



Alberta Environment and Parks (AEP)  
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February 22, 2018

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

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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 April 2017.

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

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

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

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

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

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

Respectfully,



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

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

**JOB #: 2833-2017-04-1-C**

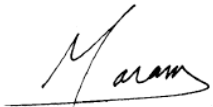
**April 2017**

Prepared for:

**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**  
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**Attention: MIKE BISAGA**

DATE: **June 7, 2017**

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## **SUMMARY**

In April 2017, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Cold Lake Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by the Lakeland Industry & Community Association.

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

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

**PM<sub>2.5</sub>:** Thirty-two hours of data were recorded at concentrations less than  $-3 \mu\text{g}/\text{m}^3$  this month, rendering the data invalid.

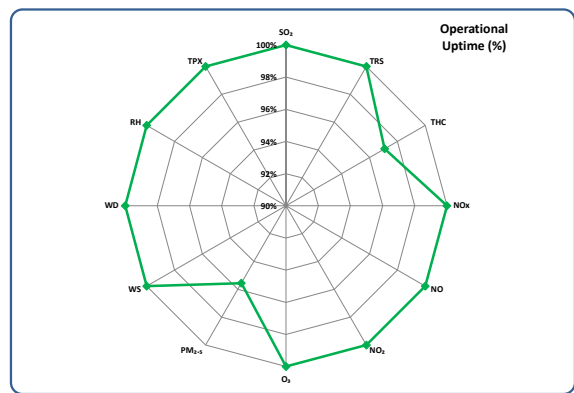
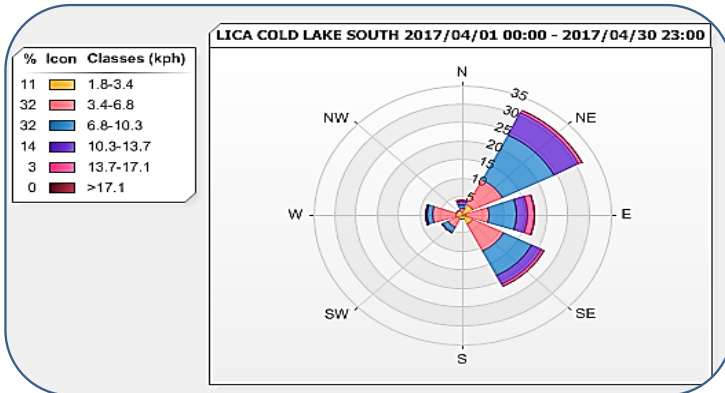
**THC:** The sample pump failed on April 26. Troubleshooting was performed on April 26 to April 27. Twenty-one hours of downtime were recorded due to this event.

**NO<sub>x</sub>/NO/NO<sub>2</sub>:** NO<sub>x</sub> calibration concentrations were calculated using a NO<sub>x</sub> gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NO<sub>x</sub> that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO<sub>x</sub> gas value (50.9 ppm) and the outcome was insignificant. The calibration is still deemed AMD complaint.

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

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

Pollutants	Monthly Records	1-Hour Records							24-Hour Records					
		Name	Unit	Avg. Conc.	Uptime	Maximum			AAAQO Objective	Exceed. Hours	Maximum		AAAQO Objective	Exceed. Days
						Conc.	Date	Hour			Conc.	Date		
SO <sub>2</sub>	ppb	0	100.0%	1	April 3	8	172	0	1	April 1	48	0		
TRS	ppb	0	100.0%	0	April 1	0	-	-	0	April 1	-	-		
THC	ppm	2.05	97.1%	2.77	April 4	5	-	-	2.23	April 4	-	-		
NOx	ppb	3	100.0%	30	April 4	6	-	-	5	April 3	-	-		
NO	ppb	0	100.0%	20	April 27	27	-	-	2	April 27	-	-		
NO <sub>2</sub>	ppb	2	100.0%	17	April 4	6	159	0	5	April 3	-	-		
O <sub>3</sub>	ppb	33.6	100.0%	50.6	April 29	12	82	0	41.3	April 15	-	-		
PM <sub>2.5</sub>	µg/m <sup>3</sup>	2	95.6%	15	April 6	19	80	0	5	April 6	30	0		
WS	%	3.6	100.0%	17.0	April 5	12	-	-	12.0	April 14	-	-		
WD	degree	78 (ENE)	100.0%	-	-	-	-	-	-	-	-	-		
RH	mm	72	100.0%	100	April 14	8	-	-	98	April 14	-	-		
AmbTPX	°C	2.2	100.0%	16.6	April 6	15	-	-	9.6	April 6	-	-		



**Monthly Update**

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

**Operational Issues**

PM<sub>2.5</sub>: Thirty-two hours of data were recorded at concentrations less than -3 µg/m<sup>3</sup> this month, rendering the data invalid.  
 THC: Twenty-one hours of downtime were recorded between April 26 and April 27, due to a maintenance event.

### Monthly Continuous Data Summary

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
Cold Lake Continuous Monitoring Station						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO <sub>2</sub> (ppb)	172	48	0	0	0	1	3	8	5	W	1	1	100.0
TRS (ppb)	-	-	-	-	0	0	1	0	5.2	WSW	0	1	100.0
THC (ppm)	-	-	-	-	2.05	2.77	4	5	1	WSW	2.23	4	97.1
NO <sub>2</sub> (ppb)	159	-	0	-	2	17	4	6	0.6	ENE	5	3	100.0
NO (ppb)	-	-	-	-	0	20	27	27	9.8	ESE	2	27	100.0
NO <sub>x</sub> (ppb)	-	-	-	-	3	30	4	6	0.6	ENE	5	3	100.0
O <sub>3</sub> (ppb)	82	-	0	-	33.6	50.6	29	12	5.7	SSW	41.3	15	100.0
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	80	30	0	0	2	15	6	19	0.7	SE	5	6	95.6
RELATIVE HUMIDITY (%)	-	-	-	-	72	100	14	8	11.9	E	98	14	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	2.2	16.6	6	15	4	WSW	9.6	6	100.0
VECTOR WS (kph)	-	-	-	-	3.6	17.0	5	12	-	NE	12.0	14	100.0
VECTOR WD (sec)	-	-	-	-	78 (ENE)	-	-	-	-	-	-	-	100.0

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## Exceedance Summary Report

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

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

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

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

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

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

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

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

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

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m<sup>3</sup>.

### **O<sub>3</sub> 1-Hour Exceedances**

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

*In accordance with EPEA and the Substance Release Regulation.*

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

### Volatile Organics (VOCs) Data Summary

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
April 1, 2017	2.49	Carbon disulfide
April 7, 2017	5.4	Acetone
April 13, 2017	4.5	Acetone
April 19, 2017	1.9	Acetone
April 25, 2017	1.1	Acetone

Note: NA



### Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collection Date	Maximum Reading (µg/puf)	Semi-Volatile Organic
April 1, 2017	0.13	Phenanthrene
April 7, 2017	0.21	Phenanthrene
April 13, 2017	0.07	2-Methylnaphthalene
April 19, 2017	0.23	Naphthalene
April 25, 2017	0.06	Phenanthrene

**Note: NA**

### Partisol Sampler Summary

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Sample Collection Date	Concentration ( $\mu\text{g}/\text{puf}$ )
April 1, 2017	0.074
April 7, 2017	< 0.004
April 13, 2017	0.048
April 19, 2017	0.057
April 25, 2017	0.056

**Note: NA**

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## 1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO<sub>2</sub>), Total Reduced Sulphur (TRS), Total Hydrocarbon (THC), Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxides (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), Particulate Matter 2.5 (PM<sub>2.5</sub>), Relative Humidity (RH), Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD). The non-continuous monitoring data results for Partisol, VOCs, and PAHs are also included in this report.

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

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

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

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

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

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

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

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (December, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

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

#### **SULPHUR DIOXIDE (SO<sub>2</sub>)**

- Operational time, for the monitoring period, was 100%.
- The routine monthly calibration was performed on April 13.
- One instance of maximum instantaneous data collected on April 29, at hour 00:00, was invalidated due to a brief power outage.

#### **TOTAL REDUCED SULPHUR (TRS)**

- Operational time, for the monitoring period, was 100%.
- The routine monthly calibration was performed on April 13.
- One instance of maximum instantaneous data collected on April 29, at hour 00:00, was invalidated due to a brief power outage.

#### **TOTAL HYDROCARBONS (THC)**

- Operational time, for the monitoring period was 97.1% equivalent to twenty-one hours of downtime.
- The routine monthly calibration was performed on April 17.
- The THC low alarm was triggered on April 26 at 14:00. This prompted an immediate site visit, where it was discovered that the sample pump had failed. The pump was rebuilt and analyzer was allowed time to stabilize overnight. A post-repair calibration was performed on April 27. Twenty-one hours of downtime were recorded due to this event.

#### **OXIDES OF NITROGEN (NO<sub>x</sub>), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO<sub>2</sub>)**

- Operational time, for the monitoring period, was 100%.
- The routine monthly calibration was performed on April 13.
- One instance of maximum instantaneous data collected on April 29, at hour 00:00, was invalidated due to a brief power outage.
- NO<sub>x</sub> calibration concentrations were calculated using a NO<sub>x</sub> gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NO<sub>x</sub> that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO<sub>x</sub> gas value (50.9 ppm) and the outcome was insignificant. The calibration is still deemed AMD compliant.

#### **OZONE (O<sub>3</sub>)**

- Operational time, for the monitoring period, was 100%.
- The routine monthly calibration was performed on April 17.
- One instance of maximum instantaneous data collected on April 29, at hour 00:00, was invalidated due to a brief power outage.

#### **PARTICULATE MATTER < 2.5 MICRONS (PM<sub>2.5</sub>)**

- Operational time, for the monitoring period was 95.6% equivalent to thirty-two hours of downtime.
- Two routine TEOM audits were performed this month. The first was completed on April 5 and the second on April 20. Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, *Zero Adjustment Criteria*. Data recorded between 0 and  $-3 \mu\text{g}/\text{m}^3$  was corrected to  $0 \mu\text{g}/\text{m}^3$ . Data recorded below  $-3 \mu\text{g}/\text{m}^3$  was invalidated. Thirty-two hours of data were invalidated as the data was below  $-3 \mu\text{g}/\text{m}^3$  this month.

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**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 collected on April 29, at hour 00:00, was invalidated due to a brief power outage.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

**RELATIVE HUMIDITY (RH)**

- Operational time, for the monitoring period, was 100%.

**AMBIENT TEMPERATURE (AmbTPX)**

- Operational time, for the monitoring period, was 100%.

#### **VOC SAMPLES**

- The sampler was programmed to run for 24 hours every 6<sup>th</sup> day per the NAPS (North American Pollution Surveillance Schedule).
- Samples were collected, as scheduled, on April 1, 7, 13, 19, and 25. Analysis and results are provided by InnoTech Alberta.

#### **PAH SAMPLES**

- The sampler was programmed to run for 24 hours every 6<sup>th</sup> day per the NAPS (North American Pollution Surveillance Schedule).
- Samples were collected, as scheduled, on April 1, 7, 13, 19, and 25. Analysis and results are provided by InnoTech Alberta.

#### **PARTISOL SAMPLES**

- The sampler was programmed to run for 24 hours every 6<sup>th</sup> day per the NAPS (North American Pollution Surveillance Schedule).
- Samples were collected, as scheduled, on April 1, 7, 13, 19, and 25. Analysis and results are provided by InnoTech Alberta.



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## **2.0 Project Personnel**

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

## **3.0 Plant Monthly Required AMD Summary**

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

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

## **4.0 Calculations and Results**

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

## 5.0 Methods and Procedures

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

- Maxxam AIR SOP-00007: TISCH PUF Sampler Operating, Calibration and Maintenance Procedures
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O<sub>3</sub> Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO<sub>2</sub>/NO<sub>x</sub> Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canister and Xontech
- Maxxam PTC SOP-00148: Monitoring NO<sub>2</sub> in the Atm. by using All-Season Passive
- Maxxam PTC SOP-00149: Monitoring SO<sub>2</sub> in the Atm. by using All-Season Passive
- Maxxam PTC SOP-00150: Monitoring H<sub>2</sub>S in the Atm. by using All-Season Passive
- Maxxam PTC SOP-00151: Mass Determination of Particulate Matter (PM<sub>2.5</sub> and PM<sub>10</sub>)
- Maxxam PTC SOP-00197: Monitoring O<sub>3</sub> in the Atm. by Using Maxxam All-Season Passive

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

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

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

#### **Level 0 Preliminary Verification**

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

#### **Level 1 Primary Validation**

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

#### **Level 2 Final Validation**

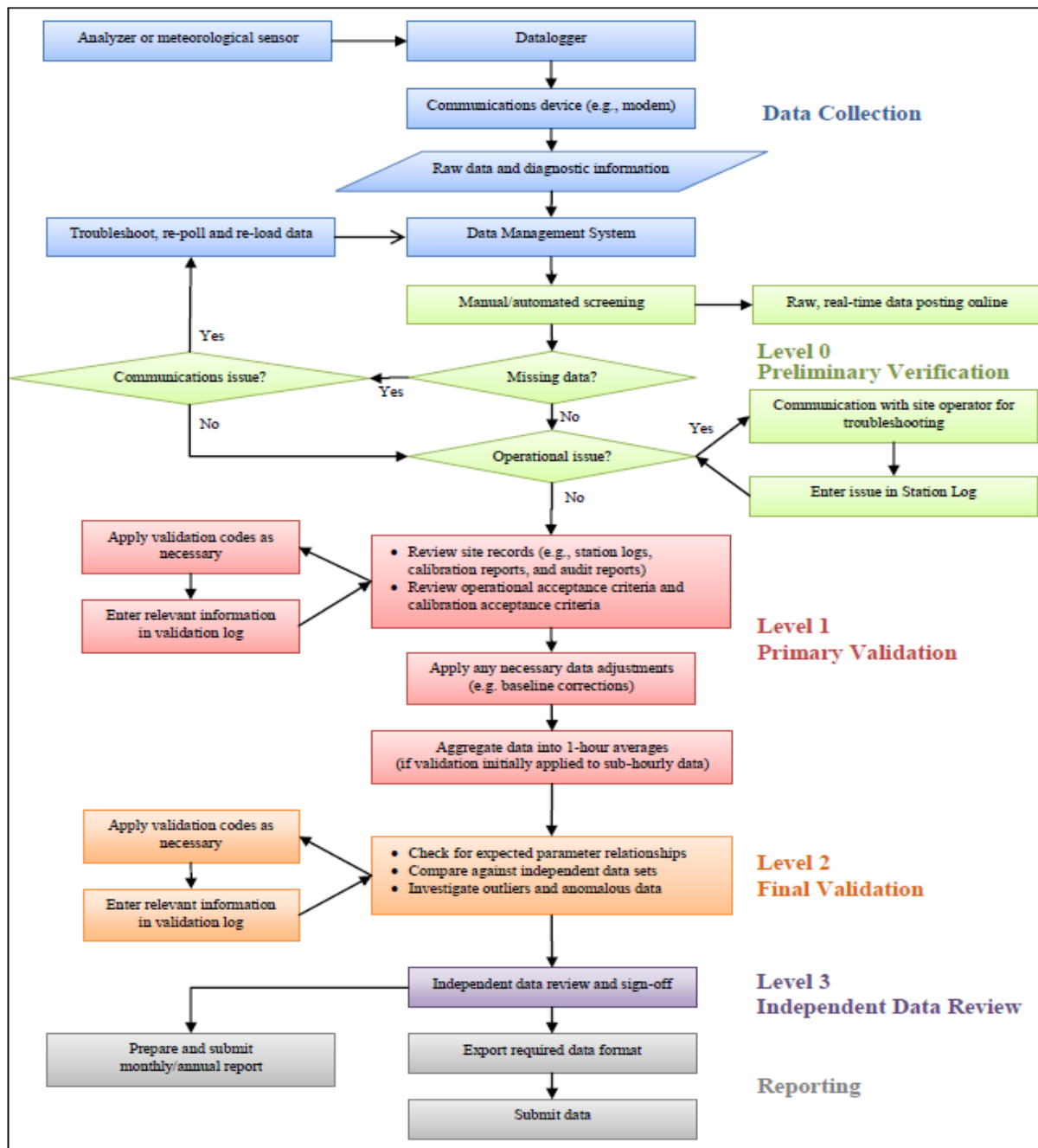
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

#### **Level 3 Independent Data Review**

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

#### **Post-Final Validation**

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



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

***APPENDIX I***  
***CONTINUOUS MONITORING DATA RESULTS***

***SULPHUR DIOXIDE***

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

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

STATUS FLAG CODES

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

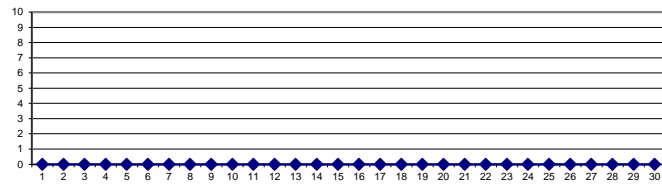
OBJECTIVE LIMIT:

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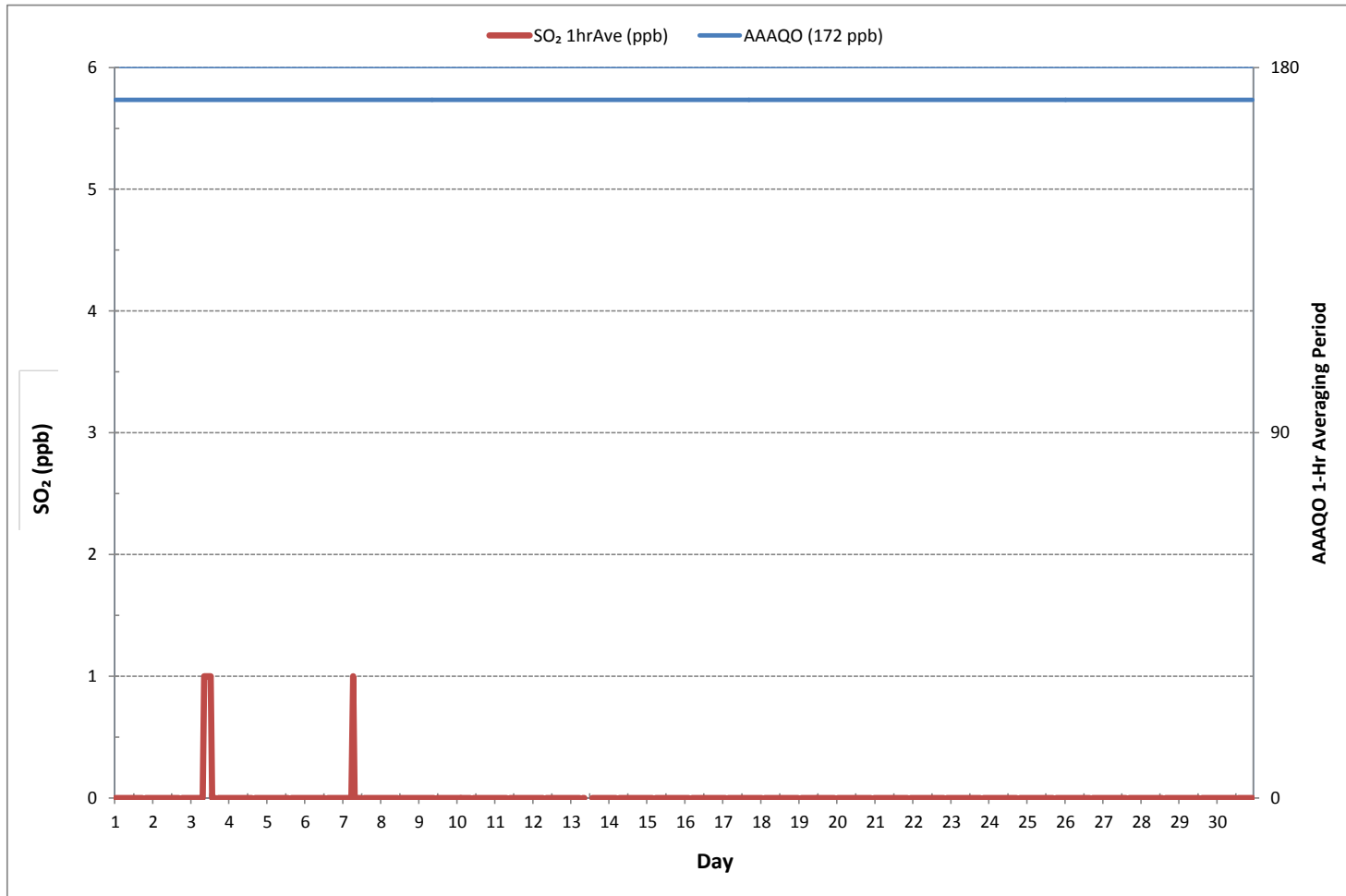
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	6		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0 ON DAY	1
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR	8 ON DAY	3
MAXIMUM 24-HR AVERAGE:	1 ppb	ON DAY	1
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES April 2017



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







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

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

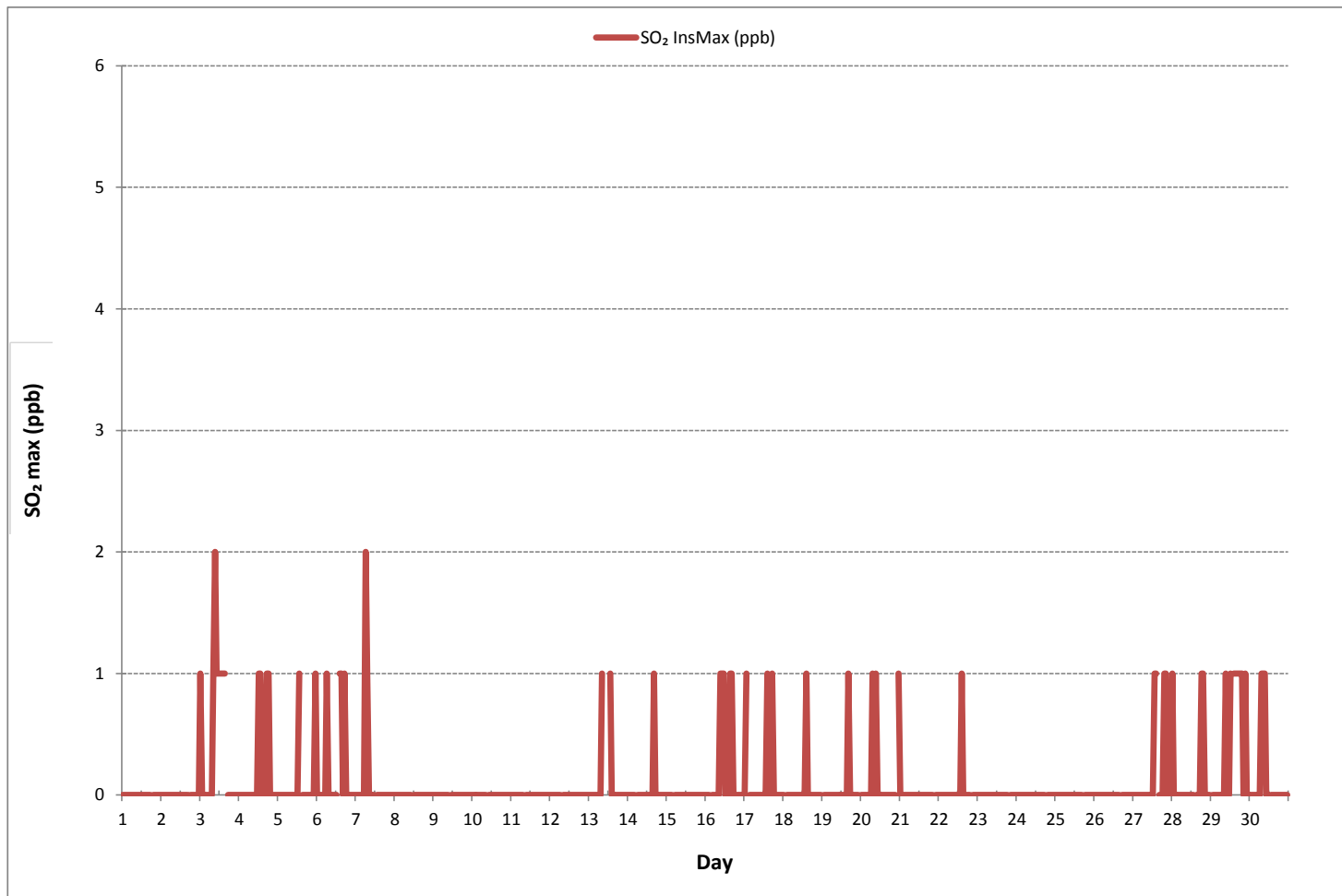
STATUS FLAG CODES

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:	57
MAXIMUM INSTANTANEOUS VALUE:	2 ppb @ HOUR 9 ON DAY 3
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	4 hrs
STANDARD DEVIATION:	0
OPERATIONAL TIME:	719 hrs

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



Wind: LICA COLD LAKE SOUTH  
 Poll.: LICA COLD LAKE SOUTH-SO2[ppb]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

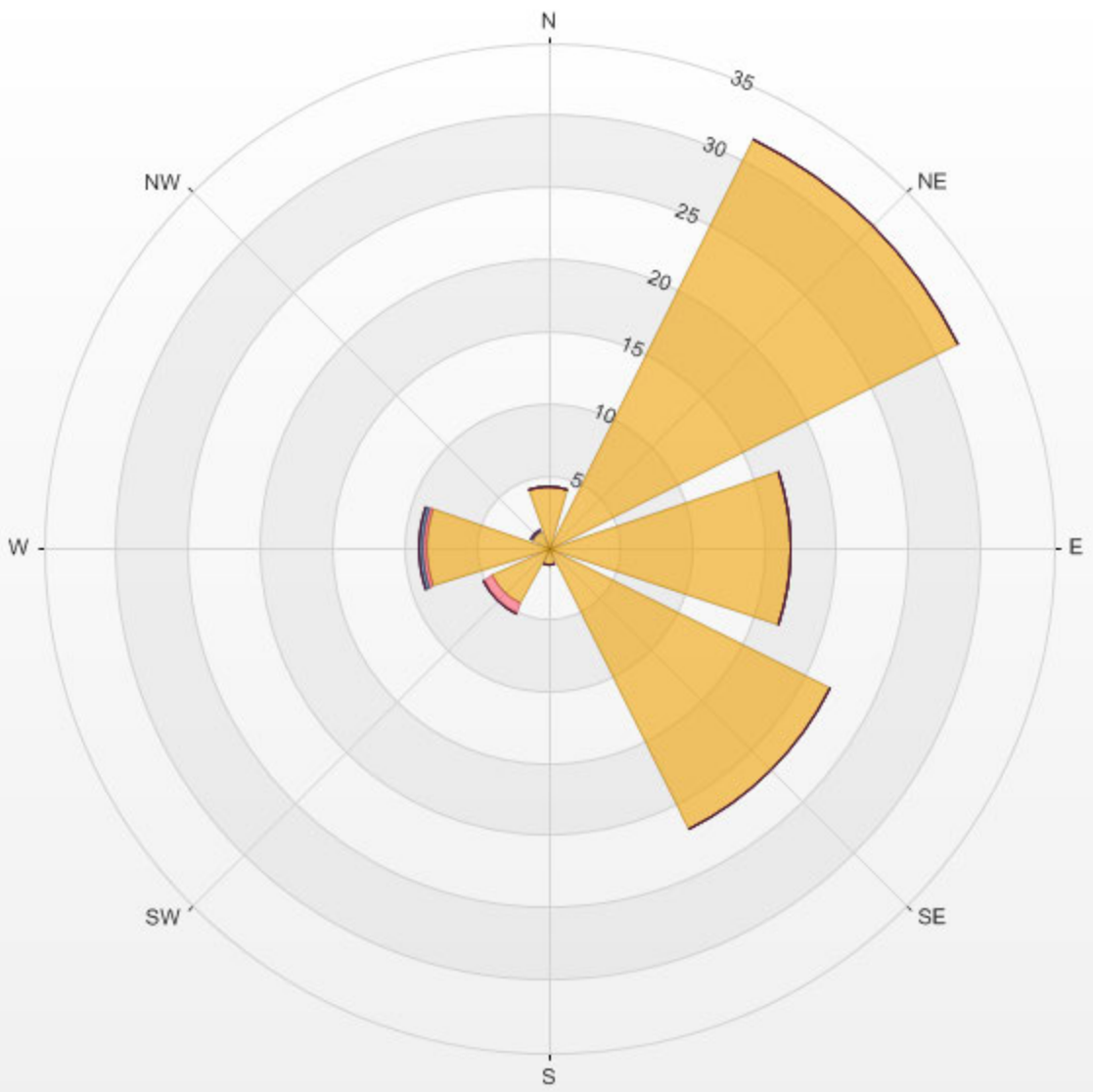
Calm: 8.61%

Calm Avg: 0.05 [ppb]

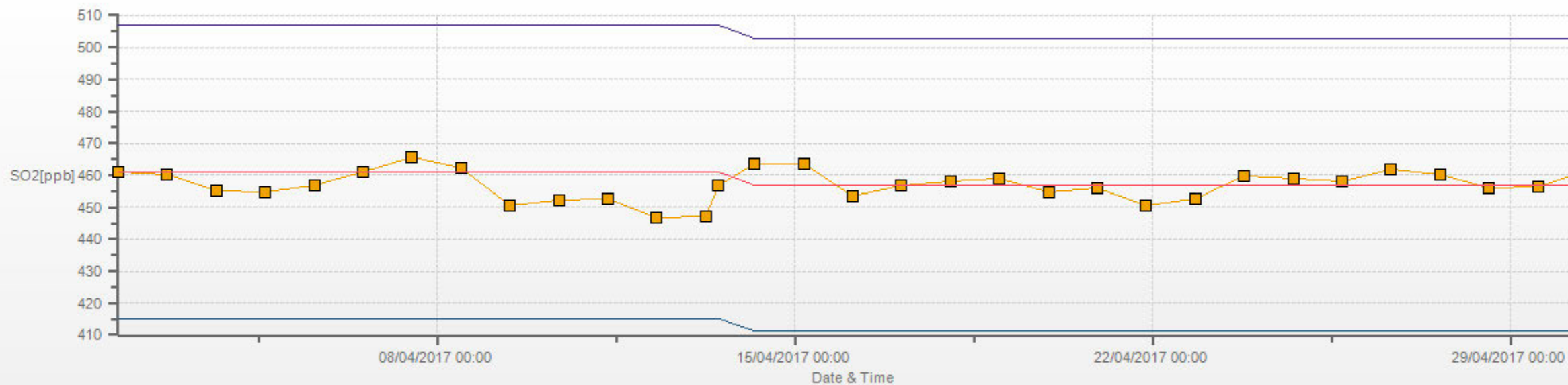
Direction	0.0-0.4	0.4-0.8	0.8-1.1	1.1-1.5	1.5-1.9	>1.9	Total
<b>N</b>	4.2	0.0	0.0	0.0	0.0	0.0	4.2
<b>NE</b>	31.7	0.0	0.0	0.0	0.0	0.0	31.7
<b>E</b>	16.8	0.0	0.0	0.0	0.0	0.0	16.8
<b>SE</b>	21.9	0.0	0.0	0.0	0.0	0.0	21.9
<b>S</b>	1.2	0.0	0.0	0.0	0.0	0.0	1.2
<b>SW</b>	4.4	0.7	0.0	0.0	0.0	0.0	5.1
<b>W</b>	8.5	0.3	0.3	0.0	0.0	0.0	9.1
<b>NW</b>	1.3	0.0	0.2	0.0	0.0	0.0	1.5
<b>Summary</b>	89.9	1.0	0.4	0.0	0.0	0.0	91.4

% Icon Classes (ppb) 90 0.0-0.4 1 0.4-0.8 0 0.8-1.1 0 1.1-1.5 0 1.5-1.9 0 >1.9

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 8.61% Calm Poll Avg: 0.05[ppb]



SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/04 Type: Span



Span Meas Span Ref Span Low Span High

***TOTAL REDUCED SULPHUR***



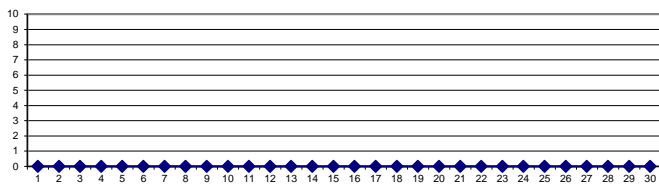
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

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 MIN.	DAILY MAX.	24-HR AVG.	RDGS.
DAY 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24
3	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
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	0	0	0	0	0	0	0	0	0	0	0	24
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	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	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	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	24
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
14	0	0	0	0	0	0	0	0	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	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	24
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	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	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	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	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	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	24
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	24
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	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	24
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	24
HOURLY MAX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

STATUS FLAG CODES

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

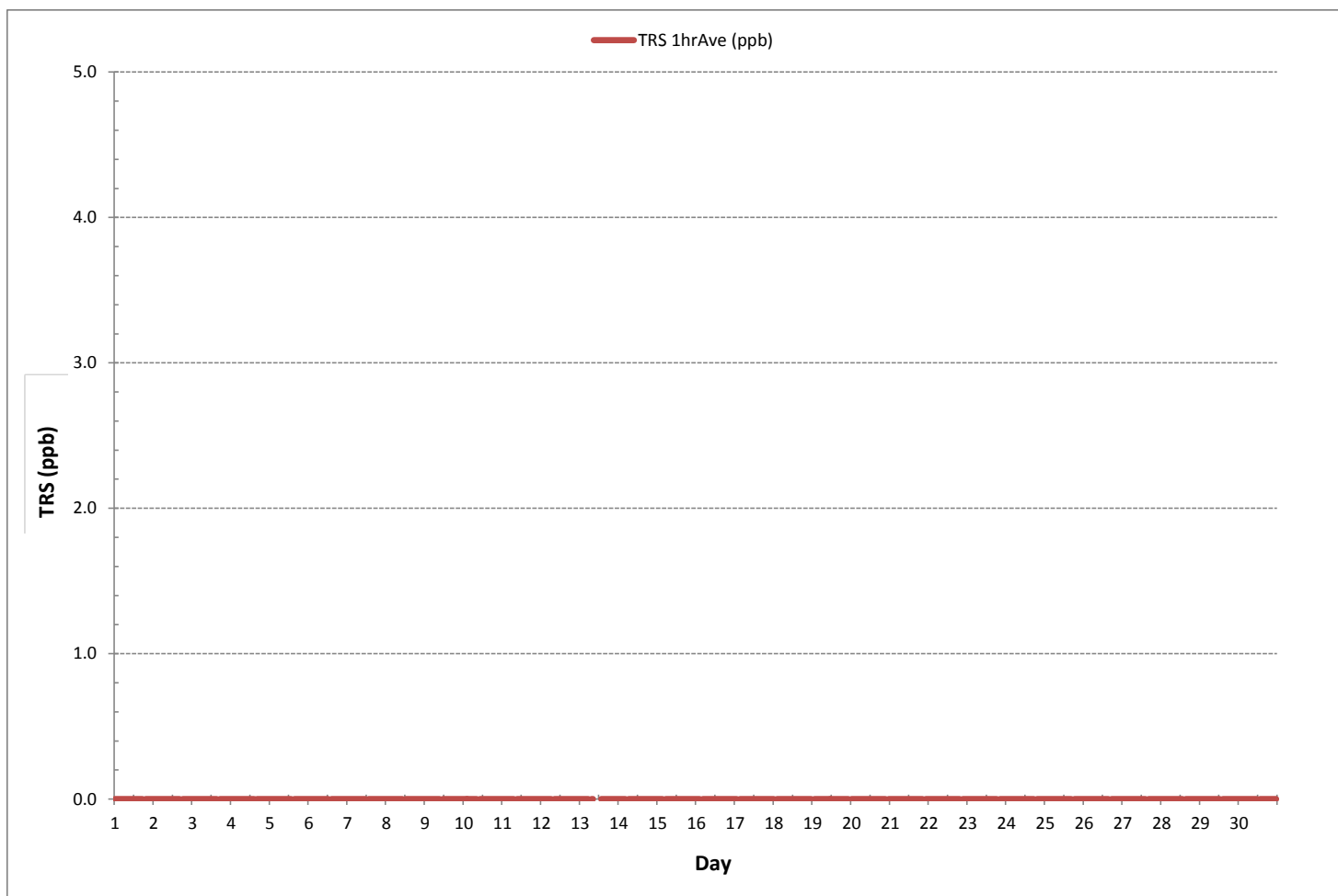
24 HR AVERAGES April 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	0			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1
MAXIMUM 24-HR AVERAGE:	0	ppb		ON DAY 1
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	4	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0 ppb

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)







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

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

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

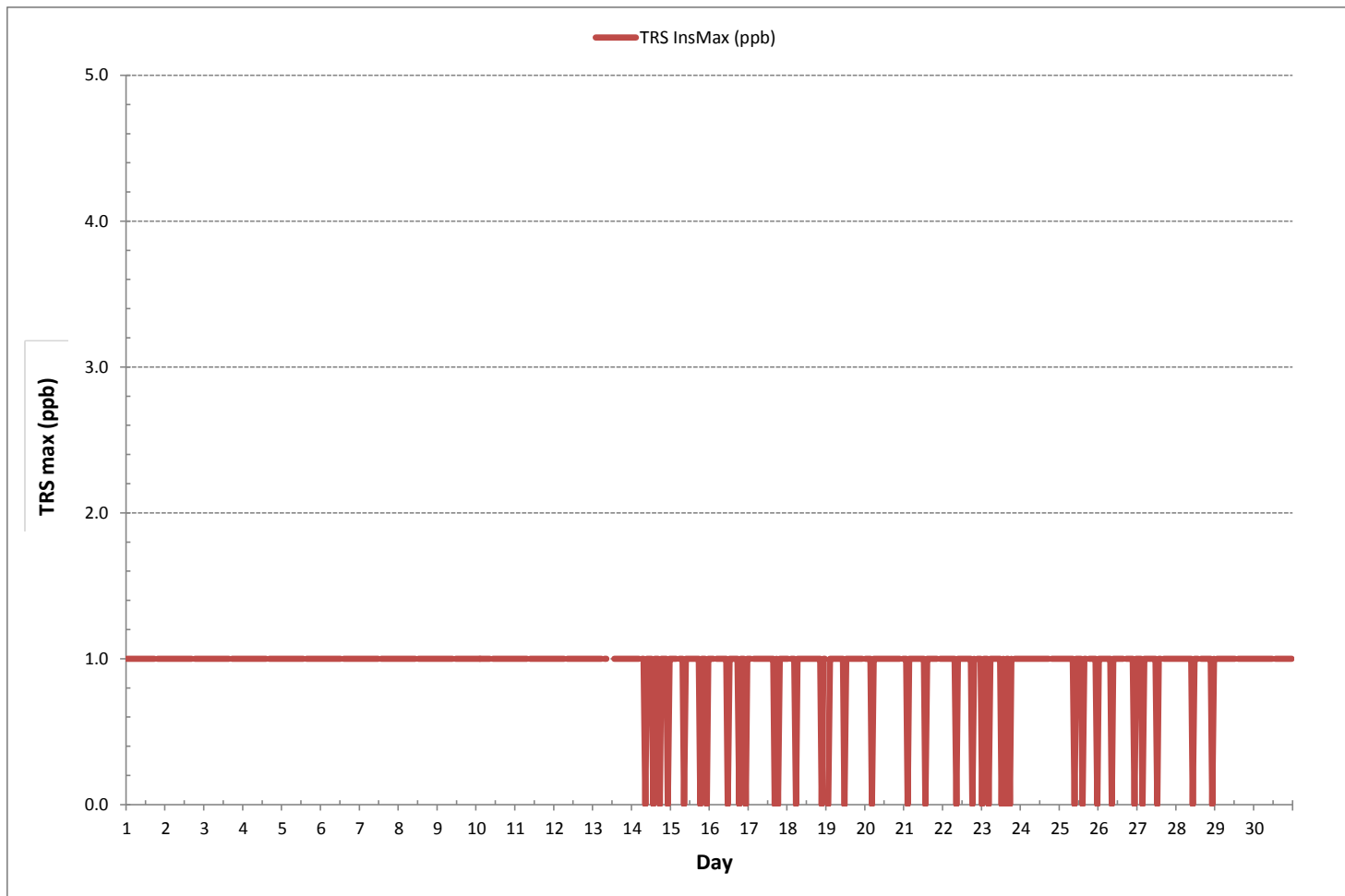
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	649
MAXIMUM INSTANTANEOUS VALUE:	1 ppb @ HOUR 0 ON DAY 1
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	4 hrs
STANDARD DEVIATION:	0
OPERATIONAL TIME:	719 hrs

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)



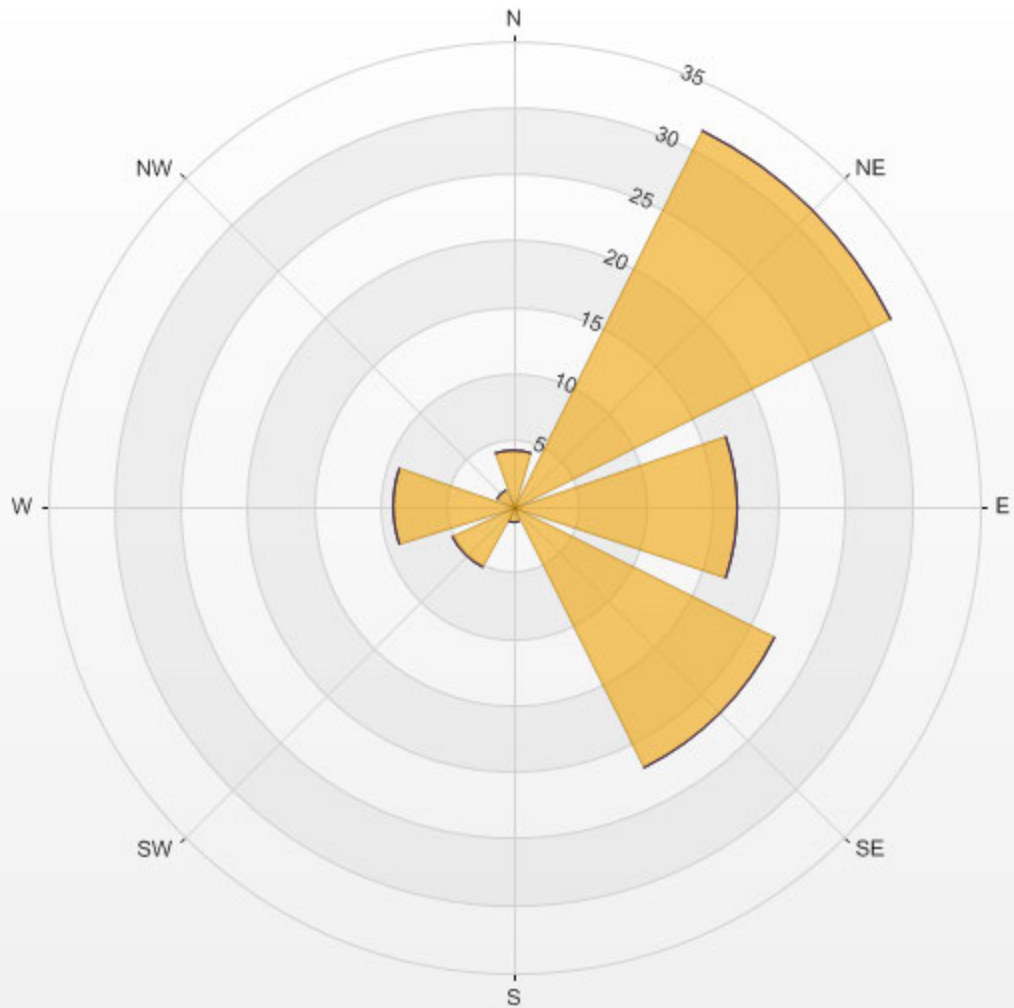
Wind: LICA COLD LAKE SOUTH  
 Poll.: LICA COLD LAKE SOUTH-TRS[ppb]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 8.61% Calm Avg: 0.21 [ppb]

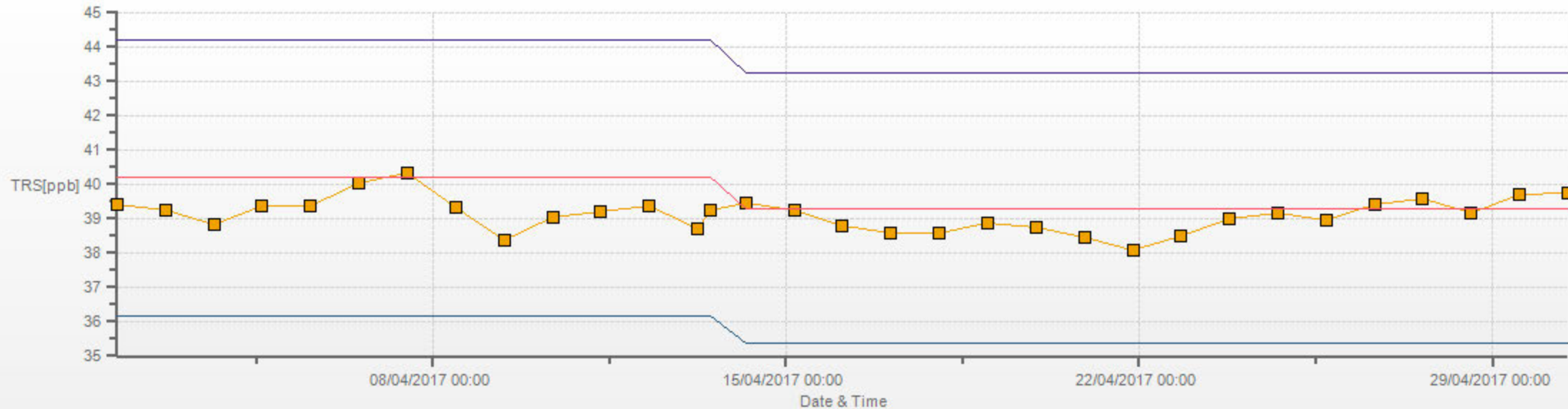
Direction	0.0-0.6	0.6-1.3	1.3-1.9	>1.9	Total
N	4.2	0.0	0.0	0.0	4.2
NE	31.7	0.0	0.0	0.0	31.7
E	16.8	0.0	0.0	0.0	16.8
SE	21.9	0.0	0.0	0.0	21.9
S	1.2	0.0	0.0	0.0	1.2
SW	5.1	0.0	0.0	0.0	5.1
W	9.1	0.0	0.0	0.0	9.1
NW	1.5	0.0	0.0	0.0	1.5
Summary	91.4	0.0	0.0	0.0	91.4

% Icon Classes (ppb) 91 0.0-0.6 0 0.6-1.3 0 1.3-1.9 0 >1.9

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 8.61% Calm Poll Avg: 0.21[ppb]



TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/04 Type: Span



Span Meas Span Ref Span Low Span High

***TOTAL HYDROCARBON***



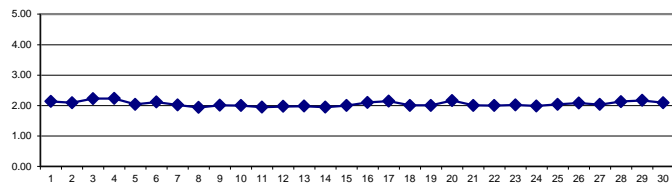
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.11	2.16	2.22	2.31	2.38	2.47	2.39	2.45	2.34	2.33	2.19	2.06	2.03	2.00	2.00	1.95	1.95	S	1.93	1.93	2.00	1.99	1.99	1.93	2.47	2.14	24	
2	2.01	2.12	2.17	2.18	2.20	2.16	2.16	2.20	2.19	2.09	2.04	2.01	2.04	2.00	1.94	1.98	1.99	S	1.99	2.05	2.12	2.17	2.14	2.17	1.94	2.20	2.09	24
3	2.21	2.29	2.31	2.52	2.46	2.45	2.39	2.43	2.41	2.21	2.06	2.05	2.03	2.02	2.03	2.03	S	2.01	2.01	1.99	2.09	2.22	2.20	2.74	1.99	2.74	2.22	24
4	2.55	2.38	2.47	2.61	2.58	2.77	2.64	2.41	2.22	2.17	2.12	2.07	2.01	2.00	2.00	S	1.96	2.02	2.02	2.04	2.04	2.04	2.10	2.13	1.96	2.77	2.23	24
5	2.09	2.07	2.13	2.18	2.11	2.09	2.14	2.13	2.06	2.02	2.00	1.99	1.92	1.94	S	1.95	1.93	1.94	1.97	2.04	2.05	2.05	2.07	2.01	1.92	2.18	2.04	24
6	2.05	1.99	2.03	1.99	2.01	2.04	2.07	2.12	2.08	2.07	2.12	2.15	2.16	S	2.17	2.14	2.12	2.14	2.18	2.21	2.34	2.18	2.19	2.17	1.99	2.34	2.12	24
7	2.14	2.18	2.07	2.09	2.11	2.25	2.17	2.02	2.04	1.99	1.97	1.97	S	1.96	1.94	1.96	1.95	1.97	2.01	2.00	1.93	1.90	1.96	1.93	1.90	2.25	2.02	24
8	1.92	1.94	1.95	1.95	1.95	1.94	1.93	1.95	1.98	1.99	1.99	S	1.89	1.86	1.87	1.90	1.86	1.85	1.88	1.95	2.01	2.04	2.01	1.99	1.85	2.04	1.94	24
9	2.00	2.00	1.99	2.01	2.01	2.00	2.00	2.00	2.01	2.02	S	2.01	2.01	2.04	2.02	2.01	1.97	1.98	1.99	2.03	2.03	2.01	2.01	2.01	1.97	2.04	2.01	24
10	2.02	2.09	2.03	2.03	2.03	2.08	2.09	2.06	2.06	S	2.03	2.04	2.02	1.99	1.99	1.96	1.92	1.88	1.87	1.92	1.95	1.95	1.95	1.97	1.87	2.09	2.00	24
11	1.95	1.96	1.97	1.95	1.97	1.98	2.00	2.00	S	1.98	1.99	1.98	1.97	1.95	1.92	1.88	1.86	1.86	1.87	1.89	1.96	1.97	1.96	1.99	1.86	2.00	1.95	24
12	2.02	2.04	2.02	1.99	2.01	2.02	2.02	S	1.97	1.96	1.96	1.95	1.94	1.93	1.91	1.90	1.94	1.87	1.89	1.93	2.00	1.99	2.02	2.03	1.87	2.04	1.97	24
13	2.05	2.03	2.02	2.00	2.01	2.03	S	2.00	1.98	1.93	1.99	1.92	1.90	1.89	1.92	1.98	1.93	1.94	2.00	2.03	2.04	2.01	1.99	1.99	1.89	2.05	1.98	24
14	1.99	1.98	1.97	1.97	2.00	S	1.96	1.95	1.93	1.94	2.02	1.93	1.92	1.90	1.91	1.93	1.91	1.91	1.92	1.92	1.93	1.94	1.94	1.95	1.90	2.02	1.94	24
15	1.96	1.98	1.97	1.96	S	1.95	1.96	1.98	2.01	2.01	2.03	2.03	2.02	2.02	2.01	2.00	2.00	2.02	2.02	2.02	2.01	2.00	1.98	1.95	2.03	2.00	2.04	24
16	1.98	2.01	2.03	S	2.12	2.16	2.13	2.12	2.17	2.15	2.15	2.12	2.10	2.11	2.08	2.02	2.05	2.04	2.03	2.13	2.19	2.12	2.10	2.14	1.98	2.19	2.10	24
17	2.19	2.26	S	2.25	2.34	2.28	2.19	2.22	2.24	2.20	2.18	2.14	C	C	C	C	C	2.01	2.00	2.00	2.03	2.04	1.99	1.99	2.34	2.14	24	
18	1.98	S	1.95	1.96	1.98	1.96	1.98	2.00	2.01	2.04	2.08	1.98	2.00	2.01	2.00	2.00	2.00	2.02	2.00	2.02	2.03	2.03	2.01	2.03	1.95	2.08	2.00	24
19	S	1.99	2.00	2.01	2.01	2.00	2.02	2.04	2.03	2.01	2.01	1.99	1.98	1.98	1.94	1.92	1.93	1.97	1.96	1.97	2.09	2.11	2.13	S	1.92	2.13	2.00	24
20	2.09	2.12	2.16	2.21	2.17	2.17	2.26	2.38	2.27	2.30	2.27	2.20	2.16	2.20	2.20	2.06	2.04	2.03	2.02	2.03	2.14	2.22	S	2.05	2.02	2.38	2.16	24
21	2.06	2.02	2.00	1.99	2.01	2.01	2.03	2.06	2.07	2.07	2.10	2.07	2.04	2.01	1.96	1.94	1.92	1.88	1.91	1.96	1.98	S	2.00	1.99	1.88	2.10	2.00	24
22	1.99	1.99	1.99	2.00	2.01	2.01	2.02	2.04	2.05	2.06	2.06	2.01	1.98	1.96	1.95	1.95	1.92	1.90	1.91	1.95	S	2.06	2.07	2.06	1.90	2.07	2.00	24
23	2.03	2.02	2.02	2.03	2.02	2.01	2.02	2.01	2.02	2.03	2.04	2.04	2.04	2.04	2.02	2.01	2.03	2.00	1.99	S	1.99	1.99	1.96	1.98	1.96	2.04	2.01	24
24	1.99	1.98	1.96	1.94	1.96	1.95	1.97	1.99	1.98	2.00	2.00	1.98	1.98	1.96	1.95	1.97	2.00	1.99	S	2.02	2.01	2.01	1.99	2.02	1.94	2.02	1.98	24
25	2.02	2.03	2.04	2.04	2.02	2.01	2.02	2.05	2.06	2.07	2.06	2.04	2.03	2.00	1.99	1.98	1.99	S	2.02	2.07	2.09	2.12	2.07	2.09	1.98	2.12	2.04	24
26	2.07	2.08	2.10	2.08	2.08	2.09	2.09	2.10	2.10	2.08	2.09	2.06	2.06	X	X	X	Y	Y	Y	Y	S1	Y	Y	Y	2.06	2.10	2.08	14
27	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	1.99	2.02	1.99	2.00	S	1.99	1.99	1.99	2.00	2.03	2.07	2.13	2.20	1.99	2.20	2.03	13
28	2.22	2.15	2.23	2.17	2.24	2.29	2.50	2.24	2.09	2.05	2.05	2.03	2.02	2.01	S	1.96	1.98	1.97	1.98	2.03	2.13	2.15	2.21	2.27	1.96	2.50	2.13	24
29	2.32	2.35	2.37	2.42	2.43	2.54	2.59	2.42	2.13	2.04	1.98	1.98	2.05	S	2.01	2.01	2.01	2.00	1.98	1.99	1.99	2.05	2.11	2.09	1.98	2.59	2.17	24
30	2.18	2.27	2.31	2.31	2.32	2.28	2.13	2.08	2.07	1.99	1.97	2.00	S	1.98	1.98	1.98	1.99	1.98	1.98	1.97	1.98	2.07	2.14	2.12	1.97	2.32	2.09	24
HOURLY MAX	2.55	2.38	2.47	2.61	2.58	2.77	2.64	2.45	2.41	2.33	2.27	2.20	2.16	2.20	2.20	2.14	2.12	2.14	2.18	2.21	2.34	2.22	2.21	2.74				
HOURLY AVG	2.08	2.09	2.09	2.11	2.13	2.14	2.14	2.12	2.09	2.07	2.05	2.03	2.01	1.99	1.99	1.98	1.97	1.97	1.98	2.00	2.04	2.05	2.05	2.07				

STATUS FLAG CODES

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

24 HR AVERAGES April 2017



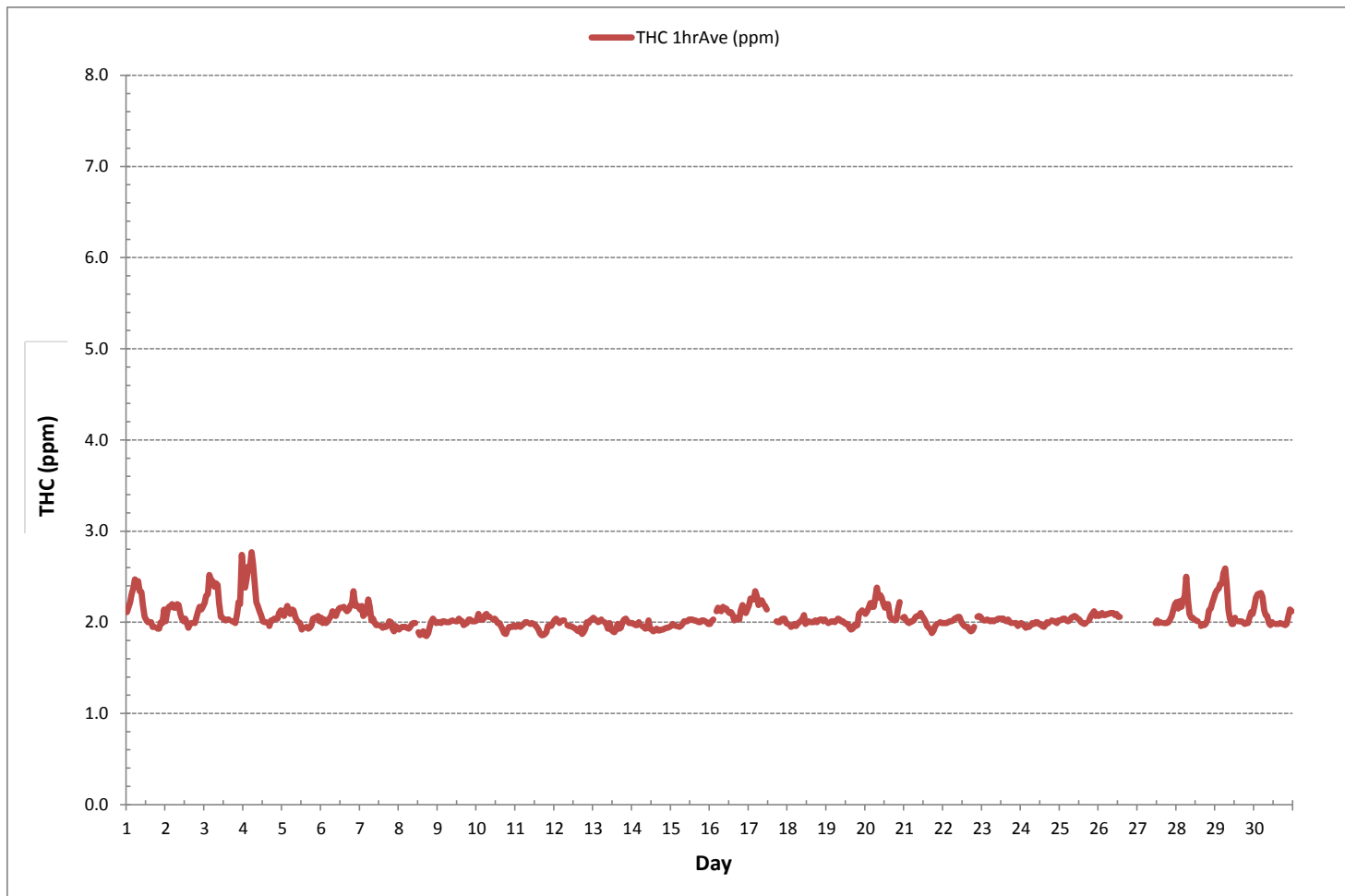
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	664			
MINIMUM 1-HR AVERAGE:	1.85 ppm	@ HOUR	17	ON DAY 8
MAXIMUM 1-HR AVERAGE:	2.77 ppm	@ HOUR	5	ON DAY 4
MAXIMUM 24-HR AVERAGE:	2.23 ppm			ON DAY 4
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	699 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	97.1 %	
STANDARD DEVIATION:	0.13	MONTHLY AVERAGE:	2.05 ppm	



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

TOTAL HYDROCARBONS Hourly Averages (THC ppm)







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

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	2.11	2.15	2.40	2.43	2.45	2.52	2.52	2.58	2.43	2.40	2.21	1.99	2.00	1.91	1.93	2.09	1.84	1.84	S	1.83	1.81	1.88	1.88	1.87	1.81	2.58	2.13	24
2	1.91	2.06	2.06	2.06	2.09	2.06	2.05	2.12	2.09	2.00	1.97	1.88	1.94	1.97	2.08	1.90	1.94	S	1.93	1.97	2.08	2.33	2.12	2.36	1.88	2.36	2.04	24
3	2.17	2.18	2.27	2.45	2.41	2.36	2.33	2.51	2.49	2.19	2.00	2.00	2.15	1.94	2.02	2.19	S	1.95	1.94	1.94	2.02	2.51	2.27	4.15	1.94	4.15	2.28	24
4	3.35	2.43	2.49	3.72	2.96	3.45	3.11	2.80	2.15	2.27	2.05	2.03	2.15	1.94	1.94	S	1.93	1.97	1.96	2.00	2.21	2.00	2.09	2.17	1.93	3.72	2.40	24
5	2.06	2.05	2.08	2.27	2.08	2.06	2.11	2.18	2.03	1.96	1.96	1.96	1.87	1.91	S	1.91	1.90	1.88	1.99	1.93	1.94	1.96	1.97	1.90	1.87	2.27	2.00	24
6	1.97	1.91	1.90	1.84	2.05	1.97	2.13	2.31	1.91	1.91	1.96	2.49	2.03	S	2.00	1.97	1.94	1.94	2.24	2.03	2.43	2.05	2.09	1.94	1.84	2.49	2.04	24
7	1.94	2.30	1.84	1.84	1.84	2.12	2.03	1.72	1.72	1.66	1.65	1.69	S	1.69	1.62	1.69	1.65	1.69	1.72	1.72	1.66	1.63	1.72	1.66	1.62	2.30	1.77	24
8	1.66	1.69	1.69	1.72	1.72	1.72	1.72	1.75	1.78	1.81	1.81	S	1.72	1.75	1.78	1.78	1.74	1.74	1.81	1.90	1.94	1.98	1.97	1.95	1.66	1.98	1.79	24
9	1.99	2.00	2.00	2.03	2.05	2.04	2.05	2.06	2.09	2.12	S	2.09	2.09	2.12	2.49	2.08	2.03	2.18	2.18	2.09	2.10	2.09	2.09	2.09	1.99	2.49	2.09	24
10	2.09	2.18	2.12	2.09	2.09	2.21	2.18	2.12	2.73	S	2.24	2.12	2.07	2.06	2.09	2.03	1.99	1.94	1.94	2.00	2.00	2.00	2.03	2.03	1.94	2.73	2.10	24
11	2.03	2.03	2.06	2.03	2.05	2.06	2.08	2.09	S	2.05	2.06	2.06	2.06	2.04	2.00	1.97	1.96	1.96	1.97	2.02	2.08	2.09	2.08	2.12	1.96	2.12	2.04	24
12	2.15	2.17	2.16	2.15	2.36	2.18	2.21	S	2.15	2.12	2.10	2.09	2.07	2.07	2.06	2.14	2.12	2.12	2.06	2.15	2.26	2.12	2.15	2.15	2.06	2.36	2.14	24
13	2.40	2.18	2.15	2.13	2.15	2.20	S	2.31	2.23	2.06	2.10	2.12	2.00	1.93	1.97	2.09	1.94	1.94	2.00	2.00	2.02	1.99	1.94	1.94	1.93	2.40	2.08	24
14	1.93	1.91	1.89	1.87	1.90	S	1.86	1.86	1.96	1.84	2.24	2.15	1.83	1.81	1.83	1.84	1.83	1.83	1.83	1.84	1.86	1.87	1.89	1.87	1.81	2.24	1.89	24
15	1.89	1.91	1.91	1.90	S	1.90	1.92	1.97	1.97	2.00	2.13	2.03	2.04	2.05	2.06	2.08	2.06	2.06	2.08	2.11	2.11	2.09	2.09	2.09	1.89	2.13	2.02	24
16	2.11	2.15	2.29	S	2.29	2.32	2.30	2.29	2.31	2.39	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.14	2.12	2.12	2.27	2.30	2.21	2.19	2.28	24
17	2.34	2.34	S	2.42	2.55	2.52	2.33	2.43	2.36	2.27	2.24	2.21	C	C	C	C	C	C	2.09	2.09	2.12	2.21	2.18	2.18	2.09	2.55	2.28	24
18	2.18	S	2.14	2.15	2.15	2.15	2.21	2.17	2.21	2.31	2.65	2.15	2.18	2.15	2.14	2.17	2.12	2.16	2.15	2.18	2.15	2.17	2.13	2.15	2.12	2.65	2.19	24
19	S	2.13	2.15	2.18	2.16	2.18	2.31	2.37	2.21	2.30	2.18	2.16	2.17	2.17	2.21	2.11	2.25	2.25	2.21	2.24	2.40	2.39	2.37	S	2.11	2.40	2.23	24
20	2.36	2.37	2.51	2.49	2.49	2.50	2.54	2.70	2.51	2.52	2.71	2.43	2.40	2.54	2.61	2.30	2.26	2.25	2.24	2.24	2.37	2.55	S	2.33	2.24	2.71	2.44	24
21	2.27	2.25	2.25	2.24	2.28	2.32	2.47	2.43	2.36	2.37	2.39	2.37	2.33	2.31	2.27	2.28	2.24	2.21	2.25	2.30	2.34	S	2.36	2.34	2.21	2.47	2.31	24
22	2.35	2.34	2.34	2.34	2.36	2.33	2.34	2.37	2.37	2.44	2.36	2.31	2.30	2.22	2.22	2.30	2.24	2.15	2.36	2.21	S	2.33	2.30	2.28	2.15	2.44	2.31	24
23	2.25	2.24	2.24	2.24	2.22	2.21	2.22	2.21	2.21	2.19	2.21	2.21	2.18	2.18	2.16	2.15	2.13	2.12	2.10	S	2.12	2.12	2.09	2.10	2.09	2.25	2.18	24
24	2.10	2.10	2.07	2.06	2.09	2.10	2.09	2.12	2.09	2.10	2.10	2.12	2.08	2.06	2.05	2.09	2.18	2.11	S	2.13	2.15	2.13	2.12	2.15	2.05	2.18	2.10	24
25	2.16	2.16	2.16	2.16	2.18	2.13	2.15	2.25	2.18	2.19	2.27	2.16	2.34	2.21	2.40	2.18	2.12	S	2.15	2.18	2.18	2.22	2.21	2.18	2.12	2.40	2.20	24
26	2.15	2.15	2.22	2.15	2.15	2.16	2.13	2.18	2.12	2.09	2.08	2.16	2.05	2.06	X	X	X	Y	Y	Y	S1	Y	Y	Y	2.05	2.22	2.13	14
27	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	2.18	2.24	3.05	S	2.08	2.06	2.12	2.09	2.12	2.18	2.37	2.40	2.06	3.05	2.26	12
28	2.43	2.30	2.46	2.37	2.37	2.47	2.65	2.59	2.22	2.43	2.18	2.15	2.13	2.12	S	2.08	2.15	2.09	2.10	2.21	2.31	2.40	2.45	2.55	2.08	2.65	2.31	24
29	P	2.77	2.58	2.58	2.61	2.87	2.75	2.68	2.49	2.24	2.13	2.19	2.27	S	2.21	2.18	2.18	2.18	2.15	2.12	2.21	2.25	2.24	2.12	2.87	2.37	23	
30	2.43	2.43	2.71	2.58	2.43	2.44	2.24	2.19	2.18	2.09	2.09	2.12	S	2.84	2.12	2.09	2.12	2.09	2.10	2.09	2.09	2.25	2.34	2.34	2.09	2.84	2.28	24
HOURLY MAX	3.35	2.77	2.71	3.72	2.96	3.45	3.11	2.80	2.73	2.52	2.71	2.49	2.61	2.84	3.05	2.37	2.26	2.25	2.36	2.30	2.43	2.55	2.45	4.15				
HOURLY AVG	2.18	2.17	2.18	2.23	2.23	2.27	2.25	2.26	2.20	2.15	2.16	2.13	2.12	2.09	2.14	2.08	2.04	2.03	2.07	2.07	2.12	2.14	2.13	2.21				

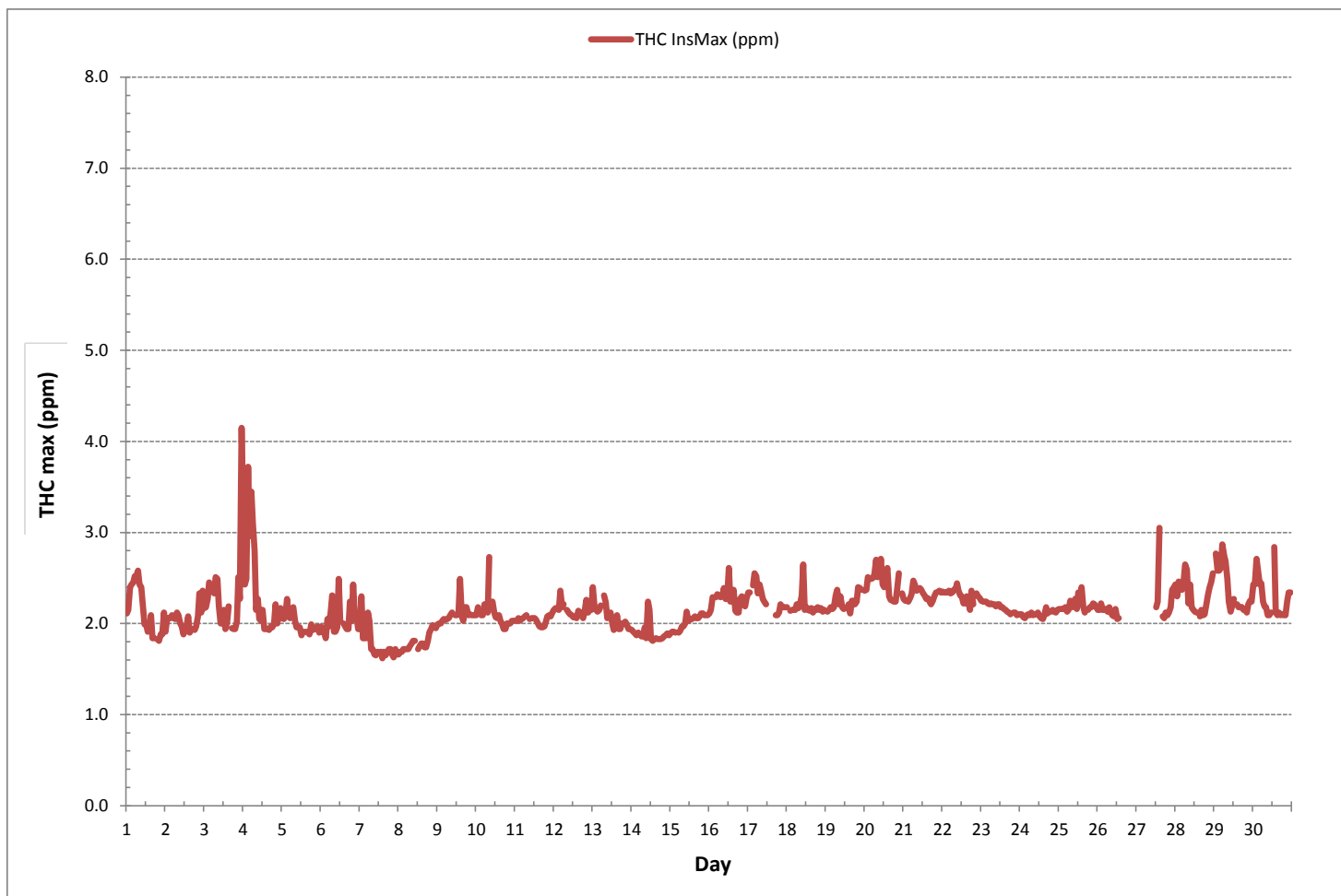
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	662
MAXIMUM INSTANTANEOUS VALUE:	4.15 ppm @ HOUR 23 ON DAY 3
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0.25
OPERATIONAL TIME:	697 hrs

**TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)**



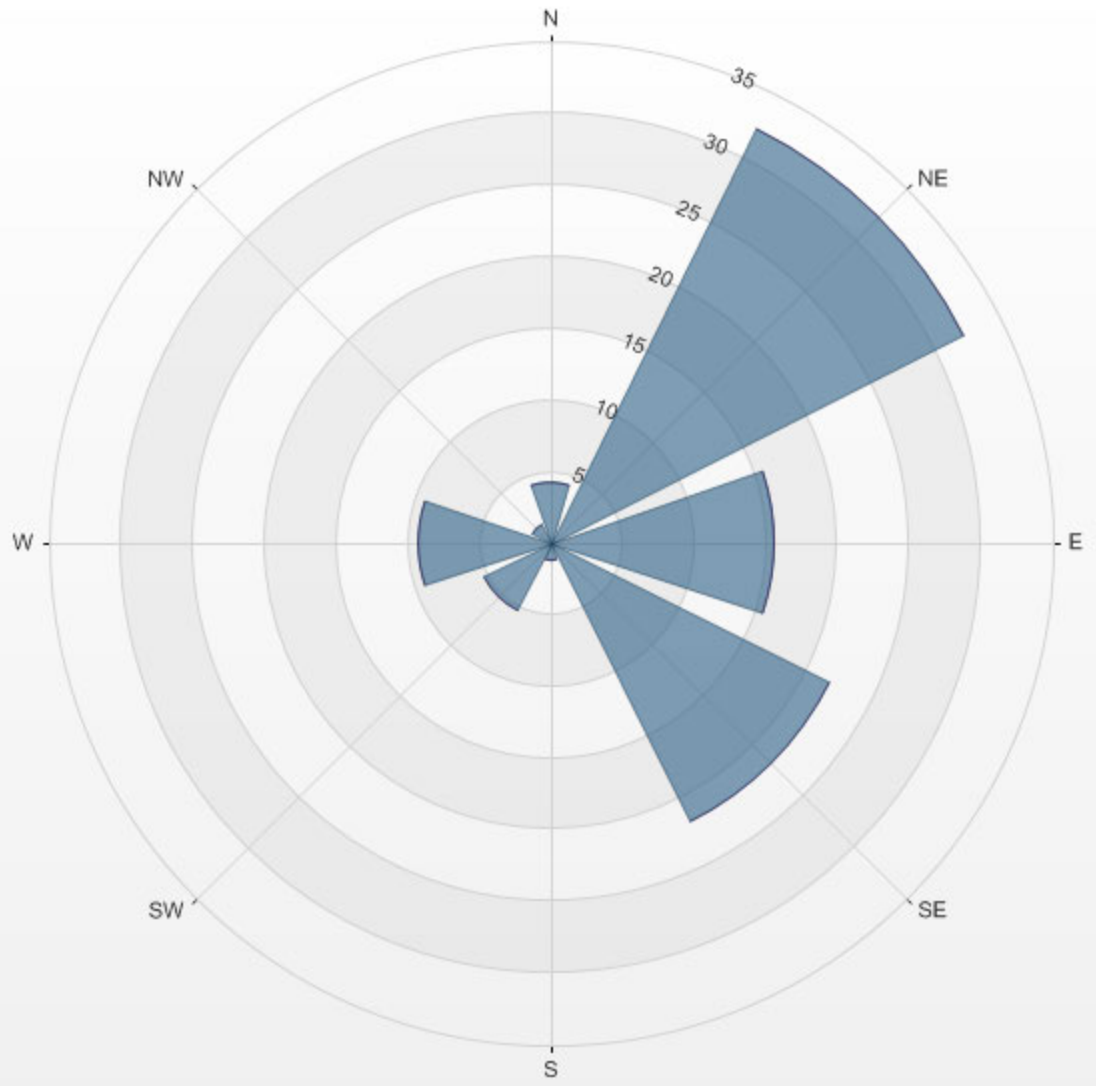
Wind: LICA COLD LAKE SOUTH  
 Poll.: LICA COLD LAKE SOUTH-THC[ppm]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 8.89% Calm Avg: 2.26 [ppm]

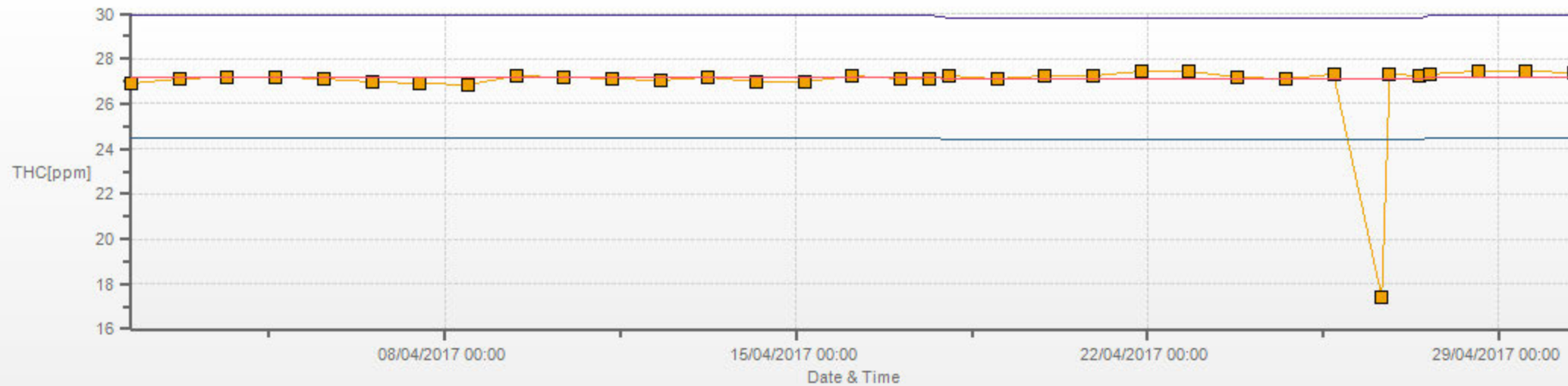
Direction	0.0-0.9	0.9-1.9	1.9-2.8	>2.8	Total
N	0.0	0.0	4.2	0.0	4.2
NE	0.0	0.0	32.2	0.0	32.2
E	0.0	0.0	15.7	0.0	15.7
SE	0.0	0.0	21.7	0.0	21.7
S	0.0	0.0	1.2	0.0	1.2
SW	0.0	0.0	5.3	0.0	5.3
W	0.0	0.0	9.3	0.0	9.3
NW	0.0	0.0	1.5	0.0	1.5
Summary	0.0	0.0	91.1	0.0	91.1

% Icon Classes (ppm) 0 0.0-0.9 91 1.9-2.8 0 >2.8

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 8.89% Calm Poll Avg: 2.26[ppm]



THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 17/04 Type: Span



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

## ***OXIDES OF NITROGEN***



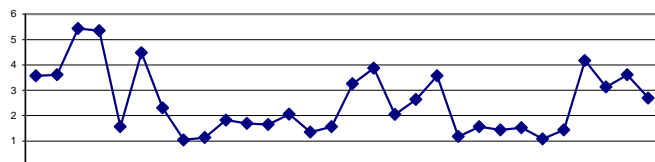
OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)

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

STATUS FLAG CODES

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

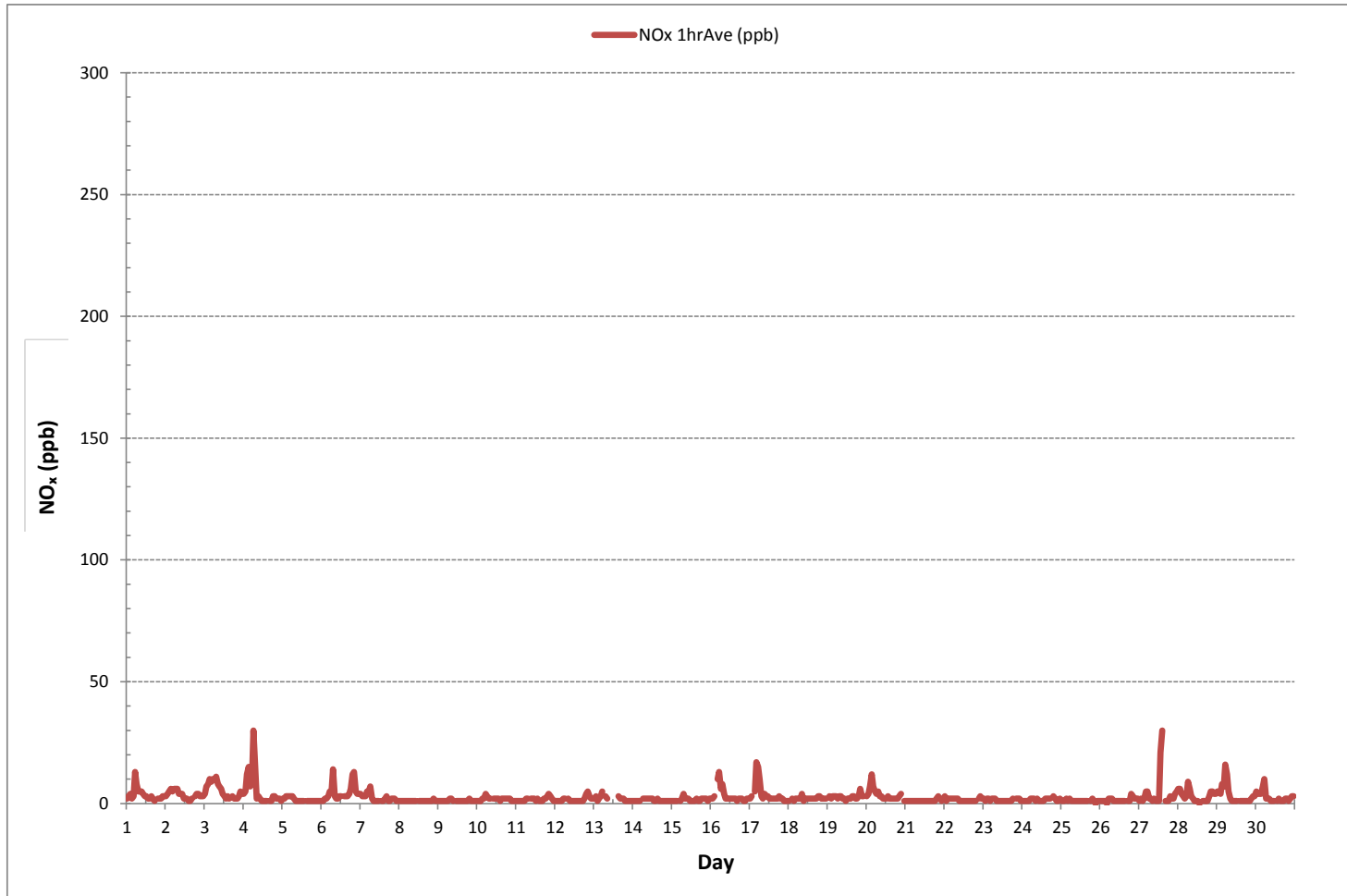
24 HR AVERAGES April 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	680			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	21	ON DAY 25
MAXIMUM 1-HR AVERAGE:	30	ppb @ HOUR	6	ON DAY 4
MAXIMUM 24-HR AVERAGE:	5	ppb		ON DAY 3
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3		MONTHLY AVERAGE:	3 ppb

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







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

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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY 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	6	11	3	8	25	24	7	6	6	6	6	6	3	6	9	8	2	S	7	3	3	6	5	2	25	7	24
2	4	6	7	7	6	8	7	8	5	5	12	3	2	2	2	2	5	S	4	6	7	5	6	6	2	12	5	24
3	7	10	12	12	11	15	13	14	10	10	7	6	5	4	7	7	S	5	3	3	4	4	11	7	3	15	8	24
4	7	20	19	20	11	22	37	36	6	16	6	10	2	7	2	S	2	2	7	7	11	3	6	3	2	37	11	24
5	5	7	8	9	6	6	5	8	2	2	3	2	3	7	S	3	3	2	1	2	2	2	2	2	1	9	4	24
6	3	2	3	4	7	11	9	50	10	4	4	4	6	S	5	6	4	7	14	19	18	8	7	7	2	50	9	24
7	8	7	6	7	9	9	8	4	3	3	2	2	S	2	2	4	7	2	2	4	3	3	3	2	2	9	4	24
8	2	1	1	1	1	1	1	1	1	1	1	S	2	2	2	3	2	2	3	2	3	5	4	4	1	5	2	24
9	3	6	5	4	4	2	3	5	5	2	S	3	2	4	1	1	3	4	2	13	2	2	2	2	1	13	3	24
10	2	2	3	3	4	7	5	3	5	S	10	3	2	7	3	3	3	2	3	4	5	2	2	2	2	10	4	24
11	2	2	2	2	2	2	3	3	S	3	3	3	2	3	4	2	2	5	4	5	15	8	4	3	2	15	4	24
12	2	2	1	2	3	3	S	5	2	4	1	2	1	2	1	2	6	2	4	10	14	6	4	6	1	14	4	24
13	8	8	4	4	8	9	S	10	4	C	C	C	C	C	C	C	6	4	4	3	4	3	3	4	3	10	5	24
14	2	3	2	3	3	S	3	3	4	3	3	5	3	2	2	3	2	2	3	2	2	4	5	5	2	5	3	24
15	1	1	1	1	S	2	3	26	3	13	4	3	2	2	2	3	3	2	4	3	3	3	3	3	1	26	4	24
16	4	3	8	S	18	22	7	11	7	3	5	4	4	3	3	4	3	4	4	11	2	3	5	4	2	22	6	24
17	3	6	S	11	26	20	20	6	5	9	7	9	3	4	3	4	6	10	5	12	4	3	4	5	3	26	8	24
18	3	S	4	3	3	3	5	10	36	4	16	5	5	10	6	7	4	5	8	7	5	6	6	5	3	36	7	24
19	S	7	7	7	5	5	4	4	7	3	18	3	6	7	5	8	7	4	3	7	33	21	5	S	3	33	8	24
20	6	6	25	19	14	11	6	8	6	6	4	3	4	12	4	3	2	3	3	5	5	9	S	4	2	25	7	24
21	1	1	2	1	2	2	4	6	8	7	2	2	3	3	4	4	3	3	3	5	11	S	2	5	1	11	4	24
22	7	5	4	4	4	4	4	7	3	4	2	3	3	2	3	6	2	8	4	2	S	5	7	5	2	8	4	24
23	4	2	4	4	3	3	5	4	3	3	2	2	3	5	2	3	2	2	2	S	3	3	3	2	2	5	3	24
24	3	2	2	2	3	3	3	6	2	12	3	3	2	7	4	4	4	5	S	5	3	2	2	5	2	12	4	24
25	2	3	2	21	3	4	3	6	2	2	5	2	9	8	4	4	3	S	3	5	7	1	1	2	1	21	4	24
26	1	1	3	2	1	5	4	4	3	11	3	5	2	5	3	5	S	3	3	7	11	5	3	3	1	11	4	24
27	3	4	3	5	10	14	4	7	2	16	8	4	8	235	141	S	5	4	3	8	6	5	6	10	2	235	22	24
28	10	13	11	5	3	8	12	11	8	3	2	3	2	1	S	3	2	2	4	7	7	8	7	6	1	13	6	24
29	P	7	8	14	12	20	21	7	5	2	2	1	1	S	3	3	2	1	2	2	2	4	5	6	1	21	6	23
30	11	6	11	9	18	16	4	5	3	2	2	2	S	3	4	2	2	2	3	3	3	3	5	4	2	18	5	24
HOURLY MAX	11	20	25	21	26	25	37	50	36	16	18	10	9	235	141	9	8	10	14	19	33	21	11	10				
HOURLY AVG	4	5	6	7	7	9	8	10	6	6	5	4	3	13	9	4	4	4	4	6	7	5	4	4				

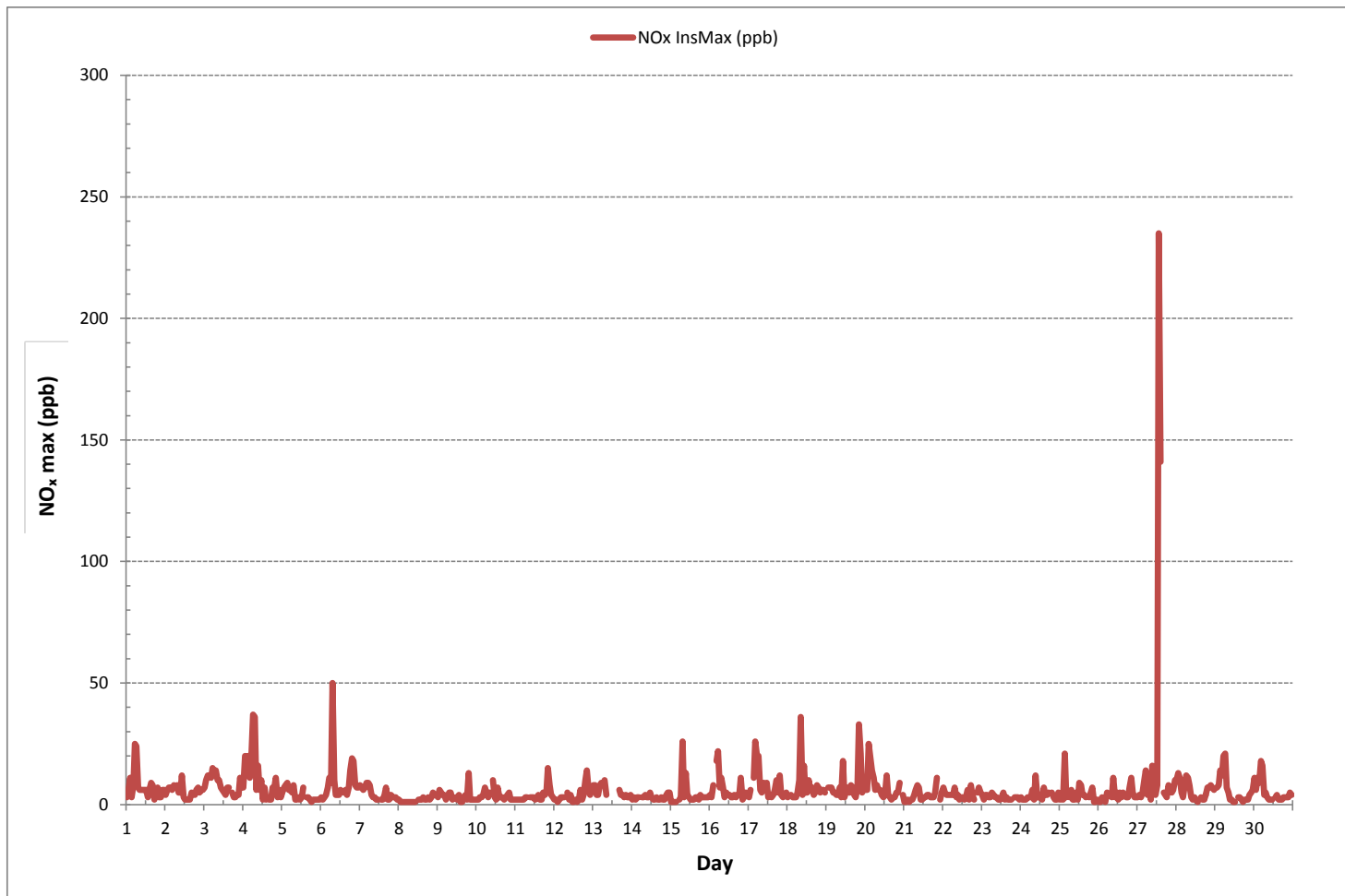
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	681
MAXIMUM INSTANTANEOUS VALUE:	235 ppb @ HOUR 13 ON DAY 27
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	11
OPERATIONAL TIME:	719 hrs

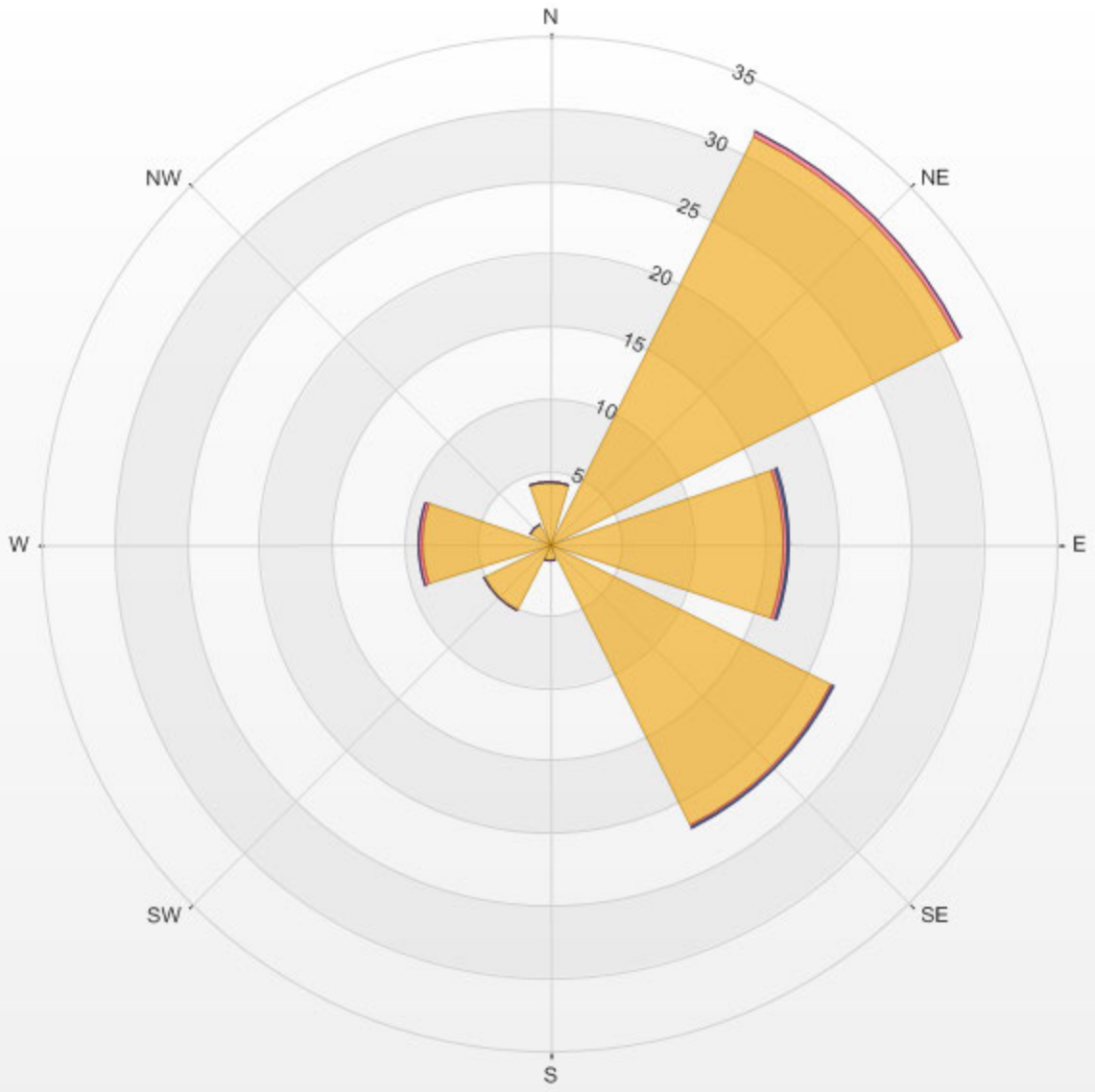
OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> ppb)



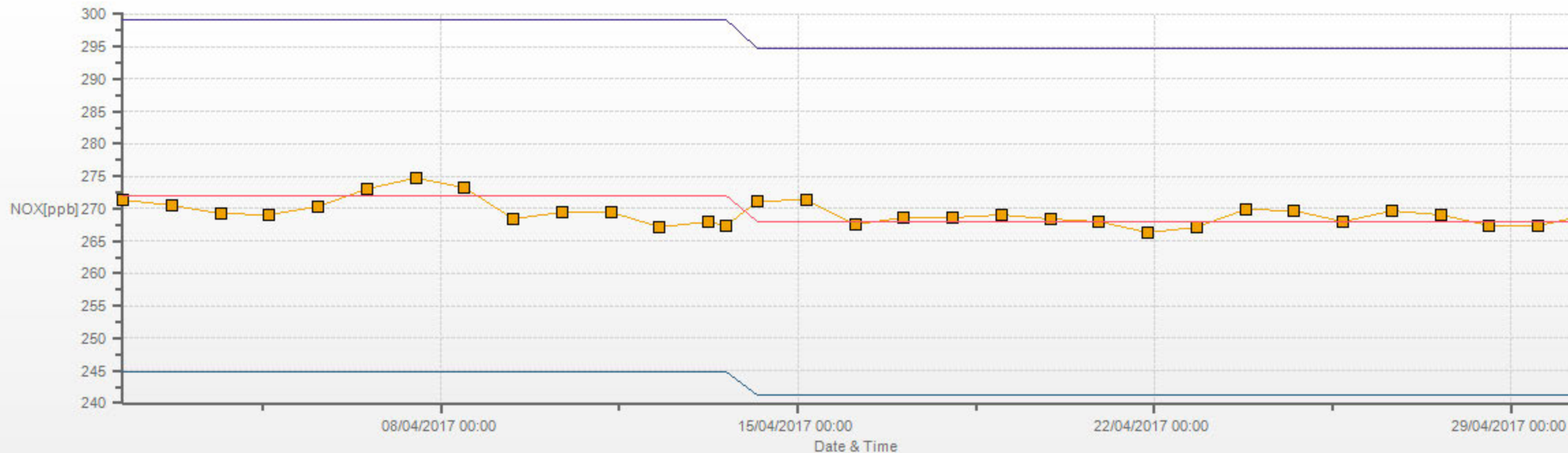


% Icon	Classes (ppb)	90	1	0	0
	0.0-10.0				
	10.0-20.1				
	20.1-30.1				
	>30.1				

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 8.64% Calm Poll Avg: 6.15[ppb]



NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/04 Type: Span



Span Meas Span Ref Span Low Span High

***NITRIC OXIDES***



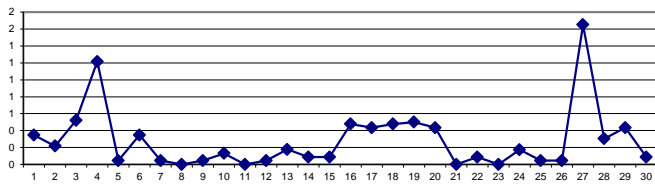
NITRIC OXIDE Hourly Averages (NO ppb)

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

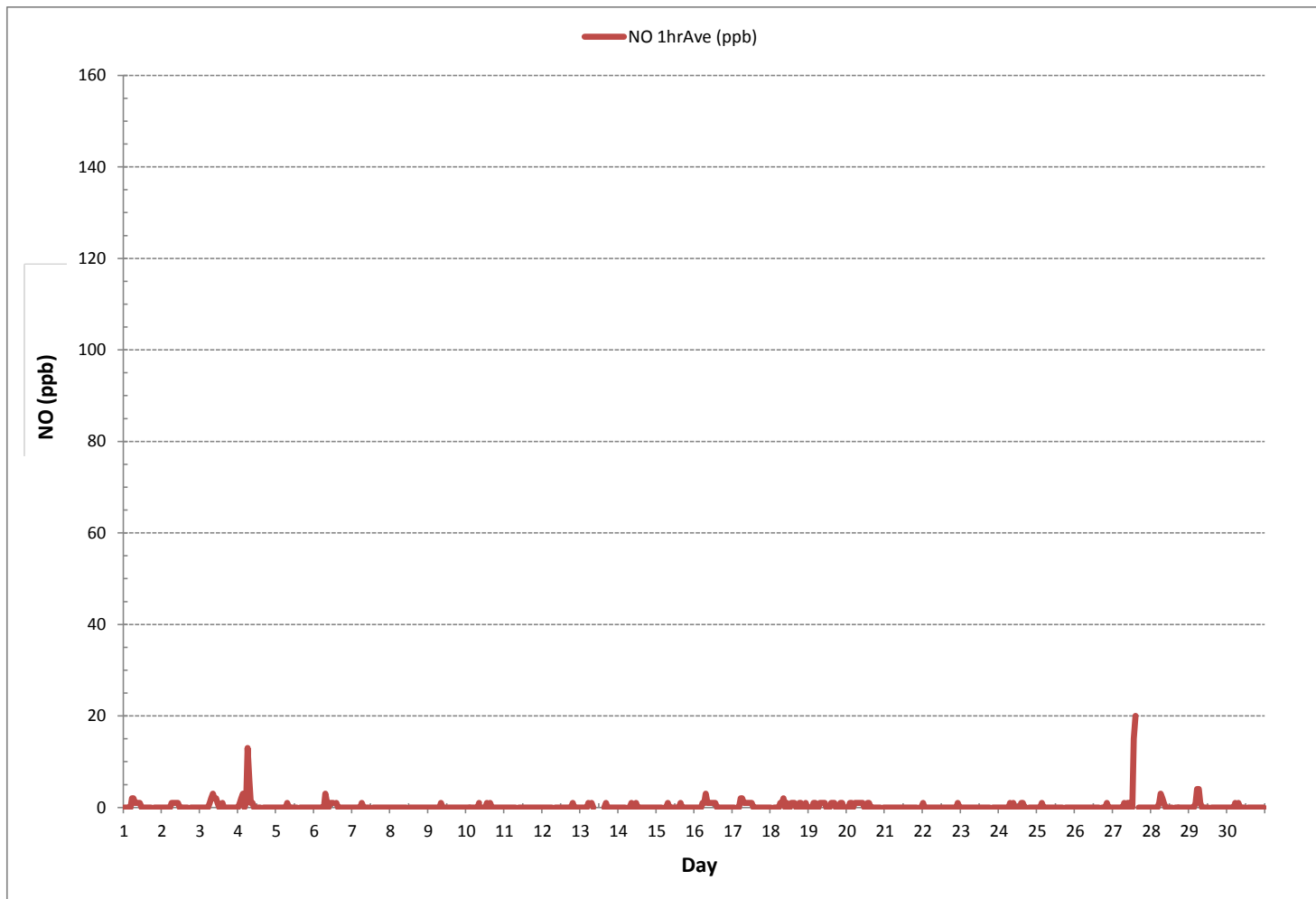
24 HR AVERAGES April 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	117			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	20 ppb	@ HOUR	27	ON DAY 27
MAXIMUM 24-HR AVERAGE:	2 ppb			ON DAY 27
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	720 hrs	
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)







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

NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	0	1	1	1	2	8	8	2	2	2	2	1	1	0	1	4	4	0	S	2	1	1	2	1	0	8	2	24
2	1	1	1	1	2	2	2	2	1	1	5	1	1	1	1	1	1	S	0	1	1	1	1	1	0	5	1	24
3	1	1	2	2	2	2	2	4	3	4	4	2	1	1	6	5	S	2	1	1	1	1	3	1	1	6	2	24
4	0	8	4	5	1	7	18	19	1	6	2	1	0	4	2	S	0	0	2	1	3	0	1	0	0	19	4	24
5	1	2	1	1	1	1	1	5	1	1	1	1	1	9	S	1	1	1	0	1	0	0	0	0	0	9	1	24
6	0	0	1	1	2	2	2	21	10	1	2	1	2	S	2	1	1	2	1	1	1	1	1	0	0	21	2	24
7	1	2	2	2	1	3	1	1	2	1	1	1	S	1	0	1	2	1	1	1	1	1	1	1	0	3	1	24
8	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	3	1	1	1	1	1	2	2	2	0	3	1	24
9	1	2	2	2	3	1	1	2	2	1	S	2	8	1	0	1	1	1	1	4	0	0	0	1	0	8	2	24
10	1	1	1	1	1	2	1	1	2	S	3	1	1	4	4	4	1	1	1	1	2	1	1	0	0	4	2	24
11	0	0	0	1	0	0	1	1	S	1	1	1	1	2	4	1	1	2	1	1	3	1	1	1	0	4	1	24
12	1	1	1	1	1	1	1	S	2	0	2	0	0	1	1	1	1	1	1	4	2	2	1	2	0	4	1	24
13	2	3	1	1	2	3	S	6	2	C	C	C	C	C	C	C	4	2	2	1	2	1	2	2	1	6	2	24
14	1	1	1	2	1	S	1	1	2	2	1	5	1	1	1	1	1	1	1	1	1	1	2	2	1	5	1	24
15	0	0	0	0	S	0	1	15	1	2	2	1	1	1	2	1	1	2	0	1	1	0	1	0	1	15	1	24
16	1	0	0	S	2	4	2	4	3	2	2	2	2	1	1	1	1	1	1	3	0	0	1	0	0	4	1	24
17	1	0	S	2	2	4	4	2	2	4	3	5	1	1	1	2	5	2	4	2	1	2	2	0	5	2	24	
18	1	S	2	1	1	1	2	4	26	2	12	2	2	4	2	2	2	2	4	3	1	3	3	2	1	26	4	24
19	S	2	4	4	2	1	1	2	3	1	11	1	2	3	2	4	3	1	1	2	13	9	1	S	1	13	3	24
20	0	1	9	5	2	3	1	3	11	3	2	1	1	3	3	1	1	1	0	1	0	0	S	0	0	11	2	24
21	0	0	1	0	1	0	2	2	4	2	1	1	1	1	5	1	1	1	2	5	S	0	5	0	5	2	24	
22	3	1	1	1	2	1	1	2	1	2	1	1	1	1	1	4	1	4	2	0	S	1	3	2	0	4	2	24
23	2	1	2	2	1	1	2	1	1	1	1	1	2	2	1	1	1	1	1	S	1	1	1	1	1	2	1	24
24	1	1	1	1	1	1	1	3	1	9	1	1	1	1	3	3	1	2	S	1	1	0	1	1	0	9	2	24
25	1	2	1	10	1	1	1	2	3	0	1	1	5	4	2	2	5	S	1	1	2	0	0	0	0	10	2	24
26	0	0	0	0	0	2	1	2	1	3	2	4	1	4	1	9	S	0	1	1	15	1	1	1	0	15	2	24
27	1	1	1	2	2	2	1	3	1	5	13	2	7	110	116	S	1	2	0	1	0	0	0	1	0	116	12	24
28	1	2	1	0	0	2	3	4	3	3	1	1	1	1	S	1	1	0	0	0	0	0	0	0	0	4	1	24
29	P	1	0	2	2	8	9	2	1	1	1	0	0	S	1	1	1	0	0	0	0	0	1	1	0	9	1	23
30	2	1	1	2	2	3	1	1	1	1	1	0	S	2	1	1	1	0	0	1	0	0	0	0	0	3	1	24
HOURLY MAX	3	8	9	10	3	8	18	21	26	9	13	5	8	110	116	9	5	5	4	4	15	9	3	5				
HOURLY AVG	1	1	1	2	1	2	2	4	3	2	3	1	2	6	6	2	2	1	1	1	2	1	1	1				

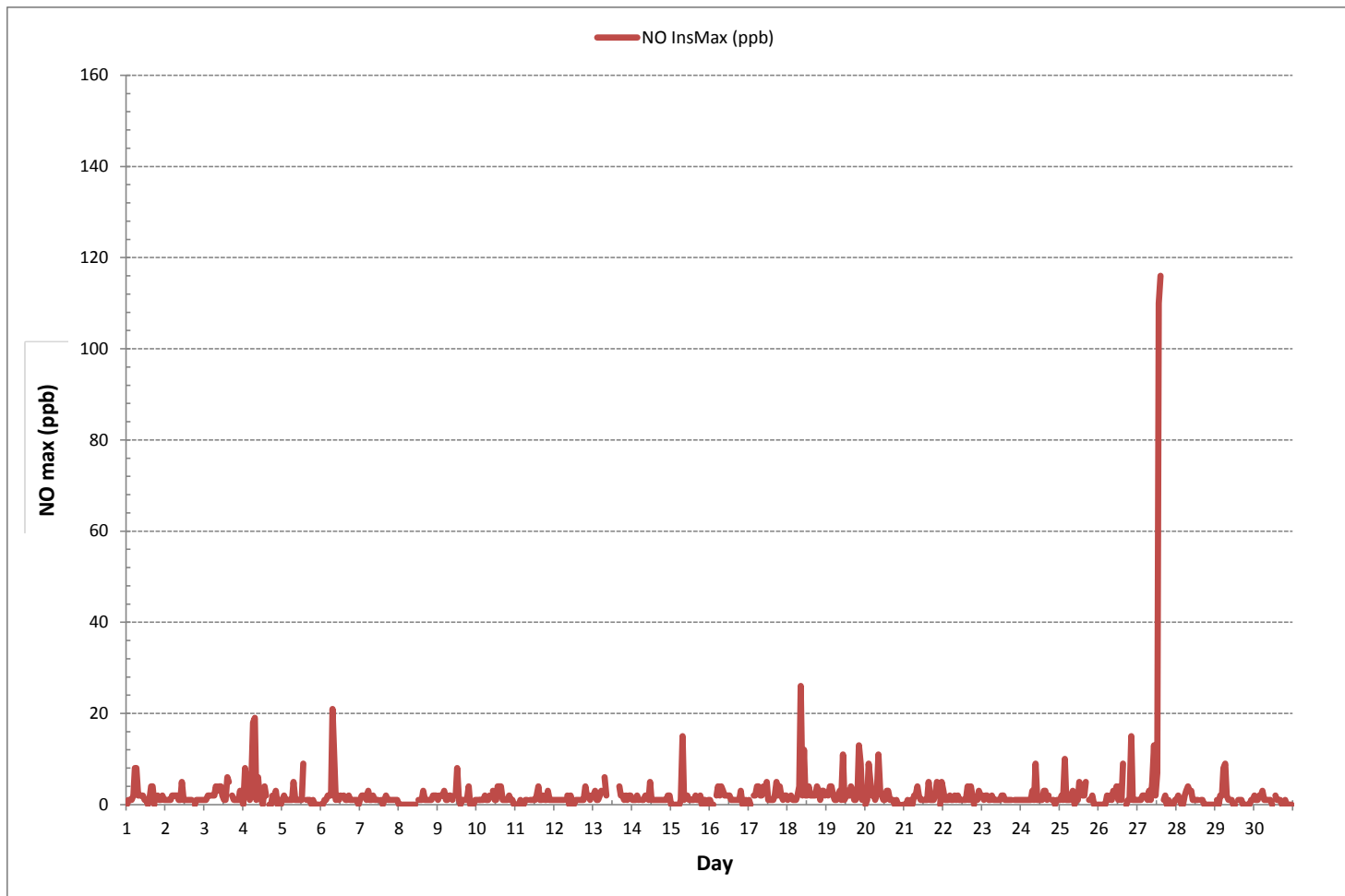
STATUS FLAG CODES

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:	575
MAXIMUM INSTANTANEOUS VALUE:	116 ppb @ HOUR 14 ON DAY 27
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	719 hrs
STANDARD DEVIATION:	6

NITRIC OXIDE Instantaneous Maximum (NO ppb)



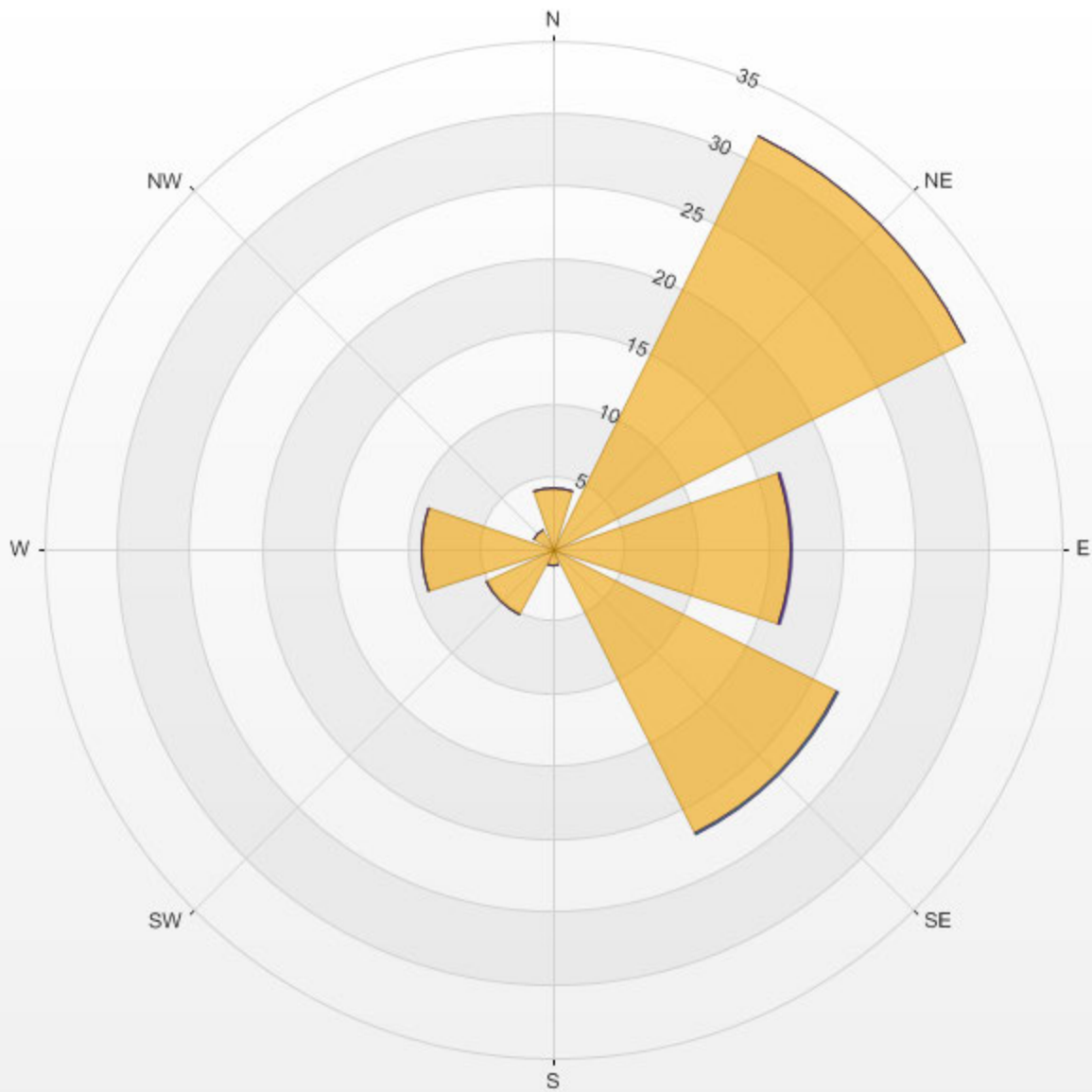
Wind: LICA COLD LAKE SOUTH  
 Poll.: LICA COLD LAKE SOUTH-NO[ppb]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 8.64% Calm Avg: 0.83 [ppb]

Direction	0.0-6.7	6.7-13.4	13.4-20.1	>20.1	Total
N	4.3	0.0	0.0	0.0	4.3
NE	31.8	0.0	0.0	0.0	31.8
E	16.4	0.0	0.0	0.2	16.6
SE	21.8	0.0	0.2	0.0	22.0
S	1.2	0.0	0.0	0.0	1.2
SW	5.1	0.0	0.0	0.0	5.1
W	9.1	0.0	0.0	0.0	9.1
NW	1.5	0.0	0.0	0.0	1.5
Summary	91.1	0.0	0.2	0.2	91.4

% Icon Classes (ppb) 91 0.0-6.7 0 6.7-13.4 0 13.4-20.1 0 >20.1

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 8.64% Calm Poll Avg: 0.83[ppb]



***NITROGEN DIOXIDE***

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

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

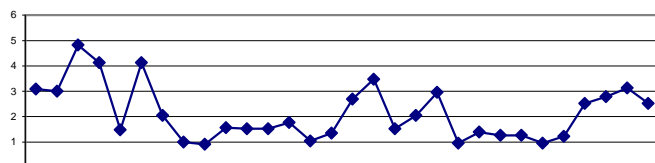
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

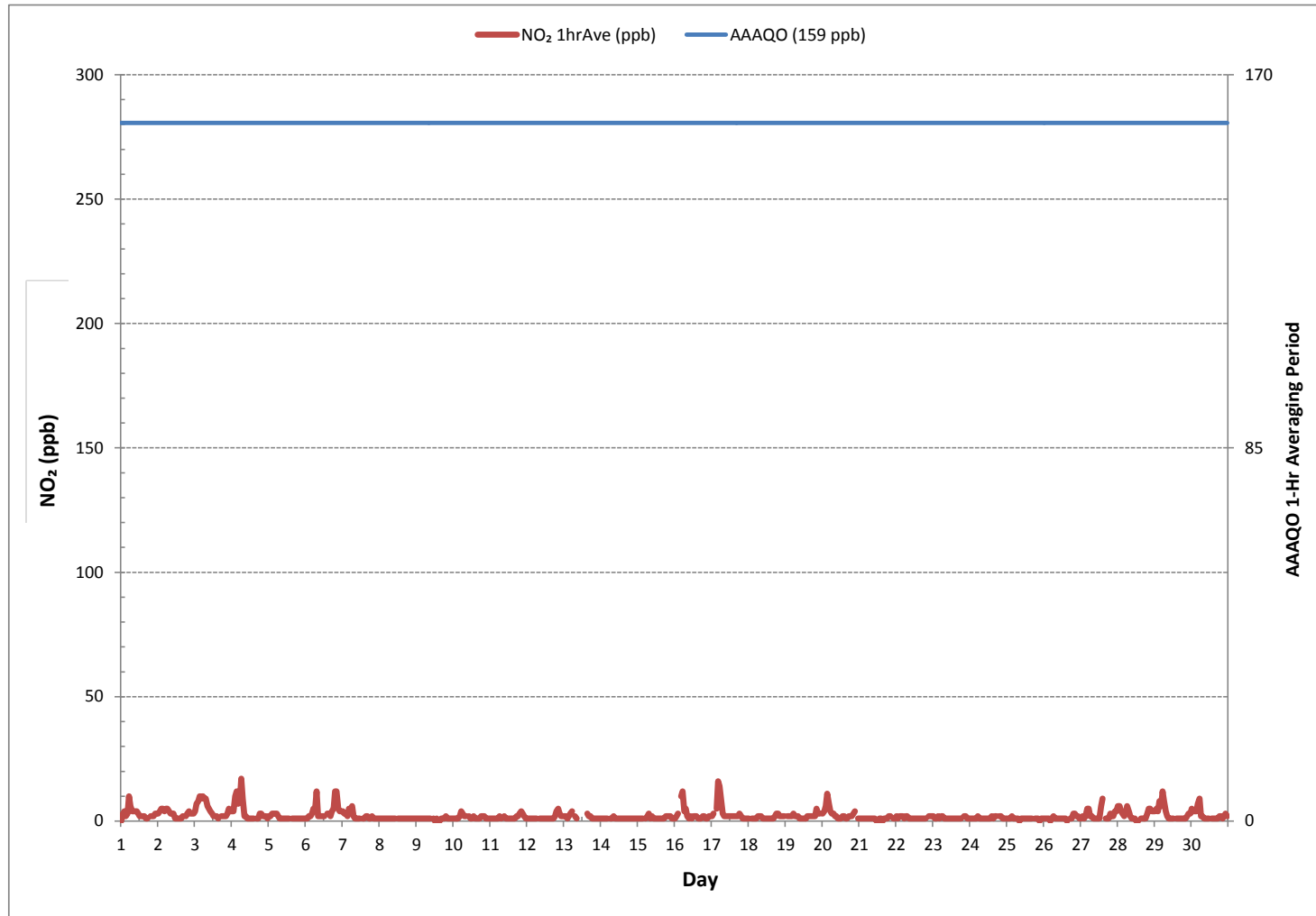
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	671			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	12	ON DAY
MAXIMUM 1-HR AVERAGE:	17	ppb @ HOUR	6	ON DAY
MAXIMUM 24-HR AVERAGE:	5	ppb		ON DAY
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	720
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:	100.0
STANDARD DEVIATION:	2		MONTHLY AVERAGE:	2
				ppb

24 HR AVERAGES April 2017



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





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

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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	2	6	9	2	7	18	17	5	5	5	5	4	5	2	5	7	4	2	S	6	2	3	4	4	2	18	6	24	
2	3	5	6	6	6	7	6	6	4	3	8	2	2	2	1	1	4	S	3	6	6	4	6	6	1	8	4	24	
3	7	10	11	11	10	13	12	12	7	6	4	4	3	3	3	5	S	4	2	2	3	4	9	6	2	13	7	24	
4	7	12	15	16	10	15	19	19	5	10	4	8	1	3	1	S	2	2	5	6	8	2	5	2	1	19	8	24	
5	4	5	8	8	5	5	4	5	1	1	2	1	2	5	S	2	2	1	1	1	1	1	2	2	1	8	3	24	
6	2	2	2	3	7	10	8	29	3	3	3	3	4	S	3	4	3	5	13	19	17	8	6	7	2	29	7	24	
7	7	5	4	5	9	8	8	3	2	2	1	2	S	1	1	3	5	2	1	3	2	2	2	1	1	9	3	24	
8	1	1	1	1	1	1	1	1	1	1	1	S	2	1	1	1	1	1	1	2	2	2	3	2	2	1	3	1	24
9	1	4	3	2	2	1	2	2	2	1	S	1	1	3	1	1	2	2	2	8	2	1	1	1	1	8	2	24	
10	1	1	2	2	3	5	4	2	3	S	7	2	1	5	2	2	2	1	2	3	4	1	1	1	1	7	2	24	
11	1	1	1	1	2	1	2	2	S	2	2	2	2	2	2	1	1	3	3	4	12	7	3	2	1	12	3	24	
12	2	1	1	1	2	2	S	3	1	2	1	1	1	1	1	5	1	3	7	12	4	3	4	1	12	3	24		
13	6	6	3	3	5	7	S	5	2	C	C	C	C	C	C	C	3	3	3	2	2	2	2	2	2	7	4	24	
14	2	2	1	2	2	S	2	2	3	2	2	2	2	2	2	2	1	1	2	1	1	2	3	3	1	3	2	24	
15	1	1	1	1	S	1	2	20	2	10	2	1	1	1	1	2	2	1	3	3	3	2	2	2	1	20	3	24	
16	2	3	8	S	16	19	6	7	4	2	3	2	2	2	2	2	3	4	8	2	2	5	3	2	19	5	24		
17	3	6	S	11	24	16	17	5	3	5	4	5	2	3	2	3	4	5	4	8	2	2	2	2	2	24	6	24	
18	1	S	3	2	2	2	3	6	13	2	5	3	3	7	4	6	2	3	5	4	4	3	4	3	1	13	4	24	
19	S	5	3	4	3	4	3	3	3	2	9	2	4	5	4	4	4	3	3	6	21	12	4	S	2	21	5	24	
20	5	6	16	17	12	7	5	5	3	4	2	2	3	9	3	2	2	2	2	4	5	8	S	4	2	17	6	24	
21	1	1	1	1	1	2	3	4	4	5	1	1	2	2	3	1	2	2	4	7	S	1	4	1	7	2	24		
22	4	4	3	3	3	3	3	5	2	2	1	2	2	1	2	3	1	4	2	2	S	3	5	4	1	5	3	24	
23	3	2	3	3	2	2	4	3	1	2	1	1	2	3	1	2	1	1	2	S	3	2	2	2	1	4	2	24	
24	2	1	2	2	2	2	2	3	1	4	2	2	2	1	4	3	3	3	S	4	2	1	2	4	1	4	2	24	
25	1	1	1	12	2	2	2	4	1	2	3	1	6	5	2	2	2	S	2	4	5	1	1	1	1	12	3	24	
26	1	1	2	1	1	3	3	3	1	10	2	3	2	2	2	1	S	2	2	6	6	3	2	3	1	10	3	24	
27	2	3	2	4	8	12	3	3	1	11	3	2	5	192	99	S	3	2	3	7	5	4	5	9	1	192	17	24	
28	10	12	10	4	3	5	8	7	6	2	1	2	1	1	S	2	1	2	3	7	7	8	7	5	1	12	5	24	
29	P	7	8	12	10	15	12	5	3	2	1	1	1	S	2	2	2	1	2	2	2	3	5	6	1	15	5	23	
30	9	6	10	7	15	13	3	4	2	2	1	1	S	2	3	1	2	1	2	3	2	3	5	4	1	15	4	24	
HOURLY MAX	10	12	16	17	24	19	19	29	13	11	9	8	6	192	99	7	5	5	13	19	21	12	9	9					
HOURLY AVG	3	4	5	5	6	7	6	6	3	4	3	2	2	10	6	2	2	2	3	5	5	4	3	3					

STATUS FLAG CODES

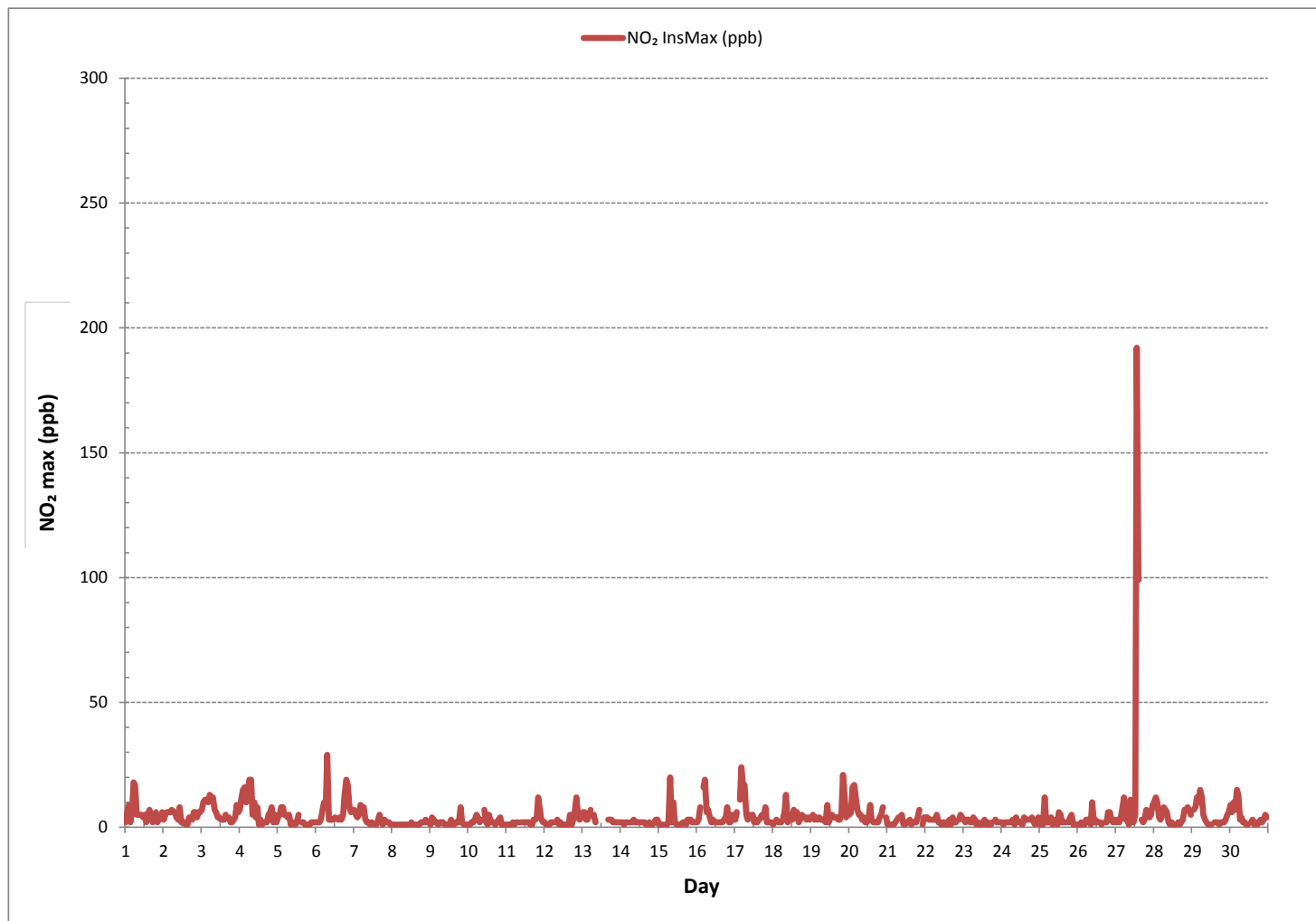
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	681
MAXIMUM INSTANTANEOUS VALUE:	192 ppb @ HOUR 13 ON DAY 27
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	9
OPERATIONAL TIME:	719 hrs



