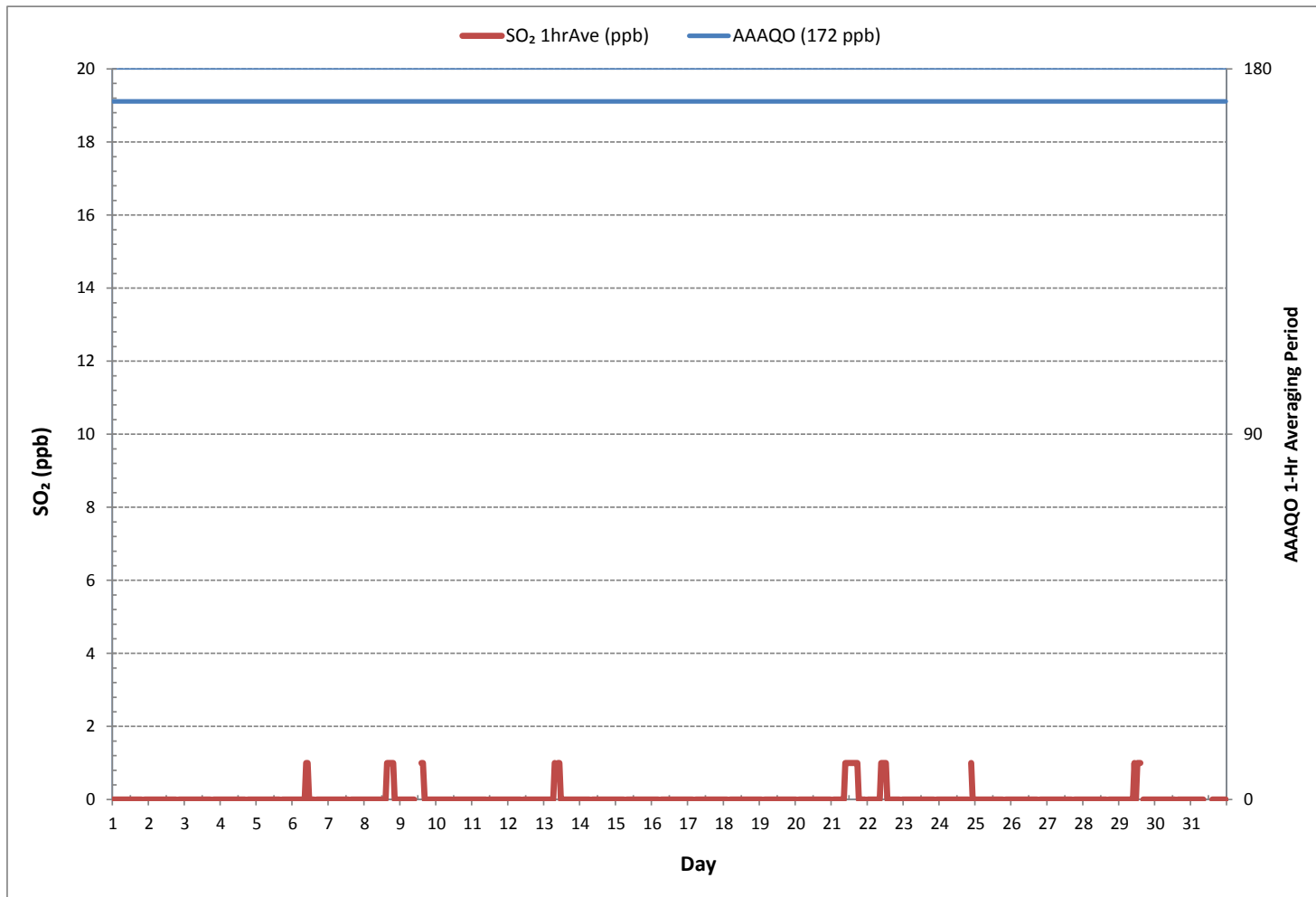
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	30
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR ON DAY 6
MAXIMUM 24-HR AVERAGE:	0 ppb ON DAY 1
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	739 hrs
AMD OPERATION UPTIME:	99.3 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES August 2018



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-SO₂[ppb]
 Monthly: 18/08
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

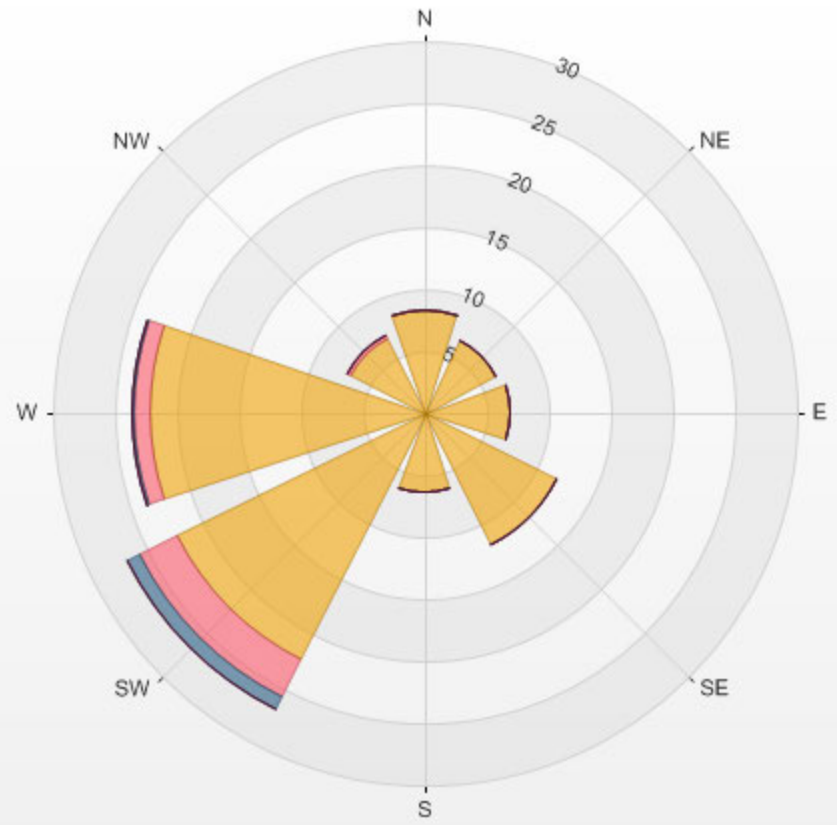
Calm: 2.27%

Calm Avg: 0.06 [ppb]

Direction	0.0-0.4	0.4-0.8	0.8-1.2	1.2-1.6	1.6-2.0	>2.0	Total
N	8.2	0.1	0.0	0.0	0.0	0.0	8.4
NE	6.5	0.0	0.0	0.0	0.0	0.0	6.5
E	7.0	0.0	0.0	0.0	0.0	0.0	7.0
SE	11.9	0.0	0.0	0.0	0.0	0.0	11.9
S	6.5	0.0	0.0	0.0	0.0	0.0	6.5
SW	22.3	3.4	1.1	0.0	0.0	0.0	26.8
W	22.1	1.3	0.3	0.0	0.0	0.0	23.7
NW	6.7	0.3	0.0	0.0	0.0	0.0	7.0
Summary	91.2	5.1	1.4	0.0	0.0	0.0	97.7

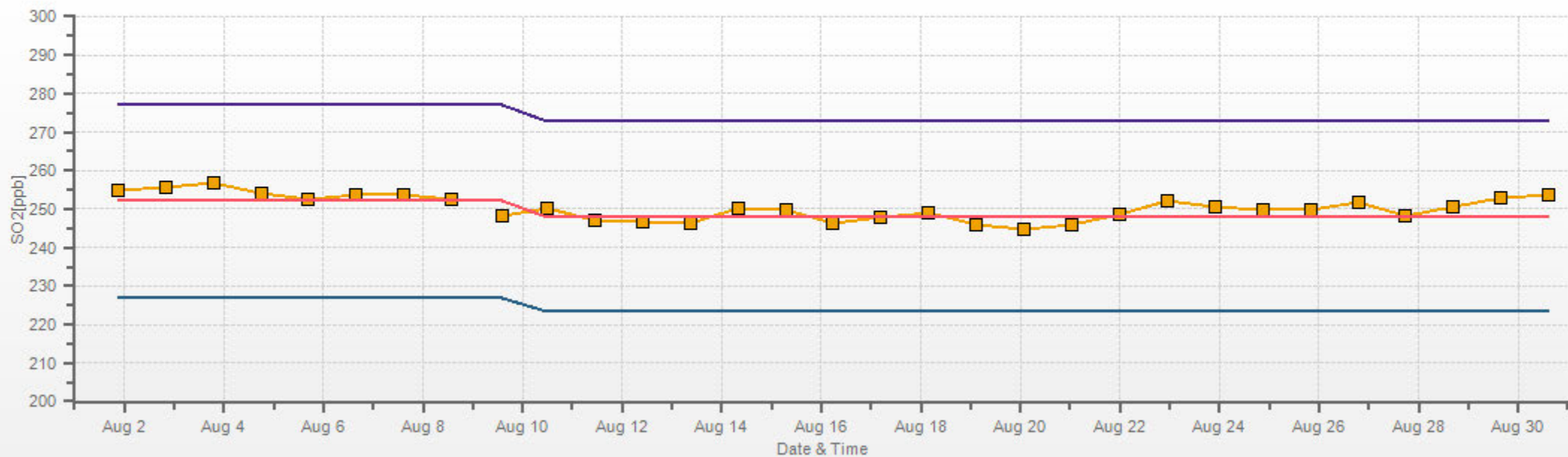
%	Icon	Classes (ppb)	91	5	1	0	0	0
			0.0-0.4	0.4-0.8	0.8-1.2	1.2-1.6	1.6-2.0	>2.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 2.27% Calm Poll Avg: 0.06[ppb]



SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL REDUCED SULPHUR

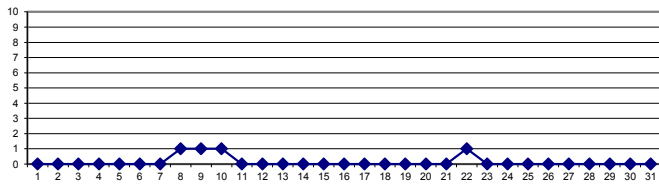
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

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

STATUS FLAG CODES

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

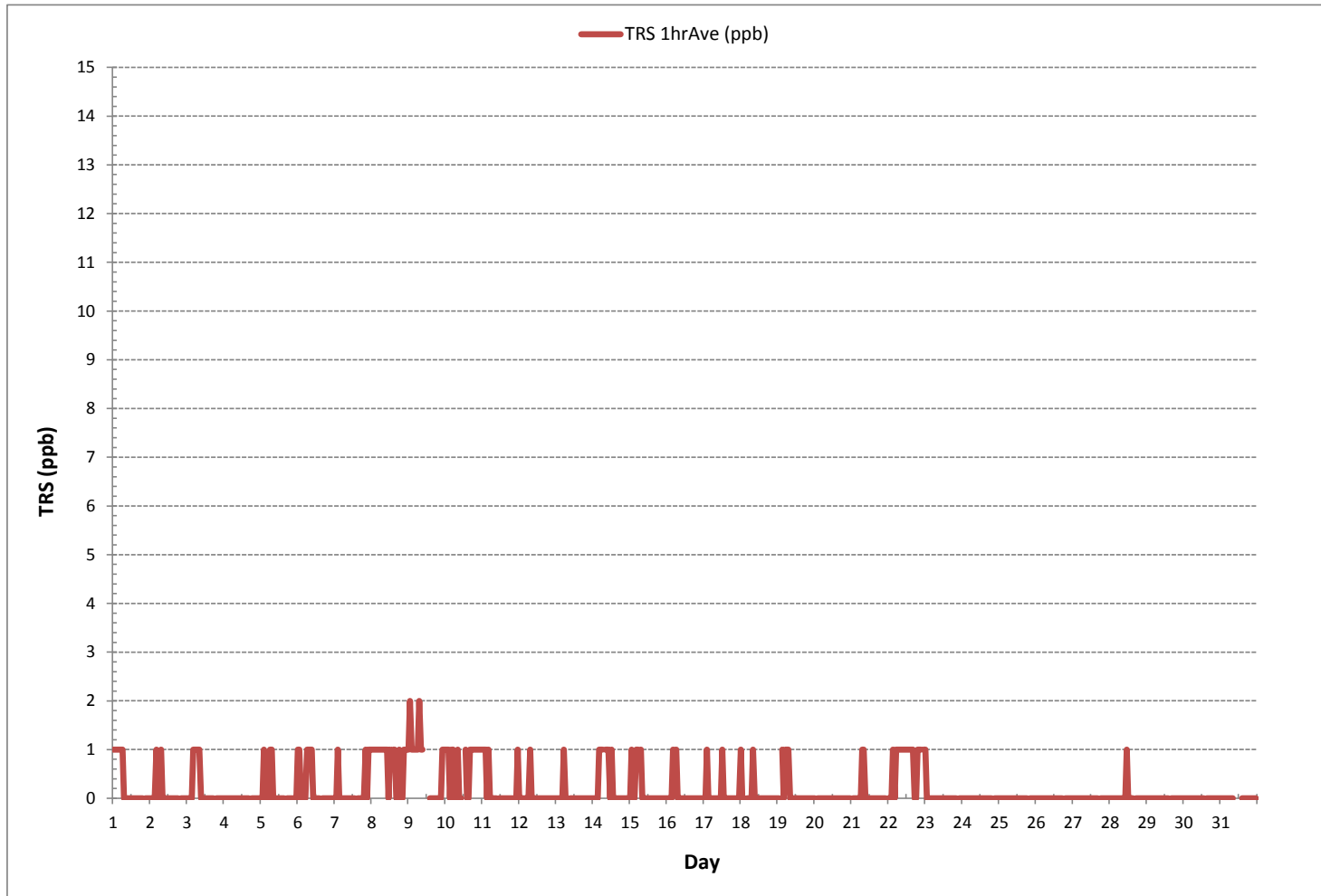
24 HR AVERAGES August 2018



MONTHLY SUMMARY

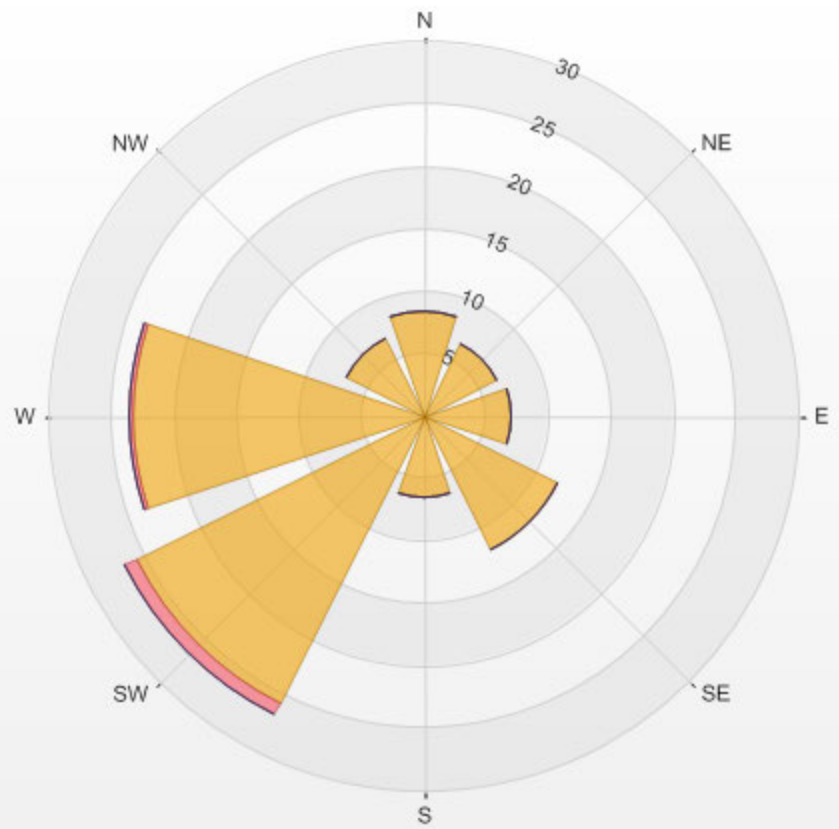
NUMBER OF NON-ZERO READINGS:	121
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 7 ON DAY 1
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR 1 ON DAY 9
MAXIMUM 24-HR AVERAGE:	1 ppb ON DAY 8
IZS CALIBRATION TIME:	30 hrs OPERATIONAL TIME: 737 hrs
MONTHLY CALIBRATION TIME:	4 hrs AMD OPERATION UPTIME: 99.1 %
STANDARD DEVIATION:	0 MONTHLY AVERAGE: 0 ppb

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)



%	Icon	Classes (ppb)	96	1	0	0
		0.0-1.0				
		1.0-2.0				
		2.0-3.0				
		>3.0				

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 2.28% Calm Poll Avg: 0.39[ppb]



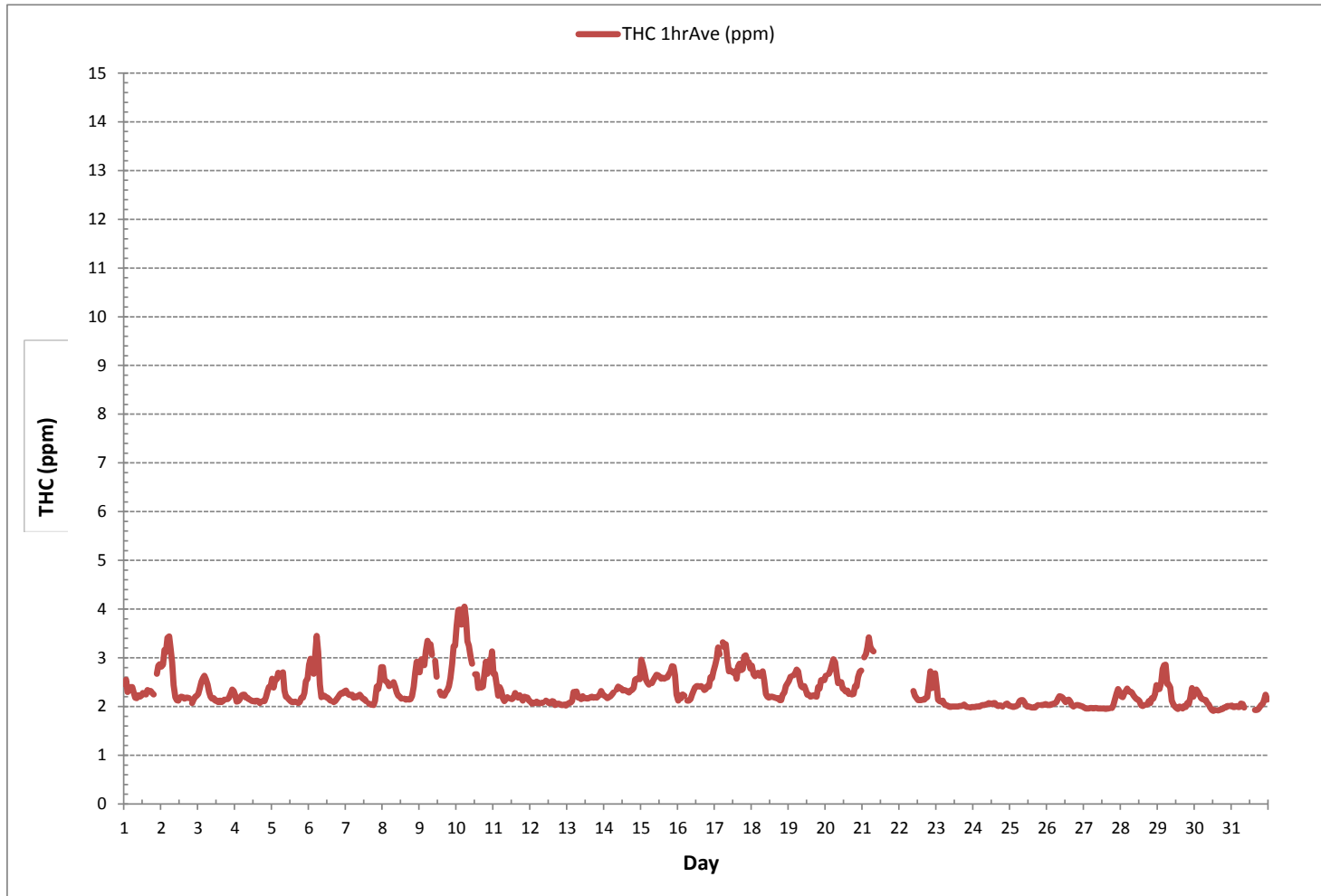
TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



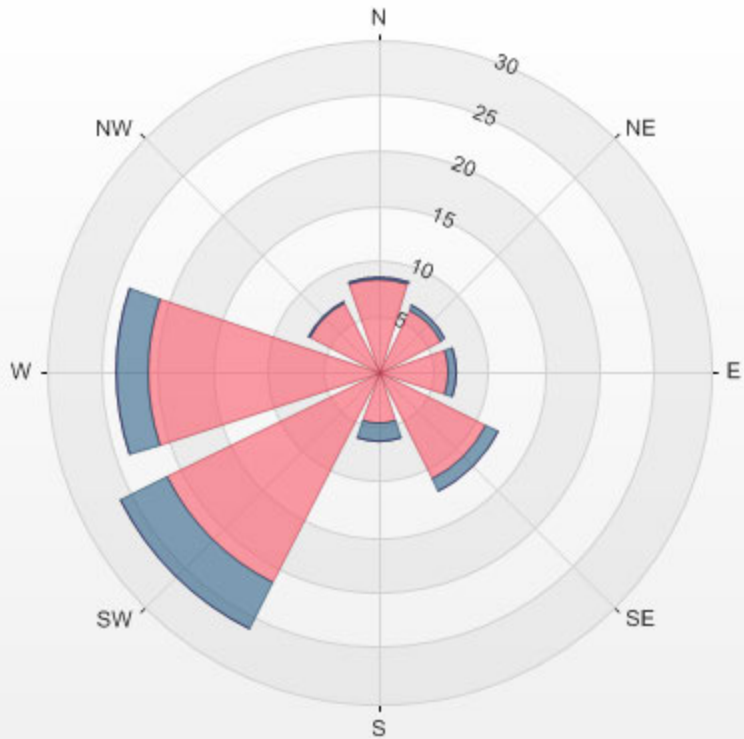
TOTAL HYDROCARBON

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



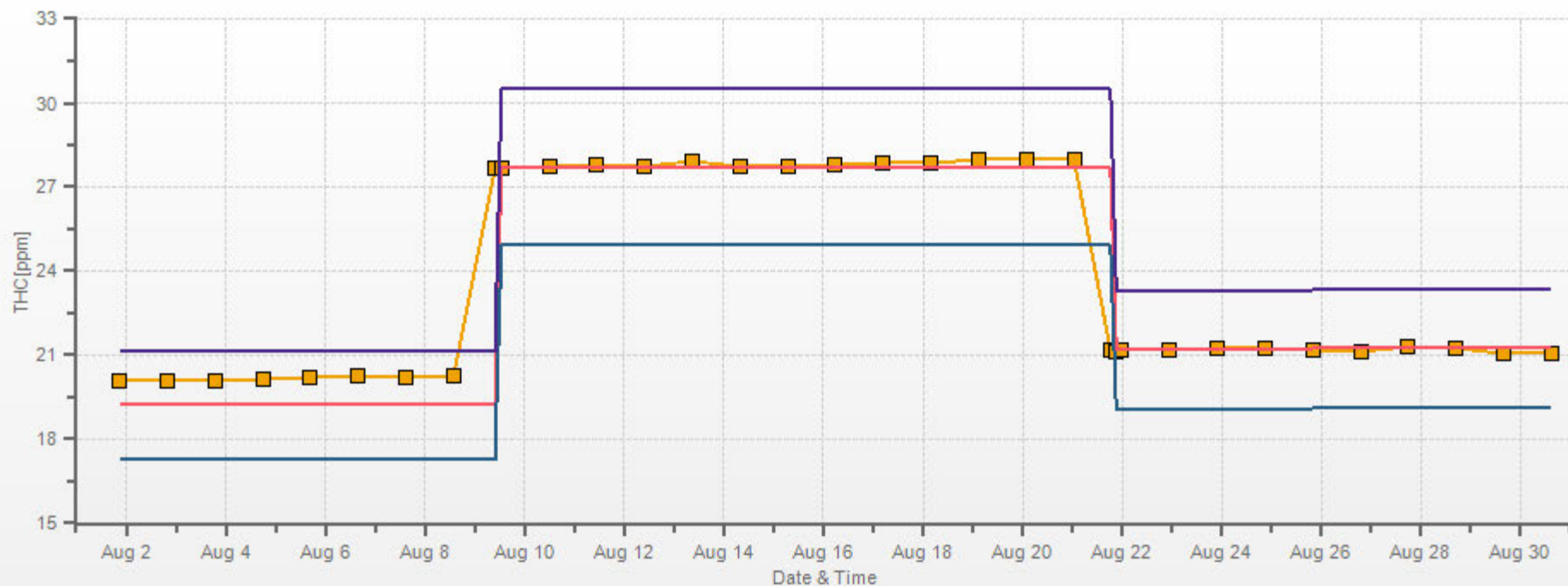
% Icon Classes (ppm) 0 0.0-1.4 86 1.4-2.7 12 2.7-4.1 0 >4.1

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 2.20% Calm Poll Avg: 3.04[ppm]



THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 18/08 Type: Span

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



METHANE



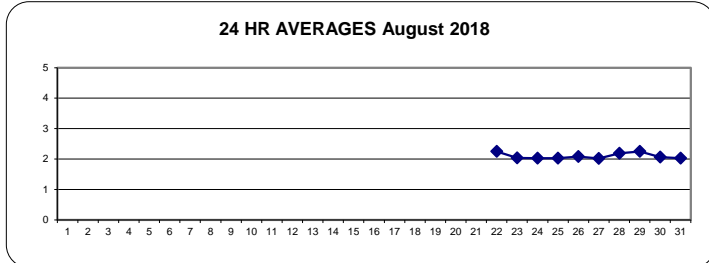
METHANE Hourly Averages (CH₄ ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
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	X	X	X	X	X	X	X	X	Y	2.32	2.22	2.17	2.13	2.13	2.14	2.14	2.14	2.17	2.19	2.47	X	2.38	S	2.68	2.13	2.68	2.25	14
23	2.43	2.14	2.11	2.10	2.12	2.05	2.03	2.02	2.00	1.99	2.00	2.00	2.00	2.00	2.01	2.01	2.00	2.00	2.00	2.00	1.99	S	1.98	1.99	1.98	2.43	2.04	24
24	1.99	1.99	2.00	2.00	2.00	2.02	2.03	2.03	2.03	2.05	2.07	2.06	2.05	2.07	2.07	2.03	2.01	2.02	2.02	2.00	S	2.05	2.06	2.02	1.99	2.07	2.03	24
25	2.01	2.00	1.99	2.00	2.01	2.04	2.11	2.13	2.13	2.09	2.03	2.00	2.00	1.99	1.98	1.98	1.98	2.01	2.03	S	2.03	2.03	2.04	2.05	1.98	2.13	2.03	24
26	2.03	2.03	2.03	2.05	2.05	2.07	2.09	2.16	2.21	2.20	2.18	2.13	2.09	2.13	2.14	2.10	2.03	2.00	S	2.03	2.03	2.02	2.01	2.00	2.00	2.21	2.08	24
27	1.98	1.96	1.96	1.96	1.97	1.97	1.96	1.97	1.97	1.96	1.96	1.96	1.96	1.96	1.95	1.96	1.96	S	1.97	2.03	2.14	2.27	2.36	2.31	1.95	2.36	2.02	24
28	2.21	2.19	2.27	2.32	2.37	2.31	2.31	2.29	2.23	2.19	2.15	2.14	2.11	2.03	2.01	2.03	S	2.04	2.11	2.07	2.17	2.16	2.25	2.44	2.01	2.44	2.19	24
29	2.35	2.36	2.49	2.76	2.84	2.86	2.46	2.45	2.39	2.12	2.04	2.00	1.97	1.95	2.00	S	1.96	2.01	1.99	2.07	2.05	2.17	2.37	2.20	1.95	2.86	2.25	24
30	2.31	2.35	2.30	2.24	2.17	2.15	2.14	2.13	2.07	2.04	1.98	1.93	1.91	1.93	S	1.92	1.93	1.94	1.95	1.98	1.98	2.01	2.01	2.01	1.91	2.35	2.06	24
31	2.02	1.99	1.99	2.01	1.99	1.99	2.06	2.05	1.98	P	P	P	P	P	R	1.93	1.93	1.94	1.98	2.03	2.05	2.13	2.24	2.14	1.93	2.24	2.03	18
HOURLY MAX	2.43	2.36	2.49	2.76	2.84	2.86	2.46	2.45	2.39	2.32	2.22	2.17	2.13	2.13	2.14	2.14	2.14	2.17	2.19	2.47	2.17	2.38	2.37	2.68				
HOURLY AVG	2.15	2.11	2.13	2.16	2.17	2.16	2.13	2.14	2.11	2.11	2.07	2.04	2.02	2.02	2.04	2.01	1.99	2.01	2.03	2.08	2.06	2.14	2.15	2.18				

STATUS FLAG CODES

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

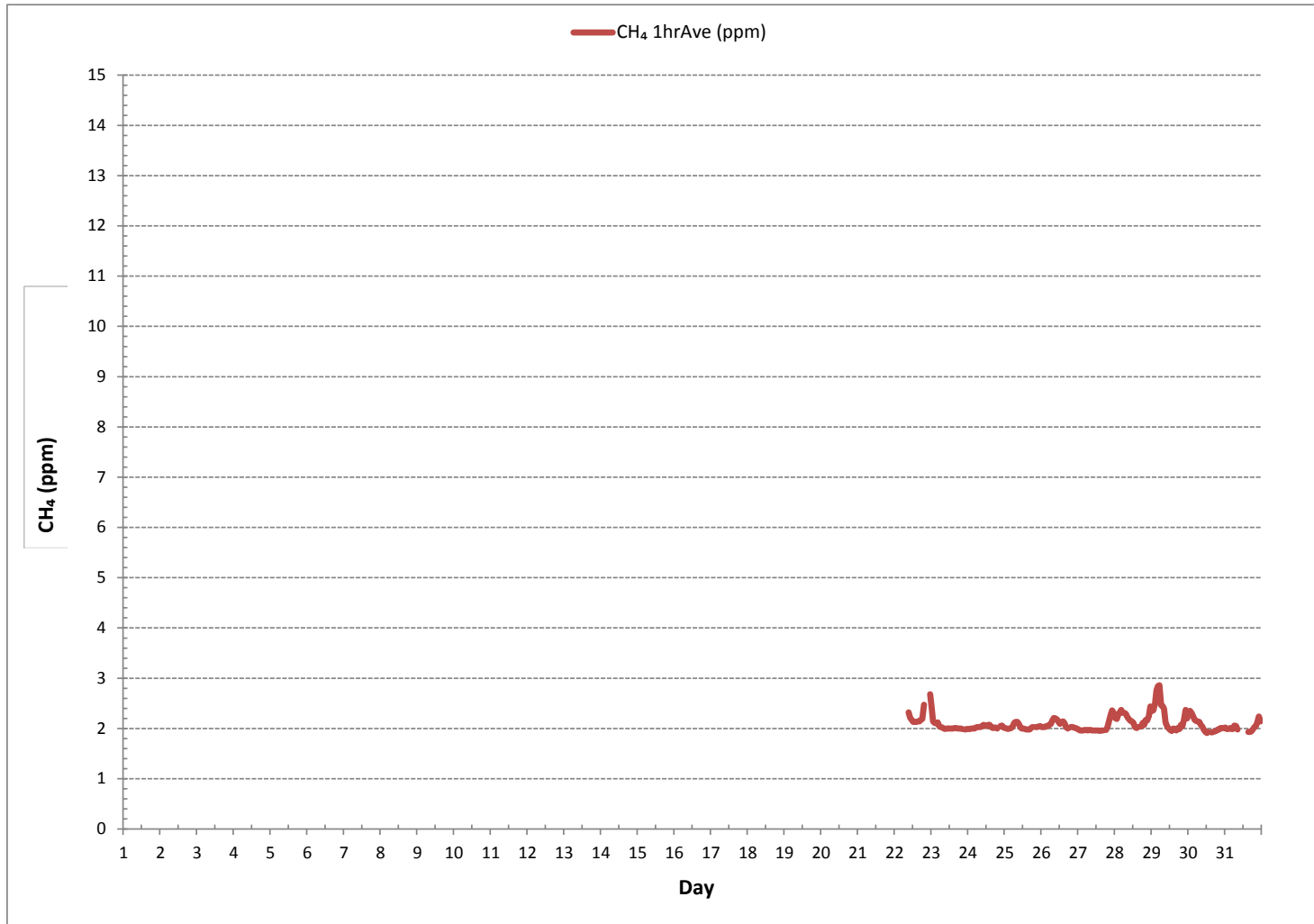
24 HR AVERAGES August 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	215
MINIMUM 1-HR AVERAGE:	1.91 ppm @ HOUR 12 ON DAY 30
MAXIMUM 1-HR AVERAGE:	2.86 ppm @ HOUR 5 ON DAY 29
MAXIMUM 24-HR AVERAGE:	2.25 ppm ON DAY 22
IZS CALIBRATION TIME:	9 hrs OPERATIONAL TIME: 229 hrs
MONTHLY CALIBRATION TIME:	5 hrs AMD OPERATION UPTIME: 30.8 %
STANDARD DEVIATION:	0.16 MONTHLY AVERAGE: 2.09 ppm

METHANE Hourly Averages (CH₄ ppm)



% Icon Classes (ppm)

0

0.0-1.0

1

1.0-1.9

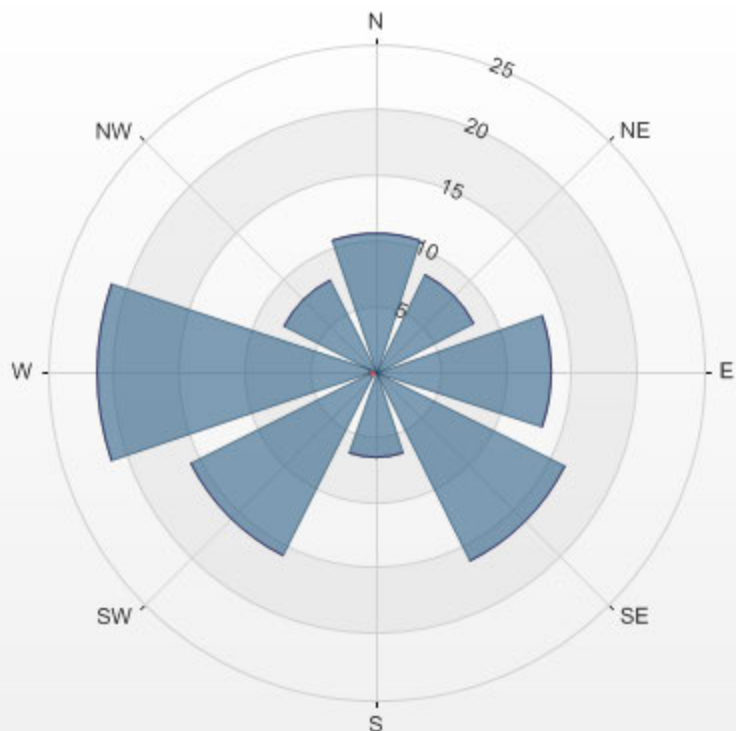
99

1.9-2.9

0

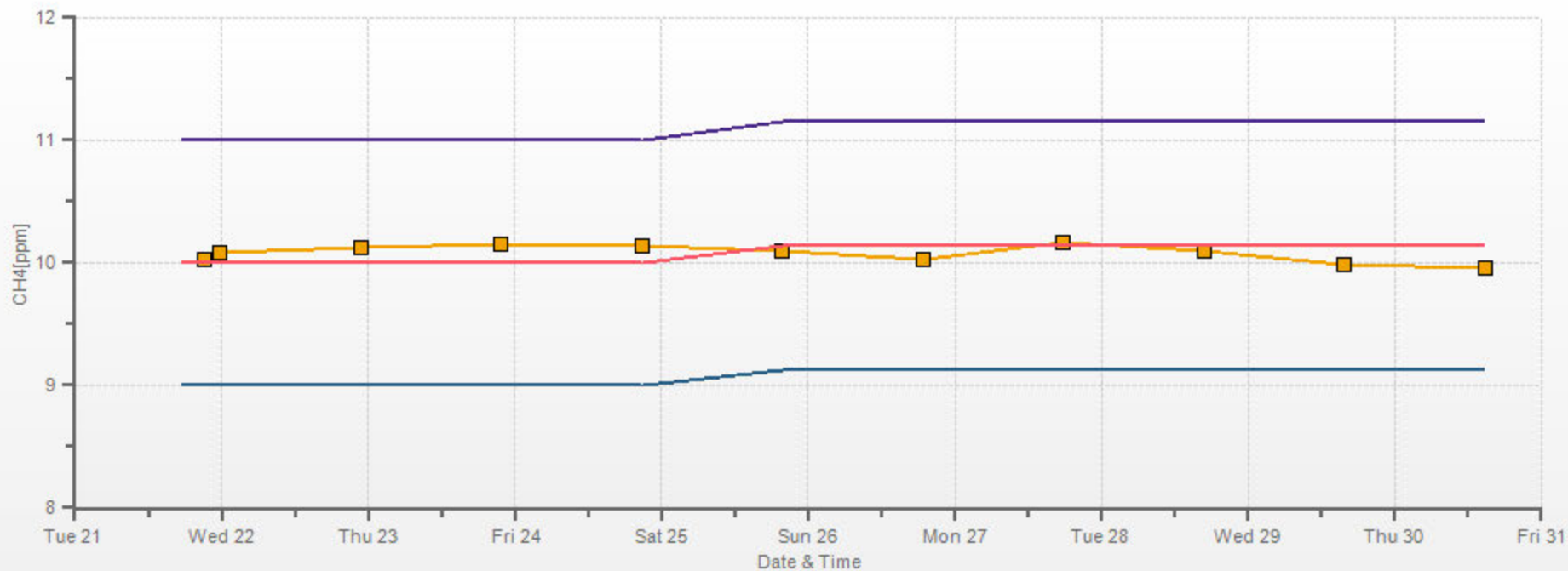
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-CH4[ppm] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



CH4[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



NON-METHANE HYDROCARBON



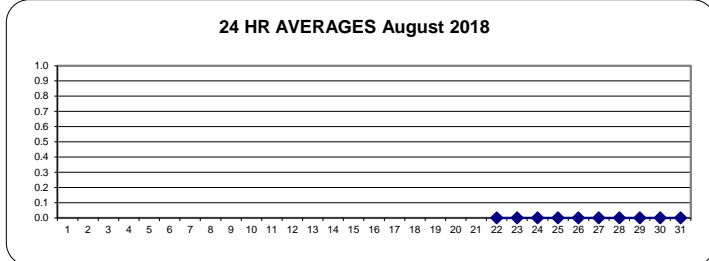
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.						
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.							
DAY																																		
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
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	X	X	X	X	X	X	X	X	Y	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	X	0.01	S	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	5	
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14	
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
29	0.01	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	0.00	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
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	S	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	0.00	0.00	0.00	0.00	0.00	0.00	P	P	P	P	P	R	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18
HOURLY MAX	0.01	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	0.00	0.00	0.00	0.00	0.00	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	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

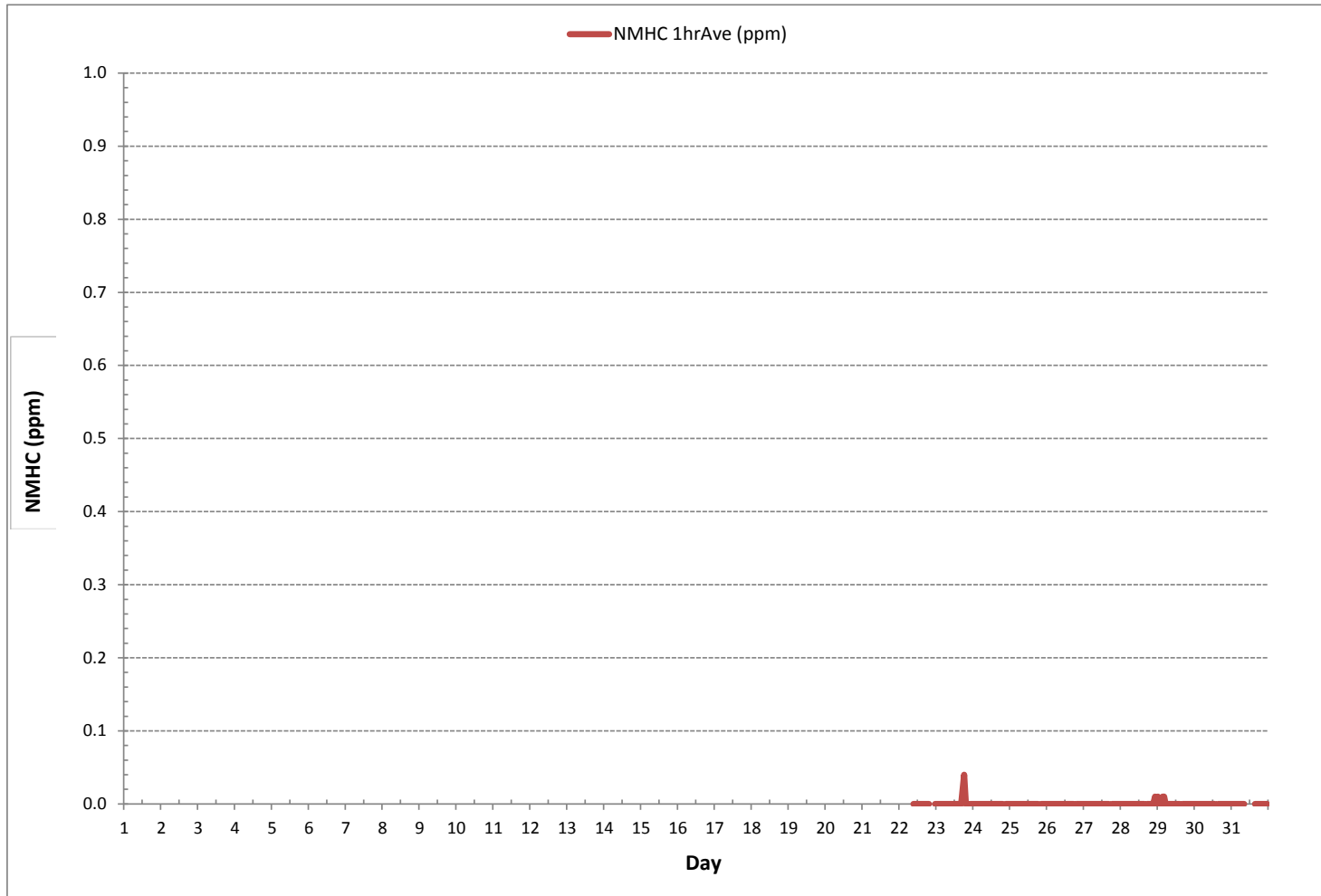
24 HR AVERAGES August 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	7
MINIMUM 1-HR AVERAGE:	0.00 ppm @ HOUR 9 ON DAY 22
MAXIMUM 1-HR AVERAGE:	0.04 ppm @ HOUR 18 ON DAY 23
MAXIMUM 24-HR AVERAGE:	0.00 ppm ON DAY 22
IZS CALIBRATION TIME:	9 hrs OPERATIONAL TIME: 229 hrs
MONTHLY CALIBRATION TIME:	5 hrs AMD OPERATION UPTIME: 30.8 %
STANDARD DEVIATION:	0.00 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: 18/08
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

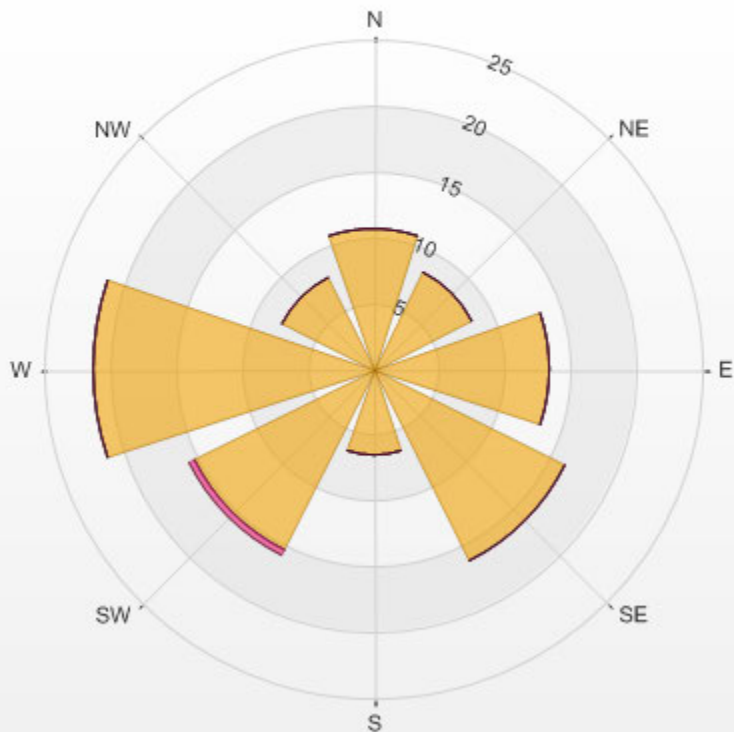
Calm: 0.00%

Calm Avg: 0.00 [ppm]

Direction	0-0.092	0.092-0.184	0.184-0.276	0.276-0.368	0.368-0.46	>0.5	Total
N	10.7	0.0	0.0	0.0	0.0	0.0	10.7
NE	8.3	0.0	0.0	0.0	0.0	0.0	8.3
E	13.4	0.0	0.0	0.0	0.0	0.0	13.4
SE	16.2	0.0	0.0	0.0	0.0	0.0	16.2
S	6.5	0.0	0.0	0.0	0.0	0.0	6.5
SW	15.3	0.0	0.0	0.0	0.5	0.0	15.7
W	21.3	0.0	0.0	0.0	0.0	0.0	21.3
NW	7.9	0.0	0.0	0.0	0.0	0.0	7.9
Summary	100.0	0.0	0.0	0.0	0.5	0.0	100.0

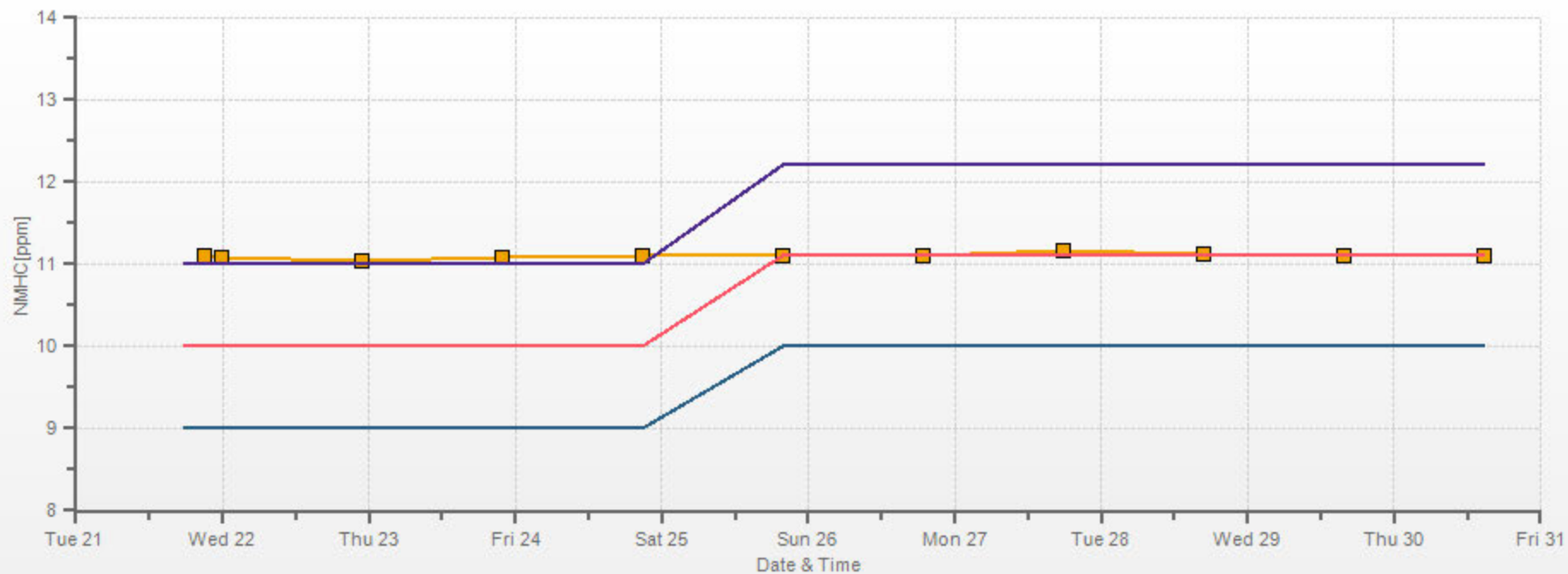
% Icon	Classes (ppm)	100	0	0	0	0	0	0					
			0-0.092		0.092-0.184		0.184-0.276		0.276-0.368		0.368-0.46		>0.5

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NMHC[ppm] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



NMHC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



OXIDES OF NITROGEN



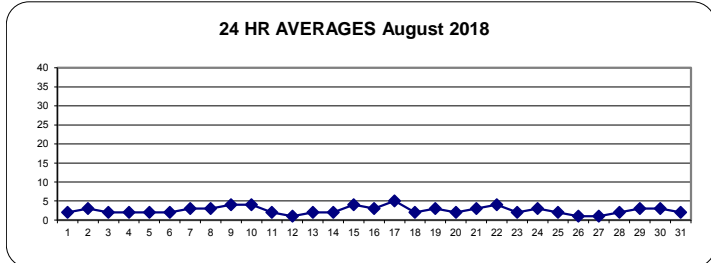
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

STATUS FLAG CODES

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

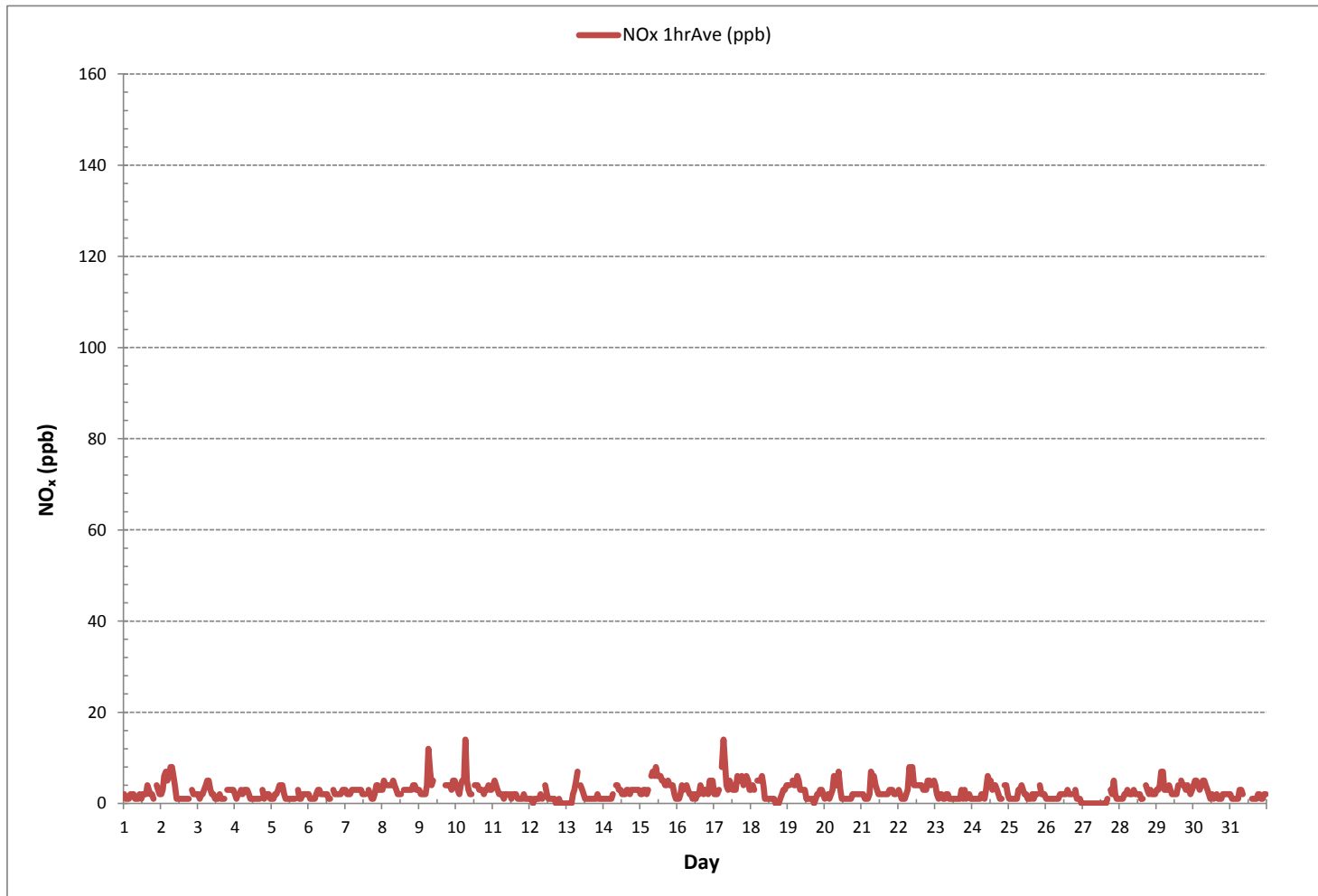
24 HR AVERAGES August 2018



MONTHLY SUMMARY

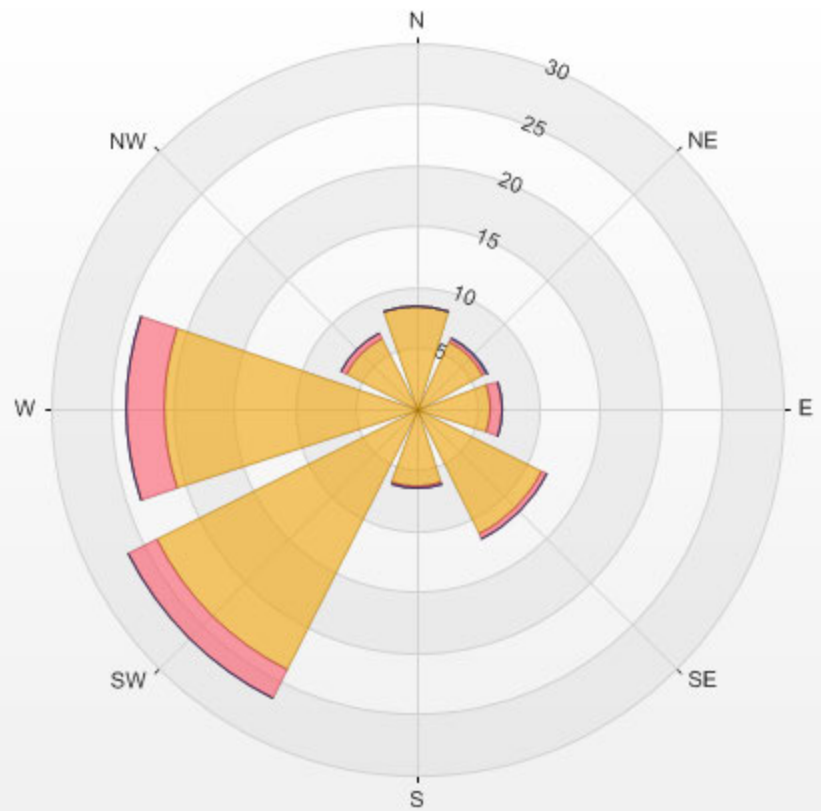
NUMBER OF NON-ZERO READINGS:	670			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	2	ON DAY 12
MAXIMUM 1-HR AVERAGE:	14	ppb @ HOUR	6	ON DAY 10
MAXIMUM 24-HR AVERAGE:	5	ppb		ON DAY 17
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	739 hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	99.3 %
STANDARD DEVIATION:	2		MONTHLY AVERAGE:	2 ppb

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



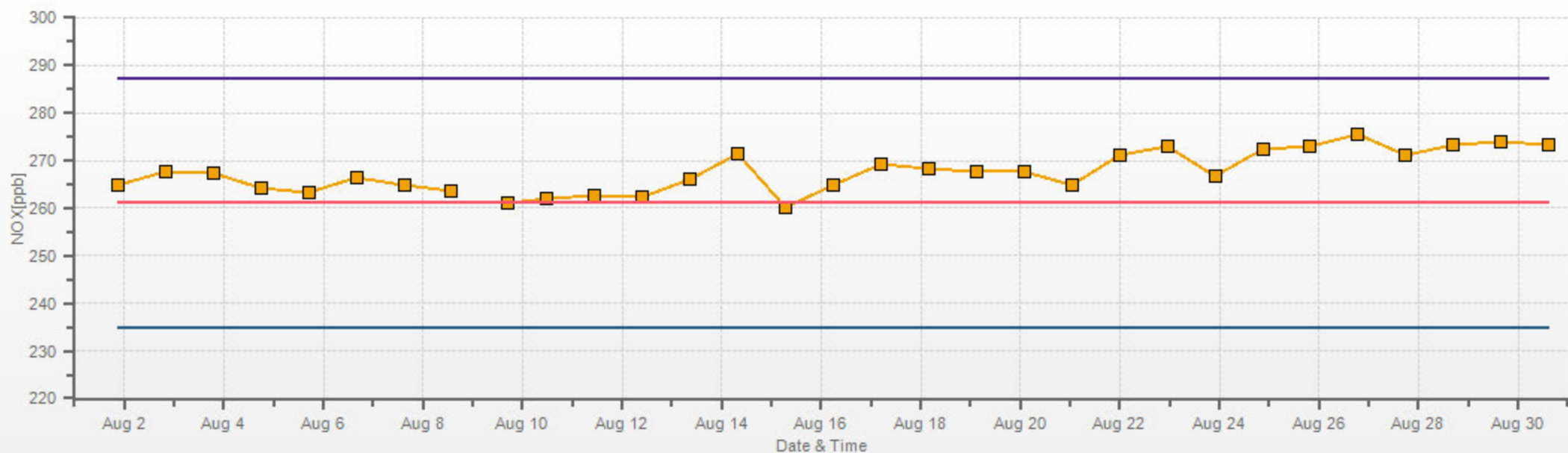
% Icon Classes (ppb) 90 0.0-5.0 8 5.0-10.0 0 10.0-15.0 0 >15.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 2.28% Calm Poll Avg: 3.98[ppb]



NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



NITRIC OXIDE



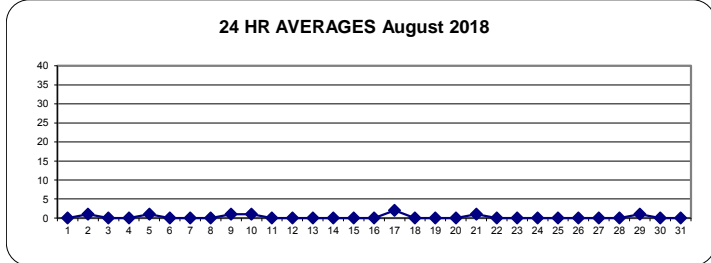
NITRIC OXIDE Hourly Averages (NO ppb)

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

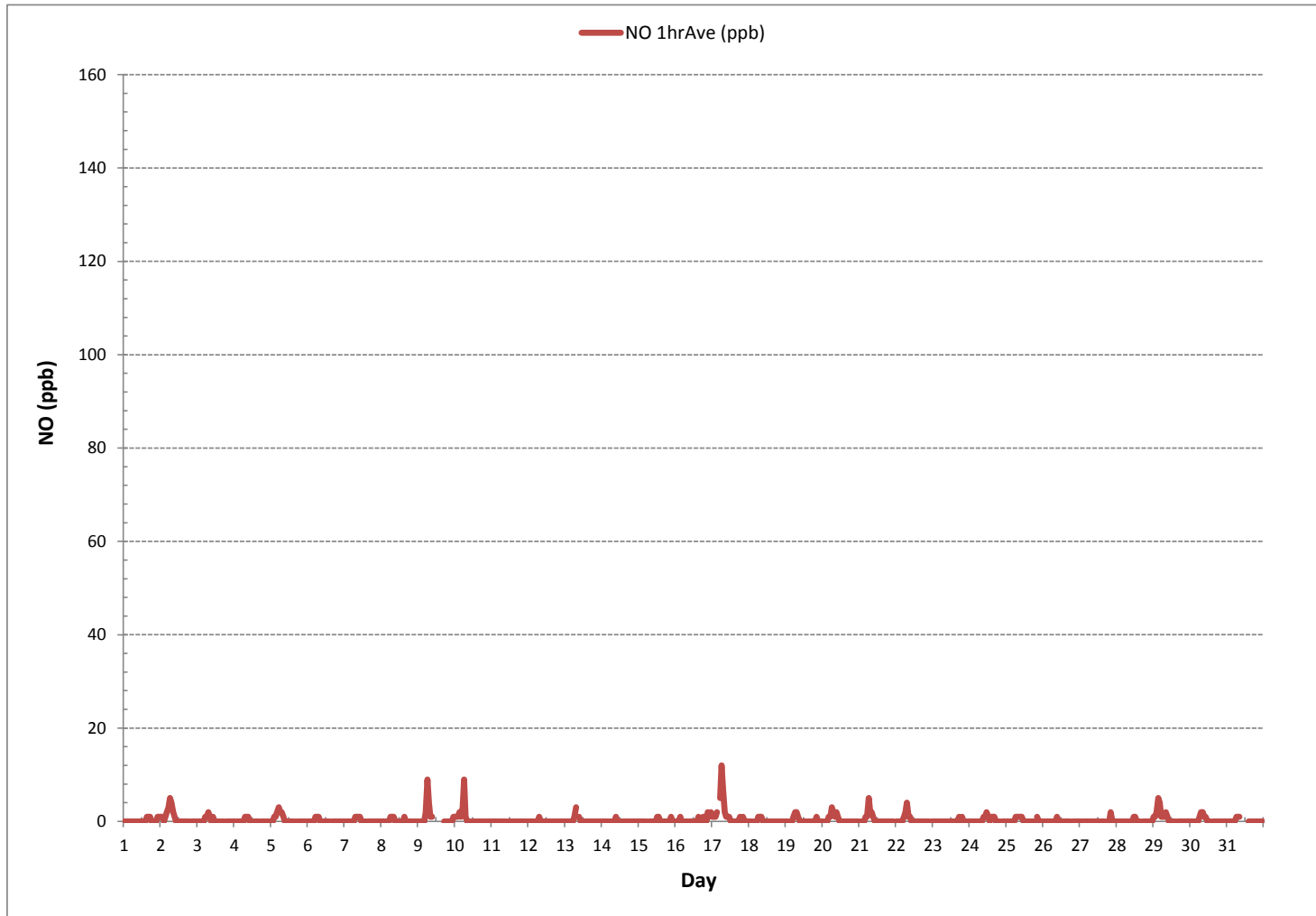
24 HR AVERAGES August 2018



MONTHLY SUMMARY

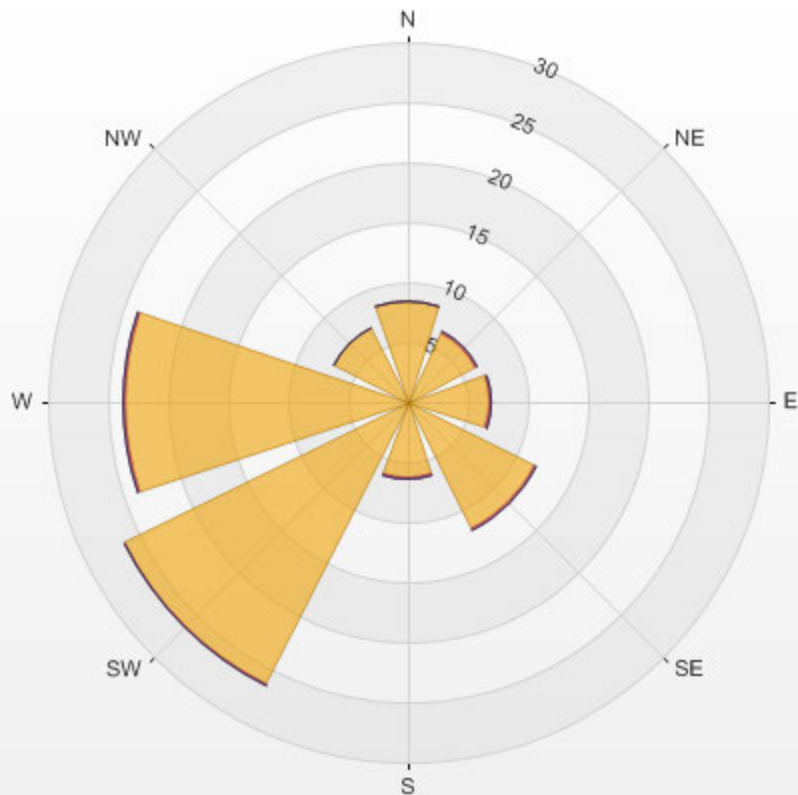
NUMBER OF NON-ZERO READINGS:	145			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	12 ppb	@ HOUR	17	ON DAY 17
MAXIMUM 24-HR AVERAGE:	2 ppb			ON DAY 17
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	739 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	99.3 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)



%	Icon	Classes (ppb)	97	1	0	0
		0.0-4.3				
		4.3-8.7				
		8.7-13.0				
		>13.0				

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 2.28% Calm Poll Avg: 2.24[ppb]



NITROGEN DIOXIDE



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

STATUS FLAG CODES

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

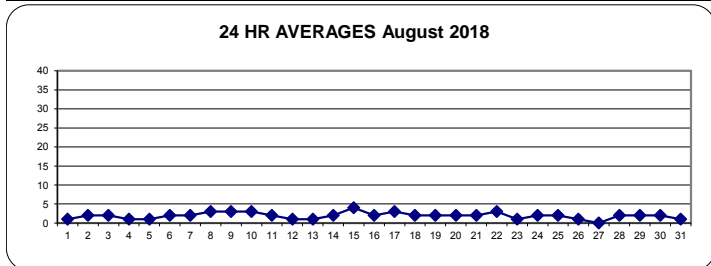
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

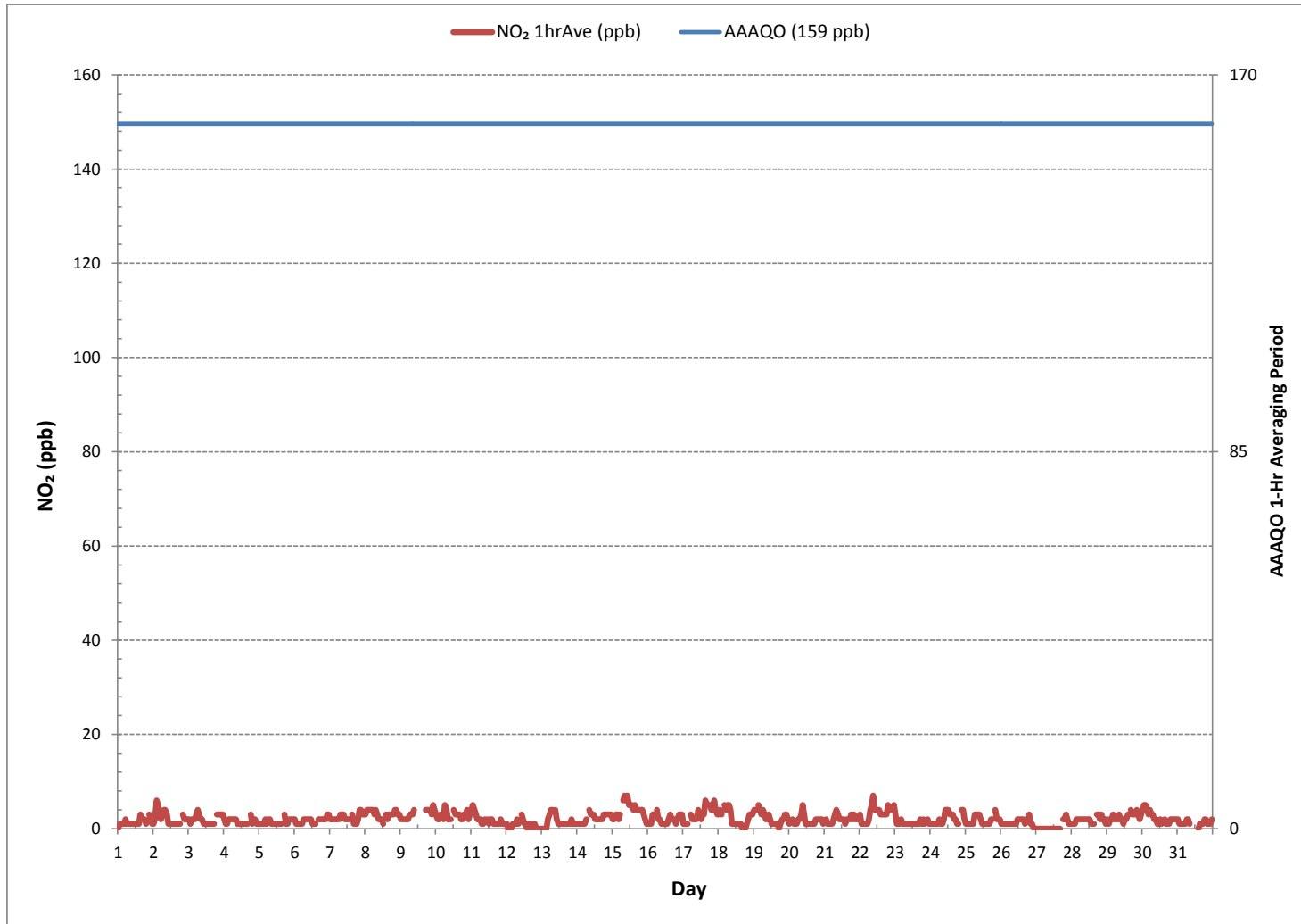
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	664			
MINIMUM 1-HR AVERAGE:	0	ppb	@ HOUR	1 ON DAY 12
MAXIMUM 1-HR AVERAGE:	7	ppb	@ HOUR	8 ON DAY 15
MAXIMUM 24-HR AVERAGE:	4	ppb		ON DAY 15
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	739 hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	99.3 %
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	2 ppb

24 HR AVERAGES August 2018



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



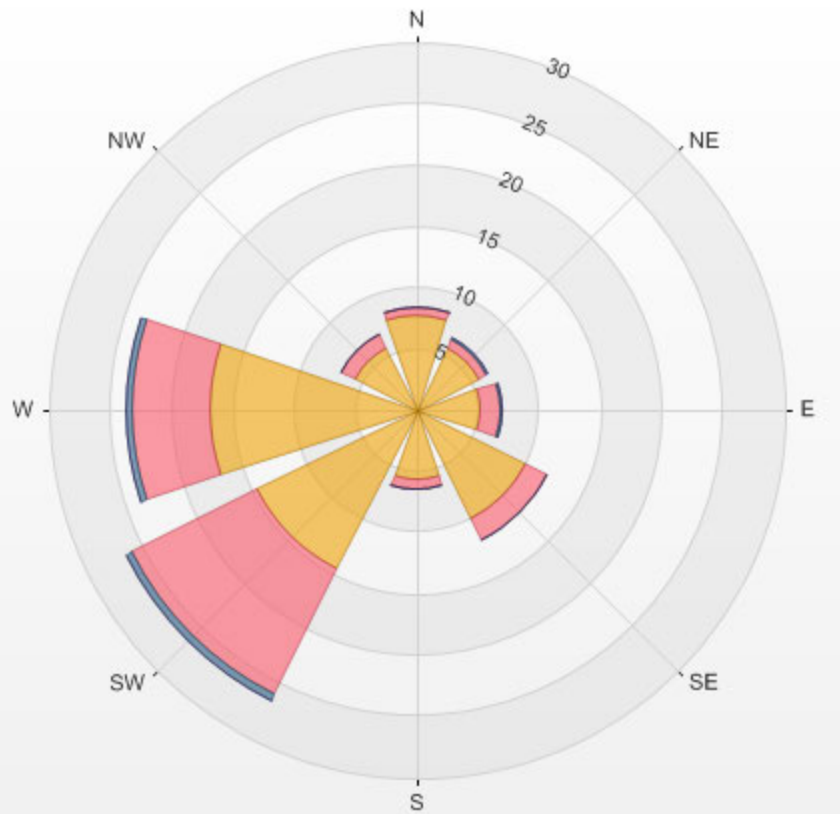
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO₂[ppb]
 Monthly: 18/08
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 2.28% Calm Avg: 1.74 [ppb]

Direction	0.0-2.7	2.7-5.3	5.3-8.0	>8.0	Total
N	7.7	0.7	0.0	0.0	8.4
NE	5.7	0.7	0.1	0.0	6.6
E	5.3	1.6	0.1	0.0	7.0
SE	10.0	2.0	0.0	0.0	12.0
S	5.7	0.9	0.0	0.0	6.6
SW	14.5	11.4	0.6	0.0	26.5
W	16.8	6.4	0.6	0.0	23.8
NW	5.6	1.4	0.0	0.0	7.0
Summary	71.2	25.1	1.4	0.0	97.7

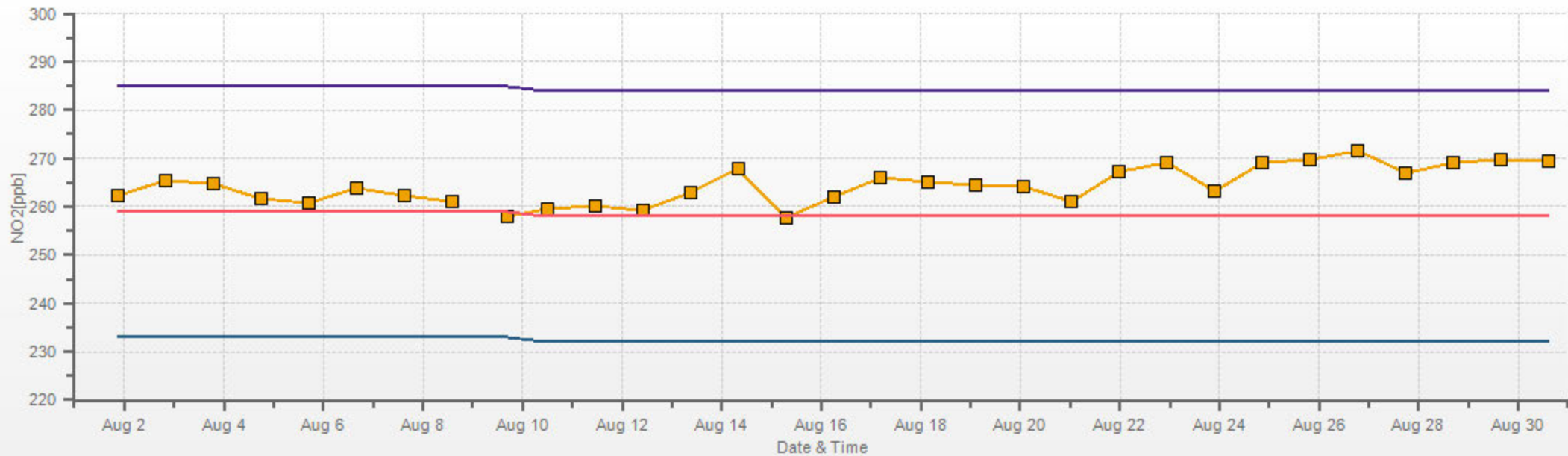
% Icon	Classes (ppb)	71	0.0-2.7	25	2.7-5.3	1	5.3-8.0	0	>8.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 2.28% Calm Poll Avg: 1.74[ppb]



NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



OZONE

OZONE Hourly Averages (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	17.3	14.4	19.9	16.1	18.2	16.0	19.8	23.1	24.7	25.8	26.6	25.9	20.4	22.6	24.0	17.4	17.1	20.4	21.0	20.3	S	5.0	1.7	1.2	1.2	26.6	18.2	24	
2	1.0	2.4	3.5	1.7	1.4	1.7	4.1	9.9	23.2	33.8	39.9	41.1	42.1	42.1	40.1	40.8	41.5	39.8	35.2	S	34.9	25.8	16.1	17.2	1.0	42.1	23.4	24	
3	21.7	17.2	12.7	9.6	7.7	11.3	12.3	14.2	18.9	23.2	26.1	29.6	32.3	32.2	24.7	27.1	22.9	20.9	S	16.5	12.5	10.5	9.4	9.4	7.7	32.3	18.4	24	
4	12.1	15.7	15.4	15.6	13.6	12.5	11.3	9.3	11.5	13.7	15.8	16.2	17.0	18.7	20.4	23.7	26.1	S	22.3	20.7	12.1	5.7	5.0	7.0	5.0	26.1	14.8	24	
5	2.5	2.5	1.7	1.6	1.0	1.0	4.6	10.6	16.3	21.5	26.1	28.0	28.2	30.8	30.7	30.2	S	27.9	26.2	22.2	15.6	9.3	11.0	9.9	1.0	30.8	15.6	24	
6	5.4	2.9	1.3	1.1	1.8	1.2	6.4	19.9	29.4	33.2	35.7	35.1	35.0	34.8	35.6	S	29.7	29.8	26.9	24.4	23.4	21.6	18.9	17.0	1.1	35.7	20.5	24	
7	16.2	16.7	16.9	16.6	15.6	15.8	15.9	17.5	18.9	20.2	23.2	26.6	30.0	33.8	S	31.0	31.2	31.3	30.0	27.1	17.4	15.8	10.4	7.9	7.9	33.8	21.1	24	
8	6.3	12.7	12.7	12.4	11.3	8.6	11.4	14.7	20.7	29.3	33.8	35.3	36.6	S	42.2	49.5	53.7	52.2	47.4	41.5	27.6	18.1	12.3	10.1	6.3	53.7	26.1	24	
9	12.6	9.2	6.8	3.3	1.8	1.1	0.9	9.3	20.4	29.8	38.5	48.5	S	49.9	52.4	55.5	55.3	52.7	35.2	14.9	3.3	0.0	0.0	0.0	0.0	55.5	21.8	24	
10	0.0	0.0	0.0	0.7	0.7	0.6	1.2	11.8	C	C	C	C	C	S	55.9	58.7	54.3	50.9	45.8	30.1	15.0	16.5	7.2	8.9	6.7	0.0	58.7	19.2	24
11	11.4	8.5	14.5	17.7	12.0	14.3	18.4	18.8	19.0	17.7	S	20.7	21.5	20.2	13.7	18.9	21.2	17.3	20.1	21.4	18.9	19.6	22.2	25.4	8.5	25.4	18.0	24	
12	24.5	22.7	24.5	22.1	21.5	24.5	22.8	23.9	26.4	S	23.1	20.3	22.4	24.7	22.7	21.7	23.1	24.3	21.7	22.0	22.3	24.1	23.7	24.1	20.3	26.4	23.2	24	
13	23.4	22.4	20.2	19.9	14.4	12.4	11.2	14.4	S	25.9	27.8	29.8	30.7	30.2	30.7	31.4	31.4	31.6	29.6	23.5	15.7	20.6	21.0	23.2	11.2	31.6	23.5	24	
14	24.6	25.8	26.8	25.6	23.6	22.1	20.9	S	20.9	24.0	28.4	33.3	36.6	39.2	41.5	43.0	40.6	39.4	33.8	22.6	19.0	23.3	20.4	15.0	15.0	43.0	28.3	24	
15	6.6	9.3	15.1	14.7	14.3	13.8	S	11.8	11.8	11.4	9.7	10.9	13.1	15.0	17.0	17.0	16.8	16.2	12.6	8.4	3.4	1.5	7.9	19.6	1.5	19.6	12.1	24	
16	19.5	10.8	9.0	6.0	12.5	S	18.4	19.1	18.9	18.0	17.2	16.1	16.0	16.2	17.3	14.0	16.0	15.7	12.5	10.4	12.6	6.9	2.4	1.2	1.2	19.5	13.3	24	
17	0.8	0.4	0.4	0.4	S	0.5	0.6	1.3	5.4	10.6	14.2	21.7	29.8	35.2	37.8	30.5	20.2	15.3	8.7	5.1	3.6	7.4	9.1	11.6	0.4	37.8	11.8	24	
18	12.0	14.2	13.1	S	11.1	12.1	11.6	12.4	20.2	32.2	37.2	36.4	33.6	32.3	31.4	30.7	31.0	30.2	28.3	24.6	18.5	13.6	9.1	7.3	7.3	37.2	21.9	24	
19	5.8	4.5	S	5.3	2.8	2.8	5.9	9.7	15.1	22.8	26.9	26.2	29.8	31.9	31.7	29.2	30.6	29.8	25.7	14.6	10.0	5.7	4.9	6.9	2.8	31.9	16.5	24	
20	5.2	S	2.9	1.5	0.9	0.8	2.2	9.0	20.1	23.9	33.5	33.3	33.7	36.3	39.1	35.9	36.2	35.2	29.6	17.6	14.7	12.0	10.1	8.1	0.8	39.1	19.2	24	
21	S	3.2	2.0	1.4	0.8	1.1	1.4	10.1	22.5	32.5	41.1	46.2	51.5	53.8	53.5	53.0	53.8	51.2	40.8	26.6	16.4	11.5	9.0	S	0.8	53.8	26.5	24	
22	5.2	5.2	5.3	2.6	2.0	1.6	2.0	7.6	23.3	30.7	33.9	33.0	33.9	35.7	36.2	38.6	39.2	38.3	34.4	22.0	11.2	7.2	S	3.8	1.6	39.2	19.7	24	
23	12.1	20.8	20.1	17.8	15.9	18.0	18.0	18.4	18.3	19.5	21.0	22.0	21.5	21.3	21.1	21.2	20.1	19.1	17.1	16.4	17.1	S	16.5	15.3	12.1	22.0	18.6	24	
24	15.2	14.8	13.8	15.0	14.7	14.1	12.8	13.3	11.8	8.4	5.2	5.8	5.5	5.4	4.7	6.2	8.6	8.4	9.4	10.6	S	7.3	5.9	7.7	4.7	15.2	9.8	24	
25	7.8	9.3	10.9	10.3	10.7	8.5	9.6	12.6	13.5	16.2	18.6	23.7	24.4	23.7	24.5	25.1	23.6	22.4	18.8	S	16.3	16.1	15.2	14.8	7.8	25.1	16.4	24	
26	15.8	16.7	17.0	14.4	13.5	12.7	11.2	10.3	9.6	10.3	14.0	20.4	25.7	20.4	16.3	22.1	23.8	25.6	S	19.1	10.7	9.8	11.9	13.4	9.6	25.7	15.9	24	
27	14.6	14.8	14.9	15.7	16.9	18.1	18.2	16.7	17.4	22.9	23.6	24.1	26.4	28.4	28.7	29.3	28.6	S	24.7	11.0	4.8	5.3	3.8	5.7	3.8	29.3	18.0	24	
28	12.0	11.7	10.8	12.1	11.4	11.4	13.7	14.1	15.6	16.3	18.4	20.3	22.4	25.5	26.3	26.5	S	26.6	21.4	20.7	18.3	14.7	7.0	1.9	1.9	26.6	16.5	24	
29	0.9	0.5	0.4	0.4	0.8	3.0	7.1	6.8	10.8	18.6	23.9	25.4	24.4	24.5	19.8	S	15.5	13.3	12.8	5.9	8.6	4.4	2.2	6.2	0.4	25.4	10.3	24	
30	5.5	5.4	8.4	9.1	8.5	7.2	7.2	8.6	11.1	14.8	20.2	24.0	21.9	19.4	S	17.9	17.0	18.1	17.1	15.8	14.4	14.6	15.7	14.4	5.4	24.0	13.8	24	
31	13.2	13.4	13.8	14.3	14.6	13.9	11.1	11.6	15.7	P	P	P	P	P	22.0	26.0	28.7	26.6	18.6	18.5	18.7	12.7	10.5	18.0	10.5	28.7	16.9	19	
HOURLY MAX	24.6	25.8	26.8	25.6	23.6	24.5	22.8	23.9	29.4	33.8	41.1	48.5	51.5	55.9	58.7	55.5	55.3	52.7	47.4	41.5	34.9	25.8	23.7	25.4					
HOURLY AVG	11.0	10.9	11.2	10.2	9.9	9.4	10.4	13.0	17.6	21.7	25.1	26.9	27.4	29.7	29.8	29.9	29.5	28.5	24.6	18.6	15.1	11.9	10.7	11.0					

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

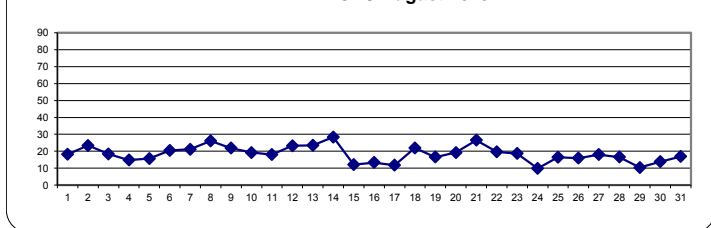
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

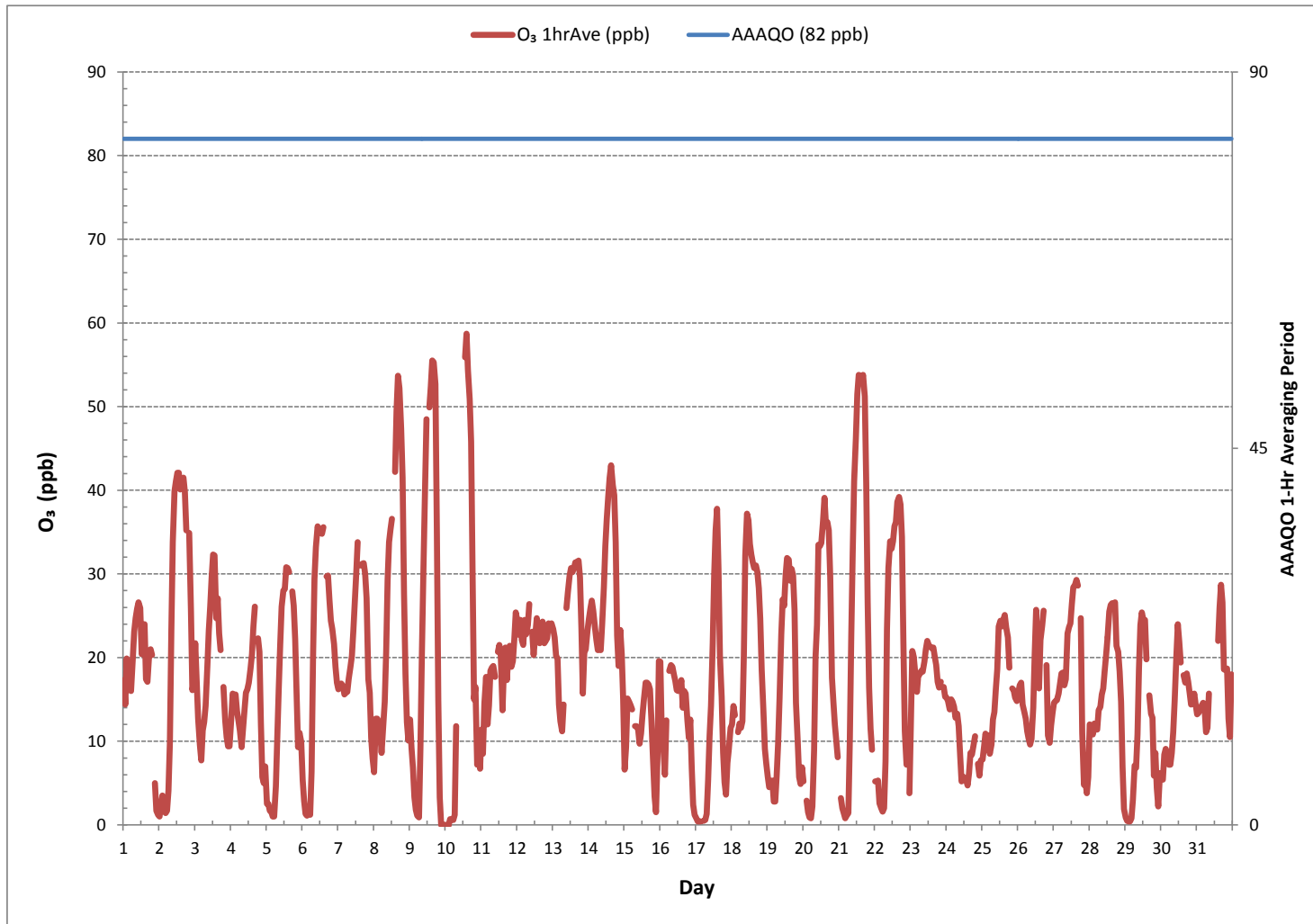
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	698			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR	21	ON DAY 9
MAXIMUM 1-HR AVERAGE:	58.7 ppb	@ HOUR	14	ON DAY 10
MAXIMUM 24-HR AVERAGE:	28.3 ppb			ON DAY 14
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	739 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.3 %	
STANDARD DEVIATION:	11.6	MONTHLY AVERAGE:	18.4 ppb	

24 HR AVERAGES August 2018

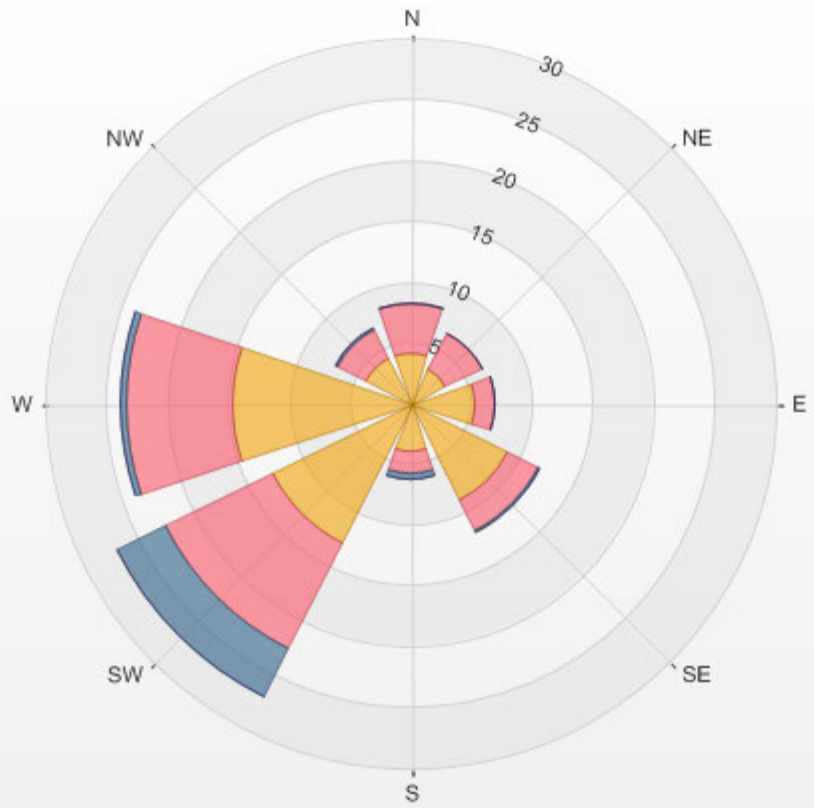


OZONE Hourly Averages (O₃ ppb)



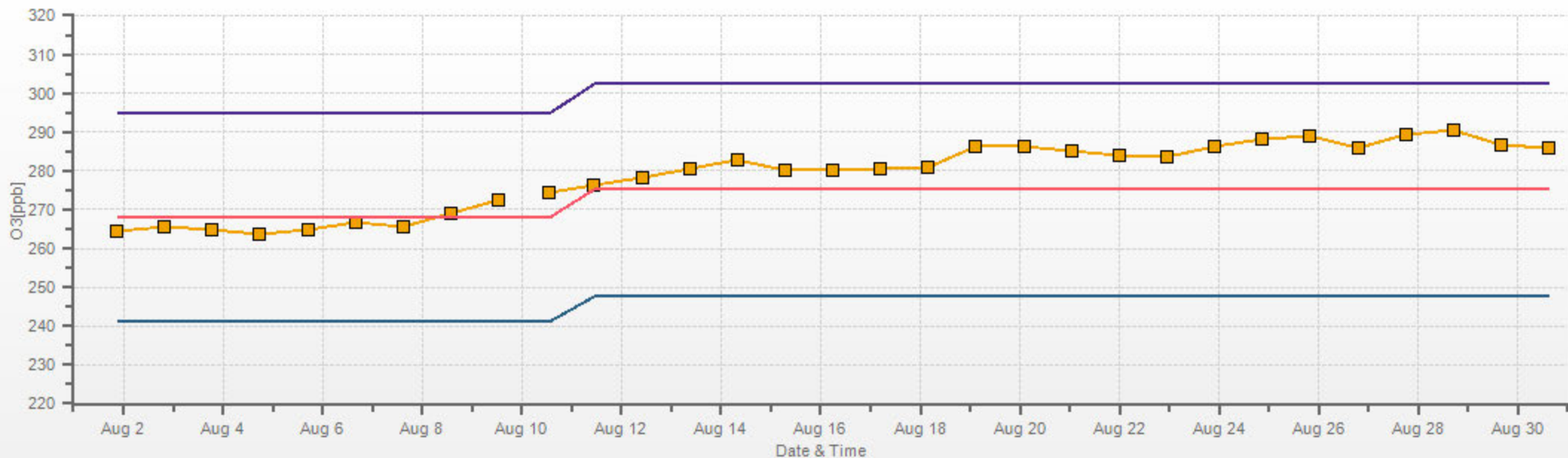
% Icon	Classes (ppb)	57	0.0-19.6	35	19.6-39.2	6	39.2-58.8	0	>58.8
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 2.27% Calm Poll Avg: 1.69[ppb]



O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



PARTICULATE MATTER 2.5



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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	13	11	2	2	4	3	3	3	12	8	6	3	3	5	4	3	2	2	2	5	7	8	13	15	2	15	6	24	
2	22	23	32	26	24	26	20	6	3	3	3	3	3	3	3	3	3	3	3	3	3	5	5	10	3	32	10	24	
3	17	17	15	19	19	18	14	16	16	19	18	9	11	9	8	6	5	4	4	4	8	9	7	12	4	19	12	24	
4	13	7	6	6	8	9	10	9	11	12	9	8	8	9	8	8	5	3	2	3	6	5	4	5	2	13	7	24	
5	12	14	12	11	10	9	7	6	4	1	1	1	2	3	3	4	5	5	6	5	8	8	5	11	1	14	6	24	
6	18	24	34	35	30	27	32	21	15	10	8	6	4	2	4	7	9	8	12	15	10	6	4	9	2	35	15	24	
7	15	15	15	14	17	19	19	18	15	14	25	30	45	55	35	5	3	5	5	7	8	7	9	21	3	55	18	24	
8	54	94	94	91	93	85	88	72	60	55	47	30	26	22	26	27	20	21	23	28	32	29	27	39	20	94	49	24	
9	54	54	53	49	45	41	40	33	22	12	23	30	28	30	38	44	50	51	42	35	42	38	39	41	12	54	39	24	
10	36	6	5	5	6	9	5	4	29	24	24	41	47	47	45	40	37	33	37	52	84	97	127	150	4	150	41	24	
11	175	161	120	93	86	70	56	40	30	27	23	13	10	10	10	9	4	2	2	3	3	6	7	5	2	175	40	24	
12	3	4	4	4	8	16	19	17	20	14	9	8	7	2	1	1	1	2	1	1	1	1	1	1	1	1	20	6	24
13	1	1	0	0	0	1	1	1	0	1	3	2	2	2	2	2	2	2	2	8	22	16	4	2	0	22	3	24	
14	2	2	2	2	2	4	13	26	39	39	11	14	24	58	93	121	130	110	81	64	66	73	68	78	2	130	47	24	
15	85	88	83	88	86	100	112	131	148	137	135	128	123	111	107	103	96	90	91	92	85	82	60	9	9	148	99	24	
16	4	4	3	3	5	17	11	7	7	10	15	15	17	20	27	36	31	25	21	24	28	26	25	33	3	36	17	24	
17	33	30	27	28	27	25	24	20	17	16	24	36	51	51	73	103	108	115	108	97	106	131	142	145	16	145	64	24	
18	144	176	188	189	201	225	223	209	173	56	20	15	21	18	13	8	8	6	5	6	7	7	7	9	5	225	81	24	
19	10	10	10	11	11	10	12	22	34	36	29	22	25	18	14	14	18	14	18	29	29	27	22	21	10	36	19	24	
20	23	21	17	15	14	15	17	17	16	14	8	2	1	2	2	2	3	3	3	7	8	8	27	22	1	27	11	24	
21	32	37	42	44	38	37	42	32	35	48	57	59	56	49	44	38	39	34	31	30	30	32	33	36	30	59	40	24	
22	34	34	33	31	29	28	28	26	23	24	28	36	68	106	113	115	115	112	108	103	95	87	87	86	23	115	65	24	
23	82	50	41	34	31	24	19	17	11	8	9	11	11	12	11	12	12	8	3	2	1	1	2	1	1	82	17	24	
24	1	1	1	1	1	1	5	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	2	3	1	5	2	24	
25	2	1	1	1	1	1	1	3	4	5	11	25	25	33	46	49	39	31	36	31	18	14	13	15	1	49	17	24	
26	19	20	20	18	19	18	19	17	19	26	39	46	47	38	36	32	23	13	6	5	9	8	3	2	2	47	21	24	
27	1	1	1	1	1	2	2	2	1	1	1	C	C	X	X	X	X	X	X	X	X	X	X	X	1	2	1	13	
28	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0	
29	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0	
30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0	
31	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0	
HOURLY MAX	175	176	188	189	201	225	223	209	173	137	135	128	123	111	113	121	130	115	108	103	106	131	142	150					
HOURLY AVG	34	34	32	30	30	31	31	29	28	23	22	23	26	28	30	31	30	27	25	25	28	28	29	30					

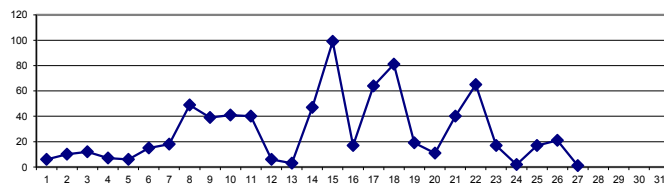
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	80 µg/m ³	24-HR	30 µg/m ³
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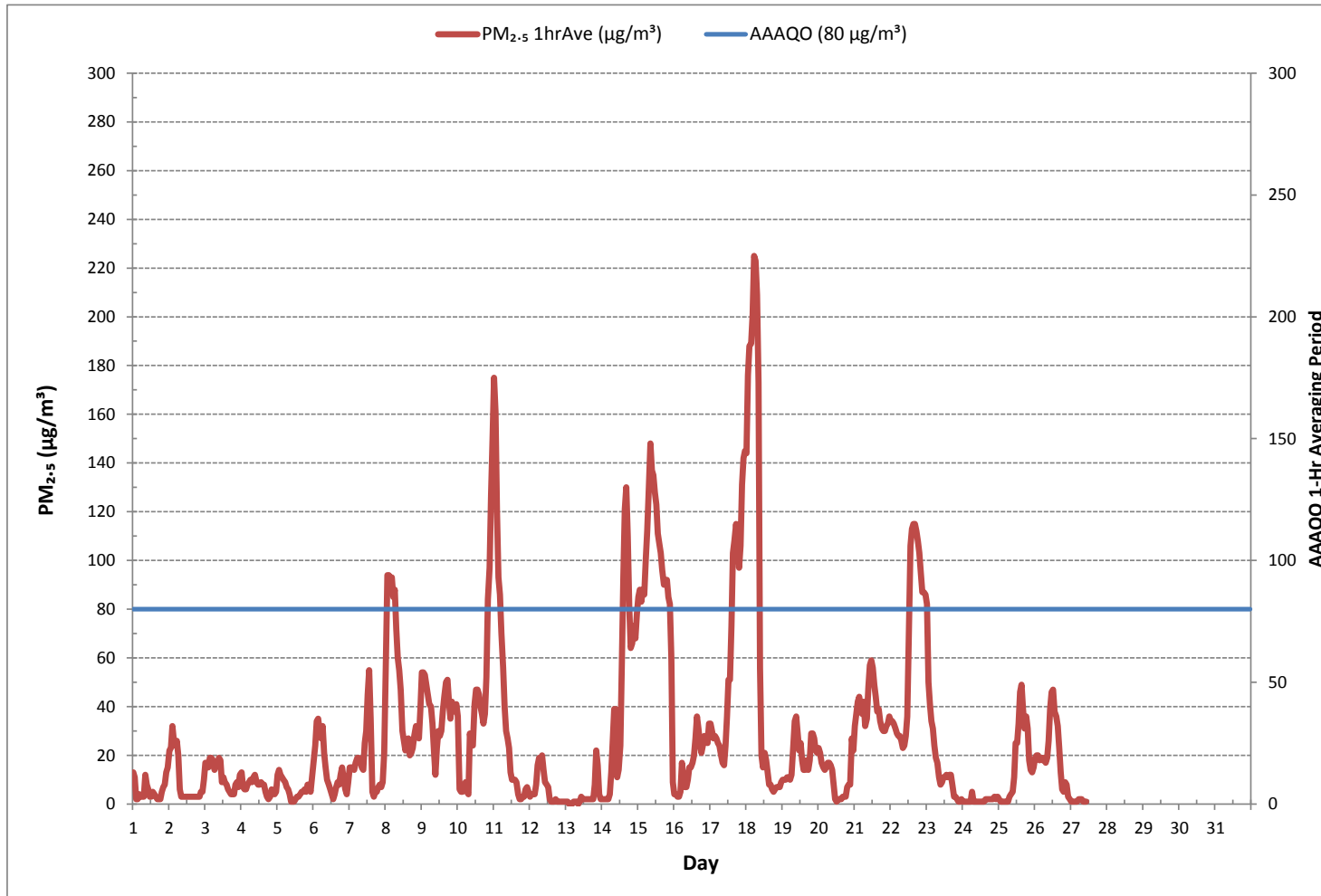
24 HR AVERAGES August 2018



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	72			
NUMBER OF 24-HR EXCEEDANCES:	10			
NUMBER OF NON-ZERO READINGS:	631			
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR	2	ON DAY	13
MAXIMUM 1-HR AVERAGE:	225 µg/m ³ @ HOUR	5	ON DAY	18
MAXIMUM 24-HR AVERAGE:	99 µg/m ³		ON DAY	15
MONTHLY CALIBRATION TIME:	2 hrs	OPERATIONAL TIME:	637 hrs	
STANDARD DEVIATION:	37	AMD OPERATION UPTIME:	85.6 %	
		MONTHLY AVERAGE:	28 µg/m ³	

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



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-PM_{2.5} [ug/m³]
 Monthly: 18/08
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

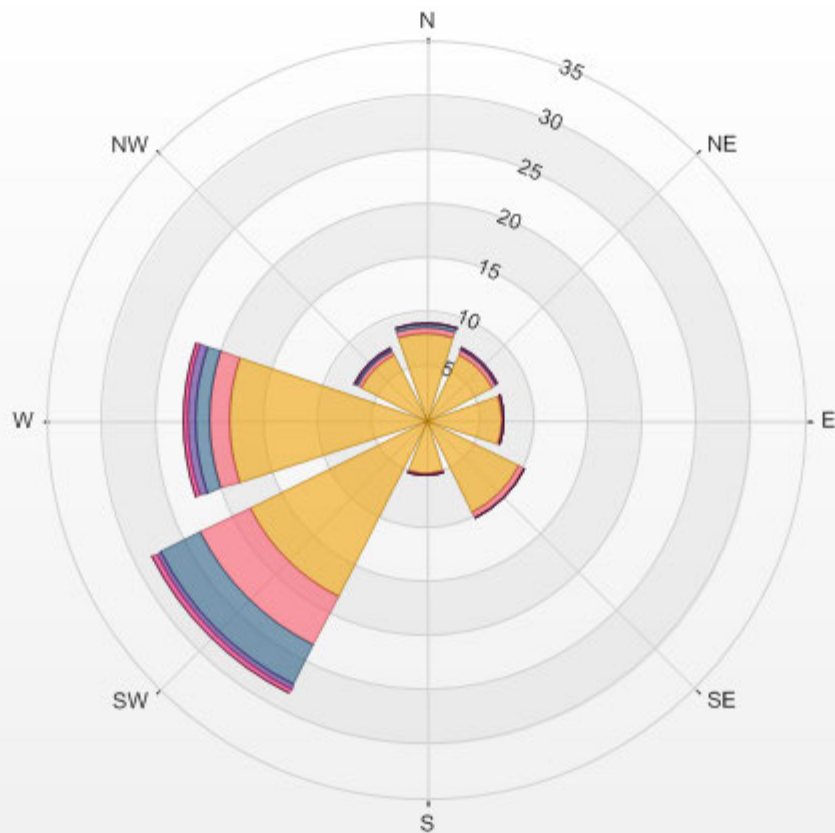
Calm: 2.68%

Calm Avg: 27.12 [ug/m3]

Direction	0.0-45.2	45.2-90.4	90.4-135.6	135.6-180.8	180.8-226.0	>226.0	Total
N	8.0	0.5	0.5	0.0	0.0	0.0	9.0
NE	6.8	0.5	0.0	0.2	0.0	0.0	7.4
E	6.9	0.3	0.0	0.0	0.0	0.0	7.2
SE	9.6	0.5	0.0	0.0	0.0	0.0	10.1
S	5.0	0.2	0.0	0.0	0.0	0.0	5.2
SW	18.3	5.0	4.1	0.5	0.5	0.0	28.3
W	18.3	1.7	1.4	0.6	0.5	0.0	22.5
NW	6.8	0.3	0.2	0.3	0.0	0.0	7.6
Summary	79.7	9.0	6.1	1.6	0.9	0.0	97.3

% Icon Classes (ug/m3(L)) 80 0.0-45.2 9 45.2-90.4 6 90.4-135.6 2 135.6-180.8 1 180.8-226.0 0 >226.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5_2[ug/m3(L)] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 2.68% Calm Poll Avg: 27.12[ug/m3(L)]



WIND SPEED



WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	2.6	2.2	5.3	3.0	3.2	4.5	5.9	6.9	8.9	7.7	7.0	5.4	1.0	2.9	5.7	2.8	1.4	3.5	4.5	3.6	0.7	0.5	1.0	1.3	0.5	8.9	2.7	24
2	0.8	2.9	1.0	1.2	0.9	1.2	2.4	0.9	1.8	2.0	1.8	3.0	1.6	3.0	4.2	3.9	2.6	3.3	5.5	9.6	2.8	2.2	0.5	3.0	0.5	9.6	0.6	24
3	3.5	2.5	2.0	0.9	3.2	2.4	4.8	5.6	6.0	6.5	7.3	5.8	2.0	6.5	5.3	6.5	8.8	6.7	6.9	5.3	4.4	3.8	3.7	5.6	0.9	8.8	4.3	24
4	5.7	4.6	4.8	5.9	5.3	4.8	5.0	6.0	6.0	6.3	6.9	10.0	8.7	9.5	9.6	6.9	7.3	5.8	3.0	4.0	1.2	1.2	1.1	3.0	1.1	10.0	4.2	24
5	1.1	1.3	2.0	2.1	1.2	0.3	1.2	1.6	1.1	3.1	2.9	1.5	3.0	4.9	3.6	6.6	7.1	7.5	5.1	3.6	2.8	2.2	2.2	1.5	0.3	7.5	2.5	24
6	0.7	0.5	0.4	1.0	0.5	0.1	0.4	4.9	7.8	8.1	9.1	10.1	10.1	13.7	13.7	14.5	11.4	12.0	6.1	4.3	5.9	6.2	3.9	4.6	0.1	14.5	6.1	24
7	4.6	6.2	6.4	5.8	4.7	5.4	5.6	7.9	6.9	8.5	7.8	8.3	9.5	8.6	9.1	9.7	9.5	8.6	6.7	3.9	3.2	3.1	1.3	1.3	1.3	9.7	6.2	24
8	1.5	5.1	4.0	3.7	2.9	1.8	4.2	4.8	3.1	5.2	6.6	8.4	9.4	9.1	10.0	9.8	10.9	8.9	6.7	4.3	0.7	0.5	1.8	1.0	0.5	10.9	5.1	24
9	0.7	0.7	0.7	1.0	1.5	0.4	0.3	1.7	3.1	5.7	4.5	6.1	6.1	7.6	7.1	6.2	5.1	3.3	1.8	1.5	1.1	0.2	0.7	0.7	0.2	7.6	2.4	24
10	0.8	0.6	0.3	1.6	0.4	0.6	1.0	3.7	5.1	4.1	4.7	6.1	7.4	8.2	8.3	6.4	5.9	5.2	2.1	2.5	2.9	0.7	2.0	1.1	0.3	8.3	2.2	24
11	2.1	0.9	5.5	4.1	1.6	4.1	5.3	4.8	4.4	3.6	6.8	7.6	8.9	5.0	1.7	5.5	6.0	7.0	5.8	4.7	6.2	3.8	5.0	8.4	0.9	8.9	4.3	24
12	12.3	8.5	11.2	8.9	7.4	8.1	4.5	6.2	11.0	8.6	5.8	5.9	11.8	13.3	12.1	7.2	17.2	13.5	7.4	6.7	7.3	9.4	9.0	8.6	4.5	17.2	8.2	24
13	7.9	5.0	5.6	4.0	2.3	2.4	3.0	3.4	4.7	4.6	5.2	5.3	6.0	6.0	5.4	5.8	5.4	5.0	4.3	2.2	2.3	3.7	3.1	3.7	2.2	7.9	2.8	24
14	4.7	4.9	6.0	6.8	5.1	4.4	4.2	6.1	6.0	9.7	9.4	9.1	9.8	11.3	9.2	11.1	10.4	8.3	5.5	1.4	2.8	3.5	2.2	1.3	1.3	11.3	6.1	24
15	0.7	3.9	4.4	4.9	4.8	5.2	4.2	4.9	5.8	5.3	4.5	4.4	5.5	6.0	6.4	5.4	5.2	4.3	3.7	2.7	0.8	0.6	4.3	6.2	0.6	6.4	3.4	24
16	4.7	1.8	1.6	2.0	4.2	4.5	5.2	5.9	6.3	6.7	8.8	6.5	5.8	6.2	5.8	5.1	5.0	4.9	3.6	4.2	3.6	0.7	0.9	0.2	0.2	8.8	4.0	24
17	0.4	0.3	0.5	0.4	0.1	0.6	0.1	0.7	2.4	3.1	2.4	2.5	3.2	5.0	5.4	4.6	4.3	2.4	1.5	1.7	2.7	4.5	4.3	4.5	0.1	5.4	2.1	24
18	4.6	5.8	5.3	5.0	5.2	6.7	5.6	5.0	7.5	17.1	16.6	14.2	15.9	16.1	13.5	12.0	12.4	9.6	5.4	4.3	4.2	4.1	1.9	2.1	1.9	17.1	7.2	24
19	0.6	0.9	2.5	2.8	0.6	2.6	2.6	6.0	6.0	5.9	6.9	6.5	9.1	10.3	8.9	7.9	7.8	7.1	3.1	1.4	0.9	0.5	0.2	0.9	0.2	10.3	3.5	24
20	0.3	0.7	1.2	0.4	0.3	1.0	0.3	0.8	1.7	3.4	3.5	4.8	6.3	5.6	8.1	7.6	8.6	6.6	3.5	1.4	1.9	2.0	0.6	0.8	0.3	8.6	2.8	24
21	0.5	0.6	0.7	0.3	0.6	0.4	0.7	2.1	6.2	7.3	8.0	9.4	11.0	10.6	9.0	8.5	7.2	5.6	2.3	1.2	0.5	0.5	0.4	1.1	0.3	11.0	3.8	24
22	0.4	0.3	0.6	1.7	0.5	1.0	0.7	1.8	4.3	6.7	7.9	8.1	8.4	9.2	8.7	9.2	7.7	6.3	5.0	3.1	1.9	1.0	1.1	1.0	0.3	9.2	3.8	24
23	3.1	7.0	4.7	4.5	5.2	9.7	8.4	9.1	8.4	8.0	7.6	8.5	7.9	8.1	8.3	9.0	8.7	8.5	6.1	5.6	7.0	9.7	6.8	3.6	3.1	9.7	7.1	24
24	5.1	3.5	3.8	4.1	5.4	1.3	2.8	5.1	4.0	2.9	3.1	5.5	7.7	7.8	8.6	7.2	7.8	5.6	9.1	9.8	7.1	3.8	4.0	4.9	1.3	9.8	3.5	24
25	5.4	6.7	6.3	7.0	3.9	4.2	5.9	5.6	5.1	4.6	4.1	5.2	6.2	5.4	4.0	3.2	3.4	2.4	2.4	3.6	4.7	5.6	5.7	6.0	2.4	7.0	2.2	24
26	6.5	4.9	6.3	7.3	6.4	7.2	5.9	5.5	5.2	4.5	3.5	4.0	2.3	6.4	2.6	6.7	0.9	5.4	1.5	3.8	8.8	12.5	11.0	8.9	0.9	12.5	3.0	24
27	9.2	10.5	9.9	12.0	13.5	11.4	10.8	9.9	10.6	12.1	11.6	10.6	8.5	8.9	7.2	6.4	3.1	3.2	2.5	1.1	1.0	0.7	0.4	2.6	0.4	13.5	6.5	24
28	4.7	2.8	2.0	0.8	2.5	2.7	6.8	6.7	5.2	4.3	2.9	5.7	6.7	7.3	6.3	4.9	4.4	5.5	2.9	2.2	3.3	0.9	0.6	0.6	0.6	7.3	3.5	24
29	0.4	0.6	0.4	0.6	0.4	1.1	1.5	1.6	4.5	6.3	7.0	7.0	6.1	6.5	2.9	1.4	1.2	1.9	0.9	0.7	1.2	0.5	1.4	2.0	0.4	7.0	1.8	24
30	3.2	3.6	3.0	4.0	5.1	5.6	5.5	6.8	7.4	8.9	9.8	10.7	11.5	12.8	14.5	13.0	10.9	11.2	7.1	7.4	8.5	8.3	6.4	8.1	3.0	14.5	7.9	24
31	6.8	5.4	6.1	6.8	8.6	7.4	6.8	7.8	8.3	P	P	P	P	P	9.3	8.7	8.9	4.4	2.1	2.2	2.7	1.1	1.7	5.2	1.1	9.3	5.4	19
HOURLY MAX	12.3	10.5	11.2	12.0	13.5	11.4	10.8	9.9	11.0	17.1	16.6	14.2	15.9	16.1	14.5	14.5	17.2	13.5	9.1	9.8	8.8	12.5	11.0	8.9				

STATUS FLAG CODES

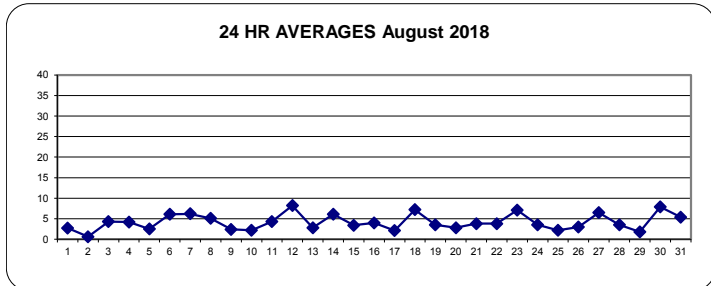
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

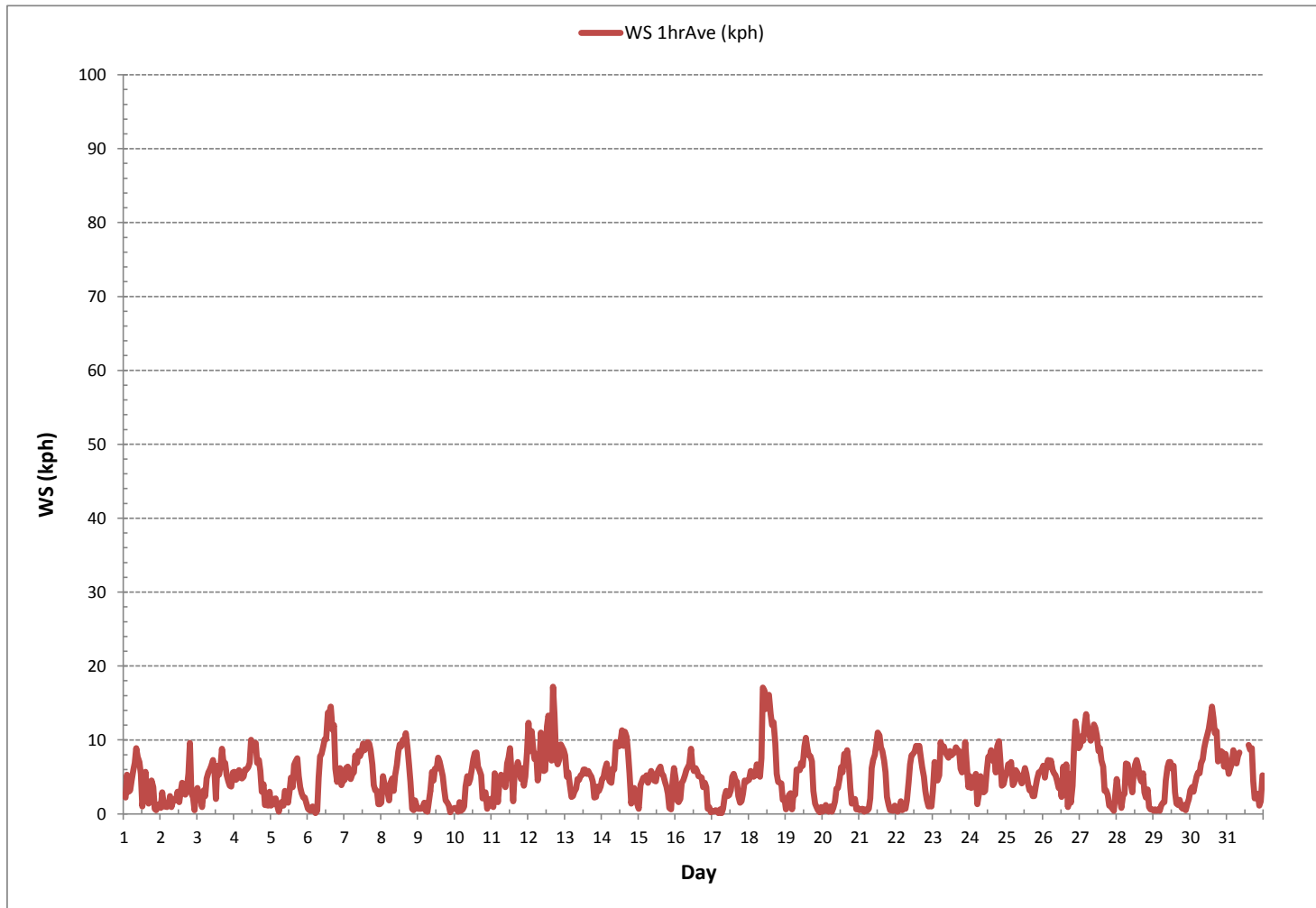
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	739
MINIMUM 1-HR AVERAGE	0.1 kph @ HOUR 5 ON DAY 6
MAXIMUM 1-HR AVERAGE:	17.2 kph @ HOUR 16 ON DAY 12
MAXIMUM 24-HR AVERAGE:	8.2 kph ON DAY 12
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	739 hrs
AMSD OPERATION UPTIME:	99.3 %
STANDARD DEVIATION:	3.3
MONTHLY AVERAGE:	1.8 kph

24 HR AVERAGES August 2018



WIND SPEED Hourly Averages (WS kph)



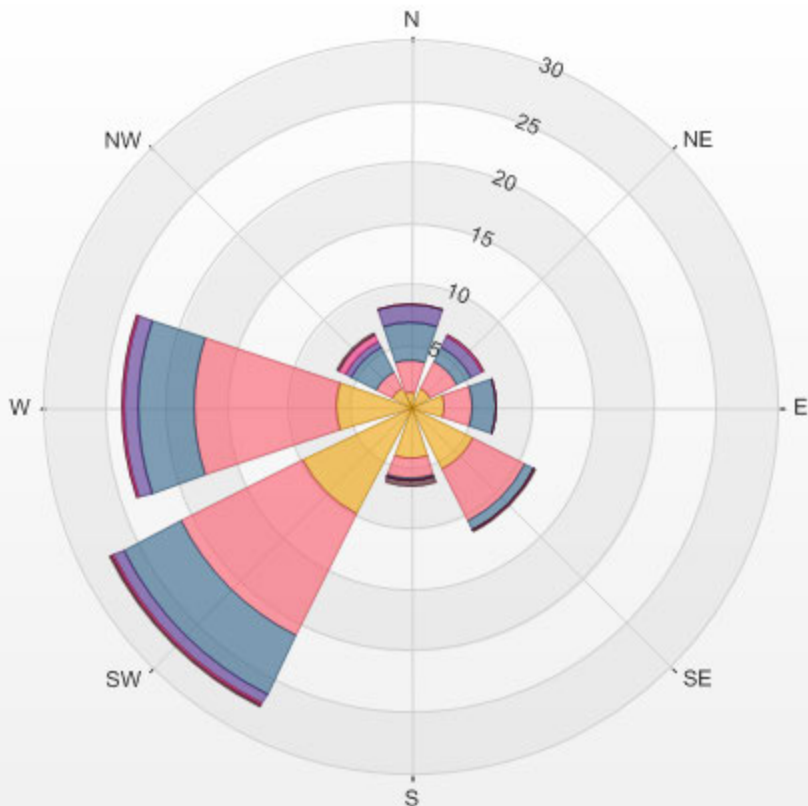
Wind: LICA COLD LAKE SOUTH
 Monitor: WSP [kph]
 Monthly: 18/08
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 2.30%

Direction	0.4-3.5	3.5-6.9	6.9-10.4	10.4-13.8	13.8-17.3	>17.3	Total
N	1.2	2.6	3.1	1.5	0.0	0.0	8.4
NE	1.8	2.4	1.4	1.0	0.1	0.0	6.6
E	2.8	2.3	1.9	0.0	0.0	0.0	7.0
SE	5.7	4.7	0.8	0.0	0.0	0.1	11.4
S	4.2	1.8	0.1	0.0	0.0	0.4	6.5
SW	9.9	11.1	5.3	1.0	0.1	0.1	27.5
W	6.1	11.6	4.6	1.1	0.1	0.0	23.6
NW	1.8	1.5	2.3	0.4	0.7	0.1	6.8
Summary	33.4	38.0	19.5	4.9	1.1	0.8	97.8

% Icon Classes (kph) 33 0.4-3.5 38 3.5-6.9 19 6.9-10.4 5 10.4-13.8 1 13.8-17.3 1 >17.3

LICA COLD LAKE SOUTH 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 2.30% Calm Wind Avg Speed: 0.25(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - August 2018

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

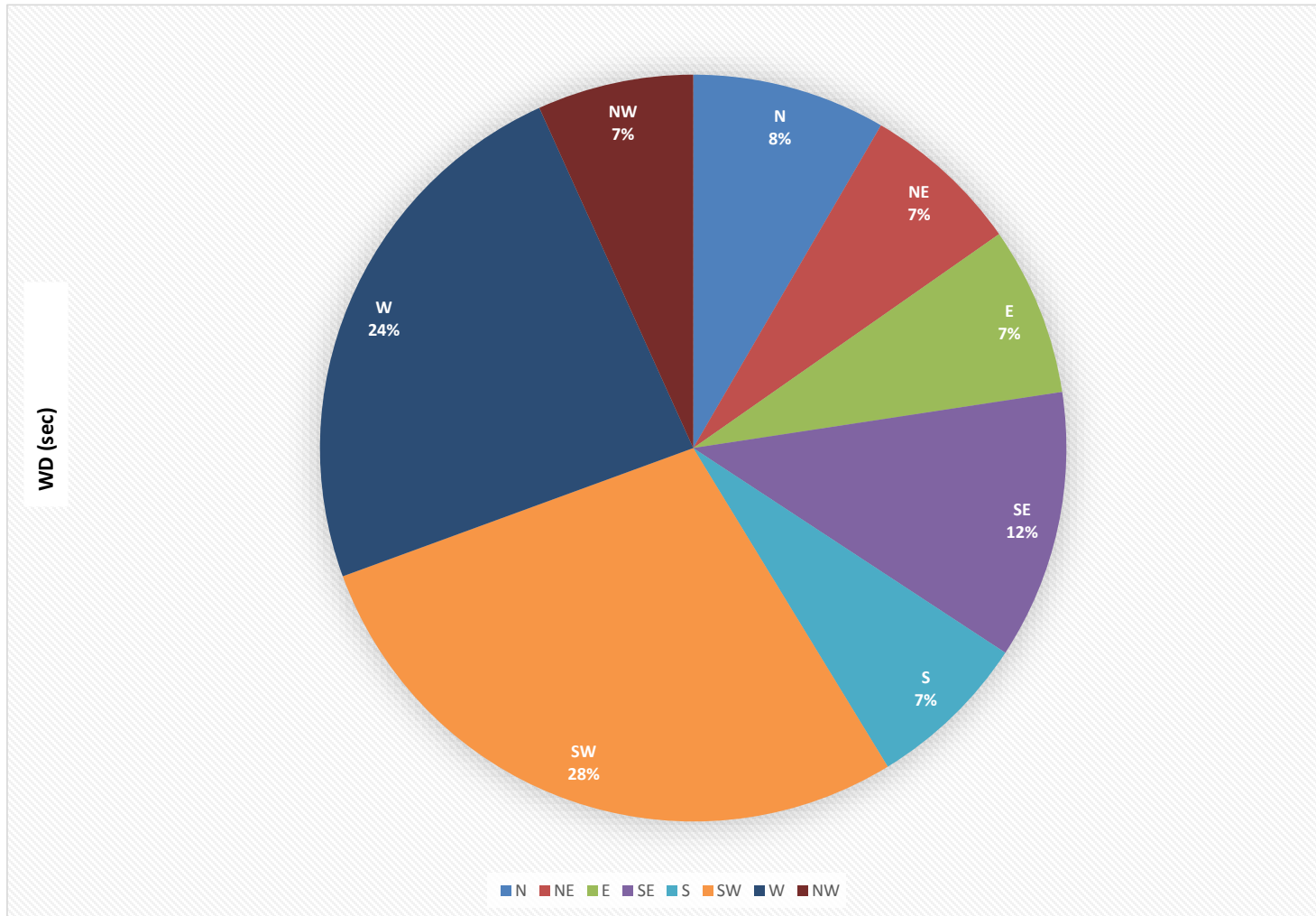
STATUS FLAG CODES

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

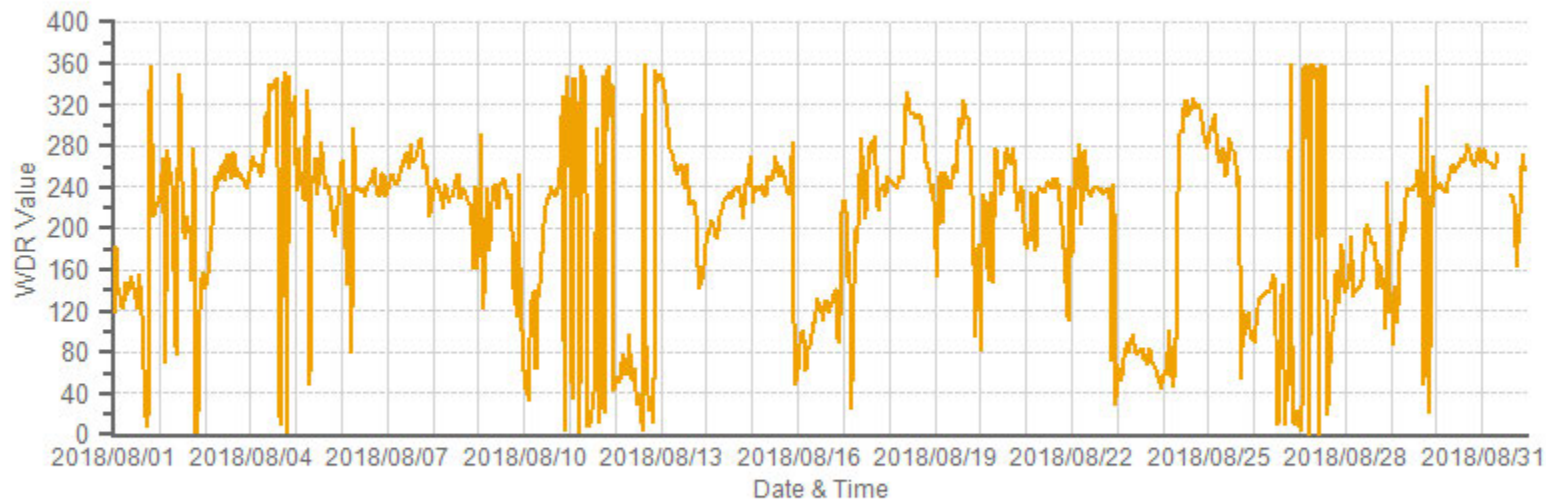
LAST CALIBRATION:	November 9, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	739	hrs
STANDARD DEVIATION:	87		AMD OPERATION UPTIME:	99.3	%
			MONTHLY AVERAGE:	264	(W)

WIND DIRECTION Hourly Averages (WD)



WDR[degwdr] Station: LICA COLD LAKE SOUTH Monthly: 18/08 Type: AVG 1 Hr. [1 Hr.]