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



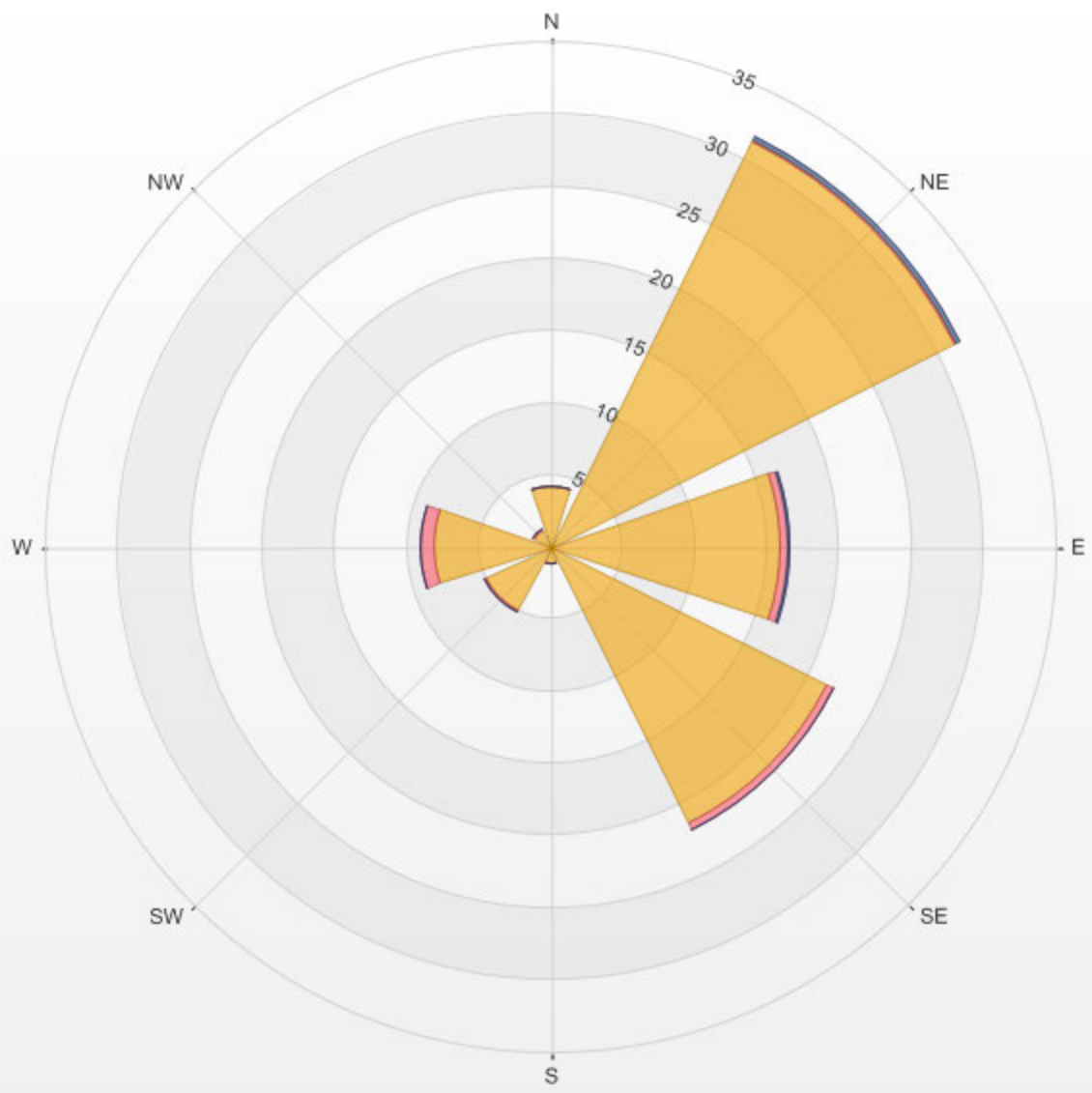
Wind: LICA COLD LAKE SOUTH  
 Poll.: LICA COLD LAKE SOUTH-NO2[ppb]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 8.64% Calm Avg: 5.32 [ppb]

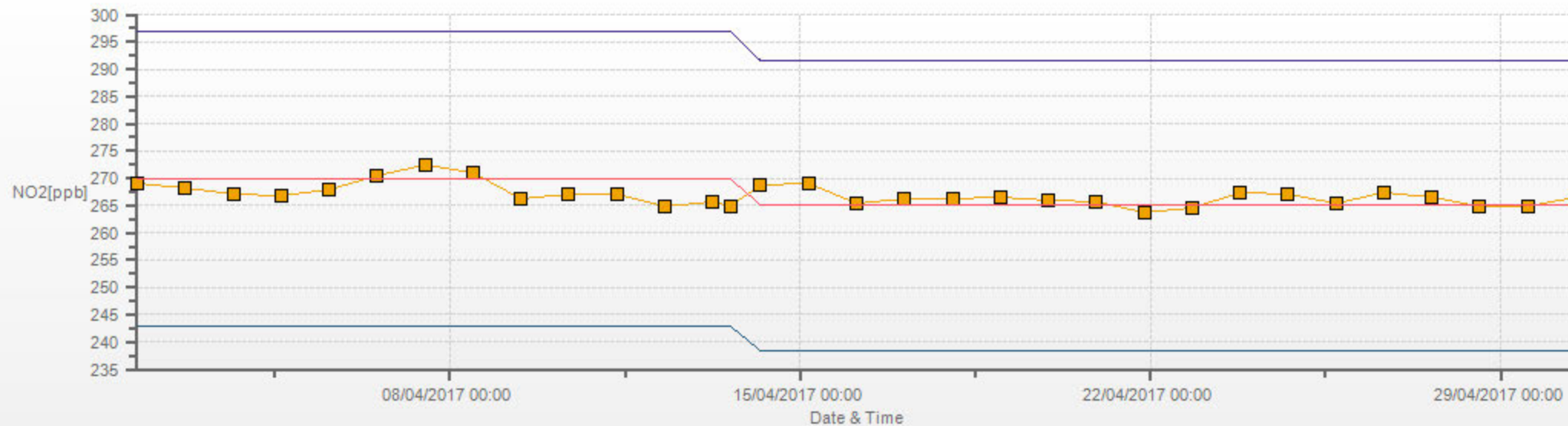
Direction	0.0-5.6	5.6-11.1	11.1-16.7	>16.7	Total
N	4.3	0.0	0.0	0.0	4.3
NE	31.3	0.2	0.3	0.0	31.8
E	16.0	0.4	0.2	0.0	16.6
SE	21.4	0.6	0.0	0.0	22.0
S	1.2	0.0	0.0	0.0	1.2
SW	5.0	0.2	0.0	0.0	5.1
W	8.1	1.0	0.0	0.0	9.1
NW	1.3	0.2	0.0	0.0	1.5
Summary	88.4	2.5	0.4	0.0	91.4

% Icon Classes (ppb) 88 0.0-5.6 3 5.6-11.1 0 11.1-16.7 0 >16.7

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 8.64% Calm Poll Avg: 5.32[ppb]



NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/04 Type: Span



Span Meas Span Ref Span Low Span High

## ***OZONE***



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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	34.2	27.3	18.3	15.9	10.3	4.9	6.3	11.1	25.0	28.7	32.2	34.9	36.7	40.4	44.1	43.4	42.3	41.6	S	37.5	34.9	33.1	30.8	35.9	4.9	44.1	29.1	24
2	35.7	30.6	26.7	23.8	24.1	23.1	24.3	25.4	29.9	32.2	33.3	36.3	39.1	39.2	41.0	41.9	39.2	S	24.5	15.4	9.2	16.3	15.6	15.6	9.2	41.9	27.9	24
3	15.0	23.4	21.8	21.1	21.0	20.4	19.7	21.3	25.8	26.9	31.2	34.7	35.5	37.1	36.9	38.9	S	36.7	38.6	38.1	36.3	33.0	25.8	23.4	15.0	38.9	28.8	24
4	14.9	10.1	3.3	2.0	5.6	6.0	2.4	16.0	29.8	30.7	34.7	37.2	39.3	41.3	42.3	S	45.5	44.6	41.8	39.6	40.4	37.7	35.2	42.2	2.0	45.5	27.9	24
5	42.6	41.2	37.7	30.8	37.8	33.3	30.7	30.7	31.2	33.9	38.8	43.6	45.0	46.5	S	47.7	47.9	47.5	46.3	45.1	44.6	43.1	42.3	41.9	30.7	47.9	40.4	24
6	40.1	38.7	36.7	35.4	32.4	29.6	27.5	21.5	30.3	30.5	31.2	32.0	34.9	S	39.1	42.7	44.7	41.0	35.4	21.1	16.0	31.5	31.8	27.6	16.0	44.7	32.7	24
7	26.7	29.5	32.4	31.6	26.3	23.7	28.1	35.3	37.7	38.3	38.8	40.0	S	40.8	40.5	39.0	38.0	38.8	37.5	37.3	38.8	38.2	37.4	36.7	23.7	40.8	35.3	24
8	36.4	37.3	37.6	37.7	38.7	38.4	37.7	35.3	33.8	32.9	34.4	S	38.2	38.3	37.1	38.6	38.4	38.3	36.5	36.1	36.4	34.8	34.3	34.4	32.9	38.7	36.6	24
9	34.1	32.5	32.1	31.8	31.4	31.2	30.8	30.4	30.4	30.1	S	31.0	32.3	33.8	34.8	34.6	34.3	33.8	32.3	30.3	29.6	28.6	27.7	26.8	26.8	34.8	31.5	24
10	25.9	24.6	23.7	24.3	24.1	21.7	22.4	22.7	22.9	S	24.5	25.4	26.9	29.3	29.1	28.6	29.9	29.5	28.5	27.7	28.0	27.8	28.2	28.1	21.7	29.9	26.3	24
11	27.5	26.7	26.8	26.2	26.9	28.7	28.9	28.6	S	28.1	28.4	29.3	30.5	32.0	34.5	36.3	36.4	37.0	36.0	34.2	31.5	33.3	36.8	30.5	26.2	37.0	31.1	24
12	28.8	29.6	30.1	30.9	32.1	33.8	33.8	S	34.1	34.3	34.3	34.7	35.3	36.4	36.5	36.4	36.4	36.1	35.8	33.5	30.6	33.7	35.0	33.9	28.8	36.5	33.7	24
13	31.9	31.3	32.0	31.5	30.3	28.5	S	31.2	32.9	33.1	34.9	36.3	38.6	39.4	38.8	36.5	35.1	34.5	33.7	32.5	34.7	38.1	40.1	40.9	28.5	40.9	34.6	24
14	40.5	40.4	39.7	38.6	37.9	S	39.3	40.5	39.8	39.4	39.0	38.5	37.7	37.6	37.7	37.8	37.6	37.9	38.4	38.5	39.1	40.2	41.9	42.0	37.6	42.0	39.1	24
15	42.2	42.1	42.3	42.4	S	42.9	43.4	43.8	43.4	42.6	42.1	42.0	41.6	40.7	40.2	39.7	40.1	40.8	40.3	39.4	39.2	38.8	39.6	39.5	38.8	43.8	41.3	24
16	39.4	38.5	34.9	S	21.8	17.3	24.8	32.9	35.4	39.3	39.6	41.2	43.2	44.4	46.9	48.2	49.0	49.3	43.4	42.5	44.2	42.0	38.8	41.0	17.3	49.3	39.0	24
17	41.5	39.7	S	33.8	20.8	18.1	29.9	35.2	35.9	35.2	37.1	38.8	S	C	C	C	C	44.0	42.7	38.1	32.7	32.5	31.6	31.0	18.1	44.0	34.4	24
18	32.4	S	34.6	35.1	34.4	35.1	34.9	34.4	33.3	33.3	32.8	32.7	32.7	32.4	32.8	32.6	31.1	29.8	28.7	28.2	27.7	26.3	25.4	23.7	23.7	35.1	31.5	24
19	S	21.9	20.7	19.7	19.6	17.9	19.6	21.1	21.0	23.3	26.9	29.0	30.4	31.1	31.8	31.9	33.2	36.5	36.3	31.4	22.0	23.4	29.1	S	17.9	36.5	26.3	24
20	27.2	27.3	17.4	12.3	20.1	24.3	24.2	24.9	26.8	29.3	33.1	36.1	37.6	36.1	33.4	33.4	33.8	33.6	33.8	32.5	30.2	20.9	S	28.9	12.3	37.6	28.6	24
21	29.5	32.5	33.5	35.5	39.1	43.1	42.1	42.0	41.8	41.8	41.6	41.7	42.3	42.2	41.6	42.5	42.5	42.0	42.4	42.1	41.2	S	40.4	39.2	29.5	43.1	40.1	24
22	38.2	38.6	38.1	38.2	39.8	40.7	40.0	39.2	39.4	39.9	40.2	41.5	42.4	42.3	42.2	43.4	45.2	44.3	43.2	39.9	S	36.5	35.1	34.6	34.6	45.2	40.1	24
23	34.5	34.1	33.6	33.6	33.4	32.4	31.8	31.5	31.3	31.5	31.5	32.0	32.6	37.5	38.0	36.8	36.2	37.3	37.6	S	35.8	34.1	33.4	32.4	31.3	38.0	34.0	24
24	32.0	31.7	31.2	30.3	28.8	27.4	27.0	26.3	26.2	26.1	26.7	26.5	26.2	26.3	26.4	27.9	30.6	31.0	S	29.9	29.9	29.6	28.7	27.9	26.1	32.0	28.5	24
25	27.4	27.0	27.7	29.0	33.5	33.6	31.2	31.4	32.8	31.2	35.3	40.5	38.3	37.7	38.4	39.7	39.6	S	40.3	39.3	39.2	38.0	35.4	32.6	27.0	40.5	34.7	24
26	33.1	33.0	32.3	33.1	33.5	32.4	31.9	32.4	35.0	37.0	37.3	37.5	37.5	37.3	36.6	36.2	S	35.4	35.0	32.2	32.4	32.2	32.0	33.0	31.9	37.5	34.3	24
27	34.0	32.6	31.7	31.8	30.3	30.1	34.5	34.9	36.2	36.1	37.9	38.7	40.4	37.9	37.4	S	41.0	40.7	42.1	42.2	37.6	34.0	31.2	25.3	42.2	35.6	24	
28	24.1	29.1	21.0	20.1	15.9	11.7	16.2	29.3	36.7	40.7	46.2	48.1	48.1	48.4	S	47.8	48.2	48.9	49.0	44.9	35.6	31.4	28.3	26.1	11.7	49.0	34.6	24
29	18.4	16.5	16.3	9.9	9.2	5.7	14.6	34.9	44.0	47.8	49.4	49.7	50.6	S	50.0	50.0	49.3	48.8	47.3	45.1	43.5	38.1	32.2	30.3	5.7	50.6	34.9	24
30	25.3	23.7	18.6	21.4	16.9	16.3	32.8	34.3	35.6	39.6	40.4	42.4	S	42.2	42.4	44.8	44.2	44.1	45.3	43.7	41.8	35.3	37.9	30.0	16.3	45.3	34.7	24
HOURLY MAX	42.6	42.1	42.3	42.4	39.8	43.1	43.4	43.8	44.0	47.8	49.4	49.7	50.6	48.4	50.0	50.0	49.3	49.3	49.0	45.1	44.6	43.1	42.3	42.2				
HOURLY AVG	31.5	30.7	28.7	27.9	26.8	25.9	28.0	30.3	33.0	34.3	35.6	37.0	37.6	38.1	38.2	39.2	39.6	39.4	38.3	35.8	33.9	33.2	33.2	32.3				

STATUS FLAG CODES

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

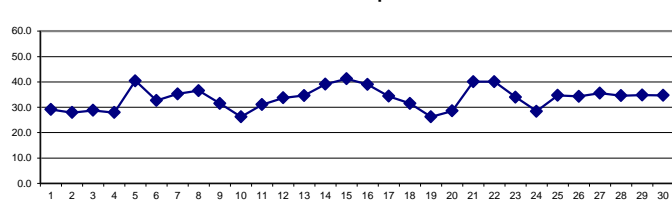
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

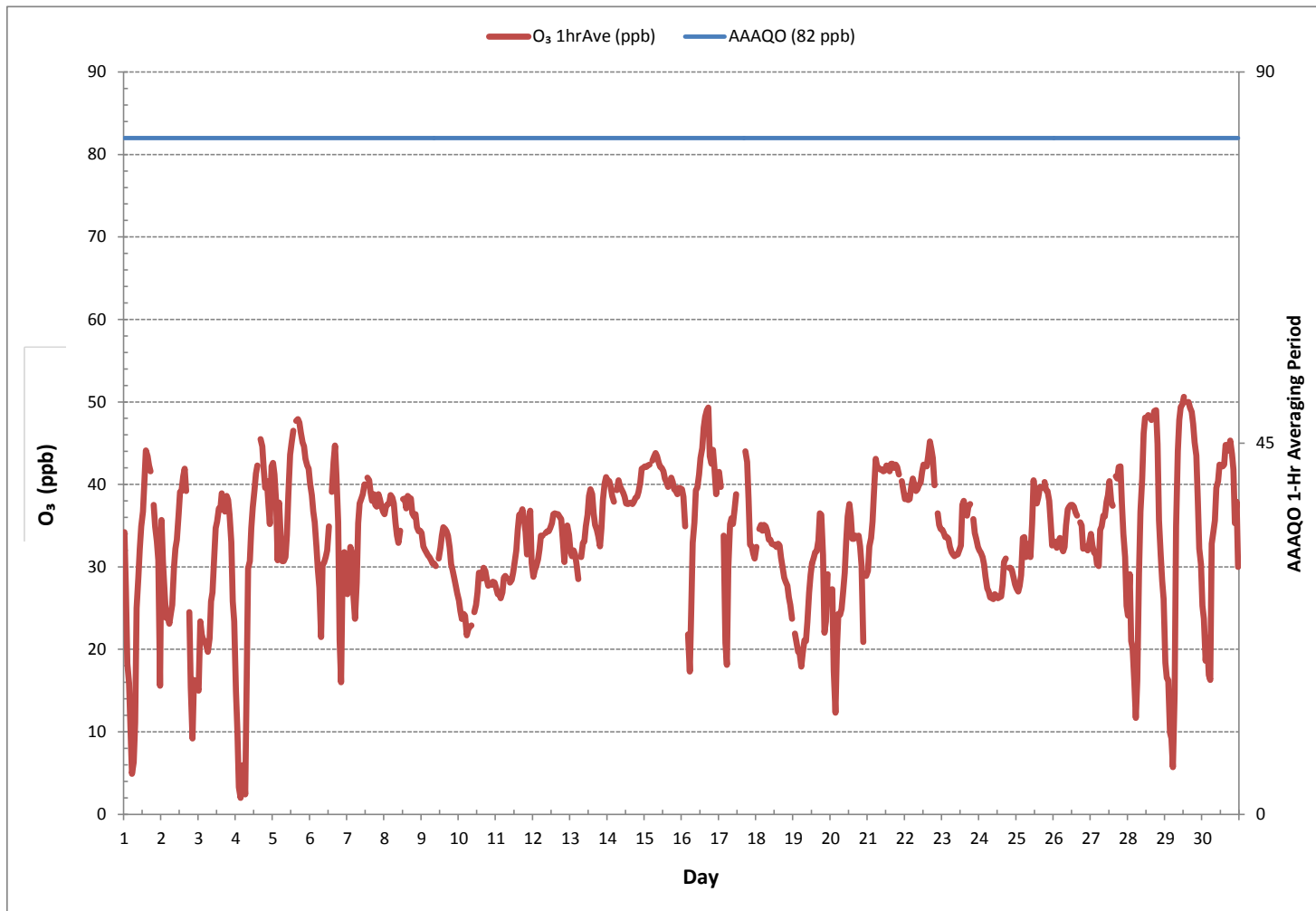
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	684			
MINIMUM 1-HR AVERAGE:	2.0	ppb @ HOUR	3	ON DAY
MAXIMUM 1-HR AVERAGE:	50.6	ppb @ HOUR	12	ON DAY
MAXIMUM 24-HR AVERAGE:	41.3	ppb		ON DAY
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	720
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0
STANDARD DEVIATION:	8.2		MONTHLY AVERAGE:	33.6
				ppb

24 HR AVERAGES April 2017



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





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

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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY 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	35.7	32.3	21.2	19.2	12.8	10.4	8.5	17.4	29.5	31.7	34.2	36.4	40.0	43.8	44.9	44.6	43.9	42.4	S	40.7	35.7	34.5	31.9	38.2	8.5	44.9	31.7	24
2	37.3	33.8	28.6	25.5	25.6	23.8	25.3	27.1	31.9	33.5	35.1	38.2	40.5	40.9	41.7	43.9	43.0	S	33.5	23.3	16.2	21.5	23.2	20.8	16.2	43.9	31.1	24
3	23.5	25.9	24.4	22.7	23.0	22.1	21.4	24.4	27.4	28.8	33.5	36.5	37.0	37.9	38.0	40.9	S	39.0	39.3	38.5	37.4	34.7	31.8	27.9	21.4	40.9	31.1	24
4	19.9	14.1	6.9	7.2	8.2	10.6	4.4	30.7	31.6	33.2	35.7	39.3	41.1	42.1	44.1	S	46.6	46.0	45.1	41.2	42.4	40.8	40.6	44.2	4.4	46.6	31.1	24
5	44.0	43.0	40.3	37.9	40.6	34.8	32.4	31.5	32.6	35.3	42.1	44.8	46.3	47.4	S	49.1	49.1	48.4	46.9	45.6	44.8	43.8	42.6	42.4	31.5	49.1	42.0	24
6	40.8	39.4	37.7	36.3	34.7	31.3	29.5	29.5	31.0	31.0	32.4	33.6	36.8	S	40.8	44.2	45.7	45.8	41.8	27.3	25.9	35.0	35.6	32.7	25.9	45.8	35.6	24
7	28.6	33.0	34.2	33.5	31.9	29.1	31.9	37.1	38.2	38.8	39.8	40.5	S	41.1	40.8	39.9	38.4	39.1	38.1	38.1	39.6	39.0	38.3	37.3	28.6	41.1	36.8	24
8	36.8	37.9	38.1	38.2	39.1	39.0	38.0	36.9	34.6	33.6	37.4	S	39.5	39.9	38.1	39.4	39.0	39.3	37.3	36.5	36.8	36.1	34.8	35.1	33.6	39.9	37.5	24
9	35.5	33.3	32.8	32.4	32.0	32.0	31.6	31.3	31.3	30.8	S	32.0	33.2	34.6	35.3	34.9	35.0	34.5	33.3	31.7	30.1	29.5	27.9	27.4	27.4	35.5	32.3	24
10	26.5	25.3	24.3	25.0	24.9	22.7	23.3	23.0	23.5	S	25.2	25.9	28.5	30.8	30.4	29.7	31.0	30.8	29.4	28.2	28.5	28.2	28.6	28.6	22.7	31.0	27.1	24
11	28.0	27.1	27.4	26.5	28.0	29.7	29.7	29.5	S	28.6	28.9	30.4	31.2	34.1	35.6	36.7	37.0	38.2	36.8	35.1	33.8	37.0	39.0	32.6	26.5	39.0	32.2	24
12	29.2	30.1	30.3	31.6	33.5	34.1	34.8	S	34.5	34.9	34.8	34.9	35.9	36.8	37.0	37.0	36.8	36.5	36.8	35.6	34.5	35.1	36.2	34.5	29.2	37.0	34.6	24
13	33.6	32.6	33.3	33.3	31.5	29.7	S	32.9	33.3	34.2	35.7	37.6	39.5	40.1	40.2	37.7	36.4	35.0	34.7	32.7	37.0	39.8	40.7	42.3	29.7	42.3	35.8	24
14	41.2	40.8	40.1	39.0	38.2	S	40.0	41.0	40.8	39.8	39.1	39.2	38.0	38.1	38.9	38.2	37.7	38.2	38.8	39.0	39.5	41.8	42.3	42.4	37.7	42.4	39.7	24
15	42.4	42.3	42.4	42.5	S	43.2	44.2	44.4	43.9	43.0	42.4	42.4	41.8	41.0	40.7	40.2	40.8	41.1	41.0	39.9	39.9	39.4	40.3	40.2	39.4	44.4	41.7	24
16	39.9	39.4	38.0	S	24.9	20.8	32.0	34.2	37.8	40.2	40.3	42.2	44.9	45.6	48.1	49.2	49.5	50.0	48.6	44.5	44.9	44.1	41.4	42.4	20.8	50.0	41.0	24
17	41.8	41.2	S	38.0	30.1	21.4	35.7	36.2	36.5	35.7	38.0	39.8	C	C	C	C	C	45.4	43.6	42.1	33.9	33.0	31.9	32.0	21.4	45.4	36.5	24
18	33.6	S	35.3	35.4	34.7	35.7	35.4	34.8	34.5	33.8	33.2	33.0	32.9	32.9	33.3	32.9	32.4	30.4	29.3	29.2	28.4	26.9	26.1	24.4	24.4	35.7	32.1	24
19	S	22.6	21.4	20.5	20.9	18.5	20.6	22.0	22.1	25.5	28.4	29.9	30.9	31.3	32.6	32.4	36.2	37.7	38.8	37.1	26.7	30.4	30.8	S	18.5	38.8	28.1	24
20	30.8	28.6	25.6	20.2	23.4	26.7	25.2	26.1	27.8	30.8	34.5	37.6	37.9	37.1	34.5	34.4	33.9	34.5	34.2	33.5	31.9	27.9	S	29.6	20.2	37.9	30.7	24
21	32.2	33.0	35.1	37.5	42.8	43.7	42.5	42.5	42.4	42.2	41.9	42.1	43.3	43.1	42.8	43.9	44.4	42.9	43.0	43.0	42.4	S	40.8	40.0	32.2	44.4	41.2	24
22	39.1	39.1	38.8	39.3	40.6	41.4	40.9	40.0	40.0	40.9	40.8	42.1	43.0	43.0	42.7	45.5	46.0	44.9	44.5	41.8	S	37.4	36.3	35.3	35.3	46.0	41.0	24
23	34.9	34.6	34.5	34.3	33.9	33.0	32.2	32.4	31.7	32.0	31.9	32.4	34.5	39.9	39.4	38.8	36.5	38.2	38.2	S	36.6	35.1	34.2	33.0	31.7	39.9	34.9	24
24	32.2	32.0	31.6	30.8	29.5	28.1	27.5	26.8	26.4	26.8	27.1	26.9	26.6	26.7	27.1	29.8	31.8	32.1	S	30.8	30.5	30.1	29.0	28.4	26.4	32.2	29.1	24
25	28.0	27.7	28.3	31.7	34.3	34.8	33.0	32.7	33.9	32.7	40.3	41.5	39.4	38.5	39.5	40.3	40.7	S	40.8	40.7	40.0	39.4	36.9	33.9	27.7	41.5	36.0	24
26	33.9	33.7	32.7	33.6	33.9	33.7	32.5	33.7	36.2	38.2	37.7	38.0	38.2	37.9	37.4	36.7	S	35.9	35.7	34.2	34.0	33.0	32.8	33.8	32.5	38.2	35.1	24
27	34.5	33.6	32.8	32.8	31.9	33.6	35.1	36.3	36.7	37.1	39.3	39.6	41.2	40.3	40.3	S	42.1	41.8	44.5	44.6	40.1	36.7	38.1	29.2	29.2	44.6	37.5	24
28	30.6	33.0	28.4	25.3	20.0	13.7	21.8	34.2	40.7	43.0	48.7	48.7	49.1	49.2	S	48.9	49.2	49.8	49.8	49.1	41.0	36.4	33.8	33.9	13.7	49.8	38.2	24
29	P	18.9	19.2	14.1	11.6	7.7	25.0	38.8	48.0	50.0	50.3	50.6	51.5	S	50.8	50.7	50.0	49.5	48.9	47.1	44.5	41.7	36.2	37.0	7.7	51.5	38.3	23
30	31.9	32.3	27.9	31.2	25.3	29.9	33.8	35.1	37.7	41.6	43.3	43.9	S	44.5	43.3	45.6	45.7	44.9	46.2	44.9	44.3	41.4	41.5	37.0	25.3	46.2	38.8	24
HOURLY MAX	44.0	43.0	42.4	42.5	42.8	43.7	44.2	44.4	48.0	50.0	50.3	50.6	51.5	49.2	50.8	50.7	50.0	50.0	49.8	49.1	44.9	44.1	42.6	44.2				
HOURLY AVG	33.8	32.4	30.7	30.2	29.0	28.1	29.9	32.5	34.4	35.4	37.0	37.9	38.6	39.2	39.2	40.2	40.7	40.4	40.0	37.8	35.9	35.5	35.3	34.4				

STATUS FLAG CODES

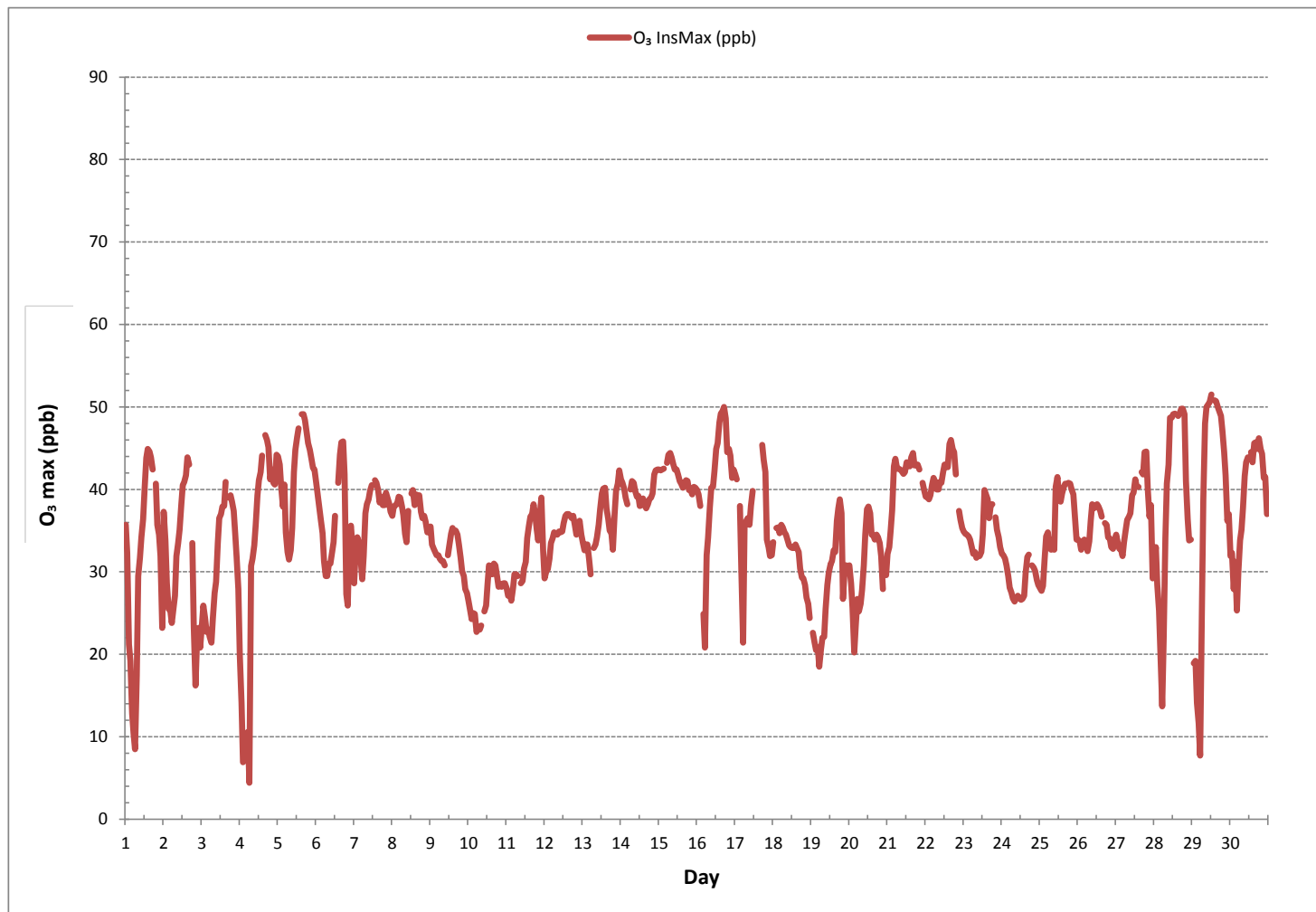
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	683
MAXIMUM INSTANTANEOUS VALUE:	51.5 ppb @ HOUR 12 ON DAY 29
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	7.5
OPERATIONAL TIME:	719 hrs



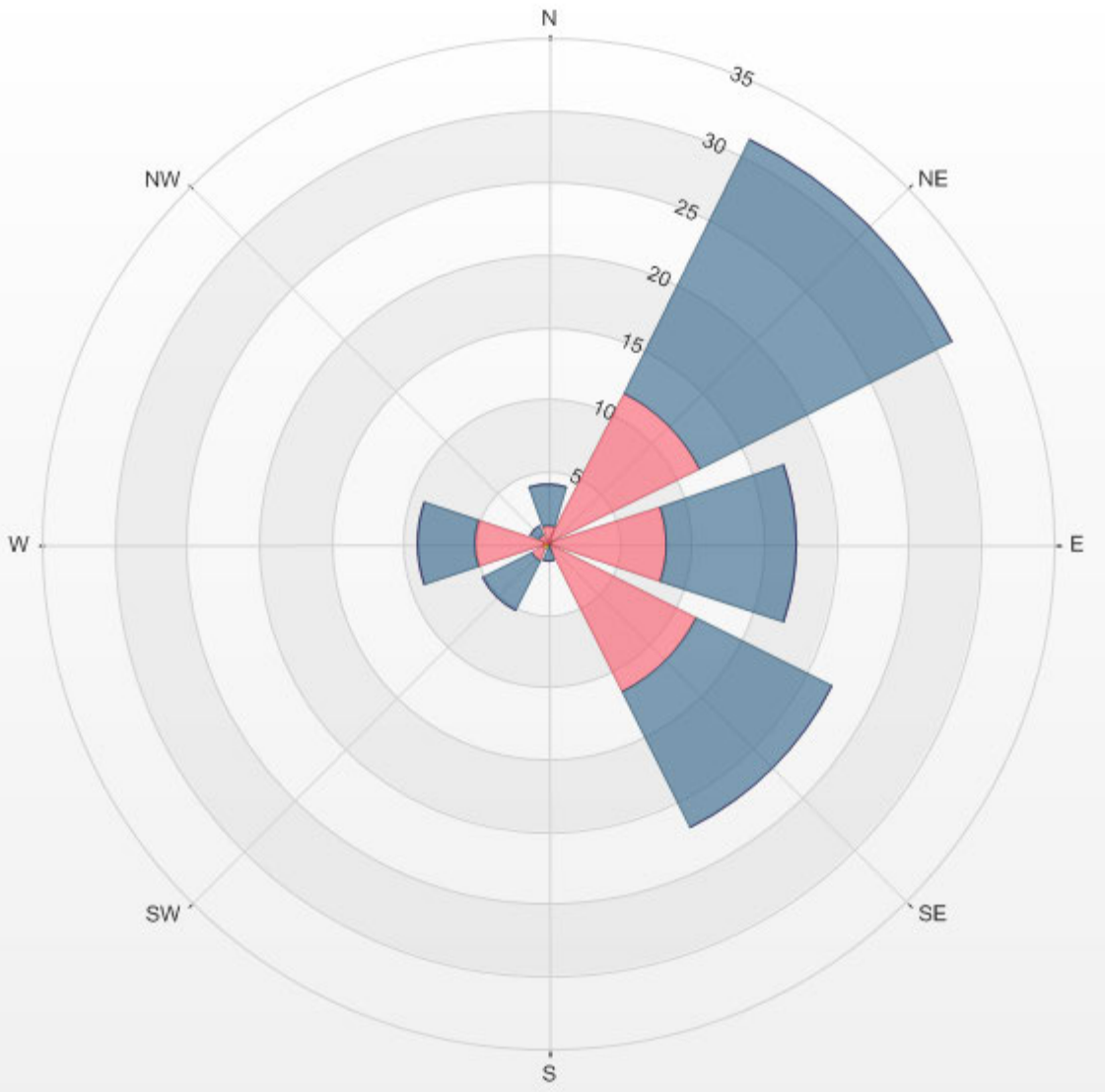
**OZONE Instantaneous Maximum (O<sub>3</sub> ppb)**



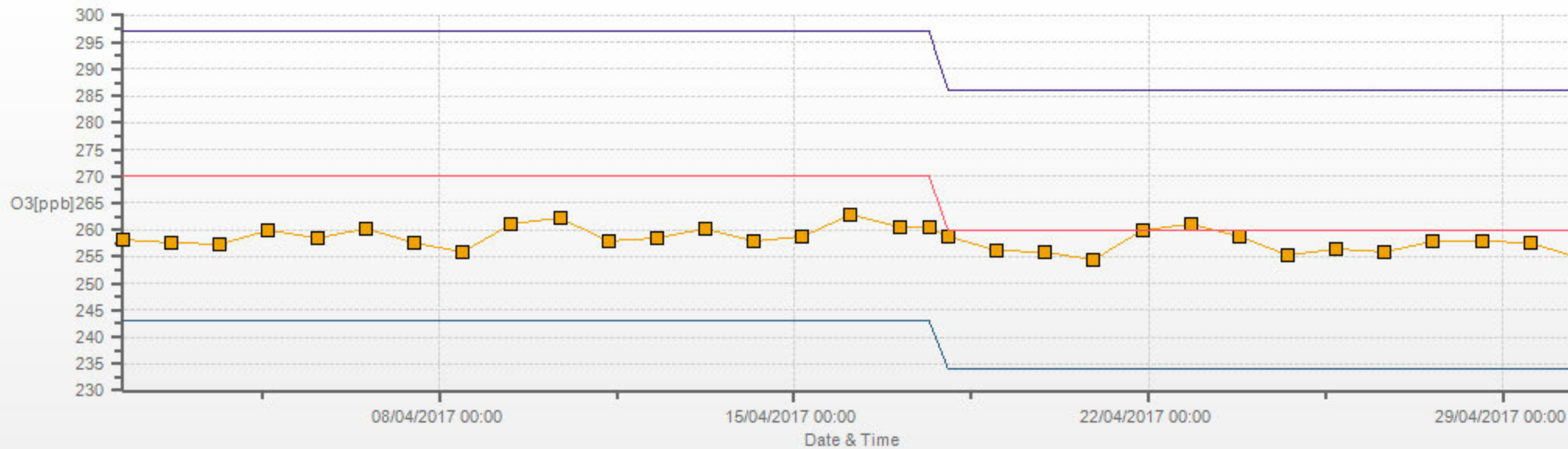


% Icon Classes (ppb) 1 0.0-16.9 38 16.9-33.8 52 33.8-50.7 0 >50.7

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 8.63% Calm Poll Avg: 21.32[ppb]



O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/04 Type: Span



Span Meas Span Ref Span Low Span High

***PARTICULATE MATTER 2.5***



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

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

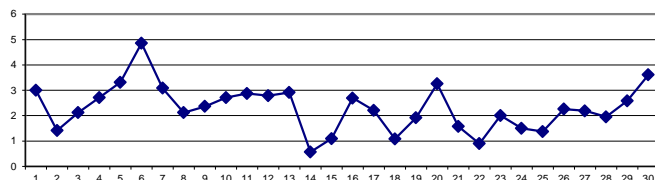
OBJECTIVE LIMIT:

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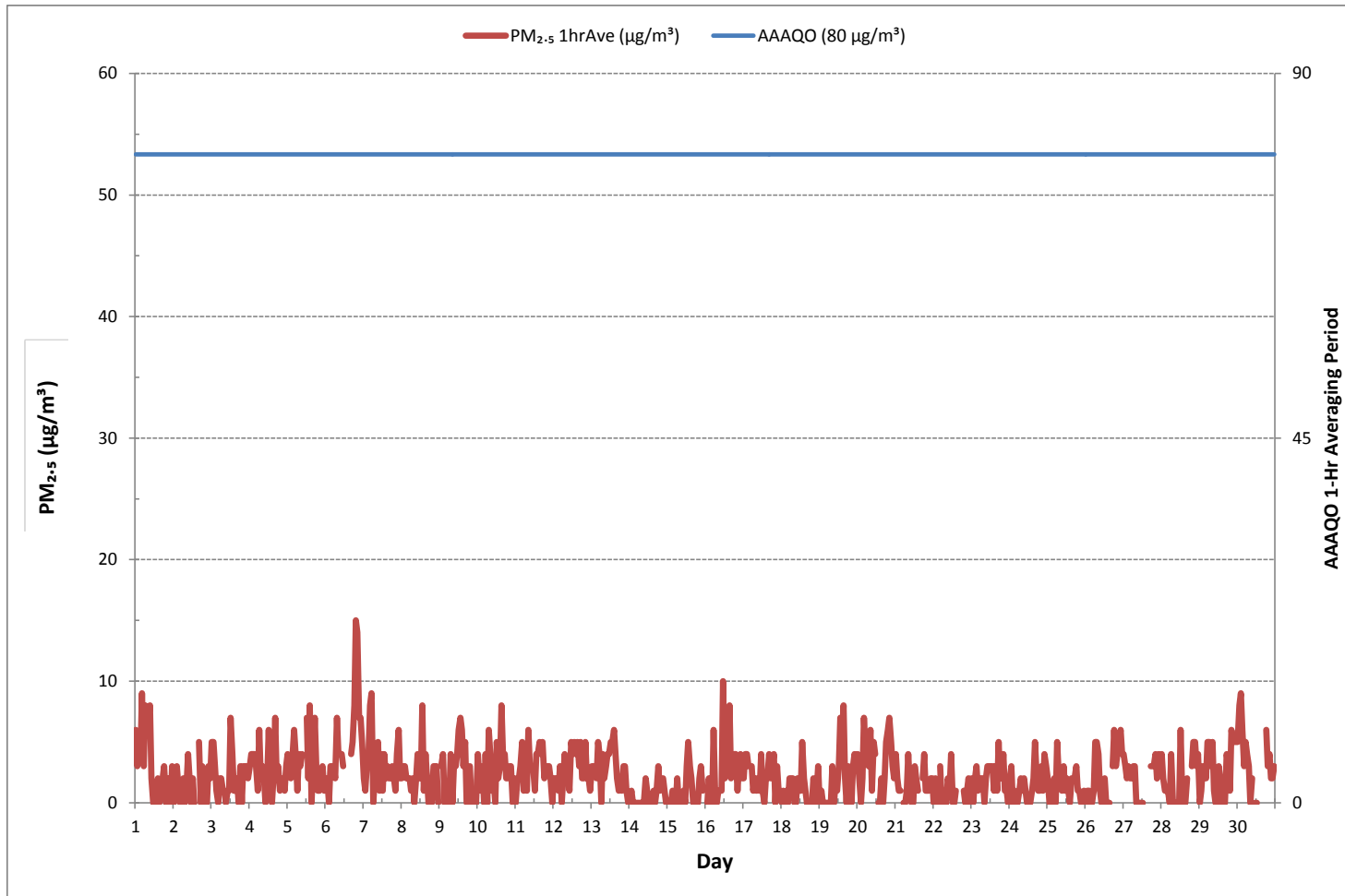
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	520				
MINIMUM 1-HR AVERAGE:	0 µg/m <sup>3</sup> @ HOUR	11	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	15 µg/m <sup>3</sup> @ HOUR	19	ON DAY	6	
MAXIMUM 24-HR AVERAGE:	5 µg/m <sup>3</sup>		ON DAY	6	
MONTHLY CALIBRATION TIME:	3	hrs	OPERATIONAL TIME:	688	hrs
STANDARD DEVIATION:	2		AMD OPERATION UPTIME:	95.6	%
			MONTHLY AVERAGE:	2	µg/m <sup>3</sup>

24 HR AVERAGES April 2017

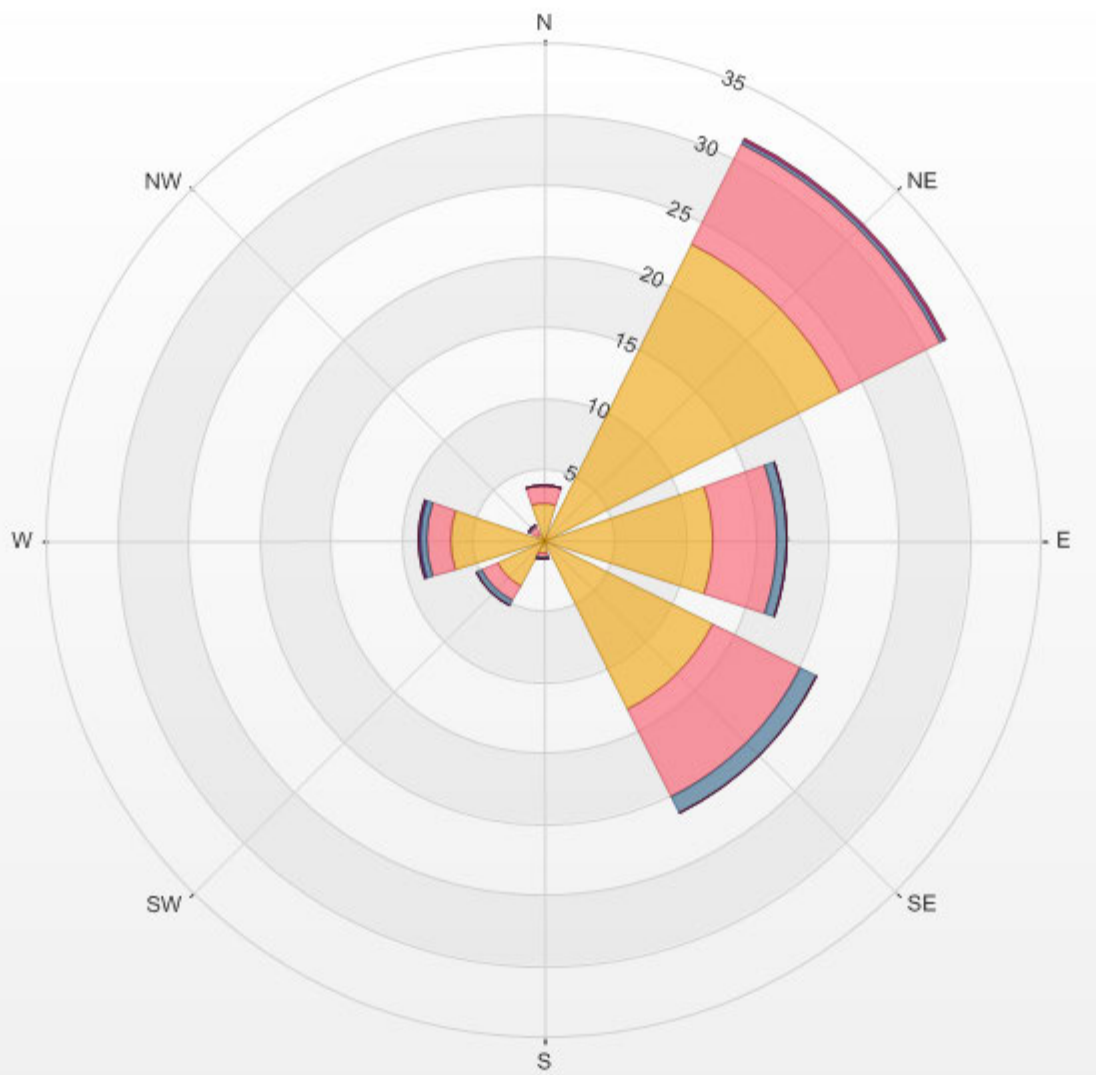


PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM<sub>2.5</sub> µg/m<sup>3</sup>)



% Icon Classes (ug/m3(L)) 63 0.0-3.0 24 3.0-6.0 4 6.0-9.1 0 9.1-12.1 0 12.1-15.1 0 >15.1

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM25[ug/m3(L)] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 8.91% Calm Poll Avg: 3.59[ug/m3(L)]





Wind: LICA COLD LAKE SOUTH  
 Poll.: LICA COLD LAKE SOUTH-PM25[ug/m3(L)]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 8.91%

Calm Avg: 3.59 [ug/m3]

Direction	0.0-3.0	3.0-6.0	6.0-9.1	9.1-12.1	12.1-15.1	>15.1	Total
<b>N</b>	2.6	1.3	0.0	0.0	0.0	0.0	3.9
<b>NE</b>	23.4	7.9	0.3	0.0	0.2	0.0	31.7
<b>E</b>	12.0	4.5	0.7	0.0	0.0	0.0	17.2
<b>SE</b>	13.4	6.9	1.3	0.0	0.0	0.0	21.6
<b>S</b>	1.0	0.3	0.2	0.0	0.0	0.0	1.5
<b>SW</b>	3.7	1.2	0.4	0.0	0.0	0.0	5.3
<b>W</b>	6.6	1.6	0.4	0.2	0.0	0.0	8.8
<b>NW</b>	0.4	0.6	0.2	0.0	0.0	0.0	1.2
<b>Summary</b>	63.1	24.2	3.5	0.2	0.2	0.0	91.1

***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	0.5	0.5	1.2	0.6	1.2	0.9	2.8	5.2	6.2	4.4	4.7	3.1	8.6	9.7	9.8	9.4	8.8	8.3	6.3	6.5	6.6	5.2	6.3	0.5	9.8	4.8	24	
2	8.1	5.5	5.7	5.7	5.6	7.1	6.3	5.7	6.7	8.0	6.8	10.2	11.7	11.5	11.7	8.1	4.4	1.6	0.9	2.0	1.2	3.0	2.8	0.7	0.7	11.7	5.4	24	
3	3.5	4.8	4.8	5.1	4.9	5.4	4.0	5.0	5.0	4.0	3.8	6.8	7.6	6.2	9.0	9.7	9.3	6.4	7.6	7.9	5.4	3.4	0.9	2.5	0.9	9.7	5.3	24	
4	0.7	0.6	0.6	0.4	0.5	0.6	0.6	2.1	3.0	4.5	4.1	4.9	7.1	7.2	3.9	4.2	9.9	6.0	5.3	2.2	2.6	0.1	3.9	6.8	0.1	9.9	2.6	24	
5	5.9	3.5	3.2	2.9	6.8	5.8	5.8	9.9	10.1	12.2	14.5	15.2	17.0	13.7	11.1	13.2	11.9	13.2	11.0	11.0	9.2	10.0	9.7	2.9	17.0	9.7	24		
6	9.8	8.9	5.9	6.2	2.9	3.6	1.8	3.3	6.7	5.2	4.3	4.6	5.4	4.4	3.9	2.6	0.6	3.1	0.7	0.9	2.0	2.4	1.0	1.4	0.6	9.8	2.0	24	
7	2.2	1.7	3.9	2.4	1.3	3.2	6.8	11.3	12.5	12.0	12.9	12.5	11.7	12.9	13.1	10.2	10.3	11.8	10.8	10.1	9.9	8.2	7.6	6.4	1.3	13.1	7.8	24	
8	8.1	10.9	10.4	11.8	11.0	13.5	12.3	11.8	10.4	12.3	10.8	11.3	10.9	11.0	13.3	12.3	13.1	11.4	10.4	7.3	8.1	10.0	9.7	7.3	13.5	10.4	24		
9	6.9	6.2	6.2	6.1	6.6	6.6	5.6	6.8	6.1	5.0	5.6	5.5	5.4	4.6	5.3	6.7	5.9	7.1	6.4	6.1	7.9	7.2	7.6	7.4	4.6	7.9	4.7	24	
10	6.5	6.0	4.4	5.8	6.1	4.4	6.0	6.9	6.3	7.8	8.7	8.8	8.1	8.0	9.6	7.2	6.9	7.9	6.2	6.1	7.5	7.6	7.7	8.4	4.4	9.6	5.2	24	
11	8.3	7.2	6.2	6.6	7.6	9.0	6.8	8.7	9.1	9.2	8.9	8.6	8.7	8.1	9.3	9.6	9.0	6.4	4.7	3.3	2.4	3.3	4.5	7.3	2.4	9.6	7.1	24	
12	6.3	7.8	8.0	8.8	9.0	8.8	8.0	8.7	8.9	9.1	9.2	9.9	10.4	11.7	11.6	11.5	10.6	9.3	7.3	5.5	5.2	5.8	6.9	5.5	5.2	11.7	8.1	24	
13	4.8	5.4	8.1	6.7	5.3	5.3	7.3	8.7	10.9	11.1	13.1	15.9	16.0	15.8	16.3	14.7	13.0	11.3	14.5	15.2	14.5	16.5	15.9	14.2	4.8	16.5	11.4	24	
14	15.0	15.6	16.2	13.6	12.5	11.9	11.8	11.9	12.2	13.1	12.1	12.0	11.5	13.8	13.0	11.8	12.2	13.0	12.6	12.2	12.0	10.7	11.5	10.3	10.3	16.2	12.0	24	
15	9.0	9.3	9.6	8.9	9.1	9.1	9.2	9.7	10.4	8.6	10.1	10.9	10.6	10.5	10.2	8.9	10.7	9.8	7.1	5.1	5.6	4.2	5.7	5.4	4.2	10.9	8.6	24	
16	5.3	3.8	0.3	1.5	0.1	0.4	1.0	2.7	4.0	5.9	5.4	4.8	6.0	5.0	5.9	4.5	5.5	3.4	0.9	2.6	3.3	2.6	2.0	5.3	0.1	6.0	1.9	24	
17	5.7	1.9	2.1	1.6	1.0	2.0	2.9	2.7	3.1	2.7	6.6	7.6	8.4	8.0	6.1	5.8	6.5	5.2	4.6	6.7	7.6	8.1	6.9	7.1	1.0	8.4	4.2	24	
18	8.4	8.2	9.0	9.4	8.6	9.7	9.3	10.1	8.6	8.4	7.0	6.9	8.3	7.9	8.0	7.5	7.3	6.1	4.8	4.6	4.6	4.1	4.0	3.0	3.0	10.1	7.2	24	
19	2.8	2.5	2.2	3.1	3.1	3.2	3.6	4.3	3.4	3.2	4.3	4.3	3.2	1.5	3.2	1.9	1.8	2.1	2.9	2.7	2.3	4.2	3.5	3.0	1.5	4.3	1.5	24	
20	2.7	2.4	0.6	2.1	2.0	4.2	5.1	4.4	7.5	8.1	8.8	7.5	8.8	7.4	8.4	6.2	5.0	4.7	5.8	4.7	4.9	2.5	5.8	15.1	0.6	15.1	0.8	24	
21	12.7	11.9	9.9	10.0	9.3	10.2	9.8	10.8	8.8	10.5	9.1	7.6	8.0	6.9	5.7	6.1	6.4	7.3	6.9	6.3	5.7	7.7	9.8	7.3	5.7	12.7	8.3	24	
22	6.1	6.9	5.5	5.3	6.4	7.6	6.3	7.0	6.5	7.0	5.4	6.6	3.5	6.0	8.7	7.6	9.9	7.4	4.3	5.9	5.9	8.8	7.5	5.8	3.5	9.9	6.1	24	
23	7.6	8.9	7.4	7.7	8.9	7.7	7.8	7.9	7.9	8.3	8.8	9.0	10.1	11.6	14.6	12.2	12.0	13.8	10.8	7.5	8.1	9.5	9.6	9.5	7.4	14.6	9.4	24	
24	10.5	9.5	9.6	9.7	9.7	9.8	10.9	9.7	10.5	9.6	9.6	10.4	9.2	10.1	10.0	9.2	6.1	5.2	7.0	4.8	5.6	6.2	5.3	6.1	4.8	10.9	8.4	24	
25	5.8	5.6	5.8	5.3	8.0	8.7	10.7	11.9	11.8	10.4	11.1	10.3	10.3	9.6	10.2	10.3	9.0	9.0	6.2	6.8	8.2	8.6	7.7	6.2	5.3	11.9	8.6	24	
26	8.7	7.5	6.7	7.0	10.5	6.3	6.3	8.0	10.0	9.6	10.6	9.9	10.2	10.4	11.1	14.2	10.0	8.9	6.3	4.2	5.0	6.3	7.0	6.7	4.2	14.2	8.2	24	
27	6.2	4.8	5.0	5.8	4.8	3.6	7.7	6.7	6.6	7.5	9.9	9.0	11.5	9.8	9.6	8.3	8.4	5.3	4.0	3.9	2.0	1.5	1.0	0.7	0.7	11.5	5.5	24	
28	1.8	1.2	0.5	0.6	1.0	1.2	1.2	1.0	3.6	3.0	2.2	3.0	2.2	3.0	4.9	1.7	5.7	4.2	3.7	3.4	3.0	2.6	3.0	3.1	1.5	0.5	5.7	0.7	24
29	0.5	0.3	1.0	0.6	0.7	0.7	0.5	2.9	1.3	3.5	6.0	5.7	6.5	5.6	6.0	5.6	7.4	7.1	5.1	5.0	4.1	2.8	3.2	2.2	0.3	7.4	2.9	24	
30	2.6	2.5	0.8	2.6	1.7	2.3	4.4	5.2	5.2	6.1	6.3	5.7	5.3	4.0	6.6	6.0	5.0	6.6	5.7	4.7	2.8	0.9	2.8	0.1	0.1	6.6	1.8	24	
HOURLY MAX	15.0	15.6	16.2	13.6	12.5	13.5	13.5	12.3	12.5	13.1	14.5	15.9	17.0	15.8	16.3	14.7	13.0	13.8	14.5	15.2	14.5	16.5	15.9	15.1					
HOURLY AVG	3.7	3.6	3.5	3.6	3.5	3.5	3.7	3.9	3.9	4.0	4.1	4.0	4.0	3.7	3.4	3.8	3.4	3.1	3.2	3.1	3.0	3.2	3.6	3.7					

STATUS FLAG CODES

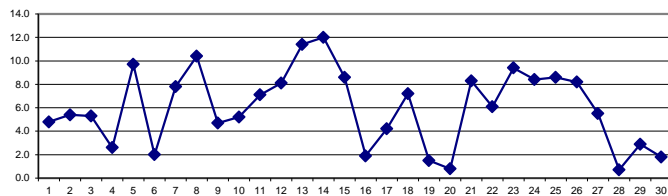
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	April 1, 2015
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

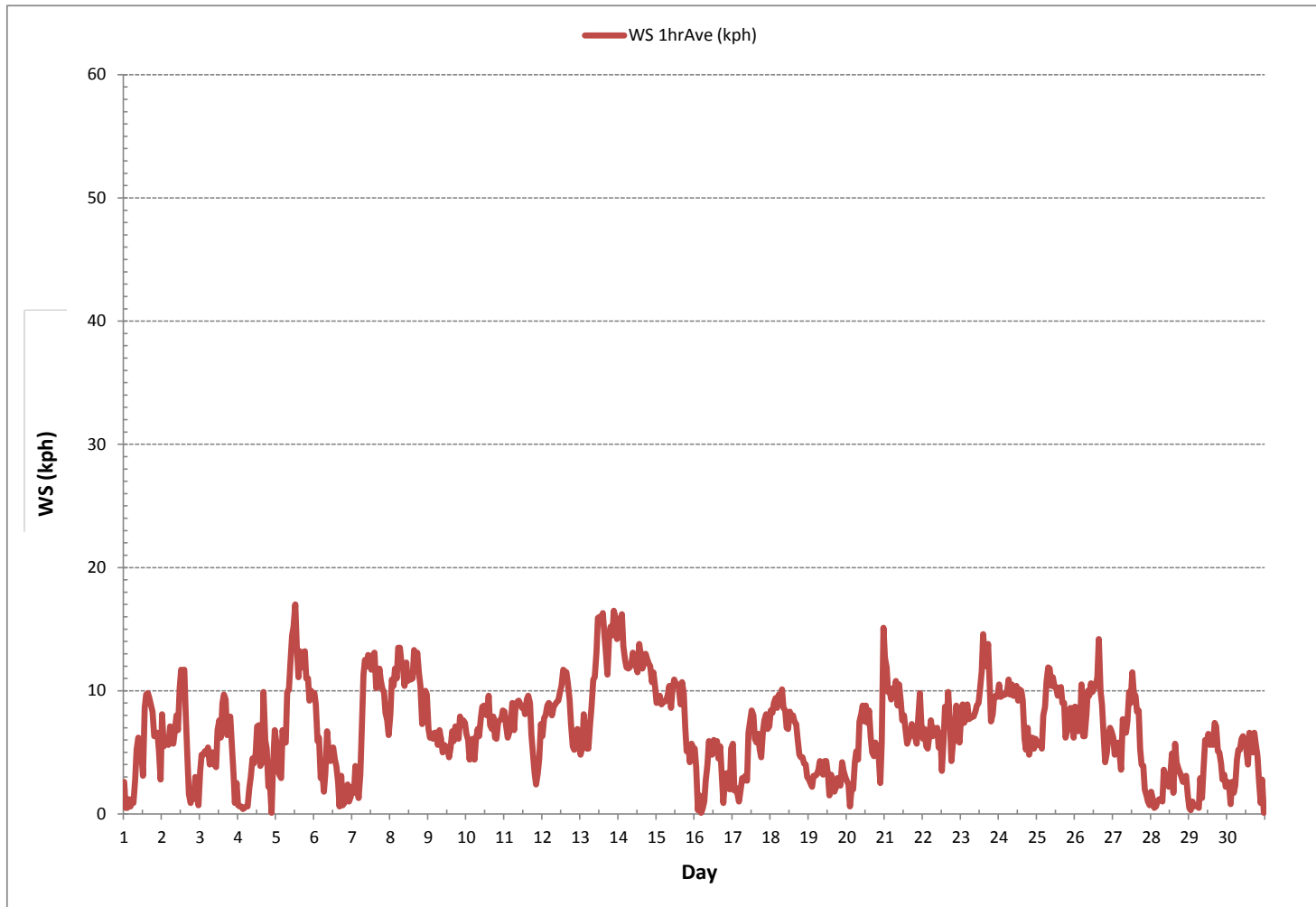
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	720
MINIMUM 1-HR AVERAGE	0.1 kph @ HOUR 21 ON DAY 4
MAXIMUM 1-HR AVERAGE:	17.0 kph @ HOUR 12 ON DAY 5
MAXIMUM 24-HR AVERAGE:	12.0 kph ON DAY 14
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	720 hrs
AMSD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3.6
MONTHLY AVERAGE:	3.6 kph

24 HR AVERAGES April 2017



WIND SPEED Hourly Averages (WS kph)





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

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	6.6	2.4	2.2	2.7	4.3	3.6	3.2	4.8	9.1	8.8	8.2	10.5	9.9	13.9	16.8	18.1	16.7	14.2	12.2	11.4	9.2	11.9	7.4	9.6	2.2	18.1	9.1	24
2	12.3	8.7	7.5	9.3	8.1	9.7	10.6	9.4	12.2	11.2	12.0	19.0	21.0	15.7	19.3	25.9	16.8	11.9	3.8	4.8	3.5	4.8	5.5	3.4	3.4	25.9	11.1	24
3	6.4	6.3	7.7	7.1	7.3	7.4	7.0	7.6	10.4	7.7	7.5	13.3	18.4	10.6	15.2	15.8	15.6	9.6	11.7	11.3	8.8	5.3	5.6	5.3	5.3	18.4	9.5	24
4	3.2	2.9	3.1	3.7	2.6	3.7	5.7	7.1	7.8	9.9	8.8	9.8	12.1	18.4	12.6	12.3	18.2	20.4	10.1	7.0	11.7	7.9	11.8	13.3	2.6	20.4	9.3	24
5	11.7	5.6	5.9	6.7	10.9	9.7	10.7	14.9	16.0	16.0	23.9	26.3	25.6	21.9	18.4	21.2	20.1	19.0	17.7	15.1	13.5	13.1	14.8	13.5	5.6	26.3	15.5	24
6	14.2	13.1	9.0	9.4	7.5	5.9	4.6	8.4	9.8	8.8	8.2	8.4	11.1	9.7	9.1	9.6	5.7	6.6	2.4	4.1	5.0	6.4	10.2	5.4	2.4	14.2	8.1	24
7	7.8	8.7	7.5	8.3	5.1	12.7	12.4	19.9	18.0	18.4	19.0	17.9	17.6	20.6	20.5	15.7	13.8	17.0	14.8	14.0	13.7	12.2	12.6	9.4	5.1	20.6	14.1	24
8	12.2	16.0	17.1	19.2	17.8	22.6	18.9	18.0	18.2	16.8	21.3	20.1	21.6	16.5	15.6	19.9	19.6	18.4	17.3	14.8	11.0	13.6	15.5	14.2	11.0	22.6	17.3	24
9	12.5	13.6	9.9	9.8	10.4	12.3	10.2	11.2	10.0	11.4	12.2	14.1	12.1	10.3	11.8	12.6	12.0	13.1	10.9	8.9	12.1	9.9	9.9	9.7	8.9	14.1	11.3	24
10	9.7	8.5	6.8	8.1	9.1	8.0	10.4	11.7	11.0	13.3	14.9	13.8	14.5	14.3	16.3	15.6	11.8	13.5	11.1	9.8	10.2	11.2	12.5	12.9	6.8	16.3	11.6	24
11	12.6	11.9	11.0	9.9	12.3	14.0	11.9	15.6	13.7	14.2	14.2	15.2	13.9	13.3	13.9	14.8	15.0	10.5	7.6	5.5	4.9	5.6	9.6	10.7	4.9	15.6	11.7	24
12	10.2	13.1	12.2	12.9	12.3	13.7	14.0	15.8	13.4	15.9	13.9	18.5	14.9	17.1	18.3	15.7	15.8	17.7	13.2	8.3	10.8	9.0	13.0	8.0	8.0	18.5	13.7	24
13	8.0	9.5	14.2	14.6	8.8	8.5	11.1	12.3	17.4	17.5	23.2	23.7	24.6	23.6	27.9	21.9	19.9	14.9	20.3	20.1	21.1	21.5	21.0	26.2	8.0	27.9	18.0	24
14	26.6	23.9	23.3	19.3	20.2	19.9	20.1	17.3	19.4	18.1	20.8	18.6	16.2	19.9	21.4	22.9	18.0	18.6	23.0	18.0	16.7	17.5	22.5	15.7	15.7	26.6	19.9	24
15	14.4	15.3	13.8	14.7	14.9	13.1	14.6	15.5	15.1	15.7	17.5	14.8	16.3	16.6	17.8	14.2	17.6	17.4	11.2	8.6	10.1	7.4	10.0	9.5	7.4	17.8	14.0	24
16	9.2	7.3	2.5	3.7	2.6	4.5	3.2	5.0	7.1	8.2	9.1	8.8	10.1	8.0	8.4	7.9	8.1	6.5	4.4	6.7	7.2	5.7	4.8	9.6	2.5	10.1	6.6	24
17	8.5	4.9	3.7	5.0	2.9	3.6	5.3	5.3	6.4	6.6	10.1	12.9	12.2	12.6	9.0	9.7	10.6	10.8	7.1	12.7	11.4	11.8	11.9	10.7	2.9	12.9	8.6	24
18	13.6	11.5	13.5	13.9	12.5	14.8	12.9	15.2	13.9	13.0	10.7	10.9	12.2	14.6	11.8	11.7	11.2	8.9	7.4	9.1	7.5	7.5	7.5	4.7	4.7	15.2	11.3	24
19	5.0	4.8	4.3	6.9	4.8	5.4	6.7	7.1	6.0	7.5	6.6	8.2	6.1	3.7	7.1	4.9	7.0	5.5	5.7	4.8	3.3	6.5	5.9	5.3	3.3	8.2	5.8	24
20	5.1	4.2	2.9	5.5	5.5	7.5	8.9	10.2	12.4	12.1	13.2	13.3	13.9	13.7	14.8	10.2	7.7	7.7	8.7	8.2	9.8	3.8	13.2	22.7	2.9	22.7	9.8	24
21	20.7	17.5	17.9	16.1	15.4	17.0	15.8	16.0	13.7	17.6	15.5	13.1	13.6	11.3	10.1	11.9	10.3	11.1	12.3	10.6	9.3	11.9	14.8	12.1	9.3	20.7	14.0	24
22	9.7	11.1	8.8	9.6	11.9	11.9	10.8	11.3	11.7	10.9	10.0	12.1	9.8	12.9	14.5	13.0	15.7	13.2	10.0	11.8	10.0	13.1	12.2	11.6	8.8	15.7	11.6	24
23	12.9	14.0	13.8	14.1	13.1	12.2	14.7	14.8	14.1	15.3	14.8	14.1	18.0	17.4	23.4	20.6	20.2	19.8	18.1	11.1	14.0	15.6	16.7	14.9	11.1	23.4	15.7	24
24	15.9	14.1	15.2	14.0	14.0	17.3	16.8	15.9	17.3	15.3	15.5	16.2	15.4	18.1	18.8	17.2	11.1	8.9	12.2	8.6	11.0	10.0	9.1	11.0	8.6	18.8	14.1	24
25	10.2	9.5	9.3	11.5	12.4	12.3	17.0	19.6	19.3	15.5	18.3	15.0	17.2	15.8	15.5	15.5	12.5	13.2	10.6	12.9	11.2	12.6	10.4	10.2	9.3	19.6	13.6	24
26	13.7	11.5	10.2	10.2	14.6	10.4	10.6	15.3	16.9	18.4	16.5	18.1	17.0	20.0	19.4	19.6	17.6	18.4	11.5	6.5	8.6	9.4	10.3	10.0	6.5	20.0	13.9	24
27	10.4	8.4	8.3	9.8	7.4	9.9	14.3	12.6	11.3	13.5	16.7	17.1	21.9	16.8	18.2	15.2	13.1	11.1	8.2	8.9	4.0	3.0	2.6	2.6	2.6	21.9	11.1	24
28	3.3	2.8	2.0	2.3	2.6	2.9	2.3	4.5	7.6	8.1	9.8	8.5	21.7	12.1	10.3	11.7	12.6	14.3	8.7	6.6	4.0	4.1	3.7	3.2	2.0	21.7	7.1	24
29	P	3.1	2.9	3.8	4.2	3.0	2.4	5.6	6.3	12.0	13.4	12.2	17.0	12.2	15.3	13.9	20.0	13.7	11.4	17.0	11.6	5.0	5.2	4.0	2.4	20.0	9.4	23
30	4.8	5.4	3.8	5.0	4.1	4.4	9.0	9.5	10.5	12.3	13.5	10.8	13.5	10.9	9.7	10.5	10.1	11.3	10.8	8.5	6.9	5.4	7.8	4.0	3.8	13.5	8.4	24
HOURLY MAX	26.6	23.9	23.3	19.3	20.2	22.6	20.1	19.9	19.4	18.4	23.9	26.3	25.6	23.6	27.9	25.9	20.2	20.4	23.0	20.1	21.1	21.5	22.5	26.2				
HOURLY AVG	10.7	9.7	9.0	9.6	9.3	10.1	10.5	11.9	12.5	13.0	14.0	14.5	15.6	14.8	15.4	15.0	14.1	13.2	11.1	10.2	9.7	9.4	10.6	10.1				

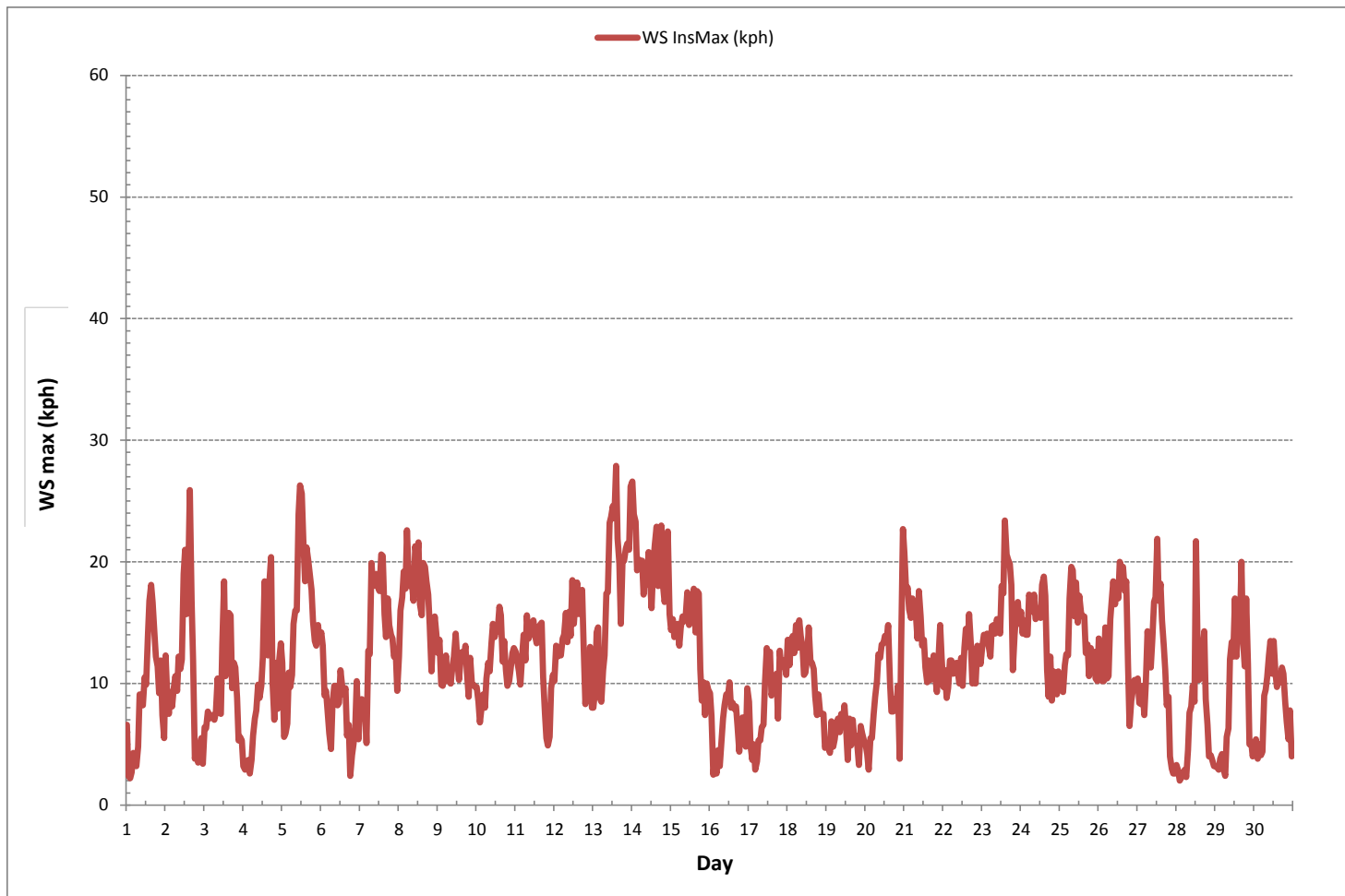
STATUS FLAG CODES

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

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	27.9	kph	@ HOUR	14	ON DAY	13	
OPERATIONAL TIME:						719	hrs

WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA COLD LAKE SOUTH  
 Monitor: WSP [kph]  
 Monthly: 17/04  
 Type: WindRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

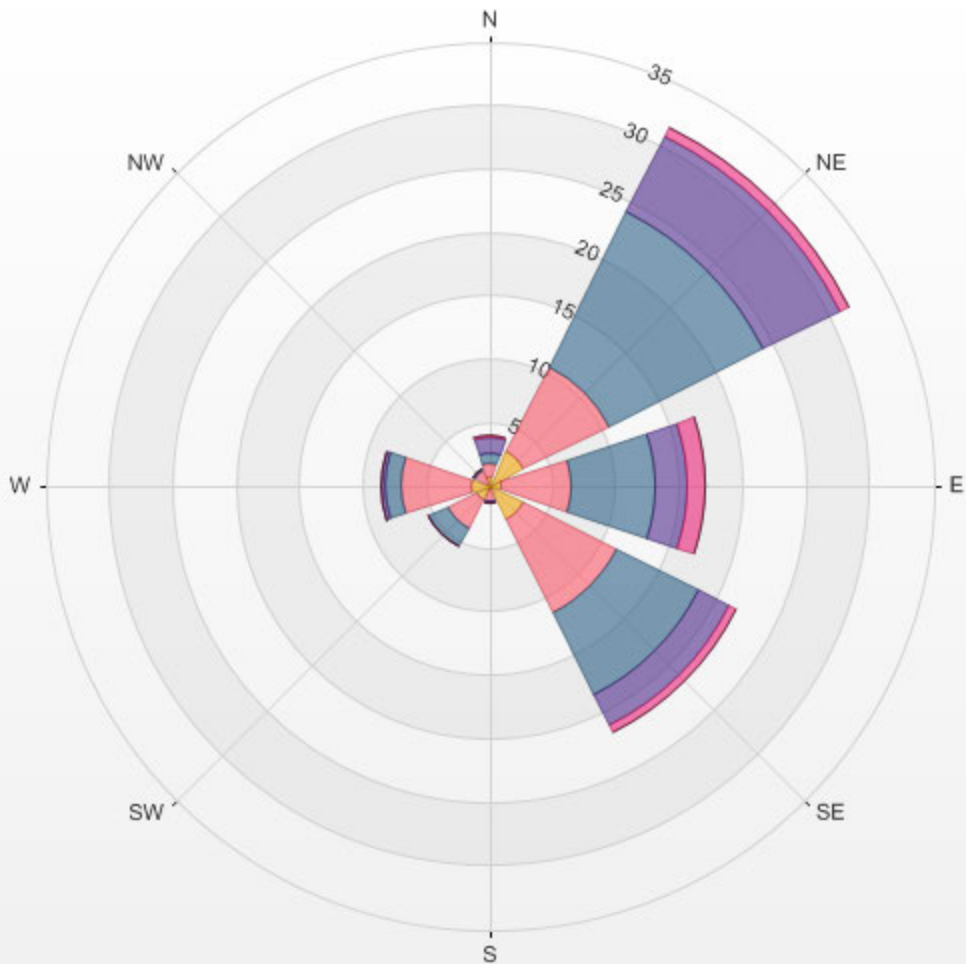
Calm: 8.61%

Calm Avg: 0.00 [kph]

Direction	1.8-3.4	3.4-6.8	6.8-10.3	10.3-13.7	13.7-17.1	>17.1	Total
<b>N</b>	0.7	1.1	0.8	1.3	0.1	0.0	4.0
<b>NE</b>	3.1	7.5	13.6	6.7	0.8	0.0	31.7
<b>E</b>	1.0	5.4	6.7	2.5	1.5	0.0	17.1
<b>SE</b>	3.1	8.1	7.4	2.6	0.6	0.0	21.7
<b>S</b>	0.3	1.0	0.0	0.1	0.0	0.0	1.4
<b>SW</b>	1.3	2.5	1.7	0.0	0.0	0.0	5.4
<b>W</b>	1.5	5.4	1.3	0.4	0.0	0.0	8.6
<b>NW</b>	0.3	1.1	0.1	0.0	0.0	0.0	1.5
<b>Summary</b>	11.1	32.1	31.5	13.6	3.1	0.0	91.4

%	Icon	Classes (kph)	11	32	32	14	3	0
								
			1.8-3.4	3.4-6.8	6.8-10.3	10.3-13.7	13.7-17.1	>17.1

LICA COLD LAKE SOUTH 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 8.61% Calm Wind Avg Speed: 0.92(kph)





***WIND DIRECTION***



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

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.	
DAY																											
1	SW	S	S	WSW	SSW	SE	WSW	WSW	SW	WSW	WSW	SW	W	SW	WSW	WSW	SW	SW	SW	WSW	WSW	WSW	WSW	W	WSW	24	
2	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	WNW	NE	W	W	SW	WNW	W	WSW	W	WSW	24	
3	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	W	WSW	SW	SW	SW	WSW	WSW	WSW	W	WNW	W	WNW	W	W	W	WSW	24	
4	SSW	SSE	NE	SSW	WSW	ENE	NNE	SE	SSW	SE	ESE	ESE	SE	SE	S	SSW	SSE	SSW	E	NE	N	SW	SSE	SE	SE	24	
5	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	SE	SE	SSE	SE	SSE	SSE	SSE	SSE	SE	SE	SE	SE	SE	SE	SE	SE	24	
6	SE	SE	SE	SE	ESE	ESE	E	ESE	SE	SE	WSW	W	WSW	WSW	WSW	SW	W	ESE	SE	E	NE	NE	NNW	ENE	SE	24	
7	NE	NNW	ENE	NE	NE	W	NW	NNW	N	NE	NE	NNE	NNE	NNE	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	24	
8	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	N	N	N	NNE	NE	NE	NE	NE	NE	NE	ENE	ENE	NE	NE	NE	ENE	NE	24	
9	NE	ENE	NE	NE	NE	NE	NNE	NE	NE	NE	ENE	ESE	SE	ESE	SE	SE	ESE	ESE	ESE	SE	SE	SE	SE	SE	E	24	
10	SE	SE	SE	SE	SE	SE	SE	SE	ESE	SE	SE	SE	SE	SE	SE	E	ENE	ENE	NE	NE	NE	NE	NNE	NNE	E	24	
11	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NE	NNE	NNE	NNE	NNE	NNE	NE	NE	NE	NE	NNE	NNE	NE	NE	NNE	NNE	24	
12	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	NNE	NNE	NE	NE	NE	NE	NE	NE	NE	E	E	E	E	E	ENE	24	
13	ENE	ENE	E	E	E	ENE	ENE	ENE	ENE	ENE	E	E	E	E	E	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	ENE	24	
14	E	E	E	E	E	ENE	E	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NE	NE	NNE	ENE	24	
15	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NE	NNE	NE	NE	NNE	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	NNE	NE	NNE	24	
16	NE	NNE	NNE	E	WNW	WNW	W	NW	WNW	W	WNW	WNW	W	WSW	WSW	W	W	W	SW	SSW	SSW	SSW	SSE	SE	W	24	
17	SE	ESE	ESE	ESE	ENE	ENE	ESE	SE	SE	E	NNE	NNE	NNE	NNE	NE	NE	NNE	NNE	NE	NE	NE	NE	NE	NE	NE	24	
18	NE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	NE	NE	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	24	
19	NE	NE	NE	NE	NE	NNE	NNE	NE	NE	NE	NNE	N	NE	NNE	WSW	E	S	SSE	SSE	SSE	SSE	SSE	SSE	SE	ENE	24	
20	SE	SE	E	ENE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	WSW	WSW	W	W	WNW	WNW	NW	NNW	WSW	NW	NNE	24	
21	NNE	NNE	NE	NE	NE	NE	NE	NE	NE	NNE	NE	ENE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	NE	24	
22	ENE	NE	NE	E	E	E	E	E	ESE	E	E	NE	NE	NNE	NE	E	NE	ENE	E	NE	NE	ENE	ENE	E	ENE	24	
23	E	E	E	E	E	E	E	E	E	E	E	ESE	ESE	E	E	E	E	E	E	E	E	E	E	E	E	24	
24	E	E	E	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	24	
25	ESE	ESE	ESE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	24	
26	SE	SE	SE	SE	SE	SE	ESE	SE	SE	ESE	SE	ESE	SE	SE	SE	SE	SE	SE	SE	E	E	E	ESE	ESE	SE	24	
27	ESE	ESE	ESE	ESE	E	ENE	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ENE	E	SE	SE	SE	E	NNE	N	NNE	E	ESE	24	
28	ENE	NE	ENE	WSW	WSW	W	W	N	ENE	E	NNE	NNE	NE	NE	ENE	SE	W	NNW	NW	WNW	WSW	WSW	WSW	WSW	N	24	
29	SE	SSW	WSW	ESE	W	SE	NW	WNW	WNW	SSE	SW	SSW	SSW	SW	SSW	SSW	SW	SW	SSE	SW	SW	SE	SE	SE	SSW	24	
30	SE	SE	E	SE	E	E	ESE	E	ESE	ESE	ESE	ESE	ESE	ENE	NE	NE	W	WNW	NW	N	N	NW	NNW	N	ENE	24	

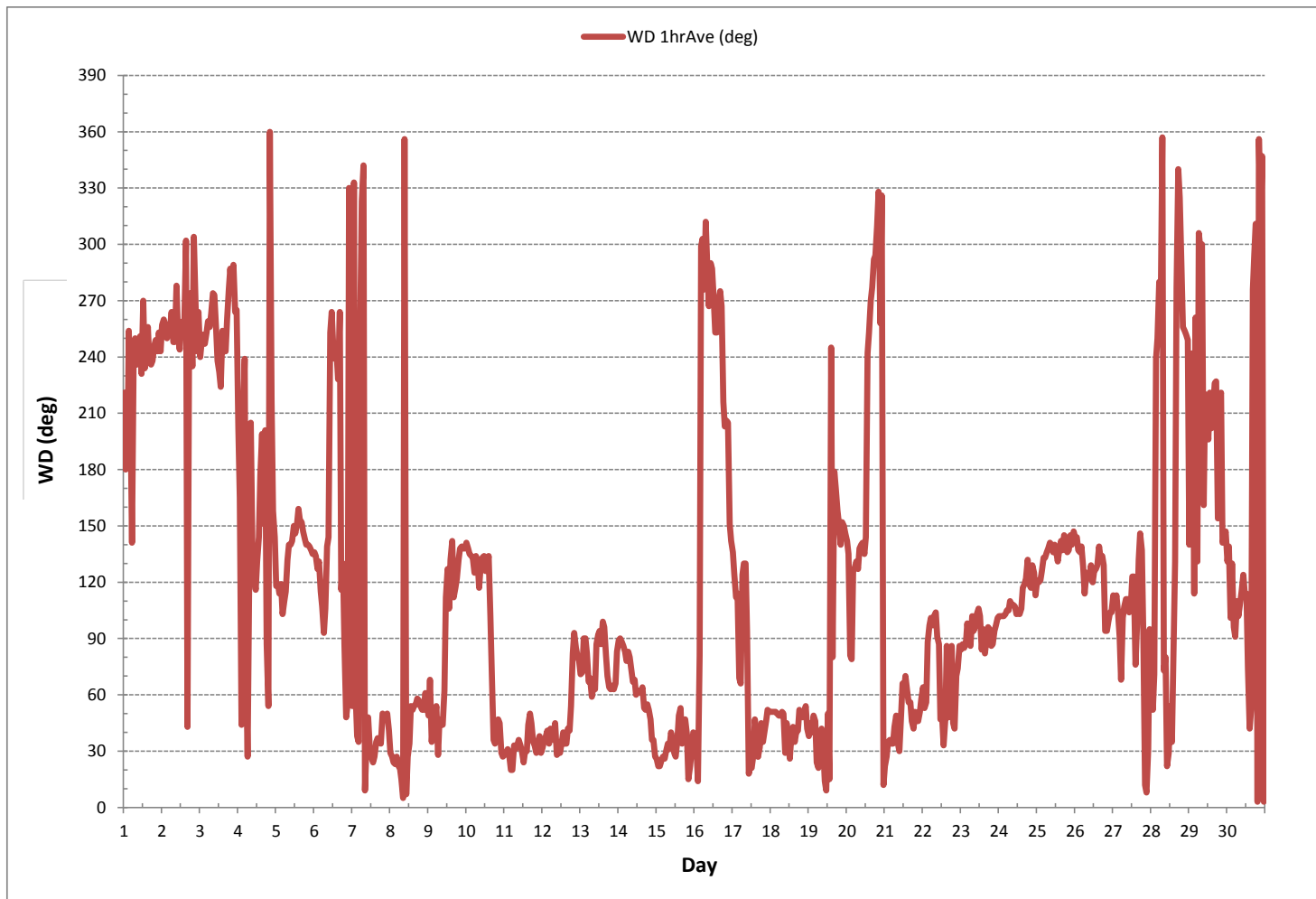
STATUS FLAG CODES

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

LAST CALIBRATION:	April 1, 2015
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	720	hrs
STANDARD DEVIATION:	84		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	78 (ENE)	

WIND DIRECTION Hourly Averages (WD)



***STANDARD DEVIATION WIND DIRECTION***



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

**STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	RDGS.	
DAY																										
1	33	61	46	40	43	51	52	23	18	21	22	28	56	20	19	21	18	20	17	16	19	18	17	19	24	
2	15	15	15	14	13	13	19	17	23	24	28	22	23	24	23	27	43	46	37	37	54	19	49	50	24	
3	21	12	10	12	12	13	17	18	28	33	40	27	22	28	20	19	18	19	20	20	18	22	52	30	24	
4	68	48	49	50	64	60	51	60	35	34	38	35	28	33	50	45	25	26	24	43	29	56	34	15	24	
5	21	25	21	17	18	22	22	19	16	16	16	26	21	28	35	28	28	20	14	13	13	14	13	13	24	
6	12	14	19	16	33	19	42	19	16	35	36	31	34	57	50	54	64	26	25	49	30	49	43	51	24	
7	44	27	24	71	45	47	19	15	21	22	20	19	19	18	19	22	19	20	20	18	19	19	18	19	24	
8	18	17	19	18	20	19	20	17	18	18	20	21	23	20	20	18	17	16	17	18	18	18	18	20	24	
9	21	22	21	22	23	19	22	21	22	32	31	33	44	36	39	38	30	24	21	16	14	13	11	11	24	
10	13	13	16	13	15	21	20	21	24	24	19	22	25	24	19	25	21	20	20	20	20	21	20	18	24	
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14	21	20	21	21	24	23	22	24	20	19	19	15	16	16	17	18	17	17	17	18	19	19	20	21	24	
15	19	18	18	19	19	19	20	19	19	21	20	18	20	19	19	20	19	19	21	19	15	20	20	19	24	
16	18	19	52	28	63	50	36	22	25	17	21	28	24	29	22	36	19	32	35	38	35	30	49	16	24	
17	13	31	17	22	52	13	18	28	29	39	15	16	17	17	22	20	18	21	21	20	20	19	18	17	24	
18	18	18	17	18	18	18	19	18	18	17	19	19	16	21	18	19	20	19	21	17	20	19	17	17	24	
19	20	20	23	23	18	21	21	22	23	23	20	19	32	53	32	50	37	41	37	15	21	14	23	15	24	
20	29	27	69	26	43	22	22	24	19	20	20	25	27	30	21	22	25	24	17	18	15	15	13	15	24	
21	18	19	19	21	20	20	20	18	20	21	23	25	23	25	30	30	24	20	23	18	19	20	18	16	24	
22	18	17	15	19	23	19	22	21	24	22	34	28	54	38	20	28	21	22	31	27	19	18	20	21	24	
23	21	21	21	22	18	19	21	22	23	23	23	23	21	21	21	21	20	19	19	21	21	19	18	20	24	
24	19	21	19	19	18	21	20	22	21	23	24	21	23	23	22	21	22	23	19	22	22	20	21	23	24	
25	23	24	22	23	18	17	16	17	15	17	18	19	21	21	19	15	16	14	18	17	14	12	13	28	24	
26	15	15	15	16	12	22	25	22	22	23	21	22	23	23	20	16	21	19	20	20	19	18	20	20	24	
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29	34	65	39	37	72	50	38	28	74	50	44	45	45	38	40	41	33	28	29	33	24	13	14	32	24	
30	16	29	56	25	25	21	23	26	28	32	36	37	57	29	22	21	41	24	20	28	28	52	32	38	24	

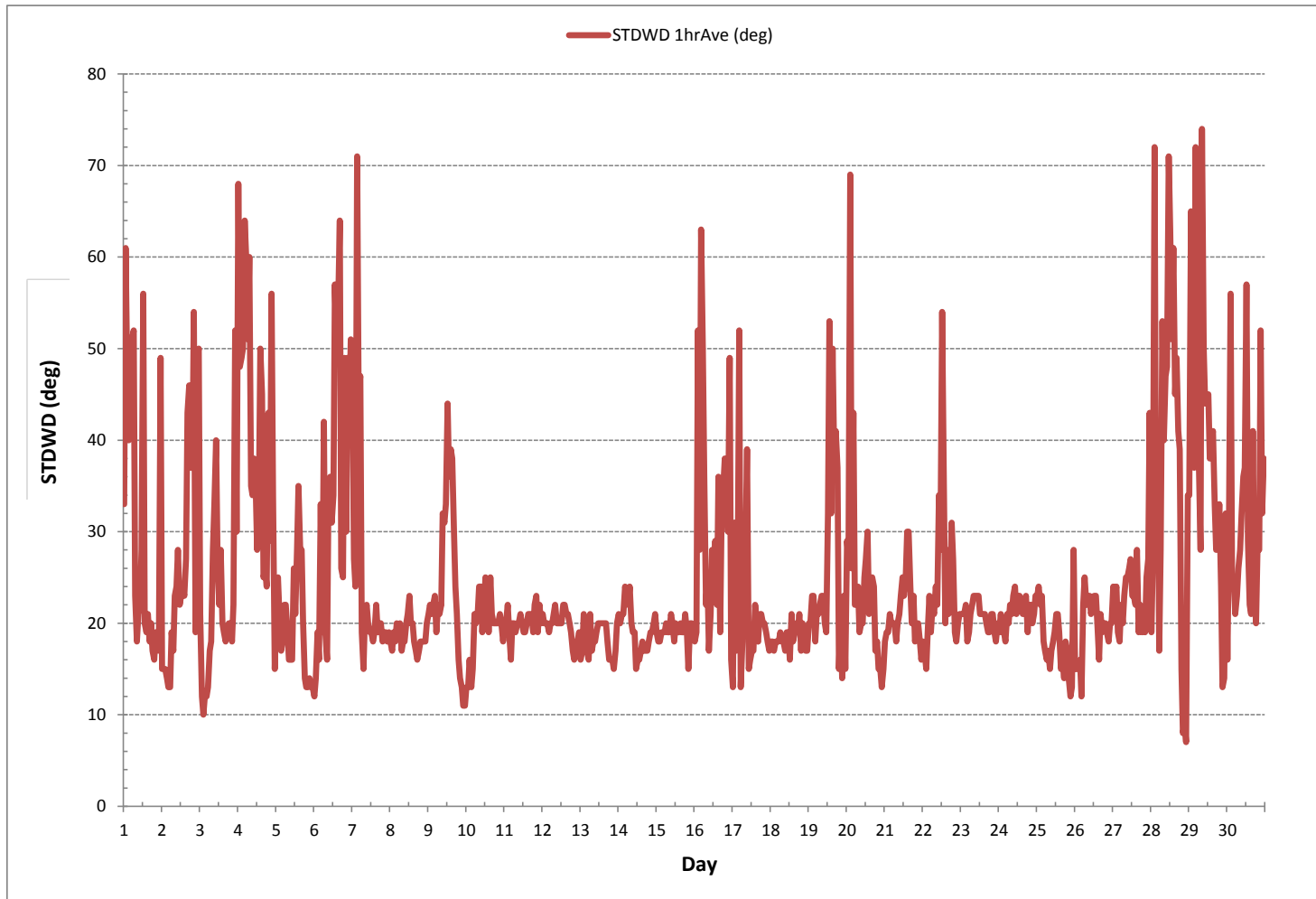
**STATUS FLAG CODES**

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

LAST CALIBRATION: April 1, 2015

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 720 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



***RELATIVE HUMIDITY***



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

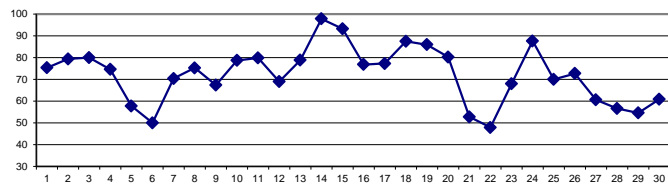
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	67	77	83	87	90	91	91	88	74	66	59	56	53	51	56	60	67	73	79	86	90	91	91	83	51	91	75	24	
2	86	91	93	93	94	94	92	86	72	63	56	53	49	47	44	45	80	86	93	97	99	98	98	97	44	99	79	24	
3	98	93	92	91	92	93	94	91	82	78	66	58	62	68	70	70	65	71	68	73	79	85	89	92	58	98	80	24	
4	94	95	96	96	96	95	95	83	68	65	58	54	48	46	42	40	45	69	74	75	80	85	95	98	40	98	75	24	
5	98	96	97	96	93	92	87	80	76	67	53	39	35	32	29	30	29	29	31	35	37	40	42	43	29	98	58	24	
6	45	47	49	51	54	57	59	59	56	52	49	47	43	39	36	34	32	37	43	55	61	61	63	71	32	71	50	24	
7	71	71	67	70	78	81	74	70	64	60	59	58	57	56	59	62	65	69	74	76	79	84	93	94	56	94	70	24	
8	97	95	96	95	95	95	94	88	86	85	79	69	57	50	51	51	55	56	62	66	71	73	70	72	50	97	75	24	
9	72	72	73	73	74	74	73	72	71	69	65	62	60	57	55	52	53	58	64	69	73	76	78	78	52	78	67	24	
10	80	83	84	85	85	86	84	83	79	74	71	68	69	78	80	75	69	72	75	79	80	83	84	85	68	86	79	24	
11	87	89	90	91	92	92	92	88	86	84	80	79	80	78	74	70	69	66	68	71	75	73	70	75	66	92	80	24	
12	75	77	78	79	81	83	84	79	78	75	70	65	62	58	56	55	53	53	55	61	67	69	71	73	53	84	69	24	
13	76	80	83	86	87	86	82	80	72	67	58	54	57	57	57	67	83	91	96	97	96	96	94	91	54	97	79	24	
14	91	90	88	91	95	98	98	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	88	100	98	24
15	99	98	98	97	96	95	95	94	95	95	94	92	92	92	92	91	90	89	90	90	90	91	90	89	89	99	93	24	
16	88	88	88	88	86	86	85	84	81	77	75	74	72	69	64	57	58	58	70	77	75	79	85	81	57	88	77	24	
17	81	84	87	87	89	90	84	77	70	65	68	67	66	62	56	54	58	69	75	84	91	95	97	100	54	100	77	24	
18	100	98	95	91	91	89	86	85	84	82	80	81	79	78	78	82	86	87	88	92	95	97	98	78	100	88	24		
19	99	99	99	100	100	99	98	93	90	86	84	83	81	76	73	71	67	66	66	80	91	91	85	87	66	100	86	24	
20	89	89	92	95	94	92	89	84	82	75	68	63	60	61	68	69	69	72	76	82	86	92	95	85	60	95	80	24	
21	85	84	83	83	79	66	61	57	57	55	52	45	35	31	30	27	29	33	40	42	45	51	49	48	27	85	53	24	
22	51	59	62	60	54	53	51	50	49	47	44	43	41	39	38	33	30	28	32	46	58	59	61	62	28	62	48	24	
23	61	60	62	62	63	66	66	65	64	61	59	57	54	50	51	60	67	74	81	86	89	92	93	90	50	93	68	24	
24	89	88	89	91	91	89	86	85	83	82	80	81	83	83	85	88	93	92	88	93	92	91	92	90	80	93	88	24	
25	90	90	91	90	89	88	87	81	76	74	68	61	59	56	54	53	54	55	57	58	59	61	63	68	53	91	70	24	
26	70	75	77	79	81	82	81	78	72	67	66	65	65	64	64	65	69	71	74	80	79	76	74	72	64	82	73	24	
27	69	70	70	69	70	69	58	52	48	44	42	44	54	62	61	54	57	60	58	57	65	69	73	79	42	79	61	24	
28	81	79	86	90	92	92	80	64	57	49	40	34	31	29	27	29	30	28	29	38	58	65	73	78	27	92	57	24	
29	80	83	86	89	91	89	74	56	40	33	30	29	30	31	32	32	33	33	36	44	55	62	69	73	29	91	55	24	
30	79	83	86	88	89	86	68	62	57	52	49	44	41	43	43	39	45	49	49	52	58	64	63	73	39	89	61	24	
HOURLY MAX	100	99	99	100	100	99	98	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	24
HOURLY AVG	82	83	84	85	85	85	82	77	72	68	64	61	59	58	58	57	60	63	66	71	76	78	80	81					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 April 2017

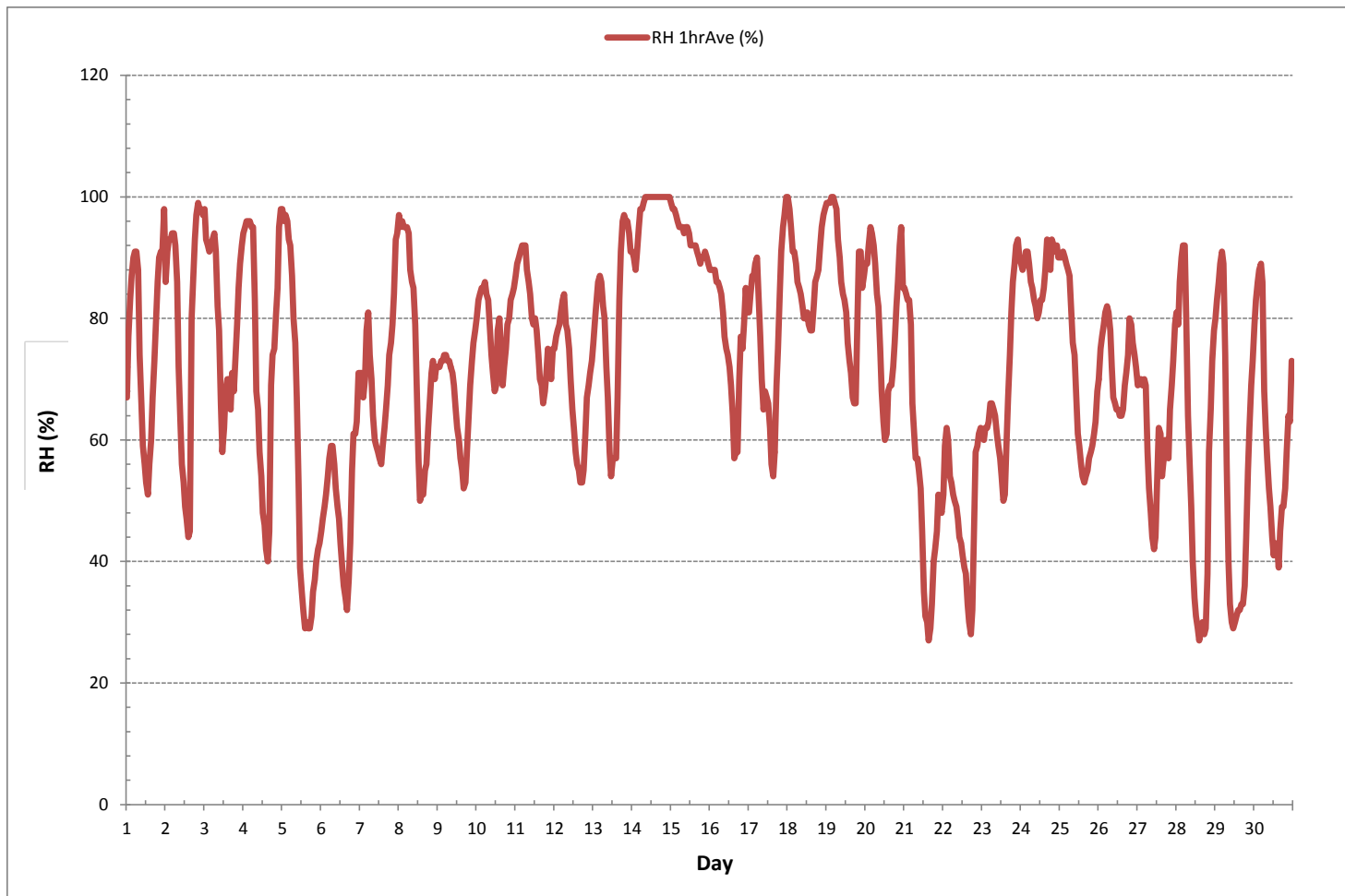


MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	27	%	@ HOUR	15	ON DAY	21
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR	8	ON DAY	14
MAXIMUM 24-HR AVERAGE:	98	%			ON DAY	14
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	19					MONTHLY AVERAGE: 72 %



RELATIVE HUMIDITY Hourly Averages (RH %)



***AMBIENT TEMPERATURE***

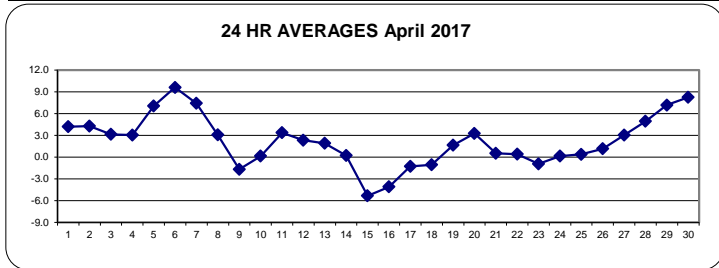


AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	5.6	2.8	0.7	-0.5	-1.3	-1.2	-0.9	1.0	4.2	5.8	7.1	7.4	8.3	8.5	8.6	7.9	7.1	6.4	5.6	4.3	3.5	3.3	3.1	3.6	-1.3	8.6	4.2	24
2	2.7	1.5	0.9	0.5	0.2	-0.1	0.5	1.8	4.8	6.0	8.0	9.4	10.5	11.3	11.9	11.5	5.3	5.4	5.1	3.0	1.7	1.5	0.2	-0.4	-0.4	11.9	4.3	24
3	-0.8	0.0	-0.7	-0.1	-0.5	-0.9	-0.3	0.8	3.0	4.3	6.8	8.4	7.9	7.0	6.4	6.5	6.6	5.6	5.2	4.5	3.4	2.1	0.8	-0.1	-0.9	8.4	3.2	24
4	-1.4	-2.3	-2.7	-2.3	-1.8	-1.6	-1.2	0.9	2.2	2.8	4.6	6.4	7.9	8.7	9.6	9.8	8.3	5.8	4.8	4.4	3.4	2.9	1.9	1.9	-2.7	9.8	3.0	24
5	1.7	1.9	1.5	0.9	1.2	0.7	0.8	1.5	2.9	5.0	8.3	10.8	11.7	12.5	13.1	12.8	12.9	12.5	11.6	10.3	9.7	9.1	8.4	7.7	0.7	13.1	7.1	24
6	7.3	6.9	6.4	6.3	5.9	5.5	5.4	5.8	6.6	8.0	9.5	10.7	12.3	14.5	16.2	16.6	16.6	15.4	13.6	10.8	9.2	7.7	7.4	6.5	5.4	16.6	9.6	24
7	6.2	5.9	6.2	5.1	3.3	2.2	5.3	8.1	10.0	10.7	10.9	11.5	11.5	11.7	11.0	10.2	9.4	8.1	7.1	6.4	5.4	4.9	4.0	3.6	2.2	11.7	7.4	24
8	3.2	2.9	2.4	2.3	1.9	1.7	1.8	2.5	2.6	3.1	4.4	6.2	7.4	7.6	7.3	6.6	5.3	4.7	2.8	0.9	-0.4	-0.7	-0.9	-1.8	-1.8	7.6	3.1	24
9	-2.1	-2.4	-2.7	-2.9	-3.4	-3.7	-3.8	-3.8	-3.6	-3.2	-2.7	-2.0	-1.1	-0.6	0.5	1.4	2.3	2.3	1.2	-0.4	-1.4	-2.2	-2.7	-3.1	-3.8	2.3	-1.7	24
10	-3.4	-3.8	-4.2	-4.2	-4.1	-4.2	-3.7	-3.2	-2.0	-0.6	0.0	1.2	2.5	3.0	2.8	4.0	5.1	4.6	3.6	2.7	2.3	2.0	1.8	1.7	-4.2	5.1	0.2	24
11	1.5	1.2	1.0	0.8	0.9	1.1	1.4	2.2	2.7	2.9	3.4	3.7	3.8	4.5	5.5	6.3	6.8	6.8	6.2	5.1	3.8	3.4	3.6	2.6	0.8	6.8	3.4	24
12	1.5	0.3	-0.3	-0.9	-1.6	-1.5	-1.1	-0.8	-0.4	1.8	3.5	4.6	5.4	6.0	6.2	6.8	6.7	6.1	4.4	3.0	2.5	2.1	1.6	1.6	-1.6	6.8	2.3	24
13	0.9	0.4	-0.1	-0.6	-0.9	-1.2	-0.4	-0.1	1.2	2.3	3.9	4.9	5.8	6.1	6.0	4.6	3.2	2.1	0.9	0.8	1.1	1.1	1.6	2.4	-1.2	6.1	1.9	24
14	2.2	2.2	2.3	1.6	0.8	0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.2	0.0	-0.4	-0.6	-1.0	-1.6	-2.3	-2.9	-2.9	2.3	0.2	24	
15	-3.3	-3.5	-3.9	-4.3	-4.6	-5.1	-5.4	-5.5	-5.6	-5.2	-5.3	-5.1	-4.9	-5.0	-5.1	-4.9	-5.6	-6.0	-6.4	-6.6	-6.7	-6.5	-6.6	-7.0	-7.0	-3.3	-5.3	24
16	-7.4	-8.2	-9.8	-11.2	-12.5	-12.5	-10.0	-7.6	-6.2	-5.2	-3.7	-2.0	-0.8	0.4	1.1	2.4	2.3	2.7	1.8	-0.2	-1.3	-2.5	-3.6	-3.9	-12.5	2.7	-4.1	24
17	-4.7	-5.5	-6.4	-6.8	-7.6	-8.1	-6.0	-3.8	-2.0	-0.2	-0.1	0.7	1.2	1.8	3.3	3.9	3.7	2.7	2.2	1.4	0.6	0.2	-0.1	-0.6	-8.1	3.9	-1.3	24
18	-1.0	-1.7	-2.3	-2.4	-2.6	-3.0	-3.4	-3.5	-3.3	-2.7	-2.0	-1.4	-0.7	0.5	1.1	1.1	0.8	0.4	0.5	0.4	0.0	0.1	0.1	0.1	-3.5	1.1	-1.0	24
19	0.0	0.1	0.1	0.1	-0.1	-0.1	0.1	0.6	0.9	1.5	1.7	2.1	2.7	3.8	4.1	4.5	4.9	4.9	4.9	2.5	0.4	0.0	0.3	-0.2	-0.2	4.9	1.7	24
20	-0.5	-0.4	-1.6	-2.0	-1.2	-0.2	0.3	1.6	2.2	3.8	5.6	7.0	7.8	7.9	6.4	6.8	7.4	7.2	6.2	4.6	3.7	1.8	1.3	2.4	-2.0	7.9	3.3	24
21	1.3	0.3	-0.2	-0.9	-1.6	-2.3	-2.5	-2.2	-1.7	-1.3	-0.4	0.6	1.8	2.6	3.7	4.0	3.8	3.5	2.4	1.7	1.3	0.3	-0.7	-0.8	-2.5	4.0	0.5	24
22	-0.9	-1.5	-1.6	-1.5	-1.7	-1.9	-1.8	-1.6	-1.2	-0.6	0.7	1.2	2.4	2.8	3.3	4.1	4.1	4.2	3.9	1.9	0.0	-0.6	-1.4	-2.1	-2.1	4.2	0.4	24
23	-2.5	-2.9	-3.2	-3.1	-3.3	-3.5	-3.2	-2.5	-1.6	-0.8	-0.2	0.4	1.1	1.6	1.7	1.4	1.2	0.4	-0.1	-0.5	-0.6	-0.6	-0.7	-0.6	-3.5	1.7	-0.9	24
24	-0.6	-0.6	-0.7	-0.9	-0.9	-0.9	-1.0	-0.7	-0.2	0.4	0.9	1.1	1.5	1.9	1.7	1.4	0.9	1.0	0.8	0.3	0.0	-0.4	-0.8	-0.9	-1.0	1.9	0.1	24
25	-0.9	-1.0	-1.2	-1.3	-1.8	-2.0	-1.6	-0.8	-0.2	0.2	0.8	1.4	1.7	2.1	2.1	2.1	2.1	1.8	1.7	1.4	1.1	0.8	0.6	0.2	-2.0	2.1	0.4	24
26	-0.2	-1.0	-1.3	-1.2	-1.5	-1.7	-1.3	-0.7	0.5	1.6	1.9	2.1	2.5	2.8	3.0	3.3	3.0	2.9	2.7	2.2	2.2	2.2	2.2	2.0	-1.7	3.3	1.2	24
27	1.9	1.5	0.9	-0.2	-1.1	-1.2	0.5	1.8	3.2	4.4	5.2	6.1	5.0	4.2	4.9	5.8	5.4	5.2	5.1	4.9	3.9	3.2	2.0	0.7	-1.2	6.1	3.1	24
28	0.4	0.2	-1.3	-2.1	-2.7	-2.7	0.6	3.6	5.0	7.1	8.2	9.3	10.1	10.1	11.2	10.5	11.2	10.9	10.7	8.6	4.8	2.9	1.7	0.7	-2.7	11.2	5.0	24
29	0.0	-0.3	-1.1	-1.8	-2.3	-2.0	2.2	5.2	8.5	10.2	11.1	11.9	12.3	12.5	12.9	13.3	13.4	13.5	12.3	11.2	9.6	8.2	6.4	5.4	-2.3	13.5	7.2	24
30	3.7	2.7	1.5	1.2	0.8	1.3	4.6	6.7	8.4	10.3	11.5	12.7	13.6	13.0	13.3	13.6	13.0	12.3	11.7	10.5	9.0	7.9	8.2	6.6	0.8	13.6	8.3	24
HOURLY MAX	7.3	6.9	6.4	6.3	5.9	5.5	5.4	8.1	10.0	10.7	11.5	12.7	13.6	14.5	16.2	16.6	16.6	15.4	13.6	11.2	9.7	9.1	8.4	7.7				
HOURLY AVG	0.3	-0.1	-0.7	-1.1	-1.5	-1.6	-0.8	0.3	1.4	2.4	3.4	4.4	5.0	5.5	5.8	5.9	5.6	5.1	4.5	3.4	2.4	1.8	1.3	0.8				

STATUS FLAG CODES

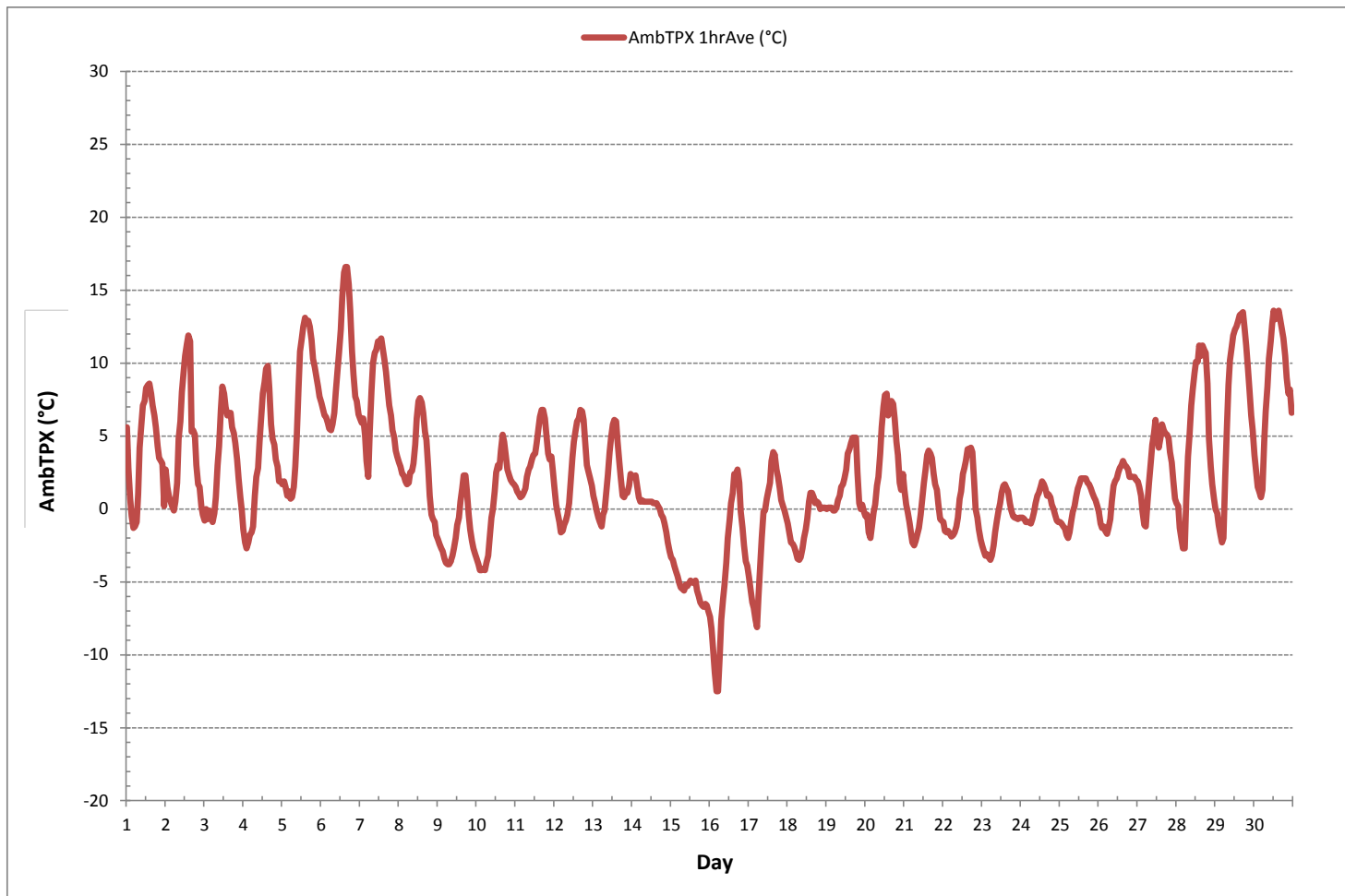
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-12.5 °C	@ HOUR	4	ON DAY	16
MAXIMUM 1-HR AVERAGE:	16.6 °C	@ HOUR	15	ON DAY	6
MAXIMUM 24-HR AVERAGE:	9.6 °C			ON DAY	6
OPERATIONAL TIME:					720 hrs
AMD OPERATION UPTIME:					100.0 %
STANDARD DEVIATION:	4.6	MONTHLY AVERAGE:			2.2 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



***APPENDIX II***  
***NON-CONTINUOUS MONITORING DATA RESULTS***

## ***VOC RESULTS***

Customer ID: LICA

Cust Samp ID: LICAVOC/CLS/April 01, 2017

Maxxam Analytics

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

Client: LICA Sampler S/N: 6167  
 Location: Cold Lake South Canister ID: 2452-  
 Station ID: LICA 01 Installation Date/Time (mst): Mar 27, 2017 @ 13:14  
 Sample ID: LICA/VOC/CLS/Apr 01, 2017 Removal Date/Time (mst): Apr 05, 2017 @ 08:17

Date and Time Information

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

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.7</u>	<u>+23.3</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.0</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst  
 Final leak check deployment vacuum (in. Hg) = - @ - mst  
 Total leak rate = - psi over - minutes  
 Timer reset to zero prior to sampling? YES (yes/no)  
 Date of last flow calibration: March 06, 2017 (due every 3 months)  
 Last date of sample line & fitting replacement: Nov 09, 2016 (due every 6 months)

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

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

Deployment Technician Signature: Alex Yakepov

Collection Technician Signature: Alex Yakepov Date: Apr 05, 2017



## Volatile Organics Data Results

Date: April 1, 2017  
Canister ID: 2452

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.06
1-Hexene	< 0.02
1-Pentene	0.01
2,2,4-Trimethylpentane	0.03
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.05
2,3-Dimethylpentane	0.04
2,4-Dimethylpentane	0.02
2-Methylheptane	0.02
2-Methylhexane	0.03
2-Methylpentane	0.13
3-Methylheptane	< 0.02
3-Methylhexane	0.04
3-Methylpentane	0.05
Acetone	2
Acrolein	< 0.3
Benzene	0.12
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.02
Carbon disulfide	2.49
Carbon tetrachloride	0.13
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.04
Chloromethane	0.61
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.08
Cyclopentane	0.03
Dibromochloromethane	< 0.01
Ethanol	0.9
Ethyl acetate	< 0.4
Ethylbenzene	0.03
Freon-11	0.28
Freon-113	0.12



## Volatile Organics Data Results

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Date: April 1, 2017  
Canister ID: 2452

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.57
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.37
Isopentane	0.32
Isoprene	0.03
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.1
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.1
Methylcyclopentane	0.09
Methylene chloride	< 0.3
n-Butane	0.81
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.05
n-Hexane	0.07
n-Nonane	< 0.01
n-Octane	0.02
n-Pentane	0.2
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	0.01
o-Xylene	0.03
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.12
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02



Maxxam Analytics

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

Client: LICA Sampler S/N: 6167  
 Location: Cold Lake South Canister ID: 1685  
 Station ID: LICA 01 Installation Date/Time (mst): Apr 05, 2017 @ 08:17  
 Sample ID: LICA/VOC/CLS/Apr 07, 2017 Removal Date/Time (mst): Apr 10, 2017 @ 09:42

Date and Time Information

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

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.3</u>	<u>+23.6</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.0</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = — @ — mst  
 Final leak check deployment vacuum (in. Hg) = — @ — mst  
 Total leak rate = — psi over — minutes  
 Timer reset to zero prior to sampling? YES (yes/no)  
 Date of last flow calibration: Mar 06, 2017 (due every 3 months)  
 Last date of sample line & fitting replacement: Nov 09, 2016 (due every 6 months)

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

Comments: m/q

Deployment Technician Signature: Alex Yakepov

Collection Technician Signature: Alex Yakepov Date: Apr 10, 2017

Sample ID: 17040133-001

Customer ID: LICA  
 Cust Samp ID: LICA/VOC/CLS/Apr 07, 2017

## Volatile Organics Data Results

Date: April 7, 2017  
Canister ID: 1685

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	< 0.02
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.04
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.02
Acetone	5.4
Acrolein	< 0.3
Benzene	0.07
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.02
Carbon disulfide	0.54
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	0.05
Chloroform	0.02
Chloromethane	0.87
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.04
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	0.01
Dibromochloromethane	< 0.01
Ethanol	1.5
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.24
Freon-113	0.1

## Volatile Organics Data Results

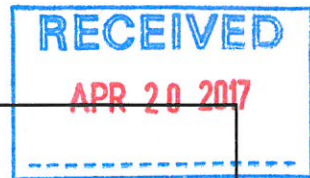
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Date: April 7, 2017  
Canister ID: 1685

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.43
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.71
Isopentane	0.37
Isoprene	0.04
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	< 0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	0.5
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.03
Methylcyclopentane	0.03
Methylene chloride	< 0.3
n-Butane	0.66
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.02
n-Hexane	0.04
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.2
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	< 0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.04
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.03
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Customer ID: LICA

Cust Samp ID: LICA/VOC/CLS/Apr 13, 2017



Maxxam Analytics

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

Client: LICA Sampler S/N: 6167  
 Location: cold lake South Canister ID: 6104  
 Station ID: LICA 01 Installation Date/Time (mst): Apr 10, 2017 @ 09:42  
 Sample ID: LICA/VOC/CLS/Apr 13, 2017 Removal Date/Time (mst): Apr 18, 2017 @ 09:06

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Apr 13, 2017</u>	<u>00:00</u>	<u>00:00 Apr 14, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>- 27.5</u>	<u>+23.8</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.0</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst  
 Final leak check deployment vacuum (in. Hg) = - @ - mst  
 Total leak rate = - psi over - minutes  
 Timer reset to zero prior to sampling? YES (yes/no)  
 Date of last flow calibration: Mar 06, 2017 (due every 3 months)  
 Last date of sample line & fitting replacement: Nov 09, 2016 (due every 6 months)

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

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

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Apr 18, 2017

## Volatile Organics Data Results

Date: April 13, 2017  
Canister ID: 6104

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	< 0.02
1-Hexene	< 0.02
1-Pentene	0.02
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.03
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.18
3-Methylheptane	< 0.02
3-Methylhexane	0.03
3-Methylpentane	0.12
Acetone	4.5
Acrolein	< 0.3
Benzene	0.09
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	2.08
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	< 0.02
Chloromethane	0.6
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.03
cis-2-Pentene	< 0.02
Cyclohexane	0.07
Cyclopentane	0.04
Dibromochloromethane	< 0.01
Ethanol	0.8
Ethyl acetate	< 0.4
Ethylbenzene	0.01
Freon-11	0.24
Freon-113	0.1

## Volatile Organics Data Results

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Date: April 13, 2017  
Canister ID: 6104

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.43
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.45
Isopentane	1.26
Isoprene	0.02
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	< 0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	0.4
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.05
Methylcyclopentane	0.15
Methylene chloride	< 0.3
n-Butane	0.88
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.03
n-Hexane	0.17
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	1.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	< 0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.1
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Customer ID: LICA

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

Maxxam Analytics

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

Client: LICA Sampler S/N: 6167  
 Location: Cold Lake South Canister ID: 23774  
 Station ID: LICA 01 Installation Date/Time (mst): Apr 18, 2017 @ 09:06  
 Sample ID: LICA/VOC/CLS/Apr 19, 2017 Removal Date/Time (mst): Apr 20, 2017 @ 10:10

Date and Time Information

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

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.2</u>	<u>+23.0</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.0</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst  
 Final leak check deployment vacuum (in. Hg) = - @ - mst  
 Total leak rate = - psi over - minutes  
 Timer reset to zero prior to sampling? YES (yes/no)  
 Date of last flow calibration: Mar 06, 2017 (due every 3 months)  
 Last date of sample line & fitting replacement: Apr 18, 2017 (due every 6 months)

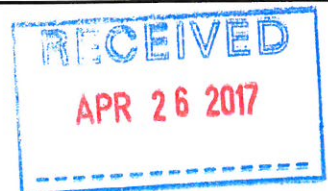
\*\*Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required\*\*

Comments: The sample line renewed; on April 18, 2017

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov

Date: Apr 20, 2017





## Volatile Organics Data Results

Date: April 19, 2017  
Canister ID: 23774

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	< 0.02
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	0.02
2-Methylpentane	< 0.01
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.01
Acetone	1.9
Acrolein	< 0.3
Benzene	0.07
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.03
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	< 0.02
Chloromethane	0.47
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.58
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	0.4
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.27
Freon-113	0.09

## Volatile Organics Data Results

Date: April 19, 2017  
Canister ID: 23774

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.39
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.13
Isopentane	0.16
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	< 0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.02
Methylcyclopentane	< 0.02
Methylene chloride	< 0.3
n-Butane	0.36
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.01
n-Hexane	0.02
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	< 0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.04
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

**Maxxam Analytics**

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

Client: LICA Sampler S/N: 6167  
 Location: Cold Lake South Canister ID: 1531  
 Station ID: LICA 01 Installation Date/Time (mst): Apr 20, 2017 @ 10:10  
 Sample ID: LICA/VOC/CLS/Apr 25, 2017 Removal Date/Time (mst): Apr 27, 2017 @ 10:28

**Date and Time Information**

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

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>- 27.7</u>	<u>+ 24.1</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.0</u>

**Deployment/Collection and Maintenance Checklist**

Initial leak check deployment vacuum (in. Hg) = — @ — mst  
 Final leak check deployment vacuum (in. Hg) = — @ — mst  
 Total leak rate = — psi over — minutes  
 Timer reset to zero prior to sampling? YES (yes/no)  
 Date of last flow calibration: Mar 06, 2017 (due every 3 months)  
 Last date of sample line & fitting replacement: Apr 18, 2017 (due every 6 months)

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

Comments: n/a

Deployment Technician Signature: Alex Yakupov

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

**Sample ID: 17040270-001**

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



## Volatile Organics Data Results

Date: April 25, 2017  
Canister ID: 1531

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	< 0.02
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	< 0.01
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	< 0.01
Acetone	1.1
Acrolein	< 0.3
Benzene	0.04
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	< 0.01
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	< 0.02
Chloromethane	0.43
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.56
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	< 0.3
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.26
Freon-113	0.09

## Volatile Organics Data Results

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Date: April 25, 2017  
Canister ID: 1531

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

## ***PAH RESULTS***

Sample ID: 17040066-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/April 01, 2017

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### TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-02</u>
Location:	<u>Cold Lake South</u>	Motor S/N:	<u>1138/100-1020</u>
Station ID:	<u>LICA 01</u>	Installation Date/Time:	<u>Mar 27, 2017/14:09</u>
Field Sample ID:	<u>LICA/PUF/CLS/Apr 01, 2017</u>	Removal Date/Time:	<u>Apr 05, 2017/08:04</u>

### Sample Data Collection Information

Sample Date:	<u>Apr 01, 2017</u>	Average Pressure (mmHg)	<u>707</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q <sub>std</sub> )	<u>229</u>
End Time (mst):	<u>00:00 Apr 02, 2017</u>	Average Temperature (°C)	<u>+5.2°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (Vstd m <sup>3</sup> )	<u>330.22</u>

### Sample Recovery Checklist

(circle one)

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

Date of last calibration/audit: Dec 28, 2016

Other observations? PUF quarterly audit was completed after the sample had been removed.

Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: April 05, 2017

RECEIVED  
APR 06 2017

## Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: April 1, 2017  
PUF S/N: TE-02

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.03
2-Methylnaphthalene	0.05
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.03
Fluorene	0.06
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.03
Perylene	< 0.01
Phenanthrene	0.13
Pyrene	0.03
Retene	0.01



Sample ID: 17040133-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Apr 07, 2017



TISCH PUF PLUS Sample Collection Data Sheet

Client: LICA Puf+ S/N: 9102
Location: Cold Lake South Motor S/N: 1138/ 100-1020
Station ID: LICA 01 Installation Date/Time: Apr 05, 2017/08:04
Field Sample ID: LICA/PUF/CLS/Apr 07, 2017 Removal Date/Time: Apr 10, 2017/09:33

Sample Data Collection Information

Sample Date: Apr 07, 2017 Average Pressure (mmHg) 715
Start Time (mst): 00:00 Average Flow (Qstd) 229
End Time (mst): 00:00 Apr 08, 2017 Average Temperature (°C) + 8.4 °
Elapsed Time (Hours): 24.0 Volume (Vstd m³) 330.20

Sample Recovery Checklist

(circle one)
Flow Rate 230 slpm +/- 0.2 slpm ? YES NO
Average temperature appears correct? YES NO
Average pressure appears correct? YES NO
Any error messages? (if yes list below) YES NO
Sample duration 24 hours? YES NO
Date of last calibration/audit: Apr 05, 2017
Other observations? n/a

Empty lines for additional notes or observations.

Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Apr 10, 2017

## Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

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Date: April 7, 2017  
PUF S/N: 9102

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.03
2-Methylnaphthalene	0.05
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	0.04
Acridine	< 0.01
Anthracene	0.03
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.05
Fluorene	0.07
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.03
Perylene	< 0.01
Phenanthrene	0.21
Pyrene	0.04
Retene	0.01

Sample ID: 17040202-002

Customer ID: LICA

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



### TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-04</u>
Location:	<u>Cold Lake South</u>	Motor S/N:	<u>1138 / 100-1020</u>
Station ID:	<u>LICA 01</u>	Installation Date/Time:	<u>Apr 10, 2017 / 09:33</u>
Field Sample ID:	<u>LICA/PUF/CLS/Apr 13, 2017</u>	Removal Date/Time:	<u>Apr 18, 2017 / 09:57</u>

### Sample Data Collection Information

Sample Date:	<u>Apr 13, 2017</u>	Average Pressure (mmHg)	<u>715</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q <sub>std</sub> )	<u>229</u>
End Time (mst):	<u>00:00 Apr 14, 2017</u>	Average Temperature (°C)	<u>+ 2.1°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V <sub>std</sub> m <sup>3</sup> )	<u>330.19</u>

### Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	<input type="radio"/> YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	<u>Apr 05, 2017</u>	
Other observations?	<u>n/a</u>	

Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	<u>Date: Apr 18, 2017</u>

## Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: April 13, 2017  
PUF S/N: TE-04

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.04
2-Methylnaphthalene	0.07
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.02
Fluorene	0.03
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.04
Perylene	< 0.01
Phenanthrene	0.06
Pyrene	0.02
Retene	0.01

Sample ID: 17040253-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/April 19, 2017



TISCH PUF PLUS Sample Collection Data Sheet

Client:	LICA	Puf+ S/N:	9801
Location:	Cold Lake South	Motor S/N:	1138 / 100 - 1020
Station ID:	LICA 01	Installation Date/Time:	Apr 18, 2017 / 09:57
Field Sample ID:	LICA/PUF/CLS/ Apr 19, 2017	Removal Date/Time:	Apr 20, 2017 / 10:21

Sample Data Collection Information

Sample Date:	Apr 19, 2017	Average Pressure (mmHg)	714
Start Time (mst):	00:00	Average Flow (Q <sub>std</sub> )	229
End Time (mst):	00:00 Apr 20, 2017	Average Temperature (°C)	+3.1
Elapsed Time (Hours):	24.0	Volume (V <sub>std</sub> m <sup>3</sup> )	330.19

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	<input type="radio"/> YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	Apr 05, 2017	
Other observations?	n/a	

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

## Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: April 19, 2017  
PUF S/N: 9801

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.08
2-Methylnaphthalene	0.15
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.02
Fluorene	0.04
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.23
Perylene	< 0.01
Phenanthrene	0.08
Pyrene	0.02
Retene	0.01

Sample ID: 17040270-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Apr. 25, 2017

**TISCH PUF PLUS Sample Collection Data Sheet**

Client:	<u>LICA</u>	Puff S/N:	<u>TE-11</u>
Location:	<u>Cold Lake South</u>	Motor S/N:	<u>1138 / 100-1020</u>
Station ID:	<u>LICA 01</u>	Installation Date/Time:	<u>Apr 20, 2017 / 10:21</u>
Field Sample ID:	<u>LICA/PUF/CLS/Apr 25, 2017</u>	Removal Date/Time:	<u>Apr 27, 2017 / 10:38</u>

**Sample Data Collection Information**

Sample Date:	<u>Apr 25, 2017</u>	Average Pressure (mmHg)	<u>714</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q <sub>std</sub> )	<u>229</u>
End Time (mst):	<u>00:00 Apr 26, 2017</u>	Average Temperature (°C)	<u>+0.5°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V <sub>std</sub> m <sup>3</sup> )	<u>330.17</u>

**Sample Recovery Checklist**

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	NO
Date of last calibration/audit:	<u>Apr 05, 2017</u>	
Other observations?	<u>n/a</u>	



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Apr 27, 2017

## Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

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Date: April 25, 2017  
PUF S/N: TE-11

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.02
2-Methylnaphthalene	0.04
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.01
Fluorene	0.03
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.03
Perylene	< 0.01
Phenanthrene	0.06
Pyrene	0.01
Retene	< 0.01



***PARTISOL RESULTS***

Sample ID: 17040064-001

Customer ID: LICA

Cust Samp ID: Filter # P6193005

### Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Apr 01, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: 619 30 05

Start Time 00:00 Apr 01, 2017

End Time 00:00 Apr 02, 2017

Status OK

Std Vol 24.129

Valid Time 24:00

Total Time 24.0

**Comments: Weather Conditions, etc.**

n/a  
Partisol sampler cover was installed on  
Apr 5, 2017.

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**Technician Signature:**

Alex Yakupov  
Date: Apr. 05, 2017  
Time: 09:11

**Programming**

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

Note: Beginning & End Date should be same date

Sample ID: 17040131-001

Customer ID: LICA

Cust Samp ID: Filter # P6193007

Priority: Normal

### Partisol Sample Data Sheet

AIR FCD-01318/2



Date Sampled: Apr 07, 2017  
 Location: Cold Lake South  
 Parameter: TSP PM10  
 Filter #: P619 30 07

PM2.5

Start Time 00:00 Apr 07, 2017  
 End Time 00:00 Apr 08, 2017  
 Status OK  
 Std Vol 23.513  
 Valid Time 24:00  
 Total Time 24.0

**Comments: Weather Conditions, etc.**

n/a

**Technician Signature:**

Alex Yakupov  
Date: Apr 10, 2017  
Time: 10:06

**Programming**

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

Note: Beginning & End Date should be same date

Sample ID: 17040204-001

Customer ID: LICA

Cust Samp ID: Filter # P6193520

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Apr 13, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P6193520

Start Time 00:00 Apr 13, 2017

End Time 00:00 Apr 14, 2017

Status OK

Std Vol 24.561

Valid Time 24:00

Total Time 24.0

Comments: Weather Conditions, etc.

n/a  
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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Technician Signature:

Alex Yakupov  
Date: Apr 18, 2017  
Time: 09:23

Programming

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

Note: Beginning & End Date should be same date

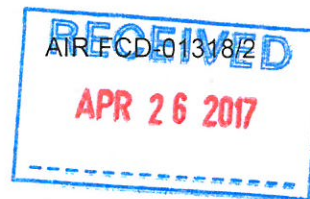
Sample ID: 17040251-001

Customer ID: LICA

Cust Samp ID: Filter # P6193003

### Partisol Sample Data Sheet

Priority: Normal



Date Sampled: April 19, 2017

Location: cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P6193003

Start Time 00:00 Apr 19, 2017

End Time 00:00 Apr 20, 2017

Status OK

Std Vol 24.546

Valid Time 24:00

Total Time 24.0

**Comments: Weather Conditions, etc.**

The quarterly audit completed on April 20, 2017

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**Technician Signature:**

Alex Yakupov  
Date: April 20, 2017  
Time: 10:48

**Programming**

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

Note: Beginning & End Date should be same date

### Partisol Sample Data Sheet

Date Sampled: Apr 25, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P619 30 04

Start Time 00:00 Apr 25, 2017

End Time 00:00 Apr 26, 2017

Status OK

Std Vol 24.664

Valid Time 24:00

Total Time 24.0



Sample ID: 17040267-001

Customer ID: LICA

Cust Samp ID: Flt # P6193004

Comments: Weather Conditions, etc.

Priority: Normal

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Last audit date: Apr 20, 2017

Technician Signature:

Alex Yakupov

Date: Apr 27, 2017

Time: 11:05

Programming

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

Note: Beginning & End Date should be same date

### Partisol Sampler Results

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Date	Filter NO.	Concentration (mg)
April 1	P6193005	0.074
April 7	P6193007	< 0.004
April 13	P6193520	0.048
April 19	P6193003	0.057
April 25	P6193004	0.056

***APPENDIX III***  
***EQUIPMENT CALIBRATION RESULTS***



***SULPHUR DIOXIDE***



## Thermo 43i Sulphur Dioxide Analyzer Calibration

<b>Date:</b> April 13, 2017	<b>Barometric Pressure:</b> 0.941 atm
<b>Company/Airshed:</b> LICA	<b>Station Temperature °C:</b> 22
<b>Location/Station Name:</b> Cold Lake South	<b>Weather Conditions:</b> Mix of sun and clouds
<b>Parameter:</b> Sulphur Dioxide	<b>Calibration Purpose:</b> routine monthly
<b>Start Time 24 hr. (mst):</b> 9:12	<b>Performed By/Reviewer:</b> Alex Yakupov Trina Whitsitt
<b>End Time 24 hr. (mst):</b> 12:52	<b>Cal Gas Expiry Date:</b> July 18, 2019
<b>Calibration Method:</b> Gas Dilution	<b>Converter Model &amp; s/n (if applicable):</b> n/a

<b>Analyzer:</b>	
<b>ID# or Serial Number:</b> 806528242	<b>Range ppb:</b> 500
<b>Last Calibration Date:</b> March 6, 2017	<b>As Found C.F.:</b> 1.011
<b>Previous C.F.:</b> 1.001	<b>New C.F.:</b> 1.000

<b>Calibrator:</b>	<b>Standard Calibration Points for Ranges</b>								
<b>Flow Meter ID's:</b> n/a	<table border="1" style="margin: auto;"> <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								
<b>Make &amp; Model:</b> API 700									
<b>Serial #:</b> 627									
<b>Cal Gas Cylinder I.D. #:</b> LL104222									
<b>Cal Gas Conc. (ppm):</b> 50.6									

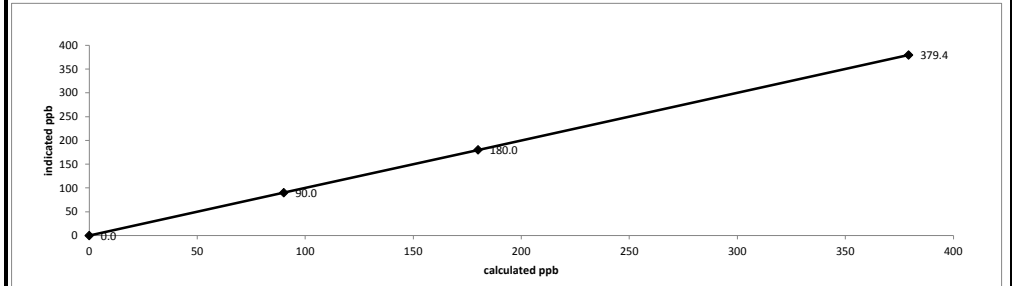
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	5000	0.00	5000	0.0	0.0	n/a
as found high	4965	37.50	5003	379.3	375.0	1.011
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4965	37.50	5003	379.3	379.4	1.000
mid	4985	17.80	5003	180.0	180.0	1.000
low	4991	8.90	5000	90.1	90.0	1.001
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
<b>Average C.F. =</b>						1.000

**Linear Regression/Calibration Results:**

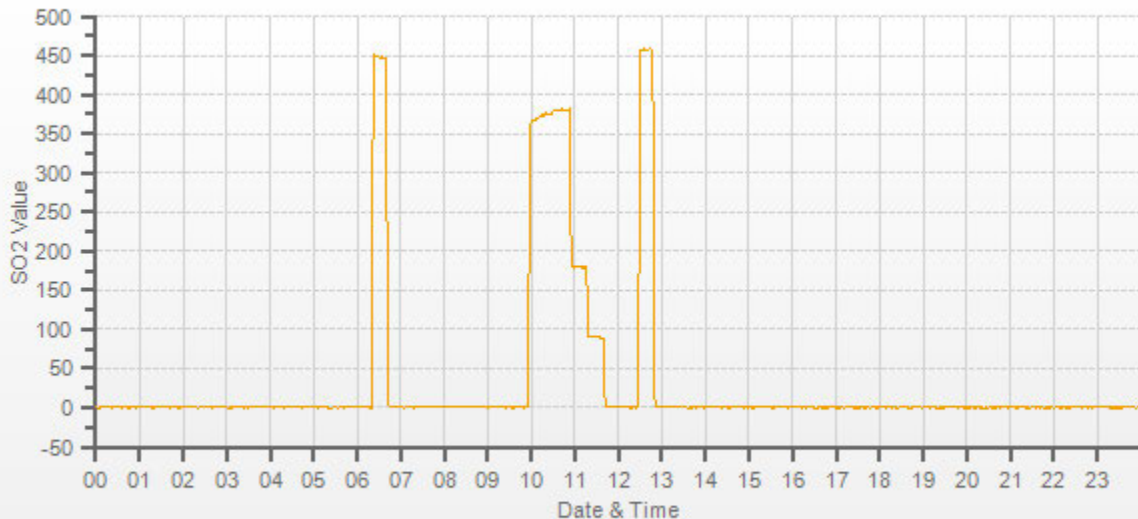
Correlation Coefficient = <u>1.000</u>	<b>LIMITS</b>
Slope = <u>1.000</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.01%</u>	.95-1.05
% change in C.F. from last cal = <u>-1.05%</u>	± 3% F.S.
	± 10%

### Thermo 43i Sulphur Dioxide Analyzer Calibration



<b>As found:</b>	<b>As left:</b>
BKG: <u>8.0</u>	BKG: <u>8.0</u>
COEF: <u>0.957</u>	COEF: <u>0.967</u>
PMT: <u>-624.2</u>	PMT: <u>-624.2</u>
FLASH: <u>773</u>	FLASH: <u>773</u>
INTERNAL: <u>30.2</u>	INTERNAL: <u>30.7</u>
CHAMBER: <u>45.0</u>	CHAMBER: <u>45.2</u>
PERM OVEN GAS: <u>45.00</u>	PERM OVEN GAS: <u>45.01</u>
PERM OVEN HEATER: <u>44.20</u>	PERM OVEN HEATER: <u>44.21</u>
PRESSURE: <u>684.6</u>	PRESSURE: <u>683.4</u>
SAMPLE FLOW: <u>0.477</u>	SAMPLE FLOW: <u>0.477</u>
LAMP INTENSITY: <u>97</u>	LAMP INTENSITY: <u>97</u>
CONVERTER: <u>n/a</u>	CONVERTER: <u>n/a</u>
CONVERTER SET: <u>n/a</u>	CONVERTER SET: <u>n/a</u>
Expected Value: <u>461.0</u>	Expected Value: <u>457.0</u>

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



— SO2[ppb]

***TOTAL REDUCED SULPHUR***

**Maxxam** Thermo 450i Total Reduced Sulphur Analyzer Calibration  
A Bureau Veritas Group Company

Date:	April 13, 2017	Barometric Pressure:	0.941 atm
Company/Airshed:	LICA	Station Temperature °C:	22
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):	9:12	Performed By/Reviewer:	Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst):	12:57	Cal Gas Expiry Date:	June 14, 2019
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	CDNova CDN-101 #501

Analyzer:	ID# or Serial Number:	812728560	Range ppb:	100
	Last Calibration Date:	March 6, 2017	As Found C.F.:	1.002
	Previous C.F.:	0.999	New C.F.:	0.999

Calibrator:	Flow Meter ID's:	n/a	<b>Standard Calibration Points for Ranges</b>	
	Make & Model:	SABIO 2010 D	Point	ppb
	Serial #:	11900613	High	78
	Cal Gas Cylinder I.D. #:	EY0000613	Mid	38
	Cal Gas Conc. (ppm):	10.2	Low	19

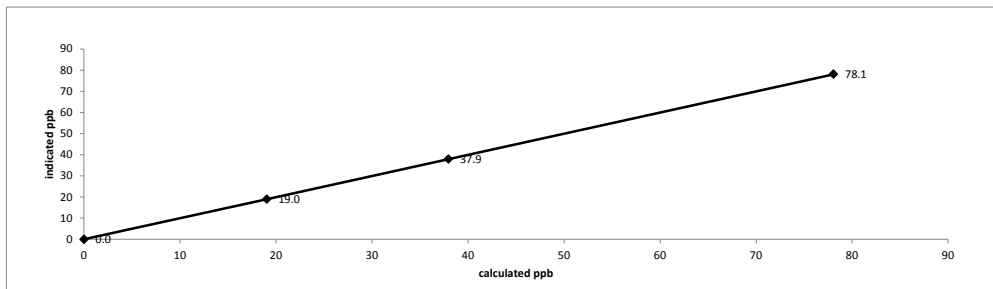
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	7500	0.00	7500	0.0	0.2	n/a
as found high	7443	57.40	7500	78.1	78.1	1.002
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7443	57.40	7500	78.1	78.1	0.999
mid	7471	27.90	7499	37.9	37.9	1.001
low	7487	14.00	7501	19.0	19.0	1.002
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F. =						1.001

**Linear Regression/Calibration Results:**

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		.95-1.05
b (Intercept as % of full scale) =	0.03%		± 3% F.S.
% change in C.F. from last cal =	-0.31%		± 10%

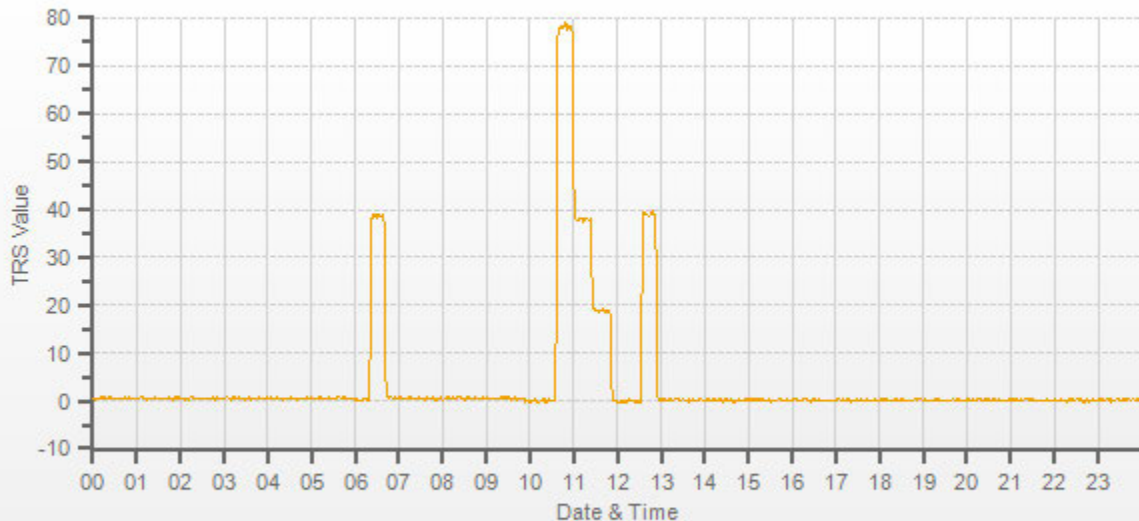
**Thermo 450i Total Reduced Sulphur Analyzer Calibration**



<b>As found:</b>	BKG:	14.0	<b>As left:</b>	BKG:	14.3
	COEF:	0.932		COEF:	0.932
	PMT:	-650.8		PMT:	-650.8
	FLASH:	741		FLASH:	741
	INTERNAL:	32.9		INTERNAL:	33.4
	CHAMBER:	45.0		CHAMBER:	45.0
	CONVERTER TEMP:	825		CONVERTER TEMP:	825
	CONVERTER SET:	825		CONVERTER SET:	825
	PERM OVEN GAS:	45.01		PERM OVEN GAS:	45.00
	PERM OVEN HTR:	44.38		PERM OVEN HTR:	44.37
	PRESSURE:	637.9		PRESSURE:	636.4
	SAMPLE FLOW:	0.491		SAMPLE FLOW:	0.492
	LAMP INTENSITY:	91		LAMP INTENSITY:	91
	Expected Value:	40.2		Expected Value:	39.3

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

No High Point adjustment made.



— TRS[ppb]

***TOTAL HYDROCARBON***



# Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	April 17, 2017	Barometric Pressure:	0.935 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	Cold Lake South	Weather Conditions:	Mix of sun and clouds
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly
Start/End Time 24 hr. (mst):	12:31 / 16:25	Performed By/Reviewer:	Alex Yakupov / Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023

Analyzer:		Range ppm:	50
ID# or Serial Number:	427408718	As Found C.F.:	0.995
Last Calibration Date:	March 7, 2017	New C.F.:	1.000
Previous Cal High Point C.F.:	1.000		

Calibrator:		Standard Calibration Points for a Range of:	50 ppm
Flow Meter ID's:	n/a	Point	Target ppm
Make & Model:	API 700	High	38
Serial #:	627	Mid	18
Cal Gas Cylinder I.D. #:	LL165372	Low	9
CH <sub>4</sub> /C <sub>2</sub> H <sub>6</sub> Cylinder Conc. (ppm):	606.0      212.0		
CH <sub>4</sub> as propane/total CH <sub>4</sub> equivalents (ppm):	583.0      1189.0		

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

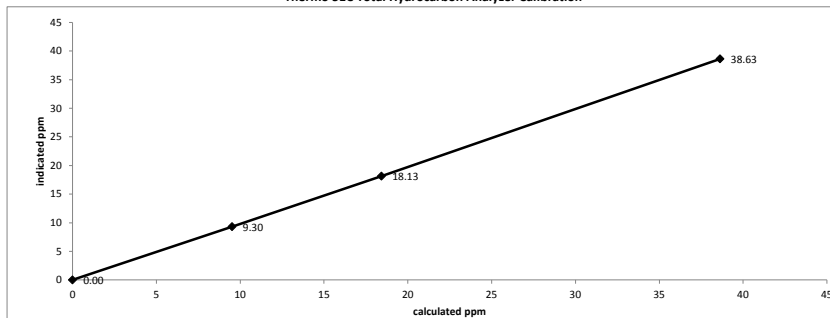
Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	2000	0.00	2000	0.0	-0.11	n/a
as found high	1936	65.00	2001	38.62	38.72	0.995
adjusted zero	2000	0.00	2000	0.00	0.00	n/a
adjusted high	1936	65.00	2001	38.62	38.63	1.000
mid	1969	31.00	2000	18.43	18.13	1.017
low	1984	16.00	2000	9.51	9.30	1.023
calibrator zero	2000	0.00	2000	0.0	0.00	n/a

Average C.F. = 1.013

### Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		.95-1.05
b (Intercept as % of full scale) =	0.30%		± 3% F.S.
% change in C.F. from last cal =	0.53%		± 10%

Thermo 51C Total Hydrocarbon Analyzer Calibration



### As found:

H2 cylinder (psi):	1300
H2 cylinder reg set (psi):	23
Span Cylinder (psi):	1100
Span Cylinder Reg Set (psi):	22
Zero Air Gen Pressure:	34
measurement alarms:	None
service alarms:	None
cnt:	1399
rng:	1
try:	1
flm:	179.9
det:	125.9
Flame:	179
Filter:	125
Base:	125
Sample psi:	06.50
Internal Air Pressure:	20
Internal Fuel Pressure:	13
Measured Flow:	0.938
Expected Value:	27.20

### As left:

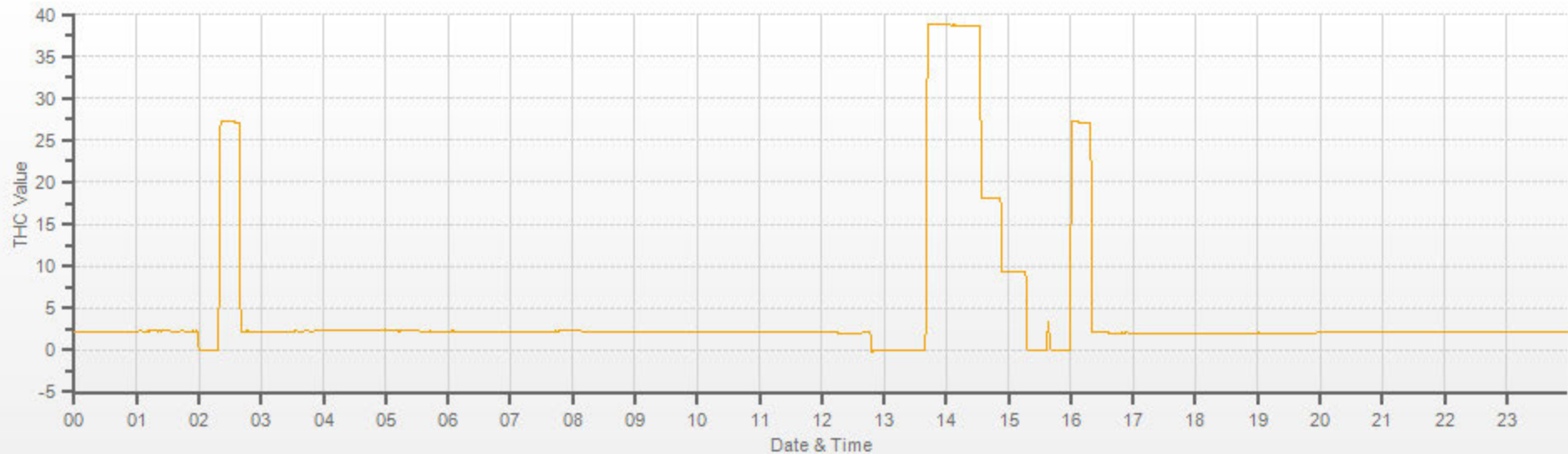
H2 cylinder (psi):	1300
H2 cylinder reg set (psi):	23
Span Cylinder (psi):	1100
Span Cylinder Reg Set (psi):	22
Zero Air Gen Pressure:	34
measurement alarms:	None
service alarms:	None
cnt:	1392
rng:	1
try:	1
flm:	179.5
det:	125.5
Flame:	179
Filter:	125
Base:	125
Sample psi:	06.50
Internal Air Pressure:	20
Internal Fuel Pressure:	13
Measured Flow:	0.938
Expected Value:	27.10

### Comments:

The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.





— THC[ppm]

***NITROGEN DIOXIDE***



## Thermo 42i NO-NO2-NOx Analyzer Calibration

**Date:** April 13, 2017  
**Company/Airshed:** LICA  
**Location/Station Name:** Cold Lake South  
**Start/End Time 24 hr. (mst):** 9:12 / 15:08  
**G.P.T. to be used for Ozone?** No  
**Calibration Method:** Gas Dilution & Gas Phase Titration

**Barometric Pressure:** 0.941 atm  
**Station Temperature °C:** 22  
**Weather Conditions:** Mix of sun and clouds  
**Calibration Purpose:** routine monthly  
**Performed By/Reviewer:** Alex Yakupov | Trina Whitsitt  
**Cal Gas Expiry Date:** July 18, 2019

**Analyzer:**

**ID# or Serial Number:** 1505664393  
**Last Calibration Date:** March 6, 2017  
**Range ppb:** 500

**Correction Factors:**

	Previous C.F.:	As Found C.F.:	New C.F.:
NO =	1.000	0.998	1.000
NO <sub>2</sub> =	1.000	1.000	1.000
NOx =	1.000	0.998	1.000

**Calibrator:**

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

**Standard Calibration Points for a Range of: 500 ppb**

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

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	0.0	n/a	n/a
as found high	4965	37.5	5003	380.1	380.1	381.0	381.0	0.998	0.998
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4965	37.50	5003	380.1	380.1	380.0	380.0	1.000	1.000
mid	4985	17.80	5003	180.4	180.4	180.0	180.0	1.002	1.002
low	4991	8.90	5000	90.2	90.2	90.0	90.0	1.003	1.003
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
<b>Average C.F.=</b>								1.002	1.002

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO <sub>2</sub>	NO drop	NO <sub>2</sub> gain	NO <sub>2</sub> C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4965	37.50	5003	0.0	380.0	381.0	1.0	0.0	1.0	
as found high NO2	4965	37.50	5003	233.0	131.0	381.0	250.0	249.0	249.0	1.000
adjusted high NO2	4965	37.50	5003	233.0	131.0	381.0	250.0	249.0	249.0	1.000
gpt mid	4965	37.50	5003	137.0	237.0	381.0	144.0	143.0	143.0	1.000
gpt low	4965	37.50	5003	45.0	331.0	381.0	50.0	49.0	49.0	1.000
<b>Average NO<sub>2</sub> C.F.=</b>										1.000

**Linear Regression/Calibration Results:**

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	1.000	1.003	.95-1.05
b (Intercept as % of full scale)=	-0.03%	-0.03%	0.12%	± 3% F.S.
% change in C.F. from last cal=	0.25%	0.25%	0.00%	± 10%
NO2 converter efficiency			1.00	0.96 to 1.04

**As found:**

NO Bkg: 3.7  
 NOx Bkg: 3.8  
 NO Coef: 1.009  
 NO2 Coef: 0.995  
 NOx Coef: 0.997  
 PMT: -854.7  
 Internal: 27.7  
 Chamber: 50.2  
 Cooler: -3.0  
 NO2 Converter: 324.5  
 NO2 Converter Set: 325.0  
 Pressure: 181.7  
 Flow: 0.789  
 Ozonator Flow: OK  
 Expected Value NO: 2.0  
 Expected Value NO2: 270.0  
 Expected Value NOx: 272.0

**As left:**

NO Bkg: 3.7  
 NOx Bkg: 3.8  
 NO Coef: 1.003  
 NO2 Coef: 0.995  
 NOx Coef: 0.999  
 PMT: -854.3  
 Internal: 28.2  
 Chamber: 50.1  
 Cooler: -2.8  
 NO2 Converter: 325.3  
 NO2 Converter Set: 325.0  
 Pressure: 181.1  
 Flow: 0.788  
 Ozonator Flow: OK  
 Expected Value NO: 2.2  
 Expected Value NO2: 265.0  
 Expected Value NOx: 368.0

**Comments:**

The analyzer sample inlet filter was changed.

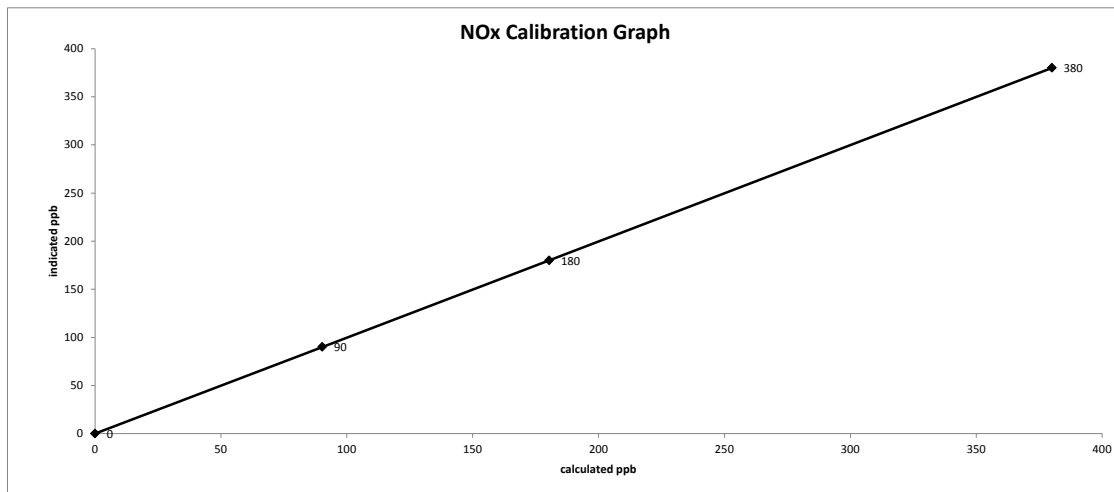
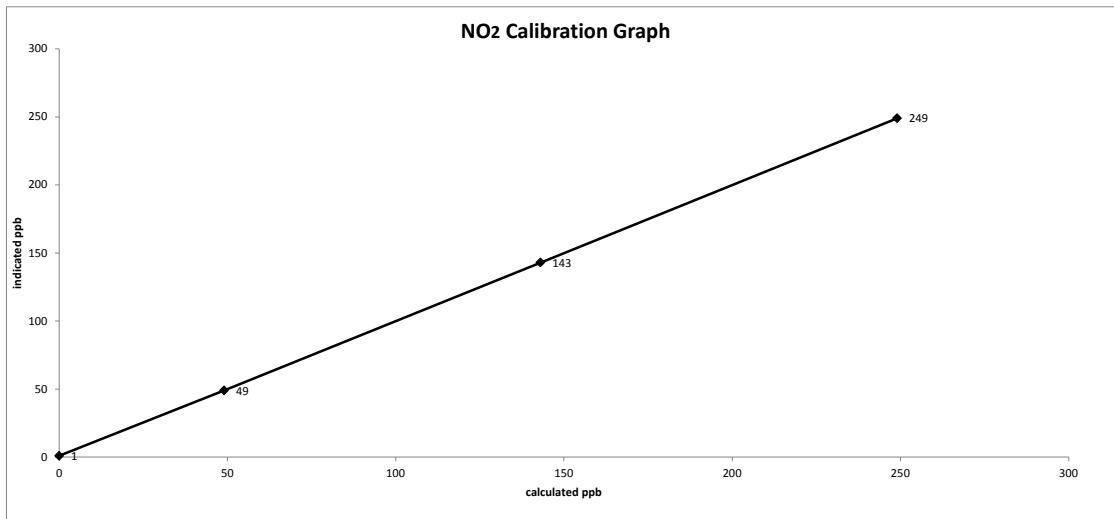
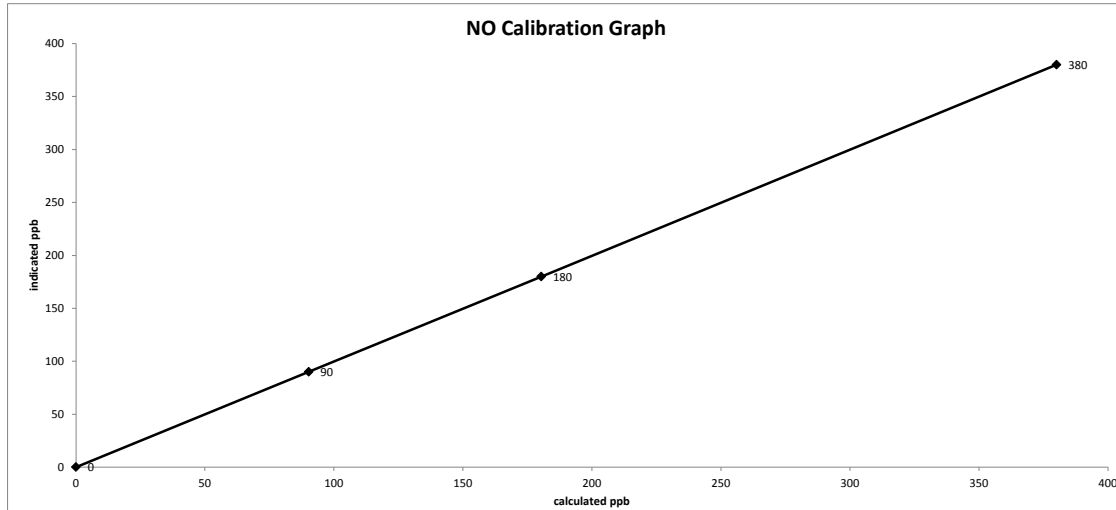
No high point NO2 adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

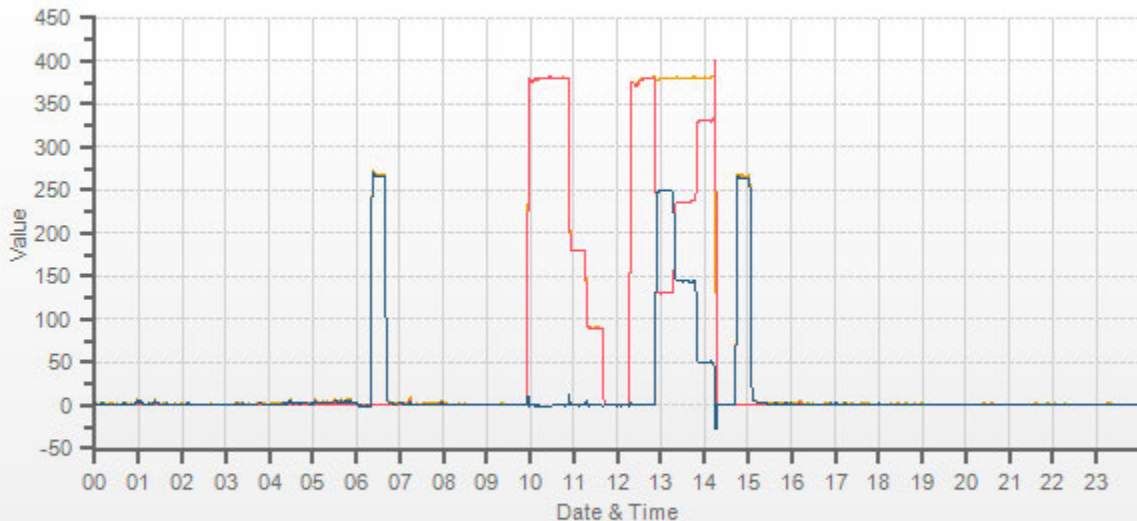
The analyzer cooling fan filter(s) were cleaned.

No ZERO adjustment made.

Date: April 13, 2017  
Company/Airshed: LICA  
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 9:12 / 15:08  
Calibration Purpose: routine monthly  
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

# ***OZONE***

# Maxxam Thermo 49i Ozone Analyzer Calibration

A Bureau Veritas Group Company

**Date:** April 17, 2017  
**Company/Airshed:** LICA  
**Location/Station Name:** Cold Lake South  
**Start/End Time 24 hr. (mst):** 12:31 / 17:42  
**Ozone Calibration Method:** Varying UV Lamp Power  
**G.P.T. Date:** n/a-done by Varying UV Lamp Power  
**Barometric Pressure:** 0.935 atm  
**Station Temperature °C:** 22  
**Weather Conditions:** Mix of sun and clouds  
**Calibration Purpose:** routine monthly  
**Performed By/Reviewer:** Alex Yakupov / Trina Whitsitt  
**Cal Gas Expiry Date:** n/a

**Analyzer:**  
**ID# or Serial Number:** 700419951  
**Last Calibration Date:** March 7, 2017  
**Previous Cal High Point C.F.:** 1.000  
**Ozone Range ppb:** 500  
**As Found C.F.:** 0.990  
**New C.F.:** 1.000

**Calibrator:**  
**Flow Meter ID's:** n/a  
**Make & Model:** SABIO 2010 D  
**Serial #:** 11900613  
**Cal Gas Cylinder I.D. #:** n/a

Point	AMD Required Range of Ozone Calibration Points
High	300-400 ppb
Mid	150-200 ppb
Low	50-75 ppb

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

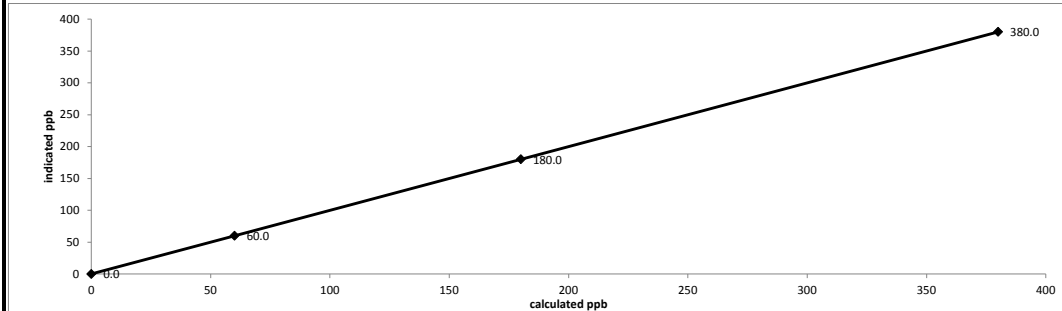
Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	384.0	0.990
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	60.0	60.0	60.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
<b>Average C.F. =</b>						1.000

Linear Regression/Calibration Results:

**Correlation Coefficient =** 1.000  
**Slope =** 1.000  
**b (Intercept as % of full scale) =** 0.00%  
**% change in C.F. from last cal =** 1.04%

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

Thermo 49i Ozone Analyzer Calibration



**As found:**

O3 Bkg: 0.3  
 O3 Coef: 1.002  
 Photo Lamp: 9.6  
 O3 Lamp: 9.0  
 Bench: 29.4  
 Bench Lamp: 53.5  
 O3 Lamp: 67.4  
 Pressure: 708.6  
 Cell A lpm: 0.718  
 Cell B lpm: 0.758  
 O3 ppb: 4.8  
 Cell A ppb: 4.9  
 Cell B ppb: 4.7  
 Cell A int: 89422  
 Expected Value: 270.0

**As left:**

O3 Bkg: 0.3  
 O3 Coef: 0.992  
 Photo Lamp: 9.6  
 O3 Lamp: 9.0  
 Bench: 30.1  
 Bench Lamp: 53.5  
 O3 Lamp: 67.4  
 Pressure: 708.9  
 Cell A lpm: 0.718  
 Cell B lpm: 0.758  
 O3 ppb: 0.2  
 Cell A ppb: 1.6  
 Cell B ppb: -1.2  
 Cell A int: 89403  
 Expected Value: 260.0

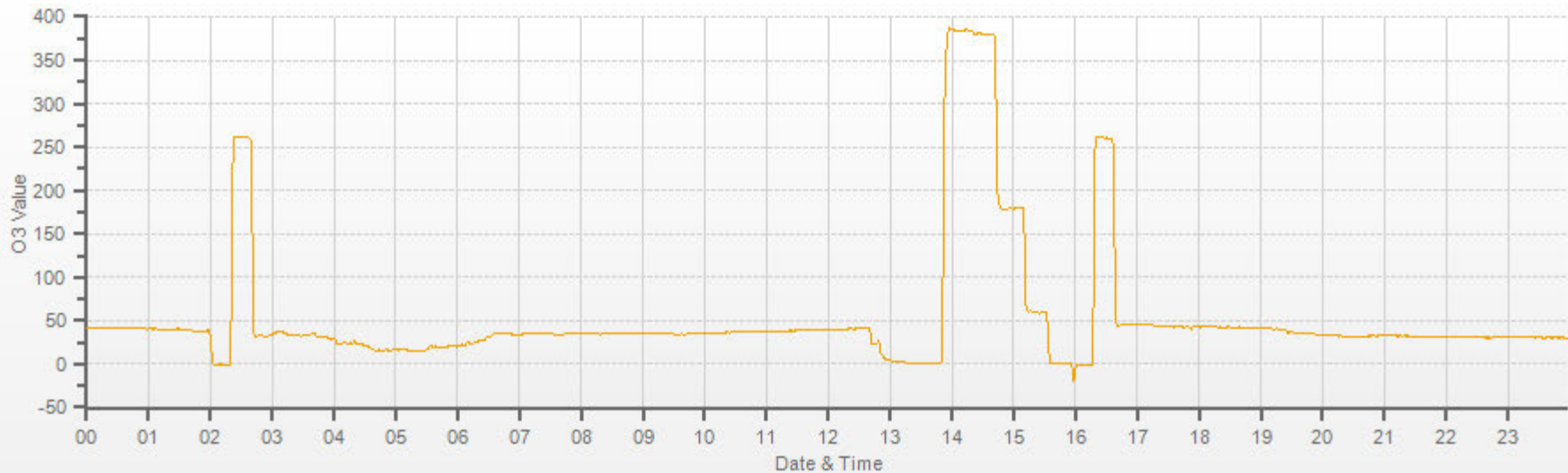
Comments:

The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.

No Zero adjustment made.

O3[ppb] Station: LICA COLD LAKE SOUTH Daily: 17.04.17 Type: AVG 1 Min. [1 Min.]



— O3[ppb]



***PARTICULATE MATTER***



# R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: April 5, 2017  
 Company: LICA  
 Station Name/Location: Cold Lake South  
 Previous Audit Date: March 27, 2017  
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt  
 Start Time (mst): 9:57  
 End Time (mst): 11:21  
 Calibration Purpose: Bi-monthly #1  
 Weather Conditions: Mainly sunny

### 1400A Information and Status:

ID# or Serial Number: 1405A201620804 As Found Filter Loading %: 17.56  
 Ko Factor: 14578 As Left Filter Loading %: 19.60  
 Ambient Temperature °C: 7.82 As Found Noise: 0.003  
 Ambient Pressure atm: 0.934 As Left Noise: 0.000  
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.39  
 Aux Flow Reading lpm: 13.67 Warnings: none

### Reference Standards:

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

### As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.12	0.00	0.12
	limit	0.15	<del>0.15</del>	0.15	<del>0.15</del>
Bypass Flow	actual	0.00	-0.01	0.00	-0.01
	limit	0.60	<del>0.60</del>	0.60	<del>0.60</del>

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.12	0.00	0.12
	limit	0.15	<del>0.15</del>	0.15	<del>0.15</del>
Bypass Flow	actual	0.00	-0.01	0.00	-0.01
	limit	0.60	<del>0.60</del>	0.60	<del>0.60</del>

### As found temperature and pressure:

tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
1405F temperature °C:	<u>7.8</u>	1405F pressure atm:	<u>0.934</u>
reference temperature °C:	<u>7.6</u>	reference pressure:	<u>0.934</u>
difference °C:	<u>-0.2</u>	difference:	<u>0.000</u>

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

tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
1405F temperature °C:	<u>7.6</u>	1405F pressure atm:	<u>0.934</u>
reference temperature °C:	<u>7.6</u>	reference pressure:	<u>0.934</u>
difference °C:	<u>0.0</u>	difference:	<u>0.000</u>

### As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.03</u>	reference total/aux flow lpm: <u>15.96</u>
difference lpm: <u>0.03</u>	difference lpm: <u>-0.71</u>

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

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

### K<sub>o</sub> Audit:

Last K<sub>o</sub> audit date: February 10, 2017  
 1405F K<sub>o</sub> factor: 14578  
 Measured K<sub>o</sub> factor: 14789.9000  
 % difference: 1.44

### Comments:

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

The 47 mm FDMS filter was changed.

Flows were calibrated



# R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: April 20, 2017  
 Company: LICA  
 Station Name/Location: Cold Lake South  
 Previous Audit Date: April 5, 2017  
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt  
 Start Time (mst): 12:01  
 End Time (mst): 13:04  
 Calibration Purpose: Bi-monthly #2  
 Weather Conditions: Mainly sunny

### 1400A Information and Status:

ID# or Serial Number: 1405A201620804 As Found Filter Loading %: 23.08  
 Ko Factor: 14578 As Left Filter Loading %: 19.51  
 Ambient Temperature °C: 8.38 As Found Noise: 0.003  
 Ambient Pressure atm: 0.936 As Left Noise: 0.000  
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.38  
 Aux Flow Reading lpm: 13.67 Warnings: none

### Reference Standards:

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

### As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.13	0.00	0.13
	limit	0.15	<del>0.15</del>	0.15	<del>0.15</del>
Bypass Flow	actual	0.00	-0.07	0.00	-0.07
	limit	0.60	<del>0.60</del>	0.60	<del>0.60</del>

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.13	0.00	0.13
	limit	0.15	<del>0.15</del>	0.15	<del>0.15</del>
Bypass Flow	actual	0.00	-0.07	0.00	-0.07
	limit	0.60	<del>0.60</del>	0.60	<del>0.60</del>

### As found temperature and pressure:

tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
1405F temperature °C:	<u>8.4</u>	1405F pressure atm:	<u>0.936</u>
reference temperature °C:	<u>9.1</u>	reference pressure:	<u>0.937</u>
difference °C:	<u>0.7</u>	difference :	<u>-0.001</u>

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

tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
1405F temperature °C:	<u>9.1</u>	1405F pressure atm:	<u>0.937</u>
reference temperature °C:	<u>9.1</u>	reference pressure:	<u>0.937</u>
difference °C:	<u>0.0</u>	difference :	<u>0.000</u>

### As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.96</u>	reference total/aux flow lpm: <u>16.52</u>
difference lpm: <u>-0.04</u>	difference lpm: <u>-0.15</u>

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

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.96</u>	reference total/aux flow lpm: <u>16.52</u>
difference lpm: <u>-0.04</u>	difference lpm: <u>-0.15</u>

### K<sub>o</sub> Audit:

Last K<sub>o</sub> audit date: February 10, 2017  
 1405F K<sub>o</sub> factor: 14578  
 Measured K<sub>o</sub> factor: 14789.9000  
 % difference: 1.44

### Comments:

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

## ***WIND SYSTEM***



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

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

### Sonic Wind Sensor Certificate of Calibration

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

#### Calibration Equipment

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

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

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

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

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

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

## ***CALIBRATORS***

**Company** Maxxam/SIA **Operator:** Chris

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

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

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

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

<b>NO</b>	<b>LIMITS</b>	<b>NOx</b>
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0041	<b>0.90-1.10</b>	m (Slope)= 1.0046
b (Intercept % of FS)= -0.1118	± 3% F.S.	b (Intercept % of FS)= -0.0871

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

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

<b>NO<sub>2</sub></b>	<b>LIMITS</b>
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9924	<b>0.90-1.10</b>
b (Intercept % of FS)= 0.1755	± 3% F.S.

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

COMMENTS: \_\_\_\_\_

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

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

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

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

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

<b>NO</b>		<b>LIMITS</b>		<b>NOx</b>	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0301	<b>0.90-1.10</b>		m (Slope)=	1.0291
b (Intercept % of FS)=	-0.0919	± 3% F.S.		b (Intercept % of FS)=	-0.0881

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

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

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

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

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton  
Operator Signature:

Date: March 16, 2017  
Location: McIntyre Center Edmonton



## ***CALIBRATION GASES***



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2016-335CGA

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

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

Expiry Date: July 2019

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

**Reference Analyzer:**

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

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

Last Calibration:                      Date: Oct 19/16                      C.F. 1.000                      Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	<del>0.01662</del>	<del>60.183</del>	<del>50.0</del>
4935	82.0	0.830	0.01662	60.183	50.0
4968	40.8	0.412	0.00821	121.765	50.2
4955	20.2	0.203	0.00408	245.297	49.8
Average Cylinder Concentration:					<b>50.0</b>

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 1

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration  \_\_\_\_\_

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

Auditor: Al Clark

Operator Signature: *Al Clark*

Date: October 19, 2016

Location: McIntyre Center Edmonton



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2016-334CGA

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

Cylinder #: EY0000654    Concentration PPM: 10.2    Tolerance(%): 2    Certified By: Praxair

Expiry Date: June 2019

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&amp;R MFC 201</u>	Make/Model: <u>Bios DC2</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>AMU 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.0 C</u>
Gas Type: <u>H2S</u> Conc. <u>20.43</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CAL015584</u>	
Expiry Date: <u>January 2019</u>	

**Reference Analyzer:**

Make/Model: Teco 450i      Serial/AMU Number: 1980

Instrument Settings:    Zero: 16.6      Span: 1.231      Range: 0.1

Last Calibration:      Date: Oct 19/16      C.F. 1.000      Done By: Al Clark

Calibrator Flows (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	<del>0.00752</del>	<del>132.895</del>	<del>10.2</del>
5050	38.0	0.0764	0.00752	132.895	10.2
5050	17.8	0.0355	0.00352	283.708	10.1
5023	9.1	0.0182	0.00181	551.978	10.0
Average Cylinder Concentration:					<b>10.1</b>

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 1

Meets Manufacturer Tolerance. Use manufacturers stated concentration  COMMENTS: \_\_\_\_\_

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration  \_\_\_\_\_

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

Auditor: Al Clark      Date: October 19, 2016

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



# Calibration Gas Audit

## CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

Company: Maxxam Operators name: Chris Wesson  
Cylinder #: LL165372 Conc CH4 (PPM) 606/212 Tolerance (%) 0.5 Certified By: Praxair

**Reference Calibrator and Gas:**

Make/Model R&R MFC 201  
Serial Number AMU 1698  
Last Verification Date January 18, 2016  
Gas Type CH4 Conc. 999.2  
Cylinder Number D751932  
Gas Type C3H8 Conc. 246.5  
Cylinder Number XF0037998

**Flow Measurement Device:**

Make/Model Bios DC-2  
Serial Number Bios D  
Temp. °C 24.5  
B.P. 688mmHg

**Reference Analyzer:**

Make/Model Thermo 55C Serial/AMU Number: 1643  
Instrument Settings Zero: NA Span: NA Range: 20.0  
Last Calibration: Date: 18-Jan-16 C.F. 1.000 Done By: SB

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2568	0.00	0.00	0.00	<del>0.02140</del>	<del>46.722</del>	<del>607</del>	<del>214</del>
2630	56.29	12.99	12.62	0.02140	46.722	607	214
2588	19.73	4.62	4.50	0.00762	131.171	606	215
2580	9.69	2.29	2.24	0.00376	266.254	610	217
Average Cylinder Concentration:						<b>608</b>	<b>215</b>

<b>CH4</b>	<b>C3H8</b>
Previous Stated Concentration PPM: <u>606</u>	<u>212</u>
Percent variance from Stated: <u>0.3</u>	<u>1.6</u>

**Cylinder gas tolerances based on CH4 only**

Meets Manufacturer Tolerance. Use manufacturers stated concentration  COMMENTS: \_\_\_\_\_  
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration  C3H8 manufacturers tolerance 1.1%  
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: January 19, 2016  
Operator Signature: \_\_\_\_\_ Location: McIntyre Center Edmonton



# Calibration Gas Audit

## NO Cylinder Gas

File No. 2016-336CGA

**Company:** Maxxam      **Operators name:** Russell Kirchner

Cylinder #: LL104222    Conc (PPM) 50.7/50.9    Tolerance (%) 1    Certified By: Praxair

Expiry Date: July 2019

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>AMU 1659</u>
Last Verification Date	<u>October 19, 2019</u>			Temp. °C	<u>24.5 C</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>706 mmhg</u>
Cylinder Number	<u>CAL018188</u>				
Expiry Date	<u>March 2019</u>				

**Reference Analyzer:**

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

Instrument Settings    Zero: 4.4      Span: 1.080      Range: 1.0

Last Calibration:      Date: Oct 18/16      C.F. 1.000      Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4935	82.0	0.838	0.837	0.017	60.183	50.4	50.4
4968	40.8	0.417	0.417	0.008	121.765	50.8	50.8
4955	20.2	0.207	0.207	0.004	245.297	50.8	50.8
Average Cylinder Concentration:						<b>50.7</b>	<b>50.6</b>

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.7</u>	<u>50.9</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

**Cylinder gas tolerances based on NO only**

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration  Contains 50.6 ppm SO2.

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

Auditor: Al Clark      Date: October 19, 2016

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

***APPENDIX IV***  
***ANALYTICAL RESULTS***

***VOCS SAMPLES***

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/CLS/April 01, 2017	2452	Ambient Air	01-Apr-17 0:00
<b>DESCRIPTION:</b>	Cold Lake South		
<b>REPORT NUMBER:</b>	17040066	<b>REPORT CREATED:</b>	02-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040066-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17
17040066-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	14-Apr-17
17040066-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	14-Apr-17
17040066-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	14-Apr-17
17040066-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	14-Apr-17
17040066-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	14-Apr-17
17040066-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040066-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	14-Apr-17
17040066-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040066-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040066-001	1-Butene		0.06	ppbv	0.02	AC-058	14-Apr-17
17040066-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	1-Pentene		0.01	ppbv	0.01	AC-058	14-Apr-17
17040066-001	2,2,4-Trimethylpentane		0.03	ppbv	0.01	AC-058	14-Apr-17
17040066-001	2,2-Dimethylbutane		0.02	ppbv	0.01	AC-058	14-Apr-17
17040066-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040066-001	2,3-Dimethylbutane		0.05	ppbv	0.02	AC-058	14-Apr-17
17040066-001	2,3-Dimethylpentane		0.04	ppbv	0.02	AC-058	14-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 02, 2017

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca



<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/April 01, 2017	2452	Ambient Air	01-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040066	<b>REPORT CREATED:</b>	02-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040066-001	2,4-Dimethylpentane		0.02	ppbv	0.01	AC-058	14-Apr-17
17040066-001	2-Methylheptane		0.02	ppbv	0.01	AC-058	14-Apr-17
17040066-001	2-Methylhexane		0.03	ppbv	0.01	AC-058	14-Apr-17
17040066-001	2-Methylpentane		0.13	ppbv	0.01	AC-058	14-Apr-17
17040066-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	3-Methylhexane		0.04	ppbv	0.02	AC-058	14-Apr-17
17040066-001	3-Methylpentane		0.05	ppbv	0.01	AC-058	14-Apr-17
17040066-001	Acetone		2.0	ppbv	0.4	AC-058	14-Apr-17
17040066-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	14-Apr-17
17040066-001	Benzene		0.12	ppbv	0.01	AC-058	14-Apr-17
17040066-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040066-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	Bromomethane	I	0.02	ppbv	0.01	AC-058	14-Apr-17
17040066-001	Carbon disulfide		2.49	ppbv	0.01	AC-058	14-Apr-17
17040066-001	Carbon tetrachloride	I	0.13	ppbv	0.01	AC-058	14-Apr-17
17040066-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	Chloroform	I	0.04	ppbv	0.02	AC-058	14-Apr-17
17040066-001	Chloromethane		0.61	ppbv	0.02	AC-058	14-Apr-17
17040066-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040066-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17
17040066-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	Cyclohexane		0.08	ppbv	0.02	AC-058	14-Apr-17

<b>Report certified by:</b>	Rebecca Holgate, Account Coordinator	<b>On behalf of:</b>	PJ Pretorius, Manager, Analysis and Testing Services
<b>Date:</b>	Tuesday, May 02, 2017	<b>Inquiries:</b>	(780) 632 8455
		<b>E-mail:</b>	EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/April 01, 2017	2452	Ambient Air	01-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040066	<b>REPORT CREATED:</b>	02-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040066-001	Cyclopentane		0.03	ppbv	0.01	AC-058	14-Apr-17
17040066-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040066-001	Ethanol		0.9	ppbv	0.3	AC-058	14-Apr-17
17040066-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040066-001	Ethylbenzene		0.03	ppbv	0.01	AC-058	14-Apr-17
17040066-001	Freon-11	I	0.28	ppbv	0.02	AC-058	14-Apr-17
17040066-001	Freon-113	I	0.12	ppbv	0.01	AC-058	14-Apr-17
17040066-001	Freon-114	I	0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	Freon-12		0.57	ppbv	0.02	AC-058	14-Apr-17
17040066-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	14-Apr-17
17040066-001	Isobutane		0.37	ppbv	0.02	AC-058	14-Apr-17
17040066-001	Isopentane		0.32	ppbv	0.03	AC-058	14-Apr-17
17040066-001	Isoprene		0.03	ppbv	0.01	AC-058	14-Apr-17
17040066-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040066-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040066-001	m,p-Xylene		0.10	ppbv	0.03	AC-058	14-Apr-17
17040066-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17
17040066-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	14-Apr-17
17040066-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	14-Apr-17
17040066-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	14-Apr-17
17040066-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040066-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	14-Apr-17
17040066-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	14-Apr-17
17040066-001	Methylcyclohexane		0.10	ppbv	0.01	AC-058	14-Apr-17
17040066-001	Methylcyclopentane		0.09	ppbv	0.02	AC-058	14-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 02, 2017

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/CLS/April 01, 2017	2452	Ambient Air	01-Apr-17 0:00
<b>DESCRIPTION:</b>	Cold Lake South		
<b>REPORT NUMBER:</b>	17040066	<b>REPORT CREATED:</b>	02-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040066-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	14-Apr-17
17040066-001	n-Butane		0.81	ppbv	0.03	AC-058	14-Apr-17
17040066-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	14-Apr-17
17040066-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040066-001	n-Heptane		0.05	ppbv	0.01	AC-058	14-Apr-17
17040066-001	n-Hexane		0.07	ppbv	0.01	AC-058	14-Apr-17
17040066-001	n-Octane		0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	n-Pentane		0.2	ppbv	0.1	AC-058	14-Apr-17
17040066-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	14-Apr-17
17040066-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	14-Apr-17
17040066-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	14-Apr-17
17040066-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040066-001	o-Ethyltoluene	I	0.01	ppbv	0.01	AC-058	14-Apr-17
17040066-001	o-Xylene		0.03	ppbv	0.01	AC-058	14-Apr-17
17040066-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17
17040066-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	14-Apr-17
17040066-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17
17040066-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17
17040066-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040066-001	Toluene		0.12	ppbv	0.01	AC-058	14-Apr-17
17040066-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040066-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17
17040066-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040066-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040066-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17

<b>Report certified by:</b>	Rebecca Holgate, Account Coordinator	<b>On behalf of:</b>	PJ Pretorius, Manager, Analysis and Testing Services
<b>Date:</b>	Tuesday, May 02, 2017	<b>Inquiries:</b>	(780) 632 8455
		<b>E-mail:</b>	EAS.Results@innotechalberta.ca



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**ENVIRONMENTAL ANALYTICAL SERVICES**

TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/April 01, 2017	2452	Ambient Air	01-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040066	<b>REPORT CREATED:</b>	02-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040066-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Apr-17
17040066-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator      **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services  
**Date:** Tuesday, May 02, 2017      **Inquiries:** (780) 632 8455      **E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/CLS/Apr 07, 2017	1685	Ambient Air	07-Apr-17 0:00
<b>DESCRIPTION:</b>	Cold Lake South		
<b>REPORT NUMBER:</b>	17040133	<b>REPORT CREATED:</b>	17-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040133-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Apr-17
17040133-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	26-Apr-17
17040133-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	26-Apr-17
17040133-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	26-Apr-17
17040133-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	26-Apr-17
17040133-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	26-Apr-17
17040133-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	26-Apr-17
17040133-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Apr-17
17040133-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Apr-17
17040133-001	1-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	2,2,4-Trimethylpentane		0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17

**Report certified by:** Krista Gegolick, Account Coordinator

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

**Date:** May-17-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/Apr 07, 2017	1685	Ambient Air	07-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040133	<b>REPORT CREATED:</b>	17-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040133-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	2-Methylpentane		0.04	ppbv	0.01	AC-058	26-Apr-17
17040133-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	3-Methylpentane		0.02	ppbv	0.01	AC-058	26-Apr-17
17040133-001	Acetone		5.4	ppbv	0.4	AC-058	26-Apr-17
17040133-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	26-Apr-17
17040133-001	Benzene		0.07	ppbv	0.01	AC-058	26-Apr-17
17040133-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Apr-17
17040133-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	Bromomethane	I	0.02	ppbv	0.01	AC-058	26-Apr-17
17040133-001	Carbon disulfide		0.54	ppbv	0.01	AC-058	26-Apr-17
17040133-001	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	26-Apr-17
17040133-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	Chloroethane	I	0.05	ppbv	0.02	AC-058	26-Apr-17
17040133-001	Chloroform	I	0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	Chloromethane		0.87	ppbv	0.02	AC-058	26-Apr-17
17040133-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Apr-17
17040133-001	cis-2-Butene		0.04	ppbv	0.02	AC-058	26-Apr-17
17040133-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17

<b>Report certified by:</b>	Krista Gegolick, Account Coordinator	<b>On behalf of:</b>	PJ Pretorius, Manager, Analysis and Testing Services
<b>Date:</b>	May-17-17	<b>Inquiries:</b>	(780) 632 8455
		<b>E-mail:</b>	EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/Apr 07, 2017	1685	Ambient Air	07-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040133	<b>REPORT CREATED:</b>	17-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040133-001	Cyclopentane		0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	Ethanol		1.5	ppbv	0.3	AC-058	26-Apr-17
17040133-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Apr-17
17040133-001	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	Freon-11	I	0.24	ppbv	0.02	AC-058	26-Apr-17
17040133-001	Freon-113	I	0.10	ppbv	0.01	AC-058	26-Apr-17
17040133-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	Freon-12		0.43	ppbv	0.02	AC-058	26-Apr-17
17040133-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	26-Apr-17
17040133-001	Isobutane		0.71	ppbv	0.02	AC-058	26-Apr-17
17040133-001	Isopentane		0.37	ppbv	0.03	AC-058	26-Apr-17
17040133-001	Isoprene		0.04	ppbv	0.01	AC-058	26-Apr-17
17040133-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Apr-17
17040133-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	26-Apr-17
17040133-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Apr-17
17040133-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Apr-17
17040133-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	26-Apr-17
17040133-001	Methyl ethyl ketone		0.5	ppbv	0.3	AC-058	26-Apr-17
17040133-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Apr-17
17040133-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	26-Apr-17
17040133-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	26-Apr-17
17040133-001	Methylcyclohexane		0.03	ppbv	0.01	AC-058	26-Apr-17
17040133-001	Methylcyclopentane		0.03	ppbv	0.02	AC-058	26-Apr-17

**Report certified by:** Krista Gegolick, Account Coordinator

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

**Date:** May-17-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/Apr 07, 2017	1685	Ambient Air	07-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040133	<b>REPORT CREATED:</b>	17-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040133-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	26-Apr-17
17040133-001	n-Butane		0.66	ppbv	0.03	AC-058	26-Apr-17
17040133-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	26-Apr-17
17040133-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Apr-17
17040133-001	n-Heptane		0.02	ppbv	0.01	AC-058	26-Apr-17
17040133-001	n-Hexane		0.04	ppbv	0.01	AC-058	26-Apr-17
17040133-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	n-Pentane		0.2	ppbv	0.1	AC-058	26-Apr-17
17040133-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	26-Apr-17
17040133-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	26-Apr-17
17040133-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	26-Apr-17
17040133-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Apr-17
17040133-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	26-Apr-17
17040133-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Apr-17
17040133-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Apr-17
17040133-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Apr-17
17040133-001	Toluene		0.04	ppbv	0.01	AC-058	26-Apr-17
17040133-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Apr-17
17040133-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Apr-17
17040133-001	trans-2-Butene		0.03	ppbv	0.01	AC-058	26-Apr-17
17040133-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Apr-17
17040133-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Apr-17

**Report certified by:** Krista Gegolick, Account Coordinator

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

**Date:** May-17-17

**Inquiries:** (780) 632 8455

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**ENVIRONMENTAL ANALYTICAL SERVICES**

TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/Apr 07, 2017	1685	Ambient Air	07-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040133	<b>REPORT CREATED:</b>	17-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040133-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	26-Apr-17
17040133-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	26-Apr-17

<b>Report certified by:</b>	Krista Gegolick, Account Coordinator	<b>On behalf of:</b>	PJ Pretorius, Manager, Analysis and Testing Services		
<b>Date:</b>	May-17-17	<b>Inquiries:</b>	(780) 632 8455	<b>E-mail:</b>	EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/CLS/Apr 13, 2017	6104	Ambient Air	13-Apr-17 0:00
<b>DESCRIPTION:</b>	Cold Lake South		
<b>REPORT NUMBER:</b>	17040202	<b>REPORT CREATED:</b>	17-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040202-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	27-Apr-17
17040202-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	27-Apr-17
17040202-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	27-Apr-17
17040202-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	27-Apr-17
17040202-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	27-Apr-17
17040202-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	27-Apr-17
17040202-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040202-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	27-Apr-17
17040202-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	27-Apr-17
17040202-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	27-Apr-17
17040202-001	1-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	1-Pentene		0.02	ppbv	0.01	AC-058	27-Apr-17
17040202-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040202-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040202-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040202-001	2,3-Dimethylbutane		0.03	ppbv	0.02	AC-058	27-Apr-17
17040202-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-17-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/Apr 13, 2017	6104	Ambient Air	13-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040202	<b>REPORT CREATED:</b>	17-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040202-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040202-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040202-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040202-001	2-Methylpentane		0.18	ppbv	0.01	AC-058	27-Apr-17
17040202-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	3-Methylhexane		0.03	ppbv	0.02	AC-058	27-Apr-17
17040202-001	3-Methylpentane		0.12	ppbv	0.01	AC-058	27-Apr-17
17040202-001	Acetone		4.5	ppbv	0.4	AC-058	27-Apr-17
17040202-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	27-Apr-17
17040202-001	Benzene		0.09	ppbv	0.01	AC-058	27-Apr-17
17040202-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	27-Apr-17
17040202-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	Bromomethane	I	0.01	ppbv	0.01	AC-058	27-Apr-17
17040202-001	Carbon disulfide		2.08	ppbv	0.01	AC-058	27-Apr-17
17040202-001	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	27-Apr-17
17040202-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	Chloroform	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	Chloromethane		0.60	ppbv	0.02	AC-058	27-Apr-17
17040202-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040202-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	27-Apr-17
17040202-001	cis-2-Butene		0.03	ppbv	0.02	AC-058	27-Apr-17
17040202-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	Cyclohexane		0.07	ppbv	0.02	AC-058	27-Apr-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-17-17

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<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/CLS/Apr 13, 2017	6104	Ambient Air	13-Apr-17 0:00
<b>DESCRIPTION:</b>	Cold Lake South		
<b>REPORT NUMBER:</b>	17040202	<b>REPORT CREATED:</b>	17-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040202-001	Cyclopentane		0.04	ppbv	0.01	AC-058	27-Apr-17
17040202-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040202-001	Ethanol		0.8	ppbv	0.3	AC-058	27-Apr-17
17040202-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	27-Apr-17
17040202-001	Ethylbenzene		0.01	ppbv	0.01	AC-058	27-Apr-17
17040202-001	Freon-11	I	0.24	ppbv	0.02	AC-058	27-Apr-17
17040202-001	Freon-113	I	0.10	ppbv	0.01	AC-058	27-Apr-17
17040202-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040202-001	Freon-12		0.43	ppbv	0.02	AC-058	27-Apr-17
17040202-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	27-Apr-17
17040202-001	Isobutane		0.45	ppbv	0.02	AC-058	27-Apr-17
17040202-001	Isopentane		1.26	ppbv	0.03	AC-058	27-Apr-17
17040202-001	Isoprene		0.02	ppbv	0.01	AC-058	27-Apr-17
17040202-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	27-Apr-17
17040202-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040202-001	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	27-Apr-17
17040202-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	27-Apr-17
17040202-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	27-Apr-17
17040202-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	27-Apr-17
17040202-001	Methyl ethyl ketone		0.4	ppbv	0.3	AC-058	27-Apr-17
17040202-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	27-Apr-17
17040202-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	27-Apr-17
17040202-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	27-Apr-17
17040202-001	Methylcyclohexane		0.05	ppbv	0.01	AC-058	27-Apr-17
17040202-001	Methylcyclopentane		0.15	ppbv	0.02	AC-058	27-Apr-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

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<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/CLS/Apr 13, 2017	6104	Ambient Air	13-Apr-17 0:00
<b>DESCRIPTION:</b>	Cold Lake South		
<b>REPORT NUMBER:</b>	17040202	<b>REPORT CREATED:</b>	17-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040202-001	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	27-Apr-17
17040202-001	n-Butane		0.88 ppbv	0.03	AC-058	27-Apr-17
17040202-001	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	27-Apr-17
17040202-001	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	27-Apr-17
17040202-001	n-Heptane		0.03 ppbv	0.01	AC-058	27-Apr-17
17040202-001	n-Hexane		0.17 ppbv	0.01	AC-058	27-Apr-17
17040202-001	n-Octane	K, T, U	< 0.02 ppbv	0.02	AC-058	27-Apr-17
17040202-001	n-Pentane		1.1 ppbv	0.1	AC-058	27-Apr-17
17040202-001	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	27-Apr-17
17040202-001	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	27-Apr-17
17040202-001	Naphthalene	K, T, U	< 0.5 ppbv	0.5	AC-058	27-Apr-17
17040202-001	n-Nonane	K, T, U	< 0.01 ppbv	0.01	AC-058	27-Apr-17
17040202-001	o-Ethyltoluene	K, T, U	< 0.01 ppbv	0.01	AC-058	27-Apr-17
17040202-001	o-Xylene	K, T, U	< 0.01 ppbv	0.01	AC-058	27-Apr-17
17040202-001	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	27-Apr-17
17040202-001	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	27-Apr-17
17040202-001	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	27-Apr-17
17040202-001	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	27-Apr-17
17040202-001	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	27-Apr-17
17040202-001	Toluene		0.10 ppbv	0.01	AC-058	27-Apr-17
17040202-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	27-Apr-17
17040202-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	27-Apr-17
17040202-001	trans-2-Butene		0.01 ppbv	0.01	AC-058	27-Apr-17
17040202-001	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	27-Apr-17
17040202-001	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	27-Apr-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-17-17

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# ENVIRONMENTAL ANALYTICAL SERVICES

## TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/Apr 13, 2017	6104	Ambient Air	13-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040202	<b>REPORT CREATED:</b>	17-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040202-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	27-Apr-17
17040202-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	27-Apr-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-17-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/April 19, 2017	23774	Ambient Air	19-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040253	<b>REPORT CREATED:</b>	23-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040253-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17
17040253-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	08-May-17
17040253-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	08-May-17
17040253-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	08-May-17
17040253-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	08-May-17
17040253-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	08-May-17
17040253-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040253-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040253-001	1-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-23-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/April 19, 2017	23774	Ambient Air	19-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040253	<b>REPORT CREATED:</b>	23-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040253-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	2-Methylhexane		0.02	ppbv	0.01	AC-058	08-May-17
17040253-001	2-Methylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	3-Methylpentane		0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	Acetone		1.9	ppbv	0.4	AC-058	08-May-17
17040253-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	08-May-17
17040253-001	Benzene		0.07	ppbv	0.01	AC-058	08-May-17
17040253-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040253-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	Carbon disulfide	I	0.03	ppbv	0.01	AC-058	08-May-17
17040253-001	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	08-May-17
17040253-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	Chloroform	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	Chloromethane		0.47	ppbv	0.02	AC-058	08-May-17
17040253-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17
17040253-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	Cyclohexane		0.58	ppbv	0.02	AC-058	08-May-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-23-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca



<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/April 19, 2017	23774	Ambient Air	19-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040253	<b>REPORT CREATED:</b>	23-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040253-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	Ethanol		0.4	ppbv	0.3	AC-058	08-May-17
17040253-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040253-001	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	Freon-11	I	0.27	ppbv	0.02	AC-058	08-May-17
17040253-001	Freon-113	I	0.09	ppbv	0.01	AC-058	08-May-17
17040253-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	Freon-12		0.39	ppbv	0.02	AC-058	08-May-17
17040253-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	08-May-17
17040253-001	Isobutane		0.13	ppbv	0.02	AC-058	08-May-17
17040253-001	Isopentane		0.16	ppbv	0.03	AC-058	08-May-17
17040253-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040253-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	08-May-17
17040253-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17
17040253-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	08-May-17
17040253-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	08-May-17
17040253-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	08-May-17
17040253-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040253-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	08-May-17
17040253-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	08-May-17
17040253-001	Methylcyclohexane		0.02	ppbv	0.01	AC-058	08-May-17
17040253-001	Methylcyclopentane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-23-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/CLS/April 19, 2017	23774	Ambient Air	19-Apr-17 0:00
<b>DESCRIPTION:</b>	Cold Lake South		
<b>REPORT NUMBER:</b>	17040253	<b>REPORT CREATED:</b>	23-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040253-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	08-May-17
17040253-001	n-Butane		0.36	ppbv	0.03	AC-058	08-May-17
17040253-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	08-May-17
17040253-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040253-001	n-Heptane		0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	n-Hexane		0.02	ppbv	0.01	AC-058	08-May-17
17040253-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	08-May-17
17040253-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	08-May-17
17040253-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	08-May-17
17040253-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	08-May-17
17040253-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17
17040253-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	08-May-17
17040253-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17
17040253-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17
17040253-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040253-001	Toluene		0.04	ppbv	0.01	AC-058	08-May-17
17040253-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17
17040253-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040253-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040253-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-23-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca



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 Vegreville, Alberta  
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# ENVIRONMENTAL ANALYTICAL SERVICES

## TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/April 19, 2017	23774	Ambient Air	19-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040253	<b>REPORT CREATED:</b>	23-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040253-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	08-May-17
17040253-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	08-May-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-23-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/Apr. 25, 2017	1531	Ambient Air	25-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040270	<b>REPORT CREATED:</b>	25-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040270-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	09-May-17
17040270-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	09-May-17
17040270-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	09-May-17
17040270-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	09-May-17
17040270-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	09-May-17
17040270-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	09-May-17
17040270-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	09-May-17
17040270-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	09-May-17
17040270-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	09-May-17
17040270-001	1-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17

<b>Report certified by:</b>	Krista Gegolick, Account Coordinator	<b>On behalf of:</b>	PJ Pretorius, Manager, Analysis and Testing Services
<b>Date:</b>	May-25-17	<b>Inquiries:</b>	(780) 632 8455
		<b>E-mail:</b>	EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/Apr. 25, 2017	1531	Ambient Air	25-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040270	<b>REPORT CREATED:</b>	25-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040270-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	2-Methylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	3-Methylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	Acetone		1.1	ppbv	0.4	AC-058	09-May-17
17040270-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	09-May-17
17040270-001	Benzene		0.04	ppbv	0.01	AC-058	09-May-17
17040270-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	09-May-17
17040270-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	Carbon disulfide	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	09-May-17
17040270-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	Chloroform	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	Chloromethane		0.43	ppbv	0.02	AC-058	09-May-17
17040270-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	09-May-17
17040270-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	Cyclohexane		0.56	ppbv	0.02	AC-058	09-May-17

<b>Report certified by:</b>	Krista Gegolick, Account Coordinator	<b>On behalf of:</b>	PJ Pretorius, Manager, Analysis and Testing Services
<b>Date:</b>	May-25-17	<b>Inquiries:</b>	(780) 632 8455
		<b>E-mail:</b>	EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/Apr. 25, 2017	1531	Ambient Air	25-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040270	<b>REPORT CREATED:</b>	25-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040270-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	Ethanol	K, T, U	< 0.3	ppbv	0.3	AC-058	09-May-17
17040270-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	09-May-17
17040270-001	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	Freon-11	I	0.26	ppbv	0.02	AC-058	09-May-17
17040270-001	Freon-113	I	0.09	ppbv	0.01	AC-058	09-May-17
17040270-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	Freon-12		0.40	ppbv	0.02	AC-058	09-May-17
17040270-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	09-May-17
17040270-001	Isobutane		0.03	ppbv	0.02	AC-058	09-May-17
17040270-001	Isopentane	K, T, U	< 0.03	ppbv	0.03	AC-058	09-May-17
17040270-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	09-May-17
17040270-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	09-May-17
17040270-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	09-May-17
17040270-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	09-May-17
17040270-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	09-May-17
17040270-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	09-May-17
17040270-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	09-May-17
17040270-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	09-May-17
17040270-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	09-May-17
17040270-001	Methylcyclohexane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	Methylcyclopentane	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17

**Report certified by:** Krista Gegolick, Account Coordinator

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

**Date:** May-25-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/Apr. 25, 2017	1531	Ambient Air	25-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040270	<b>REPORT CREATED:</b>	25-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040270-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	09-May-17
17040270-001	n-Butane	K, T, U	< 0.03	ppbv	0.03	AC-058	09-May-17
17040270-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	09-May-17
17040270-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	09-May-17
17040270-001	n-Heptane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	n-Hexane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	09-May-17
17040270-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	09-May-17
17040270-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	09-May-17
17040270-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	09-May-17
17040270-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	09-May-17
17040270-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	09-May-17
17040270-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	09-May-17
17040270-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	09-May-17
17040270-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	09-May-17
17040270-001	Toluene		0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	09-May-17
17040270-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	09-May-17
17040270-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	09-May-17
17040270-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	09-May-17

<b>Report certified by:</b>	Krista Gegolick, Account Coordinator	<b>On behalf of:</b>	PJ Pretorius, Manager, Analysis and Testing Services
<b>Date:</b>	May-25-17	<b>Inquiries:</b>	(780) 632 8455
		<b>E-mail:</b>	EAS.Results@innotechalberta.ca



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**ENVIRONMENTAL ANALYTICAL SERVICES**

TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/CLS/Apr. 25, 2017	1531	Ambient Air	25-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040270	<b>REPORT CREATED:</b>	25-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040270-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	09-May-17
17040270-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	09-May-17

<b>Report certified by:</b>	Krista Gegolick, Account Coordinator	<b>On behalf of:</b>	PJ Pretorius, Manager, Analysis and Testing Services		
<b>Date:</b>	May-25-17	<b>Inquiries:</b>	(780) 632 8455	<b>E-mail:</b>	EAS.Results@innotechalberta.ca



***PAHS SAMPLES***

<p><b>RESULTS:</b> Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p><b>INVOICE:</b> Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p><b>CLIENT SAMPLE ID</b> LICA/PUF/CLS/April 01, 2017</p> <p><b>CANISTER ID</b> TE02</p> <p><b>Matrix</b> Air Filter</p> <p><b>Priority</b> Normal</p> <p><b>DESCRIPTION:</b> Cold Lake South</p> <p><b>DATE SAMPLED:</b> 01-Apr-17 0:00</p> <p><b>REPORT CREATED:</b> 02-May-17</p> <p><b>DATE RECEIVED:</b> 06-Apr-17</p> <p><b>REPORT NUMBER:</b> 17040066</p> <p><b>VERSION:</b> Version 01</p>
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Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040066-002	1-Methylnaphthalene		0.03	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	2-Methylnaphthalene		0.05	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Acenaphthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Acenaphthylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Chrysene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 02, 2017

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca



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**ENVIRONMENTAL ANALYTICAL SERVICES**

TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/PUF/CLS/April 01, 2017	TE02	Air Filter	01-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040066	<b>REPORT CREATED:</b>	02-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040066-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Fluoranthene		0.03	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Fluorene		0.06	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Naphthalene		0.03	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Phenanthrene		0.13	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Pyrene		0.03	ug/Filter	0.01	NA-017	13-Apr-17
17040066-002	Retene		0.01	ug/Filter	0.01	NA-017	13-Apr-17

<b>Report certified by:</b>	Rebecca Holgate, Account Coordinator	<b>On behalf of:</b>	PJ Pretorius, Manager, Analysis and Testing Services	
<b>Date:</b>	Tuesday, May 02, 2017	<b>Inquiries:</b>	(780) 632 8455	<b>E-mail:</b> EAS.Results@innotechalberta.ca

<b>RESULTS:</b>	Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE		<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>Priority</b>
	Calgary AB	T2E 6P8	LICA/PUF/CLS/Apr 07, 2017	9102	Air Filter	Normal
<b>INVOICE:</b>	Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB		780 812 2182		<b>DESCRIPTION:</b>	
	Calgary AB	T9N 2J5	<b>DATE SAMPLED:</b>	07-Apr-17 0:00	<b>DATE RECEIVED:</b>	12-Apr-17
			<b>REPORT CREATED:</b>	17-May-17	<b>REPORT NUMBER:</b>	17040133
					<b>VERSION:</b>	Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040133-002	1-Methylnaphthalene		0.03	ug/Filter	0.01	NA-017	13-May-17
17040133-002	2-Methylnaphthalene		0.05	ug/Filter	0.01	NA-017	13-May-17
17040133-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Acenaphthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Acenaphthylene		0.04	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Anthracene		0.03	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Chrysene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17

**Report certified by:** Krista Gegolick, Account Coordinator

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

**Date:** May-17-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/PUF/CLS/Apr 07, 2017	9102	Air Filter	07-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040133	<b>REPORT CREATED:</b>	17-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040133-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Fluoranthene		0.05	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Fluorene		0.07	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Naphthalene		0.03	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Phenanthrene		0.21	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Pyrene		0.04	ug/Filter	0.01	NA-017	13-May-17
17040133-002	Retene		0.01	ug/Filter	0.01	NA-017	13-May-17

**Report certified by:** Krista Gegolick, Account Coordinator

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

**Date:** May-17-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<p><b>RESULTS:</b> Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p><b>INVOICE:</b> Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p><b>CLIENT SAMPLE ID</b> LICA/PUF/CLS/Apr 13, 2017</p> <p><b>CANISTER ID</b> TE-04</p> <p><b>Matrix</b> Air Filter</p> <p><b>Priority</b> Normal</p> <p><b>DESCRIPTION:</b> Cold Lake South</p> <p><b>DATE SAMPLED:</b> 13-Apr-17 0:00</p> <p><b>REPORT CREATED:</b> 17-May-17</p> <p><b>DATE RECEIVED:</b> 20-Apr-17</p> <p><b>REPORT NUMBER:</b> 17040202</p> <p><b>VERSION:</b> Version 01</p>
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Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040202-002	1-Methylnaphthalene		0.04 ug/Filter	0.01	NA-017	13-May-17
17040202-002	2-Methylnaphthalene		0.07 ug/Filter	0.01	NA-017	13-May-17
17040202-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Acenaphthene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Acenaphthylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Anthracene		0.02 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Benzo(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Benzo(a)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Benzo(e)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Chrysene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-17-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/PUF/CLS/Apr 13, 2017	TE-04	Air Filter	13-Apr-17 0:00
<b>DESCRIPTION:</b>	Cold Lake South		
<b>REPORT NUMBER:</b>	17040202	<b>REPORT CREATED:</b>	17-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040202-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Fluoranthene		0.02 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Fluorene		0.03 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Naphthalene		0.04 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Phenanthrene		0.06 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Pyrene		0.02 ug/Filter	0.01	NA-017	13-May-17
17040202-002	Retene		0.01 ug/Filter	0.01	NA-017	13-May-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-17-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<p><b>RESULTS:</b> Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p><b>INVOICE:</b> Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p><b>CLIENT SAMPLE ID</b> LICA/PUF/CLS/April 19, 2017</p> <p><b>CANISTER ID</b> 9801</p> <p><b>Matrix</b> Air Filter</p> <p><b>Priority</b> Normal</p> <p><b>DESCRIPTION:</b> Cold Lake South</p> <p><b>DATE SAMPLED:</b> 19-Apr-17 0:00</p> <p><b>REPORT CREATED:</b> 23-May-17</p> <p><b>DATE RECEIVED:</b> 26-Apr-17</p> <p><b>REPORT NUMBER:</b> 17040253</p> <p><b>VERSION:</b> Version 01</p>
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Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040253-002	1-Methylnaphthalene		0.08	ug/Filter	0.01	NA-017	13-May-17
17040253-002	2-Methylnaphthalene		0.15	ug/Filter	0.01	NA-017	13-May-17
17040253-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Acenaphthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Acenaphthylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Anthracene		0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Chrysene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-23-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca



<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/PUF/CLS/April 19, 2017	9801	Air Filter	19-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040253	<b>REPORT CREATED:</b>	23-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040253-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Fluoranthene		0.02	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Fluorene		0.04	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Naphthalene		0.23	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Phenanthrene		0.08	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Pyrene		0.02	ug/Filter	0.01	NA-017	13-May-17
17040253-002	Retene		0.01	ug/Filter	0.01	NA-017	13-May-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-23-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>RESULTS:</b> Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE  Calgary AB T2E 6P8	<b>CLIENT SAMPLE ID</b> LICA/PUF/CLS/Apr. 25, 2017	<b>CANISTER ID</b> TE-11	<b>Matrix</b> Air Filter	<b>Priority</b> Normal
	<b>DESCRIPTION:</b> Cold Lake South			
<b>INVOICE:</b> Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	<b>DATE SAMPLED:</b> 25-Apr-17	0:00	<b>DATE RECEIVED:</b> 28-Apr-17	
	<b>REPORT CREATED:</b> 25-May-17		<b>REPORT NUMBER:</b> 17040270	
			<b>VERSION:</b> Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040270-002	1-Methylnaphthalene		0.02	ug/Filter	0.01	NA-017	13-May-17
17040270-002	2-Methylnaphthalene		0.04	ug/Filter	0.01	NA-017	13-May-17
17040270-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Acenaphthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Acenaphthylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Anthracene		0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Chrysene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** May-25-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca



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

# ENVIRONMENTAL ANALYTICAL SERVICES

## TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/PUF/CLS/Apr. 25, 2017	TE-11	Air Filter	25-Apr-17	0:00
<b>DESCRIPTION:</b>	Cold Lake South			
<b>REPORT NUMBER:</b>	17040270	<b>REPORT CREATED:</b>	25-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040270-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Fluoranthene		0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Fluorene		0.03	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Naphthalene		0.03	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Phenanthrene		0.06	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Pyrene		0.01	ug/Filter	0.01	NA-017	13-May-17
17040270-002	Retene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** May-25-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

***PARTISOL SAMPLES***



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**ENVIRONMENTAL ANALYTICAL SERVICES**

TEST REPORT

<p><b>RESULTS:</b> Adewunmi Adekanmbi          Lakeland Industry and Community Assn          4000, 19 St NE</p> <p>Calgary          AB T2E 6P8</p> <p><b>INVOICE:</b> Arianna Cook 780 812 2182          PO Box 8237          5107W-50 St          Bonnyville          AB T9N 2J5</p>	<p><b>CLIENT SAMPLE ID</b>          Filter # P6193005</p> <p><b>CANISTER ID</b></p> <p><b>Matrix</b>          Air Filter</p> <p><b>Priority</b>          Normal</p> <p><b>DESCRIPTION:</b> Cold Lake South</p> <p><b>DATE SAMPLED:</b> 01-Apr-17 0:00</p> <p><b>REPORT CREATED:</b> 20-Apr-17</p> <p><b>DATE RECEIVED:</b> 06-Apr-17</p> <p><b>REPORT NUMBER:</b> 17040064</p> <p><b>VERSION:</b> Version 01</p>
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Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040064-001	Particulate Weight		0.074 mg	0.004	AC-029	10-Apr-17

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

**Date:** April-20-17      **Inquiries:** (780) 632 8455      **E-mail:** EAS.Results@innotechalberta.ca



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**ENVIRONMENTAL ANALYTICAL SERVICES**

TEST REPORT

<p><b>RESULTS:</b> Adewunmi Adekanmbi          Lakeland Industry and Community Assn          4000, 19 St NE</p> <p>Calgary          AB T2E 6P8</p> <p><b>INVOICE:</b> Arianna Cook 780 812 2182          PO Box 8237          5107W-50 St          Bonnyville          AB T9N 2J5</p>	<p><b>CLIENT SAMPLE ID</b>          Filter # P6193007</p> <p><b>CANISTER ID</b></p> <p><b>Matrix</b>          Air Filter</p> <p><b>Priority</b>          Normal</p> <p><b>DESCRIPTION:</b> Cold Lake South</p> <p><b>DATE SAMPLED:</b> 07-Apr-17 0:00</p> <p><b>REPORT CREATED:</b> 11-May-17</p> <p><b>DATE RECEIVED:</b> 12-Apr-17</p> <p><b>REPORT NUMBER:</b> 17040131</p> <p><b>VERSION:</b> Version 01</p>
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Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040131-001	Particulate Weight	K, T, U	< 0.004 mg	0.004	AC-029	18-Apr-17

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

**Date:** Thursday, May 11, 2017      **Inquiries:** (780) 632 8455      **E-mail:** EAS.Results@innotechalberta.ca



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# ENVIRONMENTAL ANALYTICAL SERVICES

## TEST REPORT

<p><b>RESULTS:</b> Adewunmi Adekanmbi          Lakeland Industry and Community Assn          4000, 19 St NE</p> <p>Calgary          AB T2E 6P8</p> <p><b>INVOICE:</b> Arianna Cook 780 812 2182          PO Box 8237          5107W-50 St          Bonnyville          AB T9N 2J5</p>	<p><b>CLIENT SAMPLE ID</b>          Filter # P6193520</p> <p><b>CANISTER ID</b></p> <p><b>Matrix</b>          Air Filter</p> <p><b>Priority</b>          Normal</p> <p><b>DESCRIPTION:</b> Cold Lake South</p> <p><b>DATE SAMPLED:</b> 13-Apr-17 0:00</p> <p><b>REPORT CREATED:</b> 01-May-17</p> <p><b>DATE RECEIVED:</b> 20-Apr-17</p> <p><b>REPORT NUMBER:</b> 17040204</p> <p><b>VERSION:</b> Version 01</p>
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Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040204-001	Particulate Weight		0.048	mg	0.004	AC-029	26-Apr-17

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

**Date:** Monday, May 01, 2017      **Inquiries:** (780) 632 8455      **E-mail:** EAS.Results@innotechalberta.ca



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**ENVIRONMENTAL ANALYTICAL SERVICES**

TEST REPORT

<p><b>RESULTS:</b> Adewunmi Adekanmbi          Lakeland Industry and Community Assn          4000, 19 St NE</p> <p>Calgary          AB T2E 6P8</p> <p><b>INVOICE:</b> Arianna Cook 780 812 2182          PO Box 8237          5107W-50 St          Bonnyville          AB T9N 2J5</p>	<p><b>CLIENT SAMPLE ID</b>          Filter # P6193003</p> <p><b>CANISTER ID</b></p> <p><b>Matrix</b>          Air Filter</p> <p><b>Priority</b>          Normal</p> <p><b>DESCRIPTION:</b> Cold Lake South</p> <p><b>DATE SAMPLED:</b> 19-Apr-17 0:00</p> <p><b>REPORT CREATED:</b> 03-May-17</p> <p><b>DATE RECEIVED:</b> 26-Apr-17</p> <p><b>REPORT NUMBER:</b> 17040251</p> <p><b>VERSION:</b> Version 01</p>
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Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040251-001	Particulate Weight		0.057 mg	0.004	AC-029	01-May-17

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

**Date:** May-03-17      **Inquiries:** (780) 632 8455      **E-mail:** EAS.Results@innotechalberta.ca





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**ENVIRONMENTAL ANALYTICAL SERVICES**

TEST REPORT

<p><b>RESULTS:</b> Adewunmi Adekanmbi          Lakeland Industry and Community Assn          4000, 19 St NE</p> <p>Calgary          AB T2E 6P8</p> <p><b>INVOICE:</b> Arianna Cook 780 812 2182          PO Box 8237          5107W-50 St          Bonnyville          AB T9N 2J5</p>	<p><b>CLIENT SAMPLE ID</b>          Flt # P6193004</p> <p><b>CANISTER ID</b></p> <p><b>Matrix</b>          Air Filter</p> <p><b>Priority</b>          Normal</p> <p><b>DESCRIPTION:</b> Cold Lake South</p> <p><b>DATE SAMPLED:</b> 25-Apr-17 0:00</p> <p><b>REPORT CREATED:</b> 03-May-17</p> <p><b>DATE RECEIVED:</b> 28-Apr-17</p> <p><b>REPORT NUMBER:</b> 17040267</p> <p><b>VERSION:</b> Version 01</p>
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Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040267-001	Particulate Weight		0.056	mg	0.004	AC-029	01-May-17

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

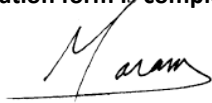
**Date:** May-03-17      **Inquiries:** (780) 632 8455      **E-mail:** EAS.Results@innotechalberta.ca

***APPENDIX V***  
***REPORT CERTIFICATION FORM***

### Report Certification Form

<b>Alberta Airshed</b> (if applicable)	<b>EPA Approval or Code of Practice Registration #</b> (if applicable)
YES	NA
<b>Company Name</b> (if applicable)	<b>Industrial Operation Name</b> (if applicable)
Lakeland Industry & Community Association	Cold Lake Continuous Monitoring Station
<b>Name of the Representative of the Person Responsible</b> (Last, First, Middle)	<b>Position / Title of the Representative of the Person Responsible</b>
Maram Ghaleb	Project Manager, Customer Service, Air Services
<b>Is an External Party Certifying the Report?</b> (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>Name of External Person Certifying the Report</b> (Last, First, Middle)	<b>Position / Title of External Person Certifying the Report</b>
NA	NA
<b>Company Name for the External Person Certifying the Report</b>	<b>Identification of Qualifications / Professional Designations of the External Person Certifying the Report</b>
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.



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

07-06-2017

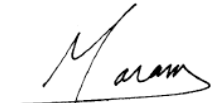
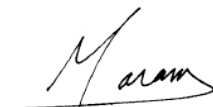
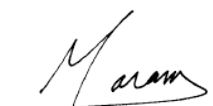

\_\_\_\_\_  
Report Issued Date (dd-mm-yyyy)

***APPENDIX VI***  
***DATA VALIDATION CERTIFICATION FORM***



### Validation Certificate Form

<b>Client:</b> <u>Lakeland Industry &amp; Community Association</u>	<b>Project #:</b> <u>2833-2017-04-1-C</u>
<b>Site:</b> <u>Cold Lake Continuous Monitoring Station</u>	<b>Contact:</b> <u>Mike Bisaga</u>

Level 0 Preliminary Verification	 _____	Date <u>29-May-17</u>
Level 1 Primary Validation	 _____	Date <u>30-May-17</u>
Level 2 Final Validation	 _____	Date <u>07-June-17</u>
Level 3 Independent Data Review	 _____	Date <u>07-June-17</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

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



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

February 22, 2018

**Subject: Monthly Report Submission for the LICA Maskwa station**

---

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

The air monitoring program consists of continuous air monitoring results for Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulphide (H<sub>2</sub>S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxides (NO), Nitrogen Dioxide (NO<sub>2</sub>), 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 April 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

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

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

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

Respectfully,



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

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

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

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

Lily Lin  
Data & Reporting Specialist  
587-225-2248  
[rebbacaa@gmail.com](mailto:rebbacaa@gmail.com)



MAXXAM ANALYTICS  
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Toll Free 800-386-7247  
Fax 403-219-3673

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

**JOB #: 2833-2017-04-30-C**

**April 2017**

Prepared for:

**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**

402 - 19 ST NW  
CALGARY, ALBERTA  
T2N 2J1

**Attention: MIKE BISAGA**

DATE: **June 6, 2017**

Prepared by:

A handwritten signature in blue ink, appearing to read "Bim Adeniji", is written over a horizontal line.

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

Reviewed by:

A handwritten signature in blue ink, appearing to read "Wunmi Adekanmbi", is written over a horizontal line.

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



## **SUMMARY**

In April 2017, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Maskwa Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by Lakeland Industry & Community Association.

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

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

**THC:** Eleven hours of downtime were recorded between April 10 and April 11, due to an analyzer flame-out event. Two additional hours of downtime were attributed to additional quality checks, that were performed on April 17, to address a biased low span response.

**NOX/NO<sub>2</sub>/NO:** The analyzer was recording elevated readings in the hour following the zero/span cycle. These data were invalidated as they were not representative of ambient concentrations. Thirty-one hours of downtime were therefore incurred.

NOx calibration concentrations were calculated using a NOx gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NOx that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NOx gas value (50.9 ppm) and the outcome was insignificant. The calibration is still deemed AMD compliant.

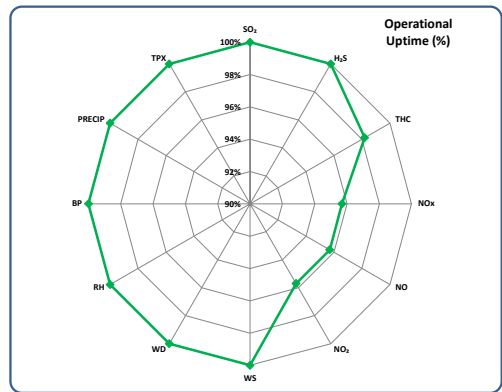
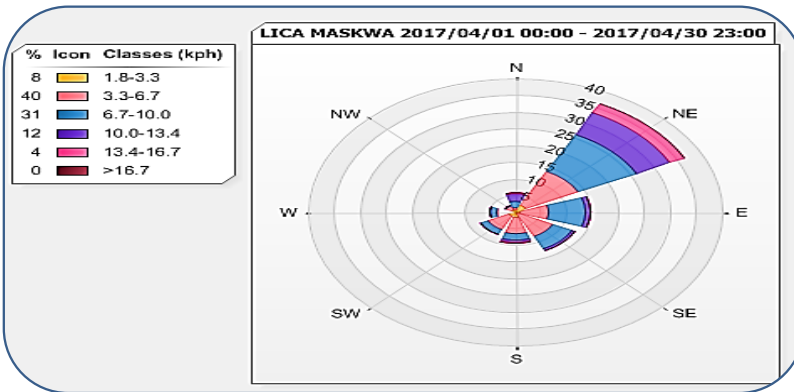
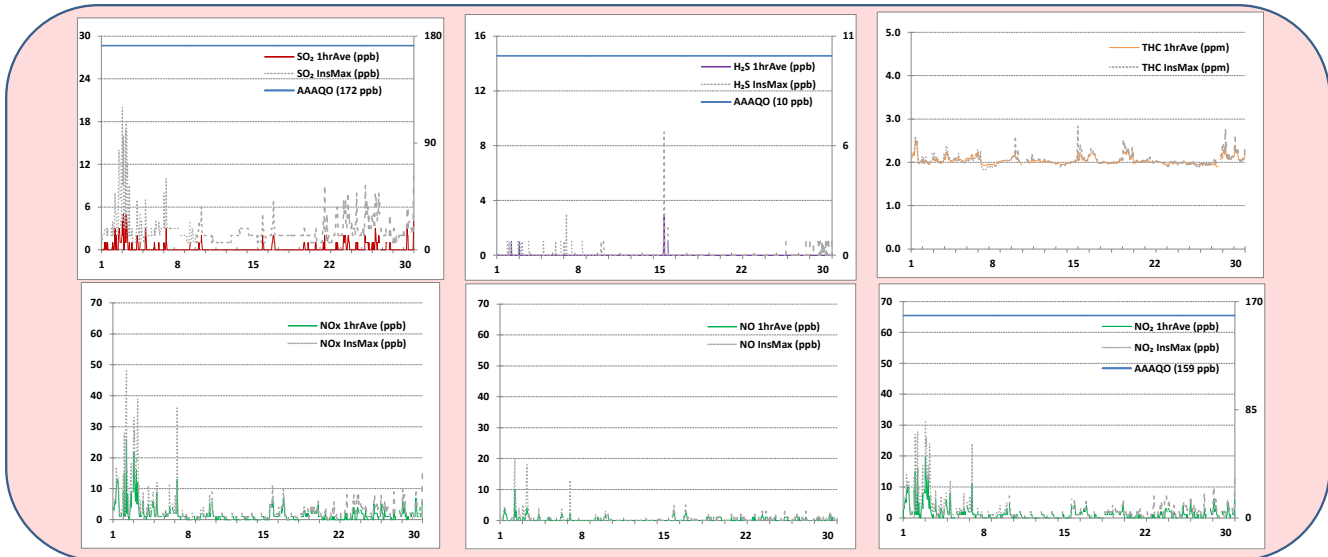
The summary of results is presented on the following pages.

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

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

April 2017 Monthly Report Summary

Pollutants		Monthly Records		1-Hour Records					24-Hour Records			
Name	Unit	Avg. Conc.	Uptime	Maximum			AAAQO Objective	Exceed. Hours	Maximum		AAAQO Objective	Exceed. Days
				Conc.	Date	Hour			Conc.	Date		
SO <sub>2</sub>	ppb	0	100.0%	5	April 3	2	172	0	3	April 3	48	0
H <sub>2</sub> S	ppb	0	100.0%	3	April 15	23	10	0	0	April 15	3	0
THC	ppm	2.04	98.2%	2.52	April 1	9	-	-	2.17	April 1	-	-
NO <sub>x</sub>	ppb	2	95.7%	26	April 2	7	-	-	7	April 3	-	-
NO	ppb	0	95.7%	10	April 2	7	-	-	1	April 1	-	-
NO <sub>2</sub>	ppb	1	95.7%	20	April 3	0	159	0	6	April 3	-	-
WS	kph	3.4	100.0%	16.6	April 14	20	-	-	12.8	April 14	-	-
WD	degree	68 (ENE)	100.0%	-	-	-	-	-	-	-	-	-
RH	%	69	100.0%	92	April 14	3	-	-	91	April 14	-	-
BP	mbar	940	100.0%	955	April 21	10	-	-	953	April 21	-	-
PRECIP	mm	0.1	100.0%	4.2	April 14	8	-	-	2.1	April 14	-	-
AmbTPX	°C	2.1	100.0%	17.7	April 6	14	-	-	9.3	April 6	-	-



Monthly Update

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

Operational Issues

**THC:** Eleven hours of downtime were recorded between April 10 and April 11, due to an analyzer flame-out event. Two additional hours of downtime were attributed to additional quality checks, that were performed on April 17, to address a biased low span response.  
**NOX/NO<sub>2</sub>/NO:** The analyzer was recording elevated readings in the hour following the zero/span cycle. These data were invalidated as they were not representative of ambient concentrations. Thirty-one hours of downtime were therefore incurred.

### Monthly Continuous Data Summary

Lakeland Industry & Community Association Maskwa Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	1-HOUR					24-HOUR		
	1-hr	24-hr	1-hr	24-hr		READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO <sub>2</sub> (ppb)	172	48	0	0	0	5	3	2	6.1	WNW	3	3	100.0
H <sub>2</sub> S (ppb)	10	3	0	0	0	3	15	23	4.1	NE	0	15	100.0
THC (ppm)	-	-	-	-	2.04	2.52	1	9	8	SSW	2.17	1	98.2
NO <sub>2</sub> (ppb)	159	-	0	-	1	20	3	0	5	WNW	6	3	95.7
NO (ppb)	-	-	-	-	0	10	2	7	5.5	W	1	1	95.7
NO <sub>x</sub> (ppb)	-	-	-	-	2	26	2	7	5.5	W	7	3	95.7
RELATIVE HUMIDITY (%)	-	-	-	-	69	92	14	3	10.7	ENE	91	14	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	940	955	21	10	7.3	NNE	953	21	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	2.1	17.7	6	14	4	SW	9.3	6	100.0
PRECIPITATION (mm)	-	-	-	-	0.1	4.2	14	8	10	NE	2.1	14	100.0
VECTOR WS (kph)	-	-	-	-	3.4	16.6	14	20	-	NE	12.8	14	100.0
VECTOR WD (sec)	-	-	-	-	68 (ENE)	-	-	-	-	-	-	-	100.0

---

## Exceedance Summary Report

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

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

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

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

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

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

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

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

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

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

*In accordance with EPEA and the Substance Release Regulation.*

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

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## 1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulphide (H<sub>2</sub>S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxides (NO), Nitrogen Dioxide (NO<sub>2</sub>), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

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

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

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

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

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

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

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

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (December, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

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

#### **SULPHUR DIOXIDE (SO<sub>2</sub>)**

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on April 28.

#### **HYDROGEN SULPHIDE (H<sub>2</sub>S)**

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on April 28.

#### **TOTAL HYDROCARBONS (THC)**

- Operational time, for the monitoring period was 98.2%, equivalent to thirteen hours of downtime.
- The analyzer flamed out on April 10, at hour 22:00, due to low hydrogen gas pressure. The gas cylinder was replaced on April 11, at hour 8:00 and no further issues were identified. Eleven hours of data were invalidated due to this event.
- The daily span results exceeded the lower acceptance limit on April 17, due to low span gas pressure. The result of a repeat span check also confirmed the drift. A site visit was scheduled immediately, during which the span gas cylinder was replaced. A successful span check was completed afterwards, to provide a reference for the expected span value. No data was discarded due to this event as analyzer performance was not impacted. However, two hours of downtime were recorded due to the additional quality checks.
- The routine monthly calibration was performed on April 28.

#### **OXIDES OF NITROGEN (NO<sub>x</sub>), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO<sub>2</sub>)**

- Operational time, for the monitoring period was 95.7%, equivalent to thirty-one hours of downtime.
- The routine monthly calibration was performed on April 28.
- It was observed that the analyzer was recording elevated readings in the hour following the zero/span cycle. These elevated readings were caused by a delay of the reaction cell purging with ambient air and re-stabilizing at ambient baseline levels; and were therefore invalidated. Arrangements are being made to temporarily replace the resident analyzer. LICA's analyzer would be installed upon its return from the manufacturer, where it is currently being repaired. Thirty-one hours (thirty-two hours of maximum instantaneous) of data were invalidated due to this issue.
- NO<sub>x</sub> calibration concentrations were calculated using a NO<sub>x</sub> gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NO<sub>x</sub> that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO<sub>x</sub> gas value (50.9 ppm) and the outcome was insignificant. The calibration is still deemed AMD compliant.

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

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

#### **RELATIVE HUMIDITY (RH)**

- Operational time, for the monitoring period was 100%.

#### **BAROMETRIC PRESSURE (BP)**

- Operational time, for the monitoring period was 100%.



**PRECIPITATION (PRECIP)**

- Operational time, for the monitoring period was 100%.

**AMBIENT TEMPERATURE (AmbTPX)**

- Operational time, for the monitoring period was 100%.

## **2.0 Project Personnel**

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakopov.