— WDR[degwdr]

STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - August 2018

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	29	60	27	28	31	29	30	19	21	24	21	21	57	35	15	37	64	34	27	18	59	68	53	41	24	
2	61	30	62	58	64	56	37	61	52	51	58	48	63	52	46	48	50	38	44	26	67	51	66	24	24	
3	14	25	39	59	19	31	17	22	23	23	23	30	60	35	33	31	21	21	21	18	17	18	17	18	24	
4	18	19	17	18	19	19	17	20	19	21	36	15	17	19	21	29	25	18	26	20	33	24	41	17	24	
5	39	44	31	17	32	64	39	42	64	38	53	66	52	35	40	27	24	20	19	21	24	23	25	30	24	
6	48	53	64	37	57	79	65	21	22	21	20	21	23	19	19	20	20	18	18	19	18	17	24	17	24	
7	18	20	16	16	17	17	19	18	21	21	25	24	22	25	26	23	25	21	21	18	28	18	42	27	24	
8	28	15	13	17	20	37	16	19	28	28	25	23	25	27	21	20	20	18	17	19	44	43	21	51	24	
9	69	66	47	38	28	65	72	26	26	19	27	28	23	21	20	21	19	19	23	18	44	73	58	48	24	
10	38	48	71	27	72	65	54	22	25	36	33	26	23	22	22	24	19	16	29	17	32	64	36	57	24	
11	62	61	16	25	55	40	33	30	39	37	19	23	22	31	49	32	31	17	23	38	35	38	39	32	24	
12	18	19	18	20	21	16	25	26	17	17	22	25	18	19	24	31	18	21	21	22	26	18	16	17	24	
13	18	19	14	25	25	18	17	25	29	37	36	36	38	37	37	32	31	29	21	30	20	21	28	37	24	
14	34	33	30	30	34	35	31	25	23	20	21	22	20	22	21	20	19	17	16	37	21	17	19	29	24	
15	56	15	16	13	15	14	17	15	21	17	19	22	23	22	22	22	18	20	16	18	50	61	36	16	24	
16	17	37	31	26	15	20	24	20	24	23	18	24	23	27	21	16	23	21	17	14	15	49	34	71	24	
17	63	69	64	74	77	68	77	62	26	38	42	45	42	31	23	19	23	22	35	30	24	13	13	16	24	
18	17	17	14	18	15	15	17	19	35	17	19	21	19	18	20	20	20	18	23	16	13	11	23	28	24	
19	58	51	28	27	45	27	21	17	21	27	22	20	24	24	28	22	26	16	16	43	55	56	64	48	24	
20	73	55	35	67	73	39	63	50	52	38	37	36	32	36	24	29	25	20	20	25	14	20	57	49	24	
21	48	49	53	67	35	58	44	25	18	19	20	21	22	20	25	21	20	20	39	45	52	56	58	27	24	
22	55	68	41	18	54	49	54	29	19	17	17	18	18	19	19	18	18	17	17	14	30	56	58	51	24	
23	22	14	21	21	24	19	21	19	20	22	22	22	24	26	26	23	20	21	19	19	17	14	15	26	24	
24	16	26	26	30	25	59	48	53	36	59	52	15	16	14	13	15	18	16	15	13	14	18	18	21	24	
25	20	19	20	15	23	20	18	20	22	23	36	32	28	29	38	44	35	50	24	23	22	22	18	19	24	
26	17	21	20	14	14	13	12	14	16	25	39	34	56	19	33	18	73	30	49	22	19	17	19	21	24	
27	18	18	19	19	19	19	19	20	19	23	23	20	23	28	32	28	39	39	30	35	39	51	65	19	24	
28	11	24	36	60	19	20	14	16	23	27	38	34	32	38	35	35	34	14	39	33	22	53	56	56	24	
29	58	39	65	60	71	42	43	37	25	23	25	23	22	18	26	44	39	40	57	64	28	64	44	41	24	
30	15	29	27	17	19	15	20	19	22	21	25	22	19	21	20	21	22	20	20	18	18	18	22	18	24	
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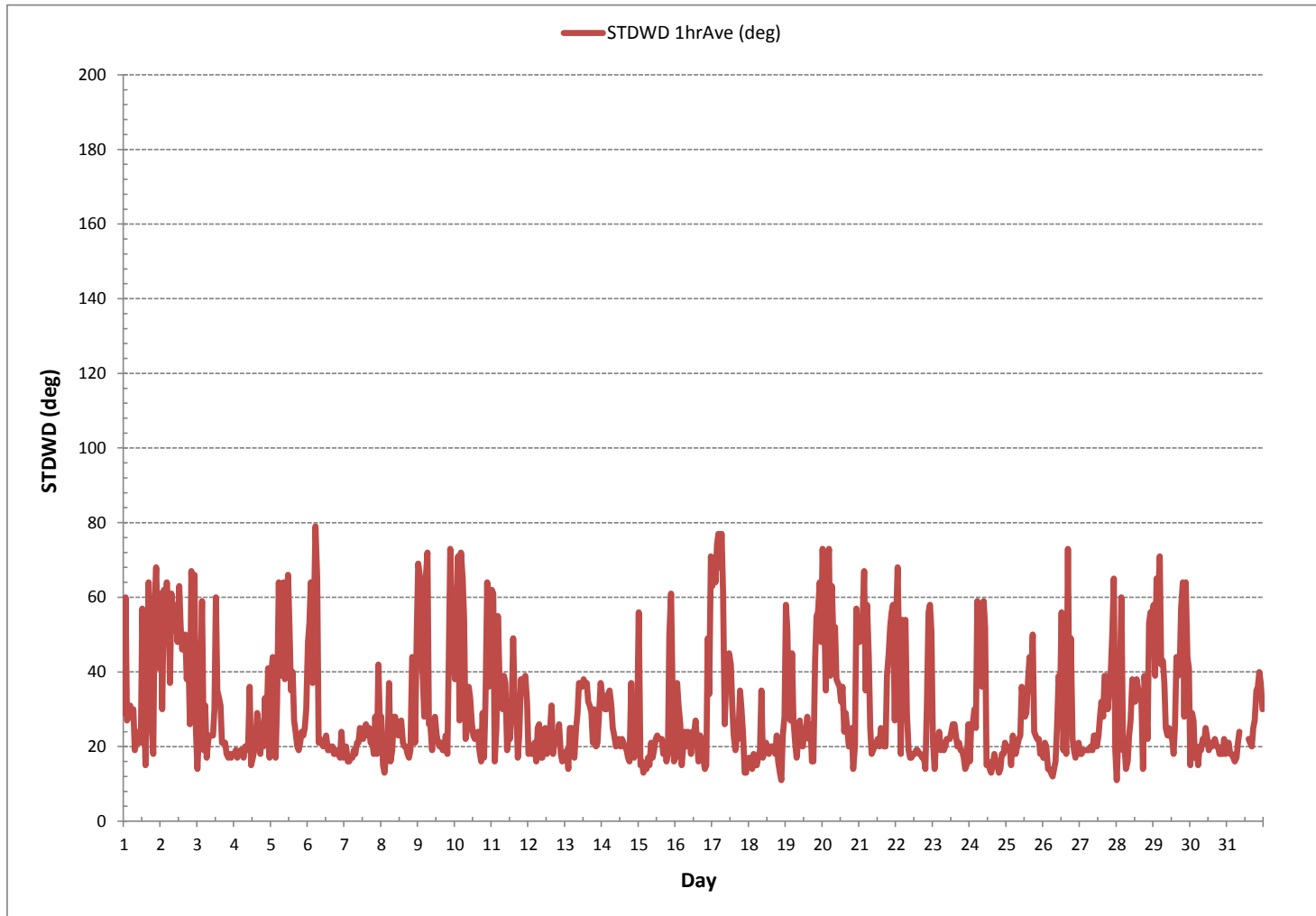
STATUS FLAG CODES

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

LAST CALIBRATION: November 9, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 739 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



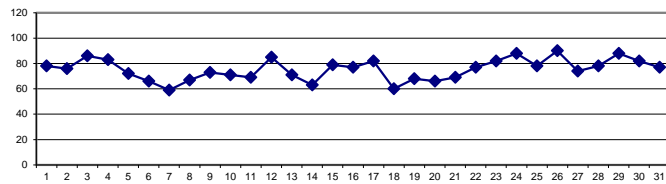
RELATIVE HUMIDITY Hourly Averages (RH %)

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

STATUS FLAG CODES

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

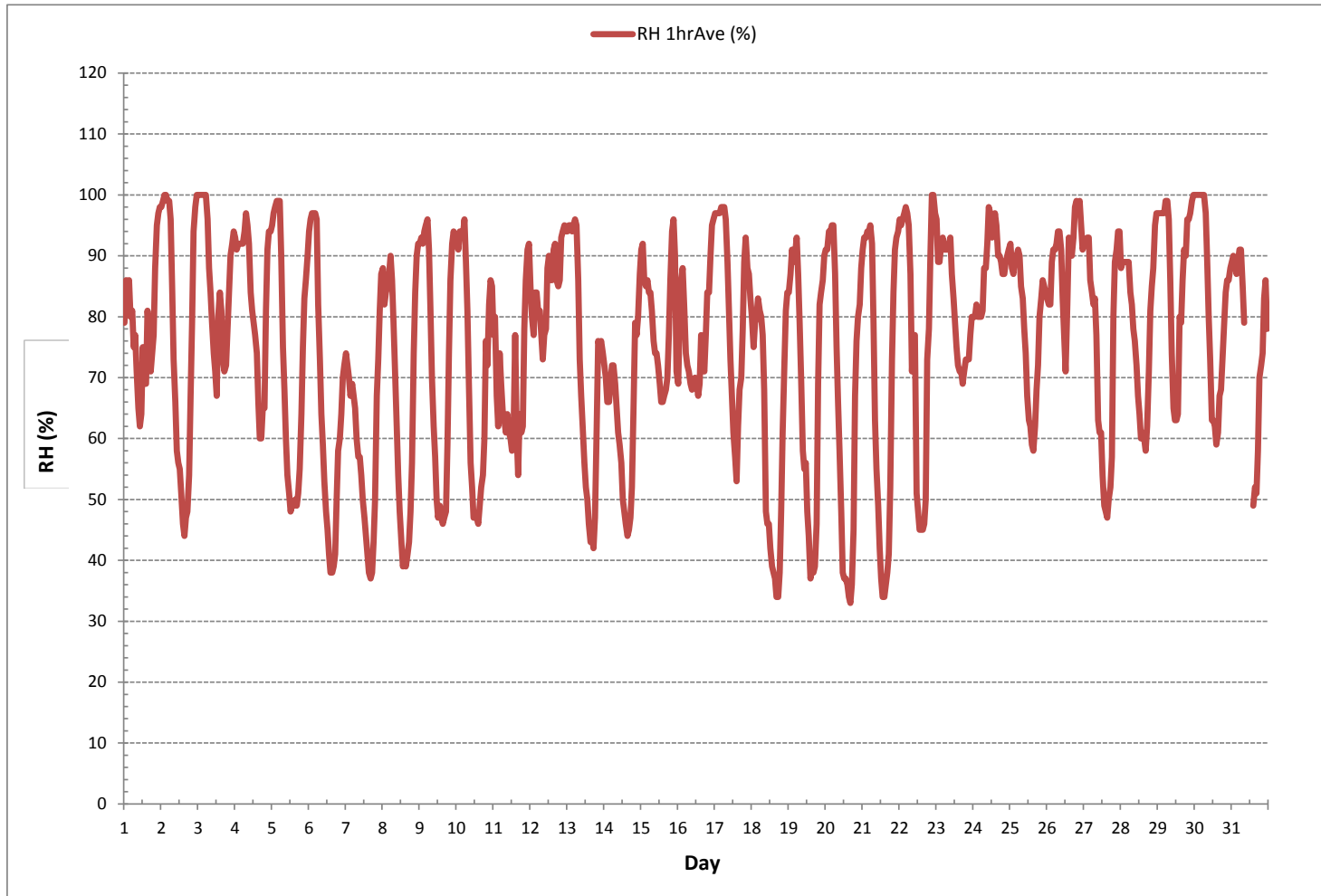
24 HR AVERAGES August 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	33	%	@ HOUR	16	ON DAY	20
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR	2	ON DAY	2
MAXIMUM 24-HR AVERAGE:	90	%			ON DAY	26
OPERATIONAL TIME:						739 hrs
AMD OPERATION UPTIME:						99.3 %
STANDARD DEVIATION:	18					MONTHLY AVERAGE: 75 %

RELATIVE HUMIDITY Hourly Averages (RH %)



AMBIENT TEMPERATURE



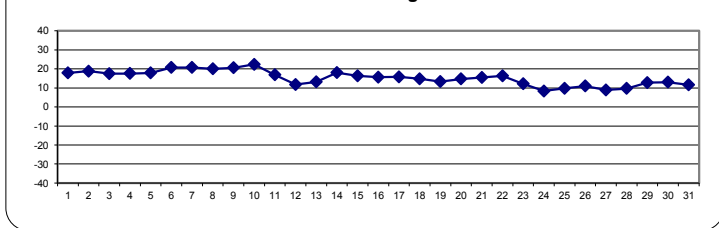
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	15.4	14.6	15.4	15.2	15.4	15.2	15.9	16.1	18.1	19.0	20.3	20.5	20.3	21.1	21.3	20.4	21.3	22.7	21.1	20.1	17.7	15.7	14.3	13.2	13.2	22.7	17.9	24	
2	12.5	12.3	13.0	12.1	11.3	11.7	14.4	17.5	19.9	21.1	22.9	23.5	24.1	24.8	25.6	25.6	25.6	25.7	24.1	19.5	17.6	16.0	15.3	14.5	11.3	25.7	18.8	24	
3	14.4	14.2	13.7	13.6	13.1	13.5	14.6	16.3	17.4	18.7	19.7	20.3	21.4	18.0	18.6	19.0	21.0	21.5	21.6	20.0	18.7	17.1	16.6	16.1	13.1	21.6	17.5	24	
4	15.9	15.8	15.3	15.1	15.1	15.3	15.7	16.3	17.3	18.2	19.4	19.4	19.3	19.4	19.4	20.8	21.7	21.8	21.2	20.2	17.3	15.1	14.1	13.5	13.5	21.8	17.6	24	
5	12.5	11.6	11.2	10.3	9.5	9.6	13.5	16.8	18.8	19.9	21.0	21.9	23.4	23.3	23.5	23.5	24.2	23.8	23.3	21.4	18.8	17.0	16.1	15.0	9.5	24.2	17.9	24	
6	14.0	13.1	12.3	11.7	11.6	11.8	15.9	18.6	21.0	22.9	24.6	26.2	27.3	27.9	28.2	28.1	27.7	26.7	25.0	22.8	21.8	20.8	20.2	19.4	11.6	28.2	20.8	24	
7	18.7	18.5	18.4	17.9	16.8	16.8	17.2	18.3	19.7	20.3	22.1	23.5	24.2	25.4	26.1	26.7	26.6	26.4	25.2	23.0	19.4	17.9	16.0	14.7	14.7	26.7	20.8	24	
8	13.9	14.5	14.3	13.9	13.4	12.8	14.2	16.3	19.2	21.7	24.1	25.6	26.7	27.8	27.9	28.0	27.4	26.9	25.5	23.1	19.2	16.9	15.4	14.4	12.8	28.0	20.1	24	
9	13.5	13.0	12.5	11.8	11.2	11.4	13.4	17.6	20.6	22.3	24.7	26.5	27.6	27.7	27.8	28.5	28.7	28.8	27.4	24.2	21.3	19.3	18.1	17.2	11.2	28.8	20.6	24	
10	16.3	15.6	14.8	14.5	14.2	14.0	16.6	20.2	22.6	25.1	26.6	27.8	28.5	29.0	29.5	29.7	29.8	29.7	28.9	25.0	23.2	20.7	18.5	17.6	14.0	29.8	22.4	24	
11	17.9	17.2	17.6	17.6	16.1	16.3	17.4	17.5	17.3	17.3	17.8	18.4	19.1	18.6	17.6	19.0	19.3	17.8	17.4	16.9	14.6	13.2	12.1	12.5	12.1	19.3	16.9	24	
12	13.5	13.4	13.4	12.4	12.0	11.9	11.9	12.0	13.2	12.7	12.6	11.7	12.0	12.4	12.3	11.2	11.3	12.0	12.0	11.5	10.4	9.7	9.2	9.2	9.2	13.5	11.8	24	
13	9.3	9.1	8.5	8.5	8.7	8.6	9.0	11.1	12.6	13.4	14.9	16.0	16.8	17.7	18.6	18.7	18.4	18.2	17.5	14.8	11.8	11.2	11.2	11.5	8.5	18.7	13.2	24	
14	11.9	12.0	12.3	12.4	11.7	11.3	11.8	13.1	15.0	17.7	18.8	19.6	21.9	23.9	24.8	25.8	25.6	25.4	25.1	23.8	20.7	18.0	17.2	16.0	14.4	11.3	25.8	18.0	24
15	13.7	13.4	14.6	14.5	14.2	14.2	14.1	14.4	15.1	15.6	15.9	17.0	18.6	19.9	20.4	20.6	20.7	20.3	19.1	17.1	15.0	13.6	13.7	15.6	13.4	20.7	16.3	24	
16	15.1	12.9	11.4	11.0	11.9	13.1	13.9	14.4	14.9	15.7	16.3	17.0	18.1	19.3	19.7	19.1	19.5	19.5	18.7	17.3	16.4	14.5	13.0	12.2	11.0	19.7	15.6	24	
17	11.4	10.7	10.1	9.7	9.6	9.3	10.1	12.9	15.7	17.8	20.3	22.3	24.0	24.9	24.6	22.5	20.4	17.9	16.1	14.4	13.2	13.4	13.4	13.6	9.3	24.9	15.8	24	
18	13.4	13.1	12.2	11.9	10.8	10.5	10.8	12.1	14.7	16.9	17.4	18.1	18.4	19.0	19.6	19.8	20.2	20.0	18.7	15.9	12.9	11.1	9.1	8.0	8.0	20.2	14.8	24	
19	7.6	6.8	6.4	7.5	7.4	7.0	8.9	11.3	14.1	16.8	17.4	17.3	18.8	19.9	20.5	19.6	20.5	19.6	18.9	15.2	12.0	10.6	9.5	8.7	6.4	20.5	13.4	24	
20	8.1	7.9	7.7	7.7	7.6	7.6	9.6	13.4	16.3	18.2	19.7	20.9	21.4	21.4	21.4	22.0	21.5	20.7	18.7	14.9	13.0	12.1	11.2	9.5	7.6	22.0	14.7	24	
21	8.1	7.1	6.5	5.7	5.1	4.9	7.1	11.6	15.0	18.4	20.9	22.8	24.0	24.6	25.0	24.9	24.8	24.1	22.1	18.0	15.0	13.2	12.0	11.1	4.9	25.0	15.5	24	
22	10.4	9.7	9.1	8.2	7.4	7.2	9.0	12.9	16.4	18.9	19.8	21.0	22.3	23.5	24.1	24.7	24.7	24.1	22.4	18.8	16.0	14.4	13.2	12.3	7.2	24.7	16.3	24	
23	13.3	14.9	14.4	13.7	13.4	13.5	13.3	12.9	11.9	11.0	11.1	11.2	11.6	12.3	12.8	13.1	13.2	12.9	12.2	11.5	10.8	10.1	9.2	8.5	8.5	14.9	12.2	24	
24	8.6	8.7	8.7	8.7	8.4	8.5	8.6	7.9	8.2	8.2	8.4	9.0	8.8	8.3	7.9	8.4	8.8	9.0	8.6	8.3	8.2	8.1	8.0	7.9	7.9	9.0	8.4	24	
25	7.8	7.7	7.4	7.1	6.9	6.8	6.9	7.4	7.7	8.4	9.7	11.3	12.2	12.6	13.4	13.9	13.6	13.1	12.6	11.0	9.8	9.5	9.4	9.1	6.8	13.9	9.8	24	
26	9.0	8.8	8.9	8.2	8.1	8.1	8.3	8.7	9.5	11.0	13.5	15.0	16.3	14.8	13.6	14.0	13.3	12.0	11.4	11.4	11.0	9.6	9.3	9.2	8.1	16.3	11.0	24	
27	8.8	8.6	8.3	7.9	7.8	7.6	7.6	7.7	8.6	10.3	10.7	10.7	11.5	12.3	12.7	12.8	12.2	12.2	11.5	7.8	5.4	4.1	3.4	3.6	3.4	12.8	8.9	24	
28	4.5	4.1	4.0	4.3	4.5	4.8	6.0	7.0	8.2	8.9	9.7	11.4	12.7	14.4	14.6	15.1	16.1	15.8	14.5	13.2	11.9	11.1	8.9	7.3	4.0	16.1	9.7	24	
29	6.3	5.7	5.2	5.0	6.0	7.3	9.0	10.4	13.5	16.6	18.6	18.9	18.8	18.2	17.0	17.4	16.6	15.6	14.6	13.9	13.6	13.0	12.7	12.9	5.0	18.9	12.8	24	
30	12.9	12.8	12.5	12.4	11.9	10.8	10.4	11.5	12.7	14.1	15.2	16.3	15.3	14.9	15.5	15.6	14.9	14.6	14.0	12.5	11.4	10.8	9.9	9.2	9.2	16.3	13.0	24	
31	9.0	8.6	8.8	8.7	8.1	7.3	7.8	9.4	10.6	P	P	P	P	P	17.1	16.7	17.0	15.7	14.2	13.8	13.1	11.3	11.1	12.1	7.3	17.1	11.6	19	
HOURLY MAX	18.7	18.5	18.4	17.9	16.8	16.8	17.4	20.2	22.6	25.1	26.6	27.8	28.5	29.0	29.5	29.7	29.8	29.7	28.9	25.0	23.2	20.8	20.2	19.4					
HOURLY AVG	11.9	11.5	11.3	10.9	10.6	10.6	11.7	13.3	15.0	16.6	17.8	18.8	19.6	19.9	20.1	20.2	20.2	19.8	18.8	16.7	14.8	13.5	12.6	12.1					

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

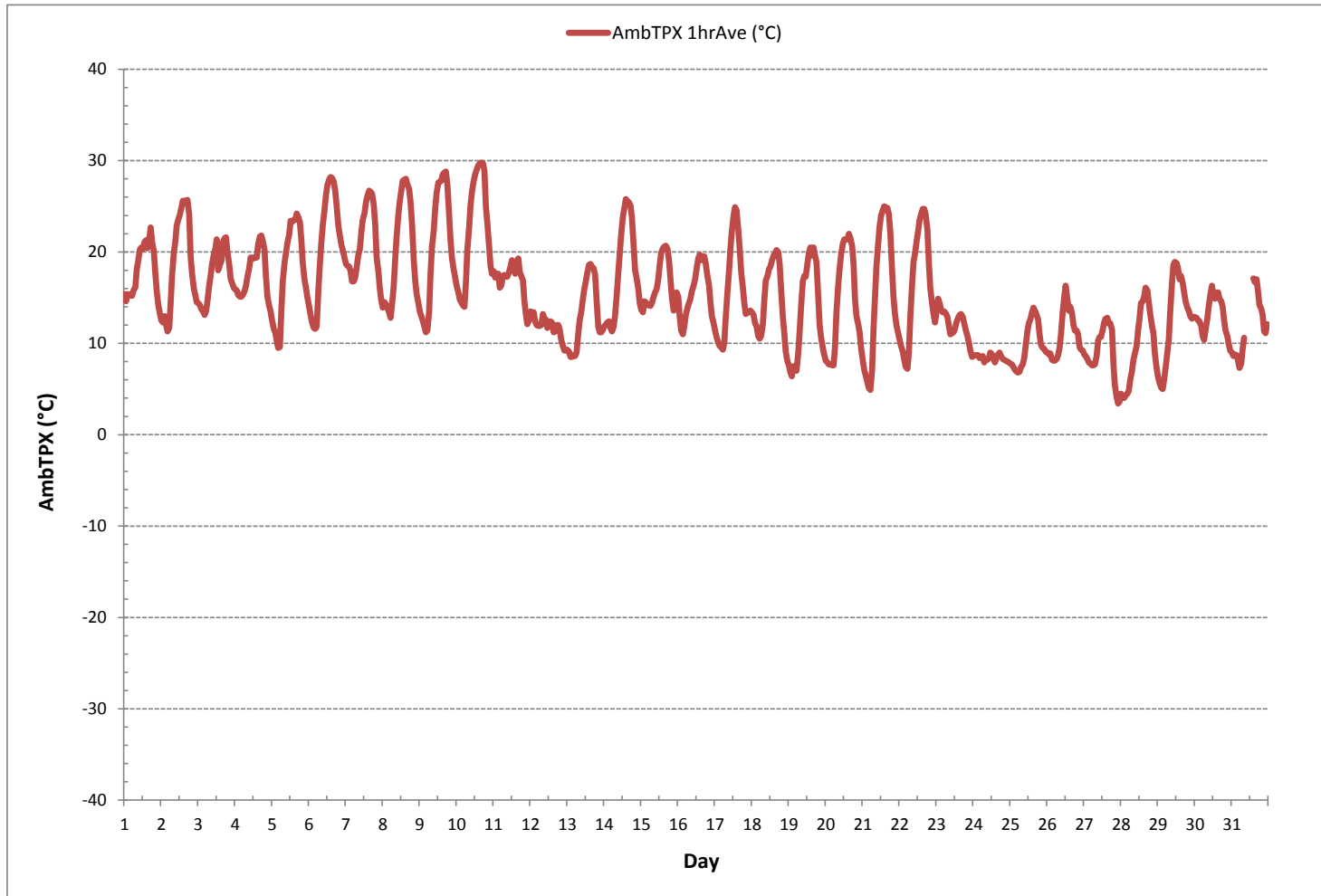
24 HR AVERAGES August 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	3.4	°C	@ HOUR	22	ON DAY	27
MAXIMUM 1-HR AVERAGE:	29.8	°C	@ HOUR	16	ON DAY	10
MAXIMUM 24-HR AVERAGE:	22.4	°C			ON DAY	10
OPERATIONAL TIME:					739	hrs
AMD OPERATION UPTIME:					99.3	%
STANDARD DEVIATION:	5.7				MONTHLY AVERAGE:	15.3 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date:	August 9, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	947	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):	9:59	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	14:10	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:	July 9, 2018	As Found C.F.:	0.981		
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: Envionics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 49.2	Standard Calibration Points for Ranges <table border="1"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>380</td></tr> <tr><td>Mid</td><td>180</td></tr> <tr><td>Low</td><td>90</td></tr> </table>	Point	ppb	High	380	Mid	180	Low	90
Point	ppb								
High	380								
Mid	180								
Low	90								

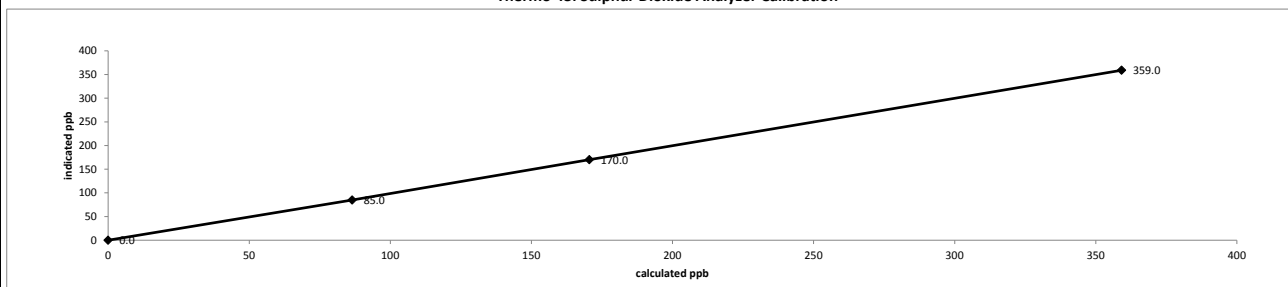
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5079	0.00	5079	0.0	0.0	n/a
as found high	5041	37.07	5078	359.2	366.0	0.981
adjusted zero	5079	0.00	5079	0.0	0.0	n/a
adjusted high	5041	37.07	5078	359.2	359.0	1.000
mid	5057	17.59	5075	170.5	170.0	1.003
low	5065	8.92	5074	86.5	85.0	1.018
calibrator zero	5079	0.00	5079	0.0	0.0	n/a
Average C.F. =						1.007

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		0.95-1.05
b (Intercept as % of full scale) =	0.14%		± 3% F.S.
% change in C.F. from last cal =	1.87%		± 10%

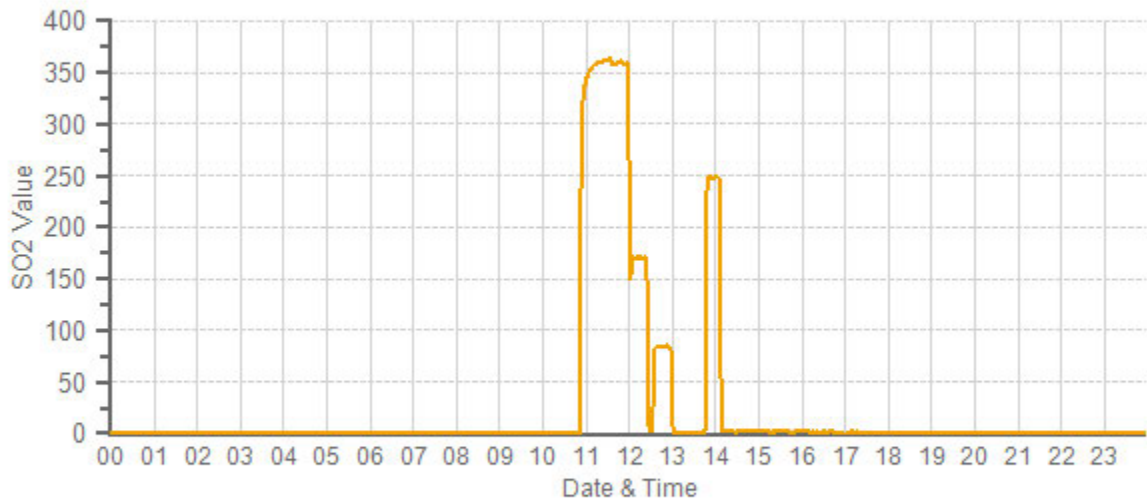
Thermo 43i Sulphur Dioxide Analyzer Calibration



As found:		As left:	
Bkg:	8.9	Bkg:	8.8
Coef:	0.979	Coef:	0.963
Pmt:	-624.6	Pmt:	-624.6
Flash:	763	Flash:	763
Internal:	25.3	Internal:	25.9
Chamber:	45.0	Chamber:	45.0
Perm Oven Gas:	45.00	Perm Oven Gas:	45.00
Perm Oven Heater:	44.23	Perm Oven Heater:	44.24
Pressure:	680.1	Pressure:	679.8
Sample Flow:	0.483	Sample Flow:	0.483
Lamp Intensity:	97	Lamp Intensity:	97
Converter:	n/a	Converter:	n/a
Converter Set:	n/a	Converter Set:	n/a
Averaging Time:	120	Averaging Time:	120
Expected Value:	252.0	Expected Value:	248.0

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: 18/08/09 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date: August 9, 2018	Barometer/B.P./units: F.S. 05544 expires January 15, 2019	947	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: Total Reduced Sulphur	Calibration Purpose: routine monthly		
Start Time 24 hr. (mst): 9:59	Performed By/Reviewer: Alex Yakupov		Rob Fisher
End Time 24 hr. (mst): 14:11	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: July 9, 2018	As Found C.F.: 0.995		
Previous C.F.: 0.996	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: Envionics id# 4760 expires March 2, 2019 Cal Gas Cylinder I.D. #: EY 0001003 Cal Gas Conc. (ppm): 9.55	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	SO2 Scrubber Check (10 minutes): Start/End Time 24 hr.: 10:46 / 10:56 SO2 Analyzer Range: 500 Target Concentration (ppb): 380 As Found Zero: 0.0 Analyzer Response: (ppb): 0.2 Zero Corrected Result (ppb): 0.2
Point	ppb									
High	78									
Mid	38									
Low	19									

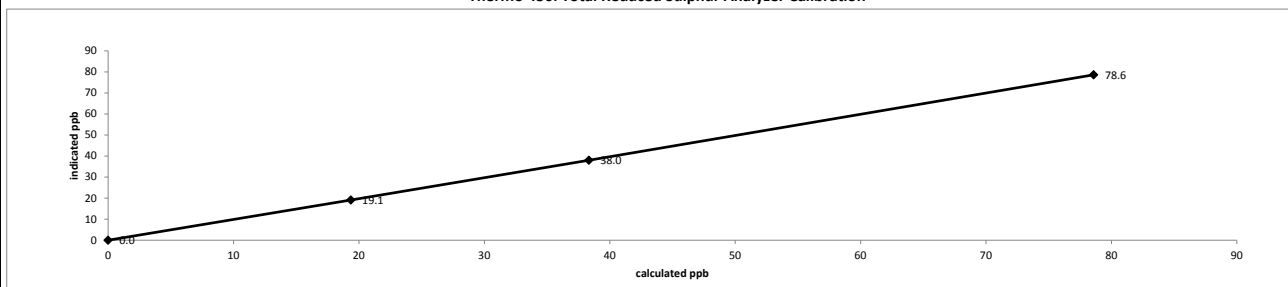
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7478	0.00	7478	0.0	0.0	n/a
as found high	7415	61.52	7477	78.6	79.0	0.995
adjusted zero	7478	0.00	7478	0.0	0.0	n/a
adjusted high	7415	61.52	7477	78.6	78.6	1.000
mid	7439	29.98	7469	38.3	38.0	1.009
low	7457	15.14	7472	19.4	19.1	1.013
calibrator zero	7478	0.00	7478	0.0	0.0	n/a
Average C.F. =						1.007

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		0.95-1.05
b (Intercept as % of full scale) =	0.17%		± 3% F.S.
% change in C.F. from last cal =	0.14%		± 10%

Thermo 450i Total Reduced Sulphur Analyzer Calibration



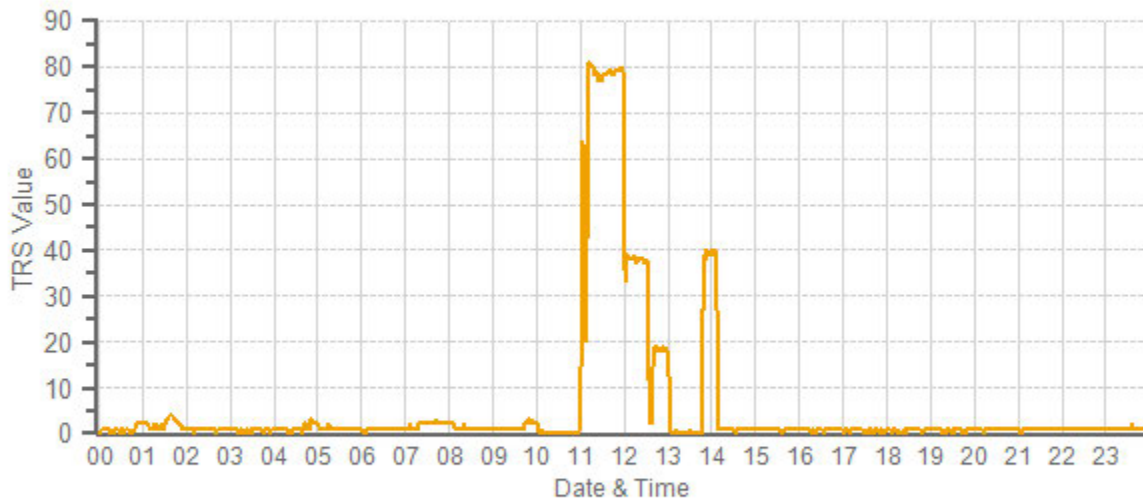
As found: Bkg: 15.5 Coef: 0.933 Pmt: -651.2 Flash: 742 Internal: 28.8 Chamber: 45.0 Converter Temp: 825 Converter Set: 825 Perm Oven Gas: 45.00 Perm Oven Htr: 44.37 Pressure: 634.0 Sample Flow: 0.491 Lamp Intensity: 92 Averaging Time: 120 Expected Value: 39.7	As left: Bkg: 15.5 Coef: 0.933 Pmt: -651.6 Flash: 742 Internal: 29.4 Chamber: 45.1 Converter Temp: 825 Converter Set: 825 Perm Oven Gas: 45.00 Perm Oven Htr: 44.38 Pressure: 633.4 Sample Flow: 0.491 Lamp Intensity: 92 Averaging Time: 120 Expected Value: 37.1
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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.

Extra time was taken to flush the regulator/gas from the cylinder because of a new calibration gas cylinder. As Found High point starts from 11:12.

TRS[ppb] Station: LICA COLD LAKE SOUTH Daily: 18/08/09 Type: AVG 1 Min. [1 Min.]



— TRS[ppb]

TOTAL HYDROCARBON



Thermo 51i Total Hydrocarbon Analyzer Calibration

Date: August 21, 2018	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 952 millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C
Location/Station Name: Cold Lake South	Weather Conditions: Mainly sunny
Parameter: Total Hydrocarbon	Calibration Purpose: shut down
Start/End Time 24 hr. (mst): 8:21 / 11:12	Performed By/Reviewer: Alex Yakupov Rob Fisher
Calibration Method: Gas Dilution	Cal Gas Expiry Date: October 18, 2025
Analyzer:	
Serial Number/Owner: 1118249035 Maxxam	Range ppm: 50
Last Calibration Date: July 6, 2018	As Found C.F.: 0.963
Previous Cal High Point C.F.: 1.000	New C.F.: n/a

Calibration Standards:

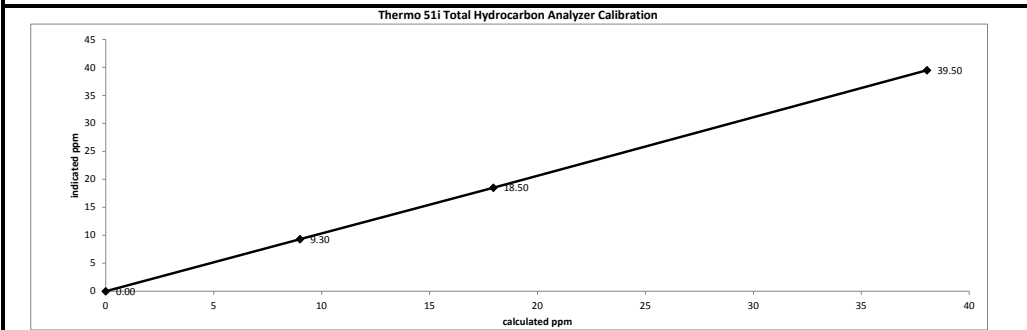
Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018	Standard Calibration Points for a Range of: 50 ppm
High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018	
Calibrator ID/Expiry Date: Enviroconics id# 4760 expires March 2, 2019	
Cal Gas Cylinder I.D. #: LL 119471	
CH₄/C₂H₆ Cylinder Conc. (ppm): 599.0 207.0	
CH₄ as propane/total CH₄ equivalents (ppm): 569.3 1168.3	

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	2512	0.00	2512	0.0	0.00	n/a
as found high	2426	81.67	2508	38.04	39.50	0.963
mid	2475	38.64	2514	17.96	18.50	0.971
low	2497	19.38	2516	9.00	9.30	0.968
Average C.F.=						0.967

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 0.963	> or = 0.995
b (Intercept as % of full scale) = 0.09%	0.90-1.10
% change in C.F. from last cal = 3.69%	± 3% F.S.
	± 10%



As found:	As left:
Bkg: 1.15	Bkg: n/a
Coef: 4.041	Coef: n/a
Bias Supply: -291	Bias Supply: n/a
Detector Base: 124.9	Detector Base: n/a
Filter: 125.1	Filter: n/a
Pump: n/a	Pump: n/a
Flame: 159.7	Flame: n/a
Internal: 27.5	Internal: n/a
Sample: 8.3	Sample: n/a
Fuel: 20.9	Fuel: n/a
Air: 39.5	Air: n/a
Signal: 234	Signal: n/a
Status: LIT	Status: n/a

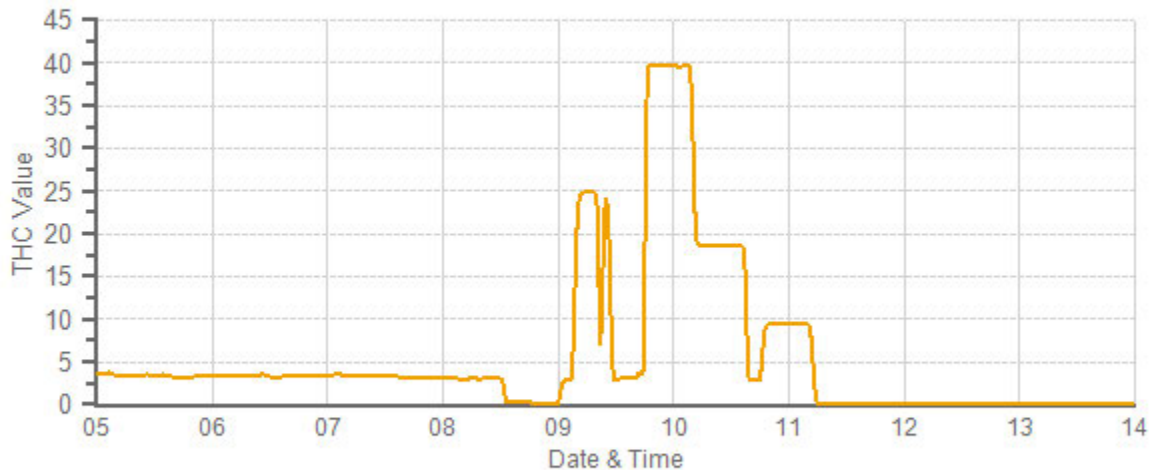
Cylinder/Regulator Pressures:	
H2 Cylinder (psi): 1400	H2 Cylinder (psi): n/a
H2 cylinder reg set (psi): 50	H2 cylinder reg set (psi): n/a
Zero Air Gen Pressure: 50	Zero Air Gen Pressure: n/a
Span Cylinder (psi): 1700	Span Cylinder (psi): n/a
Span Cylinder reg set (psi): 22	Span Cylinder reg set (psi): n/a
Measured Flow: 1203	Measured Flow: n/a
Expected Value: 27.70	Expected Value: n/a

Comments:

The manifold blower was found to be working normally.

A Shutdown calibration was completed to install a new 55i analyzer. 09:44 - High point starts (a new gas cylinder was tested before the High Point)

THC[ppm] Station: LICA COLD LAKE SOUTH Periodically: 2018/08/21 05:00-2018/08/21 14:00
Type: AVG 1 Min. [1 Min.]



— THC[ppm]



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	August 21, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	952	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Mainly sunny		
Parameter:	CH4 / NMHC / THC	Calibration Purpose:	installation		
Start/End Time 24 hr. (mst):	14:27 / 18:16	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	October 18, 2025		

Analyzer:		Correction Factors:			
Serial Number/Owner:	1180320044 | LICA	Previous C.F.:	As Found C.F.:	New C.F.:	
Measured Flow:	1185	CH ₄ =	n/a	n/a	0.998
Last Calibration Date:	n/a	NMHC =	n/a	n/a	0.998
Range ppm:	20 CH4/20 NMHC/40 THC	THC =	n/a	n/a	0.998

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018	Standard Calibration Points for Analyzer Range of 20/20/40 ppm			
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018	Point	CH4	NMHC	THC
Calibrator ID/Expiry Date:	Environics id# 4760 expires March 2, 2019	High	13.00	13.00	26.00
Cal Gas Cylinder I.D. #:	LL119471	Mid	7.00	7.00	14.00
CH4 Cylinder Conc. =	599.0 | 207.0 =C ₂ H ₆ Cylinder Conc.	Low	3.00	3.00	6.00
CH ₄ expressed as C ₂ H ₆ =	569.3 | 1168.3 =total CH4 equivalent				

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

Calibrator Flow Rates (cc/min)				Calculated					Indicated			Correction Factors:		
Point	Diluent	Cal Gas	Total Flow	CH ₄ (ppm)	NMHC (ppm)	THC (ppm)	CH ₄ (ppm)	NMHC (ppm)	THC (ppm)	CH ₄	NMHC	THC		
adjusted zero	3009	0.00	3009	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a		
adjusted high	2945	67.06	3012	13.34	12.67	26.01	13.36	12.70	26.06	0.998	0.998	0.998		
mid	2973	36.07	3009	7.18	6.82	14.00	7.22	6.88	14.00	0.995	0.992	1.000		
low	2999	15.51	3015	3.08	2.93	6.01	3.11	3.03	6.14	0.991	0.966	0.979		
calibrator zero	3009	0.00	3009	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a		
										Average C.F.=				
										0.995	0.985	0.992		

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	1.000	1.000	LIMITS
Slope =	1.001	1.000	1.000	> or = 0.995
b (Intercept as % of full scale)=	0.07%	0.24%	0.11%	0.95-1.05
% change in C.F. from last cal=	n/a	n/a	n/a	± 3% F.S.

As Left Instrument Diagnostics:

Interface Board Voltages:	Bias Supply:	-296.1	Calibration History cnt'd:	NM Peak Area:	n/a
Temperatures:	Detector Oven:	175.0	Crucial Settings:	Methane Start:	8.0
	Filter:	175.0		Methane End:	16.0
Cylinder Pressures/reg.:	Column Oven:	75.5	Run History>1:	Backflush:	18.0
	Internal:	31.4		NMHV Start:	26.0
	Carrier:	2200 | 50		NMHC End:	56.0
	Fuel:	1400 | 50		Date:	Aug 21, 2018
Internal Pressures:	Span Gas:	400 | 7	Time:	15:05	
	Zero Air Generator:	45	CH ₄ PK HT:	0	
	Carrier:	29.4	CH ₄ RT:	12.6	
FID Status:	Fuel:	44.2	CH ₄ Baseline:	3808	
	Air:	30.2	CH ₄ LOD:	63	
	Status:	LIT	CH ₄ SD:	20	
	Counts:	41398	CH ₄ CONC:	0.00	
Flame and Power Stats:	Flame:	351.7	NM PK HT:	0	
	Det Base:	175.1	NM Peak Area:	0	
	Last Power On:	Aug 21, 2018	NM CONC:	0.00	
	Flameouts:	1	NM Base Start:	3679	
Calibration History:	Det Oven at Start:	173.3	NM Base End:	3744	
	Col Oven at Start:	75.1	NM LOD:	12	
	Time:	n/a	NM Start IDX:	11	
	Type:	n/a	NM End IDX:	90	
	Status:	n/a	NM Max Slope:	2.8e+00	
	Check/Adjust:	n/a	NM Min Slope:	-2.2e-01	
	CH ₄ Span Conc:	n/a	NM PT Count:	0	
	CH ₄ SP Ratio:	n/a	Previous CH ₄ :	n/a	
	CH ₄ RT:	n/a	Previous NMHC:	n/a	
	CH ₄ PK IDX:	n/a	Previous THC:	n/a	
CH ₄ PK HT:	n/a	New CH ₄ :	n/a		
NM Span Conc:	n/a	New NMHC:	n/a		
NM SP Ratio:	n/a	New THC:	21.16		

Comments:

The analyzer sample inlet filter was changed. A new nitrogen cylinder was installed.

A new hydrogen cylinder was installed. A new sample filter was installed, new purifiers for N₂ and H₂ gases were installed.

A new span gas cylinder was installed. The oxygen purifiers were replaced.

The analyzer cooling fan filter(s) were cleaned.

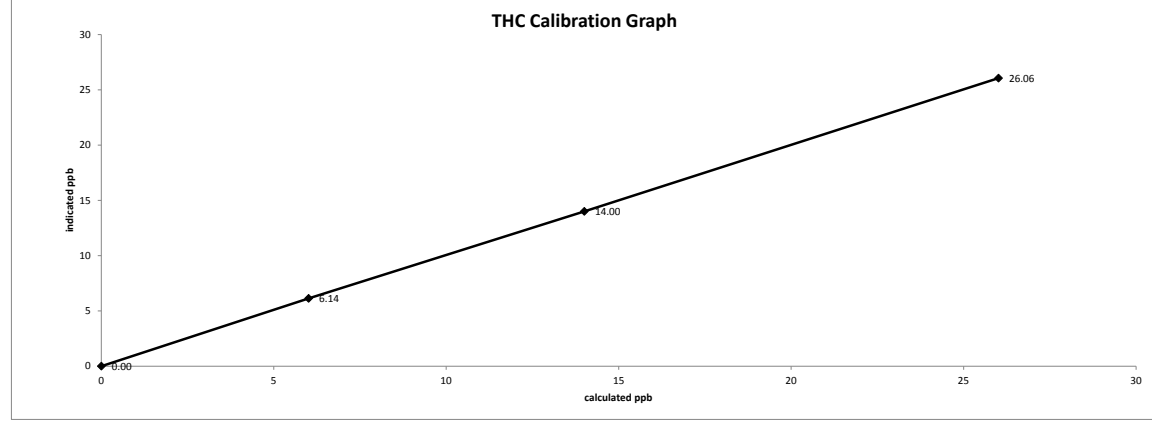
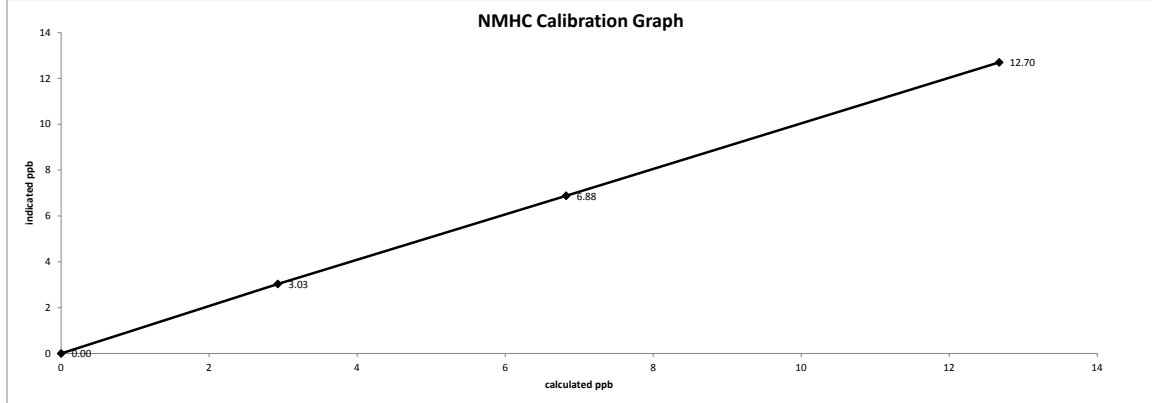
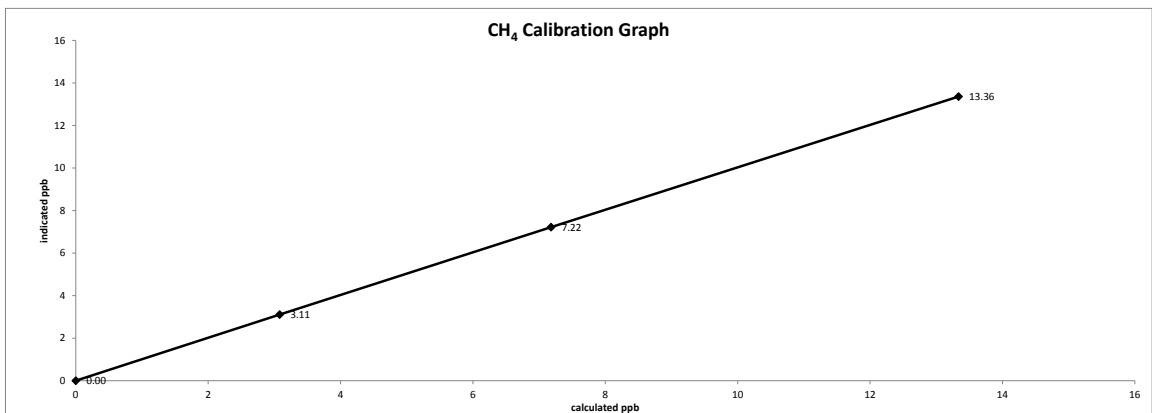
The manifold blower was found to be working normally.

The installation was completed to replace a previous 51i analyzer.

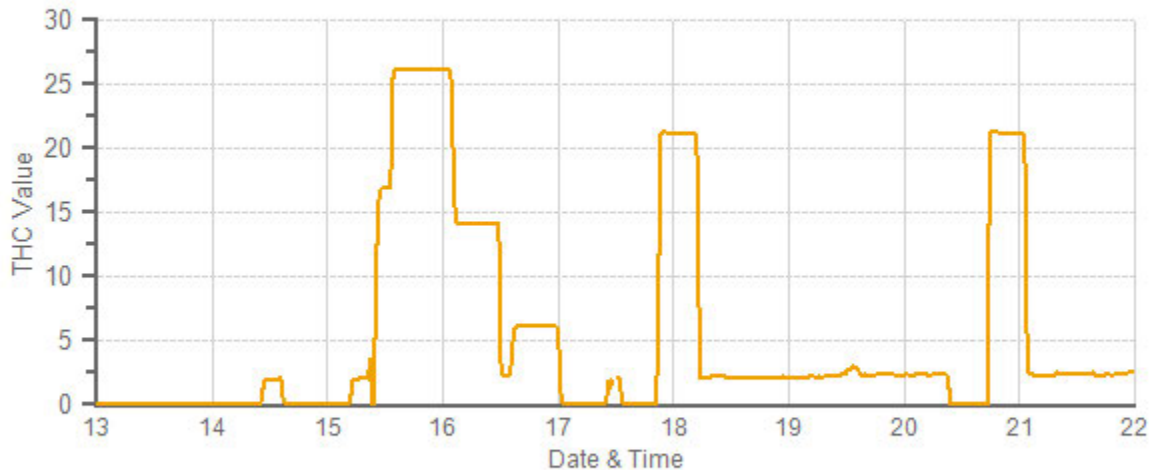
CH₄ and NMHC minute and hourly data collection did not commence until August 22. Calibration data is therefore not available for the graph.

Date: August 21, 2018
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 14:27 / 18:16
Calibration Purpose: installation
Calibration Method: Gas Dilution



THC[ppm] Station: LICA COLD LAKE SOUTH Periodically: 2018/08/21 13:00-2018/08/21 22:00
Type: AVG 1 Min. [1 Min.]



— THC[ppm]

NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: August 9, 2018	Barometer/B.P./units: F.S. 05544 expires January 15, 2019	947	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): 9:59 /16:50	Calibration Purpose: routine monthly		
G.P.T. to be used for Ozone?: Yes with 500 ppb NOx full scale	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: July 9, 2018 Range ppb: 500	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>0.999</td> <td>1.005</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>0.999</td> <td>1.004</td> <td>0.999</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	1.005	1.000	NO ₂ =	1.000	1.000	1.000	NOx =	0.999	1.004	0.999
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	0.999	1.005	1.000														
NO ₂ =	1.000	1.000	1.000														
NOx =	0.999	1.004	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: Envirionics id# 5212 expires March 1, 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 <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> <td>330</td> <td><-high ozone</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>245</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>175</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>133</td> <td><-mid ozone</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>53</td> <td><-low ozone</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	380	330	<-high ozone	Mid	180	245	n/a	Low	90	175	n/a	Extra Point #1	n/a	133	<-mid ozone	Extra Point #2	n/a	53	<-low ozone
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	380	330	<-high ozone																						
Mid	180	245	n/a																						
Low	90	175	n/a																						
Extra Point #1	n/a	133	<-mid ozone																						
Extra Point #2	n/a	53	<-low ozone																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5079	0.0	5079	0	0	0.0	0.0	n/a	n/a
as found high	5041	37.1	5078	376.0	376.7	374.0	375.0	1.005	1.004
adjusted zero	5079	0.00	5079	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5041	37.07	5078	376.0	376.7	376.0	377.0	1.000	0.999
mid	5057	17.59	5075	178.5	178.8	178.0	179.0	1.003	0.999
low	5065	8.92	5074	90.5	90.7	90.0	91.0	1.006	0.997
calibrator zero	5079	0.00	5079	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.003	0.998

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	5041	37.07	5078	0.0	376.0	377.0	1.0	0.0	1.0	
as found high NO2	5041	37.07	5078	255.0	126.0	377.0	251.0	250.0	250.0	1.000
adjusted high NO2	5041	37.07	5078	255.0	126.0	377.0	251.0	250.0	250.0	1.000
gpt mid	5041	37.07	5078	135.0	245.0	377.0	132.0	131.0	131.0	1.000
gpt low	5041	37.07	5078	49.0	326.0	377.0	51.0	50.0	50.0	1.000
Average NO ₂ C.F.=										1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.999	1.003	0.95-1.05
b (Intercept as % of full scale)=	-0.07%	0.02%	0.12%	± 3% F.S.
% change in C.F. from last cal=	-0.62%	-0.55%	0.00%	± 10%
NO2 converter efficiency			1.00	0.96 to 1.04

As found:		As left:	
NO Bkg:	4.0	NO Bkg:	4.1
NOx Bkg:	4.1	NOx Bkg:	4.1
NO Coef:	1.037	NO Coef:	1.042
NO2 Coef:	1.000	NO2 Coef:	1.000
NOx Coef:	1.001	NOx Coef:	1.002
PMT:	-855.1	PMT:	-855.1
Internal:	23.7	Internal:	24.6
Chamber:	50.0	Chamber:	50.4
Cooler:	-2.8	Cooler:	-2.9
NO2 Converter:	325.0	NO2 Converter:	323.4
NO2 Converter Set:	325.0	NO2 Converter Set:	325.0
Perm Oven Gas:	34.99	Perm Oven Gas:	35.00
Perm Oven Heater:	34.20	Perm Oven Heater:	34.23
Pressure:	183.2	Pressure:	183.5
Flow:	0.742	Flow:	0.746
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	2	Expected Value NO:	3
Expected Value NO2:	259	Expected Value NO2:	258
Expected Value NOx:	261	Expected Value NOx:	261

Comments:

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

The manifold blower was found to be working normally.

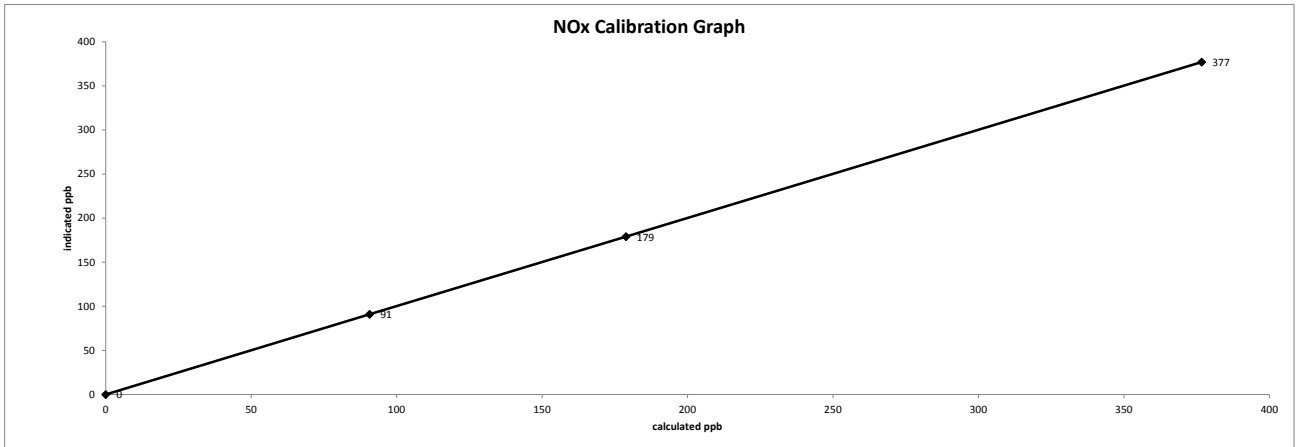
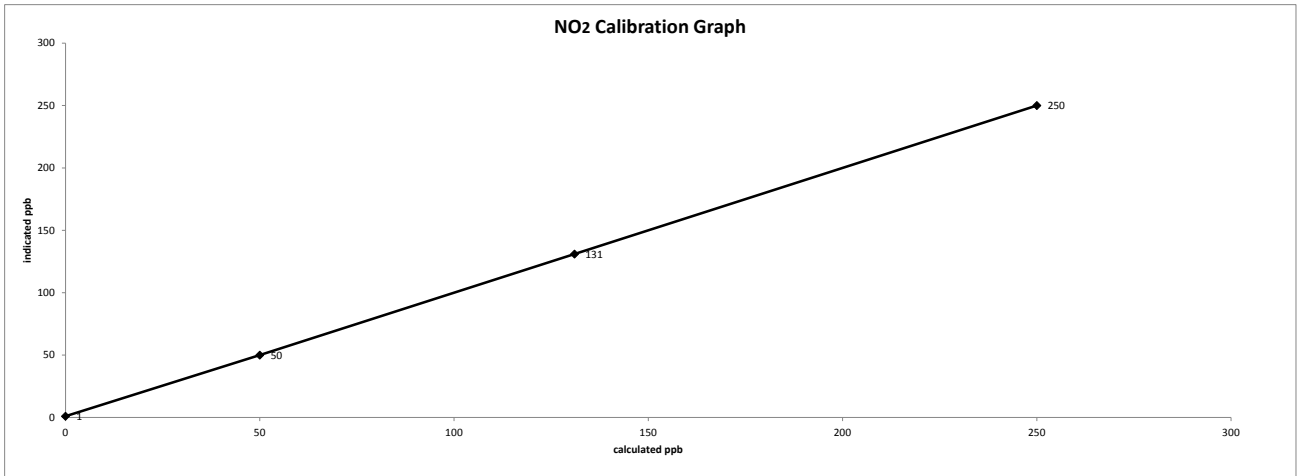
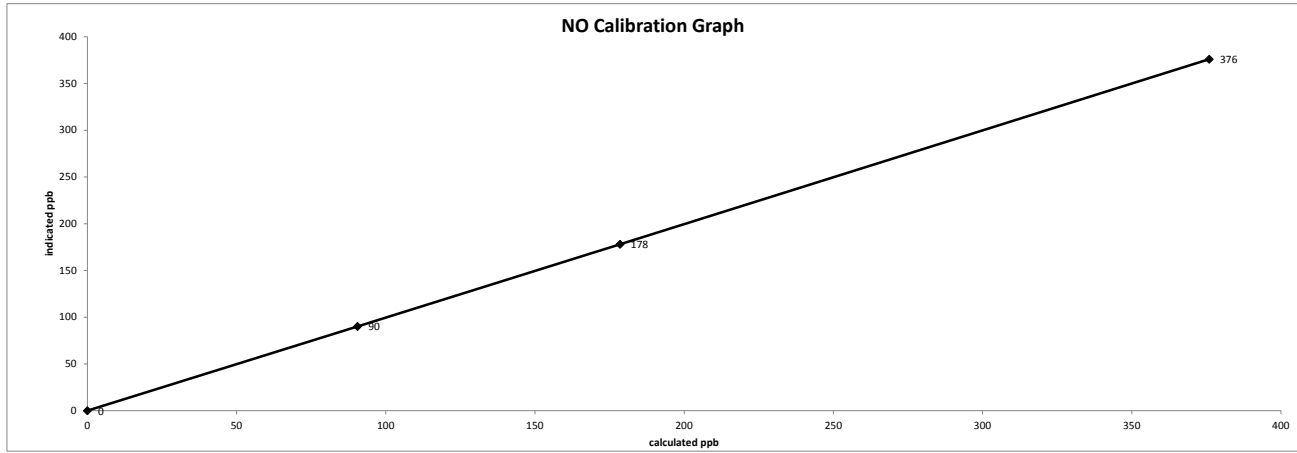
The analyzer cooling fan filter(s) were cleaned.

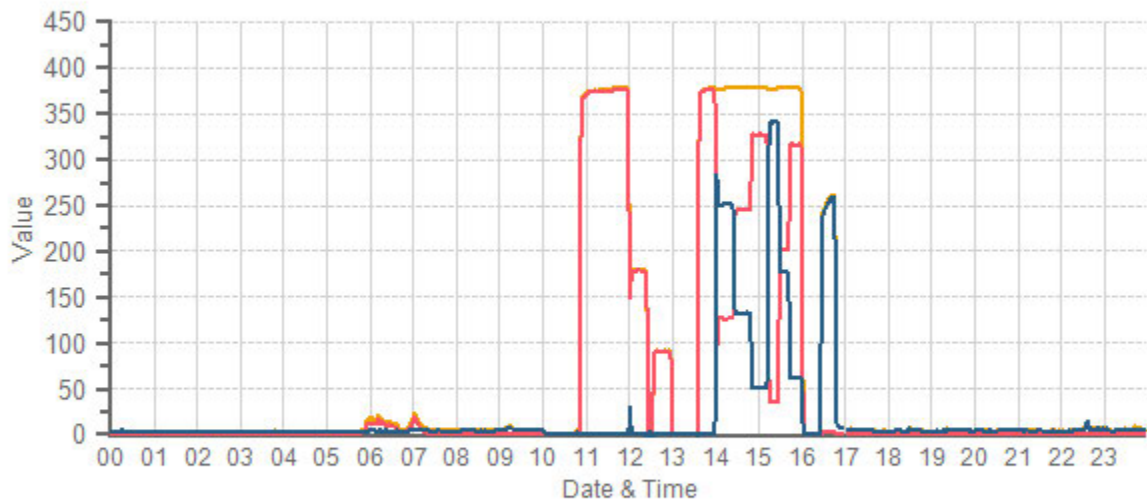
The GPT for O3 (ppb): High O3 set = 350, NO drop = 340; Mid O3 set = 180, NO drop = 176; Low O3 set = 62, NO drop = 60.

Date: August 9, 2018
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 9:59 /16:50
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration





— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date: August 10, 2018 Company/Airshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 8:12 / 13:04 Ozone Calibration Method: Direct G.P.T. G.P.T. Date: August 9, 2018 Analyzer: Serial Number/Owner: 700419951 LICA Last Calibration Date: July 10, 2018 Previous Cal High Point C.F.: 1.000	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 944 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Mix of sun and clouds Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 24, 2020 Ozone Range ppb: 500 As Found C.F.: 1.006 New C.F.: 1.000
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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: Envirionics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-100 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-100 ppb
Point	AMD Required Range of Ozone Calibration Points								
High	300-400 ppb								
Mid	150-200 ppb								
Low	50-100 ppb								

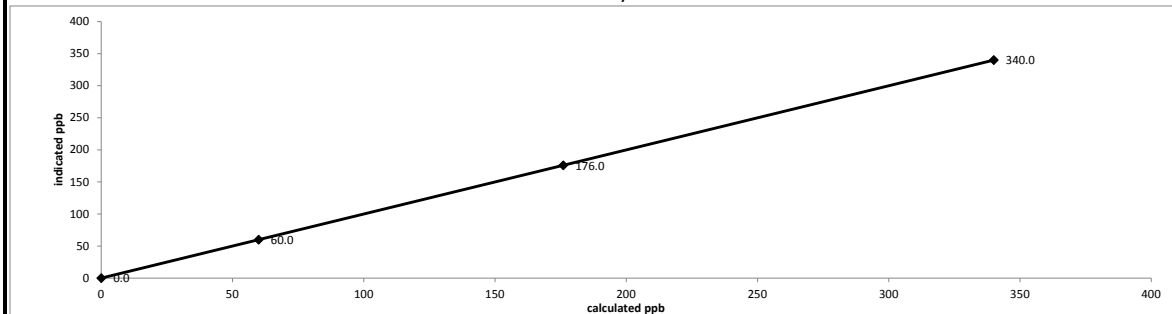
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	340.0	340.0	338.0	1.006
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	340.0	340.0	340.0	1.000
mid	5000	5000	176.0	176.0	176.0	1.000
low	5000	5000	60.0	60.0	60.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F.=						1.000

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 1.000	> or = 0.995
b (Intercept as % of full scale)= 0.00%	0.95-1.05
% change in C.F. from last cal= -0.59%	± 3% F.S.
	± 10%

Thermo 49i Ozone Analyzer Calibration



As found:

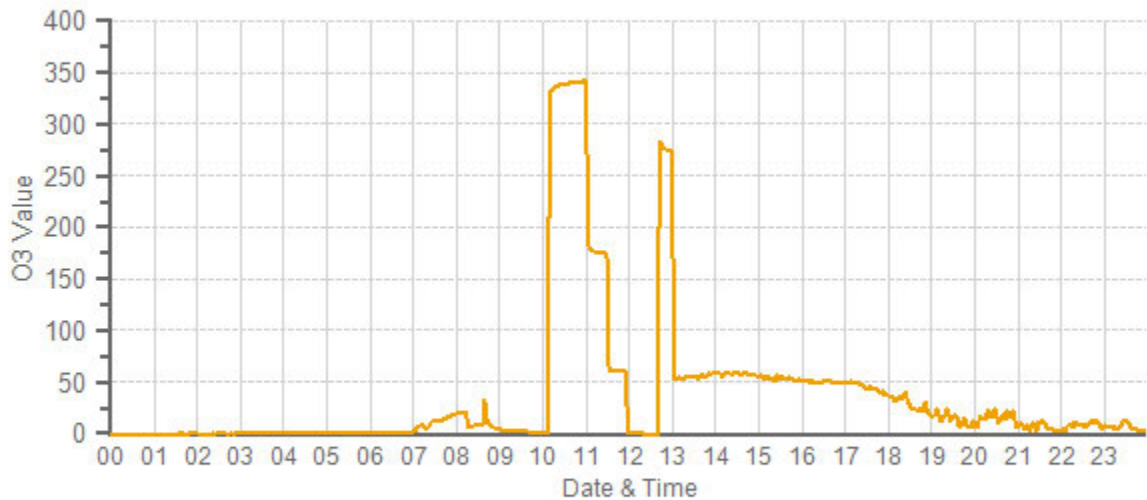
O3 Bkg:	0.0
O3 Coef:	1.020
Photo Lamp:	9.6
O3 Lamp:	8.1
Bench:	25.0
Bench Lamp:	53.4
O3 Lamp:	67.4
Pressure:	706.5
Cell A lpm:	0.710
Cell B lpm:	0.755
O3 ppb:	1.6
Cell A ppb:	2.9
Cell B ppb:	0.3
Cell A int (Hz):	79940
Cell B int (Hz):	80922
Expected Value:	268.0

As left:

O3 Bkg:	0.0
O3 Coef:	1.021
Photo Lamp:	9.6
O3 Lamp:	5.7
Bench:	25.8
Bench Lamp:	53.4
O3 Lamp:	67.4
Pressure:	705.9
Cell A lpm:	0.710
Cell B lpm:	0.754
O3 ppb:	0.2
Cell A ppb:	13.0
Cell B ppb:	-12.6
Cell A int (Hz):	79877
Cell B int (Hz):	80870
Expected Value:	275.0

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

O3[ppb] Station: LICA COLD LAKE SOUTH Daily: 18/08/10 Type: AVG 1 Min. [1 Min.]



— O3[ppb]

PARTICULATE MATTER



Thermo 5030 SHARP Monitor Audit

Date: August 27, 2019	Performed By/Reviewer: Alex Yakupov | Rob Fisher
Company: LICA	Start Time (mst): 11:09
Station Name/Location: Cold Lake South	End Time (mst): 12:59
Previous Audit Date: July 10, 2018	Calibration Purpose: quarterly
Parameter: PM 2.5	Weather Conditions: Cloudy/Overcast

SHARP Information and Status:	
Serial Number/Owner: CM - 2209 | LICA	Status Code: 0
Approx. % Tape Reaming: 60%	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:	10	21	21	21	951	34	Temp Limit: ± 4 °C Pressure Limit: ± 13.33 hPa RH Limit: ± 2%
Reference:	10.7	21.3	21.3	21.3	951.0	34.0	
Difference:	0.7	0.3	0.3	0.3	0.0	0.0	

As Left Temperature and Pressure (same as above if as found adequate):							
	T1 (°C)	T2 (°C)	T3 (°C)	T4 (°C)	P3 (hPa)	RH (%)	
SHARP:	10	21	21	21	951	34	Temp Limit: ± 4 °C Pressure Limit: ± 13.33 hPa RH Limit: ± 2%
Reference:	10.7	21.3	21.3	21.3	951.0	34.0	
Difference:	0.7	0.3	0.3	0.3	0.0	0.0%	

Mass Foil Calibration:			
	Mass Foil:	ZERO:	Span Sensitivity
Mass Foil ID:	9015	QLF:	2
Spanfoil Value (µg):	1294	CONFID:	9
		OLD:	7000
		NEW:	6999

Nephelometer Zero:				
	As Found		As Left	
Analog	160.00		159.00	
NEPH	0.30		-0.50	
C14	81.10		95.90	
Conc	0.30		-0.50	

Flow rate:				
	As Found		As Left	
SHARP AirFlow l/hr	1000		1000	
Reference AirFlow (l/min)	16.96		16.65	
Reference AirFlow (l/hr)	1018		999	
% Difference:	-1.8%		0.1%	
			$%D = 100 \times \frac{Q_m - Q_i}{Q_i}$	
			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:

Leak check: 16.65 vs 16.62, Difference = 0.03 lpm < 0.42 lpm, passed.

WIND SYSTEM

CALIBRATORS

Company: Maxxam Operator: Chris W

Calibrator:			Flow Measurement Device:		
Make/Model	<u>EnviroNics 6100</u>		Make/Model	<u>Mesa Defender 530</u>	
Serial Number	<u>5212</u>		Serial Number	<u>L-153351 H-152571</u>	
Last Verification Date	<u>February 2017</u>		Temperature (°C)	<u>24.0 C</u>	
NO Cylinder S/N	<u>EY0000715</u>		Barometric Pressure	<u>702 mmHg</u>	
NO [PPM]	<u>50.7</u>	NOx [PPM] <u>50.8</u>			
Expiry Date	<u>May 2021</u>				

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
5004	77.2	0.7822	0.7837	0.7769	0.0006	0.7774	-1%	-1%
5018	37.7	0.3809	0.3817	0.3777	0.0005	0.3782	-1%	-1%
5012	18.8	0.1902	0.1905	0.1884	-0.0002	0.1885	-1%	-1%
Absolute Average Percent Difference							1%	1%

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

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 0.9934	0.90-1.10	m (Slope)= 0.9921
b (Intercept % of FS)= -0.0332	± 3% F.S.	b (Intercept % of FS)= -0.0277

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5004	0.000	0.0000	0.7766	0.0007	0.7773	NO ₂	% Diff. Limit
5004	0.500	0.4846	0.2920	0.4797	0.7717	-1%	± 10%
5004	0.280	0.2731	0.5035	0.2713	0.7747	-1%	± 10%
5004	0.100	0.0958	0.6808	0.0962	0.7770	0%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9880	0.90-1.10
b (Intercept % of FS)= 0.1153	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	Make/Model <u>Teco 42i</u>
Make/Model <u>Teco 146i</u>	Serial/AMU Number <u>AMU 1868</u>
Serial/AMU Number <u>AMU 1809</u>	Last Calibration Date <u>March 1, 2018</u>
SRM Gas Cylinder No. <u>APEX1170572</u>	Full Scale (ppm) <u>1.0</u>
Cylinder Conc. (ppm) <u>49.99</u>	Cylinder Gas Expiry Date <u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark Date: March 1, 2018

Operator Signature: *Chris W* Location: McIntyre Center Edmonton

Company: Maxxam Operator: Chris W

Calibrator:				Flow Measurement Device:			
Make/Model	<u>Envronics 6100</u>			Make/Model	<u>Mesa Defender 530</u>		
Serial Number	<u>4760</u>			Serial Number	<u>L-153351 H-152571</u>		
Last Verification Date	<u>February 2017</u>			Temperature (°C)	<u>23.0 C</u>		
NO Cylinder S/N	<u>EY0000715</u>			Barometric Pressure	<u>704 mmHg</u>		
NO [PPM]	<u>50.7</u>	NOx [PPM]	<u>50.8</u>				
Expiry Date	<u>May 2021</u>						

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
4935	77.0	0.7911	0.7926	0.7830	0.0017	0.7846	-1%	-1%
4951	37.5	0.3840	0.3848	0.3808	-0.0001	0.3806	-1%	-1%
4938	18.9	0.1941	0.1944	0.1915	0.0003	0.1918	-1%	-1%
Absolute Average Percent Difference							1%	1%

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

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	0.9901	0.90-1.10		m (Slope)=	0.9901
b (Intercept % of FS)=	-0.0092	± 3% F.S.		b (Intercept % of FS)=	-0.0320

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas		
4935	0.000	0.0000	0.7877	0.0005	0.7881	NO ₂	% Diff. Limit	
4935	0.500	0.4912	0.2965	0.4844	0.7809	-1%	± 10%	
4935	0.280	0.2755	0.5122	0.2729	0.7851	-1%	± 10%	
4935	0.100	0.0977	0.6900	0.0991	0.7891	1%	± 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)=	0.9836	0.90-1.10	
b (Intercept % of FS)=	0.1675	± 3% F.S.	

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Last Calibration Date	<u>March 2, 2018</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark
Operator Signature: *Chris W*

Date: March 2, 2018
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2017-482CGA

Company: Maxxam **Operator's Name:** Mike
Cylinder #: LL104225 **Concentration PPM:** 49.2 **Tolerance(%)** 2 **Certified By:** Praxair
Expiry Date: October 2020

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
Serial Number: AMU 1690
Last Verification Date: December 13, 2017
Gas Type: SO2 **Conc.** 98.07
Cylinder Number: CAL016625
Expiry Date: January 2019

Flow Measurement Device:

Make/Model: Mesa Definer 220
Serial Number: H-133034 / L-132702
Temp. °C: 23.4 C
B.P. 707 mmHg

Reference Analyzer:

Make/Model: Teco 43C **Serial/AMU Number:** 1623
Instrument Settings: **Zero:** 10.0 **Span:** 1.006 **Range:** 1.0
Last Calibration: **Date:** Dec12/17 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.000	0.000	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

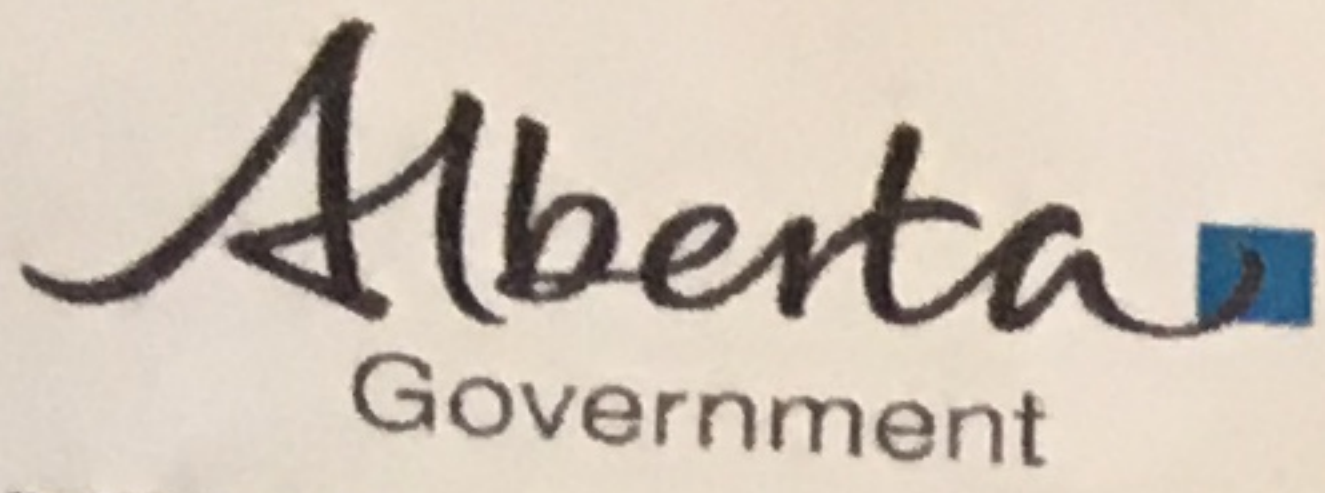
Previous Stated Concentration PPM: 49.2

Percent variance from Stated: 3

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

Auditor: Al Clark
Operator Signature: *Al Clark*

Date: December 13, 2017
Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2017-493CGA

Company: Maxxam Operator's Name: Mike
 Cylinder #: EY0001003 Concentration PPM: 9.55 Tolerance(%): 2 Certified By: Praxair
 Expiry Date: October 2020

Reference Calibrator and Gas:
 Make/Model: Sabio 2010
 Serial Number: AMU 2092
 Last Verification Date: January 17, 2018
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015272
 Expiry Date: January 2019

Flow Measurement Device:
 Make/Model: Mesa Defender 530
 Serial Number: H-153961 / L-153874
 Temp. °C: 23.0 C
 B.P.: 697 mmHg

Reference Analyzer:
 Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 12.9 Span: 0.955 Range: 0.1
 Last Calibration: Date: Jan 17/18 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	0.0000	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 COMMENTS: Used AEP regulator
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark

Date: January 18, 2018

Operator Signature: [Signature]

Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2017-483CGA

Company: Maxxam **Operators name:** Mike

Cylinder #: LL104225 Conc (PPM) 51.5/51.6 Tolerance (%) 2 Certified By: Praxair

Expiry Date: October 2020

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Mesa Definer 220</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>H-133034 / L-132702</u>
Last Verification Date	<u>December 13, 2017</u>			Temp. °C	<u>23.4 C</u>
Gas Type	<u>NO</u>	Conc.	<u>50.03</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>APEX 1223938</u>				
Expiry Date	<u>June 2020</u>				

Reference Analyzer:

Make/Model Teco 42i Serial/AMU Number: 1868

Instrument Settings Zero: 4.7 Span: 1.004 Range: 1.0

Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4989	79.5	0.813	0.812	0.016	62.755	51.0	51.0
4995	39.6	0.407	0.406	0.008	126.136	51.3	51.2
4992	19.6	0.202	0.201	0.004	254.694	51.4	51.2
Average Cylinder Concentration:						51.3	51.1

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>51.5</u>	<u>51.6</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:**

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration

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

Auditor: Al Clark Date: December 13, 2017

Operator Signature: *Al Clark* Location: McIntyre Center Edmonton

APPENDIX III
MAXIMUM INSTANTANEOUS DATA



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - August 2018

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

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

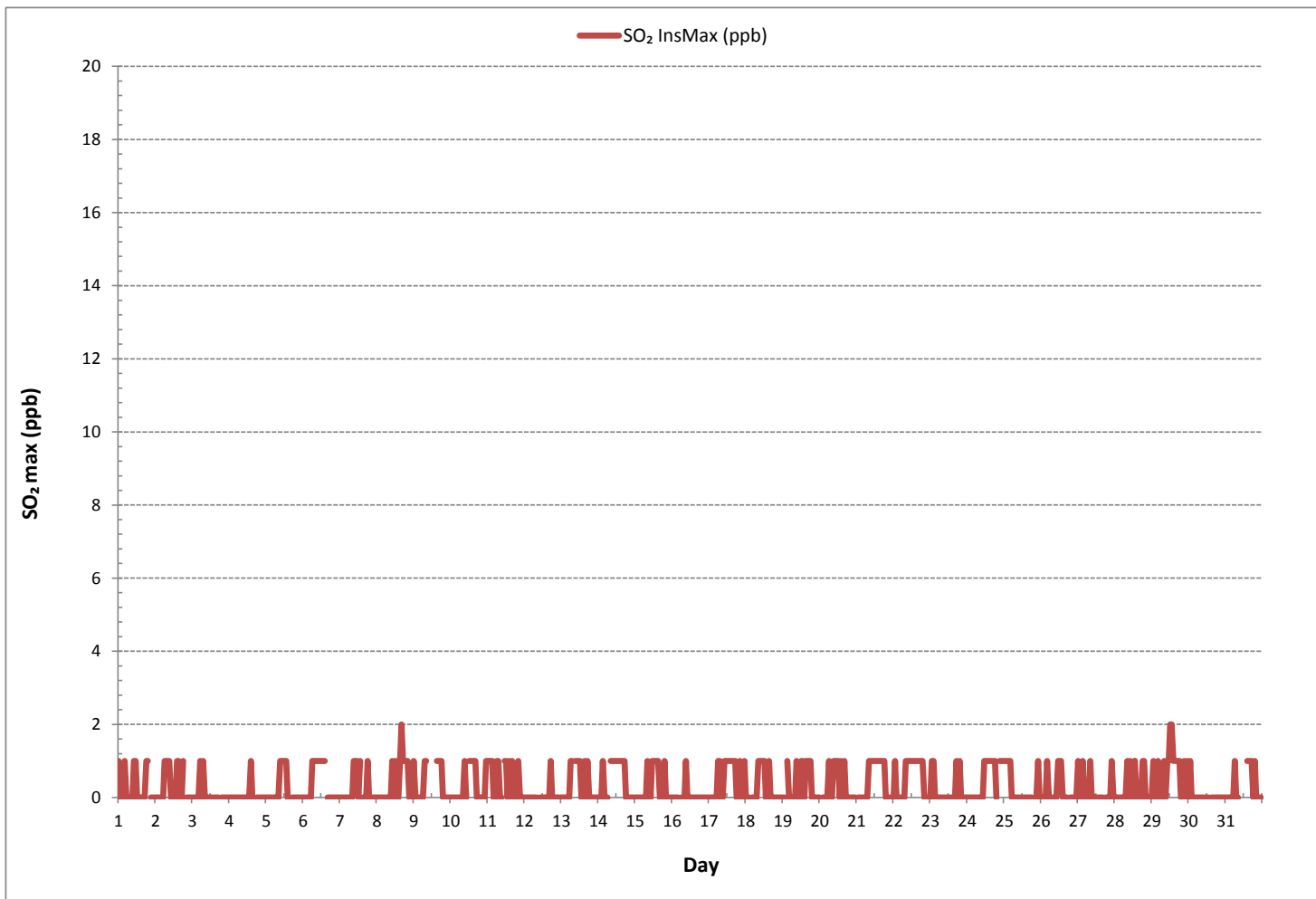
STATUS FLAG CODES

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:	207
MAXIMUM INSTANTANEOUS VALUE:	2 ppb @ HOUR 16 ON DAY 8
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	739 hrs
STANDARD DEVIATION:	0

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - August 2018

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

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

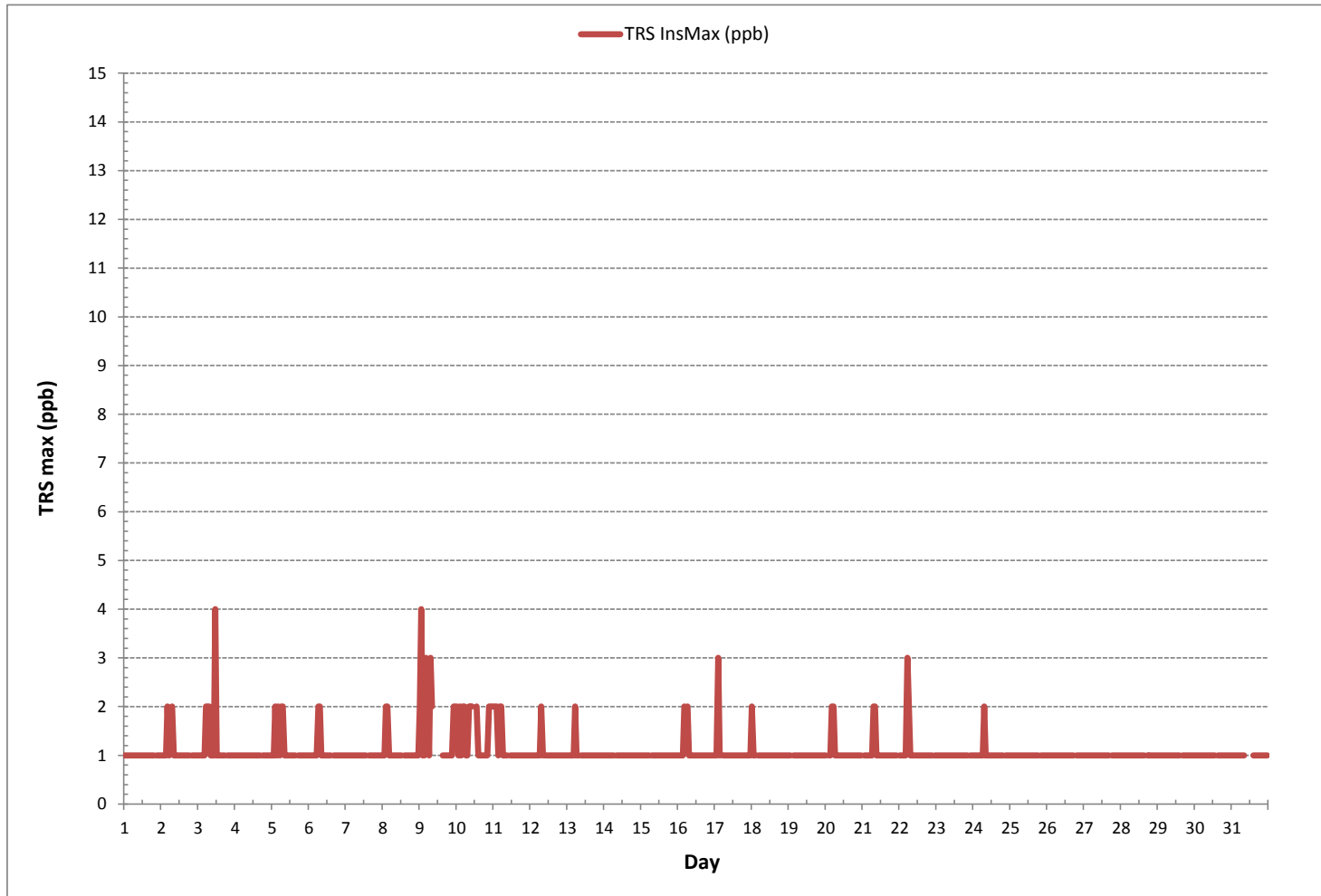
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	701
MAXIMUM INSTANTANEOUS VALUE:	4 ppb @ HOUR 11 ON DAY 3
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	737 hrs
STANDARD DEVIATION:	0

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - August 2018

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	3.23	3.23	2.58	2.99	2.68	2.93	2.61	2.42	2.42	3.10	2.41	2.52	2.52	2.45	2.47	2.78	2.49	2.51	2.52	2.45	S	4.04	3.39	3.25	2.41	4.04	2.78	24	
2	3.14	3.34	3.59	3.59	3.80	4.41	3.65	3.37	2.67	2.50	2.31	2.32	2.38	2.43	2.42	2.42	2.39	2.40	2.39	S	2.28	2.41	2.49	2.54	2.28	4.41	2.84	24	
3	2.47	2.61	2.93	3.05	2.93	2.75	2.72	2.50	2.41	2.38	2.37	2.29	2.31	2.30	2.27	2.27	2.27	2.33	S	2.33	2.41	2.63	3.16	2.49	2.27	3.16	2.53	24	
4	2.47	2.26	2.29	2.31	2.37	2.37	2.43	2.35	2.36	2.27	2.30	2.27	2.26	2.26	2.27	2.28	2.23	S	2.31	2.29	2.50	2.86	2.80	2.87	2.23	2.87	2.39	24	
5	3.27	2.77	2.97	2.89	3.02	2.95	2.95	3.11	2.67	2.44	2.45	2.40	2.37	2.33	2.44	2.35	S	2.34	2.35	2.49	2.43	2.60	2.89	3.04	2.33	3.27	2.67	24	
6	3.39	3.39	3.40	3.13	3.63	4.07	3.74	2.88	2.40	2.44	2.43	2.39	2.38	2.32	2.29	S	2.27	2.34	2.33	2.48	2.45	2.47	2.63	2.66	2.27	4.07	2.78	24	
7	2.54	2.48	2.43	2.45	2.57	2.46	2.39	2.41	2.42	2.49	2.53	2.39	2.37	2.34	S	2.27	2.26	2.27	2.27	2.55	3.33	2.83	3.11	3.22	2.26	3.33	2.54	24	
8	3.19	3.08	2.91	2.79	2.77	3.00	2.91	2.72	2.66	2.55	2.46	2.43	2.39	S	2.45	2.38	2.36	2.40	2.39	2.50	2.83	3.19	3.40	3.13	2.36	3.40	2.73	24	
9	3.13	3.40	3.62	3.31	3.69	3.74	3.86	3.78	3.41	S1	3.23	2.99	S	2.59	2.47	2.48	2.45	2.68	2.71	2.69	3.05	3.42	4.14	4.05	2.45	4.14	3.22	23	
10	4.29	4.77	4.59	4.48	4.13	4.73	4.97	4.13	3.62	3.48	3.15	S	2.94	2.95	2.69	2.65	2.61	2.77	3.54	4.30	3.34	4.21	3.41	3.62	2.61	4.97	3.71	24	
11	3.54	3.13	2.81	2.48	2.89	2.91	2.43	2.31	2.39	2.41	S	2.32	2.31	2.37	2.49	2.38	2.38	2.40	2.38	2.30	2.39	2.38	2.44	2.27	2.27	3.54	2.53	24	
12	2.24	2.21	2.21	2.20	2.25	2.25	2.24	2.22	2.22	S	2.25	2.25	2.18	2.21	2.24	2.26	2.22	2.21	2.24	2.21	2.19	2.16	2.19	2.17	2.16	2.26	2.22	24	
13	2.19	2.25	2.22	2.36	2.46	2.47	2.55	2.35	S	2.38	2.37	2.33	2.35	2.33	2.31	2.34	2.32	2.37	2.32	2.40	2.34	2.35	2.38	2.43	2.37	2.19	2.55	2.36	24
14	2.32	2.28	2.26	2.26	2.31	2.31	2.34	S	2.42	2.48	2.43	2.43	2.41	2.37	2.38	2.35	2.31	2.33	2.43	2.49	2.68	2.62	2.91	2.96	2.26	2.96	2.44	24	
15	3.63	3.39	3.51	2.63	2.65	2.53	S	2.49	2.58	2.66	2.69	2.65	2.67	2.59	2.63	2.63	2.66	2.65	2.83	3.09	3.04	3.01	3.18	2.36	2.36	3.63	2.82	24	
16	2.20	2.51	2.31	2.39	2.37	S	2.22	2.25	2.27	2.34	2.43	2.51	2.62	2.51	2.53	2.52	2.48	2.45	2.48	2.59	2.55	2.89	2.76	3.17	2.20	3.17	2.49	24	
17	3.01	3.36	3.61	3.39	S	3.66	3.42	3.56	3.27	2.82	2.83	2.80	2.78	2.83	2.67	3.03	3.00	2.89	3.02	3.58	3.30	3.24	3.31	2.89	2.67	3.66	3.14	24	
18	2.97	2.84	2.76	S	2.75	2.72	2.73	2.77	2.74	2.41	2.37	2.28	2.30	2.31	2.31	2.28	2.30	2.30	2.27	2.30	2.45	2.48	2.70	2.65	2.27	2.97	2.52	24	
19	2.77	2.92	S	2.80	2.85	3.02	2.94	2.75	2.60	2.62	2.64	2.55	2.41	2.41	2.37	2.44	2.39	2.37	2.39	2.75	2.64	2.98	2.86	2.83	2.37	3.02	2.66	24	
20	2.99	S	2.99	3.04	3.09	3.24	3.17	3.00	2.75	2.79	2.78	2.59	2.56	2.48	2.54	2.46	2.47	2.45	2.76	2.78	2.72	2.99	3.10	3.03	2.45	3.24	2.82	24	
21	S	3.37	3.41	3.48	3.78	3.66	3.44	3.45	C	C	C	Y	Y	Y	C	C	C	C	C	X	X	X	X	X	3.37	3.78	3.51	15	
22	X	X	X	X	X	X	X	X	Y	2.61	2.26	2.23	2.17	2.16	2.16	2.16	2.17	2.22	2.34	3.49	3.24	2.72	S	2.83	2.16	3.49	2.48	15	
23	2.61	2.20	2.12	2.12	2.15	2.08	2.04	2.03	2.02	2.00	2.01	2.01	2.01	2.01	2.02	2.02	2.02	2.02	2.37	2.49	2.01	2.00	S	1.99	2.02	1.99	2.61	2.10	24
24	2.01	2.01	2.01	2.03	2.01	2.11	2.07	2.07	2.30	2.08	2.14	2.08	2.08	2.09	2.12	2.07	2.04	2.04	2.03	2.01	S	2.07	2.09	2.05	2.01	2.30	2.07	24	
25	2.03	2.02	2.01	2.01	2.04	2.08	2.15	2.15	2.33	2.13	2.10	2.02	2.01	2.01	2.00	2.01	2.00	2.05	2.07	S	2.04	2.05	2.06	2.06	2.00	2.33	2.06	24	
26	2.05	2.05	2.05	2.06	2.07	2.10	2.13	2.23	2.24	2.22	2.21	2.17	2.13	2.14	2.27	2.20	2.07	2.03	S	2.06	2.05	2.05	2.02	2.03	2.02	2.27	2.11	24	
27	1.99	1.97	1.97	1.99	1.99	1.98	1.99	1.98	1.98	1.97	1.97	1.97	1.97	1.97	1.96	1.97	1.98	S	2.06	2.16	2.43	2.41	2.44	2.43	1.96	2.44	2.07	24	
28	2.29	2.24	2.34	2.38	2.52	2.37	2.35	2.30	2.27	2.23	2.18	2.17	2.15	2.06	2.02	2.04	S	2.07	2.40	2.13	2.22	2.35	2.54	2.76	2.02	2.76	2.28	24	
29	2.77	2.50	2.73	3.27	3.30	3.26	2.51	2.52	2.46	2.29	2.07	2.04	2.03	2.02	2.05	S	2.02	2.31	2.54	2.38	2.12	2.72	2.76	2.74	2.02	3.30	2.50	24	
30	2.41	2.44	2.67	2.30	2.22	2.17	2.16	2.15	2.10	2.06	2.03	1.95	1.93	1.95	S	1.94	1.96	1.96	1.98	2.02	2.01	2.02	2.06	2.03	1.93	2.67	2.11	24	
31	2.05	2.02	2.03	2.03	2.01	2.01	2.09	2.08	2.04	P	P	P	P	P	R	1.96	2.21	1.99	2.09	2.10	2.20	2.50	2.59	2.65	1.96	2.65	2.15	18	
HOURLY MAX	4.29	4.77	4.59	4.48	4.13	4.73	4.97	4.13	3.62	3.48	3.23	2.99	2.94	2.95	2.69	3.03	3.00	2.89	3.54	4.30	3.34	4.21	4.14	4.05					
HOURLY AVG	2.73	2.73	2.74	2.70	2.73	2.84	2.73	2.63	2.50	2.45	2.41	2.33	2.32	2.31	2.33	2.32	2.30	2.34	2.43	2.53	2.54	2.71	2.75	2.71					

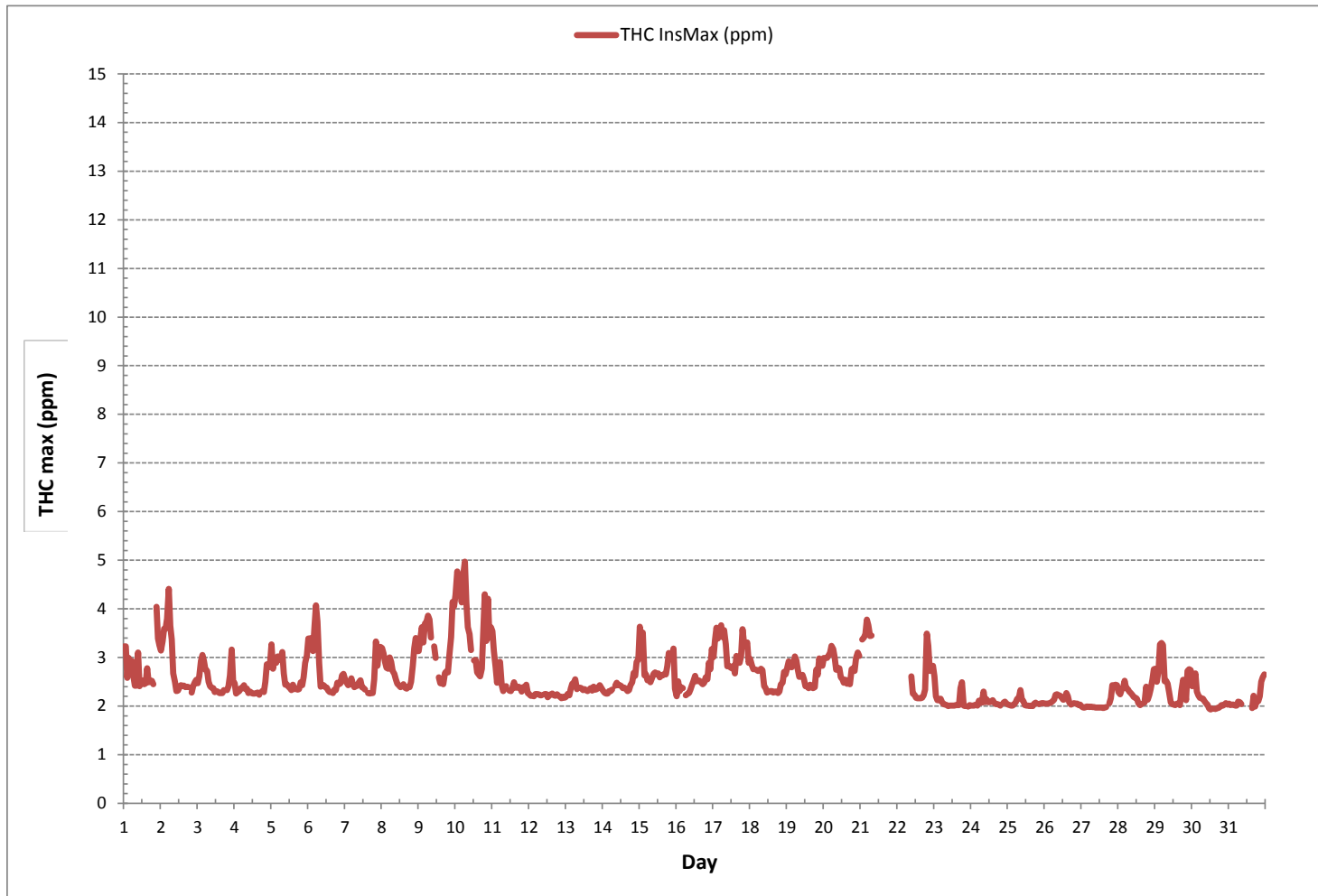
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	682				
MAXIMUM INSTANTANEOUS VALUE:	4.97	ppm	@ HOUR	6	ON DAY
					10
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	719	hrs
MONTHLY CALIBRATION TIME:	8	hrs			
STANDARD DEVIATION:	0.50				

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - August 2018

METHANE MAX Instantaneous Maximum (CH₄ ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
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	2.61	2.20	2.12	2.12	2.15	2.08	2.04	2.03	2.02	2.00	2.01	2.01	2.01	2.01	2.02	2.02	2.02	2.02	2.03	2.03	2.01	2.00	2.00	2.69	2.83	2.69	2.83	2.76
HOURLY AVG	2.24	2.16	2.21	2.20	2.24	2.24	2.17	2.17	2.17	2.12	2.09	2.05	2.04	2.03	2.06	2.03	2.01	2.06	2.15	2.11	2.13	2.32	2.28	2.36				

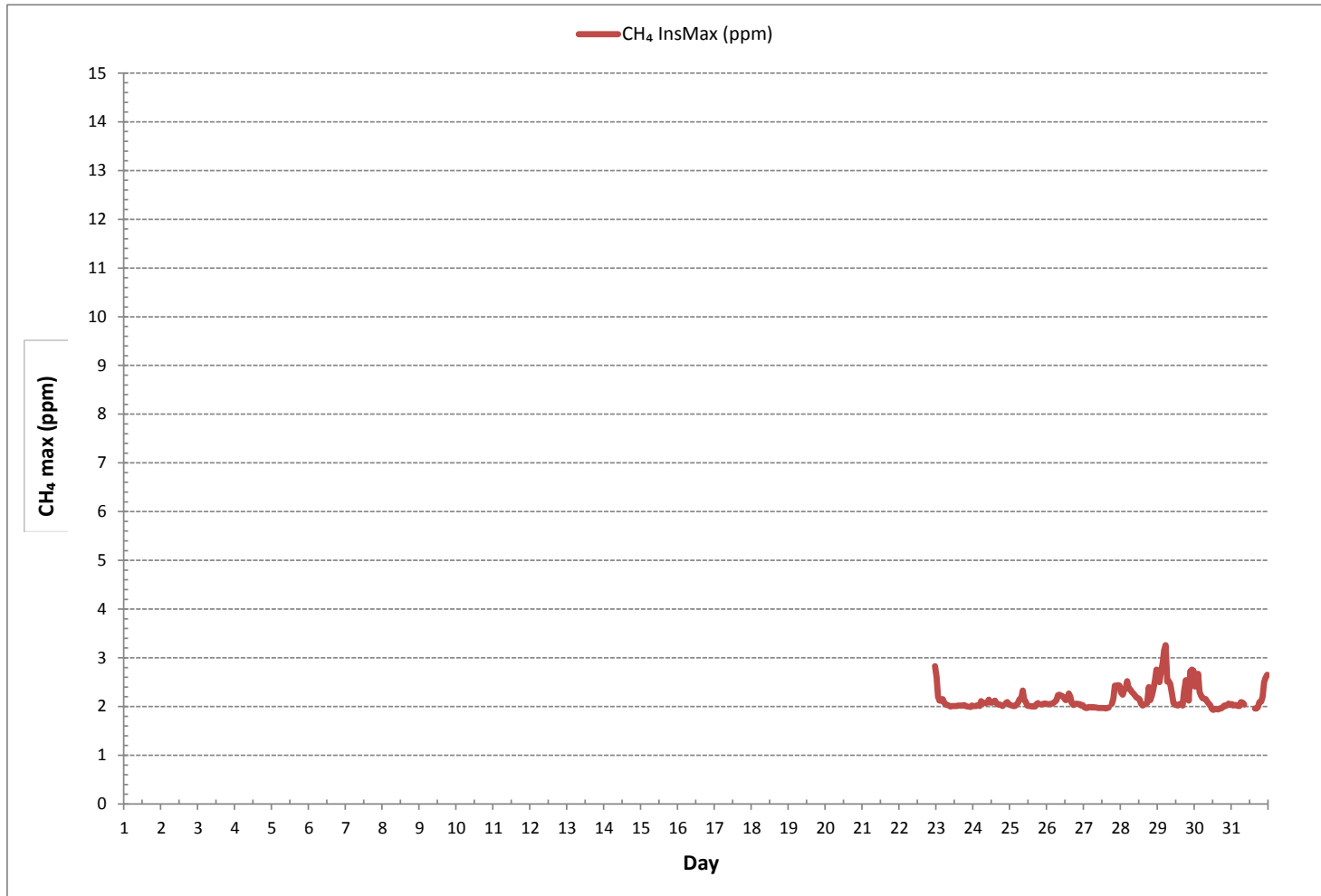
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	204
MAXIMUM INSTANTANEOUS VALUE:	3.26 ppm @ HOUR 5 ON DAY 29
IZS CALIBRATION TIME:	9 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	218 hrs
STANDARD DEVIATION:	0.23

METHANE MAX Instantaneous Maximum (CH₄ ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - August 2018

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			
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0			
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0			
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.00	0.00	0.00	0.01	S	0.00	0.00	0.00	0.01	0.01	3	
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	0.01	0.00	0.00	0.01	0.00	24
29	0.01	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	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	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	S	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	P	P	P	P	P	R	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18
HOURLY MAX	0.01	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	0.00	0.02	0.04	0.00	0.00	0.01	0.01	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							

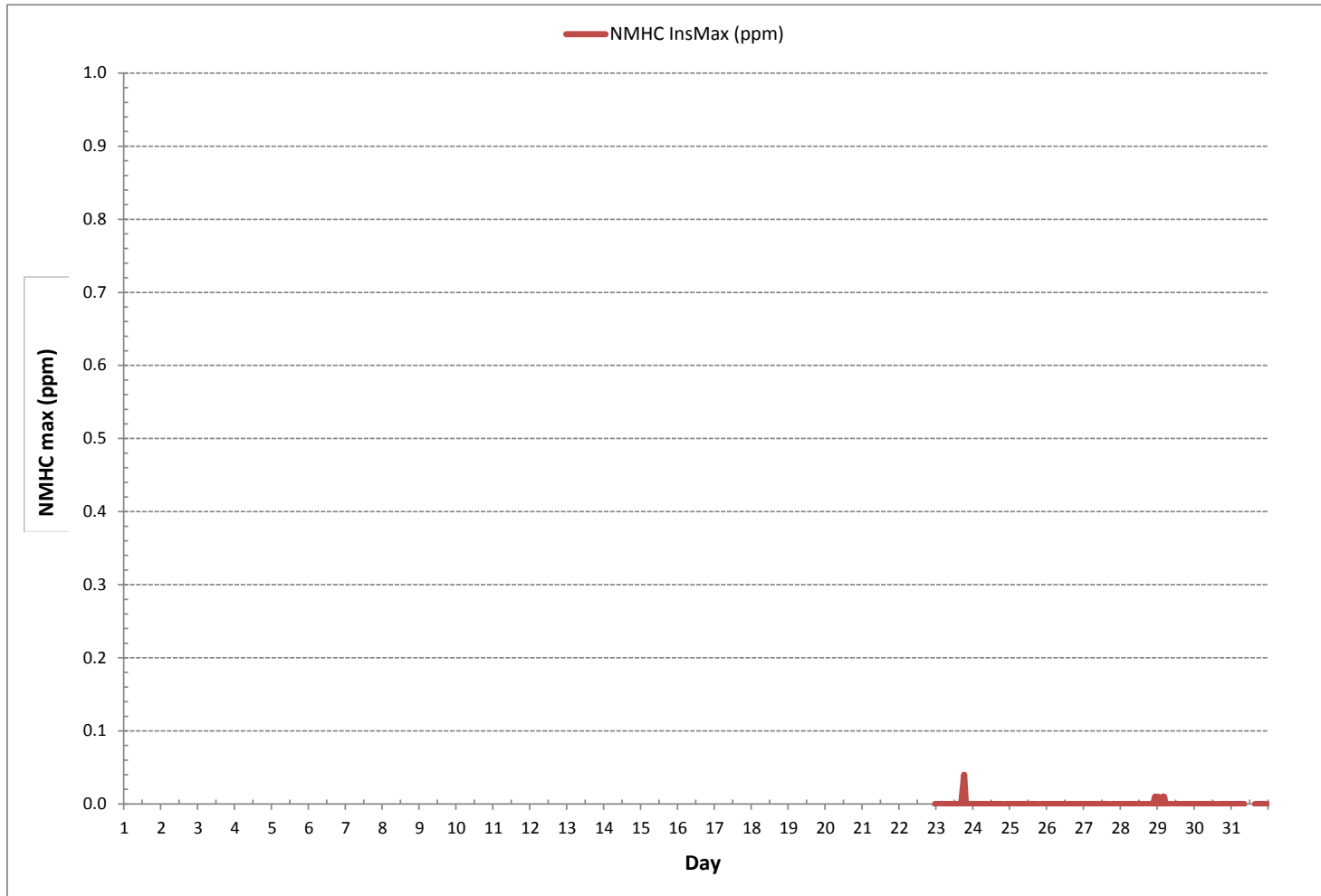
STATUS FLAG CODES

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:	7
MAXIMUM INSTANTANEOUS VALUE:	0.04 ppm @ HOUR 18 ON DAY 23
IZS CALIBRATION TIME:	9 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	218 hrs
STANDARD DEVIATION:	0.00

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - August 2018

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

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

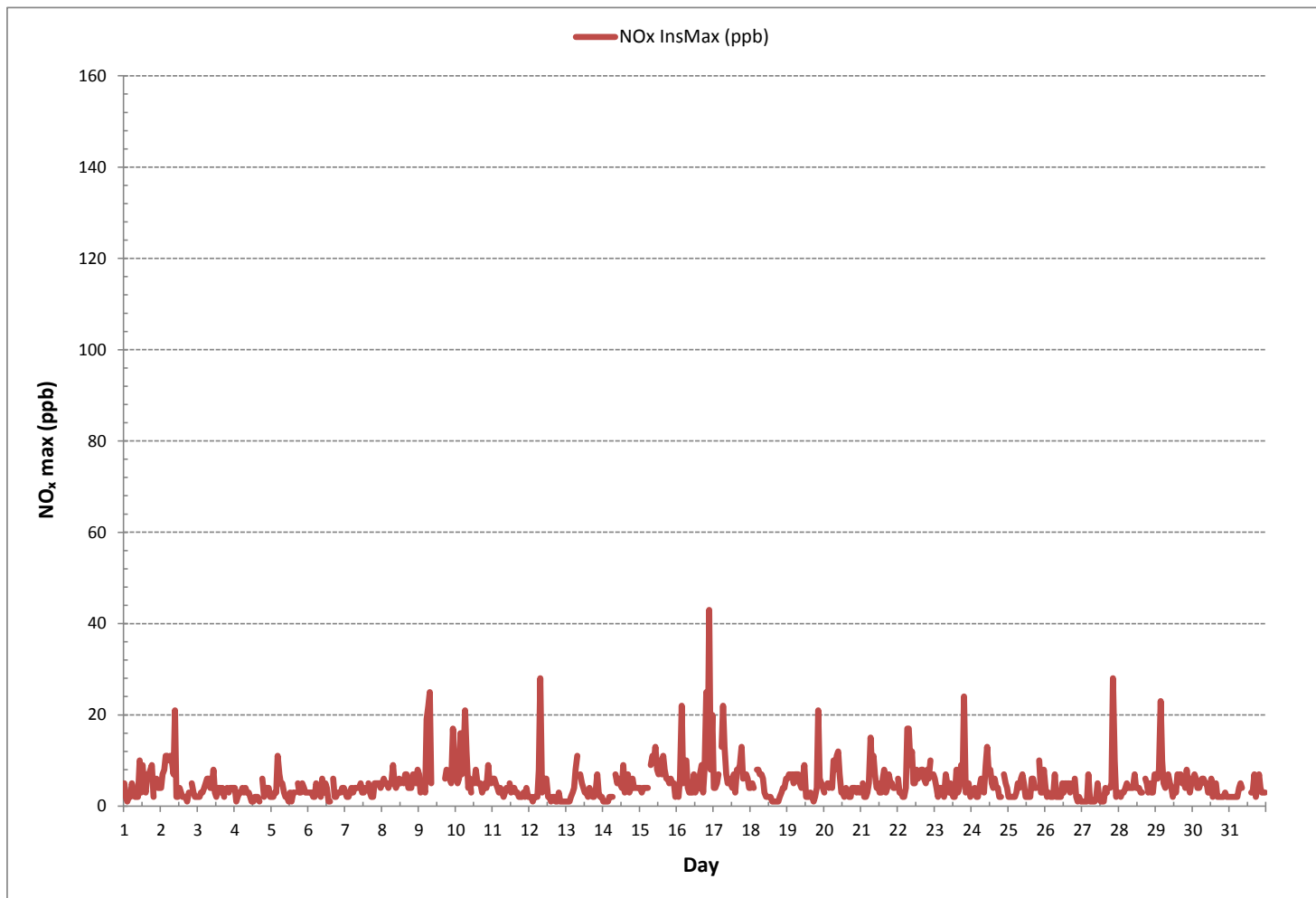
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	701
MAXIMUM INSTANTANEOUS VALUE:	43 ppb @ HOUR 21 ON DAY 16
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	739 hrs
STANDARD DEVIATION:	4

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - August 2018

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	0	0	1	1	1	1	0	3	3	4	2	1	2	4	4	1	0	S	1	1	2	0	4	1	24	
2	2	1	1	4	11	7	8	6	2	5	0	0	1	1	3	3	1	0	0	S	0	0	0	0	0	0	11	2	24
3	0	0	0	0	1	1	2	2	1	1	6	0	0	1	3	0	3	0	S	0	0	0	0	0	0	0	6	1	24
4	0	0	0	0	0	0	1	1	1	1	1	0	0	1	0	1	1	S	2	0	1	1	1	0	0	2	1	24	
5	1	1	1	1	8	5	3	2	2	0	0	0	1	0	1	2	S	0	0	1	0	2	0	0	0	8	1	24	
6	1	1	1	1	1	3	3	1	0	3	0	2	1	0	0	S	2	0	0	0	0	0	0	0	0	3	1	24	
7	0	0	0	0	1	0	0	1	1	1	2	1	0	2	S	1	1	0	0	0	0	0	0	0	0	2	0	24	
8	0	0	0	0	0	1	1	3	1	1	1	3	1	S	1	9	4	0	0	0	0	0	0	2	0	9	1	24	
9	1	0	0	1	1	15	18	20	1	C	C	C	C	C	C	C	C	0	0	1	0	0	2	6	0	20	4	24	
10	3	1	3	13	3	8	13	6	1	2	1	S	0	1	0	0	2	0	0	0	0	1	0	1	0	13	3	24	
11	1	1	0	0	0	1	0	0	0	1	S	0	0	1	1	0	0	0	1	0	0	0	1	1	0	1	0	24	
12	0	1	0	0	1	1	5	9	1	S	1	3	0	1	1	0	0	0	0	1	0	0	1	0	0	9	1	24	
13	0	0	0	0	0	0	3	6	S	2	1	1	1	0	0	1	1	0	0	0	2	0	0	0	0	6	1	24	
14	0	0	0	0	0	0	0	S	1	2	2	1	3	6	0	1	4	0	0	0	0	0	0	0	0	6	1	24	
15	1	1	0	0	0	0	S	2	1	2	2	2	2	3	2	4	2	0	0	1	1	3	2	1	0	4	1	24	
16	1	1	4	17	2	S	20	1	1	1	2	5	5	1	2	3	5	1	11	38	4	32	4	17	1	38	7	24	
17	1	3	4	5	S	10	20	10	4	1	2	1	0	1	0	0	0	0	3	1	1	1	0	0	0	20	3	24	
18	0	0	0	S	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
19	0	1	S	0	1	1	2	3	2	1	2	1	0	0	0	0	0	0	0	0	14	0	1	1	0	14	1	24	
20	0	S	1	1	3	2	7	4	4	4	2	0	0	0	1	1	1	0	0	0	0	0	0	1	0	7	1	24	
21	S	1	1	1	1	3	11	5	4	1	1	1	0	0	2	3	2	0	0	0	0	0	0	S	0	11	2	24	
22	1	1	0	1	1	2	11	11	2	2	1	0	1	2	3	2	3	2	0	1	4	S	1	0	11	2	24		
23	1	1	0	1	1	1	1	6	1	1	2	1	1	1	2	1	1	2	2	8	1	S	2	1	0	8	2	24	
24	1	1	2	1	1	1	1	2	1	9	4	3	3	1	1	2	1	1	0	0	S	0	0	0	0	9	2	24	
25	0	0	0	0	0	0	1	1	1	2	2	0	0	0	2	3	1	0	S	9	0	1	1	0	9	1	24		
26	1	1	1	0	0	1	4	0	1	1	1	2	1	1	0	2	1	1	S	1	0	0	1	0	0	4	1	24	
27	0	0	0	0	4	0	0	0	0	1	2	1	0	0	0	2	1	S	0	0	22	5	0	1	0	22	2	24	
28	1	0	1	0	1	2	1	1	1	1	3	1	1	1	4	1	S	2	0	0	1	0	0	3	0	4	1	24	
29	3	4	5	18	7	3	1	2	3	2	1	0	1	0	1	S	2	1	1	0	2	1	1	1	0	18	3	24	
30	0	0	0	0	0	1	2	2	2	2	2	1	2	1	S	1	0	0	0	0	0	0	0	0	0	2	1	24	
31	0	0	0	0	0	0	1	3	2	P	P	P	P	P	P	2	1	2	0	0	3	1	0	1	1	0	3	1	24
HOURLY MAX	3	4	5	18	11	15	20	20	4	9	6	5	5	6	4	9	5	4	11	38	22	32	4	17					
HOURLY AVG	1	1	1	2	2	2	4	4	1	2	2	1	1	1	1	2	2	1	1	2	2	2	1	1					

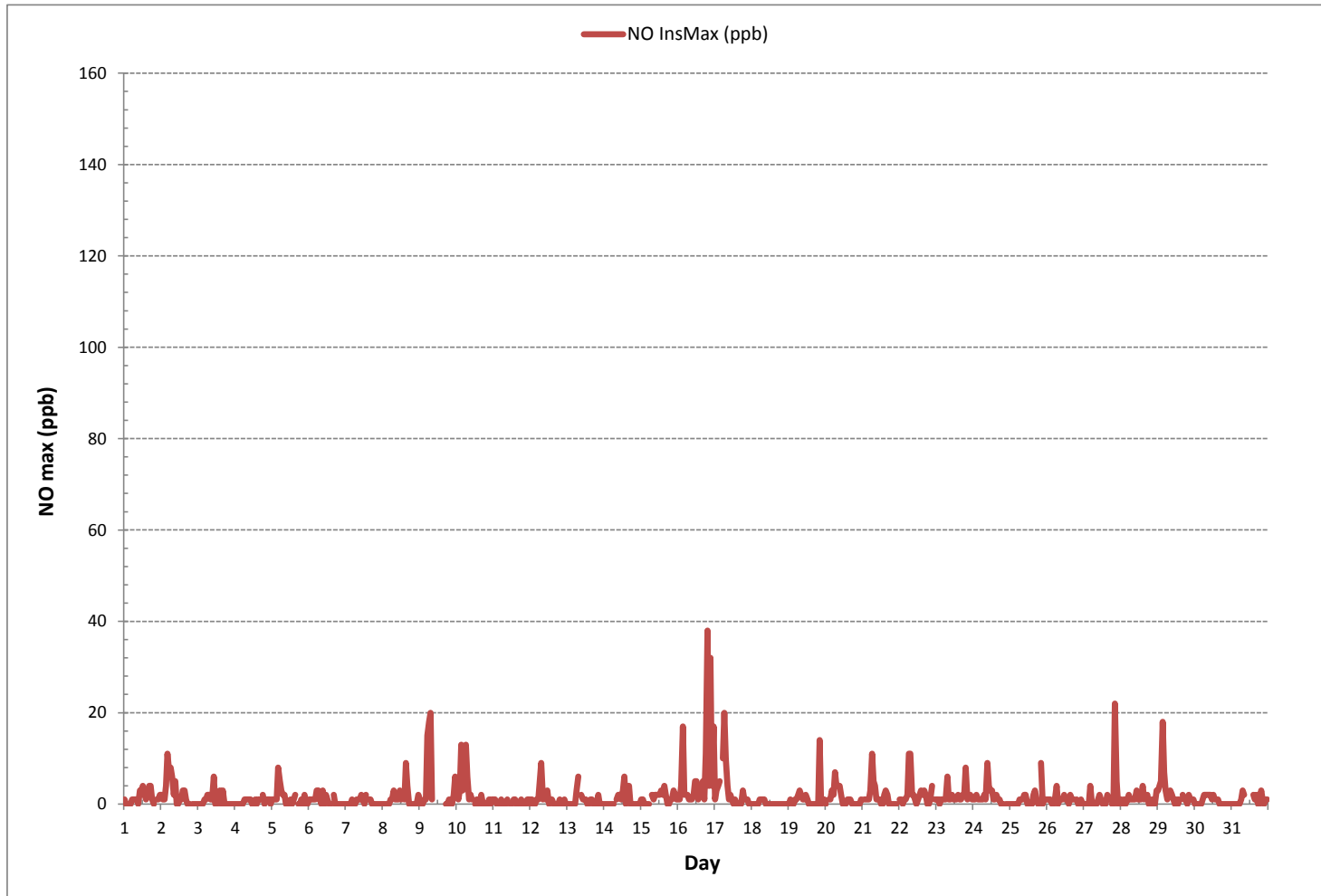
STATUS FLAG CODES

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:	416
MAXIMUM INSTANTANEOUS VALUE:	38 ppb @ HOUR 19 ON DAY 16
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	3
OPERATIONAL TIME:	739 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - August 2018

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

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

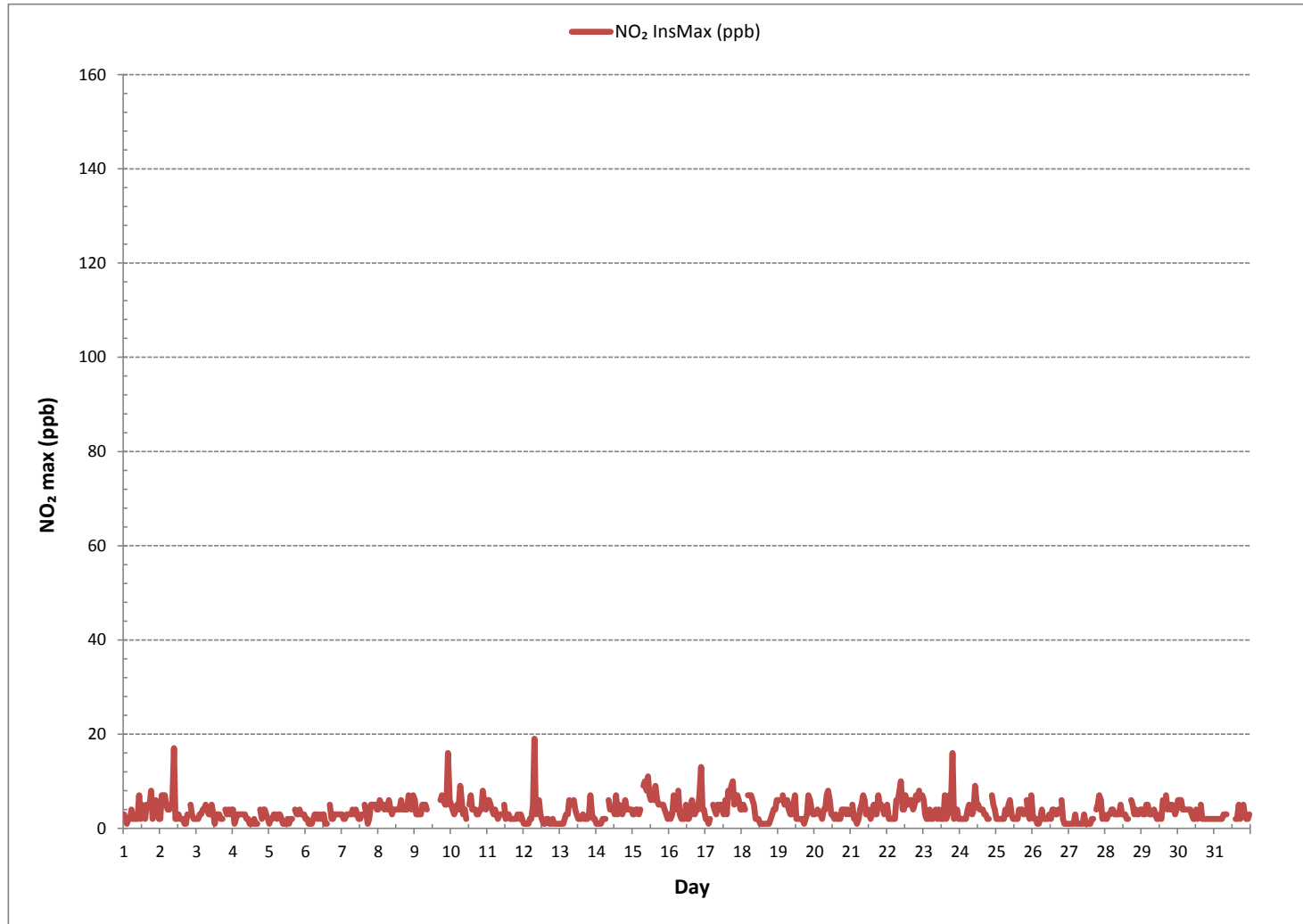
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	701
MAXIMUM INSTANTANEOUS VALUE:	19 ppb @ HOUR 7 ON DAY 12
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	739 hrs
STANDARD DEVIATION:	2

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - August 2018

OZONE Instantaneous Maximum (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	19.3	19.1	20.7	19.4	18.9	18.2	23.2	23.9	25.0	26.5	27.4	27.2	23.1	23.9	25.4	19.0	18.6	21.9	21.6	21.6	S	8.3	2.3	1.6	1.6	27.4	19.8	24
2	1.1	5.3	5.2	2.2	1.7	3.0	5.5	17.8	28.0	38.5	41.3	42.1	43.4	43.7	41.9	42.4	43.5	42.5	38.4	S	37.8	31.3	20.2	25.2	1.1	43.7	26.2	24
3	23.9	19.3	16.7	13.9	12.5	14.2	13.0	16.5	20.7	24.8	27.3	31.2	35.2	35.0	29.6	31.0	23.9	22.2	S	18.9	13.1	11.4	11.3	9.8	9.8	35.2	20.7	24
4	14.2	16.2	15.7	15.7	14.8	12.8	12.3	10.8	13.7	18.2	17.7	16.9	18.4	19.6	24.2	24.4	27.4	S	24.2	22.3	18.9	7.5	6.2	10.3	6.2	27.4	16.6	24
5	4.1	3.4	2.3	2.2	1.1	1.5	8.3	15.3	18.3	23.9	27.2	29.2	29.6	32.7	31.7	31.8	S	28.8	27.3	25.4	21.4	12.9	13.3	12.0	1.1	32.7	17.6	24
6	8.0	6.8	1.8	2.5	3.8	2.2	13.7	25.9	31.8	34.8	36.5	36.6	36.1	36.3	38.4	S	30.9	30.5	27.5	26.2	23.6	22.9	20.7	18.2	1.8	38.4	22.4	24
7	16.4	17.5	17.3	16.8	16.4	16.3	16.7	18.0	19.3	21.7	24.9	29.0	31.5	35.4	S	31.5	32.0	32.3	30.6	29.2	21.4	19.8	17.3	10.9	10.9	35.4	22.7	24
8	10.8	15.2	14.8	13.6	14.1	12.2	13.8	17.3	24.4	32.2	36.0	36.5	38.2	S	44.1	55.0	56.4	54.4	51.9	45.3	37.3	25.1	15.6	13.7	10.8	56.4	29.5	24
9	18.5	12.9	10.3	5.8	3.0	1.6	2.0	15.7	24.0	34.3	45.1	52.2	S	52.5	55.7	56.7	56.9	57.8	45.2	30.4	13.0	7.3	0.0	0.0	0.0	57.8	26.1	24
10	0.0	0.0	0.0	1.2	0.8	0.5	1.6	19.5	C	C	C	C	C	C	59.6	56.1	52.4	51.5	41.7	23.7	24.1	12.7	14.1	12.5	0.0	59.6	20.7	24
11	15.4	12.1	17.7	17.8	19.3	19.3	18.9	19.1	19.8	19.8	S	21.6	21.6	21.2	15.9	20.5	22.4	19.0	21.9	22.3	23.5	23.0	25.1	28.7	12.1	28.7	20.3	24
12	28.7	26.5	26.2	24.0	24.5	25.4	24.7	25.8	29.3	S	25.2	22.5	24.9	26.5	23.9	22.6	23.8	25.7	22.6	22.9	23.7	24.8	24.3	24.5	22.5	29.3	24.9	24
13	23.9	24.0	20.8	21.3	16.3	13.0	12.1	17.7	S	27.8	30.1	32.4	32.4	31.7	32.2	33.0	32.5	32.8	32.4	27.5	22.5	23.5	21.8	24.0	12.1	33.0	25.5	24
14	24.9	26.9	26.9	26.0	24.3	22.4	21.8	S	21.9	26.6	31.6	34.6	38.3	40.6	43.9	45.8	41.4	40.4	36.3	30.4	23.6	24.5	24.7	19.6	19.6	45.8	30.3	24
15	8.6	16.3	18.1	16.5	15.7	14.7	S	13.3	14.5	13.4	10.8	11.5	14.1	16.2	18.1	17.9	17.5	17.3	14.9	11.5	5.1	2.8	19.4	19.8	2.8	19.8	14.3	24
16	20.0	17.6	11.2	8.3	17.3	S	19.8	19.5	19.5	18.1	17.6	16.4	16.2	16.5	18.7	15.4	16.4	17.0	13.4	13.2	14.3	11.7	4.1	1.3	1.3	20.0	14.9	24
17	0.9	0.2	0.2	0.2	S	0.3	0.3	2.3	7.8	14.3	17.3	24.1	34.3	38.4	40.4	35.6	22.5	20.2	12.9	6.8	5.8	9.3	10.2	12.7	0.2	40.4	13.8	24
18	12.8	14.6	14.5	S	11.9	12.6	12.4	15.0	26.9	35.7	38.3	37.6	35.1	32.9	32.1	31.2	31.5	30.6	29.1	26.6	21.3	17.9	11.5	10.2	10.2	38.3	23.6	24
19	9.2	6.4	S	6.2	3.6	5.4	8.0	11.7	19.4	27.4	28.7	27.7	31.7	33.1	32.8	30.6	31.6	31.5	27.4	20.9	11.6	8.7	6.7	8.9	3.6	33.1	18.7	24
20	7.4	S	4.0	2.8	1.0	0.9	3.9	15.4	23.7	29.8	36.4	35.5	35.6	40.9	41.0	37.2	36.9	36.3	34.3	22.8	16.9	14.7	14.0	10.5	0.9	41.0	21.8	24
21	S	4.0	2.7	2.3	0.8	1.3	2.3	21.4	28.6	37.2	44.0	49.2	53.3	54.9	54.7	54.7	55.7	54.1	48.9	36.3	21.9	15.0	10.6	S	0.8	55.7	29.7	24
22	7.2	7.0	6.4	5.3	2.5	1.8	2.7	18.7	27.8	34.6	34.8	33.8	34.8	37.5	37.6	41.0	39.9	39.1	37.1	31.4	18.8	10.0	S	5.9	1.8	41.0	22.4	24
23	18.6	21.0	20.5	18.8	18.0	18.8	18.5	18.7	18.8	20.5	21.9	22.2	22.2	21.6	21.8	21.6	20.8	20.8	18.7	17.5	17.8	S	16.9	15.5	15.5	22.2	19.6	24
24	15.5	15.4	14.3	15.3	14.9	15.8	15.3	14.0	13.9	11.1	6.1	6.4	6.8	6.6	5.0	8.2	10.0	9.7	11.1	11.7	S	8.7	6.6	8.6	5.0	15.8	10.9	24
25	8.3	11.1	11.4	11.8	12.3	8.9	10.8	13.6	14.8	18.6	22.8	25.4	25.5	24.6	25.9	26.2	24.8	24.4	22.5	S	16.7	16.3	15.5	15.2	8.3	26.2	17.7	24
26	16.2	17.9	17.6	15.0	13.8	13.2	11.6	10.7	9.7	11.5	17.5	22.7	28.6	22.0	18.5	27.6	28.4	27.1	S	21.7	16.2	10.5	13.0	14.8	9.7	28.6	17.6	24
27	15.7	15.3	15.2	16.6	17.0	18.6	19.0	17.4	20.6	24.1	24.4	25.3	27.5	30.5	30.3	30.5	30.8	S	28.4	18.6	7.4	7.9	5.3	12.5	5.3	30.8	20.0	24
28	14.3	13.1	13.1	13.1	12.8	13.1	15.1	14.8	16.3	19.1	19.6	21.7	24.3	26.6	26.8	27.3	S	28.3	25.3	23.0	19.6	20.1	9.7	3.9	3.9	28.3	18.3	24
29	2.0	0.8	0.5	0.5	2.8	7.2	7.7	8.4	13.4	21.7	26.1	26.1	25.9	26.8	21.9	S	20.7	18.2	17.4	7.0	10.9	10.7	4.3	8.2	0.5	26.8	12.6	24
30	7.4	7.9	10.5	9.9	9.0	7.6	8.1	10.0	13.5	16.7	22.2	25.8	24.4	20.9	S	18.6	17.7	18.6	17.9	18.0	14.7	15.2	16.1	15.6	7.4	25.8	15.1	24
31	13.5	13.6	14.4	14.8	14.9	14.3	12.6	12.7	17.8	P	P	P	P	P	22.9	27.9	30.5	30.2	22.1	20.6	20.0	17.2	15.0	25.4	12.6	30.5	19.0	19
HOURLY MAX	28.7	26.9	26.9	26.0	24.5	25.4	24.7	25.9	31.8	38.5	45.1	52.2	53.3	54.9	59.6	56.7	56.9	57.8	51.9	45.3	37.8	31.3	25.1	28.7				
HOURLY AVG	12.9	12.9	12.4	11.3	11.3	10.6	11.9	16.0	20.1	24.4	27.1	28.4	29.0	30.3	31.6	31.8	31.0	30.5	27.7	22.5	18.7	15.1	13.2	13.3				

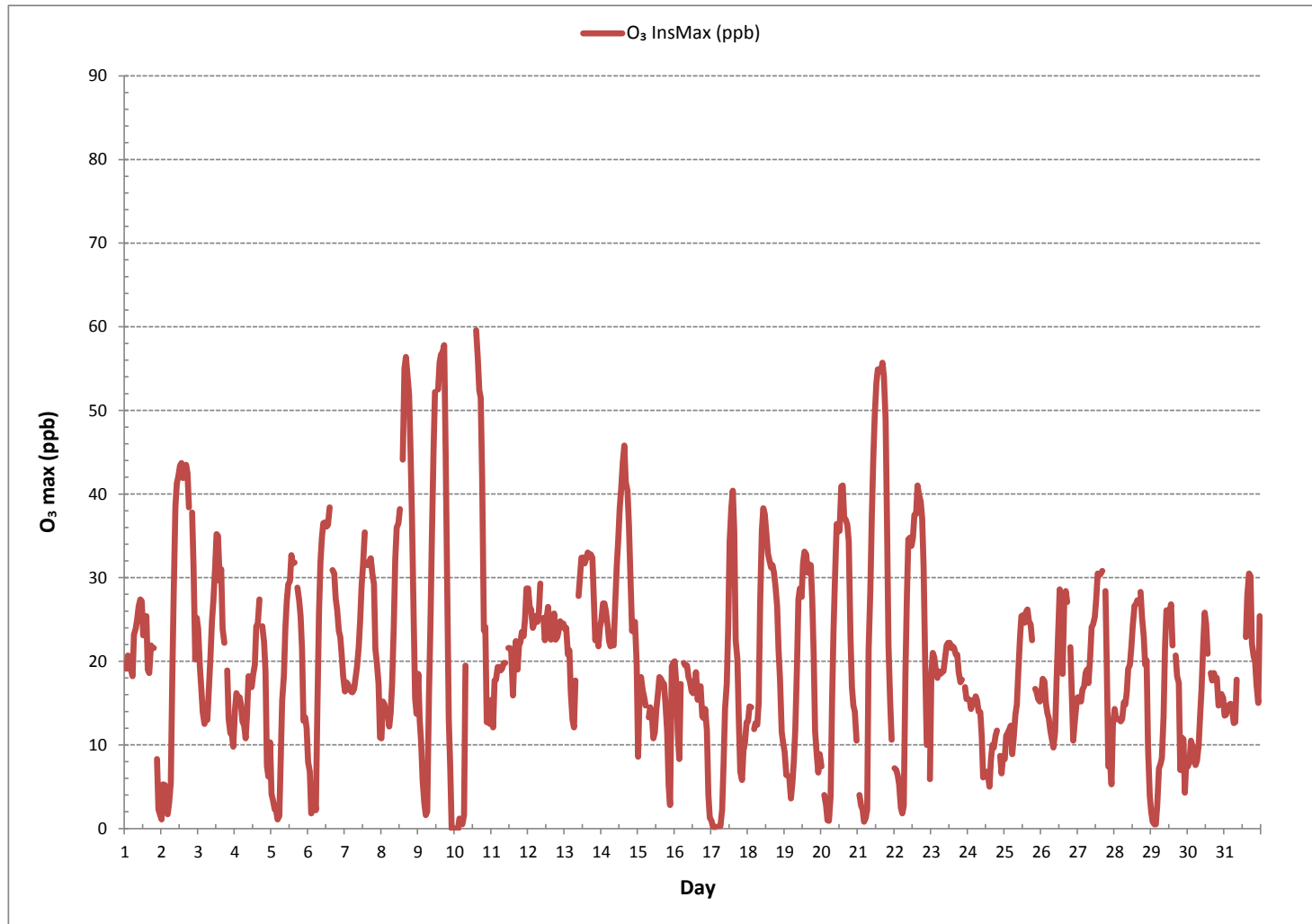
STATUS FLAG CODES

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:	698
MAXIMUM INSTANTANEOUS VALUE:	59.6 ppb @ HOUR 14 ON DAY 10
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	739 hrs
STANDARD DEVIATION:	11.8

OZONE Instantaneous Maximum (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - August 2018

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	9.1	21.3	19.1	13.2	14.2	14.9	20.7	21.7	24.9	23.2	23.9	15.5	6.3	11.5	14.4	10.3	12.2	12.2	12.2	10.1	5.4	4.0	5.4	4.2	4.0	24.9	13.7	24
2	5.8	16.6	9.3	8.1	7.6	9.6	11.5	6.2	14.0	16.6	22.1	14.4	17.6	18.7	22.2	22.0	21.0	14.2	34.3	33.5	30.8	17.4	5.4	10.4	5.4	34.3	16.2	24
3	9.3	10.3	8.5	5.7	12.3	9.0	14.2	22.7	26.4	22.7	30.5	27.1	17.1	36.1	23.2	26.0	37.0	29.8	26.5	17.6	15.2	12.1	13.5	16.7	5.7	37.0	19.6	24
4	18.6	14.3	13.2	17.9	16.2	17.6	16.7	18.8	24.0	16.2	25.6	25.2	24.8	32.3	36.1	29.3	25.2	17.4	13.7	14.7	5.0	5.0	5.2	8.1	5.0	36.1	18.4	24
5	3.9	4.9	5.1	4.6	3.7	2.4	6.7	7.3	10.8	18.3	14.9	20.5	29.3	22.0	25.6	28.1	24.6	28.3	15.2	12.5	9.0	7.9	11.0	7.0	2.4	29.3	13.5	24
6	2.8	2.6	3.4	5.9	3.5	2.3	4.9	16.9	28.9	27.8	31.0	33.7	38.3	59.7	54.7	57.3	61.2	44.6	20.7	17.1	18.5	18.3	12.4	14.9	2.3	61.2	24.2	24
7	19.1	20.3	17.6	16.2	14.2	16.9	19.0	27.6	28.8	29.3	33.4	33.4	37.8	35.8	35.8	35.1	36.9	39.0	33.4	12.4	8.1	9.1	4.7	5.1	4.7	39.0	23.7	24
8	7.4	13.0	11.5	13.7	13.7	9.1	14.1	14.3	13.5	22.2	26.1	32.6	34.7	35.1	32.9	34.4	36.8	32.7	21.5	16.1	6.9	4.2	4.5	4.3	4.2	36.8	19.0	24
9	7.6	5.4	3.5	4.0	4.5	3.4	4.2	5.7	14.9	20.0	18.6	28.8	24.9	30.7	28.3	17.3	17.6	14.2	5.0	3.4	4.3	4.7	3.6	2.6	2.6	30.7	11.6	24
10	3.6	2.6	3.1	3.9	8.4	4.7	6.2	12.0	14.9	18.1	16.9	21.5	23.5	27.8	29.3	26.1	23.1	19.8	7.6	6.4	11.3	6.9	8.6	6.7	2.6	29.3	13.0	24
11	16.3	10.3	16.6	12.5	13.7	17.6	23.7	22.7	31.5	15.7	21.8	25.5	31.5	20.5	7.9	18.3	20.0	19.3	17.9	18.8	22.5	13.0	15.4	38.7	7.9	38.7	19.7	24
12	40.1	28.8	37.4	26.4	26.3	25.2	13.7	25.9	31.5	25.4	22.2	24.9	50.8	48.6	48.5	31.0	53.7	57.2	23.0	26.5	39.6	30.5	22.2	26.4	13.7	57.2	32.7	24
13	21.0	18.1	13.5	12.3	8.6	6.4	7.9	10.3	14.9	20.1	24.4	25.2	27.1	27.8	25.9	22.5	23.0	21.1	14.8	7.6	6.7	13.0	12.0	19.3	6.4	27.8	16.8	24
14	25.2	25.2	29.3	26.1	22.0	17.6	19.1	19.6	21.3	33.0	30.7	28.3	32.5	43.2	34.9	37.3	37.8	30.4	15.9	13.1	12.1	10.5	9.2	8.8	8.8	43.2	24.3	24
15	4.5	12.4	13.7	14.1	13.2	14.0	14.2	12.7	22.2	17.9	14.7	13.5	16.7	15.4	18.1	16.1	14.9	14.2	12.9	10.7	4.5	4.2	26.1	18.6	4.2	26.1	14.1	24
16	22.2	5.2	6.3	5.7	13.0	14.7	22.0	17.4	19.3	19.6	23.0	20.0	17.4	20.4	18.3	13.2	15.2	14.7	10.1	12.9	9.3	4.3	2.6	3.9	2.6	23.0	13.8	24
17	3.6	3.1	3.5	7.5	3.6	8.4	5.9	6.2	9.1	13.7	14.2	16.5	13.4	20.3	22.2	13.5	14.4	7.6	6.5	7.1	9.3	11.3	11.5	12.5	3.1	22.2	10.2	24
18	13.8	15.4	18.4	15.9	16.9	18.2	15.2	15.2	30.1	48.3	58.3	45.6	45.9	51.2	36.3	37.1	35.8	29.9	19.3	11.0	10.1	10.7	9.6	10.1	9.6	58.3	25.8	24
19	4.3	4.7	10.2	9.1	5.2	11.3	9.8	16.9	17.4	25.6	27.4	20.0	32.9	30.0	26.7	27.1	27.1	19.9	9.8	6.2	4.7	4.0	2.0	4.0	2.0	32.9	14.8	24
20	7.1	4.2	4.0	4.0	4.9	4.5	2.5	4.0	8.6	12.8	16.4	17.4	25.1	25.4	29.5	31.2	25.1	19.8	12.2	6.0	7.4	6.4	3.7	3.4	2.5	31.2	11.9	24
21	2.9	3.1	3.3	3.1	2.5	3.0	2.9	12.6	18.6	20.3	24.9	34.9	41.5	37.6	33.4	28.5	28.3	17.8	11.0	4.9	2.8	2.9	4.2	3.4	2.5	41.5	14.5	24
22	3.5	3.0	2.8	4.1	3.0	3.7	3.6	6.4	14.4	19.8	25.7	30.2	31.7	33.3	28.3	29.1	29.5	21.8	16.2	8.7	8.2	8.6	6.7	6.4	2.8	33.3	14.5	24
23	12.0	19.1	18.1	14.2	25.9	30.1	26.4	27.4	36.9	24.2	24.0	24.9	31.5	25.2	26.7	27.4	28.8	26.0	19.6	16.5	19.6	25.7	18.6	12.7	12.0	36.9	23.4	24
24	14.0	12.3	13.7	14.8	19.8	9.1	23.2	28.3	16.0	18.8	22.7	16.2	18.8	17.4	21.3	24.3	27.1	15.8	29.8	24.7	23.2	10.7	12.0	15.9	9.1	29.8	18.7	24
25	15.9	20.3	20.0	17.4	16.2	14.2	16.6	15.9	16.9	18.6	15.2	16.6	26.6	15.7	17.1	12.7	16.4	11.0	8.4	15.4	15.4	18.6	15.2	17.1	8.4	26.6	16.4	24
26	20.3	17.4	21.0	18.8	16.7	16.2	12.7	13.5	12.5	13.5	16.2	13.7	19.6	20.8	12.3	19.1	16.9	21.0	11.3	11.2	29.3	41.8	34.9	38.3	11.2	41.8	19.5	24
27	31.0	37.1	43.3	44.5	46.3	38.7	36.6	31.5	39.4	44.0	34.2	29.1	26.5	32.0	23.7	25.4	12.6	13.0	10.1	3.2	5.3	7.4	3.8	10.1	3.2	46.3	26.2	24
28	11.3	9.7	7.6	7.6	7.6	10.5	16.4	19.7	18.4	20.5	13.1	26.6	27.7	41.5	30.5	20.0	18.6	13.2	11.0	10.3	10.3	6.9	4.8	2.9	2.9	41.5	15.3	24
29	2.9	2.3	4.0	4.1	5.0	5.9	8.4	9.6	15.8	22.0	27.3	20.3	20.8	20.0	11.9	5.4	4.7	9.6	9.3	4.5	4.5	3.2	7.4	8.1	2.3	27.3	9.9	24
30	10.4	13.8	10.5	13.2	14.7	15.9	17.7	24.0	25.7	31.8	39.1	37.4	46.9	42.7	55.6	55.9	46.9	40.3	26.2	21.5	24.7	22.7	18.6	21.6	10.4	55.9	28.2	24
31	22.2	18.1	17.9	21.8	30.1	30.1	18.6	25.7	28.8	P	P	P	P	P	31.0	28.9	30.2	20.8	8.1	9.8	10.3	4.9	7.6	29.3	4.9	31.0	20.7	19
HOURLY MAX	40.1	37.1	43.3	44.5	46.3	38.7	36.6	31.5	39.4	48.3	58.3	45.6	50.8	59.7	55.6	57.3	61.2	57.2	34.3	33.5	39.6	41.8	34.9	38.7				

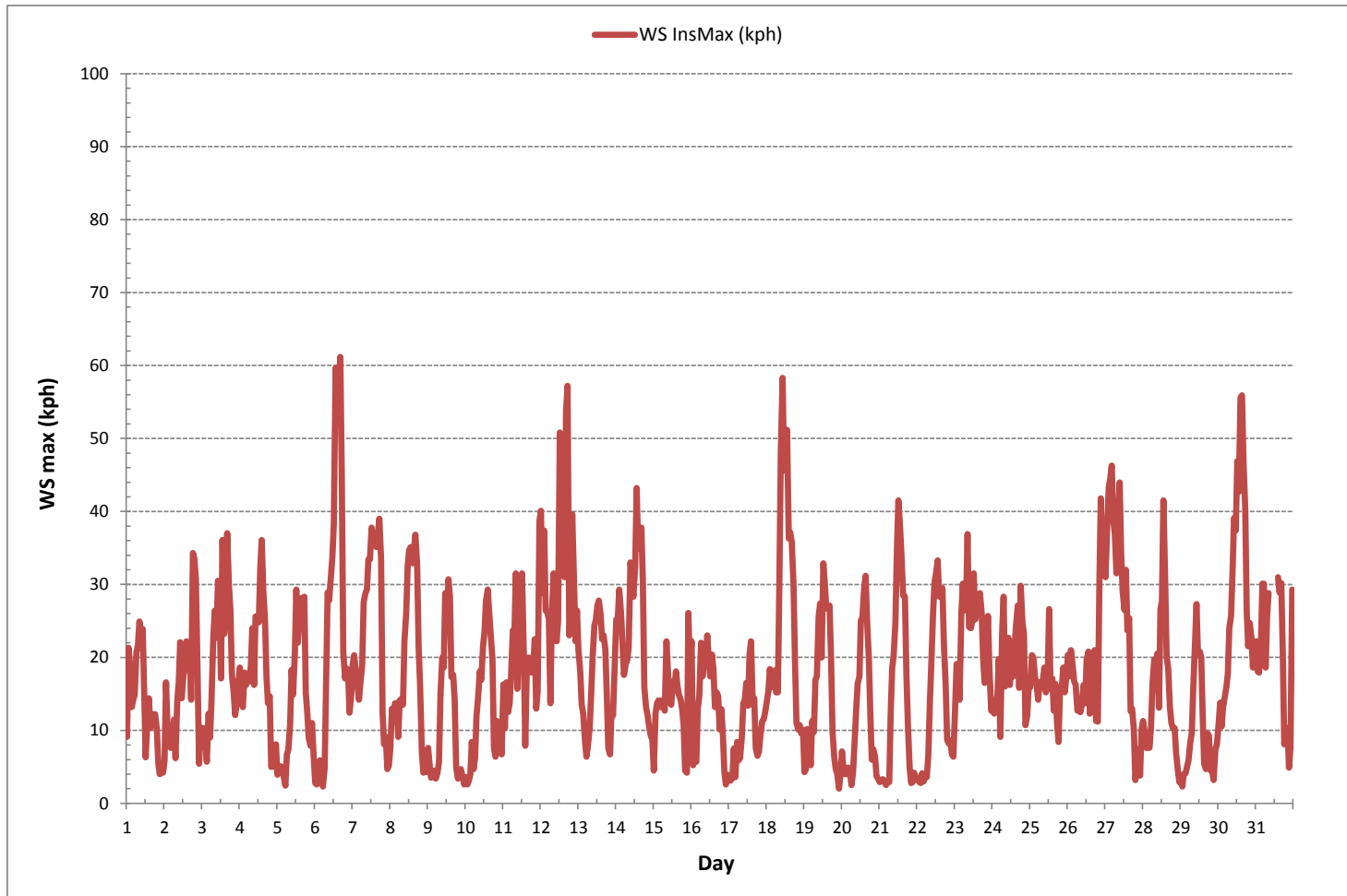
STATUS FLAG CODES

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

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	61.2	kph	@ HOUR	16	ON DAY	6	
OPERATIONAL TIME:						739	hrs

WIND SPEED Instantaneous Maximum (WS kph)



***APPENDIX IV
EXCEEDANCE REPORT***

Exceedance Report

PM_{2.5} 1-Hour Exceedances

Date	Time	LICA - CLS	LICA - CLS	LICA - CLS	ESRD Reference #
		PM _{2.5}	WDR	WSP	
		ug/m ³	degrees	kph	
2018/08/08	01:00	94	246	5.1	341965
2018/08/08	02:00	94	246	4	341965
2018/08/08	03:00	91	236	3.7	341965
2018/08/08	04:00	93	233	2.9	341965
2018/08/08	05:00	85	220	1.8	341965
2018/08/08	06:00	88	243	4.2	341965
2018/08/10	20:00	84	329	2.9	342278
2018/08/10	21:00	97	4	0.7	342278
2018/08/10	22:00	127	347	2	342278
2018/08/10	23:00	150	325	1.1	342278
2018/08/11	00:00	175	250	2.1	342304
2018/08/11	01:00	161	34	0.9	342304
2018/08/11	02:00	120	346	5.5	342304
2018/08/11	03:00	93	329	4.1	342304
2018/08/11	04:00	86	262	1.6	342304
2018/08/14	14:00	93	237	9.2	342506
2018/08/14	15:00	121	239	11.1	342506
2018/08/14	16:00	130	240	10.4	342506
2018/08/14	17:00	110	238	8.3	342506
2018/08/14	18:00	81	228	5.5	342506
2018/08/15	00:00	85	226	0.7	342507
2018/08/15	01:00	88	238	3.9	342507
2018/08/15	02:00	83	240	4.4	342507
2018/08/15	03:00	88	236	4.9	342507
2018/08/15	04:00	86	241	4.8	342507
2018/08/15	05:00	100	241	5.2	342507
2018/08/15	06:00	112	231	4.2	342507
2018/08/15	07:00	131	232	4.9	342507
2018/08/15	08:00	148	250	5.8	342507
2018/08/15	09:00	137	249	5.3	342507
2018/08/15	10:00	135	246	4.5	342507
2018/08/15	11:00	128	252	4.4	342507
2018/08/15	12:00	123	269	5.5	342507
2018/08/15	13:00	111	254	6	342507
2018/08/15	14:00	107	251	6.4	342507
2018/08/15	15:00	103	261	5.4	342507
2018/08/15	16:00	96	252	5.2	342507
2018/08/15	17:00	90	249	4.3	342507
2018/08/15	18:00	91	234	3.7	342507
2018/08/15	19:00	92	234	2.7	342507
2018/08/15	20:00	85	233	0.8	342507
2018/08/15	21:00	82	284	0.6	342507
2018/08/17	15:00	103	274	4.6	342735
2018/08/17	16:00	108	289	4.3	342735
2018/08/17	17:00	115	259	2.4	342735
2018/08/17	18:00	108	218	1.5	342735
2018/08/17	19:00	97	238	1.7	342735
2018/08/17	20:00	106	236	2.7	342735
2018/08/17	21:00	131	242	4.5	342735
2018/08/17	22:00	142	232	4.3	342735
2018/08/17	23:00	145	250	4.5	342735
2018/08/18	00:00	144	244	4.6	342800
2018/08/18	01:00	176	246	5.8	342800
2018/08/18	02:00	188	243	5.3	342800
2018/08/18	03:00	189	241	5	342800
2018/08/18	04:00	201	239	5.2	342800
2018/08/18	05:00	225	250	6.7	342800



Exceedance Report

PM_{2.5} 1-Hour Exceedances

Date	Time	LICA - CLS	LICA - CLS	LICA - CLS	LICA - CLS
		PM _{2.5}	WDR	WSP	ESRD Reference #
		ug/m ³	degrees	kph	
2018/08/18	06:00	223	249	5.6	342800
2018/08/18	07:00	209	248	5	342800
2018/08/18	08:00	173	297	7.5	342800
2018/08/22	13:00	106	241	9.2	343012
2018/08/22	14:00	113	236	8.7	343012
2018/08/22	15:00	115	239	9.2	343012
2018/08/22	16:00	115	233	7.7	343012
2018/08/22	17:00	112	237	6.3	343012
2018/08/22	18:00	108	235	5	343012
2018/08/22	19:00	103	238	3.1	343012
2018/08/22	20:00	95	229	1.9	343012
2018/08/22	21:00	87	71	1	343012
2018/08/22	22:00	87	242	1.1	343012
2018/08/22	23:00	86	30	1	343012
2018/08/23	00:00	82	68	3.1	343012



Exceedance Report

PM 2.5 24-Hour Exceedances

Date	Time	LICA - CLS	LICA - CLS	LICA - CLS	LICA - CLS
		PM _{2.5}	WDR	WSP	ESRD Reference #
		ug/m ³	degrees	kph	
2018/08/08	00:00	49	236	5.1	341965
2018/08/09	00:00	39	230	2.4	342179
2018/08/10	00:00	41	222	2.2	342278
2018/08/11	00:00	40	3	4.3	342304
2018/08/14	00:00	47	225	6.1	342506
2018/08/15	00:00	99	248	3.4	342507
2018/08/17	00:00	64	252	2.1	342735
2018/08/18	00:00	81	294	7.2	342800

APPENDIX V
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION	Cold Lake 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?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Name of External Person Certifying the Report	Position / Title of External Person Certifying the Report
Wunmi Adeganmbi	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-Sep-2018

Report Issued Date (dd-mon-yyyy)

APPENDIX VI
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-08-01-C</u>
Site: <u>Cold Lake South Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghabeb</u>	Date <u>24-Sep-2018</u>
Level 1 Primary Validation	<u>Maram Ghabeb</u>	Date <u>24-Sep-2018</u>
Level 2 Final Validation	<u>Maram Ghabeb</u>	Date <u>28-Sep-2018</u>
Level 3 Independent Data Review	<u>CSA/mbq</u>	Date <u>28-Sep-2018</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

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

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

October 4, 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 August 2018.

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

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

All data collected in August was compliant with the requirements outlined in the Air Monitoring Directive 2016 (AMD 2016), except PM_{2.5}.

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement systems. The CH₄/NMHC channel operational uptime was 22.3%. Monitoring activity for these two channels commenced on August 22. The monthly data completeness criteria was not applicable in the August monitoring period.

Non-Conformance: Forty-eight 1-Hour and eight 24-Hour contraventions were recorded for PM_{2.5} in August. AEP reference number 342180, 342279, 342305, 342508, 342736, 342801 and 342925 for 1-Hour contraventions recorded on August 9, August 10, August 11, August 15, August 17, August 18 and August 20-22, respectively. AEP reference number 342067, 342180, 342279, 342305, 342508, 342736, 342801 and 342925 for 24-Hour contraventions recorded on August 8, August 9, August 10, August 11, August 15, August 17, August 18 and August 22. High concentration of PM_{2.5} was resulted from a forest fire event.

SO₂: An analyzer upgrade was implemented this month. Following a successful shut-down calibration on August 7, the LICA-owned resident analyzer API 100E (s/n: 508) was replaced with another LICA analyzer, Thermo 431-TLE (s/n: 1180930031). A successful installation calibration was completed on August 8.

H₂S: An analyzer upgrade was implemented this month. Following a successful shut-down calibration on July 31, the LICA-owned resident analyzer, API 101E analyzer (s/n: 510), was replaced with another LICA analyzer, Thermo 450i (s/n: CM17360005). A successful installation calibration was completed on August 1.

THC/CH4/NMHC: An analyzer upgrade was implemented this month. Following a successful shut-down calibration on August 22, the LICA-owned resident analyzer, Thermo 51C analyzer (s/n: 436609738), was replaced with another LICA analyzer, Thermo 55i (s/n: 1180930026). A successful installation calibration was subsequently completed.

NOx/NO/NO2: An analyzer upgrade was implemented this month. Following a successful shut-down calibration on August 7, the LICA-owned resident analyzer API 200A (s/n: 1899) was replaced with another LICA analyzer, Thermo 42i (s/n: 1180930028). A successful installation calibration was completed on August 8.

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

Respectfully,



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



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



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

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

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

JOB #: 2833-2018-08-30-C

August 2018

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LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

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Attention: MIKE BISAGA

) ° u- " **September 26, 2018**

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Maram Ghaleb

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Mike Bisaga

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SUMMARY

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement. The CH₄/NMHC channel operational uptime was 22.3%. Monitoring activity for these two channels commenced on August 22. The monthly data completeness criteria was not applicable in the August monitoring period.

Non-Conformance 7

Analyzer upgrade:

THC/CH₄/NMHC:

PM_{2.5}

Monthly Continuous Data Summary

Lakeland Industry & Community Association Maskwa Continuous Monitoring Station					MAXIMUM VALUES							OPERATIONAL TIME (%)	
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	1-HOUR		24-HOUR			
	1-hr	24-hr	1-hr	24-hr				HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING		DAY
SO ₂ (ppb)									.0	V‡			
H ₂ S (ppb)									..	o-			
THC (ppm)									0.6	o-			
CH ₄ (ppm)									.2	o			
NMHC (ppm)									..	V-			
NO ₂ (ppb)									..	V‡			
NO (ppb)									..	‡			
NO _x (ppb)									..	V‡			
PM _{2.5} (µg/m ³)									..	‡			
RELATIVE HUMIDITY (%)									.0	o			
BAROMETRIC PRESSURE (millibar)									..	o‡			
AMBIENT TEMPERATURE (°C)									3.5	‡			
PRECIPITATION (mm)									.2	V‡			
VECTOR WS (kph)					.0	.1				V-	7.7		
VECTOR WD (sec)													

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

H₂S 1-Hour Exceedances

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

H₂S 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

PM_{2.5} 1-Hour Exceedances

Forty-eight 1-hour exceedances were recorded this month.

PM_{2.5} 24-Hour Exceedances

Eight 24-hour exceedances were recorded this month.

In accordance with EPEA and the Substance Release Regulation.

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

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1.0 Discussion

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SULPHUR DIOXIDE (SO₂)

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The permeation tube was replaced on August 8. As the permeation tube required additional time to stabilize, the expected span value was re-adjusted on August 10 with a more representative concentration.

HYDROGEN SULPHIDE (H₂S)

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TOTAL HYDROCARBONS (THC), METHANE (CH₄) and NON-METHANE HYDROCARBONS (NMHC)

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The analyzer was allowed time to stabilize overnight and a successful installation calibration was completed on August 8. The expected span value was re-adjusted following the daily zero-span on August 10 with a more representative concentration. Nineteen hours of downtime were incurred due to this event.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

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

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RELATIVE HUMIDITY (RH)

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BAROMETRIC PRESSURE (BP)

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PRECIPITATION (PRECIP)

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AMBIENT TEMPERATURE (AmbTPX)

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2.0 Project Personnel

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3.0 Plant Monthly Required AMD Summary

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U The CH₄/NMHC channel operational uptime was 22.3%. Monitoring activity for these two channels commenced on August 22. The monthly data completeness criteria was not applicable in the August monitoring period.

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4.0 Calculations and Results

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5.0 Methods and Procedures

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Level 0 Preliminary Verification

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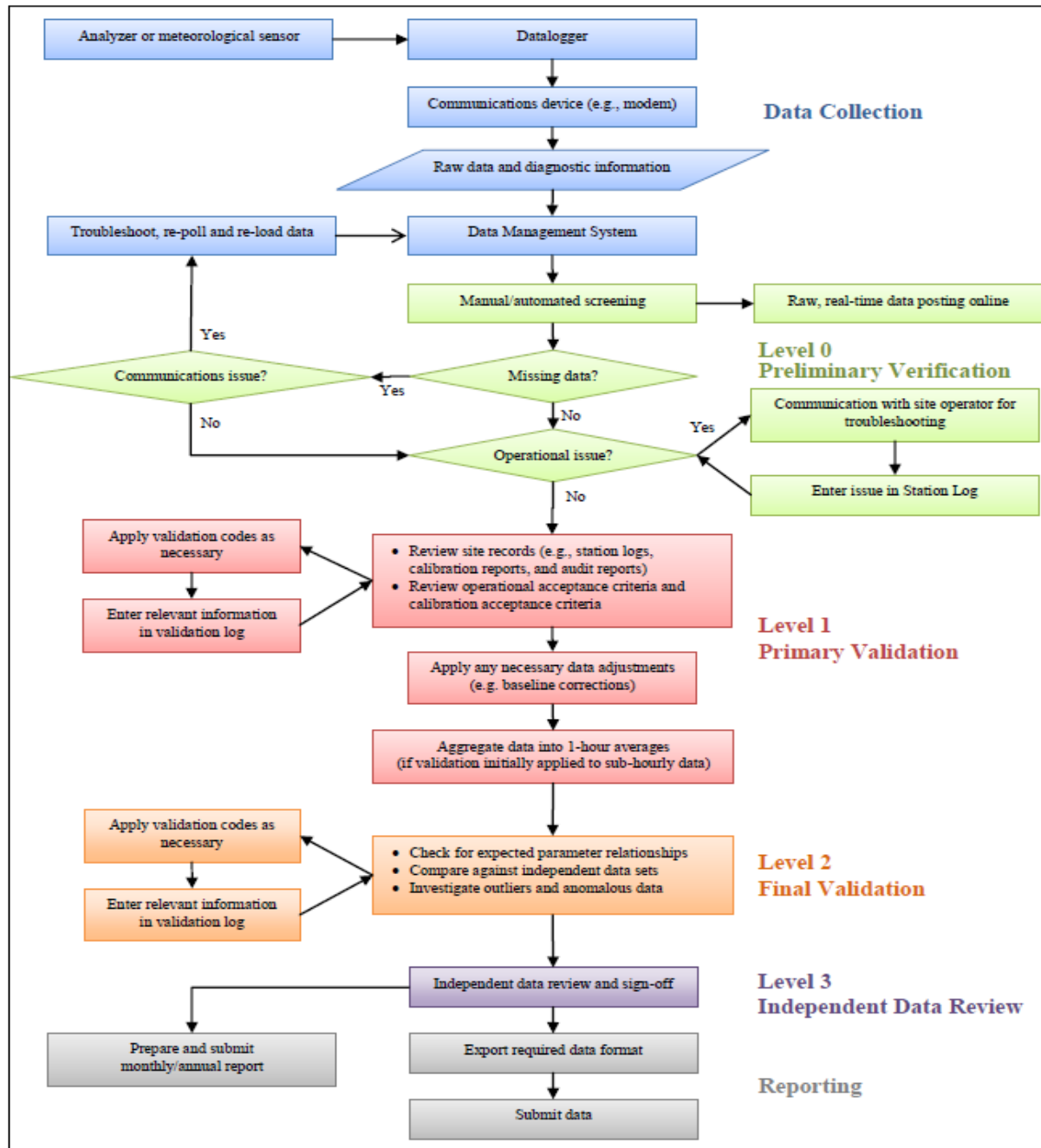
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Level 3 Independent Data Review

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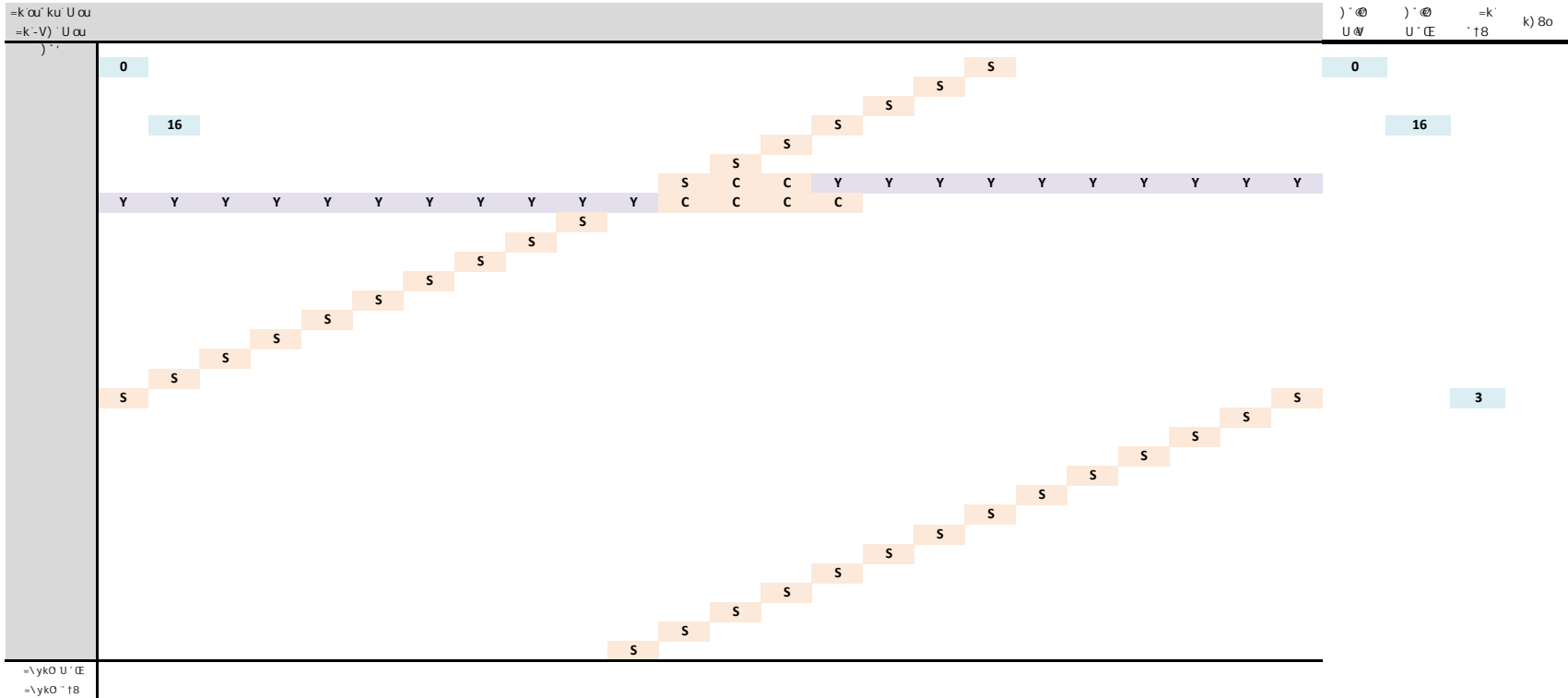


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APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



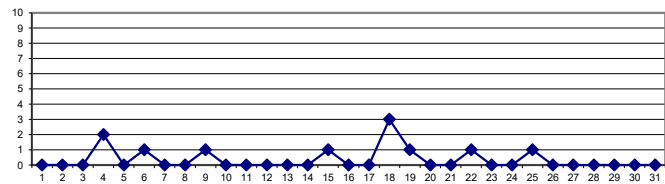
STATUS FLAG CODES

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OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	=k	=k
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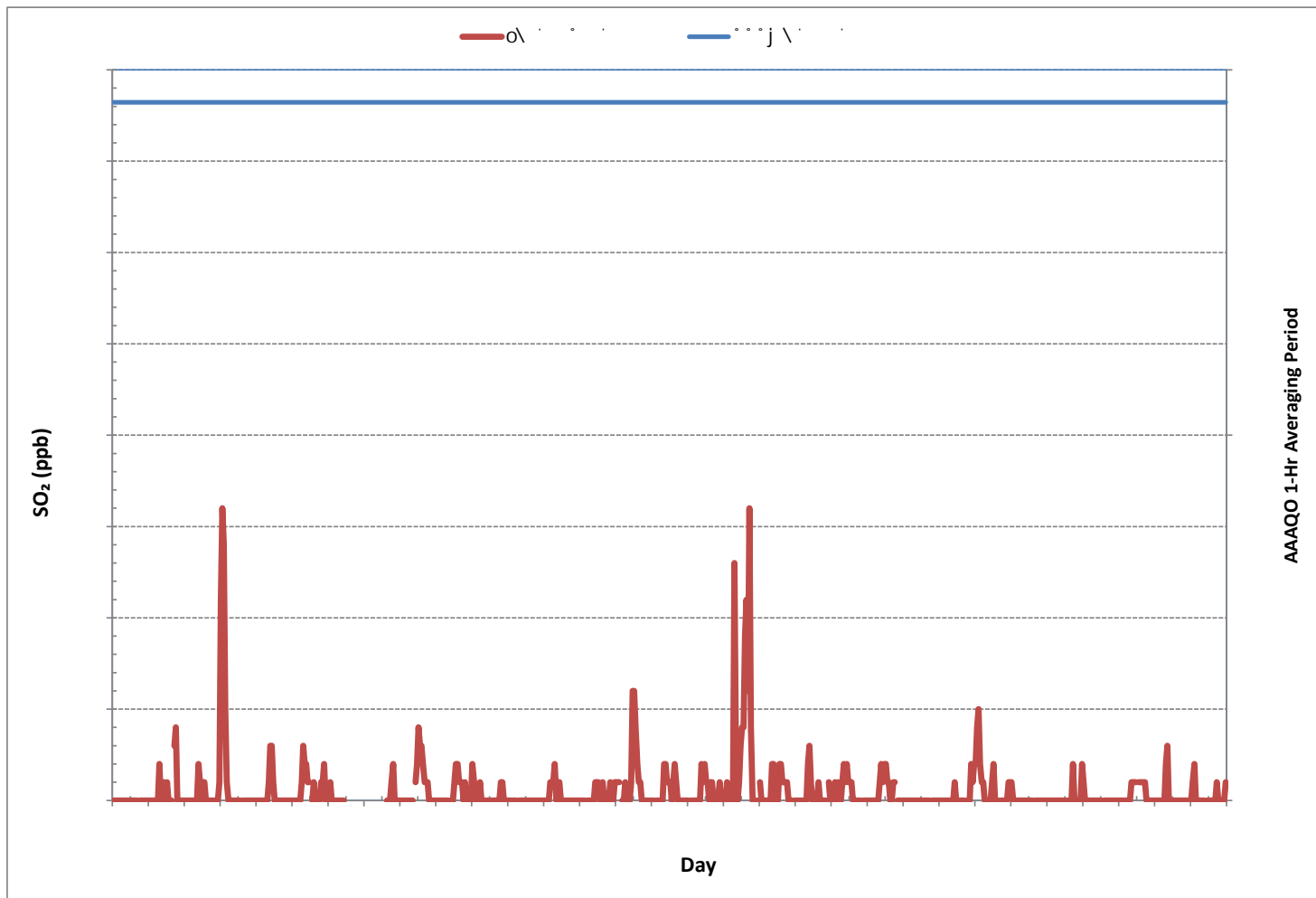
24 HR AVERAGES August 2018



MONTHLY SUMMARY

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SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



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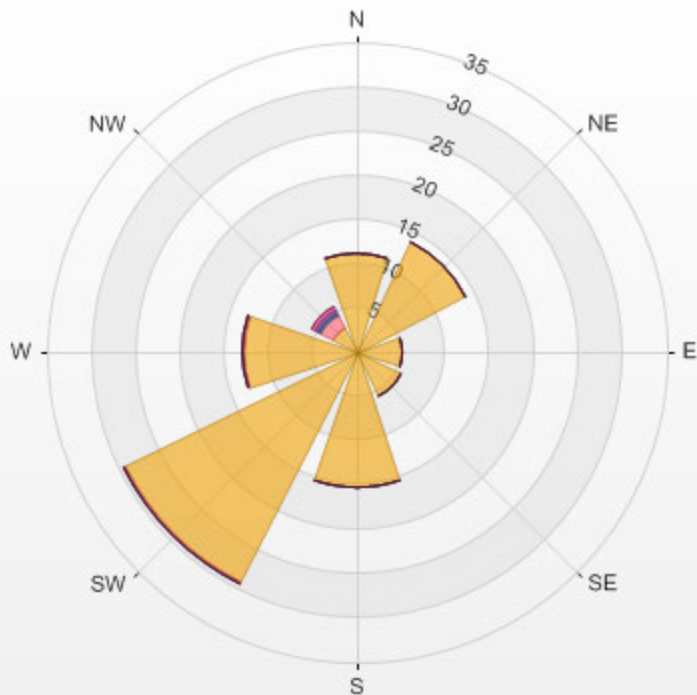
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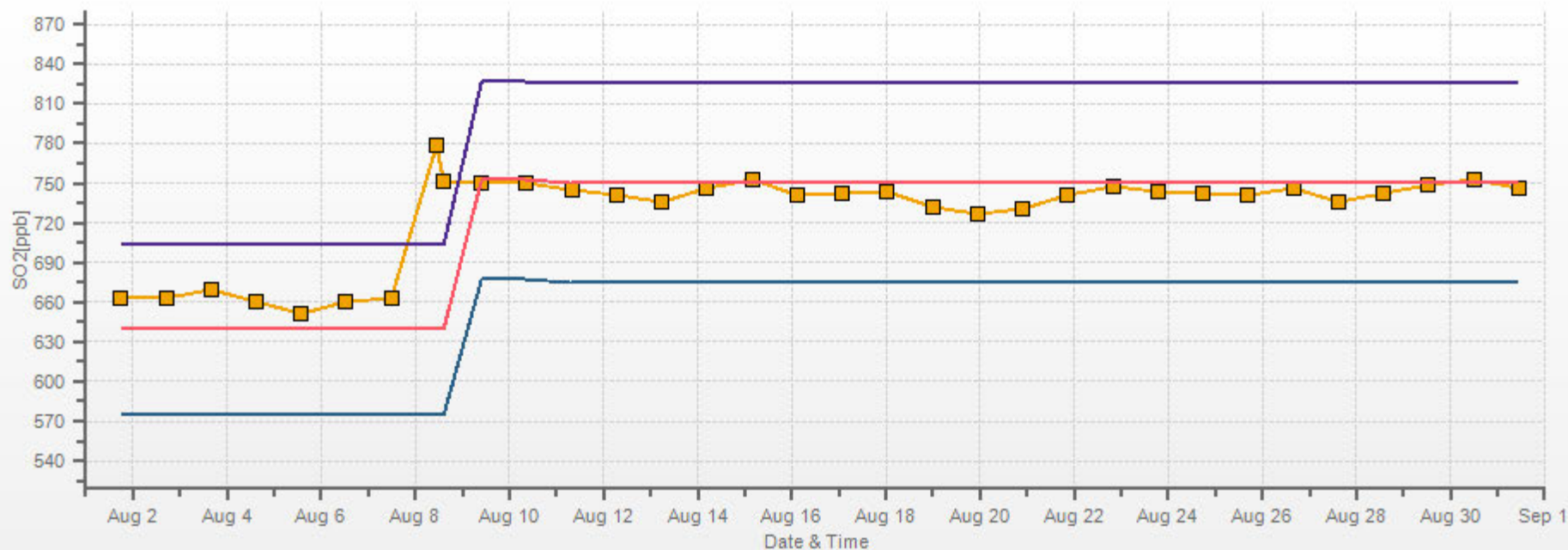
% Icon Classes (ppb) 96 0.0-3.4 2 3.4-6.8 0 6.8-10.2 0 10.2-13.6 0 13.6-17.0 0 >17.0

LICA MASKWA Poll.: LICA MASKWA-SO2[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.87% Calm Poll Avg: 0.13[ppb]



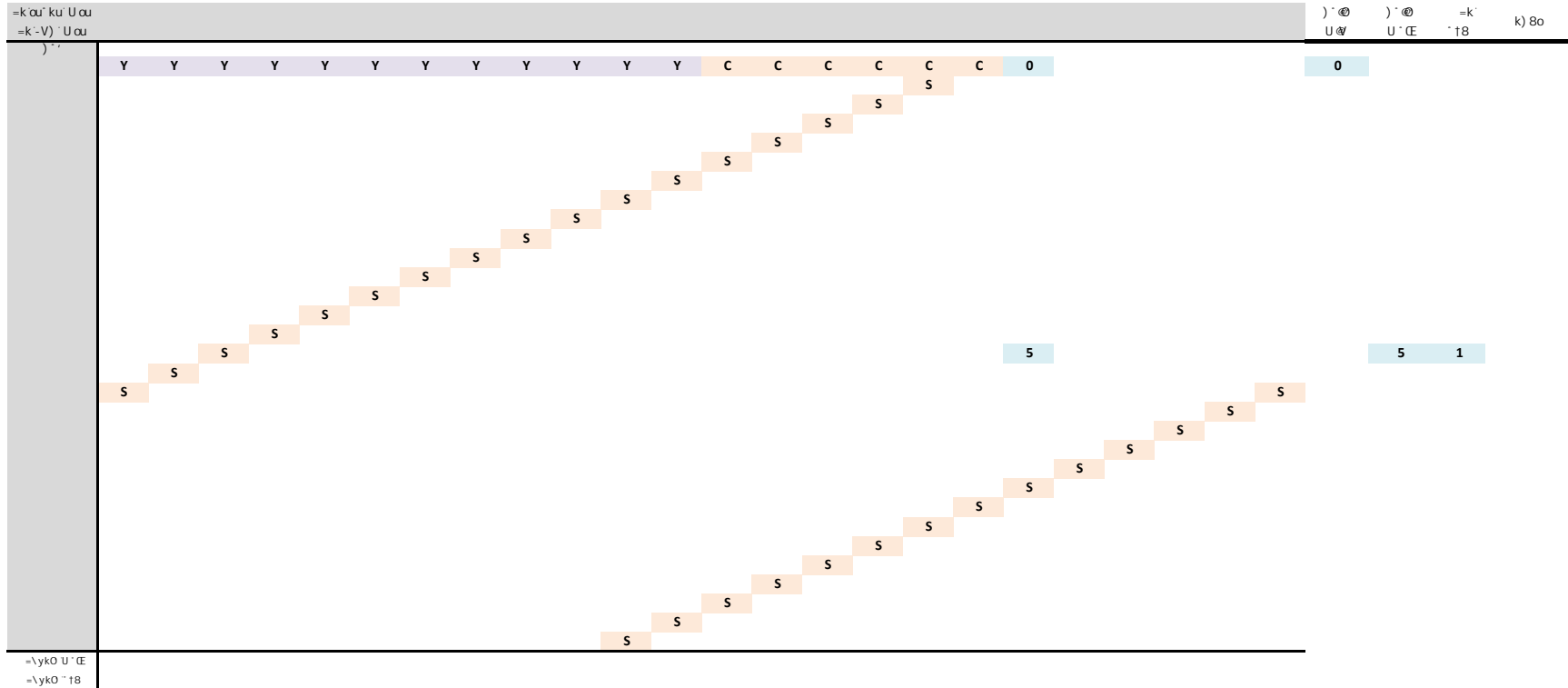
SO2[ppb] Calibration: LICA MASKWA Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



HYDROGEN SULPHIDE

HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



STATUS FLAG CODES

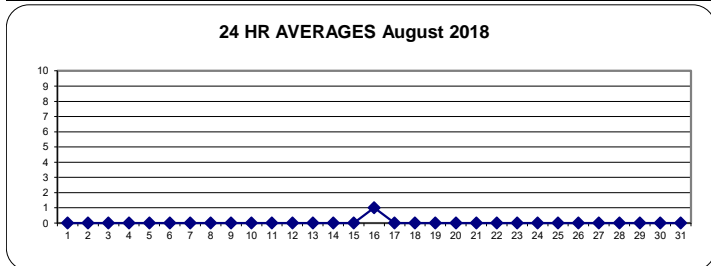
#	U \ Vu=0 # O@k' u@V	j	j y' O@r'' ooyk' V#-
#	k-h-' u# O@k' u@V	k	k-# \ t-k'
'	U' @u-V' V#-	(E	U' #=@- U' O'yV#u@V
o)' @ -k\ ch' V#=#M	8	\yu\ k k-h' @
o	k-h-' u--k\ ch' V#=#M	h	h\ t -k' @yk-

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:

=k	=k
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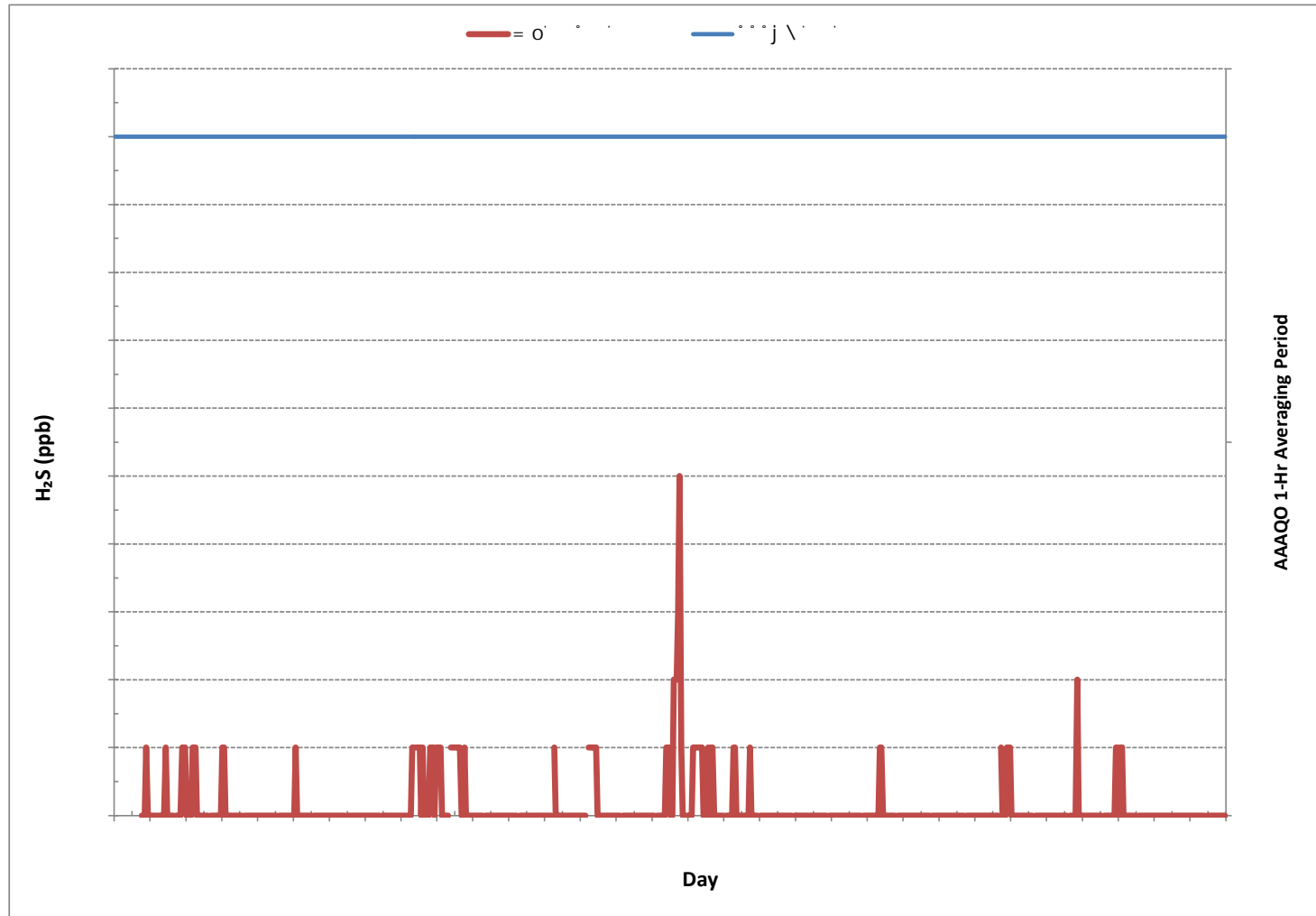
24 HR AVERAGES August 2018



MONTHLY SUMMARY

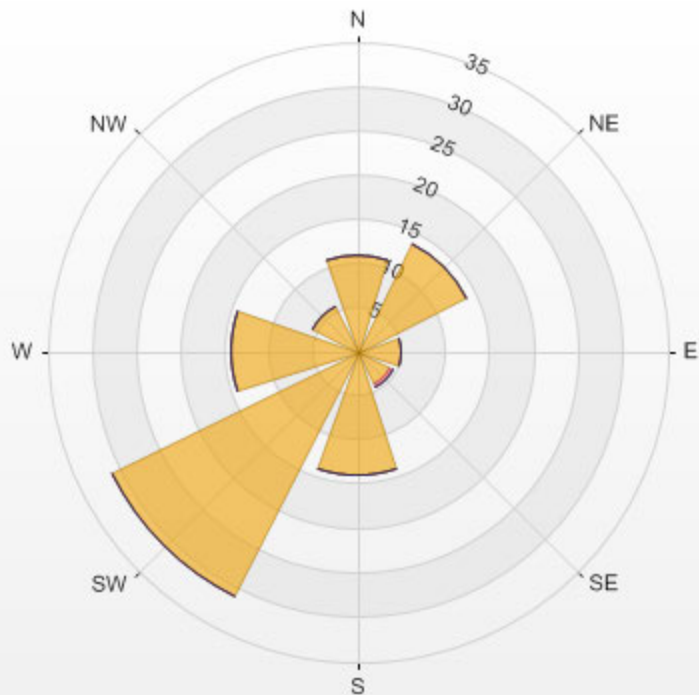
VyU"-k\7 =k-(#--)' V#-o	
VyU"-k\7 =k-(#--)' V#-o	
VyU"-k\7\ V --k\ k-') @/8o	
U @@ yU' =k" t-k' 8-	=\yk
U' @ yU' =k" t-k' 8-	=\yk
U' @ yU' =k" t-k' 8-	=\yk
@o# O@k' u@V u@ -	\h-k' u@V' Ou@ -
U \ Vu=0 # O@k' u@V u@ -	'U) \h-k' u@V yhu@ -
au' V) : k) -t@u@V	U \ Vu=0 " t-k' 8-

HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



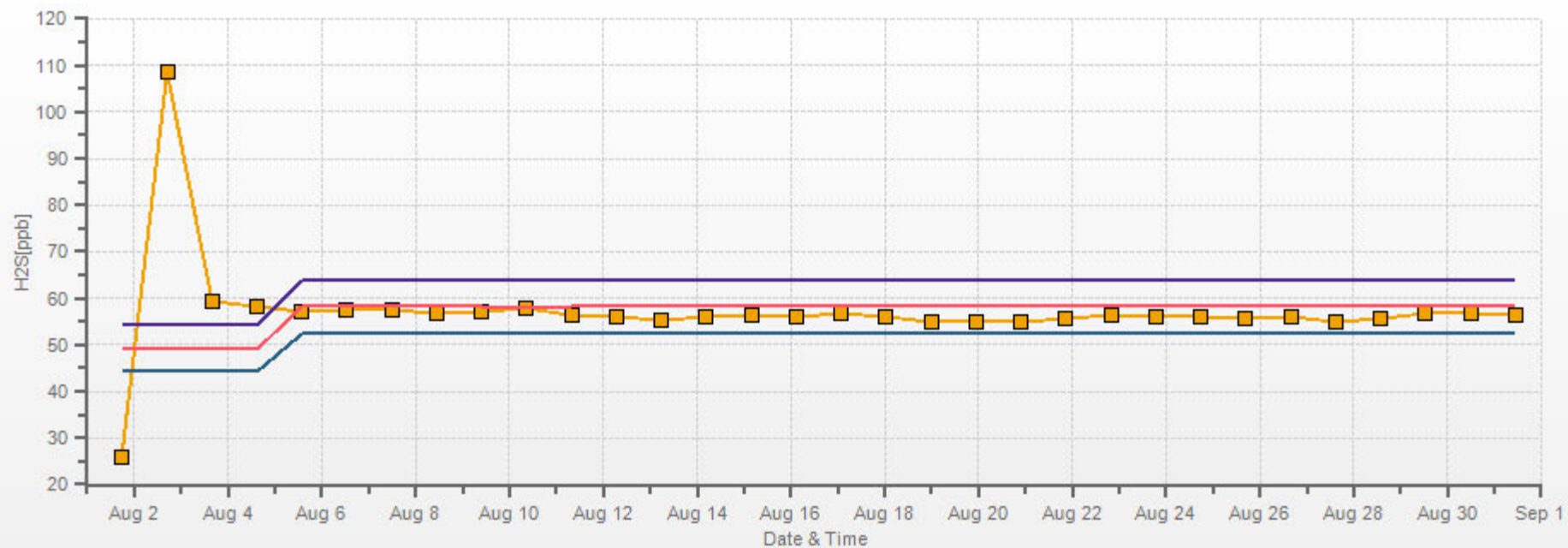
% Icon Classes (ppb) 99 0.0-2.0 0 2.0-4.0 0 4.0-6.0 0 >6.0

LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.86% Calm Poll Avg: 0.29[ppb]



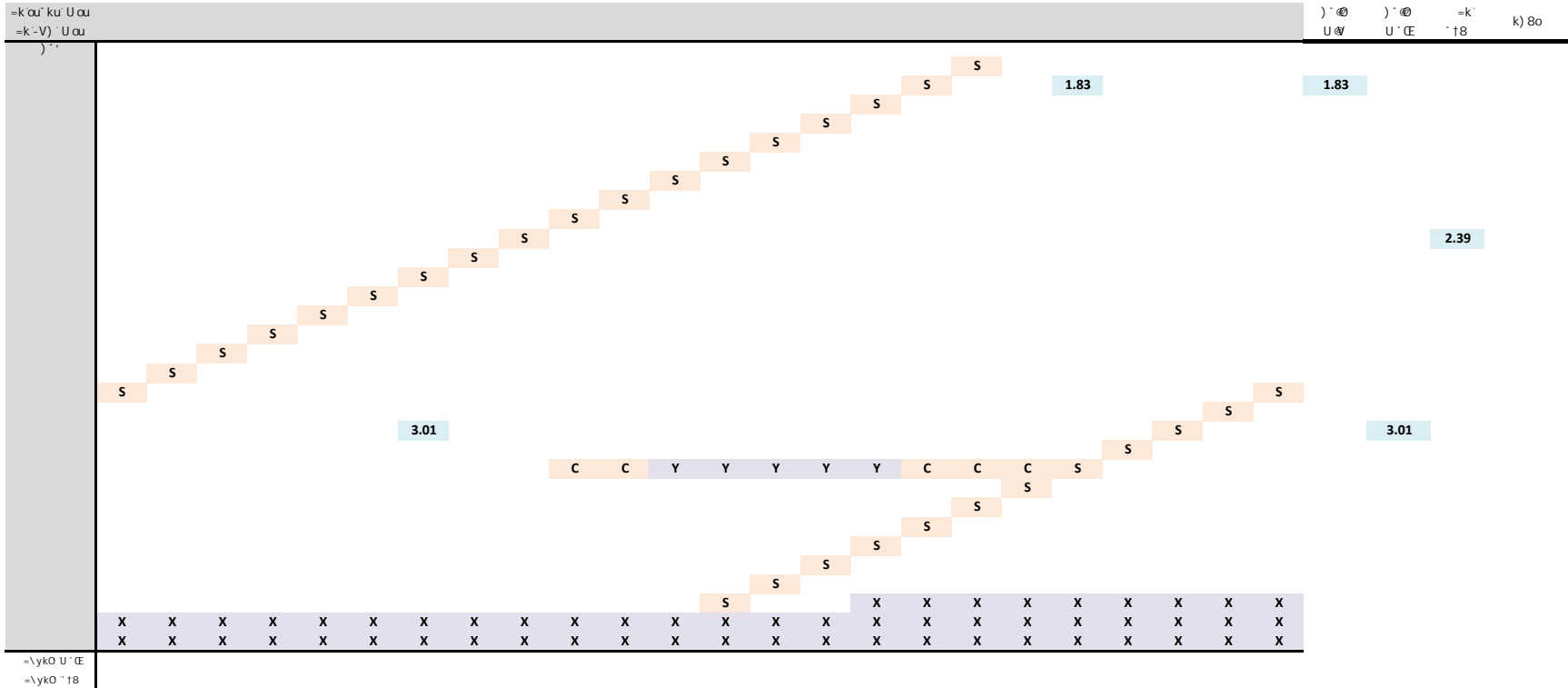
H2S[ppb] Calibration: LICA MASKWA Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL HYDROCARBON

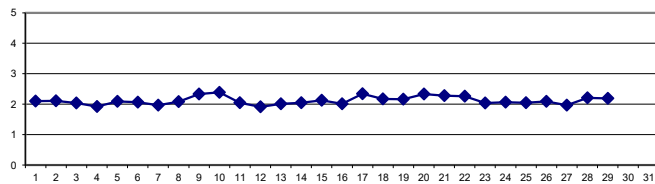
TOTAL HYDROCARBONS Hourly Averages (THC ppm)



STATUS FLAG CODES

#	U \ Vu=0 # O@k' u@V	j	j y' O@r'' ooyk' V#-
#	k-h' u# O@k' u@V	k	k-# \ t-k'
'	U' @u-V' V#-	(E	U' #=@- U' O'yV#u@V
o	)' @ -k \ ch' V#=#M	8	\ yu7 k k-h' @
o	k-h' u--k \ ch' V#=#M	h	h \ t-k' 7 @yk-

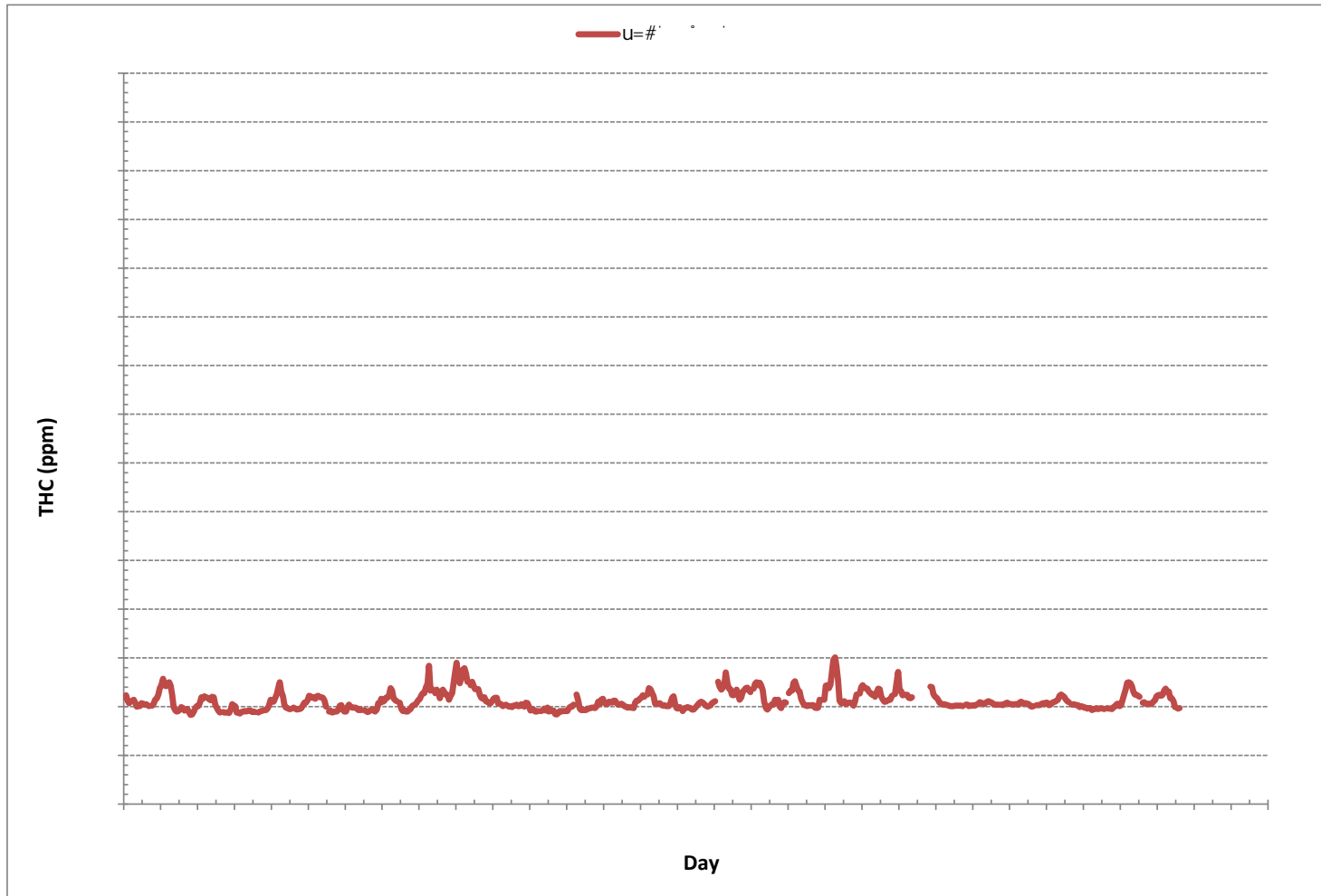
24 HR AVERAGES August 2018



MONTHLY SUMMARY

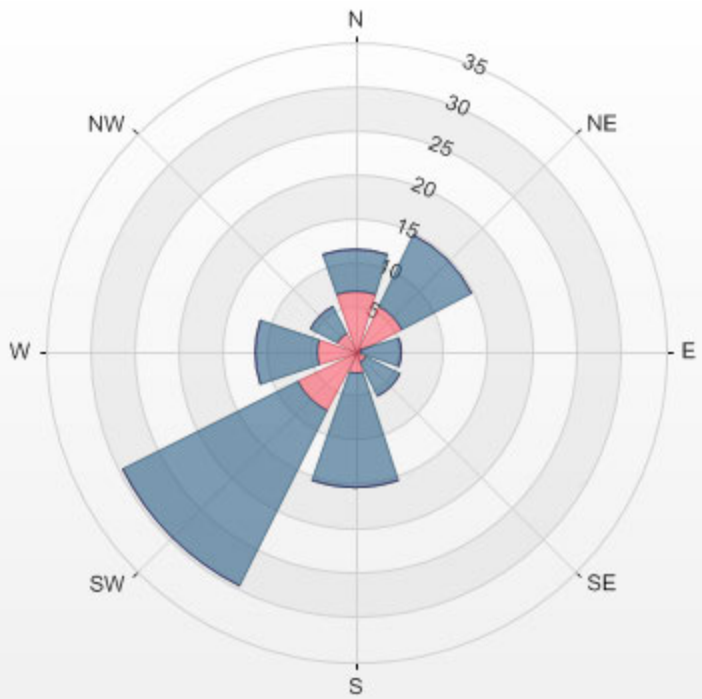
VyU" -k \ 7V \ V --k \ k-') @/8o	
U @@ yU' =k' t-k' 8-	=\yk
U' @ yU' =k' t-k' 8-	=\yk
U' @ yU' =k' t-k' 8-	=\yk
@o# O@k' u@V u@ -	\h-k' u@V' Ou@ -
U \ Vu=0 # O@k' u@V u@ -	'U) \h-k' u@V yhu@ -
au' V) :k) -t@u@V	U \ Vu=0' t-k' 8-

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



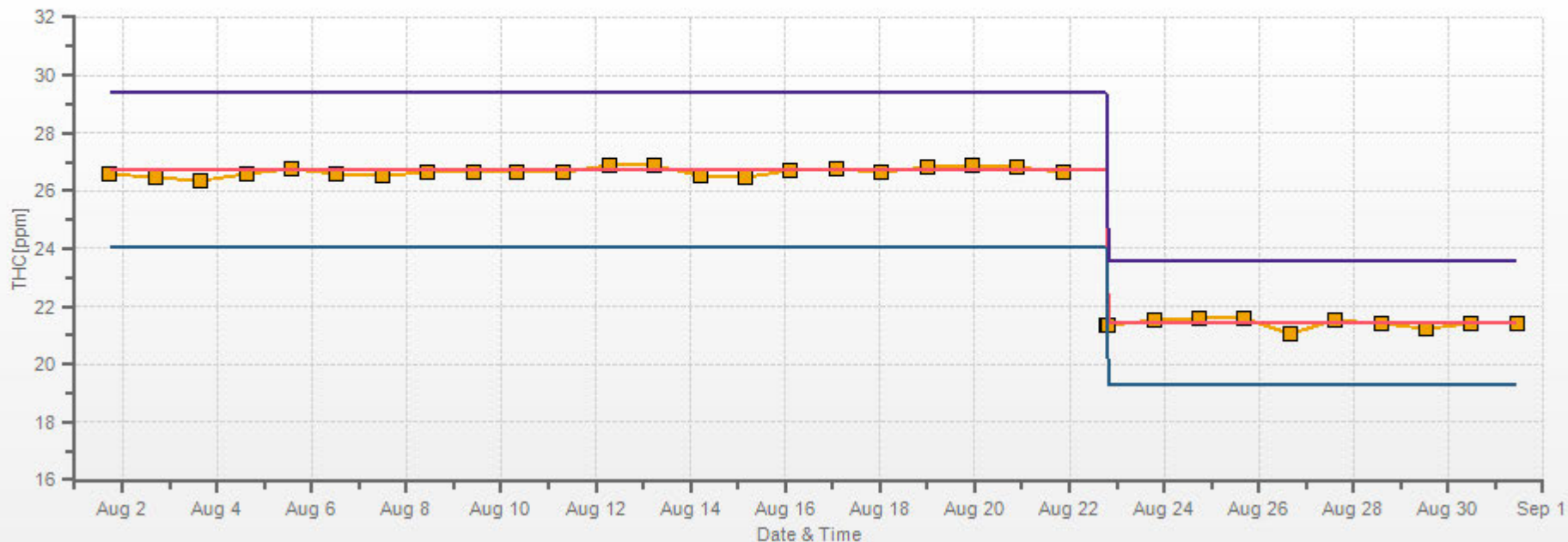
% Icon	Classes (ppm)	0	0.0-1.0	32	1.0-2.0	67	2.0-3.0	0	>3.0
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LICA MASKWA Poll.: LICA MASKWA-THC[ppm] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.77% Calm Poll Avg: 2.51[ppm]



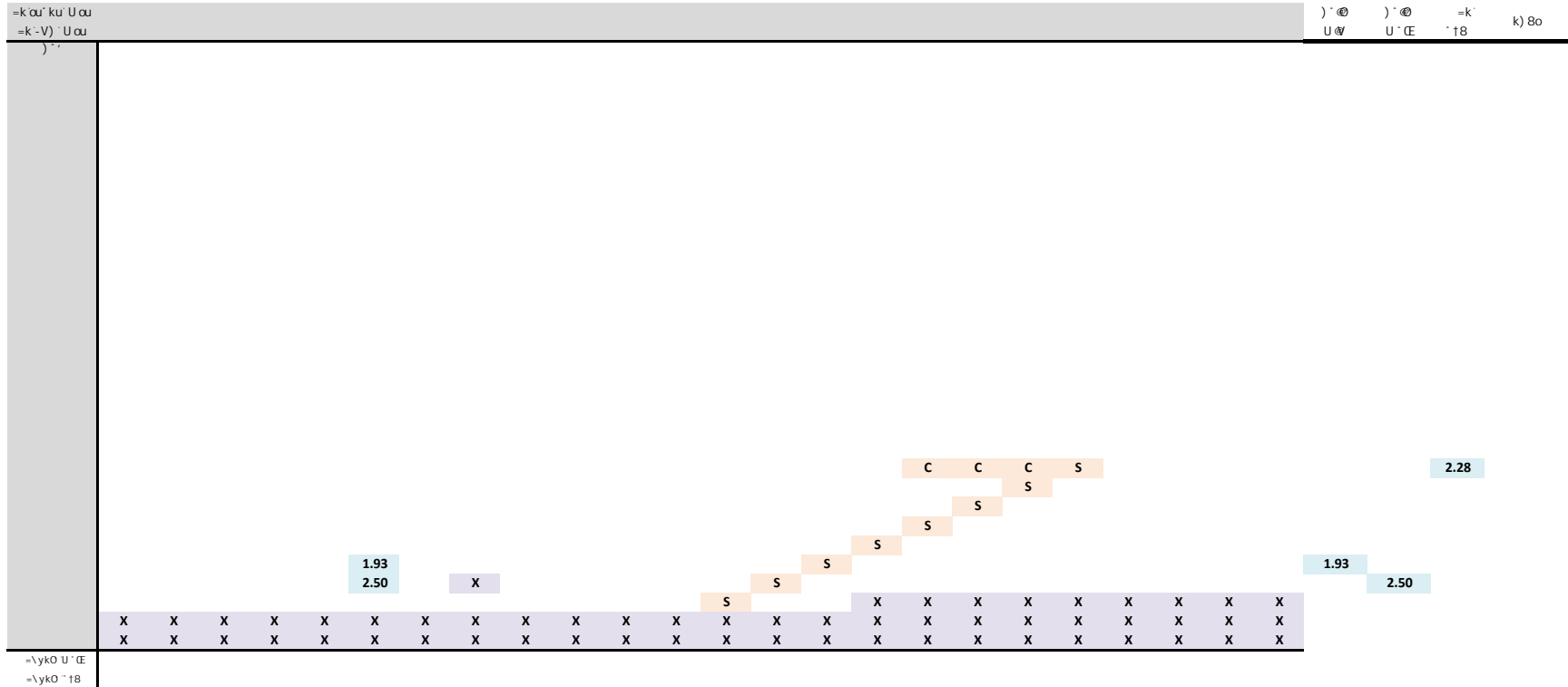
THC[ppm] Calibration: LICA MASKWA Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High

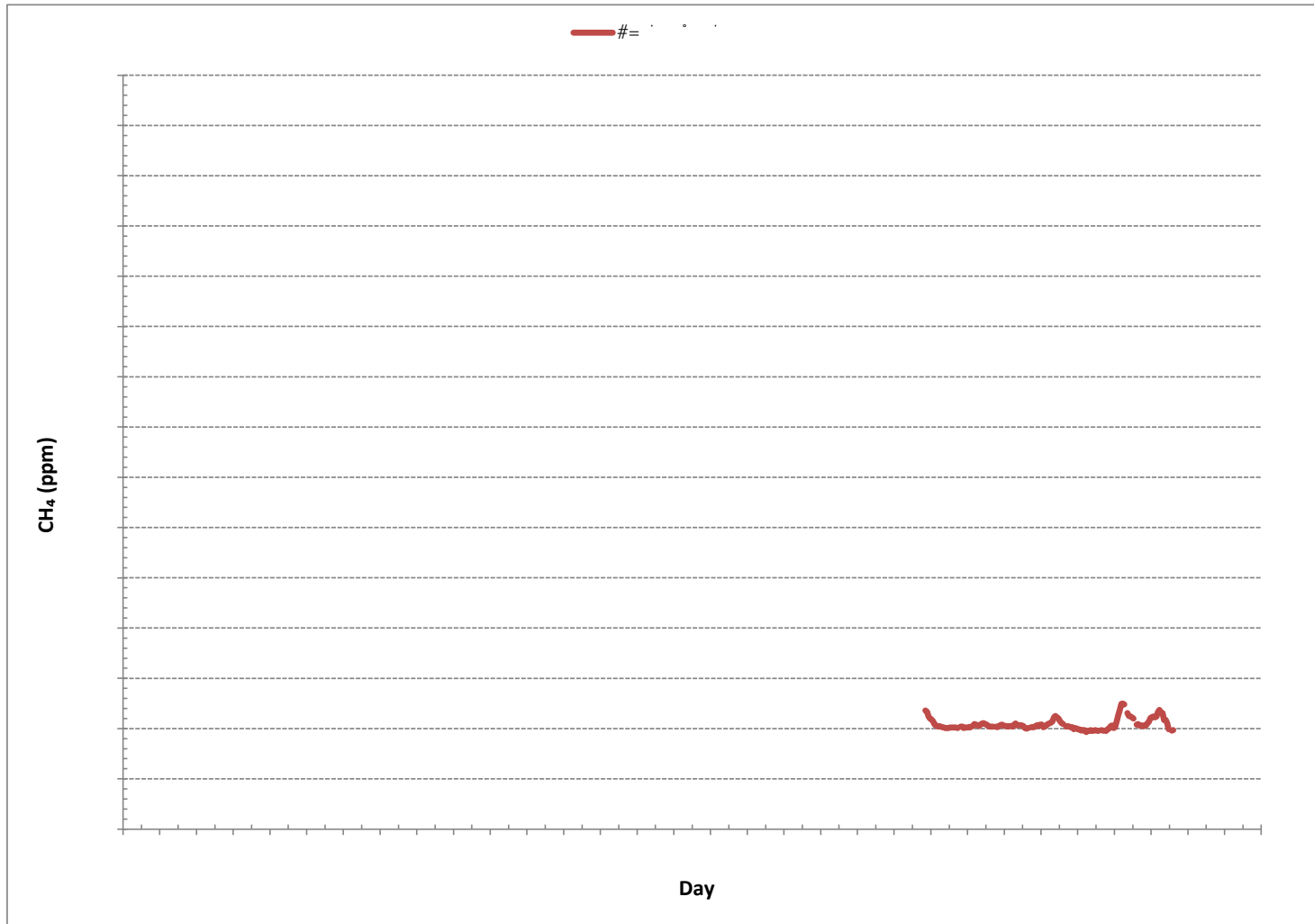


METHANE

METHANE Hourly Averages (CH₄ ppm)



METHANE Hourly Averages (CH₄ ppm)



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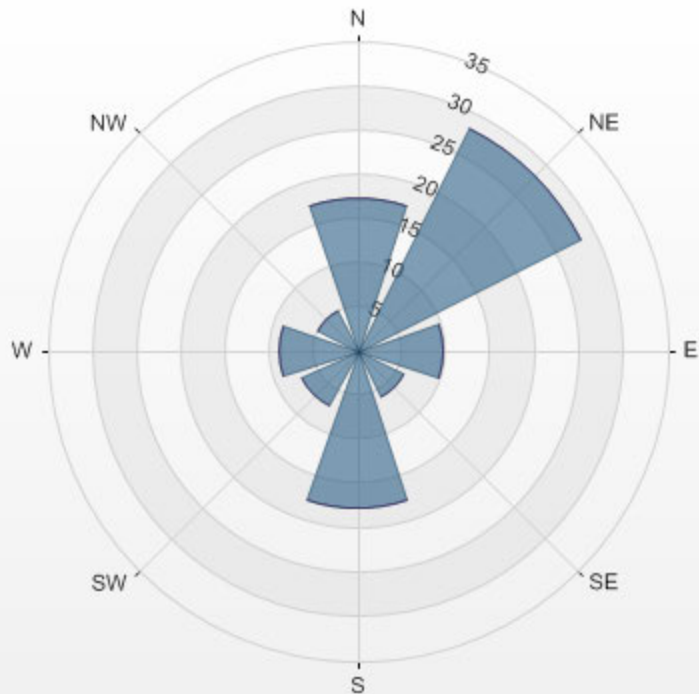
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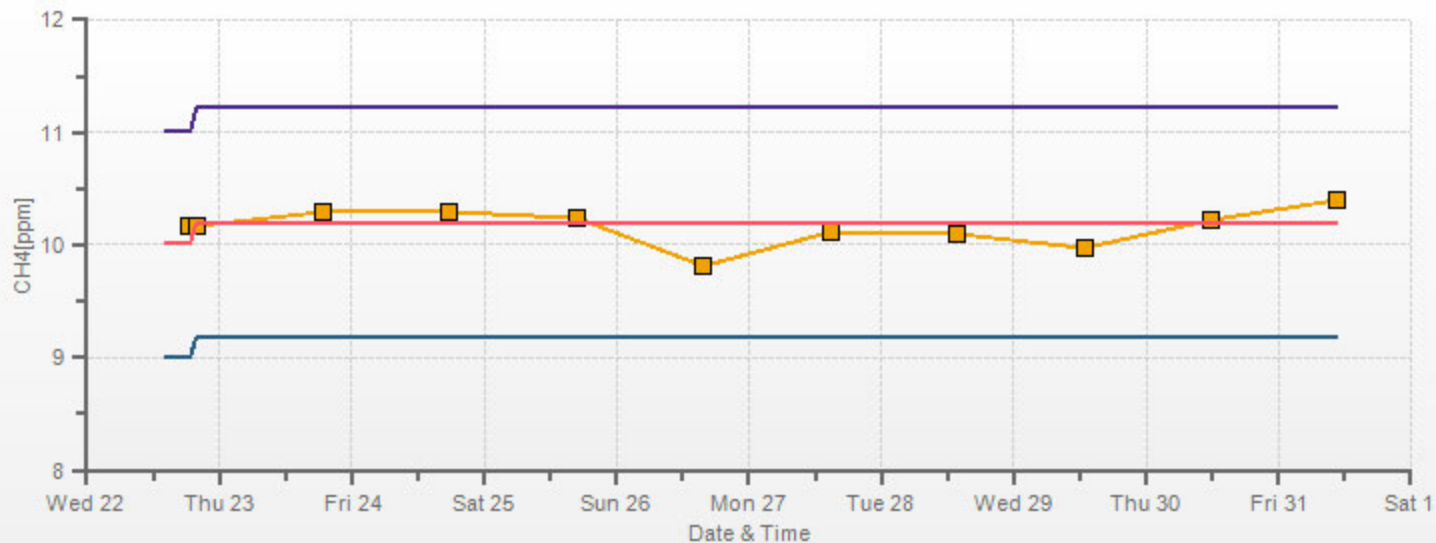
% Icon Classes (ppm) 0 0.0-0.8 0 0.8-1.7 100 1.7-2.5 0 >2.5

LICA MASKWA Poll.: LICA MASKWA-CH4[ppm] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



CH4[ppm] Calibration: LICA MASKWA Monthly: 18/08 Type: Span

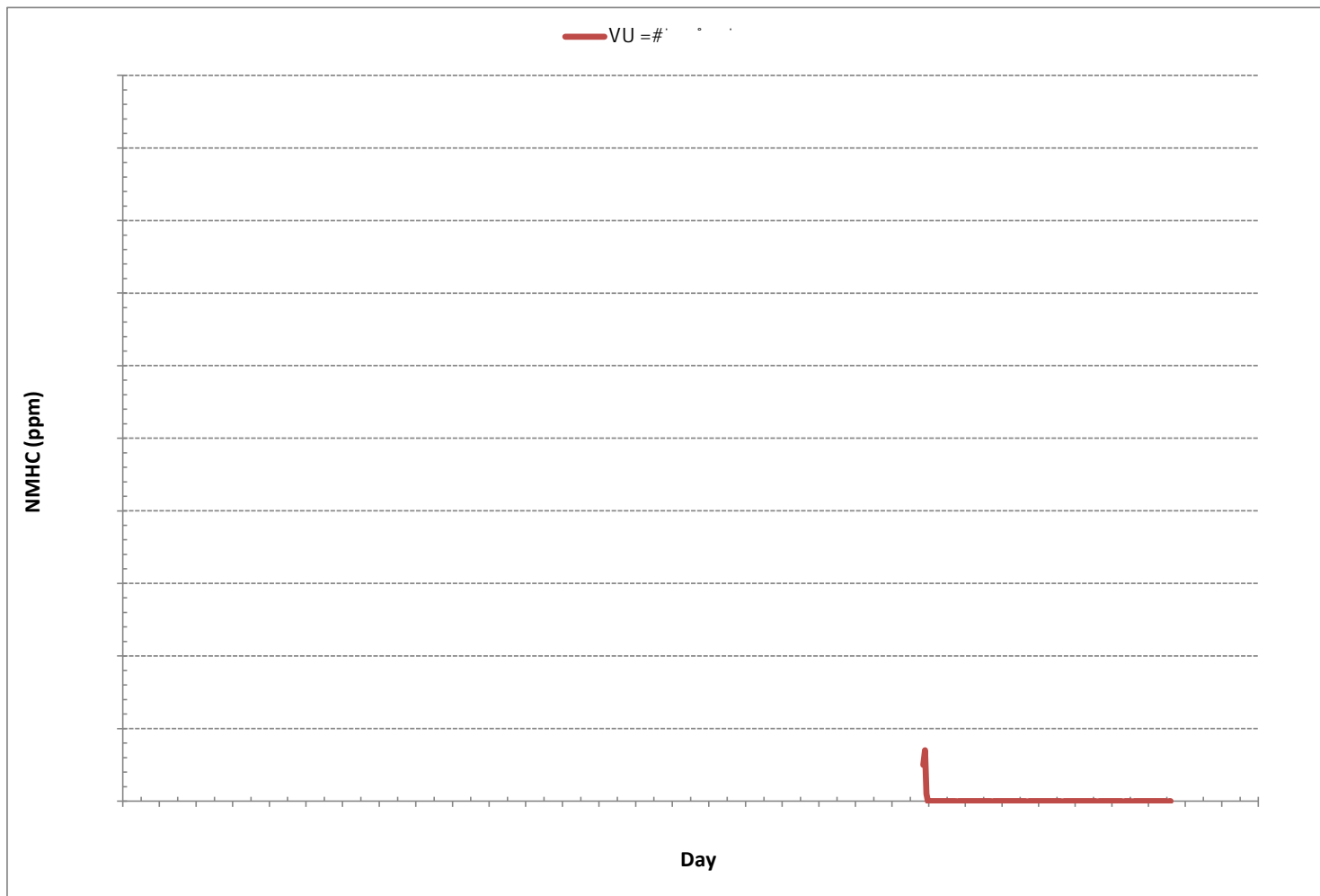
Span Meas Span Ref Span Low Span High



NON-METHANE HYDROCARBON

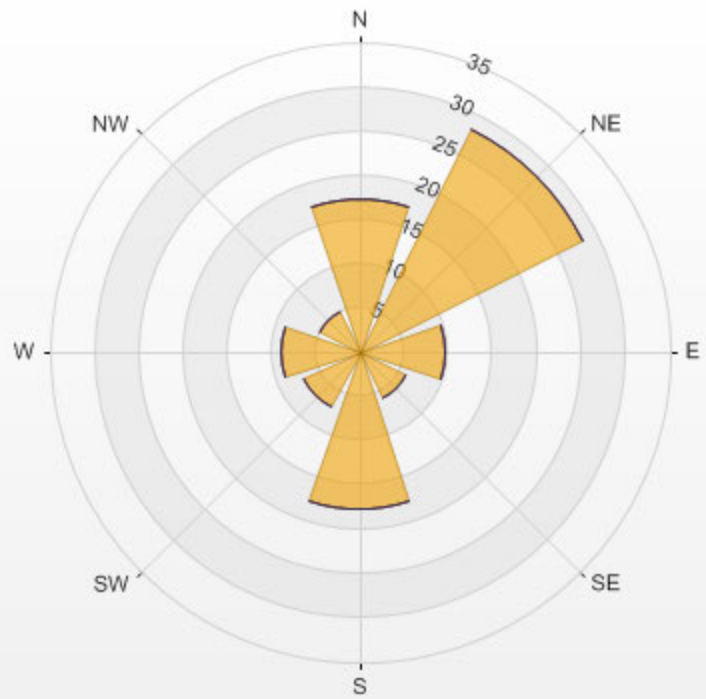


NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)