## **3.0 Plant Monthly Required AMD Summary**

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

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

## **4.0 Calculations and Results**

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

## 5.0 Methods and Procedures

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

- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO<sub>2</sub>/NO<sub>x</sub> Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - Thermo 43i UV Fluorescent Analyzer
- Hydrogen Sulphide - Thermo 43C UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - API 200A Chemiluminescent Analyzer
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

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

**Level 0 Preliminary Verification**

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

**Level 1 Primary Validation**

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

**Level 2 Final Validation**

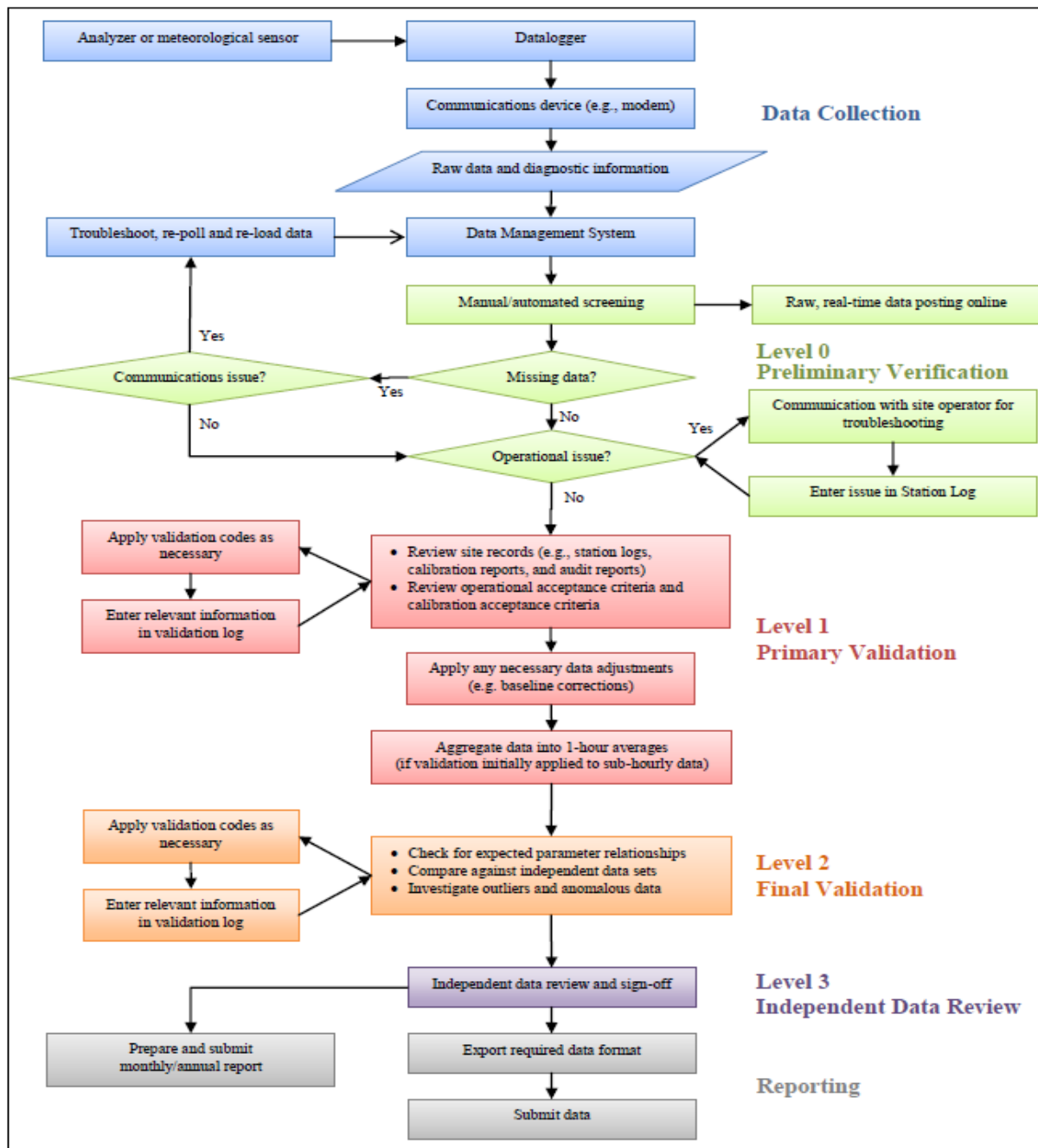
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

**Level 3 Independent Data Review**

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

**Post-Final Validation**

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



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

***APPENDIX I***  
***CONTINUOUS MONITORING DATA RESULTS***

***SULPHUR DIOXIDE***

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

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

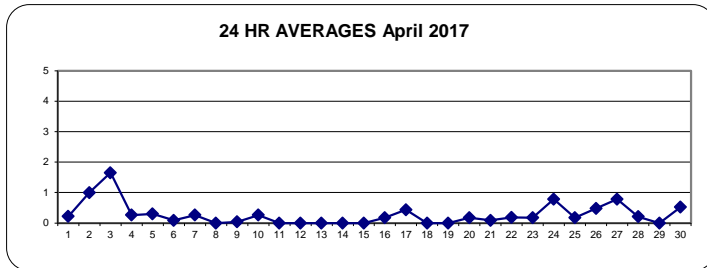
**STATUS FLAG CODES**

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

**OBJECTIVE LIMIT:**

<b>ALBERTA ENVIRONMENT:</b>	1-HR	172	ppb	24-HR	48	ppb
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**24 HR AVERAGES April 2017**

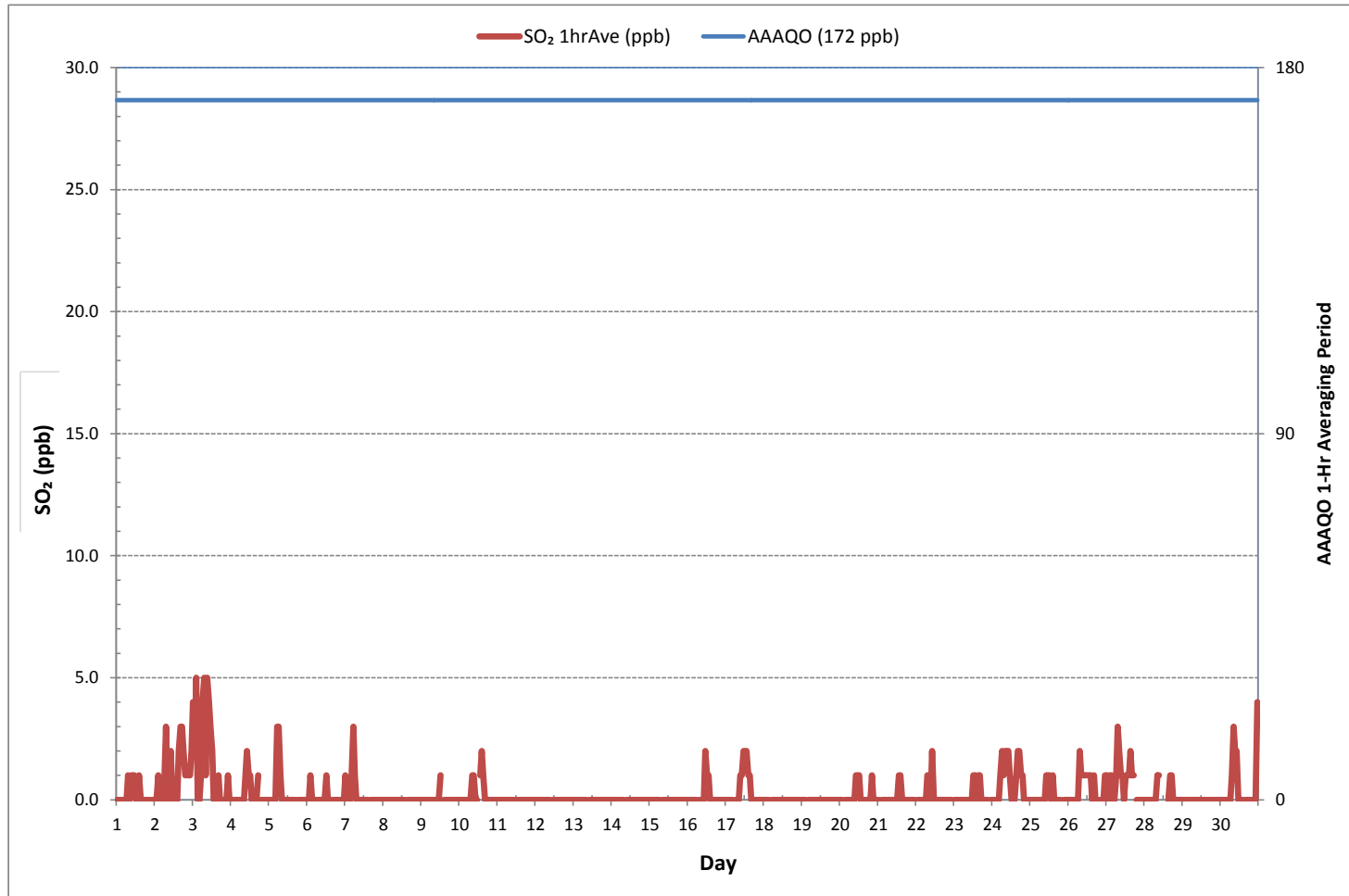


**MONTHLY SUMMARY**

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	123		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0 ON DAY	1
MAXIMUM 1-HR AVERAGE:	5 ppb @ HOUR	2 ON DAY	3
MAXIMUM 24-HR AVERAGE:	3 ppb	ON DAY	3
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb



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





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

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

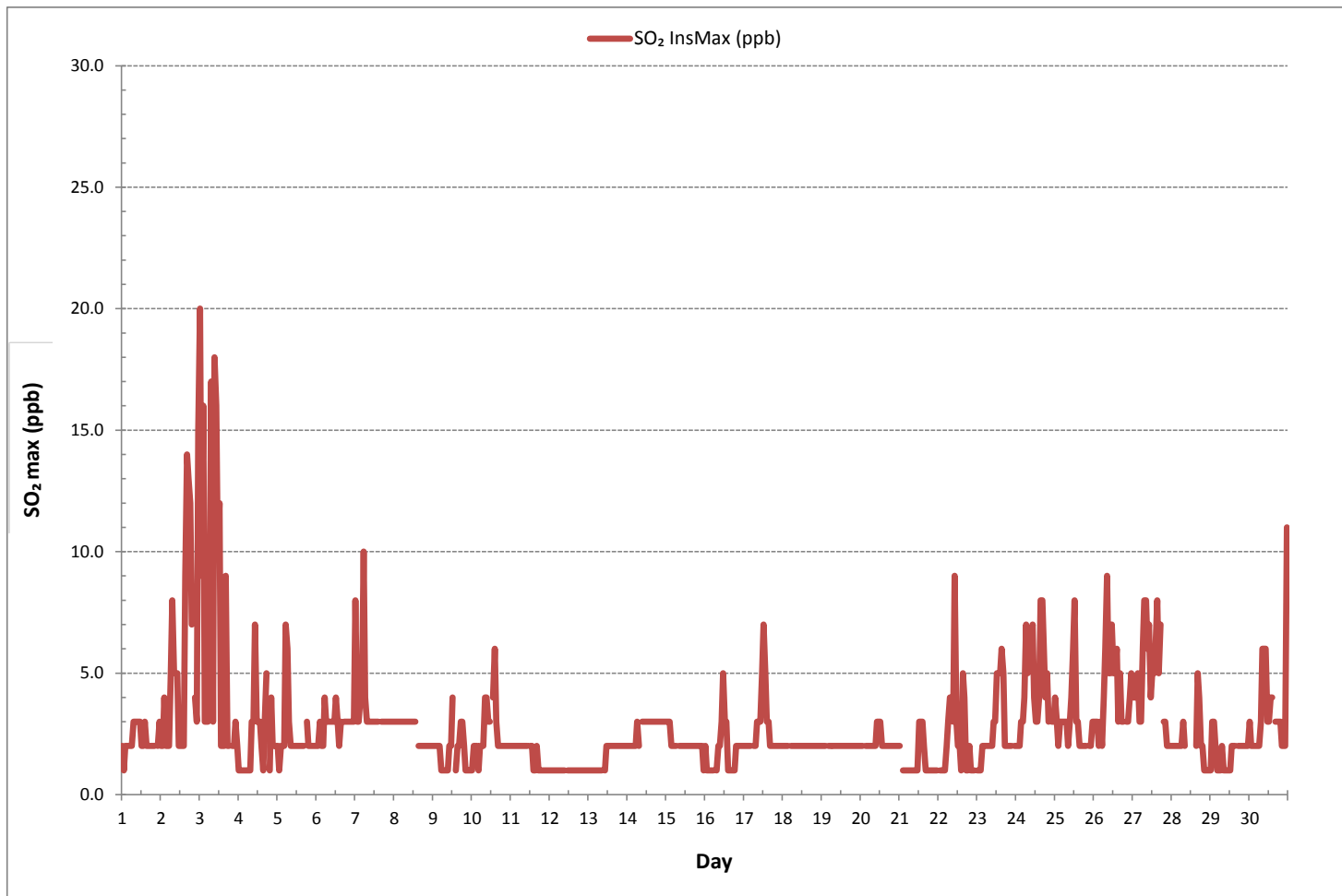
STATUS FLAG CODES

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:	684
MAXIMUM INSTANTANEOUS VALUE:	20 ppb @ HOUR 0 ON DAY 3
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	6 hrs
STANDARD DEVIATION:	2
OPERATIONAL TIME:	720 hrs

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



Wind: LICA MASKWA  
 Poll.: LICA MASKWA-SO2[ppb]  
 Monthly: 2017/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

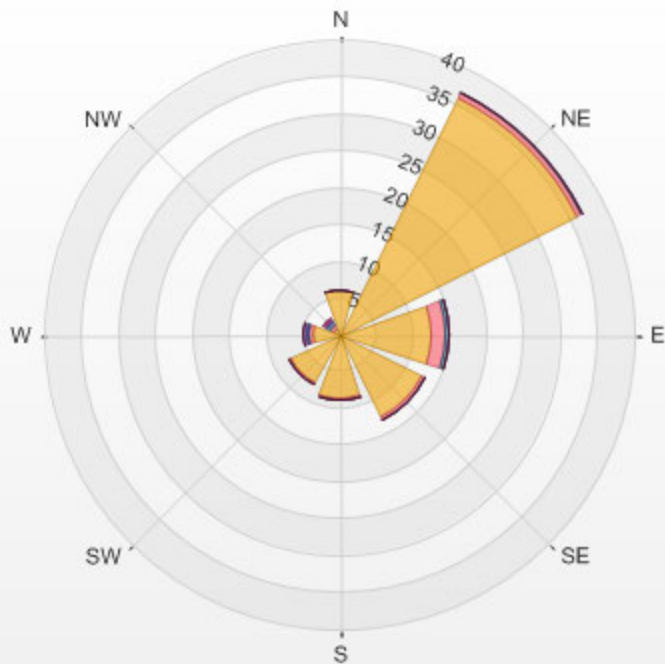
Calm: 5.11%

Calm Avg: 0.25 [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
<b>N</b>	6.0	0.0	0.0	0.0	0.0	0.0	6.0
<b>NE</b>	36.1	0.6	0.2	0.0	0.0	0.0	36.8
<b>E</b>	12.4	2.0	0.6	0.0	0.0	0.0	15.0
<b>SE</b>	12.4	0.6	0.2	0.0	0.0	0.0	13.1
<b>S</b>	8.8	0.2	0.0	0.0	0.0	0.0	8.9
<b>SW</b>	7.5	0.2	0.0	0.0	0.0	0.0	7.6
<b>W</b>	3.7	0.4	0.3	0.6	0.0	0.0	5.0
<b>NW</b>	1.0	0.6	0.4	0.2	0.3	0.0	2.5
<b>Summary</b>	87.8	4.5	1.6	0.7	0.3	0.0	94.9

% Icon	Classes (ppb)	88	0.0-1.2	5	1.2-2.4	2	2.4-3.6	1	3.6-4.8	0	4.8-6.0	0	>6.0
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LICA MASKWA Poll.: LICA MASKWA-SO2[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 5.11% Calm Poll Avg: 0.25[ppb]



SO2[ppb] Calibration: LICA MASKWA Monthly: 2017/04 Type: Span



Span Meas Span Ref Span Low Span High

***HYDROGEN SULPHIDE***

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

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

**STATUS FLAG CODES**

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

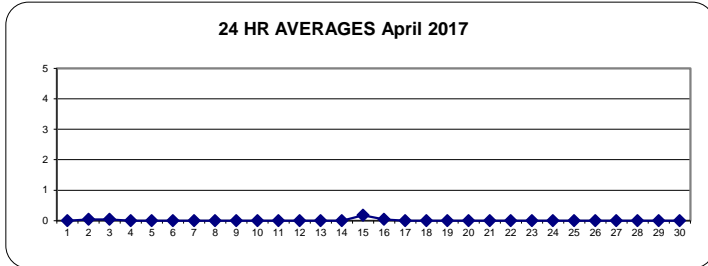
**OBJECTIVE LIMIT:**

<b>ALBERTA ENVIRONMENT:</b>	1-HR	10	ppb	24-HR	3	ppb
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**MONTHLY SUMMARY**

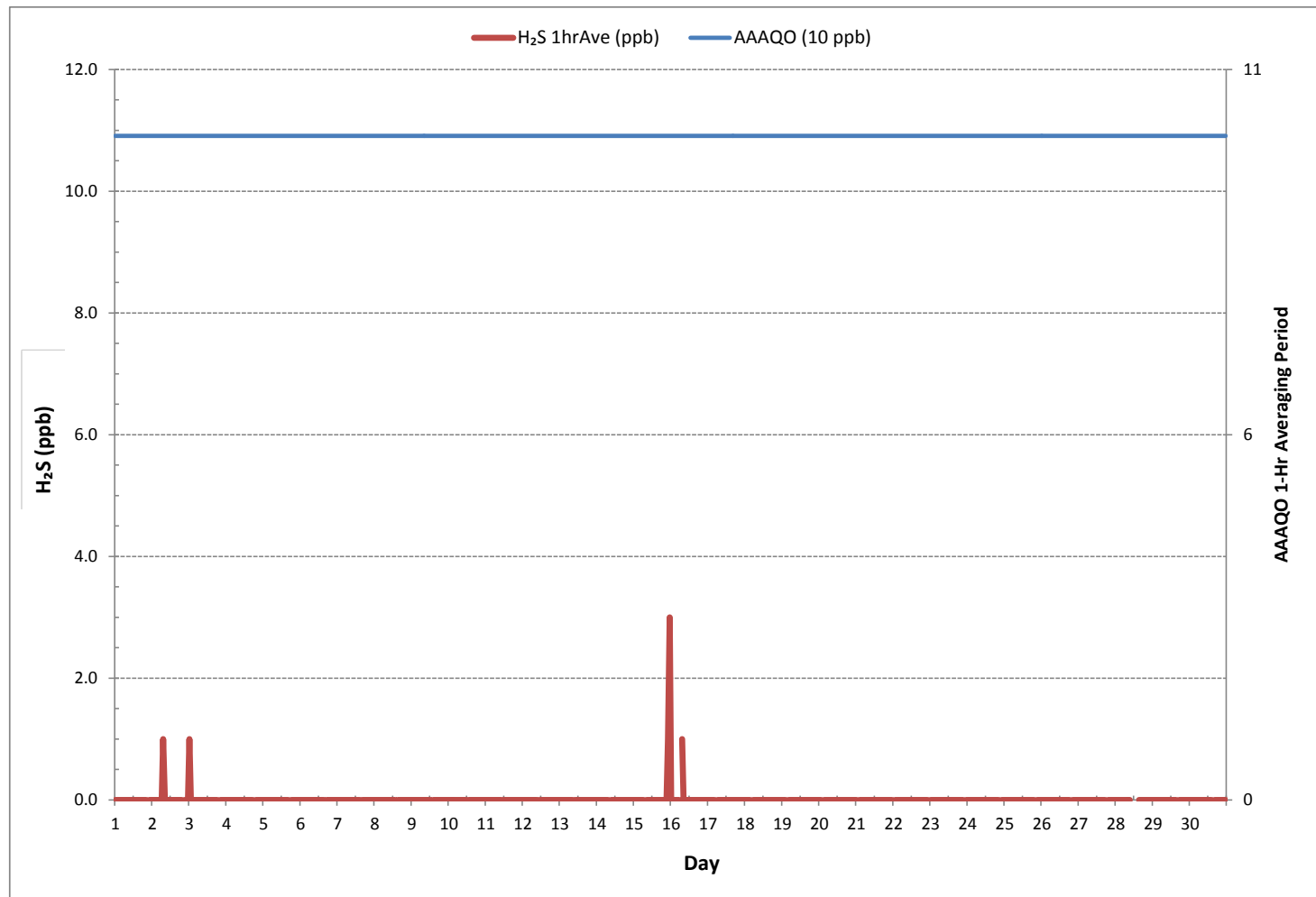
NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	5		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0 ON DAY	1
MAXIMUM 1-HR AVERAGE:	3 ppb @ HOUR	23 ON DAY	15
MAXIMUM 24-HR AVERAGE:	0 ppb	ON DAY	15
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb

**24 HR AVERAGES April 2017**





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





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

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

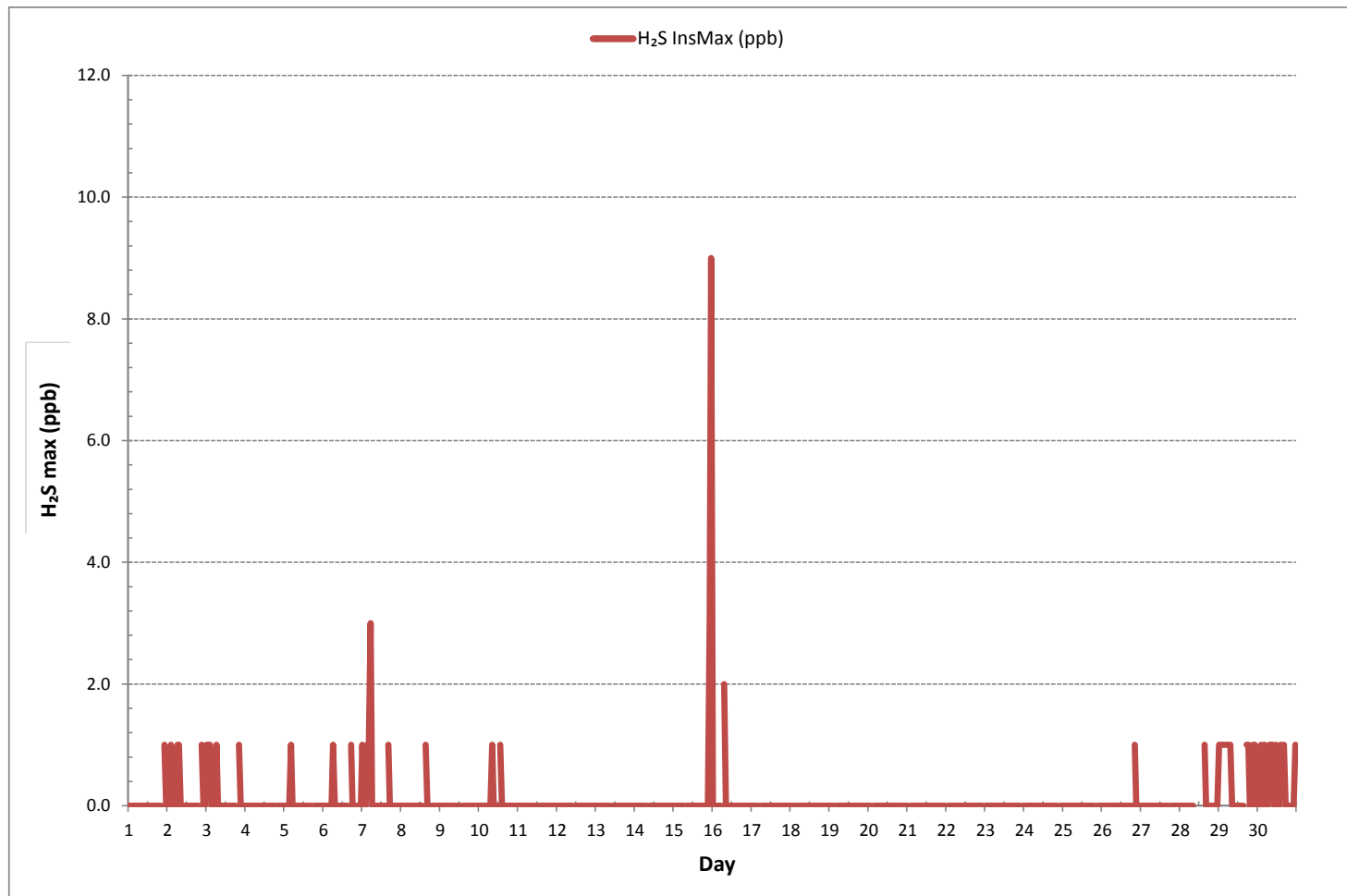
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	47
MAXIMUM INSTANTANEOUS VALUE:	9 ppb @ HOUR 23 ON DAY 15
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	6 hrs
STANDARD DEVIATION:	0
OPERATIONAL TIME:	720 hrs

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



Wind: LICA MASKWA  
 Poll.: LICA MASKWA-H2S[ppb]  
 Monthly: 2017/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 5.11% Calm Avg: 0.06 [ppb]

Direction	0.0-1.3	1.3-2.7	2.7-4.0	>4.0	Total
N	6.0	0.0	0.0	0.0	6.0
NE	36.6	0.0	0.2	0.0	36.8
E	15.0	0.0	0.0	0.0	15.0
SE	13.1	0.0	0.0	0.0	13.1
S	8.9	0.0	0.0	0.0	8.9
SW	7.6	0.0	0.0	0.0	7.6
W	5.0	0.0	0.0	0.0	5.0
NW	2.5	0.0	0.0	0.0	2.5
<b>Summary</b>	94.8	0.0	0.2	0.0	94.9

% Icon Classes (ppb)

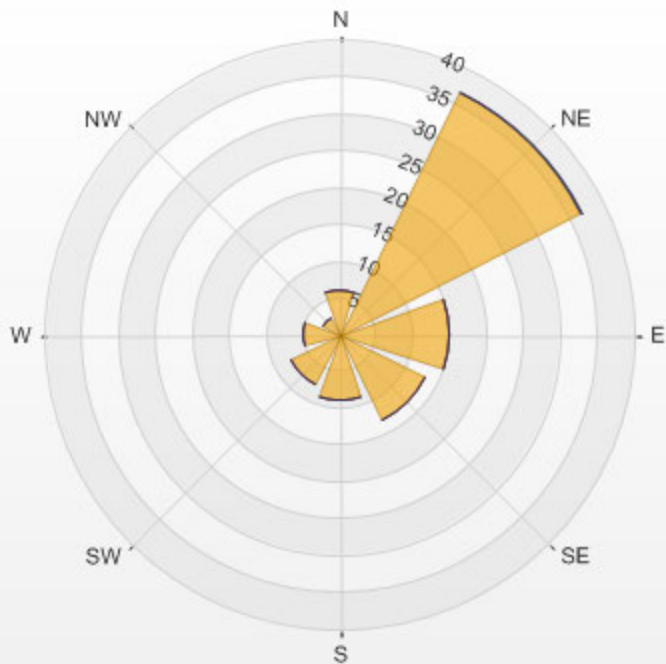
95 0.0-1.3

0 1.3-2.7

0 2.7-4.0

0 >4.0

LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 5.11% Calm Poll  
Avg: 0.06[ppb]



# H2S[ppb] Calibration: LICA MASKWA Monthly: 2017/04 Type: Span



Span Meas Span Ref Span Low Span High

***TOTAL HYDROCARBON***



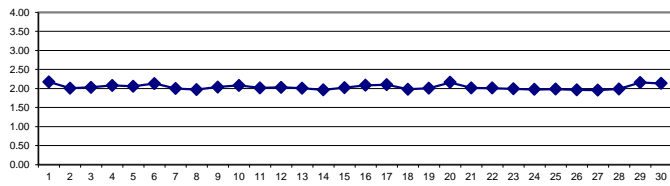
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.17	2.11	2.13	2.16	2.22	2.23	2.18	2.15	2.41	2.52	2.45	2.41	2.47	2.25	2.05	1.98	1.99	2.00	1.99	2.01	2.03	S	2.03	2.01	1.98	2.52	2.17	2.4	24
2	2.00	1.99	2.04	1.99	1.99	2.00	2.03	2.04	2.00	2.01	2.02	1.97	1.96	1.97	1.95	1.96	1.97	1.98	2.01	2.03	S	2.07	2.07	2.05	1.95	2.07	2.00	2.4	24
3	2.07	2.09	2.08	2.03	2.03	2.03	2.10	2.04	2.02	2.04	2.02	2.00	2.00	1.98	1.98	1.97	1.98	2.02	2.00	S	2.00	2.02	2.06	2.11	1.97	2.11	2.03	24	24
4	2.06	2.08	2.11	2.23	2.18	2.23	2.16	2.12	2.06	2.09	2.07	2.05	2.03	2.02	2.01	2.02	2.00	2.03	S	2.03	2.06	2.06	2.04	2.08	2.00	2.23	2.08	24	24
5	2.08	2.05	2.03	2.05	2.05	2.14	2.14	2.06	2.05	2.06	2.07	2.06	2.04	2.02	2.03	2.03	2.02	S	2.03	2.03	2.05	2.06	2.07	2.09	2.02	2.14	2.06	24	24
6	2.10	2.08	2.09	2.07	2.08	2.09	2.09	2.10	2.10	2.15	2.18	2.14	2.16	2.12	2.08	2.10	S	2.17	2.17	2.16	2.21	2.18	2.16	2.23	2.07	2.23	2.03	24	24
7	2.21	2.15	2.12	2.13	2.12	2.10	1.99	1.99	1.98	1.96	1.94	1.93	1.93	1.93	1.93	S	1.93	1.93	1.93	1.95	1.95	1.96	1.95	1.94	1.93	2.21	2.00	24	24
8	1.95	1.95	1.95	1.94	1.94	1.95	1.94	1.94	1.95	1.96	1.96	1.96	1.96	1.96	S	1.97	1.98	2.00	2.00	2.00	2.01	2.02	2.02	2.01	1.94	2.02	1.97	24	24
9	2.02	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.04	2.04	2.04	2.04	2.03	S	2.03	2.03	2.04	2.04	2.04	2.04	2.04	2.04	2.05	2.08	2.02	2.08	2.04	24	24
10	2.08	2.10	2.12	2.13	2.13	2.13	2.13	2.14	2.28	2.13	2.08	2.09	S	2.06	2.08	2.03	2.02	2.01	2.00	1.99	1.98	1.94	X	X	1.94	2.28	2.08	22	24
11	X	X	X	X	X	X	X	X	X	2.01	2.00	S	2.00	1.99	1.99	1.99	1.99	2.00	2.01	2.09	2.05	2.03	2.03	1.99	2.09	2.01	15	24	
12	2.02	2.02	2.03	2.03	2.03	2.04	2.04	2.04	2.04	S	2.04	2.03	2.02	2.02	2.02	2.01	2.01	2.02	2.02	2.03	2.04	2.03	2.02	2.01	2.01	2.04	2.03	24	24
13	2.03	2.03	2.02	2.02	2.02	2.03	2.02	2.01	2.00	S	2.00	2.00	2.01	2.00	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.98	1.99	1.98	2.03	2.00	24	24
14	1.98	1.98	1.98	1.98	1.97	1.98	1.97	1.96	S	1.94	1.94	1.96	1.96	1.95	1.94	1.95	1.95	1.96	1.96	1.96	1.96	1.98	1.97	1.98	1.94	1.98	1.96	24	24
15	1.98	1.97	1.98	1.99	1.99	1.99	2.00	S	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.02	2.01	2.02	2.03	2.03	2.04	2.03	2.09	2.25	1.97	2.25	2.02	24	24
16	2.03	2.04	2.06	2.09	2.23	2.23	S	2.19	2.07	2.05	2.05	2.08	2.09	2.06	2.04	2.05	2.03	2.03	2.02	2.02	2.06	2.11	2.13	2.12	2.02	2.23	2.08	24	24
17	2.14	2.15	2.17	2.21	2.25	S	S1	2.20	2.17	2.19	S1	2.17	2.15	2.11	2.07	2.07	2.05	2.03	2.01	1.98	1.97	1.97	1.97	1.97	1.97	2.25	2.10	22	24
18	1.97	1.97	1.97	1.97	S	1.98	1.99	2.00	2.00	2.00	2.00	1.99	1.98	1.98	1.97	1.97	1.97	1.96	1.96	1.97	1.98	1.97	1.97	1.97	1.96	2.00	1.98	24	24
19	1.97	1.98	1.98	S	1.97	1.99	1.99	1.99	2.00	1.98	1.97	1.98	1.98	1.98	2.00	2.03	2.00	2.04	2.06	2.05	2.06	2.07	2.06	2.03	1.97	2.07	2.01	24	24
20	2.06	2.10	S	2.25	2.21	2.20	2.23	2.18	2.19	2.23	2.25	2.31	2.27	2.18	2.13	2.07	2.07	2.06	2.08	2.10	2.19	2.26	2.10	1.97	1.97	2.31	2.16	24	24
21	1.97	S	1.98	1.98	2.00	2.01	2.01	2.02	2.03	2.02	2.01	2.01	2.02	2.02	2.02	2.01	2.01	2.02	2.01	2.02	2.03	2.03	2.01	2.01	1.97	2.03	2.01	24	24
22	S	2.02	2.01	2.03	2.03	2.03	2.03	2.04	2.03	2.01	2.02	2.01	2.01	2.00	2.00	2.00	2.00	1.97	1.98	2.00	2.00	2.01	S	1.97	2.04	2.01	2.01	24	24
23	2.02	2.02	2.02	2.01	2.02	2.02	2.02	2.02	2.00	2.00	2.00	1.99	1.98	1.98	1.97	1.98	1.97	1.95	1.94	1.95	1.96	S	1.96	1.94	2.02	1.99	2.4	24	24
24	1.96	1.95	1.95	1.95	1.95	1.98	2.01	2.00	2.00	2.00	2.00	1.97	1.96	1.96	1.97	1.98	2.00	2.00	1.98	1.97	1.97	S	1.97	1.98	1.95	2.01	1.98	24	24
25	1.99	1.99	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.99	2.01	2.01	2.00	2.00	2.00	1.98	1.98	1.97	1.98	S	1.97	1.98	1.98	1.97	2.01	1.99	2.4	24	24
26	1.99	1.99	1.99	1.97	1.96	1.96	1.97	1.99	1.98	1.96	1.96	1.97	1.96	1.95	1.94	1.95	1.95	1.95	1.95	S	1.95	1.95	1.96	1.97	1.94	1.99	1.96	24	24
27	1.95	1.95	1.96	1.96	1.96	1.97	1.97	1.98	1.96	1.95	1.94	1.93	1.94	1.93	1.93	1.96	1.94	1.95	S	1.95	1.96	1.97	1.96	1.95	1.93	1.98	1.95	24	24
28	1.96	1.96	1.94	1.93	1.94	1.96	2.03	1.95	1.96	1.91	1.91	1.90	1.90	1.91	C	C	C	C	C	2.06	2.08	2.09	2.10	2.14	2.09	1.90	2.14	24	24
29	2.18	2.28	2.26	2.20	2.18	2.46	2.35	2.15	2.10	2.11	2.08	2.07	2.07	2.14	2.08	2.07	S	2.08	2.11	2.12	2.14	2.13	2.13	2.14	2.07	2.46	2.16	24	24
30	2.13	2.22	2.39	2.29	2.23	2.25	2.20	2.20	2.16	2.11	2.05	2.06	2.05	2.05	2.06	S	2.04	2.06	2.08	2.08	2.06	2.07	2.07	2.19	2.04	2.39	2.13	24	24
HOURLY MAX	2.21	2.28	2.39	2.29	2.25	2.46	2.35	2.20	2.41	2.52	2.45	2.41	2.47	2.25	2.13	2.10	2.07	2.17	2.17	2.16	2.21	2.26	2.16	2.25					
HOURLY AVG	2.04	2.04	2.05	2.06	2.06	2.07	2.06	2.05	2.06	2.05	2.04	2.04	2.03	2.02	2.03	2.01	2.00	2.01	2.01	2.02	2.03	2.04	2.04	2.04					

STATUS FLAG CODES

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

24 HR AVERAGES April 2017

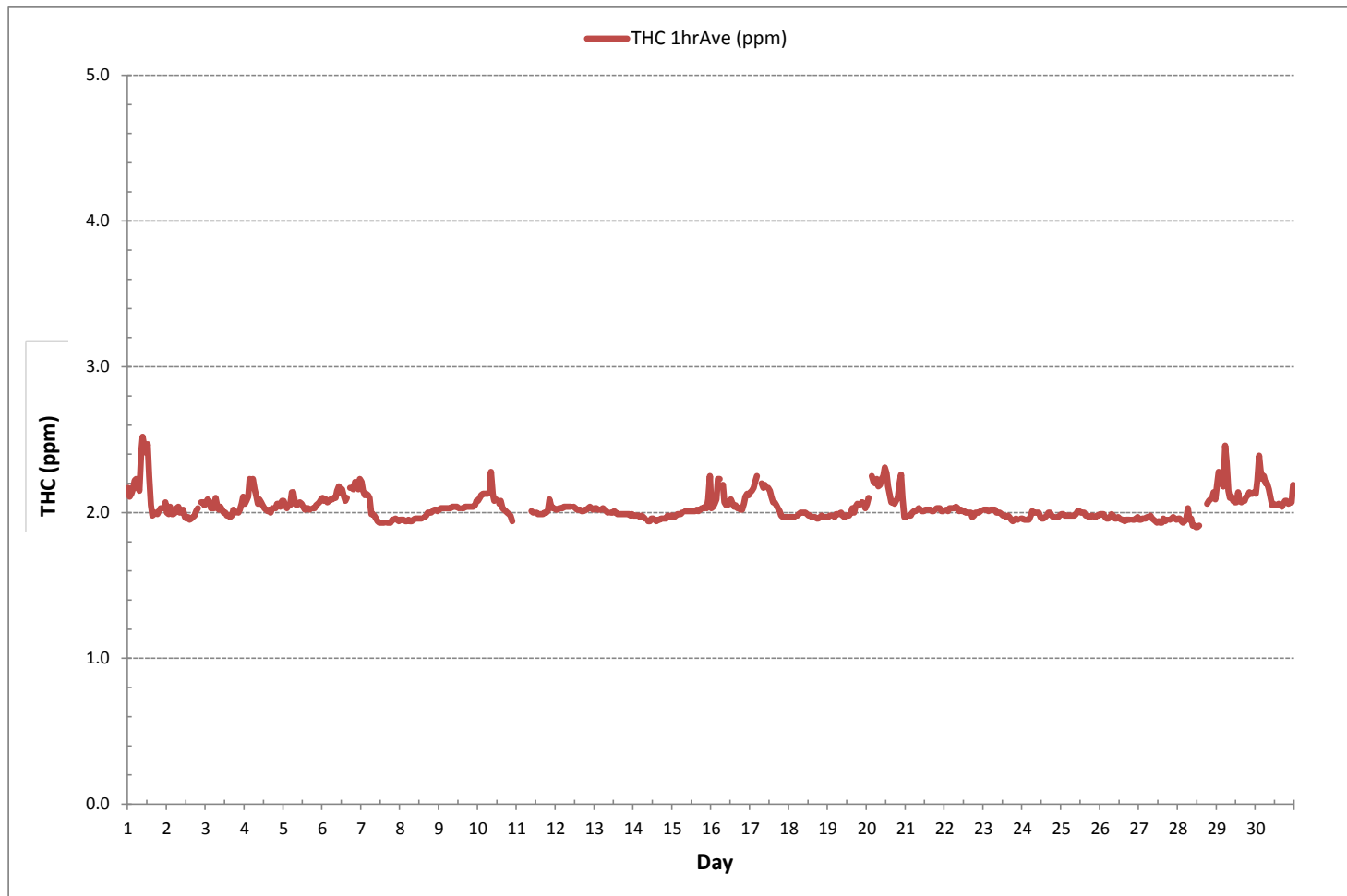


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	673
MINIMUM 1-HR AVERAGE:	1.90 ppm @ HOUR 11 ON DAY 28
MAXIMUM 1-HR AVERAGE:	2.52 ppm @ HOUR 9 ON DAY 1
MAXIMUM 24-HR AVERAGE:	2.17 ppm ON DAY 1
IZS CALIBRATION TIME:	30 hrs OPERATIONAL TIME: 707 hrs
MONTHLY CALIBRATION TIME:	4 hrs AMD OPERATION UPTIME: 98.2 %
STANDARD DEVIATION:	0.09 MONTHLY AVERAGE: 2.04 ppm



TOTAL HYDROCARBONS Hourly Averages (THC ppm)





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

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.20	2.11	2.13	2.18	2.23	2.23	2.23	2.26	2.60	2.58	2.49	2.42	2.49	2.32	2.08	1.96	1.98	1.98	1.95	1.98	2.01	S	2.04	1.98	1.95	2.60	2.19	24	
2	1.98	2.01	2.12	1.96	1.98	1.98	2.11	2.12	2.02	2.02	2.02	1.98	1.95	2.01	1.97	1.99	2.01	1.98	2.07	2.07	S	2.20	2.13	2.07	1.95	2.20	2.03	24	
3	2.20	2.23	2.17	2.04	2.05	2.07	2.14	2.08	2.04	2.10	2.04	2.04	2.02	2.01	1.98	1.99	2.02	2.04	2.04	S	2.02	2.04	2.20	2.20	1.98	2.23	2.08	24	
4	2.10	2.10	2.17	2.38	2.36	2.32	2.26	2.23	2.10	2.12	2.14	2.10	2.05	2.04	2.04	2.04	2.04	2.07	S	2.07	2.11	2.10	2.07	2.10	2.04	2.38	2.14	24	
5	2.11	2.05	2.04	2.04	2.04	2.20	2.20	2.07	2.04	2.05	2.05	2.04	2.02	2.00	2.01	2.01	1.98	S	1.99	1.99	2.01	2.01	2.02	2.04	1.98	2.20	2.04	24	
6	2.04	2.04	2.07	2.01	2.04	2.05	2.04	2.04	2.04	2.10	2.11	2.08	2.10	2.07	2.04	2.04	S	2.10	2.10	2.10	2.15	2.12	2.09	2.29	2.01	2.29	2.08	24	
7	2.27	2.07	2.04	2.10	2.11	2.26	1.90	1.90	1.89	1.89	1.86	1.83	1.83	1.84	1.86	S	1.83	1.83	1.86	1.87	1.89	1.89	1.87	1.87	1.83	2.27	1.94	24	
8	1.87	1.89	1.89	1.89	1.87	1.89	1.89	1.89	1.89	1.89	1.90	1.90	1.92	1.90	S	1.92	1.93	1.96	1.98	1.99	2.01	2.01	2.01	2.01	1.87	2.01	1.92	24	
9	2.01	2.01	2.01	2.01	2.02	2.04	2.04	2.04	2.04	2.05	2.05	2.05	2.07	S	2.05	2.05	2.07	2.07	2.07	2.07	2.07	2.05	2.05	2.07	2.10	2.01	2.10	2.05	24
10	2.10	2.12	2.13	2.14	2.14	2.15	2.13	2.14	2.60	2.29	2.08	2.08	S	2.08	2.29	2.08	2.05	2.01	2.01	1.99	1.99	1.96	X	X	1.96	2.60	2.12	22	
11	X	X	X	X	X	X	X	X	X	2.07	2.04	S	2.05	2.02	2.01	2.01	2.02	2.04	2.05	2.20	2.14	2.05	2.07	2.01	2.20	2.06	15		
12	2.05	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.08	2.07	S	2.07	2.07	2.07	2.05	2.04	2.04	2.04	2.05	2.05	2.07	2.07	2.07	2.05	2.04	2.08	2.06	24	
13	2.07	2.05	2.05	2.04	2.04	2.05	2.04	2.04	2.02	S	2.02	2.01	2.01	2.01	2.01	1.99	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	2.07	2.01	24
14	1.96	1.95	1.95	1.95	1.95	1.95	1.95	1.93	S	1.90	1.92	1.92	1.92	1.92	1.90	1.92	1.92	1.92	1.92	1.93	1.95	1.95	1.95	1.95	1.90	1.96	1.93	24	
15	1.95	1.95	1.95	1.95	1.96	1.98	1.98	S	1.99	2.01	2.01	1.99	2.01	2.01	2.01	2.02	2.01	2.04	2.05	2.07	2.07	2.05	2.38	2.84	1.95	2.84	2.06	24	
16	2.05	2.07	2.10	2.15	2.42	2.31	S	2.29	2.11	2.08	2.07	2.11	2.12	2.08	2.07	2.10	2.04	2.05	2.04	2.05	2.10	2.13	2.17	2.17	2.04	2.42	2.13	24	
17	2.17	2.17	2.20	2.32	2.32	S	S1	2.26	2.20	2.21	S1	2.20	2.17	2.14	2.08	2.07	2.07	2.04	2.04	2.01	1.98	1.98	1.98	1.98	1.98	2.32	2.12	22	
18	1.98	1.98	1.99	2.01	S	2.01	2.01	2.02	2.01	2.01	2.01	2.01	2.01	1.99	1.99	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	2.02	1.99	24	
19	1.98	1.99	2.01	S	1.98	2.04	2.02	2.01	2.02	2.01	1.99	1.99	2.01	2.01	2.03	2.04	2.02	2.08	2.07	2.07	2.10	2.10	2.10	2.05	1.98	2.10	2.03	24	
20	2.10	2.57	S	2.44	2.38	2.26	2.36	2.20	2.24	2.26	2.31	2.35	2.32	2.26	2.17	2.12	2.09	2.08	2.17	2.15	2.35	2.32	2.23	2.01	2.01	2.57	2.25	24	
21	2.01	S	2.01	2.01	2.02	2.04	2.04	2.04	2.05	2.04	2.04	2.04	2.07	2.05	2.04	2.04	2.02	2.02	2.04	2.04	2.04	2.04	2.04	2.04	2.01	2.07	2.04	24	
22	S	2.04	2.04	2.04	2.04	2.07	2.08	2.08	2.11	2.05	2.12	2.07	2.04	2.04	2.02	2.02	2.05	1.99	2.01	2.02	2.01	2.02	2.04	S	1.99	2.12	2.05	24	
23	2.04	2.04	2.02	2.01	2.01	2.01	2.01	2.01	2.01	1.99	2.01	2.02	2.01	1.98	1.99	1.99	2.01	1.92	1.92	1.91	1.92	1.92	S	1.92	1.91	2.04	1.99	24	
24	1.92	1.90	1.92	1.92	1.95	1.99	2.04	2.01	2.02	2.01	2.01	1.96	1.95	1.95	1.98	2.04	2.01	2.01	1.99	2.01	1.96	S	1.94	1.98	1.90	2.04	1.98	24	
25	1.98	1.98	1.95	1.96	1.96	1.96	1.98	1.95	1.95	1.98	2.01	2.01	2.04	2.01	2.02	1.95	1.96	1.95	1.95	1.95	1.96	S	1.95	1.95	1.95	2.04	1.97	24	
26	1.96	1.97	1.95	1.95	1.92	1.93	1.98	2.01	2.01	1.96	1.93	1.98	1.95	1.93	1.95	1.90	1.95	1.90	1.89	S	1.90	1.90	1.96	1.98	1.89	2.01	1.95	24	
27	1.92	1.93	1.95	1.98	1.93	1.94	1.99	1.99	1.98	1.96	1.95	1.93	1.98	1.92	1.92	1.98	1.94	1.99	S	1.93	1.96	1.97	1.96	1.95	1.92	1.99	1.95	24	
28	1.98	1.98	1.98	1.95	1.95	2.04	2.10	2.01	2.04	1.96	1.96	1.95	1.97	1.96	C	C	C	C	2.14	2.15	2.17	2.17	2.35	2.23	1.95	2.35	2.05	24	
29	2.35	2.41	2.36	2.26	2.24	2.79	2.57	2.27	2.12	2.17	2.09	2.07	2.10	2.17	2.08	2.07	S	2.07	2.10	2.12	2.14	2.12	2.12	2.13	2.07	2.79	2.21	24	
30	2.12	2.39	2.58	2.39	2.23	2.29	2.23	2.18	2.28	2.20	2.07	2.04	2.04	2.04	2.04	S	2.02	2.04	2.07	2.09	2.04	2.04	2.05	2.41	2.02	2.58	2.17	24	
HOURLY MAX	2.35	2.57	2.58	2.44	2.42	2.79	2.57	2.29	2.60	2.58	2.49	2.42	2.49	2.32	2.29	2.12	2.09	2.10	2.17	2.15	2.35	2.32	2.38	2.84					
HOURLY AVG	2.05	2.07	2.07	2.08	2.08	2.10	2.09	2.08	2.09	2.07	2.05	2.04	2.04	2.03	2.02	2.01	2.00	2.01	2.02	2.02	2.04	2.04	2.06	2.08					

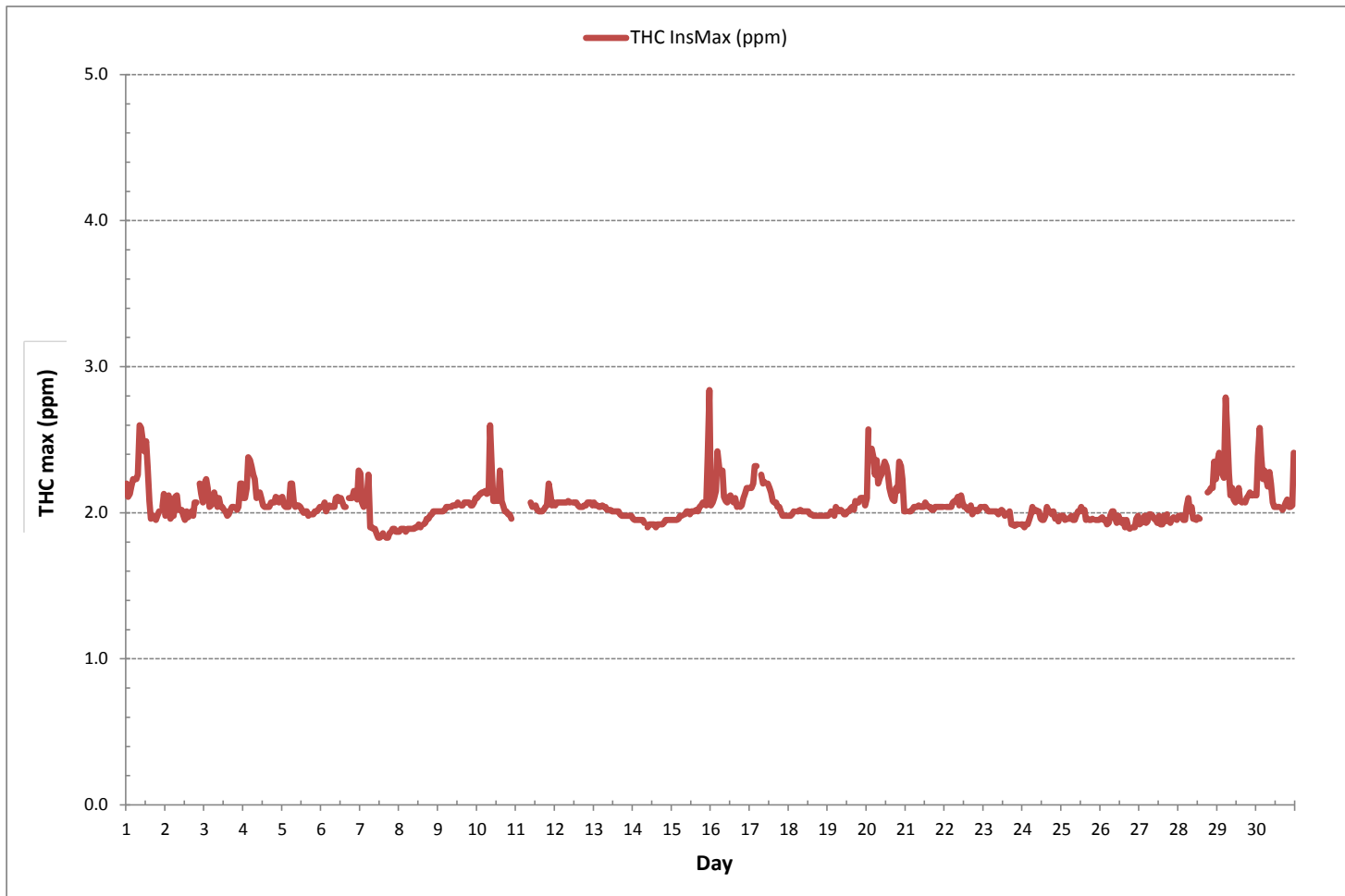
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	673
MAXIMUM INSTANTANEOUS VALUE:	2.84 ppm @ HOUR 23 ON DAY 15
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	707 hrs
STANDARD DEVIATION:	0.13

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



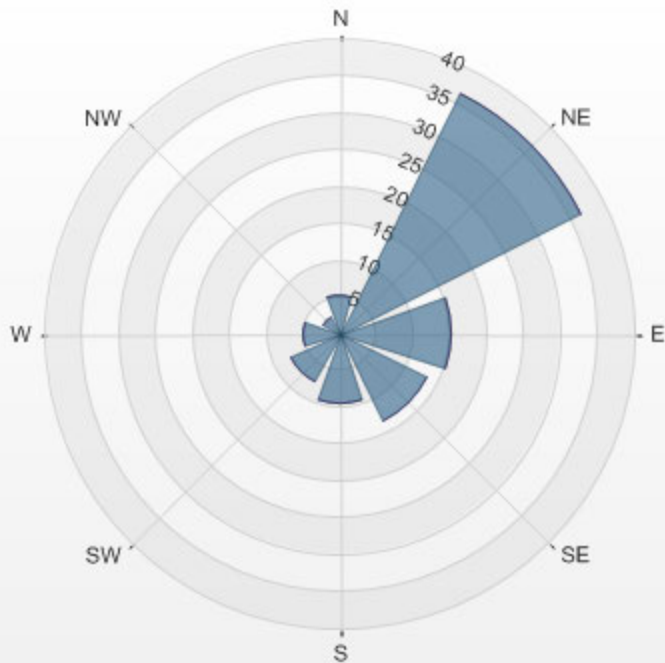
Wind: LICA MASKWA  
 Poll.: LICA MASKWA-THC[ppm]  
 Monthly: 2017/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 5.20% Calm Avg: 2.09 [ppm]

Direction	0.0-0.8	0.8-1.7	1.7-2.5	>2.5	Total
N	0.0	0.0	5.2	0.0	5.2
NE	0.0	0.0	36.6	0.0	36.6
E	0.0	0.0	15.3	0.0	15.3
SE	0.0	0.0	13.4	0.0	13.4
S	0.0	0.0	9.4	0.0	9.4
SW	0.0	0.0	7.4	0.0	7.4
W	0.0	0.0	5.1	0.0	5.1
NW	0.0	0.0	2.5	0.0	2.5
Summary	0.0	0.0	94.8	0.0	94.8

% Icon	Classes (ppm)	0	0.0-0.8	0	0.8-1.7	95	1.7-2.5	0	>2.5
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LICA MASKWA Poll.: LICA MASKWA-THC[ppm] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 5.20% Calm Poll Avg: 2.09[ppm]



THC[ppm] Calibration: LICA MASKWA Monthly: 2017/04 Type: Span



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

## ***OXIDES OF NITROGEN***



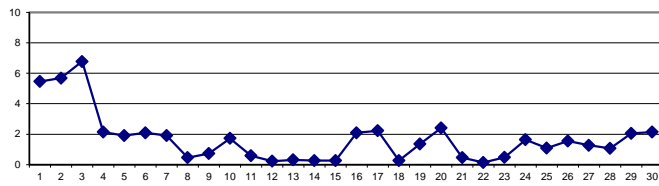
OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	4	3	3	4	6	6	5	10	10	13	13	12	12	6	4	1	1	1	1	1	1	2	S	X	2	1	13	5	23			
2	2	1	15	5	1	1	10	26	2	8	8	1	1	0	0	3	4	6	9	4	S	X	9	9	0	26	6	23				
3	22	15	14	8	6	9	16	8	5	12	8	5	3	1	1	1	2	1	1	1	S	X	2	6	3	1	22	7	23			
4	1	1	1	1	1	0	2	1	1	2	5	3	3	1	1	1	1	3	S	X	4	6	4	4	0	6	2	23	23			
5	2	1	1	1	1	7	9	4	1	1	1	1	1	1	1	1	1	S	X	2	2	1	1	1	1	1	9	2	23			
6	1	1	3	1	1	2	2	2	2	2	2	2	4	2	2	2	S	X	4	3	3	2	2	2	2	1	4	2	23			
7	2	2	2	2	3	13	3	1	1	1	1	1	1	0	1	S	X	2	1	1	1	1	1	1	0	13	2	23	23			
8	1	1	1	1	0	0	0	0	0	0	0	0	0	0	S	X	1	1	1	1	1	1	0	0	0	1	0	23	23			
9	0	0	0	0	1	0	0	0	0	0	0	0	1	2	S	X	2	2	2	1	1	1	1	1	1	0	2	1	23			
10	1	1	2	1	1	1	1	1	4	5	1	2	S	X	6	3	2	1	1	1	1	1	1	0	0	6	2	23	23			
11	1	1	0	0	0	1	1	1	1	0	0	S	X	2	1	1	1	1	1	0	0	0	0	0	0	2	1	23	23			
12	0	0	0	0	0	0	0	0	0	0	0	S	X	1	1	1	1	1	0	0	0	0	0	0	0	1	0	23	23			
13	0	0	0	0	0	0	0	0	0	0	0	S	X	1	1	1	1	1	1	0	0	0	0	0	0	1	0	23	23			
14	0	0	0	0	0	0	0	0	S	X	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	2	0	23	23			
15	0	0	0	0	0	0	0	0	S	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	23	23			
16	0	0	0	0	1	5	S	X	4	5	4	7	6	4	1	1	1	1	1	1	1	1	1	1	0	7	2	23	23			
17	1	2	2	2	1	S	X	3	2	4	3	5	6	7	4	3	1	1	1	1	0	0	0	0	0	7	2	23	23			
18	0	0	0	0	S	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	23	23			
19	0	0	0	S	X	1	1	1	1	1	1	1	3	3	3	2	1	1	2	1	2	2	2	1	0	3	1	23	23			
20	1	1	S	X	3	2	3	3	2	3	3	2	2	2	2	3	2	2	3	4	5	1	1	1	1	5	2	23	23			
21	1	S	X	1	1	1	0	0	0	1	0	0	1	1	2	1	0	0	0	0	0	0	0	0	0	2	0	23	23			
22	S	X	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	23			
23	X	1	0	0	0	0	0	0	0	0	1	2	2	0	2	2	0	0	0	0	0	0	S	X	0	2	0	22	22			
24	1	1	0	0	0	1	3	2	4	2	3	0	0	0	0	1	3	4	3	3	2	S	X	3	0	4	2	23	23			
25	3	3	2	2	2	2	1	0	0	0	1	3	1	1	1	0	0	0	0	0	0	S	X	1	1	0	3	1	23			
26	1	1	1	0	0	0	1	5	2	2	2	2	2	2	2	1	1	0	0	1	S	X	1	2	5	0	5	2	23			
27	5	3	2	2	0	0	0	3	2	1	1	1	1	1	1	1	1	1	S	X	1	1	0	0	0	5	1	23	23			
28	0	0	0	0	1	3	1	1	0	1	C	C	C	C	C	C	C	X	3	2	2	1	1	1	0	3	1	23	23			
29	2	4	6	4	2	3	5	3	1	2	0	0	0	1	0	1	S	X	2	2	2	1	2	2	0	6	2	23	23			
30	2	2	2	1	1	1	1	3	7	5	4	1	1	1	1	1	S	X	2	2	1	1	1	6	1	7	2	23	23			
HOURLY MAX	22	15	15	8	6	13	16	26	10	13	13	12	12	7	6	3	4	6	9	4	4	6	9	9								
HOURLY AVG	2	2	2	1	1	2	2	3	2	3	2	2	2	2	1	1	1	1	1	1	1	1	1	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 April 2017

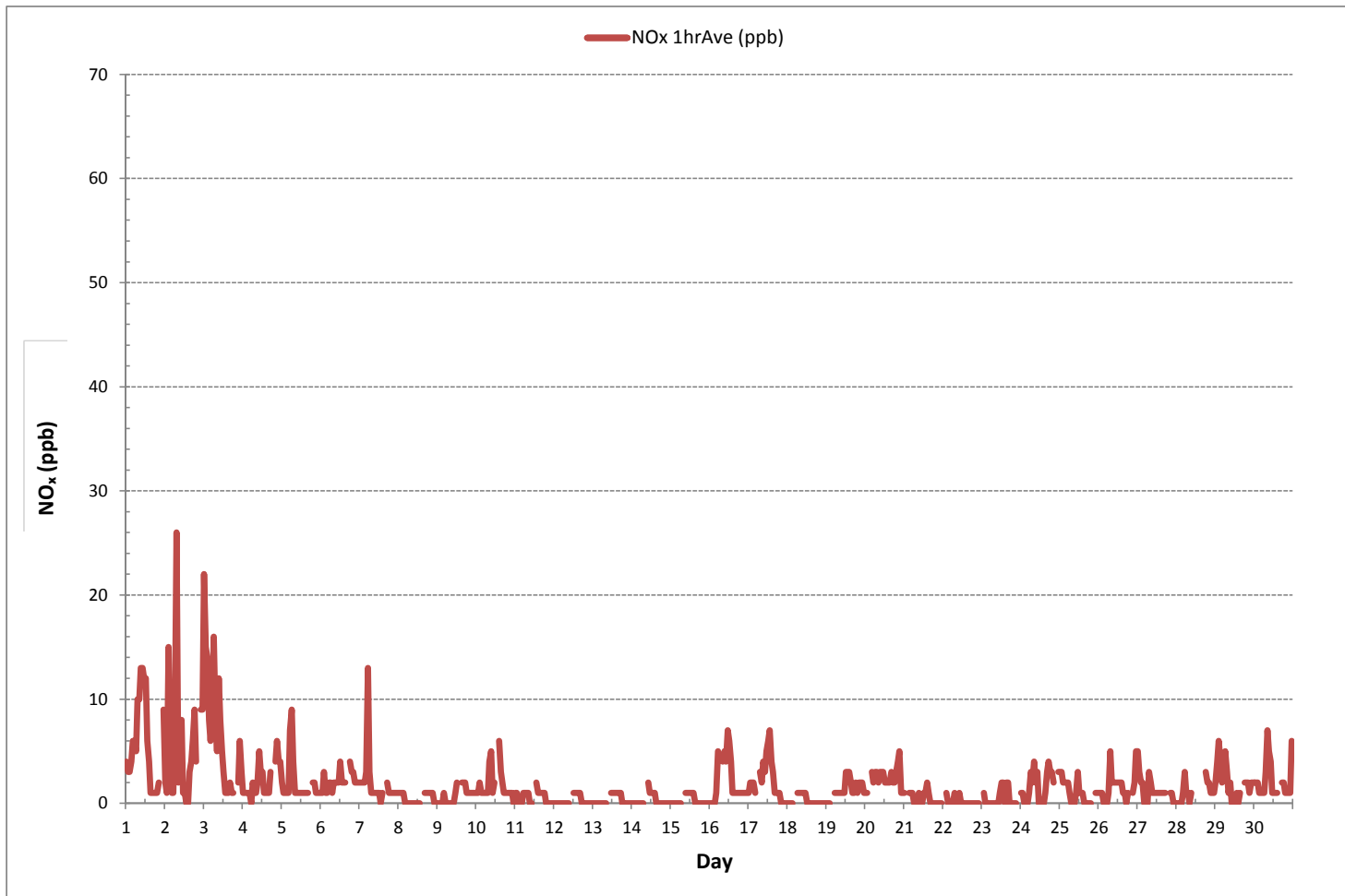


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	444			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	13	ON DAY 2
MAXIMUM 1-HR AVERAGE:	26 ppb	@ HOUR	7	ON DAY 2
MAXIMUM 24-HR AVERAGE:	7 ppb			ON DAY 3
I2S CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	689 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	95.7 %	
STANDARD DEVIATION:	3	MONTHLY AVERAGE:	2 ppb	



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





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

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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY 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	4	3	5	6	7	7	6	17	15	14	14	14	14	9	5	2	1	2	1	2	4	S	X	2	1	17	7	23	
2	2	5	28	9	2	1	38	48	15	16	11	4	2	1	1	8	12	14	18	8	S	X	14	18	1	48	13	23	
3	33	25	29	13	13	12	20	19	24	39	24	9	11	2	4	2	6	2	1	S	X	3	9	4	1	39	14	23	
4	2	1	1	1	1	1	4	1	2	2	11	8	6	2	2	1	3	6	S	X	8	9	6	5	1	11	4	23	
5	3	1	1	1	4	11	12	7	1	1	1	1	1	1	1	1	1	S	X	2	2	2	1	1	1	12	3	23	
6	1	2	3	2	1	2	2	1	2	2	2	11	6	3	2	3	S	X	5	4	4	2	2	2	1	11	3	23	
7	8	6	2	5	7	36	4	2	1	1	1	1	1	1	1	S	X	3	2	1	1	1	1	1	1	36	4	23	
8	1	1	2	1	1	1	1	0	1	1	0	0	0	0	S	X	2	1	1	1	1	1	1	1	1	0	2	1	23
9	1	1	1	1	1	1	0	1	0	1	1	2	4	S	X	2	2	4	4	2	1	1	1	1	0	4	2	23	
10	1	2	2	2	1	2	2	7	8	2	3	S	X	9	5	3	1	1	1	1	1	1	1	1	1	9	3	23	
11	1	1	1	1	1	1	1	1	1	1	1	S	X	2	2	1	1	1	1	1	1	1	1	0	0	2	1	23	
12	0	0	0	0	0	0	0	0	0	0	S	X	2	2	1	1	1	1	1	1	1	1	0	1	0	2	1	23	
13	0	0	0	0	0	0	0	0	0	S	X	2	1	1	1	1	1	1	1	1	1	0	1	0	0	2	1	23	
14	1	0	1	1	0	0	0	0	S	X	2	1	1	1	1	1	1	1	0	0	0	0	0	0	0	2	1	23	
15	0	0	0	0	0	0	0	S	X	2	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	2	0	23	
16	0	0	0	1	4	6	S	X	4	6	5	11	6	6	2	2	1	1	1	1	1	2	1	1	0	11	3	23	
17	1	4	4	2	2	S	X	4	3	5	4	7	10	8	5	5	2	1	1	1	1	1	0	0	0	10	3	23	
18	0	0	0	0	S	X	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	0	0	0	2	1	23	
19	0	0	0	S	X	2	1	1	1	2	1	2	4	4	2	2	2	2	2	2	2	4	4	1	0	4	2	23	
20	1	2	S	X	4	2	4	4	2	4	3	4	2	2	2	2	4	4	3	4	4	6	3	1	1	6	3	23	
21	1	S	X	2	1	1	1	0	1	1	1	1	3	2	4	1	1	1	0	0	0	0	0	0	0	4	1	23	
22	S	X	2	1	1	1	1	4	2	2	6	2	1	1	1	1	2	0	1	1	1	1	0	S	0	6	2	23	
23	X	2	1	1	1	1	1	1	1	1	2	2	4	4	4	5	8	1	1	1	1	0	S	X	0	8	2	22	
24	2	1	1	1	1	3	6	5	8	6	5	3	1	1	2	8	8	6	6	8	4	S	X	5	1	8	4	23	
25	5	4	3	3	4	3	3	1	1	1	3	5	4	3	2	1	1	1	1	1	S	X	2	2	1	5	2	23	
26	2	2	1	1	1	1	5	6	8	5	4	5	5	4	5	3	4	2	2	S	X	2	5	8	1	8	4	23	
27	6	5	5	5	1	1	4	6	5	3	5	2	2	2	4	4	4	2	S	X	2	1	1	1	1	6	3	23	
28	1	1	1	1	5	9	5	2	1	C	C	C	C	C	C	C	C	X	X	2	2	2	1	2	1	9	3	22	
29	3	9	10	6	3	8	8	6	2	2	1	1	1	1	1	1	S	X	2	2	2	2	2	2	1	10	3	23	
30	3	3	2	1	1	1	3	6	9	7	6	4	2	2	2	S	X	3	4	2	1	1	1	15	1	15	4	23	
HOURLY MAX	33	25	29	13	13	36	38	48	24	39	24	14	14	9	9	8	12	14	18	8	8	8	9	14	18				
HOURLY AVG	3	3	4	2	2	4	5	5	4	5	4	4	4	2	3	3	3	2	2	2	2	2	2	3					

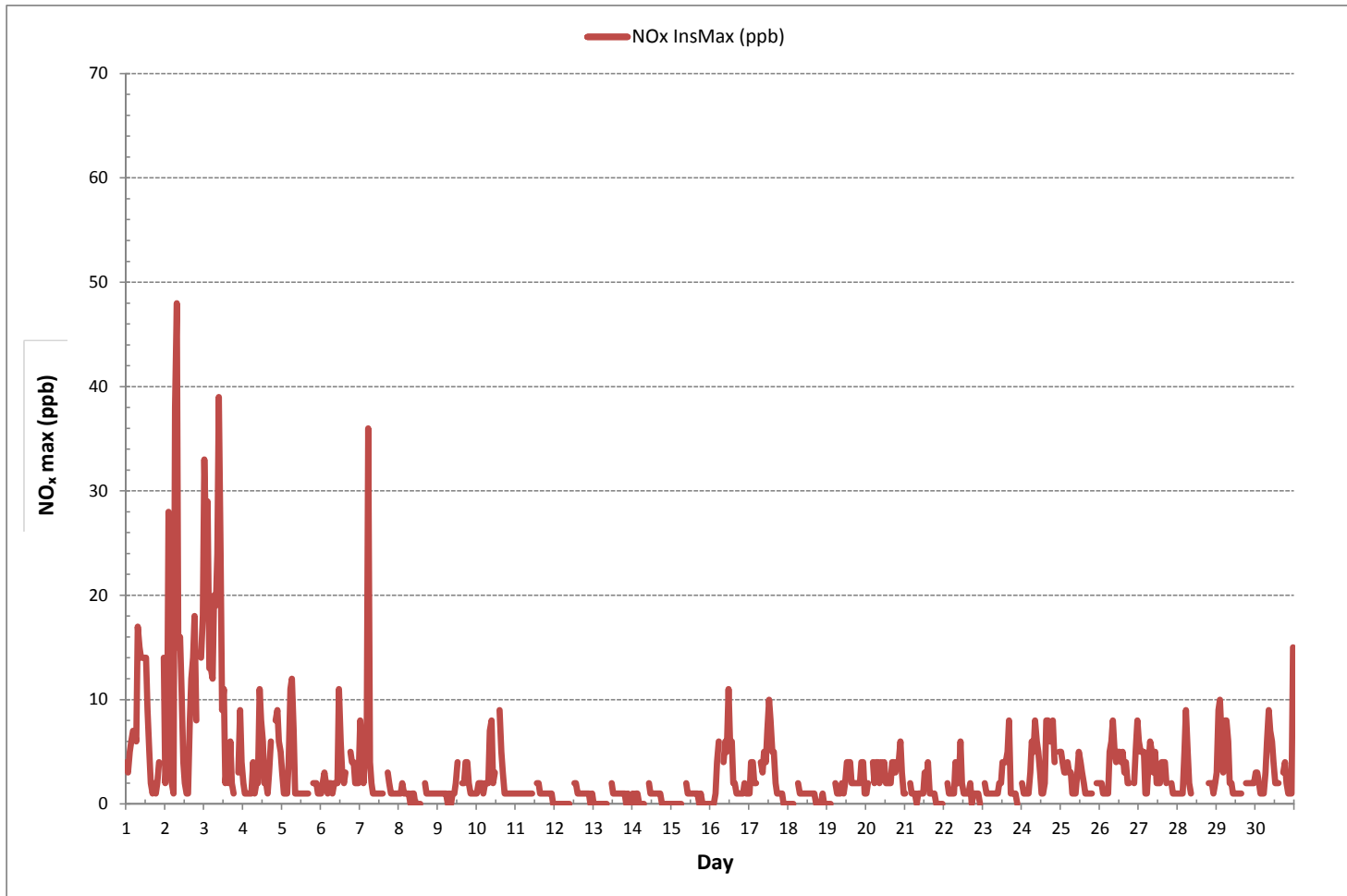
STATUS FLAG CODES

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:	567
MAXIMUM INSTANTANEOUS VALUE:	48 ppb @ HOUR 7 ON DAY 2
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	5
OPERATIONAL TIME:	688 hrs

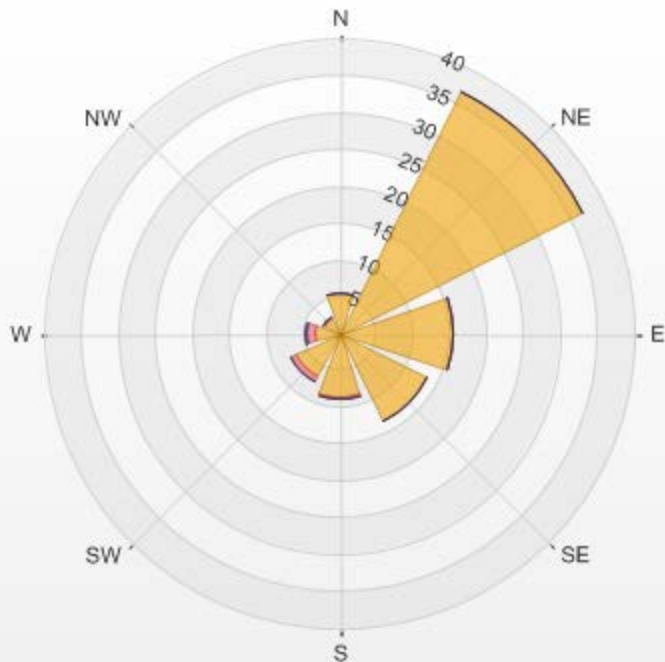
OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> ppb)



Wind: LICA MASKWA  
 Poll.: LICA MASKWA-NOX[ppb]  
 Monthly: 2017/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 5.21% Calm Avg: 2.07 [ppb]

Direction	0.0-9.0	9.0-18.0	18.0-27.0	>27.0	Total
N	5.7	0.0	0.0	0.0	5.7
NE	36.8	0.0	0.0	0.0	36.8
E	15.3	0.2	0.0	0.0	15.5
SE	13.2	0.0	0.0	0.0	13.2
S	8.7	0.2	0.0	0.0	8.9
SW	6.6	0.8	0.0	0.0	7.4
W	3.4	1.1	0.3	0.0	4.8
NW	2.3	0.3	0.0	0.0	2.6
<b>Summary</b>	92.0	2.5	0.3	0.0	94.8



% Icon Classes (ppb)	92	2	0	0
0.0-9.0	92	2	0	0
9.0-18.0	0	2	0	0
18.0-27.0	0	0	0	0
>27.0	0	0	0	0

NOX[ppb] Calibration: LICA MASKWA Monthly: 2017/04 Type: Span



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

***NITRIC OXIDES***



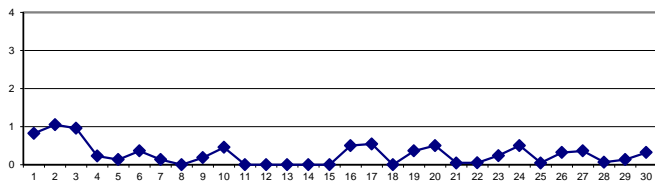
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

24 HR AVERAGES April 2017

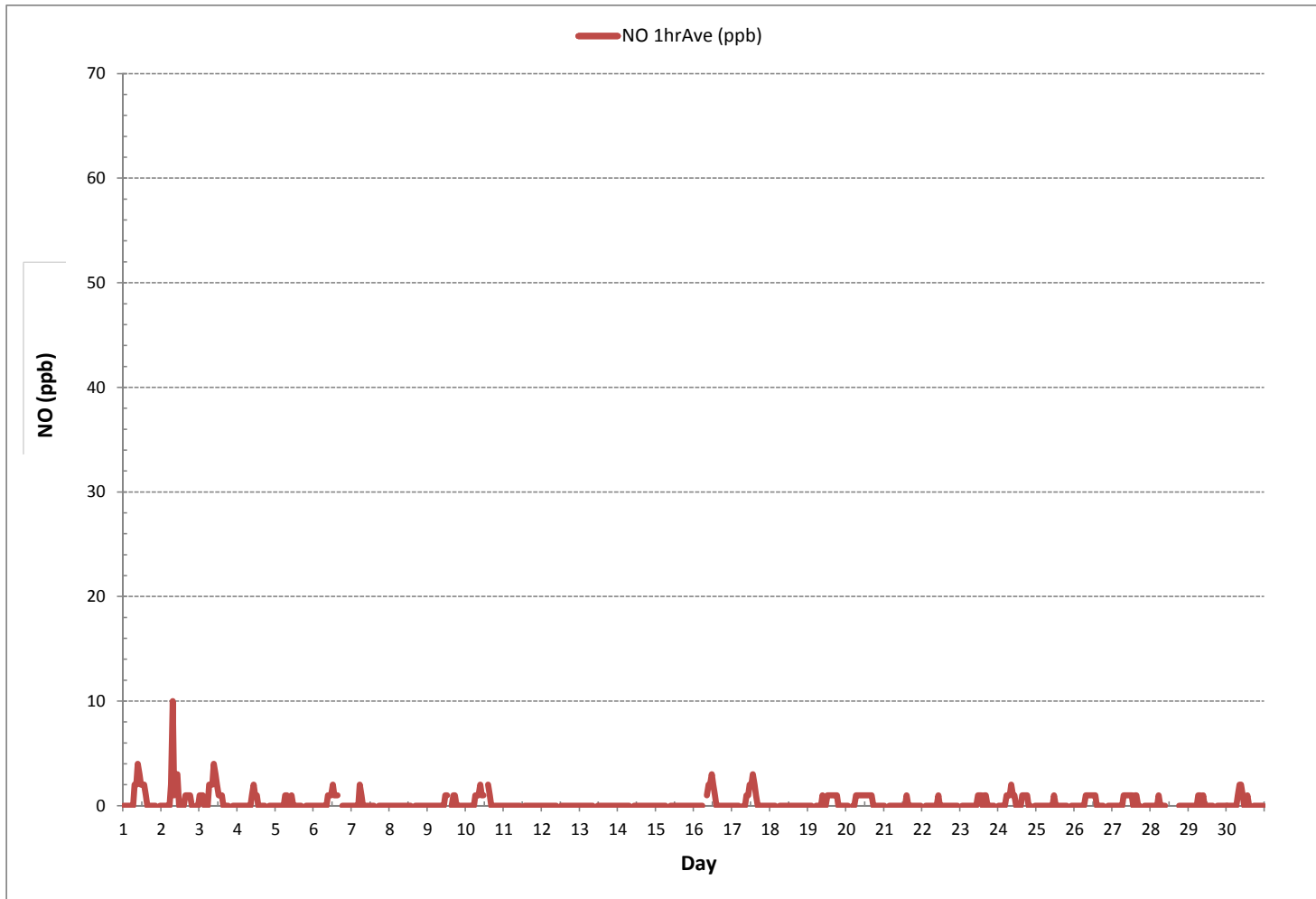


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	131			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	10 ppb	@ HOUR	7	ON DAY 2
MAXIMUM 24-HR AVERAGE:	1 ppb			ON DAY 1
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	689 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	95.7 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb	



NITRIC OXIDE Hourly Averages (NO ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

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

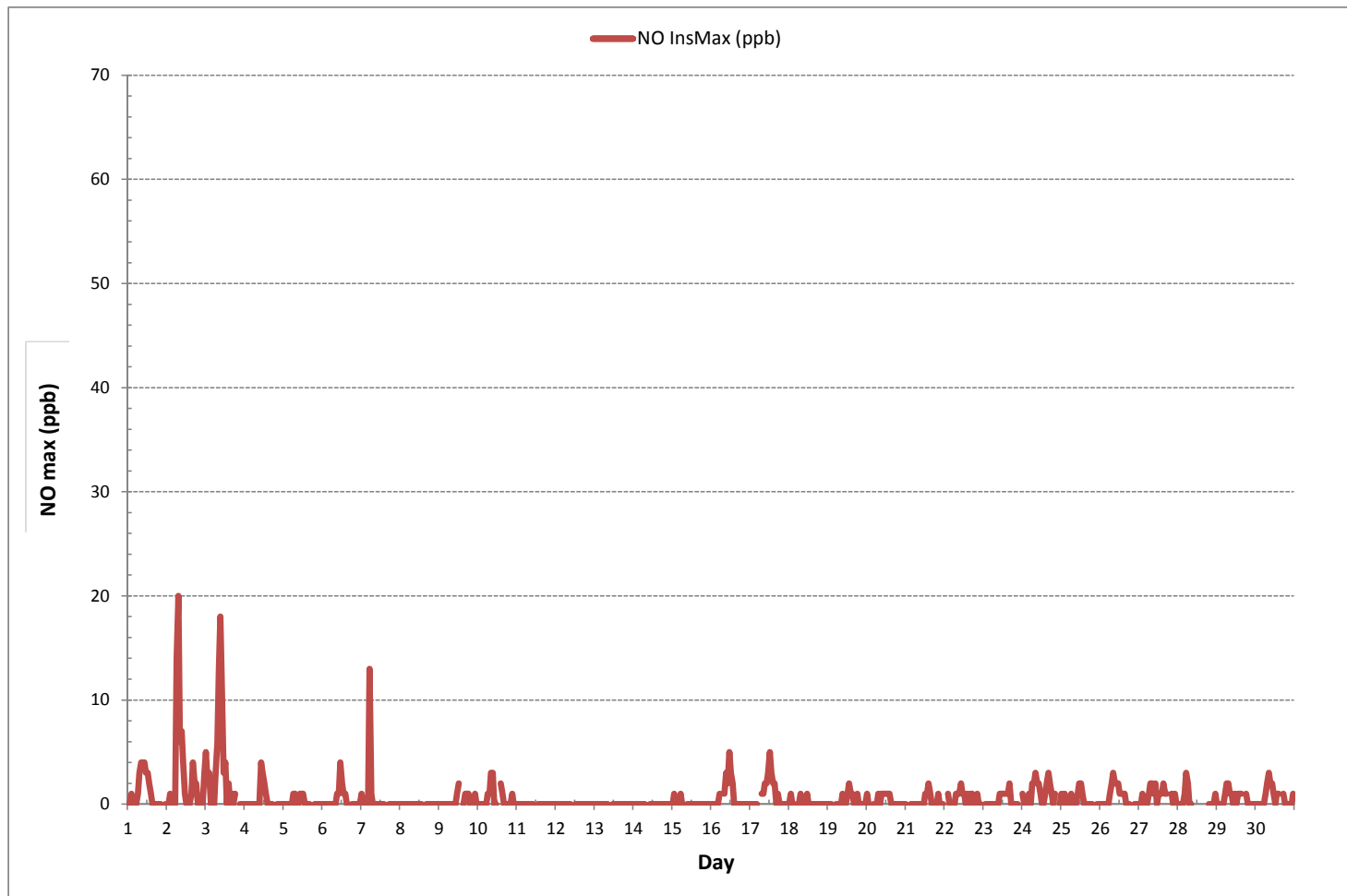
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	194
MAXIMUM INSTANTANEOUS VALUE:	20 ppb @ HOUR 7 ON DAY 2
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	688 hrs
STANDARD DEVIATION:	2

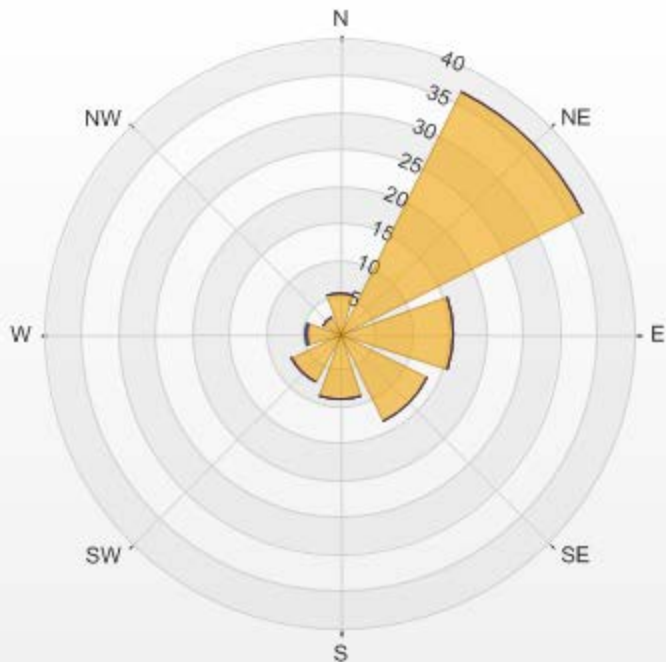
NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA MASKWA  
 Poll.: LICA MASKWA-NO[ppb]  
 Monthly: 2017/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 5.21% Calm Avg: 0.18 [ppb]

Direction	0.0-3.7	3.7-7.3	7.3-11.0	>11.0	Total
N	5.7	0.0	0.0	0.0	5.7
NE	36.8	0.0	0.0	0.0	36.8
E	15.5	0.0	0.0	0.0	15.5
SE	13.2	0.0	0.0	0.0	13.2
S	8.9	0.0	0.0	0.0	8.9
SW	7.2	0.2	0.0	0.0	7.4
W	4.6	0.0	0.2	0.0	4.8
NW	2.5	0.2	0.0	0.0	2.6
<b>Summary</b>	94.3	0.3	0.2	0.0	94.8



% Icon Classes (ppb) 94 0.0-3.7 0 3.7-7.3 0 7.3-11.0 0 >11.0

***NITROGEN DIOXIDE***



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

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

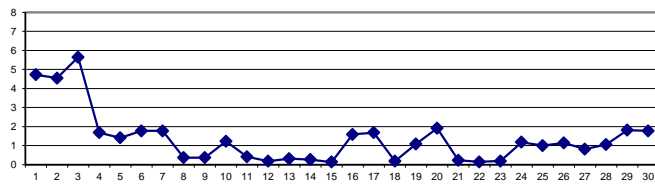
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

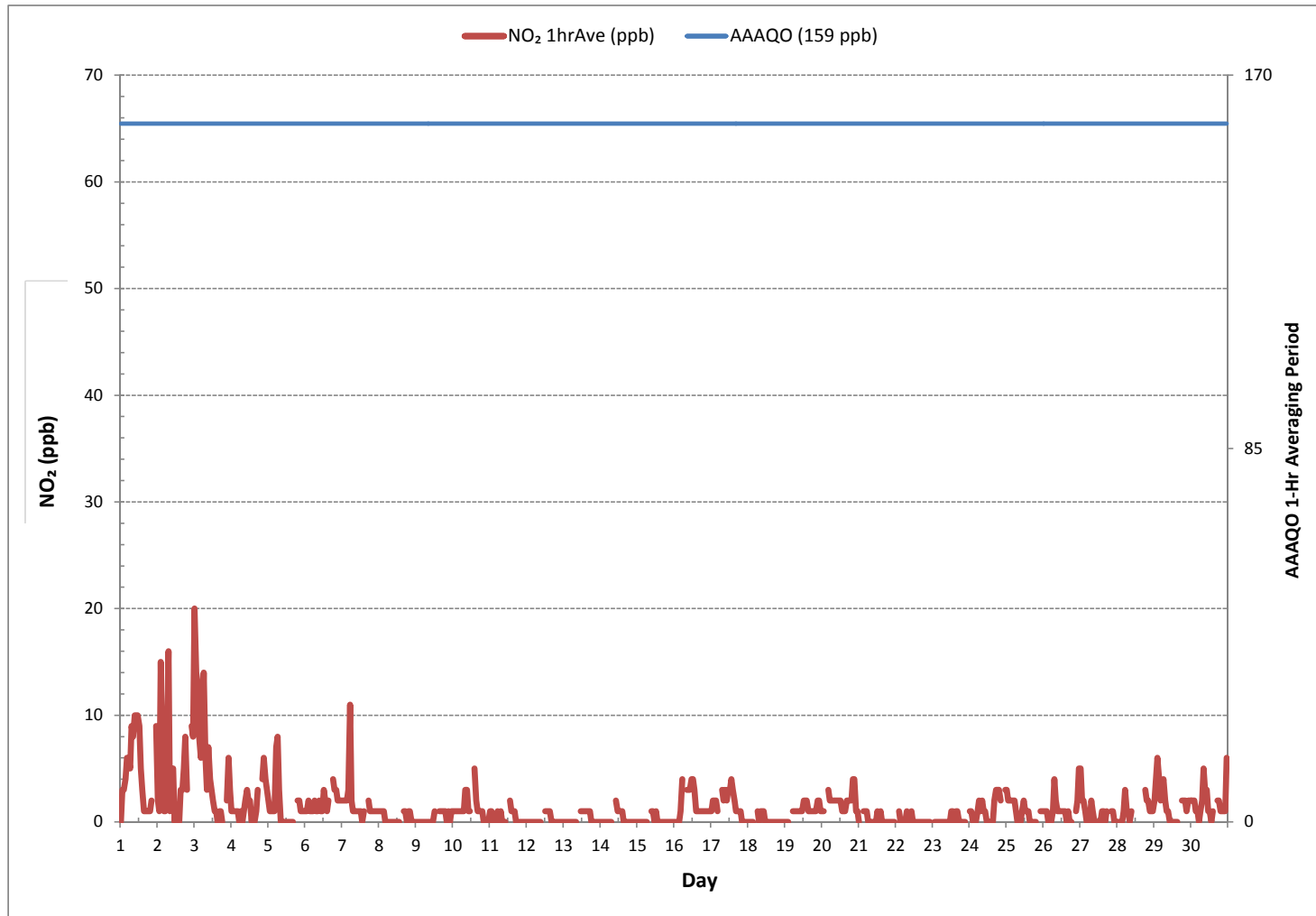
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	390				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	11	ON DAY	2
MAXIMUM 1-HR AVERAGE:	20	ppb @ HOUR	0	ON DAY	3
MAXIMUM 24-HR AVERAGE:	6	ppb		ON DAY	3
I2S CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	689	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	95.7	%
STANDARD DEVIATION:	2		MONTHLY AVERAGE:	1	ppb

24 HR AVERAGES April 2017



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







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

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

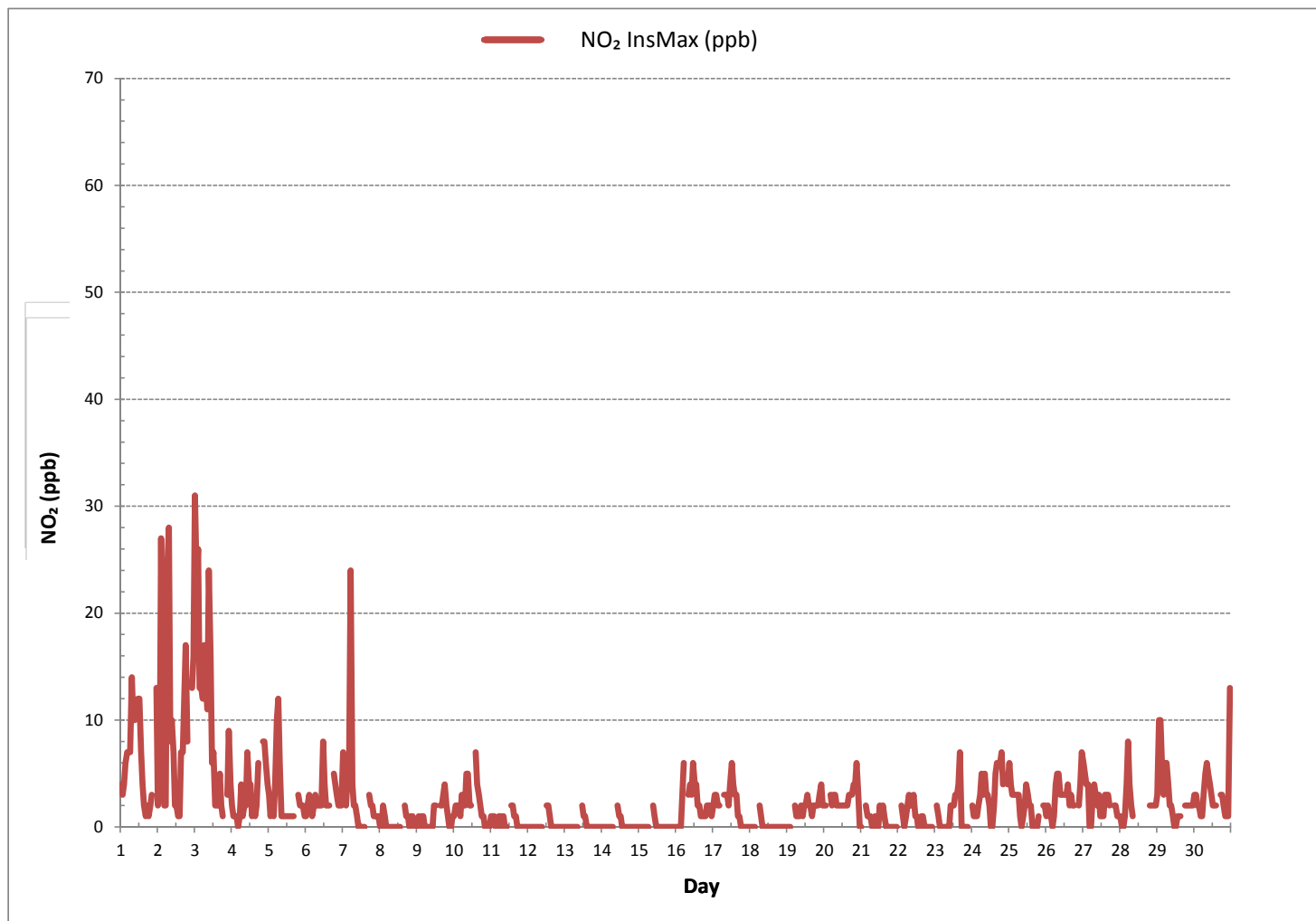
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	444
MAXIMUM INSTANTANEOUS VALUE:	31 ppb @ HOUR 0 ON DAY 3
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	4
OPERATIONAL TIME:	688 hrs

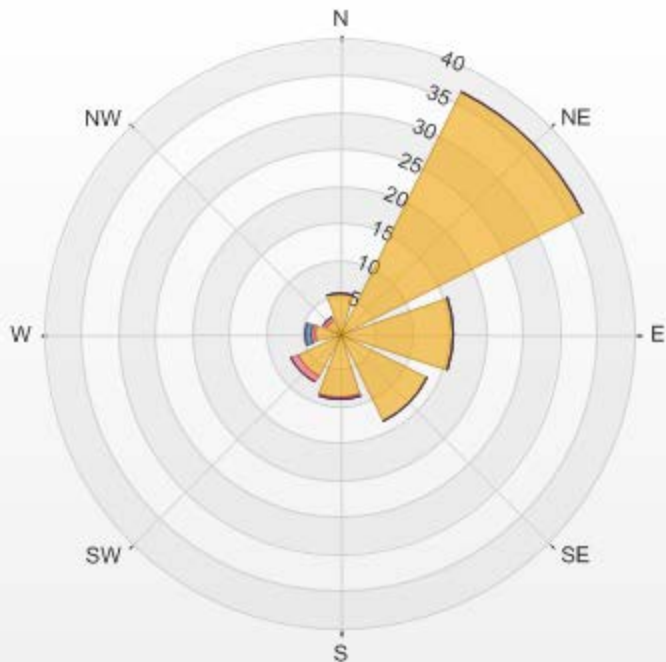
NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> ppb)



Wind: LICA MASKWA  
 Poll.: LICA MASKWA-NO2[ppb]  
 Monthly: 2017/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 5.21% Calm Avg: 1.89 [ppb]

Direction	0.0-7.0	7.0-14.0	14.0-21.0	>21.0	Total
N	5.7	0.0	0.0	0.0	5.7
NE	36.8	0.0	0.0	0.0	36.8
E	15.3	0.2	0.0	0.0	15.5
SE	13.2	0.0	0.0	0.0	13.2
S	8.7	0.2	0.0	0.0	8.9
SW	6.4	0.9	0.0	0.0	7.4
W	3.4	0.6	0.8	0.0	4.8
NW	2.2	0.5	0.0	0.0	2.6
<b>Summary</b>	91.7	2.3	0.8	0.0	94.8



% Icon Classes (ppb)	92	<span style="color: yellow;">■</span> 0.0-7.0	2	<span style="color: red;">■</span> 7.0-14.0	1	<span style="color: blue;">■</span> 14.0-21.0	0	<span style="color: purple;">■</span> >21.0
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NO2[ppb] Calibration: LICA MASKWA Monthly: 2017/04 Type: Span



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

***WIND SPEED***

**WIND SPEED Hourly Averages (WS kph)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	8.0	6.7	4.6	5.0	4.7	2.7	3.3	3.3	7.5	6.1	6.3	7.3	4.9	5.1	6.5	8.0	8.7	9.8	9.9	8.0	6.6	5.1	5.4	5.1	2.7	9.9	6.0	24
2	5.8	6.9	6.4	4.6	3.7	5.0	5.5	5.0	8.6	8.3	7.2	7.4	8.0	7.7	8.9	6.1	9.3	4.7	3.2	3.1	3.9	3.9	3.7	1.6	1.6	9.3	5.4	24
3	7.3	6.1	4.1	3.9	4.0	3.9	3.7	5.0	5.0	4.5	4.9	4.6	6.0	5.8	7.2	8.5	5.8	5.1	4.3	4.8	5.1	3.3	1.4	0.3	0.3	8.5	4.1	24
4	2.0	3.1	4.4	2.6	1.3	2.9	0.9	3.0	4.1	4.8	5.1	6.1	6.8	8.5	9.7	6.3	7.3	4.5	6.5	3.1	5.5	3.4	3.8	4.4	0.9	9.7	1.6	24
5	4.7	6.9	5.7	5.0	5.4	6.0	5.0	7.5	10.3	11.3	10.7	11.1	12.2	14.6	14.8	13.6	11.6	10.2	10.5	8.2	8.8	9.0	7.1	6.1	4.7	14.8	8.6	24
6	5.6	4.8	4.6	6.2	6.1	6.7	5.3	5.8	6.4	6.6	6.4	5.9	4.6	3.9	4.6	5.0	5.8	4.5	5.4	1.1	2.7	4.0	1.3	4.9	1.1	6.7	3.0	24
7	3.3	5.8	4.1	1.4	1.8	5.8	6.8	8.3	13.5	13.6	14.8	10.6	10.9	11.6	14.5	13.3	10.4	12.1	14.5	15.4	14.2	11.7	10.2	9.9	1.4	15.4	9.2	24
8	10.4	12.0	11.5	11.1	11.6	11.7	10.8	9.1	8.1	8.3	11.3	12.6	12.1	10.3	10.7	13.6	14.2	13.0	10.3	9.1	8.2	10.3	11.0	7.8	7.8	14.2	10.7	24
9	7.0	5.4	4.2	4.6	4.4	6.3	7.0	6.7	6.1	5.7	6.1	5.6	4.7	3.8	5.3	5.4	5.5	5.3	6.1	5.0	5.5	6.7	5.4	4.8	3.8	7.0	4.1	24
10	5.7	4.7	3.7	4.1	3.4	4.9	5.3	5.6	6.8	5.9	7.4	7.4	6.9	6.6	6.8	6.6	7.5	7.7	7.8	7.2	8.4	11.7	10.6	10.5	3.4	11.7	5.3	24
11	7.6	8.3	7.8	8.7	6.8	8.5	8.6	7.2	7.3	10.1	11.0	8.3	9.8	8.9	9.2	8.8	7.1	5.9	3.9	2.9	1.9	3.2	5.4	7.0	1.9	11.0	7.1	24
12	7.3	7.1	6.6	9.6	8.9	4.9	7.9	8.1	8.0	7.1	8.5	7.5	8.6	7.4	8.4	9.5	8.9	10.4	6.6	4.3	3.6	4.2	4.2	5.0	3.6	10.4	7.1	24
13	5.1	5.7	6.3	6.6	6.9	7.6	9.3	10.0	12.0	13.4	12.6	12.6	13.8	13.7	15.9	13.2	11.5	9.5	10.1	12.7	12.3	11.7	12.7	12.1	5.1	15.9	10.7	24
14	10.9	11.2	10.7	9.8	9.9	9.6	10.4	9.8	11.2	12.0	11.8	13.5	13.9	14.4	14.4	14.8	13.6	14.0	15.1	16.2	<b>16.6</b>	16.5	15.5	14.8	9.6	<b>16.6</b>	<b>12.8</b>	24
15	12.4	11.4	11.4	12.1	10.8	11.3	10.0	10.6	11.1	9.9	9.0	8.6	8.0	7.5	7.0	12.8	9.2	7.2	5.4	4.6	3.7	4.0	4.1	4.2	3.7	12.8	8.5	24
16	3.0	1.4	0.5	0.7	<b>0.2</b>	1.1	1.1	3.6	3.7	3.9	3.0	3.1	2.7	4.2	6.7	5.8	8.0	6.9	5.3	2.7	4.3	5.8	3.9	4.4	<b>0.2</b>	8.0	3.1	24
17	4.0	1.6	2.2	2.2	1.4	1.7	2.1	3.7	4.1	4.3	4.7	4.3	5.0	4.9	4.4	6.2	7.2	5.3	5.5	8.1	9.0	8.9	7.9	9.2	1.4	9.2	4.4	24
18	9.0	9.1	10.1	9.0	9.2	8.4	9.7	8.9	9.7	8.3	6.7	6.8	7.7	7.7	8.9	7.8	7.2	6.4	7.6	5.4	4.5	3.9	3.9	3.8	3.8	10.1	7.5	24
19	3.9	3.7	2.9	4.0	2.4	3.7	4.5	5.1	3.0	3.5	2.5	1.5	2.6	3.5	4.1	2.8	2.8	6.1	5.3	3.5	2.9	3.3	5.1	4.8	1.5	6.1	1.0	24
20	2.0	1.0	0.3	1.9	2.0	1.3	2.5	3.9	4.7	6.3	6.1	5.4	7.7	9.7	12.8	6.6	4.6	4.0	3.5	1.5	1.1	1.3	5.2	10.4	0.3	12.8	1.5	24
21	13.3	12.8	13.0	13.1	11.2	13.0	11.8	9.7	10.3	7.3	5.4	4.4	3.6	2.2	1.3	3.4	5.4	6.1	7.1	7.7	7.5	11.5	10.5	8.6	1.3	13.3	7.6	24
22	9.3	8.9	6.9	6.6	5.7	5.8	6.0	6.8	7.2	6.4	7.3	4.4	4.9	8.7	7.7	6.5	6.2	8.1	10.1	9.4	7.8	7.7	7.0	6.7	4.4	10.1	6.8	24
23	6.1	6.4	6.5	6.2	6.6	7.7	8.9	7.9	9.6	9.3	9.1	9.2	12.0	11.7	10.6	11.2	10.0	9.8	8.7	7.1	7.7	7.9	8.4	7.3	6.1	12.0	8.2	24
24	7.9	7.5	8.1	8.0	8.0	9.0	9.0	8.2	8.2	7.6	7.7	8.2	8.4	8.5	8.9	7.6	6.6	7.3	6.0	7.3	6.6	5.3	6.0	5.9	5.3	9.0	7.4	24
25	6.3	5.9	5.2	4.4	4.8	6.8	6.4	7.1	8.4	7.4	7.0	7.4	8.5	7.3	7.6	8.0	7.0	6.3	5.5	3.9	5.1	5.2	4.3	7.5	3.9	8.5	6.1	24
26	5.4	5.9	6.1	5.7	5.2	7.9	6.4	7.0	7.8	7.4	8.9	8.2	8.3	8.7	7.9	8.8	8.2	6.7	6.5	4.6	3.2	3.2	2.9	4.4	2.9	8.9	6.1	24
27	4.7	5.4	4.9	3.4	4.3	5.0	4.9	5.2	7.0	7.5	9.0	9.8	8.9	8.7	7.7	7.2	5.3	5.1	3.4	1.2	0.8	1.3	0.8	0.8	0.8	9.8	4.7	24
28	1.7	2.6	2.3	1.1	0.8	1.1	2.8	4.4	3.1	0.9	4.4	4.8	5.2	5.9	4.0	6.2	2.9	4.2	4.2	4.4	2.4	2.8	2.5	2.2	0.8	6.2	1.0	24
29	1.8	2.6	3.0	2.6	3.1	2.1	1.3	5.0	7.0	8.8	9.6	9.4	9.3	10.5	8.3	8.7	8.1	8.4	7.0	5.6	5.4	5.1	5.8	5.6	1.3	10.5	5.8	24
30	6.2	2.1	3.1	1.6	3.1	3.5	4.2	5.8	6.3	5.4	6.6	4.9	4.5	2.5	2.3	3.2	4.6	6.2	5.0	4.3	5.6	5.4	2.7	3.3	1.6	6.6	1.1	24
HOURLY MAX	13.3	12.8	13.0	13.1	11.6	13.0	11.8	10.6	13.5	13.6	14.8	13.5	13.9	14.6	15.9	14.8	14.2	14.0	15.1	16.2	16.6	16.5	15.5	14.8				
HOURLY AVG	3.2	3.7	3.7	3.6	3.5	3.9	4.2	4.1	3.9	3.7	4.0	3.8	3.8	3.0	2.4	2.6	2.8	2.8	3.0	3.0	3.0	3.5	3.4	3.6				

**STATUS FLAG CODES**

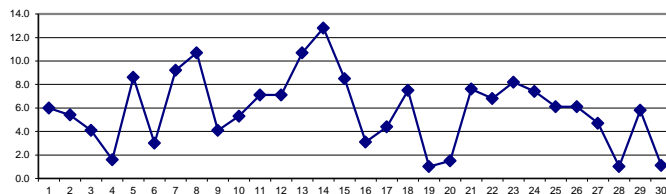
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

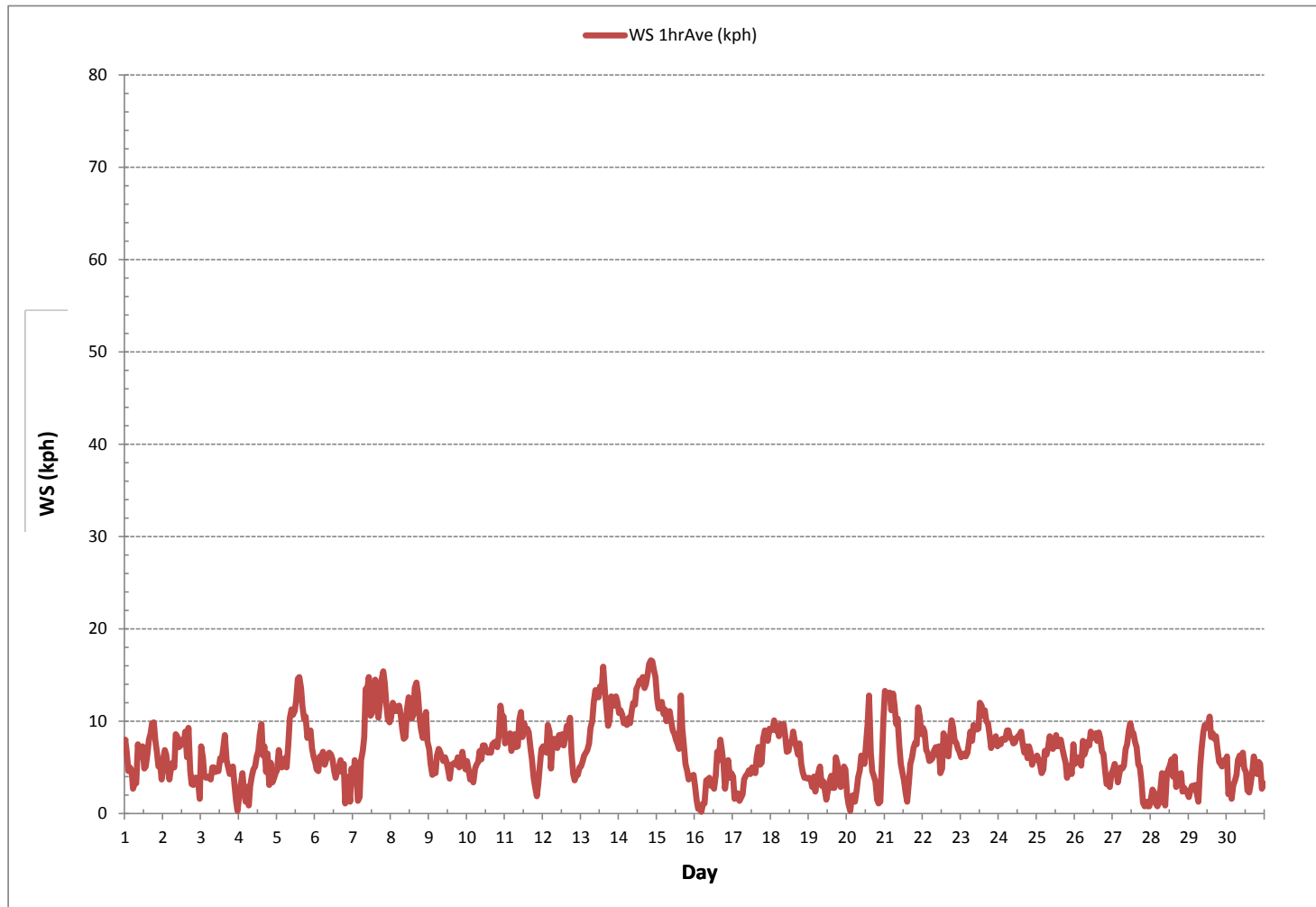
**MONTHLY SUMMARY**

NUMBER OF NON-ZERO READINGS:	720
MINIMUM 1-HR AVERAGE	0.2 kph @ HOUR 4 ON DAY 16
MAXIMUM 1-HR AVERAGE:	16.6 kph @ HOUR 20 ON DAY 14
MAXIMUM 24-HR AVERAGE:	12.8 kph ON DAY 14
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	720 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3.2
MONTHLY AVERAGE:	3.4 kph

**24 HR AVERAGES April 2017**



WIND SPEED Hourly Averages (WS kph)







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	19.6	16.0	12.7	10.7	11.8	7.0	11.6	9.9	16.1	14.3	12.4	14.0	19.8	14.6	23.6	23.0	27.3	32.0	26.7	20.9	15.6	15.3	22.6	19.1	7.0	32.0	17.4	24
2	18.2	18.6	16.2	13.1	11.4	20.0	17.4	16.0	28.6	23.5	23.6	24.3	27.3	29.0	31.7	39.1	36.2	14.7	12.0	11.6	13.8	13.7	12.5	14.3	11.4	39.1	20.3	24
3	22.0	23.5	13.3	11.3	13.2	13.8	14.0	13.2	13.5	12.6	14.5	21.0	20.1	36.3	26.4	26.6	22.1	21.3	18.4	13.7	15.4	13.5	6.3	5.6	5.6	36.3	17.2	24
4	3.7	12.9	12.4	10.7	10.9	11.6	4.8	13.3	12.5	14.3	16.1	19.4	21.5	25.8	29.1	25.7	29.0	14.8	17.0	11.4	20.3	11.1	13.1	15.5	3.7	29.1	15.7	24
5	24.7	27.3	35.4	17.1	32.2	23.4	17.5	33.7	39.2	33.5	35.4	36.5	42.4	59.5	45.7	51.6	39.1	40.0	34.8	25.8	24.0	30.6	20.8	18.4	17.1	59.5	32.9	24
6	16.3	15.8	11.8	13.3	17.3	17.5	12.6	14.5	17.3	14.9	17.9	16.6	18.9	19.7	18.2	17.6	15.8	10.7	12.0	8.5	6.6	10.7	9.5	13.6	6.6	19.7	14.5	24
7	15.8	15.7	14.5	8.2	9.9	30.2	24.5	31.3	34.7	34.5	36.0	31.7	36.1	28.4	31.7	36.2	27.1	30.4	37.0	36.8	36.7	31.9	26.7	29.1	8.2	37.0	28.1	24
8	25.4	27.5	28.6	28.6	33.7	27.8	38.3	32.7	29.9	29.7	32.4	36.1	45.7	31.7	33.9	34.8	35.6	36.5	32.2	21.6	26.9	25.6	25.6	18.2	18.2	45.7	30.8	24
9	24.5	14.8	13.3	14.9	14.6	16.3	23.3	17.0	17.7	15.6	19.9	21.4	20.8	20.6	18.4	17.9	17.4	16.2	16.8	12.9	17.5	16.5	16.6	15.9	12.9	24.5	17.5	24
10	16.8	12.2	13.6	13.0	13.8	13.7	15.0	15.2	16.0	18.4	18.8	17.7	16.2	17.3	21.5	21.5	19.5	17.3	17.0	14.3	16.6	23.2	24.3	24.4	12.2	24.4	17.4	24
11	16.5	17.2	15.4	16.3	14.1	21.7	16.4	19.4	19.2	28.0	24.9	25.6	24.7	21.0	25.6	24.0	19.5	14.7	12.0	10.4	5.8	12.9	14.2	22.7	5.8	28.0	18.4	24
12	20.8	17.5	17.5	17.9	17.0	13.3	18.6	18.6	17.9	16.4	21.8	20.5	21.0	23.4	25.1	26.9	23.4	28.2	20.6	14.0	10.0	10.5	12.2	13.3	10.0	28.2	18.6	24
13	13.5	18.4	16.8	18.6	17.8	19.6	34.6	30.9	30.6	34.8	34.8	30.7	37.9	31.5	38.2	47.9	48.9	33.1	36.8	37.6	33.7	36.3	36.8	35.7	13.5	48.9	31.5	24
14	33.0	43.1	36.3	37.0	28.0	32.7	34.2	33.1	34.8	33.9	34.1	36.8	45.5	45.7	35.7	47.1	33.9	34.0	48.6	41.4	44.7	40.5	38.1	35.7	28.0	48.6	37.8	24
15	36.8	25.2	34.9	24.9	26.3	28.9	30.2	27.3	29.1	24.7	22.6	27.8	23.0	18.8	16.8	30.9	23.4	19.9	20.8	13.8	7.8	11.3	10.2	13.1	7.8	36.8	22.9	24
16	13.3	19.3	10.4	15.7	16.6	22.5	16.8	9.4	11.2	12.9	12.0	12.0	12.2	19.2	21.8	15.0	23.4	16.6	19.7	7.4	11.2	14.2	10.7	15.3	7.4	23.4	15.0	24
17	14.9	9.6	10.9	11.6	10.8	21.2	10.9	10.9	11.6	9.8	12.0	11.8	10.7	12.6	12.2	16.2	21.7	14.0	14.8	21.0	31.3	24.1	19.7	24.1	9.6	31.3	15.4	24
18	25.8	22.9	29.5	25.9	24.5	21.7	22.8	22.9	26.1	18.8	15.0	17.5	18.7	17.3	19.5	19.0	17.3	14.4	17.0	12.9	12.0	11.9	9.9	11.6	9.9	29.5	19.0	24
19	7.7	7.0	6.3	11.4	10.5	7.6	8.5	10.2	8.7	12.0	11.4	5.9	9.1	10.0	10.2	10.7	9.1	14.8	13.5	9.8	7.2	10.2	12.4	13.7	5.9	14.8	9.9	24
20	12.3	9.8	4.8	10.5	11.4	12.0	11.6	13.3	15.1	16.8	17.7	21.3	20.0	27.6	35.5	30.8	14.2	14.6	15.9	7.6	4.8	8.9	18.1	30.6	4.8	35.5	16.1	24
21	34.1	29.5	30.3	39.7	23.4	28.4	27.1	21.0	27.6	22.3	16.8	20.5	17.7	16.4	17.3	19.0	16.9	17.2	18.5	19.1	19.3	25.1	24.2	23.8	16.4	39.7	23.1	24
22	24.3	22.0	18.6	18.3	15.2	16.9	15.8	21.0	17.3	19.0	22.6	21.1	18.6	28.7	26.8	27.2	26.2	26.3	29.0	27.7	22.9	21.1	18.5	18.4	15.2	29.0	21.8	24
23	16.7	15.9	17.7	13.7	14.8	22.2	25.5	19.1	31.7	30.6	30.4	28.8	48.0	41.5	36.8	35.7	31.5	34.9	27.8	23.1	24.5	26.1	28.3	22.4	13.7	48.0	27.0	24
24	27.0	27.2	27.6	29.0	23.5	31.2	28.7	35.0	28.9	25.4	27.8	26.4	33.0	31.5	27.1	26.2	26.2	27.5	25.6	24.7	19.7	17.8	16.0	18.8	16.0	35.0	26.3	24
25	18.8	20.1	17.5	15.3	17.0	21.2	17.7	20.8	24.8	21.7	29.5	27.8	27.1	24.5	24.7	21.2	19.9	18.8	16.8	10.2	14.0	13.8	12.0	24.1	10.2	29.5	20.0	24
26	18.0	19.5	18.4	16.2	15.5	23.4	22.8	22.2	28.0	24.1	26.7	27.1	30.6	27.3	27.3	27.5	26.0	20.5	18.4	17.0	8.1	10.3	10.5	14.2	8.1	30.6	20.8	24
27	15.1	16.6	14.4	10.7	11.6	12.0	17.0	15.7	17.6	24.4	35.6	31.7	30.2	29.5	26.0	23.2	16.2	15.7	11.1	7.0	6.7	4.6	3.9	3.2	3.2	35.6	16.7	24
28	10.7	10.0	11.6	2.8	2.4	9.2	7.3	10.7	10.4	15.4	22.3	19.5	16.1	20.9	16.6	18.6	15.3	13.8	14.4	11.3	7.5	7.0	8.0	7.4	2.4	22.3	12.1	24
29	4.8	6.7	5.4	5.4	6.4	5.3	7.6	13.3	16.5	23.6	24.8	28.1	27.3	29.5	26.6	25.3	21.8	22.2	17.5	23.2	15.3	12.9	13.1	12.1	4.8	29.5	16.4	24
30	12.0	9.0	10.9	12.3	11.9	6.7	14.7	16.0	18.3	17.2	19.2	20.4	17.6	19.0	11.7	15.5	16.7	19.4	20.3	21.8	18.2	26.5	10.6	13.8	6.7	26.5	15.8	24
HOURLY MAX	36.8	43.1	36.3	39.7	33.7	32.7	38.3	35.0	39.2	34.8	36.0	36.8	48.0	59.5	45.7	51.6	48.9	40.0	48.6	41.4	44.7	40.5	38.1	35.7				
HOURLY AVG	18.8	18.4	17.6	16.5	16.3	18.6	18.9	19.6	21.7	21.4	23.0	23.3	25.3	26.0	25.4	26.7	24.0	21.8	21.4	18.0	17.3	17.9	16.8	18.3				

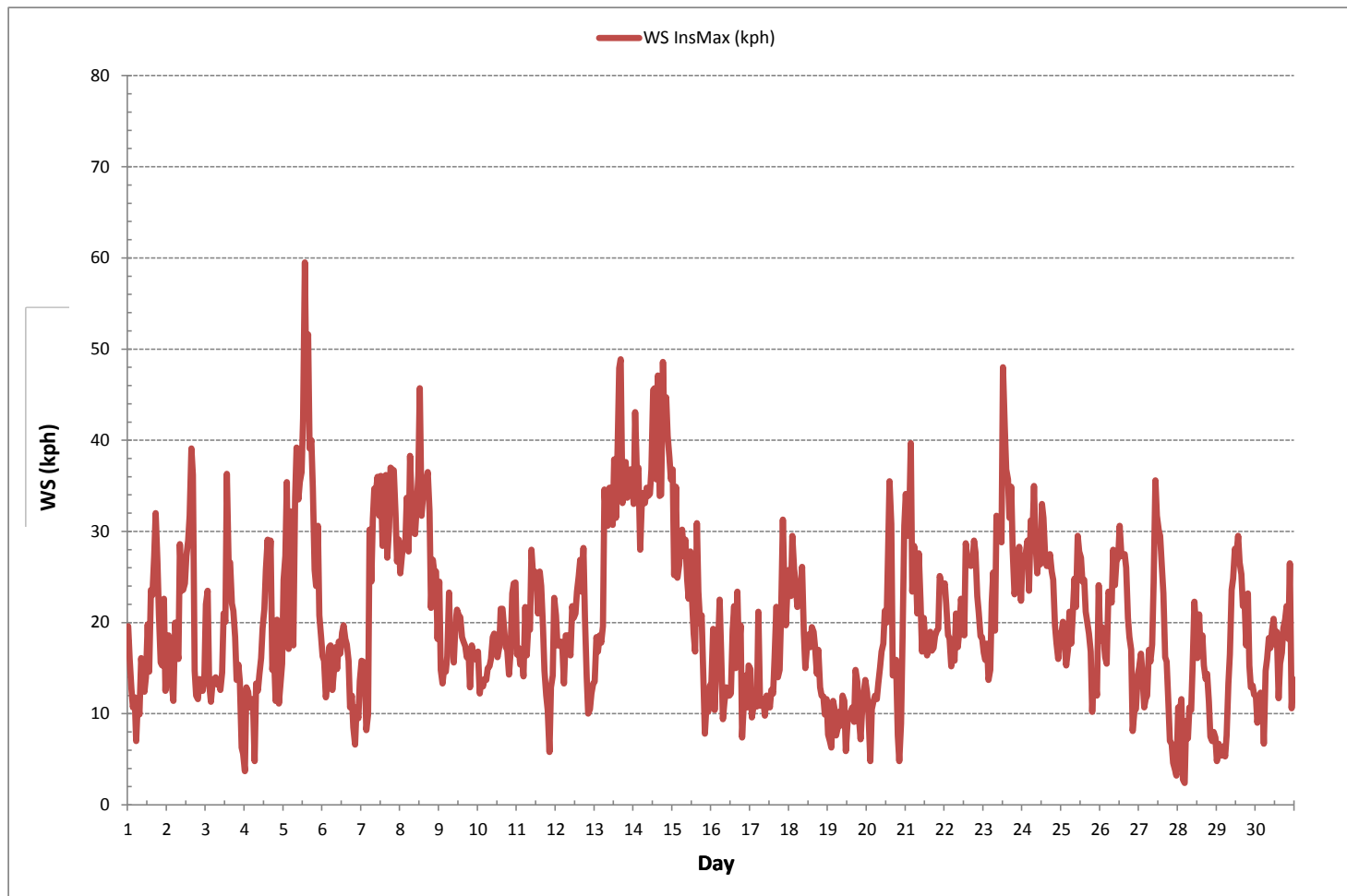
STATUS FLAG CODES

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

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	59.5	kph	@ HOUR	13	ON DAY	5	
OPERATIONAL TIME:						720	hrs

WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA MASKWA  
 Monitor: WSP [kph]  
 Monthly: 2017/04  
 Type: WindRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

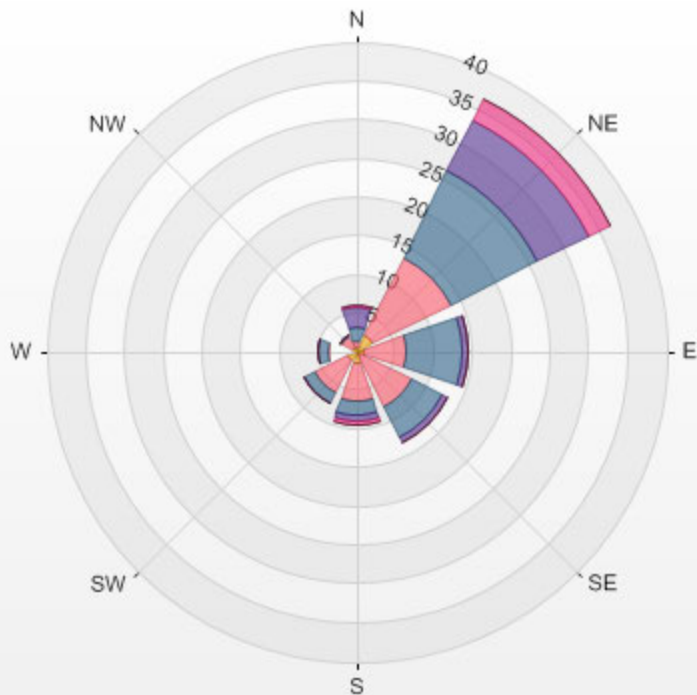
Calm: 5.28%

Calm Avg: 0.00 [kph]

Direction	1.8-3.3	3.3-6.7	6.7-10.0	10.0-13.4	13.4-16.7	>16.7	Total
<b>N</b>	0.7	0.7	1.9	2.4	0.4	0.0	6.1
<b>NE</b>	2.4	11.3	12.5	7.4	3.1	0.0	36.5
<b>E</b>	1.0	5.6	7.2	0.8	0.0	0.0	14.6
<b>SE</b>	0.4	7.6	4.3	0.7	0.0	0.0	13.1
<b>S</b>	1.5	4.9	1.9	0.7	0.4	0.0	9.4
<b>SW</b>	1.4	4.6	1.5	0.0	0.0	0.0	7.5
<b>W</b>	0.1	3.6	1.3	0.0	0.0	0.0	5.0
<b>NW</b>	0.7	1.4	0.4	0.0	0.0	0.0	2.5
<b>Summary</b>	8.2	39.6	31.1	11.9	3.9	0.0	94.7

% Icon Classes (kph) 8 1.8-3.3 40 3.3-6.7 31 6.7-10.0 12 10.0-13.4 4 13.4-16.7 0 >16.7

LICA MASKWA 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 5.28% Calm Wind Avg Speed: 1.15(kph)



***WIND DIRECTION***



**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**  
**Maskwa Continuous Monitoring Station - April 2017**

**WIND DIRECTION Hourly Averages (WD)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.	
DAY																											
1	SSW	SSW	SW	SSW	SSW	SW	WSW	WSW	SSW	SSW	SSW	SSW	SSW	SW	WSW	SW	SW	SW	SW	SSW	SSW	SW	W	WSW	SW	SW	24
2	W	W	W	WSW	WSW	W	W	W	WNW	WNW	WNW	WSW	W	WNW	W	NNW	NW	WNW	WNW	WNW	WNW	W	WSW	WNW	W	WSW	24
3	W	WNW	W	WSW	WSW	W	WNW	NW	NW	WNW	NW	NNW	NNW	NW	W	WNW	WSW	WSW	W	W	W	WSW	NNE	NW	WNW	24	
4	S	E	ENE	NE	NE	NE	NNE	ENE	SSE	S	ENE	E	SE	SSE	S	SW	N	NNE	NE	NNW	WNW	ESE	SE	ESE	SE	ESE	24
5	SSE	SE	SE	SE	ESE	E	ESE	ESE	SE	SE	SSE	SSE	SSE	SSE	S	SSE	SSE	SSE	SE	SE	SE	SE	SE	SE	SE	SE	24
6	ESE	ESE	E	ESE	ESE	ESE	ESE	ESE	SSE	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SE	SSE	ESE	NE	ENE	ESE	NE	SE	SE	24
7	N	NE	ENE	N	NNW	NW	NNW	N	NNE	NNE	ENE	NE	NE	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	24
8	NE	NNE	NNE	NNE	NNE	NNE	NNE	N	N	N	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NE	NE	NE	NNE	24
9	ENE	NE	NE	NE	NE	NE	E	ENE	ENE	ENE	NE	E	SE	SSE	SSE	SSE	S	SE	SE	ESE	SE	SE	SE	SE	SE	E	24
10	SE	SE	E	ENE	E	E	ESE	ESE	ESE	SE	SE	ESE	ESE	E	ESE	ESE	E	ENE	NE	NNE	NE	NNE	NNE	NNE	NNE	E	24
11	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NE	NE	NE	NE	ENE	NE	NNE	NE	NE	NE	NE	NNE	24
12	NE	NNE	NE	NNE	NE	NE	NE	NE	NNE	NNE	NE	ENE	NE	ENE	ENE	NE	NE	NE	NE	ENE	NE	ENE	NE	NE	NE	NE	24
13	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	NE	NE	NE	NE	NE	NE	NE	24
14	ENE	NE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	NNE	NE	24
15	NNE	NNE	NNE	NNE	NNE	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	NE	NE	NNE	NE	NNE	NNE	NE	NE	NE	NE	24
16	NE	ENE	SSE	E	SSE	SSW	S	SSW	SSW	SSW	S	SSW	SSW	SSW	SSW	SSW	S	SSW	S	S	S	S	S	S	S	SSW	24
17	S	SE	ESE	E	ENE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	24
18	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	NE	NE	NE	NE	NE	24
19	NE	NNE	NNE	NE	NE	NE	NNE	NNE	NNE	NE	ENE	SSE	S	SSW	SSW	SSW	SSW	SSW	S	S	S	S	S	S	S	SE	24
20	SSE	ENE	ESE	NE	ENE	ENE	E	ESE	ESE	SE	SE	SE	SE	SSW	SSW	SSW	SSW	SW	WSW	W	NW	WNW	NNW	NNE	NNE	SSE	24
21	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	ENE	SE	SSW	S	NE	ENE	NE	NE	NE	NE	NE	NE	ENE	ENE	NE	24
22	NE	NE	ENE	ENE	ENE	ENE	ENE	E	E	E	ESE	NE	NE	E	ENE	ENE	E	ENE	NE	NE	NE	ENE	ENE	ENE	ENE	ENE	24
23	NE	NE	ENE	NE	NE	ENE	ENE	ENE	ENE	E	E	ESE	ESE	ESE	ENE	ESE	E	ENE	ENE	ENE	ENE	ENE	ENE	E	ENE	ENE	24
24	E	ENE	E	E	E	E	E	E	ESE	E	E	E	E	E	E	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	24
25	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	SE	E	ESE	E	ESE	E	ESE	ESE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	24
26	SE	SE	SE	SE	SE	SE	ESE	ESE	E	ESE	ESE	ESE	ESE	ESE	ESE	SE	ESE	ESE	ESE	ESE	NE	NE	ENE	ESE	ESE	ESE	24
27	ESE	ESE	ESE	ENE	NE	ENE	E	E	ESE	E	ESE	E	ESE	ESE	ESE	ESE	E	E	SSE	SSW	SSE	NNW	E	ESE	ESE	ESE	24
28	E	NE	ENE	SE	SSW	ENE	NE	NNE	NNW	NNE	SSE	SSE	NNE	WSW	SSW	SW	SW	SW	WSW	SW	SSW	SW	SW	SW	SSW	SSW	24
29	S	S	S	SSW	S	SSW	ENE	S	S	SSW	SSW	SSW	SSW	SSW	SSW	S	S	SSW	SSW	SSW	S	SSE	S	SSE	S	24	
30	SSE	SE	N	ENE	NE	NNE	ENE	ESE	ESE	E	SE	ESE	SE	ESE	NW	NNW	SW	SW	W	NNW	NNE	N	NNW	WNW	E	24	

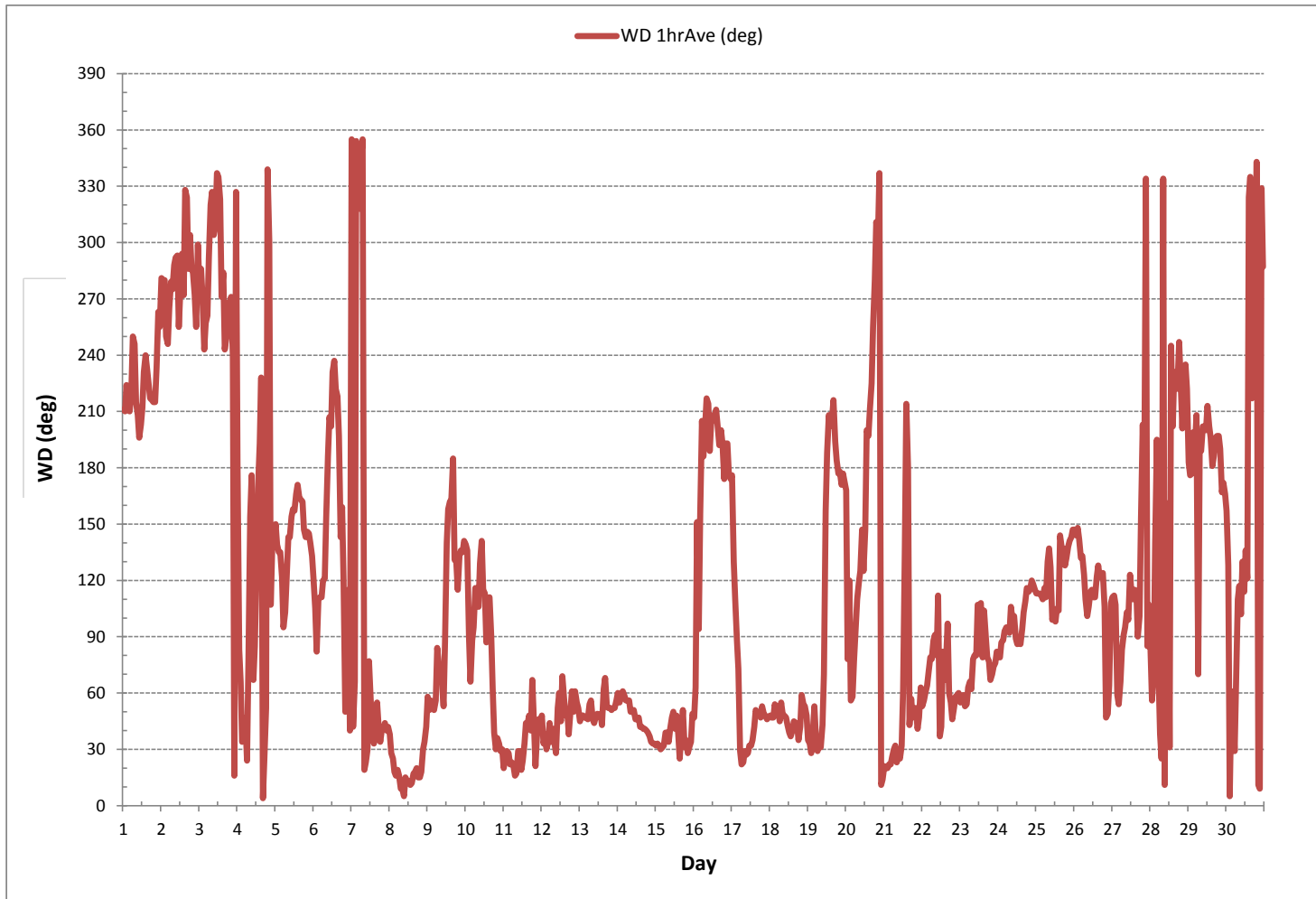
**STATUS FLAG CODES**

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

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

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	720	hrs
STANDARD DEVIATION:	85		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	68 (ENE)	

WIND DIRECTION Hourly Averages (WD)



***STANDARD DEVIATION WIND DIRECTION***





**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**  
**Maskwa Continuous Monitoring Station - April 2017**

**STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	RDGS.
DAY																									
1	17	17	27	21	19	41	29	29	16	18	15	13	56	34	35	31	25	23	20	18	19	26	29	33	24
2	30	25	24	27	27	29	32	32	28	29	33	37	36	40	39	55	36	35	39	29	32	32	34	39	24
3	25	29	31	26	27	29	36	33	33	38	42	46	40	38	32	30	39	34	32	27	28	29	42	55	24
4	36	34	14	23	69	34	47	43	33	33	38	34	44	32	28	33	30	31	22	37	31	27	18	25	24
5	37	26	27	16	22	26	30	31	27	27	30	30	29	28	29	27	26	25	25	23	23	23	23	26	24
6	22	23	25	21	21	24	28	26	28	31	39	38	56	66	49	43	27	28	16	29	38	21	37	30	24
7	36	24	29	51	35	36	35	30	22	20	21	33	30	24	19	22	25	22	17	20	21	22	20	20	24
8	19	17	16	18	19	16	19	23	31	25	23	25	26	28	25	21	20	19	20	19	17	17	17	22	24
9	27	27	30	31	26	28	27	28	39	42	48	33	52	58	48	44	39	42	24	22	24	23	32	27	24
10	21	28	26	20	26	22	30	30	27	40	32	30	33	34	41	37	29	27	18	14	15	14	15	11	24
11	14	14	14	16	15	15	15	18	17	17	15	19	17	18	22	22	24	22	26	21	20	24	21	19	24
12	19	16	17	11	13	20	14	20	21	21	26	32	27	30	32	27	28	20	24	20	20	20	19	20	24
13	20	21	21	21	20	18	24	24	22	21	22	24	23	23	19	25	25	23	23	23	23	22	24	24	24
14	26	24	24	24	23	25	26	25	23	23	23	21	21	22	21	19	20	19	19	19	18	15	15	16	24
15	17	16	14	13	13	14	17	19	17	19	24	25	21	24	25	17	18	23	21	20	15	17	16	22	24
16	23	26	28	72	46	46	63	30	34	41	43	49	51	40	25	28	20	21	19	18	18	19	21	26	24
17	29	33	26	30	39	20	17	14	14	17	23	29	18	25	35	23	21	22	19	23	21	20	20	19	24
18	19	20	19	23	23	22	21	22	22	23	25	29	20	19	21	20	20	20	12	17	23	21	21	20	24
19	15	13	19	17	28	13	15	13	23	27	37	46	45	27	25	40	48	19	19	15	17	19	19	21	24
20	39	49	50	47	45	50	30	35	31	27	36	41	33	22	18	31	29	35	35	44	46	49	17	19	24
21	16	17	17	19	16	14	14	19	16	26	37	57	57	79	67	60	37	24	22	22	23	18	22	26	24
22	22	22	25	28	29	28	30	32	31	41	41	58	59	36	38	41	58	34	23	22	21	23	25	25	24
23	22	21	22	22	22	23	23	25	27	28	27	31	32	32	30	31	29	28	27	25	24	25	26	29	24
24	27	28	28	26	27	27	26	30	30	31	28	28	28	31	28	30	31	27	31	26	25	33	26	28	24
25	26	28	31	31	32	28	28	30	27	27	30	30	27	30	30	25	27	27	27	23	21	21	23	22	24
26	23	21	22	25	26	25	29	27	29	33	34	34	33	32	31	28	26	27	26	26	20	17	25	26	24
27	25	25	25	24	16	18	26	35	31	38	35	33	37	36	32	34	34	29	24	56	47	19	60	40	24
28	50	22	20	43	58	42	20	26	49	57	61	59	49	44	59	31	51	41	31	21	45	21	25	33	24
29	36	21	15	29	30	41	48	23	25	26	26	35	32	24	37	31	26	18	20	16	16	15	15	15	24
30	12	44	25	37	36	18	24	30	34	43	37	53	59	55	60	57	28	31	28	29	19	20	31	42	24

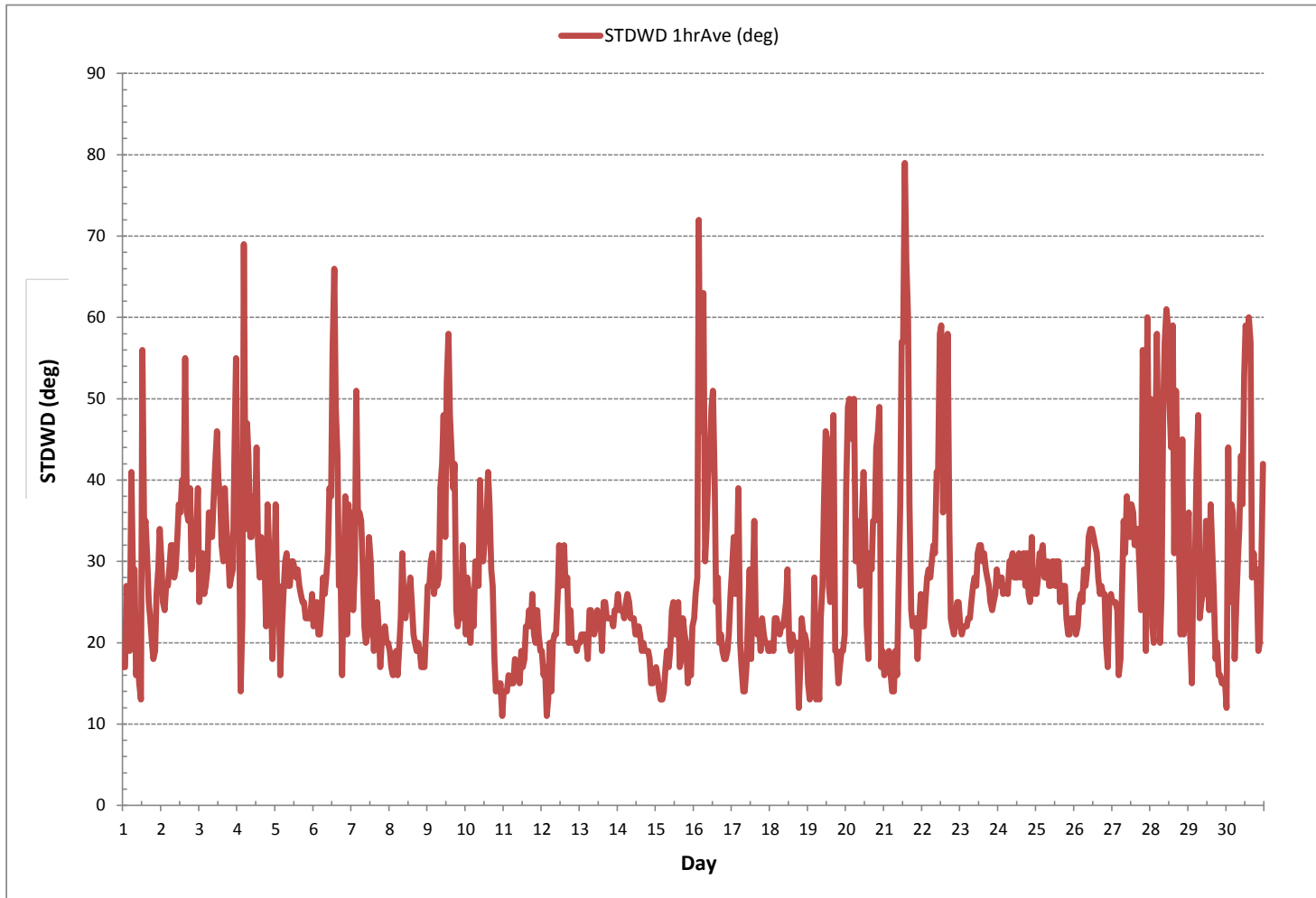
**STATUS FLAG CODES**

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

LAST CALIBRATION: March 30, 2016

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 720 hrs

**STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)**



***RELATIVE HUMIDITY***



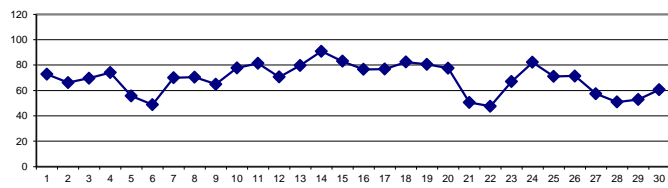
RELATIVE HUMIDITY Hourly Averages (RH %)