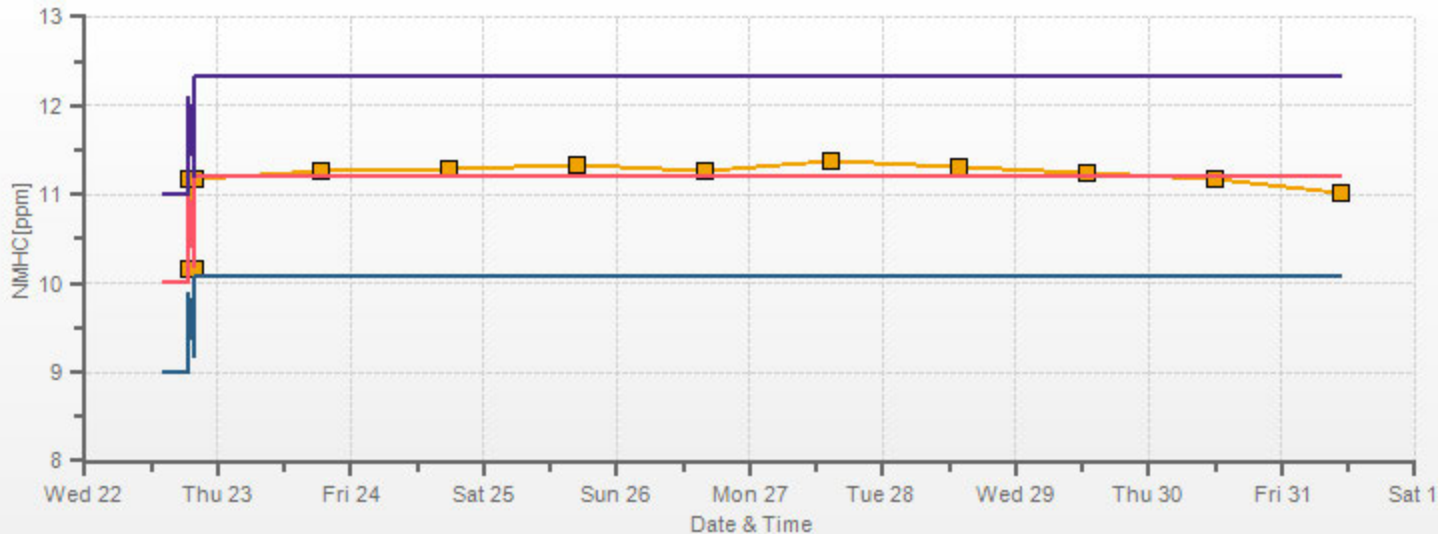
% Icon Classes (ppm) 100 0.0-0.3 0 0.3-0.7 0 0.7-1.0 0 >1.0

LICA MASKWA Poll.: LICA MASKWA-NMHC[ppm] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



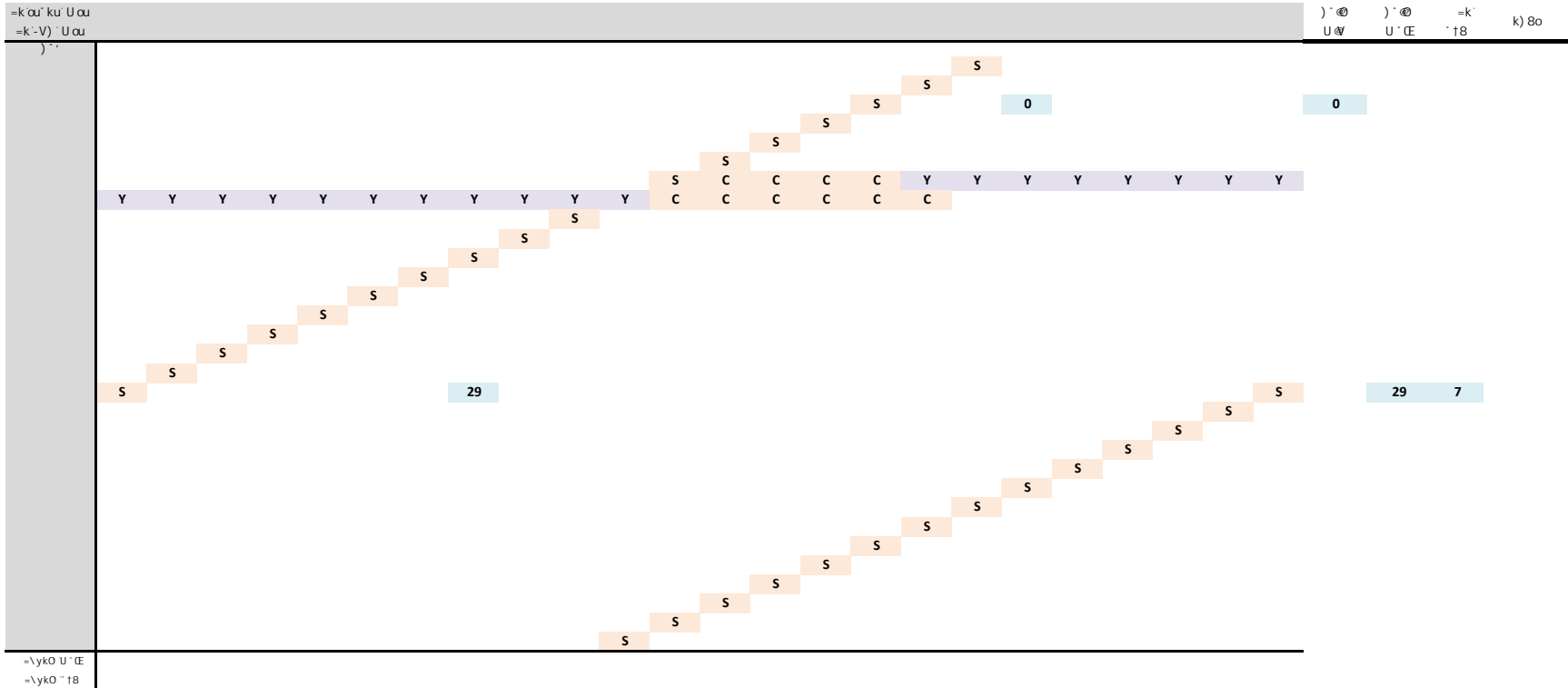
NMHC[ppm] Calibration: LICA MASKWA Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



OXIDES OF NITROGEN

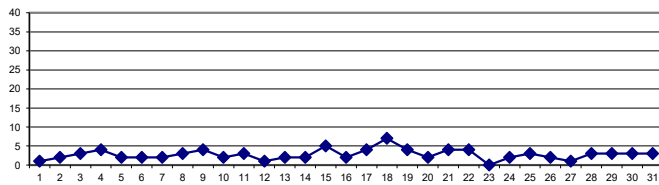
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



STATUS FLAG CODES

#	U \ Vu=0 # O@k' u@V	j	j y' O@r'' ooyk' V#-
#	k-h-' u# O@k' u@V	k	k-# \ t-k'
'	U' @u-V' V#-	E	U' #=@- U' O'yV#u@V
o	)' @ -k\ ch' V#=#M	8	\yu\ k k-h' @
o	k-h-' u--k\ ch' V#=#M	h	h\ t -k' @yk-

24 HR AVERAGES August 2018



MONTHLY SUMMARY

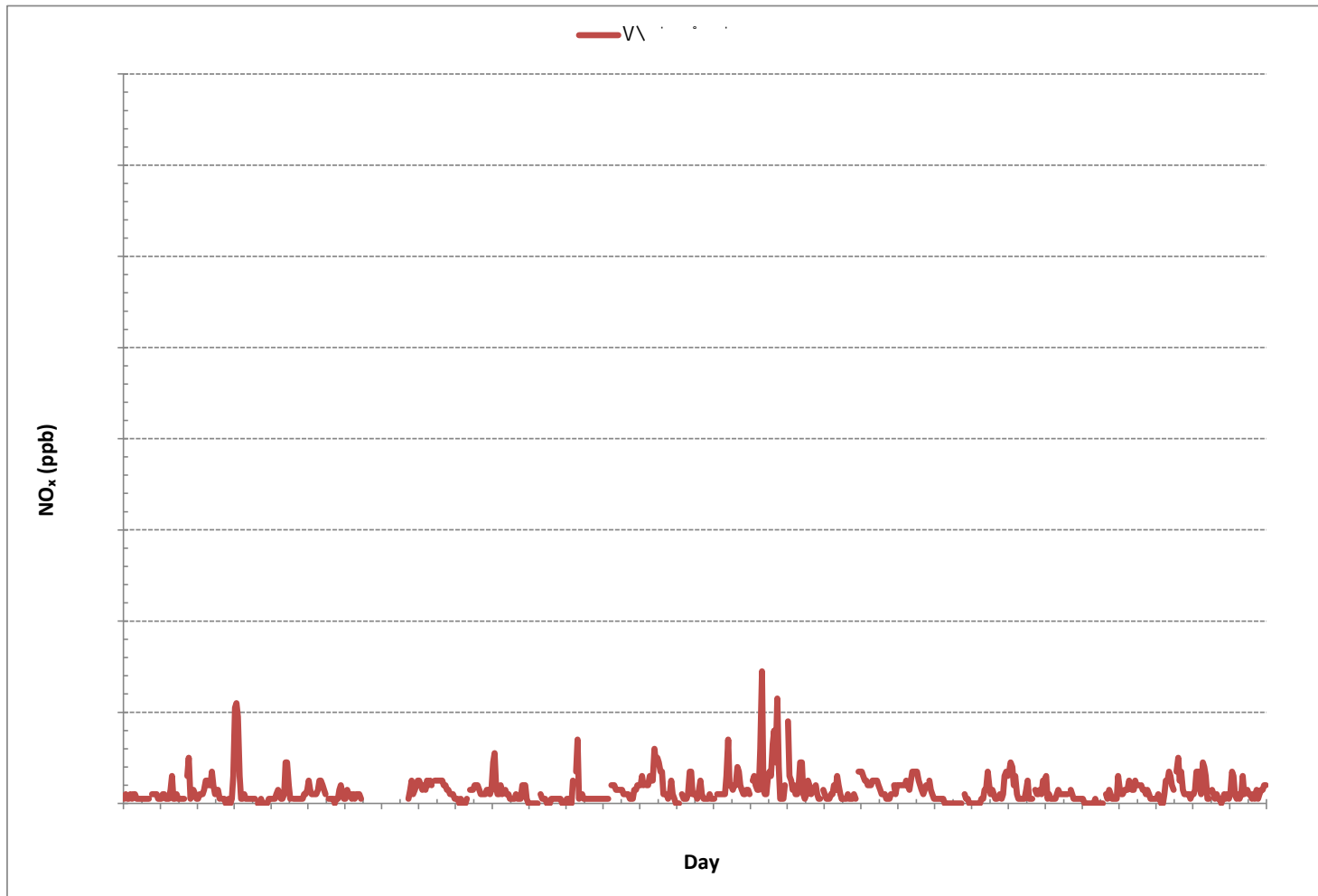
VyU" -k\ 7\ V --k\ k-') @/8o
U @@ yU' =k' t-k' 8-
U' @yU' =k' t-k' 8-
U' @yU' =k' t-k' 8-





=\yk \V)'
=\yk \V)'
=\yk \V)'

@o# O@k' u@V u@ -
U \ Vu=0 # O@k' u@V u@ -
au' V' : k) -t@u@V

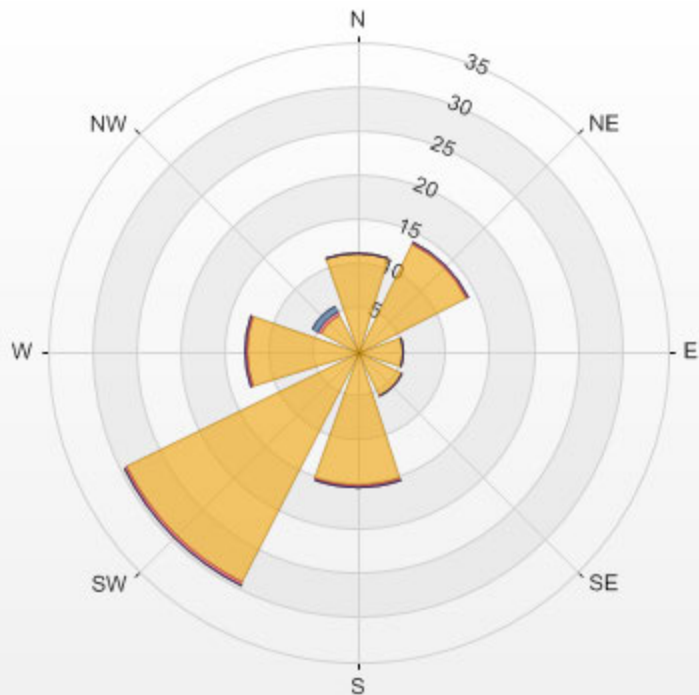
\h-k' u@V' Ou@ -
'U) \h-k' u@V yhu@ -
U \ Vu=0 " t-k' 8-

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



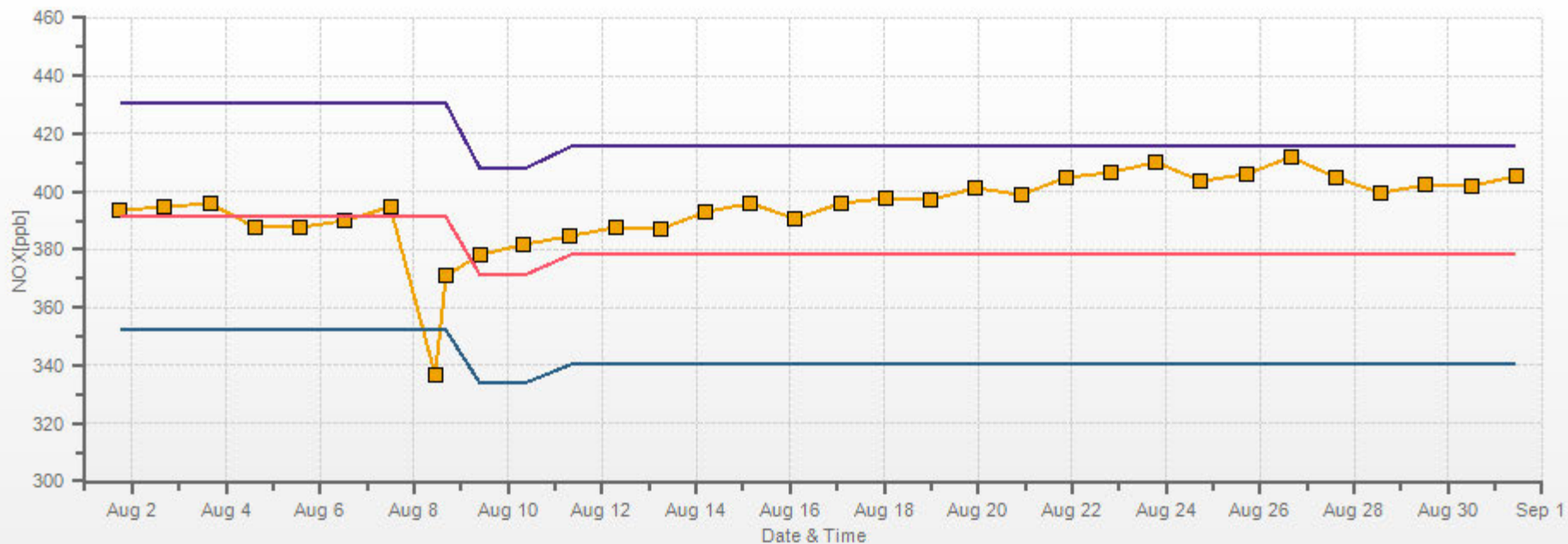
% Icon	Classes (ppb)	97	 0.0-10.0	1	 10.0-20.0	1	 20.0-30.0	0	 >30.0
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LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.88% Calm Poll Avg: 2.21[ppb]



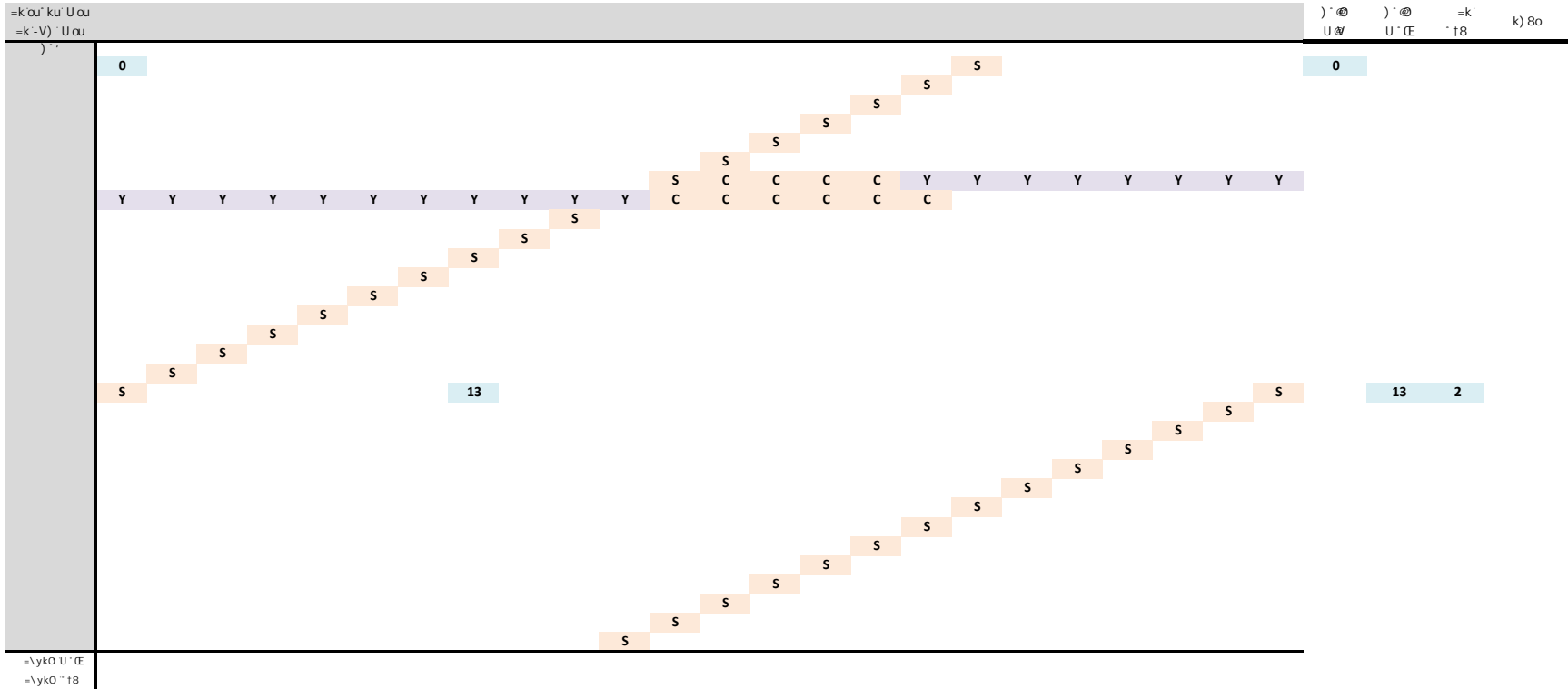
NOX[ppb] Calibration: LICA MASKWA Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



NITRIC OXIDES

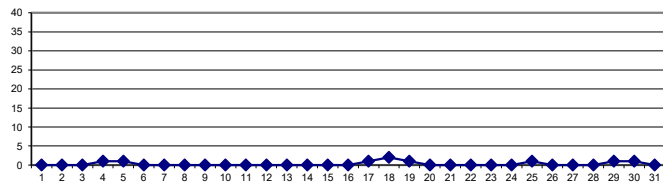
NITRIC OXIDE Hourly Averages (NO ppb)



STATUS FLAG CODES

#	U \ Vu=0 #* Q@k' u@V	j	j y' O@r'' ooyk' V#-
#	k-h-' u#* Q@k' u@V	k	k-# \ t-k'
,	U' @u-V' V#-	(E	U' #=@- U' O'yV#u@V
o	)' @ -k\ ch' V #=-#M	8	\ yu7 k k-h' @
o	k-h-' u--k\ ch' V #=-#M	h	h\ t -k' 7' @yk-

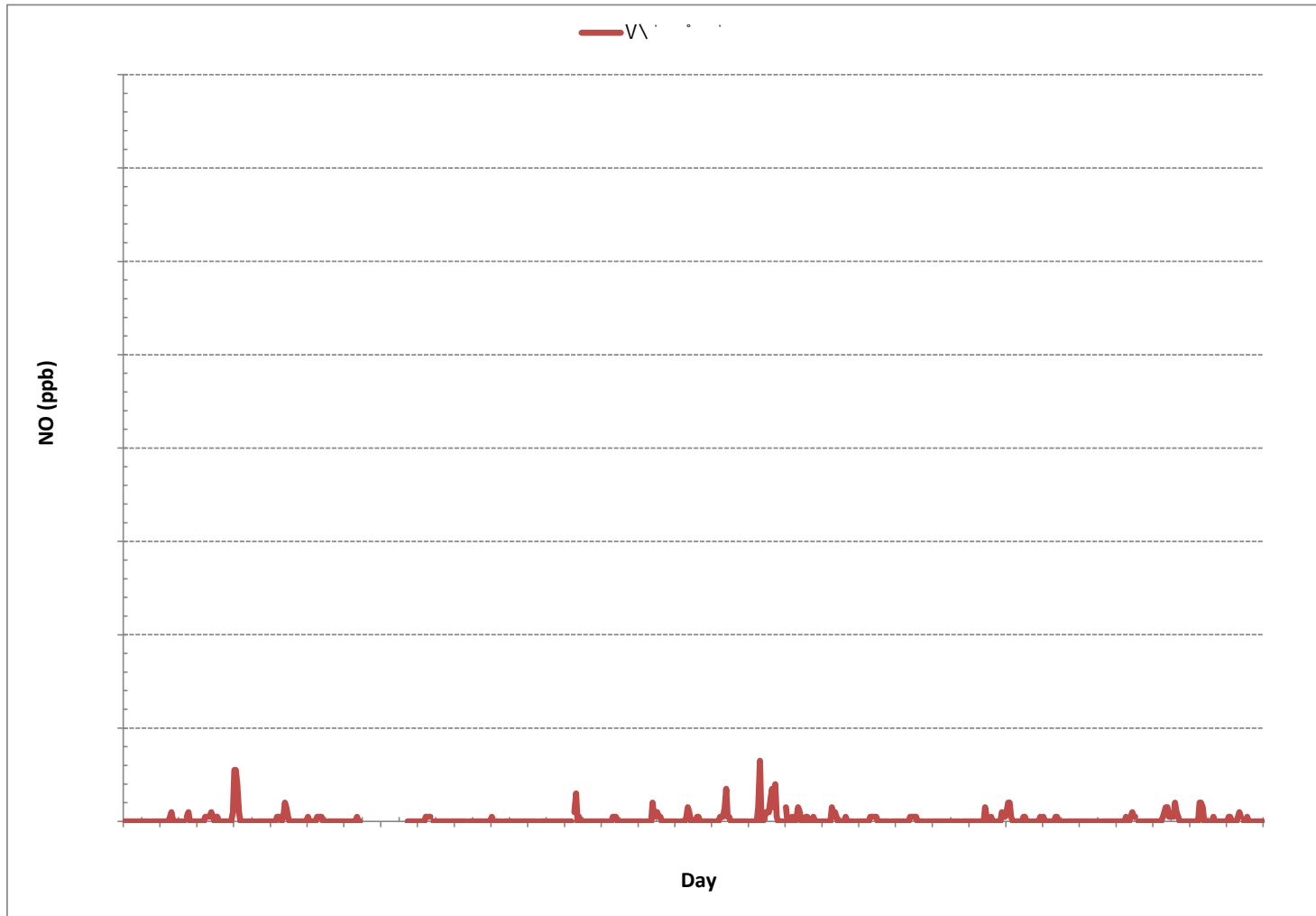
24 HR AVERAGES August 2018



MONTHLY SUMMARY

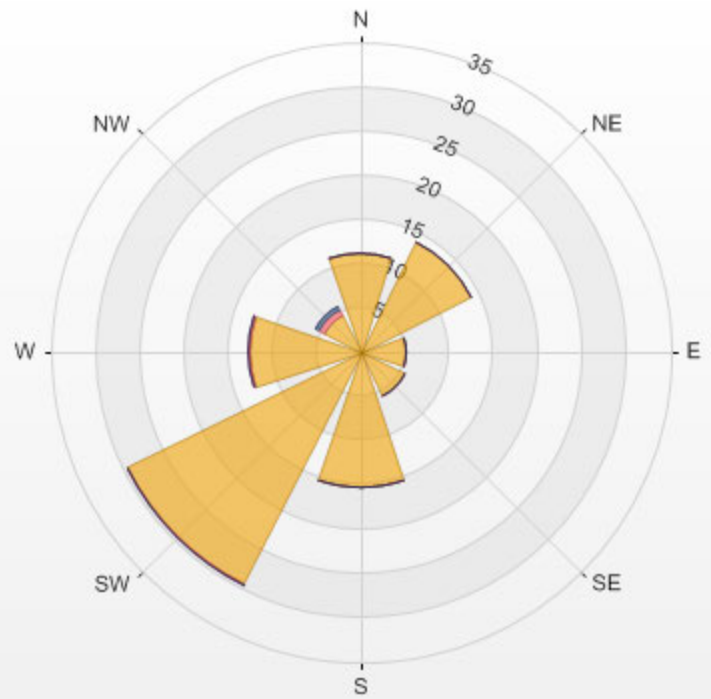
VyU" -k\ 7V\ V --k\ k-') @/8o	=\yk	\V)''
U @@ yU' =k' t-k' 8-	=\yk	\V)''
U' @yU' =k' t-k' 8-		\V)''
U' @yU' =k' t-k' 8-		\V)''
@o#* O@k' u@V u@ -	\h-k' u@V' Ou@ -	
U \ Vu=0 #* Q@k' u@V u@ -	'U) \h-k' u@V yhu@ -	
au' V) : k)) -t@u@V	U \ Vu=0 " t-k' 8-	

NITRIC OXIDE Hourly Averages (NO ppb)



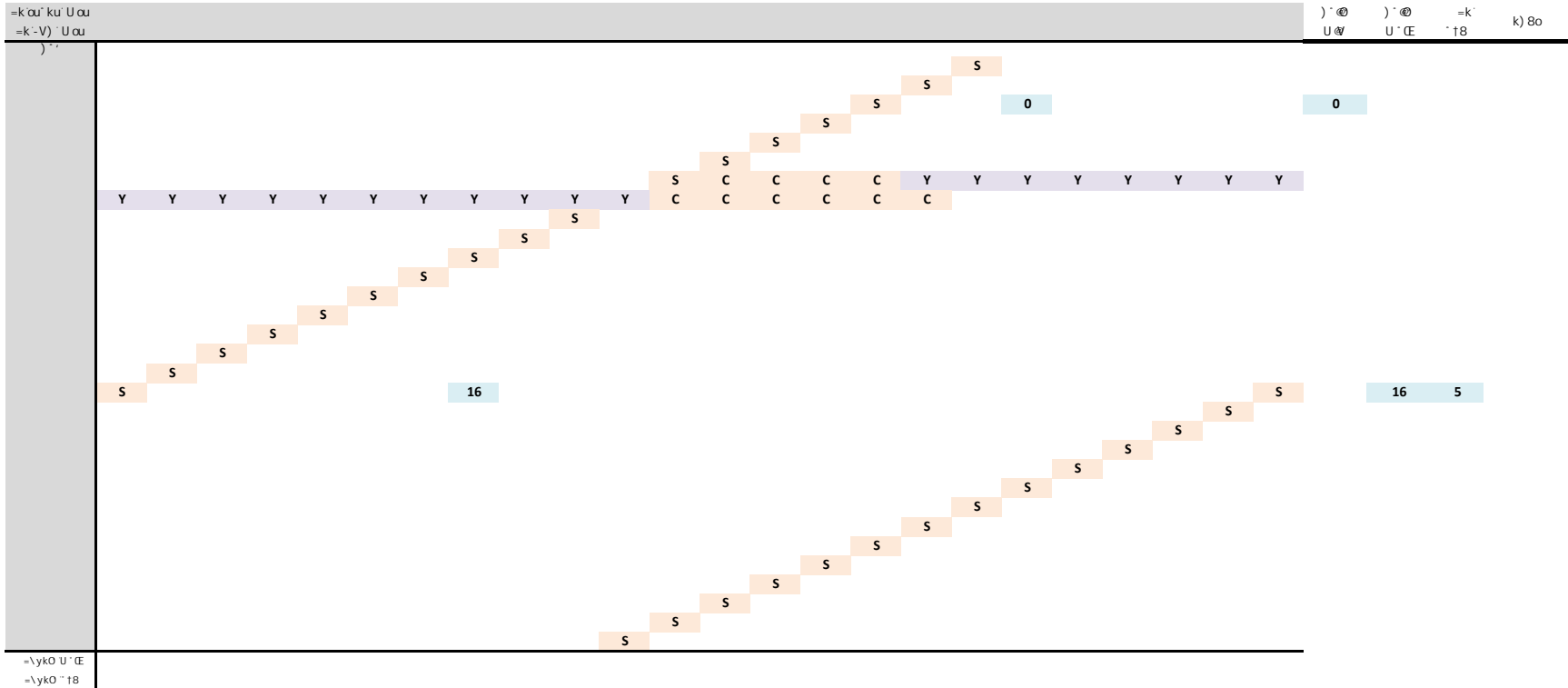
% Icon Classes (ppb) 98 0.0-4.7 1 4.7-9.3 0 9.3-14.0 0 >14.0

LICA MASKWA Poll.: LICA MASKWA-NO[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.88% Calm Poll Avg: 0.41[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



STATUS FLAG CODES

#	U \ Vu=0 # O@k' u@V	j	j y' O@r' ' ooyk' V#-
#	k-h- u# O@k' u@V	k	k-# \ t-k'
'	U' @u-V' V#-	CE	U' #=@- U' O'yV#u@V
o	)' @ -k\ ch' V#=#M	8	\yu\ k k-h' @
o	k-h- u--k\ ch' V#=#M	h	h\ t -k' 7' @yk-

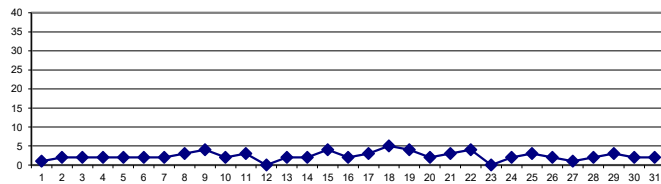
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: =k

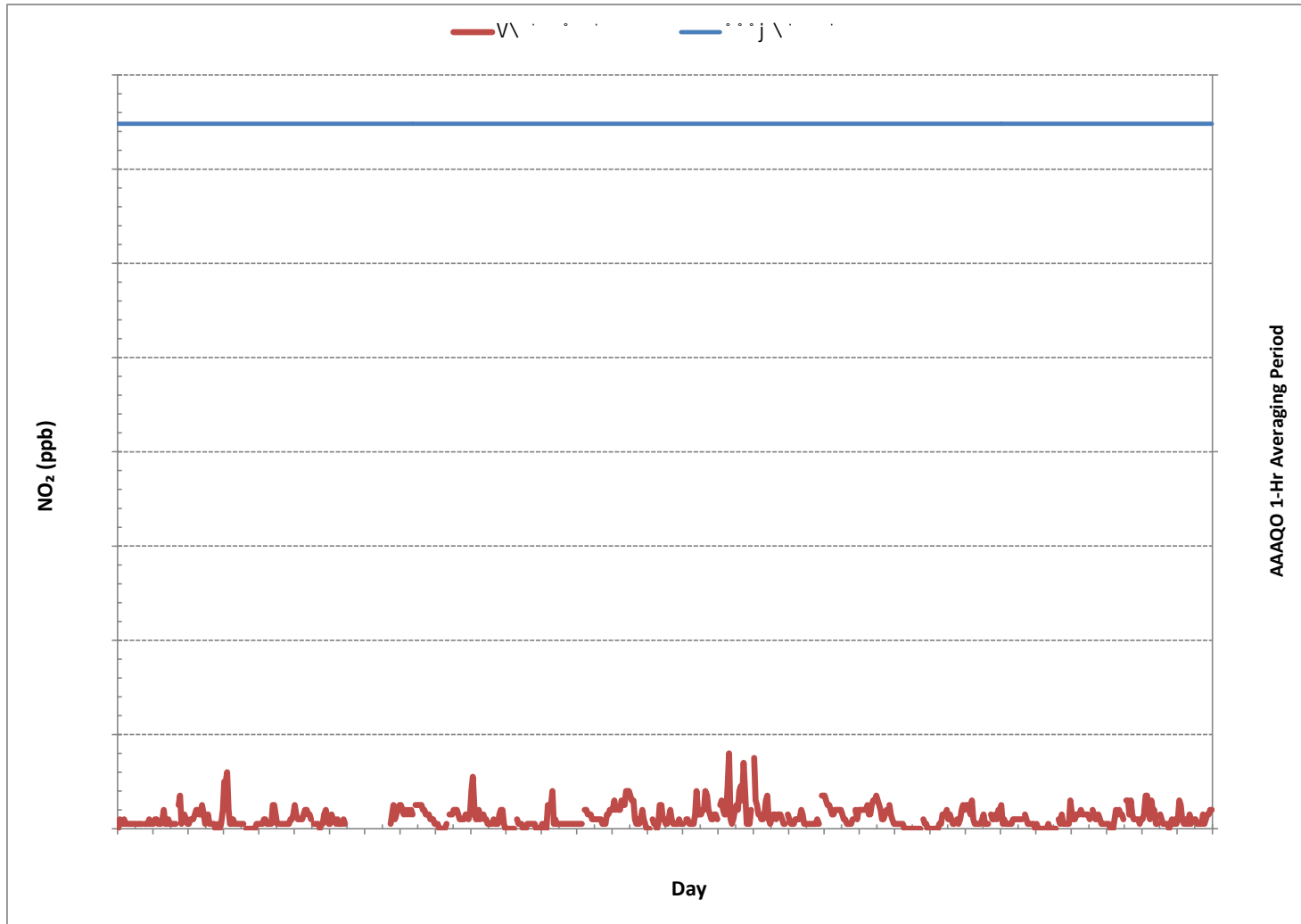
MONTHLY SUMMARY

VyU"-k\ 7 =k-(#--)' V#-o	
VyU"-k\ 7\ V --k\ k-') @/8o	
U @@ yU' =k' t-k' 8-	=\yk \V)'
U' @ yU' =k' t-k' 8-	=\yk \V)'
U' @ yU' =k' t-k' 8-	=\yk \V)'
@o# O@k' u@V u@V -	\h-k' u@V' Ou@ -
U \ Vu=0 # O@k' u@V u@V -	'U) \h-k' u@V yhu@ -
au' V) :k) -t@u@V	U \ Vu=0' t-k' 8-

24 HR AVERAGES August 2018



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



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% Icon Classes (ppb)

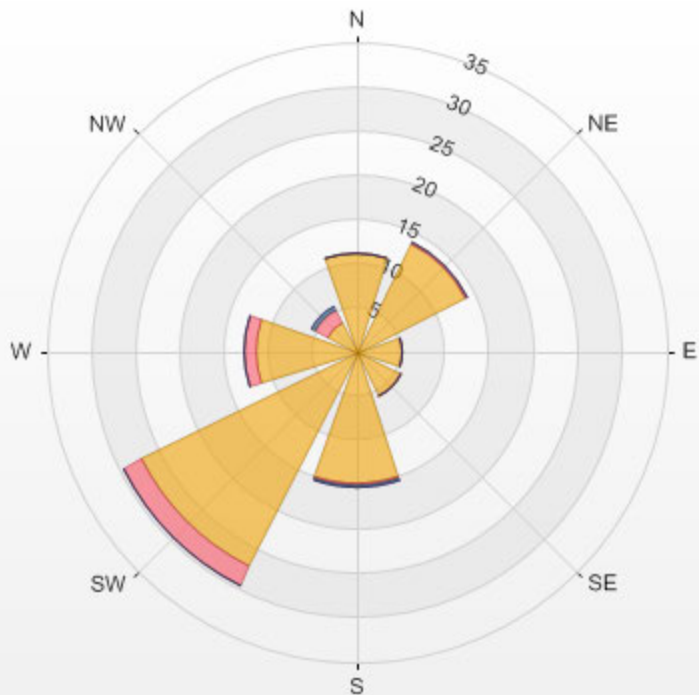
93 0.0-5.7

6 5.7-11.3

1 11.3-17.0

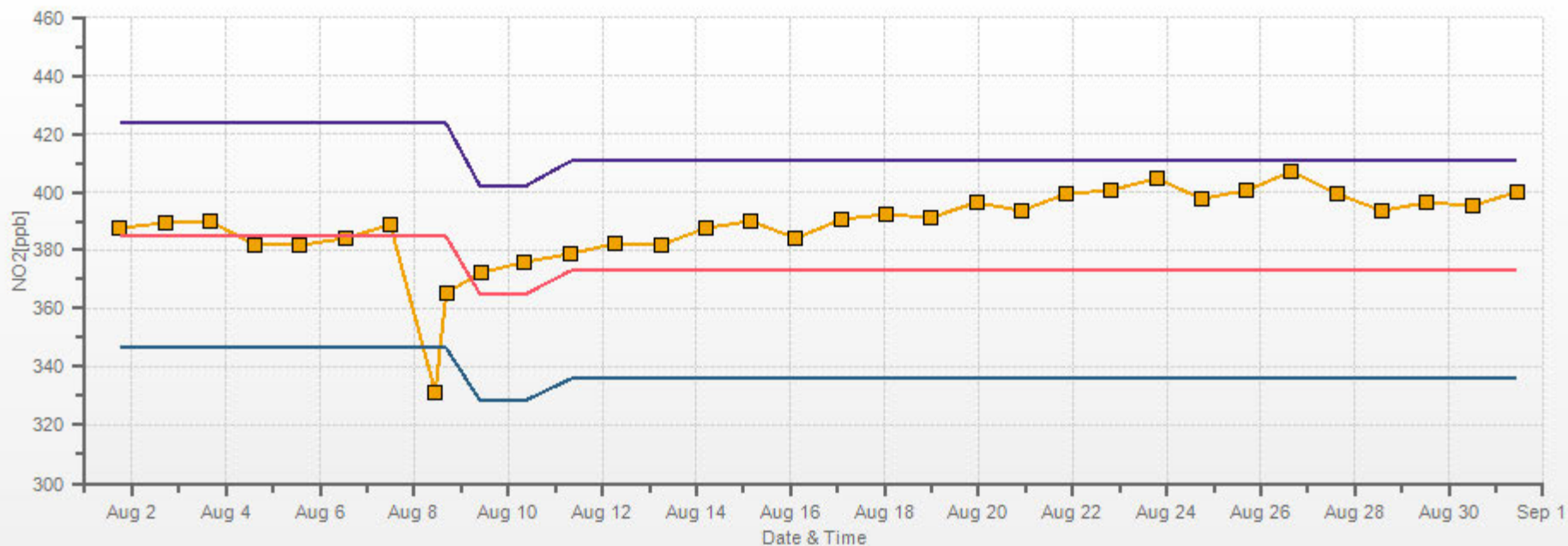
0 >17.0

LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.88% Calm Poll Avg: 1.79[ppb]



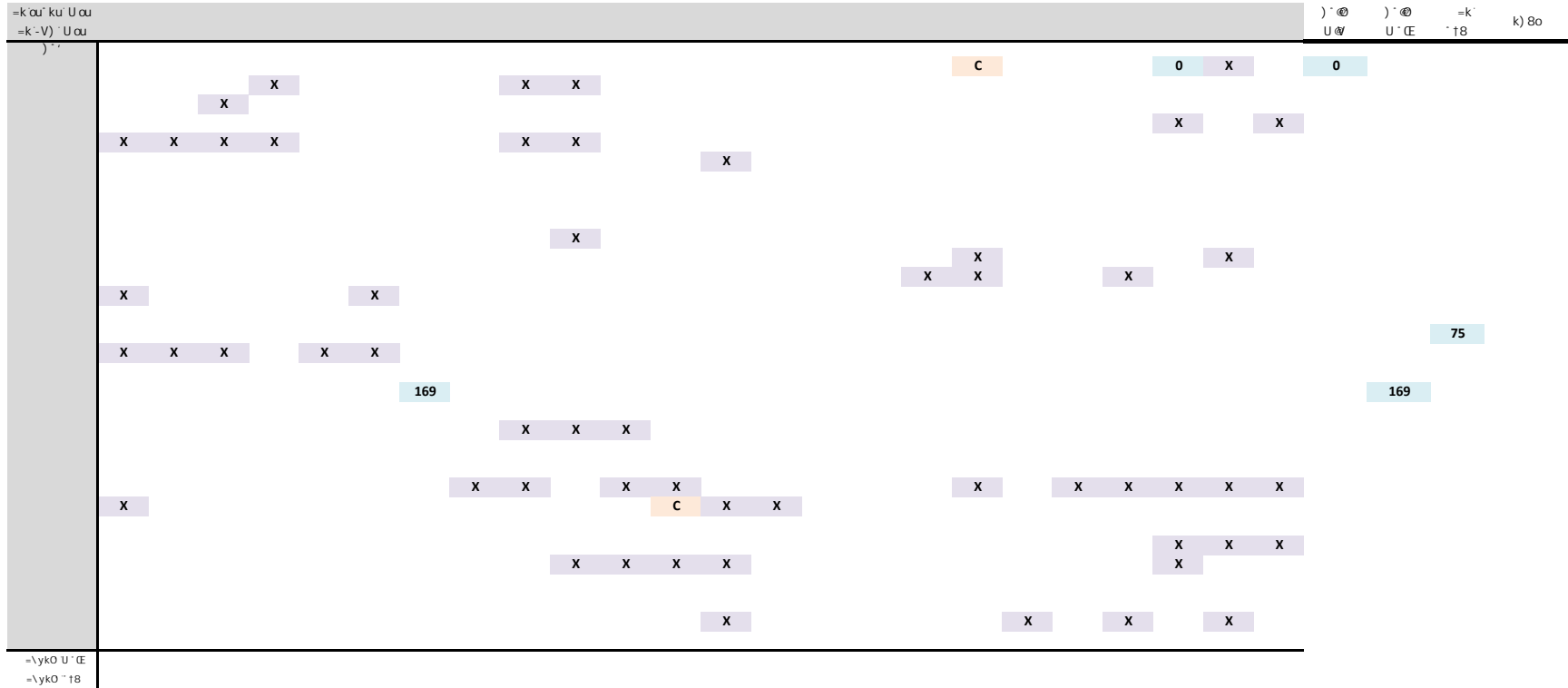
NO2[ppb] Calibration: LICA MASKWA Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



PARTICULATE MATTER 2.5

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



STATUS FLAG CODES

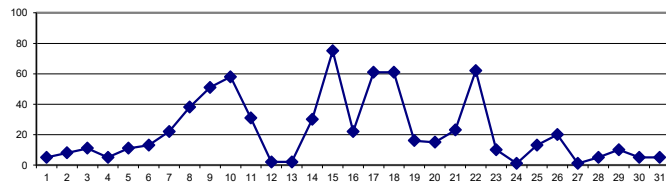
#	U \ Vu=0 # Q@k' u@V	j	j y' Oe' ' ooyk' V#-
#	k-h- ' u# Q@k' u@V	k	k-# \ t-k'
'	U' @u-V' V#-	(E	U' #=@- U' O'yV#u@V
o)' @ -k\ ch' V#=#M	8	\ yu\ k k-h' @
o	k-h- ' u--k\ ch' V#=#M	h	h\ t -k' 7' @yk-

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:

=k	=k
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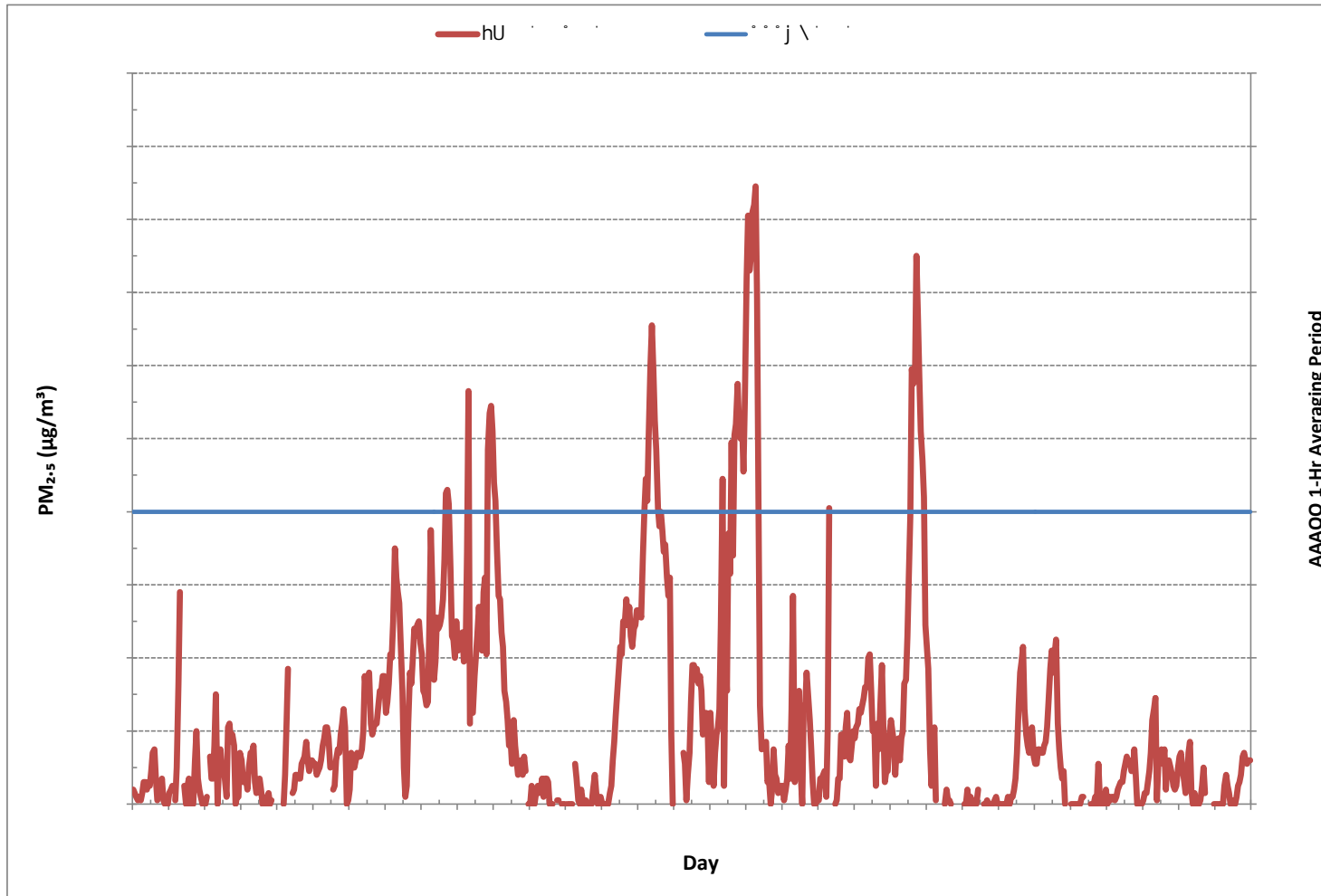
24 HR AVERAGES August 2018



MONTHLY SUMMARY

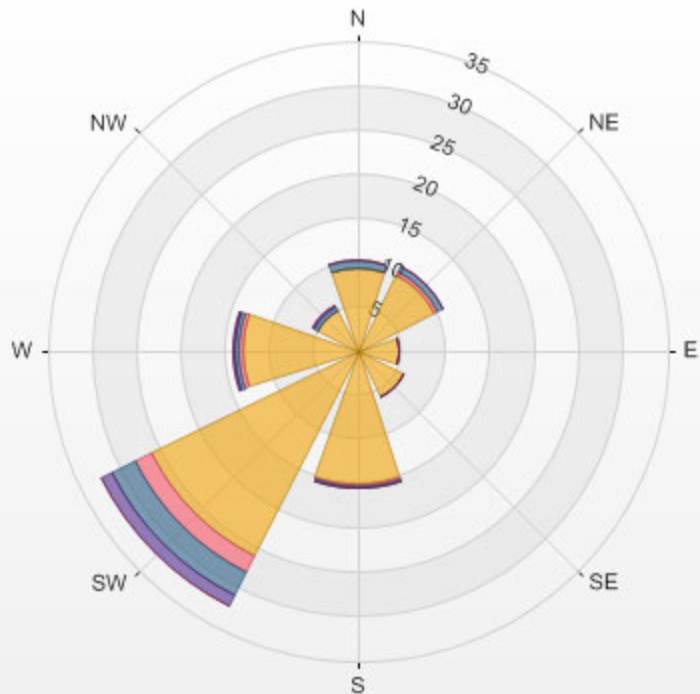
VyU"-k\ 7 =k-(#--)' V#-o	
VyU"-k\ 7 =k-(#--)' V#-o	
VyU"-k\ 7\ V --k\ k-') @/8o	
U @yU' =k' t-k' 8-	=\yk
U' @yU' =k' t-k' 8-	=\yk
U' @yU' =k' t-k' 8-	=\yk
U \ Vu=0 # Q@k' u@V u@V	\h-k' u@V' Ou@ -
U' \h-k' u@V yhu@ -	'U) \h-k' u@V yhu@ -
au' V' :k) -t@u@V	U \ Vu=0' t-k' 8-

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



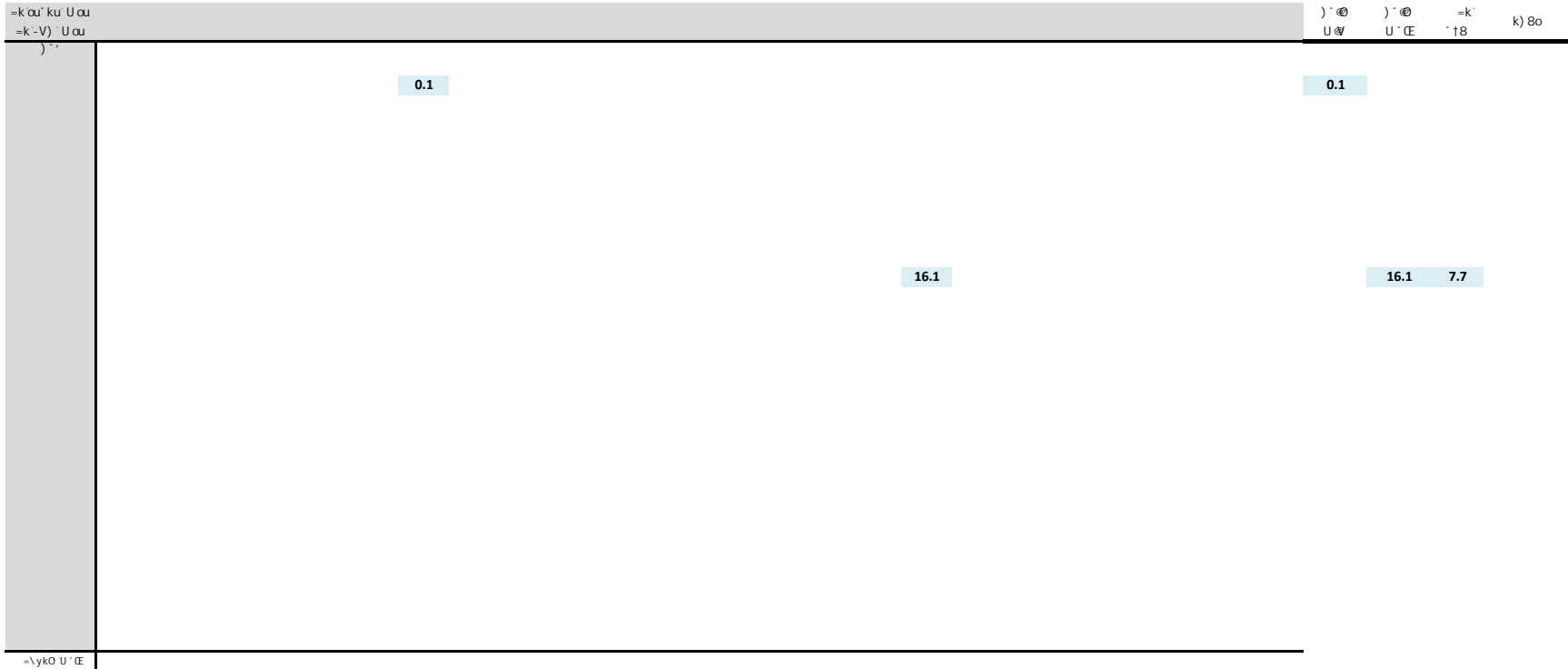
% Icon	Classes (ug/m3(L))	89	30-60	3	60-80	6	80-120	2	120-240	0	>240.0
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LICA MASKWA Poll.: LICA MASKWA-PM25[ug/m3(L)] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.87% Calm Poll Avg: 23.88[ug/m3(L)]



WIND SPEED

WIND SPEED Hourly Averages (WS kph)

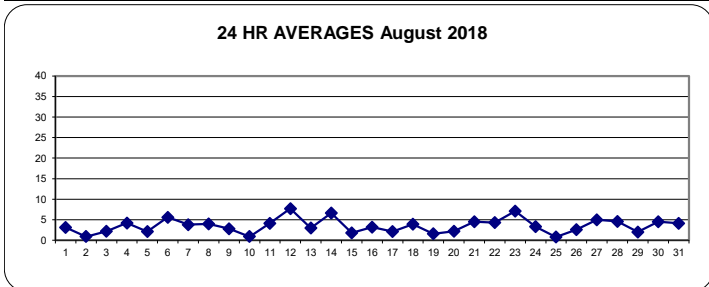


STATUS FLAG CODES

#	U \ V u=0 # " 00k" u@V	j	j y" 00r " oayk" V#-
#	k-h- " u# " 00k" u@V	k	k-# \ t-k'
'	U " @u-V" V#-	(E	U " #=@- U " QyV#u@V
o	) " @ --k\ ch" V#=-#M	8	\yu7\ k k-h" @
o	k-h- " u--k\ ch" V#=-#M	h	h\ t -k7' @yk-

0 au# " 00k" u@V	K
) -#00" u@V	U " 8V-u@#) -#00" u@V ") -8k-- " " au

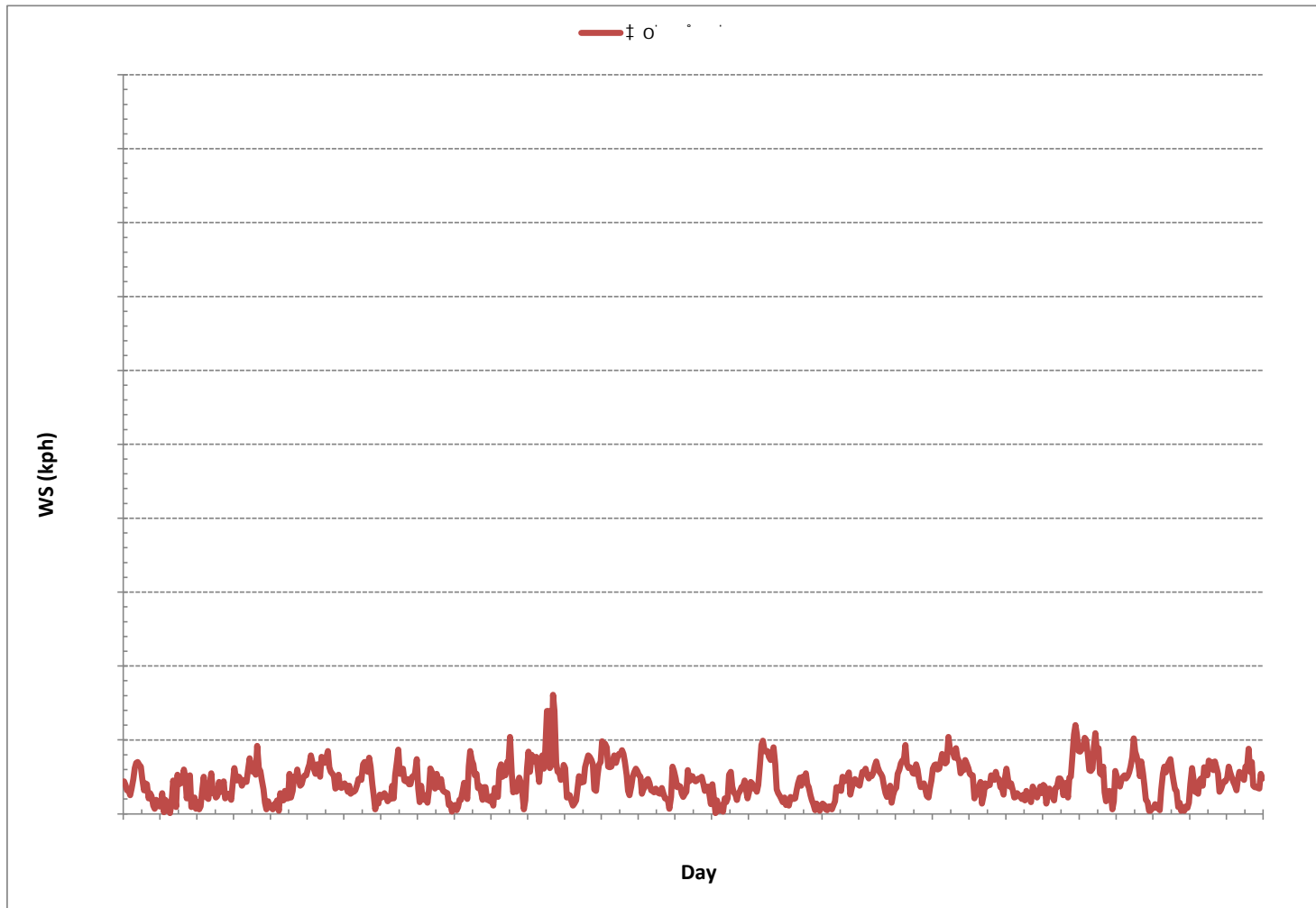
24 HR AVERAGES August 2018



MONTHLY SUMMARY

VyU" -k \ 7V\ V --k\ k-") @8o		
U @@ yU " =k " t-k' 8-	=\yk	\V) " "
U " @yU " =k " t-k' 8-	=\yk	\V) " "
U " @yU " =k " t-k' 8-		\V) " "
U \ V u=0 # " 00k" u@V u@V	\h-k' u@V" Ou@ -	
au" V) : k)) -t@u@V	"U) \h-k' u@V yhu@ -	
	U \ V u=0 " t-k' 8-	

WIND SPEED Hourly Averages (WS kph)



% Icon Classes (kph)

34 0.4-3.2

47 3.2-6.5

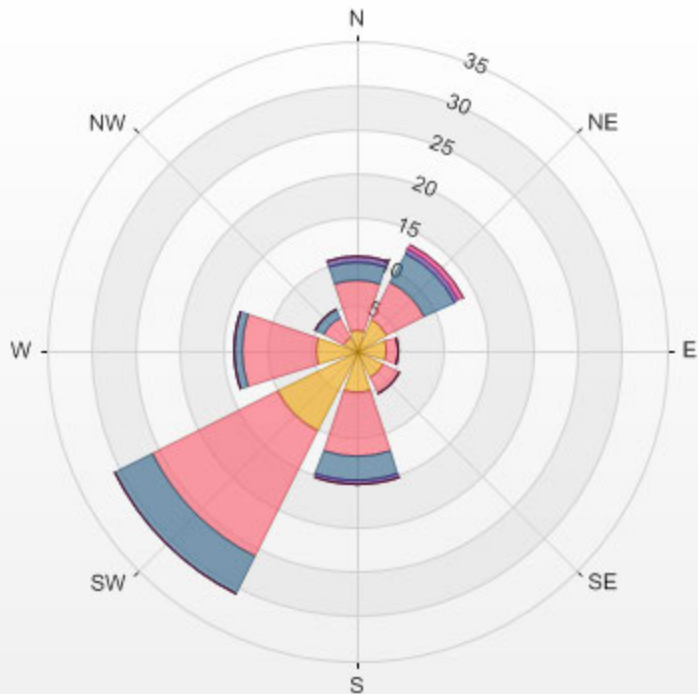
15 6.5-9.7

1 9.7-13.0

1 13.0-16.2

0 >16.2

LICA MASKWA 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.81% Calm Wind Avg Speed: 0.22(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - August 2018

WIND DIRECTION Hourly Averages (WD)

=k au' ku' U au =k-V) 'U au																				-lyk' t8 j y') k' Vu		=k k) 8o	
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ot	ot	ot	-	o	-	†	V-	V-	V-	ot	o	o	o	o	o	†	V†	V-	V-	V-	o	o-	o
o-	-	V-	o	ot	ot	†	†	ot	o	†	V†	V†	ot	o	ot	†	†	†	ot	ot	ot	ot	†
V†	V†	V†	V†	V†	V†	V	V	V	V	V	V	V	V	V	V	V	V	V-	V	V	-	V	-
ot	o	ot	o	ot	-	V-	V-	V	V†	V†	V†	ot	ot	ot	ot	ot	ot	o	o	ot	o	ot	ot
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V-	V	V	V-	V-	V-	V-	-	V-	V-	V-	V-	V-	V-	V-	V	V-	V-	V	V	V	V	V	V-
V-	V	V	V	V†	†	†	†	†	ot	ot	ot	ot	ot	o	o	o	o	o	o	o	o	o	ot
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-	o-	o	o	o	o	o-	V-	†	ot	ot	†	†	ot	†	†	†	†	†	ot	ot	ot	o	ot
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V-	V-	V-	V-	V-	V-	V-	V-	V-	V-	V-	V-	V-	V-	V-	V-	V-	V-	V-	V-	V-	V-	V-	V-
V-	V-	V-	V-	V	V	V-	V-	†	V†	V†	V	V	V	V	V	V	V	V	V	V†	V†	†	†
†	V†	V†	†	†	†	†	†	†	ot	†	V	†	†	†	ot	V-	-	-	-	-	-	-	†
-	V-	-	o-	-	o-	o-	-	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	V-
V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V†	o-	o-	o	o	o	o-
o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o-	V-	o
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ot	ot	ot	ot	ot	ot	ot	†	V†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†
†	†	†	†	†	†	†	†	V†	†	†	ot	ot	ot	ot	ot	ot	ot	o	o	o	o	ot	ot

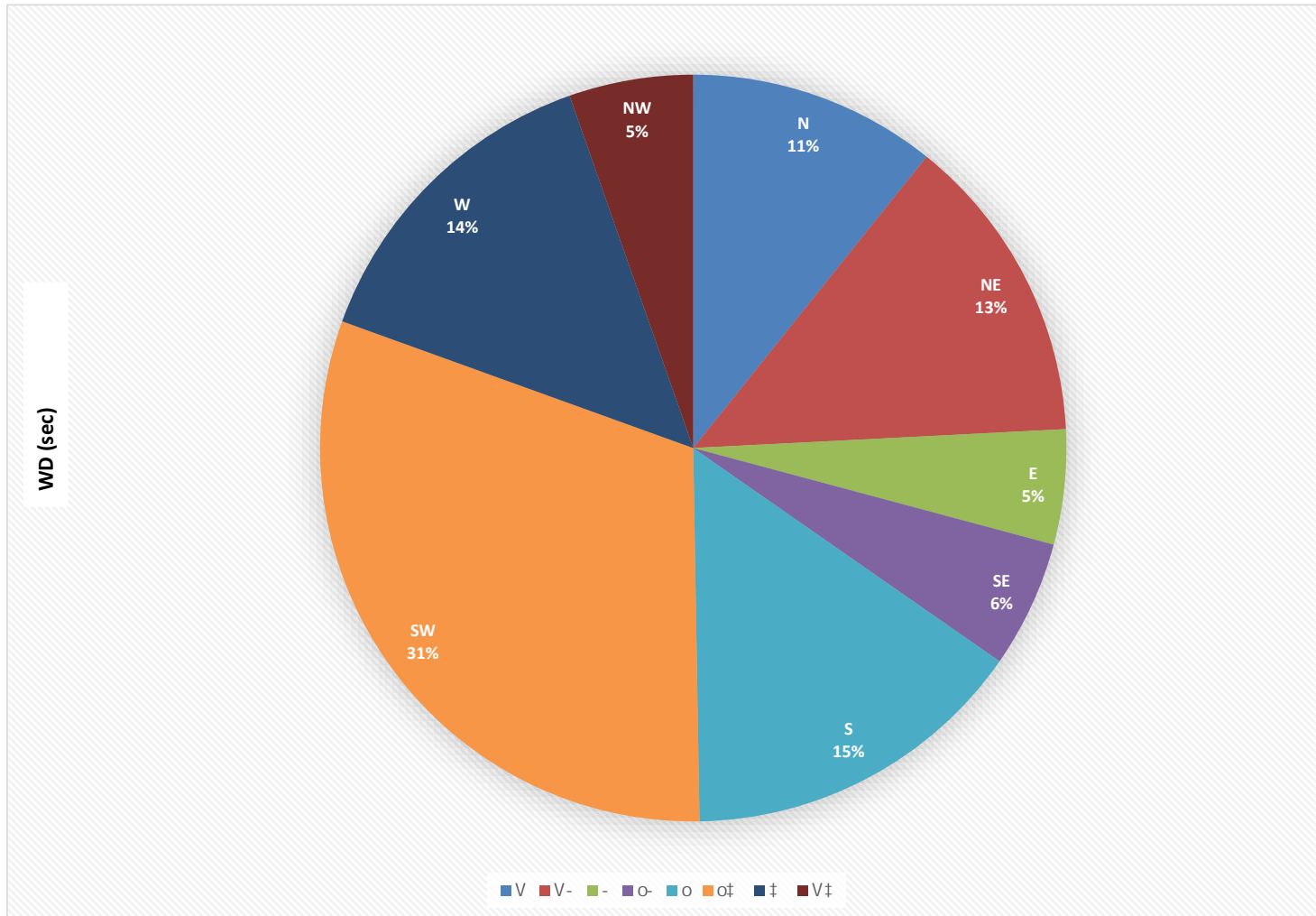
STATUS FLAG CODES

#	U \ Vu=0 # @k' u@V	j	j y' Qe' ' ooyk' V#-
#	k-h- u# @k' u@V	k	k-# \ t-k'
'	U' @u-V' V#-	(E	U' #-@- U' O'yV#u@V
o)' @'-k \ ch' V#=#M	8	\ yu \ k k-h' @
o	k-h- u--k \ ch' V#=#M	h	h \ t -k 7' @yk-

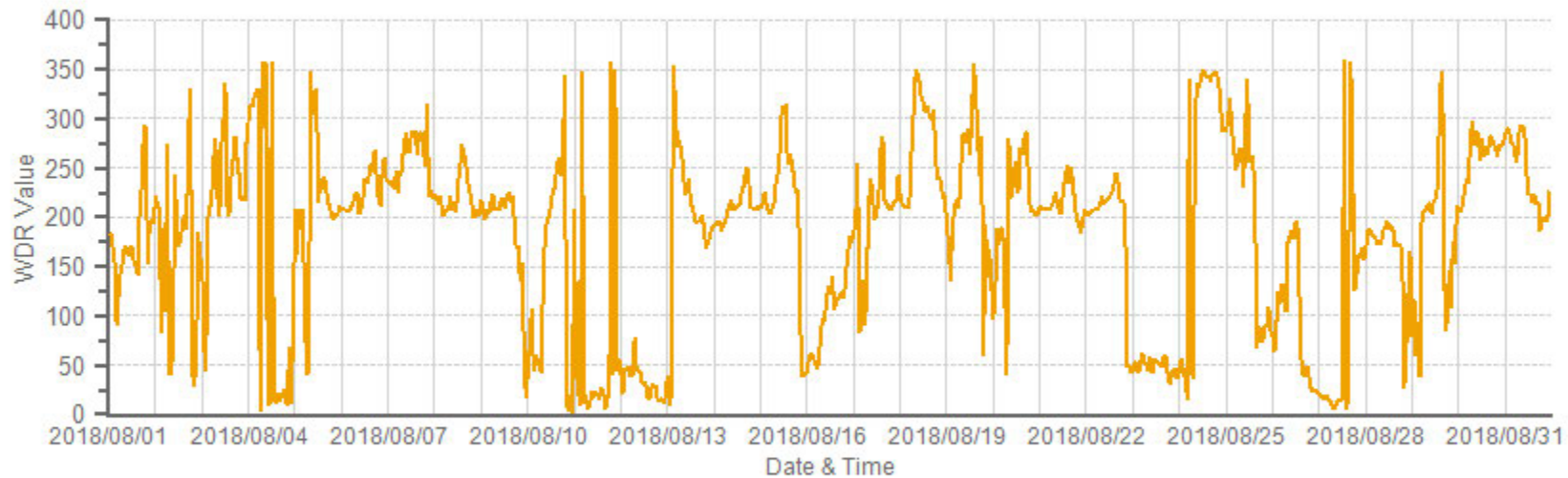
O au# @k' u@V	K
)-#@' u@V'	U' 8V-u@) -#@' u@V')-8k--' au

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au' V) 'k) -t@u@V	' U) \ h-k' u@V yhu@ -
	U \ Vu=0 ' t-k' 8-
	† ot

WIND DIRECTION Hourly Averages (WD)



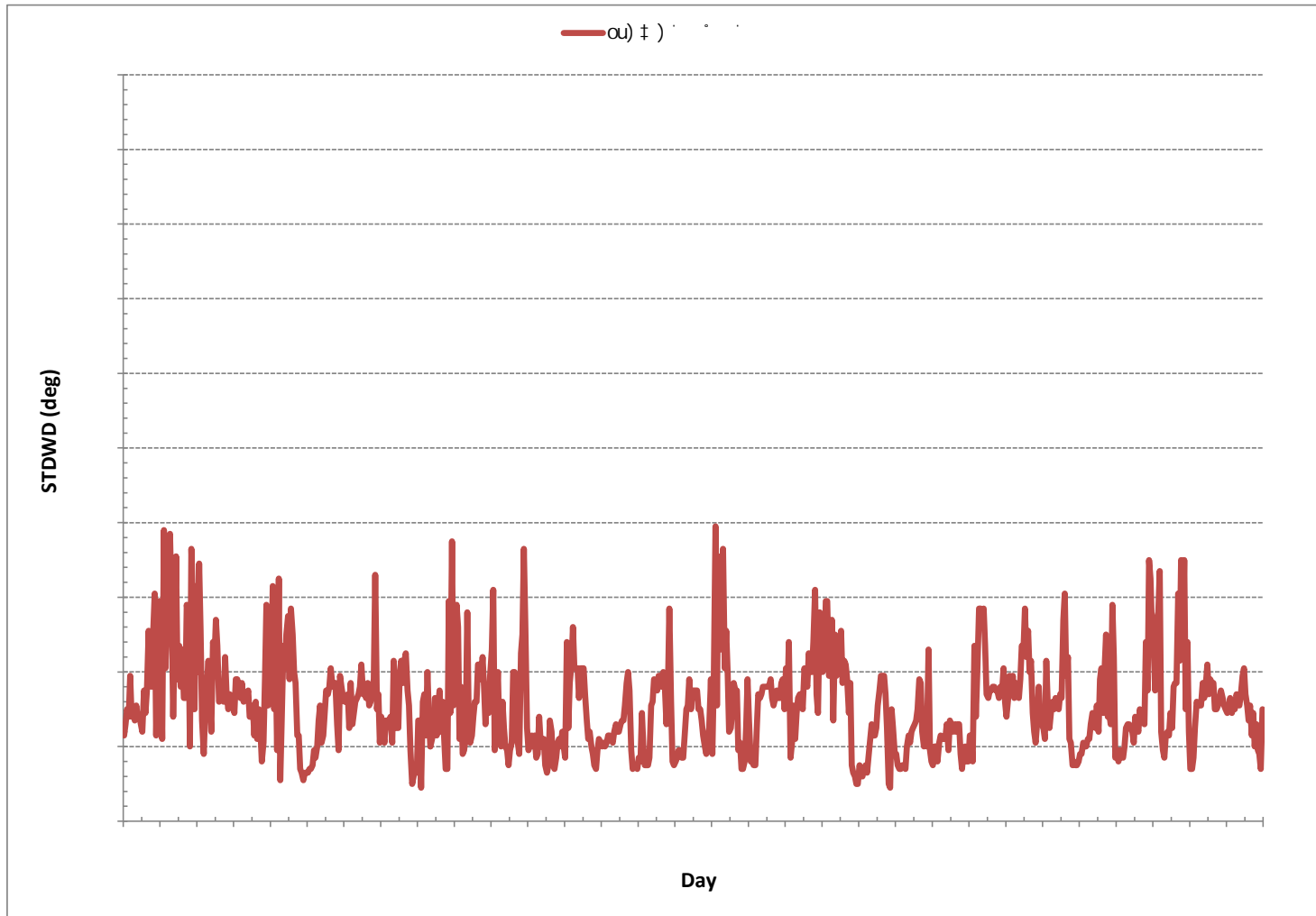
WDR[degwdr] Station: LICA MASKWA Monthly: 18/08 Type: AVG 1 Hr. [1 Hr.]



— WDR[degwdr]

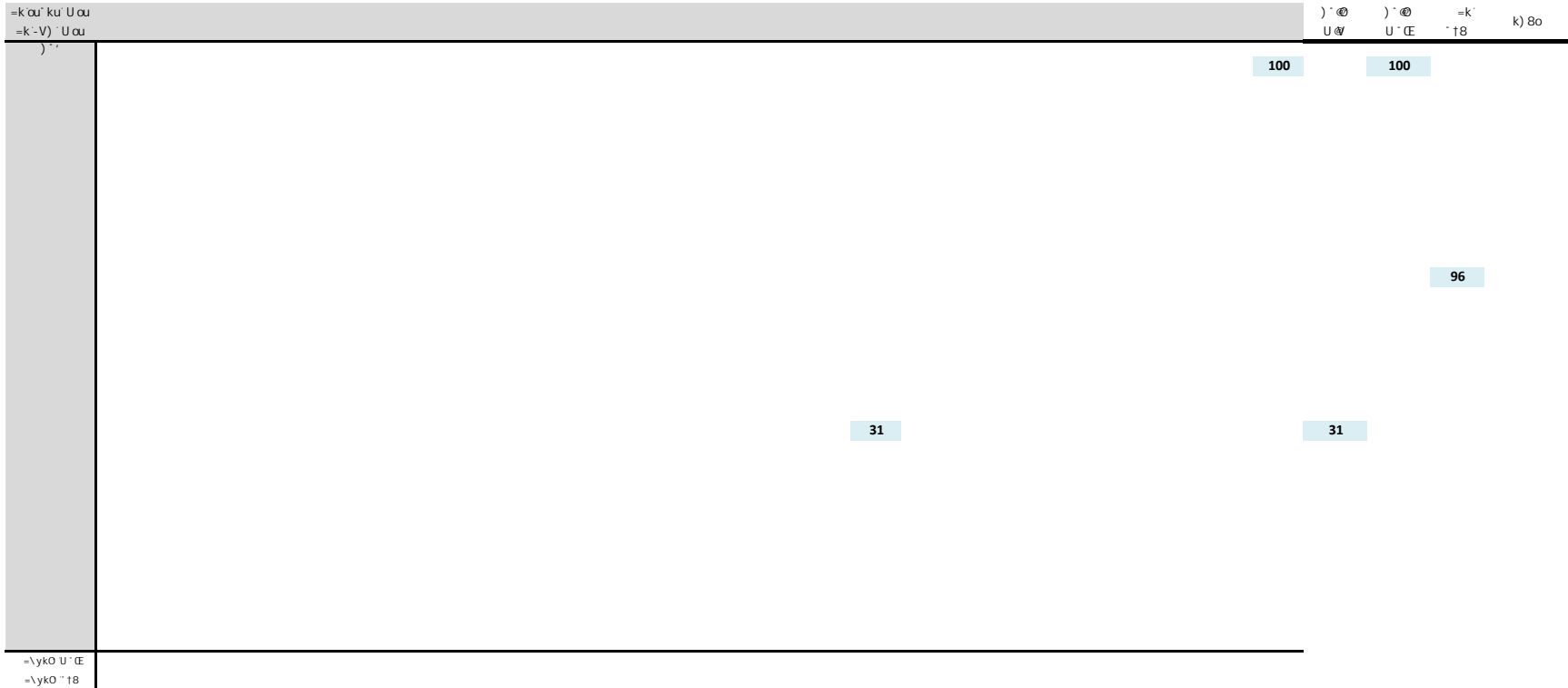
STANDARD DEVIATION WIND DIRECTION

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY

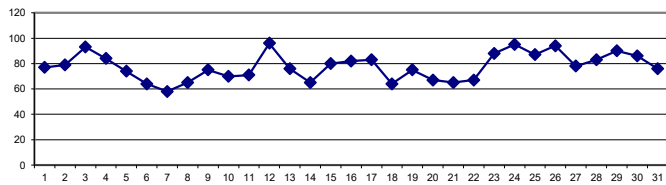
RELATIVE HUMIDITY Hourly Averages (RH %)



STATUS FLAG CODES

#	U \ Vu=0 # Q@k u@V	j	j y Oe " ooyk V#-
#	k-h- u# Q@k u@V	k	k-#\ t-k'
,	U @u-V V#-	(E	U "#=@- U ' Oyv#u@V
o	) '@ -k\ ch V#=#M	8	\yu\k k-h' @
o	k-h- u--k\ ch V#=#M	h	h\ t -k' @yk-

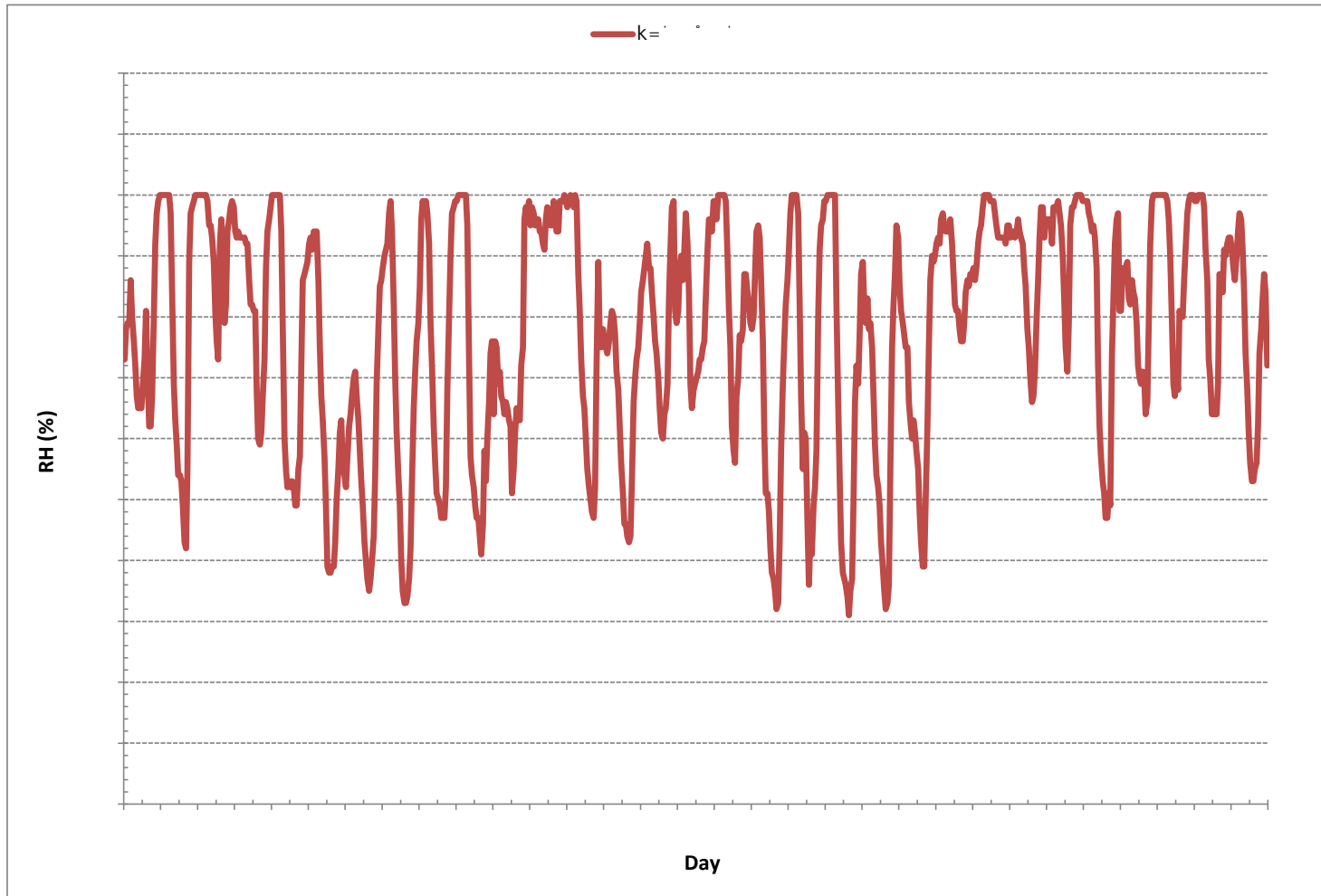
24 HR AVERAGES August 2018



MONTHLY SUMMARY

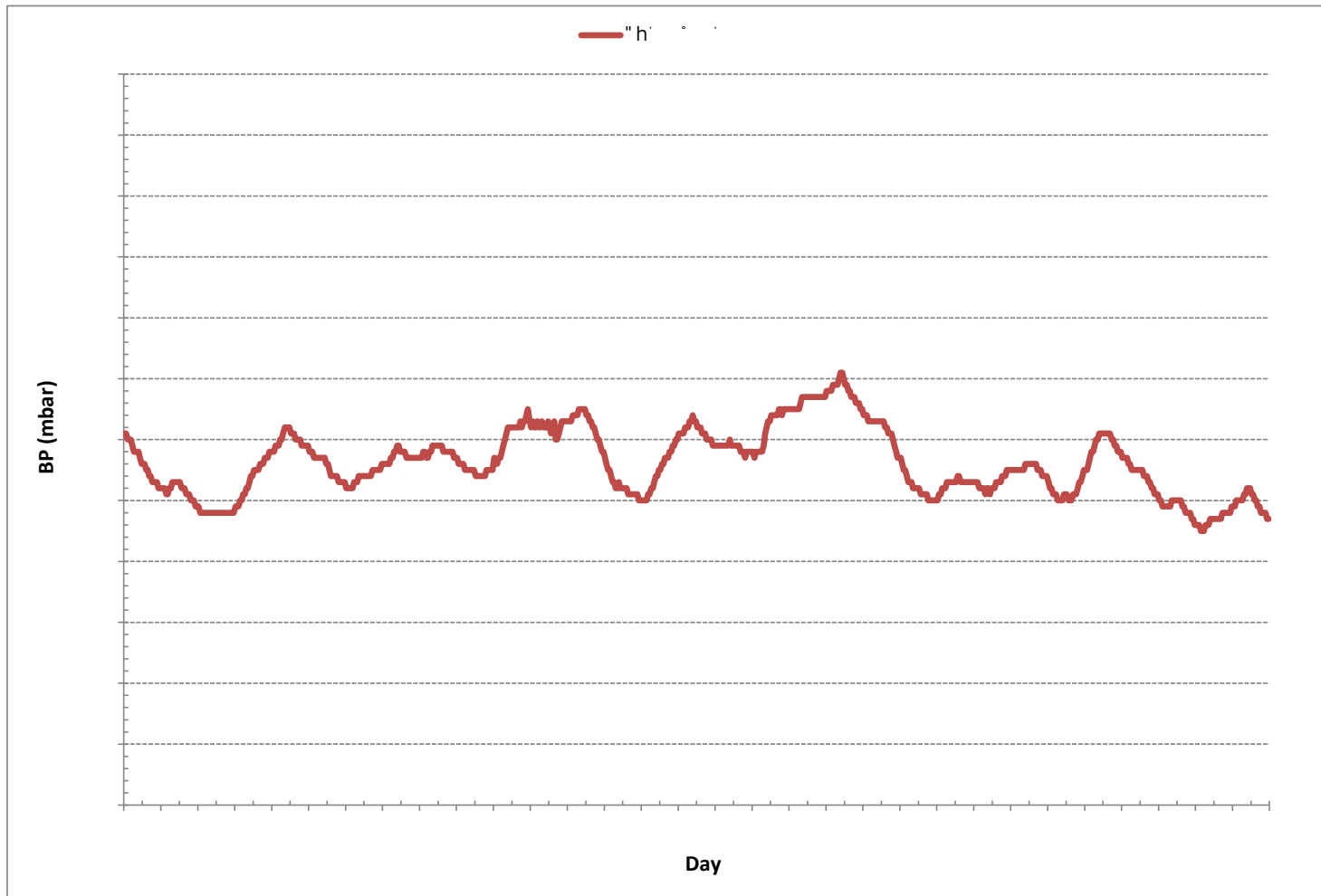
U @yU' =k' t-k' 8-	=\yk	\V)''
U' (yU' =k' t-k' 8-	=\yk	\V)''
U' (yU' =k' t-k' 8-		\V)''
	\h-k' u@V' Ou@ -	
	'U) \h-k' u@V yhu@ -	
au' V) : k) -t@u@V	U \ Vu=0 " t-k' 8-	

RELATIVE HUMIDITY Hourly Averages (RH %)



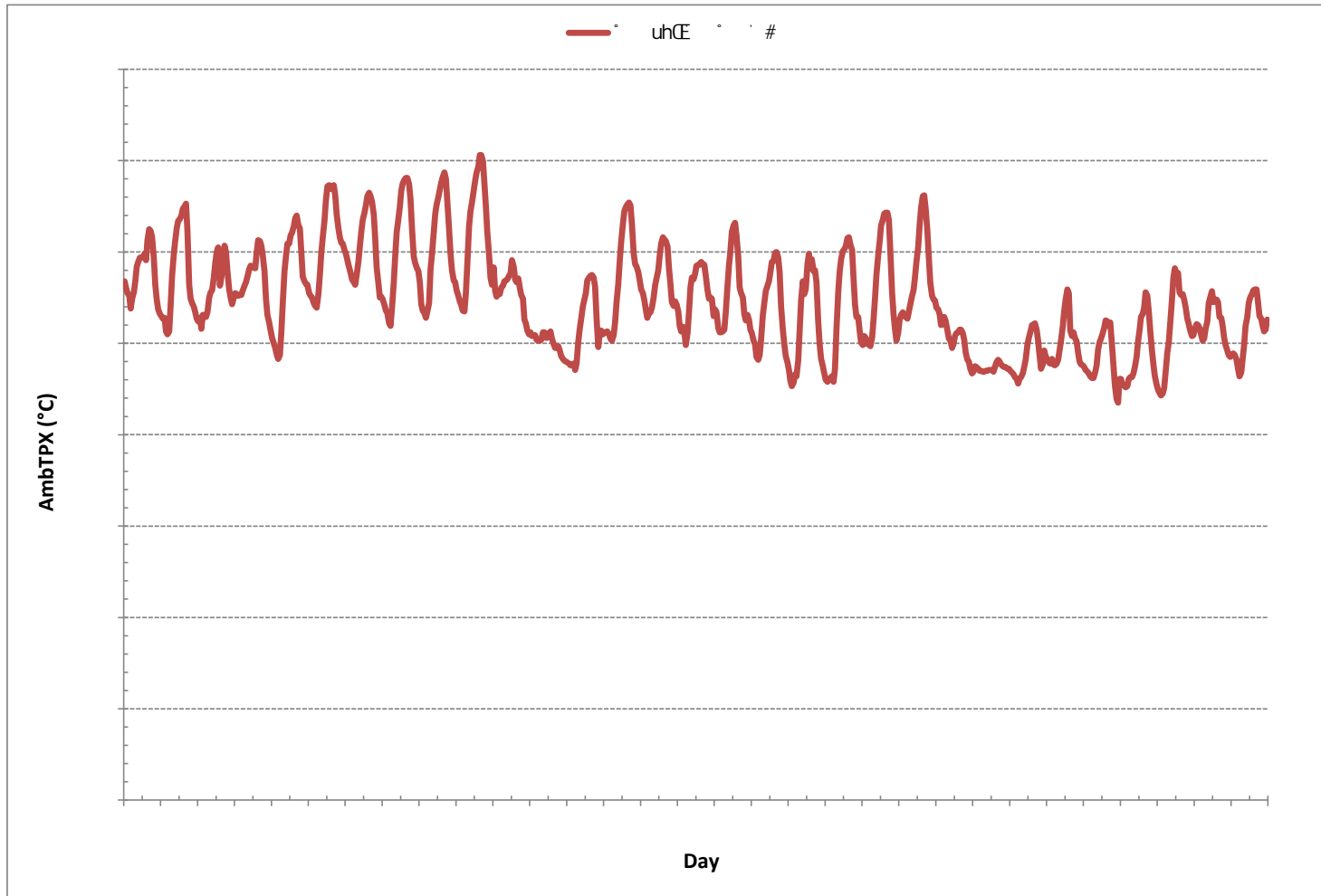
BAROMETRIC PRESSURE

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION

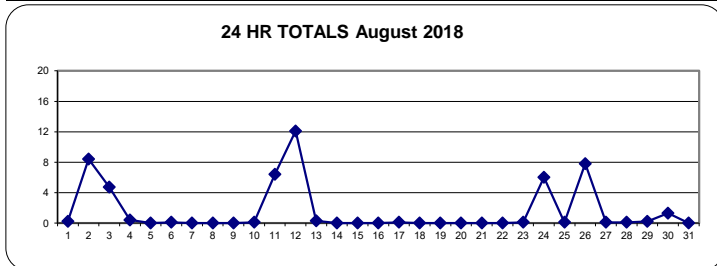
PRECIPITATION Hourly Totals (mm)



STATUS FLAG CODES

#	U \ Vu=O # ' O@k' u@V	j	j y' O@r ' ' o@k' V#-
#	k-h-' u# ' O@k' u@V	k	k-#\ t-k' '
,	U ' @u-V' V#-	CE	U ' #=@- U' OYV#u@V
o) ' @ ' --k\ ch' V#=#M	8	\yu7k k-h' @
o	k-h-' u--k\ ch' V#=#M	h	h\ t -k' 7' @yk-

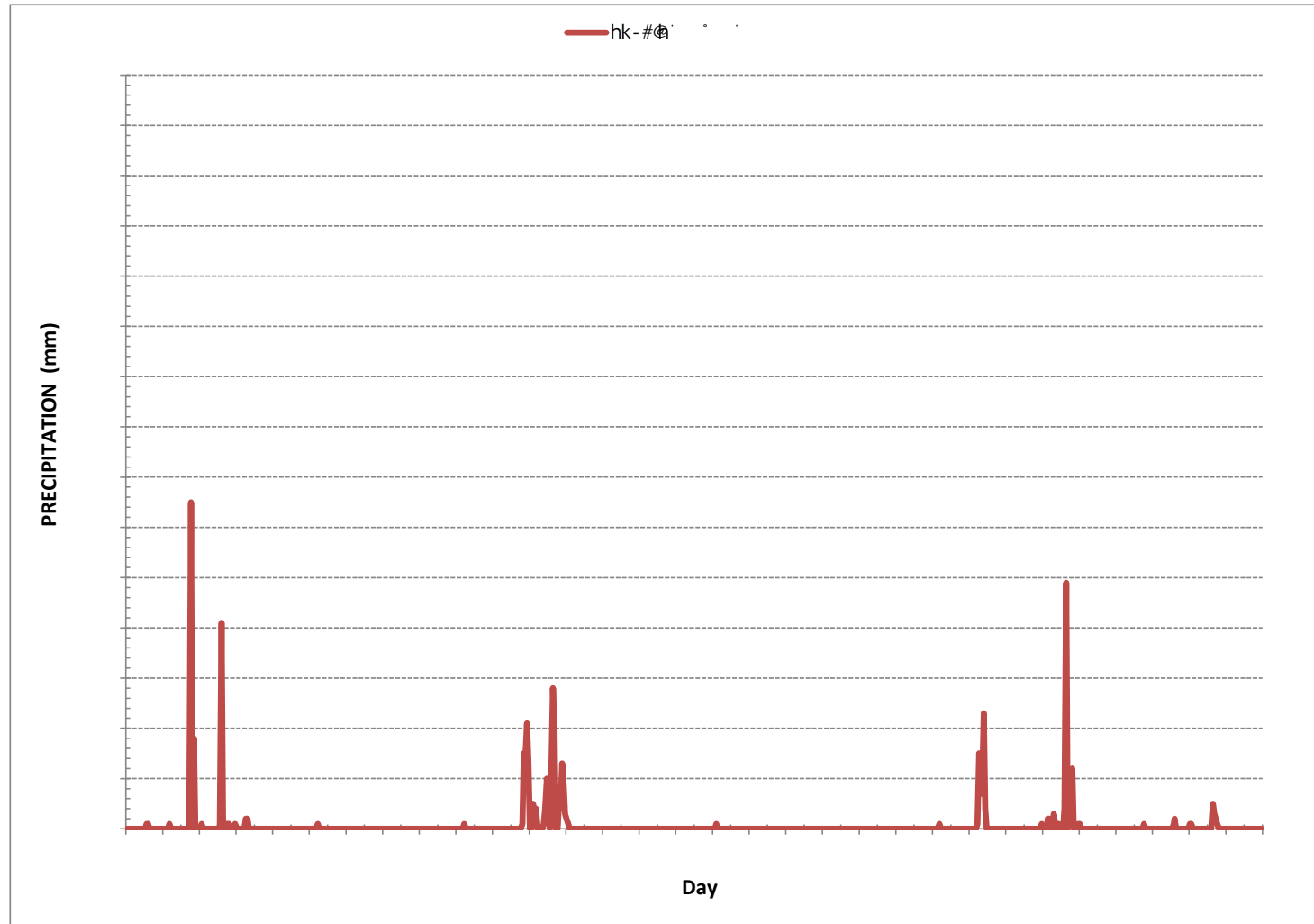
24 HR TOTALS August 2018



MONTHLY SUMMARY

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au' V) ' k)) - t@u@V	U \ Vu=O ' t-k' 8-	

PRECIPITATION Hourly Totals (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE

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h	#7					V	#7	

#	o	U	h	U	7o	K
o	7	U	h	U	7o	K
=	7	U	h	U	7o	K
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#	8	#				

h@ -o) " #

#	7	k	#	8	u	#	@	#	#	7	#7
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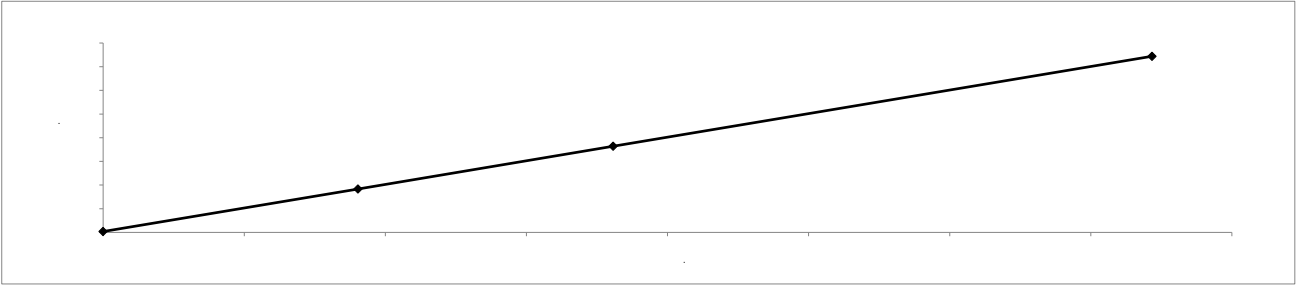
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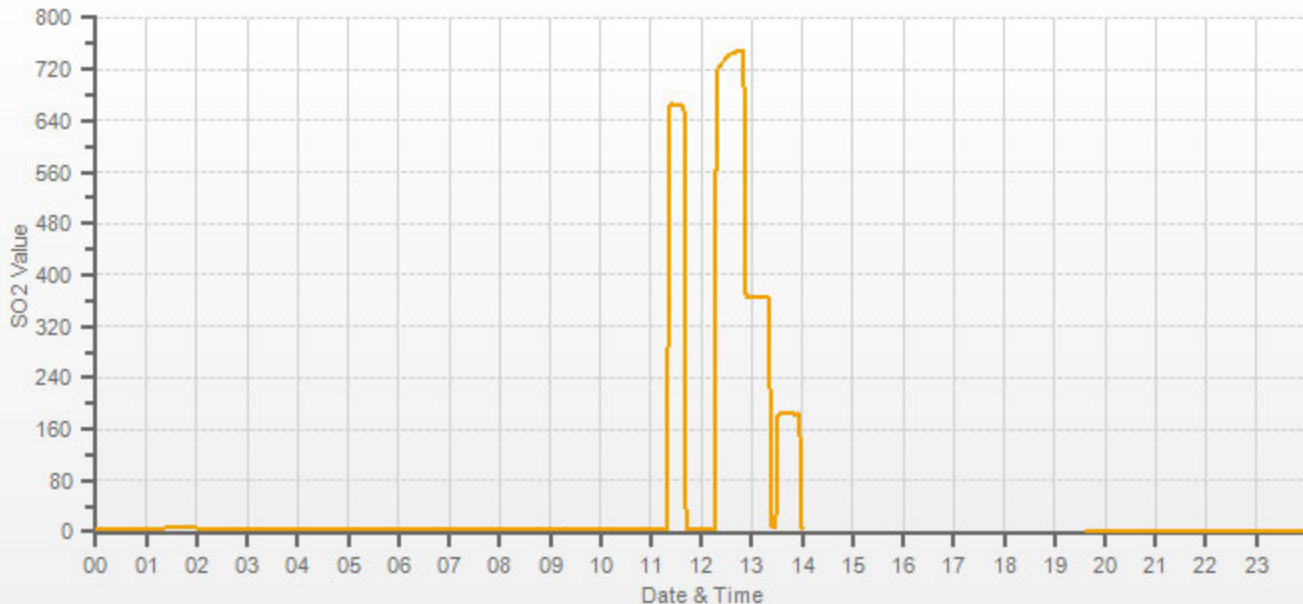
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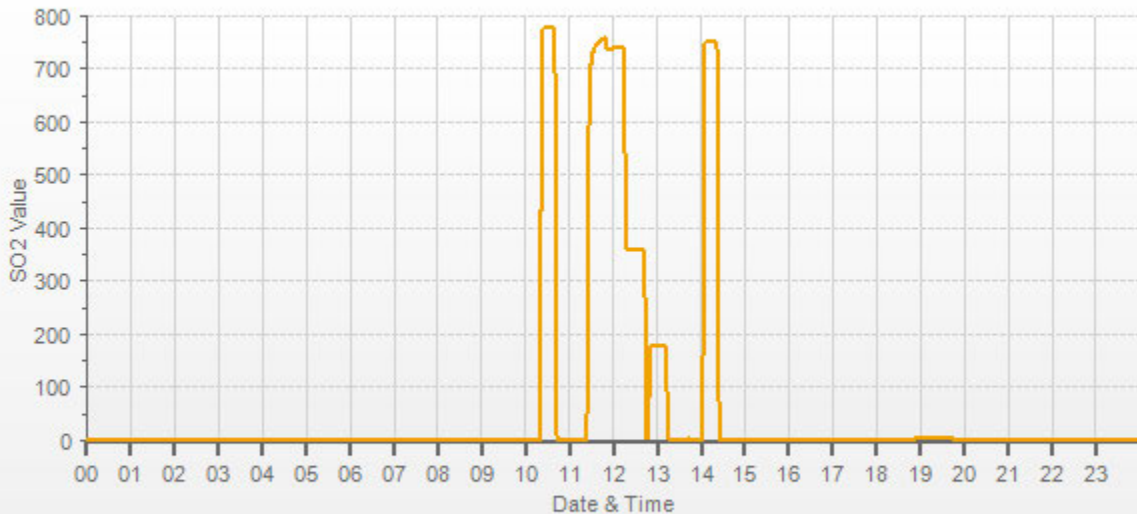
u

u o

SO2[ppb]



SO2 [ppb] Station: LICA MASKWA Daily: 18/08/08 Type: AVG 1 Min. [1 Min.]



— SO2 [ppb]

HYDROGEN SULPHIDE



Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date: August 1, 2018 Company/Airshed: LICA Location/Station Name: Maskwa Parameter: Hydrogen Sulphide Start Time 24 hr. (mst): 12:18 End Time 24 hr. (mst): 17:40 Calibration Method: Gas Dilution	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 935 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 23 °C Weather Conditions: A few clouds Calibration Purpose: installation Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 20, 2020 Converter Model & s/n (if applicable): n/a	
Analyzer: Serial Number/Owner: CM17360005 LICA Last Calibration Date: n/a Previous C.F.: n/a	Range ppb: 100 As Found 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: Envionics id# 4760 expires March 2, 2019 Cal Gas Cylinder I.D. #: EY 0001003 Cal Gas Conc. (ppm): 9.55	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	SO2 Scrubber Check (10 minutes): Start/End Time 24 hr.: 13:07 / 13:17 SO2 Analyzer Range: 1000 Target Concentration (ppb): 780 As Found Zero: 0.0 Analyzer Response: (ppb): 0.0 Zero Corrected Result (ppb): 0.0
Point	ppb									
High	78									
Mid	38									
Low	19									

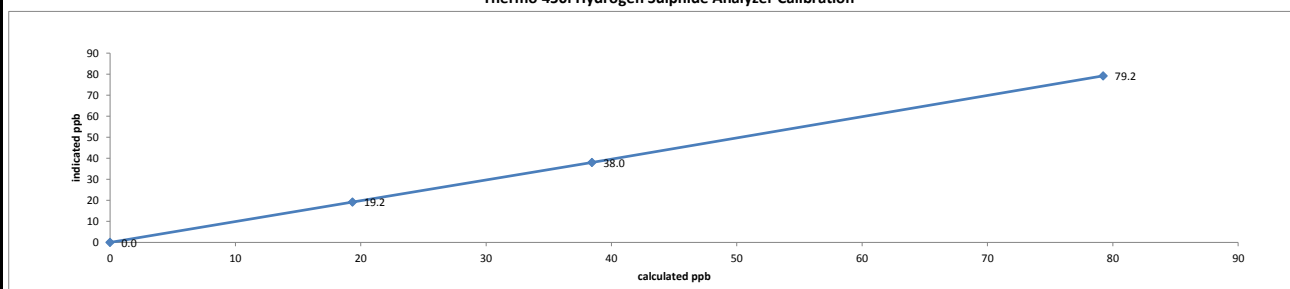
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
adjusted zero	7478	0.00	7478	0.0	0.0	n/a
adjusted high	7402	61.93	7464	79.2	79.2	1.000
mid	7457	30.14	7487	38.4	38.0	1.012
low	7470	15.16	7485	19.3	19.2	1.007
calibrator zero	7478	0.00	7478	0.0	0.0	n/a
Average C.F. =						1.007

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 Slope = 1.000 b (Intercept as % of full scale) = 0.14% % change in C.F. from last cal = n/a	LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. n/a
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Thermo 450i Hydrogen Sulphide Analyzer Calibration



As found: Bkg: n/a Coef: n/a Pmt: n/a Flash: n/a Internal: n/a Chamber: n/a Converter Temp: n/a Converter Set: n/a Perm Oven Gas: n/a Perm Oven Htr: n/a Pressure: n/a Sample Flow: n/a Lamp Intensity: n/a Averaging Time: n/a Expected Value: n/a	As left: Bkg: 14.3 Coef: 0.836 Pmt: -602.4 Flash: 812 Internal: 35.0 Chamber: 45.1 Converter Temp: 323.9 Converter Set: 325.0 Perm Oven Gas: 45.00 Perm Oven Htr: 44.30 Pressure: 576.4 Sample Flow: 0.929 Lamp Intensity: 91 Averaging Time: 120 Expected Value: n/a
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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 analyzer perm tube was changed, the new expected value will be updated once the perm tube temperature has stabilized.

A new analyzer was purchased by the Client and installed to replace the old API analyzer.

H2S[ppb]



TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: August 22, 2018 Company/Airshed: LICA Location/Station Name: Maskwa Parameter: Total Hydrocarbon Start/End Time 24 hr. (mst): 08:50/10:35 Calibration Method: Gas Dilution Analyzer: Serial Number/Owner: 436609738 LICA Last Calibration Date: July 12, 2018 Previous Cal High Point C.F.: 1.000	Barometer/B.P./units: Brunton 05535 expires December 15, 2018 27.63 inHg Thermometer/Station Temp: F.S. 160348895 expires June 19, 2020 21.6 °C Weather Conditions: Mainly sunny Calibration Purpose: shut down Performed By/Reviewer: Limin Li Rob Fisher Cal Gas Expiry Date: October 18, 2025 Range ppm: 50 As Found C.F.: 1.030 New C.F.: n/a
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Calibration Standards:

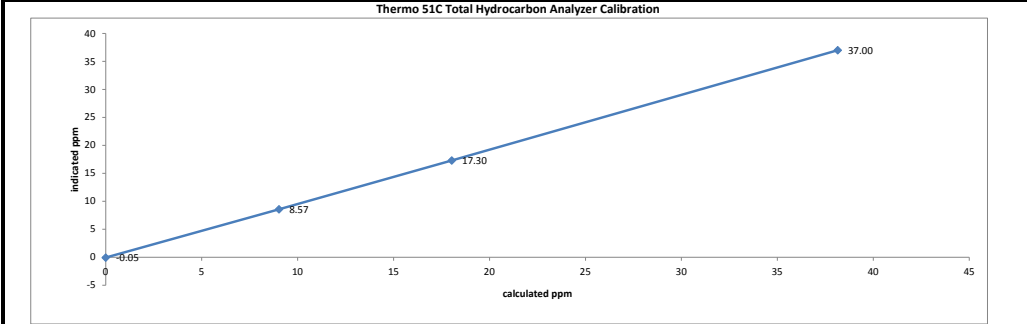
Low Flow Meter ID/Expiry Date: Defender Low 156151 expires October 2, 2018 High Flow Meter ID/Expiry Date: Defender High 156312 expires December 13, 2018 Calibrator ID/Expiry Date: Envionics id# 1991 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL168404 CH₄/C₂H₆ Cylinder Conc. (ppm): <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">597.0</td> <td style="width: 50%;">206.0</td> </tr> </table> CH₄ as propane/total CH₄ equivalents (ppm): <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">566.5</td> <td style="width: 50%;">1163.5</td> </tr> </table>	597.0	206.0	566.5	1163.5	Standard Calibration Points for a Range of: 50 ppm <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>Target ppm</th> </tr> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mid</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </table>	Point	Target ppm	High	38	Mid	18	Low	9
597.0	206.0												
566.5	1163.5												
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	2516	0.00	2516	0.0	-0.05	n/a
as found high	2433	82.45	2515	38.14	37.00	1.030
mid	2471	38.90	2510	18.03	17.30	1.039
low	2488	19.45	2507	9.03	8.57	1.047
Average C.F.=						1.039

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 Slope = 1.028 b (Intercept as % of full scale) = 0.30% % change in C.F. from last cal = -2.95%	LIMITS > or = 0.995 0.90-1.10 ± 3% F.S. ± 10%
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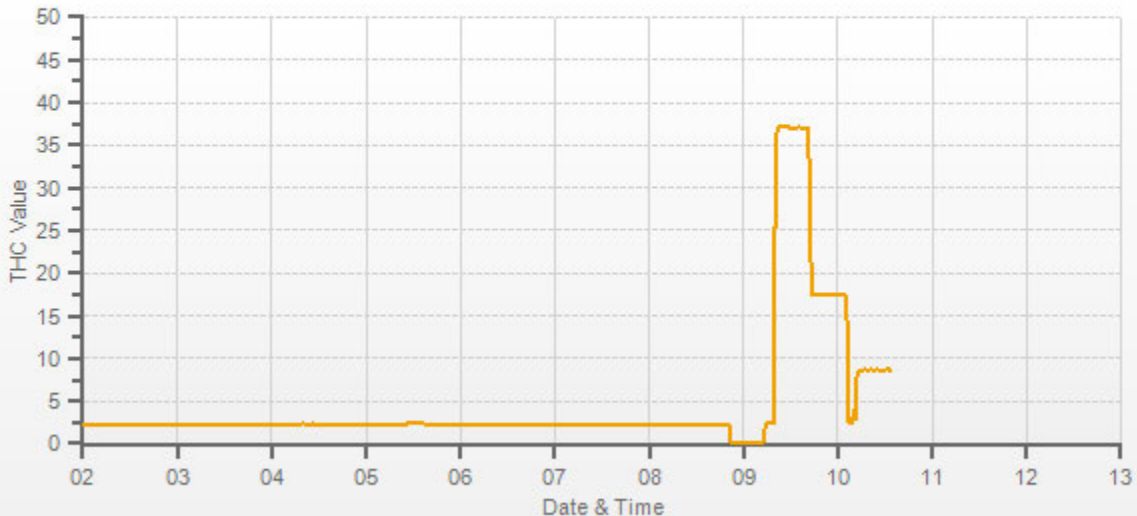
As found: measurement alarms: none service alarms: none cnt: 2693 rng: 1 try: 0 flm: 214.3 det: 125.1 Flame: 214 Filter: 125 Base: 125 Sample psi: 7.5 Internal Air Pressure: 20 Internal Fuel Pressure: 13	As left: measurement alarms: n/a service alarms: n/a cnt: n/a rng: n/a try: n/a flm: n/a det: n/a Flame: n/a Filter: n/a Base: n/a Sample psi: n/a Internal Air Pressure: n/a Internal Fuel Pressure: n/a
---	---

Cylinder/Regulator Pressures: H2 Cylinder (psi): 1000 H2 cylinder reg set (psi): 22 Zero Air Gen Pressure: 39 Span Cylinder (psi): 750 Span Cylinder reg set (psi): 22 Measured Flow: 0.881 Expected Value: 26.70	H2 Cylinder (psi): n/a H2 cylinder reg set (psi): n/a Zero Air Gen Pressure: n/a Span Cylinder (psi): n/a Span Cylinder reg set (psi): n/a Measured Flow: n/a Expected Value: n/a
---	---

Comments:

A shutdown calibraton was performed to remove the 51C and install a new 55I.

THC[ppm]





Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	August 22, 2018	Barometer/B.P./units:	Brunton 05535 expires December 15, 2018	27.60	inHg
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 160348895 expires June 19, 2020	20.7	°C
Location/Station Name:	Maskwa	Weather Conditions:	Mix of sun and clouds		
Parameter:	CH4 / NMHC / THC	Calibration Purpose:	installation		
Start/End Time 24 hr. (mst):	15:52/18:41	Performed By/Reviewer:	Limin Li	Rob Fisher	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	October 18, 2025		

Analyzer:		Correction Factors:		
Serial Number/Owner:	1180930026 | LICA	Previous C.F.:	As Found C.F.:	New C.F.:
Measured Flow:	1182	CH ₄ =	n/a	1.000
Last Calibration Date:	n/a	NMHC =	n/a	1.000
Range ppm:	20 CH4/20 NMHC/40 THC	THC =	n/a	1.000

Calibration Standards:		Standard Calibration Points for Analyzer Range of 20/20/40 ppm			
Low Flow Meter ID/Expiry Date:	Defender Low 156151 expires October 2, 2018	Point	CH4	NMHC	THC
High Flow Meter ID/Expiry Date:	Defender High 156312 expires December 13, 2018	High	13.00	13.00	26.00
Calibrator ID/Expiry Date:	Environics id# 1991 expires March 15, 2019	Mid	7.00	7.00	14.00
Cal Gas Cylinder I.D. #:	LL168404	Low	3.00	3.00	6.00
CH4 Cylinder Conc. =	597.0 | 206.0 =C ₂ H ₆ Cylinder Conc.				
CH ₄ expressed as C ₂ H ₆ =	566.5 | 1163.5 =total CH4 equivalent				

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

Calibrator Flow Rates (cc/min)				Calculated CH ₄ (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	Correction Factors:		
Point	Diluent	Cal Gas	Total Flow							CH ₄	NMHC	THC
adjusted zero	2511	0.00	2511	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	2450	60.80	2511	14.46	13.72	28.17	14.46	13.72	28.18	1.000	1.000	1.000
mid	2481	30.47	2511	7.24	6.87	14.12	7.28	6.86	14.15	0.995	1.002	0.998
low	2499	15.25	2514	3.62	3.44	7.06	3.64	3.50	7.14	0.995	0.982	0.988
calibrator zero	2511	0.00	2511	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
Average C.F. =										0.997	0.995	0.995

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	0.999	0.95-1.05
b (Intercept as % of full scale) =	0.07%	0.11%	0.09%	± 3% F.S.
% change in C.F. from last cal =	n/a	n/a	n/a	n/a

As Left Instrument Diagnostics:

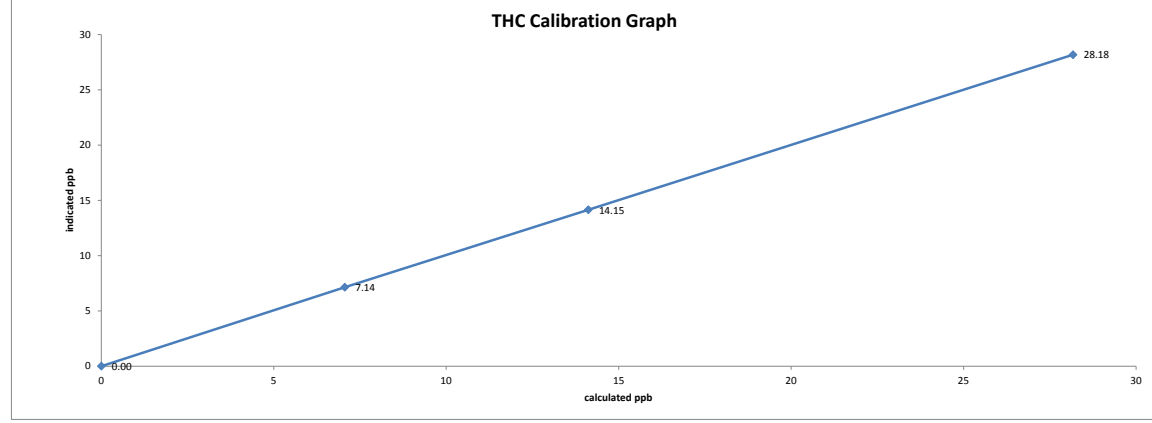
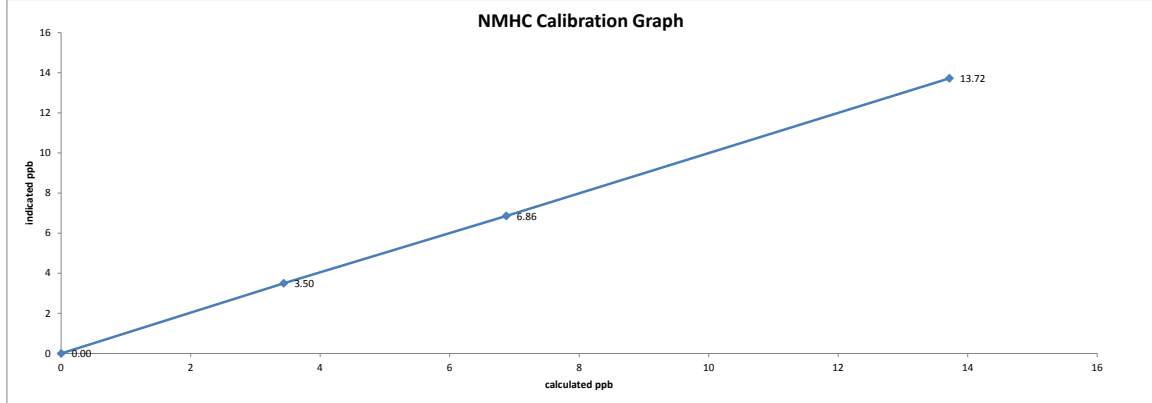
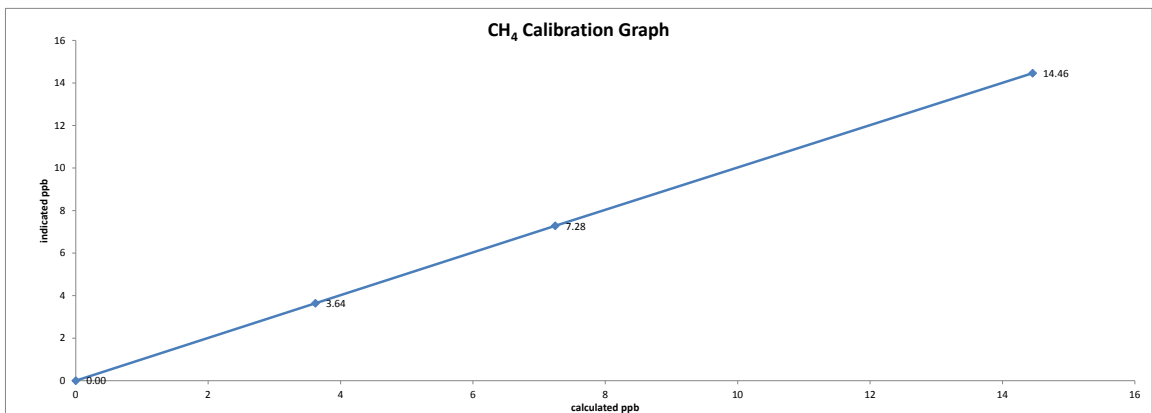
Interface Board Voltages:	Bias Supply: -300.4	Calibration History cnt'd:	NM Peak Area: 87623
Temperatures:	Detector Oven: 175.1	Crucial Settings:	Methane Start: 8
	Filter: 175.0		Methane End: 16
	Column Oven: 75.0		Backflush: 18
	Internal: 33.2		NMHV Start: 24
Cylinder Pressures/reg.:	Carrier: 2500 | 50	Run History>1:	NMHC End: 56
	Fuel: 1000 | 50		Date: 22AUG18
	Span Gas: 2100 | 13		Time: 16:43
	Zero Air Generator: 46		CH ₄ PK HT: 10050
Internal Pressures:	Carrier: 31.2		CH ₄ RT: 12.8
	Fuel: 42.9		CH ₄ Baseline: 2532
	Air: 30.6		CH ₄ LOD: 29
FID Status:	Status: LIT		CH ₄ SD: 9
	Counts: 44612		CH ₄ CONC: 7.27
	Flame: 375.5		NM PK HT: 1770
	Det Base: 175.0		NM Peak Area: 44163
Flame and Power Stats:	Last Power On: 22AUG18 11:50		NM CONC: 6.90
	Flameouts: 1		NM Base Start: 2428
	Det Oven at Start: 158.2		NM Base End: 2491
	Col Oven at Start: 35.9		NM LOD: 23
Calibration History:	Time: 22AUG18 16:14		NM Start IDX: 10
	Type: SPAN		NM End IDX: 84
	Status: GOOD		NM Max Slope: 1.1E+02
	Check/Adjust: ADJUST		NM Min Slope: -8.4E-01
	CH ₄ Span Conc: 14.42		NM PT Count: 69
	CH ₄ SP Ratio: 0.000723	Expected Values:	Previous CH ₄ : n/a
	CH ₄ RT: 12.8		Previous NMHC: n/a
	CH ₄ PK IDX: 24		Previous THC: n/a
	CH ₄ PK HT: 19933		New CH ₄ : 10.19
	NM Span Conc: 13.69		New NMHC: 11.20
	NM SP Ratio: 0.000156		New THC: 21.40

Comments:

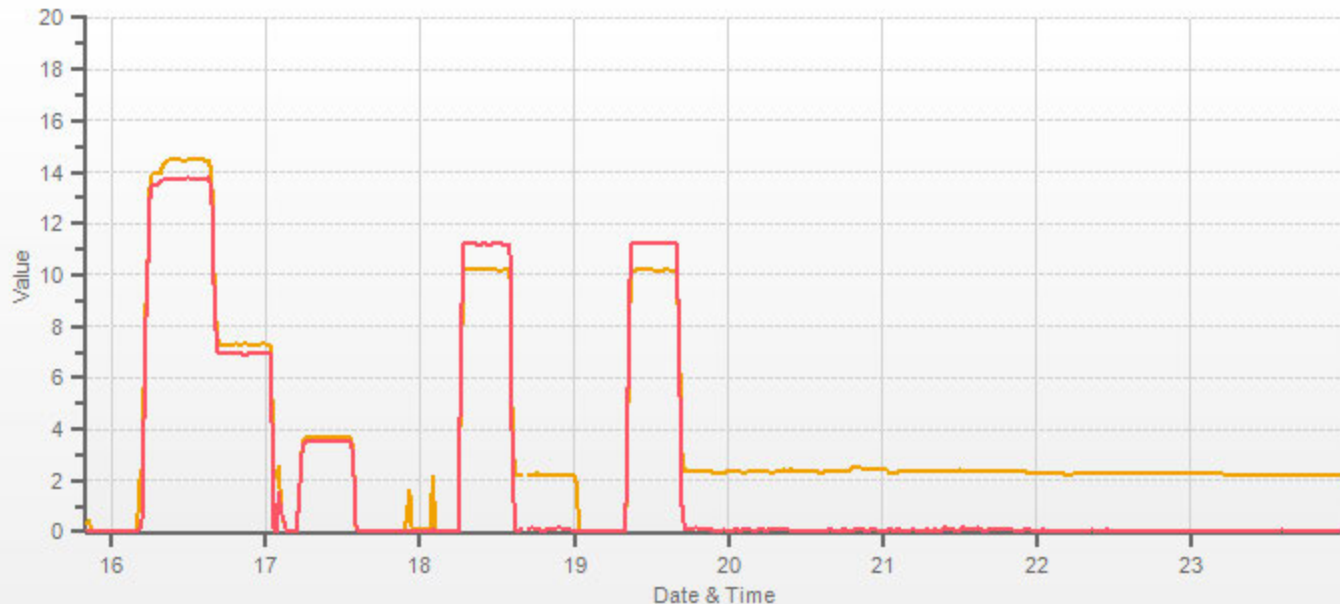
A installation calibration was performed after replacing the 51C with a new 55i.

Date: August 22, 2018
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 15:52/18:41
Calibration Purpose: installation
Calibration Method: Gas Dilution



CH4[ppm] NMHC[ppm]



NITROGEN DIOXIDE



API 200A NO-NO2-NOx Analyzer Calibration

Date:	August 7, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	934	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Maskwa	Weather Conditions:	Smoke		
Start/End Time 24 hr. (mst):	11:49 / 15:41	Calibration Purpose:	shut down		
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: 1899 Maxxam Last Calibration Date: July 12, 2018 Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.000</td> <td>1.001</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>0.994</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.000</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.001	n/a	NO ₂ =	1.000	0.994	n/a	NOx =	1.000	1.000	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.001	n/a														
NO ₂ =	1.000	0.994	n/a														
NOx =	1.000	1.000	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: EnviroNics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5088	0.0	5088	0	0	0.0	0.7	n/a	n/a
as found high	5002	76.7	5079	778.1	779.6	777.0	780.0	1.001	1.000
mid	5047	37.35	5084	378.3	379.1	373.0	375.0	1.014	1.013
low	5063	18.66	5082	189.1	189.5	182.0	184.0	1.039	1.034
Average C.F. =								1.018	1.016

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	5002	76.74	5079	0.0	780.0	783.0	3.0	0.0	3.0	
as found high NO ₂	5002	76.74	5079	500.0	286.0	786.0	500.0	494.0	497.0	0.994
gpt mid	5002	76.74	5079	275.0	504.0	785.0	281.0	276.0	278.0	0.993
gpt low	5002	76.74	5079	95.0	684.0	784.0	100.0	96.0	97.0	0.990
Average NO₂ C.F. =										0.992

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.998	0.999	0.90-1.10
b (Intercept as % of full scale) =	-0.37%	-0.27%	0.20%	± 3% F.S.
% change in C.F. from last cal =	-0.15%	0.60%	-0.04%	± 10%
NO ₂ converter efficiency			0.98	0.96 to 1.04

As found: NOx SLOPE: 1.049 NOx OFFS: -0.1 NO SLOPE: 1.050 NO OFFS: -0.8 SAMP FLW: 549 OZONE FL: 79 NORM PMT: -0.3 AZERO: 21.5 HVPS: 669 DCPS: 2562 RCELL: 50.9 BOX TEMP: 31.1 IZS TEMP: 50.0 MOLY TEMP: 316.6 RCEL: 6.7 SAMP: 25.7 Expected Value NO: 6 Expected Value NO ₂ : 385 Expected Value NOx: 391	As left: NOx SLOPE: n/a NOx OFFS: n/a NO SLOPE: n/a NO OFFS: n/a SAMP FLW: n/a OZONE FL: n/a NORM PMT: n/a AZERO: n/a HVPS: n/a DCPS: n/a RCELL: n/a BOX TEMP: n/a IZS TEMP: n/a MOLY TEMP: n/a RCEL: n/a SAMP: n/a Expected Value NO: n/a Expected Value NO ₂ : n/a Expected Value NOx: n/a
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Comments:

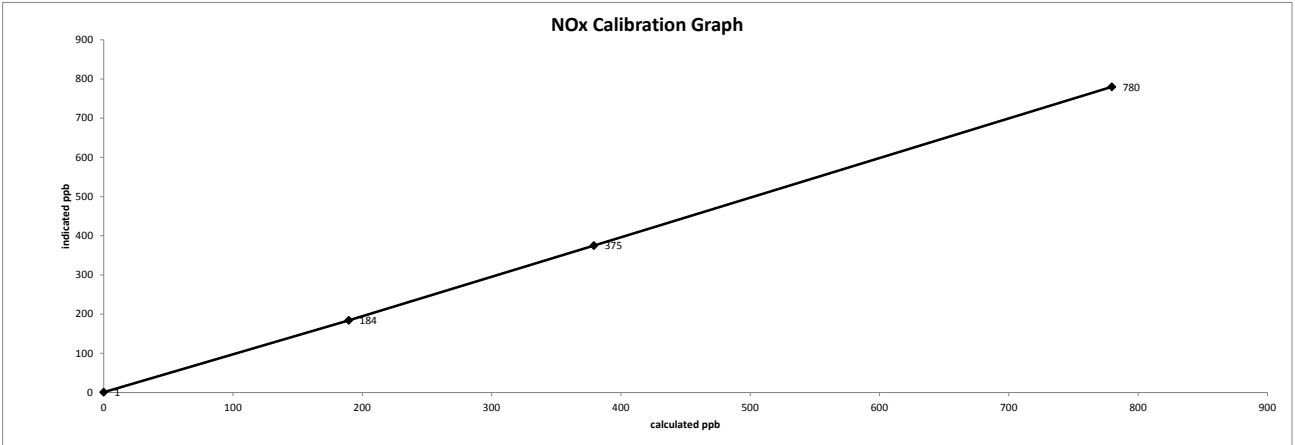
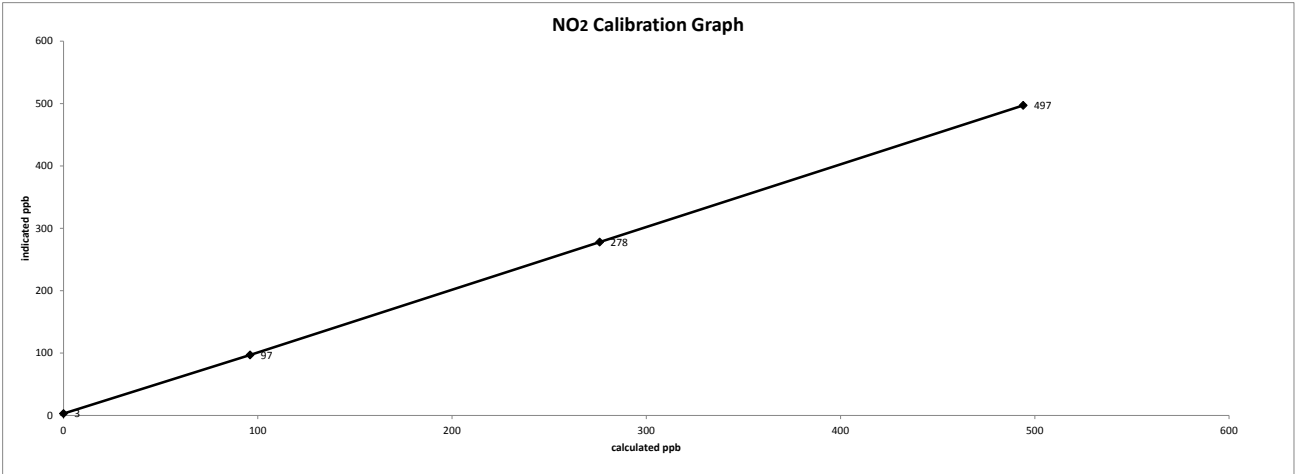
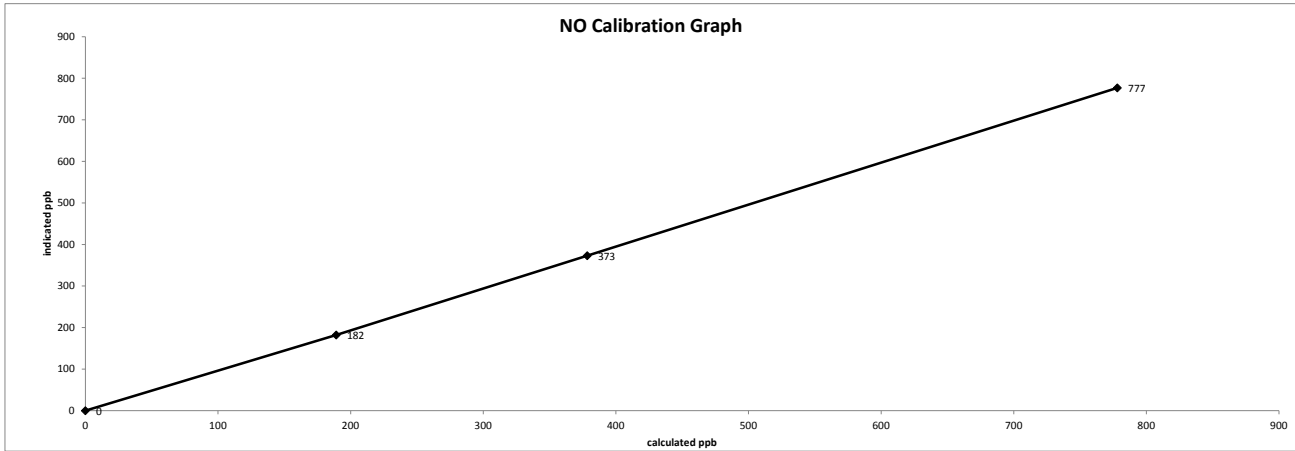
The manifold blower was found to be working normally.

The Shutdown calibration was completed to install a new Thermo-Scientific NOx analyzer.

Date: August 7, 2018
Company/Airshed: LICA
Location/Station Name: Maskwa

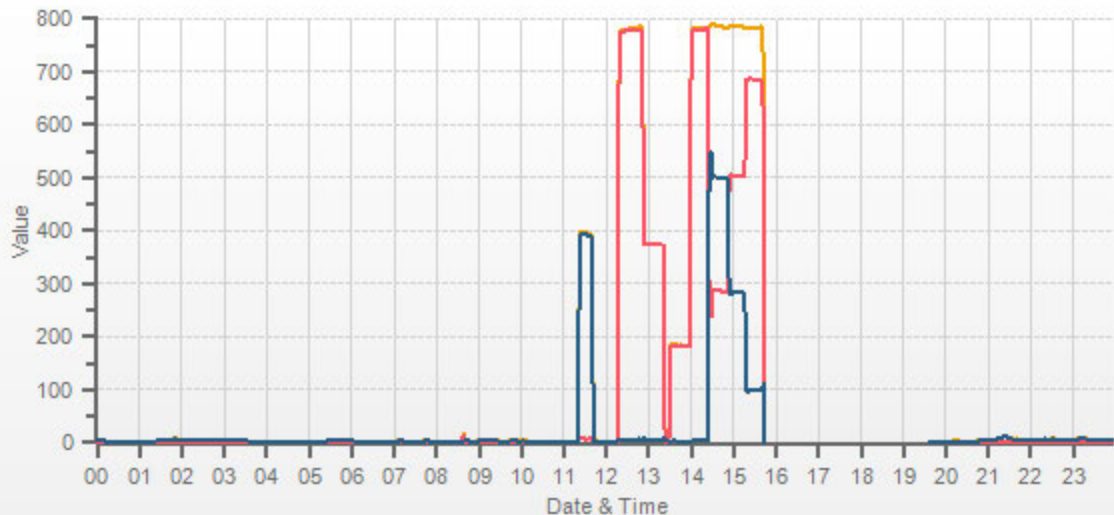
Start/End Time 24 hr. (mst): 11:49 / 15:41
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration

API 200A NO-NO2-NOx Analyzer Calibration



Station: LICA MASKWA Daily: 18/08/07 Type: AVG 1 Min. [1 Min.]

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





Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: August 8, 2018 Company/Airshed: LICA Location/Station Name: Maskwa Start/End Time 24 hr. (mst): 10:50 / 16:17 G.P.T. to be used for Ozone? No Calibration Method: Gas Dilution & Gas Phase Titration	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 938 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Smoke Calibration Purpose: Installation Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 24, 2020
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Analyzer: Serial Number/Owner: 1180930028 LICA Last Calibration Date: n/a Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>n/a</td> <td>n/a</td> <td>0.999</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	n/a	n/a	1.000	NO ₂ =	n/a	n/a	1.000	NOx =	n/a	n/a	0.999
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	n/a	n/a	1.000														
NO ₂ =	n/a	n/a	1.000														
NOx =	n/a	n/a	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: Envionics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Standard Calibration Points for a Range of: 1000 ppb</th> </tr> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	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
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)		
adjusted zero	5088	0.0	5088	0	0	0.0	0.0	n/a	n/a
adjusted high	5017	76.5	5093	773.1	774.6	773.0	775.0	1.000	0.999
mid	5046	37.17	5083	376.6	377.3	378.0	379.0	0.996	0.996
low	5061	18.66	5080	189.2	189.5	189.0	190.0	1.001	0.998
calibrator zero	5088	0.00	5088	0.0	0.0	0.0	0.0	n/a	n/a
Average C.F.=								0.999	0.998

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	5017	76.45	5093	0.0	774.0	774.0	0.0	0.0	0.0	
adjusted high NO2	5017	76.45	5093	500.0	282.0	774.0	492.0	492.0	492.0	1.000
gpt mid	5017	76.45	5093	280.0	496.0	774.0	278.0	278.0	278.0	1.000
gpt low	5017	76.45	5093	100.0	676.0	775.0	98.0	98.0	98.0	1.000
Average NO₂ C.F.=										1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	0.999	1.000	0.95-1.05
b (Intercept as % of full scale)=	0.02%	0.04%	0.00%	± 3% F.S.
% change in C.F. from last cal=	n/a	n/a	n/a	n/a
NO2 converter efficiency			1.00	0.96 to 1.04

As found: NO Bkg: n/a NOx Bkg: n/a NO Coef: n/a NO2 Coef: n/a NOx Coef: n/a PMT: n/a Internal: n/a Chamber: n/a Cooler: n/a NO2 Converter: n/a NO2 Converter Set: n/a Perm Oven Gas: n/a Perm Oven Heater: n/a Pressure: n/a Flow: n/a Ozonator Flow: n/a Expected Value NO: n/a Expected Value NO2: n/a Expected Value NOx: n/a	As left: NO Bkg: 3.1 NOx Bkg: 3.2 NO Coef: 1.052 NO2 Coef: 1.000 NOx Coef: 1.000 PMT: -866.5 Internal: 29.1 Chamber: 50.0 Cooler: -3.1 NO2 Converter: 323.4 NO2 Converter Set: 325.0 Perm Oven Gas: 45.00 Perm Oven Heater: 44.16 Pressure: 257.0 Flow: 0.561 Ozonator Flow: OK Expected Value NO: 6 Expected Value NO2: 365 Expected Value NOx: 371
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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 perm tube was changed , new expected value to be updated once the perm tube temperature has stabilized.

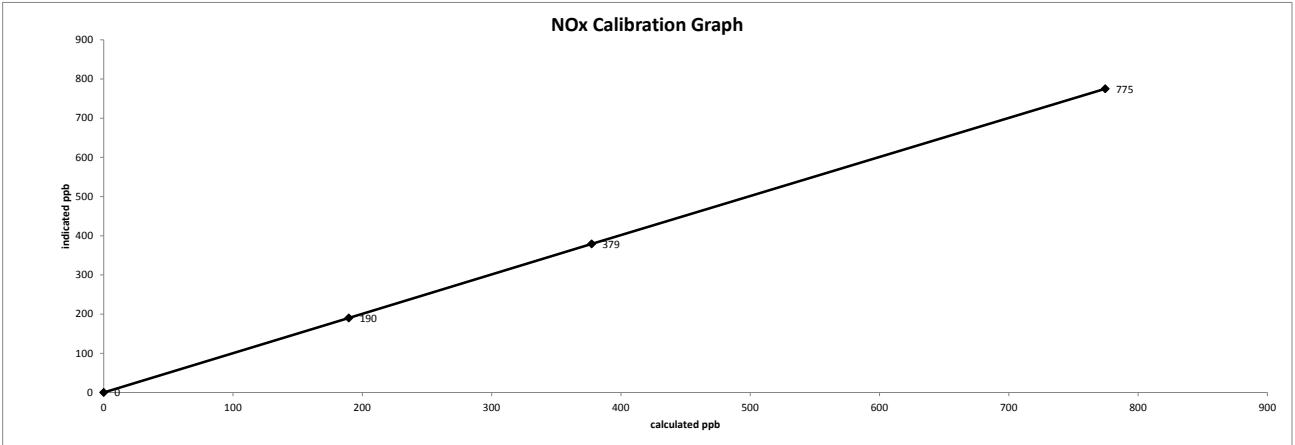
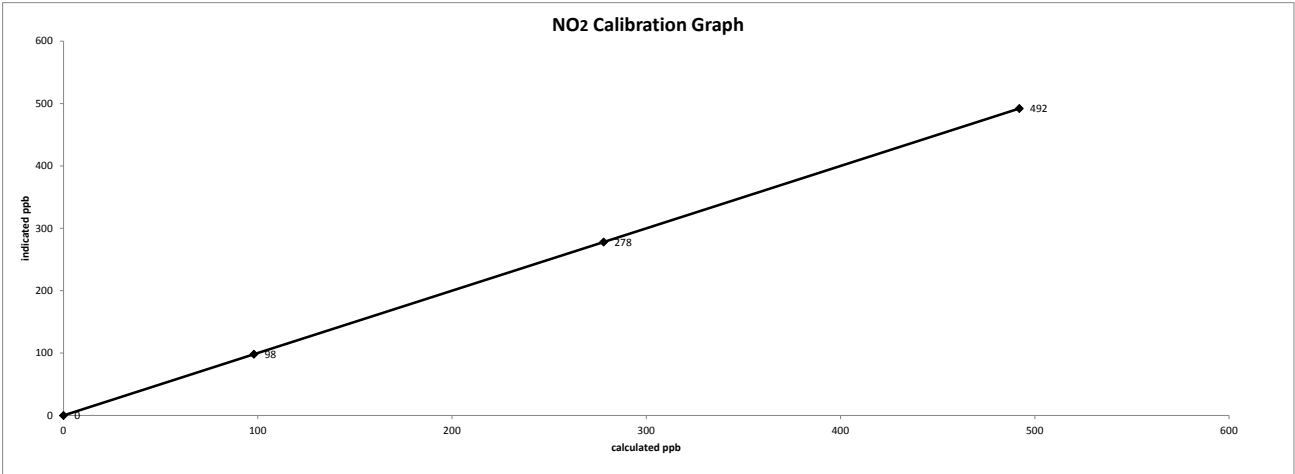
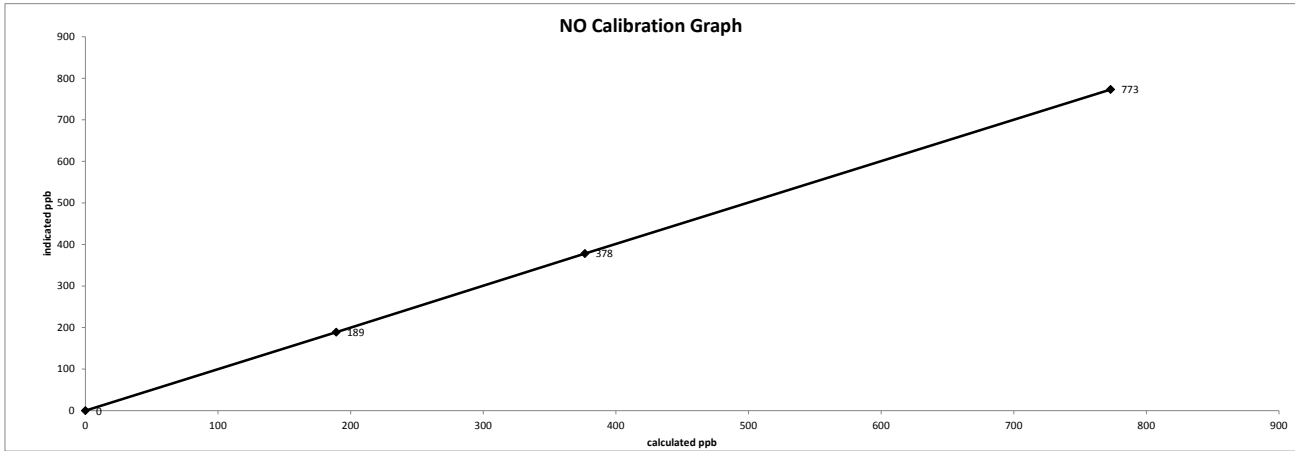
The analyzer cooling fan filter(s) were cleaned.

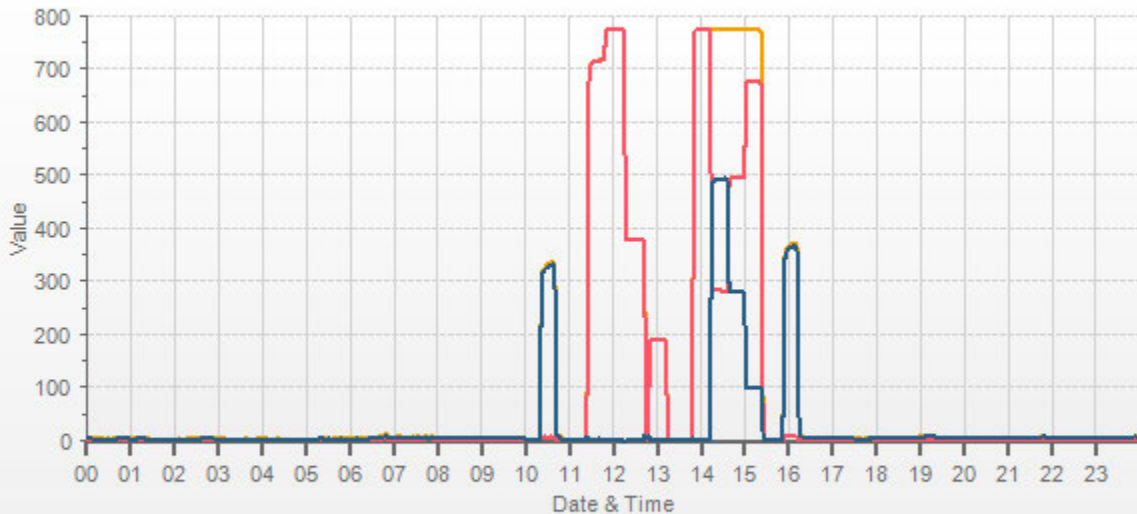
The installation calibration was completed after installing a new Thermo-Scientific analyzer.

Date: August 8, 2018
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 10:50 / 16:17
Calibration Purpose: installation
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration





— NOX [ppb] — NO [ppb] — NO2 [ppb]

PARTICULATE MATTER

Maxxam R & P 1400A TEOM PM 2.5 Analyzer Audit/Calibration

Date:	August 1, 2018	Performed By/Reviewer:	Alex Yakupov | not yet reviewed
Company:	LICA	Start Time (mst):	16:48
Station Name/Location:	Maskwa	End Time (mst):	17:40
Previous Audit Date:	July 26, 2018	Calibration Purpose:	Bi-monthly #1
Parameter:	PM 2.5	Weather Conditions:	A few clouds

1400A Information and Status:

Serial Number/Owner:	140AB228740001 | Maxxam	As Found Filter Loading %:	21%
K _o Factor:	12166	As Left Filter Loading %:	21%
Ambient Temperature °C:	18.2	As Found/As Left Noise:	0.027 / 0.032%
Ambient Pressure atm:	0.922	FDMS or SES Dryer in use?	no
Main Flow Reading lpm:	3.00	Pump Vacuum:	n/a
Aux Flow Reading lpm:	13.66	Warnings:	None

Reference Standards/I.D./Expiry Date:

Low Flow:	Airmetrics/Chinook Low Maxxam ID #3 expires April 24, 2019
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 Pump Off Test and Leak Check :

	main flow	auxiliary flow	
pump unplugged zero (lpm)	0.22	0.14	
seconds to reach full flow (max. 60s)	44	47	(maintenance required if either > 60 seconds)
leak rate (lpm)	0.22	0.25	
0 corrected leak rate (lpm)	0.00	0.11	
limit (lpm)	0.15	0.15	

As Left Pump Off Test and Leak Check (same as above if as found adequate):

	main flow	auxiliary flow	
pump unplugged zero (lpm)	0.22	0.14	
seconds to reach full flow (max. 60s)	44	47	(maintenance required if either > 60 seconds)
leak rate (lpm)	0.22	0.25	
0 corrected leak rate (lpm)	0.00	0.11	
limit (lpm)	0.15	0.15	

As found temperature and pressure:

tolerance +/- 2.0 °C	tolerance +/- 0.01 atm
1400A temperature °C: 18.2	1400A pressure atm: 0.922
reference temperature °C: 18.2	reference pressure: 0.918
difference °C: 0.0	difference: -0.004

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

tolerance +/- 2.0 °C	tolerance +/- 0.01 atm
1400A temperature °C: 18.2	1400A pressure atm: 0.922
reference temperature °C: 18.2	reference pressure: 0.918
difference °C: 0.0	difference: -0.004

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1400A main flow lpm: 3.00	1400A total/aux flow lpm: 13.67
reference main flow lpm: 2.95	reference total/aux flow lpm: 13.60
difference lpm: -0.05	difference lpm: -0.07

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

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1400A main flow lpm: 3.00	1400A total/aux flow lpm: 13.67
reference main flow lpm: 2.95	reference total/aux flow lpm: 13.60
difference lpm: -0.05	difference lpm: -0.07

<p>K_o Audit:</p> <p>Last K_o audit date: July 26, 2018</p> <p>1400A K_o factor: 12166</p> <p>Measured K_o factor: 12350</p> <p>% difference: 1.51%</p>	<p>Instrument Operating Parameters:</p> <p>Pump Vacuum: n/a</p> <p>Main Fadj: 1.000</p> <p>Aux Fadj: 1.000</p>
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Comments: The TEOM intake head and associated sharp cut components were cleaned.

WIND SYSTEM

CALIBRATORS

Company: Maxxam Operator: Chris W

Calibrator:			Flow Measurement Device:		
Make/Model	<u>Envronics 6100</u>		Make/Model	<u>Mesa Defender 530</u>	
Serial Number	<u>4760</u>		Serial Number	<u>L-153351 H-152571</u>	
Last Verification Date	<u>February 2017</u>		Temperature (°C)	<u>23.0 C</u>	
NO Cylinder S/N	<u>EY0000715</u>		Barometric Pressure	<u>704 mmHg</u>	
NO [PPM]	<u>50.7</u>	NOx [PPM] <u>50.8</u>			
Expiry Date	<u>May 2021</u>				

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
4935	77.0	0.7911	0.7926	0.7830	0.0017	0.7846	-1%	-1%
4951	37.5	0.3840	0.3848	0.3808	-0.0001	0.3806	-1%	-1%
4938	18.9	0.1941	0.1944	0.1915	0.0003	0.1918	-1%	-1%
Absolute Average Percent Difference							1%	1%

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

NO		LIMITS		NOx	
Correlation=	1.0000	≥	0.990	Correlation=	1.0000
m (Slope)=	0.9901		0.90-1.10	m (Slope)=	0.9901
b (Intercept % of FS)=	-0.0092		± 3% F.S.	b (Intercept % of FS)=	-0.0320

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas		
4935	0.000	0.0000	0.7877	0.0005	0.7881	NO ₂	% Diff. Limit	
4935	0.500	0.4912	0.2965	0.4844	0.7809	-1%	± 10%	
4935	0.280	0.2755	0.5122	0.2729	0.7851	-1%	± 10%	
4935	0.100	0.0977	0.6900	0.0991	0.7891	1%	± 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)=	0.9836		0.90-1.10
b (Intercept % of FS)=	0.1675		± 3% F.S.

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Last Calibration Date	<u>March 2, 2018</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark
Operator Signature: *Chris W*

Date: March 2, 2018
Location: McIntyre Center Edmonton

Company: <u>Maxxam</u>		Operator: <u>Chris W</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>EnviroNics 2000</u>	Make/Model	<u>Mesa Defender 530</u>
Serial Number	<u>1991</u>	Serial Number	<u>L-153351 H-152571</u>
Last Verification Date	<u>March 2017</u>	Temperature (°C)	<u>25.0 C</u>
NO Cylinder S/N	<u>LL108015</u>	Barometric Pressure	<u>695 mmHg</u>
NO [PPM]	<u>52.2</u>	NOx [PPM]	<u>52.3</u>
Expiry Date	<u>Oct 2020</u>		

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4988	75.1	0.786	0.787	0.785	-0.002	0.783	0%	-1%
4988	36.5	0.382	0.383	0.382	0.001	0.383	0%	0%
4988	18.3	0.192	0.192	0.190	0.000	0.190	-1%	-1%
Absolute Average Percent Difference							0%	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)= 0.9996	0.90-1.10	m (Slope)= 0.9956
b (Intercept % of FS)= -0.0599	± 3% F.S.	b (Intercept % of FS)= -0.0005

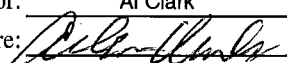
Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4988	0.000	0.000	0.788	-0.001	0.787	NO ₂	% Diff. Limit
4988	0.350	0.519	0.269	0.512	0.780	-1%	± 10%
4988	0.160	0.231	0.557	0.229	0.786	0%	± 10%
4988	0.070	0.099	0.689	0.097	0.787	-1%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9885	0.90-1.10
b (Intercept % of FS)= -0.0567	± 3% F.S.

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

COMMENTS: Cylinder contains 47.9 ppm SO2.

Auditor: Al Clark
Operator Signature: 

Date: March 15, 2018
Location: McIntyre Center Edmonton

Company: Maxxam Operator: Chris W

Calibrator:			Flow Measurement Device:		
Make/Model	<u>Envionics 6100</u>		Make/Model	<u>Mesa Defender 530</u>	
Serial Number	<u>5212</u>		Serial Number	<u>L-153351 H-152571</u>	
Last Verification Date	<u>February 2017</u>		Temperature (°C)	<u>24.0 C</u>	
NO Cylinder S/N	<u>EY0000715</u>		Barometric Pressure	<u>702 mmHg</u>	
NO [PPM]	<u>50.7</u>	NOx [PPM] <u>50.8</u>			
Expiry Date	<u>May 2021</u>				

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
5004	77.2	0.7822	0.7837	0.7769	0.0006	0.7774	-1%	-1%
5018	37.7	0.3809	0.3817	0.3777	0.0005	0.3782	-1%	-1%
5012	18.8	0.1902	0.1905	0.1884	-0.0002	0.1885	-1%	-1%
Absolute Average Percent Difference							1%	1%

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

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	0.9934	0.90-1.10		m (Slope)=	0.9921
b (Intercept % of FS)=	-0.0332	± 3% F.S.		b (Intercept % of FS)=	-0.0277

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5004	0.000	0.0000	0.7766	0.0007	0.7773	NO ₂	% Diff. Limit
5004	0.500	0.4846	0.2920	0.4797	0.7717	-1%	± 10%
5004	0.280	0.2731	0.5035	0.2713	0.7747	-1%	± 10%
5004	0.100	0.0958	0.6808	0.0962	0.7770	0%	± 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)=	0.9880	0.90-1.10	
b (Intercept % of FS)=	0.1153	± 3% F.S.	

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Last Calibration Date	<u>March 1, 2018</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark Date: March 1, 2018
 Operator Signature: [Signature] Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2017-482CGA

Company: Maxxam **Operator's Name:** Mike
Cylinder #: LL104225 **Concentration PPM:** 49.2 **Tolerance(%)** 2 **Certified By:** Praxair
Expiry Date: October 2020

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Mesa Definer 220</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>H-133034 / L-132702</u>
Last Verification Date: <u>December 13, 2017</u>	Temp. °C: <u>23.4 C</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>707 mmHg</u>
Cylinder Number: <u>CAL016625</u>	
Expiry Date: <u>January 2019</u>	

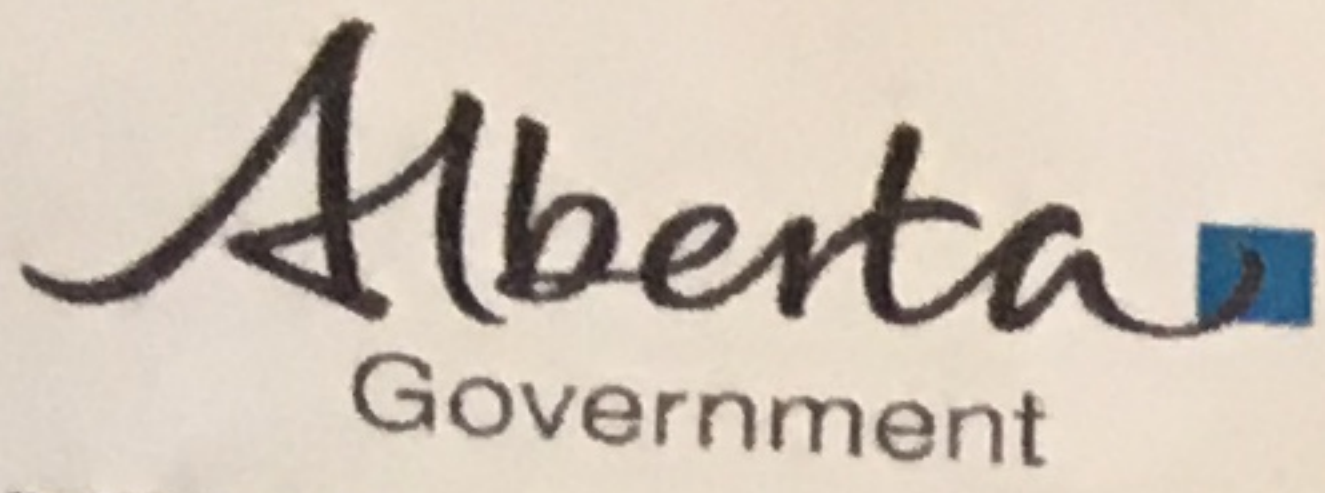
Reference Analyzer:
 Make/Model: Teco 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 10.0 Span: 1.006 Range: 1.0
 Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000			
4989	79.5	0.764	0.01594	62.755	47.9
4995	39.6	0.380	0.00793	126.136	47.9
4992	19.6	0.188	0.00393	254.694	47.9
Average Cylinder Concentration:					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 _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark Date: December 13, 2017
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2017-493CGA

Company: Maxxam Operator's Name: Mike
 Cylinder #: EY0001003 Concentration PPM: 9.55 Tolerance(%): 2 Certified By: Praxair
 Expiry Date: October 2020

Reference Calibrator and Gas:
 Make/Model: Sabio 2010
 Serial Number: AMU 2092
 Last Verification Date: January 17, 2018
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015272
 Expiry Date: January 2019

Flow Measurement Device:
 Make/Model: Mesa Defender 530
 Serial Number: H-153961 / L-153874
 Temp. °C: 23.0 C
 B.P.: 697 mmHg

Reference Analyzer:
 Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 12.9 Span: 0.955 Range: 0.1
 Last Calibration: Date: Jan 17/18 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	0.0000	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 COMMENTS: Used AEP regulator
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark

Date: January 18, 2018

Operator Signature: [Signature]

Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2017-488CGA

Company: Maxxam **Operators name:** Mike

Cylinder #: LL168404 Conc CH4 (PPM) 597/206 Tolerance (%) 2 Certified By: Praxair

Expiry Date: October 2025

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>R&R MFC 201</u>	Make/Model	<u>Mesa Definer 220</u>		
Serial Number	<u>AMU 1690</u>	Serial Number	<u>H-133034 / L-132702</u>		
Last Verification Date	<u>December 13, 2017</u>	Temp. °C	<u>23.1 C</u>		
Gas Type	<u>CH4</u>	Conc.	<u>990.4</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>5604875</u>	Expiry Date	<u>July 2021</u>		
Gas Type	<u>C3H8</u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF003845B</u>	Expiry Date	<u>July 2022</u>		

Reference Analyzer:

Make/Model Teco 55i Serial/AMU Number: 2108

Instrument Settings Zero: N/A Span: N/A Range: 20.0

Last Calibration: Date: Dec 12/17 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
3500	0.0	0.00	0.00	0.02	45.00	595	208
3618	80.4	13.22	12.69	0.02	45.00	595	208
3547	39.8	6.64	6.42	0.01	89.12	592	208
3560	19.8	3.33	3.23	0.01	179.80	599	211
Average Cylinder Concentration:						595	209

CH4	C3H8
Previous Stated Concentration PPM: <u>597</u>	<u>206</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:**

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration

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

Auditor: Al Clark Date: December 13, 2017

Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2017-483CGA

Company: Maxxam **Operators name:** Mike

Cylinder #: LL104225 Conc (PPM) 51.5/51.6 Tolerance (%) 2 Certified By: Praxair

Expiry Date: October 2020

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model <u>Teco 146i</u>	Make/Model <u>Mesa Definer 220</u>
Serial Number <u>AMU 1809</u>	Serial Number <u>H-133034 / L-132702</u>
Last Verification Date <u>December 13, 2017</u>	Temp. °C <u>23.4 C</u>
Gas Type <u>NO</u> Conc. <u>50.03</u>	B.P. <u>707 mmHg</u>
Cylinder Number <u>APEX 1223938</u>	
Expiry Date <u>June 2020</u>	

Reference Analyzer:

Make/Model Teco 42i Serial/AMU Number: 1868

Instrument Settings Zero: 4.7 Span: 1.004 Range: 1.0

Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4989	79.5	0.813	0.812	0.016	62.755	51.0	51.0
4995	39.6	0.407	0.406	0.008	126.136	51.3	51.2
4992	19.6	0.202	0.201	0.004	254.694	51.4	51.2
Average Cylinder Concentration:						51.3	51.1

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>51.5</u>	<u>51.6</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:**

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration

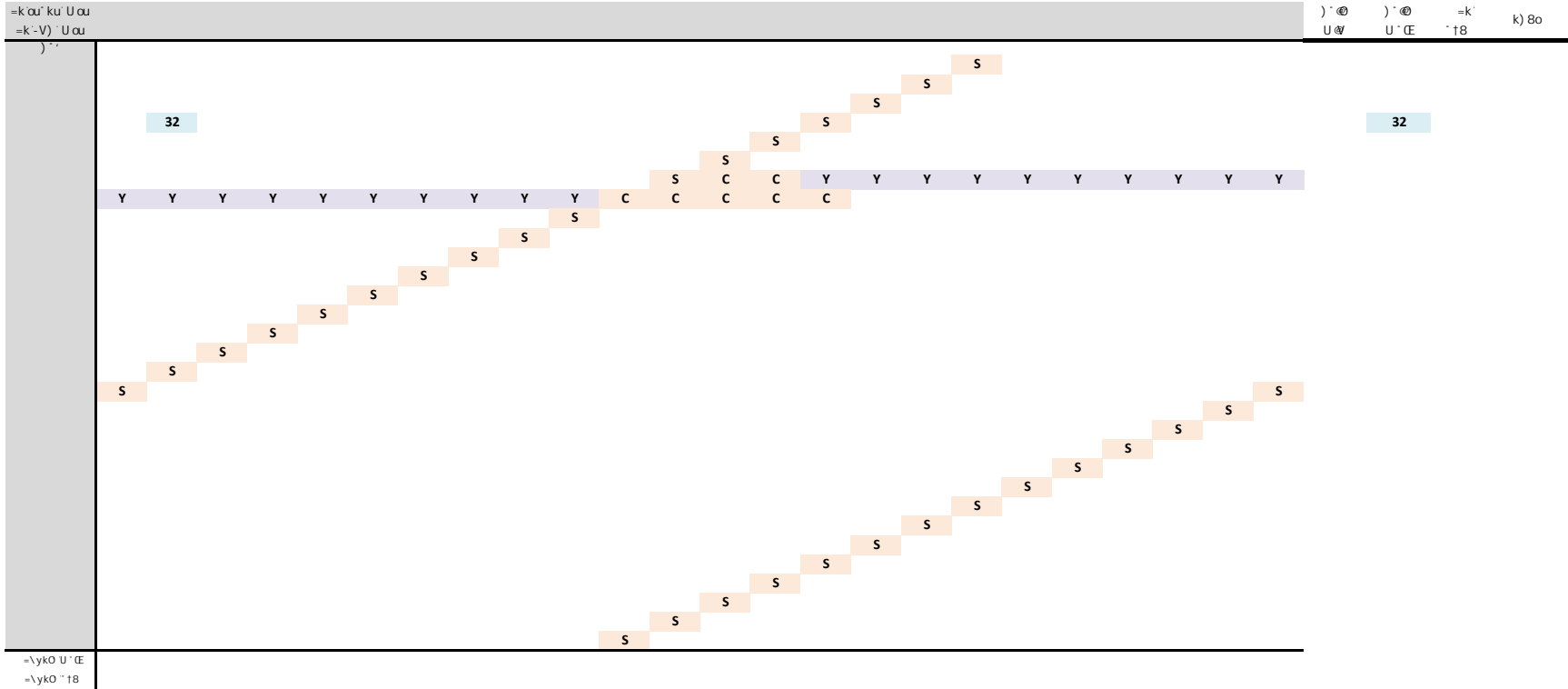
> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark Date: December 13, 2017

Operator Signature: *Al Clark* Location: McIntyre Center Edmonton

APPENDIX ~~@@~~
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SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



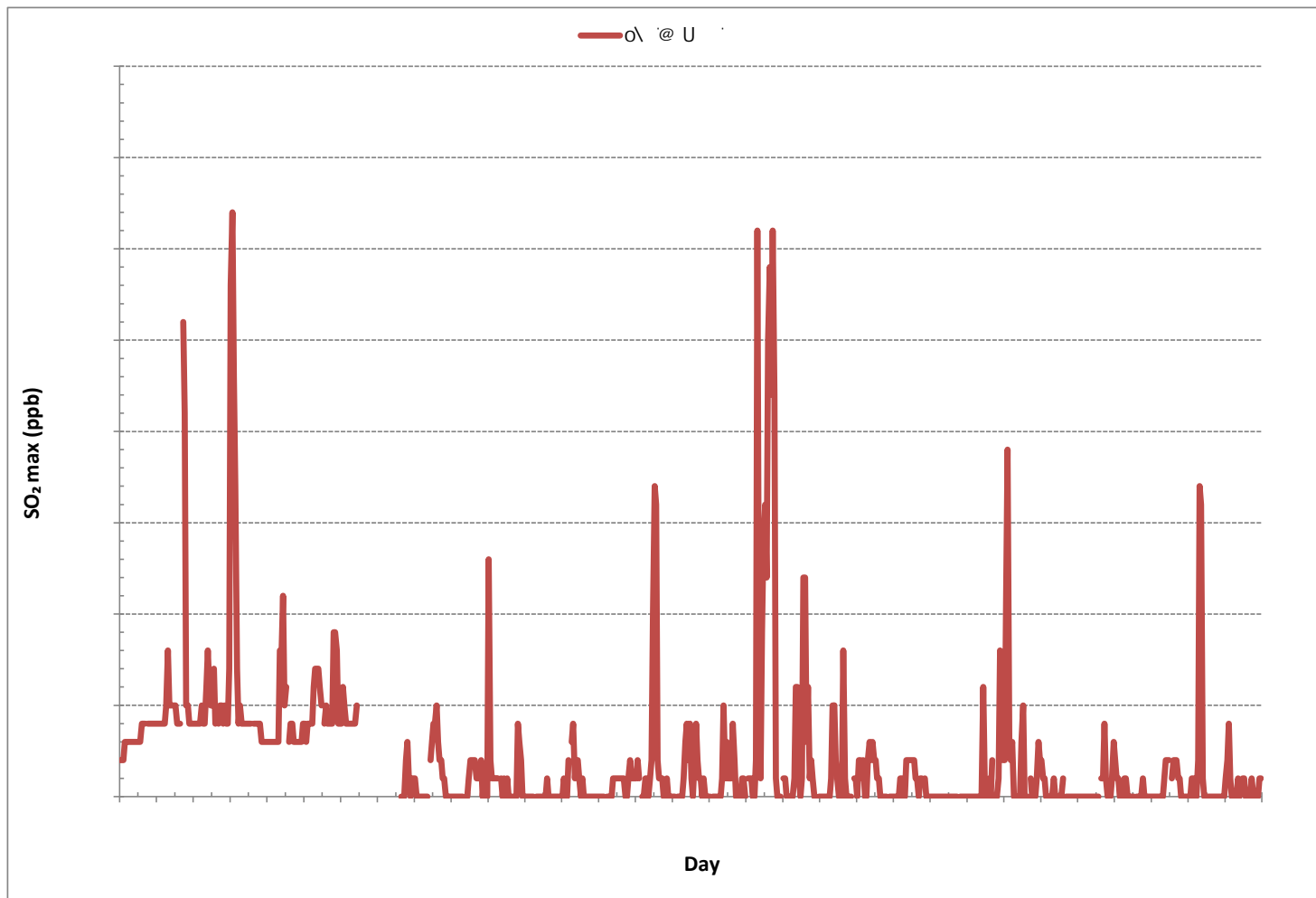
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'	U ' @u-V' V#-	(E	U ' #=@- U ' QyV#u@V
o) ' @ --k\ ch' V#=-#M	8	\ yu7 k k-h' @
o	k-h- ' u--k\ ch' V#=-#M	h	h\ t -k7 @yk-

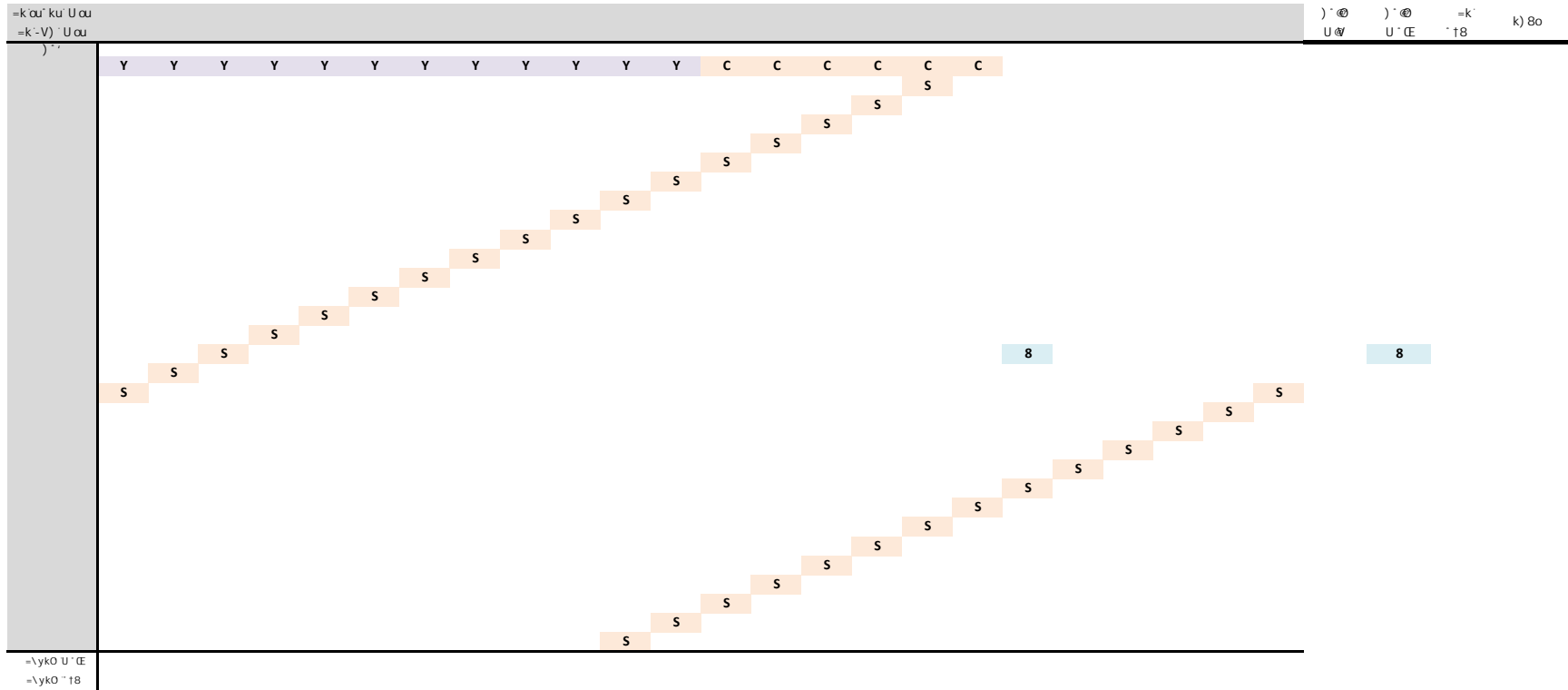
MONTHLY SUMMARY

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U ' @yU @au' Vu' V- \ yoit' Qy-	= \yk	\ V) ' ' .
@o# 00k' u@V u@ -		\ h-k' u@V' Ou@ -
U \ Vu=0 # 00k' u@V u@ -		
au' V) ' k)) -t@u@V		

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



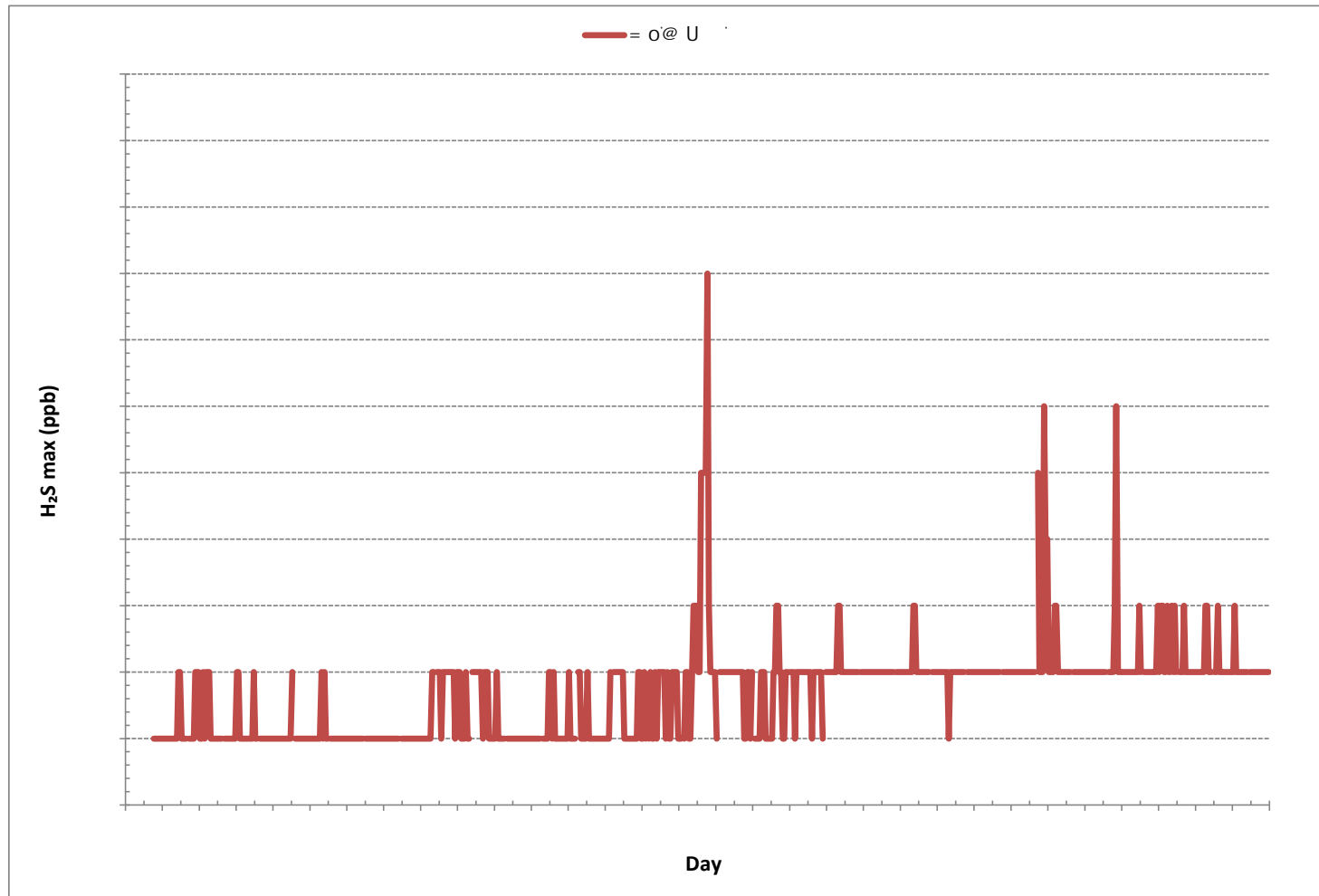
STATUS FLAG CODES

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'	U' @u-V' V#-	(E	U' #=@- U' QyV#u@V
o)' @ --k\ ch' V#=-#M	8	\ yu7 k k-h' @
o	k-h- u--k\ ch' V#=-#M	h	h \ t -k7 @yk-

MONTHLY SUMMARY

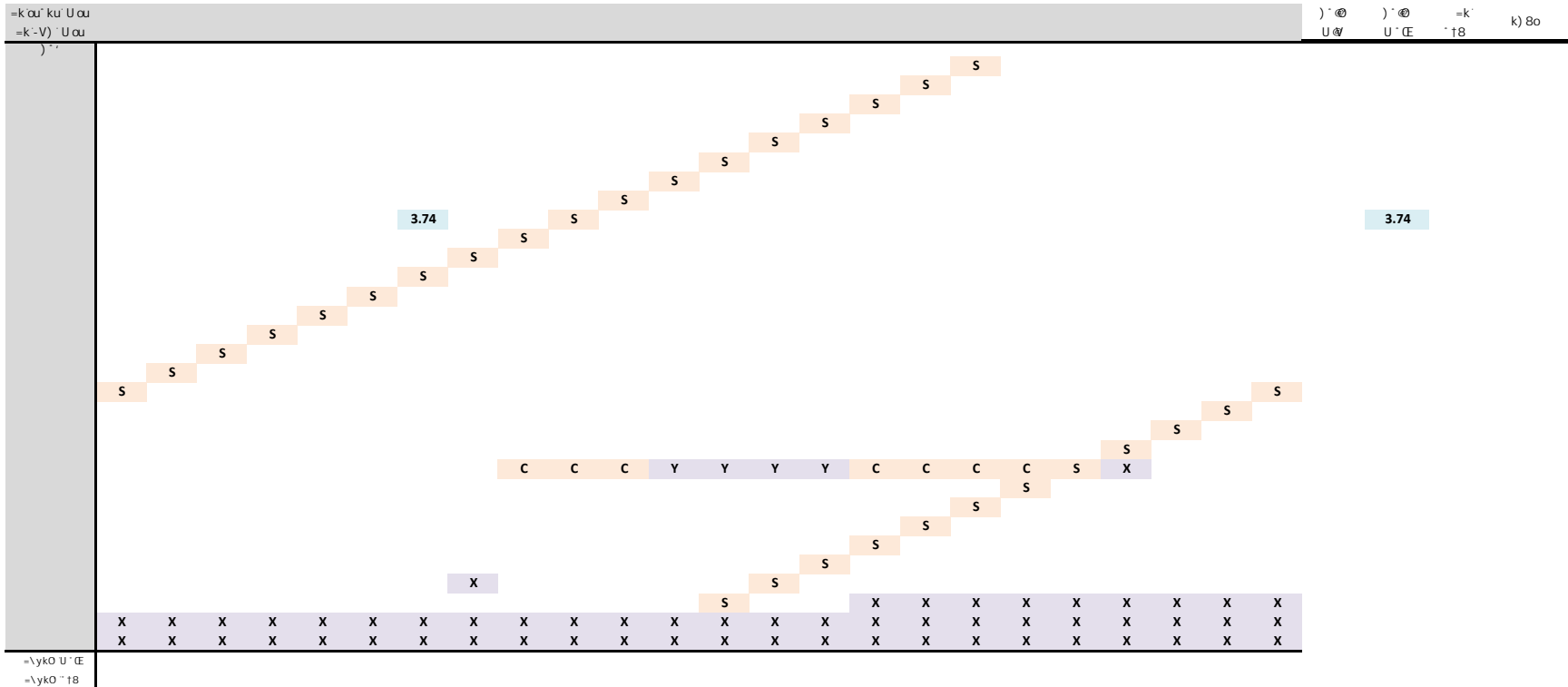
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U' @yU' @au' Vu' V- \ yoit' Qy-	= \ yk	\ V) ' ' .
@o# 00k' u@V u@V -		\ h-k' u@V' Ou@ -
U \ Vu=0 # 00k' u@V u@V -		
au' V) ' k)) -t@u@V		

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)





TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



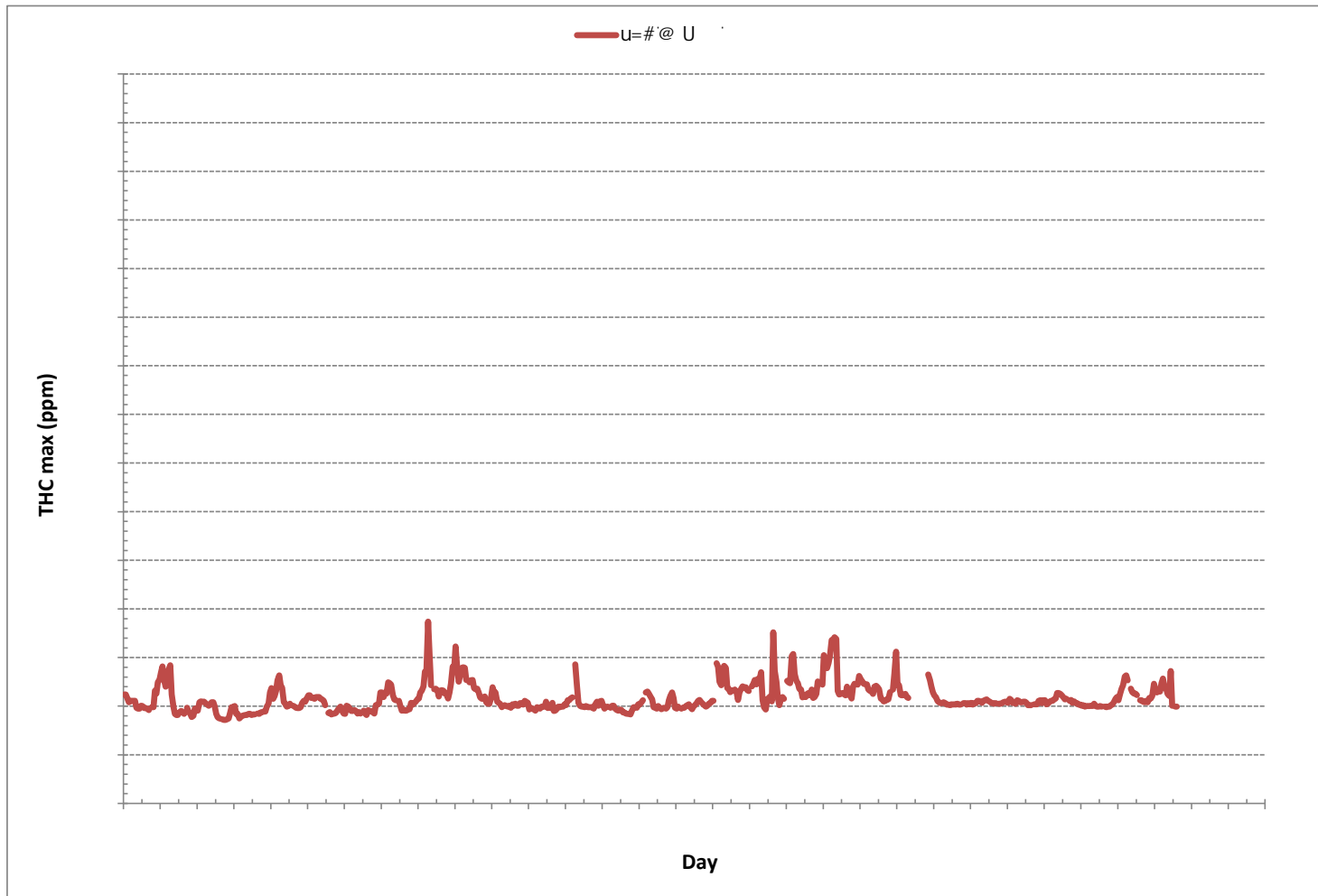
STATUS FLAG CODES

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'	U' @u-V' V#-	(E	U' #=@- U' Oyv#u@V
o)' @ --k\ ch' V#=-#M	8	\ yu \ k k-h' @
o	k-h-' u--k\ ch' V#=-#M	h	h \ t -k 7' @yk-

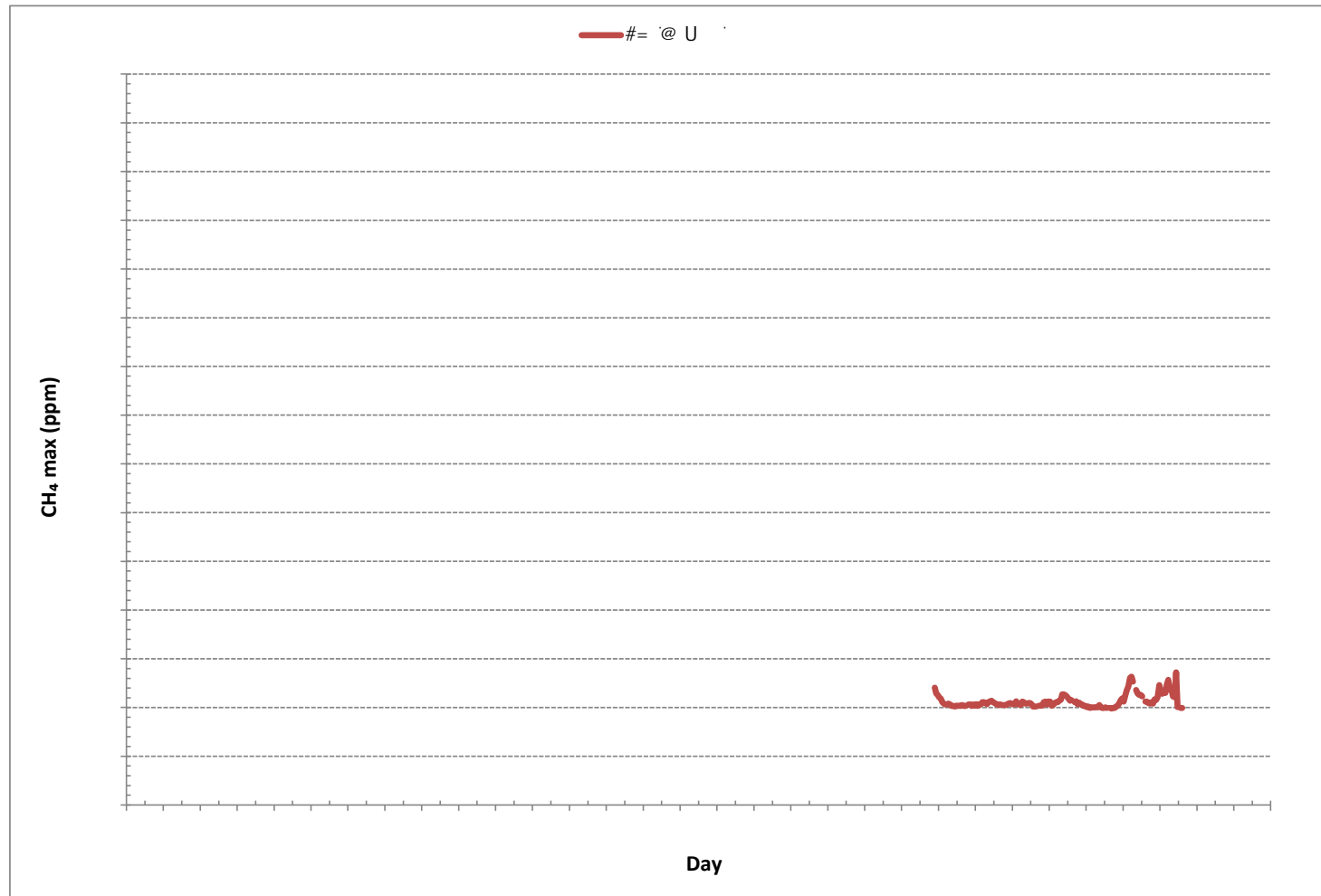
MONTHLY SUMMARY

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@o#* O@k' u@V u@V -	\ h-k' u@V' Ou@V -	
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au' V) k) -t@u@V		

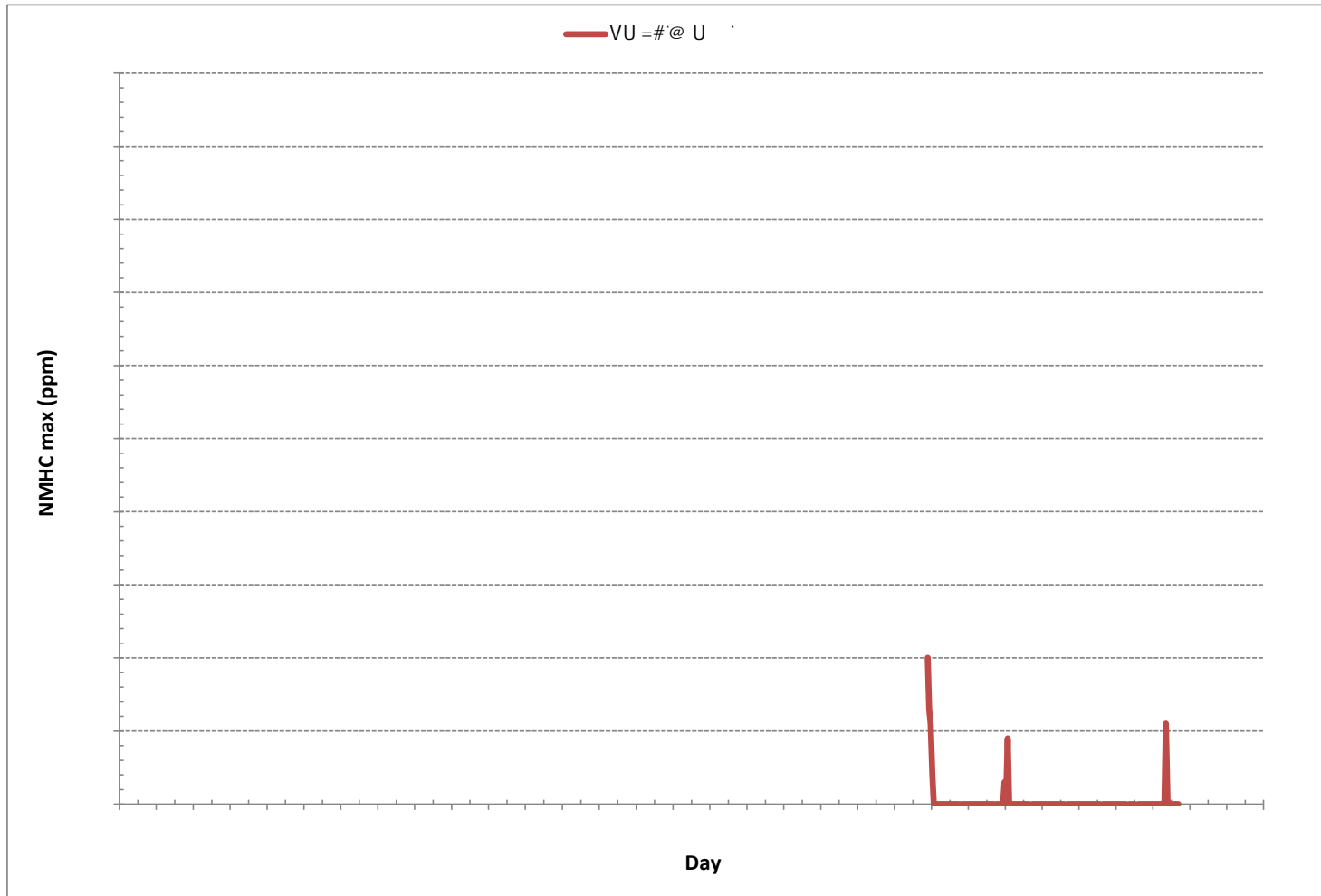
TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



METHANE MAX Instantaneous Maximum (CH₄ ppm)

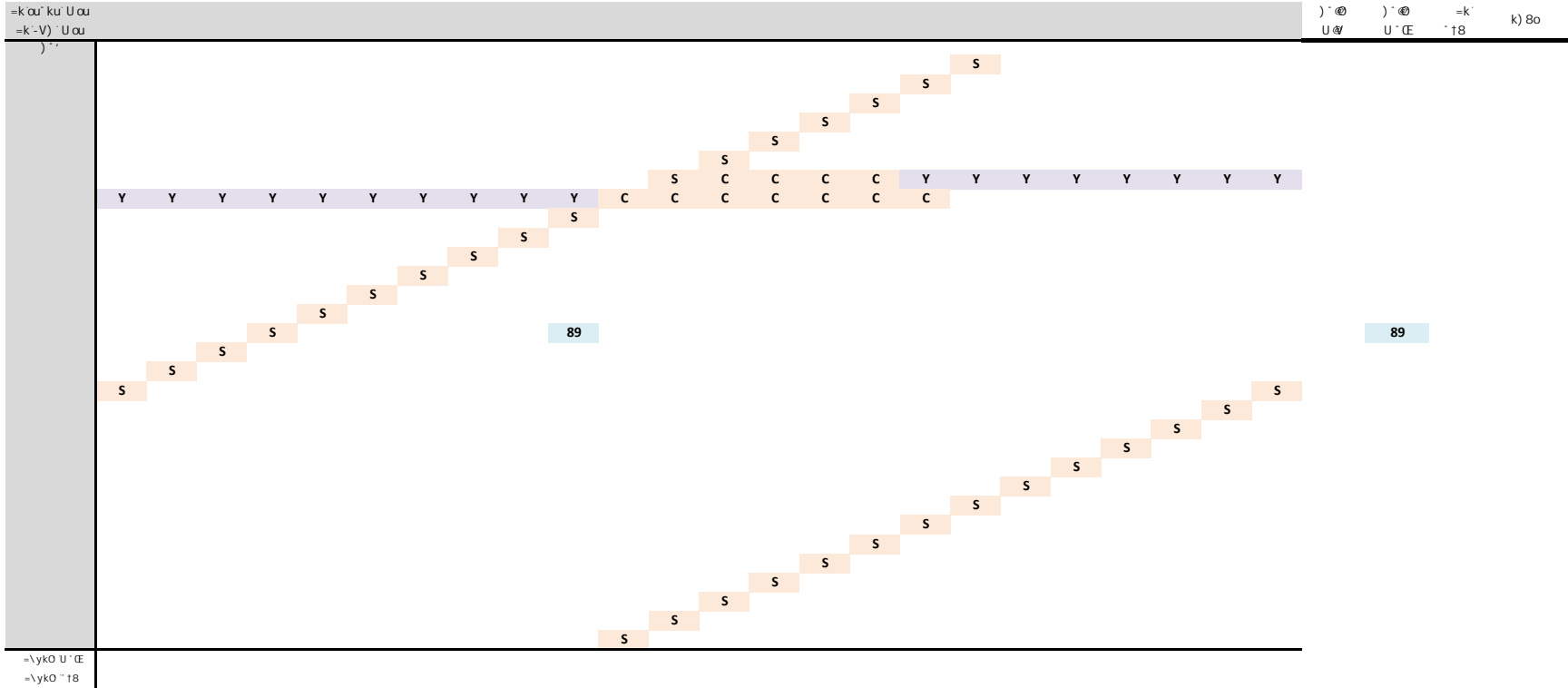


NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



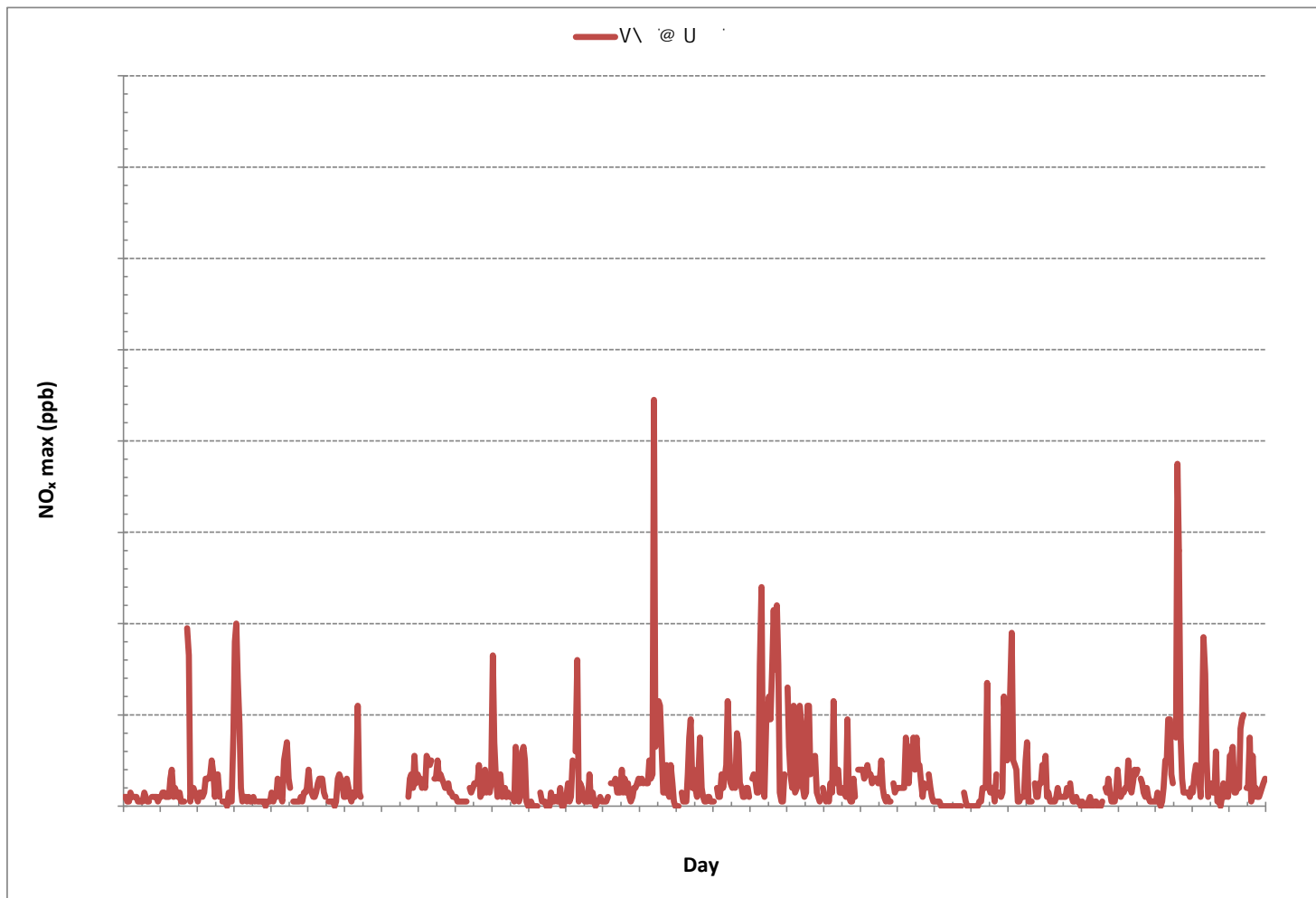
STATUS FLAG CODES

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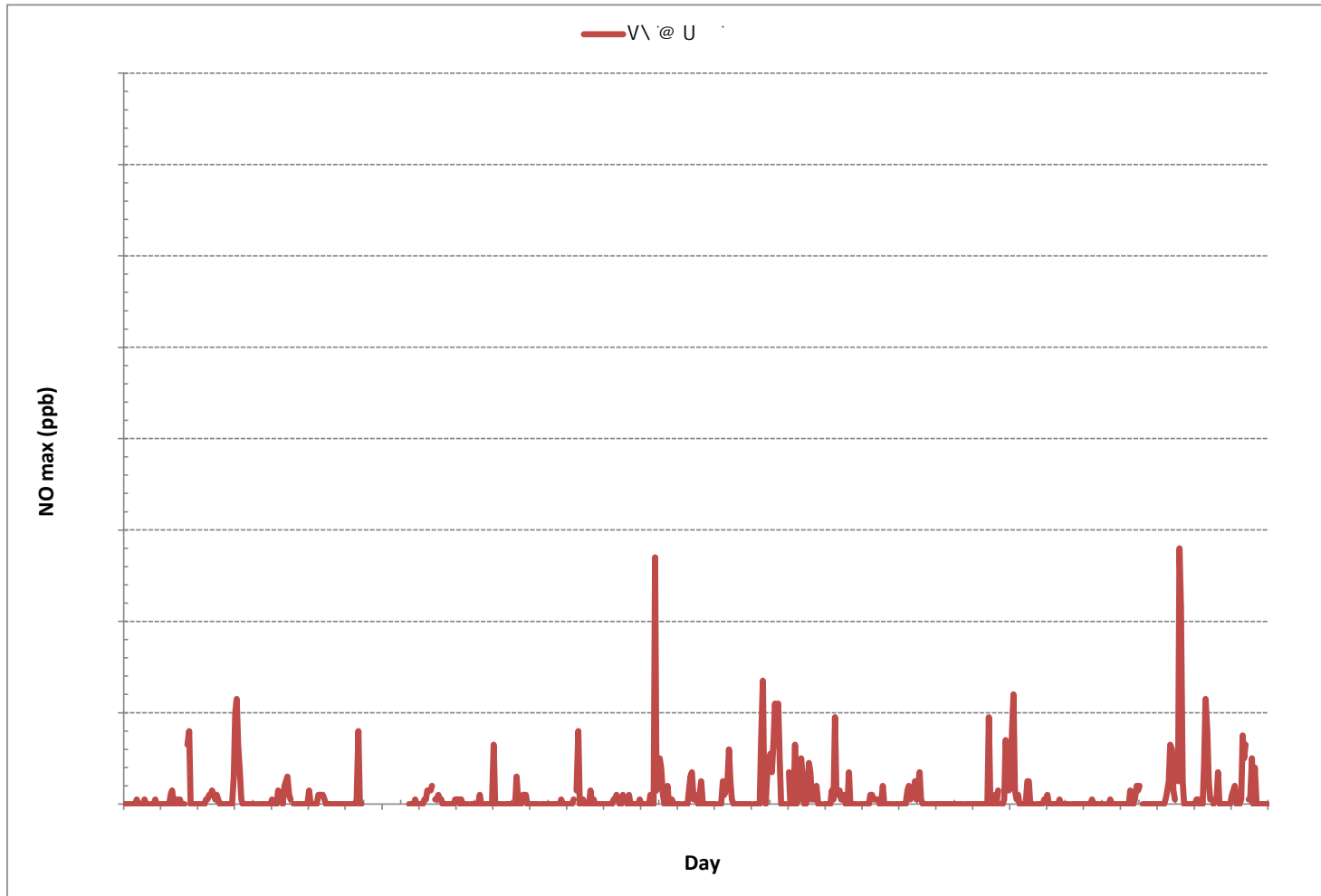
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OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

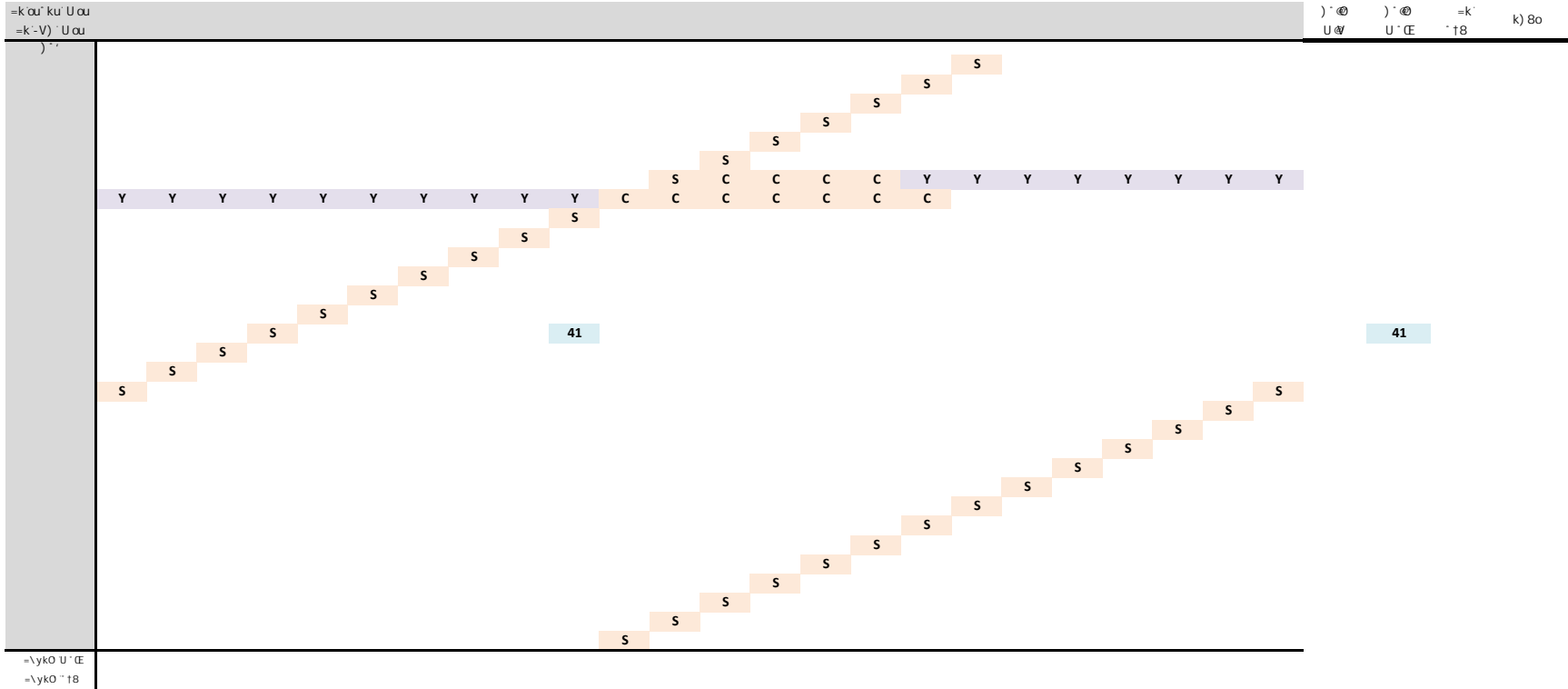


NITRIC OXIDE Instantaneous Maximum (NO ppb)





NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



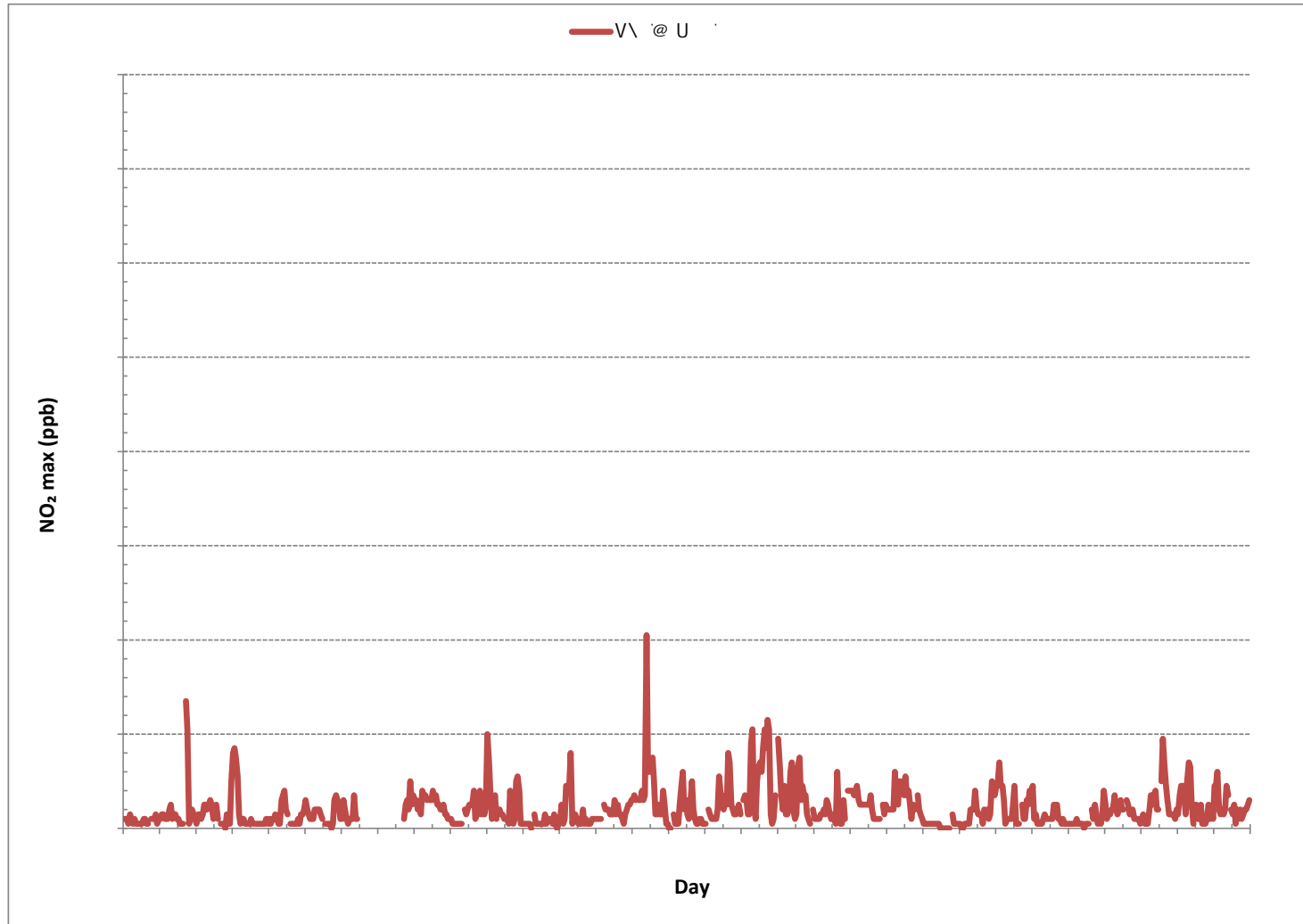
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MONTHLY SUMMARY

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NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





WIND SPEED Instantaneous Maximum (WS kph)

Time	WS (kph)	Direction
08:00	22.5	180
08:15	22.5	180
08:30	13.2	180

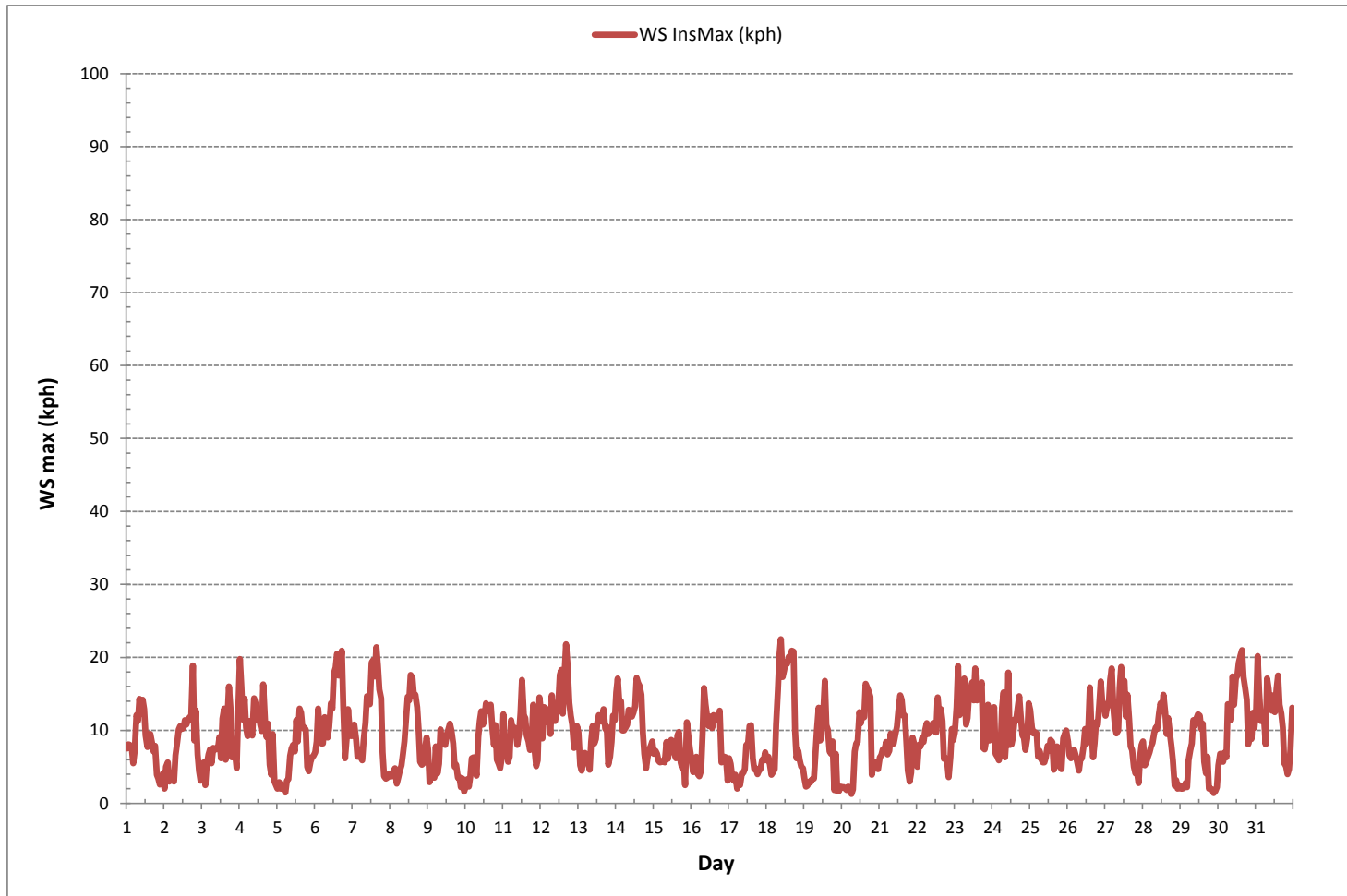
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MONTHLY SUMMARY

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WIND SPEED Instantaneous Maximum (WS kph)



***APPENDIX IV
EXCEEDANCE REPORT***



Exceedance Report

PM_{2.5} 1-Hour Exceedances

Date	Time	LICA - MASKWA	LICA - MASKWA	LICA - MASKWA	LICA - MASKWA
		PM _{2.5}	WDR	WSP	ESRD Reference #
		ug/m ³	degrees	kph	
2018/08/09	16:00	85	222	3.2	342180
2018/08/09	17:00	86	199	3	342180
2018/08/09	18:00	82	169	2.9	342180
2018/08/10	07:00	113	43	2.8	342279
2018/08/10	20:00	97	12	3.6	342279
2018/08/10	21:00	107	4	1.9	342279
2018/08/10	22:00	109	20	2	342279
2018/08/10	23:00	102	1	1.7	342279
2018/08/11	00:00	88	207	2.4	342305
2018/08/11	01:00	83	42	1.1	342305
2018/08/15	05:00	89	204	4.5	342508
2018/08/15	06:00	83	209	4.7	342508
2018/08/15	07:00	101	216	4.2	342508
2018/08/15	08:00	120	237	3.2	342508
2018/08/15	09:00	131	244	3.1	342508
2018/08/15	10:00	119	268	2.9	342508
2018/08/15	11:00	105	313	3.4	342508
2018/08/15	12:00	97	307	3	342508
2018/08/15	13:00	81	314	2.8	342508
2018/08/17	08:00	89	219	2.1	342736
2018/08/17	14:00	99	269	2.9	342736
2018/08/17	16:00	101	217	1.9	342736
2018/08/17	17:00	104	213	2.7	342736
2018/08/17	18:00	115	209	3.1	342736
2018/08/17	19:00	103	208	3.6	342736
2018/08/17	20:00	100	212	3.7	342736
2018/08/17	21:00	105	216	4.5	342736
2018/08/17	22:00	91	218	3.2	342736
2018/08/17	23:00	111	242	2.1	342736
2018/08/18	00:00	144	224	2.9	342801
2018/08/18	01:00	161	213	4.3	342801
2018/08/18	02:00	146	211	4.1	342801
2018/08/18	03:00	150	209	3.4	342801
2018/08/18	04:00	162	209	3.5	342801
2018/08/18	05:00	164	222	3	342801
2018/08/18	06:00	169	274	3.9	342801
2018/08/18	07:00	138	310	6.7	342801
2018/08/18	08:00	81	350	9.3	342801
2018/08/20	07:00	81	40	1.1	342925
2018/08/22	14:00	119	230	6	342925
2018/08/22	15:00	115	244	4.4	342925
2018/08/22	16:00	116	242	3.6	342925
2018/08/22	17:00	150	219	3.9	342925
2018/08/22	18:00	134	216	4.1	342925
2018/08/22	19:00	117	217	3.3	342925
2018/08/22	20:00	102	207	2.4	342925
2018/08/22	21:00	94	48	2.2	342925
2018/08/22	22:00	84	50	3.5	342925



Exceedance Report

PM_{2.5} 24-Hour Exceedances

Date	Time	LICA - MASKWA	LICA - MASKWA	LICA - MASKWA	LICA - MASKWA
		PM _{2.5}	WDR	WSP	ESRD Reference #
		ug/m ³	degrees	kph	
2018/08/08	00:00	38	221	4	342067
2018/08/09	00:00	51	207	2.8	342180
2018/08/10	00:00	58	222	0.9	342279
2018/08/11	00:00	31	19	4.1	342305
2018/08/15	00:00	75	241	1.8	342508
2018/08/17	00:00	61	212	2.1	342736
2018/08/18	00:00	61	297	3.9	342801
2018/08/22	00:00	62	214	4.3	342925

APPENDIX V
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION	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?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Name of External Person Certifying the Report	Position / Title of External Person Certifying the Report
Wunmi Adeganmbi	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

26-Sep-2018

Report Issued Date (dd-mon-yyyy)

APPENDIX VI
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-08-30-C</u>
Site: <u>Maskwa Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghaleb</u>	Date <u>18-Sep-2018</u>
Level 1 Primary Validation	<u>Maram Ghaleb</u>	Date <u>25-Sep-2018</u>
Level 2 Final Validation	<u>Maram Ghaleb</u>	Date <u>26-Sep-2018</u>
Level 3 Independent Data Review	<u>CSA/mbq</u>	Date <u>26-Sep-2018</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

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

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

October 11, 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 August 2018.

The air monitoring program consists of continuous air monitoring results for Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

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

All data collected in August 2018 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016), except PM_{2.5}.

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement systems. The CH₄/NMHC channel operational uptime was 25.5%. Monitoring activity for these two channels commenced on August 23. The monthly data completeness criteria was not applicable in the August monitoring period.

Non-Conformance: Sixty-seven 1-hr and twelve 24-hr contraventions were recorded for PM_{2.5} in August. AEP reference number 342280, 342306, 342510, 342599, 342734, 342802 and 343013 for 1-Hour contraventions recorded on August 10, August 11, August 15, August 16, August 17, August 18 and August 22-23, respectively. AEP reference number 342066, 342181, 342280, 342306, 342509, 342510, 342599, 342734, 342802 and 343013 for 24-Hour contraventions recorded on August 8, August 9, August 10, August 11, August 14, August 15, August 16, August 17, August 18, August 21- 23, respectively. High concentration of PM_{2.5} was resulted from a forest fire event.

SO₂: An analyzer upgrade was implemented this month. Following a successful shut-down calibration on August 14, the LICA-owned resident analyzer, API 100E (s/n: 468), was replaced with another LICA analyzer, Thermo 431-TLE (s/n: 1180930030). A successful installation calibration was completed on August 15.

H₂S: An analyzer upgrade was implemented this month. The LICA-owned resident analyzer, API 101E (s/n: 509), analyzer was replaced with another LICA analyzer, Thermo 450i (s/n: CM18010058) on August 1. A successful installation calibration was completed on August 2.

THC/CH4/NMHC: An analyzer upgrade was implemented this month. Following a successful shut-down calibration on August 23, the Maxxam-owned Thermo 51i analyzer (s/n: 925436893), was replaced with a LICA analyzer, Thermo 55i (s/n: 1180930025). A successful installation calibration was subsequently completed.

NOx/NO/NO2: An analyzer upgrade was implemented this month. Following a successful shut-down calibration on August 14, the LICA-owned resident analyzer, API 200E (s/n: 594), was replaced with another LICA analyzer, Thermo 42i (s/n: 1180930029). A successful installation calibration was completed on August 15.

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,



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



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

JOB #: 2833-2018-08-31-C

August 2018

Prepared for:

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

Attention: MIKE BISAGA

DATE: **September 29, 2018**

Prepared by: *Maram Ghaleb*

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

Reviewed by: *Wunmi Adekanmbi*

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

SUMMARY

In August 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, with the exception of PM_{2.5}, was compliant with the requirements outlined in the AMD, 2016.

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement. The CH₄/NMHC channel operational uptime was 25.5%. Monitoring activity for these two channels commenced on August 23. The monthly data completeness criteria was not applicable in the August monitoring period.

Non-Conformance: Sixty-seven 1-hr and twelve 24-hr contraventions were recorded for PM_{2.5} this month. Details of the exceedances are recorded in Appendix IV.

Analyzer upgrade: All gas analyzers, except Ozone, were replaced this month as part of a planned station upgrade by LICA. Downtime ranging from five to twenty hours were recorded across gas parameters due to this event.

SO₂: One hour of downtime was recorded on August 12 at hour 07:00 due to an additional zero-span check performed to assess a biased high drift in span response.

H₂S:

- A repeat calibration was performed on August 23 to correct a biased high zero drift, resulting in 6 hours of downtime.
- Two hours of downtime were recorded on August 30 at hours 08:00 - 09:00, due to an additional zero-span check performed to assess a biased high drift in span response.

THC/CH₄/NMHC:

- The analyzer flamed out on August 24 and was relit by its intrinsic automatic re-ignition feature. Four hours of downtime were incurred at hours 05:00 - 08:00 due to this event.
- Six hours of downtime were incurred between August 28 and August 29 due to corrective actions performed to address drifts in zero and span response.

O₃: Three hours of downtime were incurred due to the additional zero-span checks performed between August 10 and August 13 to assess a biased high drift in span response.

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						MAXIMUM VALUES							OPERATIONAL TIME (%)
St. Lina Continuous Monitoring Station						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO ₂ (ppb)	172	48	0	0	0	5	14	8	11.9	SW	2	14	97.2
H ₂ S (ppb)	10	3	0	0	0	3	9	7	4.2	SW	1	8	96.9
THC (ppm)	-	-	-	-	2.22	2.94	10	6	10.6	S	2.53	17	98.0
CH ₄ (ppm)	-	-	-	-	2.01	2.54	31	19	6.1	SW	2.08	23	25.5
NMHC (ppm)	-	-	-	-	0.00	0.01	26	14	13.0	W	0.00	23	25.5
NO ₂ (ppb)	159	-	0	-	1	6	8	19	6.9	SW	3	22	97.7
NO (ppb)	-	-	-	-	0	3	29	10	6.7	SW	1	29	97.7
NO _x (ppb)	-	-	-	-	2	7	8	19	6.9	SW	3	15	97.7
O ₃ (ppb)	82	-	0	-	24.1	60.1	9	15	3.8	SW	40.0	10	99.6
PM _{2.5} (µg/m ³)	80	30	67	12	29	203	18	5	13.6	W	102	15	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	72	99	2	5	6.3	NW	96	12	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	930	944	20	9	5.7	W	942	20	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	15.2	31.4	9	15	3.8	SW	24.0	10	100.0
PRECIPITATION (mm)	-	-	-	-	65.7	10.9	24	5	3.5	N	21.5	24	100.0
VECTOR WS (kph)	-	-	-	-	4.4	28.1	6	14	-	W	13.3	30	100.0
VECTOR WD (sec)	-	-	-	-	266 (W)	-	-	-	-	-	-	-	100.0

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

H₂S 1-Hour Exceedances

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

H₂S 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

PM_{2.5} 1-Hour Exceedances

Sixty-seven 1-hour exceedances were recorded this month.

PM_{2.5} 24-Hour Exceedances

Twelve 24-hour exceedances were recorded this month.

O₃ 1-Hour Exceedances

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

In accordance with EPEA and the Substance Release Regulation.

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

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Methane (CH₄), Non-Methane Hydrocarbon (NMHC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), 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 (SO₂)

- Operational time for the monitoring period was 97.2%, equivalent to 21 hours of downtime.
- The analyzer spanned towards the upper acceptance limit on August 10. Subsequent scheduled and repeat zero-span checks conducted between August 11 and August 13 yielded similar results. As the span results were within acceptance limits and the analyzer was already scheduled to be removed, no further action was taken. One hour of downtime was recorded due to an additional zero-span check triggered on August 12 at hour 07:00.
- An analyzer upgrade was implemented this month. Following a successful shut-down calibration on August 14, the LICA-owned resident analyzer, API 100E (s/n: 468), was replaced with another LICA analyzer, Thermo 43I-TLE (s/n: 1180930030). The analyzer was allowed time to stabilize overnight and a successful installation calibration was completed on August 15. Twenty hours of downtime were incurred due to this event.
- The permeation tube was replaced on August 15. As the permeation tube required additional time to stabilize, the expected span value was re-adjusted on August 17 with a more representative concentration.

HYDROGEN SULPHIDE (H₂S)

- Operational time for the monitoring period was 96.9%, equivalent to 23 hours of downtime.
- The analyzer began to exhibit a biased high span drift towards the end of July. The daily zero-span check of August 1 yielded results outside the upper acceptance limit. This prompted an immediate site visit where the analyzer was removed, following a successful shut-down calibration, as part of the planned upgrade. As the shut-down calibration met AMD requirements, no data was discarded due to this event.
- An analyzer upgrade was implemented this month. The LICA-owned resident analyzer, API 101E (s/n: 509), analyzer was replaced with another LICA analyzer, Thermo 450i (s/n: CM18010058). The analyzer was allowed time to stabilize overnight and a successful installation calibration was completed on August 2. Expected span value was subsequently updated following the first daily zero-span check on August 3. Fifteen hours of downtime were incurred due to this event.
- Towards mid-month, the analyzer began to exhibit a biased high zero drift. A repeat calibration was performed on August 23 as a corrective measure, incurring 6 hours of downtime. As the calibration met AMD requirements, no data were discarded due to this event.
- The analyzer spanned close to the upper acceptance limit on August 29. Subsequent scheduled and repeat zero-span checks yielded similar results. As the span results were within acceptance limits, span response was closely monitored for the rest of the month. No further issues were identified. Two hours of downtime were recorded due to an additional zero-span check triggered on August 30 at hours 08:00 - 09:00.

TOTAL HYDROCARBONS (THC), METHANE (CH₄) and NON-METHANE HYDROCARBONS (NMHC)

- Operational time for the monitoring period was 98.0%, equivalent to 15 hours of downtime. The CH₄/NMHC channel operational uptime was 25.5%. Monitoring activity for these two channels commenced on August 23. The monthly data completeness criteria was not applicable in the August monitoring period.
- An analyzer upgrade was implemented this month. Following a successful shut-down calibration on August 23, the Maxxam-owned Thermo 51i analyzer (s/n: 925436893), was replaced with a LICA analyzer, Thermo 55i (s/n: 1180930025). A successful installation calibration was subsequently completed. Five hours of downtime were incurred due to this event.
- In addition to THC, the Thermo 55i analyzes CH₄ and NMHC. Monitoring activity for these channels commenced following the installation calibration on August 23.
- The analyzer flamed out on August 24 and was relit by the analyzer's intrinsic automatic re-ignition feature. Four hours of downtime were incurred at hours 05:00 - 08:00 due to this event.
- The analyzer exhibited span drifts and unstable zero responses following its installation on August 23. As corrective actions, an additional zero-span check was performed on August 28 at hour 14:00 and a successful repeat calibration was completed on August 29. The orifice of the zero-span check valve was replaced and the zero-span regulators were adjusted during this site visit. Six hours of downtime were incurred due to the corrective actions performed around this event.
- The as-left calibrator zero obtained during the installation calibration on August 23 was applied for baseline correction to data collected from hour 19:00 on August 23 to hour 10:00 on August 29.

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

- Operational time for the monitoring period was 97.7%, equivalent to 17 hours of downtime.
- An analyzer upgrade was implemented this month. Following a successful shut-down calibration on August 14, the LICA-owned resident analyzer, API 200E (s/n: 594), was replaced with another LICA analyzer, Thermo 42i (s/n: 1180930029). The analyzer was allowed time to stabilize overnight and a successful installation calibration was completed on August 15. The expected span value was updated following the calibration. Seventeen hours of downtime were incurred due to this event.
- The permeation tube was replaced on August 15. As the permeation tube required additional time to stabilize, the expected span value was re-adjusted on August 17 with a more representative concentration.

OZONE (O₃)

- Operational time for the monitoring period was 99.6%, equivalent to 3 hours of downtime.
- The analyzer began to exhibit a biased high span drift on August 9. Three additional zero-span checks triggered on August 10 at hour 09:00, August 12 at hour 07:00, and August 13 at hour 11:00, confirmed the drift. As the span results were within acceptance limits, span response was closely monitored until August 15, when a successful routine monthly calibration was completed. The zero-span pump was repaired during this site visit. No further issues were identified.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time for the monitoring period was 100%.
- The quarterly audit/calibration was performed on August 28. The results met AMD requirements.
- There were sixty-seven 1-hr and twelve 24-hr contraventions recorded this month. Details of the exceedances are recorded in Appendix IV.

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

- Operational time for the monitoring period was 100%.
- One instance of maximum instantaneous data was invalidated on August 8 at hour 07:00, due to an anomalous spike. The corresponding anomalous minute data were discarded and the hourly average was recalculated.
- 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 100%.

BAROMETRIC PRESSURE (BP)

- Operational time for the monitoring period was 100%.

PRECIPITATION (PRECIP)

- 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 technicians were Alexander Yakupov and Limin Li.

3.0 Plant Monthly Required AMD Summary

All data collected this month, with the exception of $PM_{2.5}$, was compliant with the requirements outlined in the AMD, 2016.

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

Non-Conformance: Sixty-seven 1-hr and twelve 24-hr contraventions were recorded for $PM_{2.5}$ this month. Details of the exceedances are recorded in Appendix IV.