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

STATUS FLAG CODES

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

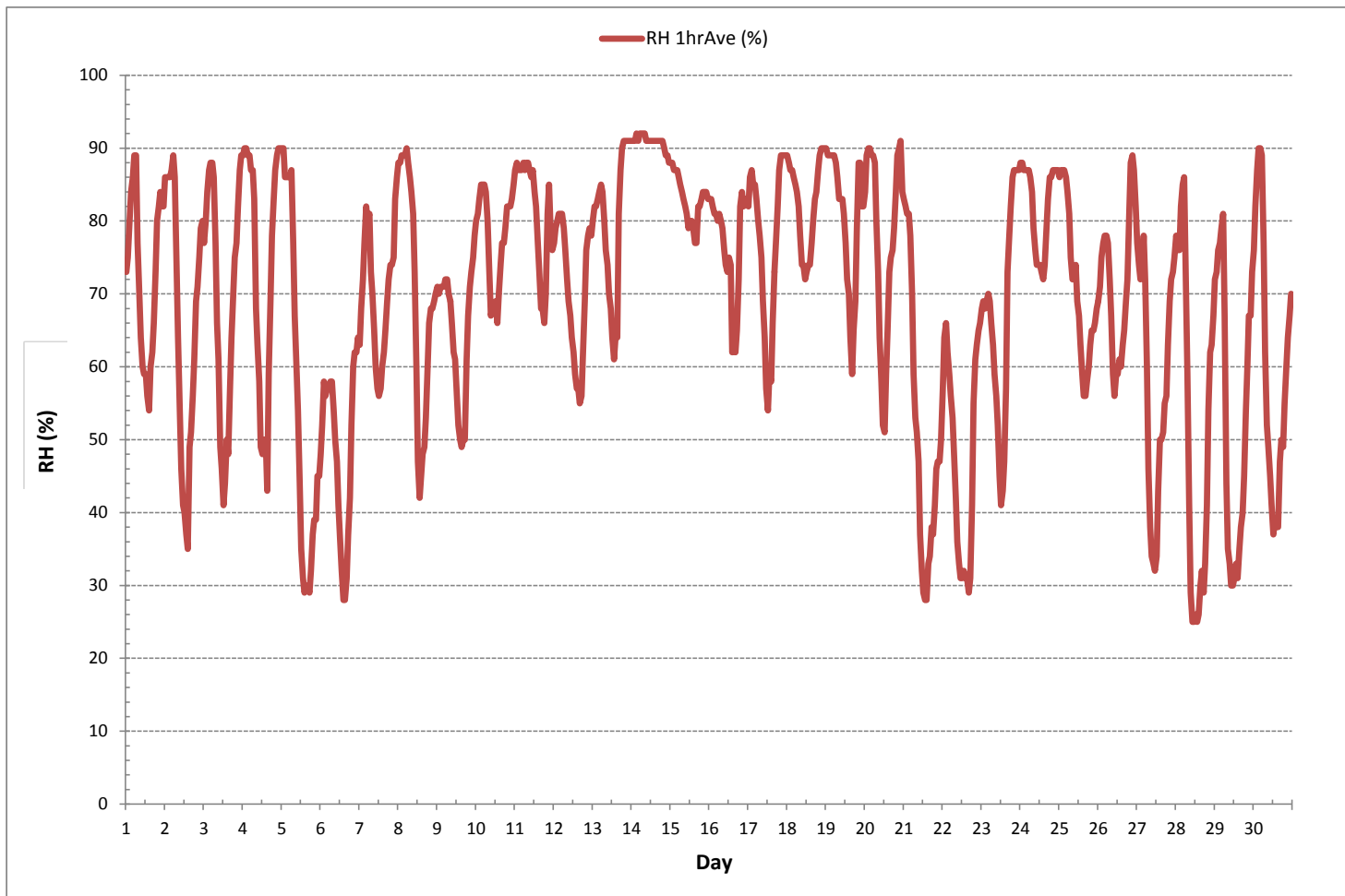
24 HR AVERAGES April 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	25	%	@ HOUR	10	ON DAY	28
MAXIMUM 1-HR AVERAGE:	92	%	@ HOUR	3	ON DAY	14
MAXIMUM 24-HR AVERAGE:	91	%			ON DAY	14
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	17					MONTHLY AVERAGE: 69 %

RELATIVE HUMIDITY Hourly Averages (RH %)



## ***BAROMETRIC PRESSURE***

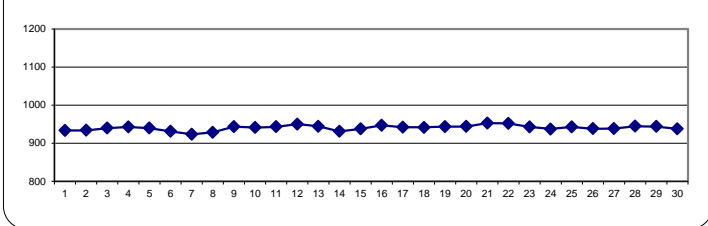
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY 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	937	937	936	936	936	935	935	934	934	935	935	934	933	933	933	933	932	932	932	932	931	931	931	931	931	937	934	24	
2	931	932	932	932	932	932	932	933	934	933	934	934	934	934	934	935	935	935	935	935	936	936	936	936	936	931	936	934	24
3	937	937	937	937	937	938	938	939	940	940	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	937	941	940	24
4	941	941	942	942	942	942	943	943	943	944	944	944	943	943	943	942	942	942	942	942	942	942	942	942	942	941	944	942	24
5	942	942	941	941	941	941	941	941	941	941	941	941	941	940	940	940	939	938	938	937	937	936	936	935	935	935	942	940	24
6	935	934	933	933	933	932	932	932	932	932	933	933	933	932	932	932	931	930	930	929	928	927	927	926	926	926	935	931	24
7	925	924	923	923	923	923	924	924	924	924	924	925	925	925	925	924	924	924	923	923	923	923	922	922	922	922	925	924	24
8	922	922	922	922	922	922	923	924	925	926	927	928	928	930	930	931	932	933	933	934	935	936	937	937	922	937	928	24	
9	938	939	939	940	940	941	942	943	944	944	945	945	945	946	946	946	946	945	945	945	945	945	944	944	938	946	943	24	
10	944	944	943	943	943	942	942	942	942	942	942	941	941	941	941	940	940	940	940	939	939	939	939	939	939	939	944	941	24
11	939	939	939	940	940	941	941	942	942	942	943	943	944	944	944	945	945	945	946	946	946	947	947	939	947	943	24		
12	948	948	948	948	948	949	949	950	950	951	951	951	951	951	951	951	951	951	951	950	950	950	950	950	948	951	950	24	
13	950	950	949	948	948	948	948	947	947	946	946	945	945	944	943	943	942	942	941	940	940	939	938	937	937	950	944	24	
14	937	936	935	934	934	933	933	932	931	930	930	929	929	929	929	929	929	929	930	930	930	930	931	929	929	937	931	24	
15	931	931	931	932	933	933	934	935	935	936	937	937	938	938	939	940	941	942	942	943	943	944	944	944	931	947	937	24	
16	945	945	946	946	946	947	947	947	948	948	949	949	949	948	948	948	947	947	946	945	945	945	944	944	944	949	947	24	
17	944	943	943	942	942	941	941	941	941	942	942	942	942	942	942	942	942	942	942	942	942	943	943	943	941	944	942	24	
18	942	942	942	942	942	942	942	942	942	942	942	942	942	942	941	941	941	941	941	941	941	941	941	941	941	941	942	942	24
19	941	941	941	941	941	942	942	942	942	943	944	944	944	945	945	945	945	945	945	944	944	944	944	944	941	945	943	24	
20	944	944	944	944	944	944	944	944	944	944	944	944	944	944	943	943	943	943	943	944	944	944	945	946	943	946	944	24	
21	947	948	949	950	951	951	952	953	954	954	955	955	955	955	954	954	954	954	954	954	954	954	954	947	955	953	24		
22	954	954	954	954	954	953	953	953	953	954	954	954	953	952	952	951	951	950	950	950	950	949	949	949	949	954	952	24	
23	949	948	947	946	946	945	945	944	944	944	943	943	942	941	941	940	940	939	939	939	938	938	938	938	938	949	943	24	
24	937	937	936	936	936	936	936	936	936	936	937	937	937	937	937	938	938	938	938	939	939	940	940	940	936	940	937	24	
25	941	941	941	941	941	942	942	943	943	943	943	944	944	944	944	943	943	943	943	943	943	942	942	942	941	944	943	24	
26	941	941	940	940	939	939	939	939	939	939	938	938	938	937	937	937	937	937	937	937	937	936	936	936	936	941	938	24	
27	936	936	936	936	936	936	937	937	938	938	938	938	938	939	939	939	939	940	940	940	940	941	941	936	941	938	24		
28	941	941	942	942	942	943	943	944	945	946	946	946	946	946	946	946	946	946	946	946	946	945	945	945	941	946	945	24	
29	945	945	945	945	945	945	946	946	947	947	946	946	945	945	944	944	943	942	941	941	941	940	940	939	939	947	944	24	
30	939	938	938	937	937	937	937	938	938	938	938	938	938	938	937	937	937	937	938	938	938	938	938	938	937	939	938	24	
HOURLY MAX	954	954	954	954	954	953	953	953	954	954	955	955	955	955	955	955	954	954	954	954	954	954	954	954	954	954	954	24	
HOURLY AVG	940	940	940	940	940	940	940	941	941	941	941	941	941	941	941	941	941	940	940	940	940	940	940	940	940	940	940	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

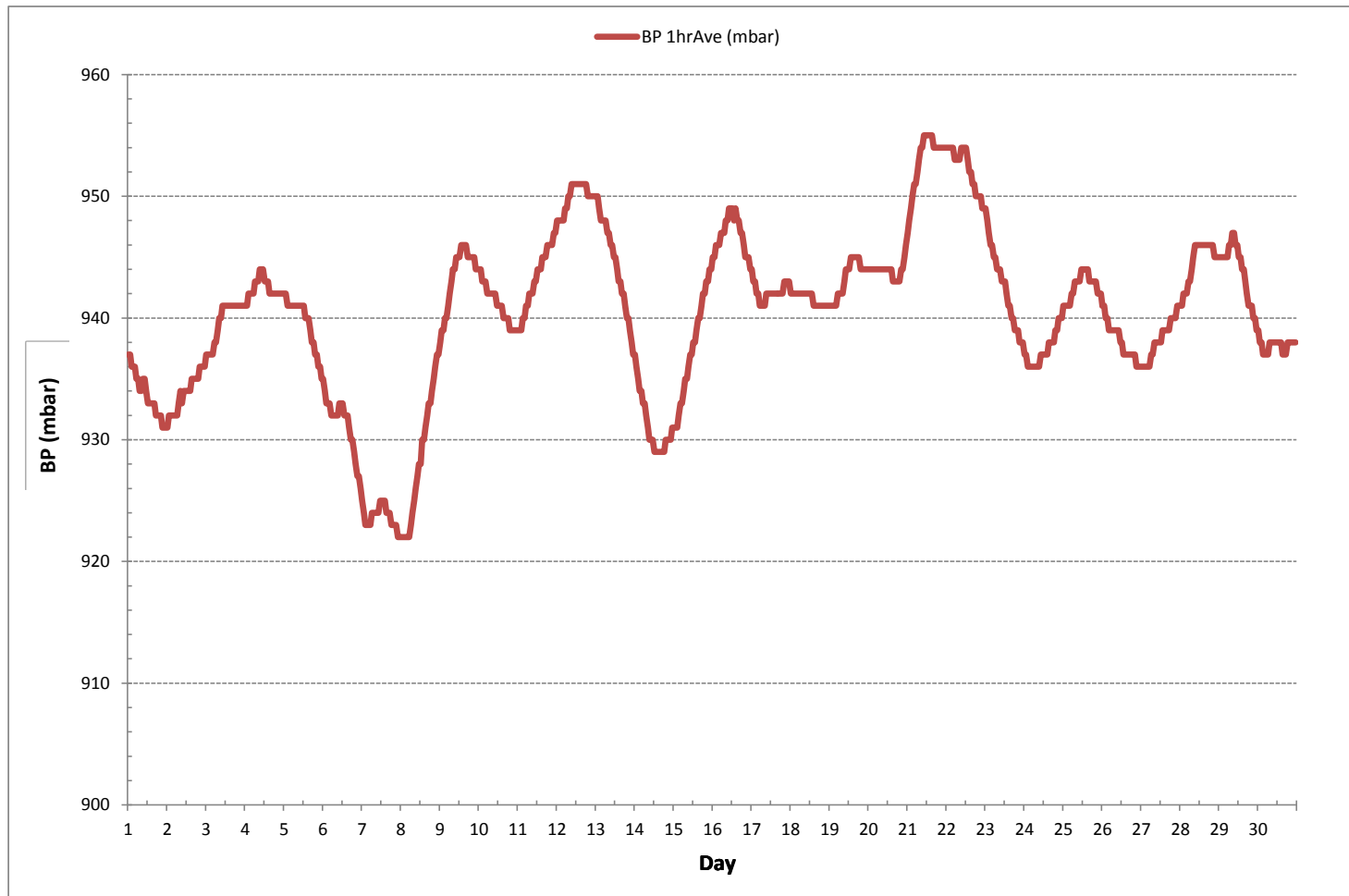
24 HR AVERAGES April 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	922	mbar	@ HOUR	22	ON DAY	7
MAXIMUM 1-HR AVERAGE:	955	mbar	@ HOUR	10	ON DAY	21
MAXIMUM 24-HR AVERAGE:	953	mbar			ON DAY	21
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	7					
MONTHLY AVERAGE:						940 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)





***AMBIENT TEMPERATURE***

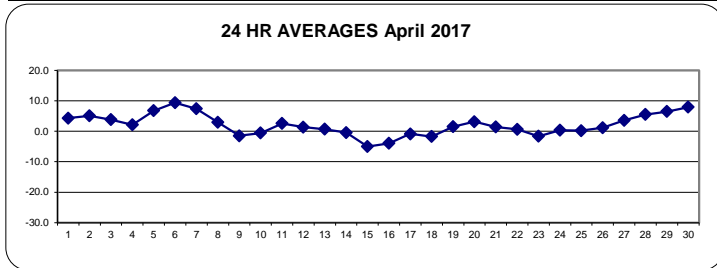


AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	4.2	3.4	1.9	0.8	0.5	-0.8	-0.2	2.4	3.9	6.0	7.0	7.0	6.9	8.2	8.8	7.7	7.6	6.9	5.1	3.7	3.2	2.9	3.1	2.8	-0.8	8.8	4.3	24	
2	1.5	1.2	0.7	0.3	-0.8	-1.2	0.3	3.9	6.0	8.8	11.2	12.3	12.2	12.6	14.0	8.4	8.8	7.4	5.8	3.3	2.6	1.4	0.9	0.7	-1.2	14.0	5.1	24	
3	1.6	0.5	-0.2	-1.4	-1.8	-1.0	-0.4	2.6	5.6	7.2	10.7	10.3	10.6	9.6	9.6	9.4	7.0	5.7	4.4	2.9	1.8	0.4	-1.2	-2.3	-2.3	10.7	3.8	24	
4	-3.0	-3.2	-3.3	-3.5	-2.9	-2.5	-2.4	-0.9	1.8	2.9	5.4	7.8	8.8	8.9	8.7	9.4	5.8	4.7	3.3	2.3	1.6	0.6	0.1	0.6	-3.5	9.4	2.1	24	
5	0.0	0.7	1.4	1.1	0.6	0.4	0.2	2.3	4.3	6.1	8.3	11.1	12.6	12.9	12.8	12.9	12.1	11.7	10.8	9.4	8.6	8.4	7.0	6.6	0.0	12.9	6.8	24	
6	5.8	5.3	4.0	4.6	4.6	4.7	4.8	5.5	7.0	8.6	10.2	12.5	14.9	16.9	17.7	17.1	16.1	14.7	12.7	9.3	7.0	6.6	6.8	6.5	4.0	17.7	9.3	24	
7	6.6	6.6	5.6	4.0	2.3	3.5	5.3	8.1	9.0	10.4	11.4	12.2	12.2	11.6	11.2	10.4	9.4	8.1	7.0	6.1	5.2	4.7	3.8	3.2	2.3	12.2	7.4	24	
8	2.8	2.5	2.2	2.3	1.3	1.1	1.5	1.8	3.1	4.9	6.7	8.5	8.5	8.1	7.3	6.0	4.5	2.0	-0.1	-0.8	-1.2	-1.8	-1.9	-1.9	-1.9	8.5	3.0	24	
9	-2.5	-2.8	-3.1	-3.3	-3.5	-3.7	-3.8	-3.6	-3.3	-2.7	-1.5	-1.1	0.9	1.8	2.7	3.1	3.0	3.1	0.0	-2.6	-3.0	-3.7	-4.2	-4.2	-4.2	3.1	-1.5	24	
10	-4.5	-4.8	-5.6	-6.3	-5.9	-5.6	-4.4	-2.9	-1.2	0.9	0.8	0.9	1.4	2.8	3.3	3.0	2.8	2.8	2.1	1.1	1.1	1.5	1.5	1.0	-6.3	3.3	-0.6	24	
11	0.1	0.2	0.4	0.6	0.8	1.2	1.6	1.6	1.6	2.3	2.3	3.2	4.0	4.6	5.4	5.7	6.3	6.3	4.3	1.1	0.5	1.1	0.2	0.1	6.3	2.6	24		
12	-0.7	-1.5	-2.0	-2.4	-2.8	-2.9	-2.0	-0.9	0.4	1.6	2.9	3.9	4.5	5.6	6.4	6.2	6.5	5.7	4.3	2.1	-0.2	-0.7	-0.8	-0.6	-2.9	6.5	1.4	24	
13	-1.0	-1.5	-1.4	-1.8	-2.4	-2.8	-2.0	-0.7	0.4	0.9	2.3	3.2	4.5	5.0	3.9	4.2	2.4	1.4	0.4	0.3	0.3	0.2	0.3	0.3	-2.8	5.0	0.7	24	
14	0.3	0.4	0.4	0.5	0.3	0.1	0.1	0.2	0.3	0.4	0.2	0.3	0.2	0.1	0.0	-0.2	-0.4	-0.8	-1.5	-2.0	-2.6	-3.1	-3.6	-3.6	-3.6	0.5	-0.4	24	
15	-3.9	-4.1	-4.5	-4.8	-5.2	-5.7	-5.9	-5.9	-5.7	-5.3	-4.8	-3.8	-3.5	-3.6	-3.4	-4.1	-4.2	-5.8	-5.7	-6.1	-6.1	-6.3	-6.7	-6.7	-6.7	-6.7	-3.4	-5.1	24
16	-8.4	-11.3	-12.6	-13.4	-13.1	-13.8	-11.3	-7.0	-4.4	-2.0	0.6	2.1	2.6	3.1	3.9	3.3	2.9	2.0	0.1	-1.9	-2.9	-3.5	-4.5	-4.9	-13.8	3.9	-3.9	24	
17	-5.2	-7.0	-8.1	-8.1	-7.8	-6.9	-5.1	-4.2	-2.9	-0.1	2.2	5.1	5.7	5.7	6.7	5.2	3.5	2.5	1.6	0.2	-0.4	-0.8	-1.1	-1.5	-8.1	6.7	-0.9	24	
18	-1.9	-2.5	-3.1	-3.5	-4.0	-4.6	-5.0	-4.5	-2.9	-1.9	-0.2	-0.1	0.2	0.9	0.7	0.6	-0.1	-0.5	-0.8	-0.9	-0.8	-0.8	-0.7	-0.7	-5.0	0.9	-1.7	24	
19	-0.7	-0.7	-0.7	-0.8	-0.7	-0.8	-0.5	0.1	1.3	1.5	1.7	2.3	3.5	4.5	4.9	6.2	6.7	5.1	4.3	1.6	-0.9	-1.2	0.0	-0.1	-1.2	6.7	1.5	24	
20	-0.7	-2.5	-3.1	-3.0	-2.6	-1.8	-0.4	2.4	4.0	6.5	8.9	11.1	11.7	9.4	7.6	5.7	5.9	5.5	4.5	2.9	1.1	0.2	0.4	1.3	-3.1	11.7	3.1	24	
21	0.1	-0.3	-1.0	-1.8	-2.1	-2.6	-2.2	-1.5	0.3	4.3	6.3	7.7	8.2	8.2	5.8	4.6	3.2	2.2	1.0	0.2	-0.7	-1.5	-1.8	-2.6	-2.6	8.2	1.4	24	
22	-2.3	-2.7	-2.8	-2.8	-2.8	-2.7	-2.3	-1.5	-0.3	1.2	3.5	5.9	6.1	5.4	5.8	5.4	6.2	4.7	2.2	-0.2	-1.7	-2.4	-3.3	-4.1	-4.1	6.2	0.6	24	
23	-5.1	-5.5	-5.5	-5.9	-6.1	-5.7	-4.9	-3.6	-1.7	-0.5	1.1	3.0	3.4	3.0	2.3	1.4	0.4	-0.4	-1.0	-1.4	-1.6	-1.7	-1.7	-1.6	-6.1	3.4	-1.6	24	
24	-1.5	-1.5	-1.5	-1.6	-1.6	-1.5	-1.3	-0.4	0.6	1.5	2.1	2.4	2.8	3.1	3.1	2.8	2.2	1.3	0.3	-0.3	-0.6	-0.8	-1.0	-1.3	-1.6	3.1	0.3	24	
25	-1.6	-1.8	-1.9	-1.9	-2.0	-2.0	-1.5	0.2	0.9	0.8	0.6	1.5	2.0	2.6	2.8	2.6	2.1	1.6	0.9	0.3	-0.1	-0.3	-0.4	-0.5	-2.0	2.8	0.2	24	
26	-0.7	-1.0	-1.5	-1.8	-1.9	-1.9	-1.3	0.0	1.4	3.8	4.6	3.6	3.8	3.4	3.8	3.3	3.0	2.5	2.2	1.2	0.3	0.0	0.0	0.4	-1.9	4.6	1.1	24	
27	0.6	0.5	0.4	-0.4	-2.4	-2.2	0.3	3.7	6.0	7.6	7.9	8.8	8.8	7.4	6.4	7.1	6.3	4.8	4.4	3.3	2.3	1.6	1.1	0.8	-2.4	8.8	3.5	24	
28	0.3	0.3	-0.2	-1.7	-2.7	-2.4	1.7	4.7	9.6	11.2	11.9	12.6	10.7	13.2	12.1	11.0	9.9	11.3	9.6	6.9	2.7	0.4	0.0	-0.8	-2.7	13.2	5.5	24	
29	-1.8	-2.1	-2.6	-3.0	-3.3	-2.9	1.4	7.3	9.4	10.8	11.9	12.5	13.3	12.9	13.9	12.6	12.1	11.3	10.4	8.2	7.2	5.8	5.6	4.2	-3.3	13.9	6.5	24	
30	3.4	1.0	-1.0	-1.4	-2.0	-1.3	2.8	7.5	10.1	11.7	13.2	14.3	15.3	14.8	15.2	14.4	12.1	11.2	11.1	9.5	8.4	7.3	6.5	5.9	-2.0	15.3	7.9	24	
HOURLY MAX	6.6	6.6	5.6	4.6	4.6	4.7	5.3	8.1	10.1	11.7	13.2	14.3	15.3	16.9	17.7	17.1	16.1	14.7	12.7	9.5	8.6	8.4	7.0	6.6					
HOURLY AVG	-0.6	-1.1	-1.6	-2.0	-2.3	-2.3	-1.2	0.5	2.0	3.4	4.8	5.9	6.5	6.8	6.9	6.3	5.6	4.8	3.7	2.2	1.1	0.6	0.2	-0.1					

STATUS FLAG CODES

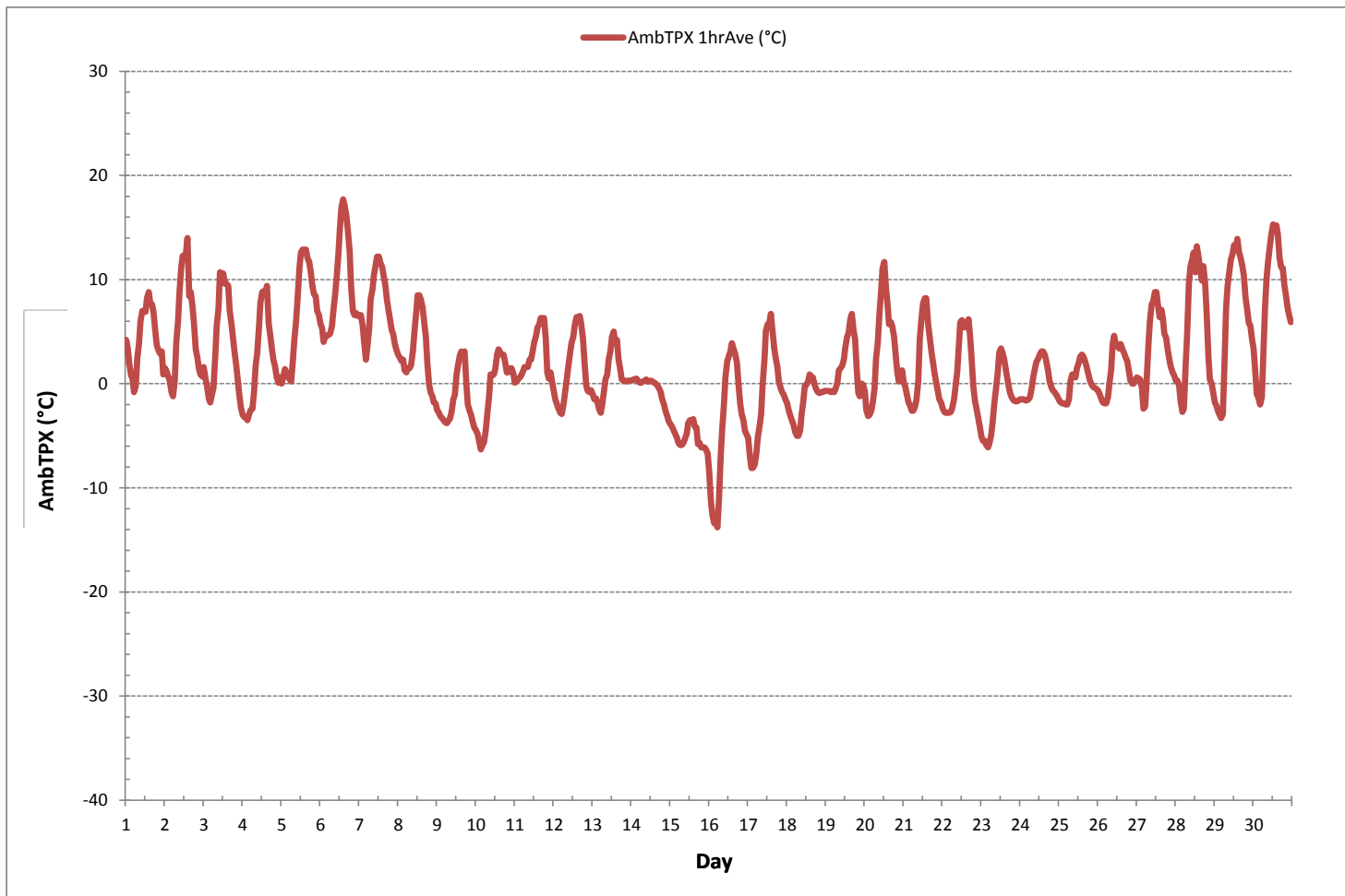
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-13.8 °C	@ HOUR	5	ON DAY	16
MAXIMUM 1-HR AVERAGE:	17.7 °C	@ HOUR	14	ON DAY	6
MAXIMUM 24-HR AVERAGE:	9.3 °C			ON DAY	6
OPERATIONAL TIME:					720 hrs
AMD OPERATION UPTIME:					100.0 %
STANDARD DEVIATION:	5.1	MONTHLY AVERAGE:			2.1 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



## ***PRECIPITATION***

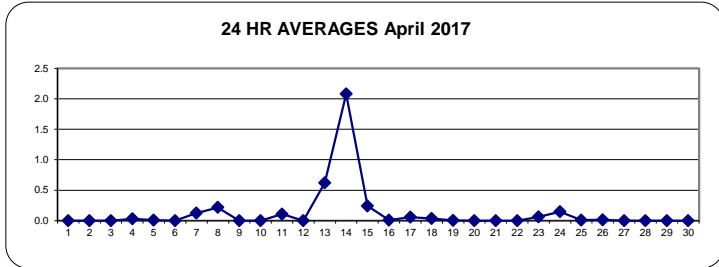


PRECIPITATION Hourly Averages (mm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.3	0.0	24
5	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.6	1.2	0.0	1.6	0.1	24
8	1.5	1.1	0.9	0.5	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.2	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.0	0.0	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.1	24
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.0	1.7	2.5	3.0	1.9	3.1	1.1	0.0	3.1	0.6	24	
14	1.8	1.8	0.6	0.7	1.5	2.4	3.2	4.0	4.2	3.7	2.8	4.2	4.2	3.2	3.3	1.8	1.7	1.2	1.3	0.5	0.6	0.4	0.4	0.4	0.4	4.2	2.1	24	
15	0.4	0.2	0.2	0.5	0.7	0.3	0.1	0.1	0.1	0.1	0.2	0.9	0.4	0.1	0.1	0.2	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.2	24	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.6	0.0	0.6	0.1	24	
18	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	24	
19	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	0.1	0.0	24	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3	0.1	0.2	0.2	0.0	0.0	0.3	0.1	24	
24	0.3	0.0	0.1	0.1	0.1	0.0	0.2	0.2	0.3	0.1	0.1	0.0	0.2	0.0	0.1	0.0	0.2	0.3	0.8	0.2	0.1	0.1	0.0	0.0	0.0	0.8	0.1	24	
25	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.0	24	
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
HOURLY MAX	1.8	1.8	0.9	0.7	1.5	2.4	3.2	4.0	4.2	3.7	2.8	4.2	4.2	3.2	3.3	1.8	1.7	1.2	1.7	2.5	3.0	1.9	3.1	1.2					
HOURLY AVG	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1				

STATUS FLAG CODES

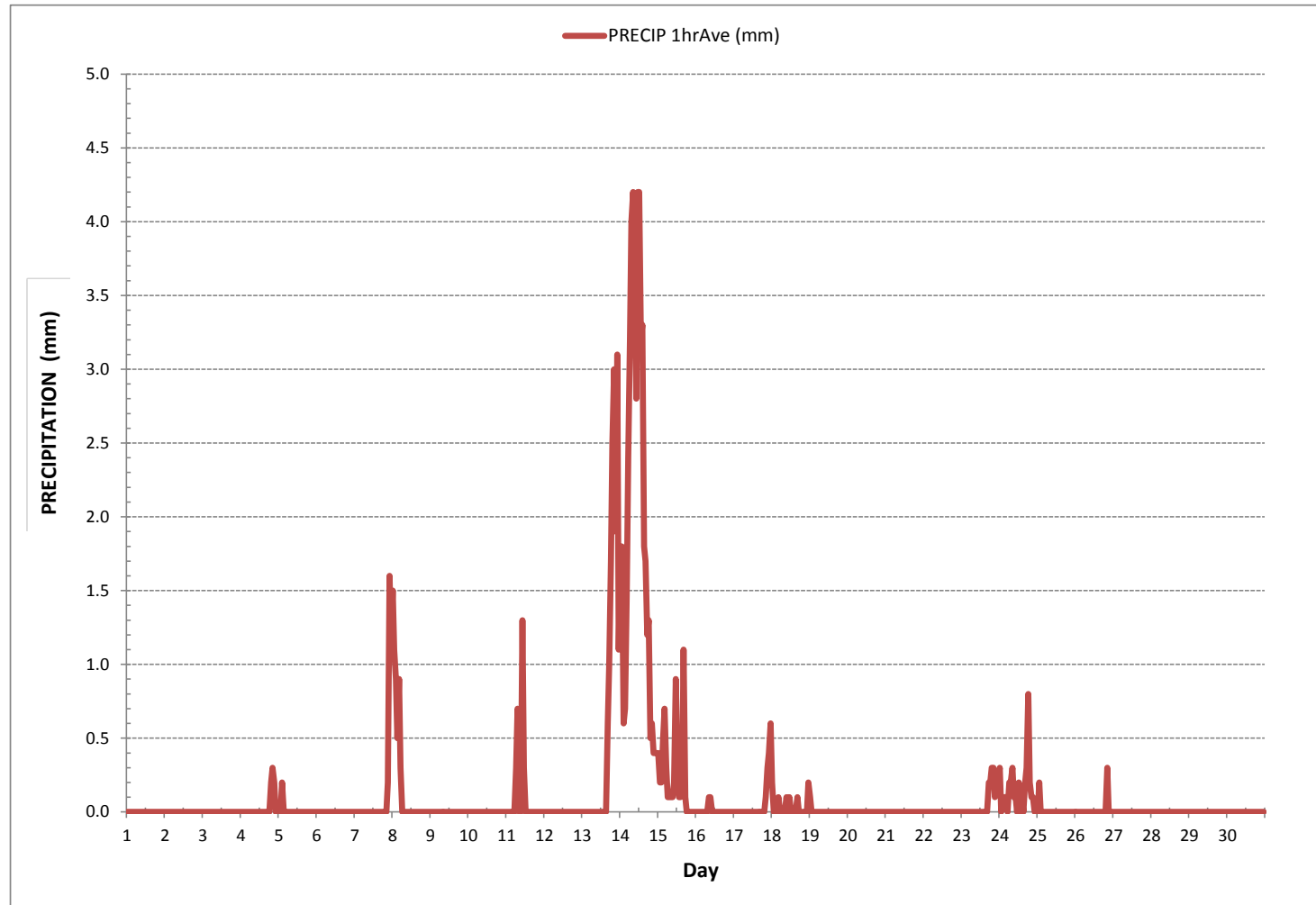
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	4.2	mm	@ HOUR	8	ON DAY	14
MAXIMUM 24-HR AVERAGE:	2.1	mm			ON DAY	14
MONTHLY TOTAL	90.3	mm				
OPERATIONAL TIME:					720	hrs
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	0.5		MONTHLY AVERAGE:		0.1	mm

PRECIPITATION Hourly Averages (mm)



***APPENDIX II***  
***EQUIPMENT CALIBRATION RESULTS***

***SULPHUR DIOXIDE***





## API 100E Sulphur Dioxide Analyzer Calibration

Date: April 28, 2017	Barometric Pressure: 0.935 atm
Company/Airshed: LICA	Station Temperature °C: 24
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 9:56	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 14:22	Cal Gas Expiry Date: July 18, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

<b>Analyzer:</b>	
ID# or Serial Number: 508	Range ppb: 1000
Last Calibration Date: March 5, 2017	As Found C.F.: 1.003
Previous C.F.: 1.000	New C.F.: 1.000

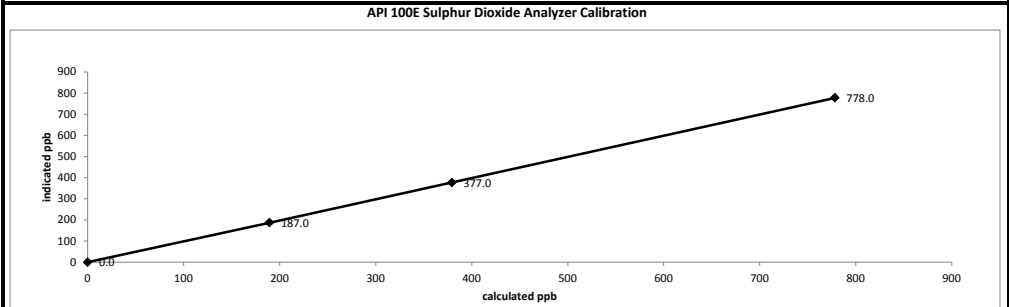
<b>Calibrator:</b>	<b>Standard Calibration Points for Ranges</b>								
Flow Meter ID's: n/a	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb								
High	780								
Mid	380								
Low	190								
Make & Model: API 700									
Serial #: 627									
Cal Gas Cylinder I.D. #: LL104222									
Cal Gas Conc. (ppm): 50.6									

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

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.00	5000	0.0	1.0	n/a
as found high	4923	76.90	5000	778.2	777.0	1.003
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4923	76.90	5000	778.2	778.0	1.000
mid	4964	37.50	5002	379.4	377.0	1.006
low	4980	18.70	4999	189.3	187.0	1.012
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F. =						1.006

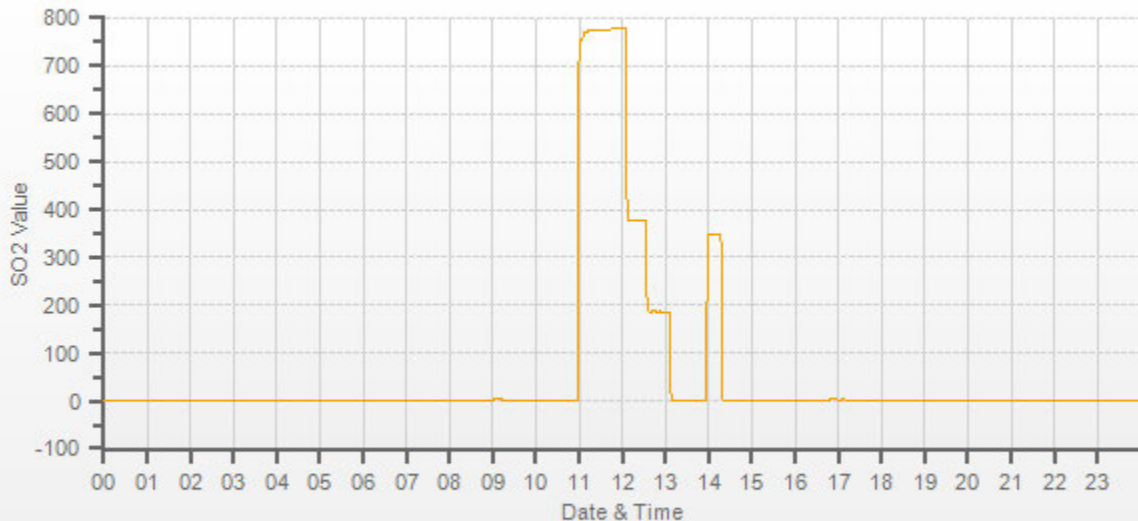
**Linear Regression/Calibration Results:**

Correlation Coefficient = 1.000	LIMITS > or = 0.995
Slope = 1.000	.95-1.05
b (Intercept as % of full scale) = 0.14%	± 3% F.S.
% change in C.F. from last cal = -0.29%	± 10%



<p style="text-align: center; font-weight: bold;">As found:</p> <p>SLOPE: 0.973</p> <p>OFFSET: 127.2</p> <p>HVPS: 483</p> <p>RCELL TEMP: 50.0</p> <p>BOX TEMP: 31.5</p> <p>PMT TEMP: 7.7</p> <p>IZS TEMP: 45.0</p> <p>PRES: 24.9</p> <p>SAMP FL: 584</p> <p>NORM PMT: 128.6</p> <p>UV LAMP: 2713.0</p> <p>LAMP RATIO: 99.0</p> <p>STR. LGT: 61.9</p> <p>DRK PMT: 10.3</p> <p>DRK LMP: -0.5</p> <p>Expected Value: 346.0</p>	<p style="text-align: center; font-weight: bold;">As left:</p> <p>SLOPE: 0.976</p> <p>OFFSET: 128.9</p> <p>HVPS: 483</p> <p>RCELL TEMP: 50.0</p> <p>BOX TEMP: 32.9</p> <p>PMT TEMP: 7.7</p> <p>IZS TEMP: 45.0</p> <p>PRES: 24.9</p> <p>SAMP FL: 585</p> <p>NORM PMT: 128.7</p> <p>UV LAMP: 2706.0</p> <p>LAMP RATIO: 99.0</p> <p>STR. LGT: 62.9</p> <p>DRK PMT: 10.8</p> <p>DRK LMP: -0.4</p> <p>Expected Value: 348.0</p>
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**Comments:**  
The analyzer sample inlet filter was changed.



— SO2[ppb]

***HYDROGEN SULPHIDE***



## API 101A Hydrogen Sulphide Analyzer Calibration

Date: April 28, 2017	Barometric Pressure: 0.935 atm
Company/Airshed: LICA	Station Temperature °C: 24
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Parameter: Hydrogen Sulphide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 9:56	Performed By/Reviewer: Alex Yakupov Trina Whittitt
End Time 24 hr. (mst): 14:45	Cal Gas Expiry Date: June 14, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

<b>Analyzer:</b>	
ID# or Serial Number: 324	Range ppb: 100
Last Calibration Date: March 5, 2017	As Found C.F.: 1.019
Previous C.F.: 0.999	New C.F.: 0.999

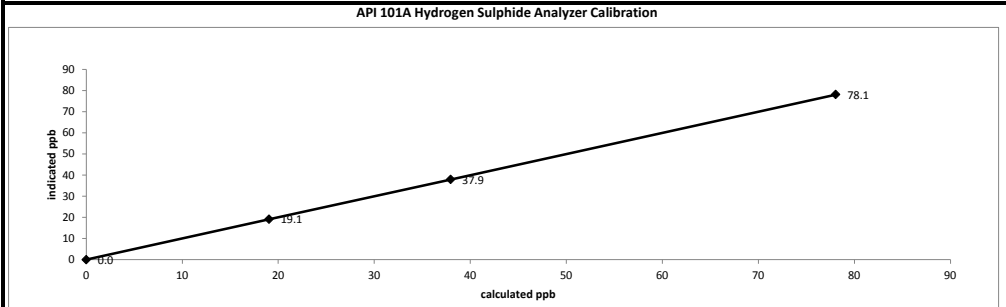
<b>Calibrator:</b>	<b>Standard Calibration Points for Ranges</b>	<b>SO<sub>2</sub> Scrubber Check (10 mins.)</b>								
Flow Meter ID's: n/a	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	Start/End Time 24 hr.: 10:42 / 10:52
Point	ppb									
High	78									
Mid	38									
Low	19									
Make & Model: SABIO 2010 D		Target Concentration (ppb): 780								
Serial #: 11900613		Result (ppb): 0.3								
Cal Gas Cylinder I.D. #: EY0000654		Zero Corrected Result (ppb): 0								
Cal Gas Conc. (ppm): 10.2										

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

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7500	0.00	7500	0.0	-0.4	n/a
as found high	7443	57.40	7500	78.1	76.2	1.019
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7443	57.40	7500	78.1	78.1	0.999
mid	7471	27.90	7499	37.9	37.9	1.001
low	7485	14.00	7499	19.0	19.1	0.997
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F. =						0.999

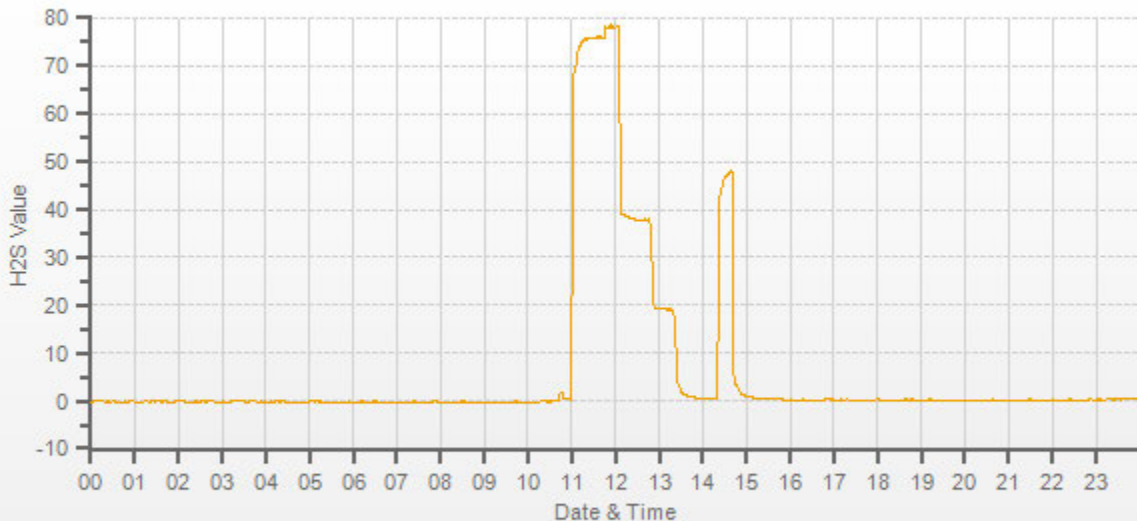
**Linear Regression/Calibration Results:**

Correlation Coefficient =	1.000	LIMITS
Slope =	1.000	> or = 0.995
b (Intercept as % of full scale) =	0.00%	.95-1.05
% change in C.F. from last cal =	-2.01%	± 3% F.S.
		± 10%



<p style="text-align: center;"><b>As found:</b></p> SLOPE: 0.953 OFFSET: 24.0 HVPS: 675 DCPS: 2579 RCCELL TEMP: 50.2 BOX TEMP: 30.9 PMT TEMP: 6.8 IZS TEMP: 50.1 Converter Temp: 324.0 PRES: 24.1 SAMP FL: 557 UV LAMP: 3959.3 LAMP RATIO: 111.5 STR. LGT: 11.4 DRK PMT: 36.8 Expected Value: 46.6	<p style="text-align: center;"><b>As left:</b></p> SLOPE: 0.973 OFFSET: 23.1 HVPS: 676 DCPS: 2578 RCCELL TEMP: 51.3 BOX TEMP: 31.6 PMT TEMP: 6.8 IZS TEMP: 50.0 Converter Temp: 324.0 PRES: 24.1 SAMP FL: 557 UV LAMP: 3958.5 LAMP RATIO: 111.5 STR. LGT: 11.2 DRK PMT: 36.9 Expected Value: 47.7
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**Comments:**  
The analyzer sample inlet filter was changed.



— H2S[ppb]

***TOTAL HYDROCARBON***



## Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: <u>April 28, 2017</u>	Barometric Pressure: <u>0.935 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>24</u>
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>Mainly sunny</u>
Parameter: <u>Total Hydrocarbon</u>	Calibration Purpose: <u>routine monthly</u>
Start/End Time 24 hr. (mst): <u>14:01 / 17:43</u>	Performed By/Reviewer: <u>Alex Yakupov   Trina Whitsitt</u>
Calibration Method: <u>Gas Dilution</u>	Cal Gas Expiry Date: <u>November 25, 2023</u>

Analyzer: ID# or Serial Number: <u>436609738</u>	Range ppm: <u>50</u>
Last Calibration Date: <u>March 5, 2017</u>	As Found C.F.: <u>1.050</u>
Previous Cal High Point C.F.: <u>1.000</u>	New C.F.: <u>1.000</u>

Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>SABIO 2010 D</u> Serial #: <u>11900613</u> Cal Gas Cylinder I.D. #: <u>LL165372</u> CH <sub>4</sub> /C <sub>2</sub> H <sub>6</sub> Cylinder Conc. (ppm): <u>606.0</u> <u>212.0</u> CH <sub>4</sub> as propane/total CH <sub>4</sub> equivalents (ppm): <u>583.0</u> <u>1189.0</u>	Standard Calibration Points for a Range of: <u>50 ppm</u> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>Target ppm</th></tr> <tr><td>High</td><td>38</td></tr> <tr><td>Mid</td><td>18</td></tr> <tr><td>Low</td><td>9</td></tr> </table>	Point	Target ppm	High	38	Mid	18	Low	9
Point	Target ppm								
High	38								
Mid	18								
Low	9								

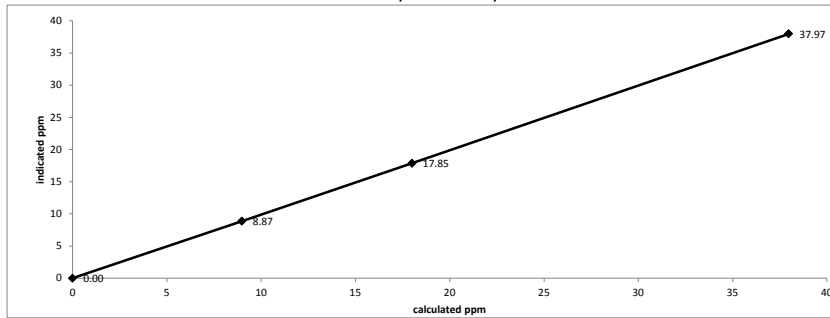
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	1999	0.00	1999	0.0	-0.01	n/a
as found high	1937	63.90	2001	37.97	36.16	1.050
adjusted zero	1999	0.00	1999	0.00	0.00	n/a
adjusted high	1937	63.90	2001	37.97	37.97	1.000
mid	1971	30.30	2001	18.00	17.85	1.008
low	1985	15.10	2000	8.98	8.87	1.012
calibrator zero	1999	0.00	1999	0.0	0.00	n/a
Average C.F. =						1.007

**Linear Regression/Calibration Results:**

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.999</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.15%</u>	.95-1.05
% change in C.F. from last cal = <u>-4.98%</u>	± 3% F.S.
	± 10%

Thermo 51C Total Hydrocarbon Analyzer Calibration



**As found:**

H2 cylinder (psi):	<u>1100</u>
H2 cylinder reg set (psi):	<u>22</u>
Span Cylinder (psi):	<u>2000</u>
Span Cylinder Reg Set (psi):	<u>22</u>
Zero Air Gen Pressure:	<u>38</u>
measurement alarms:	<u>None</u>
service alarms:	<u>None</u>
cnt:	<u>1043</u>
rng:	<u>1</u>
try:	<u>3</u>
flm:	<u>183.8</u>
det:	<u>125.4</u>
Flame:	<u>183</u>
Filter:	<u>125</u>
Base:	<u>125</u>
Sample psi:	<u>07.32</u>
Internal Air Pressure:	<u>20</u>
Internal Fuel Pressure:	<u>12</u>
Measured Flow:	<u>0.7679</u>
Expected Value:	<u>26.80</u>

**As left:**

H2 cylinder (psi):	<u>1100</u>
H2 cylinder reg set (psi):	<u>22</u>
Span Cylinder (psi):	<u>2999</u>
Span Cylinder Reg Set (psi):	<u>22</u>
Zero Air Gen Pressure:	<u>38</u>
measurement alarms:	<u>None</u>
service alarms:	<u>None</u>
cnt:	<u>1026</u>
rng:	<u>1</u>
try:	<u>3</u>
flm:	<u>183.9</u>
det:	<u>125.4</u>
Flame:	<u>183</u>
Filter:	<u>125</u>
Base:	<u>125</u>
Sample psi:	<u>07.35</u>
Internal Air Pressure:	<u>20</u>
Internal Fuel Pressure:	<u>12</u>
Measured Flow:	<u>n/a</u>
Expected Value:	<u>27.60</u>

**Comments:**

The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.



— THC[ppm]



***NITROGEN DIOXIDE***



## API 200A NO-NO2-NOx Analyzer Calibration

<b>Date:</b> April 28, 2017 <b>Company/Airshed:</b> LICA <b>Location/Station Name:</b> Maskwa <b>Start/End Time 24 hr. (mst):</b> 9:56 / 16:59 <b>G.P.T. to be used for Ozone?</b> No <b>Calibration Method:</b> Gas Dilution & Gas Phase Titration	<b>Barometric Pressure:</b> 0.935 atm <b>Station Temperature °C:</b> 24 <b>Weather Conditions:</b> Mainly sunny <b>Calibration Purpose:</b> routine monthly <b>Performed By/Reviewer:</b> Alex Yakupov   Trina Whitsitt <b>Cal Gas Expiry Date:</b> July 18, 2019
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<b>Analyzer:</b>  <b>ID# or Serial Number:</b> 1899 <b>Last Calibration Date:</b> March 5, 2017 <b>Range ppb:</b> 1000	<b>Correction Factors:</b> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.001</td> <td>0.966</td> <td>1.000</td> </tr> <tr> <td>NO<sub>2</sub> =</td> <td>0.998</td> <td>1.010</td> <td>1.010</td> </tr> <tr> <td>NOx =</td> <td>1.001</td> <td>0.966</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.001	0.966	1.000	NO <sub>2</sub> =	0.998	1.010	1.010	NOx =	1.001	0.966	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.001	0.966	1.000														
NO <sub>2</sub> =	0.998	1.010	1.010														
NOx =	1.001	0.966	1.000														

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

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

Point	Diluent	Cal Gas	Total Flow	Calculated NO (ppb)	Calculated NOx (ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	NO C.F.	NOx C.F.
as found zero	5000	0.0	5000	0	0	0.0	0.0	n/a	n/a
as found high	4923	76.9	5000	779.8	779.8	807.0	807.0	0.966	0.966
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4923	76.90	5000	779.8	779.8	780.0	780.0	1.000	1.000
mid	4964	37.50	5002	380.1	380.1	372.0	372.0	1.022	1.022
low	4980	18.70	4999	189.7	189.7	182.0	182.0	1.042	1.042
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
								Average C.F.=	1.021

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

Point	Diluent	Cal Gas	Total Flow	Calibrator Setting (volts or ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	Indicated NO <sub>2</sub> (ppb)	NO drop (ppb)	NO <sub>2</sub> gain (ppb)	NO <sub>2</sub> C.F. (ppb)	
NOx reference	4923	76.90	5000	0.0	779.0	779.0	0.0	0.0	0.0		
as found high NO2	4800	76.90	4877	485.0	274.0	773.0	500.0	505.0	500.0	1.010	
adjusted high NO2	4800	76.90	4877	485.0	274.0	773.0	500.0	505.0	500.0	1.010	
gpt mid	4800	76.90	4877	260.0	502.0	776.0	275.0	277.0	275.0	1.007	
gpt low	4800	76.90	4877	95.0	671.0	775.0	104.0	108.0	104.0	1.038	
										Average NO <sub>2</sub> C.F.=	1.019

Linear Regression/Calibration Results:

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.997	0.997	1.007	.95-1.05
b (Intercept as % of full scale)=	-0.48%	-0.48%	-0.11%	± 3% F.S.
% change in C.F. from last cal=	3.47%	3.47%	-1.20%	± 10%
NO <sub>2</sub> converter efficiency			0.99	0.96 to 1.04

<b>As found:</b> NOx SLOPE: 0.908 NOx OFFS: 0.3 NO SLOPE: 0.929 NO OFFS: -1.1 SAMP FLW: 552 OZONE FL: 78 NORM PMT: 2.0 AZERO: 21.9 HVPS: 686 DCPS: 2580 RCELL: 49.9 BOX TEMP: 30.9 IZS TEMP: 48.3 MOLY TEMP: 315.1 RCEL: 5.7 SAMP: 26.6 Expected Value NO: 4.5 Expected Value NO <sub>2</sub> : 487.0 Expected Value NOx: 491.0	<b>As left:</b> NOx SLOPE: 0.876 NOx OFFS: 0.3 NO SLOPE: 0.890 NO OFFS: -1.1 SAMP FLW: 553 OZONE FL: 78 NORM PMT: -0.2 AZERO: 21.9 HVPS: 685 DCPS: 2574 RCELL: 50.5 BOX TEMP: 33.0 IZS TEMP: 48.0 MOLY TEMP: 315.5 RCEL: 4.7 SAMP: 26.6 Expected Value NO: 4.7 Expected Value NO <sub>2</sub> : 477.0 Expected Value NOx: 482.0
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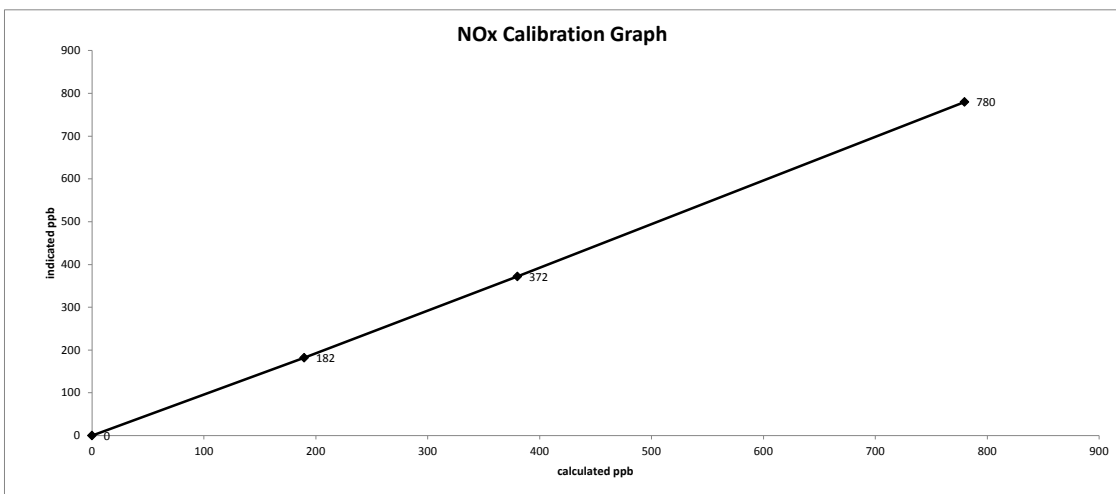
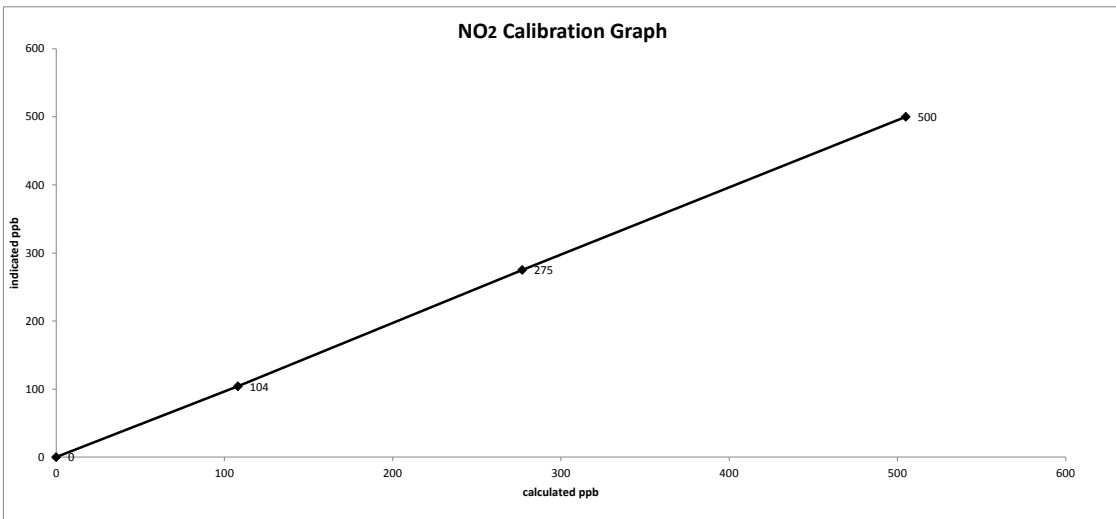
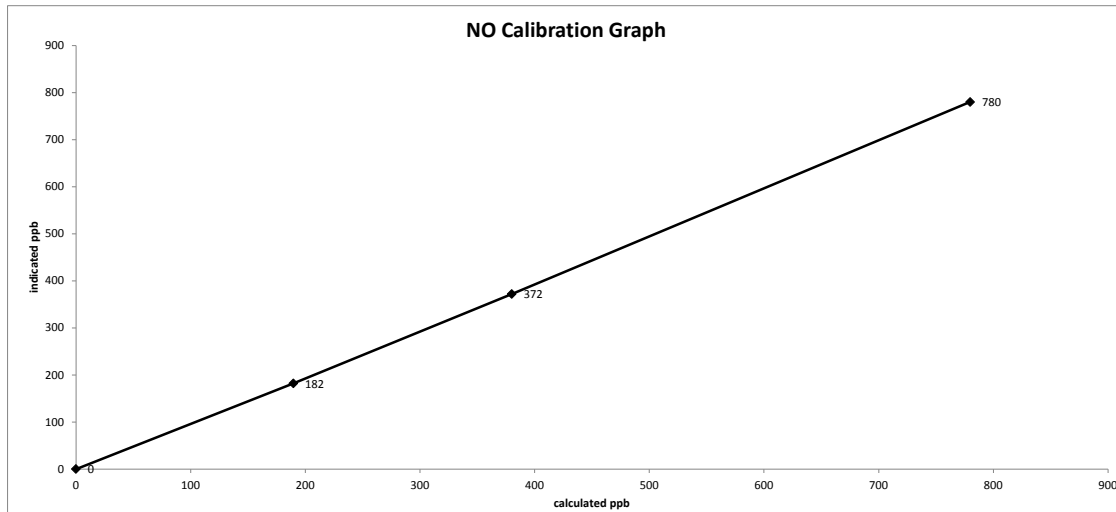
**Comments:**

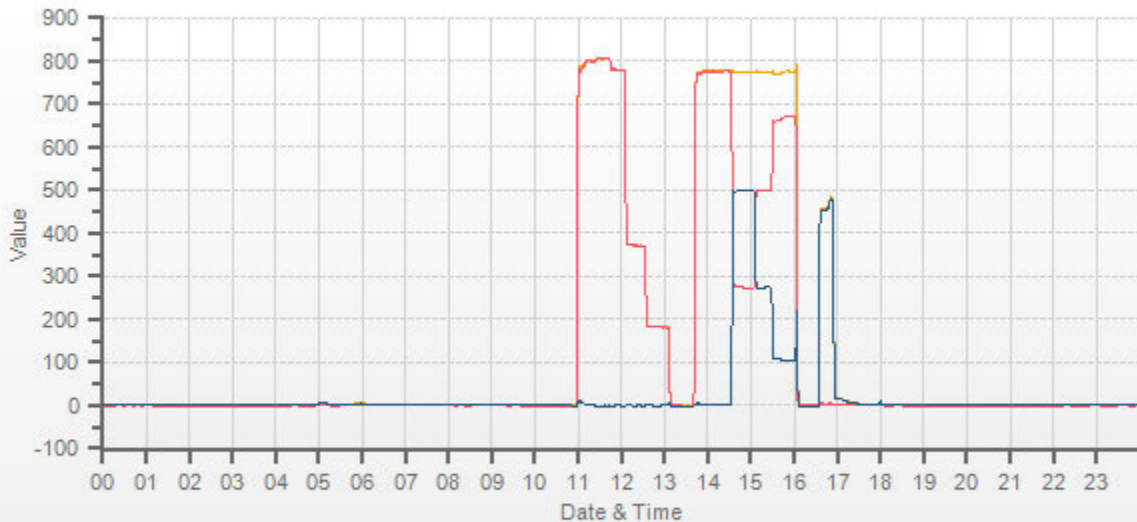
The analyzer sample inlet filter was changed. No high point NO<sub>2</sub> adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

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

Date: April 28, 2017  
Company/Airshed: LICA  
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 9:56 / 16:59  
Calibration Purpose: routine monthly  
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

## ***WIND SYSTEM***



## ***CALIBRATORS***

Company Maxxam/SIA Operator: Chris

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

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

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

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

<u>NO</u>		<u>LIMITS</u>		<u>NOx</u>	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0041	<b>0.90-1.10</b>		m (Slope)=	1.0046
b (Intercept % of FS)=	-0.1118	<b>± 3% F.S.</b>		b (Intercept % of FS)=	-0.0871

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

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

<u>NO<sub>2</sub></u>		<u>LIMITS</u>	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9924	<b>0.90-1.10</b>	
b (Intercept % of FS)=	0.1755	<b>± 3% F.S.</b>	

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

COMMENTS: \_\_\_\_\_

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



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

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

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

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

<b>NO</b>		<b>LIMITS</b>		<b>NOx</b>	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0301	<b>0.90-1.10</b>		m (Slope)=	1.0291
b (Intercept % of FS)=	-0.0919	± 3% F.S.		b (Intercept % of FS)=	-0.0881

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

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

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

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

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton

Operator Signature:

Date: March 16, 2017

Location: McIntyre Center Edmonton

## ***CALIBRATION GASES***



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2016-335CGA

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

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

Expiry Date: July 2019

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

**Reference Analyzer:**

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

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

Last Calibration: Date: Oct 19/16 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	<del>0.01662</del>	<del>60.183</del>	<del>50.0</del>
4935	82.0	0.830	0.01662	60.183	50.0
4968	40.8	0.412	0.00821	121.765	50.2
4955	20.2	0.203	0.00408	245.297	49.8
Average Cylinder Concentration:					<b>50.0</b>

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 1

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration  \_\_\_\_\_

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

Auditor: Al Clark Date: October 19, 2016

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



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2016-334CGA

**Company:** Maxxam **Operator's Name:** Russell Kirchner  
**Cylinder #:** EY0000654 **Concentration PPM:** 10.2 **Tolerance(%)** 2 **Certified By:** Praxair  
**Expiry Date:** June 2019

Reference Calibrator and Gas:	Flow Measurement Device:
<b>Make/Model:</b> <u>R&amp;R MFC 201</u>	<b>Make/Model:</b> <u>Bios DC2</u>
<b>Serial Number:</b> <u>AMU 1690</u>	<b>Serial Number:</b> <u>AMU 1659</u>
<b>Last Verification Date:</b> <u>October 19, 2016</u>	<b>Temp. °C:</b> <u>24.0 C</u>
<b>Gas Type:</b> <u>H2S</u> <b>Conc.</b> <u>20.43</u>	<b>B.P.</b> <u>706 mmhg</u>
<b>Cylinder Number:</b> <u>CAL015584</u>	
<b>Expiry Date:</b> <u>January 2019</u>	

**Reference Analyzer:**  
**Make/Model:** Teco 450i **Serial/AMU Number:** 1980  
**Instrument Settings:** **Zero:** 16.6 **Span:** 1.231 **Range:** 0.1  
**Last Calibration:** **Date:** Oct 19/16 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	<del>0.0000</del>	<del>0.0000</del>	<del>0.0000</del>
5050	38.0	0.0764	0.00752	132.895	10.2
5050	17.8	0.0355	0.00352	283.708	10.1
5023	9.1	0.0182	0.00181	551.978	10.0
Average Cylinder Concentration:					<b>10.1</b>

**Previous Stated Concentration PPM:** 10.2  
**Percent variance from Stated:** 1

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

**Auditor:** Al Clark **Date:** October 19, 2016  
**Operator Signature:** *Al Clark* **Location:** McIntyre Center Edmonton



# Calibration Gas Audit

## NO Cylinder Gas

File No. 2016-336CGA

**Company:** Maxxam      **Operators name:** Russell Kirchner

Cylinder #: LL104222    Conc (PPM) 50.7/50.9    Tolerance (%) 1    Certified By: Praxair

Expiry Date: July 2019

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>AMU 1659</u>
Last Verification Date	<u>October 19, 2019</u>			Temp. °C	<u>24.5 C</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>706 mmhg</u>
Cylinder Number	<u>CAL018188</u>				
Expiry Date	<u>March 2019</u>				

**Reference Analyzer:**

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

Instrument Settings    Zero: 4.4      Span: 1.080      Range: 1.0

Last Calibration:      Date: Oct 18/16      C.F. 1.000      Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4935	82.0	0.838	0.837	0.017	60.183	50.4	50.4
4968	40.8	0.417	0.417	0.008	121.765	50.8	50.8
4955	20.2	0.207	0.207	0.004	245.297	50.8	50.8
Average Cylinder Concentration:						<b>50.7</b>	<b>50.6</b>

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.7</u>	<u>50.9</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

**Cylinder gas tolerances based on NO only**

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration  Contains 50.6 ppm SO2.

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

Auditor: Al Clark      Date: October 19, 2016

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



# Calibration Gas Audit

## CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

Company: Maxxam Operators name: Chris Wesson  
Cylinder #: LL165372 Conc CH4 (PPM) 606/212 Tolerance (%) 0.5 Certified By: Praxair

**Reference Calibrator and Gas:**

Make/Model R&R MFC 201  
Serial Number AMU 1698  
Last Verification Date January 18, 2016  
Gas Type CH4 Conc. 999.2  
Cylinder Number D751932  
Gas Type C3H8 Conc. 246.5  
Cylinder Number XF0037998

**Flow Measurement Device:**

Make/Model Bios DC-2  
Serial Number Bios D  
Temp. °C 24.5  
B.P. 688mmHg

**Reference Analyzer:**

Make/Model Thermo 55C Serial/AMU Number: 1643  
Instrument Settings Zero: NA Span: NA Range: 20.0  
Last Calibration: Date: 18-Jan-16 C.F. 1.000 Done By: SB

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2568	0.00	0.00	0.00	<del>0.02140</del>	<del>46.722</del>	<del>607</del>	<del>214</del>
2630	56.29	12.99	12.62	0.02140	46.722	607	214
2588	19.73	4.62	4.50	0.00762	131.171	606	215
2580	9.69	2.29	2.24	0.00376	266.254	610	217
Average Cylinder Concentration:						<b>608</b>	<b>215</b>

<u>CH4</u>	<u>C3H8</u>
Previous Stated Concentration PPM: <u>606</u>	<u>212</u>
Percent variance from Stated: <u>0.3</u>	<u>1.6</u>

**Cylinder gas tolerances based on CH4 only**

Meets Manufacturer Tolerance. Use manufacturers stated concentration  COMMENTS: \_\_\_\_\_  
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration  C3H8 manufacturers tolerance 1.1%  
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton  
Operator Signature: \_\_\_\_\_

Date: January 19, 2016  
Location: McIntyre Center Edmonton

***APPENDIX III  
REPORT CERTIFICATION FORM***

### Report Certification Form

<b>Alberta Airshed</b> (if applicable)	<b>EPA Approval or Code of Practice Registration #</b> (if applicable)
YES	NA
<b>Company Name</b> (if applicable)	<b>Industrial Operation Name</b> (if applicable)
Lakeland Industry & Community Association	Maskwa Continuous Monitoring Station
<b>Name of the Representative of the Person Responsible</b> (Last, First, Middle)	<b>Position / Title of the Representative of the Person Responsible</b>
Bim Adeniji	Project Manager Assistant, Customer Service, Air Services
<b>Is an External Party Certifying the Report?</b> (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>Name of External Person Certifying the Report</b> (Last, First, Middle)	<b>Position / Title of External Person Certifying the Report</b>
NA	NA
<b>Company Name for the External Person Certifying the Report</b>	<b>Identification of Qualifications / Professional Designations of the External Person Certifying the Report</b>
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.



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

06-06-2017

\_\_\_\_\_  
Report Issued Date (dd-mm-yyyy)







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



### Validation Certificate Form

<b>Client:</b> <u>Lakeland Industry &amp; Community Association</u>	<b>Project #:</b> <u>2833-2017-04-30-C</u>
<b>Site:</b> <u>Maskwa Continuous Monitoring Station</u>	<b>Contact:</b> <u>Mike Bisaga</u>

<b>Level 0 Preliminary Verification</b>	 _____	<b>Date</b> <u>31-May-2017</u>
<b>Level 1 Primary Validation</b>	 _____	<b>Date</b> <u>31-May-2017</u>
<b>Level 2 Final Validation</b>	 _____	<b>Date</b> <u>06-June-2017</u>
<b>Level 3 Independent Data Review</b>	 _____	<b>Date</b> <u>06-June-2017</u>
<b>Post-Final Validation</b>	<b>NA</b> _____	<b>Date</b> <b>NA</b> _____

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



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

February 22, 2018

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

---

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

The air monitoring program consists of continuous air monitoring results for Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulphide (H<sub>2</sub>S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxides (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), Particulate Matter 2.5 (PM<sub>2.5</sub>), 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 April 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement systems, with the exception of H<sub>2</sub>S and NO<sub>x</sub>/NO/NO<sub>2</sub>.

**H<sub>2</sub>S:** Seventy-three hours of downtime were recorded due to analyzer malfunction and analyzer replacement. Operational time for the month was 89.9%. AEP reference number: 333881.

The LICA-owned API 101E analyzer, s/n: 509, failed on April 18. It was removed for repair and a Maxxam-supplied Thermo 43C analyzer, s/n: 43C-68187-360, was installed on April 19. The Thermo 43C started exhibiting instability in zero response after the installation. The Maxxam-supplied Thermo 43C analyzer, s/n: 43C-68187-360, was removed and the LICA-owned API 101E analyzer, s/n: 509 was re-installed onsite after it had undergone repairs at Maxxam shop on April 25.

**NO<sub>x</sub>/NO/NO<sub>2</sub>:** 257 hours of downtime were recorded due to analyzer malfunction, extra calibration checks to address a biased high zero drift and analyzer replacement. Operational time for the month was 64.3%. AEP reference number: 323328.

The LICA-owned API 101E analyzer, s/n: 509, was removed for repair on April 19 and a Maxxam-supplied Thermo 43C analyzer, s/n: 43C-68187-360, was installed. LICA-owned API 101E analyzer was re-installed onsite on April 25 after it had undergone repairs at Maxxam shop.



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

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

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

Respectfully,

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

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

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

Lily Lin  
Data & Reporting Specialist  
587-225-2248  
[rebbacaa@gmail.com](mailto:rebbacaa@gmail.com)



MAXXAM ANALYTICS  
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T2E 6P7

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

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

**JOB #: 2833-2017-04-31-C**

**April 2017**

Prepared for:

**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**

402 - 19 ST NW  
CALGARY, ALBERTA  
T2N 2J1

**Attention: MIKE BISAGA**

DATE: **June 15, 2017**

Prepared by: *Wunmi Adekanmbi*

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

Reviewed by: *Maram Ghaleb* :On behalf of

---

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

## SUMMARY

In April 2017, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the St. Lina Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by the Lakeland Industry and Community Association.

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

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems, with the exception of H<sub>2</sub>S and NO<sub>x</sub>/NO/NO<sub>2</sub>, were above the 90% requirement.

**All Parameters:** One hour of data collected on April 15, at hour 17:00, was invalidated due to a power failure.

**Intermittent Power Outages:** Brief intermittent power outages were recorded at the station during the month. This is considered to have caused some equipment failure and resulted in the invalidation of several maximum instantaneous data. The issue was resolved with the installation of a UPS in the trailer on April 25.

**SO<sub>2</sub>:** Three hours of downtime were recorded due to maintenance, power failure and recovery from power failure each.

**H<sub>2</sub>S:** Seventy-three hours of downtime were recorded.

- One hour of downtime was recorded on April 15 due to a power failure.
- The analyzer malfunctioned after a power failure. Sixty-eight hours of downtime were recorded between April 17 and April 21 due to this event and the subsequent corrective actions performed.
- Four hours of downtime were recorded on April 25 due to an analyzer replacement event.
- Operational time for the month was 89.9%. AEP reference number - 333881.

**THC:** Two hours of downtime were recorded on April 15, at hours 17:00 and 18:00, due to a power failure and a recovery from the power failure, respectively.

**NO<sub>x</sub>/NO/NO<sub>2</sub>:** 257 hours of downtime were recorded.

- The analyzer malfunctioned after a power failure. 254 hours of downtime were recorded between April 9 and April 22 due to this event and the subsequent corrective actions performed.
- Three hours of downtime were recorded on April 25 due to an as-found response check performed to address a biased high zero drift.
- LICA's analyzer (API 101E, s/n: 509) was removed for repair on April 19 and a replacement from Maxxam's inventory (Thermo 43C, s/n: 43C-68187-360). LICA's analyzer was re-installed onsite on April 25, after it had undergone repairs at Maxxam.
- NO<sub>x</sub> calibration concentrations were calculated using a NO<sub>x</sub> gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NO<sub>x</sub> that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO<sub>x</sub> gas value (50.9 ppm) and the outcome was insignificant. The calibrations are still deemed AMD complaint.
- Operational time for the month was 64.3%. AEP reference number - 323328.

**PM<sub>2.5</sub>:** Thirty-nine hours of downtime were recorded.

- One hour of downtime was recorded on April 15, at hour 17:00, due to a power failure.
- Thirty-eight hours of data were recorded at concentrations lower than  $-3 \mu\text{g}/\text{m}^3$  this month, rendering the data invalid.

**Wind System:** The wind system malfunctioned after a power failure. Fifty-four hours of downtime were recorded between April 25 and April 27 due to this event and the subsequent replacement of the unit.

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.

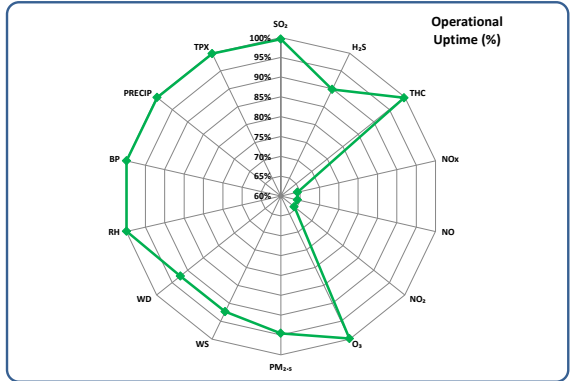
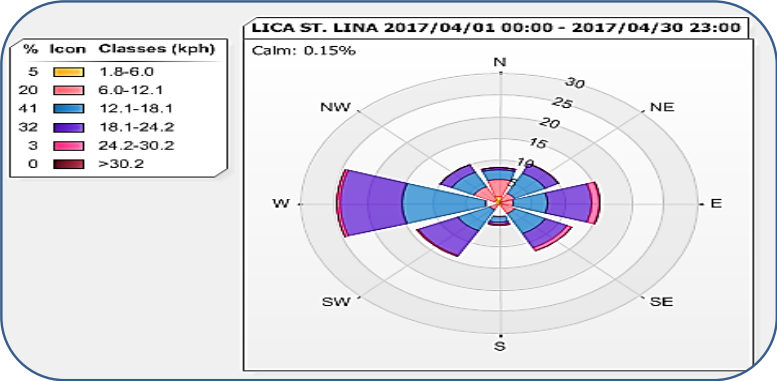
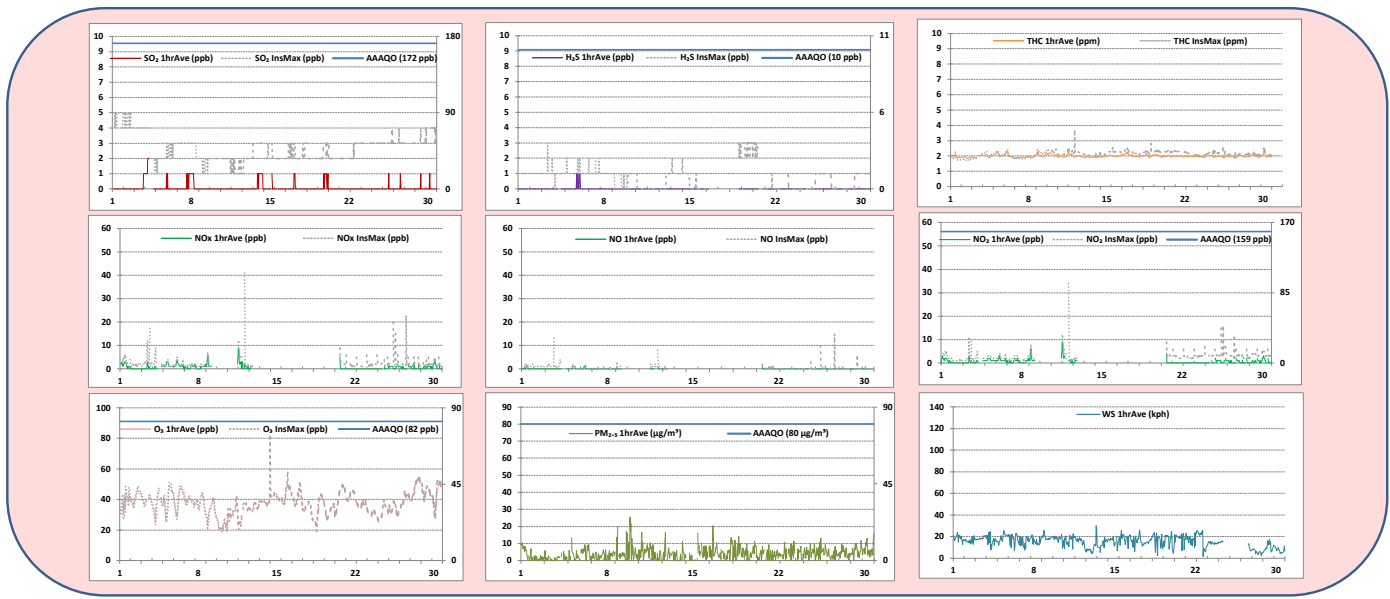
### Monthly Continuous Data Summary

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 <sub>2</sub> (ppb)	172	48	0	0	0	2	4	6	24	E	4	4	99.6
H <sub>2</sub> S (ppb)	10	3	0	0	0	1	5	23	21.3	SW	0	1	89.9
THC (ppm)	-	-	-	-	1.99	2.33	12	0	17	WNW	2.12	17	99.7
NO <sub>2</sub> (ppb)	159	-	0	-	1	9	12	0	16.7	WNW	4	11	64.3
NO (ppb)	-	-	-	-	0	1	1	1	21.8	E	0	1	64.3
NO <sub>x</sub> (ppb)	-	-	-	-	1	9	12	0	16.7	WNW	4	11	64.3
O <sub>3</sub> (ppb)	82	-	0	-	36.7	53.5	28	16	5.8	SE	47.1	28	99.9
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	80	30	0	0	4	26	10	6	20.3	SW	7	10	94.6
BAROMETRIC PRESSURE (millibar)	-	-	-	-	927	943	21	11	19.7	W	940	21	99.9
AMBIENT TEMPERATURE (°C)	-	-	-	-	1.3	15.6	6	14	7	N	9.2	6	99.9
PRECIPITATION (mm)	-	-	-	-	0.1	8.5	14	10	12	NW	2.3	14	99.9
VECTOR WS (kph)	-	-	-	-	2	30	13	22	-	ENE	19	9	92.4
VECTOR WD (sec)	-	-	-	-	253 (WSW)	-	-	-	-	-	-	-	92.4



April 2017 Monthly Report Summary

Pollutants		Monthly Records		1-Hour Records					24-Hour Records			
Name	Unit	Avg. Conc.	Uptime	Maximum			AAAQO Objective	Exceed. Hours	Maximum		AAAQO Objective	Exceed. Days
				Conc.	Date	Hour			Conc.	Date		
SO <sub>2</sub>	ppb	0	99.6%	2	April 4	6	172	0	4	April 4	48	0
H <sub>2</sub> S	ppb	0	89.9%	1	April 5	23	10	0	0	April 1	3	0
THC	ppm	1.99	99.7%	2.33	April 12	0	-	-	2.12	April 17	-	-
NO <sub>x</sub>	ppb	1	64.3%	9.0	April 12	0	-	-	4	April 11	-	-
NO	ppb	0	64.3%	1.0	April 1	1	-	-	0	April 1	-	-
NO <sub>2</sub>	ppb	1	64.3%	9.0	April 12	0	159	0	4	April 11	-	-
O <sub>3</sub>	ppb	36.7	99.9%	53.5	April 28	16	82	0	47.1	April 28	-	-
PM <sub>2.5</sub>	µg/m <sup>3</sup>	4	94.6%	26	April 10	6	80	0	7	April 10	30	0
WS	kph	1.9	92.4%	30.1	April 13	22	-	-	19.5	April 9	-	-
WD	degree	253 (WSW)	92.4%	-	-	-	-	-	-	-	-	-
RH	%	70	99.9%	90	April 5	1	-	-	90	April 14	-	-
BP	mbar	927	99.9%	943	April 21	11	-	-	940	April 21	-	-
PRECIP	mm	0.1	99.9%	8.5	April 14	10	-	-	2.3	April 14	-	-
AmbTPX	°C	1.3	99.9%	15.6	April 6	14	-	-	9.2	April 6	-	-



**Monthly Update**

\* All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.  
 \* All data collected this month were within the objectives outlined in the AMD 2016 and AAAQO 2016.  
 \* The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems, with the exception of H<sub>2</sub>S and NO<sub>x</sub>/NO/NO<sub>2</sub>, were above 90%.

**Operational Issues**

**SO<sub>2</sub>:** Three hours of downtime were recorded due to maintenance, power failure and recovery from power failure each.

**H<sub>2</sub>S:** Seventy-three hours of downtime were recorded.  
 • One hour of downtime was recorded on April 15 due to a power failure.  
 • The analyzer malfunctioned after a power failure. Sixty-eight hours of downtime were recorded between April 17 and April 21 due to this event and the subsequent corrective actions performed.  
 • Four hours of downtime were recorded on April 25 due to an analyzer replacement event.  
 • Operational time for the month was 89.9%. AEP reference number - 333881.

**THC:** Two hours of downtime were recorded on April 15, at hours 17:00 and 18:00, due to a power failure and a recovery from the power failure, respectively.

**NO<sub>x</sub>/NO/NO<sub>2</sub>:** 257 hours of downtime were recorded.  
 • The analyzer malfunctioned after a power failure. 254 hours of downtime were recorded between April 9 and April 22 due to this event and the subsequent corrective actions performed.  
 • Three hours of downtime were recorded on April 25 due to an as-found response check performed to address a biased high zero drift.  
 • Operational time for the month was 64.3%. AEP reference number - 323328.

**PM<sub>2.5</sub>:** Thirty-nine hours of downtime were recorded.  
 • One hour of downtime was recorded on April 15, at hour 17:00, due to a power failure.  
 • Thirty-eight hours of data were recorded at concentrations lower than -3 µg/m<sup>3</sup> this month, rendering the data invalid.

**Wind System:** Fifty-five hours of downtime were recorded.  
 • One hour of downtime was recorded on April 15 due to a power failure.  
 • The wind system malfunctioned after a power failure. Fifty-four hours of downtime were recorded between April 25 and April 27 due to this event and the subsequent replacement of the unit.

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## Exceedance Summary Report

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

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

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

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

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

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

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

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

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

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

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

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

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

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m<sup>3</sup>.

### O<sub>3</sub> 1-Hour Exceedances

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

*In accordance with EPEA and the Substance Release Regulation.*

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

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## 1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulphide (H<sub>2</sub>S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxides (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), Particulate Matter 2.5 (PM<sub>2.5</sub>), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

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

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

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

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

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

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

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

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (December, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

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

### **SULPHUR DIOXIDE (SO<sub>2</sub>)**

- Operational time, for the monitoring period was 99.6%, equivalent to three hours of downtime.
- Following a successful shut-down calibration on April 4, the output voltage was calibrated to correct the difference between analyzer and data logger outputs. A successful installation calibration was completed afterwards. One hour of downtime was incurred due to this event.
- One hour of data collected on April 15, at hour 17:00, was invalidated due to a power failure.
- One hour of data was discarded on April 26 at hour 10:00 as the analyzer was recovering from a brief power outage.
- Intermittent power outages at the station resulted in the invalidation of twenty instances of maximum instantaneous data during the month. The issue was resolved with the installation of a UPS in the trailer on April 25.

### **HYDROGEN SULPHIDE (H<sub>2</sub>S)**

- Operational time, for the monitoring period was 89.9%, equivalent to seventy-three hours of downtime.
- The routine monthly calibration was performed on April 4.
- One hour of data collected on April 15, at hour 17:00, was invalidated due to a power failure.
- The analyzer failed on April 18 likely due to intermittent power failures. LICA's API 101E (s/n: 509) analyzer was removed for repair and a replacement from Maxxam's inventory, Thermo 43C (s/n: 43C-68187-360), was installed on April 19. A successful installation calibration was subsequently completed. Data was invalidated back to the last valid daily zero/span check which was on April 17 at hour 05:00. Sixty hours of downtime were recorded due to this event.
- The newly-installed analyzer exhibited an unstable and span response likely due to the stabilization of a new perm tube that was installed during the analyzer replacement event. As a corrective action, the SO<sub>2</sub> scrubber material was renewed on April 21, following a successful shut-down calibration. A post-repair calibration was completed afterwards. Eight hours of downtime were incurred as a result.
- The analyzer started exhibiting instability in zero response following the calibration on April 21. It was decided that the analyzer be replaced for maintenance. On April 25, following a successful shut-down calibration of the Thermo 43C (s/n: 43C-68187-360), LICA's analyzer (API 101E, s/n: 509) was re-installed onsite after it had undergone repairs at Maxxam. A successful installation calibration was completed afterwards. As the shut-down calibration met AMD requirements, no data was discarded due to this event. However, four hours of downtime were incurred during the analyzer replacement event.
- Intermittent power outages at the station resulted in the invalidation of fourteen instances of maximum instantaneous data during the month. The issue was resolved with the installation of a UPS in the trailer on April 25.
- Operational time for the month was 89.9%. AEP reference number - 333881.

### **TOTAL HYDROCARBONS (THC)**

- Operational time, for the monitoring period was 99.7%, equivalent to two hours of downtime.
- The routine monthly calibration was performed on April 3.
- One hour of data collected on April 15, at hour 17:00, was invalidated due to a power failure. Data collected at hour 18:00, immediately after the power failure, was discarded as the analyzer was recovering from the power failure. Two hours of downtime were therefore incurred.
- Intermittent power outages at the station resulted in the invalidation of fifteen instances of maximum instantaneous data during the month. The issue was resolved with the installation of a UPS in the trailer on April 25.

### OXIDES OF NITROGEN (NO<sub>x</sub>), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO<sub>2</sub>)

- Operational time, for the monitoring period was 64.3%, equivalent to 257 hours of downtime.
- The routine monthly calibration was performed on April 4.
- The Ozone generator failed on April 10 likely due to intermittent power failures. The Ozone generator was restarted onsite on April 11. A successful zero/span was check completed afterwards. No further issues were identified. An additional zero/span check and a full repeat calibration were completed on April 12 to provide a reference for the expected span value. Sixty-one hours of downtime were recorded due to these events.
- The daily span check execution failed on April 14. Attempts to reach the site immediately failed as access was blocked by snow. A broken pump exhaust pipe was discovered upon the eventual site visit on April 19. A successful repeat calibration was subsequently completed. The analyzer was allowed ample stabilization period as it was considered to have been contaminated due to the broken tube. An additional span check was successfully completed on April 21 at hour 10:00 to assess the analyzer. No further action was required. 193 hours of downtime were recorded due to these events.
- An as-found response check was performed on April 25 to assess a biased high zero drift. The results met AMD requirements. Three hours of downtime were incurred.
- Intermittent power outages at the station resulted in the invalidation of three instances of maximum instantaneous data during the month. The issue was resolved with the installation of a UPS in the trailer on April 25.
- NO<sub>x</sub> calibration concentrations were calculated using a NO<sub>x</sub> gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NO<sub>x</sub> that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO<sub>x</sub> gas value (50.9 ppm) and the outcome was insignificant. The calibrations are still deemed AMD complaint.
- Operational time for the month was 64.3%. AEP reference number - 323328.

### OZONE (O<sub>3</sub>)

- Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime. This was incurred on April 15, hour 17:00, due to a power failure.
- The routine monthly calibration was performed on April 3.
- Intermittent power outages at the station resulted in the invalidation of seventeen instances of maximum instantaneous data during the month. The issue was resolved with the installation of a UPS in the trailer on April 25.

### PARTICULATE MATTER < 2.5 MICRONS (PM<sub>2.5</sub>)

- Operational time, for the monitoring period was 94.6%, equivalent to thirty-nine hours of downtime.
- Two routine TEOM audits were performed this month. The first was completed on April 4, and the second on April 21.
- One hour of downtime was recorded on April 15, at hour 17:00, due to a power failure.
- Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, *Zero Adjustment Criteria*. Data recorded between 0 and  $-3 \mu\text{g}/\text{m}^3$  was corrected to  $0 \mu\text{g}/\text{m}^3$ . Data recorded below  $-3 \mu\text{g}/\text{m}^3$  was invalidated. Thirty-eight hours of data were invalidated as the data was below  $-3 \mu\text{g}/\text{m}^3$  this month.

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

- Operational time, for the monitoring period was 92.4%, equivalent to fifty-five hours of downtime.
- The wind system failed on April 25 after a brief power failure. LICA's resident wind system, MetOne (s/n: H12635), was removed and a replacement from Maxxam's inventory, RM Young (s/n: 56778), was installed on April 27, following a calibration at Maxxam shop. Fifty-four hours of downtime were recorded due to this event.
- One hour of data collected on April 15, at hour 17:00, was invalidated due to a power failure.
- Intermittent power outages at the station resulted in the invalidation of twelve instances of maximum instantaneous data during the month. The issue was resolved with the installation of a UPS in the trailer on April 25.
- 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 99.9%, equivalent to one hour of downtime. This was incurred on April 15, hour 17:00, due to a power failure.

**BAROMETRIC PRESSURE (BP)**

- Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime. This was incurred on April 15, hour 17:00, due to a power failure.

**PRECIPITATION (PRECIP)**

- Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime. This was incurred on April 15, hour 17:00, due to a power failure.

**AMBIENT TEMPERATURE (AmbTPX)**

- Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime. This was incurred on April 15, hour 17:00, due to a power failure.



## **2.0 Project Personnel**

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

## **3.0 Plant Monthly Required AMD Summary**

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

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems, with the exception of H<sub>2</sub>S and NO<sub>x</sub>/NO/NO<sub>2</sub>, were above the 90% requirement.

## **4.0 Calculations and Results**

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

## 5.0 Methods and Procedures

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

- Maxxam AIR SOP-00208: RM Young Wind Monitor Calibration
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O<sub>3</sub> Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO<sub>2</sub>/NO<sub>x</sub> Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - Thermo 43i UV Fluorescent Analyzer
- Hydrogen Sulphide - Thermo 43C and API 101E UV Fluorescent Analyzers
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Methane, Non-Methane Hydrocarbon - Thermo 51C FID Analyzer
- Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM<sub>2.5</sub>) - R&P 1405F TEOM Unit
- Wind System - Met One and RM Young Units
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

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

**Level 0 Preliminary Verification**

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

**Level 1 Primary Validation**

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

**Level 2 Final Validation**

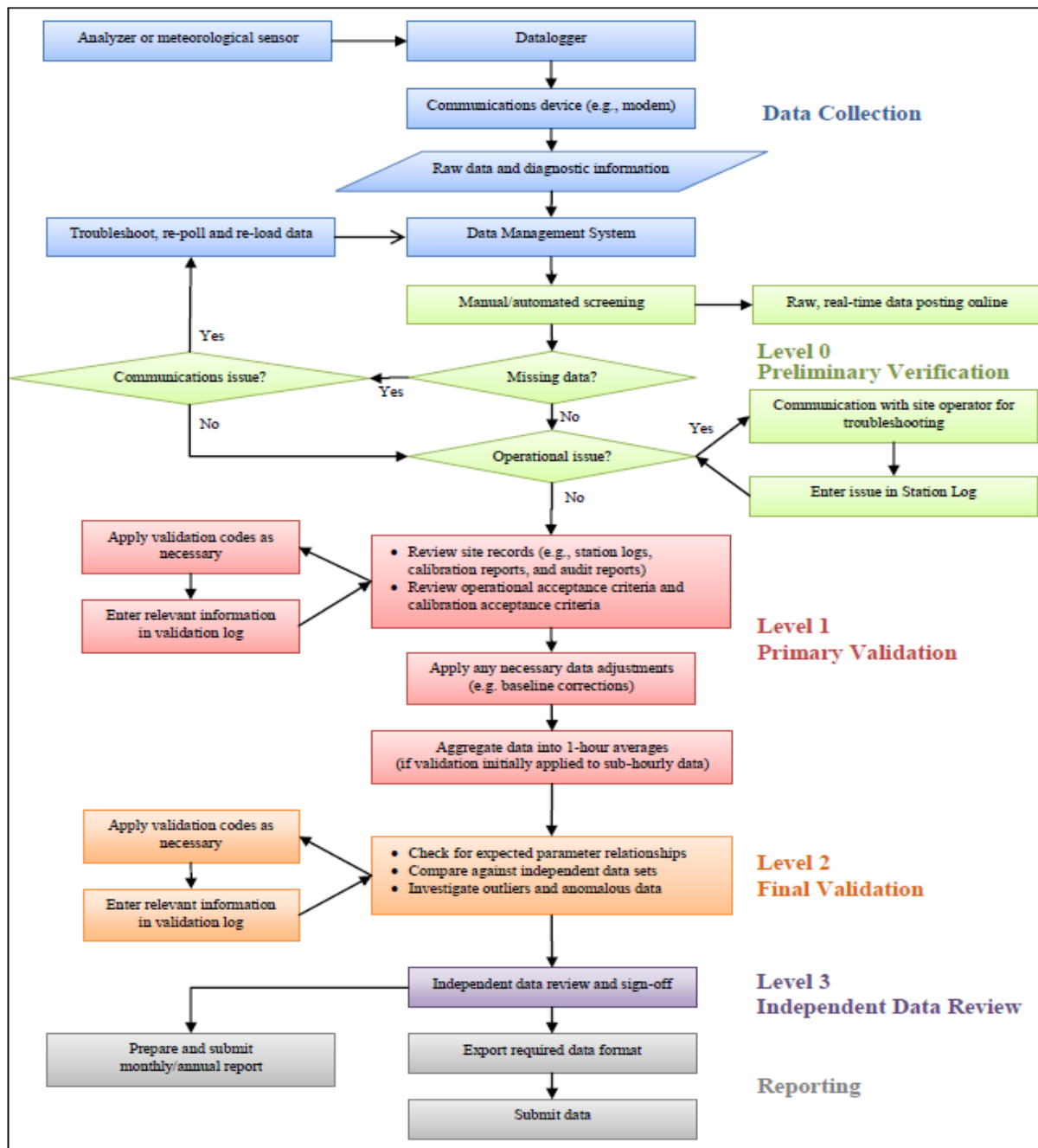
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

**Level 3 Independent Data Review**

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

**Post-Final Validation**

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



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

***APPENDIX I***  
***CONTINUOUS MONITORING DATA RESULTS***

***SULPHUR DIOXIDE***

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

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

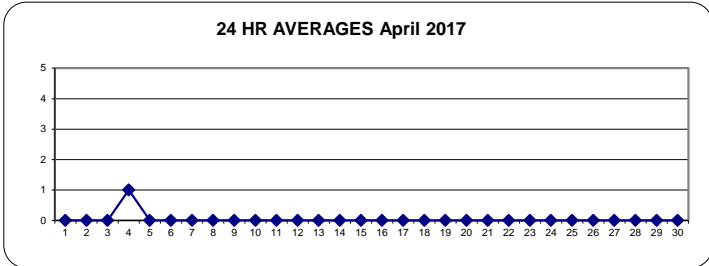
**STATUS FLAG CODES**

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

<b>ALBERTA ENVIRONMENT:</b>	1-HR	172	ppb	24-HR	48	ppb
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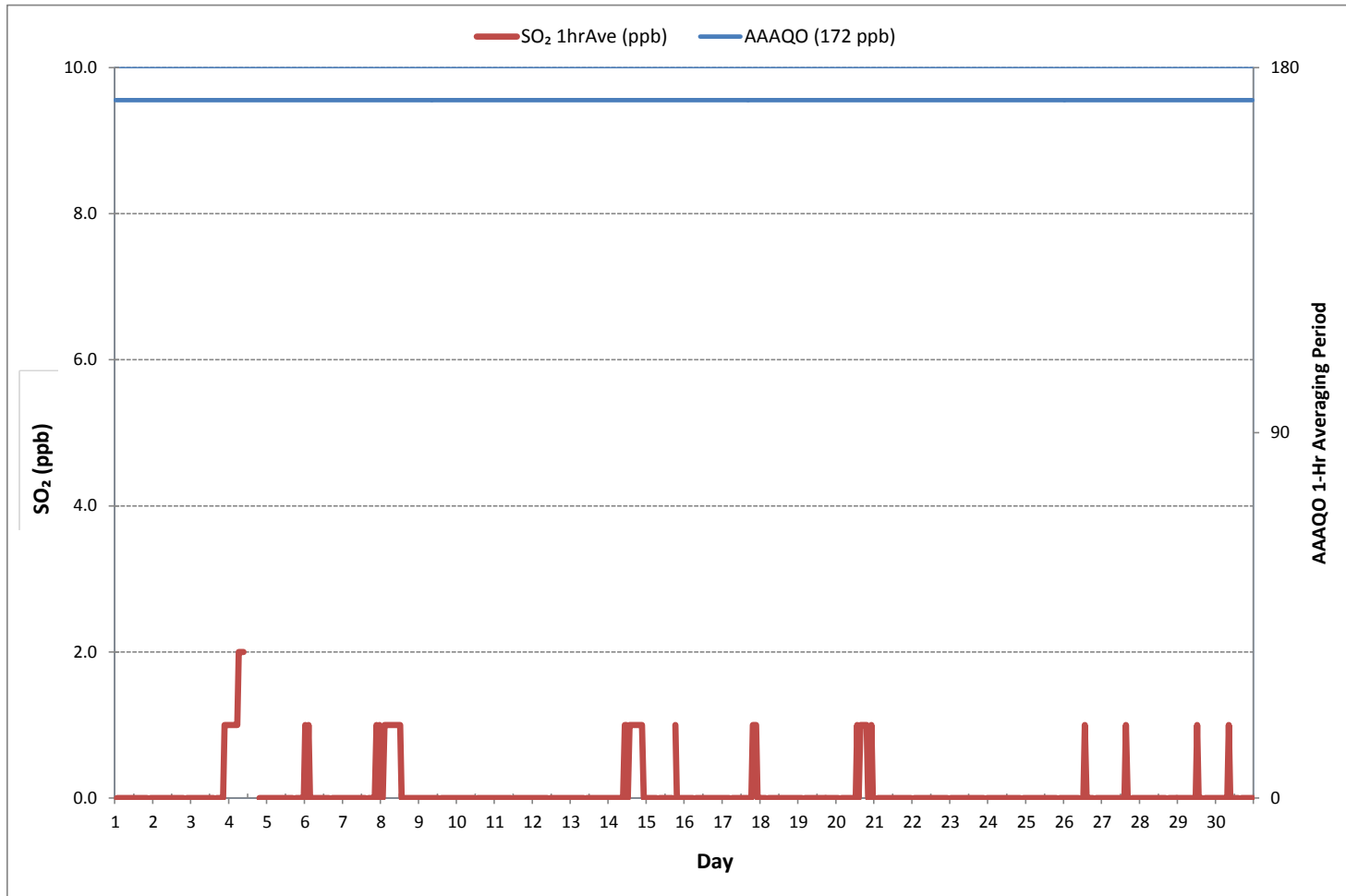
**24 HR AVERAGES April 2017**



**MONTHLY SUMMARY**

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	54
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 1 ON DAY 1
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR 6 ON DAY 4
MAXIMUM 24-HR AVERAGE:	4 ppb ON DAY 4
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	717 hrs
AMD OPERATION UPTIME:	99.6 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

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







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

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

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

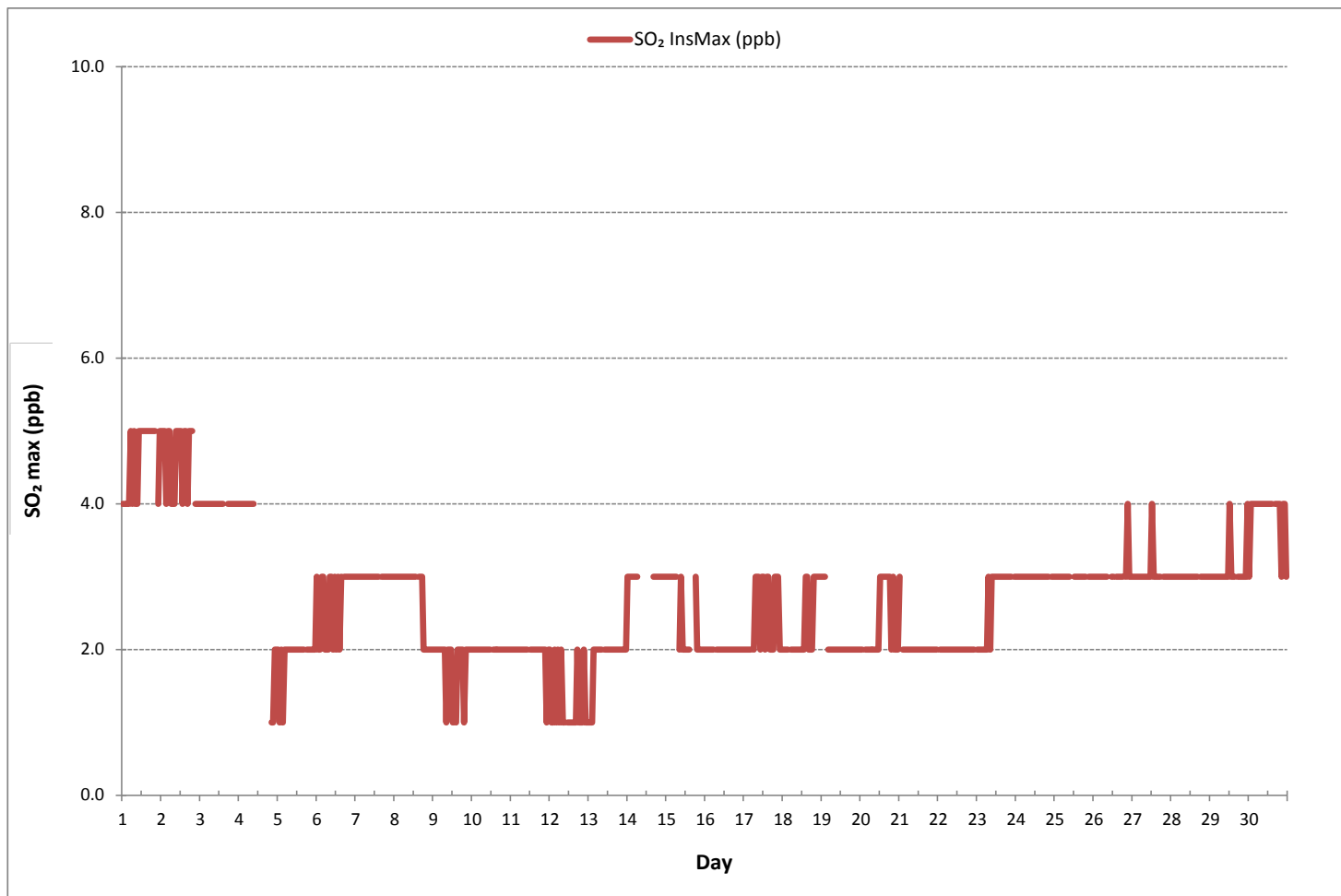
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	660
MAXIMUM INSTANTANEOUS VALUE:	5 ppb @ HOUR 5 ON DAY 1
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	9 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	699 hrs

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









Wind: LICA ST. LINA  
 Poll.: LICA ST. LINA-SO2[ppb]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

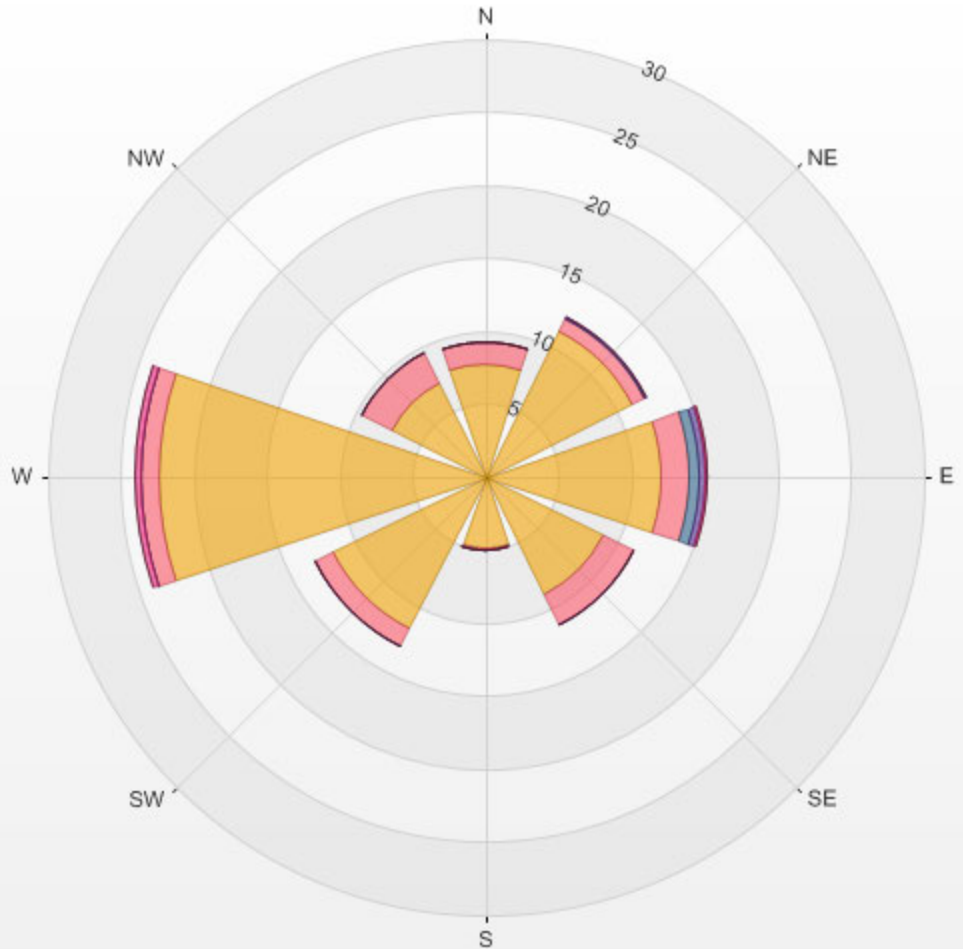
Calm: 0.15%

Calm Avg: 0.07 [ppb]

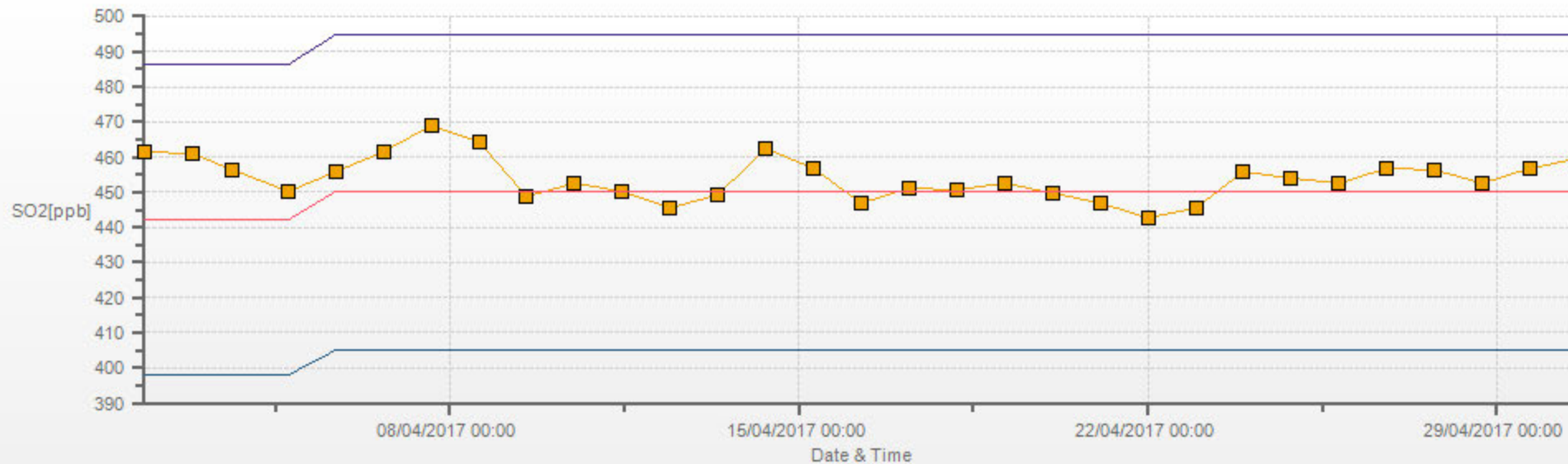
Direction	0.0-0.4	0.4-0.8	0.8-1.3	1.3-1.7	1.7-2.1	>2.1	Total
<b>N</b>	7.7	1.5	0.0	0.0	0.0	0.0	9.2
<b>NE</b>	11.2	0.9	0.0	0.2	0.0	0.0	12.3
<b>E</b>	12.0	2.0	0.6	0.5	0.2	0.0	15.2
<b>SE</b>	9.1	2.3	0.0	0.0	0.0	0.0	11.4
<b>S</b>	4.9	0.2	0.0	0.0	0.0	0.0	5.1
<b>SW</b>	11.7	1.4	0.0	0.0	0.0	0.0	13.1
<b>W</b>	22.5	1.2	0.0	0.0	0.3	0.0	24.0
<b>NW</b>	7.2	2.3	0.0	0.0	0.0	0.0	9.5
<b>Summary</b>	86.3	11.8	0.6	0.6	0.5	0.0	100.0

% Icon	Classes (ppb)	86		0.0-0.4	12		0.4-0.8	1		0.8-1.3	1		1.3-1.7	0		1.7-2.1	0		>2.1
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LICA ST. LINA Poll.: LICA ST. LINA-SO2[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 0.15% Calm Poll Avg: 0.07[ppb]



SO2[ppb] Calibration: LICA ST. LINA Monthly: 17/04 Type: Span



Span Meas Span Ref Span Low Span High

***HYDROGEN SULPHIDE***



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

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

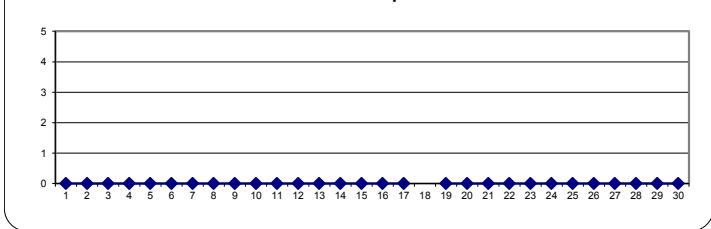
OBJECTIVE LIMIT:

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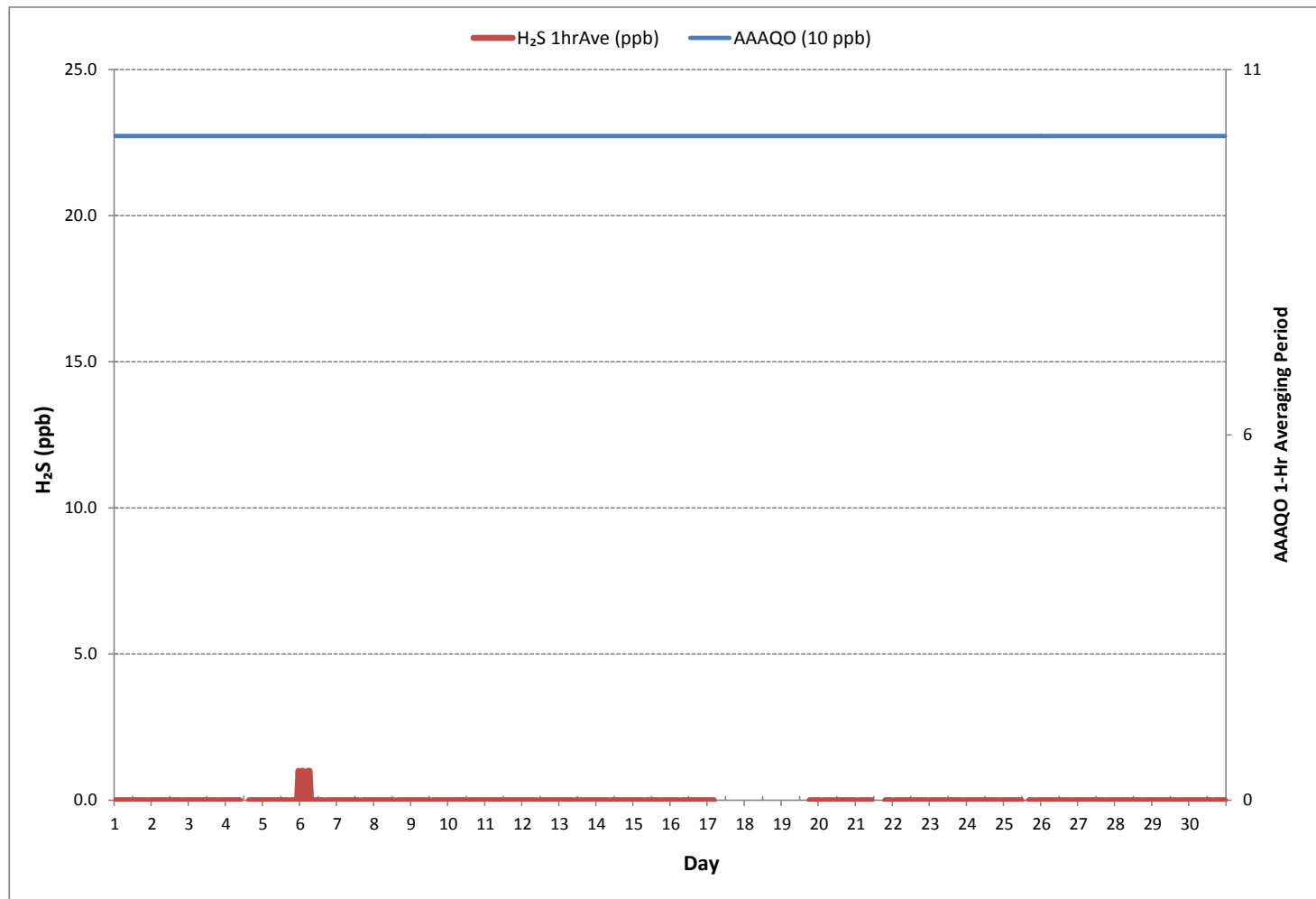
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	5				
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR	23	ON DAY	5	
MAXIMUM 24-HR AVERAGE:	0 ppb		ON DAY	1	
IZS CALIBRATION TIME:	28	hrs	OPERATIONAL TIME:	647	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	89.9	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

24 HR AVERAGES April 2017



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







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

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

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

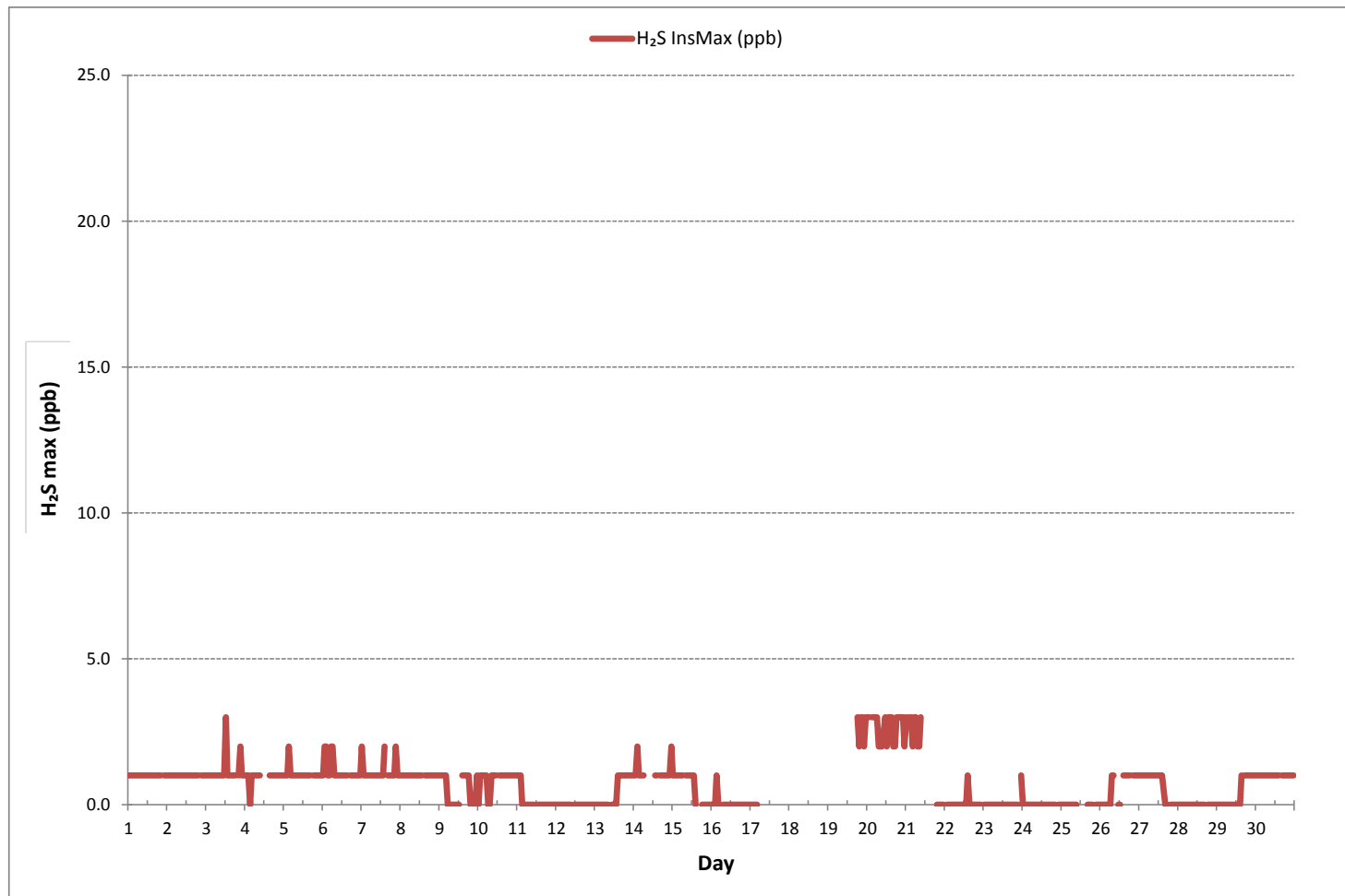
STATUS FLAG CODES

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:	350
MAXIMUM INSTANTANEOUS VALUE:	3 ppb @ HOUR 12 ON DAY 3
IZS CALIBRATION TIME:	28 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	631 hrs

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





% Icon Classes (ppb)

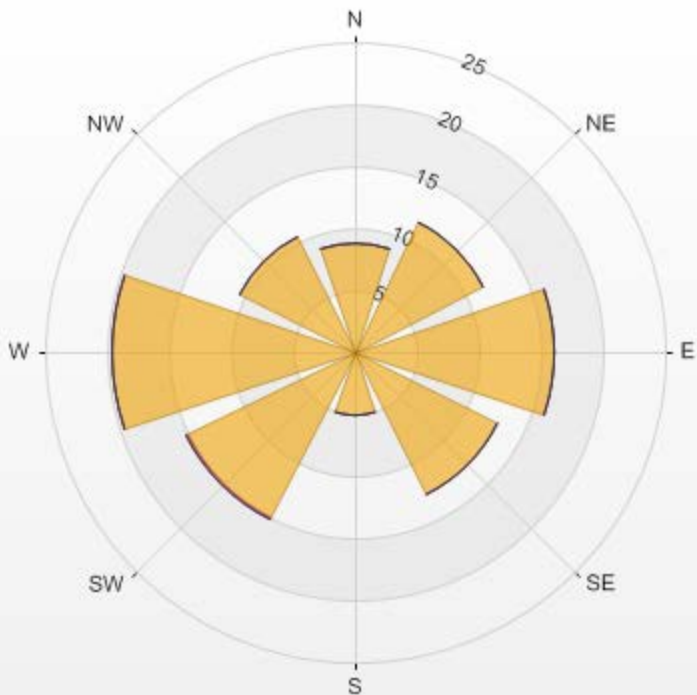
100 0.0-0.6

0 0.6-1.3

0 1.3-1.9

0 >1.9

LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 0.18% Calm Poll Avg: 0.00[ppb]



H2S[ppb] Calibration: LICA ST. LINA Monthly: 04/2017 Type: Span



Span Meas Span Ref Span Low Span High

***TOTAL HYDROCARBON***

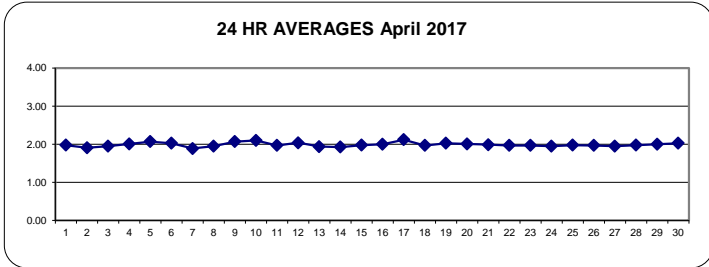


TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.03	2.05	2.04	2.04	2.01	2.01	1.98	2.03	2.06	2.05	2.06	2.06	2.01	1.93	1.88	1.88	1.89	1.90	1.91	1.93	1.90	S	1.89	1.90	1.88	2.06	1.98	24
2	1.90	1.90	1.90	1.91	1.92	1.92	1.94	1.95	1.96	1.95	1.92	1.88	1.85	1.85	1.84	1.87	1.88	1.90	1.90	1.91	S	1.90	1.92	1.95	1.84	1.96	1.91	24
3	1.95	1.93	1.91	1.90	1.91	1.90	1.89	1.88	1.89	1.86	1.87	C	C	C	C	C	1.97	2.01	2.02	2.05	2.05	2.06	2.07	2.06	1.86	2.07	1.95	24
4	2.06	2.05	2.05	2.05	2.05	2.05	2.05	2.08	2.08	2.08	2.03	1.93	1.95	1.93	1.91	1.88	1.89	1.92	S	1.96	2.03	2.06	2.05	2.04	1.88	2.08	2.01	24
5	2.05	2.06	2.03	2.04	2.07	2.07	2.19	2.23	2.25	2.28	2.20	2.17	2.07	1.96	1.94	1.95	1.99	S	2.01	2.01	1.99	1.99	2.00	1.99	1.94	2.28	2.07	24
6	2.03	2.06	2.07	2.11	2.16	2.29	2.32	2.32	2.29	2.07	1.95	1.97	1.96	1.96	1.95	1.94	S	1.93	1.91	1.90	1.89	1.90	1.84	1.87	1.84	2.32	2.03	24
7	1.85	1.87	1.83	1.86	1.88	1.91	1.93	1.89	1.88	1.87	1.91	1.91	1.91	1.90	1.95	S	1.91	1.90	1.91	1.89	1.90	1.87	1.91	1.91	1.83	1.95	1.89	24
8	1.91	1.93	1.94	1.93	1.93	1.95	1.97	1.98	1.99	1.99	1.95	1.91	1.89	1.92	S	1.91	1.93	1.93	1.92	1.95	1.99	2.01	2.05	2.06	1.89	2.06	1.95	24
9	2.06	2.06	2.12	2.24	2.29	2.13	2.07	2.03	2.02	2.01	2.00	2.00	S	1.94	1.93	1.93	1.96	2.02	2.05	2.10	2.17	2.18	2.20	1.93	2.29	2.07	24	
10	2.14	2.11	2.09	2.11	2.18	2.18	2.19	2.20	2.18	2.16	2.18	2.18	S	2.10	2.08	2.07	2.03	1.99	2.01	2.04	2.09	2.03	2.00	1.96	1.96	2.20	2.10	24
11	1.94	1.92	1.93	1.96	2.01	1.98	1.97	1.97	1.98	2.00	1.99	S	1.90	1.94	1.94	1.93	1.93	1.91	1.95	1.96	1.97	2.00	2.07	2.21	1.90	2.21	1.97	24
12	2.33	2.29	2.13	2.09	2.10	2.14	2.14	2.07	2.04	2.08	S	1.94	1.92	1.96	1.97	1.96	1.95	1.95	1.95	1.96	1.99	2.01	2.02	2.01	1.92	2.33	2.04	24
13	1.99	1.99	1.98	1.97	1.97	1.95	1.96	1.96	1.94	S	1.93	1.91	1.90	1.88	1.88	1.89	1.94	1.94	1.95	1.95	1.94	1.92	1.92	1.92	1.88	1.99	1.94	24
14	1.91	1.90	1.91	1.91	1.91	1.92	1.92	1.96	S	1.92	1.96	1.92	1.96	1.92	1.92	1.92	1.92	1.91	1.92	1.91	1.94	1.94	1.93	1.94	1.90	1.96	1.93	24
15	1.94	1.93	1.95	1.92	1.95	1.98	1.96	S	1.98	1.96	1.96	1.99	1.95	1.96	1.98	1.97	1.96	P	R	2.09	2.06	2.04	2.04	2.03	1.92	2.09	1.98	22
16	2.03	2.02	2.00	2.00	1.98	1.98	S	1.98	2.00	2.02	1.98	1.98	1.97	1.98	1.98	1.97	1.97	1.97	2.00	2.03	2.01	2.00	2.04	2.10	1.97	2.10	2.00	24
17	2.13	2.11	2.12	2.10	2.10	S	2.09	2.16	2.18	2.18	2.14	2.25	2.27	2.14	2.21	2.13	2.09	2.04	2.01	2.03	2.06	2.07	2.10	2.03	2.01	2.27	2.12	24
18	1.98	1.99	1.97	1.96	S	1.95	1.97	1.97	1.97	1.97	1.98	1.97	1.97	1.95	1.91	1.90	1.94	1.97	1.97	1.99	1.99	2.01	2.01	2.00	1.90	2.01	1.97	24
19	2.03	2.04	2.04	S	2.03	2.06	2.17	2.16	2.05	2.03	2.00	2.03	1.94	1.92	1.95	1.94	1.93	1.97	2.05	2.01	2.02	2.06	2.08	2.07	1.92	2.17	2.03	24
20	2.06	2.07	S	2.04	2.09	2.12	2.09	2.03	2.06	2.05	2.06	2.03	2.02	1.99	1.99	1.95	1.92	1.89	1.91	1.95	2.01	1.98	1.97	2.03	1.89	2.12	2.01	24
21	1.98	S	1.98	1.96	1.97	1.98	2.01	2.05	2.04	2.06	2.03	1.97	1.94	1.94	1.93	1.94	1.93	1.93	1.99	2.03	2.05	2.00	2.00	1.98	1.93	2.06	1.99	24
22	S	1.97	1.97	1.97	1.97	1.98	1.99	1.99	2.00	2.00	2.00	2.00	1.99	1.97	1.95	1.93	1.93	1.91	1.93	1.96	1.98	2.00	2.01	S	1.91	2.01	1.97	24
23	1.97	1.97	1.96	1.96	1.96	1.96	1.98	1.99	1.99	1.99	1.98	1.98	1.96	1.97	1.96	1.97	1.98	1.96	1.95	1.96	1.98	1.97	S	1.96	1.95	1.99	1.97	24
24	1.96	1.95	1.95	1.94	1.95	1.94	1.95	1.94	1.95	1.97	1.95	1.98	1.95	1.93	1.90	1.90	1.91	1.91	1.93	1.95	1.97	S	1.99	2.01	1.90	2.01	1.95	24
25	2.01	2.01	2.01	2.02	2.03	2.03	2.03	2.04	2.04	2.07	2.09	2.00	1.95	1.90	1.91	1.91	1.96	1.94	1.97	1.97	S	1.95	1.98	1.98	1.90	2.09	1.98	24
26	1.95	1.99	2.00	2.01	2.02	2.00	1.99	1.98	1.98	1.95	1.88	1.94	1.95	1.89	1.97	1.95	1.96	1.97	1.99	S	1.98	1.97	1.95	1.94	1.88	2.02	1.97	24
27	1.96	1.97	2.01	2.00	1.97	1.98	1.99	2.00	1.97	1.95	1.93	1.88	1.87	1.88	1.97	1.85	1.92	1.91	S	1.92	1.95	1.97	2.00	2.02	1.85	2.02	1.95	24
28	2.02	2.02	2.04	2.03	2.02	2.02	2.03	2.02	1.97	1.93	1.92	1.93	1.94	1.94	1.95	1.96	1.95	S	1.96	2.00	2.01	1.96	1.96	1.97	1.92	2.04	1.98	24
29	2.00	1.99	2.02	2.08	2.08	2.13	2.16	2.11	2.07	2.02	1.97	1.97	1.97	1.99	1.97	1.95	S	1.87	1.92	1.95	1.97	1.94	1.93	1.94	1.87	2.16	2.00	24
30	1.95	1.97	1.97	2.02	2.10	2.13	2.33	2.29	2.19	2.14	2.09	2.03	1.92	1.97	1.95	S	1.95	1.95	1.95	1.96	1.98	1.97	1.95	1.94	1.92	2.33	2.03	24
HOURLY MAX	2.33	2.29	2.13	2.24	2.29	2.29	2.33	2.32	2.29	2.28	2.20	2.25	2.27	2.14	2.21	2.13	2.09	2.04	2.05	2.09	2.10	2.17	2.18	2.21				
HOURLY AVG	2.00	2.00	2.00	2.00	2.02	2.02	2.04	2.04	2.03	2.02	2.00	1.99	1.96	1.95	1.95	1.94	1.94	1.94	1.96	1.98	1.99	1.99	2.00	2.00				