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
- MET One Instruments: Operation Manual Document No. 50.5-9800
- Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E & Thermo 43I-TLE UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E & Thermo 450i UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51i FID Analyzer
- Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
- Oxides of Nitrogen - API 200E & 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 - RM Young Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - RM Young 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

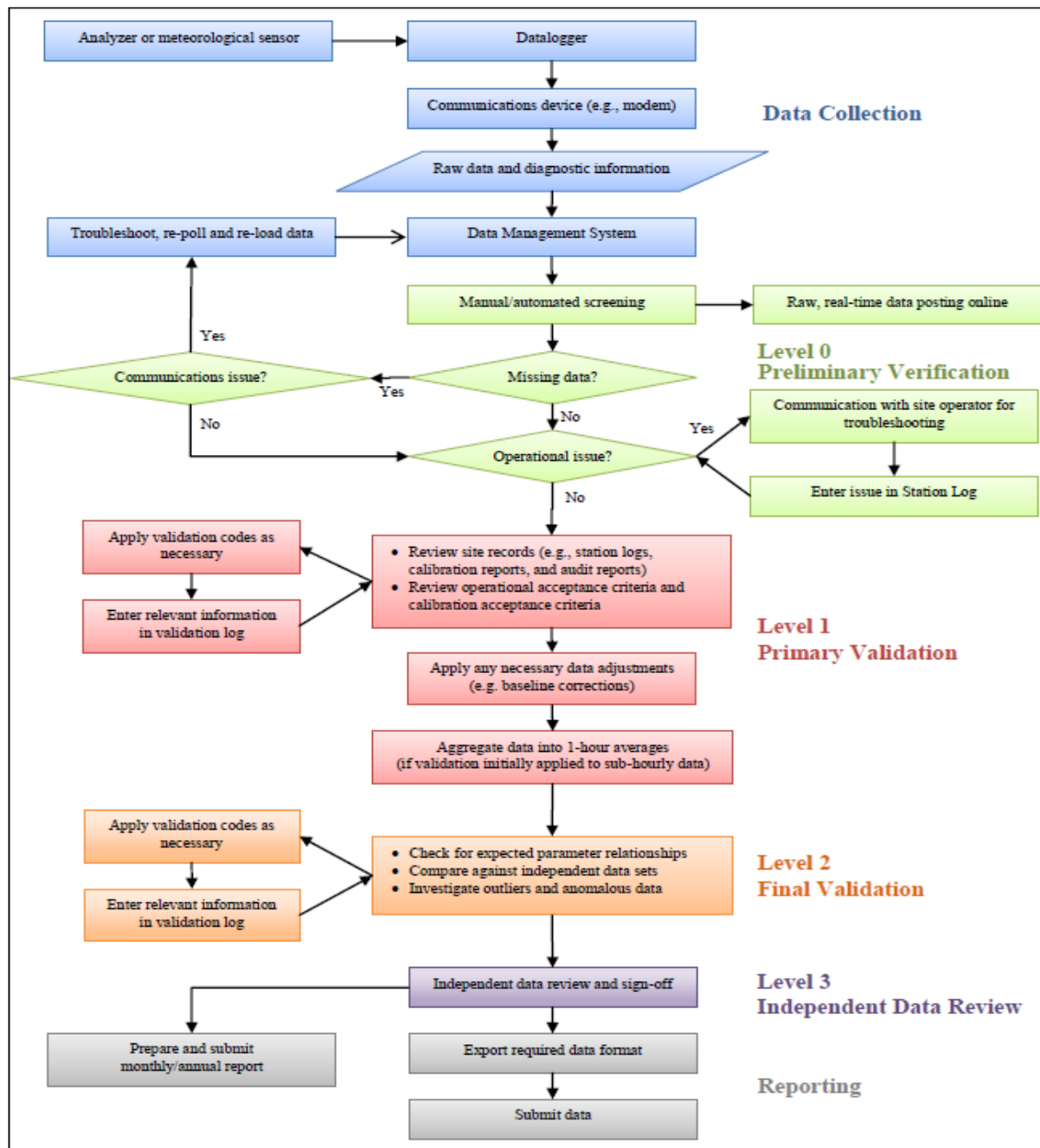
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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 (SO₂ ppb)

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

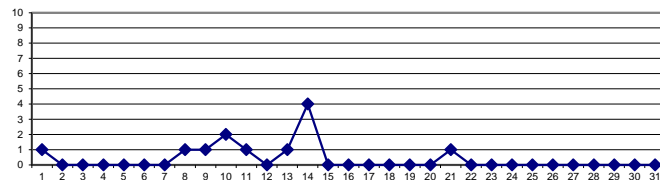
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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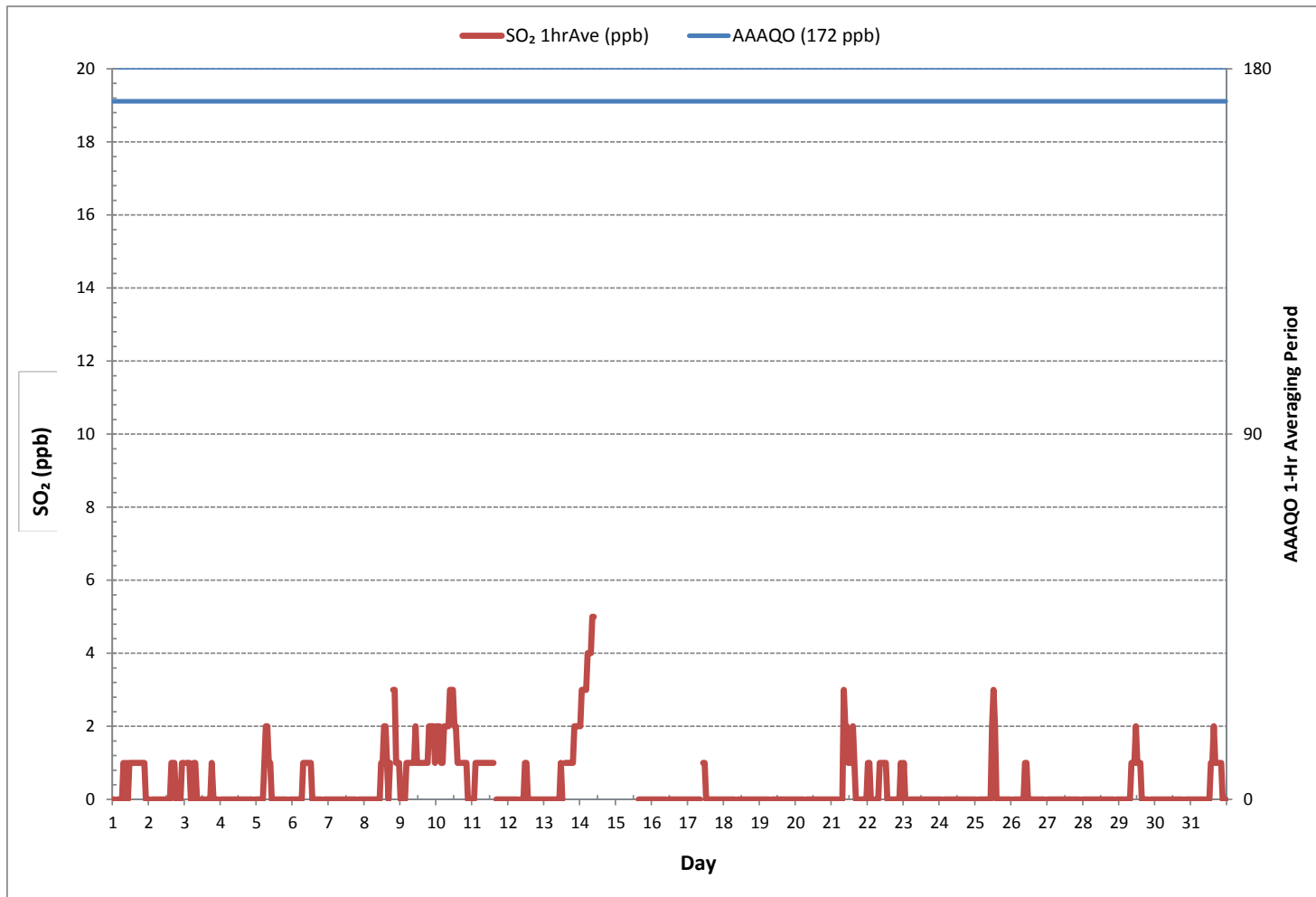
24 HR AVERAGES August 2018



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	159
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1
MAXIMUM 1-HR AVERAGE:	5 ppb @ HOUR ON DAY 14
MAXIMUM 24-HR AVERAGE:	2 ppb ON DAY 14
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	9 hrs
OPERATIONAL TIME:	723 hrs
AMD OPERATION UPTIME:	97.2 %
STANDARD DEVIATION:	1
MONTHLY AVERAGE:	0 ppb

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-SO2[ppb]
 Monthly: 18/08
 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	11.1	0.0	0.0	0.0	0.0	0.0	11.1
NE	7.3	0.0	0.0	0.0	0.0	0.0	7.3
E	5.4	0.3	0.0	0.0	0.0	0.0	5.7
SE	2.2	1.0	0.0	0.0	0.0	0.0	3.2
S	7.5	1.8	0.7	0.0	0.0	0.0	10.0
SW	18.5	2.8	1.0	0.3	0.3	0.0	22.8
W	25.3	0.9	0.2	0.0	0.0	0.0	26.4
NW	13.2	0.3	0.0	0.0	0.0	0.0	13.5
Summary	90.5	7.0	1.9	0.3	0.3	0.0	100.0

% Icon Classes (ppb)

91  0.0-1.2

7  1.2-2.4

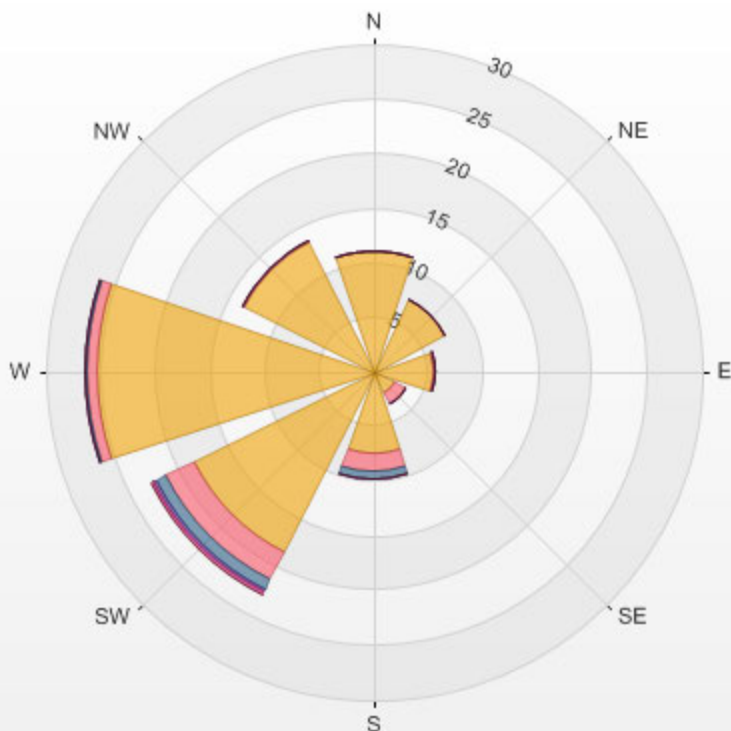
2  2.4-3.6

0  3.6-4.8

0  4.8-6.0

0  >6.0

LICA ST. LINA Poll.: LICA ST. LINA-SO₂[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



SO2[ppb] Calibration: LICA ST. LINA Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

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

STATUS FLAG CODES

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

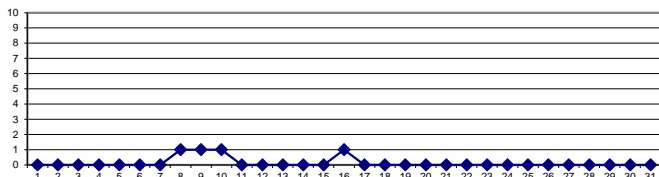
OBJECTIVE LIMIT:

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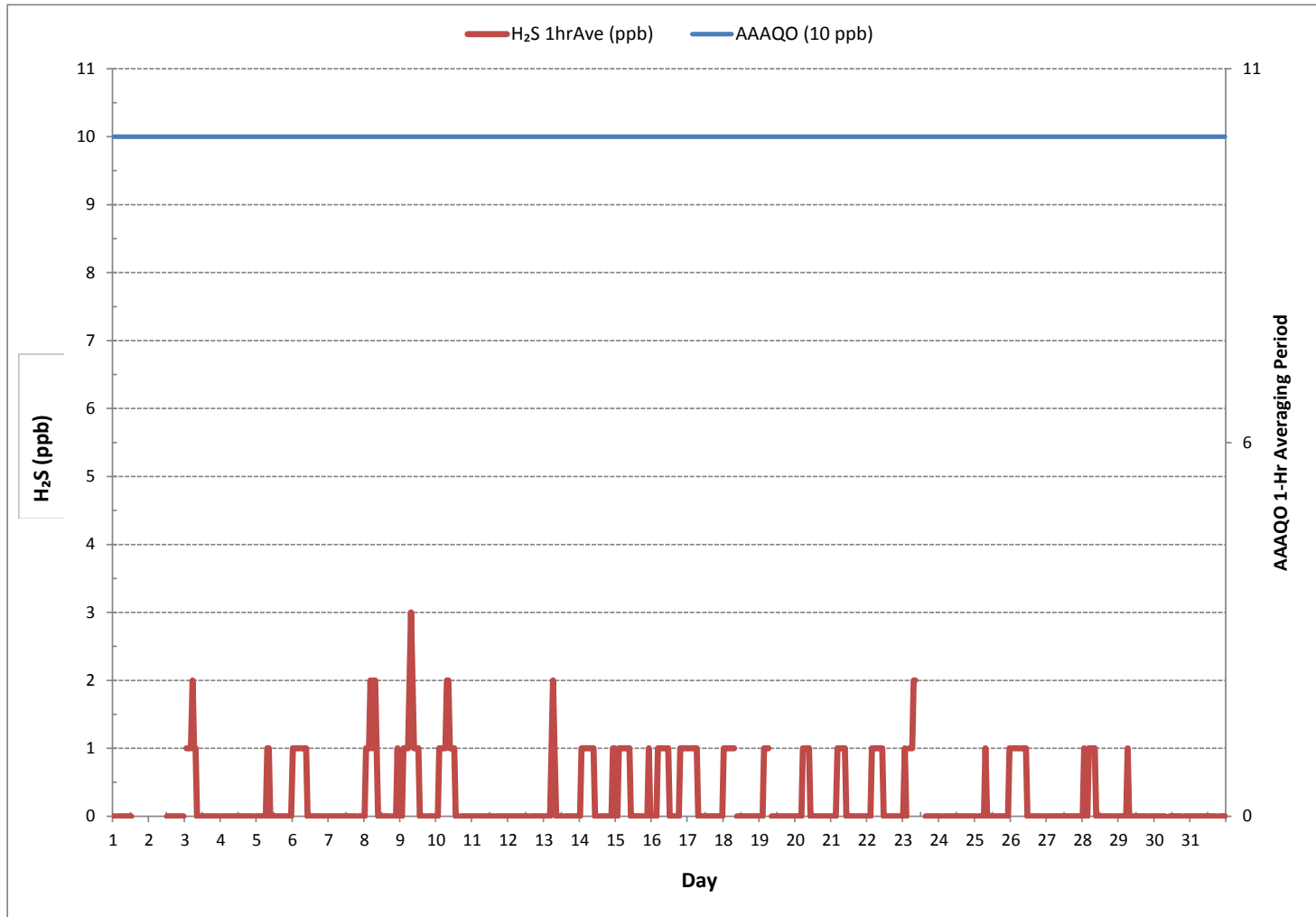
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	145				
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	3 ppb @ HOUR	7	ON DAY	9	
MAXIMUM 24-HR AVERAGE:	1 ppb		ON DAY	8	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	721	hrs
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	96.9	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

24 HR AVERAGES August 2018



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



% Icon Classes (ppb)

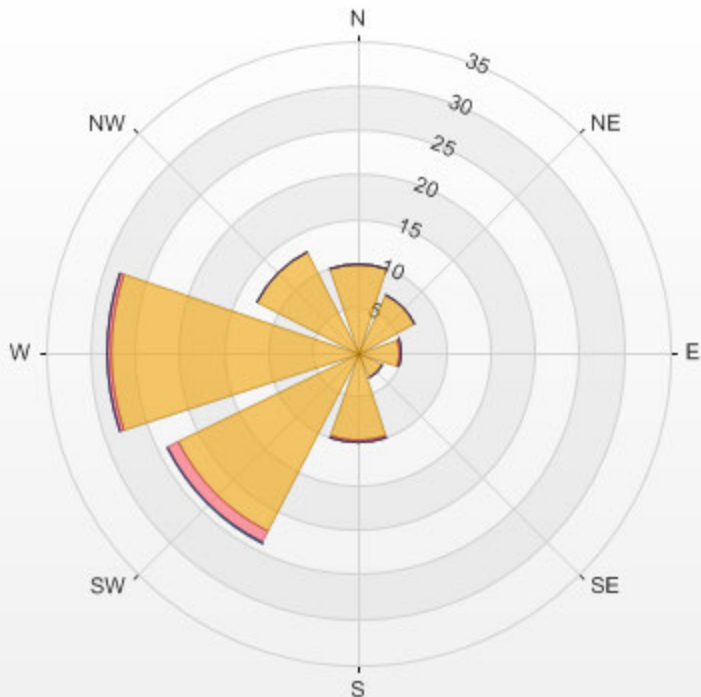
98  0.0-1.3

2  1.3-2.7

0  2.7-4.0

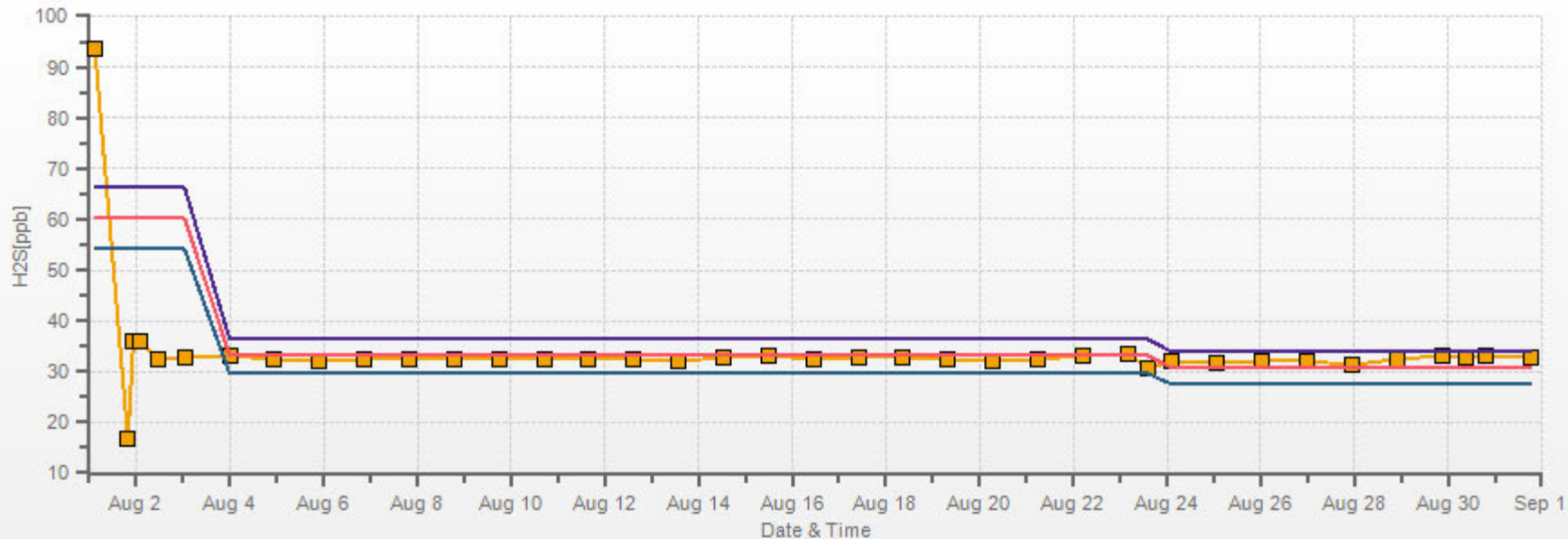
0  >4.0

LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



H2S[ppb] Calibration: LICA ST. LINA Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL HYDROCARBON



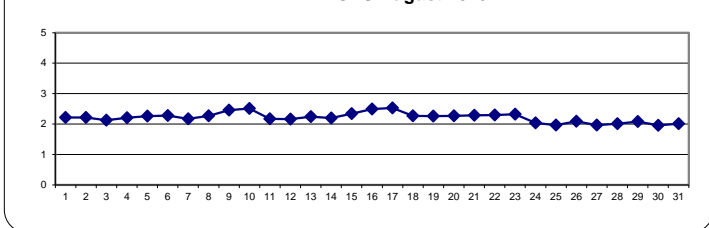
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.19	2.17	S	2.15	2.16	2.20	2.23	2.24	2.24	2.19	2.18	2.22	2.19	2.22	2.19	2.19	2.23	2.24	2.25	2.27	2.30	2.25	2.28	2.27	2.15	2.30	2.22	24	
2	2.31	S	2.35	2.40	2.55	2.50	2.49	2.45	2.40	2.32	2.28	2.19	2.12	2.07	2.08	2.06	2.04	2.04	2.01	2.05	2.04	2.07	2.07	2.08	2.01	2.55	2.22	24	
3	S	2.12	2.17	2.20	2.22	2.25	2.25	2.18	2.14	2.08	2.06	2.07	2.06	2.08	2.09	2.08	2.08	2.08	2.09	2.09	2.14	2.09	2.18	S	2.06	2.25	2.13	24	
4	2.16	2.11	2.15	2.17	2.18	2.14	2.15	2.16	2.18	2.28	2.31	2.31	2.26	2.22	2.28	2.16	2.19	2.12	2.22	2.43	2.17	2.18	S	2.22	2.11	2.43	2.21	24	
5	2.26	2.25	2.18	2.23	2.37	2.45	2.37	2.35	2.38	2.29	2.26	2.19	2.17	2.18	2.20	2.21	2.16	2.18	2.21	2.21	2.25	S	2.28	2.32	2.16	2.45	2.26	24	
6	2.29	2.32	2.38	2.35	2.37	2.40	2.38	2.37	2.42	2.34	2.28	2.28	2.21	2.16	2.13	2.18	2.18	2.20	2.20	2.21	S	2.25	2.32	2.28	2.13	2.42	2.28	24	
7	2.20	2.17	2.16	2.15	2.21	2.17	2.20	2.19	2.19	2.18	2.15	2.12	2.07	2.09	2.10	2.10	2.17	2.15	2.09	S	2.18	2.24	2.42	2.20	2.07	2.42	2.17	24	
8	2.19	2.27	2.25	2.27	2.29	2.23	2.27	2.34	2.29	2.26	2.21	2.19	2.19	2.17	2.18	2.18	2.20	2.21	S	2.30	2.35	2.39	2.45	2.43	2.17	2.45	2.27	24	
9	2.45	2.36	2.33	2.35	2.43	2.48	2.58	2.60	2.55	2.54	2.49	2.48	2.44	2.37	2.33	2.34	2.38	S	2.38	2.59	2.53	2.37	2.49	2.64	2.33	2.64	2.46	24	
10	2.69	2.65	2.82	2.70	2.73	2.86	2.94	2.72	2.50	2.49	2.49	2.47	2.45	2.45	2.46	2.43	S	2.32	2.35	2.38	2.28	2.19	2.17	2.18	2.17	2.94	2.51	24	
11	2.15	2.22	2.38	2.29	2.29	2.27	2.21	2.24	2.42	2.16	2.15	2.17	2.07	2.18	2.10	S	2.06	2.05	2.05	2.06	2.15	2.12	2.11	2.12	2.05	2.42	2.17	24	
12	2.15	2.17	2.12	2.15	2.13	2.19	2.18	2.16	2.16	2.14	2.20	2.15	2.16	2.17	S	2.12	2.14	2.09	2.14	2.14	2.21	2.20	2.21	2.22	2.09	2.22	2.16	24	
13	2.24	2.28	2.30	2.28	2.49	2.38	2.32	2.25	2.18	2.17	2.14	2.15	2.20	S	2.16	2.15	2.18	2.18	2.15	2.17	2.26	2.33	2.24	2.21	2.14	2.49	2.24	24	
14	2.19	2.23	2.23	2.22	2.24	2.27	2.28	2.26	2.26	2.28	2.20	2.23	S	2.12	2.11	2.17	2.13	2.17	2.14	2.16	2.18	2.19	2.20	2.22	2.11	2.28	2.20	24	
15	2.18	2.20	2.21	2.23	2.28	2.22	2.27	2.29	2.29	2.32	2.34	S	2.33	2.36	2.36	2.35	2.44	2.68	2.45	2.29	2.31	2.35	2.32	2.76	2.18	2.76	2.34	24	
16	2.36	2.45	2.37	2.33	2.35	2.38	2.35	2.36	2.34	2.31	S	2.36	2.43	2.47	2.47	2.51	2.61	2.69	2.67	2.66	2.69	2.67	2.75	2.67	2.31	2.75	2.49	24	
17	2.54	2.54	2.56	2.58	2.61	2.64	2.56	2.62	2.53	S	2.47	2.46	2.56	2.82	2.52	2.54	2.56	2.55	2.54	2.52	2.42	2.34	2.32	2.38	2.32	2.82	2.53	24	
18	2.52	2.46	2.47	2.42	2.37	2.39	2.42	2.41	S	2.20	2.18	2.16	2.15	2.14	2.18	2.21	2.24	2.25	2.25	2.17	2.14	2.18	2.15	2.18	2.14	2.52	2.27	24	
19	2.18	2.18	2.23	2.26	2.31	2.30	2.29	S	2.22	2.16	2.14	2.13	2.20	2.19	2.20	2.20	2.17	2.16	2.26	2.47	2.16	2.77	2.54	2.37	2.13	2.77	2.26	24	
20	2.19	2.29	2.26	2.31	2.50	2.50	S	2.46	2.42	2.38	2.19	2.17	2.19	2.24	2.21	2.20	2.20	2.16	2.16	2.16	2.18	2.21	2.37	2.31	2.16	2.50	2.27	24	
21	2.32	2.30	2.28	2.28	2.33	S	2.38	2.38	2.29	2.22	2.23	2.21	2.17	2.19	2.22	2.21	2.29	2.46	2.58	2.16	2.23	2.24	2.34	2.32	2.16	2.58	2.29	24	
22	2.28	2.30	2.27	2.24	S	2.28	2.29	2.30	2.31	2.31	2.33	2.39	2.37	2.33	2.30	2.30	2.30	2.29	2.29	2.29	2.31	2.28	2.38	2.26	2.24	2.39	2.30	24	
23	2.33	2.58	2.43	S	2.51	2.60	2.47	2.42	C	C	C	Y	Y	Y	Y	Y	C	C	C	2.06	2.08	2.08	2.10	2.13	2.06	2.60	2.32	19	
24	2.10	2.09	S	2.08	2.12	X	X	X	X	2.01	1.97	1.95	1.94	1.96	1.95	2.02	2.04	2.06	2.07	2.07	2.08	2.06	2.04	2.06	1.94	2.12	2.04	20	
25	1.99	S	1.96	2.03	1.97	1.97	1.96	2.00	1.97	1.94	1.93	1.94	1.93	1.93	1.94	1.93	1.94	1.96	1.99	2.02	2.01	2.07	2.10	1.93	2.10	1.97	24		
26	S	2.15	2.18	2.20	2.23	2.33	2.38	2.34	2.19	2.14	2.07	2.01	1.97	1.92	1.92	1.94	2.02	1.98	1.93	1.97	2.02	2.01	2.00	S	1.92	2.38	2.09	24	
27	C	1.96	1.95	1.95	1.95	1.94	1.95	1.97	1.96	1.95	1.95	1.96	1.96	1.95	1.98	1.98	1.98	1.96	1.97	1.95	1.97	2.05	S	2.10	1.94	2.10	1.97	24	
28	2.20	2.11	2.05	2.03	2.04	2.02	2.01	2.02	2.02	2.02	2.00	1.99	1.97	1.97	S1	1.97	1.95	1.94	1.92	1.95	2.01	S	2.03	2.04	1.92	2.20	2.01	23	
29	2.07	2.08	2.06	2.06	2.05	2.06	2.11	2.13	2.08	2.08	2.06	2.03	C1	C1	C1	C1	C1	1.93	2.46	2.32	S	1.98	1.99	1.96	1.93	2.46	2.08	19	
30	1.98	1.99	1.97	1.94	1.93	1.94	1.96	1.95	1.93	1.92	1.92	1.92	1.94	1.93	1.94	1.94	1.95	1.98	2.02	S	1.99	1.98	2.01	1.97	1.92	2.02	1.96	24	
31	1.97	1.97	1.99	1.97	1.97	1.99	1.99	2.00	2.00	1.98	1.96	1.96	1.97	1.97	1.96	1.96	1.97	1.97	S	2.55	2.03	2.01	2.01	2.03	1.96	2.55	2.01	24	
HOURLY MAX	2.69	2.65	2.82	2.70	2.73	2.86	2.94	2.72	2.55	2.54	2.49	2.48	2.56	2.82	2.52	2.54	2.61	2.69	2.67	2.66	2.69	2.77	2.75	2.76					
HOURLY AVG	2.24	2.24	2.24	2.23	2.27	2.29	2.28	2.28	2.25	2.20	2.18	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.21	2.23	2.20	2.21	2.24	2.24				

STATUS FLAG CODES

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

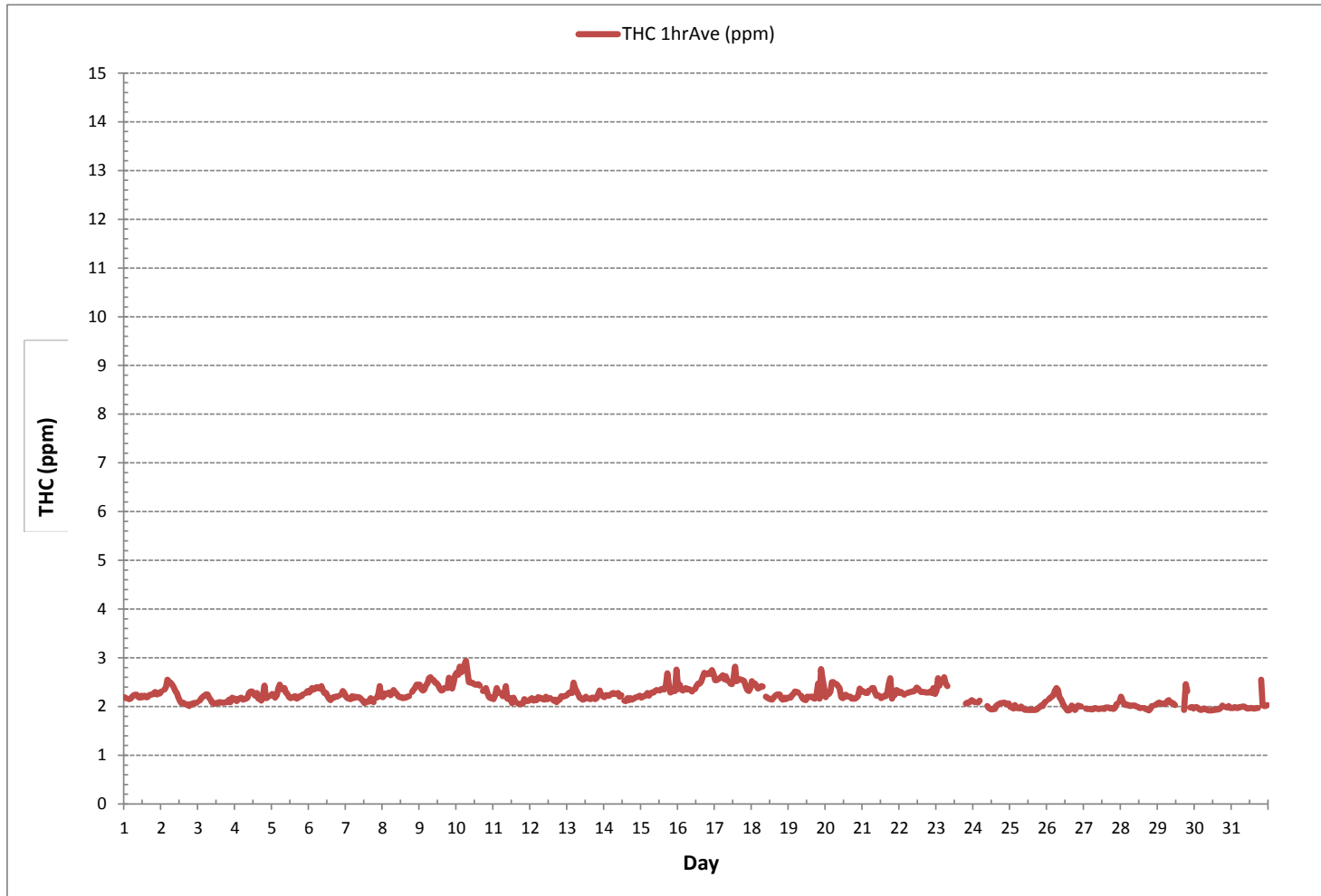
24 HR AVERAGES August 2018



MONTHLY SUMMARY

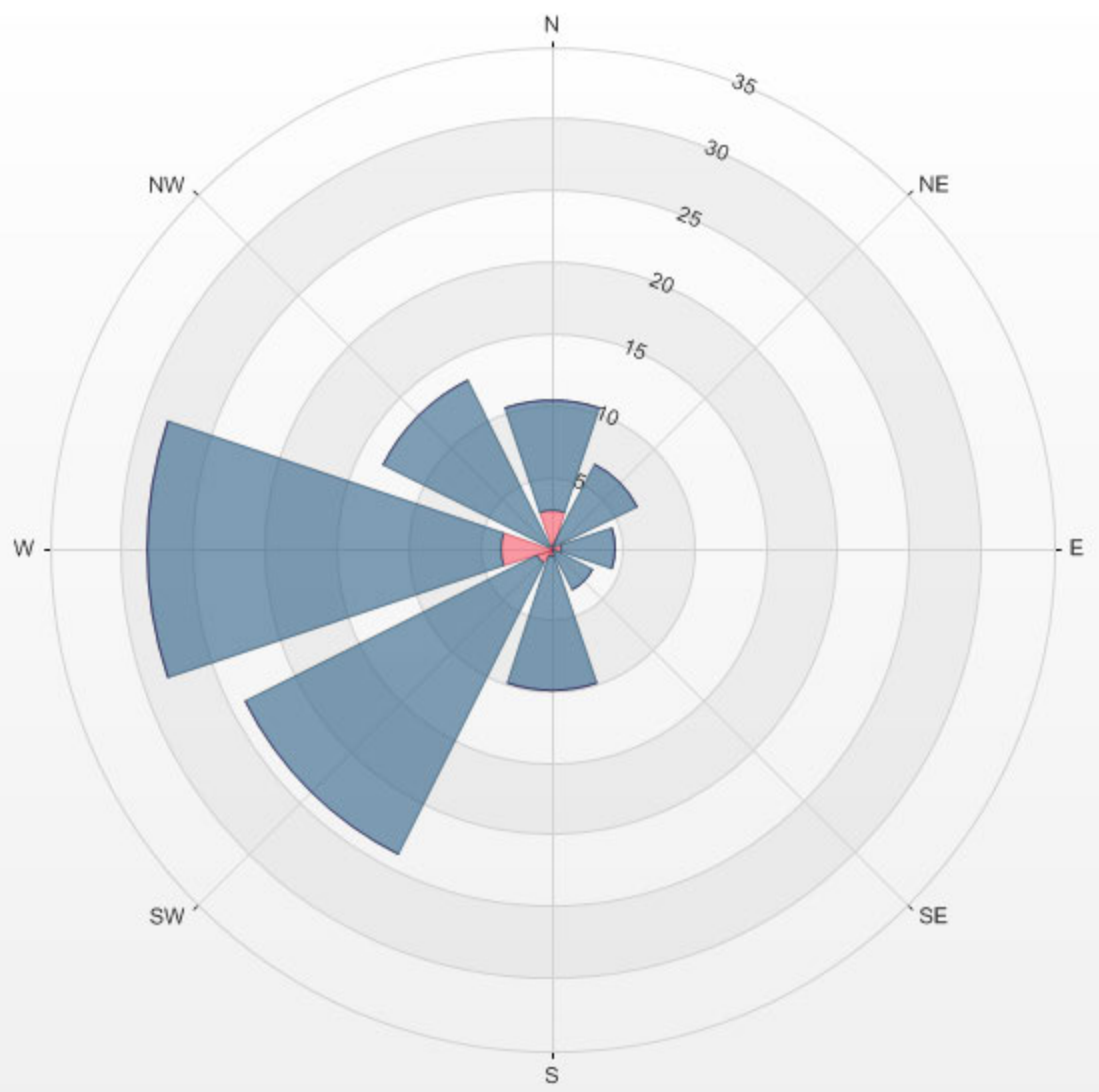
NUMBER OF NON-ZERO READINGS:	689			
MINIMUM 1-HR AVERAGE:	1.77 ppm	@ HOUR	13	ON DAY 26
MAXIMUM 1-HR AVERAGE:	2.94 ppm	@ HOUR	6	ON DAY 10
MAXIMUM 24-HR AVERAGE:	2.53 ppm			ON DAY 17
IZS CALIBRATION TIME:	33 hrs	OPERATIONAL TIME:	729 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	98.0 %	
STANDARD DEVIATION:	0.19	MONTHLY AVERAGE:	2.22 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



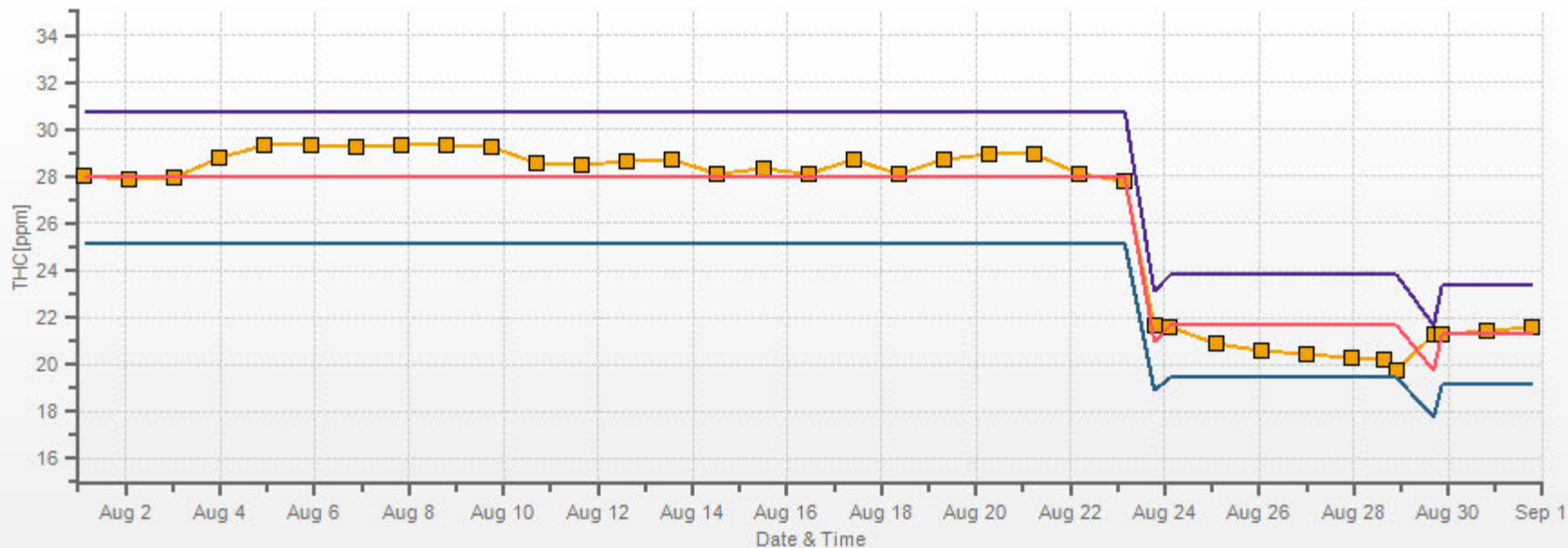
% Icon Classes (ppm) 0 0.0-1.0 9 1.0-2.0 91 2.0-3.0 0 >3.0

LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



THC[ppm] Calibration: LICA ST. LINA Monthly: 18/08 Type: Span

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



METHANE



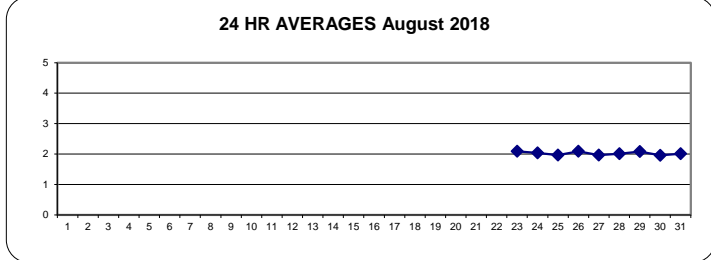
METHANE Hourly Averages (CH₄ ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
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	2.11	2.09	S	2.08	2.13	X	X	X	X	2.01	1.97	1.95	1.94	1.96	1.95	2.02	2.04	2.06	2.07	2.07	2.08	2.06	2.04	2.06	1.94	2.13	2.04	20	
25	1.99	S	1.96	2.03	1.97	1.97	1.96	2.00	1.97	1.94	1.93	1.94	1.93	1.93	1.94	1.93	1.93	1.94	1.96	1.99	2.02	2.01	2.07	2.10	1.93	2.10	1.97	24	
26	S	2.15	2.18	2.20	2.23	2.33	2.38	2.34	2.19	2.14	2.07	2.01	1.97	1.93	1.91	1.94	2.02	1.98	1.93	1.97	2.02	2.01	2.00	S	1.91	2.38	2.09	24	
27	1.97	1.96	1.96	1.95	1.95	1.94	1.95	1.97	1.96	1.95	1.95	1.96	1.96	1.95	1.98	1.98	1.98	1.96	1.97	1.95	1.97	2.05	S	2.10	1.94	2.10	1.97	24	
28	2.20	2.11	2.05	2.03	2.04	2.02	2.01	2.02	2.02	2.02	2.00	1.99	1.97	1.97	S1	1.97	1.95	1.94	1.92	1.95	2.01	S	2.03	2.04	1.92	2.20	2.01	23	
29	2.07	2.08	2.06	2.06	2.05	2.06	2.11	2.13	2.08	2.08	2.06	2.03	C1	C1	C1	C1	C1	1.93	2.44	2.32	S	1.98	1.99	1.96	1.93	2.44	2.08	19	
30	1.98	1.99	1.97	1.94	1.93	1.94	1.96	1.95	1.93	1.92	1.92	1.92	1.94	1.93	1.94	1.94	1.95	1.97	2.01	S	1.99	1.97	2.01	1.97	1.92	2.01	1.96	24	
31	1.96	1.97	1.99	1.97	1.97	1.99	1.99	1.99	2.00	1.97	1.96	1.95	1.97	1.97	1.96	1.96	1.97	1.97	S	2.54	2.03	2.00	2.01	2.03	1.95	2.54	2.01	24	
HOURLY MAX	2.20	2.15	2.18	2.20	2.23	2.33	2.38	2.34	2.19	2.14	2.07	2.03	1.97	1.97	1.98	2.02	2.04	2.06	2.44	2.54	2.08	2.08	2.10	2.13					
HOURLY AVG	2.04	2.05	2.02	2.03	2.03	2.04	2.05	2.06	2.02	2.00	1.98	1.97	1.95	1.95	1.95	1.96	1.98	1.97	2.04	2.11	2.03	2.02	2.03	2.05					

STATUS FLAG CODES

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

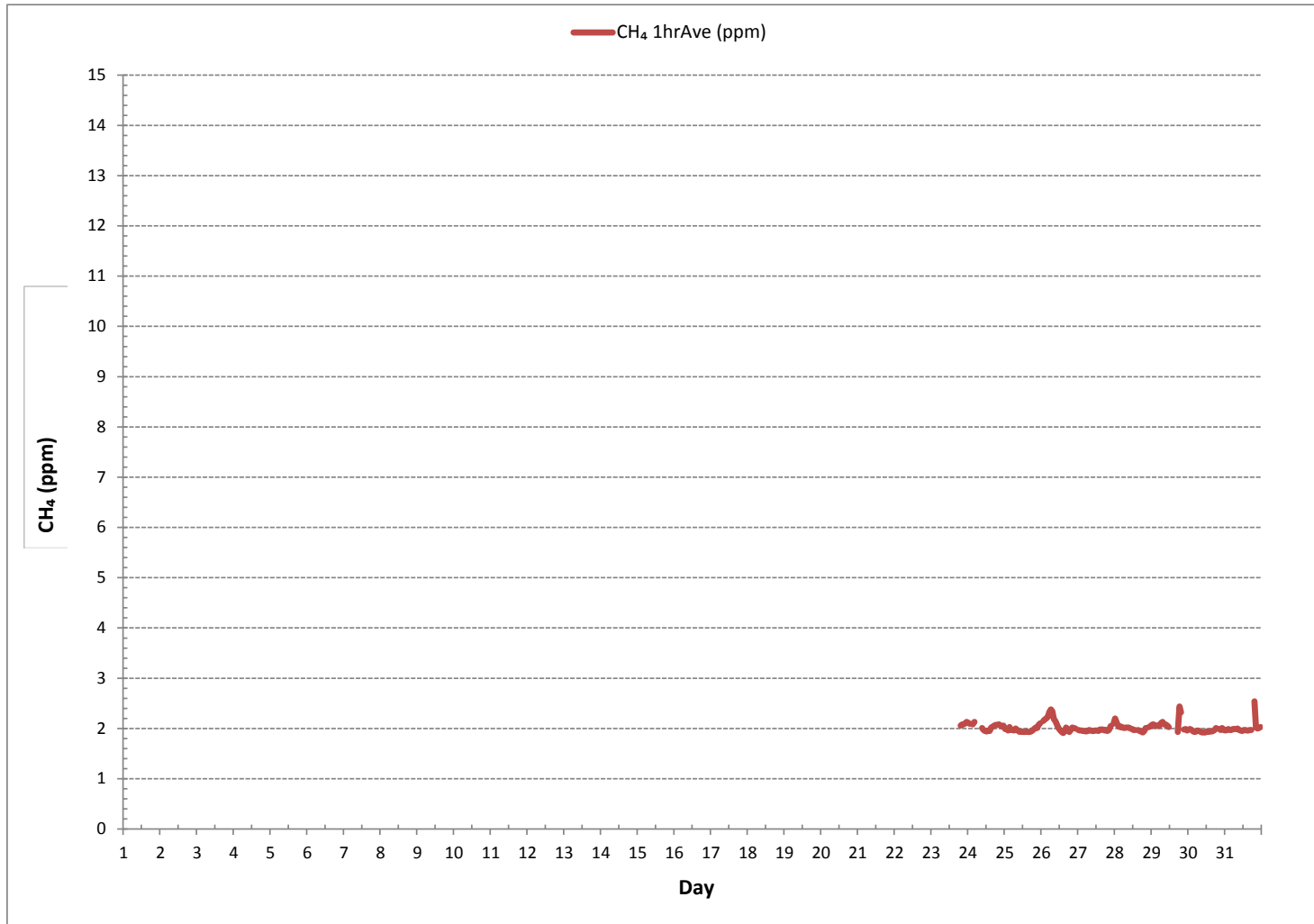
24 HR AVERAGES August 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	178			
MINIMUM 1-HR AVERAGE:	1.77 ppm	@ HOUR	14	ON DAY 26
MAXIMUM 1-HR AVERAGE:	2.54 ppm	@ HOUR	19	ON DAY 31
MAXIMUM 24-HR AVERAGE:	2.08 ppm			ON DAY 23
IZS CALIBRATION TIME:	9 hrs	OPERATIONAL TIME:	190 hrs	
MONTHLY CALIBRATION TIME:	3 hrs	AMD OPERATION UPTIME:	25.5 %	
STANDARD DEVIATION:	0.10	MONTHLY AVERAGE:	2.01 ppm	

METHANE Hourly Averages (CH₄ ppm)



% Icon Classes (ppm)

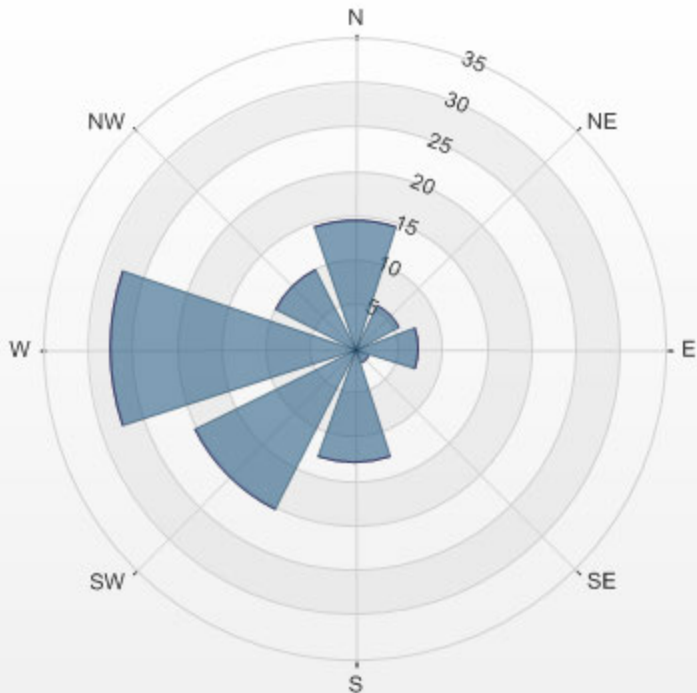
0  0.0-0.8

0  0.8-1.7

100  1.7-2.5

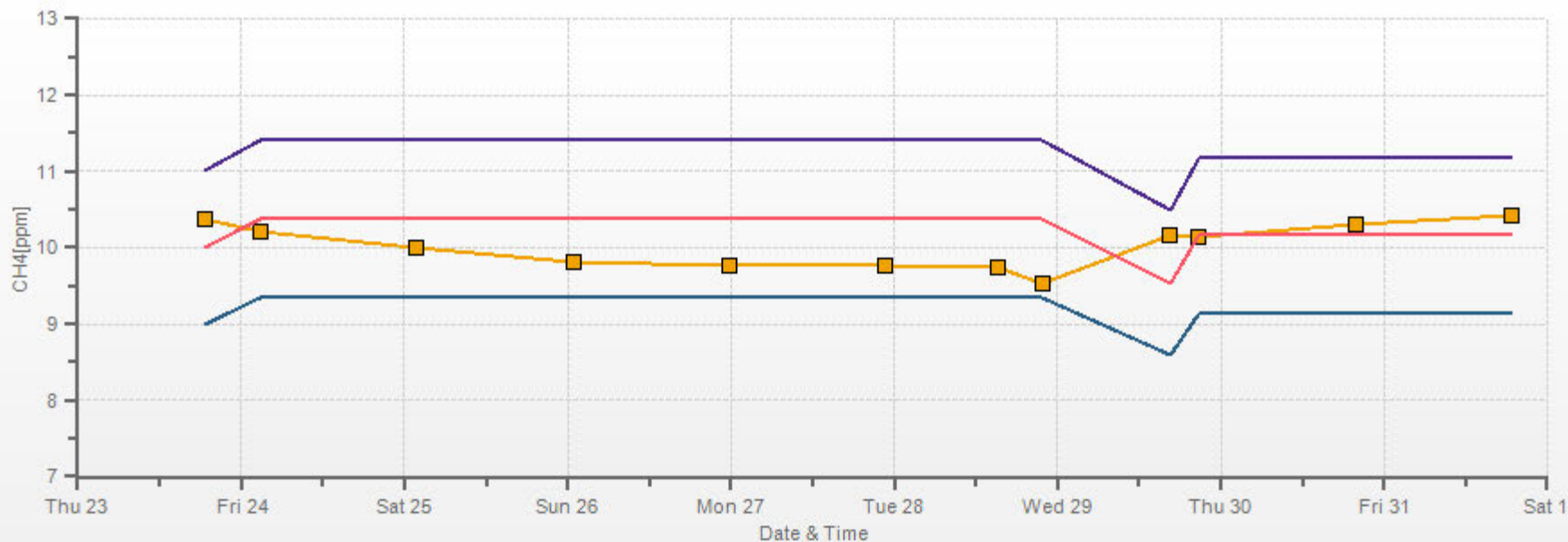
0  >2.6

LICA ST. LINA Poll.: LICA ST. LINA-CH4[ppm] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



CH4[ppm] Calibration: LICA ST. LINA Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



NON-METHANE HYDROCARBON



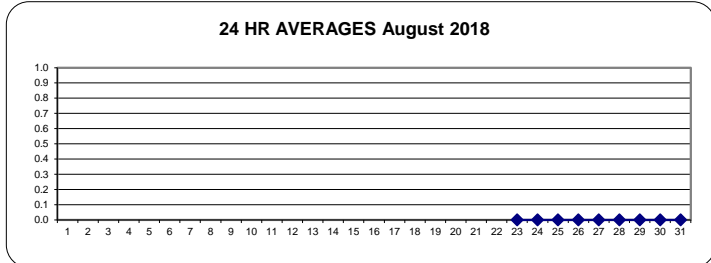
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	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	8
24	0.00	0.00	S	0.00	0.00	X	X	X	X	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20	
25	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
26	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	0.00	24	
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	24	
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S1	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	23	
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C1	C1	C1	C1	C1	0.00	0.01	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	19	
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	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	0.01	0.00	0.00	0.00	0.00	0.01	0.01	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	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 August 2018



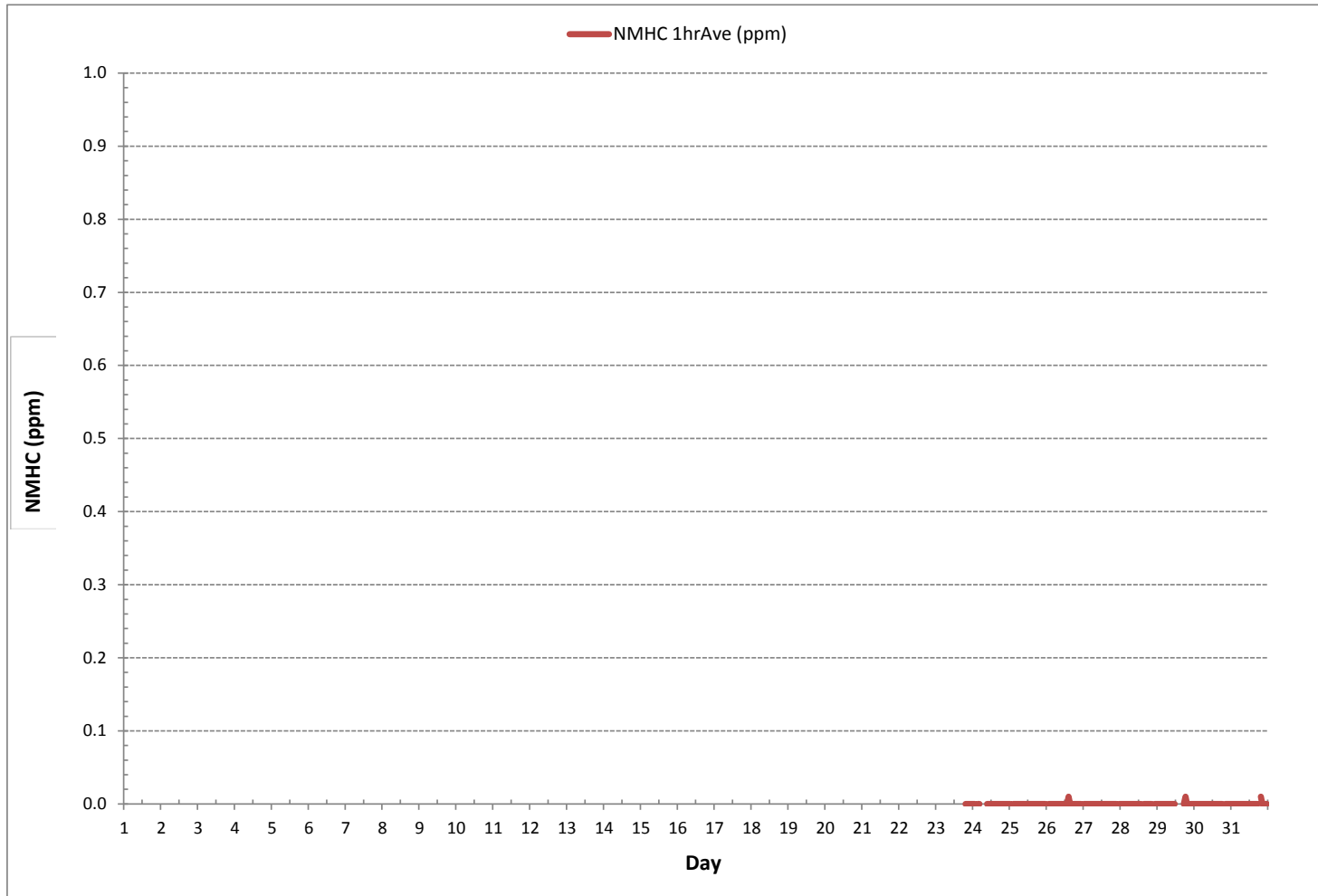
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	3				
MINIMUM 1-HR AVERAGE:	0.00	ppm @ HOUR	19	ON DAY 23	
MAXIMUM 1-HR AVERAGE:	0.01	ppm @ HOUR	14	ON DAY 26	
MAXIMUM 24-HR AVERAGE:	0.00	ppm		ON DAY 23	
IZS CALIBRATION TIME:	9	hrs	OPERATIONAL TIME:	190	hrs
MONTHLY CALIBRATION TIME:	3	hrs	AMD OPERATION UPTIME:	25.5	%
STANDARD DEVIATION:	0.00		MONTHLY AVERAGE:	0.00	ppm



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - August 2018

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-NMHC[ppm]
 Monthly: 18/08
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

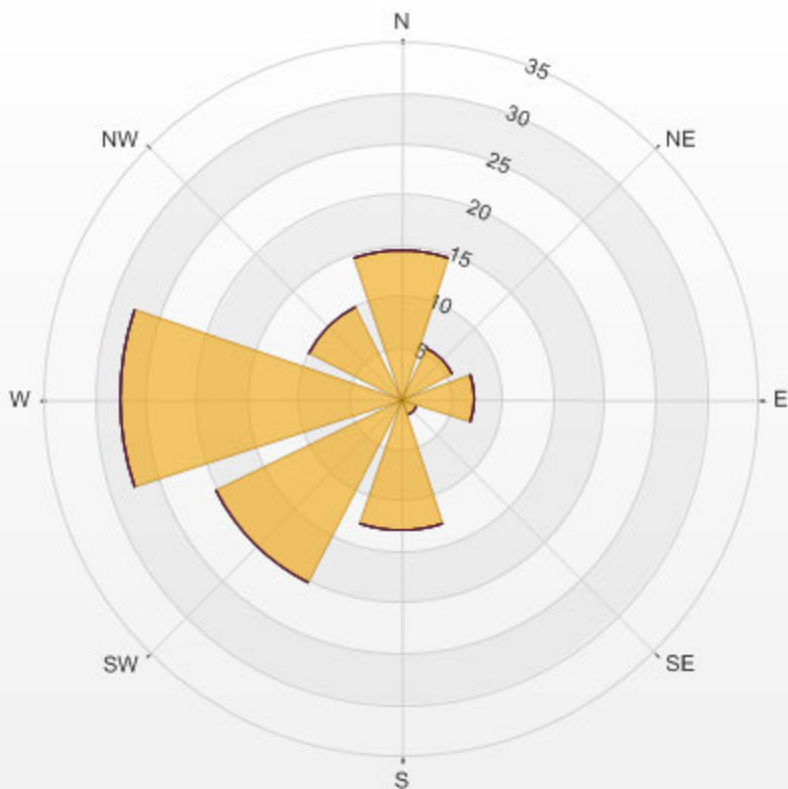
Calm: 0.00%

Calm Avg: 0.00 [ppm]

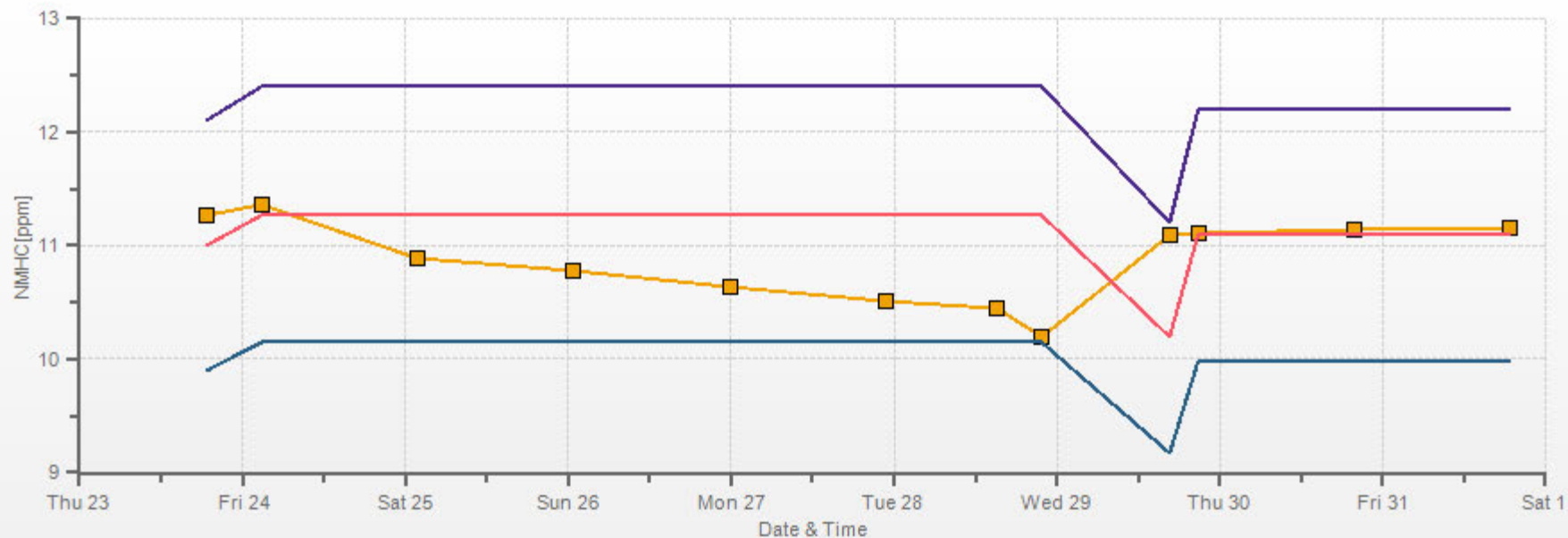
Direction	0-0.074	0.074-0.148	0.148-0.222	0.222-0.296	0.296-0.37	>0.4	Total
N	14.6	0.0	0.0	0.0	0.0	0.0	14.6
NE	5.6	0.0	0.0	0.0	0.0	0.0	5.6
E	7.3	0.0	0.0	0.0	0.0	0.0	7.3
SE	1.7	0.0	0.0	0.0	0.0	0.0	1.7
S	12.9	0.0	0.0	0.0	0.0	0.0	12.9
SW	20.2	0.0	0.0	0.0	0.0	0.0	20.2
W	27.5	0.0	0.0	0.0	0.0	0.0	27.5
NW	10.1	0.0	0.0	0.0	0.0	0.0	10.1
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] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



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



OXIDES OF NITROGEN



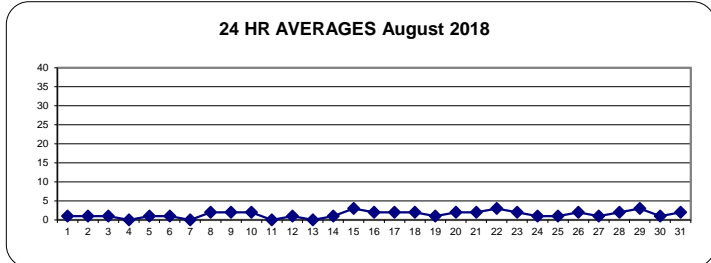
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

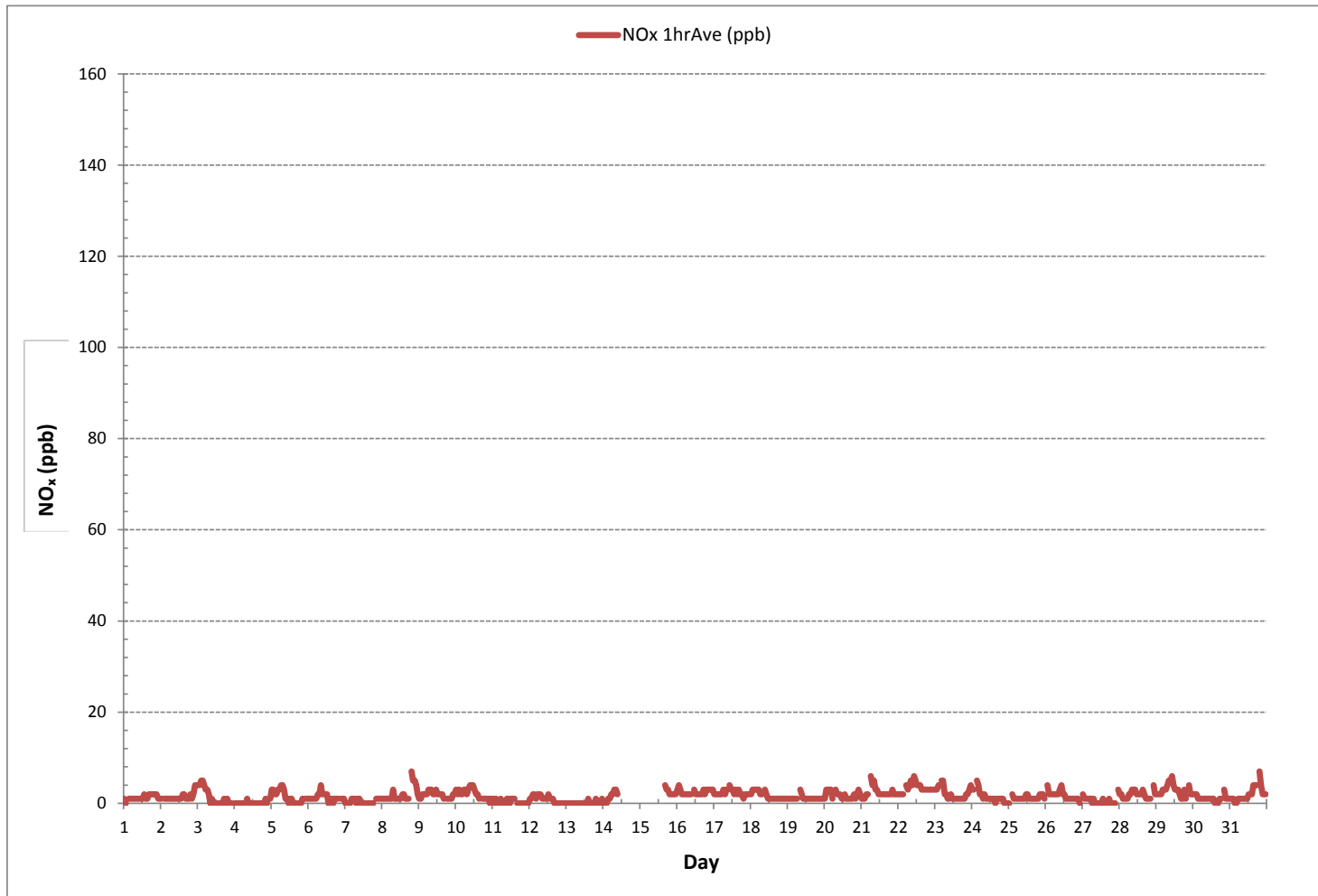
24 HR AVERAGES August 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	555			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	1	ON DAY 1
MAXIMUM 1-HR AVERAGE:	7 ppb	@ HOUR	19	ON DAY 8
MAXIMUM 24-HR AVERAGE:	3 ppb			ON DAY 15
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	727 hrs	
MONTHLY CALIBRATION TIME:	13 hrs	AMD OPERATION UPTIME:	97.7 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	2 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



% Icon Classes (ppb)

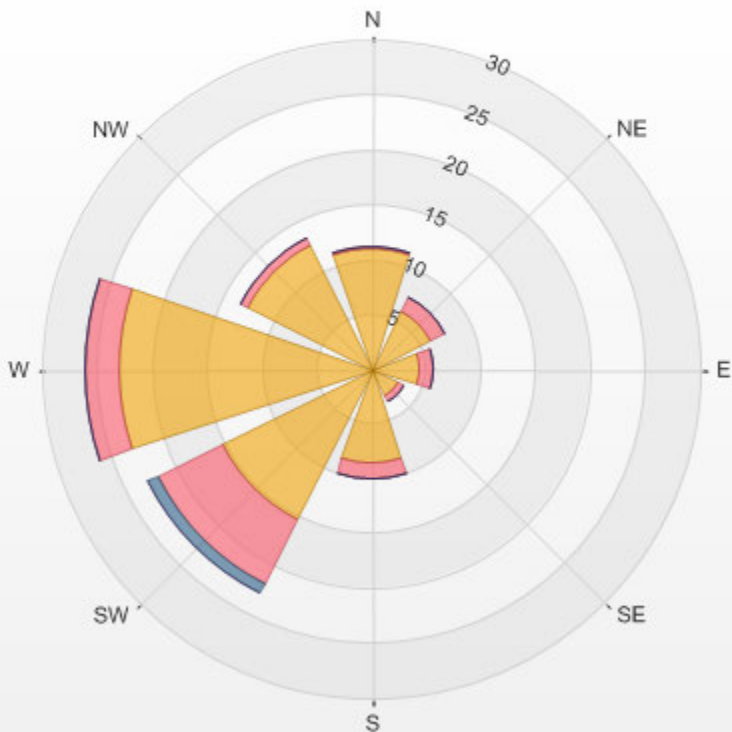
84 0.0-2.7

15 2.7-5.3

1 5.3-8.0

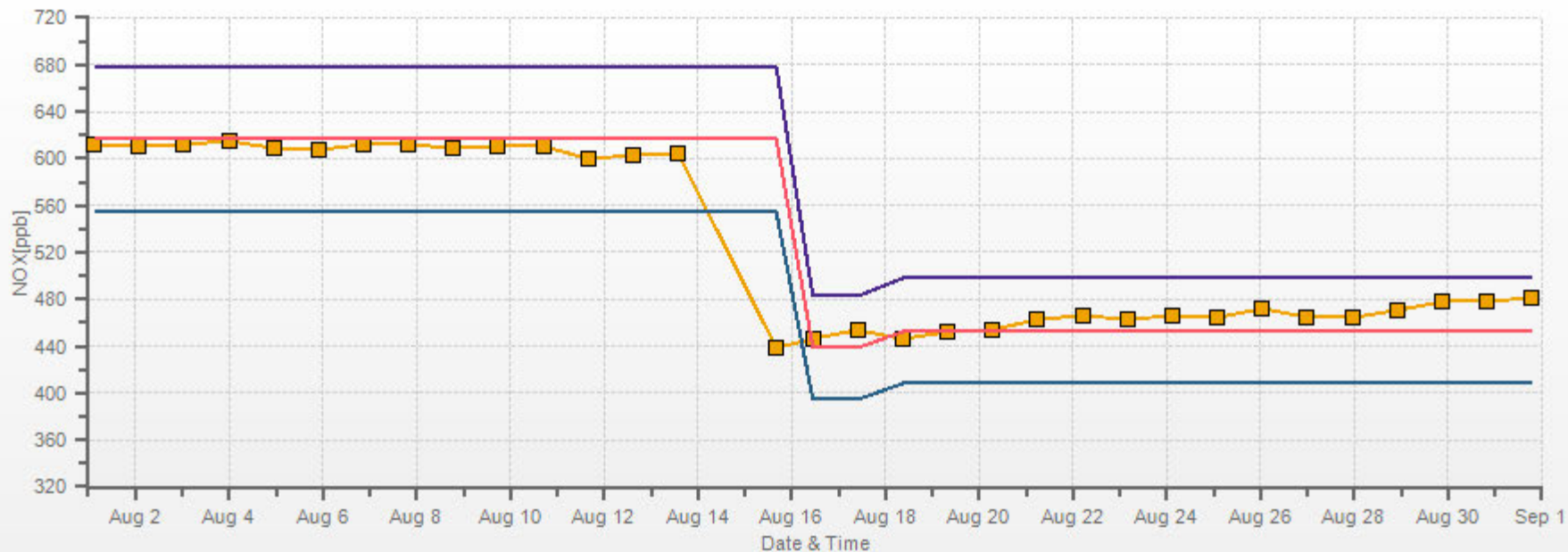
0 >8.0

LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



NOX[ppb] Calibration: LICA ST. LINA Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



NITRIC OXIDES

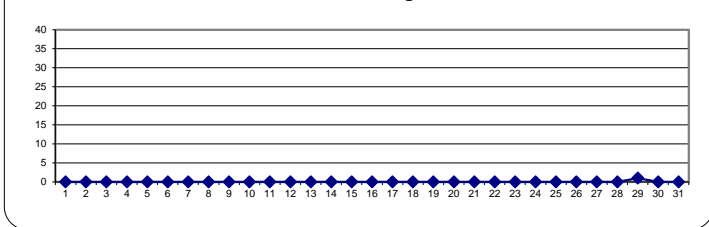
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

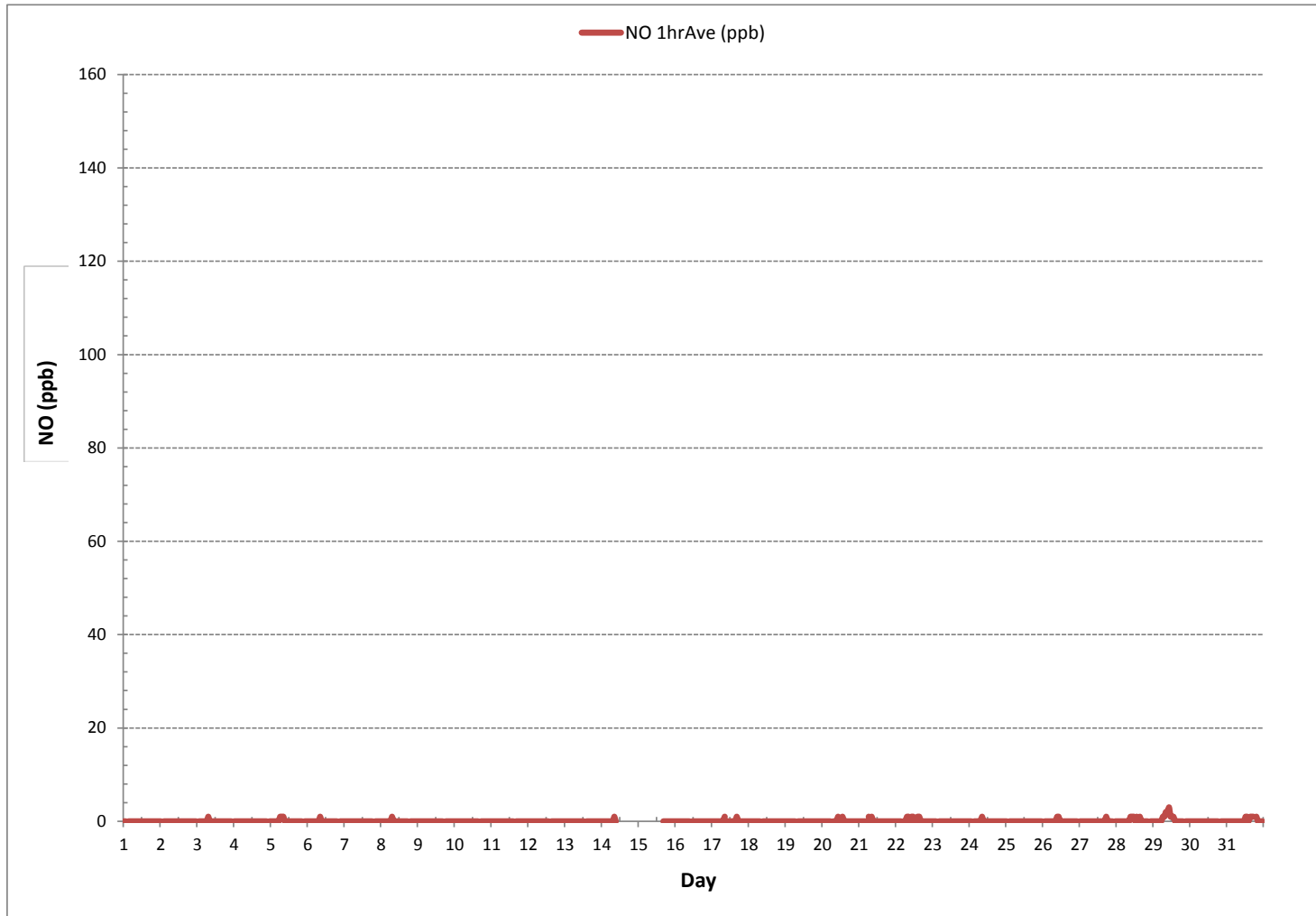
24 HR AVERAGES August 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	42			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	3 ppb	@ HOUR	10	ON DAY 29
MAXIMUM 24-HR AVERAGE:	1 ppb			ON DAY 29
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	727 hrs	
MONTHLY CALIBRATION TIME:	13 hrs	AMD OPERATION UPTIME:	97.7 %	
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)



% Icon Classes (ppb)

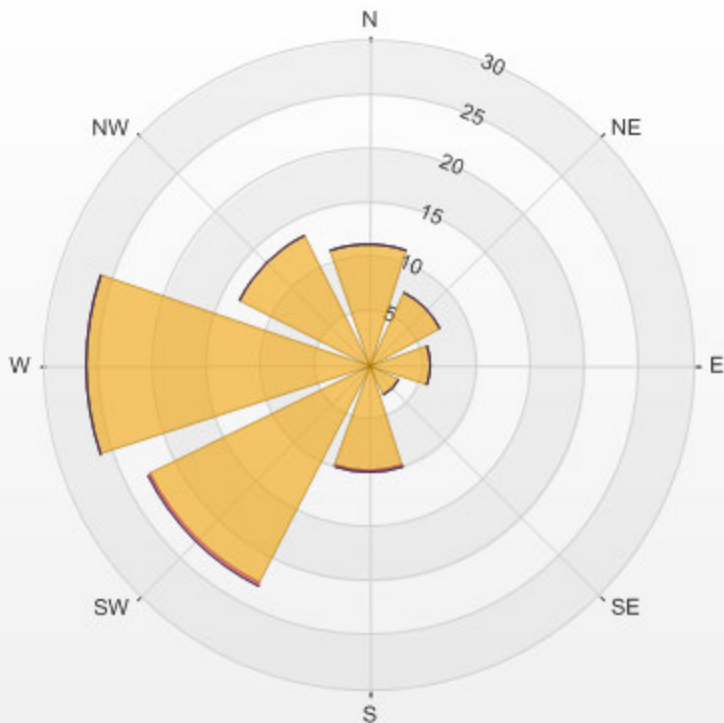
99 0.0-1.3

1 1.3-2.7

0 2.7-4.0

0 >4.0

LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

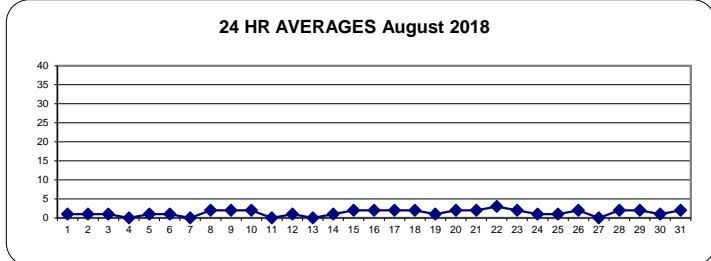
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

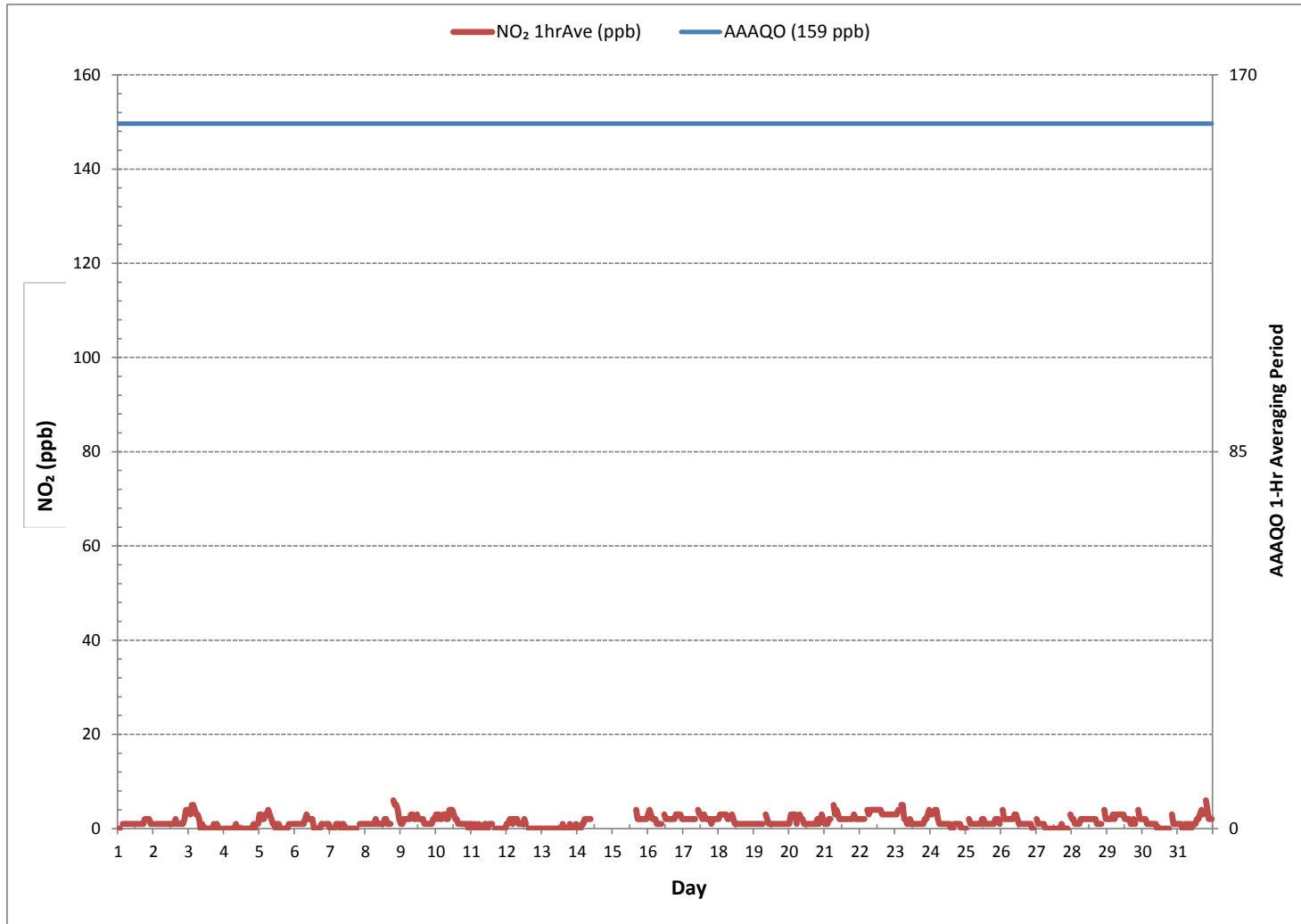
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	540			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	1	ON DAY
MAXIMUM 1-HR AVERAGE:	6	ppb @ HOUR	19	ON DAY
MAXIMUM 24-HR AVERAGE:	3	ppb		ON DAY
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	727
MONTHLY CALIBRATION TIME:	13	hrs	AMD OPERATION UPTIME:	97.7
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	1
				ppb

24 HR AVERAGES August 2018



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



% Icon Classes (ppb)

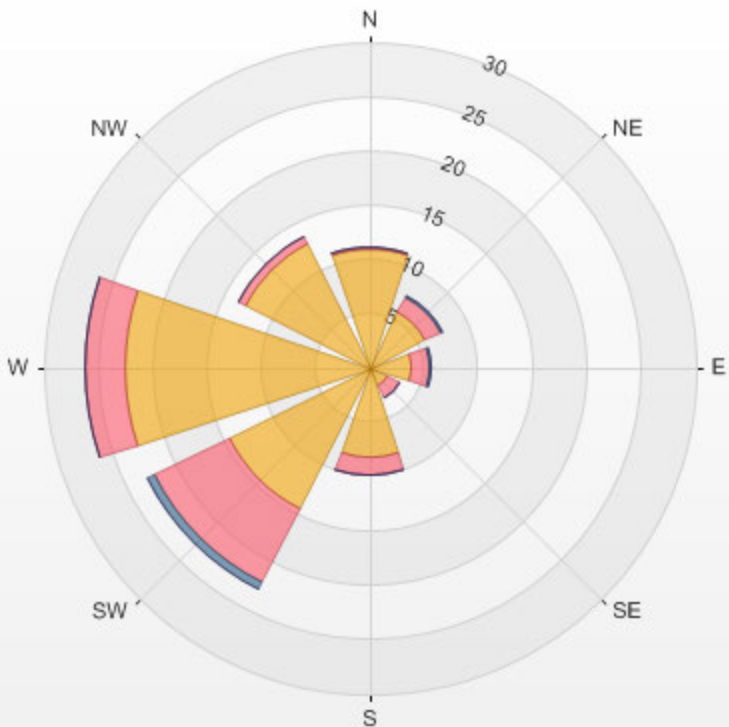
81 0.0-2.3

18 2.3-4.7

1 4.7-7.0

0 >7.0

LICA ST. LINA Poll.: LICA ST. LINA-NO2[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



NO2[ppb] Calibration: LICA ST. LINA Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



OZONE

OZONE Hourly Averages (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	24.2	24.8	S	25.8	23.8	22.4	21.2	20.6	21.1	23.6	23.7	27.9	28.8	29.5	32.3	36.7	38.2	34.4	34.4	32.4	30.2	33.1	33.2	35.3	20.6	38.2	28.6	24	
2	26.4	S	22.8	19.1	16.2	13.0	13.7	15.1	18.0	21.0	25.6	33.5	35.9	38.1	45.7	54.1	55.3	50.0	42.4	38.6	32.7	29.9	27.2	24.3	13.0	55.3	30.4	24	
3	S	18.5	14.4	13.0	11.6	11.5	12.4	18.7	25.5	28.4	26.6	25.9	25.2	22.6	21.9	20.8	20.7	23.5	23.1	21.0	28.2	29.5	27.2	S	11.5	29.5	21.4	24	
4	33.2	32.5	31.9	28.2	24.7	21.7	21.1	21.2	19.8	18.2	18.1	17.0	15.8	15.1	15.5	20.5	21.0	19.4	17.6	17.2	17.4	18.8	S	17.3	15.1	33.2	21.0	24	
5	17.1	18.1	20.9	20.4	17.2	15.0	14.0	12.5	14.5	21.8	25.9	23.9	24.4	26.9	26.4	27.1	27.2	27.1	24.9	21.0	20.3	S	19.6	18.2	12.5	27.2	21.1	24	
6	18.3	21.5	20.3	20.2	18.4	16.9	17.5	20.8	24.3	31.7	36.4	38.9	37.8	30.2	31.4	33.5	33.9	30.9	27.8	24.9	S	24.7	23.7	21.4	16.9	38.9	26.3	24	
7	23.6	23.9	22.9	22.5	21.2	19.2	18.5	21.2	24.0	25.6	25.3	26.0	27.4	28.0	29.1	31.0	31.8	30.7	29.4	S	28.1	28.7	29.1	26.5	18.5	31.8	25.8	24	
8	27.8	24.9	21.1	20.8	20.0	23.9	19.3	19.0	24.1	30.6	38.2	41.5	45.5	45.9	46.2	39.8	39.1	41.3	S	40.8	41.0	35.4	30.6	27.2	19.0	46.2	32.3	24	
9	26.0	27.0	24.4	24.8	22.6	20.6	17.7	24.7	30.0	35.0	41.9	45.8	50.9	53.4	56.4	60.1	56.9	S	48.1	45.5	48.6	54.5	51.6	46.6	17.7	60.1	39.7	24	
10	47.3	48.6	44.0	44.2	41.8	35.8	34.5	34.2	34.4	S1	33.7	39.7	47.9	52.8	54.5	51.2	S	40.2	38.2	35.9	33.9	29.9	29.2	28.5	28.5	54.5	40.0	23	
11	28.6	26.8	21.1	21.4	20.1	19.1	18.8	18.0	16.5	17.3	16.6	19.1	22.4	18.5	18.8	S	16.9	13.7	15.9	25.6	35.0	37.2	42.3	33.3	13.7	42.3	22.7	24	
12	26.4	27.5	28.6	24.0	23.1	19.5	16.0	S1	15.1	16.1	15.7	18.3	16.4	17.0	S	23.1	25.3	22.0	20.1	21.9	23.2	22.7	23.1	23.8	15.1	28.6	21.3	23	
13	23.3	24.3	20.7	20.3	19.6	20.5	18.9	22.8	29.2	29.3	28.1	S1	26.3	S	32.2	33.0	33.7	32.9	33.7	31.4	29.3	28.3	28.5	26.6	18.9	33.7	27.0	23	
14	25.9	25.8	24.9	24.2	23.5	22.2	20.3	18.7	18.4	23.3	28.0	28.8	S	34.6	38.3	39.9	39.8	38.1	34.2	31.5	30.7	30.2	28.3	27.4	18.4	39.9	28.6	24	
15	24.6	23.2	21.6	20.6	20.3	20.1	18.9	17.1	17.3	15.3	C	C	C	C	14.3	13.6	14.4	15.0	14.7	14.8	16.5	17.8	10.3	14.3	10.3	24.6	17.2	24	
16	11.3	11.3	13.4	14.0	13.4	12.5	11.7	11.1	10.8	10.9	S	13.3	15.6	20.8	23.8	24.4	24.5	24.0	19.7	17.3	14.7	11.2	9.1	9.0	9.0	24.5	15.1	24	
17	10.2	10.3	10.1	9.4	8.8	9.1	9.9	7.7	12.0	S	27.6	31.0	30.1	26.7	22.1	21.1	19.3	16.9	17.7	21.0	19.8	23.8	26.1	20.7	7.7	31.0	17.9	24	
18	15.9	17.6	19.6	21.9	24.3	25.0	24.2	24.0	S	30.3	32.1	33.0	32.3	31.5	31.2	29.1	29.2	28.6	27.9	27.0	24.4	23.0	22.1	21.6	15.9	33.0	25.9	24	
19	21.3	21.9	18.6	17.4	15.9	16.9	17.8	S	21.8	24.3	27.4	29.5	31.6	33.6	31.7	33.7	32.6	31.0	27.9	29.3	30.6	29.3	28.1	25.8	15.9	33.7	26.0	24	
20	24.0	23.8	27.7	25.6	20.3	15.0	S	10.5	15.1	17.1	24.7	30.1	28.5	30.0	32.8	34.1	34.3	34.3	31.5	28.1	30.6	28.9	20.8	24.0	10.5	34.3	25.7	24	
21	25.6	26.3	25.8	27.4	27.3	S	21.0	23.1	29.1	33.9	38.9	43.0	46.9	49.8	54.4	56.9	53.1	51.4	46.7	49.4	41.5	42.4	39.8	38.8	21.0	56.9	38.8	24	
22	42.5	41.6	43.4	44.1	S	40.4	36.5	32.7	29.4	27.2	26.2	27.3	28.4	31.4	33.2	36.3	36.0	35.8	33.7	36.3	36.6	33.9	36.7	38.1	26.2	44.1	35.1	24	
23	31.4	19.6	25.4	S	16.7	13.2	13.4	14.2	14.6	14.9	14.6	12.9	13.3	14.9	16.8	17.8	18.7	17.9	16.9	15.9	12.8	10.0	9.6	9.3	9.3	31.4	15.9	24	
24	9.6	9.3	S	9.0	8.2	9.9	9.5	8.0	8.1	10.3	9.6	10.1	11.2	12.0	12.8	10.1	9.0	8.5	9.0	8.4	7.9	9.3	12.2	13.4	7.9	13.4	9.8	24	
25	14.7	S	18.4	19.5	16.9	12.8	15.0	11.1	14.8	21.5	22.2	22.9	25.0	25.6	21.8	24.9	24.1	23.1	22.4	22.2	20.7	18.8	17.0	15.5	11.1	25.6	19.6	24	
26	S	13.8	10.5	8.9	8.4	10.5	8.8	8.4	11.5	16.1	22.9	27.6	29.1	27.6	30.3	30.0	28.6	26.3	25.8	20.5	14.0	10.7	10.6	S	8.4	30.3	18.2	24	
27	15.1	15.1	14.2	14.0	14.3	16.3	16.8	14.5	15.3	19.5	23.5	26.3	28.5	30.1	30.3	29.7	29.5	27.3	28.3	28.2	28.8	26.4	S	21.6	14.0	30.3	22.3	24	
28	17.6	17.0	18.0	17.6	17.5	18.0	17.8	18.0	16.7	16.1	16.7	20.3	24.9	27.2	29.0	30.4	34.6	30.6	27.2	26.5	26.6	S	20.2	21.1	16.1	34.6	22.2	24	
29	18.5	16.5	17.0	14.5	14.1	11.1	9.2	8.8	9.2	9.4	8.9	12.6	11.0	14.2	20.8	24.7	20.8	19.6	19.5	18.9	S	12.8	14.7	17.8	8.8	24.7	15.0	24	
30	13.8	12.3	13.3	15.9	17.1	16.1	13.9	14.2	17.6	21.7	20.1	17.5	15.9	15.7	16.6	16.8	15.0	15.3	19.0	S	16.6	15.4	15.6	15.1	12.3	21.7	16.1	24	
31	15.7	15.2	15.6	15.4	14.0	12.0	10.8	10.4	11.3	14.6	15.3	18.4	21.8	24.4	27.0	25.8	23.5	24.1	S	25.2	23.7	27.4	26.7	25.3	10.4	27.4	19.3	24	
HOURLY MAX	47.3	48.6	44.0	44.2	41.8	40.4	36.5	34.2	34.4	35.0	41.9	45.8	50.9	53.4	56.4	60.1	56.9	51.4	48.1	49.4	48.6	54.5	51.6	46.6					
HOURLY AVG	22.8	22.0	21.7	20.8	18.7	18.0	17.3	17.3	19.0	21.6	24.6	26.3	27.5	28.6	29.9	31.0	29.6	27.8	26.8	26.8	26.4	25.7	24.6	23.7					

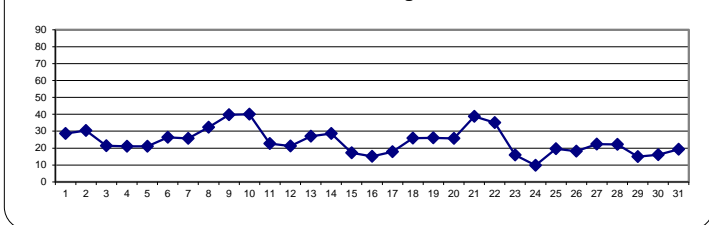
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

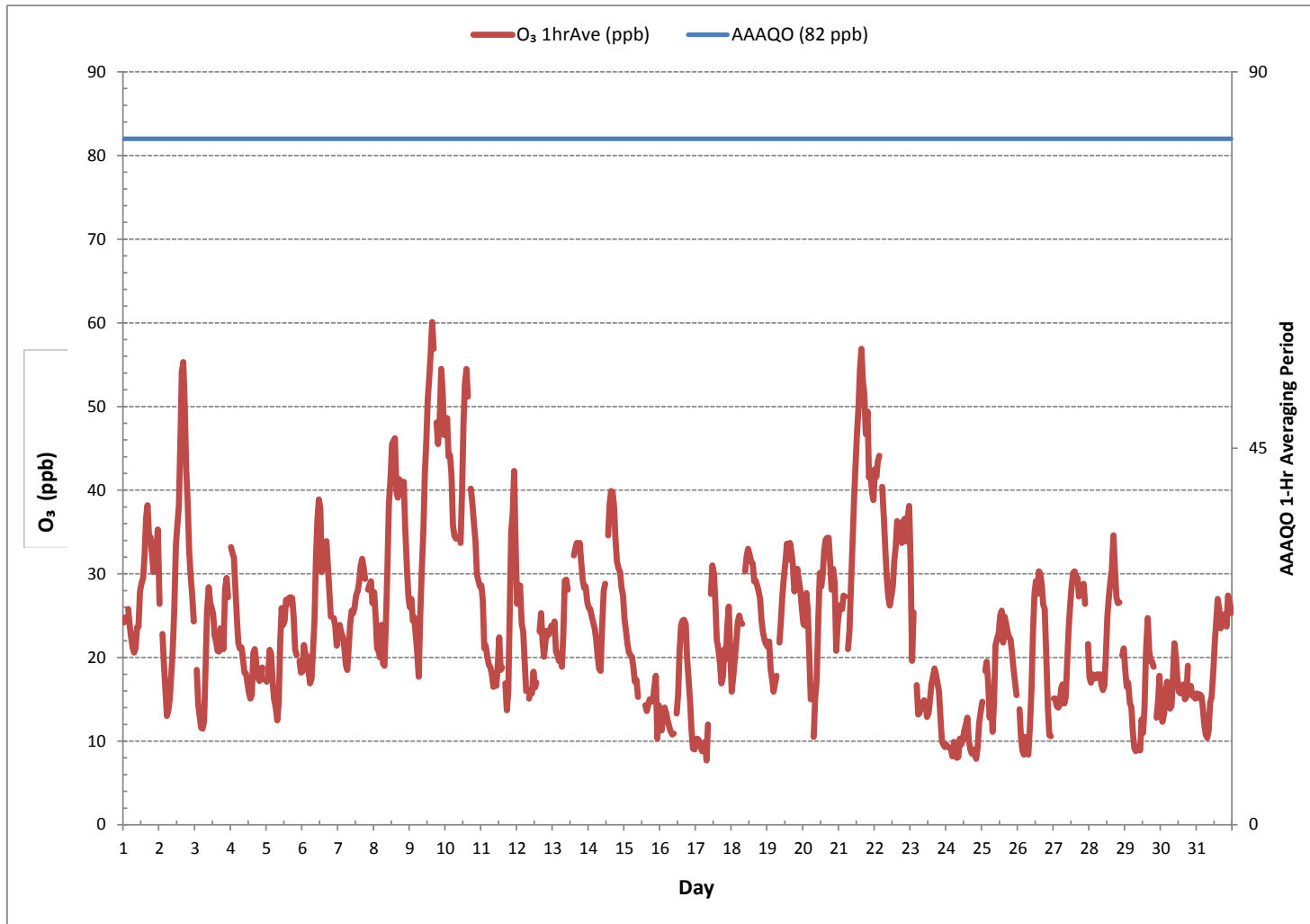
24 HR AVERAGES August 2018



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	705			
MINIMUM 1-HR AVERAGE:	7.7 ppb	@ HOUR	7	ON DAY 17
MAXIMUM 1-HR AVERAGE:	60.1 ppb	@ HOUR	15	ON DAY 9
MAXIMUM 24-HR AVERAGE:	40.0 ppb			ON DAY 10
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	741 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.6 %	
STANDARD DEVIATION:	10.0	MONTHLY AVERAGE:	24.1 ppb	

OZONE Hourly Averages (O₃ ppb)



% Icon Classes (ppb)

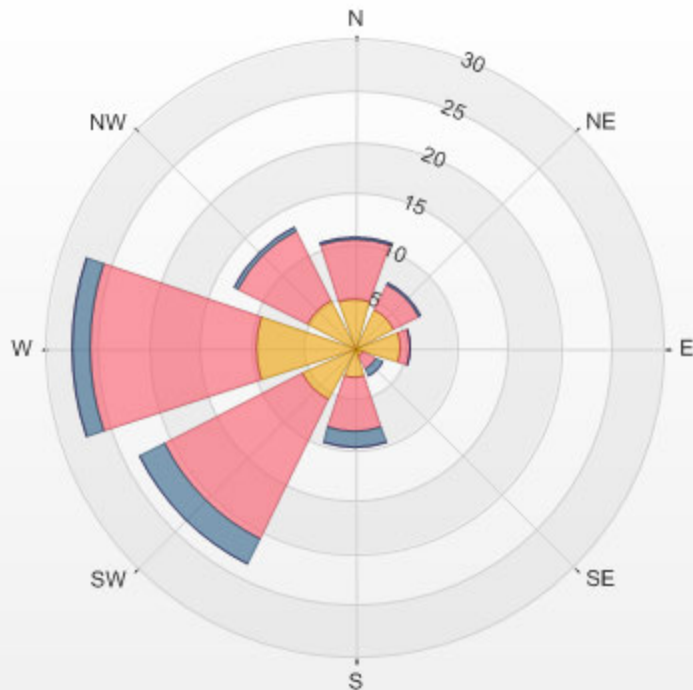
38  0.0-20.1

55  20.1-40.1

7  40.1-60.2

0  >60.2

LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



O3[ppb] Calibration: LICA ST. LINA Monthly: 18/08 Type: Span

Span Meas Span Ref Span Low Span High



PARTICULATE MATTER 2.5



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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	4	3	4	4	3	3	3	3	4	3	4	5	6	8	9	10	11	10	10	11	11	13	13	12	3	13	7	24	
2	13	13	13	13	12	8	9	13	12	12	13	11	9	8	8	11	13	12	10	9	8	8	9	9	8	13	11	24	
3	10	11	12	12	12	12	13	12	10	11	14	14	15	18	18	18	21	24	24	24	15	9	8	5	5	24	14	24	
4	4	4	4	5	7	7	7	7	5	5	5	6	6	7	7	7	6	5	4	3	3	4	4	3	7	5	24		
5	5	5	4	4	3	3	3	3	3	3	3	5	6	7	10	16	19	18	16	15	14	14	15	16	17	3	19	9	24
6	17	18	18	19	19	20	20	18	16	13	12	12	9	11	15	20	21	16	14	13	14	16	17	17	9	21	16	24	
7	16	15	15	14	16	19	20	20	20	19	17	13	10	11	13	20	26	28	31	40	49	57	60	59	10	60	25	24	
8	64	63	64	70	72	73	71	63	51	40	47	42	37	38	38	36	33	36	44	46	50	48	44	37	33	73	50	24	
9	35	35	36	38	38	36	37	45	50	50	52	49	48	58	64	65	59	54	55	58	67	72	65	59	35	72	51	24	
10	43	35	35	33	33	35	33	32	33	34	34	34	34	36	37	38	42	53	55	98	113	81	84	84	32	113	49	24	
11	79	84	103	92	93	90	71	52	40	30	23	17	18	20	23	13	6	4	3	3	4	16	12	3	103	37	24		
12	7	10	9	5	5	5	6	8	9	9	8	7	7	8	5	2	2	2	2	2	1	2	2	2	1	10	5	24	
13	2	2	2	2	2	3	2	3	3	4	4	5	5	5	5	5	5	5	7	9	9	8	6	4	2	9	4	24	
14	3	3	3	5	8	13	16	20	28	39	44	49	58	66	69	70	67	65	61	59	62	66	65	62	3	70	42	24	
15	57	54	61	73	86	94	101	109	124	128	133	131	125	123	115	116	109	102	105	103	97	97	100	93	54	133	102	24	
16	81	61	41	30	25	21	17	15	16	21	34	43	58	61	64	61	64	62	63	60	57	53	52	48	15	81	46	24	
17	44	42	41	41	40	41	41	41	52	65	95	99	105	118	122	127	126	119	120	122	124	112	114	136	40	136	87	24	
18	126	156	189	202	191	203	190	149	104	51	40	28	16	12	10	8	10	11	12	12	13	12	11	12	8	203	74	24	
19	15	19	20	22	23	25	27	28	30	31	29	26	28	29	19	23	31	22	22	25	24	23	22	18	15	31	24	24	
20	13	14	15	15	18	20	20	17	16	13	10	17	16	19	22	26	28	35	36	37	41	42	41	44	10	44	24	24	
21	44	45	45	42	41	40	38	36	34	32	32	30	28	27	27	25	22	22	21	21	23	25	26	27	21	45	31	24	
22	28	29	32	35	33	31	28	27	26	29	45	62	69	82	89	106	75	81	84	88	90	94	105	106	26	106	61	24	
23	104	95	100	80	61	57	47	46	49	57	60	31	19	20	19	20	20	18	17	17	13	7	4	3	3	104	40	24	
24	2	2	1	1	1	1	1	1	1	1	3	3	2	5	7	4	3	3	2	2	2	1	1	2	1	7	2	24	
25	2	2	2	2	2	3	2	4	9	22	25	22	30	34	29	27	28	29	32	35	36	37	36	35	2	37	20	24	
26	34	32	30	29	28	25	25	27	39	52	58	52	34	21	11	9	9	9	8	10	11	8	3	2	2	58	24	24	
27	2	2	1	1	1	2	2	2	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	2	1	2	1	24	
28	2	2	3	3	4	5	7	7	8	10	11	C	C	C	C	19	20	10	5	5	6	7	10	12	2	20	8	24	
29	12	12	10	9	10	10	9	10	11	12	13	12	12	12	11	11	11	10	10	10	11	11	12	13	9	13	11	24	
30	13	14	15	15	13	12	12	11	7	5	4	3	2	1	1	1	0	1	1	2	1	1	2	2	0	15	6	24	
31	2	2	2	2	2	2	2	2	2	1	1	1	2	3	7	10	13	14	16	21	28	30	31	27	1	31	9	24	
HOURLY MAX	126	156	189	202	191	203	190	149	124	128	133	131	125	123	122	127	126	119	120	122	124	112	114	136					
HOURLY AVG	28	29	30	30	29	30	28	27	26	26	28	28	27	29	29	30	29	28	29	31	32	31	32	31					

STATUS FLAG CODES

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

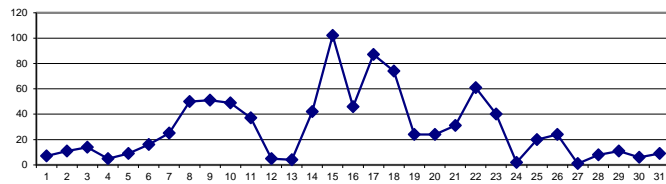
OBJECTIVE LIMIT:

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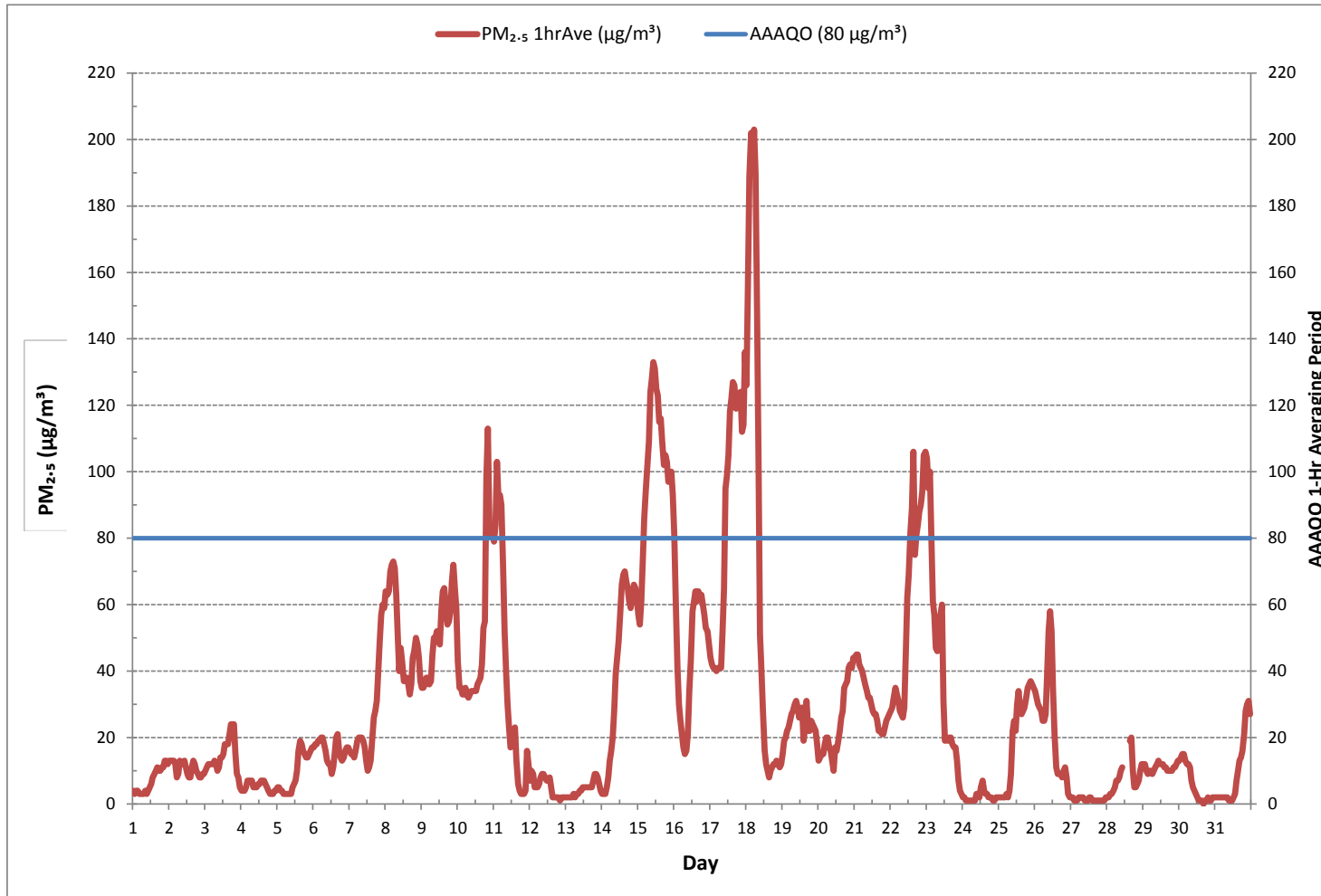
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	67			
NUMBER OF 24-HR EXCEEDANCES:	12			
NUMBER OF NON-ZERO READINGS:	739			
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR	16	ON DAY	30
MAXIMUM 1-HR AVERAGE:	203 µg/m ³ @ HOUR	5	ON DAY	18
MAXIMUM 24-HR AVERAGE:	102 µg/m ³		ON DAY	15
MONTHLY CALIBRATION TIME:	4 hrs	OPERATIONAL TIME:	744 hrs	
STANDARD DEVIATION:	33	AMD OPERATION UPTIME:	100.0 %	
		MONTHLY AVERAGE:	29 µg/m ³	

24 HR AVERAGES August 2018



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



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-PM25[ug/m3]
 Monthly: 18/08
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

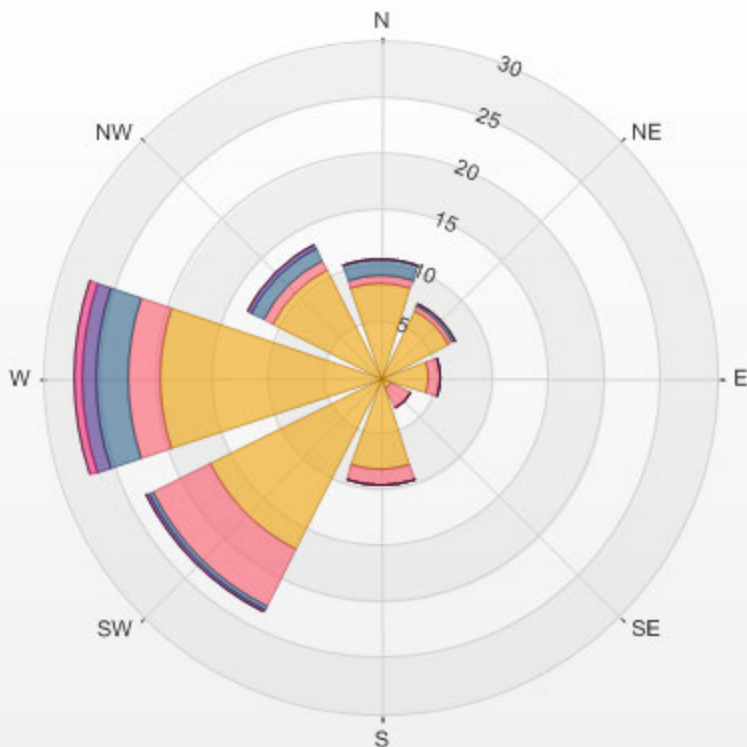
Calm: 0.00%

Calm Avg: 0.00 [ug/m3]

Direction	0.0-40.8	40.8-81.6	81.6-122.4	122.4-163.2	163.2-204.0	>204.0	Total
N	8.4	0.8	1.4	0.0	0.0	0.0	10.5
NE	6.8	0.4	0.3	0.0	0.0	0.0	7.4
E	4.3	1.1	0.0	0.0	0.0	0.0	5.4
SE	1.1	2.0	0.0	0.0	0.0	0.0	3.1
S	8.2	1.4	0.0	0.0	0.0	0.0	9.6
SW	17.0	5.7	0.4	0.3	0.0	0.0	23.4
W	19.7	2.8	2.8	1.2	0.7	0.0	27.3
NW	10.8	0.8	1.4	0.3	0.0	0.0	13.2
Summary	76.4	15.0	6.2	1.8	0.7	0.0	100.0

% Icon	Classes (ug/m3(L))	76		0.0-40.8	15		40.8-81.6	6		81.6-122.4	2		122.4-163.2	1		163.2-204.0	0		>204.0
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LICA ST. LINA Poll.: LICA ST. LINA-PM25[ug/m3(L)] 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



WIND SPEED



WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	11.3	12.6	13.8	12.5	9.7	12.6	12.6	14.2	14.0	15.1	10.7	13.1	10.7	7.0	4.5	7.8	7.1	7.2	5.0	5.2	6.7	6.7	6.1	6.0	4.5	15.1	4.7	24
2	8.8	3.7	6.6	8.2	8.5	6.3	4.5	4.0	1.2	4.8	5.9	7.3	9.5	11.5	12.0	15.5	17.9	19.6	15.1	7.7	11.0	9.4	10.4	6.7	1.2	19.6	7.7	24
3	7.0	7.9	8.5	7.9	6.5	8.7	8.0	10.4	16.9	17.4	13.5	17.5	17.6	17.1	18.2	17.5	18.3	18.0	14.8	10.9	12.3	9.4	14.7	14.4	6.5	18.3	12.3	24
4	13.7	15.8	16.3	14.5	13.2	12.3	14.4	10.9	7.3	8.0	7.6	8.6	9.4	13.6	9.9	11.2	9.9	9.3	6.7	6.7	7.2	6.9	6.5	5.9	5.9	16.3	9.8	24
5	5.7	6.4	6.1	8.3	7.4	6.6	3.7	2.4	1.1	3.9	4.0	6.5	5.5	10.7	9.3	9.3	9.5	7.4	6.1	7.2	8.4	8.0	6.8	7.6	1.1	10.7	2.6	24
6	7.7	7.4	7.9	8.3	8.0	8.7	10.9	11.1	9.2	10.1	10.4	14.6	18.1	23.7	28.1	24.7	20.3	17.3	13.1	10.3	9.9	10.4	7.5	9.2	7.4	28.1	12.2	24
7	11.9	11.0	11.7	12.0	10.9	11.7	9.1	11.0	12.6	12.0	14.3	14.0	16.0	14.9	16.6	15.5	15.7	10.8	8.9	9.1	8.9	8.5	9.0	8.5	8.5	16.6	11.3	24
8	9.9	9.4	11.0	10.0	10.3	9.2	7.3	7.7	11.7	13.4	19.0	21.3	19.0	21.2	20.6	19.6	18.5	12.8	9.1	6.9	7.5	7.5	9.0	12.2	6.9	21.3	11.9	24
9	10.7	10.6	9.1	8.5	8.2	8.9	7.2	4.2	4.0	7.2	7.6	8.4	7.8	7.9	6.1	3.8	6.9	6.9	5.6	6.3	9.8	11.4	8.7	8.7	3.8	11.4	5.5	24
10	11.0	11.1	11.3	11.8	10.5	10.8	10.6	11.0	8.9	9.8	11.0	12.6	8.7	10.1	8.5	9.1	6.6	6.5	6.5	8.4	11.2	13.6	12.3	9.1	6.5	13.6	2.0	24
11	8.5	9.6	11.3	9.2	10.1	13.1	10.6	9.0	3.0	9.7	10.0	11.2	9.7	5.6	8.5	8.5	10.3	11.5	13.7	12.1	8.0	6.0	15.4	15.6	3.0	15.6	9.4	24
12	9.0	13.0	11.8	11.3	12.4	13.4	11.1	11.1	11.6	12.2	12.9	14.2	17.2	9.8	18.3	16.9	14.1	11.9	11.1	12.6	12.4	11.5	11.3	9.1	9.0	18.3	12.0	24
13	7.2	6.3	8.2	7.0	6.3	7.5	6.6	7.5	11.6	13.0	10.4	9.6	6.7	8.1	8.6	8.3	9.7	10.7	8.5	7.7	9.4	11.6	15.1	16.6	6.3	16.6	5.9	24
14	17.2	17.3	17.0	15.8	14.2	11.9	11.3	11.1	11.9	14.3	13.5	17.3	16.0	15.0	19.3	18.6	17.4	14.3	10.1	8.4	8.2	8.4	8.9	10.0	8.2	19.3	12.6	24
15	12.0	9.6	10.2	10.1	10.7	11.2	11.3	9.5	10.5	10.1	7.9	9.4	9.7	8.9	8.3	9.7	6.9	6.8	7.8	7.6	8.5	6.5	3.8	4.8	3.8	12.0	7.9	24
16	9.3	11.5	11.9	11.1	10.5	8.9	9.6	9.5	7.7	7.2	6.7	5.1	6.3	6.3	7.3	9.1	9.8	9.1	7.8	9.4	9.1	8.9	9.4	9.2	5.1	11.9	7.4	24
17	10.3	9.2	8.7	9.7	8.3	6.0	5.6	2.5	3.7	2.4	1.9	4.4	6.8	7.0	6.0	4.6	5.3	5.6	4.5	6.2	8.9	9.3	10.3	9.7	1.9	10.3	4.7	24
18	9.8	10.8	10.3	11.8	13.5	13.6	14.1	13.3	16.0	15.5	19.4	19.6	19.4	18.4	19.3	15.5	14.9	11.4	8.7	7.4	9.2	9.4	9.4	9.5	7.4	19.6	12.1	24
19	8.3	7.9	8.3	7.9	10.2	10.9	10.3	10.7	11.3	9.5	9.8	12.6	10.8	11.8	12.0	10.5	9.3	7.5	5.2	7.4	6.8	7.0	5.6	6.9	5.2	12.6	8.2	24
20	7.8	8.6	5.5	3.2	4.6	5.8	7.3	7.1	7.1	5.7	6.7	9.7	7.9	9.2	9.8	8.7	8.0	8.1	6.0	6.4	7.0	6.7	7.0	8.0	3.2	9.8	4.8	24
21	8.6	9.0	9.1	9.5	8.6	7.1	7.9	8.5	11.1	8.3	9.5	10.4	13.9	15.6	12.3	11.6	8.0	4.4	1.0	5.3	7.1	8.7	8.9	9.4	1.0	15.6	8.1	24
22	10.9	11.5	10.7	10.8	10.2	10.0	10.3	12.8	11.1	11.3	10.2	10.0	13.9	13.8	11.9	12.1	10.5	8.3	9.1	8.4	8.9	8.1	9.0	7.6	7.6	13.9	9.7	24
23	6.8	1.7	7.8	10.1	12.4	13.3	13.8	14.1	11.2	10.5	10.9	12.3	12.5	12.6	15.2	14.3	13.9	10.6	9.6	10.5	12.5	9.8	9.7	10.7	1.7	15.2	10.2	24
24	9.2	9.4	6.2	7.3	5.1	3.5	4.7	0.8	5.6	13.0	9.2	10.0	12.5	12.0	11.0	11.3	11.5	12.4	11.4	11.7	10.6	10.9	10.1	8.3	0.8	13.0	7.9	24
25	7.9	8.6	8.6	7.2	8.7	8.6	9.1	11.0	10.0	12.1	8.8	7.6	5.7	5.1	5.4	5.8	8.3	9.2	10.2	10.6	10.6	9.7	8.3	7.2	5.1	12.1	1.8	24
26	7.0	4.9	5.2	4.6	4.9	5.1	6.0	7.1	8.1	7.9	9.4	12.4	13.3	11.2	13.0	11.8	10.3	8.6	7.0	6.0	11.5	13.2	12.9	13.8	4.6	13.8	2.4	24
27	14.1	13.1	11.9	16.1	14.0	13.9	10.5	11.2	10.9	12.7	12.6	13.6	12.7	10.7	10.5	8.9	7.9	5.9	4.3	4.0	2.8	7.8	7.4	8.5	2.8	16.1	7.6	24
28	8.9	8.5	10.2	11.3	10.3	12.2	11.8	11.2	9.7	10.7	12.1	12.2	11.9	10.7	8.9	8.1	9.9	7.2	1.8	4.9	8.8	9.2	9.0	8.9	1.8	12.2	9.3	24
29	7.6	7.7	7.4	8.2	8.5	7.3	7.3	8.0	6.4	7.5	6.7	7.7	3.3	1.6	3.7	3.0	5.2	2.7	1.1	4.1	5.0	6.7	7.4	7.5	1.1	8.5	4.3	24
30	8.5	8.5	11.0	12.6	13.8	11.9	13.8	14.3	14.0	17.9	19.3	19.3	14.9	18.1	20.7	20.4	14.5	9.8	11.4	11.8	11.0	8.5	9.2	10.1	8.5	20.7	13.3	24
31	11.1	11.6	11.4	11.0	9.8	9.6	10.0	10.3	13.2	10.0	15.1	16.3	14.8	15.1	15.8	11.0	6.3	6.9	7.1	6.1	8.6	10.8	12.5	10.8	6.1	16.3	10.5	24
HOURLY MAX	17.2	17.3	17.0	16.1	14.2	13.9	14.4	14.3	16.9	17.9	19.4	21.3	19.4	23.7	28.1	24.7	20.3	19.6	15.1	12.6	12.5	13.6	15.4	16.6				

STATUS FLAG CODES

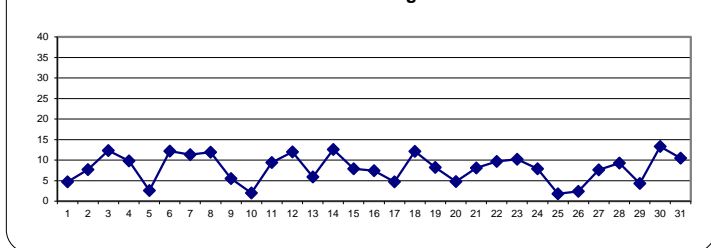
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

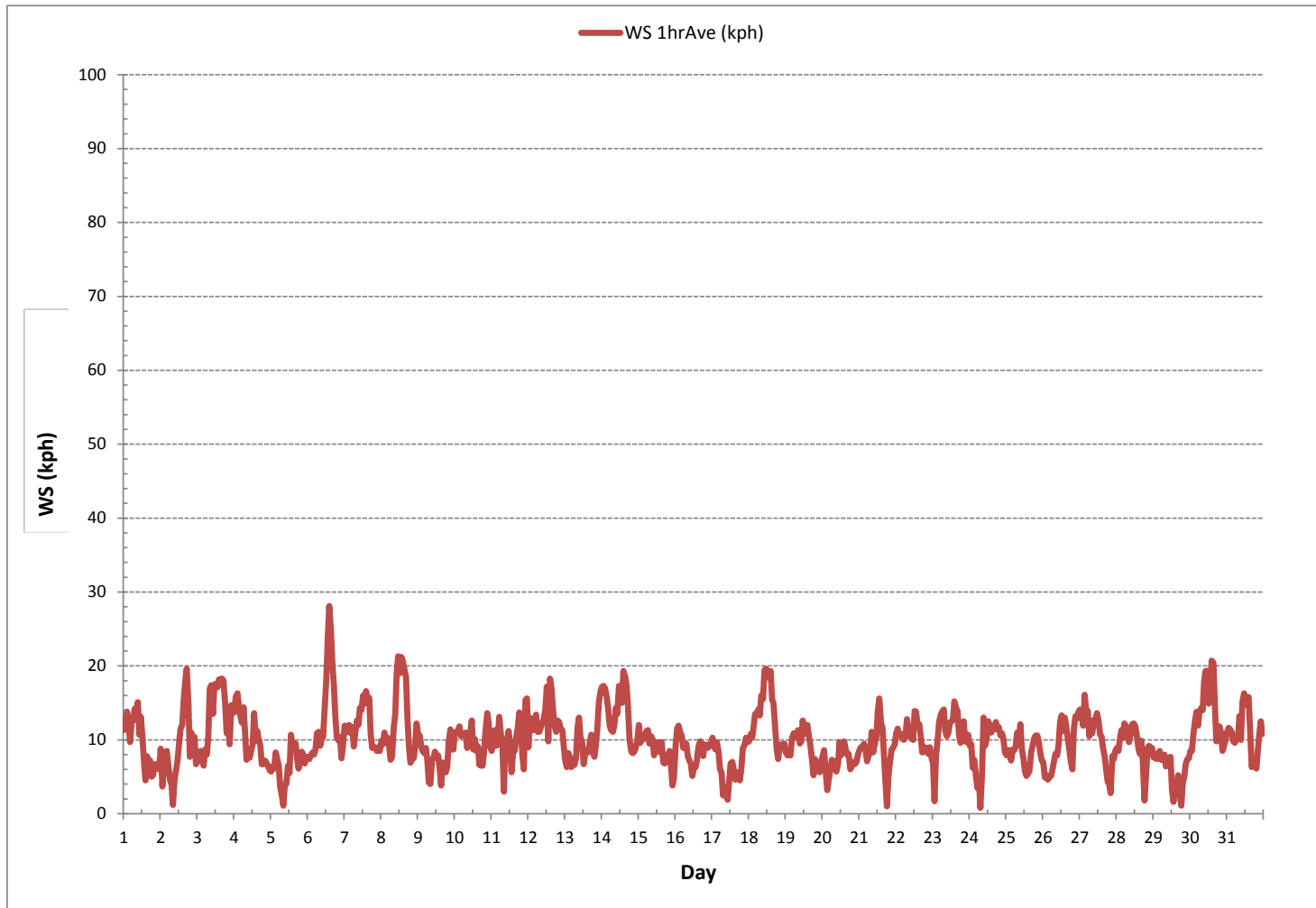
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MINIMUM 1-HR AVERAGE	0.8 kph @ HOUR 7 ON DAY 24
MAXIMUM 1-HR AVERAGE:	28.1 kph @ HOUR 14 ON DAY 6
MAXIMUM 24-HR AVERAGE:	13.3 kph ON DAY 30
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	744 hrs
AMT OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3.7
MONTHLY AVERAGE:	4.4 kph

24 HR AVERAGES August 2018



WIND SPEED Hourly Averages (WS kph)



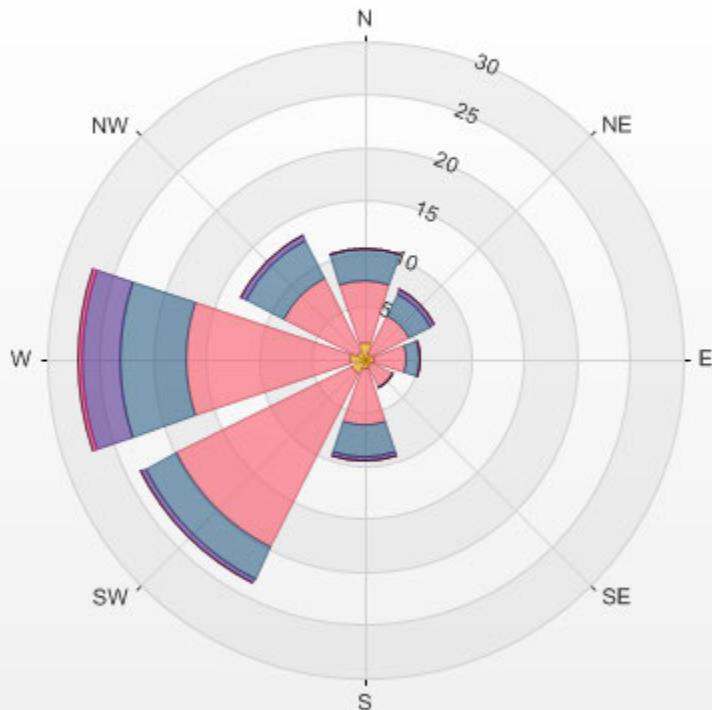
Wind: LICA ST. LINA
 Monitor: WSP [kph]
 Monthly: 18/08
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.00%

Direction	0.4-5.6	5.6-11.3	11.3-16.9	16.9-22.6	22.6-28.2	>28.2	Total
N	1.6	5.8	3.1	0.0	0.0	0.0	10.5
NE	0.7	4.0	2.3	0.4	0.0	0.0	7.4
E	0.9	3.1	1.3	0.0	0.0	0.0	5.4
SE	0.7	2.3	0.1	0.0	0.0	0.0	3.1
S	0.9	5.4	3.0	0.4	0.0	0.0	9.7
SW	1.5	18.4	3.2	0.5	0.0	0.0	23.7
W	1.3	15.5	6.3	3.6	0.4	0.0	27.2
NW	0.9	7.7	3.9	0.7	0.0	0.0	13.2
Summary	8.6	62.1	23.3	5.6	0.4	0.0	100.0

% Icon Classes (kph) 9 0.4-5.6 62 5.6-11.3 23 11.3-16.9 6 16.9-22.6 0 22.6-28.2 0 >28.2

LICA ST. LINA 2018/08/01 00:00 - 2018/08/31 23:00 Calm: 0.00%



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - August 2018

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

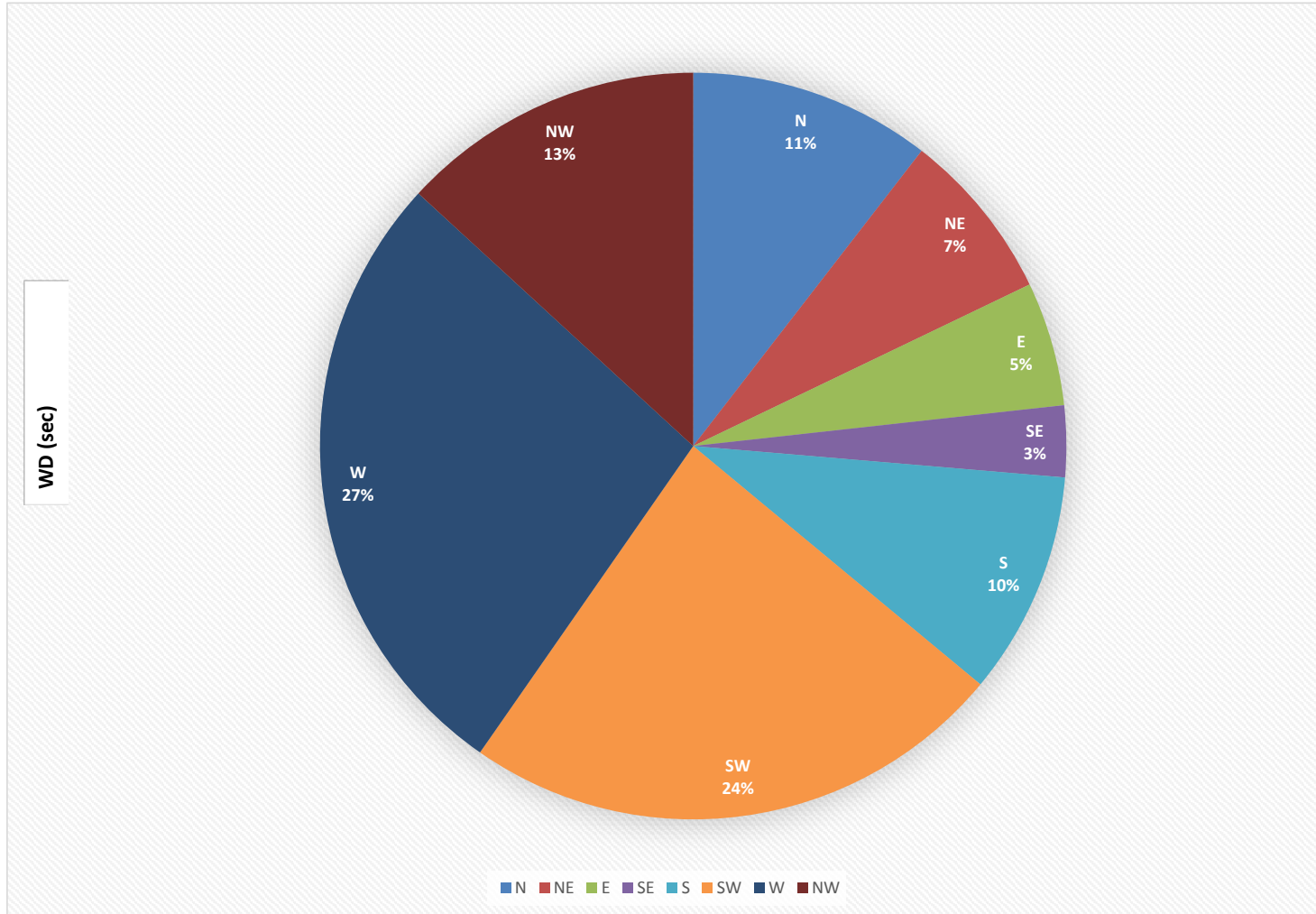
STATUS FLAG CODES

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

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

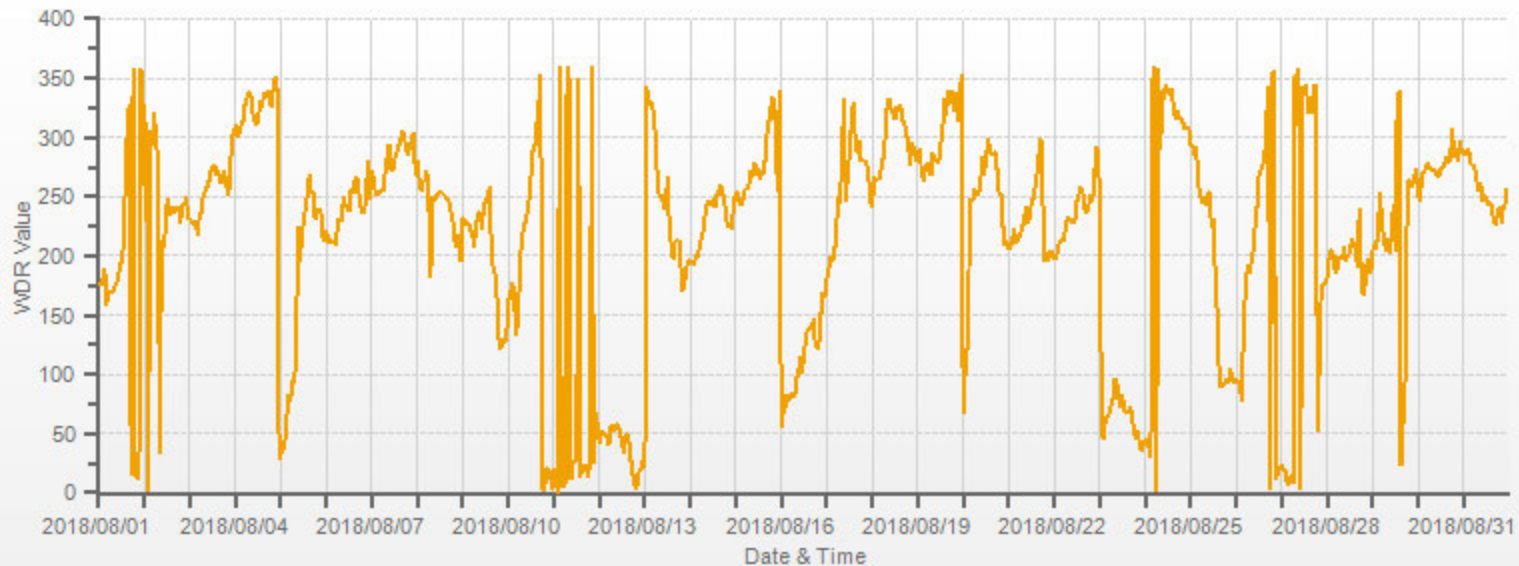
MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	93		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	266	266 (W)

WIND DIRECTION Hourly Averages (WD)



WDR[degwdr] Station: LICA ST. LINA Monthly: 18/08 Type: AVG 1 Hr. [1 Hr.]