STATUS FLAG CODES

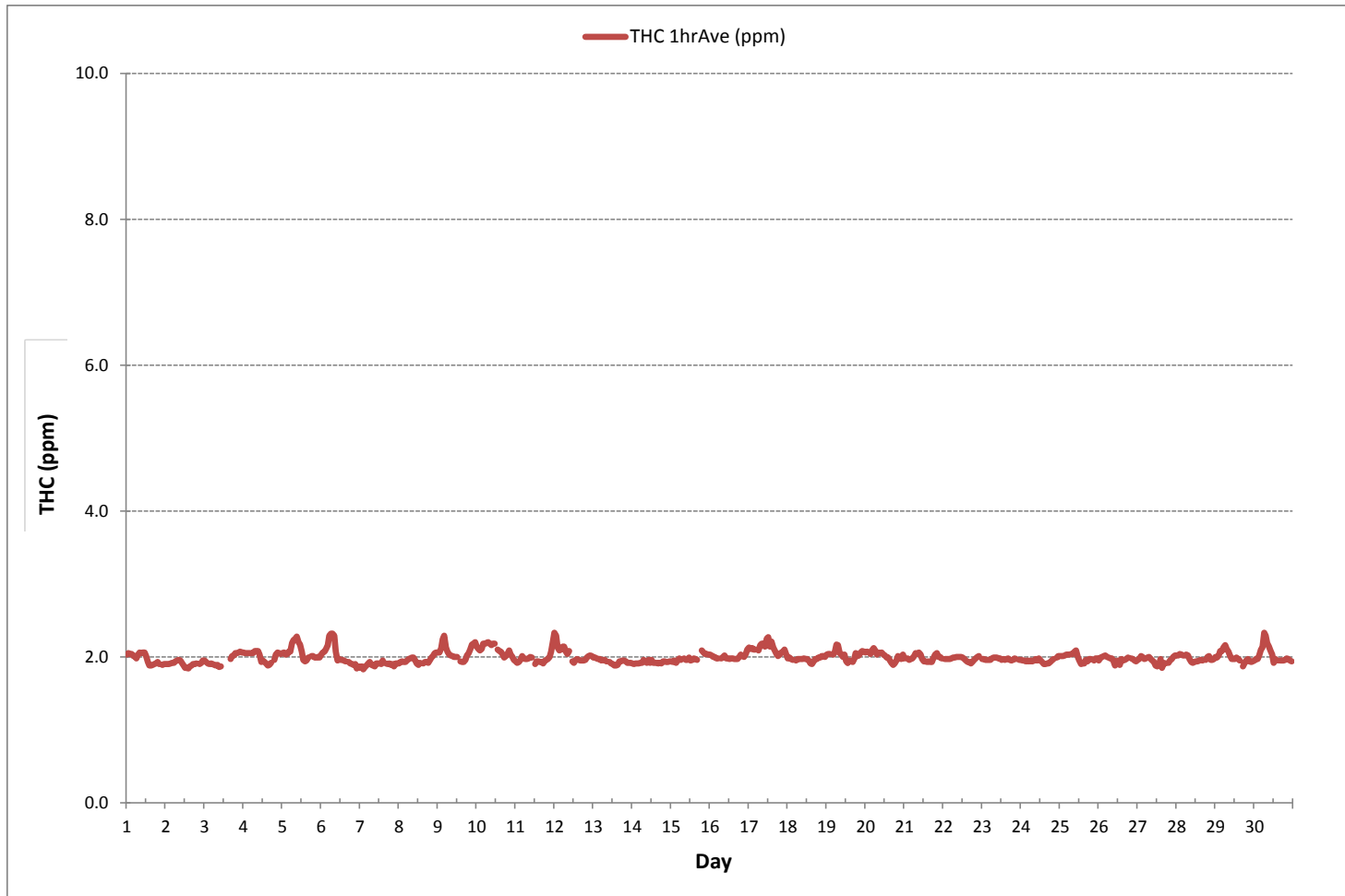
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	683			
MINIMUM 1-HR AVERAGE:	1.83 ppm	@ HOUR	2	ON DAY 7
MAXIMUM 1-HR AVERAGE:	2.33 ppm	@ HOUR	0	ON DAY 12
MAXIMUM 24-HR AVERAGE:	2.12 ppm			ON DAY 17
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	718 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.7 %	
STANDARD DEVIATION:	0.08	MONTHLY AVERAGE:	1.99 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)







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

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1.92	1.92	1.94	1.92	1.89	1.91	1.86	1.92	1.94	1.94	2.29	1.92	1.89	1.82	1.75	1.73	1.75	1.75	1.76	1.78	1.76	S	1.75	1.73	1.73	1.73	2.29	1.86	24
2	1.75	1.75	1.75	1.75	1.76	1.76	1.79	1.79	1.80	1.79	1.75	1.72	1.69	1.69	1.69	1.69	1.70	1.75	1.73	1.74	S	1.76	1.81	1.82	1.69	1.82	1.75	24	
3	1.85	1.82	1.82	1.83	1.85	1.85	1.85	1.85	1.86	1.85	1.95	C	C	C	C	C	2.04	2.07	2.08	2.10	2.13	2.13	2.14	2.14	1.82	2.14	1.96	24	
4	2.16	2.14	2.16	2.17	2.20	2.14	2.14	2.19	2.20	2.36	P	2.04	2.14	2.05	P	2.02	2.04	2.05	S	2.11	2.19	2.17	2.17	2.02	2.36	2.14	22		
5	2.17	2.17	2.14	2.14	2.17	2.20	2.31	2.32	2.35	2.36	2.30	2.26	2.20	2.04	1.99	2.01	2.04	S	2.07	2.07	2.04	2.04	2.05	2.04	1.99	2.36	2.15	24	
6	2.11	2.11	2.13	2.16	2.23	2.35	2.36	2.38	2.44	2.22	2.05	2.04	2.01	1.98	1.98	1.98	S	1.95	1.95	1.92	1.92	1.92	1.85	1.88	1.85	2.44	2.08	24	
7	1.86	1.86	1.81	1.83	1.84	1.88	1.88	1.85	1.83	1.81	1.86	1.86	1.83	1.81	1.91	S	1.82	1.81	1.83	1.81	1.83	1.81	1.84	1.84	1.81	1.91	1.84	24	
8	1.85	1.89	1.89	1.87	1.88	1.91	1.92	1.94	1.95	1.95	1.94	1.89	1.86	1.89	S	1.89	1.94	1.95	1.95	2.01	2.02	2.08	2.13	2.14	1.85	2.14	1.95	24	
9	2.14	2.16	2.36	2.41	2.44	2.32	2.25	2.19	2.17	2.20	2.20	2.18	2.20	S	2.14	2.11	2.13	2.16	2.23	2.26	2.31	2.38	2.38	2.38	2.11	2.44	2.25	24	
10	2.35	2.29	2.28	2.32	2.38	2.38	2.36	2.38	2.36	2.35	2.35	S	2.30	2.26	2.23	2.20	2.16	2.19	2.29	2.45	2.26	2.17	2.14	2.14	2.45	2.30	24		
11	2.13	2.11	2.11	2.15	2.17	2.17	2.14	2.14	2.15	2.17	2.17	S	2.11	2.11	2.12	2.11	2.13	2.13	2.14	2.17	2.19	2.22	2.31	2.53	2.11	2.53	2.17	24	
12	2.57	2.59	2.39	2.32	2.35	2.42	2.39	2.32	2.29	2.36	S	2.19	2.16	2.28	3.71	2.20	2.19	2.20	2.19	2.22	2.23	2.25	2.26	2.25	2.16	3.71	2.36	24	
13	2.23	2.23	2.23	2.20	2.20	2.20	2.20	2.19	2.20	S	2.14	2.13	2.09	2.07	2.07	2.07	2.10	2.11	2.10	2.10	2.10	2.07	2.04	2.04	2.04	2.04	2.23	2.14	24
14	2.02	2.01	2.01	2.01	2.01	2.00	2.01	P	S	P	P	P	P	2.16	2.00	P	1.98	1.98	2.00	2.10	2.04	2.01	2.01	2.38	1.98	2.38	2.04	18	
15	2.02	2.02	2.04	2.01	2.05	2.08	2.08	S	2.11	2.08	2.10	2.14	2.08	2.11	2.14	P	P	P	R	2.29	2.26	2.28	2.29	2.28	2.01	2.29	2.14	20	
16	2.29	2.29	2.26	2.58	2.26	2.26	S	2.26	2.28	2.29	2.26	2.23	2.23	2.25	2.23	2.23	2.22	2.23	2.25	2.26	2.26	2.23	2.29	2.34	2.22	2.58	2.27	24	
17	2.34	2.32	2.32	2.31	2.29	S	2.31	2.37	2.38	2.41	2.33	2.49	2.50	2.38	2.49	2.38	2.28	2.28	2.20	2.25	2.26	2.28	2.32	2.28	2.20	2.50	2.34	24	
18	2.20	2.20	2.17	2.17	S	2.16	2.17	2.17	2.17	2.17	2.20	2.17	2.17	2.20	2.10	2.08	2.19	2.17	2.17	2.20	2.20	2.22	2.23	2.20	2.08	2.23	2.18	24	
19	2.23	2.25	2.23	S	2.25	2.29	2.42	2.44	2.25	2.29	2.26	2.39	2.20	2.13	2.17	2.17	2.14	2.81	2.28	2.23	2.25	2.29	2.30	2.30	2.13	2.81	2.29	24	
20	2.29	2.30	S	2.26	2.35	2.36	2.36	2.29	2.32	2.29	2.54	2.29	2.28	2.25	2.25	2.25	2.19	2.17	2.23	2.26	2.30	2.32	2.29	2.32	2.17	2.54	2.29	24	
21	2.29	S	2.28	2.26	2.26	2.29	2.32	2.35	2.36	2.49	2.35	2.29	2.27	2.25	2.23	2.26	2.26	2.25	2.41	2.38	2.45	2.33	2.35	2.32	2.23	2.49	2.32	24	
22	S	2.29	2.29	2.29	2.29	2.29	2.30	2.29	2.30	2.29	2.29	2.29	2.26	2.25	2.23	2.20	2.20	2.17	2.20	2.23	2.23	2.26	2.29	S	2.17	2.30	2.26	24	
23	2.22	2.20	2.19	2.17	2.17	2.17	2.19	2.17	2.17	2.17	2.16	2.14	2.11	2.11	2.11	2.11	2.11	2.08	2.07	2.08	2.08	2.08	S	2.07	2.07	2.22	2.14	24	
24	2.04	2.05	2.05	2.04	2.07	2.05	2.05	2.05	2.07	2.10	2.08	2.11	2.11	2.10	2.02	2.02	2.04	2.04	2.07	2.08	2.10	S	2.14	2.17	2.02	2.17	2.07	24	
25	2.17	2.17	2.17	2.20	2.22	2.23	2.22	2.23	2.23	2.35	P	P	2.14	2.41	2.13	2.14	2.33	2.17	2.20	2.22	S	2.17	2.20	2.20	2.13	2.41	2.21	22	
26	2.16	2.20	2.20	2.20	2.20	2.20	2.17	2.14	2.14	P	2.55	2.08	2.11	P	2.11	2.33	2.08	2.11	2.11	S	2.10	2.08	2.08	2.08	2.08	2.08	2.55	2.16	22
27	2.08	2.10	2.14	2.14	2.10	2.10	2.13	2.11	2.10	2.05	2.05	2.01	1.98	2.01	2.22	2.13	2.04	2.02	S	2.04	2.07	2.08	2.13	2.14	1.98	2.22	2.09	24	
28	2.14	2.16	2.17	2.17	2.15	2.17	2.17	2.17	2.11	2.08	2.07	2.08	2.10	2.10	2.11	2.13	2.11	S	2.14	2.17	2.19	2.11	2.11	2.11	2.07	2.19	2.13	24	
29	2.16	2.14	2.19	2.23	2.22	2.29	2.29	2.26	2.20	2.14	2.08	2.08	2.08	2.11	2.08	2.07	S	2.01	2.10	2.05	2.10	2.06	2.04	2.04	2.01	2.29	2.13	24	
30	2.05	2.10	2.10	2.16	2.22	2.30	2.50	2.49	2.32	2.30	2.20	2.19	2.05	2.08	2.05	S	2.07	2.05	2.07	2.07	2.08	2.08	2.07	2.05	2.05	2.50	2.16	24	
HOURLY MAX	2.57	2.59	2.39	2.58	2.44	2.42	2.50	2.49	2.44	2.49	2.55	2.49	2.50	2.41	3.71	2.38	2.33	2.81	2.41	2.38	2.45	2.38	2.38	2.53					
HOURLY AVG	2.13	2.13	2.13	2.15	2.15	2.16	2.18	2.19	2.17	2.18	2.17	2.14	2.11	2.11	2.16	2.10	2.09	2.10	2.10	2.12	2.15	2.14	2.14	2.15					

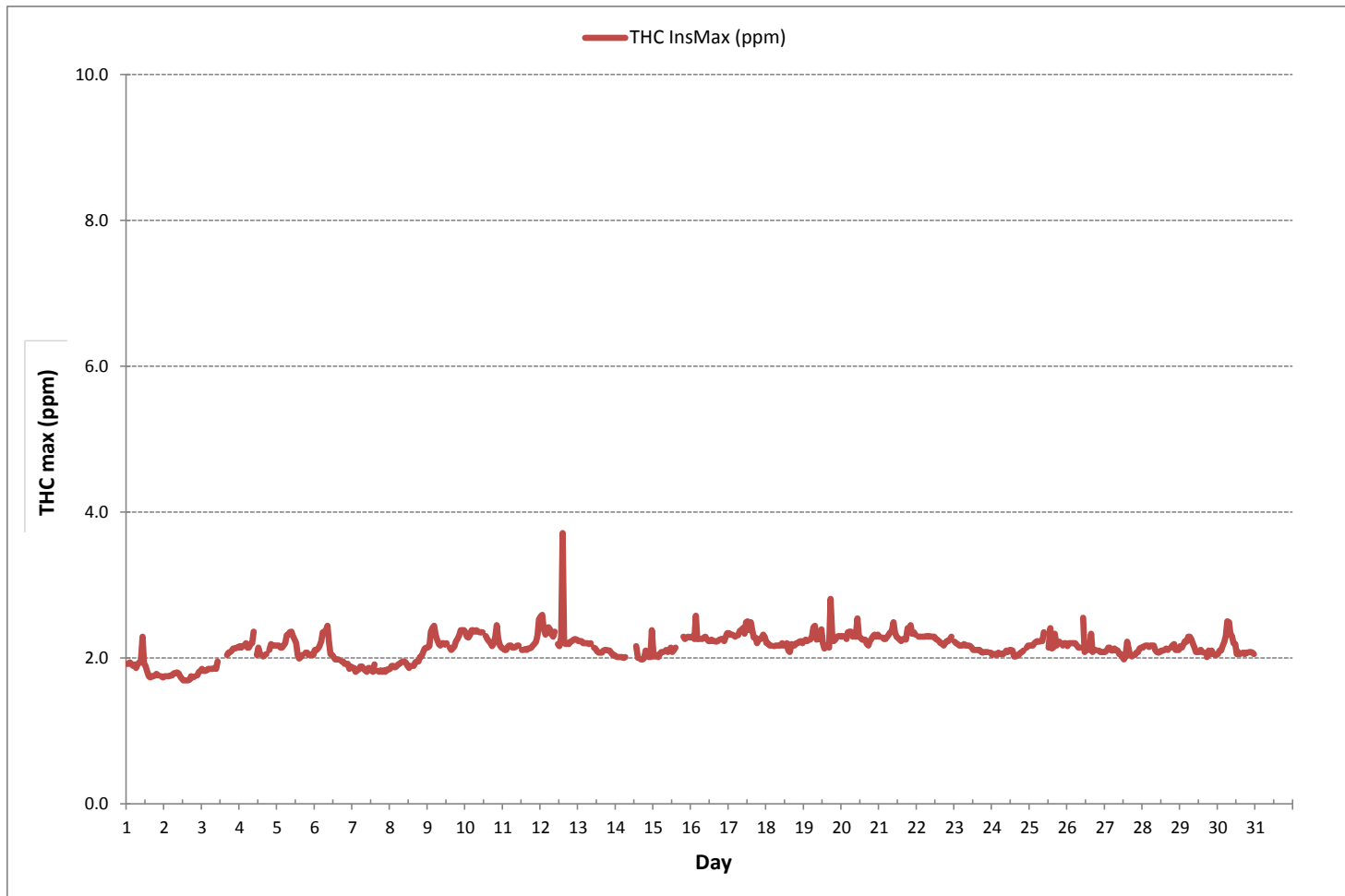
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	669
MAXIMUM INSTANTANEOUS VALUE:	3.71 ppm @ HOUR 14 ON DAY 12
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	704 hrs
STANDARD DEVIATION:	0.18

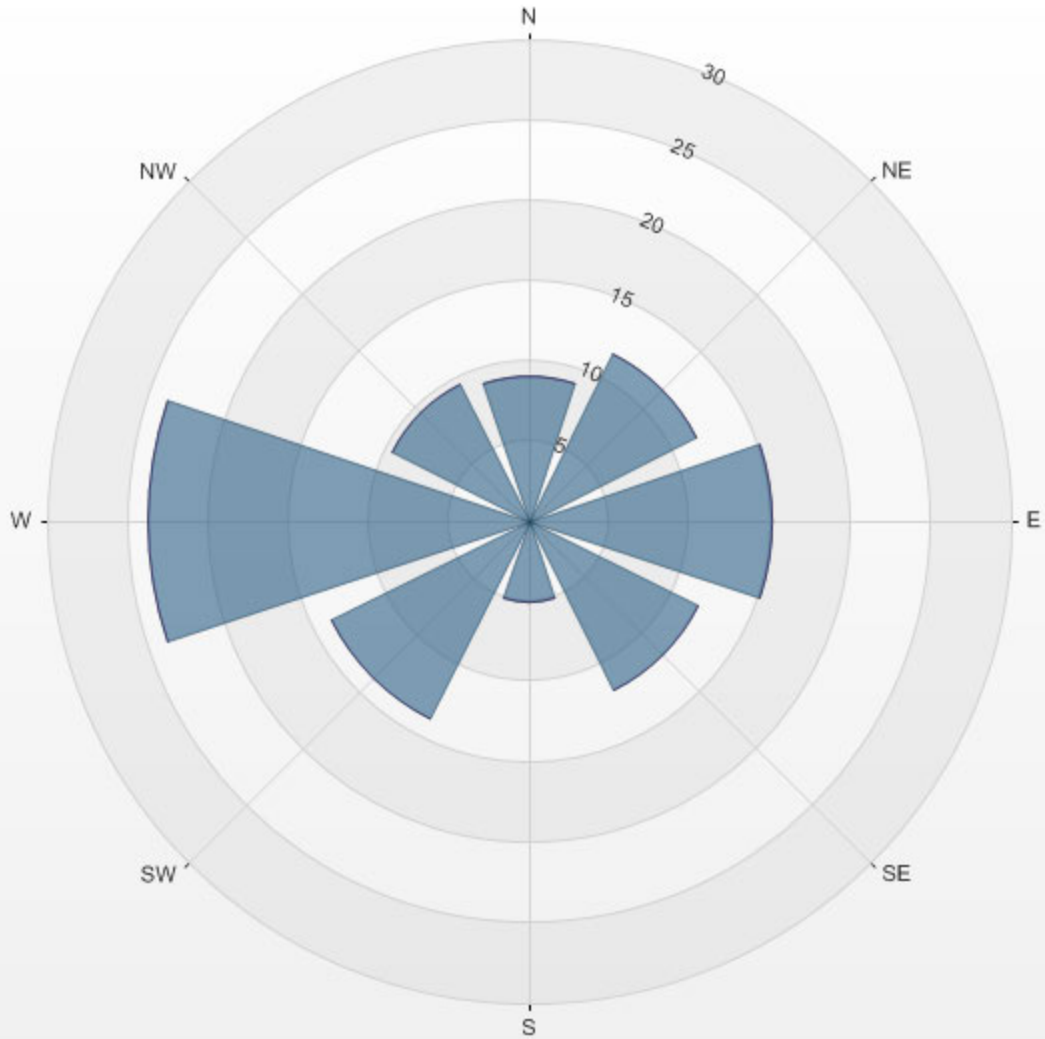
TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



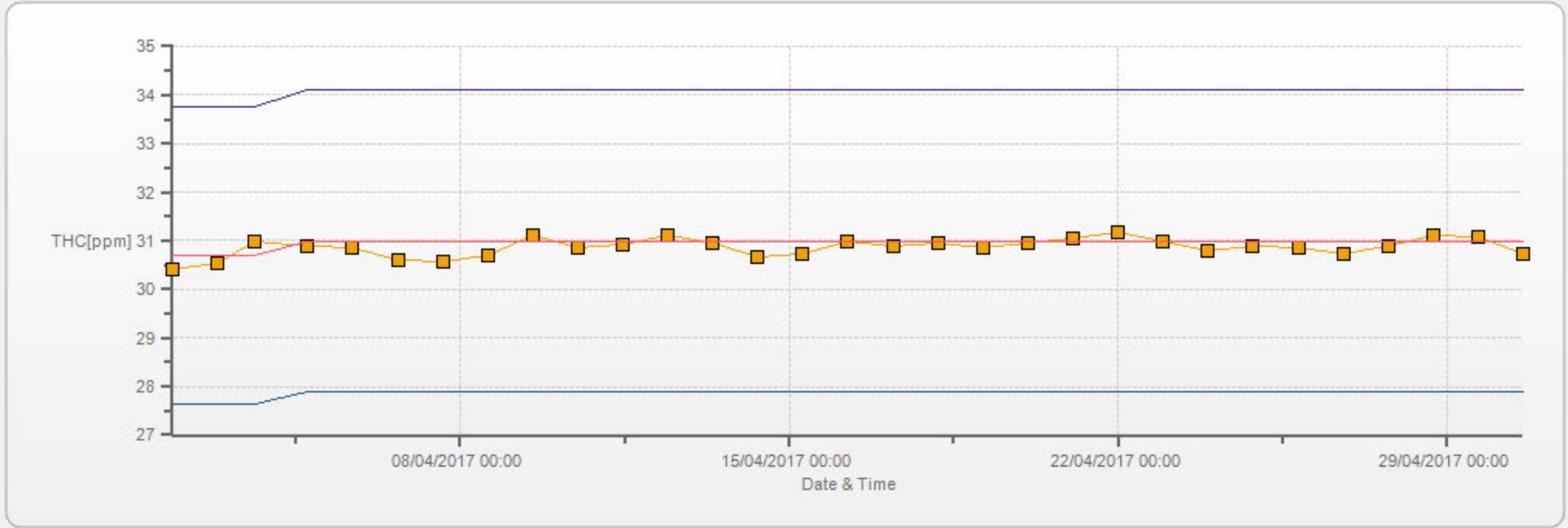


% Icon Classes (ppm) 0 0.0-0.8 0 0.8-1.6 100 1.6-2.3 0 >2.3

LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 0.15% Calm Poll Avg: 1.96[ppm]



THC[ppm] Calibration: LICA ST. LINA Monthly: 17/04 Type: Span



Span Meas Span Ref Span Low Span High

## ***OXIDES OF NITROGEN***



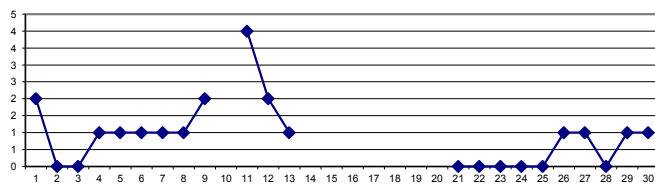
OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)

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

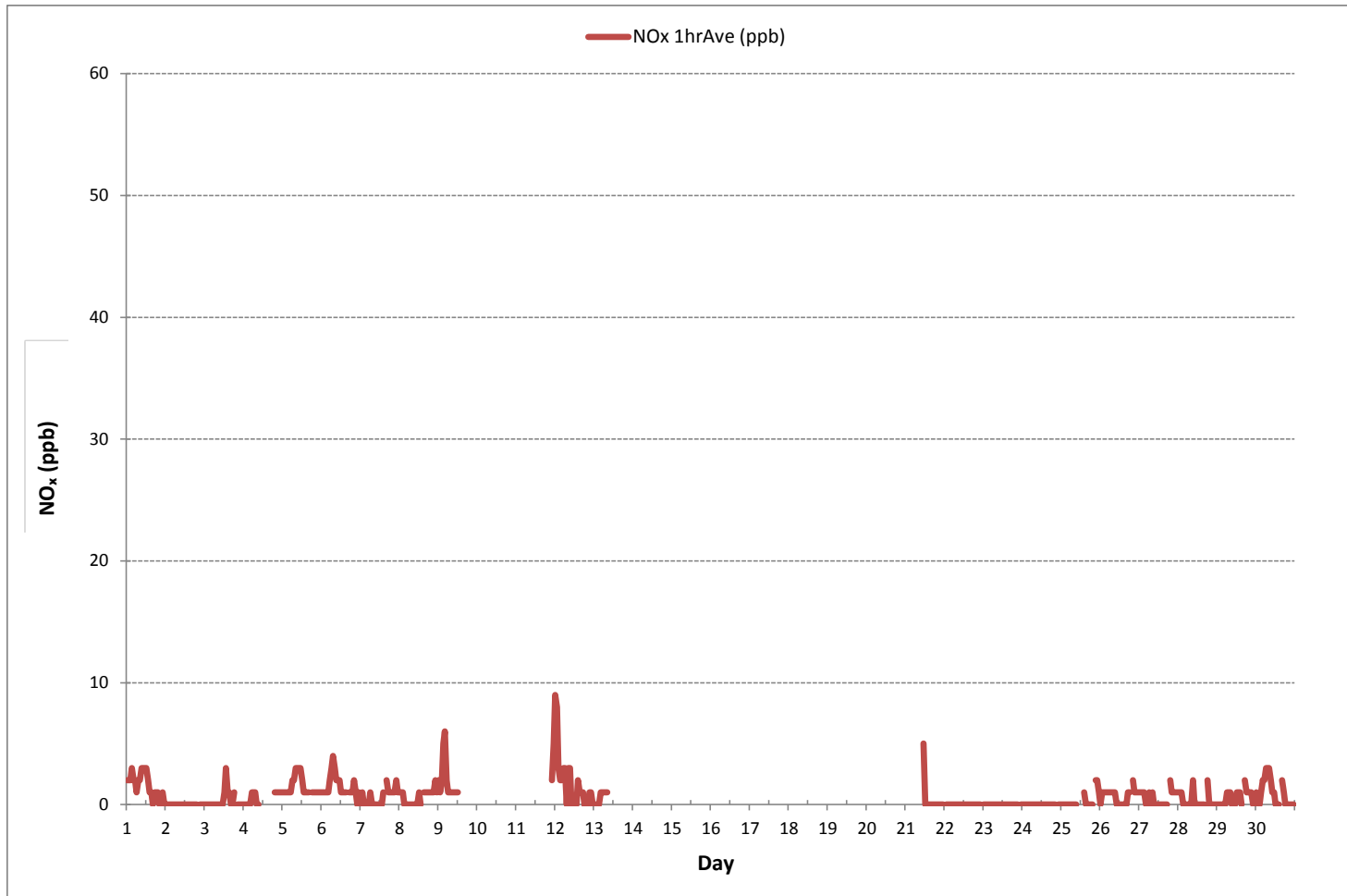
24 HR AVERAGES April 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	196			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	16	ON DAY 1
MAXIMUM 1-HR AVERAGE:	9 ppb	@ HOUR	0	ON DAY 12
MAXIMUM 24-HR AVERAGE:	4 ppb			ON DAY 11
I2S CALIBRATION TIME:	19 hrs	OPERATIONAL TIME:	463 hrs	
MONTHLY CALIBRATION TIME:	9 hrs	AMD OPERATION UPTIME:	64.3 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1	ppb

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







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

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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY 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	4	4	4	4	4	4	3	5	4	6	5	5	6	4	2	3	2	2	2	2	2	2	4	2	2	6	4	24	
2	2	1	2	2	2	1	2	2	2	2	1	2	1	2	1	1	2	2	2	2	2	2	2	1	1	2	2	24	
3	1	1	1	1	2	2	3	2	3	2	2	2	11	12	3	3	2	2	18	5	2	2	3	2	1	18	4	24	
4	2	2	2	2	2	5	7	9	3	2	C	C	C	C	C	C	C	C	C	C	C	2	2	1	2	1	9	3	24
5	1	2	1	1	1	2	2	3	3	3	4	4	3	1	1	1	1	S	1	1	1	1	1	1	1	1	4	2	24
6	2	2	1	2	2	2	4	5	4	3	3	2	2	2	2	1	S	2	1	2	4	3	1	1	1	5	2	24	
7	1	1	1	0	1	1	2	1	1	1	1	1	2	1	2	S	2	2	2	1	2	2	2	2	2	0	2	1	24
8	1	2	2	1	0	0	0	1	1	1	1	1	2	1	S	1	1	1	1	1	1	2	1	2	2	0	2	1	24
9	2	2	3	7	7	4	1	1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X	1	7	2	13
10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0
11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	10	10	10	1
12	12	12	6	4	4	6	S1	S1	5	4	C1	C1	C1	C1	41	2	2	2	1	1	1	1	2	1	1	41	6	18	
13	1	1	1	1	1	1	1	1	1	S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	1	1	10
14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	P	X	X	X	X	X	X	X	X	X	X	0
16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0
17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0
19	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	0
20	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	0
21	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	S1	9	4	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	13
22	S	6	2	2	2	2	2	2	2	2	2	1	1	2	1	1	2	1	1	1	1	1	2	S	1	6	2	24	
23	5	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	6	1	6	1	24
24	2	2	2	2	1	2	1	1	1	2	1	2	1	1	1	2	2	2	2	2	2	2	S	6	3	1	6	2	24
25	2	2	2	2	2	2	2	2	2	3	C1	C1	C1	C1	4	1	2	2	2	2	2	S	5	3	3	1	5	2	20
26	2	2	2	2	2	2	2	2	2	P	20	2	1	P	1	15	2	2	2	S	6	3	2	2	1	20	4	22	
27	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	23	1	1	S	5	2	2	2	2	1	23	3	24	
28	2	2	2	2	2	1	2	1	3	5	2	1	1	1	1	1	1	S	5	2	3	1	1	1	1	1	5	2	24
29	1	1	1	1	1	2	3	2	2	2	1	2	3	4	2	1	S	5	2	2	2	2	1	2	1	5	2	24	
30	2	2	2	3	3	3	5	5	4	3	2	2	1	1	1	S	5	2	2	1	1	1	1	1	1	1	5	2	24
HOURLY MAX	12	12	6	7	7	6	7	9	5	6	20	9	11	12	41	23	5	5	18	5	6	5	6	10					
HOURLY AVG	2	3	2	2	2	2	2	3	2	2	3	2	2	2	4	4	2	2	3	2	2	2	2	2					

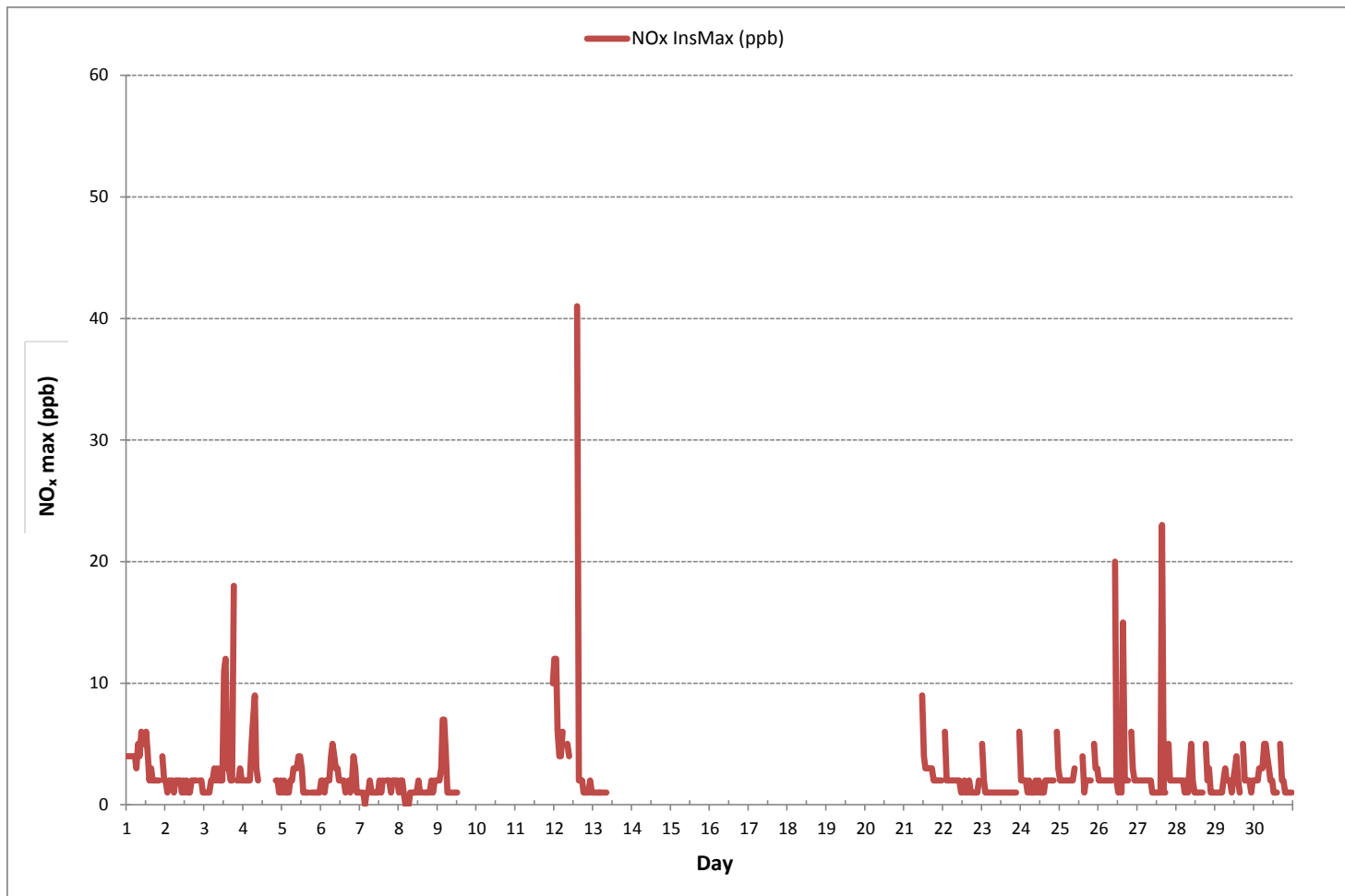
STATUS FLAG CODES

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:	425
MAXIMUM INSTANTANEOUS VALUE:	41 ppb @ HOUR 14 ON DAY 12
IZS CALIBRATION TIME:	18 hrs
MONTHLY CALIBRATION TIME:	10 hrs
STANDARD DEVIATION:	3
OPERATIONAL TIME:	457 hrs

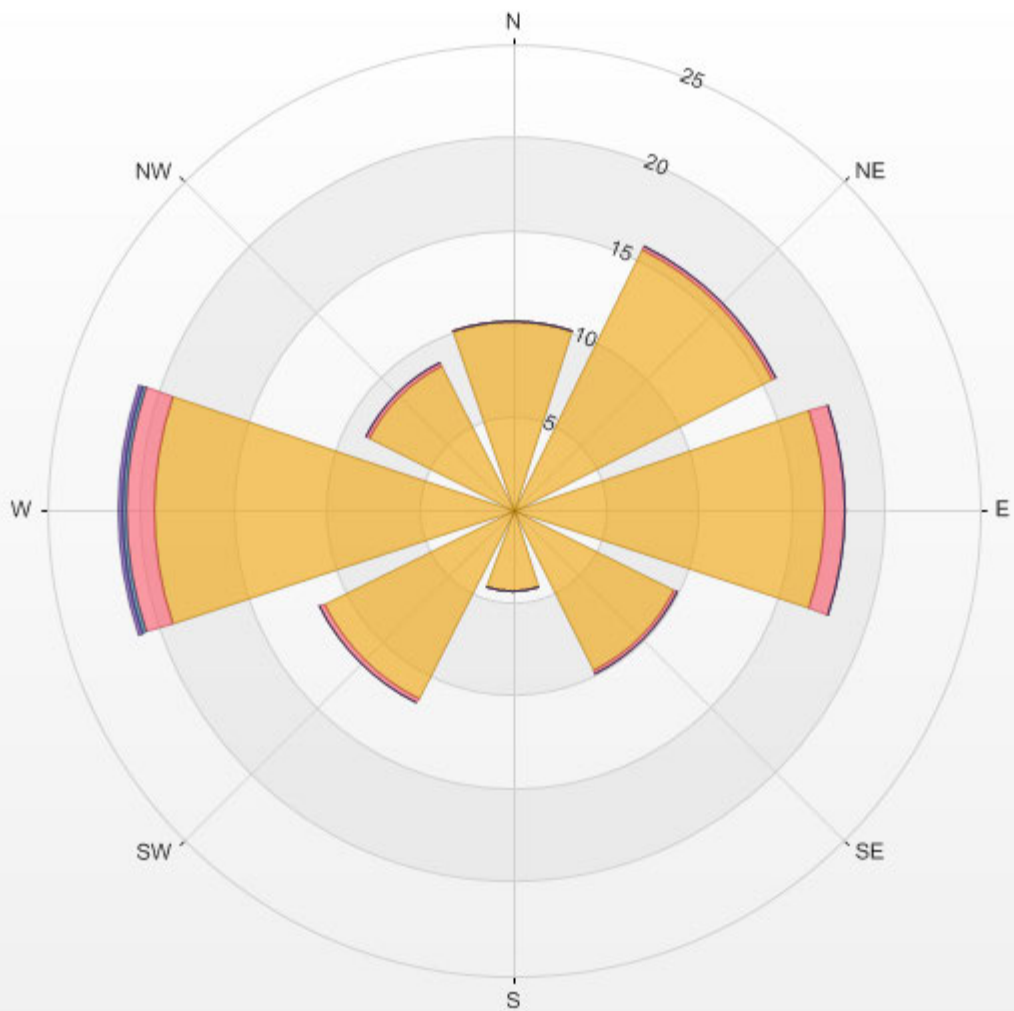
OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> ppb)



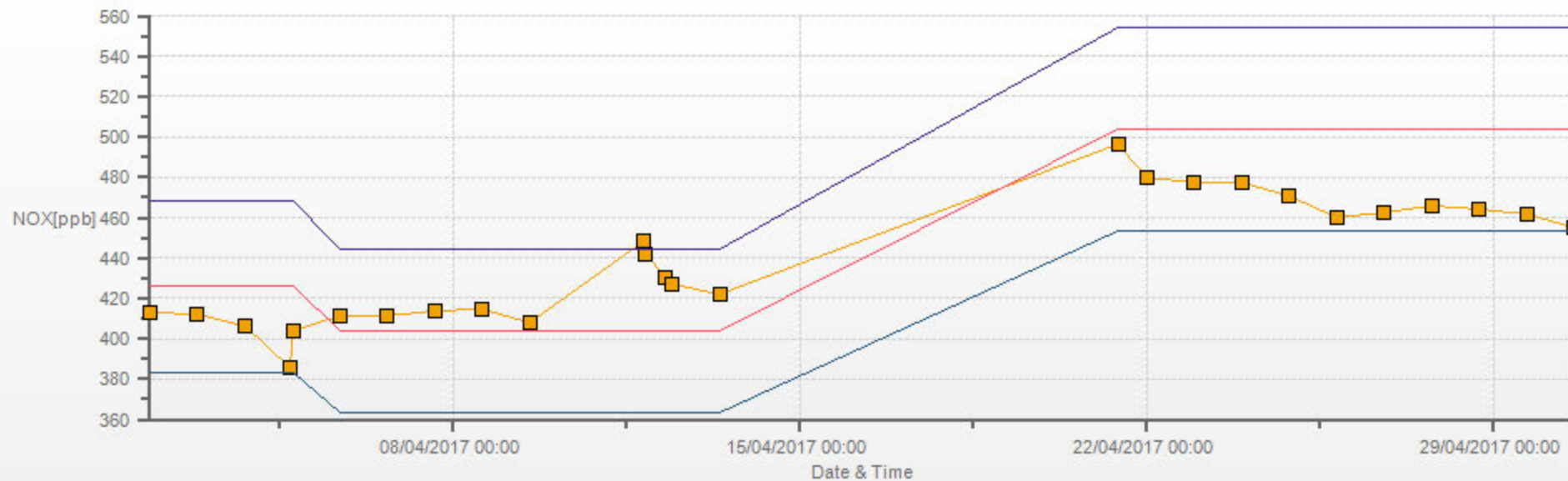


% Icon Classes (ppb) 96 0.0-3.0 3 3.0-6.1 0 6.1-9.1 0 >9.1

LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 0.25% Calm Poll Avg: 0.00[ppb]



NOX[ppb] Calibration: LICA ST. LINA Monthly: 17/04 Type: Span



Span Meas Span Ref Span Low Span High

***NITRIC OXIDES***



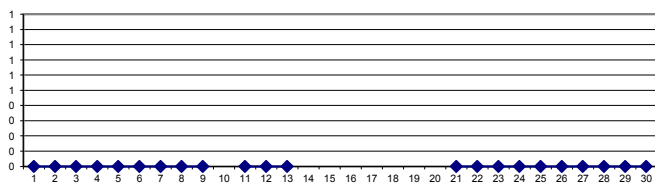
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

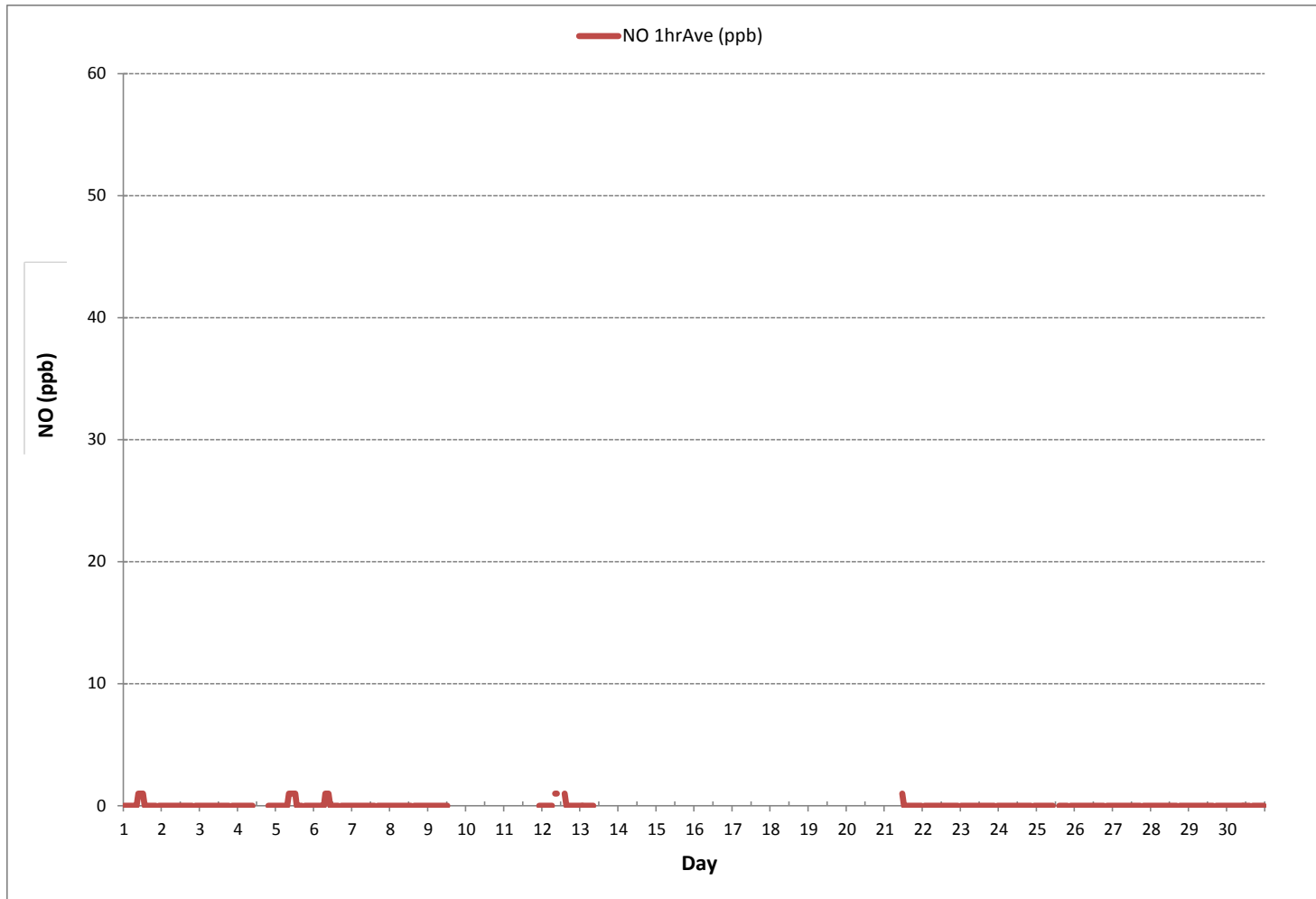
24 HR AVERAGES April 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	16
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 0 ON DAY 1
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR 1 ON DAY 1
MAXIMUM 24-HR AVERAGE:	0 ppb ON DAY 1
IZS CALIBRATION TIME:	19 hrs
MONTHLY CALIBRATION TIME:	9 hrs
OPERATIONAL TIME:	463 hrs
AMD OPERATION UPTIME:	64.3 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

NITRIC OXIDE Hourly Averages (NO ppb)







NITRIC OXIDE Instantaneous Maximum (NO ppb)

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

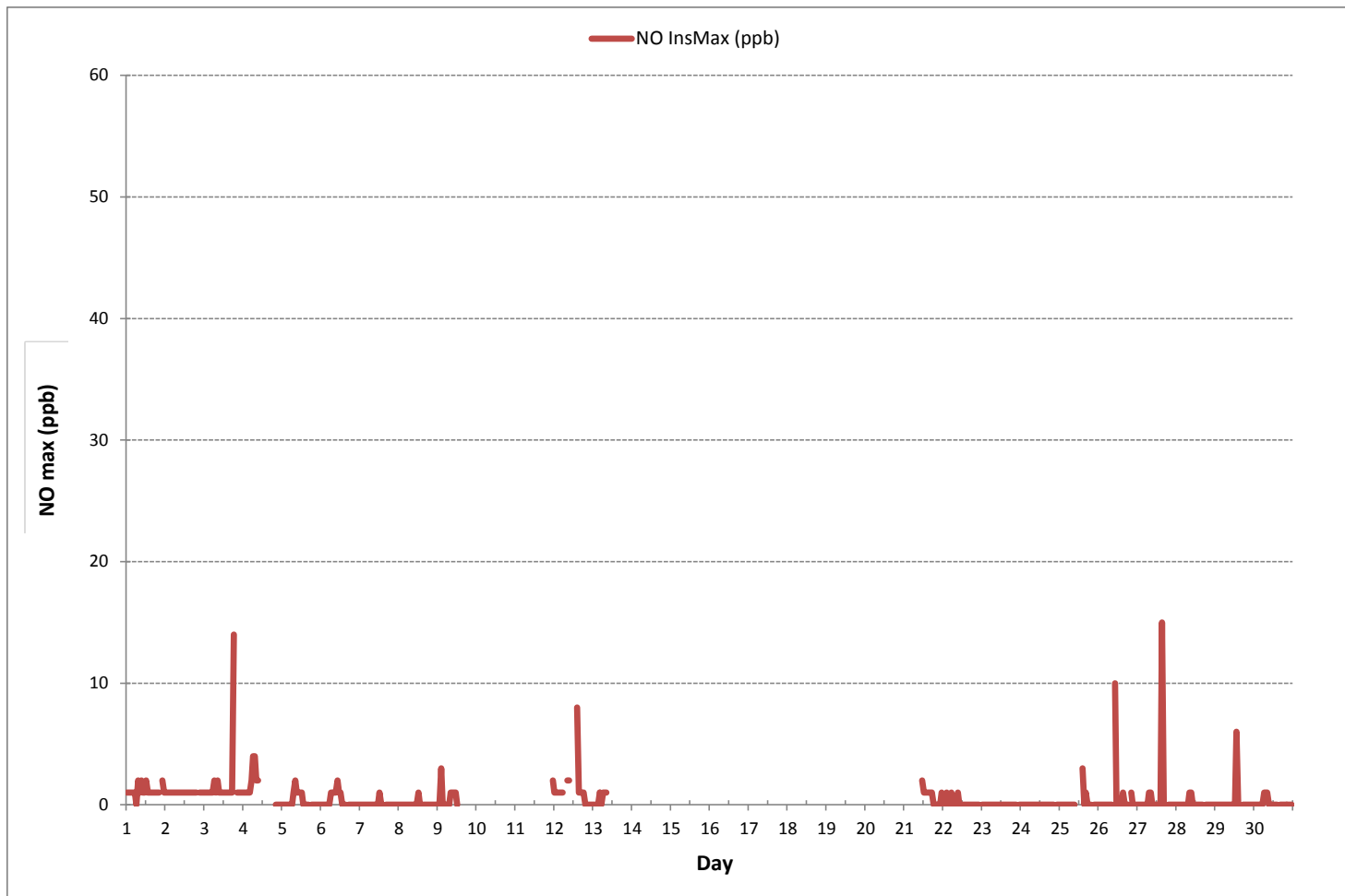
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	141
MAXIMUM INSTANTANEOUS VALUE:	15 ppb @ HOUR 15 ON DAY 27
IZS CALIBRATION TIME:	18 hrs
MONTHLY CALIBRATION TIME:	10 hrs
OPERATIONAL TIME:	457 hrs
STANDARD DEVIATION:	1

NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA ST. LINA  
Poll.: LICA ST. LINA-NO[ppb]  
Monthly: 17/04  
Type: PollutionRose  
Direction: Blowing From (Wind Frequency)  
Based On 1 Hr.

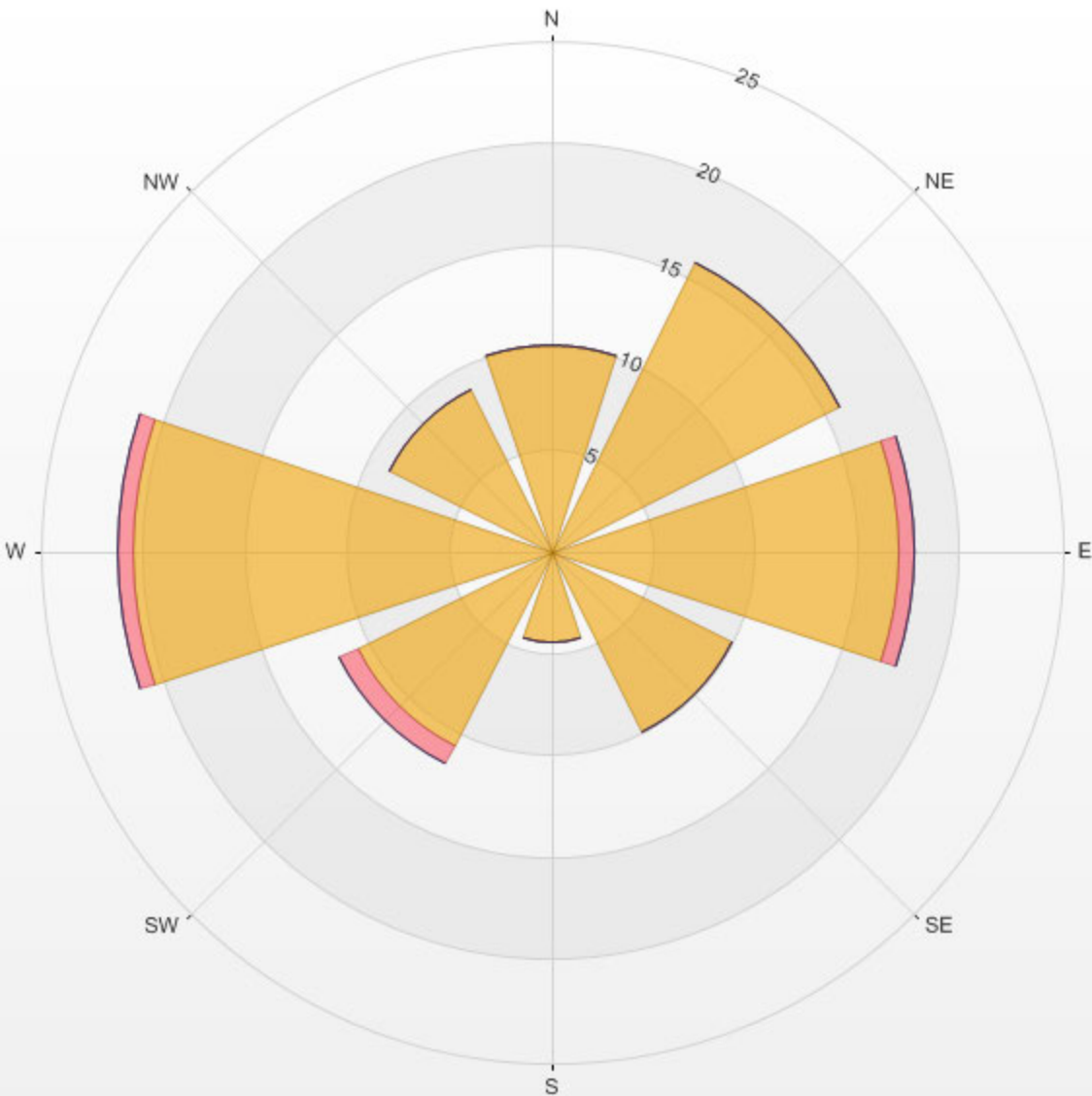
Calm: 0.25%

Calm Avg: 0.00 [ppb]

Direction	0.0-0.6	0.6-1.3	1.3-1.9	>1.9	Total
N	10.1	0.0	0.0	0.0	10.1
NE	15.8	0.0	0.0	0.0	15.8
E	17.0	0.7	0.0	0.0	17.8
SE	9.9	0.0	0.0	0.0	9.9
S	4.4	0.0	0.0	0.0	4.4
SW	10.6	1.0	0.0	0.0	11.6
W	20.5	0.7	0.0	0.0	21.2
NW	8.9	0.0	0.0	0.0	8.9
Summary	97.3	2.5	0.0	0.0	100.0

% Icon Classes (ppb) 97 0.0-0.6 2 0.6-1.3 0 1.3-1.9 0 >1.9

LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 0.25% Calm Poll Avg: 0.00[ppb]



***NITROGEN DIOXIDE***

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

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

**STATUS FLAG CODES**

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

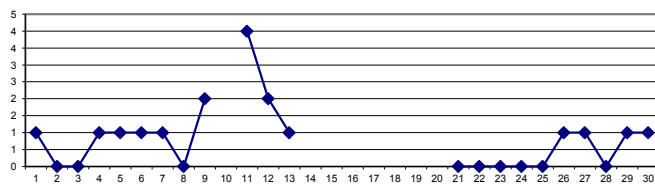
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

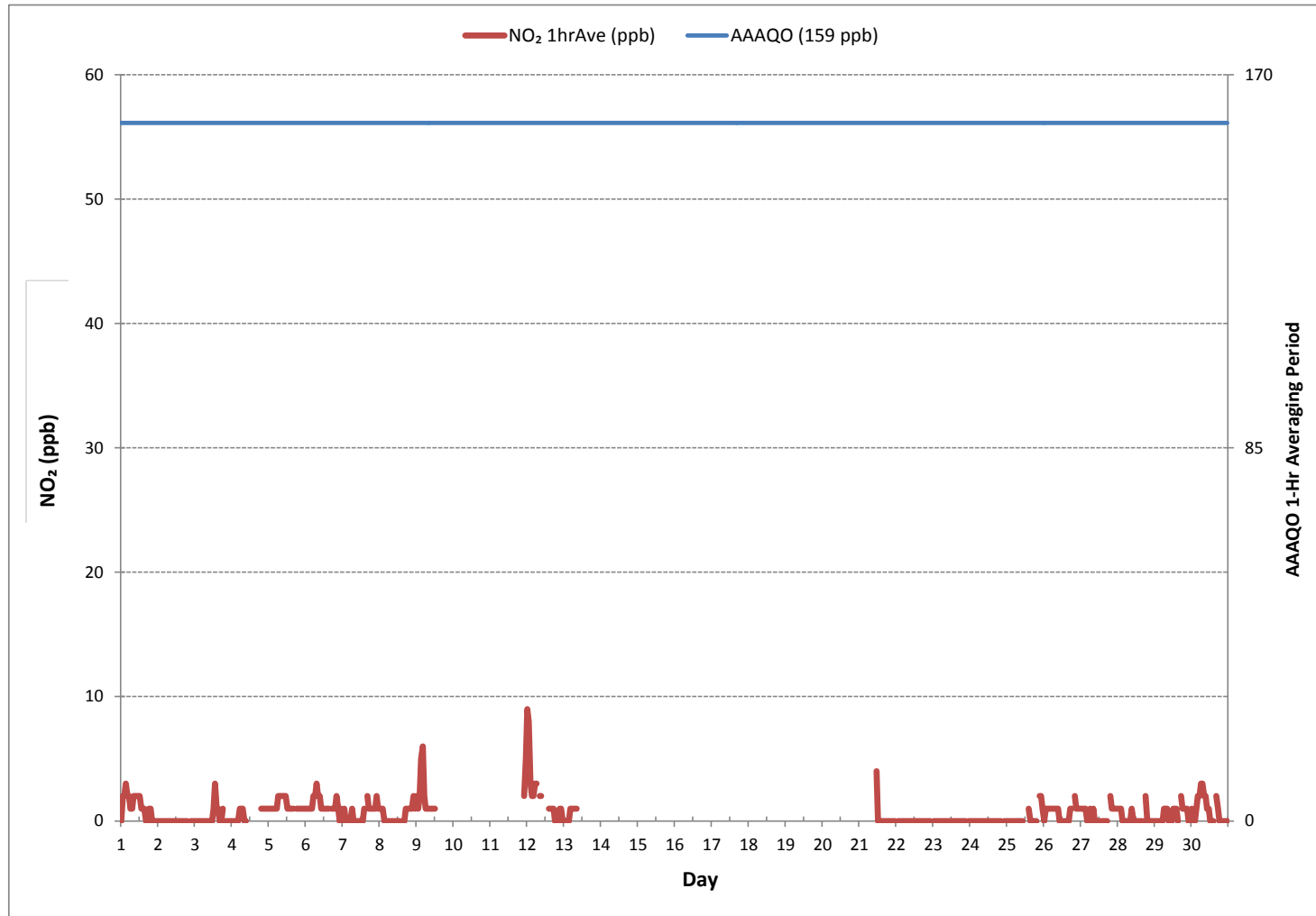
**MONTHLY SUMMARY**

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	191			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	16	ON DAY
MAXIMUM 1-HR AVERAGE:	9 ppb	@ HOUR	0	ON DAY
MAXIMUM 24-HR AVERAGE:	4 ppb			ON DAY
IZS CALIBRATION TIME:	19 hrs	OPERATIONAL TIME:	463 hrs	
MONTHLY CALIBRATION TIME:	9 hrs	AMD OPERATION UPTIME:	64.3 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1 ppb	

**24 HR AVERAGES April 2017**



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





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

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

DAY	HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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					
1		3	3	4	4	4	4	3	4	4	5	4	4	5	3	2	2	2	2	2	2	2	2	2	2	2	5	3	24	
2		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	24	
3		1	1	1	1	1	1	1	1	2	1	1	1	10	11	2	2	2	2	2	10	S	2	1	2	1	1	11	3	24
4		1	2	2	2	2	3	4	5	2	1	C	C	C	C	C	C	C	C	C	C	C	2	2	2	2	1	5	2	24
5		2	2	2	2	2	2	3	3	3	3	3	3	3	2	2	2	2	2	S	2	2	2	2	2	2	2	3	2	24
6		2	2	2	2	2	3	4	4	4	3	3	2	2	2	2	2	S	2	2	2	2	4	3	2	2	2	4	3	24
7		2	2	1	1	1	1	2	2	1	1	1	1	2	2	3	S	3	3	2	2	2	2	2	3	2	1	3	2	24
8		2	2	2	2	1	1	1	1	1	1	1	1	2	1	S	1	1	1	1	1	1	2	2	3	3	1	3	1	24
9		3	2	3	7	8	4	2	2	2	2	2	1	1	X	X	X	X	X	X	X	X	X	X	X	X	1	8	3	13
10		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0
11		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0
12		12	12	6	4	4	6	S1	S1	4	3	C1	C1	C1	C1	34	2	2	1	1	1	1	2	2	1	1	1	2	1	18
13		1	1	2	1	2	2	2	2	1	S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	2	2	10
14		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	10
15		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	P	X	X	X	X	X	X	X	X	X	10
16		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	10
17		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	10
18		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	10
19		X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	10
20		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10
21		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	S1	9	4	3	3	3	3	4	3	3	3	3	3	3	3	2	9	4	13
22		S	6	3	3	3	3	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	S	2	6	3	24
23		6	3	3	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	3	2	S	6	2	6	3	24
24		3	3	3	3	3	3	2	2	3	2	2	3	3	2	2	3	3	3	3	3	3	3	S	7	4	2	7	3	24
25		3	3	3	3	3	3	3	3	3	3	C1	C1	C1	C1	3	3	3	3	3	3	3	S	6	4	4	3	6	3	20
26		3	3	4	4	4	4	3	3	3	P	15	3	3	P	3	16	3	3	3	S	7	4	4	4	3	16	5	22	
27		4	3	3	3	3	3	3	3	3	3	3	2	2	2	2	12	2	2	S	6	3	3	3	3	4	2	12	3	24
28		4	3	4	3	3	3	3	3	3	4	3	2	2	2	2	2	2	S	6	3	4	2	3	2	2	6	3	2	24
29		2	2	3	3	3	3	4	4	4	3	3	3	3	4	3	3	S	6	3	3	3	3	3	3	3	2	6	3	24
30		3	3	3	4	5	4	5	5	5	4	4	3	3	3	2	S	6	3	3	3	3	3	3	3	3	2	6	4	24
HOURLY MAX		12	12	6	7	8	6	5	5	5	5	15	9	10	11	34	16	6	6	10	6	7	6	7	10					
HOURLY AVG		3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	2	3	3	2	3	3	3	3					

STATUS FLAG CODES

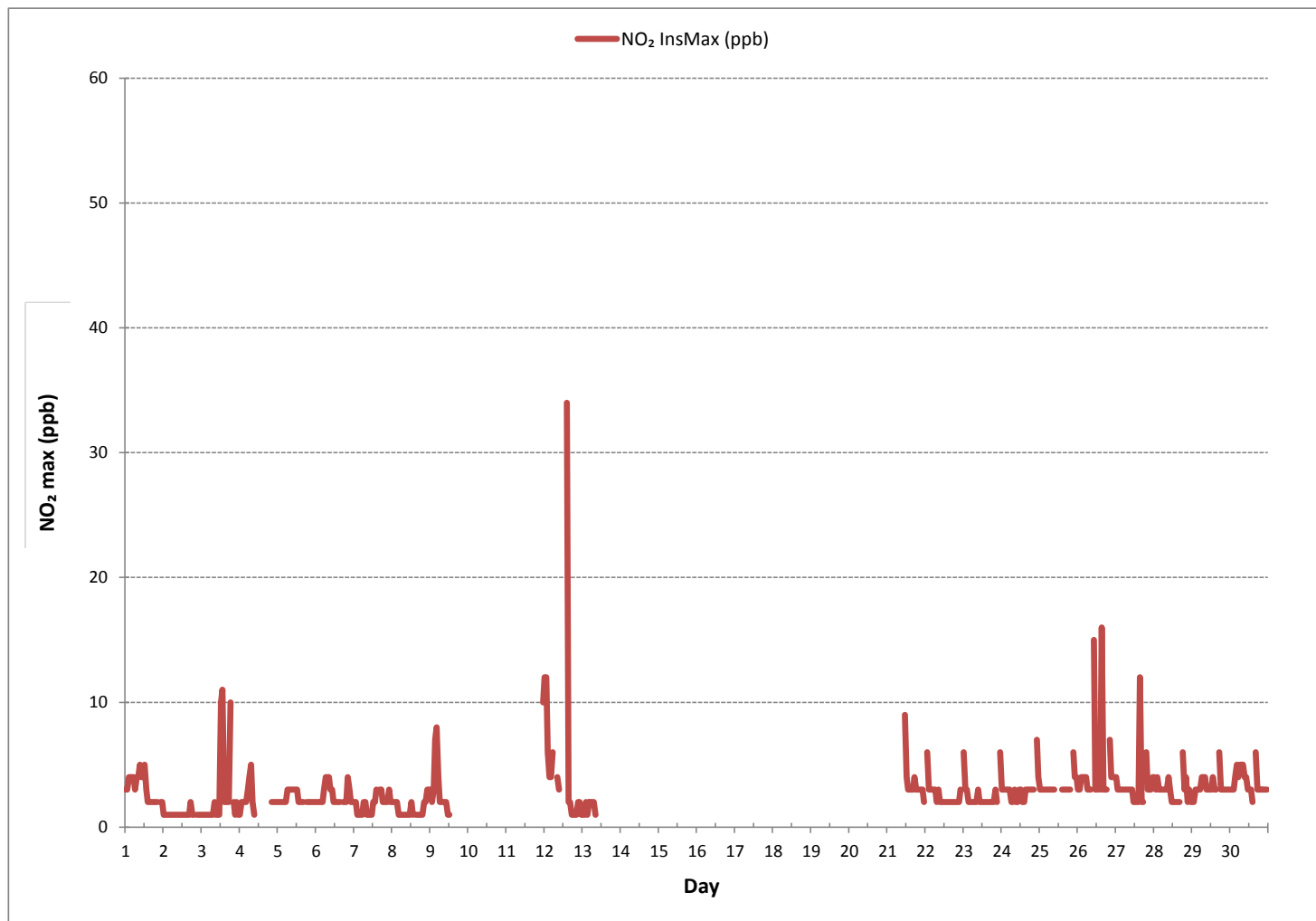
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	429
MAXIMUM INSTANTANEOUS VALUE:	34 ppb @ HOUR 14 ON DAY 12
	VAR-VARIOUS
IZS CALIBRATION TIME:	18 hrs
MONTHLY CALIBRATION TIME:	10 hrs
STANDARD DEVIATION:	2
OPERATIONAL TIME:	457 hrs



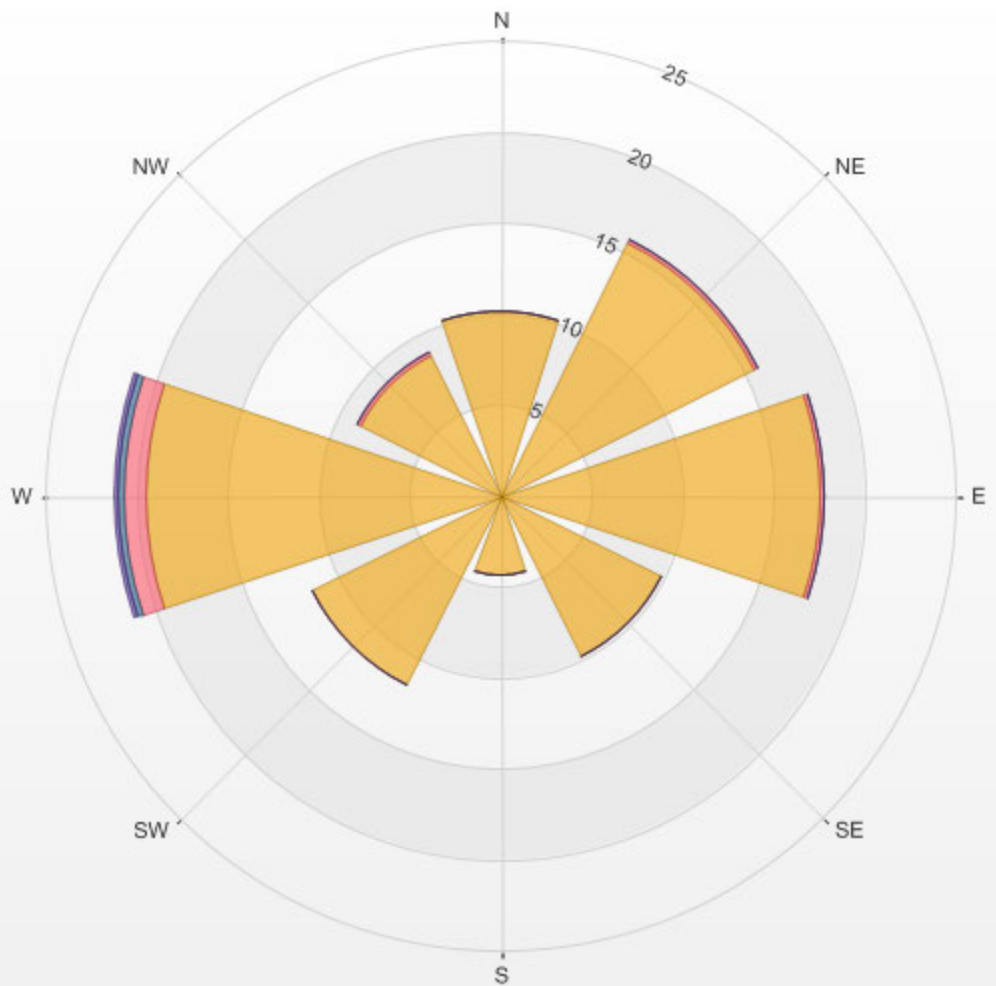
NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> ppb)



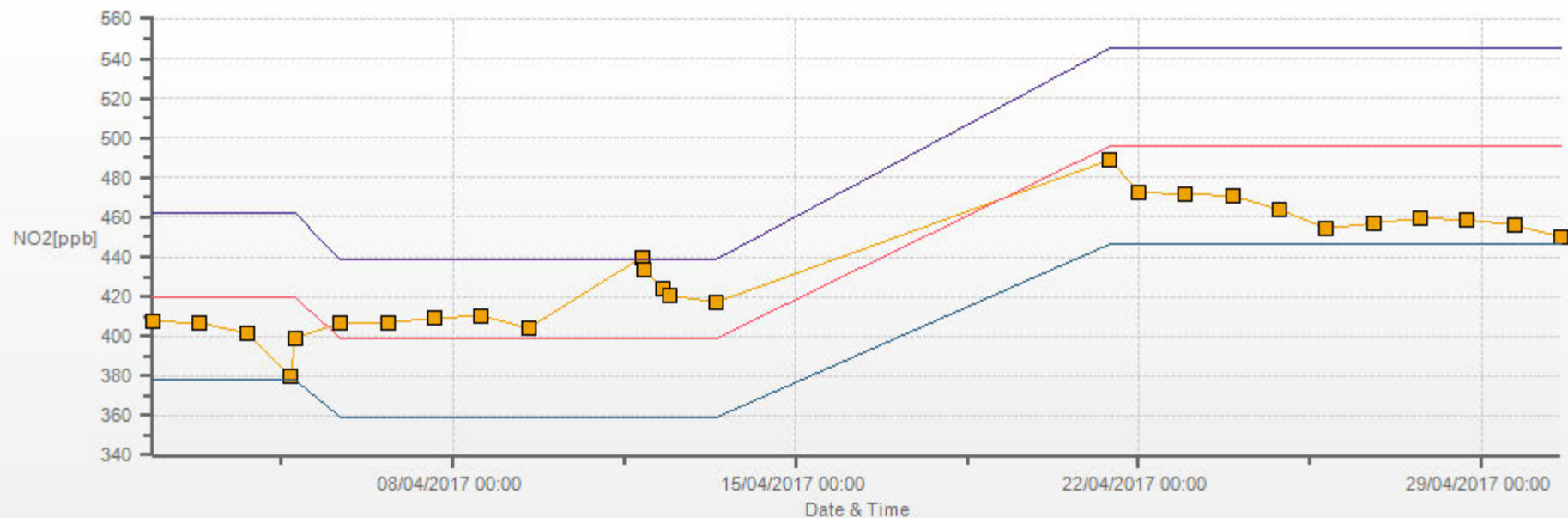


% Icon Classes (ppb) 97 0.0-3.0 2 3.0-6.1 0 6.1-9.1 0 >9.1

LICA ST. LINA Poll.: LICA ST. LINA-NO2[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 0.25% Calm Poll Avg: 0.00[ppb]



NO2[ppb] Calibration: LICA ST. LINA Monthly: 17/04 Type: Span



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

## ***OZONE***



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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	31.4	30.4	29.9	32.1	35.4	36.3	40.5	31.8	26.9	28.9	28.5	29.6	32.0	37.8	43.3	41.5	40.4	39.7	38.3	35.6	43.5	S	41.9	38.4	26.9	43.5	35.4	24	
2	38.0	38.3	38.9	37.7	36.3	35.9	34.3	33.8	35.3	38.2	39.7	40.3	41.3	43.3	43.9	45.3	46.7	46.3	44.5	45.3	S	43.7	42.4	42.1	33.8	46.7	40.5	24	
3	42.3	41.5	40.9	39.0	37.5	36.5	35.4	35.0	35.5	36.5	37.5	39.3	C	C	C	C	41.3	41.5	42.1	41.4	40.6	39.5	39.0	37.6	35.0	42.3	39.0	24	
4	35.9	35.0	33.2	33.0	30.0	29.7	27.5	23.5	25.2	29.4	29.8	38.2	41.8	42.7	45.4	45.9	45.6	44.7	S	40.8	38.4	37.0	35.9	35.1	23.5	45.9	35.8	24	
5	35.6	36.5	40.7	41.1	38.8	35.0	27.7	25.1	25.0	26.3	32.1	32.7	38.3	46.4	48.2	50.0	49.6	S	48.2	46.0	45.0	44.2	44.7	43.5	25.0	50.0	39.2	24	
6	41.3	38.9	36.7	34.6	32.5	29.8	28.7	27.0	27.4	32.8	36.8	39.1	41.7	44.2	47.0	46.6	S	46.7	46.6	45.9	44.9	43.6	44.0	40.8	27.0	47.0	39.0	24	
7	40.6	39.6	38.2	36.6	37.4	38.6	36.3	37.4	38.0	38.8	40.7	41.2	40.2	39.9	38.3	S	38.3	38.6	38.5	37.7	37.0	36.2	34.5	36.5	34.5	41.2	38.2	24	
8	37.0	37.1	36.5	38.0	37.6	38.4	37.5	33.7	32.6	33.3	34.7	36.8	38.8	40.5	S	42.8	42.5	42.8	40.9	39.1	35.0	33.6	31.9	30.3	30.3	42.8	37.0	24	
9	29.2	28.5	26.4	22.4	20.0	24.0	26.2	30.9	32.5	33.2	33.9	34.2	35.2	S	37.0	38.5	39.8	40.6	39.0	35.6	31.8	30.0	28.8	27.8	20.0	40.6	31.5	24	
10	27.3	26.8	25.7	24.1	22.0	21.5	20.5	20.2	20.2	20.8	20.2	19.0	S	20.1	20.8	22.6	23.9	24.8	25.5	24.5	22.4	19.6	18.9	19.6	18.9	27.3	22.2	24	
11	23.9	31.2	30.3	27.3	25.6	29.4	31.2	29.9	28.1	27.8	28.0	S	29.5	31.4	32.3	32.4	33.1	32.4	33.3	34.6	40.7	38.3	34.5	28.0	23.9	40.7	31.0	24	
12	21.7	20.3	23.8	25.2	24.6	22.4	23.0	26.8	28.4	29.1	S	33.7	35.5	35.9	37.0	37.2	37.3	37.2	35.7	34.0	33.2	32.2	32.2	33.8	20.3	37.3	30.4	24	
13	34.3	33.5	33.1	32.6	31.6	31.8	31.5	31.9	32.6	S	33.6	36.5	37.6	37.8	37.6	36.5	34.3	34.3	34.1	33.6	33.1	34.4	36.7	37.5	31.5	37.8	34.4	24	
14	37.9	39.2	38.6	38.5	38.3	37.8	37.7	37.9	S	38.8	38.9	38.4	36.7	36.7	36.6	35.7	36.6	35.9	36.9	37.1	36.5	37.4	38.9	41.8	35.7	41.8	37.8	24	
15	41.8	41.5	40.9	41.6	41.4	41.0	41.2	S	42.3	43.5	44.0	43.8	42.6	42.2	41.8	41.3	41.3	P	39.9	39.3	39.1	39.9	39.9	39.0	39.0	44.0	41.3	23	
16	38.7	38.4	39.9	38.9	37.1	37.4	S	36.9	38.3	39.5	43.6	46.8	46.6	48.2	50.4	49.3	46.8	46.7	48.4	47.8	45.6	45.3	44.4	43.0	36.9	50.4	43.4	24	
17	41.4	41.3	40.9	39.8	38.4	S	36.4	35.6	35.2	35.5	37.8	36.6	38.4	44.4	41.5	42.3	46.7	50.5	49.4	46.5	42.6	40.5	38.4	34.0	34.0	50.5	40.6	24	
18	32.5	31.5	33.0	32.4	S	33.3	33.8	34.5	34.8	35.3	35.6	36.1	36.9	37.5	37.9	37.7	37.5	36.3	33.6	31.4	29.6	27.3	26.2	25.4	25.4	37.9	33.5	24	
19	24.3	24.3	24.4	S	24.0	22.1	19.7	18.9	23.5	27.7	31.2	32.4	39.1	40.5	40.1	40.6	41.8	43.4	41.9	40.7	39.4	39.6	39.5	38.2	18.9	43.4	32.9	24	
20	36.3	35.1	S	31.5	28.7	26.2	26.2	27.7	27.9	28.7	28.8	30.5	30.9	31.4	32.4	34.0	35.5	36.6	36.9	35.9	35.0	35.5	35.0	30.8	26.2	36.9	32.1	24	
21	25.8	S	30.2	31.9	33.1	36.2	36.9	38.9	42.0	43.1	44.3	45.2	46.1	47.1	48.1	48.7	48.8	48.6	46.9	45.9	46.1	47.5	44.5	41.9	25.8	48.8	42.1	24	
22	S	39.8	39.7	39.3	39.6	38.1	38.8	40.1	40.9	42.0	43.4	44.2	45.2	46.0	46.2	45.1	45.0	44.4	44.3	43.7	43.1	42.7	38.6	S	38.1	46.2	42.3	24	
23	37.1	36.7	36.3	35.6	35.1	34.8	34.0	33.5	33.2	33.1	34.3	36.4	37.5	39.1	37.3	36.8	36.4	38.0	38.6	39.1	37.1	36.7	S	33.3	33.1	39.1	36.1	24	
24	32.3	31.7	30.9	30.0	29.6	29.5	29.2	29.1	28.6	28.9	30.3	32.9	32.2	31.0	31.3	31.7	31.4	29.4	28.0	28.6	27.6	S	27.4	27.1	27.1	32.9	29.9	24	
25	25.9	25.1	25.1	25.5	26.1	27.3	27.8	28.2	28.7	29.7	33.2	36.7	37.2	38.6	38.3	36.4	35.8	35.3	35.4	35.7	S	32.4	31.0	31.9	25.1	38.6	31.6	24	
26	35.0	34.5	32.1	31.2	30.2	31.3	31.3	32.2	33.8	36.0	38.2	38.1	37.8	37.0	35.8	34.9	33.1	28.7	28.7	S	29.3	29.9	32.0	31.7	28.7	38.2	33.2	24	
27	31.9	32.2	33.2	35.2	36.9	36.0	35.2	35.1	35.9	39.0	40.1	42.7	43.1	41.8	41.5	42.3	41.8	41.0	S	42.8	42.3	41.2	40.6	41.5	31.9	43.1	38.8	24	
28	41.6	39.5	38.9	39.5	40.4	40.8	41.9	43.9	43.4	44.6	46.9	49.7	50.0	51.0	51.4	52.7	53.5	S	53.3	52.8	52.9	52.3	51.0	50.3	38.9	53.5	47.1	24	
29	50.3	50.5	47.6	44.4	46.1	44.3	39.5	37.9	39.0	41.7	44.7	46.4	46.2	46.6	47.3	47.1	S	45.5	45.2	44.7	42.8	41.4	42.7	42.2	37.9	50.5	44.5	24	
30	41.2	41.3	40.3	35.7	33.5	32.6	25.8	27.5	30.7	36.8	41.3	45.3	50.8	50.5	49.0	S	49.8	50.4	50.4	49.7	48.4	46.1	45.8	48.4	25.8	50.8	42.2	24	
HOURLY MAX	50.3	50.5	47.6	44.4	46.1	44.3	41.9	43.9	43.4	44.6	46.9	49.7	50.8	51.0	51.4	52.7	53.5	50.5	53.3	52.8	52.9	52.3	51.0	50.3					
HOURLY AVG	34.9	35.2	34.7	34.3	33.4	33.0	32.3	31.9	32.6	34.4	36.3	38.0	39.6	40.3	40.6	40.6	40.5	40.0	40.2	39.9	38.7	38.1	37.3	36.3					

STATUS FLAG CODES

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

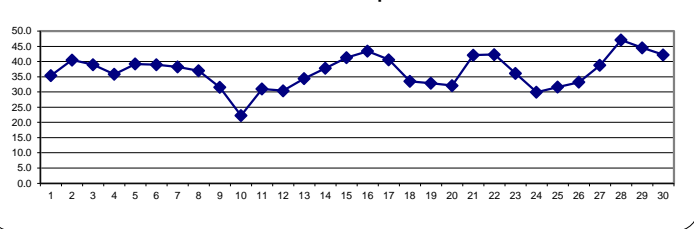
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

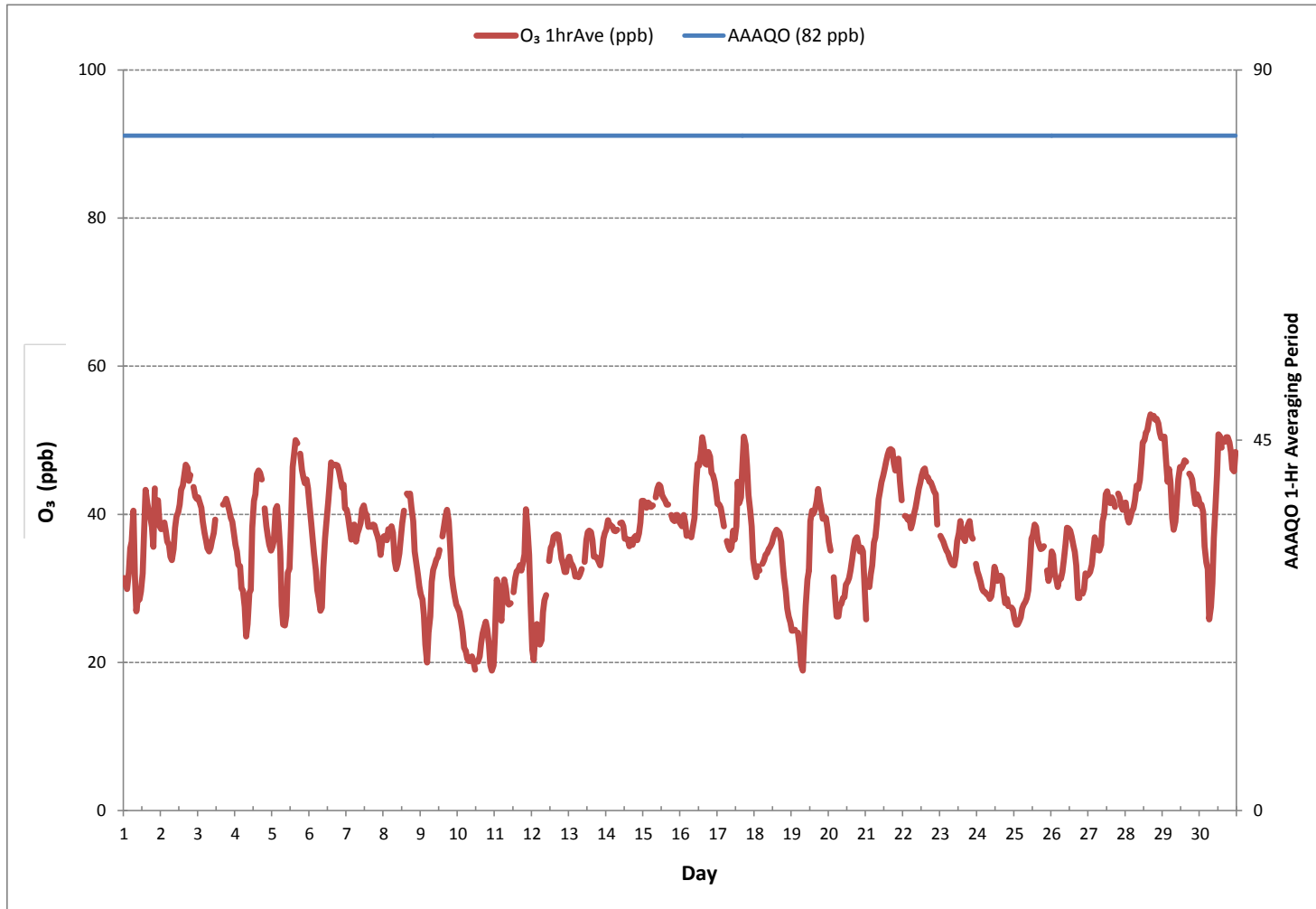
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	685			
MINIMUM 1-HR AVERAGE:	18.9 ppb	@ HOUR	22	ON DAY 10
MAXIMUM 1-HR AVERAGE:	53.5 ppb	@ HOUR	16	ON DAY 28
MAXIMUM 24-HR AVERAGE:	47.1 ppb			ON DAY 28
I2S CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	719 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.9 %	
STANDARD DEVIATION:	7.0	MONTHLY AVERAGE:	36.7 ppb	

24 HR AVERAGES April 2017



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





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

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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY 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	33.5	32.5	32.1	34.7	40.1	41.4	43.4	41.3	30.3	36.5	42.8	33.0	35.3	48.5	45.9	44.6	43.0	42.3	41.0	39.2	49.3	S	46.2	40.8	30.3	49.3	39.9	24
2	40.2	40.2	41.3	40.1	38.7	38.0	37.1	35.7	38.7	40.9	41.8	42.5	44.4	45.8	46.0	48.2	48.6	48.7	46.9	47.6	S	45.5	45.4	44.2	35.7	48.7	42.9	24
3	44.3	43.2	42.8	41.5	39.3	38.0	37.0	36.3	37.6	38.0	39.7	C	C	C	C	C	C	42.9	43.8	43.4	41.7	40.6	40.2	39.1	36.3	44.3	40.5	24
4	37.5	37.7	35.7	35.5	33.5	33.5	33.8	26.0	27.7	36.9	P	39.8	43.8	45.1	P	47.2	46.7	46.2	S	P	40.9	38.7	37.3	37.4	26.0	47.2	38.0	21
5	37.1	38.9	42.7	43.2	40.5	38.1	30.9	26.8	27.2	28.9	34.0	34.0	45.5	48.0	50.8	51.2	51.1	S	50.0	47.5	46.3	45.5	45.7	45.0	26.8	51.2	41.3	24
6	43.2	40.6	38.2	36.5	34.3	31.9	30.0	29.5	29.7	35.6	39.3	42.0	44.0	47.2	49.0	49.4	S	48.3	47.5	47.1	46.8	45.4	45.2	45.2	29.5	49.4	41.1	24
7	42.3	41.5	40.5	38.1	39.4	40.1	38.4	39.3	39.7	40.0	42.1	42.8	41.7	41.4	39.8	S	39.6	40.1	39.9	39.2	38.7	38.2	36.2	38.5	36.2	42.8	39.9	24
8	38.7	38.7	38.4	39.4	38.8	40.6	39.2	36.4	33.8	35.0	36.6	39.3	40.5	43.1	S	44.4	43.9	44.6	42.7	40.4	38.9	35.1	33.6	31.5	31.5	44.6	38.9	24
9	30.8	29.6	29.4	26.0	22.9	27.8	28.5	33.1	33.8	34.4	35.1	35.4	36.7	S	38.5	41.0	41.3	41.7	41.4	38.4	33.5	31.5	30.0	28.9	22.9	41.7	33.5	24
10	28.1	28.0	26.9	25.8	23.4	22.5	21.8	21.1	21.3	22.2	21.1	21.1	S	21.4	22.2	24.9	25.5	26.6	27.1	26.2	25.4	21.0	20.4	21.3	20.4	28.1	23.7	24
11	30.0	33.9	32.1	31.6	27.7	32.7	33.8	31.5	29.7	29.2	29.8	S	31.5	33.9	34.4	34.6	34.6	34.4	34.6	40.3	42.3	40.9	37.0	33.2	27.7	42.3	33.6	24
12	23.5	22.5	26.4	26.7	25.9	24.7	25.9	28.8	29.8	30.6	S	36.5	37.6	37.6	38.3	38.8	38.4	38.5	37.1	35.8	34.3	33.8	33.9	35.1	22.5	38.8	32.2	24
13	35.9	34.6	34.4	33.8	33.0	33.1	33.0	33.1	33.5	S	36.1	38.1	38.7	39.0	38.5	37.7	36.0	35.3	35.1	34.3	34.0	36.5	37.6	38.5	33.0	39.0	35.6	24
14	39.0	40.3	39.7	39.3	39.0	38.8	38.7	P	S	P	P	P	P	37.6	37.5	P	37.9	36.9	37.9	38.4	37.9	38.6	41.3	82.4	36.9	82.4	41.2	18
15	43.1	42.7	42.3	42.5	42.5	42.1	42.6	S	43.6	45.2	45.1	45.0	44.0	43.2	43.1	P	P	P	40.6	40.3	40.5	40.8	40.8	40.0	40.0	45.2	42.5	21
16	39.8	39.8	41.0	40.6	38.6	39.4	S	38.4	39.7	41.1	46.8	48.0	47.9	49.7	58.4	51.2	48.0	48.9	49.3	47.1	46.2	45.4	44.7	38.4	58.4	45.2	24	
17	42.2	42.1	41.8	41.0	39.7	S	37.3	36.4	36.0	37.6	40.1	40.7	41.5	46.2	45.9	46.1	48.9	52.0	51.0	48.7	45.4	42.7	40.5	36.5	36.0	52.0	42.6	24
18	33.5	32.9	34.3	33.8	S	34.7	35.1	35.5	35.8	36.2	36.5	37.1	38.2	38.7	38.8	38.5	38.4	38.3	34.8	33.1	30.8	29.5	27.2	26.9	26.9	38.8	34.7	24
19	25.5	25.4	25.9	S	25.4	23.8	22.3	22.7	26.2	32.4	33.9	37.6	41.7	41.5	41.1	42.0	42.7	44.7	43.9	41.7	41.3	40.6	40.5	39.8	22.3	44.7	34.9	24
20	37.4	36.1	S	32.9	30.8	27.6	27.3	28.6	28.6	30.3	P	31.3	31.7	32.6	33.8	35.8	36.8	37.9	37.8	37.7	36.6	37.3	36.9	33.5	27.3	37.9	35.8	23
21	27.2	S	31.6	32.9	35.0	37.1	37.9	41.7	43.7	44.9	45.2	46.3	47.2	48.4	49.3	49.5	49.8	49.8	48.6	47.1	48.2	48.7	47.7	42.9	27.2	49.8	43.5	24
22	S	40.6	40.6	40.1	40.6	39.3	39.9	41.7	42.0	43.5	44.6	45.1	46.6	46.8	47.2	46.3	45.9	45.5	45.4	44.6	44.3	43.8	41.4	S	39.3	47.2	43.4	24
23	38.1	37.4	37.1	36.6	36.0	35.6	35.1	34.3	34.2	34.2	35.7	37.9	40.3	40.5	38.7	37.7	37.5	39.7	39.7	40.3	38.0	37.9	S	34.8	34.2	40.5	37.3	24
24	33.5	32.7	31.8	31.2	30.4	30.4	30.1	29.8	29.6	30.4	33.0	34.2	34.2	33.8	33.1	32.6	32.6	31.1	29.2	29.5	29.1	S	28.4	28.1	28.1	34.2	31.3	24
25	27.2	26.0	26.1	26.5	27.4	28.4	28.6	29.3	29.7	31.9	P	P	38.5	39.9	39.4	38.0	37.0	36.4	36.2	36.7	S	33.5	31.8	35.1	26.0	39.9	32.6	22
26	36.2	36.3	34.0	32.2	30.9	32.5	32.4	33.2	35.2	P	39.2	39.2	38.8	P	36.8	36.2	35.0	30.3	29.6	S	30.1	32.2	33.0	32.6	29.6	39.2	34.1	22
27	32.6	33.1	34.0	36.9	37.8	37.9	36.4	36.2	39.1	41.3	41.4	45.1	45.2	42.8	42.5	43.6	42.6	42.5	S	43.8	43.4	42.5	41.7	42.7	32.6	45.2	40.2	24
28	42.6	41.8	40.7	40.9	41.5	42.2	43.8	45.3	44.9	47.3	49.0	51.8	50.9	52.6	53.0	53.8	54.4	S	54.4	54.0	54.5	53.4	52.3	51.3	40.7	54.5	48.5	24
29	51.2	51.7	49.9	46.8	47.2	47.1	42.9	40.1	40.5	44.0	46.0	47.9	47.7	48.6	49.3	49.2	S	46.7	46.6	45.9	44.3	42.7	44.2	44.3	40.1	51.7	46.3	24
30	42.1	42.2	41.4	39.0	34.8	37.9	28.6	30.1	33.1	40.6	43.6	50.3	52.5	51.6	51.5	S	50.8	51.6	51.9	51.2	50.0	49.9	48.7	49.9	28.6	52.5	44.5	24
HOURLY MAX	51.2	51.7	49.9	46.8	47.2	47.1	43.8	45.3	44.9	47.3	49.0	51.8	52.5	52.6	58.4	53.8	54.4	52.0	54.4	54.0	54.5	53.4	52.3	82.4				
HOURLY AVG	36.4	36.7	36.3	36.1	35.0	35.1	34.2	33.7	34.3	36.6	39.1	40.1	41.7	42.4	42.3	42.5	41.8	41.6	41.6	41.5	40.5	39.8	39.0	39.5				

STATUS FLAG CODES

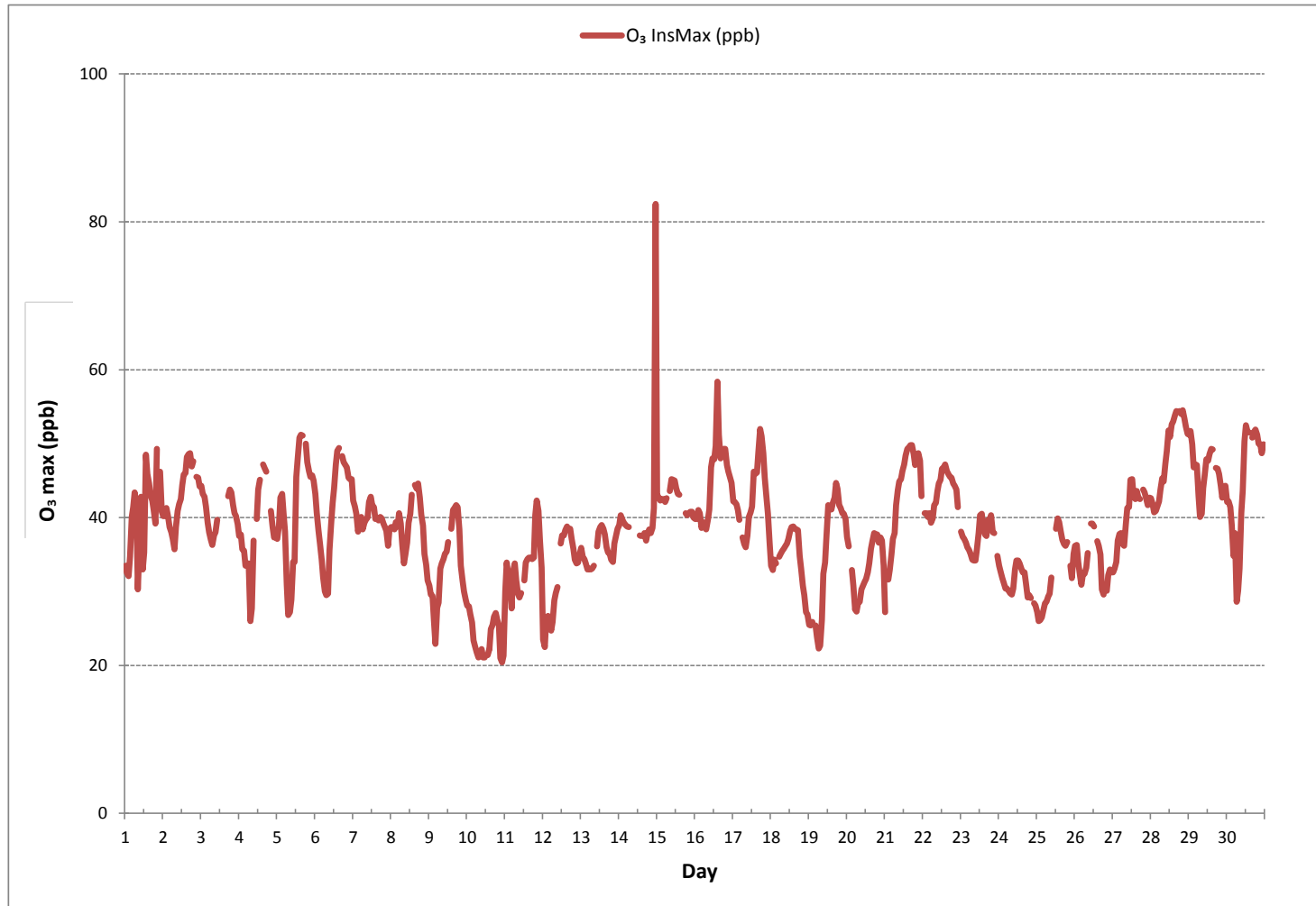
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	667
MAXIMUM INSTANTANEOUS VALUE:	82.4 ppb @ HOUR 23 ON DAY 14
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	6 hrs
STANDARD DEVIATION:	7.2
OPERATIONAL TIME:	703 hrs



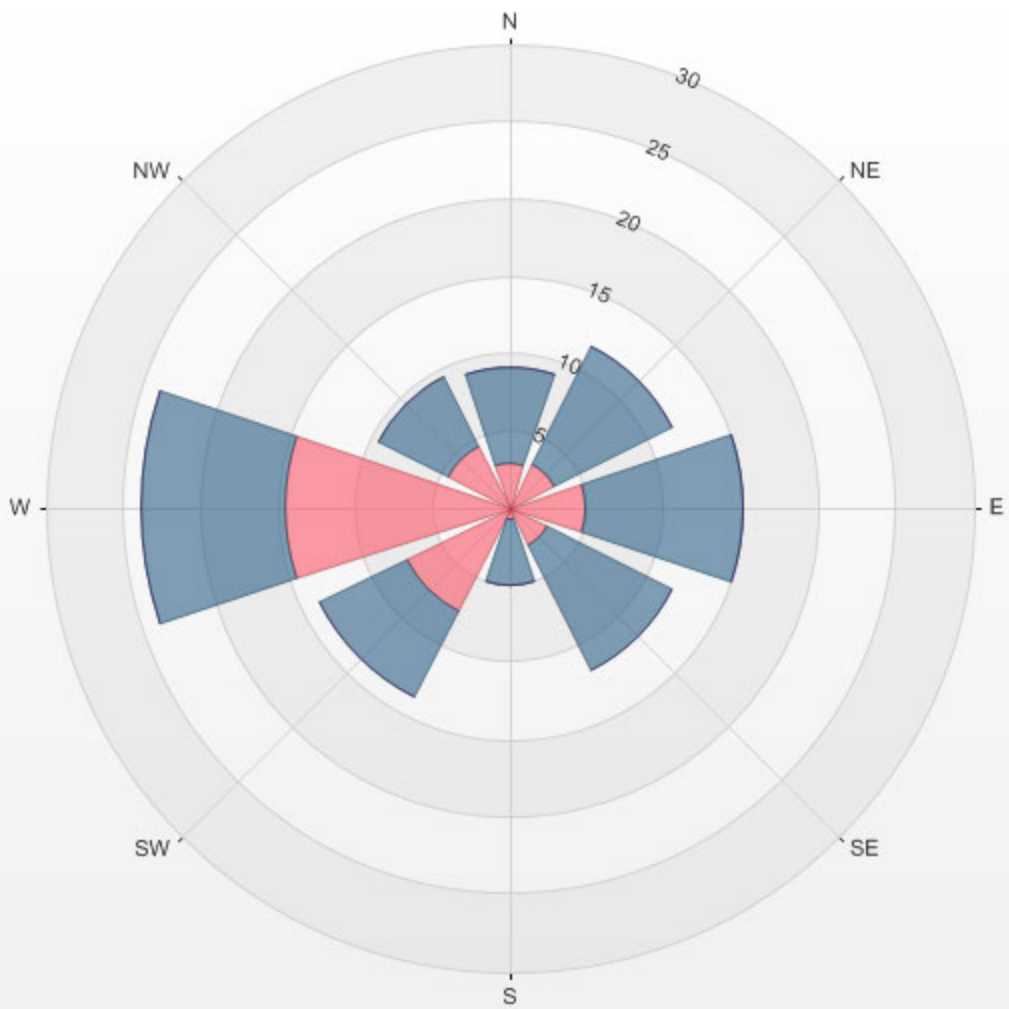
OZONE Instantaneous Maximum (O<sub>3</sub> ppb)



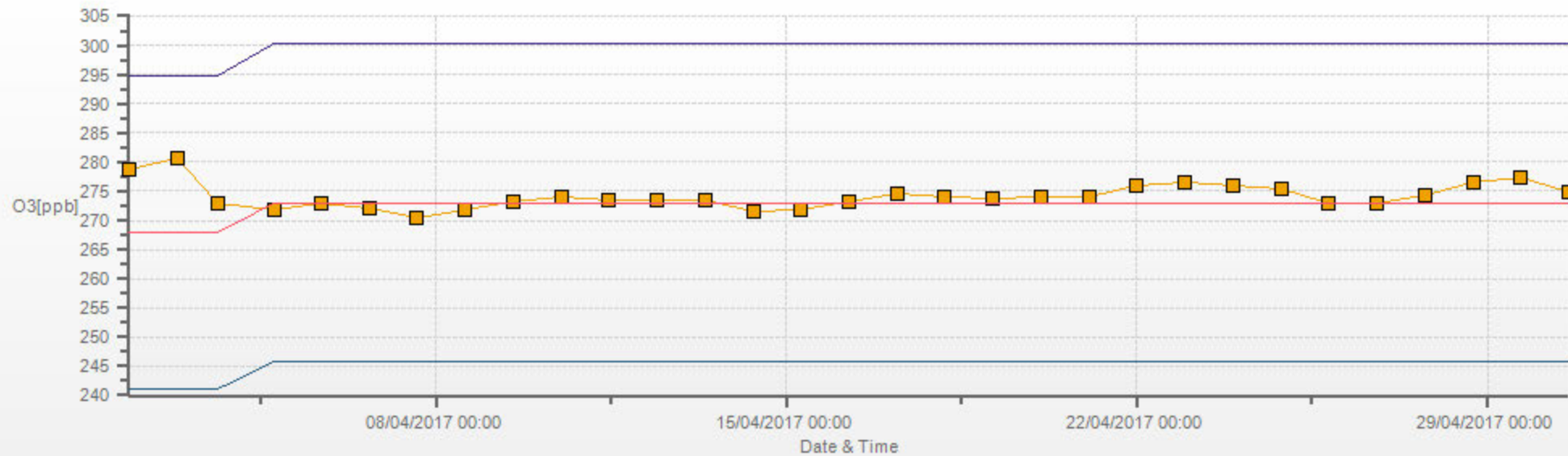


% Icon Classes (ppb) 0 0.0-17.9 41 17.9-35.7 59 35.7-53.6 0 >53.6

LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 0.15% Calm Poll Avg: 37.30[ppb]



O3[ppb] Calibration: LICA ST. LINA Monthly: 17/04 Type: Span



Span Meas Span Ref Span Low Span High

***PARTICULATE MATTER 2.5***



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

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

STATUS FLAG CODES

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

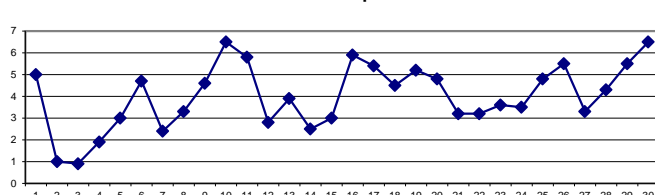
OBJECTIVE LIMIT:

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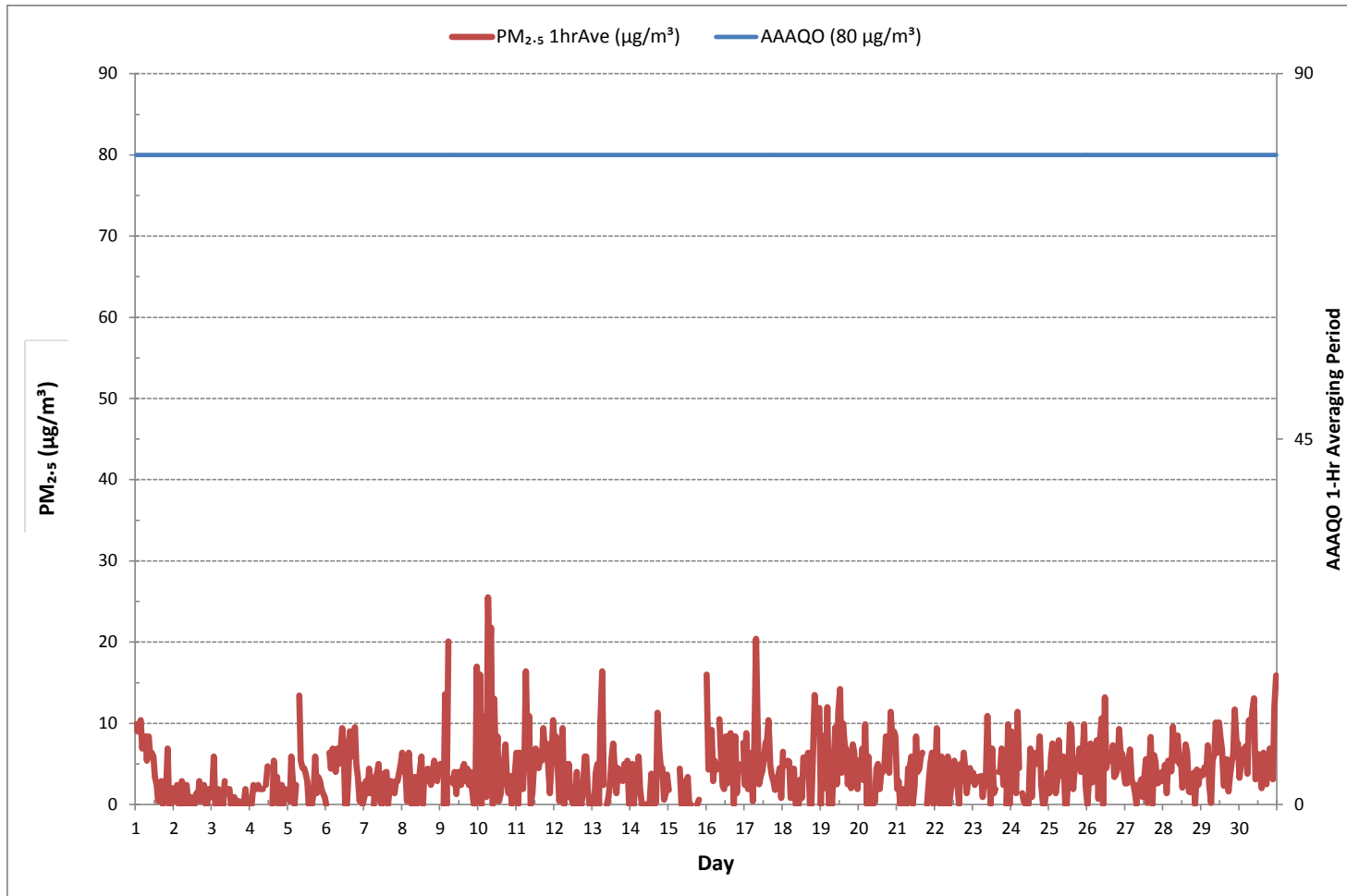
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	565				
MINIMUM 1-HR AVERAGE:	0 µg/m <sup>3</sup> @ HOUR	17	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	26 µg/m <sup>3</sup> @ HOUR	6	ON DAY	10	
MAXIMUM 24-HR AVERAGE:	7 µg/m <sup>3</sup>		ON DAY	10	
MONTHLY CALIBRATION TIME:	4	hrs	OPERATIONAL TIME:	681	hrs
STANDARD DEVIATION:	4		AMD OPERATION UPTIME:	94.6	%
			MONTHLY AVERAGE:	4	µg/m <sup>3</sup>

24 HR AVERAGES April 2017



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



Wind: LICA ST. LINA  
 Poll.: LICA ST. LINA-PM25[ug/m3(L)]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 0.15%

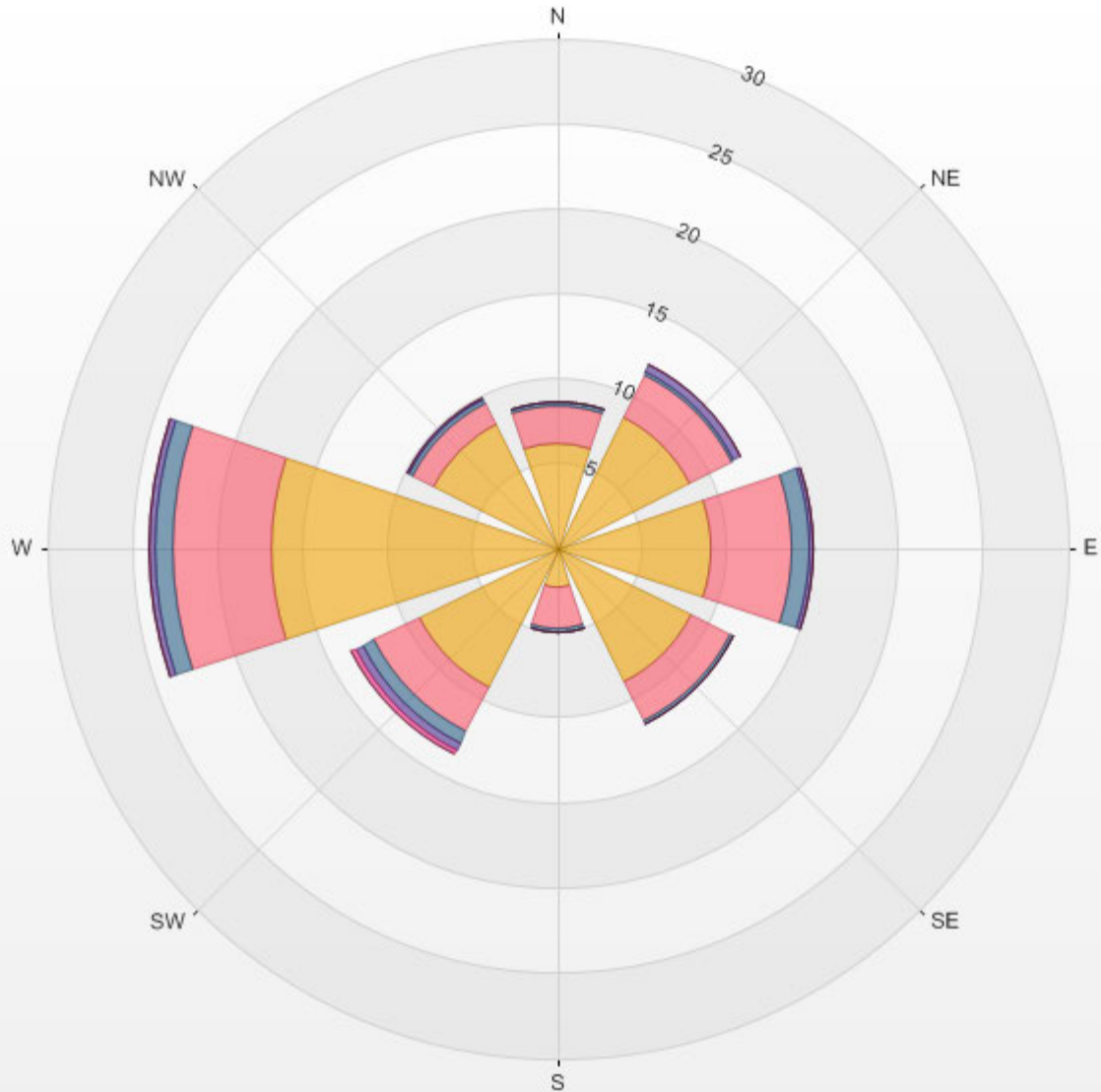
Calm Avg: 1.92 [ug/m3(L)]

Direction	0.0-5.1	5.1-10.2	10.2-15.4	15.4-20.5	20.5-25.6	>25.6	Total
<b>N</b>	6.2	2.2	0.3	0.0	0.0	0.0	8.7
<b>NE</b>	8.7	2.8	0.2	0.5	0.0	0.0	12.1
<b>E</b>	9.0	4.8	1.1	0.2	0.0	0.0	15.0
<b>SE</b>	8.8	2.5	0.3	0.0	0.0	0.0	11.6
<b>S</b>	2.3	2.5	0.2	0.0	0.0	0.0	5.0
<b>SW</b>	9.1	2.9	0.8	0.5	0.3	0.0	13.6
<b>W</b>	16.9	5.7	1.1	0.3	0.0	0.0	24.0
<b>NW</b>	8.2	1.4	0.2	0.2	0.0	0.0	9.9
<b>Summary</b>	69.2	24.8	4.0	1.5	0.3	0.0	100.0



% Icon Classes (ug/m3(L)) 69 0.0-5.1 25 5.1-10.2 4 10.2-15.4 2 15.4-20.5 0 20.5-25.6 0 >25.6

LICA ST. LINA Poll.: LICA ST. LINA-PM25[ug/m3(L)] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 0.15% Calm Poll Avg: 1.92[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	21.3	21.2	17.1	16.4	18.1	19.0	19.6	21.6	21.8	24.2	21.4	14.8	21.6	19.0	21.0	19.5	18.2	20.5	17.4	17.5	12.6	16.3	16.4	16.2	12.6	24.2	18.9	24	
2	16.6	16.5	16.2	17.5	16.4	14.9	15.0	15.3	15.8	15.8	14.3	16.7	15.9	13.3	13.9	18.0	14.4	20.4	16.9	12.9	16.3	21.0	17.4	16.9	12.9	21.0	16.2	24	
3	17.8	17.0	17.1	17.8	17.0	17.7	17.4	17.7	18.0	18.8	17.9	18.2	17.8	18.5	18.7	18.2	17.7	18.7	20.8	20.9	20.7	20.3	20.8	19.0	17.0	20.9	18.5	24	
4	21.3	17.8	21.1	12.5	14.1	24.0	23.2	14.4	24.7	7.8	13.0	8.1	12.9	14.1	16.5	16.6	18.5	11.9	14.4	17.0	17.9	16.3	15.2	15.7	7.8	24.7	16.2	24	
5	15.1	15.2	12.4	12.1	15.4	16.3	16.6	20.8	19.7	17.4	15.4	16.1	20.2	24.3	25.7	23.0	22.4	20.9	20.5	21.3	21.5	21.6	21.3	21.4	12.1	25.7	19.0	24	
6	20.6	22.1	16.4	12.6	11.4	21.1	9.7	22.2	21.5	19.7	17.5	18.7	11.6	7.0	12.9	20.3	23.2	21.9	21.6	21.4	17.3	15.0	15.4	12.4	7.0	23.2	17.2	24	
7	20.5	13.9	11.4	19.7	17.5	12.0	19.3	19.1	10.1	11.5	11.5	7.4	14.1	9.0	18.4	19.8	20.2	16.5	19.0	16.9	15.3	16.2	17.5	17.8	7.4	20.5	15.6	24	
8	18.7	19.7	20.6	21.7	13.8	18.9	12.8	17.4	16.5	15.6	14.2	14.7	13.1	17.2	12.4	13.6	13.4	13.2	12.4	19.9	16.6	14.0	16.6	19.3	12.4	21.7	16.1	24	
9	19.3	19.4	21.0	19.8	25.6	25.6	22.7	19.6	18.9	17.0	17.7	17.7	18.3	17.8	17.4	18.1	17.4	18.0	18.6	17.9	19.7	20.4	20.1	19.5	17.0	25.6	19.5	24	
10	19.7	20.0	18.9	17.3	20.7	20.3	18.4	17.9	18.8	19.3	17.4	14.8	14.6	19.2	18.6	19.3	17.5	18.6	19.3	22.0	17.7	9.2	12.0	15.7	9.2	22.0	17.8	24	
11	16.7	8.7	18.8	17.4	20.6	14.4	13.0	13.8	12.9	15.3	11.6	10.8	20.6	21.1	18.4	18.0	17.5	18.9	20.3	8.3	22.5	20.2	19.2	20.0	8.3	22.5	16.6	24	
12	20.7	18.7	17.2	17.7	15.9	17.5	18.1	15.0	16.7	18.3	19.1	17.4	16.1	18.1	18.1	15.0	12.4	12.1	14.1	16.5	13.4	10.5	7.7	6.5	6.5	20.7	15.5	24	
13	5.9	6.7	8.7	6.9	8.3	7.4	7.2	8.3	8.2	8.5	8.0	5.5	6.8	4.4	5.2	5.2	9.1	10.9	12.8	12.9	12.8	11.3	30.1	26.6	4.4	30.1	9.9	24	
14	12.9	10.5	10.1	10.1	10.3	10.0	9.5	5.5	12.0	11.8	11.7	11.8	15.3	16.1	16.1	9.7	19.3	18.5	15.6	16.0	16.4	17.1	14.9	16.4	5.5	19.3	13.2	24	
15	17.9	17.8	17.3	16.9	16.4	18.7	17.3	17.3	17.7	18.8	16.8	19.6	15.6	11.9	11.4	14.3	14.3	P	20.6	15.4	7.0	12.0	14.9	15.5	7.0	20.6	15.9	23	
16	20.1	19.0	12.0	21.4	23.6	26.0	18.3	21.3	21.4	22.4	21.3	19.1	14.9	12.7	14.3	18.8	20.6	19.8	19.1	9.1	20.2	20.7	20.2	21.3	9.1	26.0	19.1	24	
17	21.7	18.2	15.8	15.3	16.8	15.1	10.1	20.7	19.7	6.2	7.0	20.5	18.3	16.7	15.9	14.0	18.4	18.5	17.9	22.6	25.8	23.3	18.5	14.8	6.2	25.8	17.2	24	
18	14.7	14.7	11.2	12.7	12.2	13.0	14.4	14.2	13.3	13.6	14.5	14.9	15.3	15.0	14.9	13.4	14.1	16.0	16.7	16.8	16.5	18.1	17.7	19.1	11.2	19.1	14.9	24	
19	19.8	21.5	21.8	22.6	23.9	19.9	5.4	9.7	19.1	23.3	16.7	2.4	20.0	19.3	19.3	19.4	18.8	17.0	9.2	11.6	22.2	13.6	8.8	11.2	2.4	23.9	16.5	24	
20	13.9	16.1	10.9	14.7	21.4	20.5	21.1	19.6	20.4	21.3	20.0	20.2	8.5	11.6	15.1	19.6	18.4	24.6	24.8	7.5	7.3	4.5	6.4	12.5	4.5	24.8	15.9	24	
21	21.7	14.7	21.1	21.3	21.6	19.8	20.3	20.2	19.4	19.2	19.7	18.1	20.8	19.9	18.6	22.6	6.9	18.4	21.1	22.9	19.1	7.8	18.0	17.7	6.9	22.9	18.8	24	
22	20.2	23.1	21.0	17.4	18.4	20.4	15.2	14.4	18.2	20.4	18.7	13.2	12.6	18.0	11.7	15.9	18.4	17.0	17.0	10.0	23.5	11.8	23.5	22.7	10.0	23.5	17.6	24	
23	25.5	25.2	24.8	24.6	22.5	23.1	21.4	21.3	23.2	22.3	21.8	24.4	23.4	25.8	1.5	9.3	6.9	7.9	6.4	6.0	9.0	10.2	11.7	12.1	1.5	25.8	17.1	24	
24	13.3	14.6	15.5	15.1	14.1	14.4	15.5	13.0	13.6	15.1	14.5	13.6	13.4	13.2	14.4	12.9	14.4	14.0	13.3	13.1	14.3	14.0	14.3	13.8	12.9	15.5	14.1	24	
25	14.7	14.7	14.8	14.5	15.1	14.8	15.8	15.2	16.2	14.8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	14.5	16.2	15.1	10	
26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	10
27	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Y	12.8	13.6	10.6	9.4	7.1	7.0	6.9	7.4	6.9	13.6	9.4	8	
28	8.1	8.8	8.5	7.8	8.5	8.5	7.7	6.9	3.9	6.4	5.6	5.3	4.2	3.3	4.9	5.8	6.0	6.4	5.6	4.6	2.2	5.3	4.7	4.9	2.2	8.8	6.0	24	
29	5.4	6.2	7.0	7.3	8.0	9.0	8.4	10.2	8.9	11.1	16.1	12.7	13.2	16.1	17.3	12.5	15.0	6.8	5.8	6.4	8.0	9.5	10.8	12.0	5.4	17.3	10.2	24	
30	11.7	11.3	10.8	9.6	9.9	6.9	7.4	7.9	7.8	10.2	8.7	7.6	7.0	4.1	4.3	5.5	5.3	5.4	4.8	5.2	6.4	7.1	11.3	6.7	4.1	11.7	7.6	24	
HOURLY MAX	25.5	25.2	24.8	24.6	25.6	26.0	23.2	22.2	24.7	24.2	21.8	24.4	23.4	25.8	25.7	23.0	23.2	24.6	24.8	22.9	25.8	23.3	30.1	26.6					
HOURLY AVG	2.8	1.9	1.6	0.3	0.8	1.7	0.8	1.1	2.5	2.0	1.5	1.6	0.7	1.4	1.7	2.8	2.7	1.9	4.2	4.5	5.1	4.0	3.1	2.2					

STATUS FLAG CODES

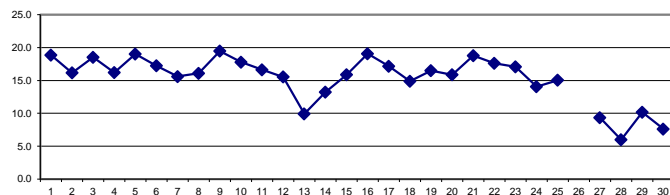
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	April 27, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

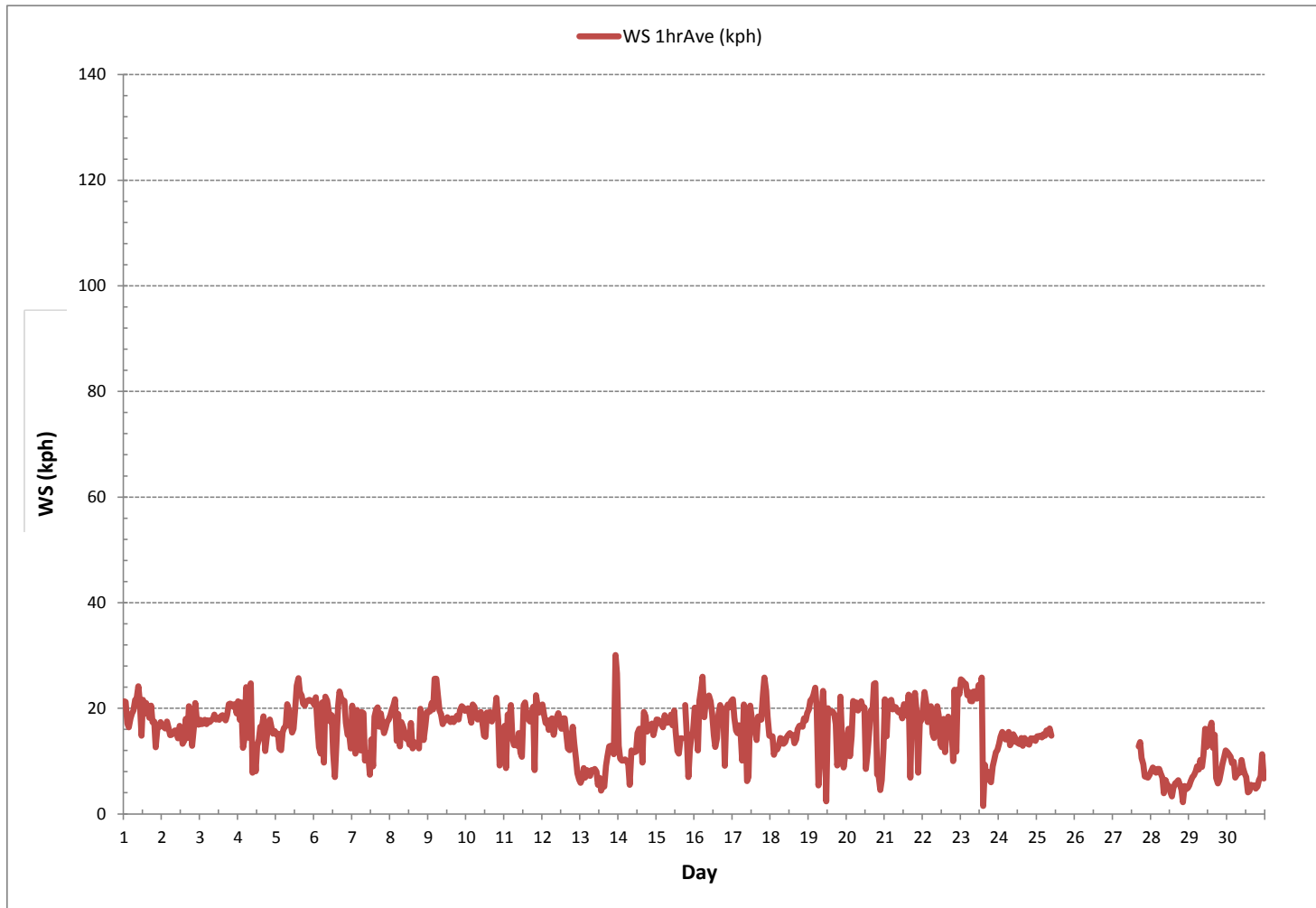
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	665
MINIMUM 1-HR AVERAGE	1.5 kph @ HOUR 14 ON DAY 23
MAXIMUM 1-HR AVERAGE:	30.1 kph @ HOUR 22 ON DAY 13
MAXIMUM 24-HR AVERAGE:	19.5 kph ON DAY 9
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	665 hrs
AMD OPERATION UPTIME:	92.4 %
STANDARD DEVIATION:	5.2
MONTHLY AVERAGE:	1.9 kph

24 HR AVERAGES April 2017



WIND SPEED Hourly Averages (WS kph)





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

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	28.4	27.6	23.4	26.9	26.4	25.4	26.2	25.7	26.2	30.4	29.7	28.2	28.0	27.1	28.9	24.6	23.8	26.9	26.4	22.9	32.1	22.4	22.3	24.0	22.3	32.1	26.4	24	
2	26.4	26.2	28.2	25.9	26.4	25.4	25.1	27.7	28.8	30.4	28.4	30.4	29.1	32.1	28.3	32.8	29.3	29.3	30.6	31.5	37.8	29.1	27.4	26.2	25.1	37.8	28.9	24	
3	26.5	27.1	27.8	26.7	26.7	27.8	26.9	28.9	27.6	30.9	27.6	31.4	34.4	33.7	33.6	31.6	31.0	28.4	28.3	27.7	30.1	28.6	27.3	30.1	26.5	34.4	29.2	24	
4	32.6	28.4	29.7	31.7	37.4	39.5	36.3	35.2	34.9	32.3	P	30.8	31.5	34.3	P	36.9	32.0	39.4	38.6	32.5	25.2	25.0	25.0	26.0	25.0	39.5	32.5	22	
5	25.9	25.7	22.4	22.6	26.3	28.3	30.7	33.3	31.2	29.0	33.4	33.2	50.1	55.8	53.2	46.5	45.3	40.9	34.4	37.8	34.8	39.6	33.9	39.1	22.4	55.8	35.6	24	
6	36.8	35.4	35.6	32.1	28.3	27.7	27.2	27.9	27.5	28.7	30.4	31.8	34.6	33.3	31.8	30.7	30.7	29.5	26.7	26.0	25.4	24.9	29.1	30.4	24.9	36.8	30.1	24	
7	34.5	40.4	37.8	36.2	36.8	38.2	28.9	38.4	35.4	36.3	35.4	31.7	33.1	34.5	39.1	29.0	33.7	32.5	35.1	29.9	29.9	28.1	28.6	32.0	28.1	40.4	34.0	24	
8	32.3	37.3	37.5	38.4	38.2	43.4	41.0	38.8	38.8	38.6	43.8	40.8	37.1	37.8	38.6	36.9	42.6	42.4	40.6	33.6	27.2	25.7	25.9	26.6	25.7	43.8	36.8	24	
9	27.2	26.6	25.9	25.9	32.9	35.3	32.3	29.5	30.4	31.1	30.6	32.4	34.1	32.5	30.6	31.2	32.8	28.6	26.8	27.2	27.9	27.5	35.5	31.2	25.9	35.5	30.3	24	
10	31.7	33.4	34.3	31.2	29.0	31.7	27.5	28.9	27.6	27.9	27.9	28.8	27.7	29.0	29.7	31.0	28.4	28.1	27.3	27.7	30.1	34.3	33.2	34.9	27.3	34.9	30.1	24	
11	32.5	31.2	31.0	31.7	31.0	34.5	33.4	59.5	36.9	32.5	33.6	35.0	31.7	31.5	29.5	26.8	29.0	27.9	27.0	27.7	27.5	28.4	26.1	26.4	26.1	59.5	31.8	24	
12	27.5	26.3	25.3	27.3	28.2	25.9	27.9	27.5	26.2	29.4	30.1	29.0	28.3	31.3	32.8	29.9	28.9	26.9	24.9	26.4	25.5	22.0	25.5	22.7	22.0	32.8	27.3	24	
13	34.1	26.5	26.4	29.2	28.4	40.4	29.7	37.5	33.8	32.3	33.4	48.1	40.4	45.5	43.2	42.7	35.8	35.1	35.1	37.4	39.5	52.4	56.6	55.2	26.4	56.6	38.3	24	
14	36.9	36.9	38.0	51.8	48.1	34.5	33.2	P	30.8	P	P	P	P	30.8	32.7	P	33.8	28.1	28.1	26.5	26.1	28.8	27.0	31.9	26.1	51.8	33.6	18	
15	29.5	26.8	26.8	26.2	28.4	28.0	27.3	30.4	28.1	29.2	31.7	28.6	28.6	26.6	27.7	P	P	P	32.9	30.7	27.9	27.9	28.5	27.8	26.2	32.9	28.6	21	
16	32.2	27.1	28.6	33.5	40.3	36.3	27.4	26.3	27.6	30.9	34.3	27.8	30.6	33.0	35.6	36.0	34.1	36.9	29.7	30.3	29.3	31.8	34.2	33.5	26.3	40.3	32.0	24	
17	35.0	37.9	37.6	36.5	36.1	33.5	30.3	32.5	27.7	29.5	33.3	30.2	28.7	27.5	26.4	27.6	27.8	33.2	28.4	33.0	35.4	32.5	28.4	26.8	26.4	37.9	31.5	24	
18	26.4	29.3	25.3	25.1	25.3	26.8	27.7	27.5	26.2	26.4	27.9	27.9	27.8	27.2	27.4	27.6	25.8	25.8	26.2	27.4	27.1	24.5	25.8	26.0	24.5	29.3	26.7	24	
19	28.0	30.0	29.1	28.6	30.2	35.0	29.5	27.1	30.0	38.1	30.0	34.5	32.6	31.3	32.9	29.5	27.2	28.8	28.3	27.9	27.2	27.3	27.5	28.3	27.1	38.1	30.0	24	
20	31.6	30.2	28.6	31.3	27.2	33.6	33.7	33.2	34.8	33.7	29.5	30.6	30.0	30.0	28.3	31.1	31.1	32.2	29.8	31.0	28.3	31.0	27.6	36.7	27.2	36.7	31.0	24	
21	37.6	38.9	37.8	36.1	37.1	31.2	29.9	29.4	30.5	30.1	31.6	32.5	32.7	32.9	32.5	31.1	30.9	29.0	29.1	27.4	29.7	29.1	44.9	40.1	27.4	44.9	33.0	24	
22	36.4	35.7	42.9	46.6	42.5	31.9	39.2	40.9	41.5	30.2	30.4	30.7	30.9	33.6	35.5	41.6	42.7	44.2	32.6	29.1	28.2	40.9	42.5	52.1	28.2	52.1	37.6	24	
23	52.3	55.3	56.5	48.2	51.4	47.0	45.2	42.4	45.0	47.9	49.2	61.0	54.8	61.0	52.0	27.3	28.8	24.0	22.9	38.6	24.2	24.1	23.9	24.9	22.9	61.0	42.0	24	
24	26.9	28.9	27.1	27.1	25.6	26.2	25.3	25.1	27.1	27.7	27.3	27.1	27.1	26.4	28.2	26.5	25.8	26.4	24.5	26.2	25.7	25.4	30.0	25.1	24.5	30.0	26.6	24	
25	25.6	26.7	26.9	26.7	29.1	26.6	27.5	27.9	26.7	27.3	P	X	X	X	X	X	X	X	X	X	X	X	X	X	25.6	29.1	33.5	10	
26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
27	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Y	25.8	29.4	20.6	17.7	13.2	14.3	10.8	10.0	10.0	10.0	29.4	17.7	8
28	11.3	15.2	13.3	13.3	12.8	13.2	15.0	13.6	11.6	15.7	13.1	16.7	13.6	14.9	19.8	14.6	16.5	14.4	13.8	8.4	7.7	7.5	6.1	6.9	6.1	19.8	12.9	24	
29	7.2	7.5	11.2	9.6	10.2	11.8	16.8	18.8	18.6	26.0	29.2	26.2	26.9	32.7	32.6	32.2	30.6	19.4	14.3	12.5	13.4	13.8	16.4	20.2	7.2	32.7	19.1	24	
30	17.4	17.7	17.2	18.3	15.0	14.3	13.7	15.3	14.5	20.7	18.8	24.0	21.5	16.6	17.5	13.6	11.5	15.6	10.0	8.7	13.1	14.0	25.0	14.7	8.7	25.0	16.2	24	
HOURLY MAX	52.3	55.3	56.5	51.8	51.4	47.0	45.2	59.5	45.0	47.9	49.2	61.0	54.8	61.0	53.2	46.5	45.3	44.2	40.6	38.6	39.5	52.4	56.6	55.2					
HOURLY AVG	29.7	29.9	29.7	30.2	30.5	30.5	29.1	30.7	29.5	30.5	30.8	31.9	31.8	32.7	32.6	30.8	30.2	29.8	27.6	27.3	26.8	27.2	28.4	28.9					

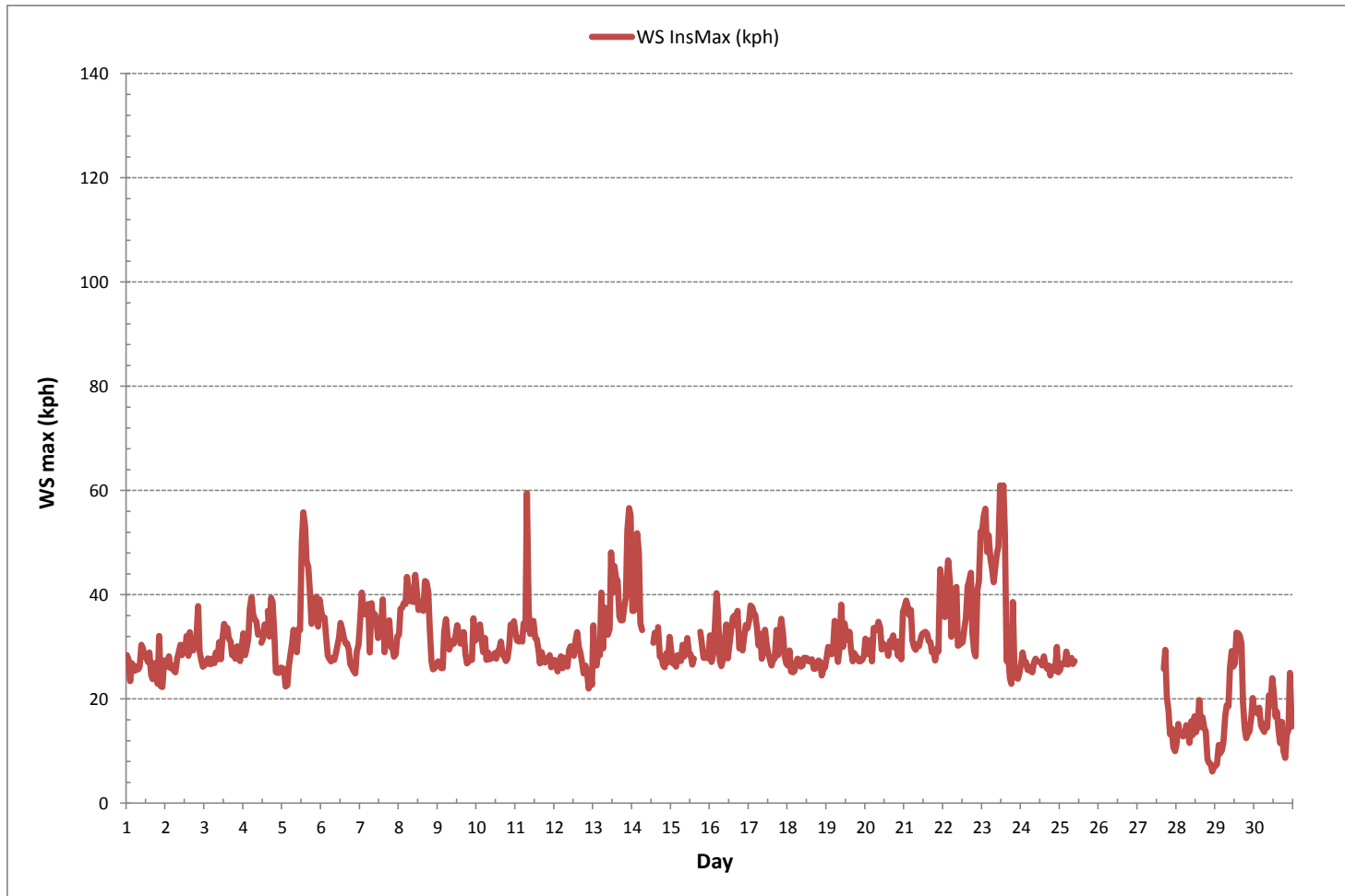
STATUS FLAG CODES

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

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	61.0	kph	@ HOUR	11	ON DAY	23	
OPERATIONAL TIME:						655	hrs

WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA ST. LINA  
 Monitor: WSP [kph]  
 Monthly: 17/04  
 Type: WindRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

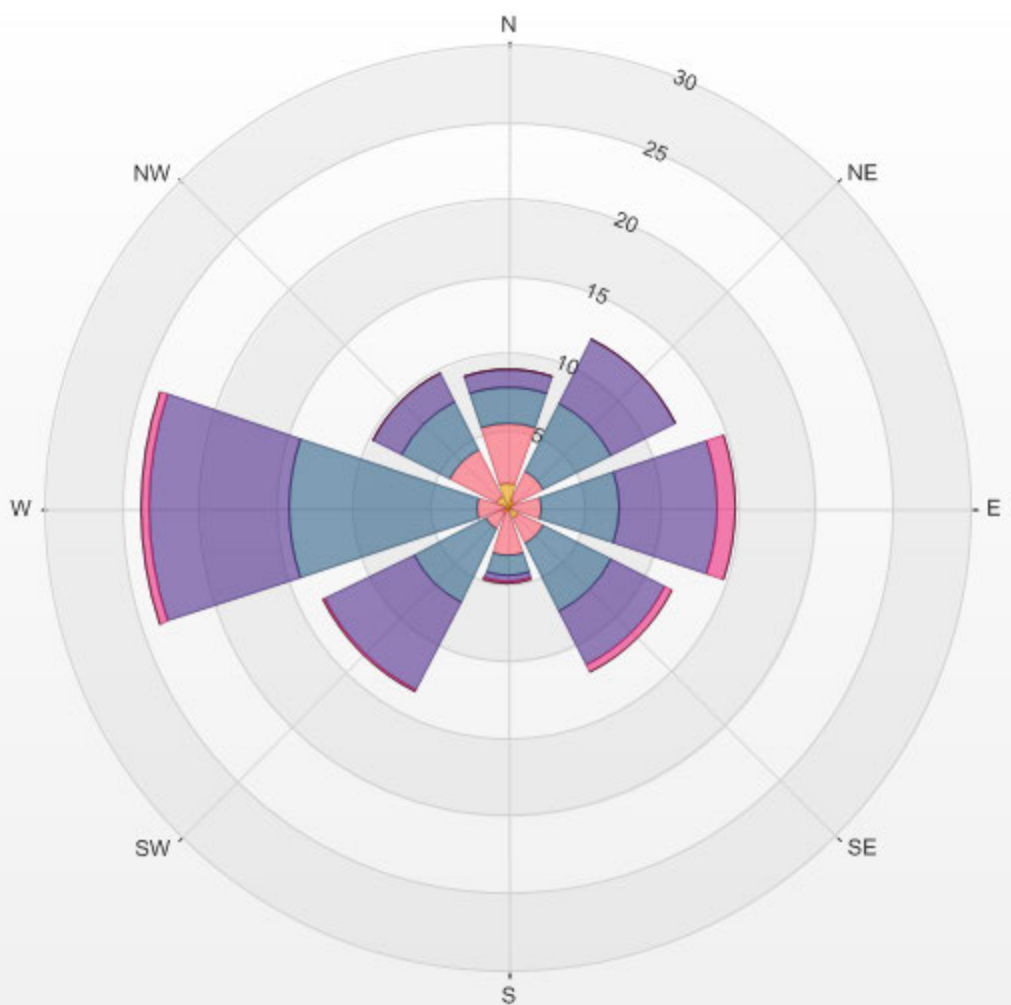
Calm: 0.15%

Calm Avg: 0.00 [kph]

Direction	1.8-6.0	6.0-12.1	12.1-18.1	18.1-24.2	24.2-30.2	>30.2	Total
<b>N</b>	1.6	3.9	2.3	1.2	0.0	0.0	9.0
<b>NE</b>	0.6	2.0	4.9	4.7	0.0	0.0	12.2
<b>E</b>	0.3	1.9	5.1	6.4	1.2	0.0	14.8
<b>SE</b>	0.7	1.9	4.9	3.8	0.6	0.0	11.9
<b>S</b>	0.2	2.9	1.3	0.4	0.2	0.0	5.0
<b>SW</b>	0.4	1.2	5.2	6.4	0.2	0.0	13.4
<b>W</b>	0.2	1.9	12.2	9.0	0.6	0.0	23.8
<b>NW</b>	0.9	3.3	3.5	2.0	0.0	0.0	9.7
<b>Summary</b>	4.8	19.0	39.5	33.9	2.6	0.0	100.0

% Icon	Classes (kph)	5	1.8-6.0	19	6.0-12.1	40	12.1-18.1	34	18.1-24.2	3	24.2-30.2	0	>30.2
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LICA ST. LINA 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 0.15% Calm Wind Avg Speed: 1.47(kph)





***WIND DIRECTION***



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

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.	
DAY																											
1	ESE	ESE	E	ENE	ENE	ENE	ENE	E	E	E	E	ESE	E	E	ENE	E	ESE	ESE	ESE	ESE	E	ESE	E	E	E	E	24
2	ENE	ENE	ENE	E	ENE	ENE	E	ENE	ENE	NE	NE	NE	NE	NE	NE	NE	NE	NE	W	NE	NE	ENE	ENE	ENE	ENE	E	24
3	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	NE	ENE	ENE	NE	NE	ENE	ENE	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	24
4	ENE	ENE	ENE	ENE	ENE	E	E	E	W	WSW	SW	SSW	SE	SE	SE	SW	SW	SW	NNW	WNW	W	W	W	W	W	W	24
5	W	WSW	SW	WSW	WSW	WSW	SW	SW	SW	WSW	SW	SW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	24
6	SW	SW	SSW	SSE	SW	WSW	SE	E	E	ENE	ENE	ENE	ENE	N	ENE	W	W	WSW	W	W	W	WSW	W	NE	WSW	24	
7	WNW	NNW	NNW	NE	NE	NNW	NE	NE	N	N	NNE	N	NE	NNW	WNW	WNW	WNW	WNW	NNW	WNW	WNW	WNW	WNW	WNW	WNW	NNW	24
8	WNW	WNW	WNW	WNW	NNW	NW	NNW	NNE	NNE	NNE	N	N	NNE	NE	NNE	NNE	NNW	NNW	NNW	WNW	WNW	WNW	WNW	W	NNW	24	
9	W	W	W	W	W	W	W	W	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	WSW	24
10	SW	SW	SW	SW	SW	SW	WSW	WSW	SW	SW	WSW	WSW	WSW	W	WSW	W	W	WNW	WNW	WNW	WNW	NNW	NW	WNW	WSW	24	
11	WNW	N	NE	NE	ENE	NE	NNE	NE	NNE	WNW	NW	NW	WNW	WNW	WNW	WNW	W	W	W	WNW	W	WNW	WNW	WNW	NW	24	
12	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	W	WNW	W	W	WNW	W	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	24
13	NNW	NW	NNW	NNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNE	N	NNW	N	NNW	NNW	NNW	NNW	N	N	E	ESE	ESE	N	24
14	N	N	N	N	N	NNW	NNW	NNE	NW	NW	NW	NW	WNW	NW	NW	SE	SE	SSE	SE	SE	SSE	SSE	SE	SE	N	24	
15	SE	SSE	SSE	SSE	SSE	SSE	SSE	SE	SSE	SSE	SE	SSE	SSE	SSE	SSE	SSE	SSE	P	WNW	WNW	NW	NE	ENE	ENE	SSE	23	
16	ENE	ENE	NE	ENE	ENE	E	E	E	E	E	ESE	ESE	SE	SE	SE	SE	ESE	ESE	SSE	SW	SW	SW	SW	SW	ESE	24	
17	SW	SSW	S	SSE	SE	SE	SSW	WSW	WSW	SSW	ESE	W	W	W	WNW	WNW	W	W	W	WSW	W	W	W	W	WSW	24	
18	W	W	W	WNW	WNW	WNW	W	W	W	W	W	W	W	W	W	W	W	W	WNW	W	W	W	W	W	W	W	24
19	W	W	W	W	W	W	N	WNW	SSE	S	S	ENE	E	ENE	E	ESE	ESE	SE	SE	ESE	SW	S	S	S	S	24	
20	SE	SE	SSE	SW	WSW	SW	SW	SW	SW	SW	SW	SW	SSE	ESE	ESE	E	ENE	E	E	ESE	W	NE	N	NW	S	24	
21	WNW	NW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	W	W	W	W	WSW	W	NNE	N	N	N	N	ENE	SE	SE	WNW	24	
22	SE	SE	SE	ESE	SE	SE	SE	ESE	SE	SE	SE	SE	SE	SE	E	NE	NNE	NE	NNE	NE	SSE	ESE	SE	ESE	ESE	24	
23	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	SE	ESE	ESE	ESE	ESE	ESE	ENE	NW	WNW	WNW	W	WNW	W	W	W	W	ESE	24	
24	W	W	W	W	W	W	W	W	W	WSW	WSW	WSW	W	W	WSW	WSW	WSW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	24	
25	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	N	10
26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	24
27	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Y	ENE	E	ESE	E	ENE	NE	NE	ENE	ENE	ENE	8
28	NNE	NNE	NNE	NNE	NNE	N	NNE	NE	NNE	N	N	N	NNW	E	SE	SE	SE	SE	SE	S	SW	WNW	WNW	WSW	NNE	24	
29	SW	SW	SW	SSW	SSW	S	S	S	S	S	S	SSW	SW	SW	WSW	WSW	WNW	WSW	SSW	S	SSE	SSW	S	S	SSW	24	
30	S	S	SSE	SSE	S	SE	E	ESE	ESE	E	ESE	SE	SE	SE	N	N	NNW	NW	NNE	NNE	NNE	NNW	NNW	NNE	ESE	24	

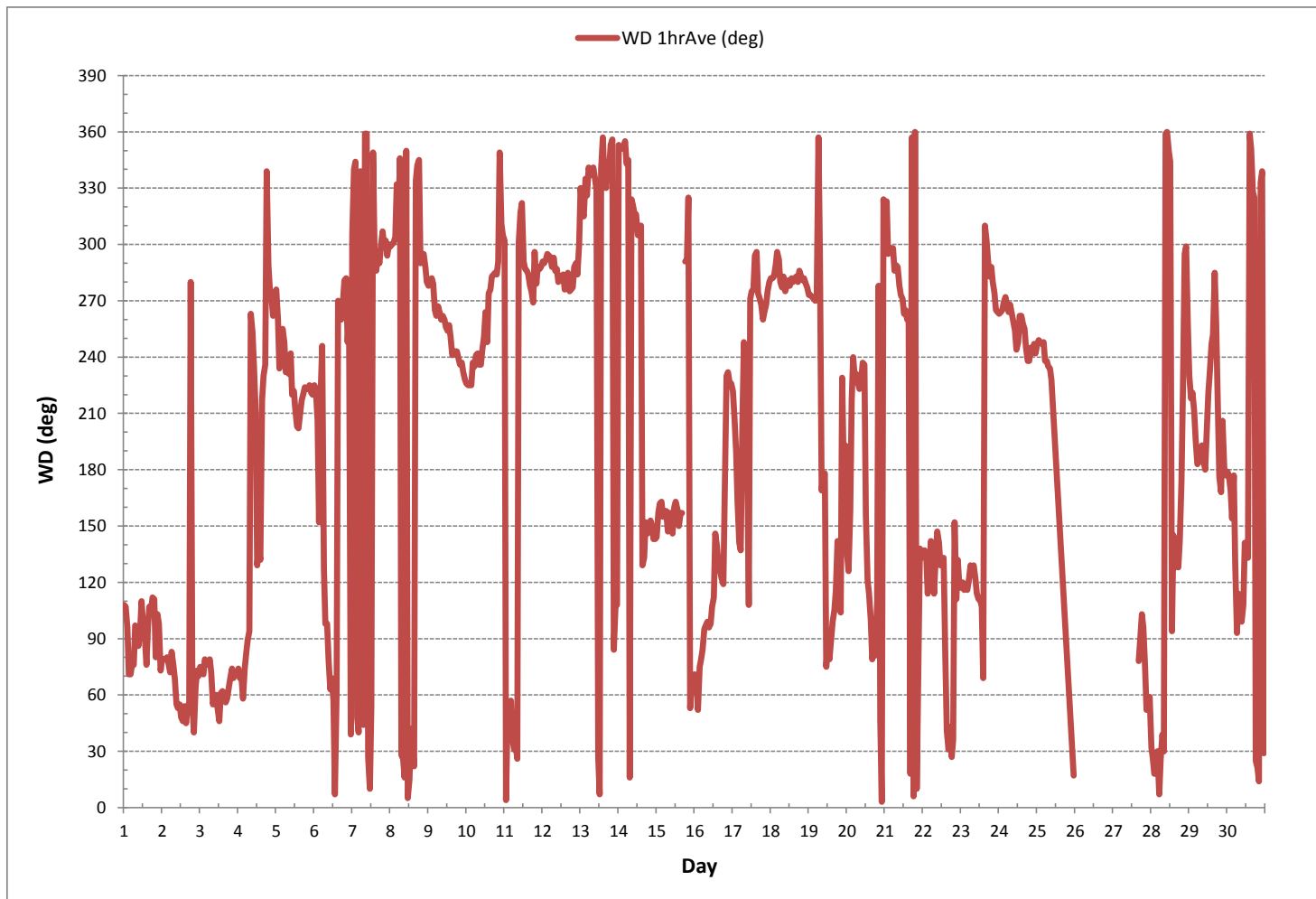
STATUS FLAG CODES

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

LAST CALIBRATION:	April 27, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	665	hrs
STANDARD DEVIATION:	100		AMD OPERATION UPTIME:	92.4	%
			MONTHLY AVERAGE:	253	(WSW)

WIND DIRECTION Hourly Averages (WD)



***STANDARD DEVIATION WIND DIRECTION***



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

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	
DAY																									
1	28	4	6	9	7	4	5	3	2	5	26	54	7	9	9	4	5	4	6	5	48	5	3	6	24
2	8	7	9	6	8	11	9	12	13	19	23	18	21	30	25	19	22	16	45	49	51	13	9	10	24
3	8	9	10	8	9	8	9	10	14	14	13	17	27	22	29	20	14	12	12	5	5	5	4	18	24
4	10	38	8	32	45	4	6	61	28	72	63	57	59	55	41	45	16	34	39	11	5	8	10	8	24
5	8	9	15	16	10	9	14	18	18	13	20	21	24	27	29	25	32	13	16	17	17	26	33	24	
6	34	31	54	65	57	29	59	17	10	12	37	24	60	76	63	25	6	5	2	4	7	14	12	49	24
7	32	51	62	26	27	53	11	35	66	66	67	78	57	65	39	13	13	14	14	18	17	16	13	14	24
8	14	15	28	26	60	44	46	50	52	58	60	57	56	42	56	58	60	58	62	34	15	17	12	7	24
9	6	7	6	4	2	2	4	8	9	13	12	19	22	29	31	33	30	18	10	8	12	14	28	34	24
10	35	33	38	44	21	16	9	10	17	19	11	21	21	11	9	9	10	12	21	13	43	74	61	52	24
11	48	48	35	42	19	55	62	59	62	53	62	68	27	18	14	12	11	9	3	50	22	32	7	7	24
12	8	8	10	11	14	11	11	16	12	12	11	12	14	13	11	17	23	23	15	8	15	23	43	49	24
13	51	50	36	49	42	48	49	44	46	43	48	73	61	67	67	63	39	37	26	29	31	30	12	30	24
14	27	37	37	37	37	34	38	34	24	22	35	22	17	17	18	16	14	12	15	14	12	13	17	14	24
15	14	12	10	10	11	9	11	13	9	12	14	10	17	23	25	15	15	P	23	50	73	61	53	50	23
16	29	33	62	22	5	4	43	3	4	6	13	7	45	57	57	39	19	33	36	61	31	26	33	29	24
17	28	47	57	58	51	54	57	24	27	42	51	6	7	9	15	19	9	10	8	5	2	3	8	14	24
18	14	17	27	18	22	20	15	17	18	17	16	13	13	12	11	17	13	11	11	10	9	8	8	6	24
19	5	4	4	3	4	41	80	62	44	19	56	58	27	15	27	8	9	45	60	59	13	10	49	58	24
20	59	43	51	51	17	28	23	31	30	21	26	23	55	50	43	26	42	16	18	30	53	52	40	62	24
21	24	55	19	22	19	15	15	12	13	12	10	33	23	30	41	8	54	38	25	3	42	46	46	49	24
22	39	23	33	52	46	35	55	56	39	21	38	60	59	45	56	50	38	50	49	64	13	55	20	39	24
23	31	30	34	33	41	36	37	38	29	36	42	37	40	36	47	35	49	45	57	58	37	31	26	25	24
24	19	16	13	13	13	15	12	20	18	12	17	16	19	19	15	16	13	15	17	17	14	14	13	15	24
25	11	12	12	12	14	14	15	17	18		X	X	X	X	X	X	X	X	X	X	X	X	X	X	10
26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Y		14	13	11	11	10	10	7	5
28	4	7	7	10	8	9	11	13	29	20	27	29	33	36	49	27	31	21	17	8	17	4	3	3	
29	3	2	5	5	5	5	12	14	16	20	15	20	17	18	14	19	14	26	17	9	10	7	7	8	
30	8	8	11	11	7	16	11	15	15	12	16	25	38	43	41	26	18	23	14	10	10	13	13	14	

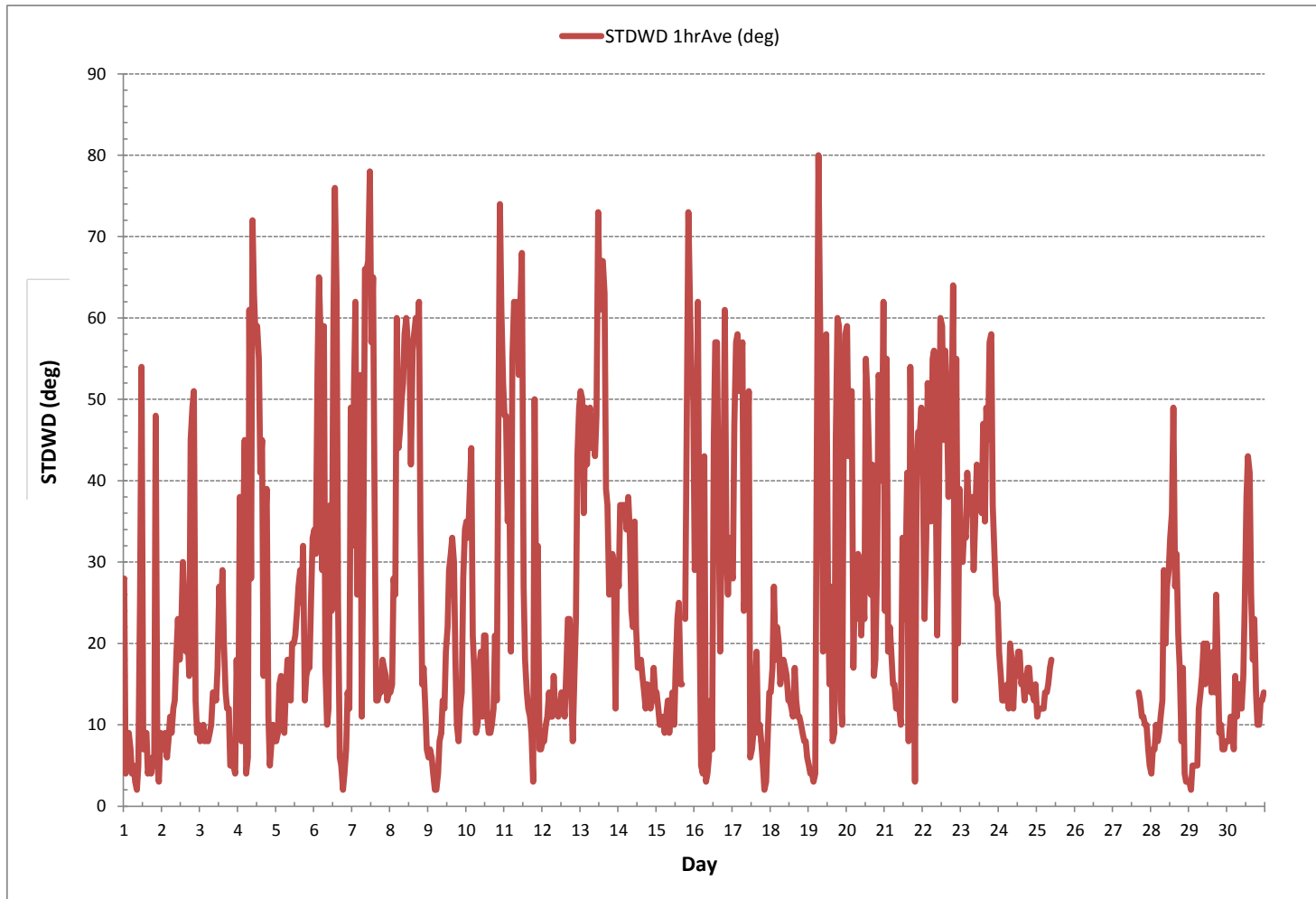
STATUS FLAG CODES

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

LAST CALIBRATION: April 27, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 665 hrs

**STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)**



***RELATIVE HUMIDITY***



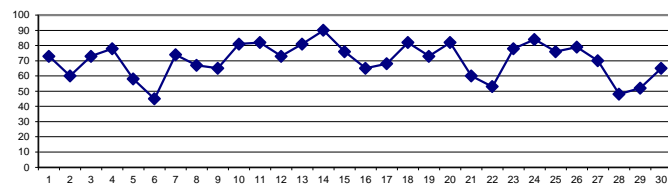
RELATIVE HUMIDITY Hourly Averages (RH %)

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

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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 April 2017

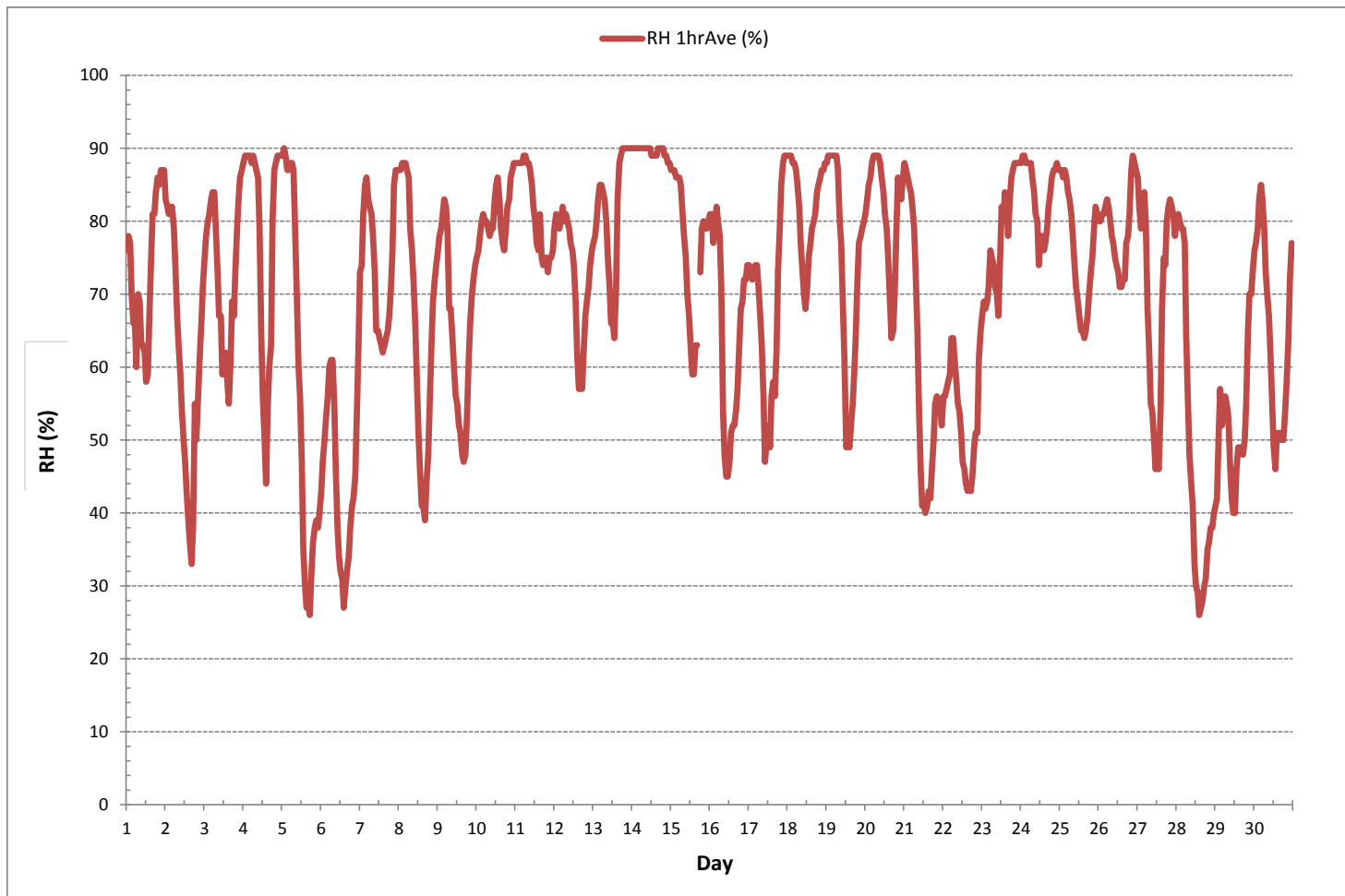


MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	26	%	@ HOUR	17	ON DAY	5
MAXIMUM 1-HR AVERAGE:	90	%	@ HOUR	1	ON DAY	5
MAXIMUM 24-HR AVERAGE:	90	%			ON DAY	14
OPERATIONAL TIME:						719 hrs
AMD OPERATION UPTIME:						99.9 %
STANDARD DEVIATION:	16		MONTHLY AVERAGE:			70 %



RELATIVE HUMIDITY Hourly Averages (RH %)



## ***BAROMETRIC PRESSURE***



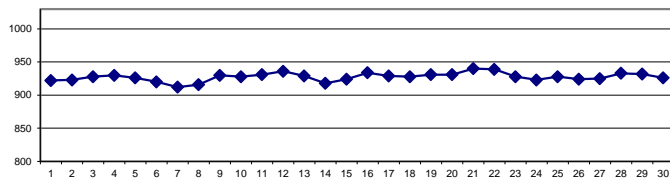
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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 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	925	925	925	925	924	924	923	923	923	923	923	923	922	922	922	921	921	921	921	920	921	920	920	920	920	920	925	922	24
2	920	920	920	920	920	921	921	921	922	922	923	923	923	924	924	924	925	925	924	924	925	925	925	925	925	920	925	923	24
3	925	925	925	925	926	926	926	927	927	928	929	929	930	930	930	930	930	929	930	929	929	929	929	929	929	925	930	928	24
4	929	929	929	929	929	929	929	930	930	931	931	931	931	931	931	930	930	929	929	928	929	928	928	928	928	928	931	930	24
5	927	927	927	927	927	927	926	926	926	927	927	928	927	927	927	927	926	925	924	924	923	923	922	922	922	922	928	926	24
6	922	921	920	920	920	920	920	920	921	922	922	922	922	922	921	920	920	919	918	917	916	915	915	915	915	915	922	920	24
7	913	912	912	912	912	912	913	913	913	913	913	914	914	914	913	913	912	912	911	911	911	910	910	910	910	910	914	912	24
8	909	909	909	909	910	911	912	912	913	914	915	916	918	919	920	920	921	921	922	922	923	923	924	924	909	924	916	24	
9	924	925	925	925	926	927	928	929	930	930	931	932	932	933	933	933	933	932	931	931	931	931	931	930	924	933	930	24	
10	930	930	929	929	928	928	928	928	928	927	927	927	927	927	927	927	927	927	927	927	927	927	927	926	926	930	928	24	
11	926	927	927	927	928	928	929	929	929	930	931	931	931	932	932	932	933	933	933	934	934	934	934	934	926	934	931	24	
12	934	934	934	934	934	935	935	936	937	937	938	938	938	938	938	939	938	938	938	937	936	936	936	936	934	939	936	24	
13	935	935	934	934	933	932	932	932	931	931	931	931	930	929	928	928	927	926	926	925	925	924	923	922	922	935	929	24	
14	921	921	920	920	919	918	918	918	917	917	917	916	916	916	916	916	917	917	917	917	918	918	918	918	916	921	918	24	
15	918	918	918	919	919	920	920	921	922	923	924	925	925	926	927	927	P	928	929	930	930	930	931	918	931	924	23		
16	931	932	932	932	933	933	933	934	935	936	937	937	936	936	936	935	935	935	934	933	932	931	931	930	930	930	937	934	24
17	929	929	928	928	927	927	927	927	927	928	929	930	930	929	929	929	929	929	929	929	929	929	929	929	927	930	929	24	
18	929	928	928	928	928	928	928	928	929	929	929	929	929	928	928	928	928	927	927	927	927	927	927	927	927	927	929	928	24
19	928	928	928	928	928	929	929	929	930	931	932	933	934	934	934	934	934	934	933	932	932	931	931	931	928	934	931	24	
20	931	931	931	931	930	930	930	930	930	931	931	931	931	931	931	932	933	932	932	931	932	932	933	933	930	933	931	24	
21	934	935	936	937	937	938	939	940	941	941	942	943	943	943	943	943	942	942	941	940	940	940	940	934	943	940	24		
22	940	940	940	939	939	939	939	939	939	940	941	941	941	941	940	940	939	938	937	936	936	935	935	935	935	941	939	24	
23	934	933	932	931	931	930	930	929	929	929	928	928	927	926	926	925	925	925	924	924	924	924	923	923	923	934	928	24	
24	923	922	922	922	922	921	922	922	922	922	923	923	923	924	924	924	924	924	925	925	925	925	926	926	921	926	923	24	
25	926	926	926	927	927	927	928	928	929	929	929	930	930	930	930	930	930	929	929	929	929	928	928	928	926	930	928	24	
26	927	927	926	926	925	925	925	924	924	924	924	924	924	923	923	923	923	923	923	923	923	922	922	922	922	927	924	24	
27	922	922	922	922	922	922	923	923	924	925	925	925	925	926	926	926	926	927	927	927	927	927	927	928	922	928	925	24	
28	928	928	929	929	929	930	931	932	933	934	934	935	935	935	936	936	936	936	936	935	934	934	934	934	928	936	933	24	
29	933	933	933	933	933	933	933	933	934	934	934	933	933	933	932	932	932	931	930	929	928	927	926	926	926	934	932	24	
30	926	925	925	925	924	924	924	924	925	925	926	926	926	927	927	927	927	927	927	927	927	927	927	927	924	927	926	24	
HOURLY MAX	940	940	940	939	939	939	939	940	941	941	942	943	943	943	943	943	943	942	942	941	940	940	940	940					
HOURLY AVG	927	927	926	926	926	926	927	927	927	928	928	928	928	929	929	928	928	928	928	928	927	927	927	927					

STATUS FLAG CODES

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

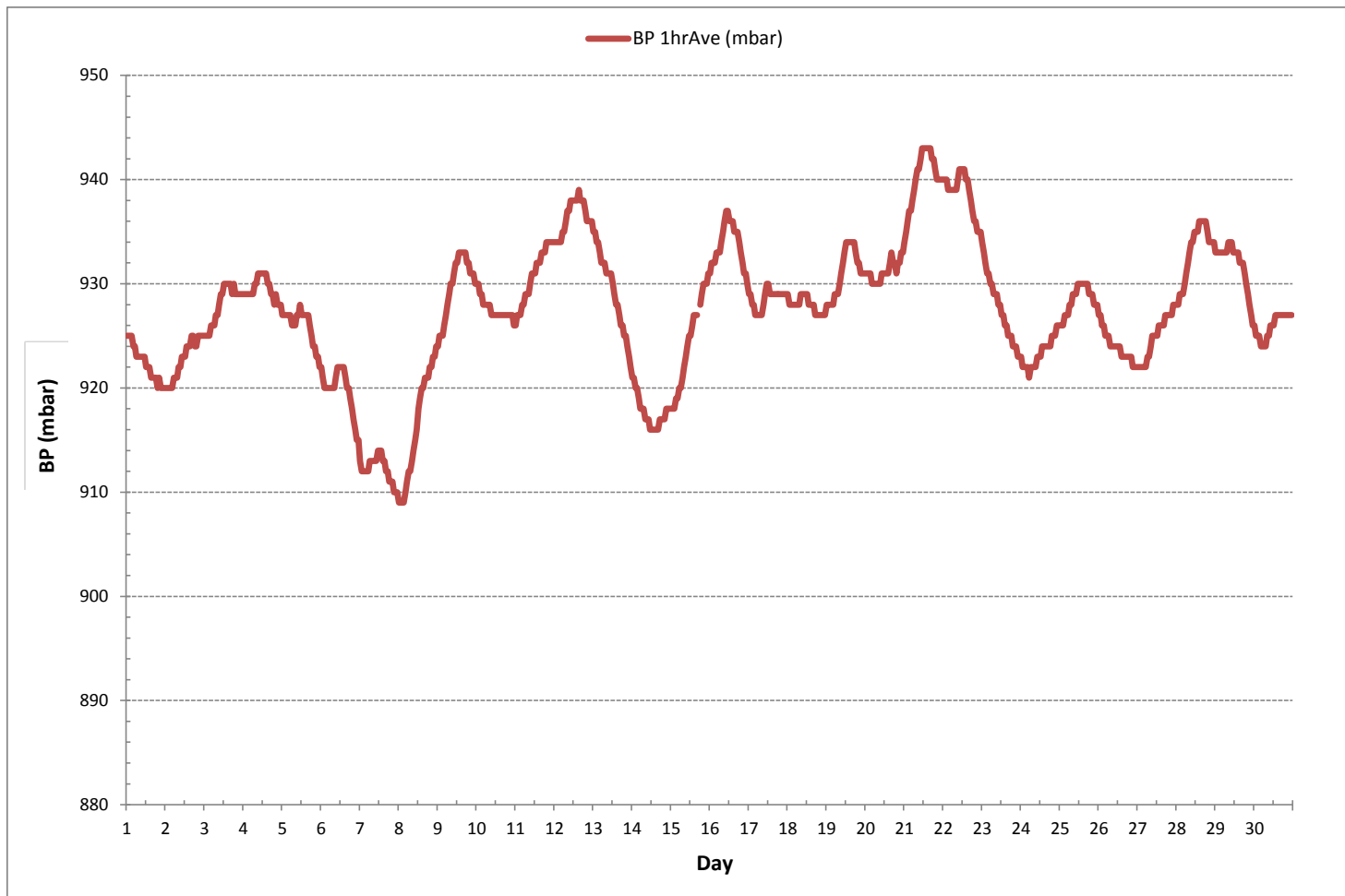
24 HR AVERAGES April 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	909	mbar	@ HOUR	0	ON DAY	8
MAXIMUM 1-HR AVERAGE:	943	mbar	@ HOUR	11	ON DAY	21
MAXIMUM 24-HR AVERAGE:	940	mbar			ON DAY	21
OPERATIONAL TIME:						719 hrs
AMD OPERATION UPTIME:						99.9 %
STANDARD DEVIATION:	7					
MONTHLY AVERAGE:						927 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



***AMBIENT TEMPERATURE***



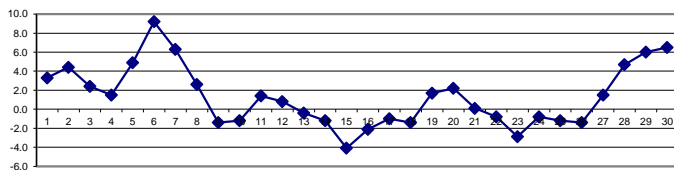
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	2.7	2.2	2.2	3.2	3.3	2.9	3.6	2.0	3.0	4.7	4.9	5.1	6.0	6.3	5.4	4.4	3.8	3.5	2.9	2.5	2.0	0.8	0.6	0.5	0.5	6.3	3.3	24	
2	0.5	0.1	0.2	-0.3	-0.4	-0.2	0.3	2.1	3.8	5.3	6.6	8.0	8.6	9.3	9.7	10.1	10.1	8.5	5.7	5.7	4.9	3.3	2.0	0.9	-0.4	10.1	4.4	24	
3	0.1	-0.4	-0.5	-0.7	-1.2	-1.4	-1.2	0.2	2.4	3.8	3.8	6.6	7.0	6.9	7.2	7.7	5.7	4.4	3.7	1.7	0.9	0.4	-0.1	-0.6	-1.4	7.7	2.4	24	
4	-1.1	-1.1	-1.1	-1.6	-2.7	-3.0	-2.6	-1.9	1.2	3.5	4.3	6.0	6.8	7.8	7.4	6.0	5.4	4.7	1.4	0.1	-0.7	-0.9	-1.1	-1.3	-3.0	7.8	1.5	24	
5	-1.4	-1.7	-1.1	-0.8	-1.1	-1.5	-1.5	-1.2	1.1	3.5	5.5	7.2	9.1	10.6	11.3	11.4	11.8	11.3	9.7	8.7	7.8	6.7	6.4	6.1	-1.7	11.8	4.9	24	
6	5.6	5.3	4.9	4.5	3.9	3.1	2.9	3.3	5.7	8.8	12.1	13.5	14.5	15.0	15.6	15.0	14.1	13.2	11.4	10.5	10.0	9.9	9.5	7.9	2.9	15.6	9.2	24	
7	6.3	5.7	4.4	3.6	3.2	3.5	4.1	4.8	5.9	7.2	9.3	9.1	9.4	9.9	10.0	9.6	9.0	8.4	7.3	6.1	5.0	3.6	2.8	2.1	2.1	10.0	6.3	24	
8	1.7	1.2	0.7	0.5	0.7	0.6	0.5	0.7	1.3	2.4	4.4	6.0	7.1	7.3	8.0	7.5	7.8	5.8	3.7	1.8	0.4	-1.7	-2.9	-3.7	-3.7	8.0	2.6	24	
9	-4.6	-5.2	-5.6	-6.0	-6.2	-5.1	-4.4	-1.9	-2.6	-1.9	-0.7	0.3	0.8	2.0	2.9	4.1	4.2	3.5	2.3	0.3	-1.1	-2.2	-2.6	-2.9	-6.2	4.2	-1.4	24	
10	-3.2	-3.4	-3.7	-4.1	-4.4	-4.1	-4.0	-3.7	-2.9	-2.2	-1.5	-1.2	-1.0	-1.1	0.7	2.3	2.9	3.0	2.0	1.1	0.7	0.2	-0.4	-0.6	-4.4	3.0	-1.2	24	
11	-0.6	-0.2	-0.3	-0.3	-0.5	-1.0	-1.0	-0.7	-0.6	0.4	1.1	1.9	2.6	3.4	3.9	3.3	4.8	4.6	3.8	3.2	2.4	1.7	1.5	0.8	-1.0	4.8	1.4	24	
12	-0.1	-1.4	-2.2	-2.7	-3.1	-3.6	-3.1	-2.4	-1.3	-0.2	1.0	1.8	2.2	3.3	5.1	6.4	5.7	5.2	3.5	1.9	1.1	0.8	0.5	0.0	-3.6	6.4	0.8	24	
13	-0.4	-0.8	-1.3	-1.7	-2.2	-2.4	-2.5	-2.3	-1.6	-0.1	1.1	2.8	3.0	3.2	2.4	0.9	-0.7	-0.8	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-2.5	3.2	-0.4	24
14	-0.9	-0.9	-0.9	-0.9	-0.9	-1.0	-1.1	-1.0	-0.9	-0.8	-0.7	-0.3	-0.1	-0.3	-0.5	-0.6	-0.6	-0.8	-1.5	-2.0	-2.2	-2.5	-3.1	-3.7	-3.7	-0.1	-1.2	24	
15	-4.4	-4.8	-4.9	-5.1	-5.5	-5.9	-4.8	-3.5	-3.0	-2.8	-1.8	-0.9	-0.7	-0.4	-0.7	-2.1	-2.1	P	-5.9	-6.7	-6.9	-6.8	-6.8	-6.8	-6.9	-0.4	-4.1	23	
16	-6.7	-6.8	-6.5	-7.3	-8.0	-7.7	-6.8	-4.9	0.9	3.9	5.0	4.0	3.9	2.9	2.3	1.4	0.9	0.1	-1.2	-2.4	-3.3	-4.0	-4.5	-4.8	-8.0	5.0	-2.1	24	
17	-5.1	-5.1	-5.3	-5.5	-5.6	-5.6	-4.6	-3.1	-1.8	0.7	3.8	4.3	3.6	3.7	3.1	2.3	2.1	0.9	-0.2	-1.1	-1.5	-1.5	-1.5	-1.6	-5.6	4.3	-1.0	24	
18	-2.0	-2.1	-2.6	-2.9	-3.4	-3.6	-3.3	-2.8	-1.7	-0.5	0.5	1.4	1.3	0.7	0.4	-0.1	-0.4	-0.8	-1.6	-2.0	-2.0	-2.0	-2.0	-2.0	-3.6	1.4	-1.4	24	
19	-1.9	-1.8	-1.7	-1.7	-1.7	-1.6	-1.2	-0.5	0.8	1.5	3.4	5.0	7.4	6.7	6.9	6.1	5.6	4.5	3.5	1.9	0.6	-0.1	-0.1	-0.3	-1.9	7.4	1.7	24	
20	-0.3	-0.1	0.0	-0.1	-0.7	-1.2	-1.0	-0.6	0.0	1.0	2.1	2.9	3.2	3.9	5.1	6.5	7.8	7.1	5.7	3.6	2.3	2.7	2.7	1.2	-1.2	7.8	2.2	24	
21	-0.5	-1.1	-1.7	-2.1	-2.5	-3.1	-3.0	-2.7	-2.3	-0.7	1.0	2.5	2.7	3.7	4.0	3.6	4.4	2.7	1.6	0.1	-0.5	-0.6	-0.7	-1.2	-3.1	4.4	0.1	24	
22	-1.8	-2.8	-3.2	-3.5	-3.5	-3.6	-3.3	-2.3	-0.7	0.8	0.8	1.0	2.3	2.5	2.6	2.4	1.9	1.1	0.2	-0.8	-1.4	-1.5	-2.3	-2.9	-3.6	2.6	-0.8	24	
23	-3.6	-4.1	-4.4	-4.7	-5.0	-5.3	-5.0	-4.4	-3.7	-2.8	-1.5	-1.6	-1.7	-1.6	-1.8	-1.4	-1.1	-1.8	-2.1	-2.6	-2.7	-2.7	-2.6	-2.5	-5.3	-1.1	-2.9	24	
24	-2.6	-2.5	-2.5	-2.6	-2.6	-2.5	-1.9	-1.0	-0.1	0.8	1.1	1.9	1.1	1.0	1.6	1.4	1.0	0.3	-0.6	-1.3	-1.7	-2.0	-2.3	-2.5	-2.6	1.9	-0.8	24	
25	-2.6	-2.8	-3.0	-3.1	-3.1	-3.0	-2.7	-2.3	-1.6	-0.7	-0.2	0.2	1.0	1.0	1.0	0.9	0.7	0.2	-0.5	-1.0	-1.4	-1.8	-2.1	-2.3	-3.1	1.0	-1.2	24	
26	-2.5	-2.8	-3.0	-3.1	-3.2	-3.4	-3.2	-2.5	-2.0	-1.7	-1.1	-0.5	-0.3	0.1	0.4	0.3	0.3	-0.1	-0.3	-0.4	-0.9	-0.9	-1.0	-1.2	-3.4	0.4	-1.4	24	
27	-1.3	-1.4	-1.4	-1.4	-1.4	-0.9	1.0	1.1	3.6	4.2	5.1	5.2	4.8	5.5	4.6	3.1	2.3	2.1	0.7	0.4	0.2	0.0	-0.2	0.0	-1.4	5.5	1.5	24	
28	-0.7	-1.0	-1.1	-1.3	-1.8	-1.3	2.1	4.6	6.8	7.4	8.2	8.9	9.2	8.9	9.3	8.5	8.9	7.6	6.9	5.7	4.8	4.3	4.2	3.4	-1.8	9.3	4.7	24	
29	3.0	2.5	1.6	0.4	0.8	0.9	2.8	4.8	5.9	7.9	8.7	9.1	9.7	9.8	10.3	10.2	10.2	9.8	9.1	7.6	6.1	5.1	4.5	3.8	0.4	10.3	6.0	24	
30	3.2	2.9	2.3	1.4	1.1	1.7	2.3	4.6	6.0	7.4	8.6	9.6	9.8	10.6	10.5	10.9	10.0	9.2	8.2	7.4	6.8	5.7	5.3	1.1	10.9	6.5	24		
HOURLY MAX	6.3	5.7	4.9	4.5	3.9	3.5	4.1	4.8	6.8	8.8	12.1	13.5	14.5	15.0	15.6	15.0	14.1	13.2	11.4	10.5	10.0	9.9	9.5	7.9					
HOURLY AVG	-0.8	-1.1	-1.4	-1.7	-1.9	-2.0	-1.4	-0.6	0.7	2.0	3.2	4.0	4.4	4.8	5.0	4.7	4.6	4.1	2.7	1.7	1.0	0.5	0.1	-0.3					

STATUS FLAG CODES

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

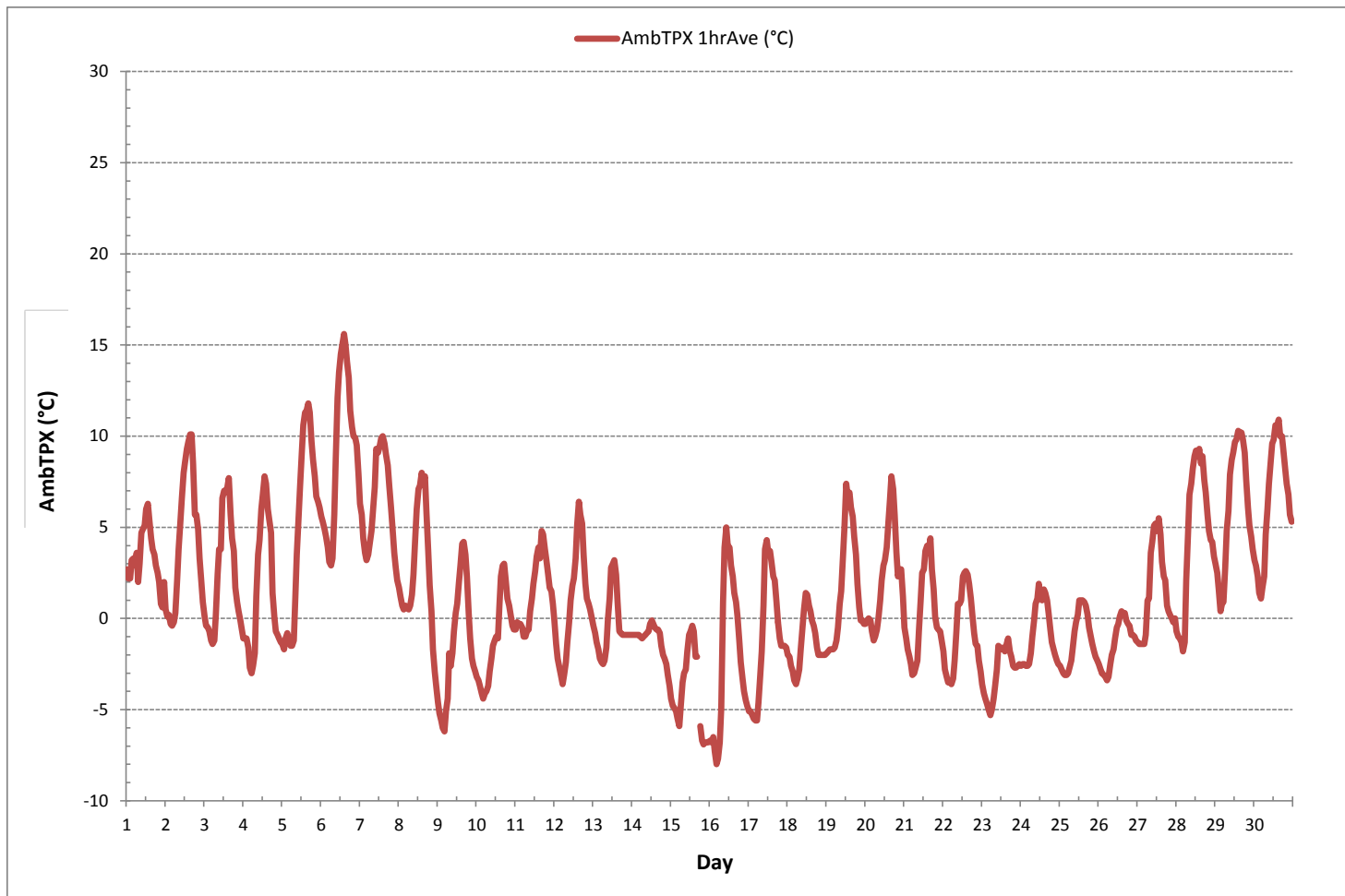
24 HR AVERAGES April 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-8.0 °C	@ HOUR	4	ON DAY	16
MAXIMUM 1-HR AVERAGE:	15.6 °C	@ HOUR	14	ON DAY	6
MAXIMUM 24-HR AVERAGE:	9.2 °C			ON DAY	6
OPERATIONAL TIME:					719 hrs
AMD OPERATION UPTIME:					99.9 %
STANDARD DEVIATION:	4.2	MONTHLY AVERAGE:			1.3 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



## ***PRECIPITATION***





PRECIPITATION Hourly Averages (mm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.1	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	1.8	0.1	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.9	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.6	2.3	2.0	0.0	2.3	0.2	24
8	1.9	1.9	1.3	1.1	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.3	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	24
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1	1.9	3.6	3.1	2.5	1.9	1.8	1.3	2.3	0.0	3.6	0.8	24
14	3.2	0.1	0.5	1.6	3.2	1.6	1.0	1.9	2.4	4.6	8.5	7.9	2.1	2.4	2.5	2.6	2.6	2.1	1.4	0.8	0.7	1.0	0.5	0.3	0.1	8.5	2.3	24
15	0.0	0.2	0.5	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.1	23
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.5	0.2	0.1	0.0	0.6	0.1	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	0.1	0.4	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.5	0.1	24
19	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.7	0.1	0.1	0.3	0.3	0.4	0.0	0.2	0.2	0.2	0.2	0.0	0.7	0.1	24
24	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.2	0.4	0.4	0.2	0.4	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.4	0.2	24
25	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.0	24
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0	24
HOURLY MAX	3.2	1.9	1.3	1.6	3.2	1.6	1.0	1.9	2.4	4.6	8.5	7.9	2.1	2.4	2.5	2.6	2.6	3.6	3.1	2.5	1.9	1.8	2.3	2.3				
HOURLY AVG	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2				

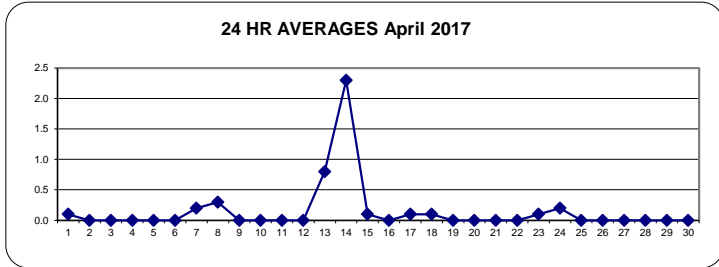
STATUS FLAG CODES

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

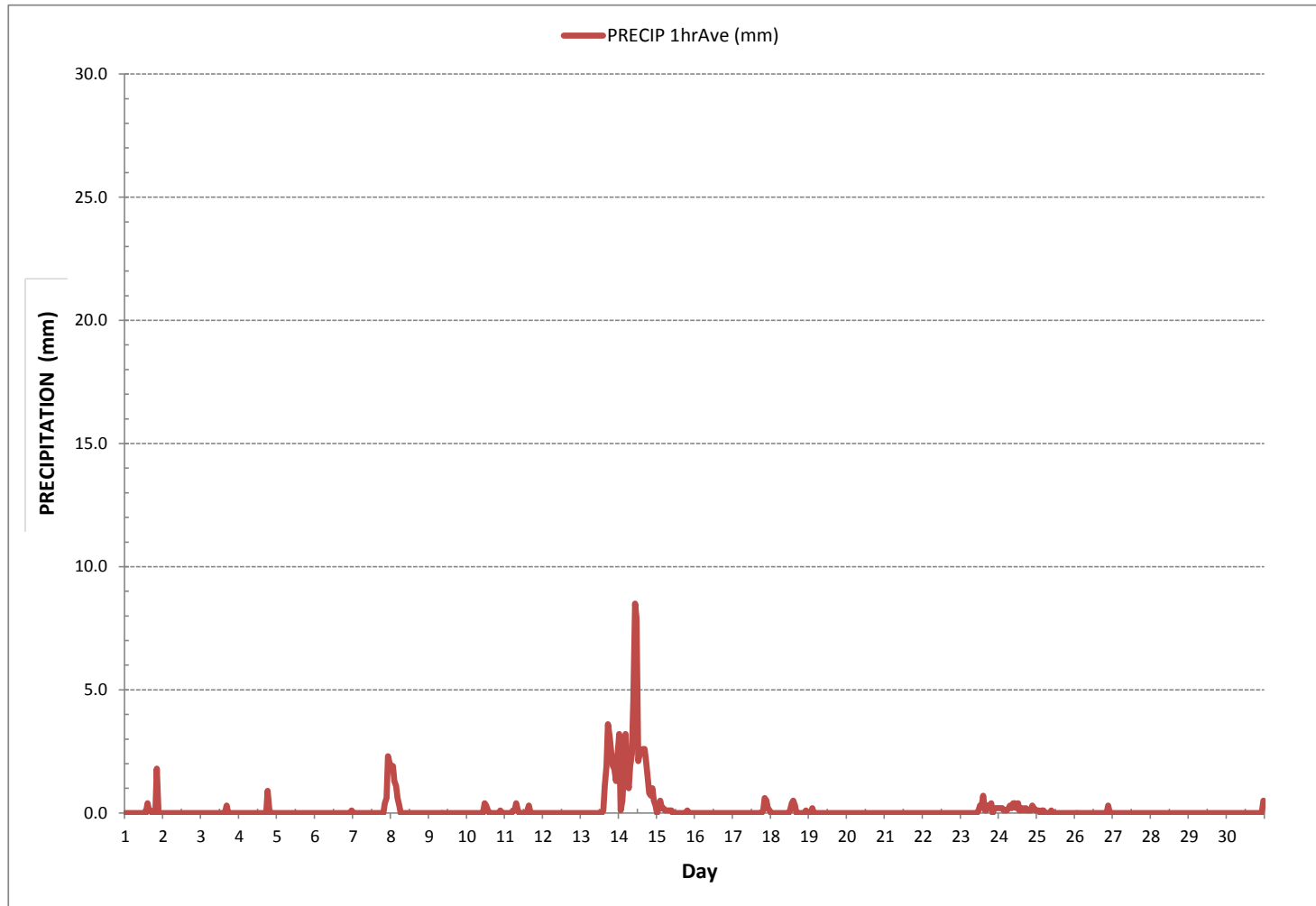
MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	8.5	mm	@ HOUR	10	ON DAY	14
MAXIMUM 24-HR AVERAGE:	2.3	mm			ON DAY	14
MONTHLY TOTAL	107.2	mm				
OPERATIONAL TIME:					719	hrs
AMD OPERATION UPTIME:					99.9	%
STANDARD DEVIATION:	0.6		MONTHLY AVERAGE:		0.1	mm

24 HR AVERAGES April 2017



PRECIPITATION Hourly Averages (mm)



***APPENDIX II***  
***EQUIPMENT CALIBRATION RESULTS***

***SULPHUR DIOXIDE***



## API 100E Sulphur Dioxide Analyzer Calibration

Date: <u>April 4, 2017</u>	Barometric Pressure: <u>0.919 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>21</u>
Location/Station Name: <u>St. Lina</u>	Weather Conditions: <u>Fog</u>
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>shut down</u>
Start Time 24 hr. (mst): <u>10:27</u>	Performed By/Reviewer: <u>Alex Yakupov</u>   <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>14:30</u>	Cal Gas Expiry Date: <u>July 18, 2019</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:	
ID# or Serial Number: <u>468</u>	Range ppb: <u>1000</u>
Last Calibration Date: <u>March 2, 2017</u>	As Found C.F.: <u>1.004</u>
Previous C.F.: <u>1.000</u>	New C.F.: <u>n/a</u>

Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>API 700</u> Serial #: <u>627</u> Cal Gas Cylinder I.D. #: <u>LL104222</u> Cal Gas Conc. (ppm): <u>50.6</u>	<b>Standard Calibration Points for Ranges</b> <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb								
High	780								
Mid	380								
Low	190								

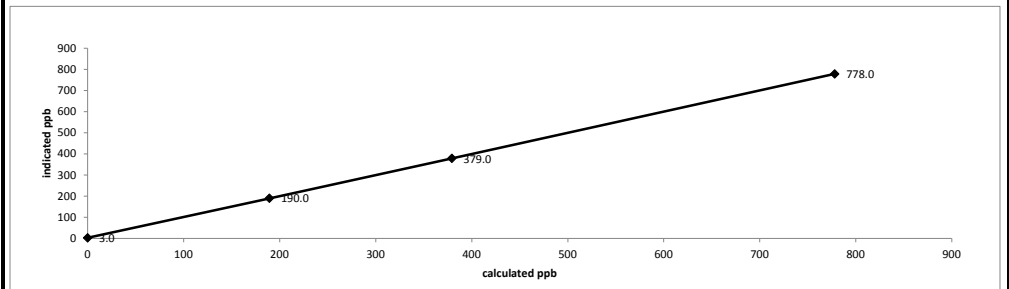
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.00	5000	0.0	3.0	n/a
as found high	4924	76.90	5001	778.1	778.0	1.004
mid	4964	37.50	5002	379.4	379.0	1.009
low	4980	18.70	4999	189.3	190.0	1.012
Average C.F.=						1.008

**Linear Regression/Calibration Results:**

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>1.004</u>	> or = 0.995
b (Intercept as % of full scale) = <u>-0.20%</u>	0.90-1.10
% change in C.F. from last cal = <u>-0.40%</u>	± 3% F.S.
	± 10%

**API 100E Sulphur Dioxide Analyzer Calibration**



<b>As found:</b> SLOPE: <u>1.010</u> OFFSET: <u>116.4</u> HVPS: <u>651</u> RCELL TEMP: <u>50.0</u> BOX TEMP: <u>29.7</u> PMT TEMP: <u>7.8</u> IZS TEMP: <u>53.0</u> PRES: <u>24.2</u> SAMP FL: <u>596</u> NORM PMT: <u>118.2</u> UV LAMP: <u>3118.3</u> LAMP RATIO: <u>99.1</u> STR. LGT: <u>58.8</u> DRK PMT: <u>5.6</u> DRK LMP: <u>6.5</u> Expected Value: <u>442.0</u>	<b>As left:</b> SLOPE: <u>n/a</u> OFFSET: <u>n/a</u> HVPS: <u>n/a</u> RCELL TEMP: <u>n/a</u> BOX TEMP: <u>n/a</u> PMT TEMP: <u>n/a</u> IZS TEMP: <u>n/a</u> PRES: <u>n/a</u> SAMP FL: <u>n/a</u> NORM PMT: <u>n/a</u> UV LAMP: <u>n/a</u> LAMP RATIO: <u>n/a</u> STR. LGT: <u>n/a</u> DRK PMT: <u>n/a</u> DRK LMP: <u>n/a</u> Expected Value: <u>n/a</u>
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**Comments:**

Shutdown calibration completed to calibrate output voltage: the difference between on-screen readings and datalogger is 2.2 ppb. Correction is required.



## API 100E Sulphur Dioxide Analyzer Calibration

<b>Date:</b> April 4, 2017	<b>Barometric Pressure:</b> 0.919 atm
<b>Company/Airshed:</b> LICA	<b>Station Temperature °C:</b> 21
<b>Location/Station Name:</b> St. Lina	<b>Weather Conditions:</b> Mix of sun and clouds
<b>Parameter:</b> Sulphur Dioxide	<b>Calibration Purpose:</b> post repair
<b>Start Time 24 hr. (mst):</b> 16:41	<b>Performed By/Reviewer:</b> Alex Yakupov   Trina Whitsitt
<b>End Time 24 hr. (mst):</b> 19:10	<b>Cal Gas Expiry Date:</b> July 18, 2019
<b>Calibration Method:</b> Gas Dilution	<b>Converter Model &amp; s/n (if applicable):</b> n/a

<b>Analyzer:</b>	
<b>ID# or Serial Number:</b> 468	<b>Range ppb:</b> 1000
<b>Last Calibration Date:</b> n/a	<b>As Found C.F.:</b> n/a
<b>Previous C.F.:</b> n/a	<b>New C.F.:</b> 1.000

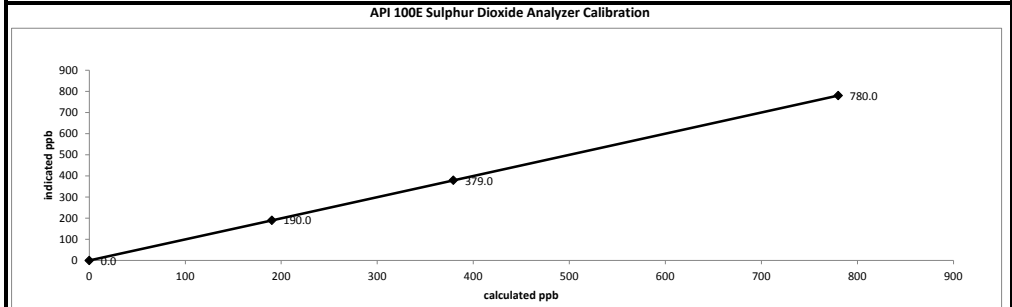
<b>Calibrator:</b>	<b>Standard Calibration Points for Ranges</b>								
<b>Flow Meter ID's:</b> n/a	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb								
High	780								
Mid	380								
Low	190								
<b>Make &amp; Model:</b> API 700									
<b>Serial #:</b> 627									
<b>Cal Gas Cylinder I.D. #:</b> LL104222									
<b>Cal Gas Conc. (ppm):</b> 50.6									

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

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4924	77.10	5001	780.1	780.0	1.000
mid	4965	37.50	5003	379.3	379.0	1.001
low	4980	18.80	4999	190.3	190.0	1.002
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
<b>Average C.F. =</b>						1.001

**Linear Regression/Calibration Results:**

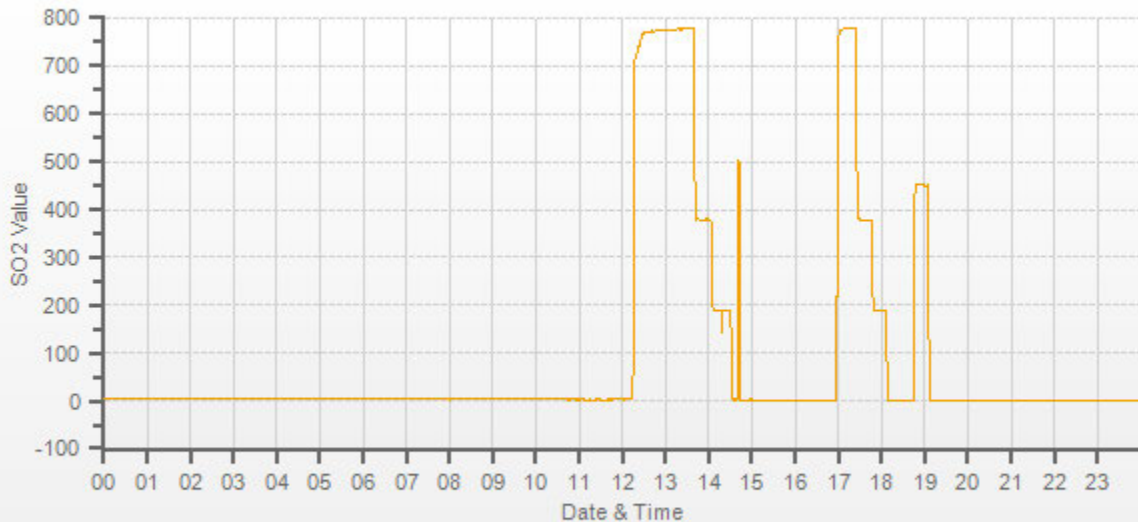
<b>Correlation Coefficient =</b> 1.000	<b>LIMITS</b>
<b>Slope =</b> 1.000	> or = 0.995
<b>b (Intercept as % of full scale) =</b> 0.02%	.95-1.05
<b>% change in C.F. from last cal =</b> n/a	± 3% F.S.
	± 10%



<b>As found:</b>	<b>As left:</b>
<b>SLOPE:</b> n/a	<b>SLOPE:</b> 1.012
<b>OFFSET:</b> n/a	<b>OFFSET:</b> 119.1
<b>HVPS:</b> n/a	<b>HVPS:</b> 651
<b>RCELL TEMP:</b> n/a	<b>RCELL TEMP:</b> 50.0
<b>BOX TEMP:</b> n/a	<b>BOX TEMP:</b> 29.5
<b>PMT TEMP:</b> n/a	<b>PMT TEMP:</b> 7.8
<b>IZS TEMP:</b> n/a	<b>IZS TEMP:</b> 53.0
<b>PRES:</b> n/a	<b>PRES:</b> 24.1
<b>SAMP FL:</b> n/a	<b>SAMP FL:</b> 595
<b>NORM PMT:</b> n/a	<b>NORM PMT:</b> 118.1
<b>UV LAMP:</b> n/a	<b>UV LAMP:</b> 3121.6
<b>LAMP RATIO:</b> n/a	<b>LAMP RATIO:</b> 99.1
<b>STR. LGT:</b> n/a	<b>STR. LGT:</b> 60.3
<b>DRK PMT:</b> n/a	<b>DRK PMT:</b> 5.9
<b>DRK LMP:</b> n/a	<b>DRK LMP:</b> 6.6
<b>Expected Value:</b> n/a	<b>Expected Value:</b> 450.0

**Comments:**  
The analyzer sample inlet filter was changed.

Output voltage was calibrated. 3 ppb Zero error was corrected.



— SO2[ppb]

***HYDROGEN SULPHIDE***





## API 101E Hydrogen Sulphide Analyzer Calibration

Date: April 4, 2017	Barometric Pressure: 0.919 atm
Company/Airshed: LICA	Station Temperature °C: 21
Location/Station Name: St. Lina	Weather Conditions: Fog
Parameter: Hydrogen Sulphide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 10:27	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 14:15	Cal Gas Expiry Date: June 14, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

<b>Analyzer:</b>	
ID# or Serial Number: 509	Range ppb: 100
Last Calibration Date: March 23, 2017	As Found C.F.: 0.996
Previous C.F.: 0.997	New C.F.: 0.998

<b>Calibrator:</b>	<b>Standard Calibration Points for Ranges</b>	<b>SO2 Scrubber Check (10 mins.)</b>								
Flow Meter ID's: n/a	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	Start/End Time 24 hr.: 11:07/11:17
Point	ppb									
High	78									
Mid	38									
Low	19									
Make & Model: SABIO 2010 D		Target Concentration (ppb): 780								
Serial #: 11900613		Result (ppb): 0								
Cal Gas Cylinder I.D. #: EY0000654		'Zero Corrected Result (ppb): 0								
Cal Gas Conc. (ppm): 10.2										

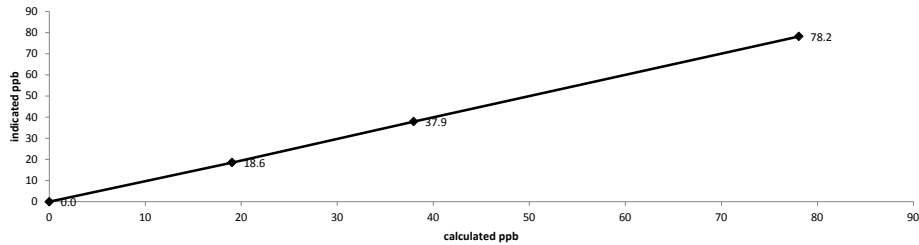
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7500	0.00	7500	0.0	0.0	n/a
as found high	7442	57.40	7499	78.1	78.4	0.996
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7442	57.40	7499	78.1	78.2	0.998
mid	7471	27.90	7499	37.9	37.9	1.001
low	7486	14.00	7500	19.0	18.6	1.024
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F. =						1.008

**Linear Regression/Calibration Results:**

Correlation Coefficient =	1.000	LIMITS
Slope =	0.996	> or = 0.995
b (Intercept as % of full scale) =	0.21%	.95-1.05
% change in C.F. from last cal =	0.12%	± 3% F.S.
		± 10%

**API 101E Hydrogen Sulphide Analyzer Calibration**

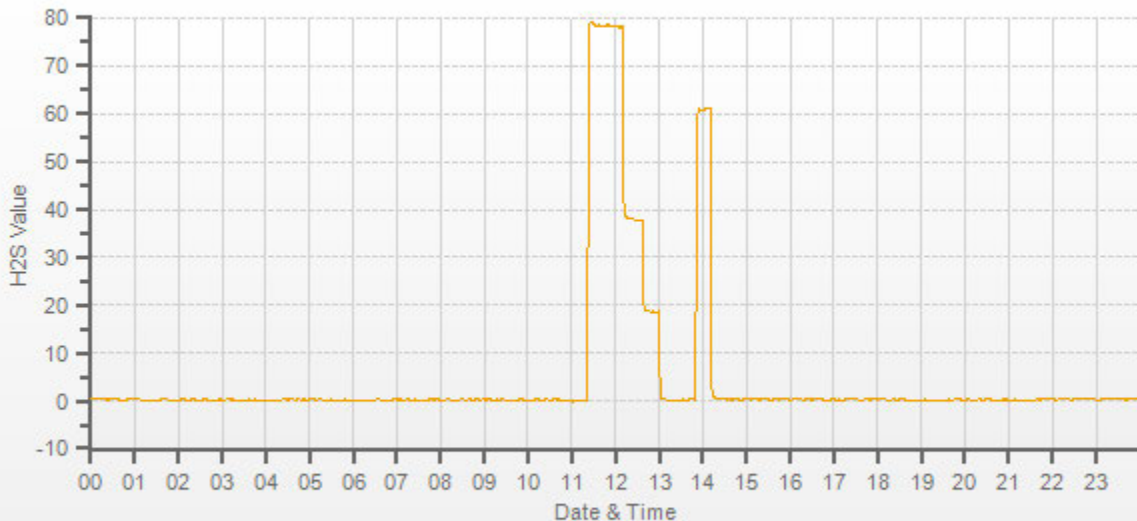


<b>As found:</b>	<b>As left:</b>
SLOPE: 1.047	SLOPE: 1.046
OFFSET: 51.8	OFFSET: 51.8
HVPS: 697	HVPS: 679
RCCELL TEMP: 50.0	RCCELL TEMP: 50.0
BOX TEMP: 30.3	BOX TEMP: 30.6
PMT TEMP: 8.0	PMT TEMP: 8.0
IZS TEMP: 48.0	IZS TEMP: 48.0
Converter Temp: 314.5	Converter Temp: 314.2
PRES: 20.7	PRES: 20.6
SAMP FL: 544	SAMP FL: 543
UV LAMP: 3134.2	UV LAMP: 3131.9
LAMP RATIO: 102.7	LAMP RATIO: 102.7
STR. LGT: 27.1	STR. LGT: 27.1
DRK PMT: 0.4	DRK PMT: 0.5
DRK LMP: 0.2	DRK LMP: 0.2
Expected Value: 61.5	Expected Value: 61.3

**Comments:**

The analyzer sample inlet filter was changed.

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



— H2S[ppb]



### Thermo 43C Hydrogen Sulphide Analyzer Calibration

Date:	April 19, 2017	Barometric Pressure:	0.918 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	St. Lina	Weather Conditions:	A few clouds
Parameter:	Hydrogen Sulphide	Calibration Purpose:	installation
Start Time 24 hr. (mst):	12:53	Performed By/Reviewer:	Alex Yakupov / Trina Whitsitt
End Time 24 hr. (mst):	17:29	Cal Gas Expiry Date:	June 14, 2019
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	Model 340 / 340-8460-99

<b>Analyzer:</b>	
ID# or Serial Number:	43C-68187-360
Last Calibration Date:	n/a
Previous C.F.:	n/a
Range ppb:	100
As Found C.F.:	n/a
New C.F.:	1.001

<b>Calibrator:</b>	<b>Standard Calibration Points for Ranges</b>	<b>SO2 Scrubber Check (10 mins.)</b>
Flow Meter ID's:	Point	Start/End Time 24 hr.:
Make & Model:	High	13:35/13:48
Serial #:	Mid	Target Concentration (ppb):
Cal Gas Cylinder I.D. #:	Low	Result (ppb):
Cal Gas Conc. (ppm):		'Zero Corrected Result (ppb):

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

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7442	57.40	7499	78.1	78.0	1.001
mid	7471	27.90	7499	37.9	37.9	1.001
low	7486	14.00	7500	19.0	18.8	1.013
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						1.005

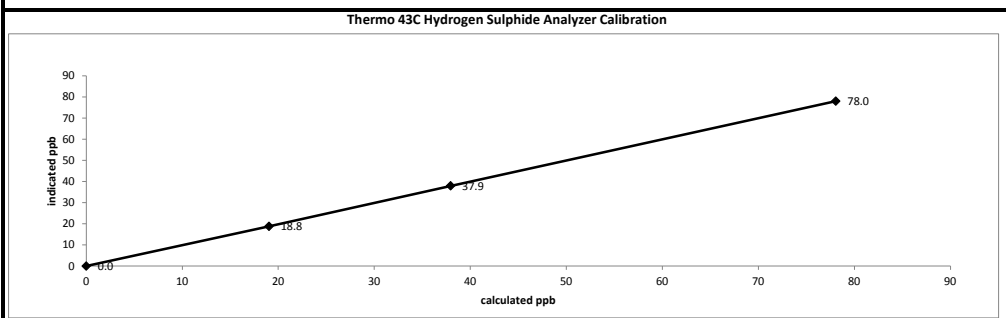
**Linear Regression/Calibration Results:**

Correlation Coefficient = 1.000      LIMITS > or = 0.995

Slope = 1.000      .95-1.05

b (Intercept as % of full scale) = 0.09%      ± 3% F.S.

% change in C.F. from last cal = n/a      ± 10%



As found:	As left:
BKG: n/a	BKG: 76.0
COEF: n/a	COEF: 0.996
PMT: n/a	PMT: -577
LAMP: n/a	LAMP: 844
BATTERY: n/a	BATTERY: 3.0
INTERNAL: n/a	INTERNAL: 28.0
CHAMBER: n/a	CHAMBER: 46.2
PRESSURE: n/a	PRESSURE: 604.4
FLOW: n/a	FLOW: 0.513
INTENSITY: n/a	INTENSITY: 38088
CONVERTER: n/a	CONVERTER: 350
CONVERTER SET: n/a	CONVERTER SET: 350
Expected Value: n/a	Expected Value: 56.4

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

The analyzer #43C-68187-360 was installed because the #509 failed after power outage. It was removed and sent to Edmonton for repair. A Shutdown calibration was not possible as the UV lamp was out of order.



— H2S[ppb]



## Thermo 43C Hydrogen Sulphide Analyzer Calibration

<b>Date:</b> April 21, 2017	<b>Barometric Pressure:</b> 0.930 atm
<b>Company/Airshed:</b> LICA	<b>Station Temperature °C:</b> 22
<b>Location/Station Name:</b> St. Lina	<b>Weather Conditions:</b> A few clouds
<b>Parameter:</b> Hydrogen Sulphide	<b>Calibration Purpose:</b> shut down
<b>Start Time 24 hr. (mst):</b> 10:33	<b>Performed By/Reviewer:</b> Alex Yakupov   Trina Whitsitt
<b>End Time 24 hr. (mst):</b> 13:02	<b>Cal Gas Expiry Date:</b> June 14, 2019
<b>Calibration Method:</b> Gas Dilution	<b>Converter Model &amp; s/n (if applicable):</b> Model 340 / 340-8460-99

<b>Analyzer:</b>	
<b>ID# or Serial Number:</b> 43C-68187-360	<b>Range ppb:</b> 100
<b>Last Calibration Date:</b> April 19, 2017	<b>As Found C.F.:</b> 1.005
<b>Previous C.F.:</b> 1.001	<b>New C.F.:</b> n/a

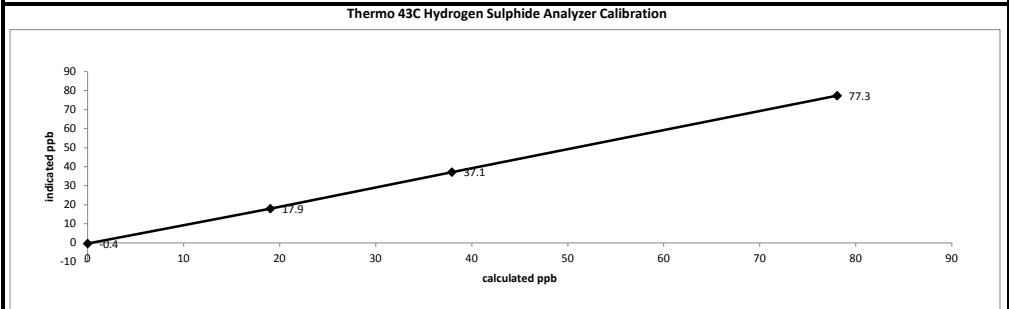
<b>Calibrator:</b>	<b>Standard Calibration Points for Ranges</b>	<b>SO2 Scrubber Check (10 mins.)</b>								
<b>Flow Meter ID's:</b> n/a	<table border="1" style="width: 100%; border-collapse: collapse;"><tr><th>Point</th><th>ppb</th></tr><tr><td>High</td><td>78</td></tr><tr><td>Mid</td><td>38</td></tr><tr><td>Low</td><td>19</td></tr></table>	Point	ppb	High	78	Mid	38	Low	19	<b>Start/End Time 24 hr.:</b> 10:59/11:18
Point	ppb									
High	78									
Mid	38									
Low	19									
<b>Make &amp; Model:</b> SABIO 2010 D		<b>Target Concentration (ppb):</b> 780								
<b>Serial #:</b> 11900613		<b>Result (ppb):</b> 2								
<b>Cal Gas Cylinder I.D. #:</b> EY0000654		<b>Zero Corrected Result (ppb):</b> 2								
<b>Cal Gas Conc. (ppm):</b> 10.2										

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

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7500	0.00	7500	0.0	-0.4	n/a
as found high	7442	57.40	7499	78.1	77.3	1.005
mid	7471	27.90	7499	37.9	37.1	1.012
low	7486	14.00	7500	19.0	17.9	1.040

**Linear Regression/Calibration Results:**

Correlation Coefficient = 1.000	<b>LIMITS</b>
Slope = 1.002	> or = 0.995
b (Intercept as % of full scale) = 0.72%	0.90-1.10
% change in C.F. from last cal = -0.38%	± 3% F.S.
	± 10%



<b>As found:</b>	<b>As left:</b>
BKG: 76	BKG: n/a
COEF: 0.996	COEF: n/a
PMT: -577	PMT: n/a
LAMP: 854	LAMP: n/a
BATTERY: 3.0	BATTERY: n/a
INTERNAL: 25.9	INTERNAL: n/a
CHAMBER: 46.0	CHAMBER: n/a
PRESSURE: 610.7	PRESSURE: n/a
FLOW: 0.516	FLOW: n/a
INTENSITY: 37677	INTENSITY: n/a
CONVERTER: 350	CONVERTER: n/a
CONVERTER SET: 350	CONVERTER SET: n/a
Expected Value: 56.4	Expected Value: n/a

**Comments:**

It was started as As Found calibration to re-test the SO2 scrubber and because the last ZS check revealed 20% difference with the EV. Urgent check required. It continued as Shutdown calibration to rebuild SO2 scrubber.



## Thermo 43C Hydrogen Sulphide Analyzer Calibration

<b>Date:</b> April 21, 2017 <b>Company/Airshed:</b> LICA <b>Location/Station Name:</b> St. Lina <b>Parameter:</b> Hydrogen Sulphide <b>Start Time 24 hr. (mst):</b> 14:34 <b>End Time 24 hr. (mst):</b> 18:40 <b>Calibration Method:</b> Gas Dilution	<b>Barometric Pressure:</b> 0.930 atm <b>Station Temperature °C:</b> 22 <b>Weather Conditions:</b> A few clouds <b>Calibration Purpose:</b> post repair <b>Performed By/Reviewer:</b> Alex Yakupov / Trina Whittitt <b>Cal Gas Expiry Date:</b> June 14, 2019 <b>Converter Model &amp; s/n (if applicable):</b> Model 340 / 340-8460-99
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<b>Analyzer:</b> <b>ID# or Serial Number:</b> 43C-68187-360 <b>Last Calibration Date:</b> n/a <b>Previous C.F.:</b> n/a	<b>Range ppb:</b> 100 <b>As Found C.F.:</b> n/a <b>New C.F.:</b> 1.000
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<b>Calibrator:</b> <b>Flow Meter ID's:</b> n/a <b>Make &amp; Model:</b> SABIO 2010 D <b>Serial #:</b> 11900613 <b>Cal Gas Cylinder I.D. #:</b> EY0000654 <b>Cal Gas Conc. (ppm):</b> 10.2	<b>Standard Calibration Points for Ranges</b> <table border="1" style="margin: auto;"> <thead> <tr><th>Point</th><th>ppb</th></tr> </thead> <tbody> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </tbody> </table>	Point	ppb	High	78	Mid	38	Low	19	<b>SO2 Scrubber Check (10 mins.)</b> <b>Start/End Time 24 hr.:</b> 15:07/15:17 <b>Target Concentration (ppb):</b> 780 <b>Result (ppb):</b> 0 <b>'Zero Corrected Result (ppb):</b> 0
Point	ppb									
High	78									
Mid	38									
Low	19									

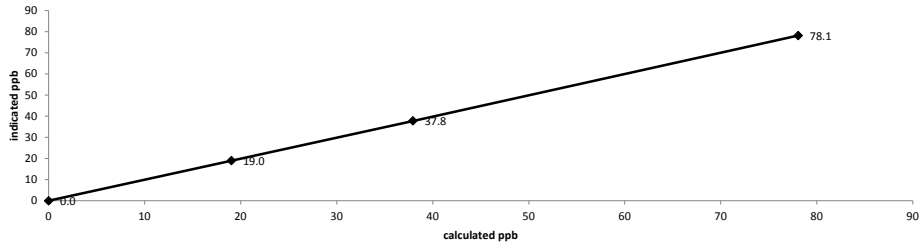
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7442	57.40	7499	78.1	78.1	1.000
mid	7471	27.90	7499	37.9	37.8	1.004
low	7486	14.00	7500	19.0	19.0	1.002
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
<b>Average C.F.=</b>						1.002

**Linear Regression/Calibration Results:**

<b>Correlation Coefficient =</b> 1.000	<b>LIMITS</b>
<b>Slope =</b> 1.000	> or = 0.995
<b>b (Intercept as % of full scale) =</b> 0.05%	.95-1.05
<b>% change in C.F. from last cal =</b> n/a	± 3% F.S.
	± 10%

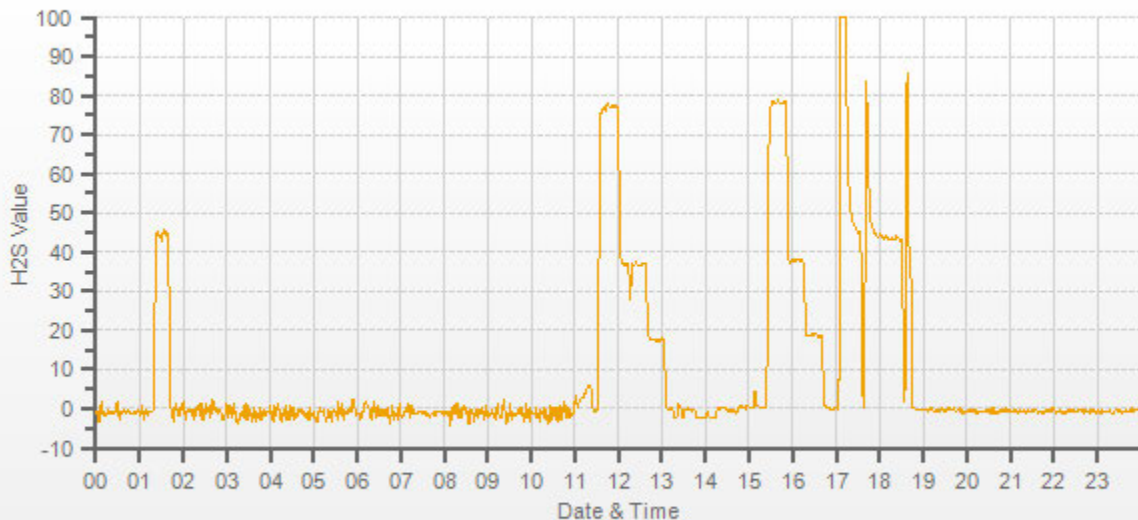
**Thermo 43C Hydrogen Sulphide Analyzer Calibration**



<b>As found:</b> BKG: n/a COEF: n/a PMT: n/a LAMP: n/a BATTERY: n/a INTERNAL: n/a CHAMBER: n/a PRESSURE: n/a FLOW: n/a INTENSITY: n/a CONVERTER: n/a CONVERTER SET: n/a Expected Value: n/a	<b>As left:</b> BKG: 75.6 COEF: 0.990 PMT: -577 LAMP: 853 BATTERY: 3.0 INTERNAL: 28.2 CHAMBER: 46.3 PRESSURE: 587.6 FLOW: 0.596 INTENSITY: 37945 CONVERTER: 350 CONVERTER SET: 350 Expected Value: n/a
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**Comments:**

SO2 scrubber was rebuilt, leak check conducted, all connectings were tightened, no leaks detected. The EV will be adjusted after the first scheduled ZS check to minimize downtime of the analyzer.



— H2S[ppb]



## Thermo 43C Hydrogen Sulphide Analyzer Calibration

Date:	April 25, 2017	Barometric Pressure:	0.919 atm
Company/Airshed:	LICA	Station Temperature °C:	20
Location/Station Name:	St. Lina	Weather Conditions:	A few clouds
Parameter:	Hydrogen Sulphide	Calibration Purpose:	shut down
Start Time 24 hr. (mst):	11:11	Performed By/Reviewer:	Alex Yakupov   Trina Whitsitt
End Time 24 hr. (mst):	13:20	Cal Gas Expiry Date:	June 14, 2019
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	Model 340 / 340-8460-99

Analyzer:		Range ppb:	100
ID# or Serial Number:	43C-68187-360	As Found C.F.:	1.007
Last Calibration Date:	April 21, 2017	New C.F.:	n/a
Previous C.F.:	1.000		

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

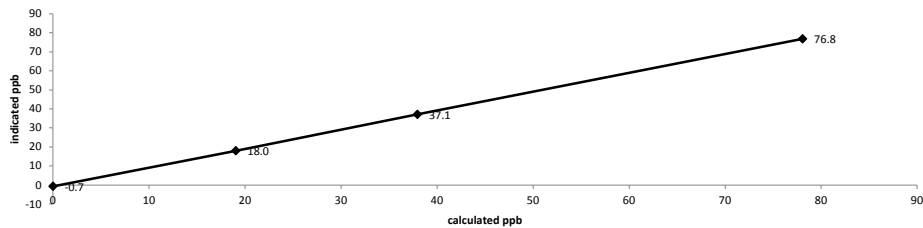
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:		Indicated Concentration:		Correction Factors (C.F.):
	Diluent	Cal Gas	Total	(ppb)	(ppb)	(ppb)	(ppb)	
as found zero	7500	0.00	7500	0.0	-0.7			n/a
as found high	7442	57.40	7499	78.1	76.8			1.007
mid	7471	27.90	7499	37.9	37.1			1.004
low	7486	14.00	7500	19.0	18.0			1.018
Average C.F. =								1.010

### Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.006		0.90-1.10
b (Intercept as % of full scale) =	0.76%		± 3% F.S.
% change in C.F. from last cal =	-0.74%		± 10%

### Thermo 43C Hydrogen Sulphide Analyzer Calibration



As found:	As left:
BKG: 75.9	BKG: n/a
COEF: 0.990	COEF: n/a
PMT: -577	PMT: n/a
LAMP: 854	LAMP: n/a
BATTERY: 3.0	BATTERY: n/a
INTERNAL: 26.4	INTERNAL: n/a
CHAMBER: 46.2	CHAMBER: n/a
PRESSURE: 583.7	PRESSURE: n/a
FLOW: 0.592	FLOW: n/a
INTENSITY: 38012	INTENSITY: n/a
CONVERTER: 350	CONVERTER: n/a
CONVERTER SET: 350	CONVERTER SET: n/a
Expected Value: 56.4	Expected Value: n/a

### Comments:

The analyzer sample inlet filter was changed.

Shutdown calibration completed to replace the LICA analyzer that came back after repair from Calgary.





## API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>April 25, 2017</u> Company/Airshed: <u>LICA</u> Location/Station Name: <u>St. Lina</u> Parameter: <u>Hydrogen Sulphide</u> Start Time 24 hr. (mst): <u>13:53</u> End Time 24 hr. (mst): <u>15:57</u> Calibration Method: <u>Gas Dilution</u>	Barometric Pressure: <u>0.919 atm</u> Station Temperature °C: <u>20</u> Weather Conditions: <u>A few clouds</u> Calibration Purpose: <u>installation</u> Performed By/Reviewer: <u>Alex Yakupov</u> / <u>Trina Whitsitt</u> Cal Gas Expiry Date: <u>June 14, 2019</u> Converter Model & s/n (if applicable): <u>n/a</u>
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Analyzer: ID# or Serial Number: <u>509</u> Last Calibration Date: <u>n/a</u> Previous C.F.: <u>n/a</u>	Range ppb: <u>100</u> As Found C.F.: <u>n/a</u> New C.F.: <u>1.000</u>
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Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>SABIO 2010 D</u> Serial #: <u>11900613</u> Cal Gas Cylinder I.D. #: <u>EY000654</u> Cal Gas Conc. (ppm): <u>10.2</u>	Standard Calibration Points for Ranges <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>ppb</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>78</td> </tr> <tr> <td>Mid</td> <td>38</td> </tr> <tr> <td>Low</td> <td>19</td> </tr> </tbody> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								

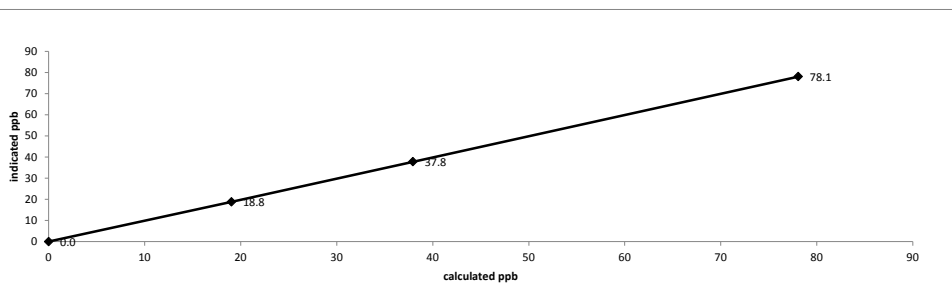
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7442	57.40	7499	78.1	78.1	1.000
mid	7471	27.90	7499	37.9	37.8	1.004
low	7486	14.00	7500	19.0	18.8	1.013
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						1.005

**Linear Regression/Calibration Results:**

Correlation Coefficient =	<u>1.000</u>	LIMITS	> or = 0.995
Slope =	<u>0.999</u>		.95-1.05
b (Intercept as % of full scale)=	<u>0.13%</u>		± 3% F.S.
% change in C.F. from last cal=	<u>n/a</u>		± 10%

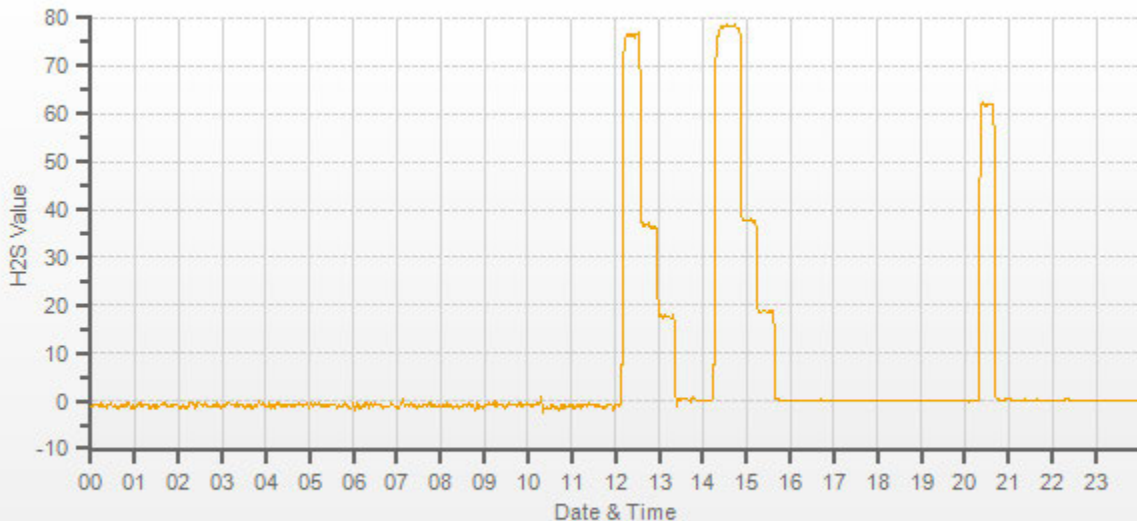
API 101E Hydrogen Sulphide Analyzer Calibration



<b>As found:</b> SLOPE: <u>n/a</u> OFFSET: <u>n/a</u> HVPS: <u>n/a</u> RCELL TEMP: <u>n/a</u> BOX TEMP: <u>n/a</u> PMT TEMP: <u>n/a</u> IZS TEMP: <u>n/a</u> Converter Temp: <u>n/a</u> PRES: <u>n/a</u> SAMP FL: <u>n/a</u> UV LAMP: <u>n/a</u> LAMP RATIO: <u>n/a</u> Expected Value: <u>n/a</u>	<b>As left:</b> SLOPE: <u>0.943</u> OFFSET: <u>58.6</u> HVPS: <u>671</u> RCELL TEMP: <u>50.0</u> BOX TEMP: <u>31.6</u> PMT TEMP: <u>8.0</u> IZS TEMP: <u>48.0</u> Converter Temp: <u>315.9</u> PRES: <u>20.6</u> SAMP FL: <u>529</u> UV LAMP: <u>3235.2</u> LAMP RATIO: <u>96.5</u> Expected Value: <u>56.4</u>
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**Comments:**  
The analyzer sample inlet filter was changed.

Installation calibration was completed to install the analyzer #509 back after repair. (The UV lamp burnt because of power fluctuation). The analyzer is protected with a UPS unit now. The EV will be corrected later.



— H2S[ppb]

***TOTAL HYDROCARBON***



# Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	April 3, 2017	Barometric Pressure:	0.917 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	St. Lina	Weather Conditions:	Mix of sun and clouds
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly
Start/End Time 24 hr. (mst):	11:56 / 15:40	Performed By/Reviewer:	Alex Yakupov / Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023

Analyzer:	ID# or Serial Number:	51CLT-77021-384	Range ppm:	50
	Last Calibration Date:	March 1, 2017	As Found C.F.:	1.001
	Previous Cal High Point C.F.:	1.000	New C.F.:	1.000

Calibrator:	Flow Meter ID's:	n/a	Standard Calibration Points for a Range of:	50 ppm
	Make & Model:	API 700		
	Serial #:	627		
	Cal Gas Cylinder I.D. #:	LL165372		
	CH <sub>4</sub> /C <sub>2</sub> H <sub>6</sub> Cylinder Conc. (ppm):	606.0      212.0		
	CH <sub>4</sub> as propane/total CH <sub>4</sub> equivalents (ppm):	583.0      1189.0		

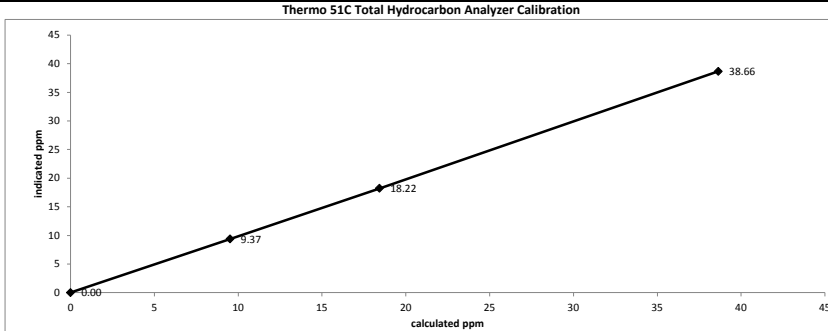
Point	Target ppm
High	38
Mid	18
Low	9

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	2000	0.00	2000	0.0	-0.20	n/a
as found high	1935	65.00	2000	38.64	38.40	1.001
adjusted zero	2000	0.00	2000	0.00	0.00	n/a
adjusted high	1935	65.00	2000	38.64	38.66	1.000
mid	1969	31.00	2000	18.43	18.22	1.011
low	1984	16.00	2000	9.51	9.37	1.015
calibrator zero	2000	0.00	2000	0.0	0.00	n/a
Average C.F. =						1.009

Linear Regression/Calibration Results:

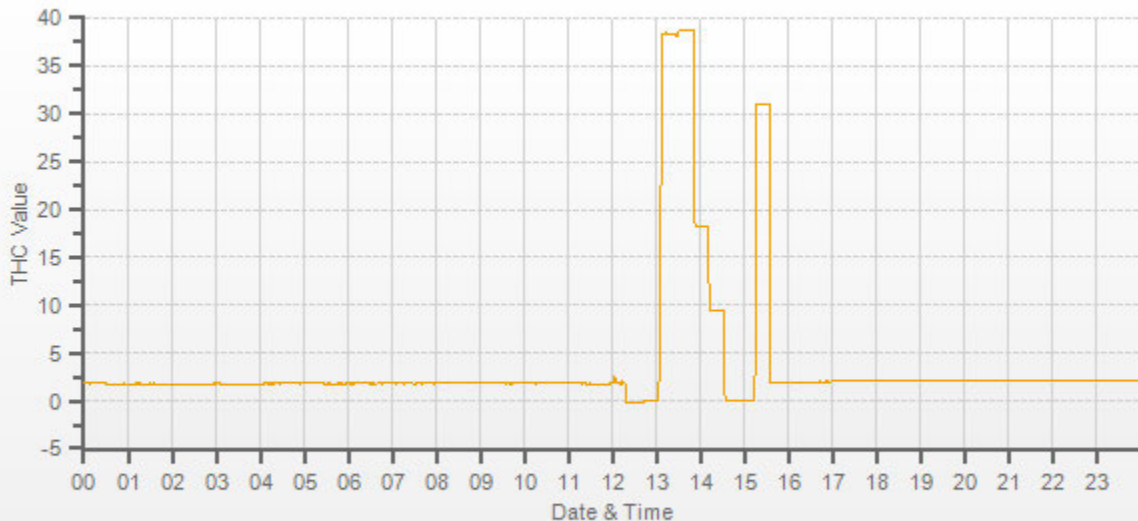
Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		.95-1.05
b (Intercept as % of full scale) =	0.21%		± 3% F.S.
% change in C.F. from last cal =	-0.11%		± 10%



As found:	As left:
H2 cylinder (psi): 1100	H2 cylinder (psi): 1100
H2 cylinder reg set (psi): 22	H2 cylinder reg set (psi): 22
Span Cylinder (psi): 900	Span Cylinder (psi): 900
Span Cylinder Reg Set (psi): 23	Span Cylinder Reg Set (psi): 23
Zero Air Gen Pressure: 41	Zero Air Gen Pressure: 41
measurement alarms: None	measurement alarms: None
service alarms: None	service alarms: None
cnt: 1799	cnt: 1804
rng: 1	rng: 1
try: 1	try: 1
flm: 189.6	flm: 190.0
det: 125.2	det: 125.7
Flame: 189	Flame: 190
Filter: 125	Filter: 125
Base: 125	Base: 125
Sample psi: 06.91	Sample psi: 06.91
Internal Air Pressure: 20	Internal Air Pressure: 20
Internal Fuel Pressure: 13	Internal Fuel Pressure: 13
Measured Flow: 0.9904	Measured Flow: n/a
Expected Value: 30.70	Expected Value: 31.00

Comments:  
The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.



— THC[ppm]

***NITROGEN DIOXIDE***



## API 200E NO-NO2-NOx Analyzer Calibration

<b>Date:</b> April 4, 2017 <b>Company/Airshed:</b> LICA <b>Location/Station Name:</b> St. Lina <b>Start/End Time 24 hr. (mst):</b> 10:27 / 17:28 <b>G.P.T. to be used for Ozone?</b> No <b>Calibration Method:</b> Gas Dilution & Gas Phase Titration	<b>Barometric Pressure:</b> 0.919 atm <b>Station Temperature °C:</b> 21 <b>Weather Conditions:</b> Fog <b>Calibration Purpose:</b> routine monthly <b>Performed By/Reviewer:</b> Alex Yakupov   Trina Whitsitt <b>Cal Gas Expiry Date:</b> July 18, 2019
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<b>Analyzer:</b> <b>ID# or Serial Number:</b> 594 <b>Last Calibration Date:</b> March 7, 2017 <b>Range ppb:</b> 1000	<b>Correction Factors:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.000</td> <td>1.011</td> <td>1.000</td> </tr> <tr> <td>NO<sub>2</sub> =</td> <td>1.002</td> <td>0.988</td> <td>0.988</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.007</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.011	1.000	NO <sub>2</sub> =	1.002	0.988	0.988	NOx =	1.000	1.007	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.011	1.000														
NO <sub>2</sub> =	1.002	0.988	0.988														
NOx =	1.000	1.007	1.000														

<b>Calibrator:</b> <b>Flow Meter ID's:</b> n/a <b>Make &amp; Model:</b> SABIO 2010 D <b>Serial #:</b> 11900613 <b>Cal Gas Cylinder I.D. #:</b> LL104222 <b>NO/NOx Gas Conc. (ppm):</b> 50.7   50.7	<b>Standard Calibration Points for a Range of: 1000 ppb</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO<sub>2</sub> (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO <sub>2</sub> (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO <sub>2</sub> (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	1.0	2.0	n/a	n/a
as found high	4924	76.9	5001	779.6	779.6	772.0	776.0	1.011	1.007
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4924	76.90	5001	779.6	779.6	780.0	780.0	1.000	1.000
mid	4964	37.50	5002	380.1	380.1	379.0	379.0	1.003	1.003
low	4980	18.70	4999	189.7	189.7	189.0	189.0	1.004	1.004
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
<b>Average C.F. =</b>								1.002	1.002

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO <sub>2</sub>	NO drop	NO <sub>2</sub> gain	NO <sub>2</sub> C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	76.90	5001	0.0	784.0	782.0	-2.0	0.0	-2.0	
as found high NO <sub>2</sub>	4924	76.90	5001	500.0	278.0	788.0	510.0	506.0	512.0	0.988
adjusted high NO <sub>2</sub>	4924	76.90	5001	500.0	278.0	788.0	510.0	506.0	512.0	0.988
gpt mid	4924	76.90	5001	275.0	501.0	785.0	284.0	283.0	286.0	0.990
gpt low	4924	76.90	5001	95.0	686.0	782.0	97.0	98.0	99.0	0.990
<b>Average NO<sub>2</sub> C.F. =</b>										0.989

**Linear Regression/Calibration Results:**

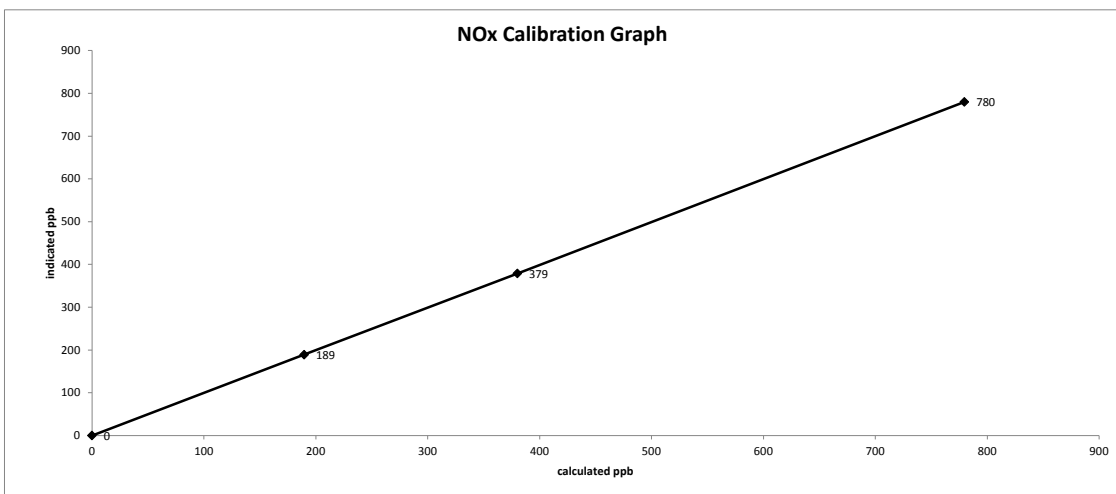
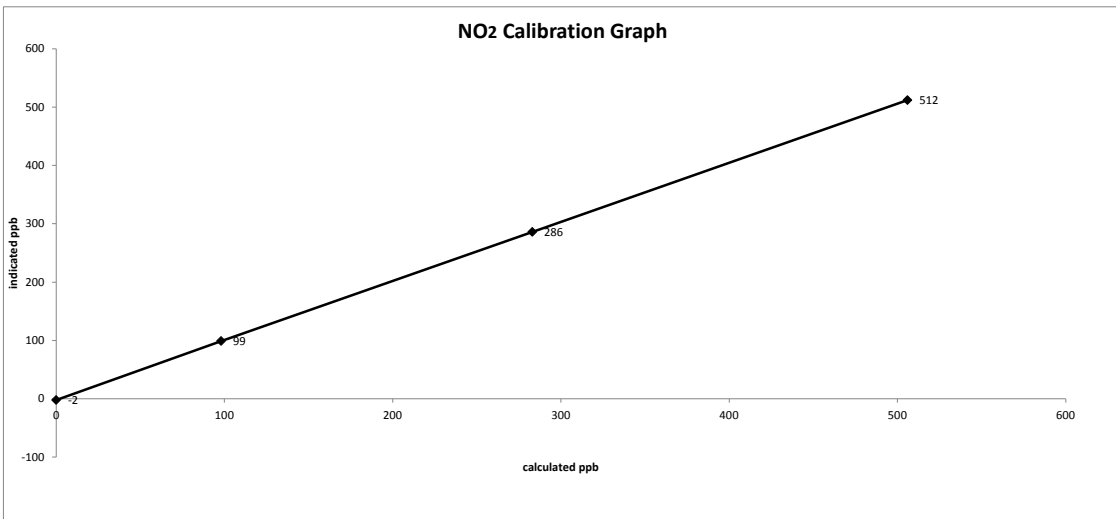
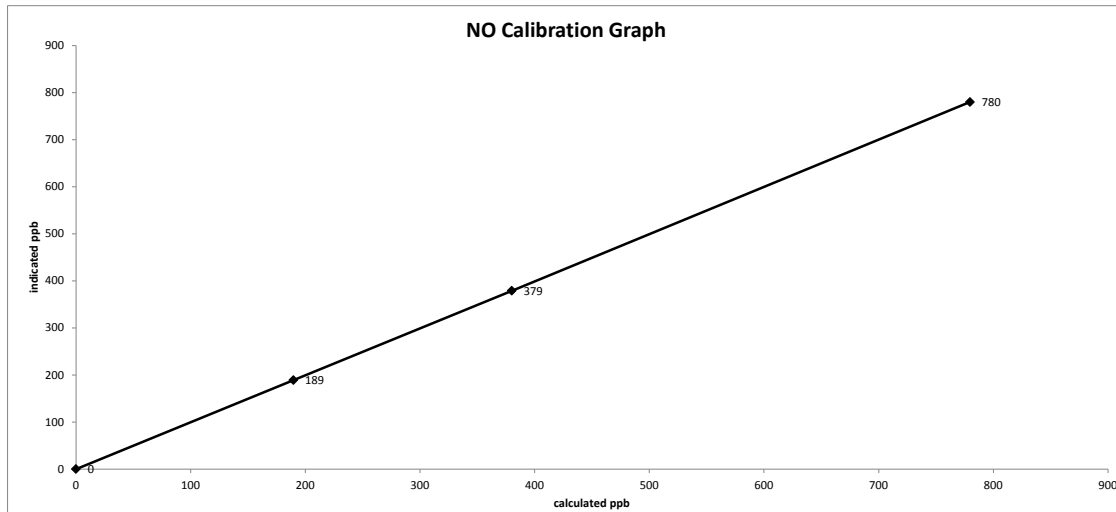
	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.999	0.985	.95-1.05
b (Intercept as % of full scale) =	-0.06%	-0.06%	-0.13%	± 3% F.S.
% change in C.F. from last cal =	-1.12%	-0.73%	1.37%	± 10%
NO <sub>2</sub> converter efficiency			0.97	0.96 to 1.04

As found:	As left:
NOx SLOPE: 0.965	NOx SLOPE: 0.969
NOx OFFS: 0.2	NOx OFFS: 1.7
NO SLOPE: 0.962	NO SLOPE: 0.970
NO OFFS: -0.3	NO OFFS: 1.3
SAMP FLW: 483	SAMP FLW: 483
OZONE FL: 78	OZONE FL: 78
PMT: 24.5	PMT: 22.5
NORM PMT: 1.1	NORM PMT: 2.6
AZERO: 16.1	AZERO: 16.3
HVPS: 767	HVPS: 767
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 30.6	BOX TEMP: 31.5
PMT TEMP: 6.7	PMT TEMP: 6.7
IZS TEMP: 40.2	IZS TEMP: 40.3
MOLY TEMP: 315.2	MOLY TEMP: 316.6
RCEL: 5.2	RCEL: 5.2
SAMP: 26.2	SAMP: 26.2
Expected Value NO: 7.1	Expected Value NO: 6.0
Expected Value NO <sub>2</sub> : 420.0	Expected Value NO <sub>2</sub> : 399.0
Expected Value NOx: 426.0	Expected Value NOx: 404.0

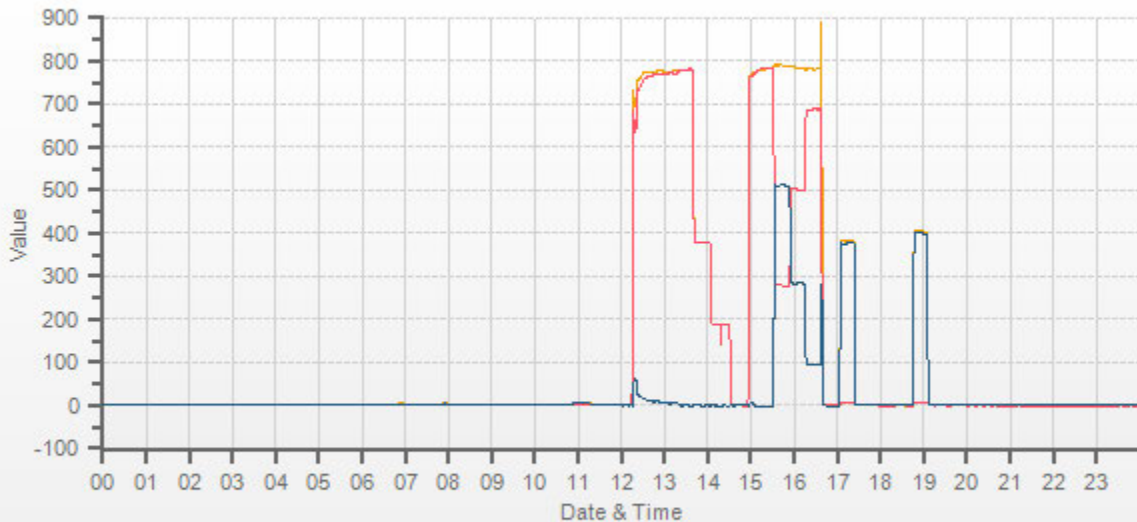
**Comments:**  
 The analyzer sample inlet filter was changed. No high point NO<sub>2</sub> adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

Date: April 4, 2017  
Company/Airshed: LICA  
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 10:27 / 17:28  
Calibration Purpose: routine monthly  
Calibration Method: Gas Dilution & Gas Phase Titration







— NOX[ppb] — NO[ppb] — NO2[ppb]



## API 200E NO-NO2-NOx Analyzer Calibration

<b>Date:</b> April 12, 2017	<b>Barometric Pressure:</b> 0.926 atm
<b>Company/Airshed:</b> LICA	<b>Station Temperature °C:</b> 21
<b>Location/Station Name:</b> St. Lina	<b>Weather Conditions:</b> A few clouds
<b>Start/End Time 24 hr. (mst):</b> 10:42 / 13:21	<b>Calibration Purpose:</b> as found
<b>G.P.T. to be used for Ozone?</b> No	<b>Performed By/Reviewer:</b> Alex Yakupov / Trina Whitsitt
<b>Calibration Method:</b> Gas Dilution & Gas Phase Titration	<b>Cal Gas Expiry Date:</b> July 18, 2019

<b>Analyzer:</b>	<b>Correction Factors:</b>																
<b>ID# or Serial Number:</b> 594	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="text-align: center;">Previous C.F.:</td> <td style="text-align: center;">As Found C.F.:</td> <td style="text-align: center;">New C.F.:</td> </tr> <tr> <td><b>NO =</b></td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">0.981</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td><b>NO<sub>2</sub> =</b></td> <td style="text-align: center;">0.988</td> <td style="text-align: center;">0.981</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td><b>NOx =</b></td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">0.982</td> <td style="text-align: center;">n/a</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	<b>NO =</b>	1.000	0.981	n/a	<b>NO<sub>2</sub> =</b>	0.988	0.981	n/a	<b>NOx =</b>	1.000	0.982	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
<b>NO =</b>	1.000	0.981	n/a														
<b>NO<sub>2</sub> =</b>	0.988	0.981	n/a														
<b>NOx =</b>	1.000	0.982	n/a														
<b>Last Calibration Date:</b> April 4, 2017																	
<b>Range ppb:</b> 1000																	

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

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	1.0	n/a	n/a
as found high	4924	76.9	5001	779.6	779.6	795.0	795.0	0.981	0.982
<b>Average C.F.=</b>								n/a	n/a

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO <sub>2</sub>	NO drop	NO <sub>2</sub> gain	NO <sub>2</sub> C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	76.90	5001	0.0	797.0	797.0	0.0	0.0	0.0	n/a
as found high NO <sub>2</sub>	4924	76.90	5001	500.0	276.0	806.0	531.0	521.0	531.0	0.981
<b>Average NO<sub>2</sub> C.F.=</b>										n/a

**Linear Regression/Calibration Results:**

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coefficient =	n/a	n/a	n/a	> or = 0.995
Slope =	n/a	n/a	n/a	.95-1.05
b (Intercept as % of full scale)=	n/a	n/a	n/a	± 3% F.S.
% change in C.F. from last cal=	1.93%	0.69%	1.81%	± 10%
NO <sub>2</sub> converter efficiency	n/a	n/a	0.97	0.96 to 1.04

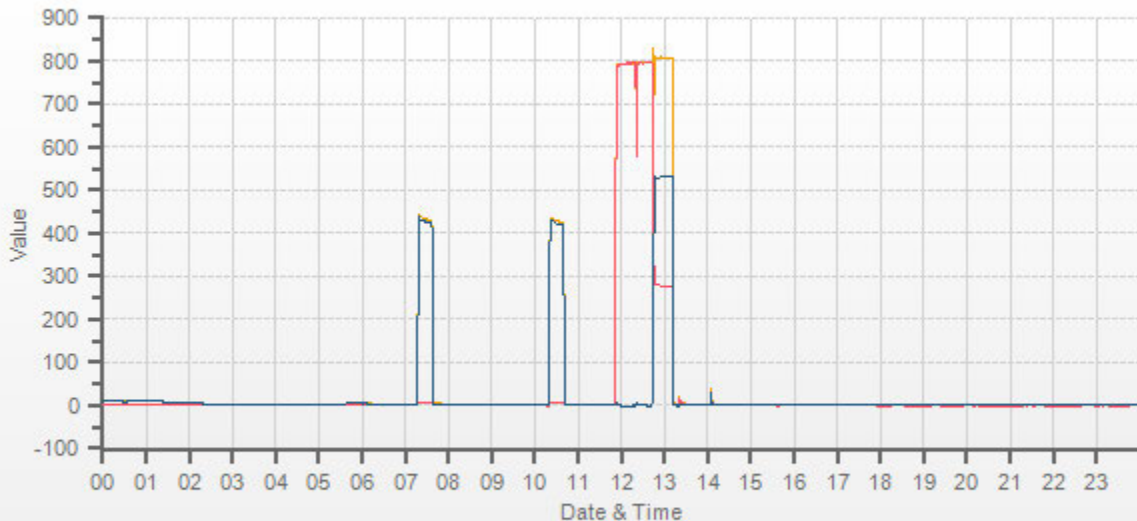
<b>As found:</b>	<b>As left:</b>
NOx SLOPE: 0.969	NOx SLOPE: 0.969
NOx OFFS: 1.7	NOx OFFS: 1.7
NO SLOPE: 0.970	NO SLOPE: 0.970
NO OFFS: 1.3	NO OFFS: 1.3
SAMP FLW: 488	SAMP FLW: 488
OZONE FL: 78	OZONE FL: 78
PMT: 20.9	PMT: 16.2
NORM PMT: 0.7	NORM PMT: 2.6
AZERO: 16.2	AZERO: 16.2
HVPS: 767	HVPS: 767
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 30.6	BOX TEMP: 30.9
PMT TEMP: 6.7	PMT TEMP: 6.7
IZS TEMP: 40.2	IZS TEMP: 40.2
MOLY TEMP: 316.3	MOLY TEMP: 316.3
RCEL: 5.6	RCEL: 5.6
SAMP: 26.9	SAMP: 26.9
Expected Value NO: 6.0	Expected Value NO: 6.0
Expected Value NO <sub>2</sub> : 399.0	Expected Value NO <sub>2</sub> : 399.0
Expected Value NOx: 404.0	Expected Value NOx: 404.0

**Comments:**

No high point NO<sub>2</sub> adjustment was required/made.