— WDR[degwdr]



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - August 2018

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	13	12	12	14	15	15	14	15	15	15	17	17	18	18	38	23	26	18	19	17	14	13	17	24	24	
2	31	57	25	15	16	27	38	30	68	33	26	28	22	21	21	14	13	13	13	17	8	10	12	14	24	
3	15	11	13	17	13	9	10	14	13	15	18	18	18	19	15	16	14	13	14	15	14	24	15	15	24	
4	16	16	16	16	16	16	16	17	20	20	18	17	20	17	19	22	20	17	16	15	14	16	35	13	24	
5	12	10	7	9	11	10	21	35	64	34	41	33	27	17	21	25	18	24	13	12	8	6	12	11	24	
6	10	11	12	12	13	13	10	12	16	15	17	18	17	14	12	12	14	12	9	9	8	20	22	8	24	
7	15	14	8	8	8	8	13	13	17	18	15	16	18	22	19	19	18	19	15	13	12	11	14	12	24	
8	16	10	9	8	7	15	7	28	12	14	12	13	15	13	12	13	10	13	11	8	12	10	13	11	24	
9	10	8	8	7	5	7	11	34	29	18	16	17	17	15	16	36	22	14	13	9	7	9	11	16	24	
10	10	14	9	10	15	15	18	15	15	14	14	13	22	20	25	22	18	21	15	18	15	17	15	38	24	
11	13	15	19	27	16	18	20	26	60	17	16	19	19	32	20	18	19	18	21	16	27	36	16	16	24	
12	20	16	17	18	15	16	16	16	16	16	16	16	16	18	16	18	18	18	18	19	19	17	17	17	24	
13	17	26	17	14	17	15	16	15	13	14	27	25	29	30	27	24	21	18	17	16	7	11	14	14	24	
14	14	13	13	15	15	15	15	15	16	12	14	12	12	16	13	12	13	11	8	8	9	10	10	14	24	
15	6	7	9	4	6	4	5	8	9	8	14	17	15	15	14	14	20	13	16	9	12	20	29	29	24	
16	15	13	14	14	13	13	13	15	18	20	20	25	17	28	22	18	17	15	13	10	10	13	11	10	24	
17	13	10	12	9	13	17	22	42	28	31	41	30	21	15	13	21	18	15	17	10	9	9	13	16	24	
18	14	8	7	7	10	10	12	18	20	19	17	18	18	19	17	19	17	17	16	13	8	12	10	8	24	
19	11	11	14	7	7	8	7	10	14	18	22	23	26	23	24	23	18	18	18	9	10	10	12	22	24	
20	15	12	13	54	6	9	6	8	12	24	29	25	26	23	28	26	20	16	12	5	5	13	11	12	24	
21	11	12	13	12	13	10	12	11	12	20	17	17	17	16	18	19	19	23	50	8	10	9	10	10	24	
22	10	9	13	13	13	13	12	8	10	11	12	12	10	11	14	15	13	12	9	5	11	21	12	10	24	
23	27	71	13	12	13	15	14	16	19	18	17	18	18	19	17	17	17	17	16	15	15	18	17	14	24	
24	14	17	22	29	57	66	38	69	29	16	19	18	17	17	17	16	20	16	16	16	16	16	16	16	24	
25	16	16	15	17	8	10	12	11	14	15	21	17	22	28	30	29	18	15	16	16	16	15	14	15	24	
26	19	20	13	15	14	17	12	14	18	21	22	19	23	23	16	33	17	28	20	19	20	19	17	19	24	
27	17	18	19	17	17	18	20	18	21	21	24	21	24	23	22	32	32	21	19	13	35	7	14	10	24	
28	8	10	12	12	13	12	15	16	18	18	18	19	21	22	22	22	17	41	49	23	13	10	12	11	24	
29	13	14	13	10	13	10	13	14	16	16	19	17	25	60	29	34	20	30	58	8	19	6	9	11	24	
30	5	8	8	8	9	10	11	13	13	17	15	14	18	15	18	19	16	21	23	16	15	14	15	13	24	
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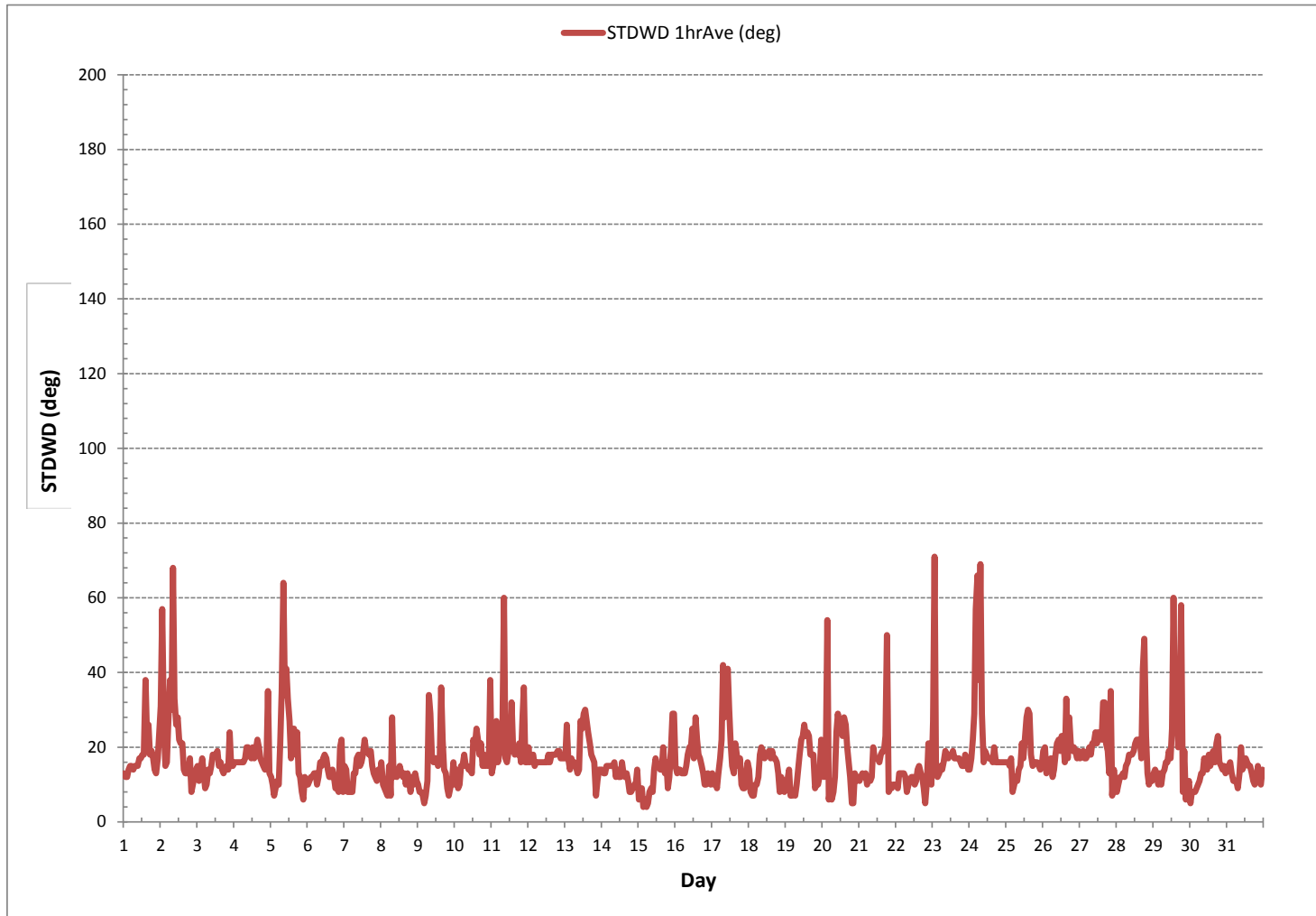
STATUS FLAG CODES

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

LAST CALIBRATION: May 25, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



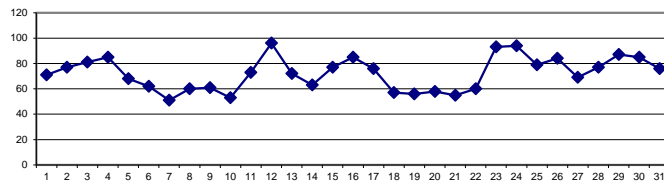
RELATIVE HUMIDITY Hourly Averages (RH %)

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

STATUS FLAG CODES

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

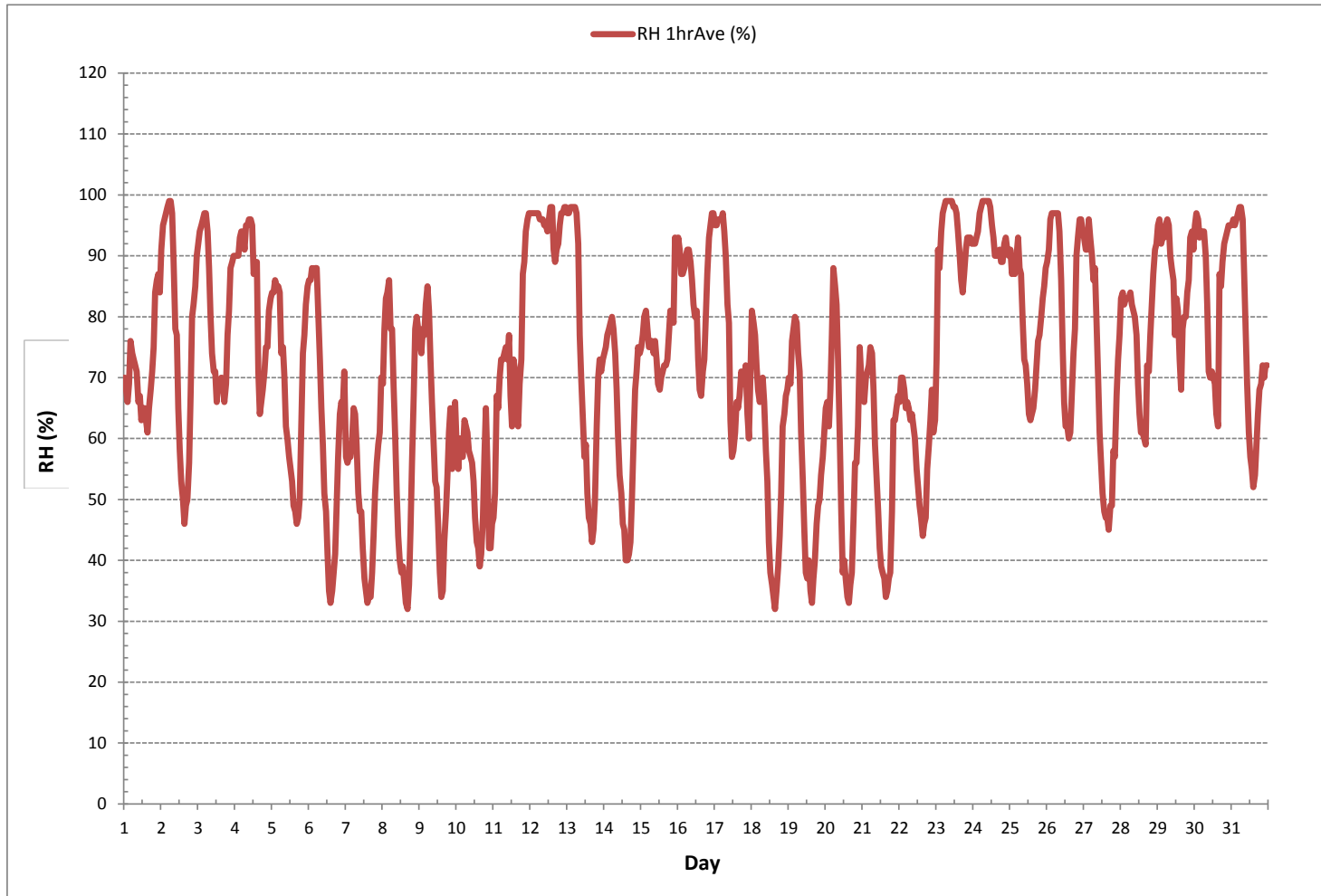
24 HR AVERAGES August 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	32	%	@ HOUR	16	ON DAY	8
MAXIMUM 1-HR AVERAGE:	99	%	@ HOUR	5	ON DAY	2
MAXIMUM 24-HR AVERAGE:	96	%			ON DAY	12
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	18					MONTHLY AVERAGE: 72 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



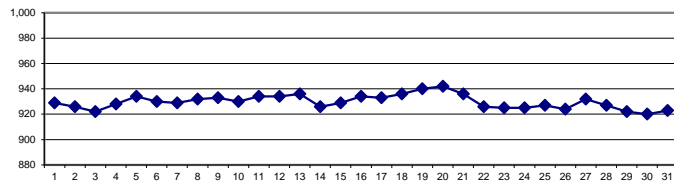
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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	934	933	933	932	932	931	930	930	930	930	929	929	929	929	929	929	929	928	928	928	927	926	926	926	926	926	934	929	24
2	926	926	925	925	925	925	926	926	927	927	927	927	928	928	927	927	927	926	925	924	923	923	923	923	923	923	928	926	24
3	922	921	921	921	921	921	921	921	922	922	922	923	923	923	923	923	923	923	924	923	923	923	923	923	923	921	924	922	24
4	923	923	924	924	924	925	925	926	926	927	928	928	929	929	929	930	931	931	931	931	931	931	932	932	932	923	932	928	24
5	932	932	932	932	933	933	933	934	935	936	936	936	936	936	936	936	936	935	935	934	933	933	932	932	932	932	936	934	24
6	932	931	931	931	930	930	930	931	931	932	932	932	931	931	931	930	930	930	929	929	928	928	928	927	927	927	932	930	24
7	927	927	927	927	927	927	927	928	929	929	929	929	930	930	930	930	930	931	930	930	930	930	930	930	927	931	929	24	
8	930	930	930	930	931	931	932	933	933	933	933	933	934	933	934	934	933	933	933	932	931	931	931	931	931	930	934	932	24
9	931	931	931	931	931	931	931	932	933	933	934	934	934	935	935	935	935	934	934	934	933	933	932	932	931	931	935	933	24
10	931	931	930	930	929	929	929	929	929	930	930	930	930	931	931	931	931	931	930	930	929	929	930	931	929	931	930	24	
11	931	930	930	931	931	932	933	934	935	935	935	935	935	936	936	936	936	936	936	936	936	936	937	935	933	930	937	934	24
12	934	934	934	934	934	934	934	934	934	934	934	934	933	934	933	933	933	933	934	934	935	935	935	935	935	933	935	934	24
13	935	935	936	936	936	936	937	937	937	938	938	938	938	938	937	937	937	936	935	934	933	931	931	930	930	930	938	936	24
14	929	928	927	927	926	926	925	926	926	927	927	927	927	927	927	927	927	927	927	927	926	925	924	924	924	924	929	926	24
15	925	924	925	925	925	925	926	927	927	927	928	929	929	930	930	931	931	931	932	932	932	932	933	933	933	924	933	929	24
16	933	933	934	934	934	934	935	935	935	935	935	936	935	935	935	934	934	934	934	933	933	933	932	932	932	932	936	934	24
17	932	932	932	932	932	931	932	932	933	933	934	934	934	934	933	933	933	933	933	932	932	932	933	933	933	931	934	933	24
18	932	932	932	932	932	933	933	933	935	936	937	938	938	939	939	940	940	940	940	939	939	939	938	938	932	940	936	24	
19	938	939	938	938	938	938	939	939	940	941	941	942	942	941	942	942	942	942	942	941	941	941	941	941	941	938	942	940	24
20	941	941	941	941	941	941	942	942	943	944	944	944	944	943	943	943	942	941	940	939	938	938	938	938	938	944	942	24	
21	938	938	937	936	936	935	935	936	937	937	938	938	938	938	937	937	937	937	936	935	933	932	931	931	931	931	938	936	24
22	930	929	929	928	927	926	926	926	926	926	927	926	926	926	927	926	926	926	926	925	924	924	924	924	924	924	930	926	24
23	924	923	923	923	923	924	924	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	923	925	925	24	
24	925	924	924	924	924	924	924	924	925	924	924	925	925	925	925	926	926	926	926	927	927	927	927	927	924	927	925	24	
25	927	927	927	927	927	927	927	928	928	929	929	929	929	929	929	928	928	927	927	926	926	926	925	925	925	925	929	927	24
26	925	924	923	923	923	922	922	922	923	923	924	924	924	923	924	924	924	924	924	924	925	925	926	926	927	922	927	924	24
27	927	928	929	929	930	931	931	932	933	934	934	934	934	935	935	934	935	934	934	934	932	932	931	930	930	927	935	932	24
28	929	929	928	928	927	927	927	926	926	927	927	927	927	928	927	927	927	926	926	925	925	924	924	923	923	929	927	24	
29	923	923	922	922	922	922	922	922	922	922	923	923	923	923	923	922	922	921	921	921	920	920	920	920	920	920	923	922	24
30	919	919	919	919	918	918	919	919	920	920	920	920	921	921	921	922	921	922	922	921	921	922	922	922	922	918	922	920	24
31	922	922	923	923	923	923	923	923	923	924	925	925	925	925	924	924	923	922	922	921	921	921	921	920	920	920	925	923	24
HOURLY MAX	941	941	941	941	941	941	942	942	943	944	944	944	944	943	943	943	943	942	942	941	941	941	941	941	941	941	941	941	24
HOURLY AVG	929	929	929	929	929	929	929	929	930	930	931	931	931	931	931	931	931	931	930	930	930	929	929	929	929	929	929	929	24

STATUS FLAG CODES

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

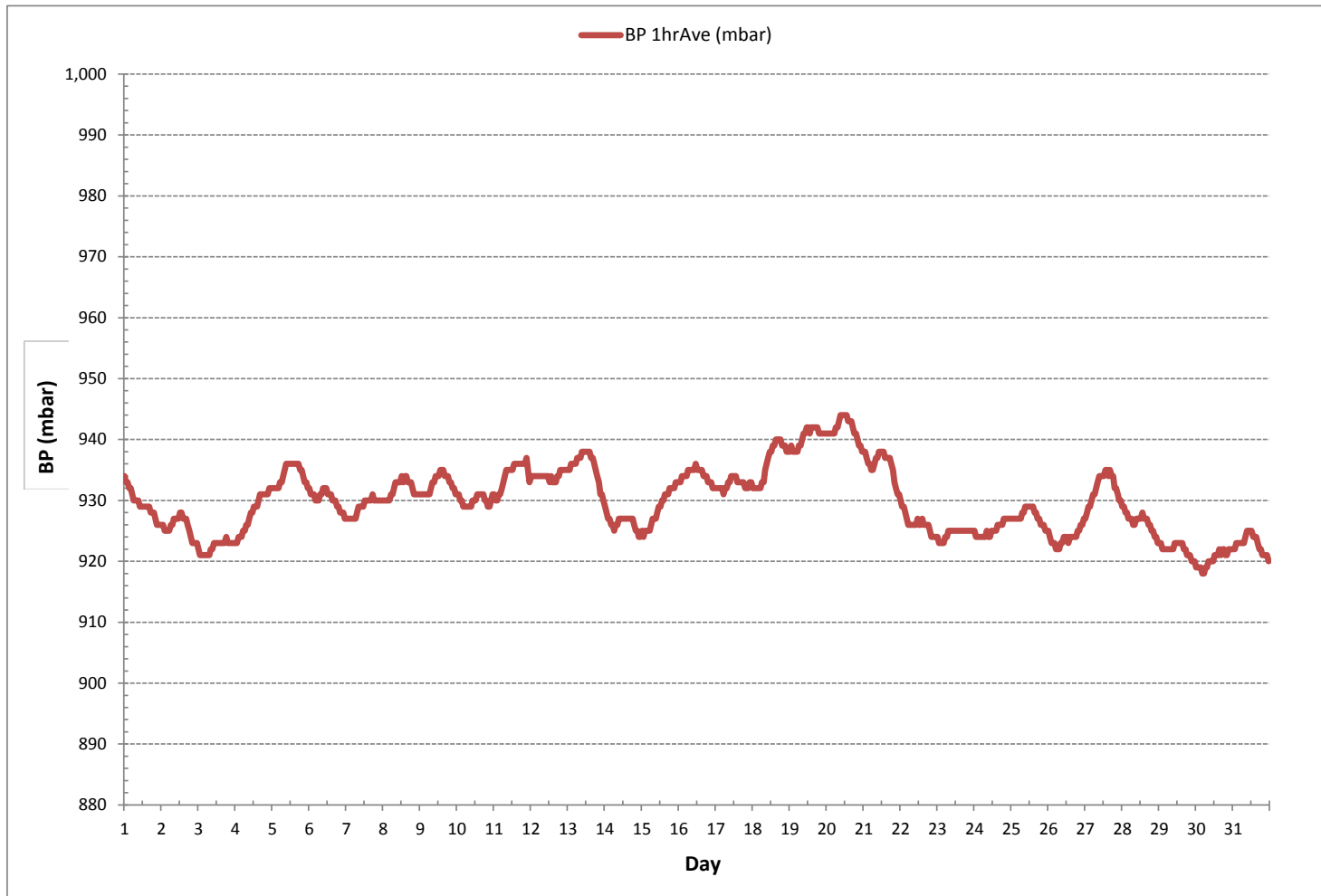
24 HR AVERAGES August 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	918 mbar	@ HOUR	4	ON DAY	30
MAXIMUM 1-HR AVERAGE:	944 mbar	@ HOUR	9	ON DAY	20
MAXIMUM 24-HR AVERAGE:	942 mbar			ON DAY	20
OPERATIONAL TIME:					744 hrs
AMD OPERATION UPTIME:					100.0 %
STANDARD DEVIATION:	6			MONTHLY AVERAGE:	930 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



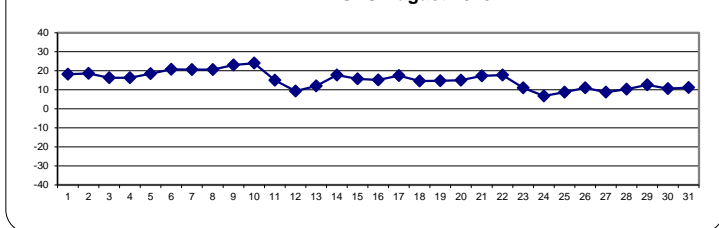
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	16.2	16.0	15.7	15.1	14.1	14.3	14.7	15.5	15.8	17.3	18.0	19.5	19.5	20.8	21.6	22.7	23.2	22.5	21.8	20.9	18.5	17.7	17.1	17.3	14.1	23.2	18.2	24	
2	15.7	15.4	15.4	15.2	14.7	14.4	14.7	15.9	17.3	19.6	20.2	22.4	23.2	24.9	24.7	25.5	24.4	23.5	19.7	18.1	16.1	15.7	14.9	14.1	14.1	25.5	18.6	24	
3	13.6	12.7	12.6	12.4	12.2	12.6	14.0	15.9	17.2	18.6	19.2	18.6	19.8	18.7	19.1	19.3	19.7	20.0	19.6	18.1	16.4	14.9	15.0	14.2	12.2	20.0	16.4	24	
4	14.1	13.9	13.6	13.4	13.8	14.4	14.9	14.2	14.9	14.7	15.0	15.6	17.6	17.2	17.4	20.1	21.1	20.9	20.4	19.1	17.6	17.1	16.0	15.0	13.4	21.1	16.3	24	
5	14.1	13.4	12.7	12.5	12.5	13.0	15.5	16.3	17.9	19.7	20.9	21.7	22.4	23.0	23.5	23.4	24.5	24.2	24.4	21.4	18.5	17.2	16.3	15.5	12.5	24.5	18.5	24	
6	15.0	14.9	14.2	14.0	13.4	13.4	15.3	17.5	20.4	22.7	24.9	25.8	26.7	27.1	27.3	26.7	26.3	25.8	24.1	22.5	20.8	20.4	20.3	18.7	13.4	27.3	20.8	24	
7	19.4	18.9	18.3	17.8	17.3	16.7	17.3	18.2	19.7	20.7	21.1	22.7	23.9	25.0	25.4	25.4	25.1	24.7	23.0	21.3	20.0	19.3	18.7	16.9	16.7	25.4	20.7	24	
8	17.0	15.2	14.1	13.8	13.3	14.4	15.0	17.8	20.1	22.4	24.2	25.0	25.9	25.8	26.5	26.9	26.9	26.9	25.9	22.5	19.9	18.4	18.1	17.9	13.3	26.9	20.6	24	
9	17.1	16.9	16.3	16.2	15.7	15.3	16.0	17.6	20.4	22.8	25.0	26.1	27.9	29.4	30.3	31.4	30.3	29.2	28.0	25.9	24.1	24.6	23.2	21.8	15.3	31.4	23.0	24	
10	22.4	22.3	21.4	21.3	20.4	19.1	19.6	20.4	22.1	23.5	24.4	25.7	27.9	28.7	30.1	30.5	30.4	29.2	26.8	24.0	22.0	21.5	21.2	20.6	19.1	30.5	24.0	24	
11	19.9	19.2	18.2	17.9	16.9	16.6	15.9	15.2	15.2	14.9	17.1	16.8	15.8	15.6	17.0	16.7	15.4	14.3	11.0	9.8	9.0	8.9	9.4	8.9	19.9	15.1	24		
12	9.6	9.6	9.5	9.6	9.6	9.6	9.7	9.8	10.0	10.0	10.3	10.2	9.7	9.6	9.2	10.5	10.1	9.7	9.3	8.5	8.0	7.8	7.7	7.4	7.4	10.5	9.4	24	
13	7.1	7.0	7.1	7.0	6.5	6.4	6.5	8.6	10.7	12.2	13.9	15.4	15.0	17.2	17.5	17.3	17.8	17.1	16.6	13.9	12.2	11.4	11.6	11.3	6.4	17.8	12.0	24	
14	11.0	10.6	10.2	10.2	10.3	10.5	11.7	13.6	16.1	19.0	20.7	22.1	23.4	24.7	24.9	25.0	24.8	24.4	23.3	20.7	18.6	18.0	17.2	16.9	10.2	25.0	17.8	24	
15	16.6	16.2	15.0	14.4	14.3	14.3	14.2	14.0	14.3	14.0	15.0	16.7	17.4	18.0	18.3	18.4	18.2	17.9	17.1	15.9	15.2	15.6	13.8	14.3	13.8	18.4	15.8	24	
16	12.9	12.9	12.6	12.3	11.8	11.4	11.3	11.4	12.3	13.6	15.4	16.4	16.8	18.7	19.6	19.8	19.6	19.2	18.3	17.0	15.9	15.2	14.8	14.6	11.3	19.8	15.2	24	
17	14.6	14.4	14.0	13.7	13.6	13.5	14.3	15.6	17.8	18.4	21.8	22.7	22.4	20.9	20.1	20.4	20.0	19.5	18.8	17.8	17.3	16.9	16.4	14.6	13.5	22.7	17.5	24	
18	13.2	13.2	12.7	12.2	11.8	11.7	11.5	12.1	13.3	14.4	15.8	16.7	17.4	18.3	18.8	19.2	18.5	17.8	16.7	15.1	13.6	12.8	11.9	11.4	11.4	19.2	14.6	24	
19	11.0	11.0	9.6	8.9	8.7	9.0	9.5	10.9	13.3	15.8	17.7	18.8	19.3	18.8	19.8	19.9	19.5	19.1	17.8	16.1	15.3	14.8	14.4	13.4	8.7	19.9	14.7	24	
20	11.8	11.8	12.5	11.3	10.2	9.2	10.5	11.3	13.7	16.5	18.1	19.3	19.2	19.9	20.3	20.3	19.9	19.1	17.6	16.0	14.8	13.7	12.7	12.5	9.2	20.3	15.1	24	
21	12.6	12.3	11.1	10.2	9.8	8.8	9.6	12.2	15.6	18.3	20.9	22.7	23.1	23.3	23.7	23.6	23.2	23.5	24.4	20.5	18.0	16.9	15.5	15.0	8.8	24.4	17.3	24	
22	14.7	13.4	12.8	12.3	12.1	11.3	11.8	13.3	14.6	16.6	18.5	20.2	20.9	22.4	23.4	24.5	25.5	25.1	22.1	19.8	18.6	17.3	18.7	18.4	11.3	25.5	17.8	24	
23	16.1	12.7	13.1	12.1	11.7	11.0	11.1	11.7	12.0	12.3	12.8	12.1	11.3	10.9	10.6	10.9	11.0	11.3	10.5	9.4	8.7	7.7	7.0	6.7	6.7	16.1	11.0	24	
24	6.7	6.8	6.6	6.5	6.2	5.9	6.2	6.5	6.7	6.7	6.7	6.9	7.4	7.8	8.0	7.8	7.7	7.4	7.4	7.1	6.8	6.3	6.1	5.9	5.9	8.0	6.8	24	
25	5.5	5.5	5.3	5.0	4.6	5.1	5.2	6.8	8.6	9.4	9.7	10.5	11.2	11.6	12.1	12.6	12.3	11.6	10.5	10.0	9.6	9.2	8.9	8.5	4.6	12.6	8.7	24	
26	8.3	8.0	7.7	7.5	7.3	7.8	8.2	9.0	10.7	12.8	15.0	16.4	16.2	16.1	15.7	15.3	14.5	12.9	11.4	10.5	10.3	8.8	7.6	7.2	7.2	16.4	11.1	24	
27	6.9	6.8	6.5	5.8	5.8	6.0	6.2	6.3	7.8	9.0	10.0	10.3	11.0	11.9	12.0	12.4	12.9	12.2	12.0	9.3	9.3	7.7	7.1	6.3	5.8	12.9	8.8	24	
28	5.6	5.5	5.3	5.0	4.8	5.1	5.6	6.1	6.8	7.7	9.5	12.7	15.3	16.6	16.8	17.3	17.3	14.8	14.6	12.9	11.5	10.8	10.2	9.6	4.8	17.3	10.3	24	
29	8.9	8.8	9.4	9.1	9.6	9.1	9.7	10.6	12.1	12.8	14.0	15.9	15.2	15.8	16.2	16.5	15.2	14.8	14.4	13.7	13.6	12.6	12.2	12.0	8.8	16.5	12.6	24	
30	11.2	10.6	10.3	9.5	8.7	8.3	8.4	9.3	10.7	12.2	12.3	12.0	12.1	12.7	14.1	14.7	11.3	12.0	10.5	9.5	9.1	8.1	7.9	7.9	7.9	14.7	10.6	24	
31	7.8	7.7	7.4	6.5	5.9	5.7	6.1	7.2	9.4	10.8	12.3	13.5	14.6	15.4	16.1	15.8	15.5	14.8	14.1	13.2	12.7	12.4	12.2	11.7	5.7	16.1	11.2	24	
HOURLY MAX	22.4	22.3	21.4	21.3	20.4	19.1	19.6	20.4	22.1	23.5	25.0	26.1	27.9	29.4	30.3	31.4	30.4	29.2	28.0	25.9	24.1	24.6	23.2	21.8					
HOURLY AVG	12.8	12.4	12.0	11.6	11.2	11.1	11.6	12.6	14.1	15.5	16.7	17.8	18.4	18.9	19.3	19.7	19.5	18.9	17.9	16.2	14.9	14.2	13.7	13.1					

STATUS FLAG CODES

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

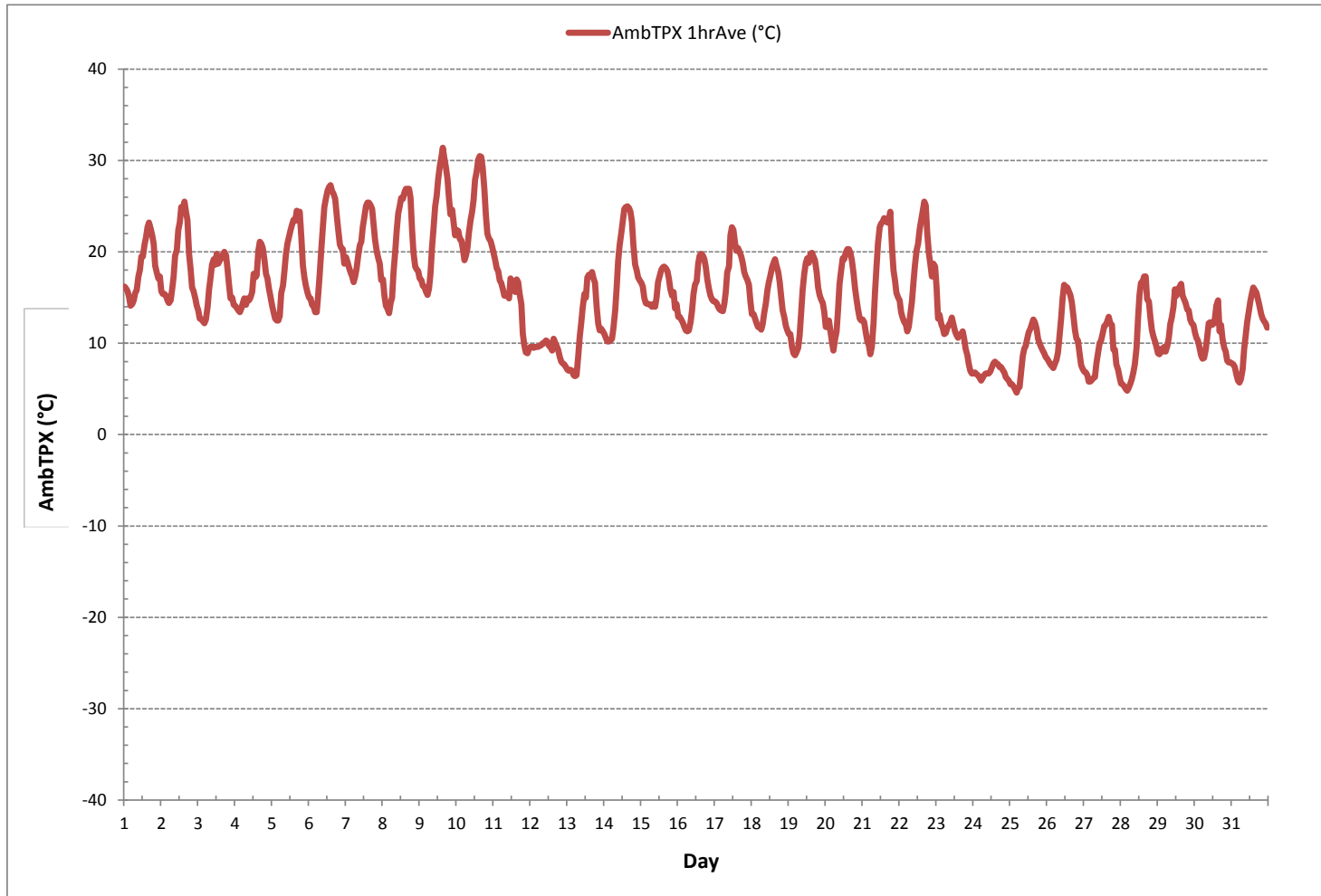
24 HR AVERAGES August 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	4.6 °C	@ HOUR	4	ON DAY	25
MAXIMUM 1-HR AVERAGE:	31.4 °C	@ HOUR	15	ON DAY	9
MAXIMUM 24-HR AVERAGE:	24.0 °C			ON DAY	10
OPERATIONAL TIME:					744 hrs
AMD OPERATION UPTIME:					100.0 %
STANDARD DEVIATION:	5.6	MONTHLY AVERAGE:			15.2 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



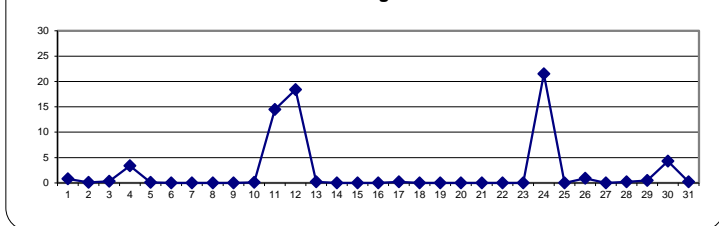
PRECIPITATION Hourly Totals (mm)

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.	TOTALS		
DAY																													
1	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.2	0.3	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.2	0.1	0.1	0.0	0.0	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	2.2	3.4	24
5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.5	3.7	5.1	3.4	0.1	0.0	5.1	14.5	24	
12	0.0	2.4	0.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.4	5.4	0.0	0.0	0.0	0.0	1.0	0.7	0.5	1.9	0.7	0.0	0.0	5.4	18.4	24	
13	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	24	
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	24
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
24	0.0	0.0	0.0	0.2	7.4	10.9	0.3	0.7	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	10.9	21.5	24	
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
26	0.0	0.0	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.9	24
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	24
29	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.5	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	0.1	0.5	0.0	3.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	3.4	4.3	24	
31	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.2	24
HOURLY MAX	0.1	2.4	0.4	1.2	7.4	10.9	0.3	2.2	2.0	0.1	0.1	1.0	3.4	5.4	0.1	0.5	0.2	3.4	1.5	3.7	5.1	3.4	0.7						
HOURLY AVG	0.0	0.1	0.0	0.1	0.2	0.4	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	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

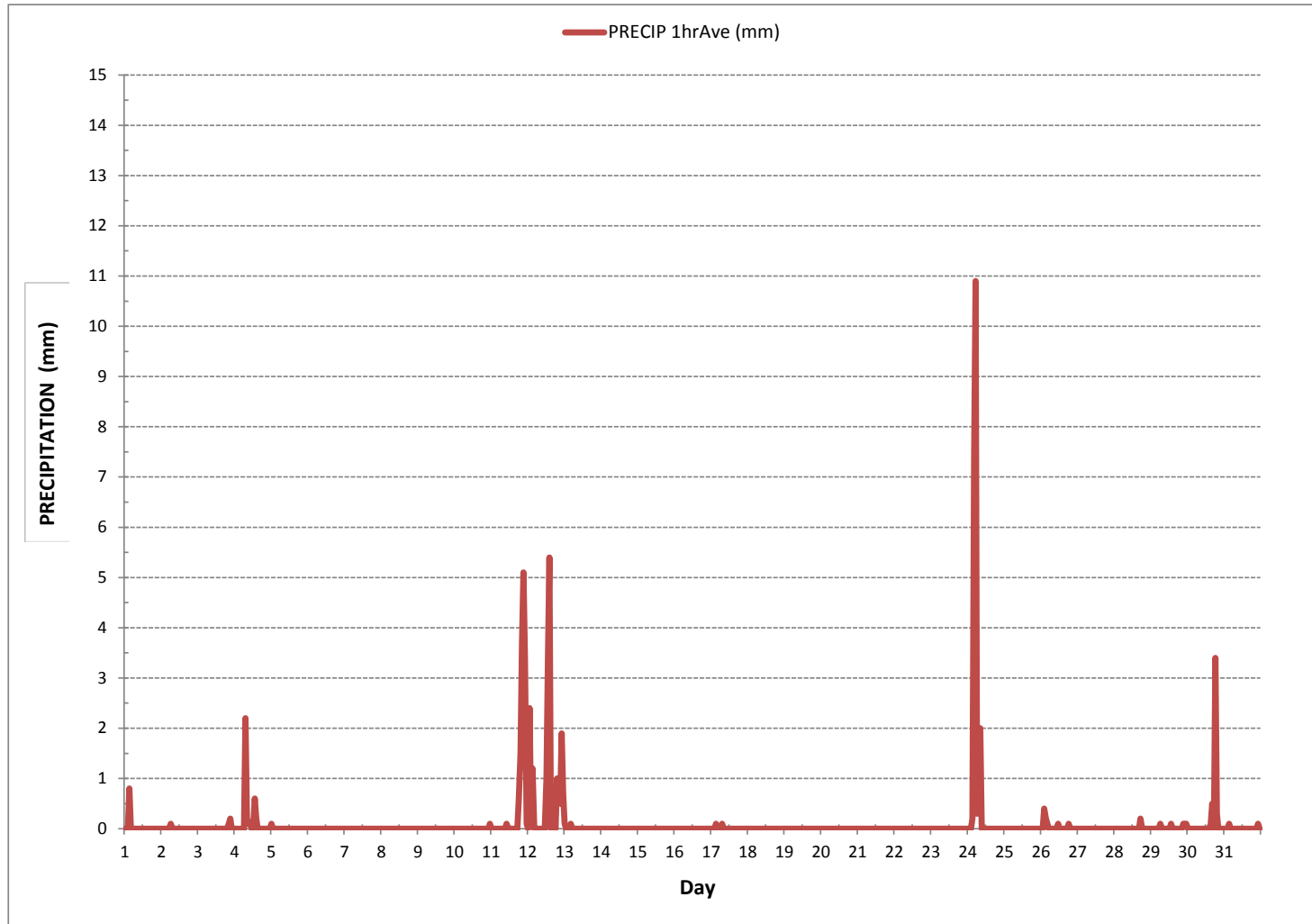
24 HR TOTALS August 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	10.9	mm	@ HOUR	5	ON DAY	24
MAXIMUM 24-HR AVERAGE:	21.5	mm			ON DAY	24
MONTHLY TOTAL	65.7	mm				
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	0.6					
MONTHLY AVERAGE:						65.7 mm

PRECIPITATION Hourly Totals (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date:	August 14, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	927	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	Weather Conditions:	Mainly sunny		
Parameter:	Sulphur Dioxide	Calibration Purpose:	shut down		
Start Time 24 hr. (mst):	10:31	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	13:35	Cal Gas Expiry Date:	October 24, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:					
Serial Number/Owner:	468 | LICA	Range ppb:	1000		
Last Calibration Date:	July 17, 2018	As Found C.F.:	0.978		
Previous C.F.:	1.000	New C.F.:	n/a		

Calibration Standards:	Standard Calibration Points for Ranges
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:	Environics id# 5212 expires March 1, 2019
Cal Gas Cylinder I.D. #:	LL 104225
Cal Gas Conc. (ppm):	49.2

Point	ppb
High	780
Mid	380
Low	190

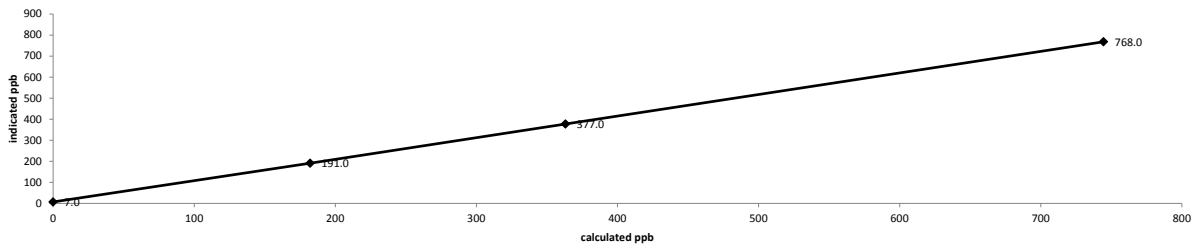
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	5074	0.00	5074	0.0	7.0	n/a
as found high	4983	76.56	5060	744.4	768.0	0.978
mid	5029	37.39	5066	363.1	377.0	0.981
low	5038	18.72	5057	182.1	191.0	0.990
Average C.F. =						0.983

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.977		0.90-1.10
b (Intercept as % of full scale) =	-0.57%		± 3% F.S.
% change in C.F. from last cal =	2.18%		± 10%

API 100E Sulphur Dioxide Analyzer Calibration



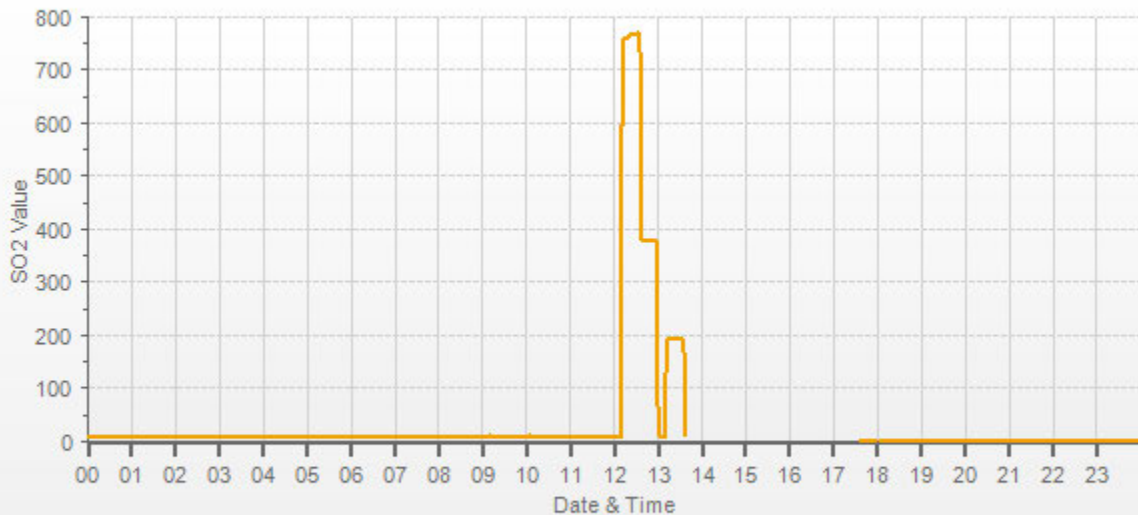
As found:	As left:
Slope: 0.947	Slope: n/a
Offset: 162.8	Offset: n/a
Hvps: 651	Hvps: n/a
Rcell Temp: 50.0	Rcell Temp: n/a
Box Temp: 29.9	Box Temp: n/a
Pmt Temp: 7.9	Pmt Temp: n/a
Izs Temp: 45.0	Izs Temp: n/a
Pres: 22.0	Pres: n/a
Samp Fl: 561	Samp Fl: n/a
Norm Pmt: 178.8	Norm Pmt: n/a
Uv Lamp: 2698.8	Uv Lamp: n/a
Lamp Ratio: 85.8	Lamp Ratio: n/a
Str Lgt: 77.1	Str Lgt: n/a
Drk Pmt: 5.7	Drk Pmt: n/a
Expected Value: 522.0	Expected Value: n/a

Comments:

The manifold blower was found to be working normally.

A Shutdown calibration was completed to install a new Thermo- Scientific analyzer.

SO2 [ppb] Station: LICA ST. LINA Daily: 18/08/14 Type: AVG 1 Min. [1 Min.]



— SO2 [ppb]



Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

Date: August 15, 2018 Company/Airshed: LICA Location/Station Name: St. Lina Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 9:54 End Time 24 hr. (mst): 14:20 Calibration Method: Gas Dilution	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 927 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Smoke Calibration Purpose: installation Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 24, 2020 Converter Model & s/n (if applicable): n/a	
Analyzer: Serial Number/Owner: 1180930030 | LICA Last Calibration Date: n/a Previous C.F.: n/a	Range ppb: 1000 As Found 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: Envionics id# 4760 expires March 2, 2019
Cal Gas Cylinder I.D. # : LL 104225
Cal Gas Conc. (ppm): 49.2

Point	ppb
High	780
Mid	380
Low	190

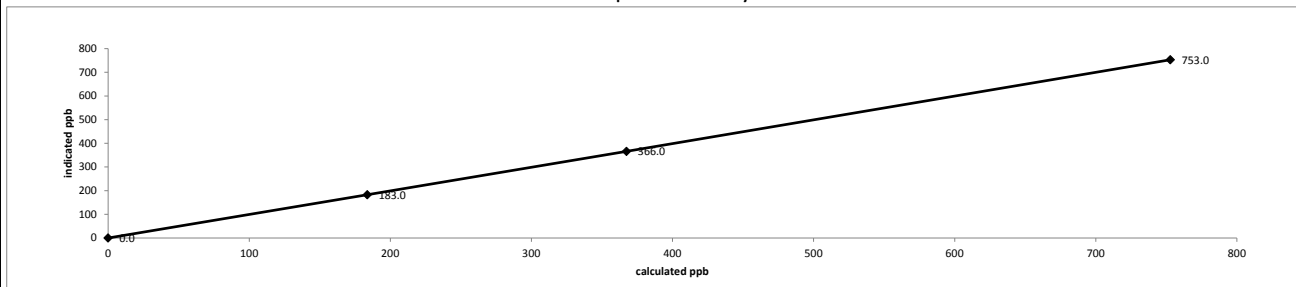
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
adjusted zero	4995	0.00	4995	0.0	0.0	n/a
adjusted high	4920	76.45	4996	752.9	753.0	1.000
mid	4957	37.29	4994	367.4	366.0	1.004
low	4974	18.64	4993	183.7	183.0	1.004
calibrator zero	4995	0.00	4995	0.0	0.0	n/a
Average C.F. =						1.002

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS > or = 0.995
Slope = <u>1.000</u>	0.95-1.05
b (Intercept as % of full scale) = <u>0.06%</u>	± 3% F.S.
% change in C.F. from last cal = <u>n/a</u>	n/a

Thermo 431-TLE Sulphur Dioxide Analyzer Calibration



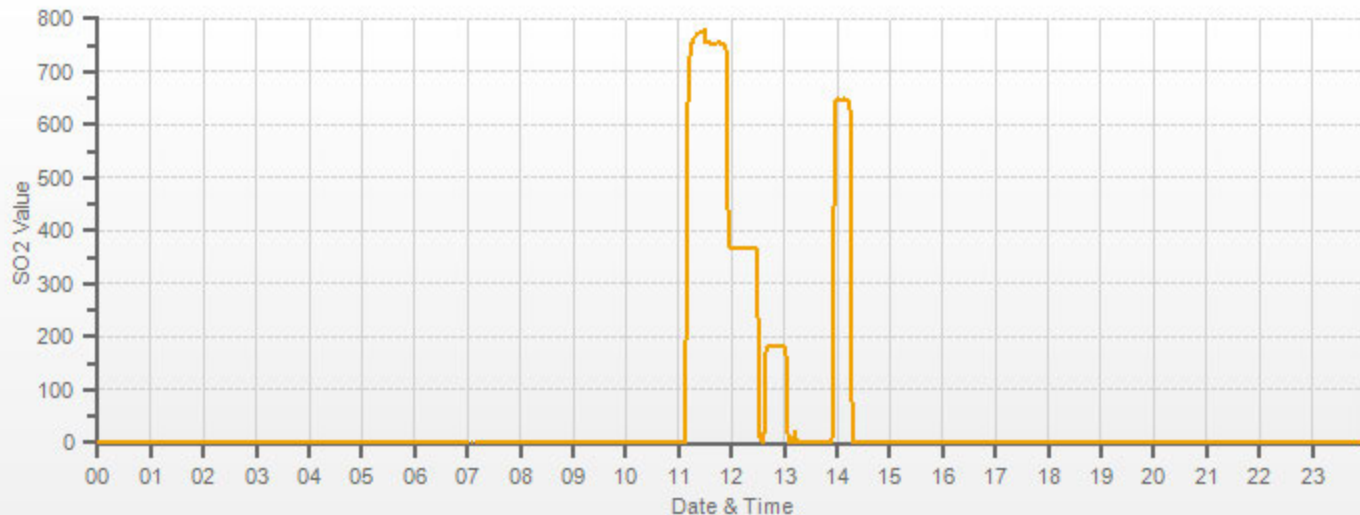
As found:	As left:
Bkg: <u>n/a</u>	Bkg: <u>3.06</u>
Coef: <u>n/a</u>	Coef: <u>0.941</u>
Pmt: <u>n/a</u>	Pmt: <u>-696.0</u>
Flash: <u>n/a</u>	Flash: <u>997</u>
Internal: <u>n/a</u>	Internal: <u>29.8</u>
Chamber: <u>n/a</u>	Chamber: <u>45.0</u>
Perm Oven Gas: <u>n/a</u>	Perm Oven Gas: <u>45.00</u>
Perm Oven Heater: <u>n/a</u>	Perm Oven Heater: <u>44.15</u>
Pressure: <u>n/a</u>	Pressure: <u>667.5</u>
Sample Flow: <u>n/a</u>	Sample Flow: <u>0.437</u>
Lamp Intensity: <u>n/a</u>	Lamp Intensity: <u>91</u>
Converter: <u>n/a</u>	Converter: <u>n/a</u>
Converter Set: <u>n/a</u>	Converter Set: <u>n/a</u>
Averaging Time: <u>n/a</u>	Averaging Time: <u>120</u>
Expected Value: <u>n/a</u>	Expected Value: <u>647.0</u>

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

A new Thermo-Scientific analyzer installed.

SO2[ppb] Station: LICA ST. LINA Daily: 18/08/15 Type: AVG 1 Min. [1 Min.]

SO2[ppb]



HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date:	August 1, 2018	Barometer/B.P./units:	Brunton 05535 expires December 15, 2018	27.42	inHg
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 160348895 expires June 19, 2020	20.9	°C
Location/Station Name:	St. Lina	Weather Conditions:	Mainly cloudy with clear breaks		
Parameter:	Hydrogen Sulphide	Calibration Purpose:	shut down		
Start Time 24 hr. (mst):	13:40	Performed By/Reviewer:	Limin Li	Rob Fisher	
End Time 24 hr. (mst):	15:30	Cal Gas Expiry Date:	August 23, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	Internal		
Analyzer:					
Serial Number/Owner:	509 | LICA	Range ppb:	100		
Last Calibration Date:	July 19, 2018	As Found C.F.:	1.055		
Previous C.F.:	1.011	New C.F.:	n/a		

Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 156151 expires October 2, 2018 High Flow Meter ID/Expiry Date: Defender High 156312 expires December 13, 2018 Calibrator ID/Expiry Date: Enviroconics id# 1991 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL119500 Cal Gas Conc. (ppm): 9.8	Standard Calibration Points for Ranges <table border="1"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								

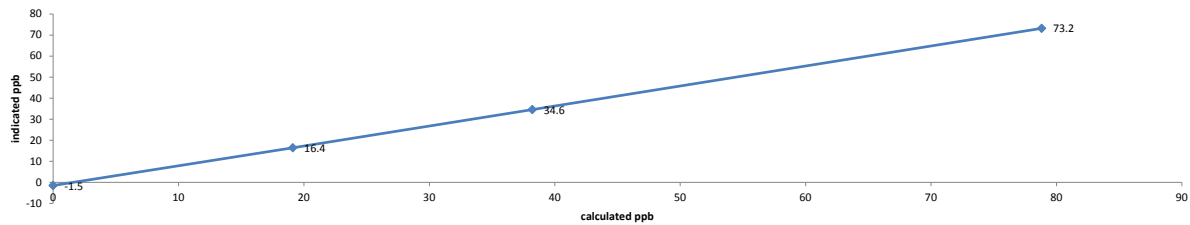
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	7506	0.00	7506	0.0	-1.5	n/a
as found high	7462	60.51	7523	78.8	73.2	1.055
mid	7494	29.33	7523	38.2	34.6	1.058
low	7507	14.67	7522	19.1	16.4	1.068
Average C.F. =						1.060

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.054		0.90-1.10
b (Intercept as % of full scale) =	1.70%		± 3% F.S.
% change in C.F. from last cal =	-4.37%		± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



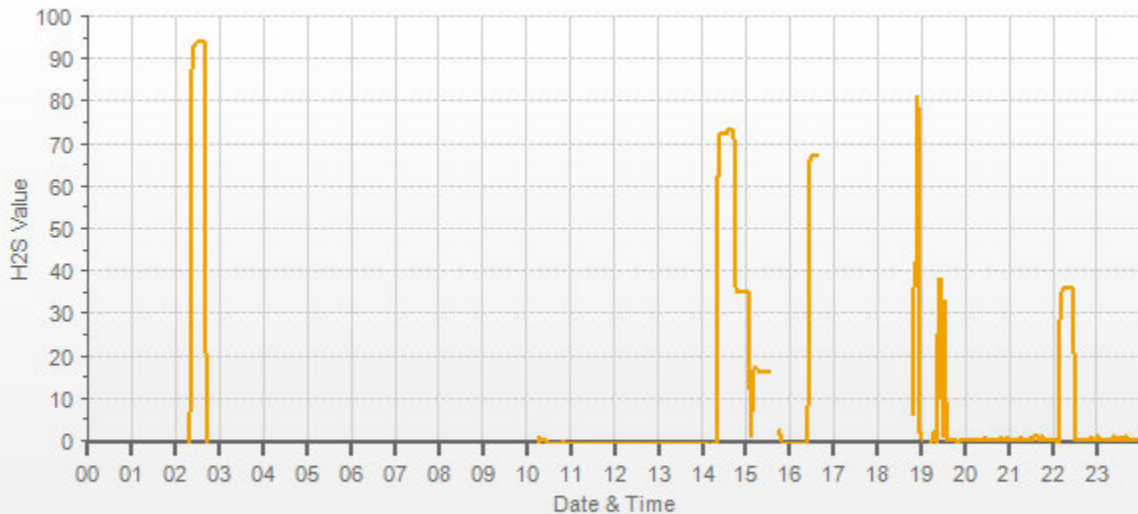
As found:	As left:
Slope: 0.883	Slope: n/a
Offset: 78.6	Offset: n/a
Hvps: 671	Hvps: n/a
Rcell Temp: 50	Rcell Temp: n/a
Box Temp: 31.5	Box Temp: n/a
Pmt Temp: 7.9	Pmt Temp: n/a
Izs Temp: 48	Izs Temp: n/a
Converter Temp: 314.2	Converter Temp: n/a
Pres: 21.3	Pres: n/a
Samp Fl: 444	Samp Fl: n/a
Uv Lamp: 2760	Uv Lamp: n/a
Lamp Ratio: 82.3	Lamp Ratio: n/a
Str Lgt: 34.7	Str Lgt: n/a
Drk Pmt: 0.1	Drk Pmt: n/a
Expected Value: 60.1	Expected Value: n/a

Comments:

The manifold blower was found to be working normally.

A shutdown calibration was performed due to span drift.

H2S [ppb] Station: LICA ST. LINA Daily: 18/08/01 Type: AVG 1 Min. [1 Min.]



— H2S [ppb]



Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date: August 2, 2018	Barometer/B.P./units: Brunton 05535 expires December 15, 2018	27.39	inHg
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 160348895 expires June 19, 2020	20.9	°C
Location/Station Name: St. Lina	Weather Conditions: Mainly sunny		
Parameter: Hydrogen Sulphide	Calibration Purpose: installation		
Start Time 24 hr. (mst): 8:30	Performed By/Reviewer: Limin Li	Rob Fisher	
End Time 24 hr. (mst): 11:36	Cal Gas Expiry Date: August 23, 2020		
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): Internal		
Analyzer:	Serial Number/Owner: CM18010058 | LICA	Range ppb: 100	
	Last Calibration Date: n/a	As Found C.F.: n/a	
	Previous C.F.: n/a	New C.F.: 1.002	

Calibration Standards:	Standard Calibration Points for Ranges	SO2 Scrubber Check (10 minutes):								
Low Flow Meter ID/Expiry Date: Defender Low 156151 expires October 2, 2018	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	Start/End Time 24 hr.: 08:48/09:00
Point	ppb									
High	78									
Mid	38									
Low	19									
High Flow Meter ID/Expiry Date: Defender High 156312 expires December 13, 2018		SO2 Analyzer Range: 1000								
Calibrator ID/Expiry Date: Envionics id# 1991 expires March 15, 2019		Target Concentration (ppb): 780								
Cal Gas Cylinder I.D. #: LL119500		As Found Zero: 0.0								
Cal Gas Conc. (ppm): 9.8		Analyzer Response: (ppb): 0.0								
		Zero Corrected Result (ppb): 0.0								

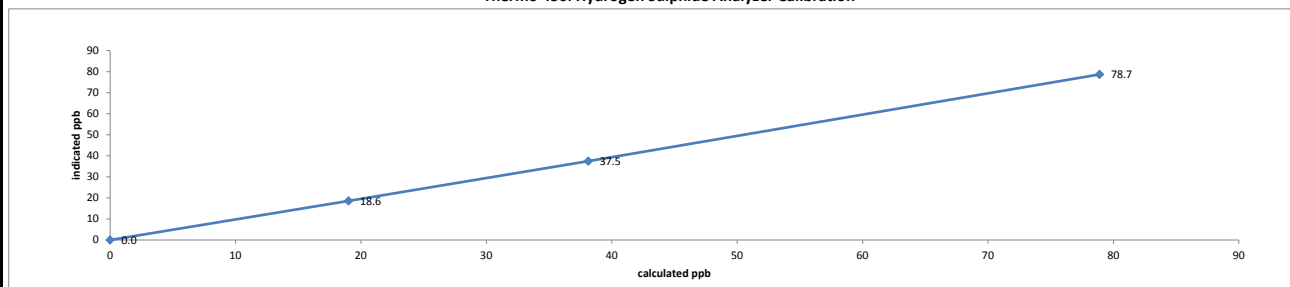
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
adjusted zero	7517	0.00	7517	0.0	0.0	n/a
adjusted high	7457	60.52	7518	78.9	78.7	1.002
mid	7510	29.33	7539	38.1	37.5	1.017
low	7525	14.63	7540	19.0	18.6	1.022
calibrator zero	7540	0.00	7540	0.0	0.0	n/a
Average C.F. =						1.014

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 1.001	> or = 0.995
b (Intercept as % of full scale) = 0.26%	0.95-1.05
% change in C.F. from last cal = n/a	± 3% F.S.
	n/a

Thermo 450i Hydrogen Sulphide Analyzer Calibration



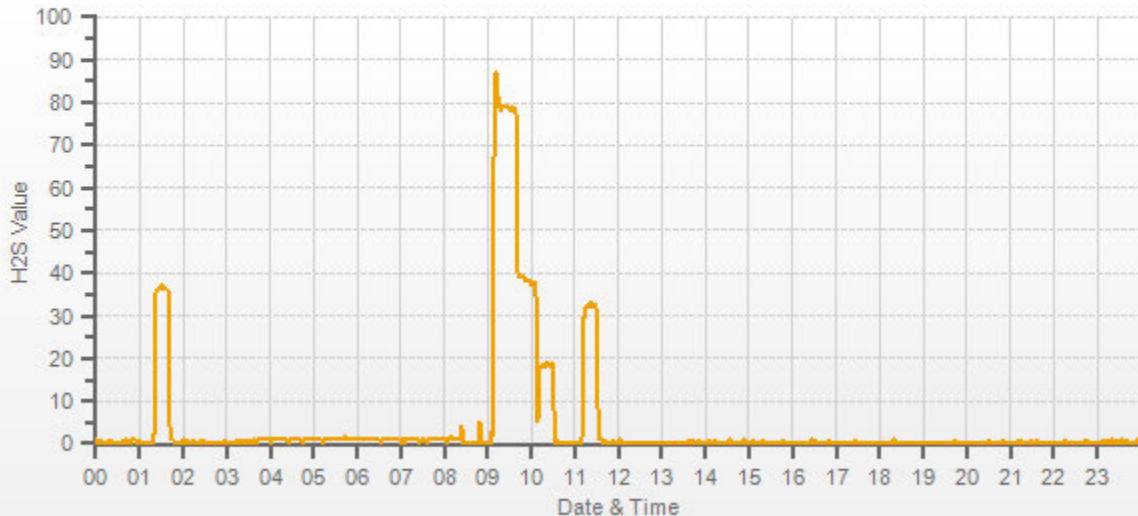
As found:	As left:
Bkg: n/a	Bkg: 21.5
Coef: n/a	Coef: 0.837
Pmt: n/a	Pmt: -634.6
Flash: n/a	Flash: 913
Internal: n/a	Internal: 35.8
Chamber: n/a	Chamber: 45.3
Converter Temp: n/a	Converter Temp: 326.0
Converter Set: n/a	Converter Set: 325.0
Perm Oven Gas: n/a	Perm Oven Gas: 45.00
Perm Oven Htr: n/a	Perm Oven Htr: 44.14
Pressure: n/a	Pressure: 579.1
Sample Flow: n/a	Sample Flow: 0.820
Lamp Intensity: n/a	Lamp Intensity: 90
Averaging Time: n/a	Averaging Time: 120
Expected Value: n/a	Expected Value: 33.0

Comments:

The manifold blower was found to be working normally.

An installation calibration was performed due to the previous Analyzer's #509 span drift.

H2S[ppb]





Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date:	August 23, 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:	Fog		
Parameter:	Hydrogen Sulphide	Calibration Purpose:	repeat		
Start Time 24 hr. (mst):	9:10	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	14:24	Cal Gas Expiry Date:	August 23, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:		Range ppb:	100		
Serial Number/Owner:	CM 18010058 | LICA	As Found C.F.:	1.097		
Last Calibration Date:	August 2, 2018	New C.F.:	1.000		
Previous C.F.:	1.002				

Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 156151 expires October 2, 2018 High Flow Meter ID/Expiry Date: Defender High 156312 expires December 13, 2018 Calibrator ID/Expiry Date: Envionics id# 4760 expires March 2, 2019 Cal Gas Cylinder I.D. #: LL 119500 Cal Gas Conc. (ppm): 9.8	Standard Calibration Points for Ranges <table border="1"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								

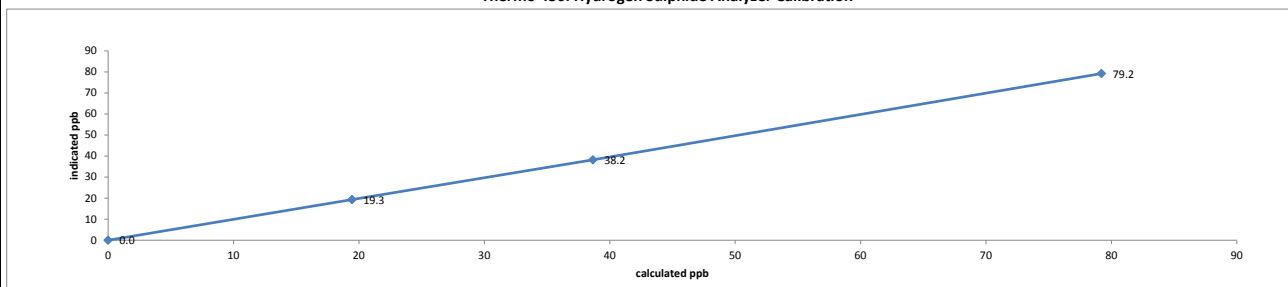
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7478	0.00	7478	0.0	2.8	n/a
as found high	7421	60.46	7481	79.2	75.0	1.097
adjusted zero	7478	0.00	7478	0.0	0.0	n/a
adjusted high	7421	60.46	7481	79.2	79.2	1.000
mid	7453	29.52	7483	38.7	38.2	1.012
low	7480	14.87	7495	19.4	19.3	1.007
calibrator zero	7478	0.00	7478	0.0	0.0	n/a
Average C.F. =						1.006

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		0.95-1.05
b (Intercept as % of full scale) =	0.15%		± 3% F.S.
% change in C.F. from last cal =	-9.48%		± 10%

Thermo 450i Hydrogen Sulphide Analyzer Calibration



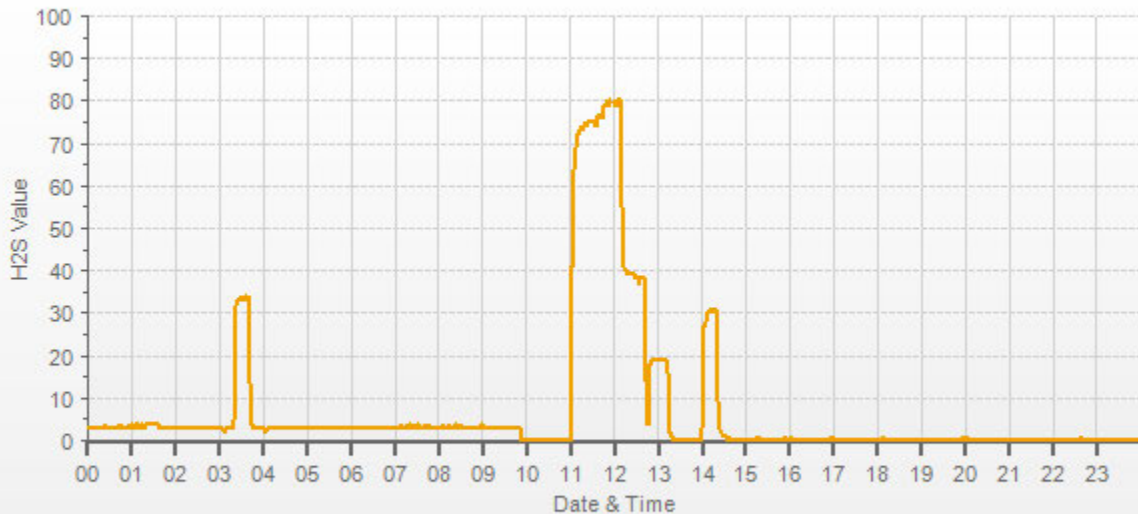
As found:	As left:
Bkg:	21.5
Coef:	0.837
Pmt:	-634.2
Flash:	906
Internal:	35.7
Chamber:	45.0
Converter Temp:	325.2
Converter Set:	325.0
Perm Oven Gas:	45.00
Perm Oven Htr:	44.30
Pressure:	580.0
Sample Flow:	0.821
Lamp Intensity:	91
Averaging Time:	120
Expected Value:	33.0

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 zero drift of 2.8 ppb. (A new analyzer was installed and calibrated the same day). SO2 Scrubber was tested during installation calibration.

H2S [ppb] Station: LICA ST. LINA Daily: 18/08/23 Type: AVG 1 Min. [1 Min.]



— H2S [ppb]

TOTAL HYDROCARBON



Thermo 51i Total Hydrocarbon Analyzer Calibration

Date: August 23, 2018	Barometer/B.P./units: Brunton 05535 expires December 15, 2018	27.38	inHg
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 160348895 expires June 19, 2020	22.7	°C
Location/Station Name: St. Lina	Weather Conditions: Fog		
Parameter: Total Hydrocarbon	Calibration Purpose: shut down		
Start/End Time 24 hr. (mst): 08:15/10:18	Performed By/Reviewer: Limin Li	Rob Fisher	
Calibration Method: Gas Dilution	Cal Gas Expiry Date: October 18, 2025		
Analyzer:	Serial Number/Owner: 925436893 | Maxxam	Range ppm: 50	
Last Calibration Date: July 1, 2018	As Found C.F.: 1.025		
Previous Cal High Point C.F.: 1.000	New C.F.: n/a		

Calibration Standards:

Low Flow Meter ID/Expiry Date: Defender Low 156151 expires October 2, 2018
 High Flow Meter ID/Expiry Date: Defender High 156312 expires December 13, 2018
 Calibrator ID/Expiry Date: Envionics id# 1991 expires March 15, 2019
 Cal Gas Cylinder I.D. #: LL168404
 CH₄/C₂H₆ Cylinder Conc. (ppm): 597.0 206.0
 CH₄ as propane/total CH₄ equivalents (ppm): 566.5 1163.5

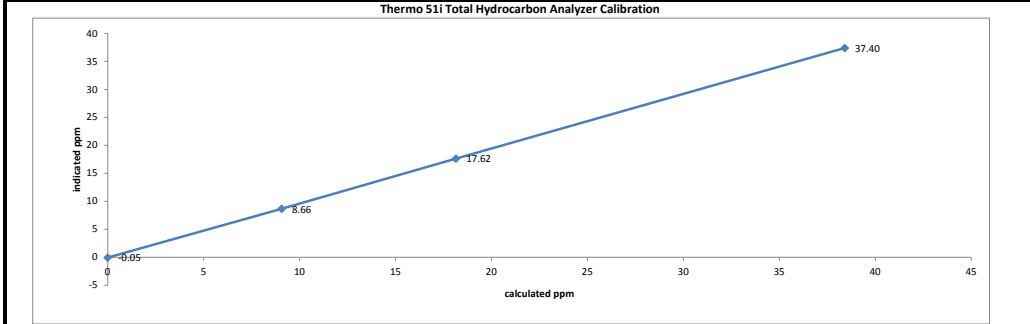
Point	Target ppm
High	38
Mid	18
Low	9

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

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	2521	0.00	2521	0.0	-0.05	n/a
as found high	2429	82.91	2512	38.40	37.40	1.025
mid	2471	39.14	2510	18.14	17.62	1.027
low	2490	19.55	2510	9.06	8.66	1.040
Average C.F.=						1.031

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.024		0.90-1.10
b (Intercept as % of full scale) =	0.22%		± 3% F.S.
% change in C.F. from last cal =	-2.54%		± 10%



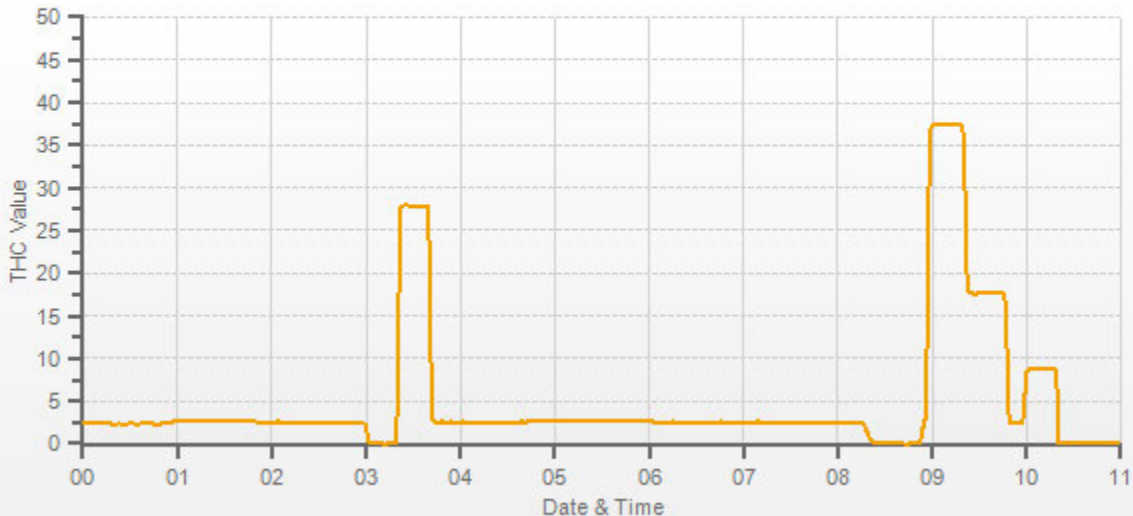
As found:	As left:
Bkg: 4.76	Bkg: n/a
Coef: 4.496	Coef: n/a
Bias Supply: -298	Bias Supply: n/a
Detector Base: 125.0	Detector Base: n/a
Filter: 125	Filter: n/a
Pump: n/a	Pump: n/a
Flame: 141.5	Flame: n/a
Internal: 30.1	Internal: n/a
Sample: 8.3	Sample: n/a
Fuel: 19.9	Fuel: n/a
Air: 39.8	Air: n/a
Signal: 895	Signal: n/a
Status: LIT	Status: n/a

Cylinder/Regulator Pressures:	H2 Cylinder (psi): 1950	H2 Cylinder (psi): n/a
H2 cylinder reg set (psi): 50	H2 cylinder reg set (psi): n/a	H2 cylinder reg set (psi): n/a
Zero Air Gen Pressure: 45	Zero Air Gen Pressure: n/a	Zero Air Gen Pressure: n/a
Span Cylinder (psi): 300	Span Cylinder (psi): n/a	Span Cylinder (psi): n/a
Span Cylinder reg set (psi): 22	Span Cylinder reg set (psi): n/a	Span Cylinder reg set (psi): n/a
Measured Flow: 0.690	Measured Flow: n/a	Measured Flow: n/a
Expected Value: 27.93	Expected Value: n/a	Expected Value: n/a

Comments:

A shut down calibration was performed to remove the 51i to install a new 55i analyzer.

THC[ppm]





Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	August 23, 2018	Barometer/B.P./units:	Brunton 05535 expires December 15, 2018	27.38	inHg
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 160348895 expires June 19, 2020	22.7	°C
Location/Station Name:	St. Lina	Weather Conditions:	Fog		
Parameter:	CH4 / NMHC / THC	Calibration Purpose:	installation		
Start/End Time 24 hr. (mst):	15:45/18:40	Performed By/Reviewer:	Limin Li	Rob Fisher	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	October 18, 2025		

Analyzer:		Correction Factors:			
Serial Number/Owner:	1180930025 | LICA	Previous C.F.:	As Found C.F.:	New C.F.:	
Measured Flow:	1245	CH ₄ =	n/a	n/a	0.999
Last Calibration Date:	n/a	NMHC =	n/a	n/a	0.994
Range ppm:	20 CH4/20 NMHC/40 THC	THC =	n/a	n/a	0.997

Low Flow Meter ID/Expiry Date:	Defender Low 156151 expires October 2, 2018	Standard Calibration Points for Analyzer Range of 20/20/40 ppm			
High Flow Meter ID/Expiry Date:	Defender High 156312 expires December 13, 2018	Point	CH4	NMHC	THC
Calibrator ID/Expiry Date:	Environics id# 1991 expires March 15, 2019	High	13.00	13.00	26.00
Cal Gas Cylinder I.D. #:	LL168404	Mid	7.00	7.00	14.00
CH4 Cylinder Conc. =	597.0 | 206.0 =C ₂ H ₆ Cylinder Conc.	Low	3.00	3.00	6.00
CH ₄ expressed as C ₂ H ₆ =	566.5 | 1163.5 =total CH4 equivalent				

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

Calibrator Flow Rates (cc/min)				Calculated						Correction Factors:		
Point	Diluent	Cal Gas	Total Flow	CH ₄ (ppm)	NMHC (ppm)	THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	CH ₄	NMHC	THC
adjusted zero	2498	0.00	2498	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	2435	60.66	2496	14.51	13.77	28.28	14.52	13.85	28.37	0.999	0.994	0.997
mid	2464	30.28	2494	7.25	6.88	14.13	7.22	6.93	14.15	1.004	0.992	0.998
low	2479	15.07	2494	3.61	3.42	7.03	3.57	3.46	7.03	1.010	0.989	1.000
calibrator zero	2494	0.00	2494	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
Average C.F. =										1.005	0.992	0.998

Linear Regression/Calibration Results:

	CH ₄	NMHC	THC	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.001	1.006	1.004	0.95-1.05
b (Intercept as % of full scale) =	-0.11%	0.04%	-0.04%	± 3% F.S.
% change in C.F. from last cal =	n/a	n/a	n/a	n/a

As Left Instrument Diagnostics:

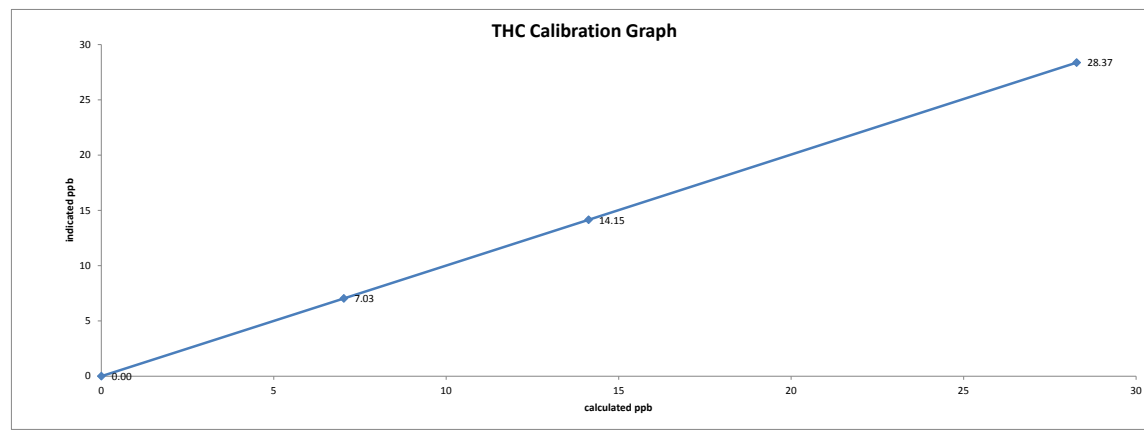
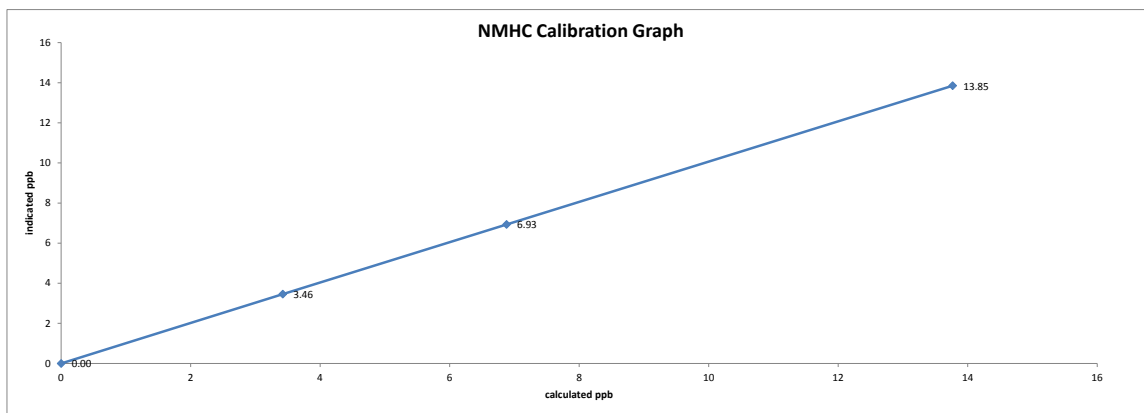
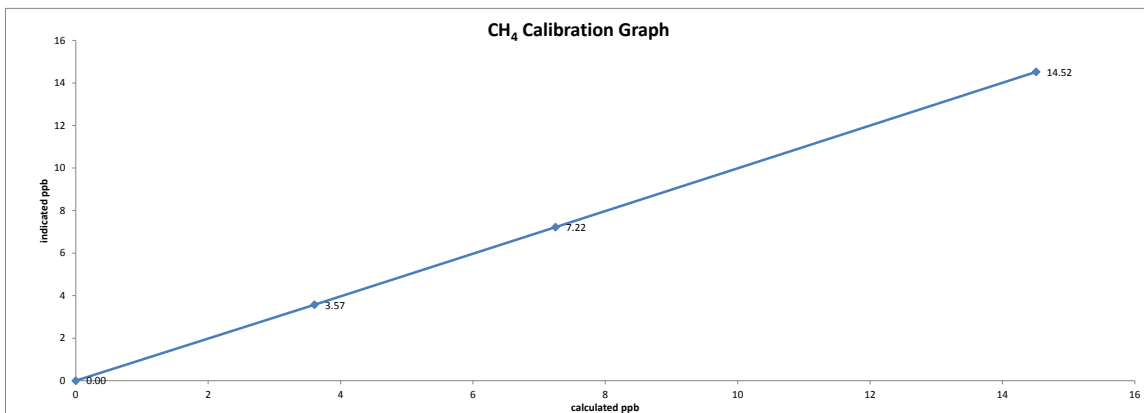
Interface Board Voltages:	Bias Supply:	-296.1	Calibration History cnt'd:	NM Peak Area:	87566
Temperatures:	Detector Oven:	175.0	Crucial Settings:	Methane Start:	8
	Filter:	175.0		Methane End:	16
	Column Oven:	75.0		Backflush:	18
	Internal:	29.0		NMHV Start:	24
Cylinder Pressures/reg.:	Carrier:	2550 | 50	Run History>1:	NMHC End:	56
	Fuel:	1900 | 55		Date:	23AUG18
	Span Gas:	2000 | 25		Time:	15:47
	Zero Air Generator:	46		CH ₄ PK HT:	0
Internal Pressures:	Carrier:	32.0		CH ₄ RT:	13.0
	Fuel:	48.2		CH ₄ Baseline:	4657
	Air:	36.2		CH ₄ LOD:	42
FID Status:	Status:	LIT		CH ₄ SD:	14
	Counts:	66048		CH ₄ CONC:	0.00
	Flame:	405.0		NM PK HT:	0
	Det Base:	175.0		NM Peak Area:	0
Flame and Power Stats:	Last Power On:	23AUG18 11:15		NM CONC:	0.00
	Flameouts:	1		NM Base Start:	4524
	Det Oven at Start:	43.5		NM Base End:	4526
	Col Oven at Start:	24.8		NM LOD:	38
Calibration History:	Time:	23AUG18 16:18		NM Start IDX:	4
	Type:	SPAN		NM End IDX:	38
	Status:	GOOD		NM Max Slope:	1.8E+00
	Check/Adjust:	ADJUST		NM Min Slope:	-1.5E+00
	CH ₄ Span Conc:	14.54	Expected Values:	NM PT Count:	0
	CH ₄ SP Ratio:	0.000756		Previous CH ₄ :	n/a
	CH ₄ RT:	13.2		Previous NMHC:	n/a
	CH ₄ PK IDX:	26		Previous THC:	n/a
	CH ₄ PK HT:	19196		New CH ₄ :	10.00
	NM Span Conc:	13.77		New NMHC:	11.00
	NM SP Ratio:	0.000157		New THC:	21.00

Comments:

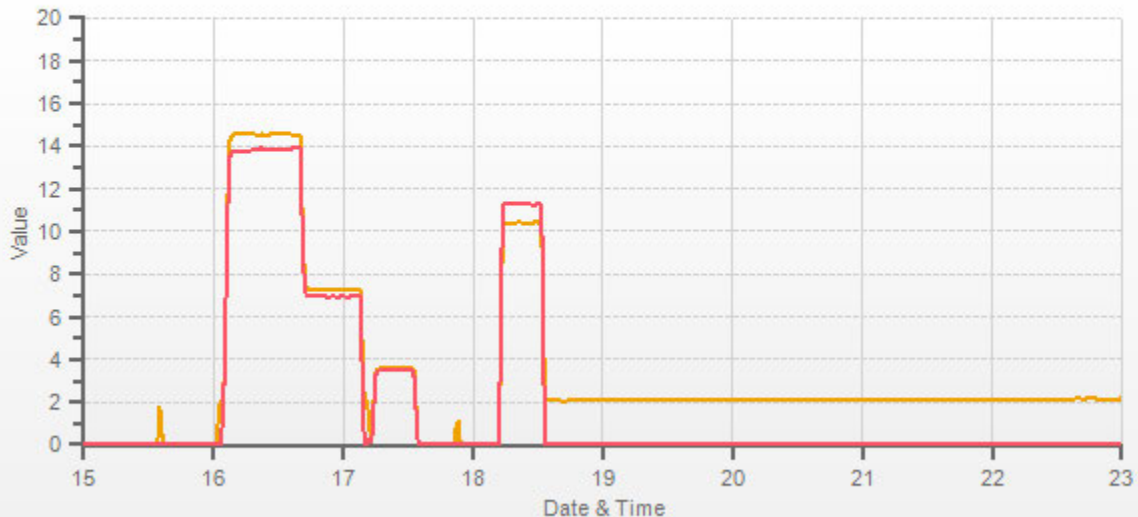
A new 55i analyzer was installed to replace the 51i analyzer.

Date: August 23, 2018
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 15:45/18:40
Calibration Purpose: installation
Calibration Method: Gas Dilution



CH4[ppm] NMHC[ppm]





Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	August 29, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	922	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	Weather Conditions:	Mainly cloudy with drizzle		
Parameter:	CH4 / NMHC / THC	Calibration Purpose:	repeat		
Start/End Time 24 hr. (mst):	12:43 / 16:36	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	October 18, 2025		

Analyzer:		Correction Factors:			
Serial Number/Owner:	1180930025 | LICA	Previous C.F.:	As Found C.F.:	New C.F.:	
Measured Flow:	1245	CH ₄ =	0.999	0.985	1.002
Last Calibration Date:	August 23, 2018	NMHC =	0.994	0.993	1.000
Range ppm:	20 CH4/20 NMHC/40 THC	THC =	0.997	0.988	1.002

Calibration Standards:		Standard Calibration Points for Analyzer Range of 20/20/40 ppm			
Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018	Point	CH4	NMHC	THC
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018	High	13.00	13.00	26.00
Calibrator ID/Expiry Date:	Enviroconics id# 4760 expires March 2, 2019	Mid	7.00	7.00	14.00
Cal Gas Cylinder I.D. #:	LL 119471	Low	3.00	3.00	6.00
CH4 Cylinder Conc. =	599.0 | 207.0 =C ₂ H ₆ Cylinder Conc.				
CH ₄ expressed as C ₂ H ₆ =	569.3 | 1168.3 =total CH4 equivalent				

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

Point	Calibrator Flow Rates (cc/min)			Calculated CH ₄ (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	Correction Factors:		
	Diluent	Cal Gas	Total Flow							CH ₄	NMHC	THC
as found zero	3022	0.00	3022	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	2959	67.43	3026	13.35	12.68	26.03	13.55	12.78	26.35	0.985	0.993	0.988
adjusted zero	3022	0.00	3022	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	2959	67.43	3026	13.35	12.68	26.03	13.32	12.68	25.99	1.002	1.000	1.002
mid	2986	36.41	3022	7.22	6.86	14.08	7.14	6.86	14.00	1.011	1.000	1.005
low	3009	15.66	3025	3.10	2.95	6.05	3.07	2.96	6.03	1.010	0.996	1.003
calibrator zero	3022	0.00	3022	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
Average C.F. =										1.008	0.999	1.003

Linear Regression/Calibration Results:

Correlation Coefficient =	CH ₄	NMHC	THC	LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. ± 10%	
	1.000	1.000	1.000		
	Slope =	0.998	0.999		0.998
	b (Intercept as % of full scale) =	-0.10%	0.03%		-0.03%
% change in C.F. from last cal =	1.39%	0.14%	0.91%		

As Left Instrument Diagnostics:

Interface Board Voltages:	Bias Supply: -297.2	Calibration History cnt'd:	NM Peak Area: 87566
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: 30.3		NMHV Start: n/a
Cylinder Pressures/reg.:	Carrier: 2400 | 55	Run History>1:	NMHC End: n/a
	Fuel: 1700 | 56		Date: Aug 29, 2018
	Span Gas: 1900 | 26		Time: 13:03
	Zero Air Generator: 43		CH ₄ PK HT: 0
Internal Pressures:	Carrier: 32.0		CH ₄ RT: 12.4
	Fuel: 48.2		CH ₄ Baseline: 3803
	Air: 36.2		CH ₄ LOD: 33
FID Status:	Status: LIT		CH ₄ SD: 11
	Counts: 42101		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: 3754
	Det Oven at Start: 43.5		NM Base End: 3793
	Col Oven at Start: 24.8		NM LOD: 39
Calibration History:	Time: Aug 23, 2018/16:18		NM Start IDX: 4
	Type: SPAN		NM End IDX: 43
	Status: GOOD		NM Max Slope: 1.9e+00
	Check/Adjust: ADJUST		NM Min Slope: -9.8e-01
	CH ₄ Span Conc: 14.51		NM PT Count: 0
	CH ₄ SP Ratio: 0.000756	Expected Values:	Previous CH ₄ : 10.37
	CH ₄ RT: 13.2		Previous NMHC: 11.27
	CH ₄ PK IDX: 26		Previous THC: 21.64
	CH ₄ PK HT: 19196		New CH ₄ : 10.16
	NM Span Conc: 13.77		New NMHC: 11.09
	NM SP Ratio: 0.000157		New THC: 21.26

Comments:

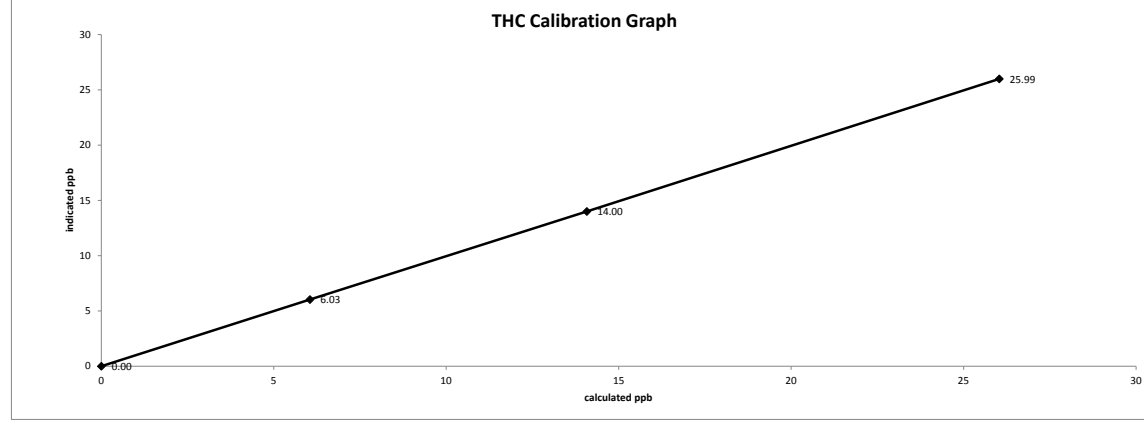
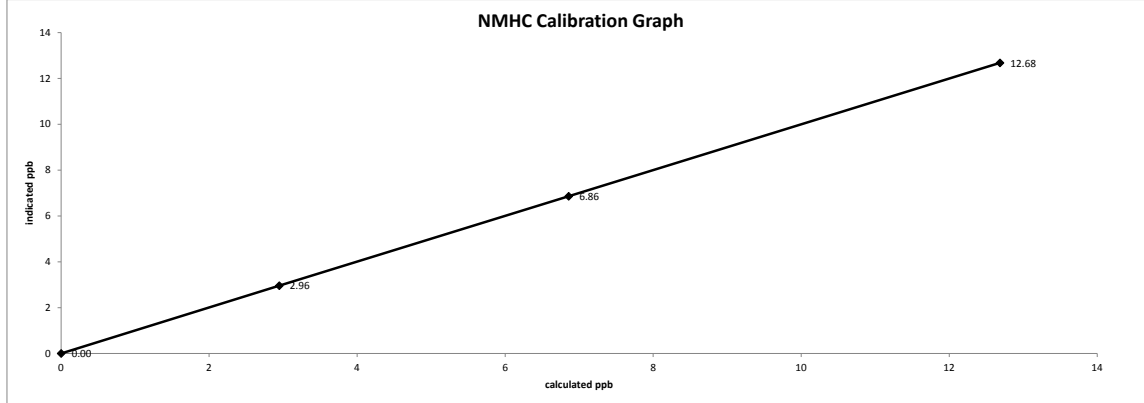
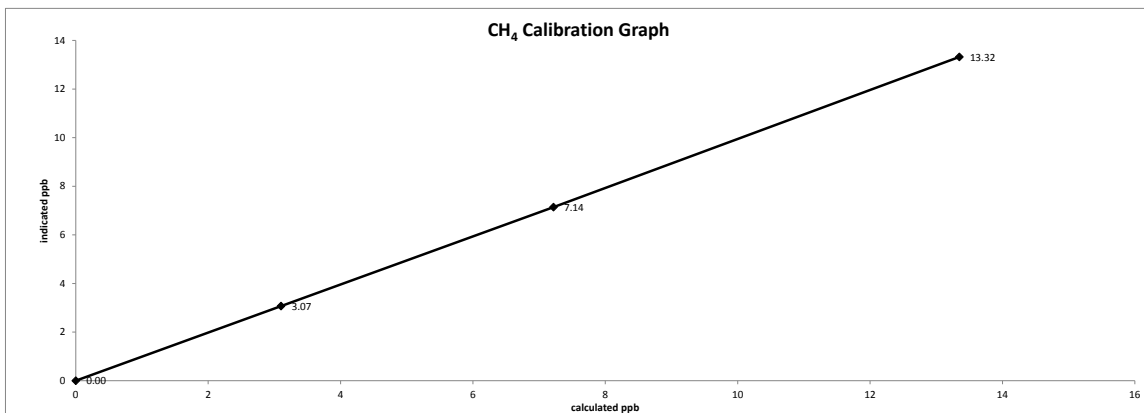
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

The manifold blower was found to be working normally.

A Repeat calibration was completed because the orifice of the ZS check valve was replaced and the regulators for span and Zero checks were re-adjusted. The reason for visit was unstable span results.

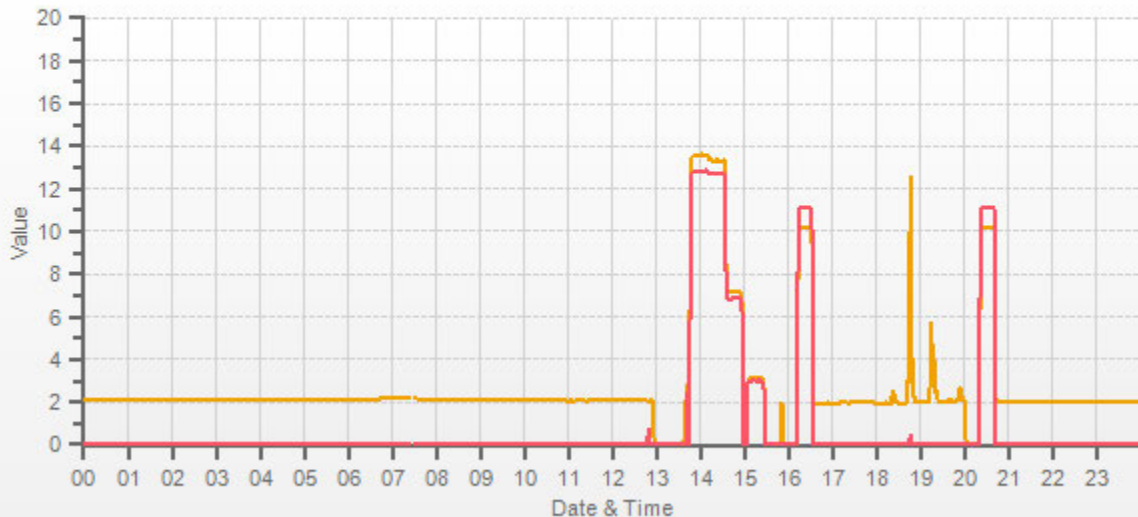
Date: August 29, 2018
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 12:43 / 16:36
Calibration Purpose: repeat
Calibration Method: Gas Dilution



Station: LICA ST. LINA Daily: 18/08/29 Type: AVG 1 Min. [1 Min.]

CH4[ppm] NMHC[ppm]



NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: August 14, 2018 Company/Airshed: LICA Location/Station Name: St. Lina Start/End Time 24 hr. (mst): 10:31 / 16:12 G.P.T. to be used for Ozone? Yes with 1000 ppb NOx full scale Calibration Method: Gas Dilution & Gas Phase Titration	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 927 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Mainly sunny Calibration Purpose: shut down Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 24, 2020
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Analyzer: Serial Number/Owner: 594 LICA Last Calibration Date: July 17, 2018 Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.000</td> <td>1.017</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.017</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.017	n/a	NO ₂ =	1.000	1.000	n/a	NOx =	1.000	1.017	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.017	n/a														
NO ₂ =	1.000	1.000	n/a														
NOx =	1.000	1.017	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: Envionics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Standard Calibration Points for a Range of: 1000 ppb</th> </tr> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>610</td> <td>375</td> <td><-high ozone</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>190</td> <td><-mid ozone</td> </tr> <tr> <td>Low</td> <td>190</td> <td>70</td> <td><-low ozone</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Standard Calibration Points for a Range of: 1000 ppb				Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	610	375	<-high ozone	Mid	380	190	<-mid ozone	Low	190	70	<-low ozone	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Standard Calibration Points for a Range of: 1000 ppb																													
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																										
High	610	375	<-high ozone																										
Mid	380	190	<-mid ozone																										
Low	190	70	<-low ozone																										
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	5074	0.0	5074	0	0	0.0	2.0	n/a	n/a
as found high NO2	4983	76.6	5060	779.2	780.7	766.0	770.0	1.017	1.017
mid	5029	37.39	5066	380.1	380.8	373.0	375.0	1.019	1.021
low	5038	18.72	5057	190.6	191.0	186.0	188.0	1.025	1.027
Average C.F.=								1.020	1.022

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	4983	76.56	5060	0.0	766.0	768.0	2.0	0.0	2.0	
as found high NO2	4983	76.56	5060	510.0	273.0	768.0	495.0	493.0	493.0	1.000
gpt mid	4983	76.56	5060	280.0	493.0	768.0	275.0	273.0	273.0	1.000
gpt low	4983	76.56	5060	100.0	671.0	768.0	97.0	95.0	95.0	1.000
Average NO₂ C.F.=									1.000	

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.017	1.016	1.003	0.90-1.10
b (Intercept as % of full scale)=	-0.07%	0.09%	0.12%	± 3% F.S.
% change in C.F. from last cal=	-1.73%	0.00%	-1.66%	± 10%
NO ₂ converter efficiency			0.99	0.96 to 1.04

As found:	As left:
NOx SLOPE: 1.188	NOx SLOPE: n/a
NOx OFFS: 0.9	NOx OFFS: n/a
NO SLOPE: 1.184	NO SLOPE: n/a
NO OFFS: -0.7	NO OFFS: n/a
SAMP FLW: 479	SAMP FLW: n/a
OZONE FL: 77	OZONE FL: n/a
PMT: 28.8	PMT: n/a
NORM PMT: 13.0	NORM PMT: n/a
AZERO: 17.7	AZERO: n/a
HVPS: 759	HVPS: n/a
RCELL TEMP: 50.0	RCELL TEMP: n/a
BOX TEMP: 32.7	BOX TEMP: n/a
PMT TEMP: 6.7	PMT TEMP: n/a
IZS TEMP: 45.0	IZS TEMP: n/a
MOLY TEMP: 314.3	MOLY TEMP: n/a
RCEL: 4.9	RCEL: n/a
SAMP: 26.4	SAMP: n/a
Expected Value NO: 10	Expected Value NO: n/a
Expected Value NO ₂ : 607	Expected Value NO ₂ : n/a
Expected Value NOx: 616	Expected Value NOx: n/a

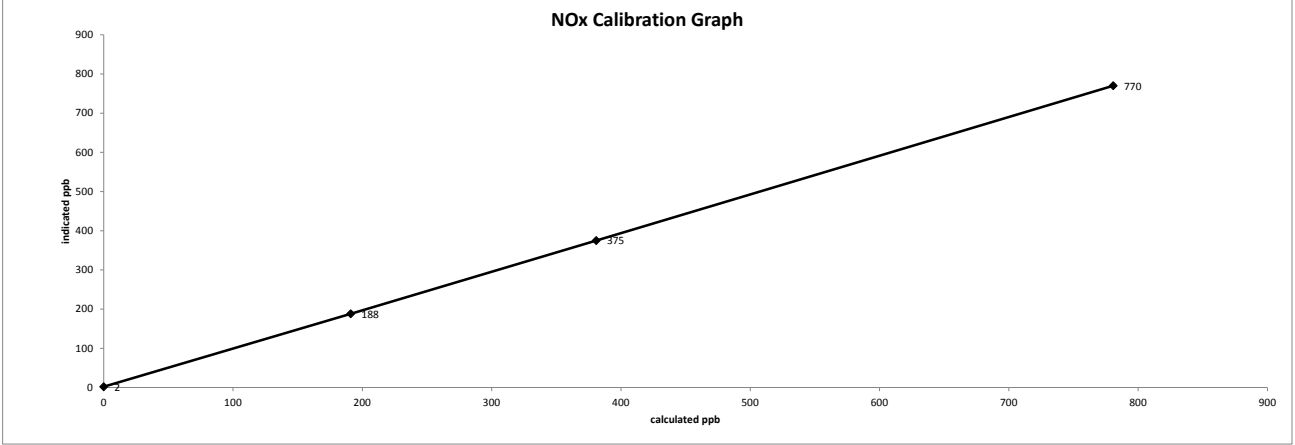
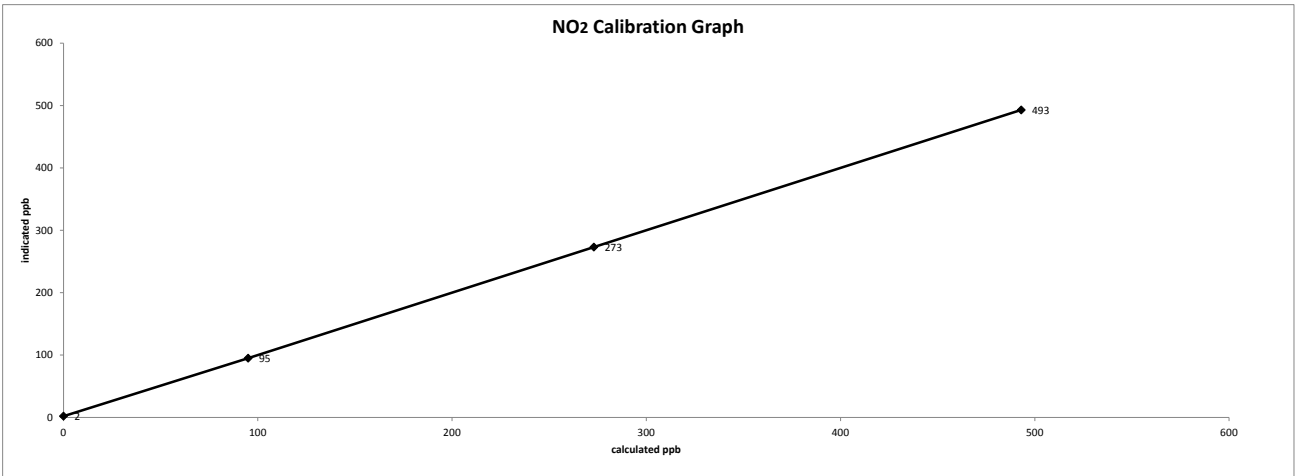
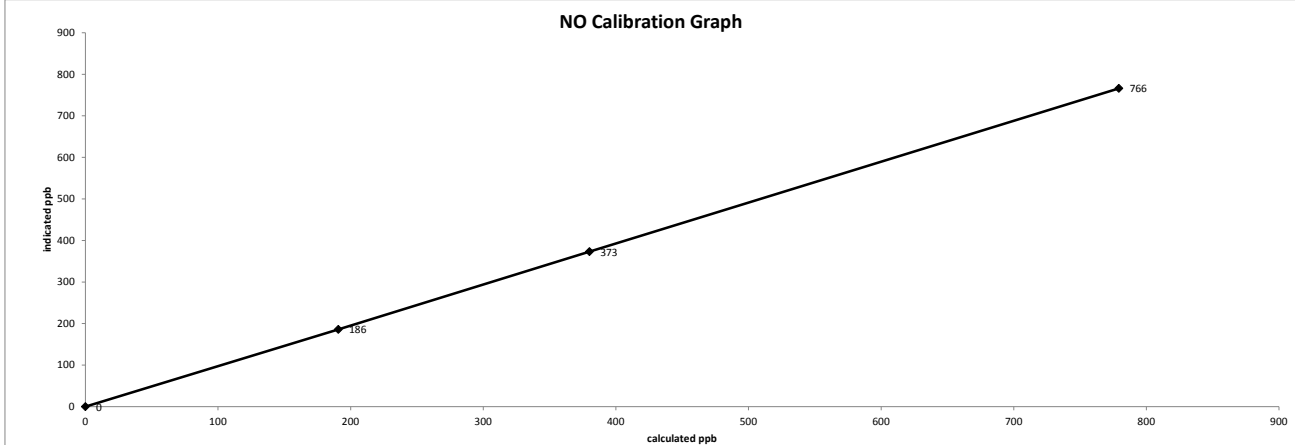
Comments:
The manifold blower was found to be working normally.

A Shutdown calibration was completed to install a new Thermo-Scientific analyzer. The GPT for O3 (ppb): High O3 set = 390, NO drop = 378; Mid O3 set = 185, NO drop = 176; Low O3 set = 65, NO drop = 60.

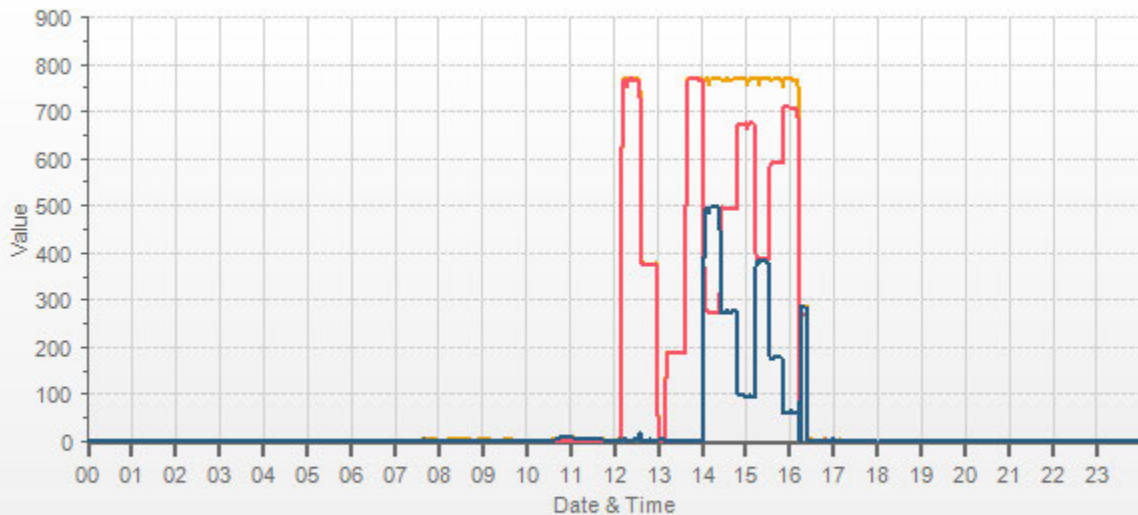
Date: August 14, 2018
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 10:31 / 16:12
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration

API 200E NO-NO2-NOx Analyzer Calibration



Station: LICA ST. LINA Daily: 18/08/14 Type: AVG 1 Min. [1 Min.]



— NOX [ppb] — NO [ppb] — NO2 [ppb]



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: August 15, 2018 Company/Airshed: LICA Location/Station Name: St. Lina Start/End Time 24 hr. (mst): 9:54 / 16:05 G.P.T. to be used for Ozone? No Calibration Method: Gas Dilution & Gas Phase Titration	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 927 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Smoke Calibration Purpose: Installation Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 24, 2020
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Analyzer: Serial Number/Owner: 1180930029 LICA Last Calibration Date: n/a Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>n/a</td> <td>n/a</td> <td>1.001</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	n/a	n/a	1.000	NO ₂ =	n/a	n/a	1.000	NOx =	n/a	n/a	1.001
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	n/a	n/a	1.000														
NO ₂ =	n/a	n/a	1.000														
NOx =	n/a	n/a	1.001														

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: Envionics id# 4760 expires March 2, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Standard Calibration Points for a Range of: 1000 ppb</th> </tr> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	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
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)		
adjusted zero	4995	0.0	4995	0	0	0.0	0.0	n/a	n/a
adjusted high	4920	76.5	4996	788.1	789.6	788.0	789.0	1.000	1.001
mid	4957	37.29	4994	384.5	385.3	384.0	385.0	1.001	1.001
low	4974	18.64	4993	192.3	192.6	193.0	194.0	0.996	0.993
calibrator zero	4995	0.00	4995	0.0	0.0	0.0	0.0	n/a	n/a
Average C.F.=								0.999	0.998

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	4920	76.45	4996	0.0	791.0	792.0	1.0	0.0	1.0	
adjusted high NO2	4920	76.45	4996	510.0	309.0	792.0	483.0	482.0	482.0	1.000
gpt mid	4920	76.45	4996	290.0	517.0	792.0	275.0	274.0	274.0	1.000
gpt low	4920	76.45	4996	115.0	682.0	792.0	110.0	109.0	109.0	1.000
Average NO₂ C.F.=										1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	1.001	1.002	0.95-1.05
b (Intercept as % of full scale)=	0.02%	0.06%	0.06%	± 3% F.S.
% change in C.F. from last cal=	n/a	n/a	n/a	n/a
NO2 converter efficiency			1.00	0.96 to 1.04

As found:	As left:
NO Bkg: n/a	NO Bkg: 5.5
NOx Bkg: n/a	NOx Bkg: 5.6
NO Coef: n/a	NO Coef: 1.204
NO2 Coef: n/a	NO2 Coef: 0.995
NOx Coef: n/a	NOx Coef: 1.002
PMT: n/a	PMT: -824.7
Internal: n/a	Internal: 29.4
Chamber: n/a	Chamber: 50.5
Cooler: n/a	Cooler: -2.9
NO2 Converter: n/a	NO2 Converter: 325.0
NO2 Converter Set: n/a	NO2 Converter Set: 325.0
Perm Oven Gas: n/a	Perm Oven Gas: 45.00
Perm Oven Heater: n/a	Perm Oven Heater: 44.17
Pressure: n/a	Pressure: 255.7
Flow: n/a	Flow: 0.534
Ozonator Flow: n/a	Ozonator Flow: OK
Expected Value NO: n/a	Expected Value NO: 5
Expected Value NO2: n/a	Expected Value NO2: 435
Expected Value NOx: n/a	Expected Value NOx: 439

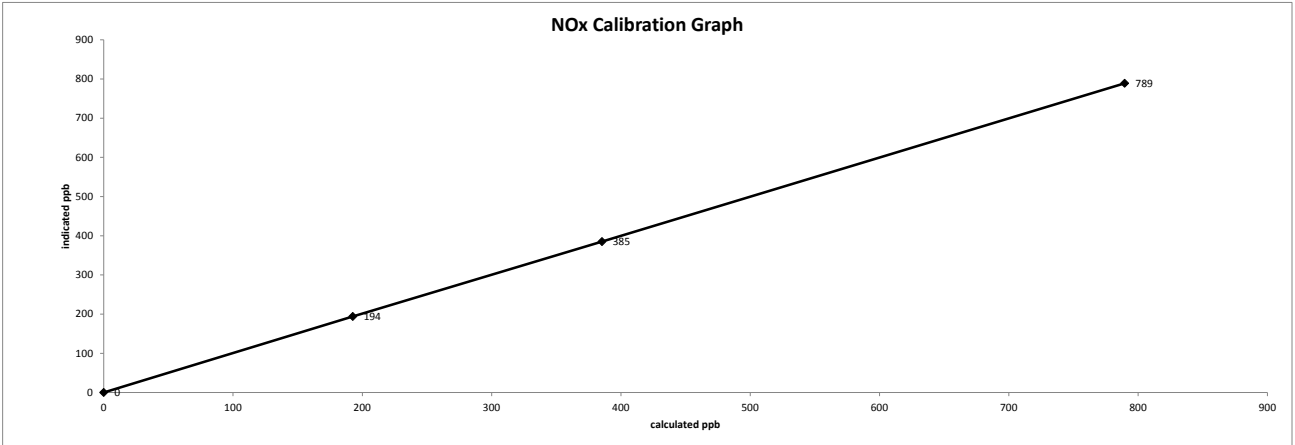
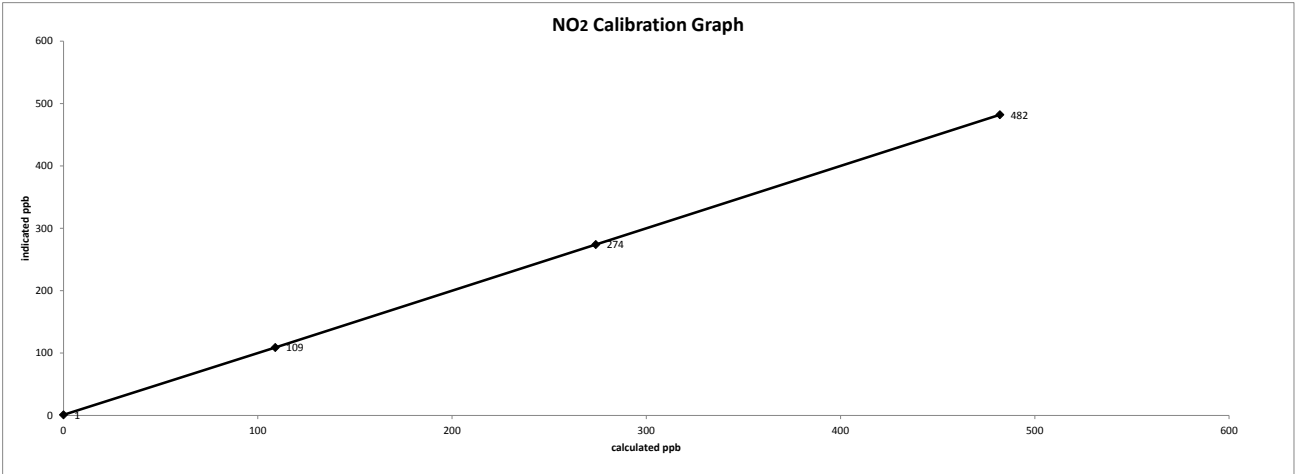
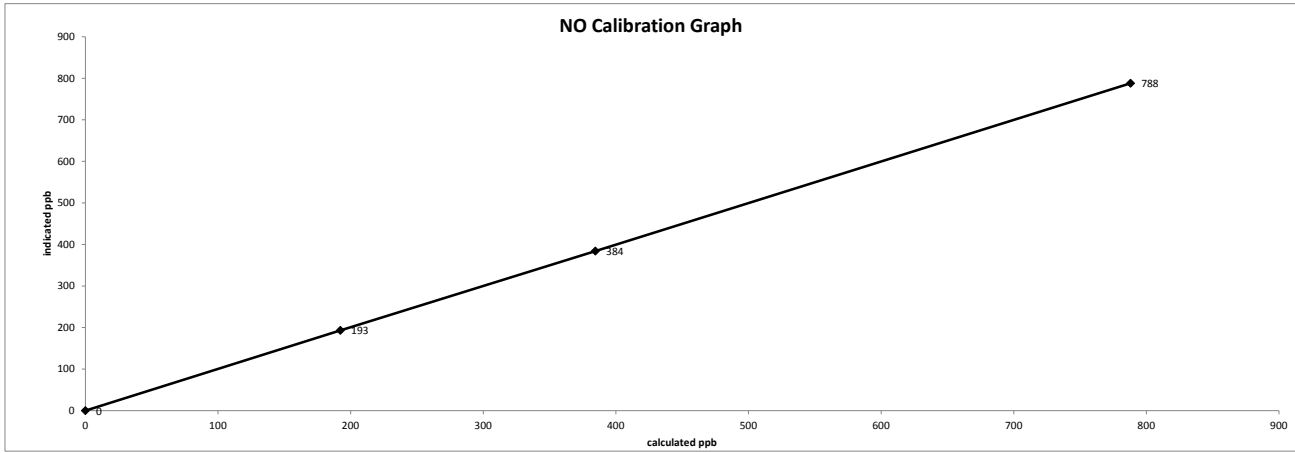
Comments: The analyzer sample inlet filter was changed. The manifold blower was found to be working normally. The analyzer perm tube was changed , new expected value to be updated once the perm tube temperature has stabilized. The analyzer cooling fan filter(s) were cleaned.

A new Thermo-Scientific analyzer installed.

Date: August 15, 2018
Company/Airshed: LICA
Location/Station Name: St. Lina

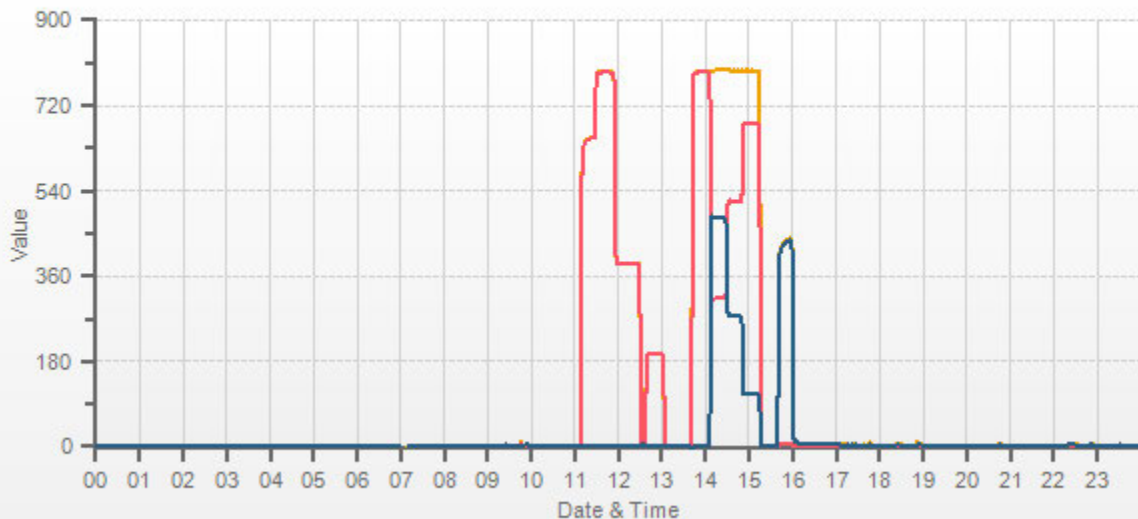
Start/End Time 24 hr. (mst): 9:54 / 16:05
Calibration Purpose: installation
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration



Station: LICA ST. LINA Daily: 18/08/15 Type: AVG 1 Min. [1 Min.]

— NOX[ppb] — NO[ppb] — NO2[ppb]



OZONE



Thermo 49i Ozone Analyzer Calibration

Date: August 15, 2018 Company/Airshed: LICA Location/Station Name: St. Lina Start/End Time 24 hr. (mst): 9:54 / 14:01 Ozone Calibration Method: Direct G.P.T. G.P.T. Date: August 14, 2018 Analyzer: Serial Number/Owner: 1002240371 LICA Last Calibration Date: July 18, 2018 Previous Cal High Point C.F.: 1.000	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 927 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Smoke Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 24, 2020 Ozone Range ppb: 500 As Found C.F.: 0.987 New C.F.: 1.000
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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: Envirionics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-100 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-100 ppb
Point	AMD Required Range of Ozone Calibration Points								
High	300-400 ppb								
Mid	150-200 ppb								
Low	50-100 ppb								

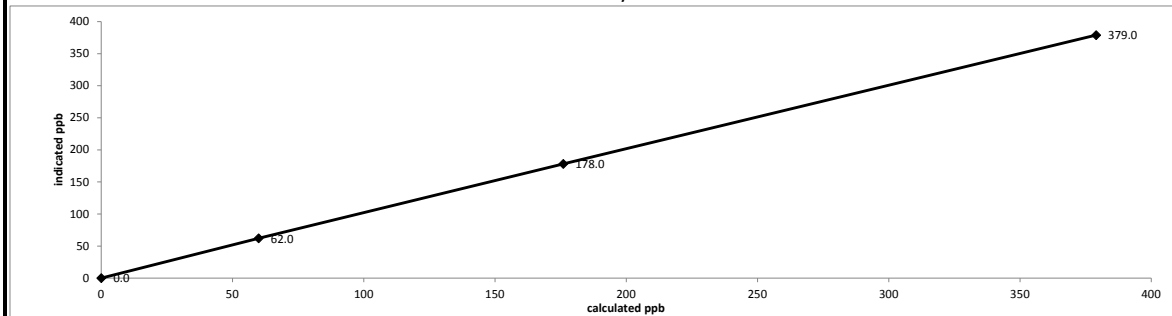
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	379.0	379.0	384.0	0.987
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	379.0	379.0	379.0	1.000
mid	5000	5000	176.0	176.0	178.0	0.989
low	5000	5000	60.0	60.0	62.0	0.968
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F.=						0.986

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>1.002</u>	> or = 0.995
b (Intercept as % of full scale) = <u>-0.25%</u>	0.95-1.05
% change in C.F. from last cal = <u>1.30%</u>	± 3% F.S.
	± 10%

Thermo 49i Ozone Analyzer Calibration



As found:

O3 Bkg:	<u>-0.3</u>
O3 Coef:	<u>0.990</u>
Photo Lamp:	<u>10.7</u>
O3 Lamp:	<u>8.2</u>
Bench:	<u>32.9</u>
Bench Lamp:	<u>53.7</u>
O3 Lamp:	<u>67.9</u>
Pressure:	<u>679.4</u>
Cell A lpm:	<u>0.730</u>
Cell B lpm:	<u>0.781</u>
O3 ppb:	<u>-0.1</u>
Cell A ppb:	<u>3.0</u>
Cell B ppb:	<u>-3.3</u>
Cell A int (Hz):	<u>74307</u>
Cell B int (Hz):	<u>93950</u>
Expected Value:	<u>337.0</u>

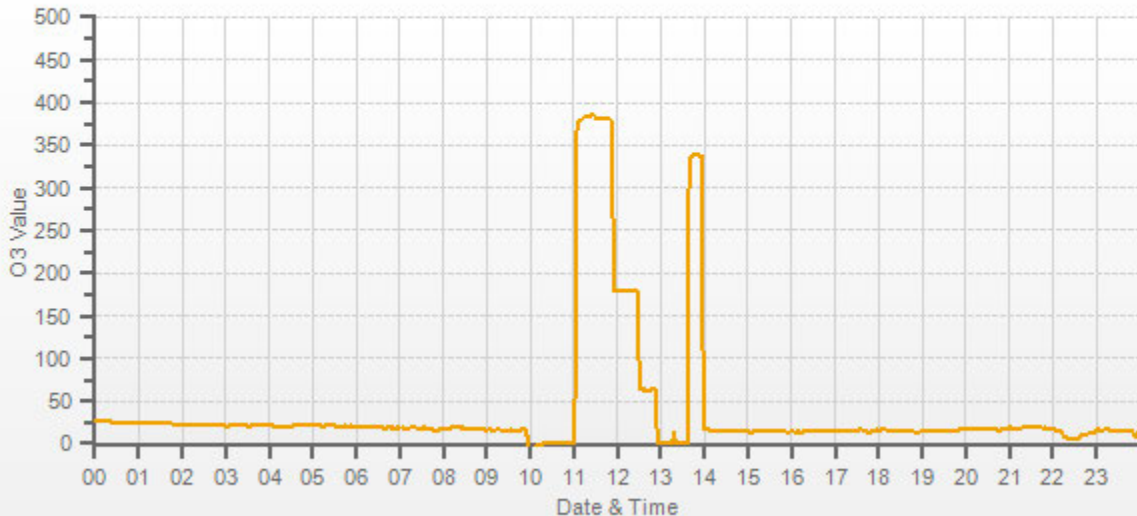
As left:

O3 Bkg:	<u>-0.3</u>
O3 Coef:	<u>0.971</u>
Photo Lamp:	<u>10.7</u>
O3 Lamp:	<u>5.7</u>
Bench:	<u>31.4</u>
Bench Lamp:	<u>53.7</u>
O3 Lamp:	<u>67.9</u>
Pressure:	<u>679.4</u>
Cell A lpm:	<u>0.730</u>
Cell B lpm:	<u>0.782</u>
O3 ppb:	<u>0.3</u>
Cell A ppb:	<u>0.3</u>
Cell B ppb:	<u>-0.1</u>
Cell A int (Hz):	<u>74305</u>
Cell B int (Hz):	<u>93965</u>
Expected Value:	<u>337.0</u>

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

The EV did not change after the calibration.

O3[ppb]



PARTICULATE MATTER

Thermo 5030i SHARP Monitor Quarterly Audit/Calibration

Date: August 28, 2018	Performed By/Reviewer: Alex Yakupov | Rob Fisher
Company: LICA	Start Time (mst): 11:26
Station Name/Location: St. Lina	End Time (mst): 14:17
Previous Audit Date: July 18, 2018	Calibration Purpose: quarterly
Parameter: PM 2.5	Weather Conditions: A few clouds and light rain showers

SHARP 5030i Information and Status:		
Serial Number: CM17091001	Filter Tape Counter	323

Reference Standards: Air Flow			
Make:	Manometer: Dwyer	Orifice: Chinook	Pressure: Fisher Scientific
Model:	475 Mk.III	CHN0901	FB61291
Serial Number:	#3	#2	130168457 / 05544
Expiry Date:	January 9, 2019	April 24, 2019	January 15, 2019
			Temp / RH: Fisher Scientific
			11-661-7A, 11745843
			170286131
			April 19, 2019

Ambient Temperature (°C)							
As Found:			As Left: (same as found if acceptable)				
Reference	SHARP	Difference	Reference	SHARP	Difference	Temp Limit: ± 2°C	
#1	14.45	14.5	-0.1	14.52	14.5		0.0
#2	14.51	14.6	-0.1	14.54	14.5		0.0
#3	14.49	14.5	0.0	14.54	14.5		0.0
Average	14.5	14.5	-0.1	14.5	14.5		0.0

Ambient Relative Humidity (%RH)							
As Found:			As Left: (same as found if acceptable)				
Reference	SHARP	Offset (ZERO)	Reference	SHARP	Offset (ZERO)	RH Limit: ± 2 %RH	
#1	68.61	68.2	0.4	69.40	68.6		0.8
#2	68.34	67.5	0.8	68.21	67.5		0.7
#3	67.89	67.1	0.8	68.20	67.3		0.9
Average	68.3	67.6	0.7	68.6	67.8		0.8

Flow Temperature (°C)							
As Found:			As Left: (same as found if acceptable)				
Reference	SHARP	Difference	Reference	SHARP	Difference	Temp Limit: ± 2°C	
#1	24.80	25.5	-0.7	25.10	25.0		0.1
#2	24.45	25.1	-0.7	25.23	25.1		0.1
#3	24.61	25.4	-0.8	25.46	25.3		0.2
Average	24.6	25.3	-0.7	25.3	25.1		0.1

Barometric Pressure (mmHg)						
As Found:			As Left: (same as found if acceptable)			
Reference	SHARP	Difference	Reference	SHARP	Difference	BP Limit: ± 2 mmHg
#1	695.3	696.6	-1.3	695.3	695.3		0.0

Nephelometer Relative Humidity (%RH)						
As Found:			As Left: (same as found if acceptable)			
Reference	SHARP	Difference	Reference	SHARP	Difference	RH Limit: ± 2 %RH
#1	36.88	37.8	-0.9	36.55	36.6		0.0

Nephelometer Temperature (%RH)						
As Found:			As Left: (same as found if acceptable)			
Reference	SHARP	Difference	Reference	SHARP	Difference	Temp Limit: ± 2°C
#1	24.48	25.0	-0.5	24.80	24.5		0.3

Nephelometer Source Level						
As Found:			As Left: (same as found if acceptable)			
Variable	Value		Variable	Value		IRED Limit (as found): 60-70 mA Adjusted IRED Limit (as left): 65 mA
IRED	67		IRED	67		
SRC LEVEL	47		SRC LEVEL	47		

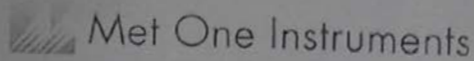
Detector Calibration (Auto)						
Detector Auto Calibration Completed: YES			As Left:			
			Variable	Value		
			HIGH VOLT	1360		
			BETA REF TH	270		
			ALPHA TH	690		
			DIFF HV	1		

Mass Coefficient (Auto)						
Zero			Span			
Variable	Value		Variable	Value		Foil Set: 4804
MASS COEF	7131.1		MASS COEF	7073.8		
FOIL VALUE	0		FOIL VALUE	1045		
Beta Avg	9377		Beta Avg	8089		
difference	N/A		difference	-0.8		

Flow Calibration (L/min)							
As Found:			As Left: (same as found if acceptable)				
Reference	SHARP	Difference	Reference	SHARP	Difference	Flow Limit: 16.67 ± 0.33 L/min	
#1	16.65	16.67	-0.02	16.65	16.67		-0.02
#2	16.65	16.67	-0.02	16.65	16.67		-0.02
#3	16.66	16.68	-0.02	16.66	16.68		-0.02
Average	16.65	16.67	-0.02	16.65	16.67		-0.02

Leak Check (L/min)							
Without Leak Check Adapter			With leak Check Adapter				
Reference	SHARP	Difference	Reference	SHARP	Difference	Leak Limit: 0.08 L/min	
#1	16.66	16.67	-0.01	16.60	16.64		-0.04
				LEAK RATE:	-0.03		

WIND SYSTEM



Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H
 Sensor Output Swing: 0V - 1.0V
 Customer: MAXXAM Analytics
 Tested per PO: 35-67600
 Calibrated by: David Frith *DF*

Sensor Serial No.: H12635
 Sensor Output Range: 0 - 50.0 MPS
 Sales Order No.: 122618
 Calibration Date: 05/25/2017

QC Inspection *Chris Paul*

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

As Found Test Date: N/A As Left Test Date: 05/25/2017

Quality Control Manual Revision: September 16, 2013 MP42201 Rev. G.
 All Work Performed per Customer Purchase Order Requirements.
 Calibration Document No. 50.5-6100

Test Equipment Used for Calibration of Instruments

Description	Manufacturer	Model No.	Serial No.	Cal Date	Cal Due	Voltage Accuracy	Time Base Accuracy
Data Acquisition	Campbell Scientific	CR1000	6569	4/06/2015	4/06/2018	+/- 3mV	< 6 ppm
NIST Cupset	Met One Instruments	170-41	3309	1/26/2017	1/26/2022	Accuracy < 0.15 mph or 1% WS	

Environmental Data: Temperature 65 to 80 Deg F Vibration none
 Humidity 20 to 70% Radiation none

Firmware Version: 3194-01 R2.62

The standards used for calibration have accuracies equal to or greater than the instruments tested. These standards are on record and are traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated heron, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A (8/1/88). Instrument's accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with IS) 9001:2008 requirements

CALIBRATORS

Company: Maxxam Operator: Chris W

Calibrator:			Flow Measurement Device:		
Make/Model	<u>Envionics 6100</u>		Make/Model	<u>Mesa Defender 530</u>	
Serial Number	<u>5212</u>		Serial Number	<u>L-153351 H-152571</u>	
Last Verification Date	<u>February 2017</u>		Temperature (°C)	<u>24.0 C</u>	
NO Cylinder S/N	<u>EY0000715</u>		Barometric Pressure	<u>702 mmHg</u>	
NO [PPM]	<u>50.7</u>	NOx [PPM] <u>50.8</u>			
Expiry Date	<u>May 2021</u>				

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
5004	77.2	0.7822	0.7837	0.7769	0.0006	0.7774	-1%	-1%
5018	37.7	0.3809	0.3817	0.3777	0.0005	0.3782	-1%	-1%
5012	18.8	0.1902	0.1905	0.1884	-0.0002	0.1885	-1%	-1%
Absolute Average Percent Difference							1%	1%

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

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	0.9934	0.90-1.10		m (Slope)=	0.9921
b (Intercept % of FS)=	-0.0332	± 3% F.S.		b (Intercept % of FS)=	-0.0277

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5004	0.000	0.0000	0.7766	0.0007	0.7773	NO ₂	% Diff. Limit
5004	0.500	0.4846	0.2920	0.4797	0.7717	-1%	± 10%
5004	0.280	0.2731	0.5035	0.2713	0.7747	-1%	± 10%
5004	0.100	0.0958	0.6808	0.0962	0.7770	0%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

NO₂		LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9880	0.90-1.10
b (Intercept % of FS)=	0.1153	± 3% F.S.

AENV Standards		NO_x Analyzer	
Audit Calibrator		Make/Model	<u>Teco 42i</u>
Make/Model	<u>Teco 146i</u>	Serial/AMU Number	<u>AMU 1868</u>
Serial/AMU Number	<u>AMU 1809</u>	Last Calibration Date	<u>March 1, 2018</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Full Scale (ppm)	<u>1.0</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark Date: March 1, 2018
 Operator Signature: [Signature] Location: McIntyre Center Edmonton

Company: Maxxam **Operator:** Chris W

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Envronics 6100</u>	Make/Model	<u>Mesa Defender 530</u>
Serial Number	<u>4760</u>	Serial Number	<u>L-153351 H-152571</u>
Last Verification Date	<u>February 2017</u>	Temperature (°C)	<u>23.0 C</u>
NO Cylinder S/N	<u>EY0000715</u>	Barometric Pressure	<u>704 mmHg</u>
NO [PPM]	<u>50.7</u>	NOx [PPM]	<u>50.8</u>
Expiry Date	<u>May 2021</u>		

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
4935	77.0	0.7911	0.7926	0.7830	0.0017	0.7846	-1%	-1%
4951	37.5	0.3840	0.3848	0.3808	-0.0001	0.3806	-1%	-1%
4938	18.9	0.1941	0.1944	0.1915	0.0003	0.1918	-1%	-1%
Absolute Average Percent Difference							1%	1%

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

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 0.9901	0.90-1.10	m (Slope)= 0.9901
b (Intercept % of FS)= -0.0092	± 3% F.S.	b (Intercept % of FS)= -0.0320

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4935	0.000	0.0000	0.7877	0.0005	0.7881	NO ₂	% Diff. Limit
4935	0.500	0.4912	0.2965	0.4844	0.7809	-1%	± 10%
4935	0.280	0.2755	0.5122	0.2729	0.7851	-1%	± 10%
4935	0.100	0.0977	0.6900	0.0991	0.7891	1%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9836	0.90-1.10
b (Intercept % of FS)= 0.1675	± 3% F.S.

AENV Standards		NO_x Analyzer	
Audit Calibrator		Make/Model	<u>Teco 42i</u>
Make/Model	<u>Teco 146i</u>	Serial/AMU Number	<u>AMU 1868</u>
Serial/AMU Number	<u>AMU 1809</u>	Last Calibration Date	<u>March 2, 2018</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Full Scale (ppm)	<u>1.0</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark
Operator Signature: *Chris W*

Date: March 2, 2018
Location: McIntyre Center Edmonton

Company: <u>Maxxam</u>		Operator: <u>Chris W</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>EnviroNics 2000</u>	Make/Model	<u>Mesa Defender 530</u>
Serial Number	<u>1991</u>	Serial Number	<u>L-153351 H-152571</u>
Last Verification Date	<u>March 2017</u>	Temperature (°C)	<u>25.0 C</u>
NO Cylinder S/N	<u>LL108015</u>	Barometric Pressure	<u>695 mmHg</u>
NO [PPM]	<u>52.2</u>	NOx [PPM]	<u>52.3</u>
Expiry Date	<u>Oct 2020</u>		

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4988	75.1	0.786	0.787	0.785	-0.002	0.783	0%	-1%
4988	36.5	0.382	0.383	0.382	0.001	0.383	0%	0%
4988	18.3	0.192	0.192	0.190	0.000	0.190	-1%	-1%
Absolute Average Percent Difference							0%	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)= 0.9996	0.90-1.10	m (Slope)= 0.9956
b (Intercept % of FS)= -0.0599	± 3% F.S.	b (Intercept % of FS)= -0.0005

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4988	0.000	0.000	0.788	-0.001	0.787	NO ₂	% Diff. Limit
4988	0.350	0.519	0.269	0.512	0.780	-1%	± 10%
4988	0.160	0.231	0.557	0.229	0.786	0%	± 10%
4988	0.070	0.099	0.689	0.097	0.787	-1%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9885	0.90-1.10
b (Intercept % of FS)= -0.0567	± 3% F.S.

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

COMMENTS: Cylinder contains 47.9 ppm SO2.

Auditor: Al Clark
Operator Signature:

Date: March 15, 2018
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2017-482CGA

Company: Maxxam **Operator's Name:** Mike
Cylinder #: LL104225 **Concentration PPM:** 49.2 **Tolerance(%)** 2 **Certified By:** Praxair
Expiry Date: October 2020

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Mesa Definer 220</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>H-133034 / L-132702</u>
Last Verification Date: <u>December 13, 2017</u>	Temp. °C: <u>23.4 C</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>707 mmHg</u>
Cylinder Number: <u>CAL016625</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:
 Make/Model: Teco 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 10.0 Span: 1.006 Range: 1.0
 Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000			
4989	79.5	0.764	0.01594	62.755	47.9
4995	39.6	0.380	0.00793	126.136	47.9
4992	19.6	0.188	0.00393	254.694	47.9
Average Cylinder Concentration:					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 _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark Date: December 13, 2017
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2017-213CGA

Company: Maxxam **Operator's Name:** C. Wesson
Cylinder #: LL119500 **Concentration PPM:** 9.8 **Tolerance(%)** 2 **Certified By:** Praxair
Expiry Date: August 2020

Reference Calibrator and Gas:
Make/Model: R&R MFC 201
Serial Number: AMU 1690
Last Verification Date: September 22, 2017
Gas Type: H2S **Conc.** 20.43
Cylinder Number: CAL015272
Expiry Date: January 2019

Flow Measurement Device:
Make/Model: Mesa Definer 220
Serial Number: H-133034 L-132702
Temp. °C: 23.5 C
B.P. 705 mmhg

Reference Analyzer:
Make/Model: Teco 450i **Serial/AMU Number:** 1980
Instrument Settings: **Zero:** 22.4 **Span:** 1.091 **Range:** 0.1
Last Calibration: **Date:** Sep 22/17 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000			
5114	39.5	0.0734	0.00772	129.468	9.5
5096	18.5	0.0345	0.00363	275.459	9.5
5089	9.5	0.0178	0.00187	535.684	9.5
Average Cylinder Concentration:					9.5

Previous Stated Concentration PPM: 9.8
 Percent variance from Stated: 3

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

Auditor: Al Clark **Date:** September 22, 2017
Operator Signature: *Al Clark* **Location:** McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2017-488CGA

Company: Maxxam **Operators name:** Mike
Cylinder #: LL168404 **Conc CH4 (PPM)** 597/206 **Tolerance (%)** 2 **Certified By:** Praxair
Expiry Date: October 2025

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>R&R MFC 201</u>			Make/Model	<u>Mesa Definer 220</u>
Serial Number	<u>AMU 1690</u>			Serial Number	<u>H-133034 / L-132702</u>
Last Verification Date	<u>December 13, 2017</u>			Temp. °C	<u>23.1 C</u>
Gas Type	<u>CH4</u>	Conc.	<u>990.4</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>5604875</u>	Expiry Date	<u>July 2021</u>		
Gas Type	<u>C3H8</u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF003845B</u>	Expiry Date	<u>July 2022</u>		

Reference Analyzer:
Make/Model Teco 55i **Serial/AMU Number:** 2108
Instrument Settings **Zero:** N/A **Span:** N/A **Range:** 20.0
Last Calibration: **Date:** Dec 12/17 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
3500	0.0	0.00	0.00	0.02	45.00	595	208
3618	80.4	13.22	12.69	0.02	45.00	595	208
3547	39.8	6.64	6.42	0.01	89.12	592	208
3560	19.8	3.33	3.23	0.01	179.80	599	211
Average Cylinder Concentration:						595	209

CH4	C3H8
Previous Stated Concentration PPM: <u>597</u>	<u>206</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

Cylinder gas tolerances based on CH4 only
 Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:**
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark **Date:** December 13, 2017
Operator Signature: *Al Clark* **Location:** McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2017-483CGA

Company: Maxxam **Operators name:** Mike

Cylinder #: LL104225 Conc (PPM) 51.5/51.6 Tolerance (%) 2 Certified By: Praxair

Expiry Date: October 2020

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Mesa Definer 220</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>H-133034 / L-132702</u>
Last Verification Date	<u>December 13, 2017</u>			Temp. °C	<u>23.4 C</u>
Gas Type	<u>NO</u>	Conc.	<u>50.03</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>APEX 1223938</u>				
Expiry Date	<u>June 2020</u>				

Reference Analyzer:

Make/Model Teco 42i Serial/AMU Number: 1868

Instrument Settings Zero: 4.7 Span: 1.004 Range: 1.0

Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4989	79.5	0.813	0.812	0.016	62.755	51.0	51.0
4995	39.6	0.407	0.406	0.008	126.136	51.3	51.2
4992	19.6	0.202	0.201	0.004	254.694	51.4	51.2
Average Cylinder Concentration:						51.3	51.1

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>51.5</u>	<u>51.6</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:**

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration

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

Auditor: Al Clark Date: December 13, 2017

Operator Signature: *Al Clark* Location: McIntyre Center Edmonton

APPENDIX III
MAXIMUM INSTANTANEOUS DATA



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - August 2018

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

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

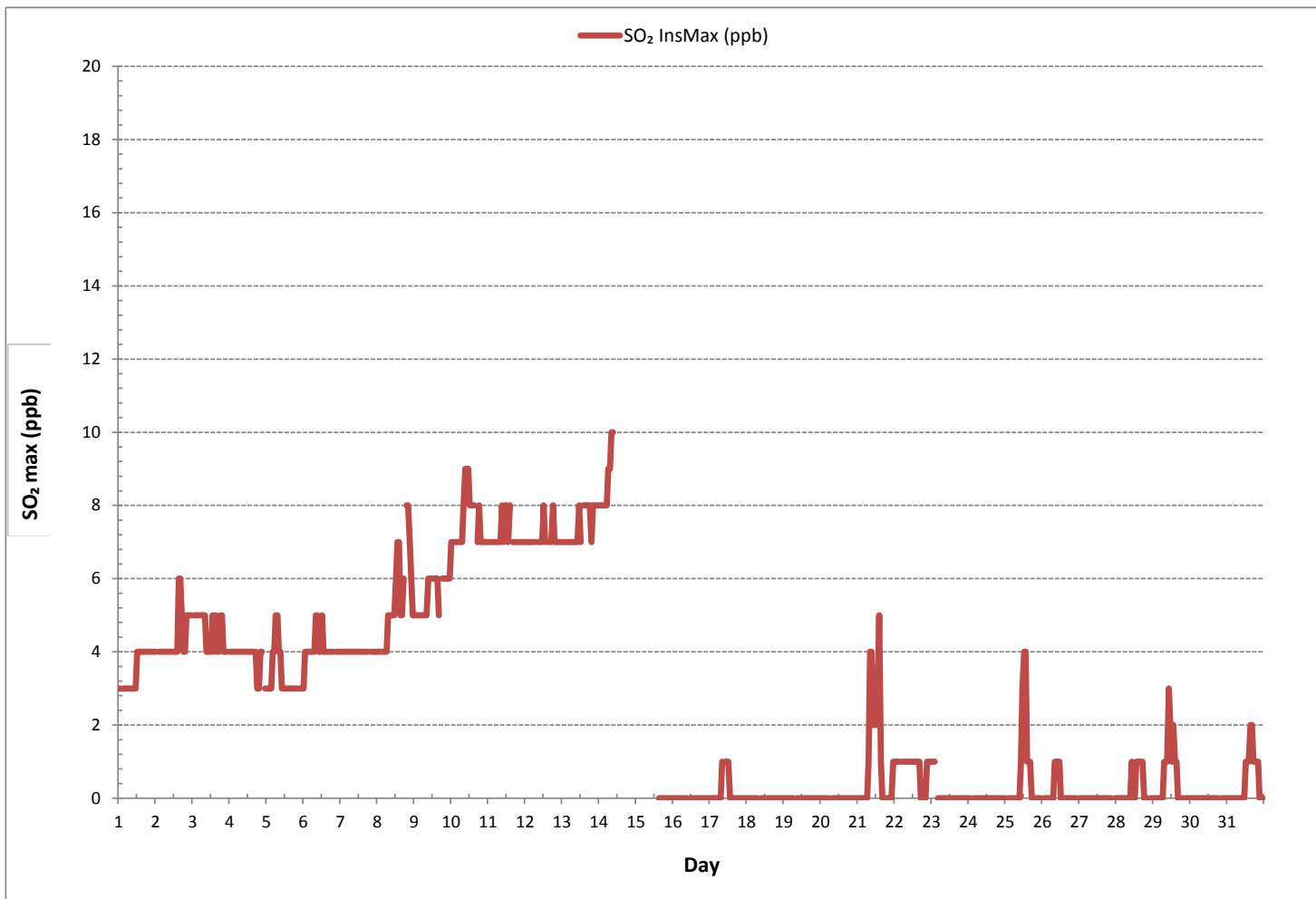
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	377
MAXIMUM INSTANTANEOUS VALUE:	10 ppb @ HOUR 8 ON DAY 14
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	9 hrs
STANDARD DEVIATION:	3
OPERATIONAL TIME:	723 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - August 2018

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

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

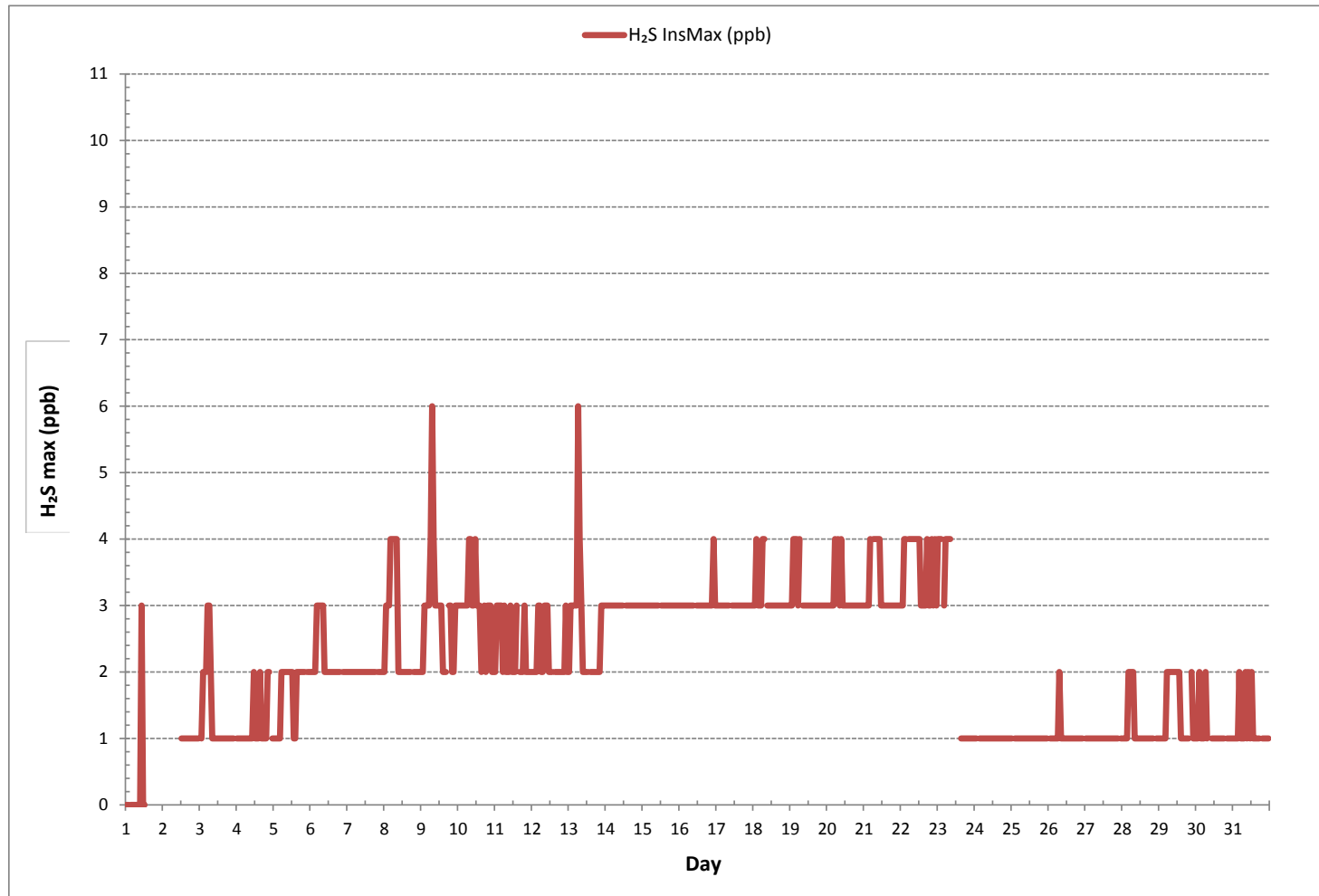
STATUS FLAG CODES

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:	670
MAXIMUM INSTANTANEOUS VALUE:	6 ppb @ HOUR 7 ON DAY 9
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	721 hrs
STANDARD DEVIATION:	1

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - August 2018

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	2.35	2.36	S	2.30	2.36	2.37	2.37	2.41	2.38	2.34	2.36	2.34	2.32	2.56	2.39	2.34	2.34	2.39	2.38	2.42	2.45	2.40	2.44	2.42	2.30	2.56	2.38	24
2	2.48	S	2.49	2.56	2.76	2.77	2.73	2.68	2.88	2.47	2.46	2.33	2.26	2.19	2.25	2.24	2.18	2.20	2.15	2.21	2.16	2.22	2.22	2.27	2.15	2.88	2.40	24
3	S	2.32	2.32	2.38	2.35	2.39	2.42	2.29	2.30	2.25	2.18	2.22	2.20	2.21	2.21	2.20	2.22	2.16	2.19	2.23	2.26	2.19	2.33	S	2.16	2.42	2.26	24
4	2.27	2.22	2.28	2.28	2.32	2.31	2.30	2.27	2.35	2.57	2.57	2.50	2.46	2.49	2.50	2.29	2.43	2.31	2.50	3.44	2.41	2.96	S	2.36	2.22	3.44	2.45	24
5	2.43	2.39	2.29	2.40	2.63	2.70	2.63	2.76	2.52	2.44	2.40	2.33	2.27	2.29	2.34	2.34	2.28	2.32	2.35	2.32	2.36	S	2.41	2.46	2.27	2.76	2.42	24
6	2.40	2.44	2.48	2.47	2.46	2.51	2.47	2.50	2.51	2.45	2.40	2.39	2.30	2.25	2.17	2.28	2.26	2.29	2.28	2.33	S	2.53	2.53	2.39	2.17	2.53	2.39	24
7	2.31	2.27	2.27	2.30	2.35	2.34	2.33	2.34	2.34	2.41	2.36	2.30	2.27	2.30	2.29	2.30	2.40	2.43	2.44	S	2.41	2.63	2.95	2.39	2.27	2.95	2.38	24
8	2.40	2.44	2.44	2.45	2.46	2.37	2.43	2.54	2.46	2.43	2.37	2.33	2.34	2.32	2.34	2.33	2.31	2.32	S	2.74	3.12	2.51	2.64	2.59	2.31	3.12	2.46	24
9	2.61	2.49	2.44	2.48	2.53	2.59	2.71	2.89	2.64	2.67	2.62	2.61	2.54	2.46	2.43	2.46	2.50	S	2.48	2.71	2.64	2.50	2.65	2.81	2.43	2.89	2.59	24
10	2.82	2.84	2.91	2.87	2.94	2.96	3.03	2.91	2.64	2.60	2.60	2.54	2.57	2.59	2.66	2.63	S	2.42	2.44	2.53	2.40	2.29	2.30	2.44	2.29	3.03	2.65	24
11	2.27	2.48	2.54	2.50	2.46	2.43	2.63	2.79	6.00	2.34	2.32	2.35	2.25	2.87	2.28	S	2.26	2.23	2.23	2.25	2.75	2.65	2.28	2.29	2.23	6.00	2.58	24
12	2.34	2.38	2.30	2.34	2.30	2.44	2.37	2.32	2.32	2.29	2.34	2.30	2.29	2.35	S	2.23	2.25	2.21	2.32	2.28	2.36	2.32	2.34	2.33	2.21	2.44	2.32	24
13	2.54	3.19	2.67	2.55	3.90	2.86	2.56	2.34	2.32	2.25	2.22	2.27	2.83	S	2.27	2.20	2.23	2.27	2.22	2.24	2.40	2.42	2.33	2.29	2.20	3.90	2.49	24
14	2.28	2.32	2.29	2.30	2.32	2.36	2.36	2.36	2.32	2.39	2.33	2.37	S	2.18	2.19	2.22	2.18	2.23	2.20	2.24	2.24	2.25	2.27	2.27	2.18	2.39	2.28	24
15	2.25	2.28	2.28	2.34	2.37	2.29	2.34	2.35	2.34	2.36	2.47	S	2.43	2.41	2.54	2.41	3.01	3.12	2.96	2.35	3.36	3.23	2.43	5.24	2.25	5.24	2.66	24
16	2.54	2.55	2.49	2.46	2.47	2.50	2.48	2.46	2.45	2.46	S	2.46	2.53	2.63	2.57	2.70	2.74	2.83	2.77	2.76	2.77	2.79	2.85	2.80	2.45	2.85	2.61	24
17	2.63	2.62	2.63	2.63	2.69	3.25	2.94	3.00	2.69	S	2.56	2.77	2.88	3.66	2.82	2.90	3.17	3.08	3.28	2.89	2.47	2.44	2.40	2.45	2.40	3.66	2.82	24
18	2.61	2.53	2.52	2.49	2.42	2.46	2.49	2.54	S	2.27	2.31	2.24	2.26	2.21	2.26	2.32	2.33	2.52	2.53	2.53	2.23	2.36	2.22	2.27	2.21	2.61	2.39	24
19	2.29	2.27	2.33	2.39	2.43	2.43	2.37	S	2.31	2.28	2.29	2.30	2.37	2.43	2.39	2.42	2.33	2.38	2.42	3.77	2.63	5.75	4.17	3.85	2.27	5.75	2.76	24
20	2.32	2.40	2.34	2.52	3.73	2.63	S	2.61	2.56	2.55	2.40	2.39	2.35	2.44	2.35	2.36	2.38	2.40	2.25	2.25	2.28	2.32	2.54	2.43	2.25	3.73	2.47	24
21	2.41	2.41	2.40	2.39	2.44	S	2.47	2.44	2.37	2.34	2.33	2.30	2.28	2.32	2.34	2.32	2.76	3.12	4.01	2.27	2.36	2.36	2.43	2.48	2.27	4.01	2.49	24
22	2.42	2.40	2.38	2.36	S	2.41	2.38	2.39	2.41	2.39	2.44	2.51	2.49	2.41	2.40	2.40	2.39	2.35	2.36	2.32	2.36	2.37	3.16	2.69	2.32	3.16	2.44	24
23	2.67	2.68	2.50	S	2.65	2.68	2.56	2.50	C	C	C	Y	Y	Y	Y	C	C	C	C	2.10	2.11	2.11	2.13	2.14	2.10	2.68	2.40	20
24	2.14	2.12	S	2.13	2.57	X	X	X	X	2.40	2.22	2.01	1.97	2.13	2.12	2.50	2.34	2.30	2.26	2.43	2.32	2.25	2.25	2.37	1.97	2.57	2.25	20
25	2.12	S	2.04	2.68	2.15	2.03	1.98	2.08	1.99	1.95	1.96	2.01	1.95	1.95	1.97	1.95	1.95	1.99	2.00	2.06	2.05	2.04	2.10	2.12	1.95	2.68	2.05	24
26	S	2.21	2.21	2.23	2.33	2.37	2.42	2.39	2.25	2.22	2.12	2.04	2.17	2.07	2.16	2.17	2.28	2.36	1.97	2.12	2.04	2.03	2.01	S	1.97	2.42	2.19	24
27	2.00	1.98	2.00	1.96	1.97	1.96	1.98	2.03	2.00	2.00	1.97	2.20	2.07	2.02	2.18	2.22	2.10	2.49	2.29	2.00	2.25	2.25	S	2.17	1.96	2.49	2.09	24
28	2.25	2.24	2.08	2.05	2.08	2.04	2.06	2.07	2.03	2.03	2.02	2.06	1.99	1.99	S1	1.99	2.03	2.14	1.97	1.98	2.13	S	2.08	2.06	1.97	2.25	2.06	23
29	2.10	2.10	2.09	2.09	2.07	2.09	2.15	2.18	2.10	2.18	2.08	2.05	C1	C1	C1	C1	C1	1.99	14.52	6.06	S	2.04	2.04	2.00	1.99	14.52	3.00	19
30	1.99	2.03	2.04	2.01	1.96	1.97	1.98	2.02	2.11	2.38	1.95	2.06	2.03	2.07	2.01	2.03	2.04	2.32	2.30	S	2.18	2.00	2.24	2.02	1.95	2.38	2.08	24
31	2.04	2.00	2.35	2.18	1.99	2.01	2.00	2.00	2.01	2.11	1.98	2.01	2.01	2.00	1.98	1.98	2.00	1.98	S	10.20	2.04	2.03	2.05	2.27	1.98	10.20	2.40	24
HOURLY MAX	2.82	3.19	2.91	2.87	3.90	3.25	3.03	3.00	6.00	2.67	2.62	2.77	2.88	3.66	2.82	2.90	3.17	3.12	14.52	10.20	3.36	5.75	4.17	5.24				
HOURLY AVG	2.35	2.38	2.36	2.37	2.48	2.43	2.41	2.43	2.49	2.34	2.30	2.30	2.31	2.35	2.31	2.31	2.35	2.38	2.89	2.83	2.40	2.49	2.44	2.51				

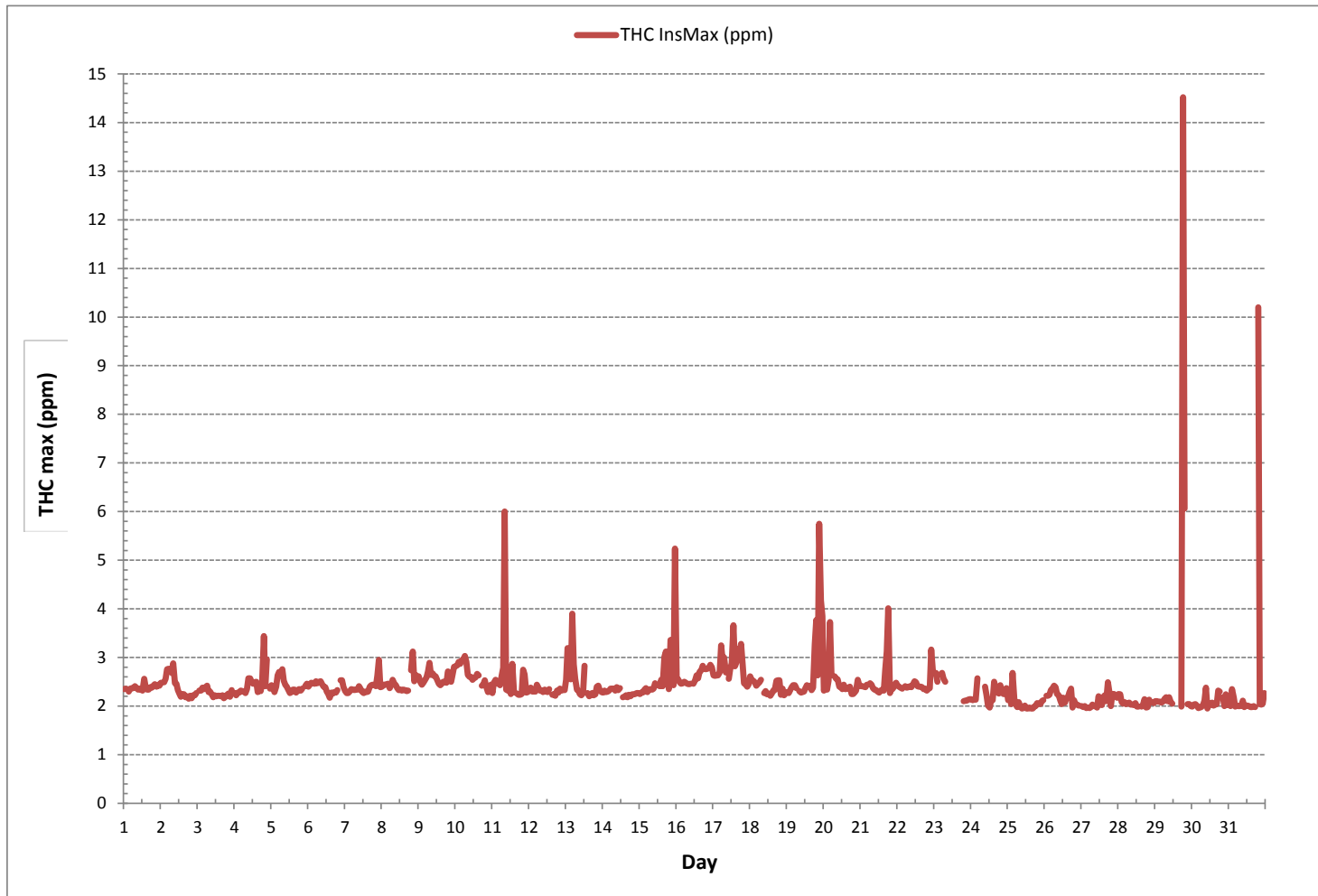
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	690
MAXIMUM INSTANTANEOUS VALUE:	14.52 ppm @ HOUR 18 ON DAY 29
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	730 hrs
STANDARD DEVIATION:	0.67

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





METHANE MAX Instantaneous Maximum (CH₄ ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0		
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0		
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0		
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	2.14	2.12	S	2.13	2.57	X	X	X	X	2.40	2.22	2.01	1.97	2.13	2.12	2.50	2.35	2.30	2.26	2.43	2.32	2.25	2.25	2.37	2.10	2.14	2.12	9		
25	2.12	S	2.04	2.68	2.15	1.98	1.98	2.08	1.99	1.95	1.96	1.96	1.95	1.95	1.97	1.95	1.95	1.96	2.00	2.05	2.05	2.04	2.10	2.12	2.10	2.12	1.95	2.68	2.04	24
26	S	2.21	2.21	2.23	2.33	2.37	2.42	2.39	2.25	2.22	2.12	2.04	2.17	2.07	2.06	2.17	2.28	2.36	1.97	2.12	2.04	2.03	2.01	S	1.97	2.42	2.19	2.19	24	
27	2.00	1.98	2.00	1.96	1.97	1.96	1.96	2.03	2.00	1.96	1.97	2.20	2.07	2.02	2.18	2.22	2.10	2.49	2.29	2.00	2.25	2.25	S	2.17	1.96	2.49	2.09	2.09	24	
28	2.25	2.24	2.08	2.05	2.08	2.04	2.06	2.07	2.03	2.03	2.02	2.06	1.99	1.99	S1	1.98	2.01	2.14	1.95	1.98	2.13	S	2.08	2.06	1.95	2.25	2.06	2.06	23	
29	2.10	2.10	2.09	2.09	2.07	2.09	2.15	2.18	2.10	2.09	2.08	2.05	C1	C1	C1	C1	C1	1.99	14.01	6.02	S	2.04	2.04	2.00	1.99	14.01	2.96	1.99	19	
30	1.99	2.03	2.04	1.97	1.95	1.97	1.98	2.02	2.11	2.38	1.95	2.06	2.03	2.07	2.01	2.03	2.04	2.32	2.29	S	2.18	2.00	2.24	2.02	1.95	2.38	2.07	2.07	24	
31	2.04	2.00	2.35	2.18	1.99	2.01	2.00	2.00	2.01	2.11	1.98	1.97	2.01	2.00	1.98	1.98	1.97	1.98	S	9.89	2.04	2.03	2.05	2.27	1.97	9.89	2.38	2.38	24	
HOURLY MAX	2.25	2.24	2.35	2.68	2.57	2.37	2.42	2.39	2.25	2.40	2.22	2.20	2.17	2.13	2.18	2.50	2.35	2.49	14.01	9.89	2.32	2.25	2.25	2.37						
HOURLY AVG	2.09	2.10	2.12	2.16	2.14	2.06	2.08	2.11	2.07	2.14	2.04	2.04	2.03	2.03	2.05	2.12	2.10	2.19	3.82	3.57	2.14	2.09	2.11	2.14						

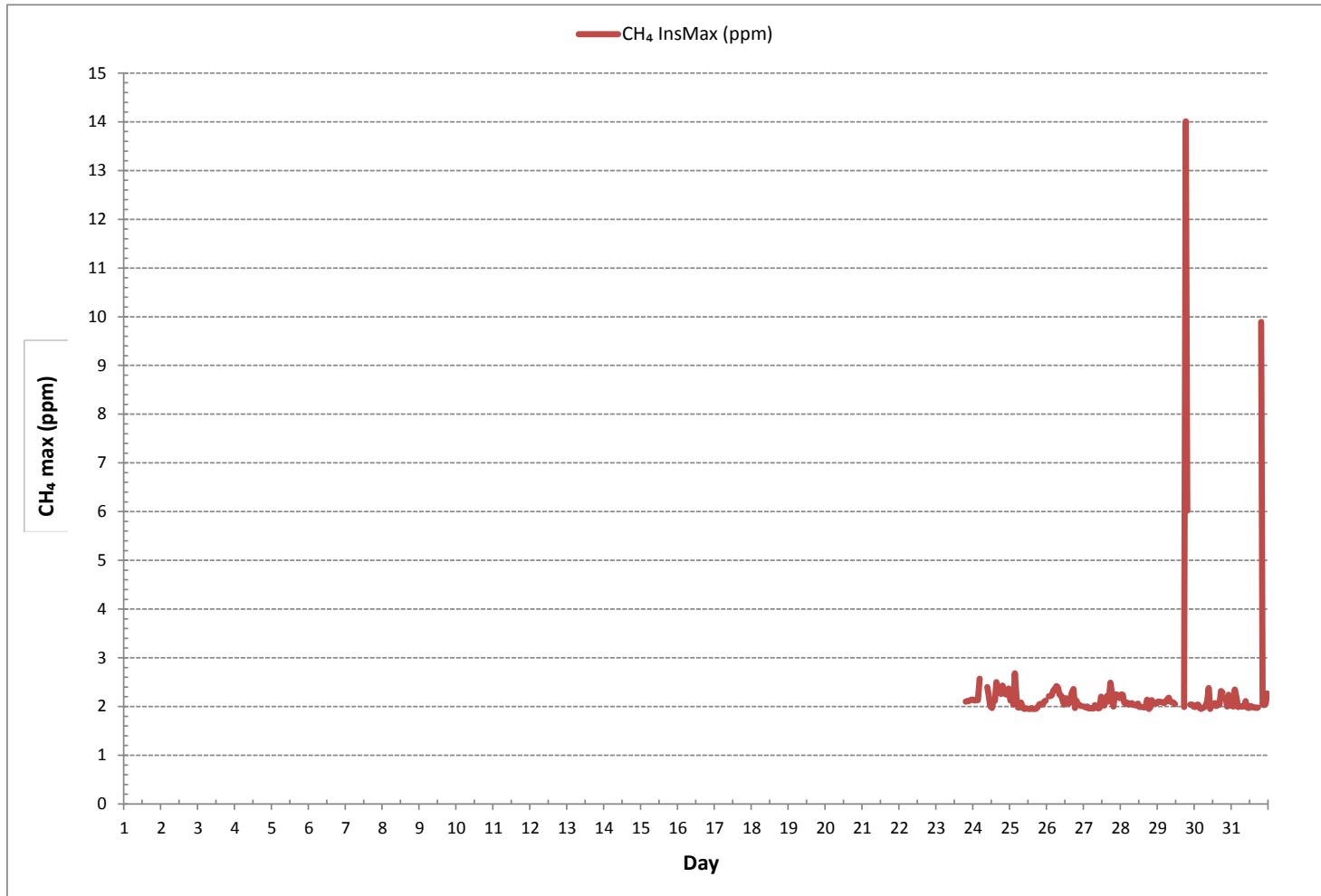
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	178
MAXIMUM INSTANTANEOUS VALUE:	14.01 ppm @ HOUR 18 ON DAY 29
IZS CALIBRATION TIME:	9 hrs
MONTHLY CALIBRATION TIME:	4 hrs
STANDARD DEVIATION:	1.11
OPERATIONAL TIME:	191 hrs

METHANE MAX Instantaneous Maximum (CH₄ 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	
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
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	0.00	0.00	S	0.00	0.00	X	X	X	X	0.00	0.01	0.00	0.01	0.00	0.00	0.02	0.04	0.02	0.00	0.00	0.00	0.05	0.00	0.03	0.00	0.00	0.05	0.01	20
25	0.00	S	0.04	0.00	0.00	0.07	0.00	0.00	0.01	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.05	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.01	24	
26	S	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.03	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.31	0.02	24	
27	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.00	0.00	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	S	0.00	0.00	0.05	0.01	24	
28	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	S1	0.02	0.02	0.00	0.05	0.00	0.00	S	0.00	0.00	0.00	0.05	0.01	23	
29	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.11	0.00	0.00	C1	C1	C1	C1	C1	0.00	0.51	0.04	S	0.01	0.00	0.00	0.00	0.51	0.04	19	
30	0.01	0.03	0.00	0.05	0.03	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	S	0.03	0.00	0.04	0.00	0.00	0.07	0.01	24	
31	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.01	0.00	0.03	0.00	S	0.32	0.00	0.02	0.00	0.00	0.00	0.00	0.32	0.02	24
HOURLY MAX	0.02	0.03	0.04	0.05	0.03	0.07	0.03	0.01	0.02	0.11	0.01	0.07	0.01	0.01	0.31	0.02	0.04	0.07	0.51	0.32	0.03	0.05	0.04	0.03					
HOURLY AVG	0.00	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.05	0.01	0.02	0.02	0.08	0.06	0.00	0.01	0.01	0.01					

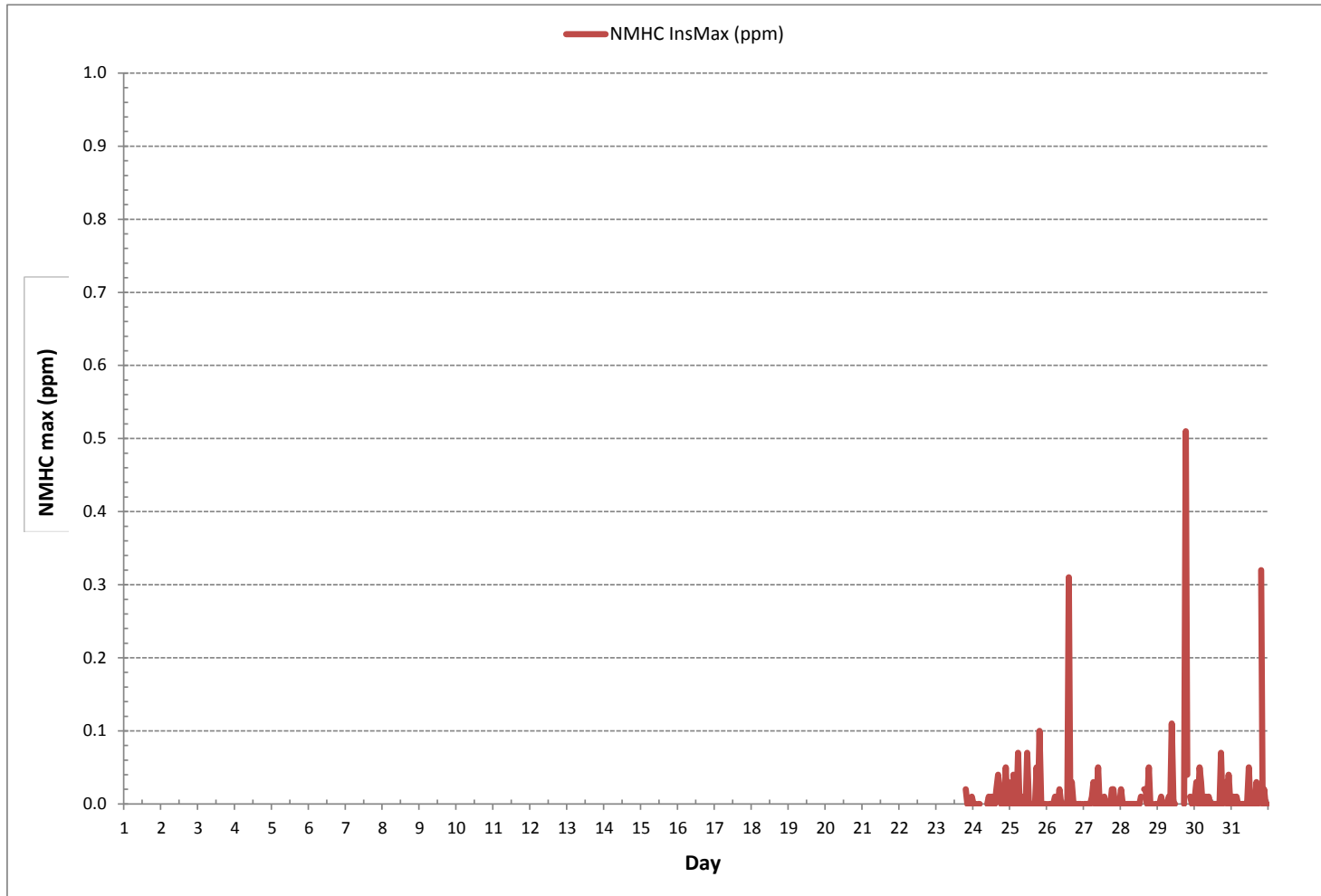
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	52
MAXIMUM INSTANTANEOUS VALUE:	0.51 ppm @ HOUR 18 ON DAY 29
IZS CALIBRATION TIME:	9 hrs
MONTHLY CALIBRATION TIME:	4 hrs
STANDARD DEVIATION:	0.05
OPERATIONAL TIME:	191 hrs

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - August 2018

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

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

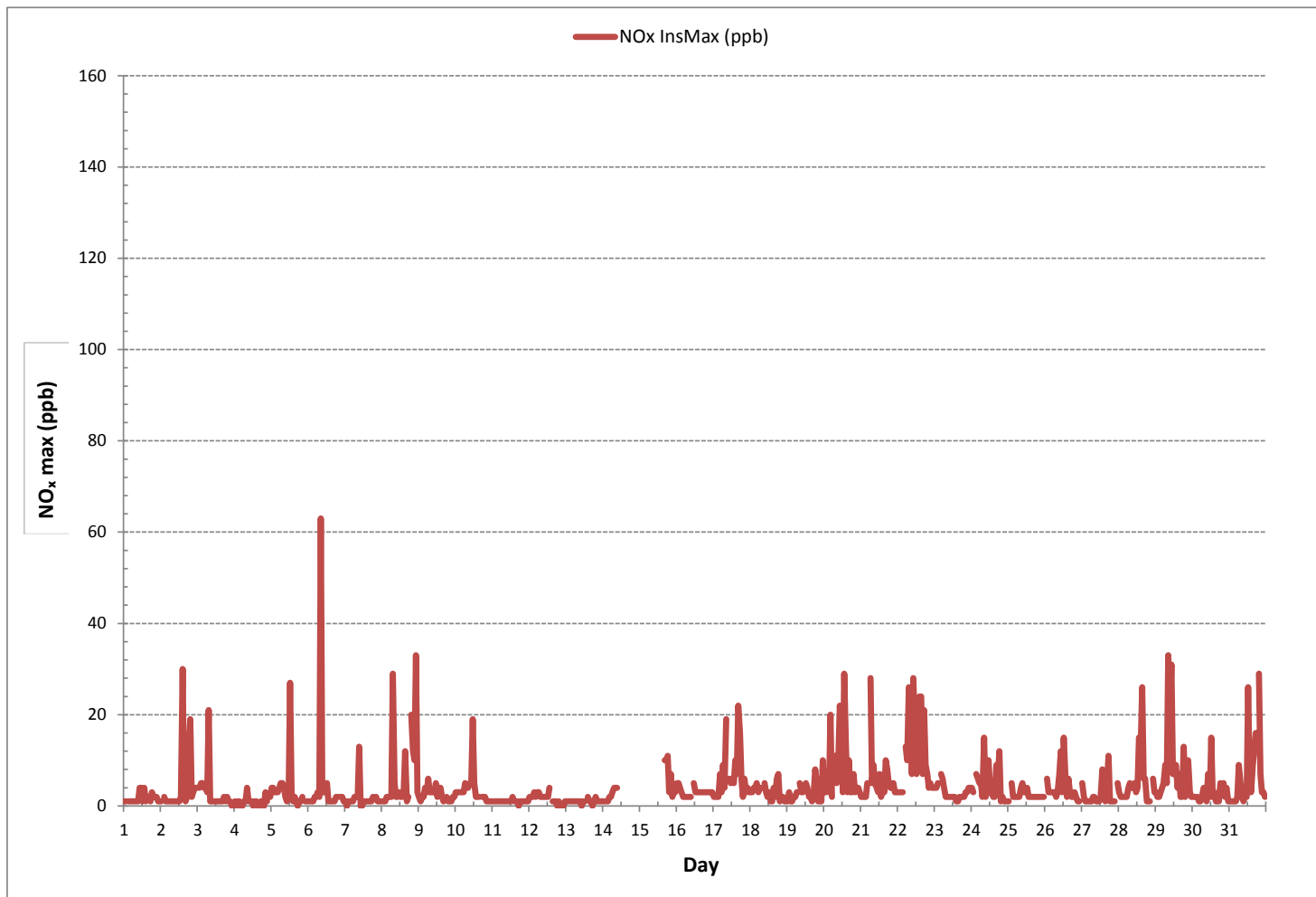
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	664
MAXIMUM INSTANTANEOUS VALUE:	63 ppb @ HOUR 8 ON DAY 6
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	13 hrs
OPERATIONAL TIME:	727 hrs
STANDARD DEVIATION:	6

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	1	S	1	0	1	0	1	1	1	2	2	1	2	1	1	0	0	1	0	0	0	0	0	0	0	0	2	1	24				
2	0	S	1	0	0	0	0	0	0	1	0	0	0	1	13	1	0	1	10	5	1	0	0	0	0	0	0	13	1	24				
3	S	1	0	1	1	1	1	15	1	1	0	1	0	0	1	1	0	2	1	0	1	0	0	S	1	0	15	1	24					
4	1	0	0	0	0	0	0	0	2	0	1	1	0	1	1	0	0	1	1	0	1	0	S	1	1	0	2	0	24					
5	0	0	0	1	0	1	2	2	2	1	0	1	19	1	1	1	1	1	1	0	1	0	S	1	1	0	19	2	24					
6	0	0	0	0	1	1	2	1	36	1	1	1	2	1	1	1	1	1	1	1	1	S	1	1	0	0	36	2	24					
7	0	0	1	0	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	S	1	0	0	0	0	4	1	24					
8	0	0	0	0	0	0	1	19	1	1	2	2	1	0	1	10	1	1	S	2	1	2	12	0	0	0	19	2	24					
9	0	0	0	0	1	0	3	1	1	1	1	1	0	1	1	0	0	S	1	0	0	0	0	0	0	0	3	1	24					
10	0	0	0	0	0	0	1	1	1	1	1	11	1	0	0	0	S	1	0	0	0	0	0	0	0	0	11	1	24					
11	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	S	1	0	1	1	1	1	1	1	0	1	0	1	0	24				
12	1	1	0	1	1	1	1	0	1	1	1	1	1	2	S	1	1	1	1	0	1	1	1	1	1	0	2	1	24					
13	1	1	1	1	1	1	1	1	1	1	1	1	1	S	2	1	1	1	1	1	0	0	1	1	1	0	2	1	24					
14	1	1	1	1	1	1	1	2	2	1	C	C	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	1	2	1	17				
15	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	3	7	4	0	3	0	0	0	0	0	7	2	14					
16	0	0	0	0	0	0	0	0	0	0	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24					
17	0	0	0	0	4	1	5	1	14	S	1	1	1	1	3	2	11	11	2	0	2	0	1	0	0	0	14	3	24					
18	0	0	0	0	1	0	1	1	S	0	1	0	1	0	0	1	1	3	3	0	0	0	0	0	0	0	3	1	24					
19	0	1	0	0	0	0	1	S	0	1	1	2	2	2	1	0	0	0	2	2	0	0	0	4	0	4	1	24						
20	0	0	0	0	9	0	S	6	3	3	16	14	1	21	5	1	6	1	0	2	0	1	0	0	0	21	4	24						
21	0	0	0	0	1	S	10	1	3	1	0	1	2	0	2	0	6	2	0	0	0	0	0	0	0	10	1	24						
22	0	0	0	0	S	3	2	11	15	2	19	9	2	11	7	16	2	9	3	1	0	0	0	0	0	19	5	24						
23	0	0	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					
24	0	0	S	0	0	2	2	1	11	1	1	6	1	2	1	1	6	3	10	0	0	0	0	0	0	11	2	24						
25	0	S	0	0	0	0	0	0	2	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24						
26	S	0	0	0	0	0	0	0	1	3	5	1	10	3	0	2	2	0	0	1	0	0	0	S	0	10	1	24						
27	0	0	0	0	0	0	0	0	1	0	1	0	1	5	1	0	3	7	0	0	0	0	S	0	0	7	1	24						
28	0	0	0	0	0	0	1	1	1	1	1	1	2	12	7	13	1	2	0	0	0	S	0	0	0	13	2	24						
29	0	0	0	0	0	1	6	2	29	14	22	3	3	6	1	2	0	0	7	1	S	4	0	0	0	29	4	24						
30	0	0	0	0	0	0	0	2	2	1	8	2	13	1	1	1	0	0	2	S	1	0	2	0	0	13	2	24						
31	0	0	0	0	0	1	8	3	1	1	2	1	22	3	1	2	3	8	S	12	1	0	0	0	0	0	22	3	24					
HOURLY MAX	1	1	1	1	9	3	10	19	36	14	22	14	22	21	13	16	11	11	10	12	3	4	12	4										
HOURLY AVG	0	0	0	0	1	1	2	3	5	2	3	2	3	3	2	2	2	2	2	1	1	0	1	0										

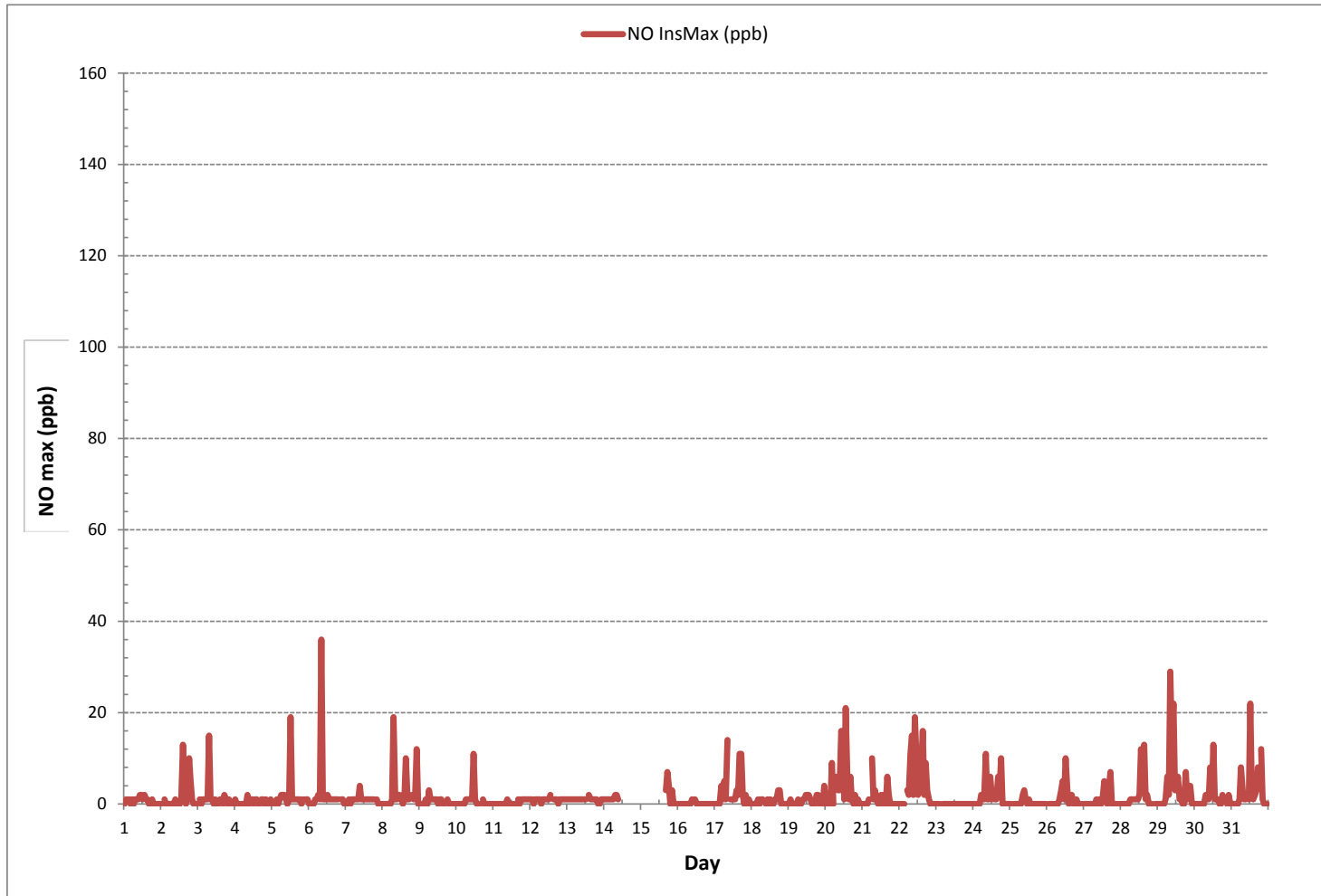
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	358
MAXIMUM INSTANTANEOUS VALUE:	36 ppb @ HOUR 8 ON DAY 6
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	13 hrs
STANDARD DEVIATION:	4
OPERATIONAL TIME:	727 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - August 2018

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

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

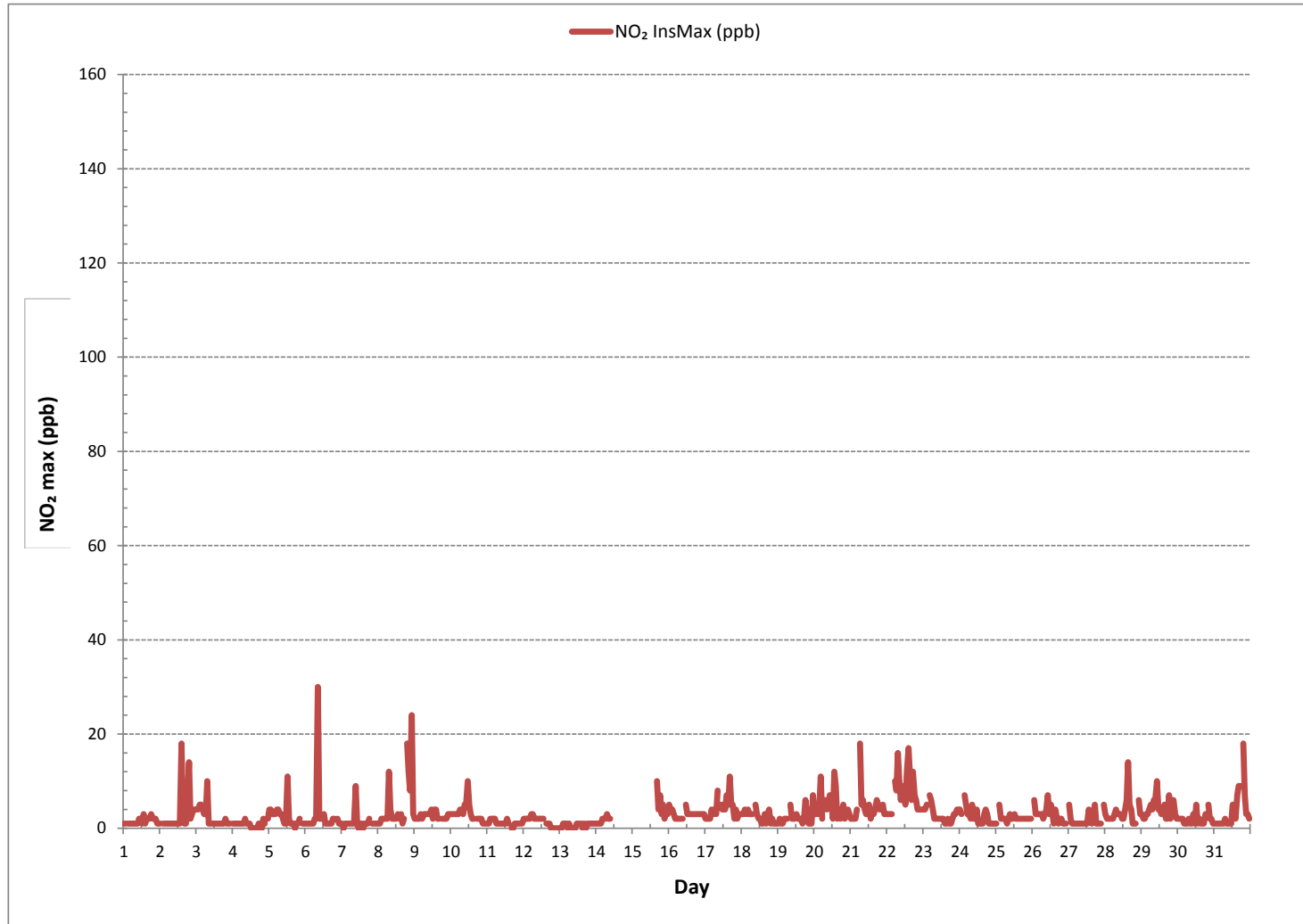
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	656
MAXIMUM INSTANTANEOUS VALUE:	30 ppb @ HOUR 8 ON DAY 6
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	13 hrs
OPERATIONAL TIME:	727 hrs
STANDARD DEVIATION:	3

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - August 2018

OZONE Instantaneous Maximum (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	25.3	25.9	S	26.6	25.5	23.6	21.7	21.5	22.4	24.9	26.6	30.8	30.3	33.6	36.4	40.9	41.9	38.1	36.8	34.1	33.3	34.3	35.1	38.8	21.5	41.9	30.8	24
2	37.6	S	25.2	22.6	17.9	14.3	14.8	22.7	20.9	24.9	35.2	36.7	38.3	44.3	50.9	57.4	57.6	55.5	44.7	43.4	36.3	32.4	28.7	25.5	14.3	57.6	34.3	24
3	S	22.6	15.9	14.0	12.7	12.4	14.5	22.6	27.9	30.1	28.5	27.9	28.2	23.4	22.9	22.0	23.4	24.2	24.0	23.3	35.1	36.1	29.1	S	12.4	36.1	23.7	24
4	33.5	33.4	33.2	30.3	26.1	23.0	21.9	22.9	21.9	20.9	19.6	19.0	17.1	17.6	19.8	22.1	22.2	21.5	18.6	18.1	19.1	19.3	S	18.2	17.1	33.5	22.6	24
5	18.1	18.8	22.9	22.2	18.7	16.3	15.8	13.9	18.4	26.3	27.0	25.3	27.8	28.2	27.8	28.3	28.7	28.5	27.1	22.5	21.2	S	21.1	19.5	13.9	28.7	22.8	24
6	20.0	23.3	21.7	22.4	19.4	18.2	20.6	21.9	29.3	35.1	39.6	40.8	42.8	33.1	32.6	34.4	34.7	32.8	29.5	26.2	S	26.1	25.8	21.8	18.2	42.8	28.4	24
7	25.4	25.2	23.4	23.0	22.4	20.2	19.8	22.2	26.2	26.3	26.0	27.3	28.4	28.9	30.1	32.3	32.7	32.4	30.5	S	28.9	29.6	29.6	28.7	19.8	32.7	26.9	24
8	29.2	25.7	24.5	22.6	22.7	26.1	22.3	20.5	27.6	36.2	43.9	43.2	49.2	48.1	49.2	40.7	40.5	43.3	S	45.2	45.9	39.3	34.0	29.2	20.5	49.2	35.2	24
9	30.2	29.9	25.7	25.5	24.5	21.5	20.0	30.8	34.7	45.2	44.5	48.3	54.0	55.9	60.0	63.1	62.2	S	50.2	47.2	53.9	56.1	54.1	48.4	20.0	63.1	42.9	24
10	48.2	50.6	44.8	45.1	44.7	37.8	36.6	35.6	35.5	S1	35.8	45.5	50.7	56.2	55.6	55.3	S	43.3	41.0	37.1	36.6	31.2	29.4	29.3	29.3	56.2	42.1	23
11	29.3	27.5	23.4	22.4	21.3	19.7	19.5	19.0	18.6	18.1	17.8	22.6	23.1	23.1	20.1	S	19.3	14.9	20.5	30.0	39.7	40.8	46.2	43.0	14.9	46.2	25.2	24
12	28.8	30.7	31.3	25.9	23.9	23.2	17.6	S1	17.1	17.7	18.0	19.8	17.5	18.4	S	26.2	27.3	24.8	21.5	24.9	24.8	24.1	24.8	24.8	17.1	31.3	23.3	23
13	26.1	26.6	21.7	21.3	21.6	21.6	21.1	28.6	31.4	32.0	30.2	S1	29.3	S	33.4	35.2	35.1	34.1	35.2	32.8	30.2	29.7	29.5	28.0	21.1	35.2	28.9	23
14	26.4	26.3	25.4	24.8	24.2	23.4	21.5	20.3	21.3	26.5	30.7	33.6	S	37.8	40.2	41.2	41.4	40.0	36.7	32.8	31.5	31.2	30.0	28.5	20.3	41.4	30.2	24
15	27.0	24.3	22.5	21.3	21.4	20.8	20.1	18.8	18.4	C	C	C	C	C	C	14.4	15.7	15.6	15.5	15.7	17.9	18.6	15.6	15.9	14.4	27.0	18.9	24
16	12.8	12.4	14.4	14.6	14.2	12.8	12.2	12.0	11.8	11.7	S	14.3	16.4	24.3	25.7	25.7	25.8	25.2	22.3	18.1	16.0	13.1	9.9	9.5	9.5	25.8	16.3	24
17	10.6	11.7	10.7	10.1	9.4	9.7	11.8	10.9	15.7	S	31.9	35.9	33.2	28.6	25.1	23.0	21.6	18.9	19.3	22.7	21.9	26.7	28.5	23.2	9.4	35.9	20.0	24
18	16.5	18.5	21.7	23.3	26.1	26.0	24.7	24.5	S	32.0	32.9	33.5	32.6	32.0	31.6	30.0	29.8	29.9	28.6	27.2	26.2	24.1	22.4	22.0	16.5	33.5	26.8	24
19	22.3	22.6	21.9	18.8	16.6	17.7	18.7	S	24.1	26.0	29.6	31.0	33.1	34.9	33.7	35.8	35.9	32.6	30.3	30.9	31.4	30.8	29.1	27.0	16.6	35.9	27.6	24
20	25.6	28.8	28.8	29.2	22.7	20.7	S	12.4	17.5	22.4	28.7	33.6	30.7	33.7	34.4	35.3	35.9	35.8	33.4	30.2	32.1	31.5	23.3	25.1	12.4	35.9	28.3	24
21	27.1	27.1	27.1	29.3	28.7	S	23.8	25.8	33.6	36.6	42.2	46.0	50.1	51.9	57.3	59.3	54.8	53.6	50.5	51.2	46.0	43.9	43.1	43.2	23.8	59.3	41.4	24
22	44.3	43.2	45.0	45.5	S	42.8	39.5	35.4	32.3	28.3	28.3	29.2	30.9	34.7	35.9	39.3	40.1	39.9	35.9	37.1	38.0	37.0	39.2	39.5	28.3	45.5	37.4	24
23	39.3	30.4	27.0	S	18.4	14.1	14.5	16.0	16.3	16.4	15.9	15.8	14.4	16.4	18.3	18.8	19.9	19.4	18.0	17.1	14.6	11.0	10.5	10.0	10.0	39.3	17.9	24
24	10.1	10.1	S	9.7	9.8	10.9	11.2	9.5	9.6	11.7	10.5	11.3	12.1	13.3	13.9	11.8	10.2	9.2	9.9	9.2	8.8	11.6	13.6	13.9	8.8	13.9	11.0	24
25	16.8	S	19.6	20.7	19.5	15.0	17.4	13.2	20.3	24.0	23.8	25.8	26.6	26.6	27.3	26.6	25.0	24.7	23.5	23.1	22.0	20.5	18.5	16.1	13.2	27.3	21.6	24
26	S	15.6	12.4	10.5	10.0	11.4	10.3	9.9	13.7	19.1	27.8	30.2	30.7	30.5	31.7	32.1	29.7	28.9	27.7	23.8	16.3	13.8	11.9	S	9.9	32.1	20.4	24
27	16.8	16.2	15.1	14.6	15.9	17.5	17.6	16.9	17.8	22.5	26.6	28.7	30.5	31.3	31.7	31.0	30.5	29.3	29.7	29.6	29.8	28.4	S	24.2	14.6	31.7	24.0	24
28	19.7	18.4	19.3	18.9	18.2	18.8	18.9	19.1	17.8	16.9	17.9	22.8	27.4	28.9	30.8	32.6	36.6	34.0	33.7	33.8	28.8	S	21.5	22.6	16.9	36.6	24.2	24
29	21.1	18.6	18.4	16.9	16.0	13.5	11.0	9.8	10.6	10.2	13.3	14.0	12.0	18.8	24.7	27.9	23.7	21.4	23.3	20.6	S	17.3	18.9	19.0	9.8	27.9	17.4	24
30	15.1	13.6	16.4	17.3	17.6	17.0	15.2	15.9	20.8	22.7	21.9	18.4	16.7	16.7	17.8	18.0	15.9	16.4	21.3	S	18.6	15.9	16.3	16.2	13.6	22.7	17.5	24
31	16.3	15.9	16.2	15.9	15.2	12.8	11.7	11.2	12.8	18.0	17.1	20.9	23.7	27.0	29.3	28.9	25.9	26.2	S	28.6	27.2	29.5	28.6	26.7	11.2	29.5	21.1	24
HOURLY MAX	48.2	50.6	45.0	45.5	44.7	42.8	39.5	35.6	35.5	45.2	44.5	48.3	54.0	56.2	60.0	63.1	62.2	55.5	50.5	51.2	53.9	56.1	54.1	48.4				
HOURLY AVG	24.8	23.9	23.3	22.2	20.2	19.4	18.9	19.4	21.5	24.4	27.3	28.7	29.6	31.0	32.7	33.0	31.5	29.8	28.9	28.8	28.7	27.7	26.5	25.4				

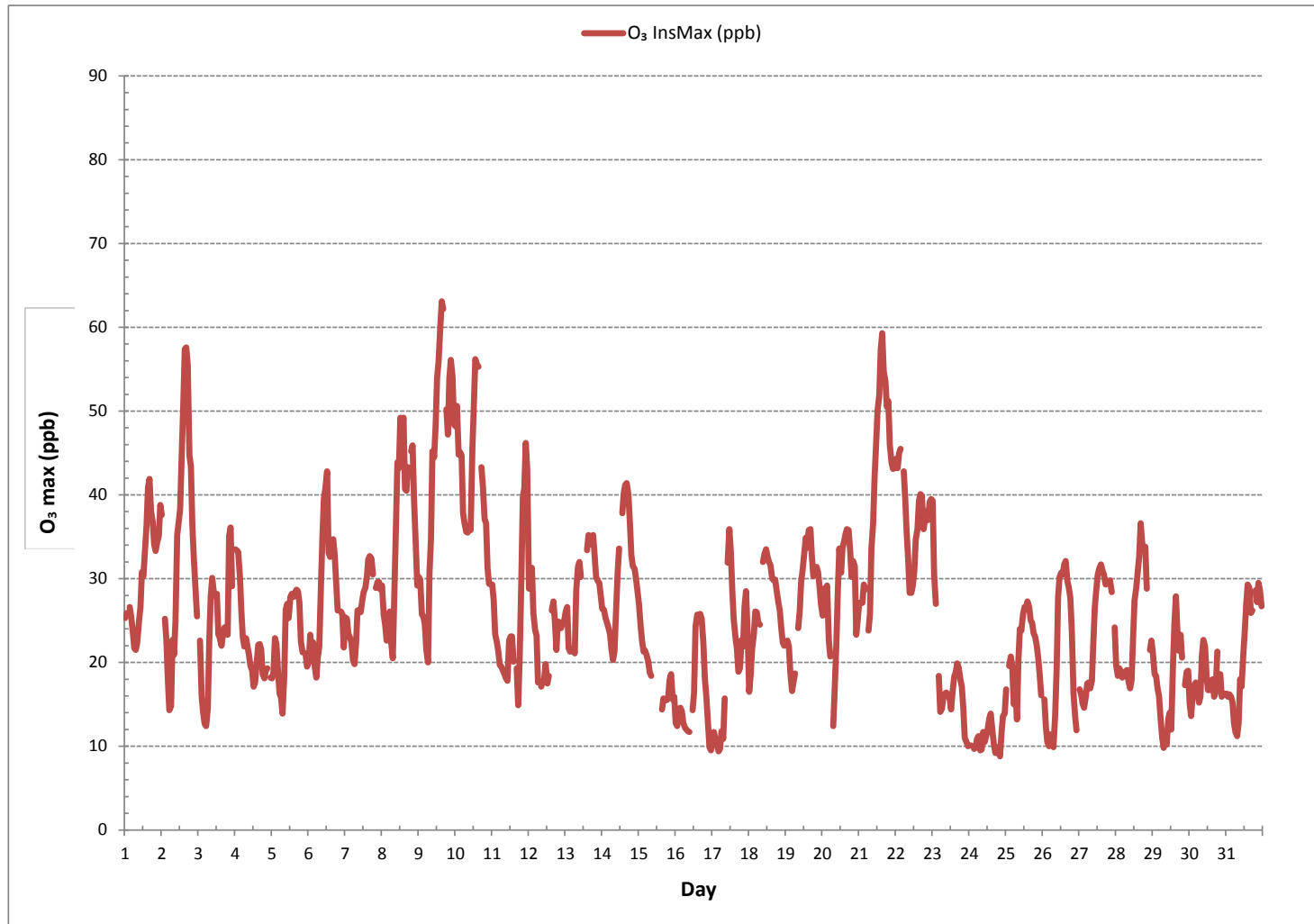
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	703
MAXIMUM INSTANTANEOUS VALUE:	63.1 ppb @ HOUR 15 ON DAY 9
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	741 hrs
STANDARD DEVIATION:	10.5

OZONE Instantaneous Maximum (O₃ 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	27.6	29.4	32.2	29.1	21.0	30.7	32.4	34.8	36.4	35.7	32.4	37.9	26.9	17.3	13.4	16.9	18.0	24.1	11.6	12.3	15.8	13.2	10.7	10.5	10.5	37.9	23.8	24
2	20.4	14.2	13.0	16.0	18.6	14.7	13.2	11.4	10.6	12.9	14.9	20.6	22.1	34.4	33.1	37.9	35.2	46.6	47.3	19.5	18.0	22.8	20.6	12.5	10.6	47.3	22.1	24
3	13.6	13.8	14.7	18.8	12.7	13.6	16.4	21.7	41.8	35.9	35.9	38.3	41.1	43.1	38.5	39.4	39.9	35.7	40.9	21.7	31.1	22.2	34.6	33.5	12.7	43.1	29.1	24
4	32.2	42.5	36.6	34.4	31.1	32.0	35.0	32.6	31.1	22.3	23.4	23.6	22.1	39.8	31.8	33.5	31.3	28.2	21.9	18.4	14.7	13.8	20.4	14.2	13.8	42.5	27.8	24
5	13.0	12.7	10.5	11.2	11.0	10.5	8.0	10.5	11.6	11.4	15.3	22.3	19.1	27.4	23.4	21.5	20.1	18.4	14.3	15.3	14.9	11.2	12.1	15.2	8.0	27.4	15.0	24
6	14.7	14.0	15.3	18.8	15.8	17.5	20.8	20.2	17.5	19.7	23.2	33.3	48.4	74.2	54.5	55.1	47.1	40.7	24.5	18.2	18.2	23.9	23.6	15.6	14.0	74.2	28.1	24
7	24.9	19.7	18.4	21.2	17.3	19.6	15.8	20.6	29.3	33.9	33.1	31.3	46.6	38.1	39.4	43.1	35.7	25.2	22.1	18.0	19.0	14.9	17.5	13.4	13.4	46.6	25.8	24
8	16.7	13.4	15.3	15.1	14.5	17.1	9.6	X	23.4	28.5	37.7	40.1	42.2	38.3	41.4	40.1	32.4	24.7	19.5	11.0	11.7	12.3	16.2	33.9	9.6	42.2	24.1	23
9	18.2	17.5	15.6	14.2	10.5	11.9	13.4	12.9	13.1	16.2	15.6	17.1	15.3	16.9	14.7	16.7	22.5	25.2	13.8	10.1	15.8	18.4	14.2	14.2	10.1	25.2	15.6	24
10	16.7	20.2	24.9	26.3	19.1	25.6	27.2	24.5	19.5	21.7	22.3	23.9	28.9	30.0	24.7	26.5	21.7	26.5	22.3	26.0	31.3	38.1	32.4	32.6	16.7	38.1	25.5	24
11	22.6	27.6	32.2	35.0	37.9	42.0	31.1	28.3	22.3	30.2	27.4	32.9	28.7	18.7	26.5	30.9	34.4	36.1	36.6	33.1	23.7	18.2	46.9	44.2	18.2	46.9	31.1	24
12	28.3	33.5	29.4	26.5	29.1	35.9	29.6	28.4	25.8	28.9	30.9	34.8	43.4	39.4	56.7	47.5	42.0	30.9	28.9	37.0	33.1	35.3	30.2	31.3	25.8	56.7	34.0	24
13	19.8	15.0	19.7	15.6	12.7	13.6	12.7	17.4	19.9	22.8	25.2	24.1	24.1	25.2	26.1	33.3	26.7	29.8	20.6	14.5	16.4	27.8	35.9	39.7	12.7	39.7	22.4	24
14	38.3	40.7	39.9	34.2	35.0	26.9	26.1	27.2	24.1	25.8	27.4	34.6	30.0	31.8	42.0	37.9	39.9	32.4	22.5	13.8	14.0	16.2	19.5	17.5	13.8	42.0	29.1	24
15	21.0	15.6	13.2	12.9	14.5	14.5	14.7	13.6	16.3	14.7	14.2	18.4	19.9	16.7	21.5	18.6	15.6	14.5	14.9	12.7	14.5	13.1	6.8	11.0	6.8	21.5	15.1	24
16	21.9	23.4	29.2	21.2	21.2	17.8	18.7	19.5	16.5	18.0	18.2	12.3	15.1	19.1	17.3	21.9	20.6	20.6	15.6	16.9	18.4	17.7	16.7	15.3	12.3	29.2	18.9	24
17	18.2	14.5	14.5	15.6	15.4	11.8	8.6	7.5	9.0	13.6	6.8	12.9	15.6	15.3	12.3	11.2	11.6	13.1	13.4	14.5	13.4	14.9	16.4	14.7	6.8	18.2	13.1	24
18	16.0	15.8	16.9	18.4	22.1	22.8	30.7	34.0	39.6	46.6	50.6	52.1	45.5	45.1	46.0	45.8	39.2	30.7	21.7	13.8	15.1	17.7	16.4	14.2	13.8	52.1	29.9	24
19	14.0	15.4	15.6	11.0	15.8	17.3	16.0	20.2	22.8	18.4	24.1	43.1	34.2	30.7	34.2	26.3	32.9	21.5	11.8	12.3	11.8	11.4	9.4	12.5	9.4	43.1	20.1	24
20	11.2	12.1	10.1	7.5	6.2	9.2	9.9	10.7	11.8	12.3	20.2	23.9	22.8	23.0	25.4	18.8	19.3	19.5	11.2	9.9	10.4	9.6	12.5	15.3	6.2	25.4	14.3	24
21	16.2	16.4	18.0	21.5	18.0	13.2	14.2	17.1	21.5	18.4	21.5	24.5	31.3	30.9	24.9	24.9	17.5	11.8	3.7	9.6	12.1	15.3	15.1	15.8	3.7	31.3	18.1	24
22	17.3	22.3	23.4	25.0	20.8	18.8	19.9	21.7	19.9	19.7	20.4	19.3	26.8	25.8	22.8	22.3	23.7	17.5	14.7	13.1	14.7	17.7	16.5	15.3	13.1	26.8	20.0	24
23	20.2	14.0	13.6	21.5	24.3	38.8	40.1	40.8	32.9	23.9	38.6	42.3	35.3	42.7	43.6	44.0	41.8	28.9	25.2	25.8	27.2	24.5	22.8	25.6	13.6	44.0	30.8	24
24	22.8	31.3	18.6	18.6	48.4	34.8	16.9	9.0	16.9	36.6	27.6	33.3	30.0	30.0	33.3	28.1	26.9	32.7	32.2	27.6	26.9	28.5	26.5	19.9	9.0	48.4	27.4	24
25	19.7	18.2	19.5	18.6	13.8	14.3	14.9	21.0	32.4	23.9	17.5	18.0	13.6	16.9	15.3	13.9	21.2	20.4	27.4	27.4	30.5	23.0	18.4	16.2	13.6	32.4	19.8	24
26	17.1	11.0	9.7	8.3	7.9	9.0	11.6	14.0	18.4	20.4	20.6	34.8	28.0	26.5	29.6	34.7	26.5	25.9	20.4	20.2	32.7	38.3	37.2	37.7	7.9	38.3	22.5	24
27	35.3	38.5	39.7	41.0	45.6	36.1	31.6	33.8	34.4	35.5	38.8	37.0	34.4	34.4	28.7	26.1	23.0	19.9	14.2	5.3	6.0	11.6	10.5	14.0	5.3	45.6	28.1	24
28	13.6	16.9	20.8	24.3	27.4	26.9	26.5	28.1	22.3	27.2	30.5	32.0	37.3	32.7	24.5	26.9	27.4	49.9	12.5	14.7	14.2	18.0	16.7	16.2	12.5	49.9	24.5	24
29	14.5	16.5	13.4	13.0	18.8	10.7	15.1	16.2	13.8	16.7	17.7	18.0	9.6	10.8	10.6	15.1	11.8	10.4	6.2	7.5	9.2	11.0	11.9	13.8	6.2	18.8	13.0	24
30	11.4	12.9	18.8	20.4	21.7	22.1	26.3	26.1	34.0	48.6	46.1	49.9	41.2	51.9	53.8	52.7	44.7	27.1	38.1	27.4	26.1	17.3	20.2	21.0	11.4	53.8	31.7	24
31	23.7	32.0	27.8	21.7	18.2	16.7	17.6	16.9	25.8	24.3	44.4	45.1	32.6	34.2	34.9	27.6	16.2	14.9	19.1	11.2	18.8	19.1	25.8	31.8	11.2	45.1	25.0	24
HOURLY MAX	38.3	42.5	39.9	41.0	48.4	42.0	40.1	40.8	41.8	48.6	50.6	52.1	48.4	74.2	56.7	55.1	47.1	49.9	47.3	37.0	33.1	38.3	46.9	44.2				

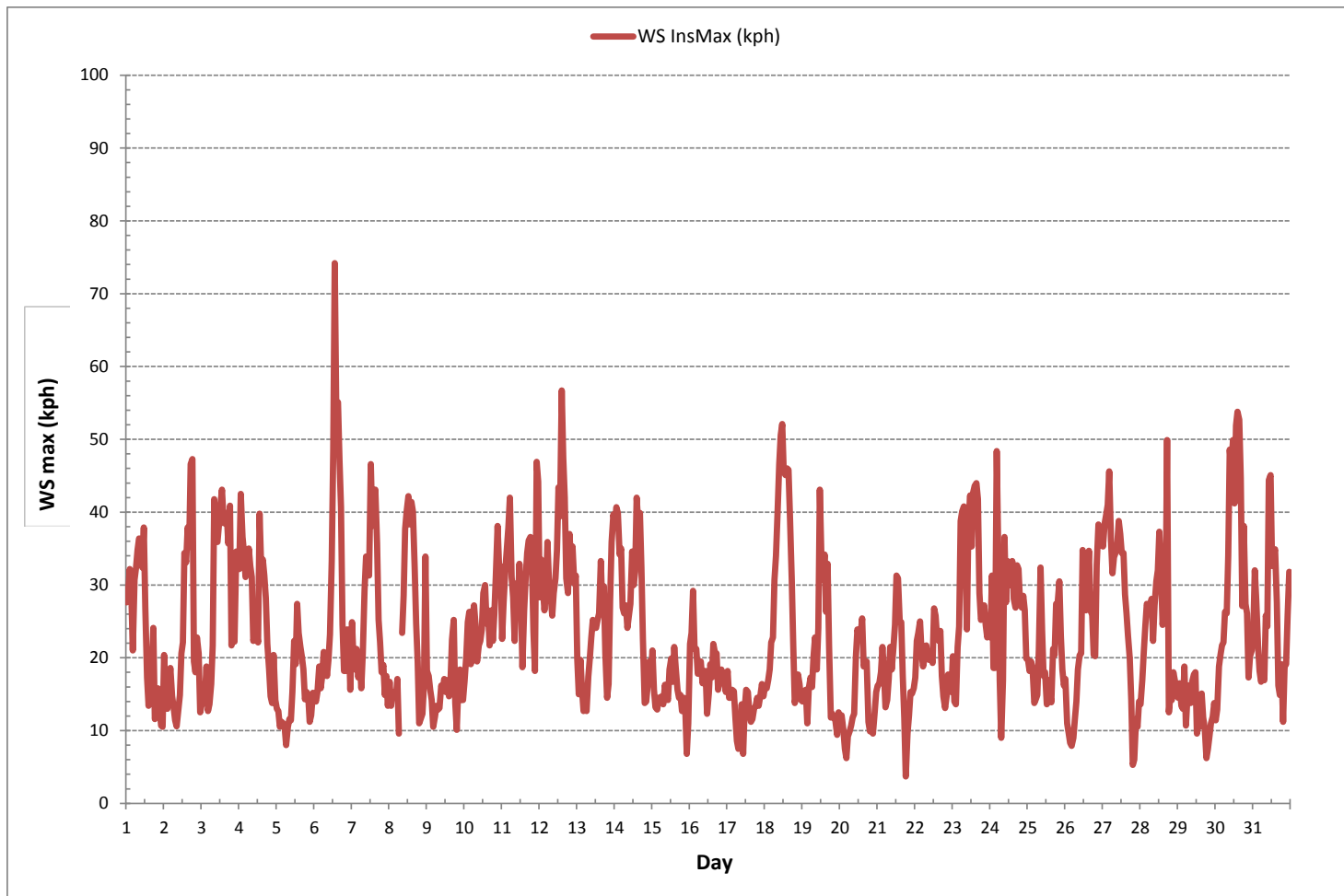
STATUS FLAG CODES

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

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	74.2	kph	@ HOUR	13	ON DAY	6	
OPERATIONAL TIME:						743	hrs

WIND SPEED Instantaneous Maximum (WS kph)



***APPENDIX IV
EXCEEDANCE REPORT***



Exceedance Summary Report

PM_{2.5} 1-Hour Exceedances

Date	Time	LICA - St. Lina	LICA - St. Lina	LICA - St. Lina	ESRD Reference #
		PM _{2.5}	WDR	WSP	
		ug/m ³	degrees	kph	
2018/08/10	19:00	98	2	8.4	342280
2018/08/10	20:00	113	21	11.2	342280
2018/08/10	21:00	81	21	13.6	342280
2018/08/10	22:00	84	17	12.3	342280
2018/08/10	23:00	84	3	9.1	342280
2018/08/11	01:00	84	13	9.6	342306
2018/08/11	02:00	103	0	11.3	342306
2018/08/11	03:00	92	359	9.2	342306
2018/08/11	04:00	93	5	10.1	342306
2018/08/11	05:00	90	5	13.1	342306
2018/08/15	04:00	86	250	10.7	342510
2018/08/15	05:00	94	256	11.2	342510
2018/08/15	06:00	101	257	11.3	342510
2018/08/15	07:00	109	262	9.5	342510
2018/08/15	08:00	124	272	10.5	342510
2018/08/15	09:00	128	266	10.1	342510
2018/08/15	10:00	133	278	7.9	342510
2018/08/15	11:00	131	275	9.4	342510
2018/08/15	12:00	125	269	9.7	342510
2018/08/15	13:00	123	265	8.9	342510
2018/08/15	14:00	115	271	8.3	342510
2018/08/15	15:00	116	270	9.7	342510
2018/08/15	16:00	109	295	6.9	342510
2018/08/15	17:00	102	311	6.8	342510
2018/08/15	18:00	105	317	7.8	342510
2018/08/15	19:00	103	334	7.6	342510
2018/08/15	20:00	97	333	8.5	342510
2018/08/15	21:00	97	307	6.5	342510
2018/08/15	22:00	100	255	3.8	342510
2018/08/15	23:00	93	340	4.8	342510
2018/08/16	00:00	81	56	9.3	342599
2018/08/17	10:00	95	246	1.9	342734
2018/08/17	11:00	99	269	4.4	342734
2018/08/17	12:00	105	286	6.8	342734
2018/08/17	13:00	118	313	7	342734
2018/08/17	14:00	122	329	6	342734
2018/08/17	15:00	127	299	4.6	342734
2018/08/17	16:00	126	287	5.3	342734
2018/08/17	17:00	119	297	5.6	342734
2018/08/17	18:00	120	280	4.5	342734
2018/08/17	19:00	122	281	6.2	342734
2018/08/17	20:00	124	281	8.9	342734
2018/08/17	21:00	112	279	9.3	342734
2018/08/17	22:00	114	268	10.3	342734
2018/08/17	23:00	136	247	9.7	342734
2018/08/18	00:00	126	241	9.8	342802
2018/08/18	01:00	156	267	10.8	342802
2018/08/18	02:00	189	264	10.3	342802
2018/08/18	03:00	202	265	11.8	342802
2018/08/18	04:00	191	265	13.5	342802
2018/08/18	05:00	203	279	13.6	342802
2018/08/18	06:00	190	283	14.1	342802
2018/08/18	07:00	149	304	13.3	342802
2018/08/18	08:00	104	330	16	342802
2018/08/22	13:00	82	252	13.8	343013
2018/08/22	14:00	89	258	11.9	343013
2018/08/22	15:00	106	255	12.1	343013



Exceedance Summary Report

PM_{2.5} 1-Hour Exceedances

Date	Time	LICA - St. Lina	LICA - St. Lina	LICA - St. Lina	LICA - St. Lina
		PM _{2.5}	WDR	WSP	ESRD Reference #
		ug/m ³	degrees	kph	
2018/08/22	17:00	81	236	8.3	343013
2018/08/22	18:00	84	240	9.1	343013
2018/08/22	19:00	88	252	8.4	343013
2018/08/22	20:00	90	247	8.9	343013
2018/08/22	21:00	94	255	8.1	343013
2018/08/22	22:00	105	292	9	343013
2018/08/22	23:00	106	288	7.6	343013
2018/08/23	00:00	104	251	6.8	343013
2018/08/23	01:00	95	53	1.7	343013
2018/08/23	02:00	100	46	7.8	343013



Exceedance Summary Report

PM_{2.5} 24-Hour Exceedances

Date	Time	LICA - St. Lina	LICA - St. Lina	LICA - St. Lina	LICA - St. Lina
		PM _{2.5}	WDR	WSP	ESRD Reference #
		ug/m ³	degrees	kph	
2018/08/08	00:00	50	243	12.3	342066
2018/08/09	00:00	51	205	5.5	342181
2018/08/10	00:00	49	245	2	342280
2018/08/11	00:00	37	19	9.4	342306
2018/08/14	00:00	42	230	12.6	342509
2018/08/15	00:00	102	273	7.9	342510
2018/08/16	00:00	46	110	7.4	342599
2018/08/17	00:00	87	254	4.7	342734
2018/08/18	00:00	74	302	12.1	342802
2018/08/21	00:00	31	229	8.1	343013
2018/08/22	00:00	61	235	9.7	343013
2018/08/23	00:00	40	66	10.2	343013

APPENDIX V
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION	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?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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

29-09-2018

Report Issued Date (dd-mm-yyyy)

APPENDIX VI
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-08-31-C</u>
Site: <u>St. Lina Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghalet</u>	Date <u>27 - 09 -2018</u>
Level 1 Primary Validation	<u>Maram Ghalet</u>	Date <u>27 - 09 -2018</u>
Level 2 Final Validation	<u>Maram Ghalet</u>	Date <u>28 - 09 -2018</u>
Level 3 Independent Data Review	<u>CSA-Lmka</u>	Date <u>29 - 09 -2018</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

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