No zero adjustment was required/made.

As Found calibration completed to check the analyzer after the exhaust tubing was fixed. ZS SPAN check results are good (0.0 and 5%, for ZERO and SPAN)



— NOX[ppb] — NO[ppb] — NO2[ppb]



## API 200E NO-NO2-NOx Analyzer Calibration

**Date:** April 19, 2017  
**Company/Airshed:** LICA  
**Location/Station Name:** St. Lina  
**Start/End Time 24 hr. (mst):** 9:45 / 18:24  
**G.P.T. to be used for Ozone?** No  
**Calibration Method:** Gas Dilution & Gas Phase Titration

**Barometric Pressure:** 0.918 atm  
**Station Temperature °C:** 22  
**Weather Conditions:** A few clouds  
**Calibration Purpose:** repeat  
**Performed By/Reviewer:** Alex Yakupov | Trina Whitsitt  
**Cal Gas Expiry Date:** July 18, 2017

**Analyzer:**

**ID# or Serial Number:** 594  
**Last Calibration Date:** April 4, 2017  
**Range ppb:** 1000

**Correction Factors:**

	Previous C.F.:	As Found C.F.:	New C.F.:
NO =	0.981	0.984	0.998
NO <sub>2</sub> =	0.982	1.006	1.006
NOx =	0.981	0.984	0.998

**Calibrator:**

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

**Standard Calibration Points for a Range of: 1000 ppb**

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

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	3.0	3.0	n/a	n/a
as found high	4924	76.9	5001	779.6	779.6	795.0	795.0	0.984	0.984
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4924	76.90	5001	779.6	779.6	781.0	781.0	0.998	0.998
mid	4965	37.50	5003	380.1	380.1	379.0	380.0	1.003	1.000
low	4981	18.70	5000	189.6	189.6	189.0	190.0	1.003	0.998
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
<b>Average C.F.=</b>								1.001	0.999

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO <sub>2</sub>	NO drop	NO <sub>2</sub> gain	NO <sub>2</sub> C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	76.90	5001	0.0	781.0	781.0	1.0	0.0	1.0	
as found high NO <sub>2</sub>	4924	76.90	5001	495.0	277.0	779.0	502.0	504.0	501.0	1.006
adjusted high NO <sub>2</sub>	4924	76.90	5001	495.0	277.0	779.0	502.0	504.0	501.0	1.006
gpt mid	4924	76.90	5001	265.0	509.0	780.0	272.0	272.0	271.0	1.004
gpt low	4924	76.90	5001	100.0	680.0	781.0	102.0	101.0	101.0	1.000
<b>Average NO<sub>2</sub> C.F.=</b>									1.003	

**Linear Regression/Calibration Results:**

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.998	1.008	.95-1.05
b (Intercept as % of full scale)=	-0.07%	-0.01%	0.09%	± 3% F.S.
% change in C.F. from last cal=	-0.34%	-0.34%	-2.44%	± 10%
NO <sub>2</sub> converter efficiency			0.97	0.96 to 1.04

**As found:**

NOx SLOPE: 0.969  
 NOx OFFS: 1.7  
 NO SLOPE: 0.970  
 NO OFFS: 1.3  
 SAMP FLW: 485  
 OZONE FL: 78  
 PMT: 21.1  
 NORM PMT: 8.0  
 AZERO: 15.8  
 HVPS: 767  
 RCELL TEMP: 50.0  
 BOX TEMP: 29.2  
 PMT TEMP: 6.6  
 IZS TEMP: 40.0  
 MOLY TEMP: 314.9  
 RCEL: 5.7  
 SAMP: 26.2  
 Expected Value NO: 6.0  
 Expected Value NO<sub>2</sub>: 399.0  
 Expected Value NOx: 404.0

**As left:**

NOx SLOPE: 0.950  
 NOx OFFS: 3.0  
 NO SLOPE: 0.946  
 NO OFFS: 3.8  
 SAMP FLW: 485  
 OZONE FL: 78  
 PMT: 23.5  
 NORM PMT: 3.6  
 AZERO: 16.8  
 HVPS: 767  
 RCELL TEMP: 50.0  
 BOX TEMP: 31.4  
 PMT TEMP: 6.7  
 IZS TEMP: 40.2  
 MOLY TEMP: 316.4  
 RCEL: 5.7  
 SAMP: 26.3  
 Expected Value NO: 6.0  
 Expected Value NO<sub>2</sub>: 399.0  
 Expected Value NOx: 404.0

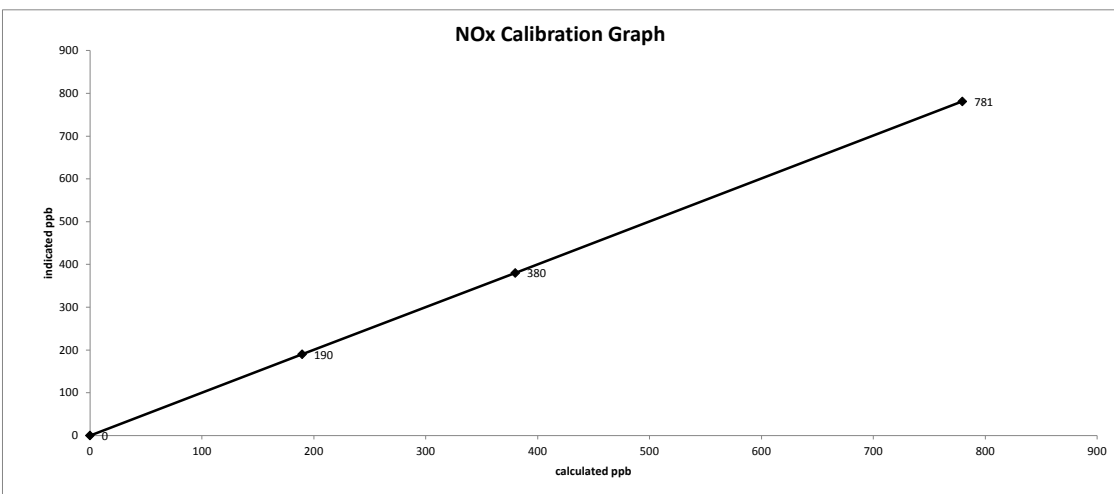
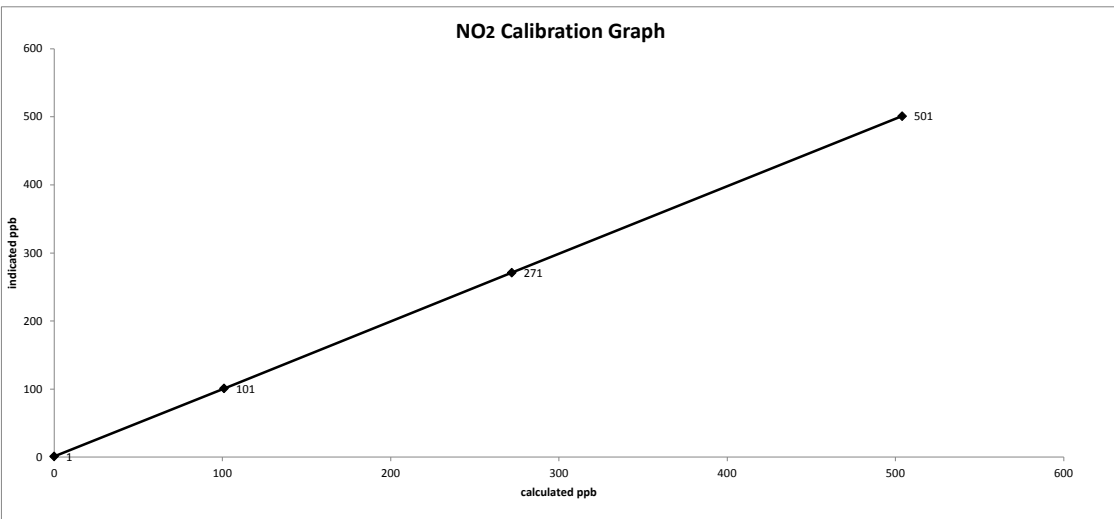
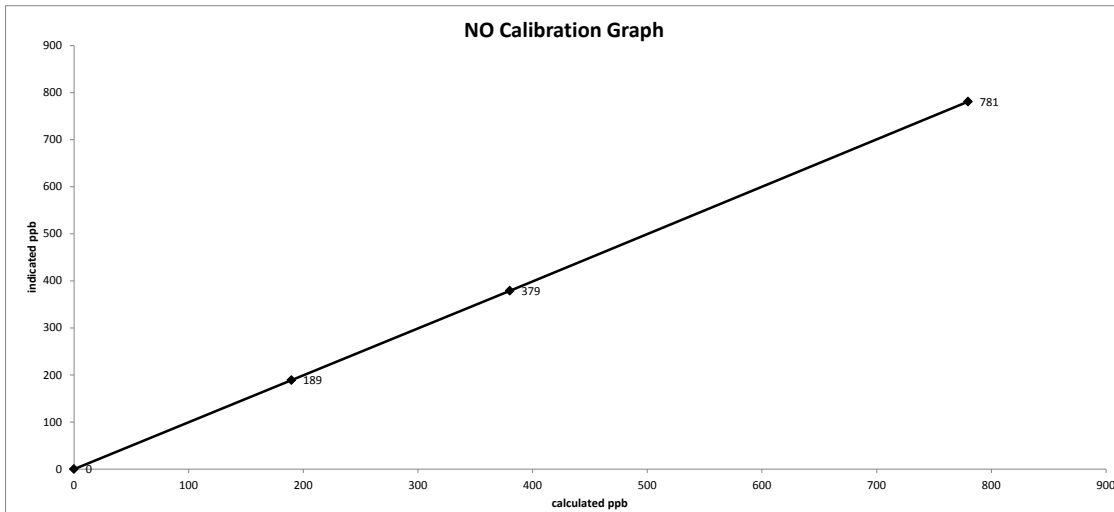
**Comments:**

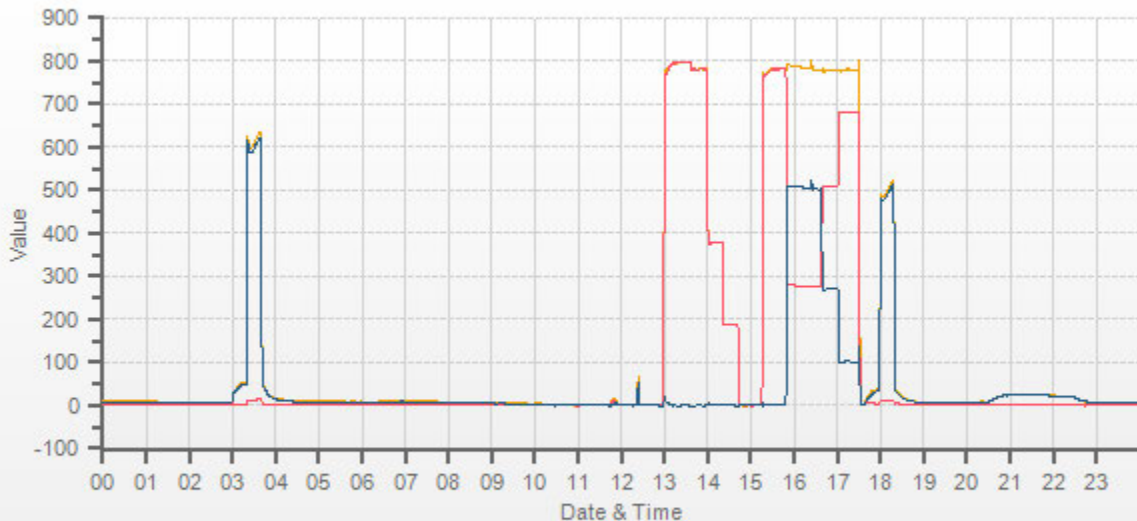
No high point NO<sub>2</sub> adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

11:45 - power outage event. Calibration has been started at the beginning. The EV will be adjusted in the morning on April 20, 2017 due to contamination. Additional time is needed to flush the analyzer with at least three ZS checks before adjustment.

Date: April 19, 2017  
Company/Airshed: LICA  
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 9:45 / 18:24  
Calibration Purpose: repeat  
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]



## API 200E NO-NO2-NOx Analyzer Calibration

remove

<b>Date:</b> April 25, 2017	<b>Barometric Pressure:</b> 0.919 atm
<b>Company/Airshed:</b> LICA	<b>Station Temperature °C:</b> 20
<b>Location/Station Name:</b> St. Lina	<b>Weather Conditions:</b> A few clouds
<b>Start/End Time 24 hr. (mst):</b> 11:11 / 13:53	<b>Calibration Purpose:</b> as found
<b>G.P.T. to be used for Ozone?</b> No	<b>Performed By/Reviewer:</b> Alex Yakupov / Trina Whitsitt
<b>Calibration Method:</b> Gas Dilution & Gas Phase Titration	<b>Cal Gas Expiry Date:</b> July 18, 2017

<b>Analyzer:</b>	<b>Correction Factors:</b>																
<b>ID# or Serial Number:</b> 594	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%; text-align: center;"><b>Previous C.F.:</b></td> <td style="width: 33%; text-align: center;"><b>As Found C.F.:</b></td> <td style="width: 33%; text-align: center;"><b>New C.F.:</b></td> </tr> <tr> <td><b>Last Calibration Date:</b> April 19, 2017</td> <td>NO = 0.998</td> <td>1.002</td> <td>n/a</td> </tr> <tr> <td><b>Range ppb:</b> 1000</td> <td>NO<sub>2</sub> = 1.006</td> <td>0.982</td> <td>n/a</td> </tr> <tr> <td></td> <td>NOx = 0.998</td> <td>0.996</td> <td>n/a</td> </tr> </table>		<b>Previous C.F.:</b>	<b>As Found C.F.:</b>	<b>New C.F.:</b>	<b>Last Calibration Date:</b> April 19, 2017	NO = 0.998	1.002	n/a	<b>Range ppb:</b> 1000	NO <sub>2</sub> = 1.006	0.982	n/a		NOx = 0.998	0.996	n/a
	<b>Previous C.F.:</b>	<b>As Found C.F.:</b>	<b>New C.F.:</b>														
<b>Last Calibration Date:</b> April 19, 2017	NO = 0.998	1.002	n/a														
<b>Range ppb:</b> 1000	NO <sub>2</sub> = 1.006	0.982	n/a														
	NOx = 0.998	0.996	n/a														

<b>Calibrator:</b>	<b>Standard Calibration Points for a Range of: 1000 ppb</b>																								
<b>Flow Meter ID's:</b> n/a																									
<b>Make &amp; Model:</b> API 700																									
<b>Serial #:</b> 627																									
<b>Cal Gas Cylinder I.D. #:</b> LL104222																									
<b>NO/NOx Gas Conc. (ppm):</b> 50.7   50.7																									
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO<sub>2</sub> (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </table>	Point	Target NO (ppb)	Target NO <sub>2</sub> (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO <sub>2</sub> (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	-0.2	0.6	n/a	n/a
as found high	4924	76.9	5001	779.6	779.6	778.0	783.0	1.002	0.996
<b>Average C.F.=</b>								n/a	n/a

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO <sub>2</sub>	NO drop	NO <sub>2</sub> gain	NO <sub>2</sub> C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	76.90	5001	0.0	780.0	785.0	6.0	-0.2	6.0	
as found high NO <sub>2</sub>	4924	76.90	5001	495.0	278.0	794.0	517.0	502.0	511.0	0.982
<b>Average NO<sub>2</sub> C.F.=</b>										n/a

**Linear Regression/Calibration Results:**

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coefficient =	n/a	n/a	n/a	> or = 0.995
Slope =	n/a	n/a	n/a	.95-1.05
b (Intercept as % of full scale)=	n/a	n/a	n/a	± 3% F.S.
% change in C.F. from last cal=	-0.38%	2.35%	0.15%	± 10%
NO <sub>2</sub> converter efficiency			0.97	0.96 to 1.04

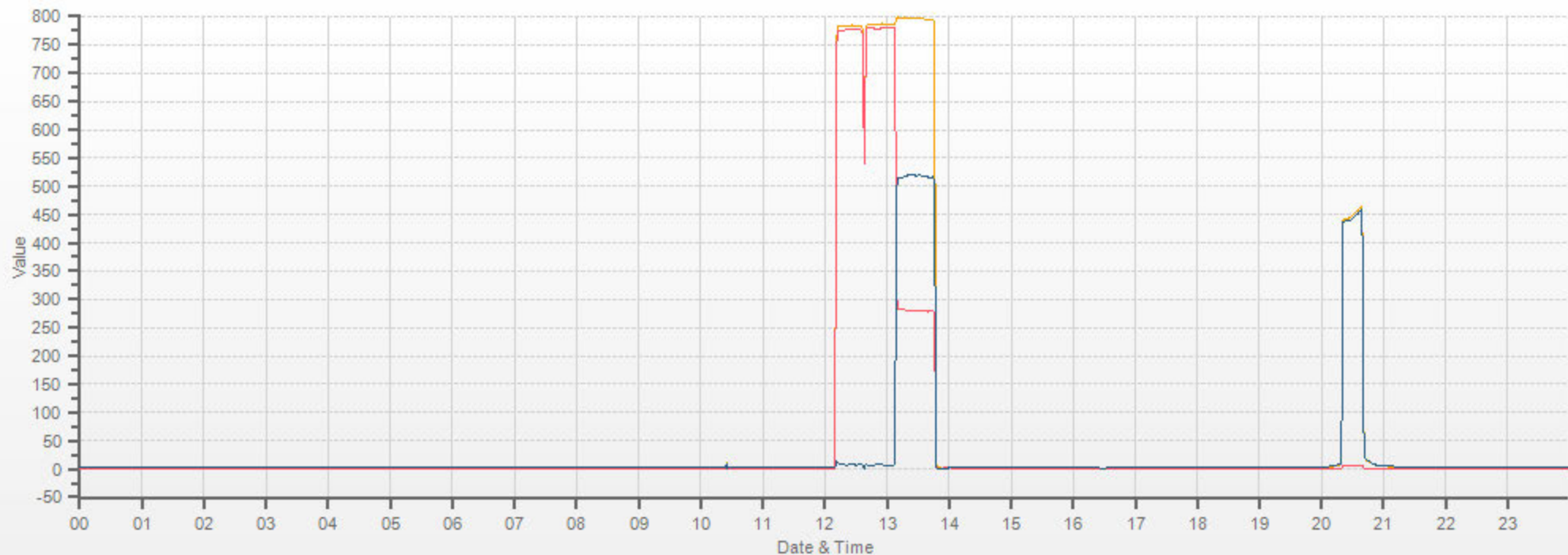
<p style="text-align: center;"><b>As found:</b></p> NOx SLOPE: 0.950 NOx OFFS: 3.0 NO SLOPE: 0.946 NO OFFS: 3.8 SAMP FLW: 484 OZONE FL: 78 PMT: 16.8 NORM PMT: 0.8 AZERO: 15.9 HVPS: 767 RCELL TEMP: 50.0 BOX TEMP: 29.6 PMT TEMP: 6.6 IZS TEMP: 40.1 MOLY TEMP: 313.8 RCEL: 5.7 SAMP: 26.6 Expected Value NO: 496.0 Expected Value NO <sub>2</sub> : 9.9 Expected Value NOx: 504.0	<p style="text-align: center;"><b>As left:</b></p> NOx SLOPE: 0.950 NOx OFFS: 3.0 NO SLOPE: 0.946 NO OFFS: 3.8 SAMP FLW: 484 OZONE FL: 78 PMT: 22.1 NORM PMT: 9.2 AZERO: 16.3 HVPS: 767 RCELL TEMP: 50.0 BOX TEMP: 31.4 PMT TEMP: 6.7 IZS TEMP: 40.3 MOLY TEMP: 315.3 RCEL: 5.7 SAMP: 26.6 Expected Value NO: 496.0 Expected Value NO <sub>2</sub> : 9.9 Expected Value NOx: 504.0
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**Comments:**

No high point NO<sub>2</sub> adjustment was required/made.

No zero adjustment was required/made.

"As Found" calibration was completed to verify ZERO readings.



— NOX[ppb] — NO[ppb] — NO2[ppb]



## ***OZONE***

# Maxxam Thermo 49i Ozone Analyzer Calibration

A Bureau Veritas Group Company

Date: April 3, 2017	Barometric Pressure: 0.917 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: St. Lina	Weather Conditions: Mix of sun and clouds
Start/End Time 24 hr. (mst): 11:56 / 16:11	Calibration Purpose: routine monthly
Ozone Calibration Method: Varying UV Lamp Power	Performed By/Reviewer: Alex Yakupov / Trina Whitsitt
G.P.T. Date: n/a-done by Varying UV Lamp Power	Cal Gas Expiry Date: n/a

Analyzer ID# or Serial Number: 1002240371	Ozone Range ppb: 500
Last Calibration Date: March 2, 2017	As Found C.F.: 0.982
Previous Cal High Point C.F.: 1.000	New C.F.: 1.000

Calibrator:	Flow Meter ID's: n/a	Point	AMD Required Range of Ozone Calibration Points
Make & Model: SABIO 2010 D	Serial #: 11900613	High	300-400 ppb
Cal Gas Cylinder I.D. #: n/a		Mid	150-200 ppb
		Low	50-75 ppb

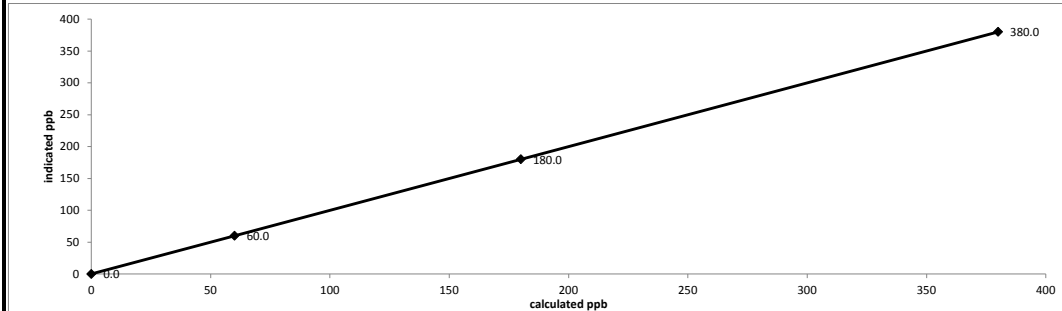
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	387.0	0.982
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	60.0	60.0	60.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F. =						1.000

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 1.000	> or = 0.995
b (Intercept as % of full scale) = 0.00%	.95-1.05
% change in C.F. from last cal = 1.81%	± 3% F.S.
	± 10%

Thermo 49i Ozone Analyzer Calibration



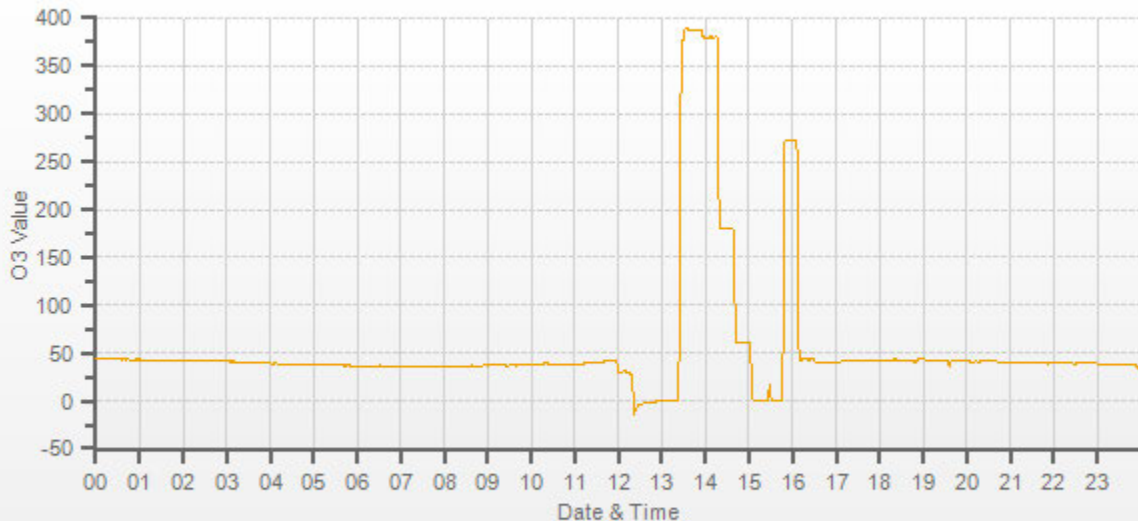
**As found:**

O3 Bkg:	-1.5
O3 Coef:	0.978
Photo Lamp:	10.7
O3 Lamp:	8.2
Bench:	28.6
Bench Lamp:	53.6
O3 Lamp:	67.8
Pressure:	681.5
Cell A lpm:	732
Cell B lpm:	766
O3 ppb:	-3.3
Cell A ppb:	-3.1
Cell B ppb:	-3.5
Cell A int:	86785
Expected Value:	268.0

**As left:**

O3 Bkg:	-0.5
O3 Coef:	0.958
Photo Lamp:	10.7
O3 Lamp:	8.2
Bench:	28.2
Bench Lamp:	53.6
O3 Lamp:	67.8
Pressure:	680.3
Cell A lpm:	731
Cell B lpm:	767
O3 ppb:	0.1
Cell A ppb:	3.5
Cell B ppb:	-3.5
Cell A int:	86796
Expected Value:	273.0

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



— O3[ppb]

***PARTICULATE MATTER***



# R & P 1405F TEOM PM 2.5 Analyzer Calibration

remove color

Date: April 4, 2017  
 Company: LICA  
 Station Name/Location: St. Lina  
 Previous Audit Date: March 28, 2017  
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whatsitt  
 Start Time (mst): 11:55  
 End Time (mst): 13:36  
 Calibration Purpose: Bi-monthly #1  
 Weather Conditions: Fog

### 1400A Information and Status:

ID# or Serial Number: 1405A208301003 As Found Filter Loading %: 34.16  
 Ko Factor: 13125 As Left Filter Loading %: 16.75  
 Ambient Temperature °C: 7.29 As Found Noise: 0.003  
 Ambient Pressure atm: 0.919 As Left Noise: 0.000  
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.30  
 Aux Flow Reading lpm: 13.67 Warnings: None

### Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#3</u>	<u>#05544</u>	<u>4295</u>
Calibration Date:	<u>January 1, 2017</u>	<u>December 5, 2016</u>	<u>November 15, 2016</u>

### As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.03	0.00	0.03
	limit	0.15	<del>0.15</del>	0.15	<del>0.15</del>
Bypass Flow	actual	0.03	-0.74	0.01	-0.74
	limit	0.60	<del>0.60</del>	0.60	<del>0.60</del>

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.03	0.00	0.03
	limit	0.15	<del>0.15</del>	0.15	<del>0.15</del>
Bypass Flow	actual	0.03	-0.74	0.01	-0.74
	limit	0.60	<del>0.60</del>	0.60	<del>0.60</del>

### As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>7.3</u>	1405F pressure atm: <u>0.919</u>
reference temperature °C: <u>9.3</u>	reference pressure: <u>0.919</u>
difference °C: <u>2.0</u>	difference : <u>0.000</u>

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>9.3</u>	1405F pressure atm: <u>0.919</u>
reference temperature °C: <u>9.3</u>	reference pressure: <u>0.919</u>
difference °C: <u>0.0</u>	difference : <u>0.000</u>

### As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.91</u>	reference total/aux flow lpm: <u>15.94</u>
difference lpm: <u>-0.09</u>	difference lpm: <u>-0.73</u>

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

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

### K<sub>o</sub> Audit:

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

### Comments:

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



# R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: April 21, 2017  
 Company: LICA  
 Station Name/Location: St. Lina  
 Previous Audit Date: April 4, 2017  
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt  
 Start Time (mst): 17:04  
 End Time (mst): 18:35  
 Calibration Purpose: Bi-monthly #2  
 Weather Conditions: A few clouds

### 1400A Information and Status:

ID# or Serial Number: 1405A208301003 As Found Filter Loading %: 21.24  
 Ko Factor: 13125 As Left Filter Loading %: 22.16  
 Ambient Temperature °C: 3.13 As Found Noise: 0.004  
 Ambient Pressure atm: 0.930 As Left Noise: 0.000  
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.30  
 Aux Flow Reading lpm: 13.67 Warnings: None

### Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#3</u>	<u>#05544</u>	<u>4295</u>
Calibration Date:	<u>January 1, 2017</u>	<u>December 5, 2016</u>	<u>November 15, 2016</u>

### As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.01	0.00	0.01
	limit	0.15	<del>0.15</del>	0.15	<del>0.15</del>
Bypass Flow	actual	0.01	-0.75	0.01	-0.75
	limit	0.60	<del>0.60</del>	0.60	<del>0.60</del>

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.01	0.00	0.01
	limit	0.15	<del>0.15</del>	0.15	<del>0.15</del>
Bypass Flow	actual	0.01	-0.75	0.01	-0.75
	limit	0.60	<del>0.60</del>	0.60	<del>0.60</del>

### As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>3.1</u>	1405F pressure atm: <u>0.930</u>
reference temperature °C: <u>3.4</u>	reference pressure: <u>0.929</u>
difference °C: <u>0.3</u>	difference: <u>0.001</u>

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>3.4</u>	1405F pressure atm: <u>0.929</u>
reference temperature °C: <u>3.4</u>	reference pressure: <u>0.929</u>
difference °C: <u>0.0</u>	difference: <u>0.000</u>

### As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.94</u>	reference total/aux flow lpm: <u>16.42</u>
difference lpm: <u>-0.06</u>	difference lpm: <u>-0.25</u>

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

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.94</u>	reference total/aux flow lpm: <u>16.42</u>
difference lpm: <u>-0.06</u>	difference lpm: <u>-0.25</u>

### K<sub>o</sub> Audit:

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

### Comments:

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

The 47 mm FDMS filter was changed.

## ***WIND SYSTEM***





# Meteorological Sensor Audit/Calibration

## Location Information

Company: <u>LICA (St Lina)</u>	Performed By: <u>Chris Wesson</u>
Audit Location: <u>Edmonton Shop</u>	Reviewed By: <u>Trina Whitsitt</u>
Audit Date: <u>April 27, 2017</u>	Start /EndTime (mst): <u>7:40 / 08:05</u>

## Wind Sensor Information

Sensor ID Data:	Sensor Outputs:
Sensor Make: <u>RM Young</u>	Velocity Voltage Output Range: <u>0-1 V</u>
Sensor Model: <u>05305VK</u>	Velocity Unit Output Range: <u>0-200 km/h</u>
Serial #: <u>56778</u>	Direction Voltage Output Range: <u>0-1 V</u>
Previous Cal/Audit Date: <u>February 28, 2017</u>	Direction Unit Output Range: <u>0-360°</u>

## Wind Calibrator Information

Calibrator Make/ Model: <u>RM Young</u>	Serial #: <u>CA 4309</u>
Maxxam Unit ID #: <u>n/a</u>	Certification Date: <u>February 24, 2017</u>

### Wind Speed Audit Data **\*\*+/- 2% of the average correction factor is the limit\*\***

RPM	Wind Speed Generated kph	Clockwise Wind Speed kph	Counter Clockwise Wind Speed kph	Correction Factor
0	0	0.2	0.2	-
1000	18.4	18.4	18.5	1.000
2000	36.9	36.9	36.8	1.001
3000	55.3	55.3	55.2	1.001
4000	73.7	73.7	73.7	1.000
5000	92.2	92.1	92.1	1.001
6000	110.6	110.5	110.5	1.001
7000	129.0	128.9	128.9	1.001
8000	147.4	147.3	147.3	1.001
9000	165.9	165.7	165.8	1.001
10000	184.3	184.2	184.2	1.001
<b>The audit meets AMD requirements.</b>			<b>Average Correction Factor=</b>	<b>1.001</b>

### Wind Direction Audit Data **\*\*+/- 5° of the absolute average degrees difference for all points is the limit\*\***

Generated Wind Direction 0-360 (Up)	Generated Wind Direction 360-0 (Down)	Indicated Wind Direction 0-360 (Up)	Indicated Wind Direction 360-0 (Down)	Degrees Difference 0-360 (Up)	Degrees Difference 360-0 (Down)	Average Absolute Degrees Difference
0	355	1	355	0.6	0.1	0.3
30	330	30	331	0.2	-0.6	0.4
60	300	62	302	-1.5	-1.6	1.6
90	270	92	272	-2.3	-2.2	2.2
120	240	122	242	-2.2	-1.9	2.1
150	210	152	212	-2.0	-1.6	1.8
180	180	182	181	-1.6	-1.4	1.5
210	150	211	151	-1.2	-1.2	1.2
240	120	241	122	-0.9	-1.6	1.3
270	90	271	91	-0.5	-1.3	0.9
300	60	300	62	-0.3	-2.0	1.1
330	30	330	32	0.2	-1.8	1.0
355	0	355	2	0.5	2.1	1.3
<b>The audit meets AMD requirements.</b>				<b>Average Absolute Degrees Difference=</b>		<b>1.3</b>

#### Comments:

Audited at Edmonton shop prior to install at St Lina  
 Previous calibration = Campbell.

## ***CALIBRATORS***

**Company** Maxxam/SIA **Operator:** Chris

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

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

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

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

<b>NO</b>	<b>LIMITS</b>	<b>NOx</b>
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0041	<b>0.90-1.10</b>	m (Slope)= 1.0046
b (Intercept % of FS)= -0.1118	± 3% F.S.	b (Intercept % of FS)= -0.0871

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

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

<b>NO<sub>2</sub></b>	<b>LIMITS</b>
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9924	<b>0.90-1.10</b>
b (Intercept % of FS)= 0.1755	± 3% F.S.

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

COMMENTS: \_\_\_\_\_

Auditor: Shea Beaton  
Operator Signature: \_\_\_\_\_

Date: January 27, 2017  
Location: McIntyre Center Edmonton

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

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

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

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

<b>NO</b>	<b>LIMITS</b>	<b>NOx</b>
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0301	<b>0.90-1.10</b>	m (Slope)= 1.0291
b (Intercept % of FS)= -0.0919	± 3% F.S.	b (Intercept % of FS)= -0.0881

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

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

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

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

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton  
Operator Signature: [Signature]

Date: March 16, 2017  
Location: McIntyre Center Edmonton

## ***CALIBRATION GASES***



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2016-335CGA

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

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

Expiry Date: July 2019

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

**Reference Analyzer:**

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

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

Last Calibration:                      Date: Oct 19/16                      C.F. 1.000                      Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	<del>0.01662</del>	<del>60.183</del>	<del>50.0</del>
4935	82.0	0.830	0.01662	60.183	50.0
4968	40.8	0.412	0.00821	121.765	50.2
4955	20.2	0.203	0.00408	245.297	49.8
Average Cylinder Concentration:					<b>50.0</b>

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 1

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration  \_\_\_\_\_

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

Auditor: Al Clark

Operator Signature: *Al Clark*

Date: October 19, 2016

Location: McIntyre Center Edmonton





# Calibration Gas Audit

## CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

Company: Maxxam Operators name: Chris Wesson  
Cylinder #: LL165372 Conc CH4 (PPM) 606/212 Tolerance (%) 0.5 Certified By: Praxair

**Reference Calibrator and Gas:**

Make/Model R&R MFC 201  
Serial Number AMU 1698  
Last Verification Date January 18, 2016  
Gas Type CH4 Conc. 999.2  
Cylinder Number D751932  
Gas Type C3H8 Conc. 246.5  
Cylinder Number XF0037998

**Flow Measurement Device:**

Make/Model Bios DC-2  
Serial Number Bios D  
Temp. °C 24.5  
B.P. 688mmHg

**Reference Analyzer:**

Make/Model Thermo 55C Serial/AMU Number: 1643  
Instrument Settings Zero: NA Span: NA Range: 20.0  
Last Calibration: Date: 18-Jan-16 C.F. 1.000 Done By: SB

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2568	0.00	0.00	0.00	<del>0.02140</del>	<del>46.722</del>	<del>607</del>	<del>214</del>
2630	56.29	12.99	12.62	0.02140	46.722	607	214
2588	19.73	4.62	4.50	0.00762	131.171	606	215
2580	9.69	2.29	2.24	0.00376	266.254	610	217
Average Cylinder Concentration:						<b>608</b>	<b>215</b>

<b>CH4</b>	<b>C3H8</b>
Previous Stated Concentration PPM: <u>606</u>	<u>212</u>
Percent variance from Stated: <u>0.3</u>	<u>1.6</u>

**Cylinder gas tolerances based on CH4 only**

Meets Manufacturer Tolerance. Use manufacturers stated concentration  COMMENTS: \_\_\_\_\_  
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration  C3H8 manufacturers tolerance 1.1%  
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: January 19, 2016  
Operator Signature: \_\_\_\_\_ Location: McIntyre Center Edmonton





# Calibration Gas Audit

## NO Cylinder Gas

File No. 2016-336CGA

**Company:** Maxxam      **Operators name:** Russell Kirchner

Cylinder #: LL104222    Conc (PPM) 50.7/50.9    Tolerance (%) 1    Certified By: Praxair

Expiry Date: July 2019

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>AMU 1659</u>
Last Verification Date	<u>October 19, 2019</u>			Temp. °C	<u>24.5 C</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>706 mmhg</u>
Cylinder Number	<u>CAL018188</u>				
Expiry Date	<u>March 2019</u>				

**Reference Analyzer:**

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

Instrument Settings    Zero: 4.4      Span: 1.080      Range: 1.0

Last Calibration:      Date: Oct 18/16      C.F. 1.000      Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4935	82.0	0.838	0.837	0.017	60.183	50.4	50.4
4968	40.8	0.417	0.417	0.008	121.765	50.8	50.8
4955	20.2	0.207	0.207	0.004	245.297	50.8	50.8
Average Cylinder Concentration:						<b>50.7</b>	<b>50.6</b>

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.7</u>	<u>50.9</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

**Cylinder gas tolerances based on NO only**

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration  Contains 50.6 ppm SO2.

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

Auditor: Al Clark      Date: October 19, 2016

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

***APPENDIX III  
REPORT CERTIFICATION FORM***

### Report Certification Form

<b>Alberta Airshed</b> (if applicable)	<b>EPA Approval or Code of Practice Registration #</b> (if applicable)
YES	NA
<b>Company Name</b> (if applicable)	<b>Industrial Operation Name</b> (if applicable)
Lakeland Industry & Community Association	St. Lina Continuous Monitoring Station
<b>Name of the Representative of the Person Responsible</b> (Last, First, Middle)	<b>Position / Title of the Representative of the Person Responsible</b>
Wunmi Adekanmbi	Project Manager, Customer Service, Air Services
<b>Is an External Party Certifying the Report?</b> (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>Name of External Person Certifying the Report</b> (Last, First, Middle)	<b>Position / Title of External Person Certifying the Report</b>
NA	NA
<b>Company Name for the External Person Certifying the Report</b>	<b>Identification of Qualifications / Professional Designations of the External Person Certifying the Report</b>
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.



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

June 15, 2017  
\_\_\_\_\_  
Report Issued Date (dd-mm-yyyy)

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



### Validation Certificate Form

<b>Client:</b> <u>Lakeland Industry &amp; Community Association</u>	<b>Project #:</b> <u>2833-2017-04-31-C</u>
<b>Site:</b> <u>St. Lina Continuous Monitoring Station</u>	<b>Contact:</b> <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u><i>MS Almbaq</i></u>	Date <u>June 2, 2017</u>
Level 1 Primary Validation	<u><i>MS Almbaq</i></u>	Date <u>June 2, 2017</u>
Level 2 Final Validation	<u><i>MS Almbaq</i></u>	Date <u>June 13, 2017</u>
Level 3 Independent Data Review	<u><i>Maram Ghalet</i></u>	Date <u>June 15, 2017</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

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



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

February 22, 2018

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

---

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

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

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

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

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

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

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

Respectfully,



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

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

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

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

Lily Lin  
Data & Reporting Specialist  
587-225-2248  
[rebbacaa@gmail.com](mailto:rebbacaa@gmail.com)



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

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

**JOB #: 2833-2017-04-35-C**


**April 2017**

Prepared for:

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

**Attention: MIKE BISAGA**

DATE: **June 12, 2017**

Prepared by: 

---

Bim Adeniji, B.Tech., C.Tech., CSSBB  
Supervisor, Ambient Air / Edmonton Operations

Reviewed by: 

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



## **SUMMARY**

In April 2017, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Bonnyville Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by the Lakeland Industry & Community Association.

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

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

**PM<sub>2.5</sub>:** Fifty seven hours of downtime were recorded this month.

- Forty two hours of data were invalidated between April 27 and 28, due to a malfunction of the TEOM unit.
- Fourteen hours of data were recorded at concentrations lower than  $-3 \mu\text{g}/\text{m}^3$  this month, rendering the data invalid.

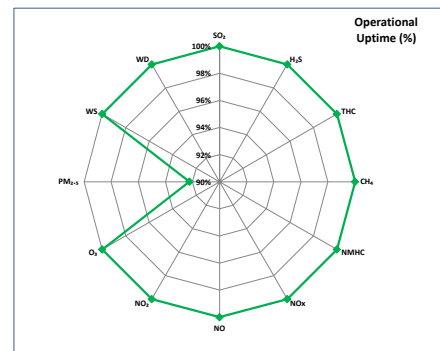
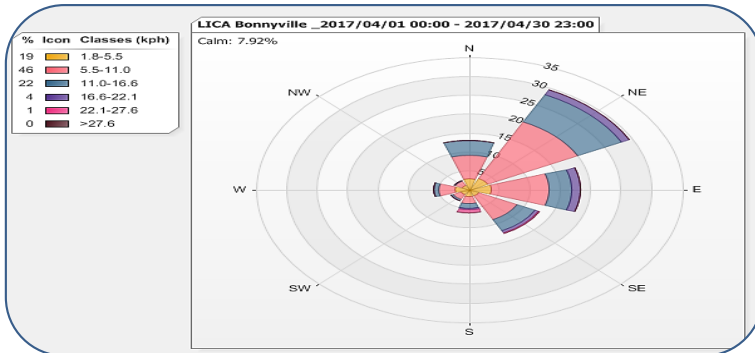
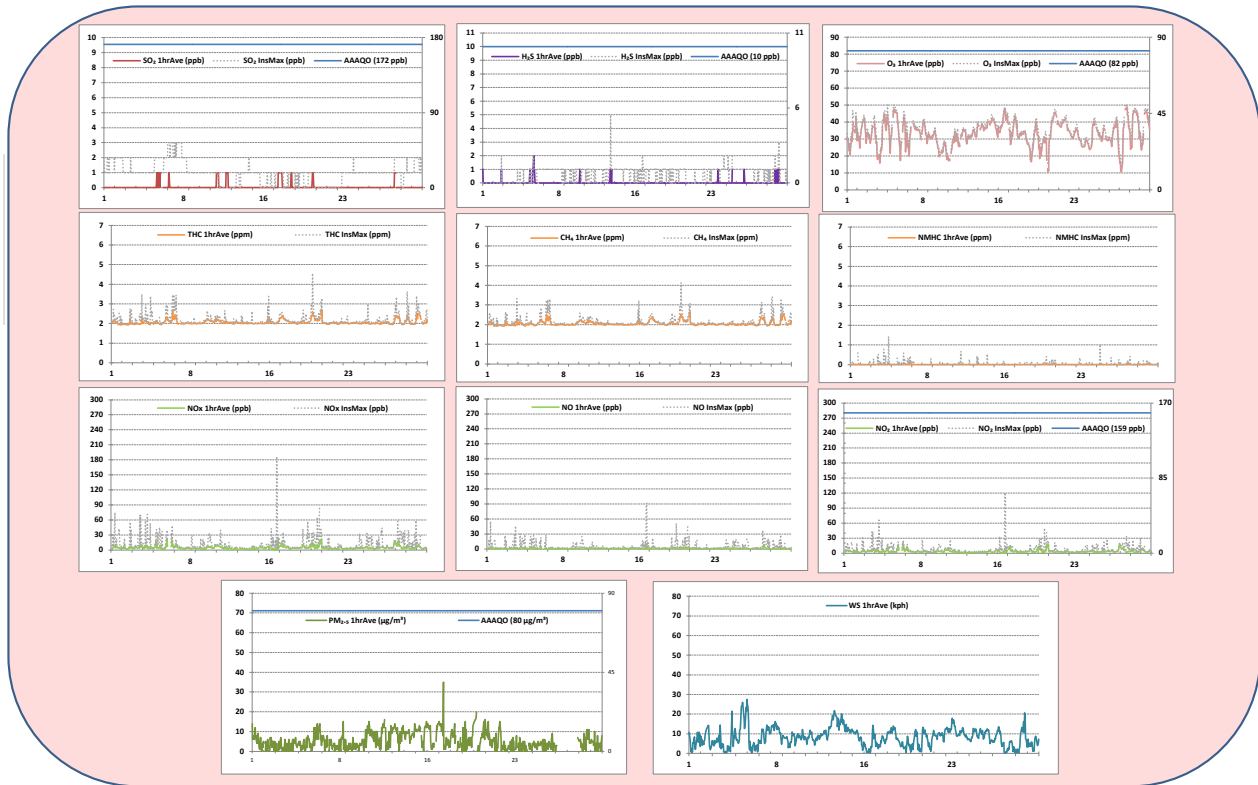
**NO<sub>x</sub>/NO/NO<sub>2</sub>:** NO<sub>x</sub> calibration concentrations were calculated using a NO<sub>x</sub> gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NO<sub>x</sub> that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO<sub>x</sub> gas value (50.9 ppm) and the outcome was insignificant. The calibration is still deemed AMD complaint.

The summary of results is presented on the following pages.

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

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 780-408-5309 or toll-free at 1-800-386-7247.

Pollutants		Monthly Records		1-Hour Records					24-Hour Records			
Name	Unit	Avg. Conc.	Uptime	Maximum			AAAQO Objective	Exceed. Hours	Maximum		AAAQO Objective	Exceed. Days
				Conc.	Date	Hour			Conc.	Date		
SO <sub>2</sub>	ppb	0	100.0%	1	April 5	23	172	0	0	April 1	48	0
H <sub>2</sub> S	ppb	0	100.0%	2	April 6	0	10	0	0	April 1	3	0
THC	ppm	2.06	100.0%	2.70	April 20	23	-	-	2.32	April 20	-	-
CH <sub>4</sub>	ppm	2.06	100.0%	2.63	April 20	23	-	-	2.30	April 20	-	-
NMHC	ppm	0.00	100.0%	0.15	April 6	19	-	-	0.02	April 6	-	-
NO <sub>x</sub>	ppb	4	100.0%	22	April 20	23	-	-	9	April 20	-	-
NO	ppb	1	100.0%	10	April 16	16	-	-	2	April 20	-	-
NO <sub>2</sub>	ppb	3	100.0%	18	April 6	19	159	0	7	April 6	-	-
O <sub>3</sub>	ppb	32.9	100.0%	48.7	April 28	18	82	0	40.4	April 16	-	-
PM <sub>2.5</sub>	µg/m <sup>3</sup>	5	92.2%	35	April 17	9	80	0	10	April 15	30	0
WS	kph	4.3	100.0%	27.5	April 5	23	-	-	16.5	April 13	-	-
WD	degree	68 (ENE)	100.0%	-	-	-	-	-	-	-	-	-



**Monthly Update**

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

**Operational Issues**

- PM<sub>2.5</sub>: Fifty seven hours of downtime were recorded this month.
- \* Forty two hours of data were invalidated between April 27 and 28, due to a TEOM unit malfunction.
- \* Fourteen hours of data were recorded at concentrations lower than -3 µg/m<sup>3</sup> this month, rendering the data invalid.

### Monthly Continuous Data Summary

Lakeland Industry & Community Association Bonnyville Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-hr	24-hr	1-hr	24-hr				WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY		
SO <sub>2</sub> (ppb)	172	48	0	0	0	1	5	23	21.5	SSE	0	1	100.0
H <sub>2</sub> S (ppb)	10	3	0	0	0	2	6	0	0.4	WSW	0	1	100.0
THC (ppm)	-	-	-	-	2.06	2.70	20	23	1	N	2.32	20	100.0
CH <sub>4</sub> (ppm)	-	-	-	-	2.06	2.63	20	23	1	N	2.30	20	100.0
NMHC (ppm)	-	-	-	-	0.00	0.15	6	19	4	ENE	0.02	6	100.0
NO <sub>2</sub> (ppb)	159	-	0	-	3	18	6	19	4	ENE	7	6	100.0
NO (ppb)	-	-	-	-	1	10	16	16	3.5	SSW	2	20	100.0
NO <sub>x</sub> (ppb)	-	-	-	-	4	22	20	23	0.9	N	9	20	100.0
O <sub>3</sub> (ppb)	82	-	0	-	32.9	48.7	28	18	3.7	S	40.4	16	100.0
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	80	30	0	0	5	35	17	9	4.2	SSE	10	15	92.2
VECTOR WS (kph)	-	-	-	-	4	28	5	23	-	NE	17	13	100.0
VECTOR WD (sec)	-	-	-	-	68 (ENE)	-	-	-	-	-	-	-	100.0

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## Exceedance Summary Report

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

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

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

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

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

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

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

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

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

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

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

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

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

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m<sup>3</sup>.

### O<sub>3</sub> 1-Hour Exceedances

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

*In accordance with EPEA and the Substance Release Regulation.*

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

### Volatile Organics (VOCs) Data Summary

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
April 1, 2017	2.1	Acetone
April 7, 2017	4.1	Acetone
April 13, 2017	3.0	Acetone
April 19, 2017	2.7	Acetone
April 25, 2017	1.4	Acetone

Note: NA

### Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collection Date	Maximum Reading ( $\mu\text{g}/\text{puf}$ )	Semi-Volatile Organic
April 1, 2017	0.12	Phenanthrene
April 7, 2017	0.14	Phenanthrene
April 13, 2017	0.12	Phenanthrene
April 19, 2017	0.24	2-Methylnaphthalene
April 25, 2017	0.17	2-Methylnaphthalene

Note: NA

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### Volatile Organics (VOCs) Data Summary - NMHC Canister System

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Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
April 6, 2017	7.80	Acetone
April 28, 2017	2.72	n-Butane

Note: NA

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## 1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulphide (H<sub>2</sub>S), Total Hydrocarbon (THC), Methane (CH<sub>4</sub>), Non-Methane Hydrocarbon (NMHC), Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxides (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), Particulate Matter 2.5 (PM<sub>2.5</sub>), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD). The non-continuous monitoring data results for VOCs, PAHs and NMHC canister are also included in this report.

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

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

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

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

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

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

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

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (December, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

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

#### **SULPHUR DIOXIDE (SO<sub>2</sub>)**

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on April 6.

#### **HYDROGEN SULPHIDE (H<sub>2</sub>S)**

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on April 6.

#### **TOTAL HYDROCARBONS (THC), METHANE (CH<sub>4</sub>) and NON-METHANE HYDROCARBONS (NMHC)**

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on April 7.
- One hour of maximum instantaneous data was invalidated on April 6, due to a brief power interference that occurred during the routine monthly visit.

#### **OXIDES OF NITROGEN (NO<sub>x</sub>), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO<sub>2</sub>)**

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on April 6.
- NO<sub>x</sub> calibration concentrations were calculated using a NO<sub>x</sub> gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NO<sub>x</sub> that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO<sub>x</sub> gas value (50.9 ppm) and the outcome was insignificant. The calibration is still deemed AMD compliant.

#### **OZONE (O<sub>3</sub>)**

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on April 7.
- One hour of maximum instantaneous data was invalidated on April 6, due to a brief power interference that occurred during the routine monthly visit.

#### **PARTICULATE MATTER < 2.5 MICRONS (PM<sub>2.5</sub>)**

- Operational time, for the monitoring period was 92.2%, equivalent to fifty six hours of downtime.
- Two routine TEOM audits were performed this month. The first was completed on April 7, and the second on April 24.
- The TEOM unit malfunctioned at hour 3:00 on April 27. This prompted a site visit on April 28, where the unit was restarted. No further issues were identified, operations resumed at hour 21:00. Forty two hours of downtime were recorded due to this event.
- Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, Zero Adjustment Criteria. Data recorded between 0 and -3 µg/m<sup>3</sup> was corrected to 0 µg/m<sup>3</sup>. Data recorded below -3 µg/m<sup>3</sup> was invalidated. Fourteen hours of data were invalidated as the data was below -3 µg/m<sup>3</sup> this month.

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

- Operational time, for the monitoring period was 100%.
- One hour of maximum instantaneous data was invalidated on April 6, due to a brief power interference that occurred during the routine monthly visit.

#### **VOC SAMPLES**

- The sampler was programmed to run for 24 hours every 6<sup>th</sup> day per the NAPS (North American Pollution Surveillance Schedule).
- Samples were collected, as scheduled, on April 1, 7, 13, 19 and 25. Analysis was provided by InnoTech Alberta, results are included in this report.
- The VOC sampler quarterly audit was performed on April 6.

#### **PAH SAMPLES**

- The sampler was programmed to run for 24 hours every 6<sup>th</sup> day per the NAPS (North American Pollution Surveillance Schedule).
- Samples were collected, as scheduled, on April 1, 7, 13, 19 and 25. Analysis was provided by InnoTech Alberta, results are included in this report.
- The PAH sampler quarterly audit was performed on April 6.

#### **NMHC CANISTER SAMPLES**

The canister sampler is programmed to draw in a whole air sample when the 5-minute average concentration of NMHC is above 0.30 ppm. A representative sample of ambient air is collected over a one-hour period when the canister event is triggered.

Two canister events were recorded this month. The date, time and initial 5-min average concentration measurements are as follows:

- April 6 at 19:50 - 0.36 ppm
- April 28 at 06:45 - 0.32 ppm

Other five-minute averages recorded at concentrations above 0.30 ppm are not considered sample-collection events as they occurred between events, before the canisters were replaced. Analysis was provided by InnoTech Alberta, results are included in this report.

---

## **2.0 Project Personnel**

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

## **3.0 Plant Monthly Required AMD Summary**

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

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

## **4.0 Calculations and Results**

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

## 5.0 Methods and Procedures

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

- Maxxam AIR SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring
- Maxxam AIR SOP-00208: RM Young Wind Monitor Calibration
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O<sub>3</sub> Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO<sub>2</sub>/NO<sub>x</sub> Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canister and Xontech
- Maxxam AIR SOP-00007: TISCH PUF Sampler Operating, Calibration and Maintenance Procedures

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 55i FID Analyzer
- Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
- Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM<sub>2.5</sub>) - R&P 1405F TEOM Unit
- Wind System - RM Young Unit
- Datalogger - ESC 8832
- VOC - XONTECH 910A Gaseous Air Sampler
- PAH - TISCH PUF Plus

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

**Level 0 Preliminary Verification**

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

**Level 1 Primary Validation**

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

**Level 2 Final Validation**

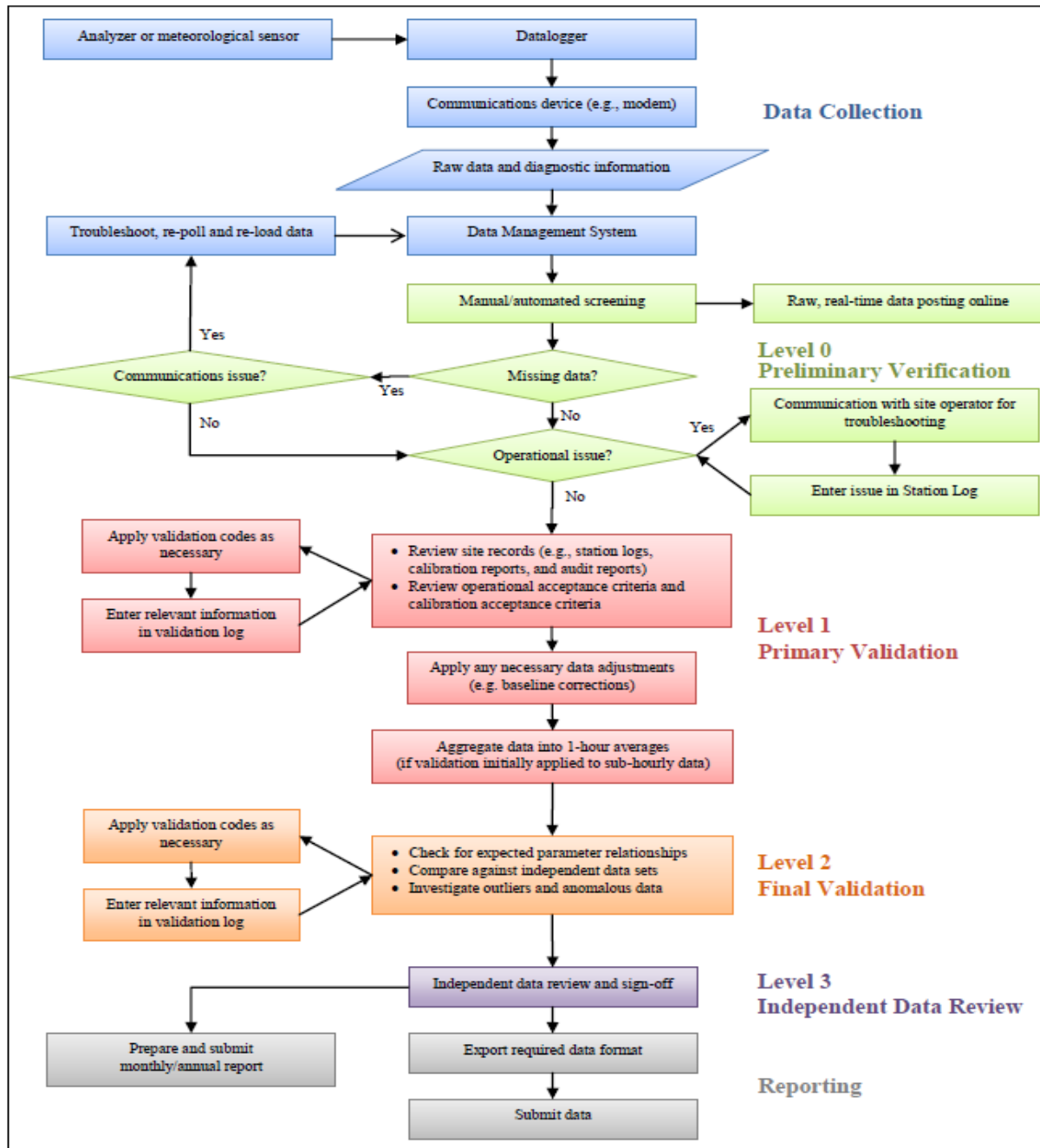
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

**Level 3 Independent Data Review**

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

**Post-Final Validation**

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



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

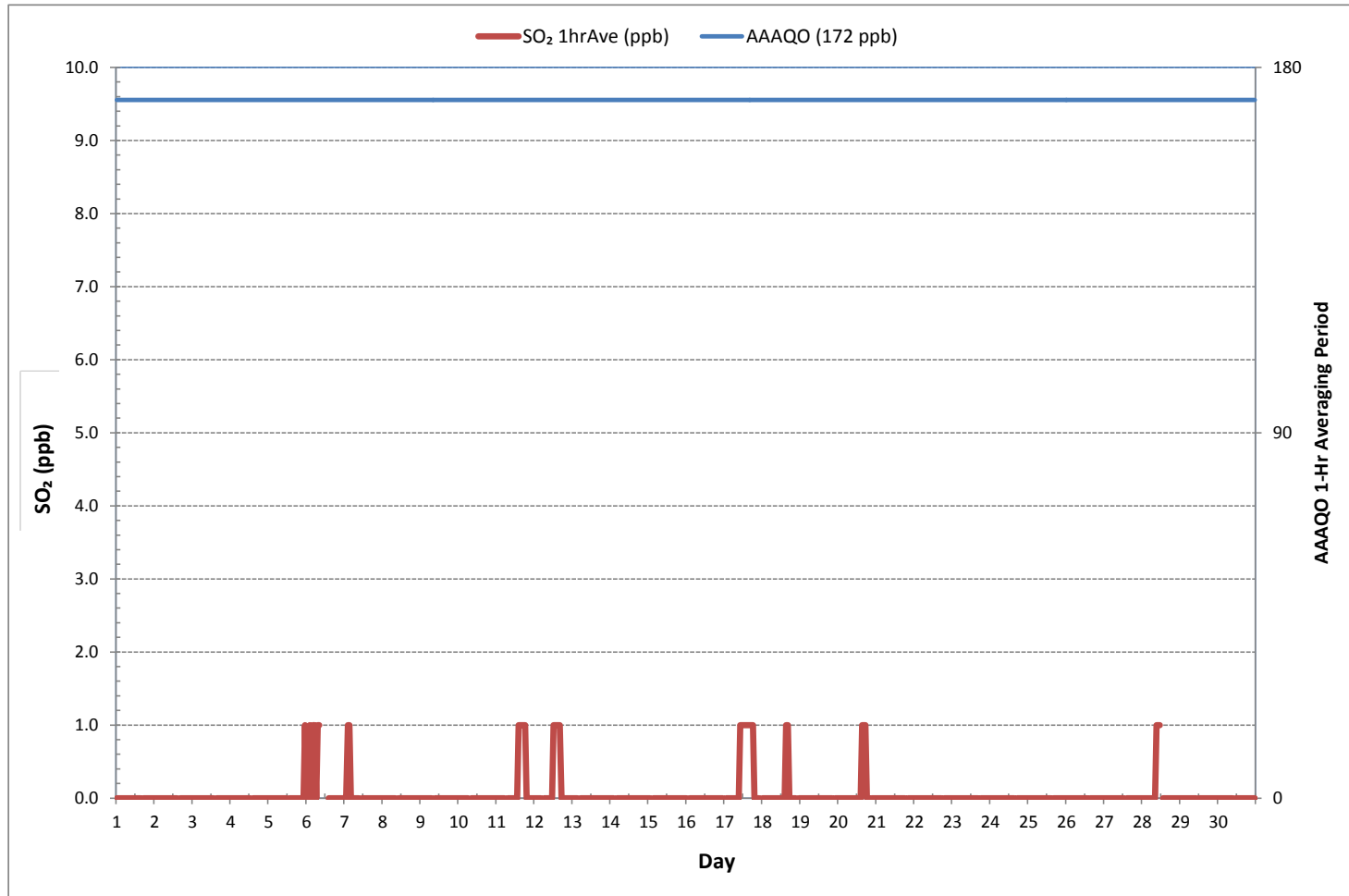


***APPENDIX I***  
***CONTINUOUS MONITORING DATA RESULTS***

***SULPHUR DIOXIDE***



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





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville Continuous Monitoring Station - April 2017

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

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

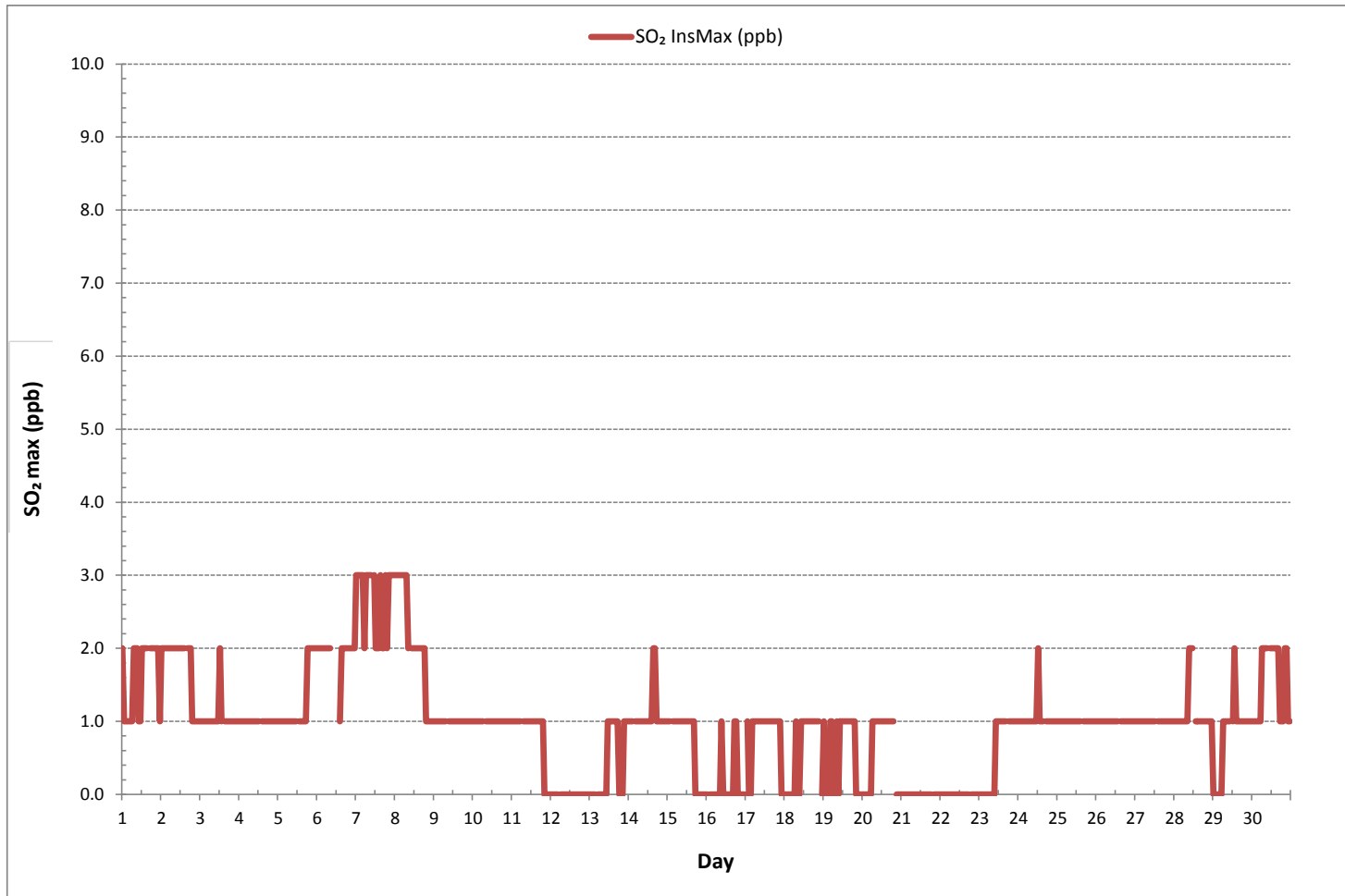
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	525
MAXIMUM INSTANTANEOUS VALUE:	3 ppb @ HOUR 0 ON DAY 7
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	720 hrs



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville Continuous Monitoring Station - April 2017

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



Wind: LICA Bonnyville  
 Poll.: LICA Bonnyville-SO2[ppb]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

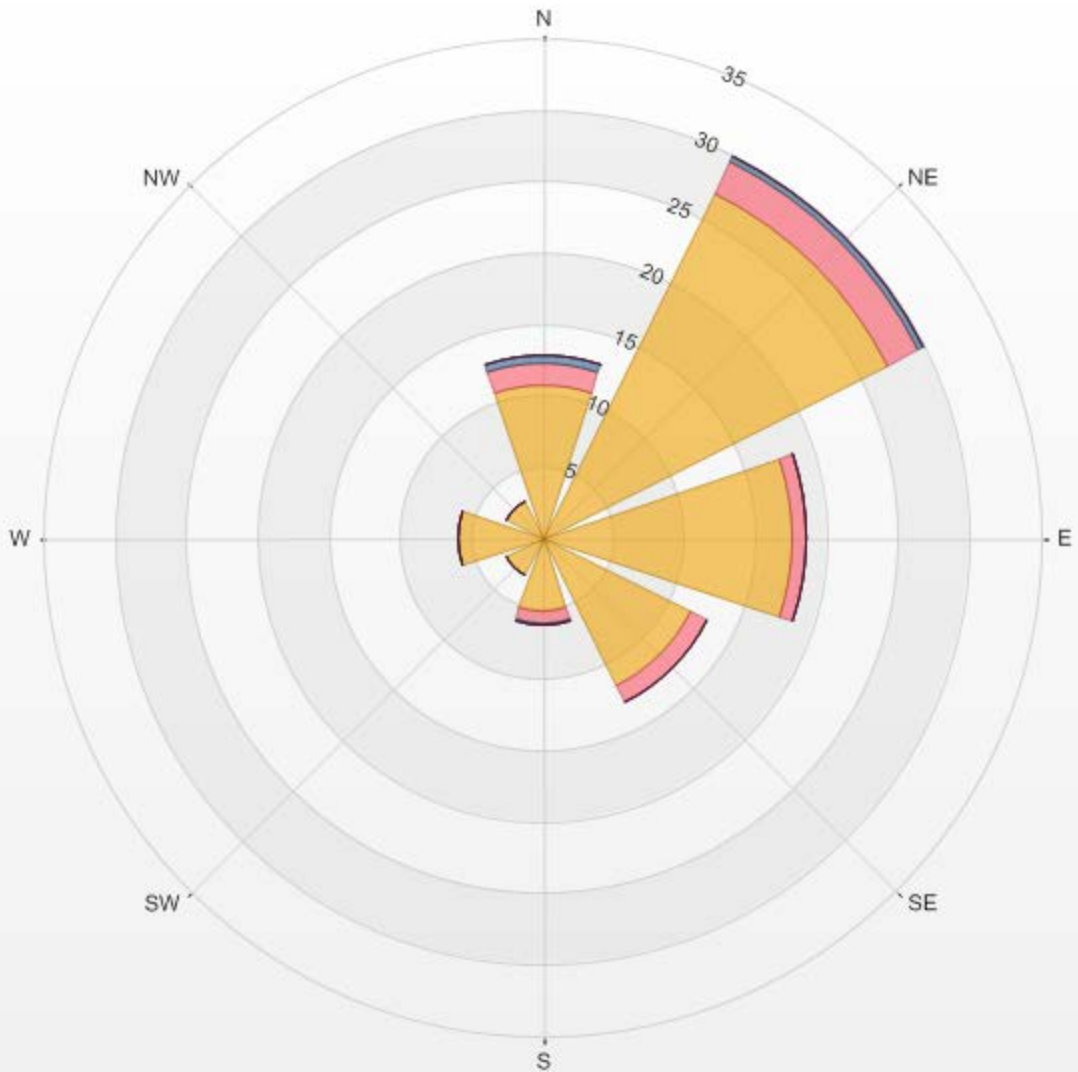
Calm: 7.88%

Calm Avg: 0.09 [ppb]

Direction	0.0-0.4	0.4-0.8	0.8-1.1	1.1-1.5	1.5-1.9	>1.9	Total
<b>N</b>	10.8	1.5	0.6	0.0	0.0	0.0	12.8
<b>NE</b>	27.0	2.5	0.4	0.0	0.0	0.0	29.9
<b>E</b>	17.5	1.0	0.0	0.0	0.0	0.0	18.5
<b>SE</b>	11.7	1.2	0.0	0.0	0.0	0.0	12.9
<b>S</b>	5.3	0.7	0.2	0.0	0.0	0.0	6.1
<b>SW</b>	2.9	0.0	0.0	0.0	0.0	0.0	2.9
<b>W</b>	6.0	0.0	0.0	0.0	0.0	0.0	6.0
<b>NW</b>	2.9	0.0	0.0	0.0	0.0	0.0	2.9
<b>Summary</b>	84.1	6.9	1.2	0.0	0.0	0.0	92.1

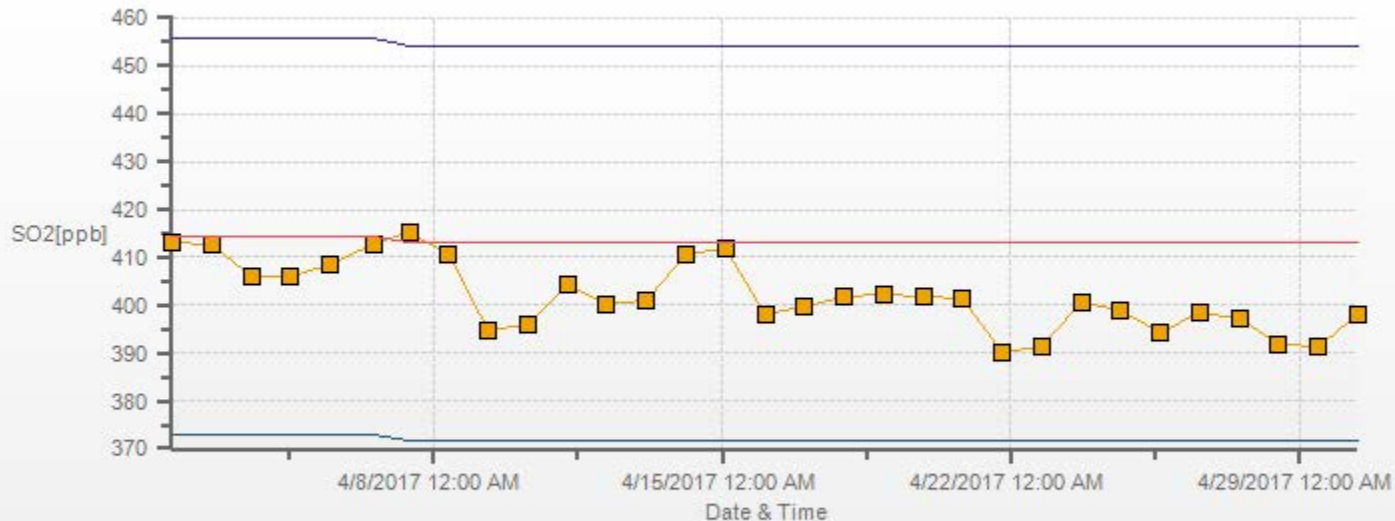
% Icon	Classes (ppb)	84	7	1	0	0	0
	0.0-0.4						
	0.4-0.8						
	0.8-1.1						
	1.1-1.5						
	1.5-1.9						
	>1.9						

LICA Bonnyville Poll.: LICA Bonnyville-SO2[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 7.88% Calm Poll Avg: 0.09[ppb]





SO2[ppb] Calibration: LICA Bonnyville Monthly: 2017/04 Type: Span



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

***HYDROGEN SULPHIDE***



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

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

STATUS FLAG CODES

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

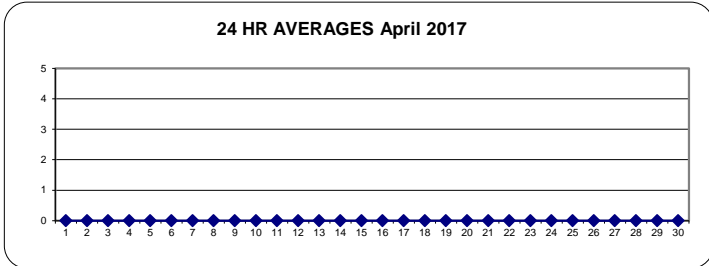
OBJECTIVE LIMIT:

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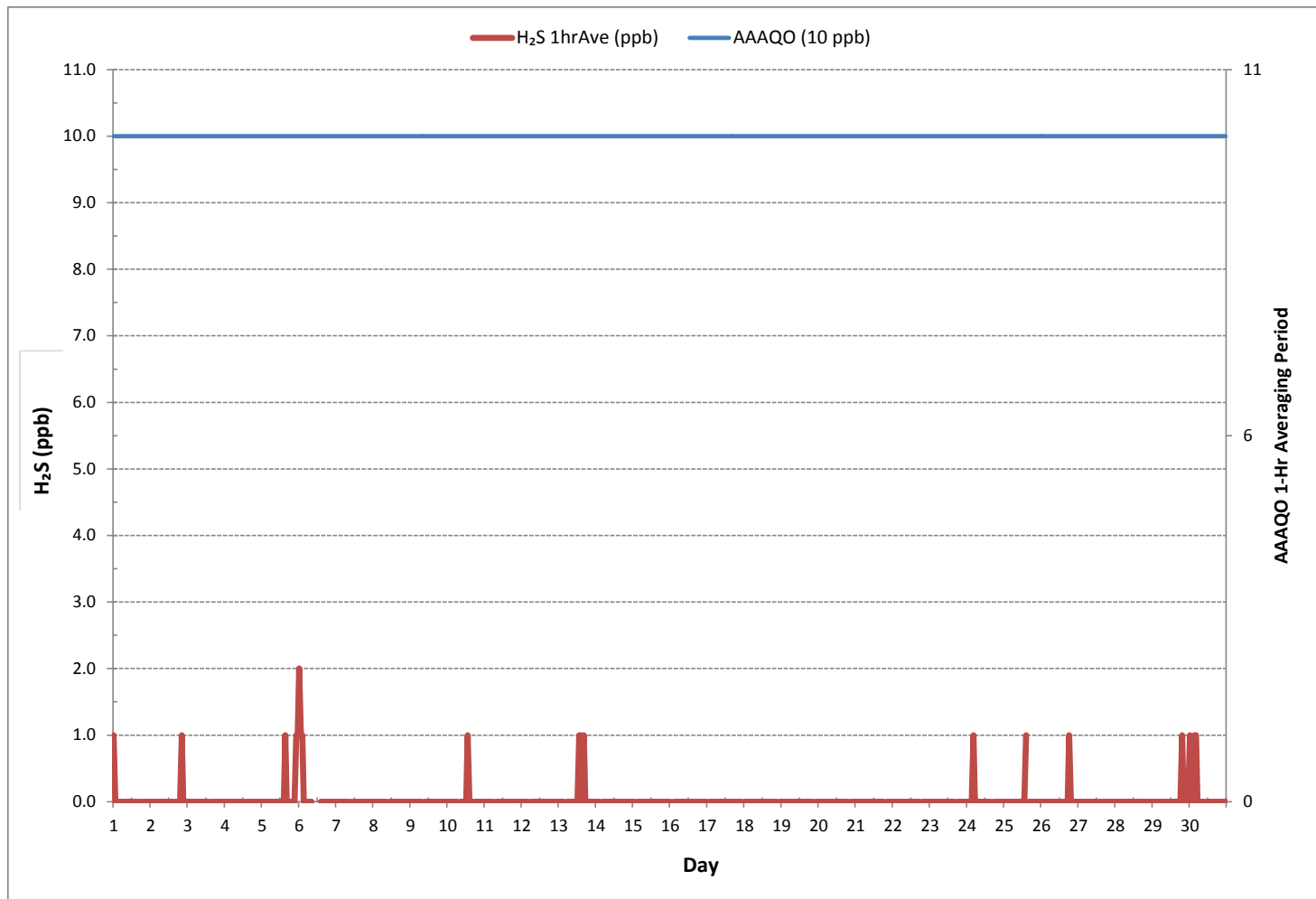
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	19		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	1 ON DAY	1
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR	0 ON DAY	6
MAXIMUM 24-HR AVERAGE:	0 ppb	ON DAY	1
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES April 2017



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





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville Continuous Monitoring Station - April 2017

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

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

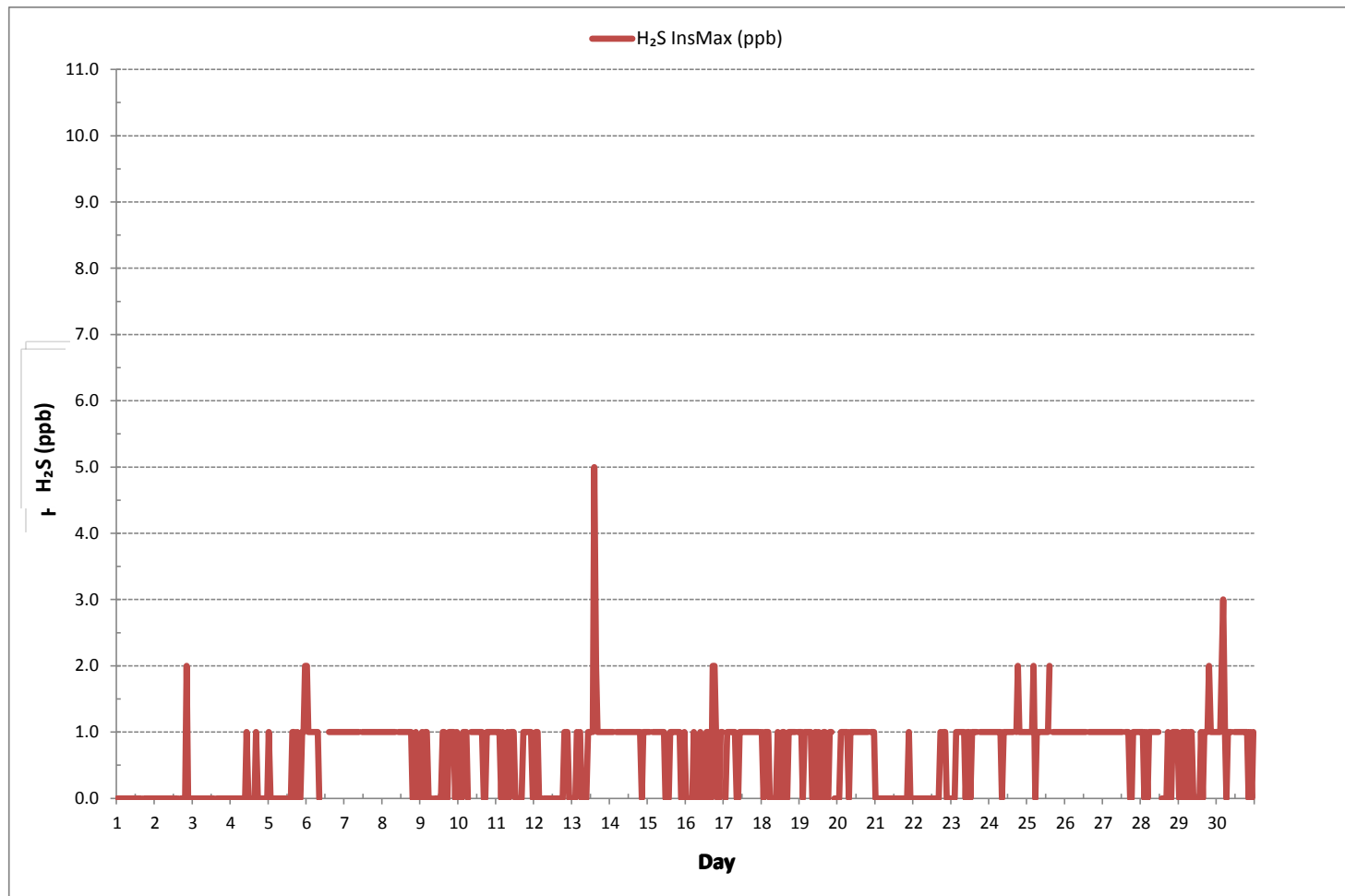
STATUS FLAG CODES

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:	405
MAXIMUM INSTANTANEOUS VALUE:	5 ppb @ HOUR 14 ON DAY 13
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	720 hrs

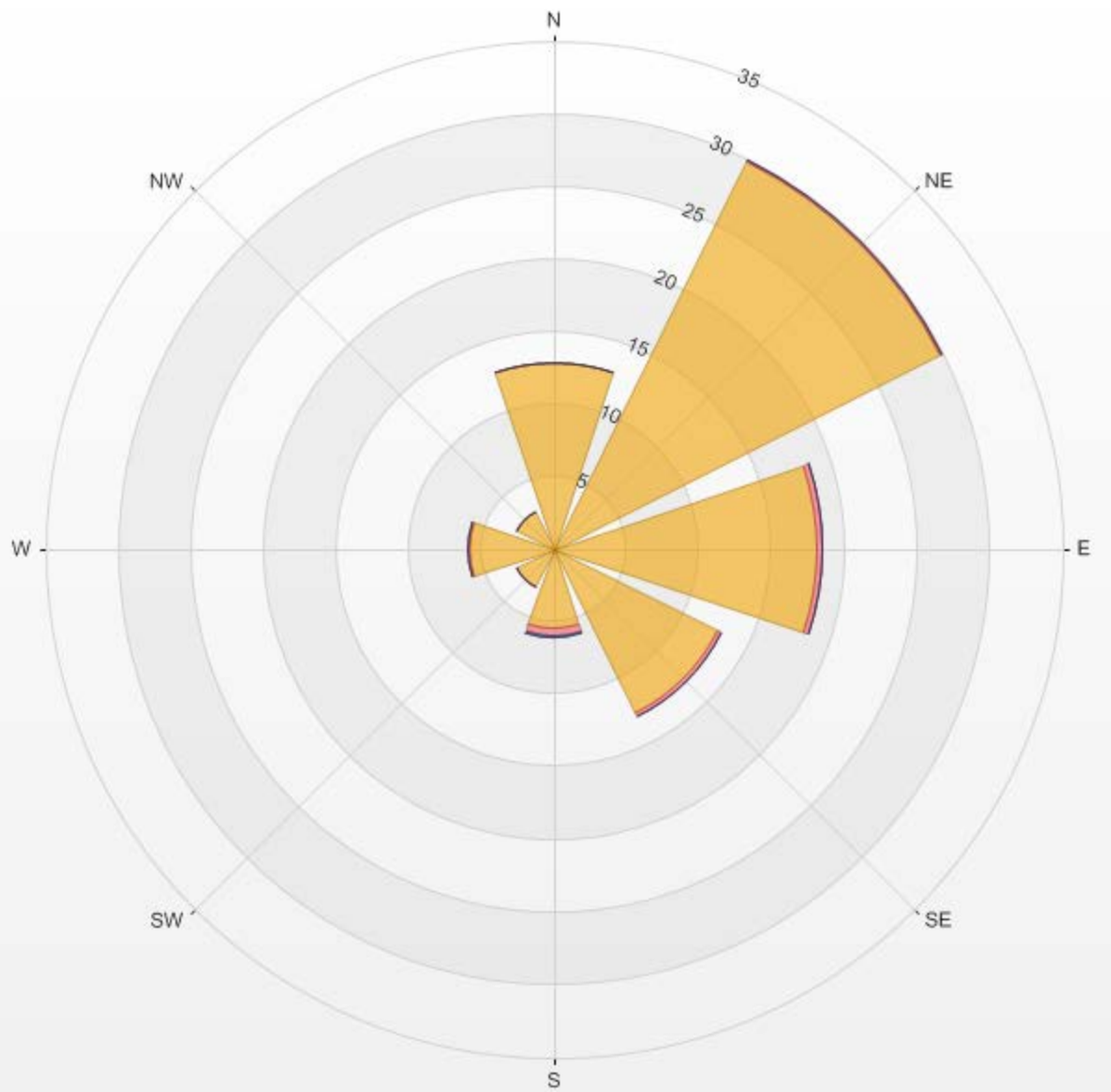
HYDROGEN SULPHIDE Instantaneous Maximum (H<sub>2</sub>S ppb)





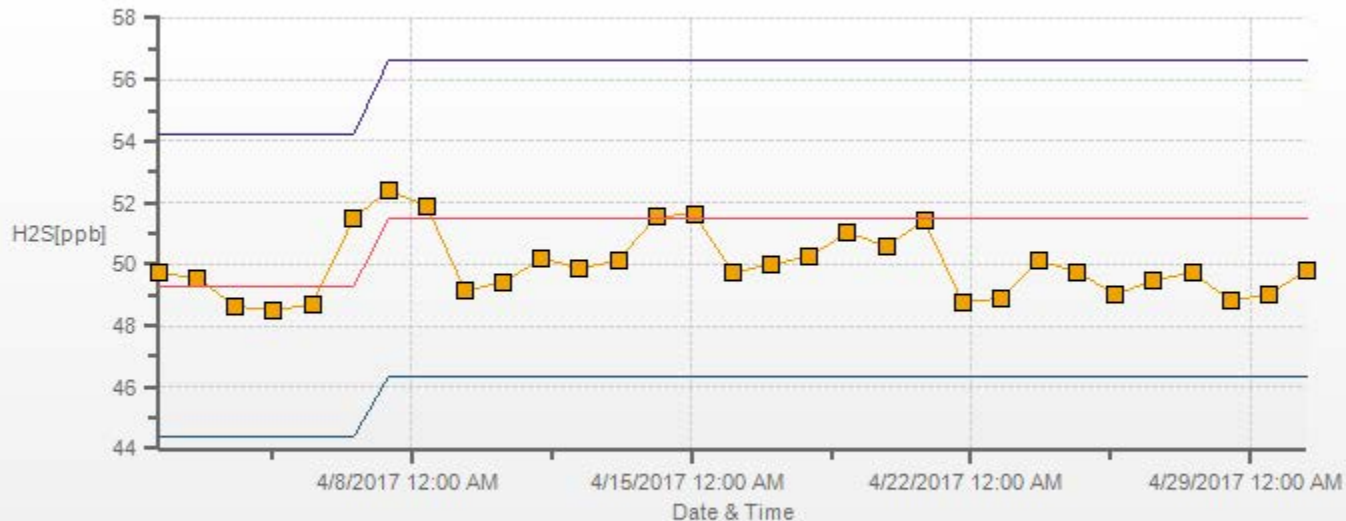
% Icon Classes (ppb) 91 0.0-0.7 1 0.7-1.4 0 1.4-2.1 0 >2.1

LICA Bonnyville Poll.: LICA Bonnyville-H2S[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 7.88% Calm Poll Avg: 0.10[ppb]





H2S[ppb] Calibration: LICA Bonnyville Monthly: 2017/04 Type: Span



Span Meas Span Ref Span Low Span High

***TOTAL HYDROCARBON***

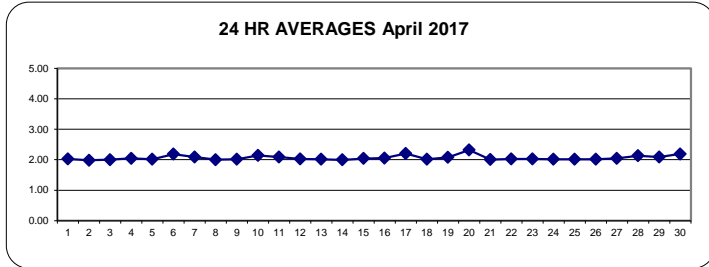


TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.04	2.04	2.03	2.04	2.14	2.08	2.15	2.14	2.15	2.06	2.02	2.08	2.10	2.06	1.99	1.93	S	1.95	1.94	1.94	1.93	1.97	1.93	1.92	1.92	1.92	1.92	2.15	2.03	24
2	1.94	1.95	1.95	1.96	1.97	1.97	1.97	1.96	1.95	1.95	1.94	1.93	1.93	1.93	1.93	S	1.94	2.02	2.25	1.96	2.01	2.04	2.06	2.04	1.93	2.25	1.98	24		
3	1.97	1.97	1.98	1.97	1.97	1.95	1.97	1.96	1.98	2.05	2.01	1.99	1.98	1.97	S	1.96	1.98	1.97	1.96	2.00	2.04	2.33	1.99	2.05	1.95	2.33	2.00	24		
4	2.05	2.07	2.11	2.09	2.09	2.13	2.17	2.11	2.09	2.03	2.06	2.05	1.97	S	1.97	1.95	1.93	1.98	2.05	2.03	2.05	2.01	2.00	1.99	1.93	2.17	2.04	24		
5	1.97	2.01	2.07	2.06	2.06	2.07	2.12	2.12	2.03	2.03	2.04	2.03	S	1.98	1.96	1.95	1.94	1.95	1.97	1.98	1.98	2.02	2.03	2.04	1.94	2.12	2.02	24		
6	2.10	2.10	2.11	2.12	2.25	2.20	2.33	2.31	2.16	2.17	2.13	S	2.11	2.10	2.05	2.01	2.02	2.11	2.17	2.68	2.33	2.26	2.22	2.19	2.01	2.68	2.18	24		
7	2.43	2.43	2.29	2.42	2.23	2.08	2.05	1.99	1.97	C	C	C	C	1.99	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.99	1.99	1.97	2.43	2.09	24		
8	1.99	1.99	2.00	2.02	2.02	2.01	2.01	2.01	1.99	S	2.00	2.00	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	2.00	2.02	2.01	2.02	1.99	1.98	2.02	2.00	24	
9	1.98	1.98	2.00	2.00	2.00	1.99	1.99	2.00	S	1.99	1.99	1.99	1.99	1.99	1.99	1.99	2.01	2.02	2.04	2.04	2.03	2.09	2.13	2.17	1.98	2.17	2.02	24		
10	2.16	2.15	2.20	2.24	2.22	2.21	2.15	S	2.12	2.14	2.16	2.11	2.12	2.11	2.11	2.09	2.08	2.06	2.06	2.07	2.18	2.24	2.12	2.11	2.06	2.24	2.14	24		
11	2.13	2.22	2.17	2.16	2.18	2.13	S	2.16	2.10	2.09	2.05	2.03	2.02	2.04	2.02	1.99	1.99	2.04	2.07	2.06	2.13	2.08	2.08	2.06	1.99	2.22	2.09	24		
12	2.03	2.04	2.03	2.02	2.04	S	2.02	2.01	2.02	2.03	2.01	2.00	1.98	1.97	1.98	1.98	1.99	2.00	2.01	2.07	2.12	2.07	2.06	2.04	1.97	2.12	2.02	24		
13	2.02	2.04	2.03	2.02	S	2.01	2.00	2.00	2.04	2.02	2.09	2.00	1.99	2.00	2.01	2.01	2.02	2.02	2.00	2.00	2.01	1.99	2.00	2.00	1.99	2.09	2.01	24		
14	2.02	2.00	1.99	S	2.02	2.01	2.01	2.02	2.01	1.99	1.98	1.98	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.98	2.02	2.00	24		
15	1.99	1.99	S	2.01	2.01	2.00	2.00	2.00	1.99	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.02	2.02	2.03	2.04	2.03	2.23	2.35	2.12	1.99	2.35	2.04	24		
16	2.06	S	2.08	2.09	2.09	2.08	2.06	2.06	2.01	2.00	2.00	1.99	1.99	2.00	2.00	2.00	2.00	2.02	2.02	2.08	2.11	2.10	2.13	2.25	1.99	2.25	2.05	24		
17	S	2.29	2.28	2.30	2.37	2.40	2.39	2.34	2.22	2.23	2.20	2.17	2.17	2.18	2.14	2.12	2.14	2.14	2.11	2.12	2.09	2.08	2.09	S	2.08	2.40	2.21	24		
18	2.04	2.04	2.02	2.02	2.02	2.04	2.02	2.04	2.02	2.02	2.05	2.20	2.01	1.99	1.98	1.97	1.97	1.98	1.99	2.01	2.00	2.03	S	2.05	1.97	2.05	2.01	24		
19	2.06	2.10	2.09	2.08	2.09	2.13	2.12	2.06	2.03	2.02	2.05	2.04	2.04	2.01	2.04	2.05	2.05	2.05	2.05	2.08	2.09	S	2.15	2.32	2.01	2.32	2.08	24		
20	2.41	2.38	2.60	2.46	2.41	2.41	2.34	2.22	2.15	2.18	2.23	2.24	2.20	2.13	2.15	2.14	2.19	2.17	2.18	2.30	S	2.69	2.38	2.70	2.13	2.70	2.32	24		
21	2.08	2.05	2.03	2.04	2.03	2.01	2.01	2.01	1.99	1.96	1.96	1.96	1.96	1.97	1.97	1.99	1.98	1.98	2.02	S	2.02	2.02	2.02	2.02	1.96	2.08	2.01	24		
22	2.02	2.04	2.06	2.04	2.05	2.04	2.05	2.03	2.04	2.00	1.97	1.97	1.97	1.97	1.98	1.98	2.00	2.02	S	2.06	2.10	2.04	2.03	2.03	1.97	2.10	2.02	24		
23	2.06	2.05	2.04	2.05	2.05	2.05	2.04	2.04	2.04	2.06	2.01	2.00	1.99	1.98	1.98	1.99	1.99	S	2.01	2.01	2.02	2.03	2.04	2.04	1.98	2.06	2.02	24		
24	2.05	2.03	2.04	2.03	2.03	2.04	2.04	2.03	2.02	2.01	2.01	1.99	1.98	1.99	1.99	2.00	S	1.98	1.98	2.02	2.02	2.02	2.03	2.04	1.98	2.05	2.02	24		
25	2.05	2.04	2.05	2.06	2.08	2.07	2.05	2.03	2.02	1.99	1.99	1.98	1.98	1.98	1.97	S	1.99	1.99	1.98	2.00	2.00	2.01	2.01	1.99	1.97	2.08	2.01	24		
26	1.98	1.99	2.00	2.01	2.02	2.06	2.02	2.02	2.00	1.99	1.98	1.99	1.98	1.97	S	1.99	1.99	2.00	2.03	2.04	2.05	2.06	2.07	2.04	1.97	2.07	2.01	24		
27	2.04	2.04	2.06	2.06	2.09	2.09	2.07	1.99	1.98	1.97	1.96	1.96	1.96	S	1.94	1.96	1.95	1.98	1.97	2.00	2.10	2.18	2.29	2.40	1.94	2.40	2.05	24		
28	2.35	2.41	2.32	2.29	2.31	2.31	2.27	2.36	2.22	2.06	2.04	2.02	S	1.94	1.94	1.95	1.96	1.97	1.96	1.98	2.02	2.10	2.14	2.09	1.94	2.41	2.13	24		
29	2.15	2.23	2.42	2.25	2.22	2.23	2.14	2.04	1.99	1.96	S	1.98	1.99	1.98	1.97	1.96	1.96	1.97	1.97	2.00	2.04	2.19	2.51	1.96	2.51	2.09	24			
30	2.33	2.24	2.44	2.48	2.51	2.47	2.43	2.41	2.32	2.21	S	2.03	2.00	1.99	1.97	1.98	2.03	2.04	2.05	2.03	2.10	2.21	2.06	1.97	2.51	2.19	24			
HOURLY MAX	2.43	2.43	2.60	2.48	2.51	2.47	2.43	2.41	2.32	2.23	2.23	2.24	2.20	2.18	2.15	2.14	2.19	2.17	2.25	2.68	2.33	2.69	2.38	2.70						
HOURLY AVG	2.09	2.10	2.12	2.12	2.12	2.11	2.10	2.08	2.06	2.05	2.03	2.02	2.01	2.01	2.00	2.00	2.00	2.01	2.03	2.05	2.06	2.09	2.09	2.11						

STATUS FLAG CODES

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



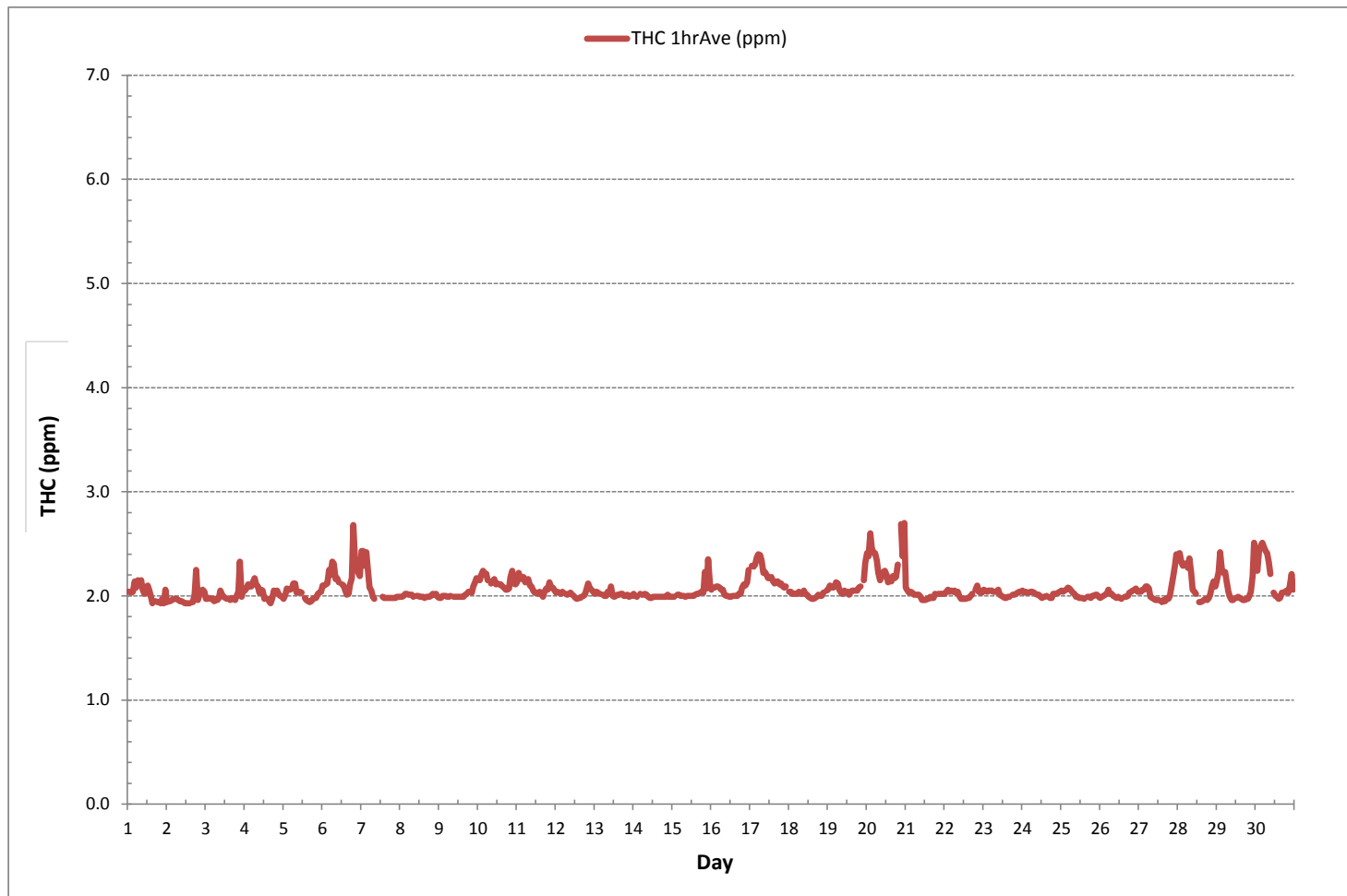
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	686			
MINIMUM 1-HR AVERAGE:	1.92 ppm	@ HOUR	23	ON DAY 1
MAXIMUM 1-HR AVERAGE:	2.70 ppm	@ HOUR	23	ON DAY 20
MAXIMUM 24-HR AVERAGE:	2.32 ppm			ON DAY 20
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	720 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.12	MONTHLY AVERAGE:	2.06 ppm	



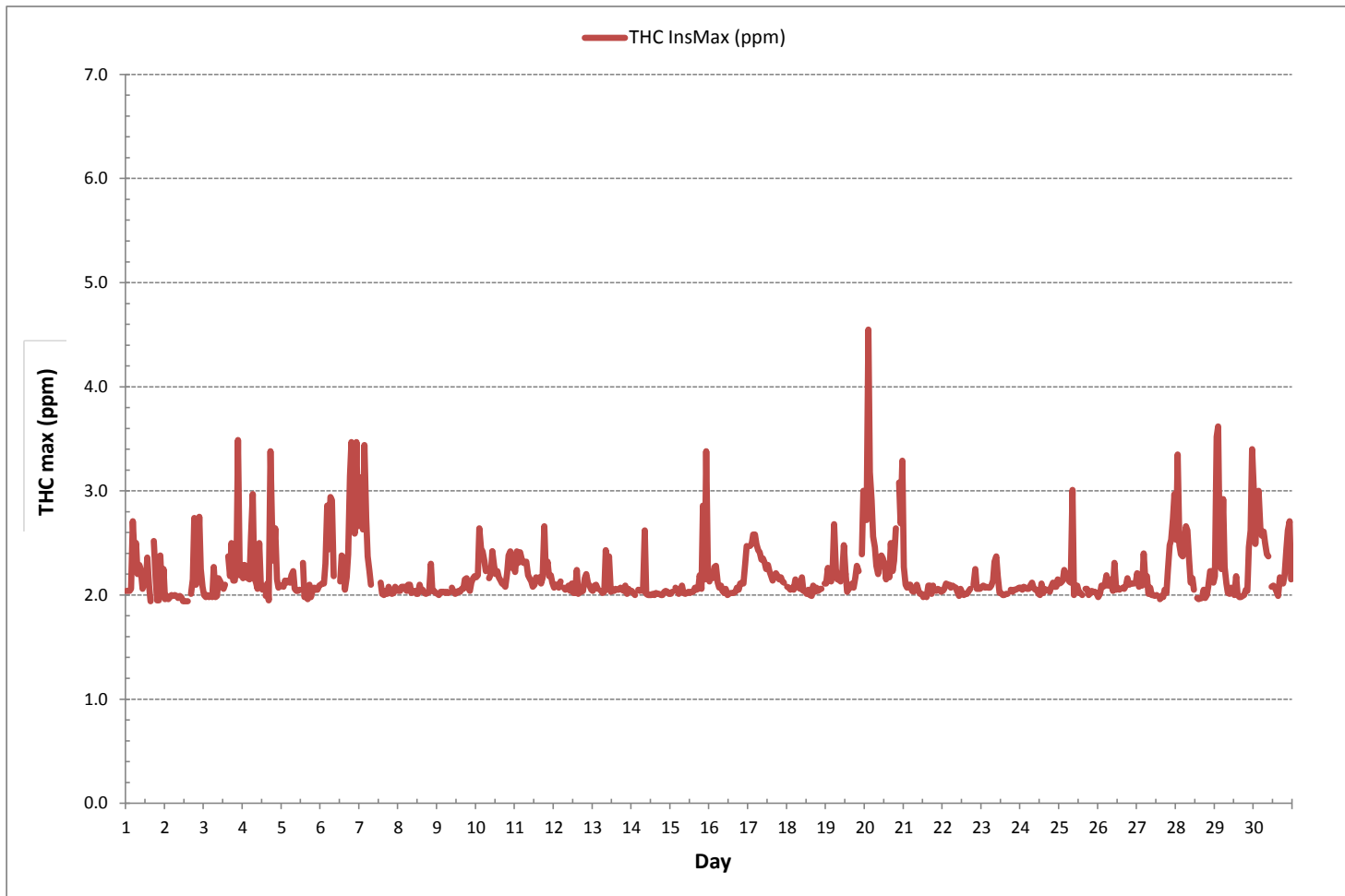
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville Continuous Monitoring Station - April 2017

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



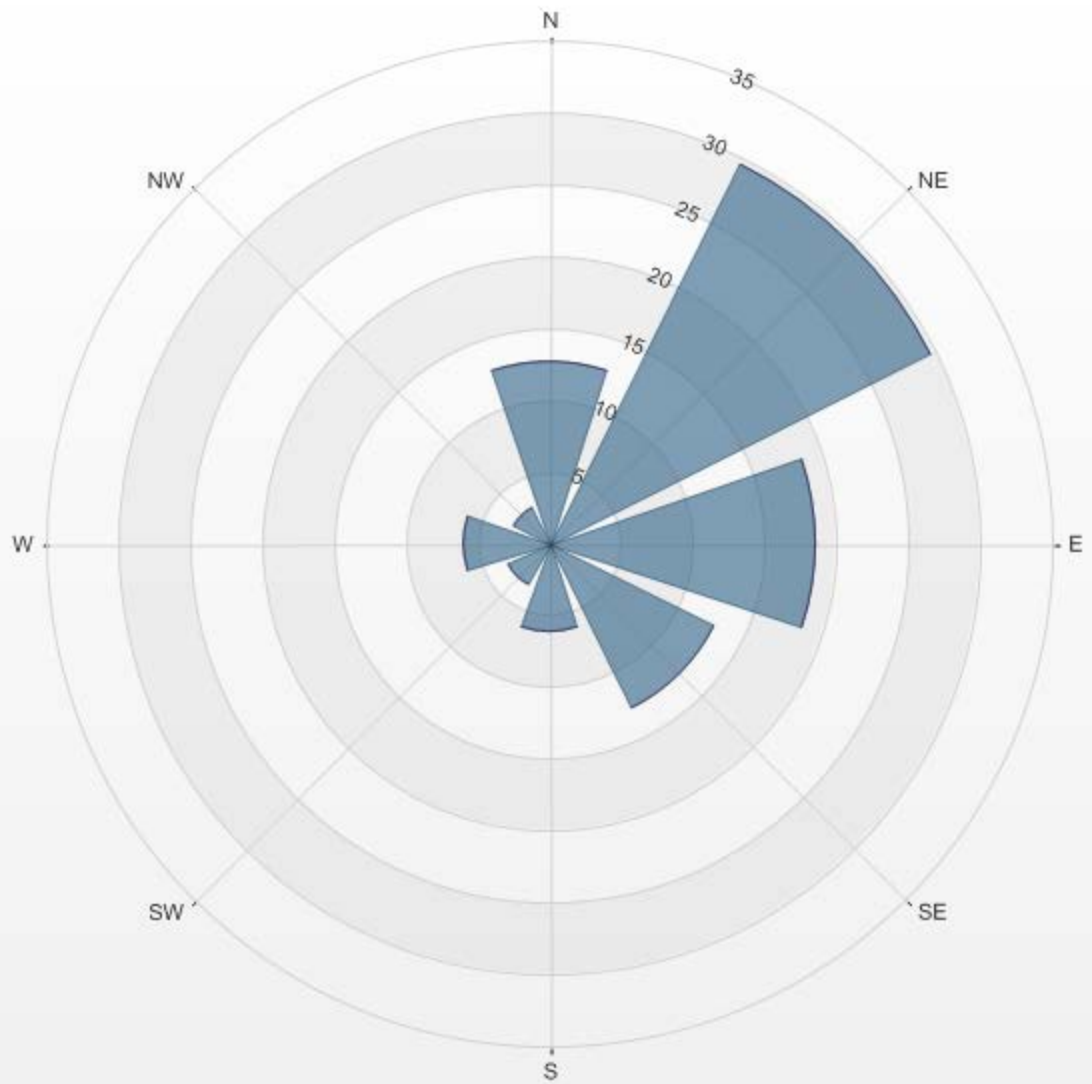
Wind: LICA Bonnyville  
 Poll.: LICA Bonnyville-THC55[ppm]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 8.03% Calm Avg: 2.16 [ppm]

Direction	0.0-0.9	0.9-1.8	1.8-2.7	>2.7	Total
N	0.0	0.0	12.7	0.0	12.7
NE	0.0	0.0	29.6	0.0	29.6
E	0.0	0.0	18.5	0.0	18.5
SE	0.0	0.0	12.9	0.0	12.9
S	0.0	0.0	6.1	0.0	6.1
SW	0.0	0.0	3.2	0.0	3.2
W	0.0	0.0	6.0	0.0	6.0
NW	0.0	0.0	2.9	0.0	2.9
Summary	0.0	0.0	92.0	0.0	92.0

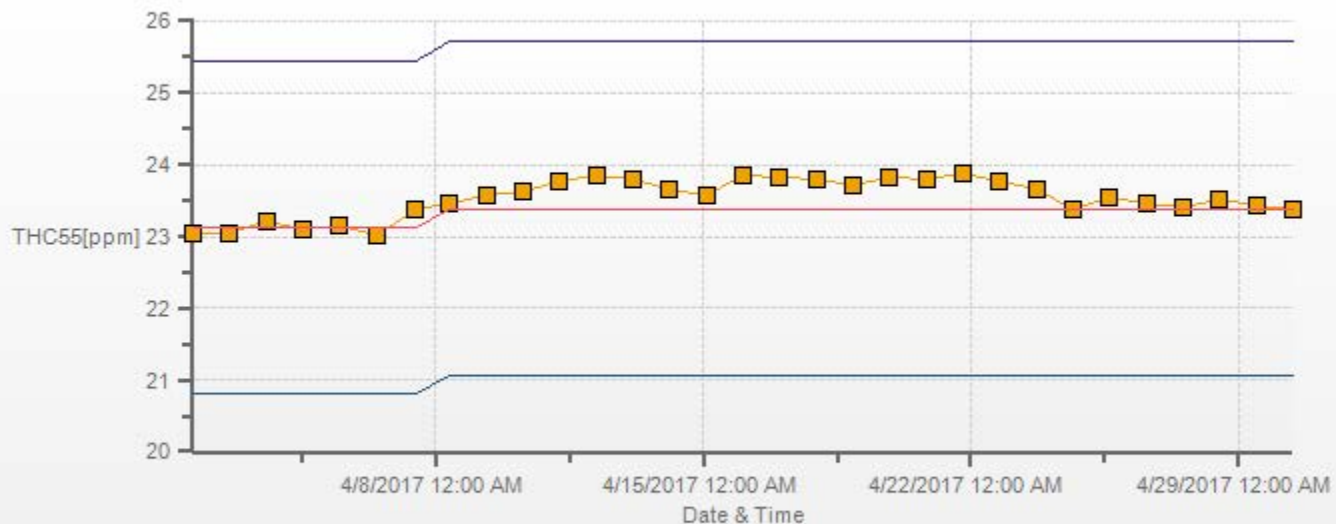
% Icon	Classes (ppm)	0	0.0-0.9	0	0.9-1.8	92	1.8-2.7	0	>2.7
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LICA Bonnyville Poll.: LICA Bonnyville-THC55[ppm] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 8.03% Calm Poll Avg: 2.16[ppm]





THC55[ppm] Calibration: LICA Bonnyville Monthly: 2017/04 Type: Span



Span Meas Span Ref Span Low Span High

***METHANE***



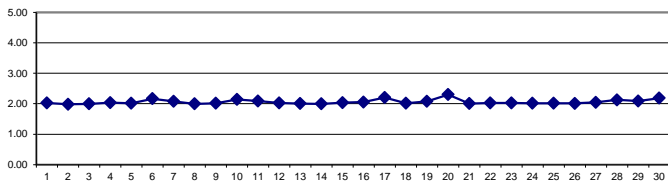
METHANE Hourly Averages (CH<sub>4</sub> ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	2.04	2.04	2.03	2.04	2.14	2.08	2.15	2.14	2.15	2.06	2.02	2.08	2.10	2.06	1.99	1.93	S	1.94	1.94	1.94	1.93	1.97	1.93	1.92	1.92	2.15	2.03	24
2	1.94	1.95	1.95	1.96	1.97	1.97	1.97	1.96	1.95	1.95	1.94	1.93	1.93	1.93	1.93	S	1.94	2.02	2.23	1.96	2.01	2.03	2.06	2.04	1.93	2.23	1.98	24
3	1.97	1.97	1.98	1.97	1.97	1.95	1.96	1.96	1.98	2.05	2.01	1.99	1.98	1.96	S	1.95	1.98	1.94	1.96	2.00	2.04	2.29	1.99	2.05	1.94	2.29	2.00	24
4	2.04	2.07	2.11	2.09	2.09	2.12	2.11	2.11	2.09	2.03	2.06	2.05	1.97	S	1.97	1.95	1.93	1.94	1.97	2.03	2.04	2.01	2.00	1.99	1.93	2.12	2.03	24
5	1.97	2.01	2.07	2.06	2.06	2.07	2.12	2.12	2.03	2.03	2.04	2.03	S	1.98	1.96	1.95	1.94	1.95	1.97	1.98	1.98	2.02	2.03	2.04	1.94	2.12	2.02	24
6	2.10	2.10	2.11	2.12	2.21	2.20	2.26	2.28	2.16	2.17	2.12	S	2.11	2.08	2.04	2.01	2.01	2.10	2.17	2.53	2.28	2.26	2.22	2.19	2.01	2.53	2.17	24
7	2.41	2.42	2.29	2.40	2.22	2.08	2.05	1.99	1.97	C	C	C	C	1.99	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.99	1.99	1.97	2.42	2.08	24
8	1.99	1.99	2.00	2.02	2.02	2.01	2.01	2.01	1.99	S	2.00	2.00	1.99	1.99	1.98	1.98	1.99	1.99	1.99	2.00	2.00	2.00	2.02	1.99	1.98	2.02	2.00	24
9	1.98	1.98	2.00	2.00	2.00	1.99	1.99	2.00	S	1.99	1.99	1.98	1.98	1.99	1.99	1.99	2.01	2.02	1.99	2.04	2.03	2.09	2.13	2.17	1.98	2.17	2.02	24
10	2.16	2.15	2.20	2.24	2.22	2.21	2.15	S	2.12	2.14	2.16	2.11	2.12	2.10	2.11	2.09	2.08	2.06	2.06	2.07	2.18	2.24	2.12	2.11	2.06	2.24	2.14	24
11	2.13	2.22	2.17	2.16	2.18	2.13	S	2.16	2.10	2.09	2.05	2.03	2.03	2.01	2.04	2.02	1.99	1.99	2.04	2.06	2.13	2.08	2.08	2.06	1.99	2.22	2.09	24
12	2.03	2.04	2.03	2.02	2.04	S	2.02	2.01	2.02	2.03	2.01	2.00	1.98	1.97	1.98	1.98	1.99	2.00	2.01	2.07	2.12	2.07	2.06	2.04	1.97	2.12	2.02	24
13	2.02	2.04	2.03	2.02	S	2.01	2.00	2.00	2.01	2.02	2.01	2.00	1.99	2.00	2.01	2.01	2.02	2.02	2.00	2.00	2.01	1.99	2.00	2.00	1.99	2.04	2.01	24
14	2.02	2.00	1.99	S	2.02	2.01	2.01	2.02	2.01	1.99	1.98	1.98	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.98	1.99	1.99	2.01	1.99	1.98	2.02	2.00	24
15	1.99	1.99	S	2.01	2.01	2.00	2.00	2.00	1.99	1.99	2.00	2.00	2.00	2.00	2.01	2.02	2.02	2.03	2.04	2.03	2.22	2.07	2.32	2.12	1.99	2.32	2.04	24
16	2.06	S	2.08	2.09	2.09	2.07	2.06	2.06	2.01	2.00	2.00	1.99	1.99	2.00	2.00	2.00	2.00	2.02	2.02	2.08	2.11	2.10	2.13	2.25	1.99	2.25	2.05	24
17	S	2.29	2.28	2.30	2.37	2.40	2.39	2.34	2.22	2.23	2.20	2.17	2.16	2.18	2.14	2.12	2.14	2.14	2.11	2.12	2.09	2.08	2.09	S	2.08	2.40	2.21	24
18	2.04	2.04	2.02	2.02	2.02	2.04	2.04	2.02	2.02	2.05	2.02	2.01	1.99	1.98	1.97	1.97	1.98	1.99	2.01	2.00	2.00	S	2.05	1.97	2.05	2.01	24	
19	2.06	2.10	2.09	2.08	2.09	2.12	2.12	2.06	2.03	2.02	2.05	2.04	2.04	2.01	2.04	2.05	2.05	2.05	2.05	2.07	2.09	S	2.15	2.31	2.01	2.31	2.08	24
20	2.41	2.37	2.55	2.44	2.41	2.41	2.34	2.22	2.15	2.18	2.22	2.24	2.20	2.13	2.14	2.14	2.17	2.17	2.18	2.29	S	2.62	2.36	2.63	2.13	2.63	2.30	24
21	2.08	2.05	2.03	2.04	2.03	2.01	2.01	2.01	1.99	1.96	1.96	1.96	1.96	1.97	1.97	1.98	1.98	1.98	2.02	S	2.02	2.02	2.02	2.02	1.96	2.08	2.01	24
22	2.02	2.04	2.06	2.04	2.05	2.04	2.05	2.03	2.04	2.00	1.97	1.97	1.97	1.97	1.98	1.98	2.00	2.02	S	2.06	2.10	2.04	2.03	2.03	1.97	2.10	2.02	24
23	2.06	2.05	2.04	2.05	2.04	2.05	2.04	2.04	2.03	2.01	2.01	2.00	1.99	1.98	1.98	1.99	1.99	S	2.01	2.01	2.02	2.03	2.04	2.04	1.98	2.06	2.02	24
24	2.04	2.03	2.04	2.03	2.03	2.04	2.04	2.03	2.02	2.01	2.01	1.99	1.98	1.99	1.99	2.00	S	1.98	1.98	2.02	2.02	2.02	2.03	2.04	1.98	2.04	2.02	24
25	2.05	2.04	2.05	2.06	2.08	2.07	2.05	2.03	2.00	1.99	1.99	1.98	1.98	1.98	1.97	S	1.99	1.99	1.98	2.00	2.00	2.01	2.01	1.99	1.97	2.08	2.01	24
26	1.97	1.99	2.00	2.01	2.02	2.06	2.02	2.02	2.00	1.98	1.97	1.99	1.98	1.97	S	1.99	1.99	2.00	2.03	2.04	2.05	2.06	2.07	2.04	1.97	2.07	2.01	24
27	2.04	2.04	2.06	2.06	2.09	2.08	2.07	1.99	1.98	1.97	1.96	1.96	1.96	S	1.94	1.96	1.95	1.98	1.97	2.00	2.10	2.18	2.28	2.39	1.94	2.39	2.04	24
28	2.35	2.36	2.32	2.29	2.31	2.31	2.23	2.35	2.21	2.06	2.04	2.02	S	1.94	1.94	1.95	1.96	1.97	1.96	1.98	2.02	2.10	2.14	2.08	1.94	2.36	2.13	24
29	2.15	2.23	2.39	2.25	2.22	2.23	2.14	2.04	1.99	1.96	S	1.98	1.98	1.98	1.97	1.96	1.96	1.97	1.97	2.00	2.03	2.17	2.46	1.96	2.46	2.09	24	
30	2.30	2.24	2.42	2.47	2.51	2.46	2.43	2.41	2.32	2.21	S	2.03	2.00	1.99	1.97	1.98	2.03	2.04	2.05	2.03	2.09	2.20	2.06	1.97	2.51	2.19	24	
HOURLY MAX	2.41	2.42	2.55	2.47	2.51	2.46	2.43	2.41	2.32	2.23	2.22	2.24	2.20	2.18	2.14	2.14	2.17	2.17	2.23	2.53	2.28	2.62	2.36	2.63				
HOURLY AVG	2.08	2.10	2.12	2.12	2.12	2.11	2.10	2.08	2.06	2.04	2.03	2.02	2.01	2.00	2.00	2.00	2.00	2.01	2.02	2.05	2.05	2.09	2.09	2.11				

STATUS FLAG CODES

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

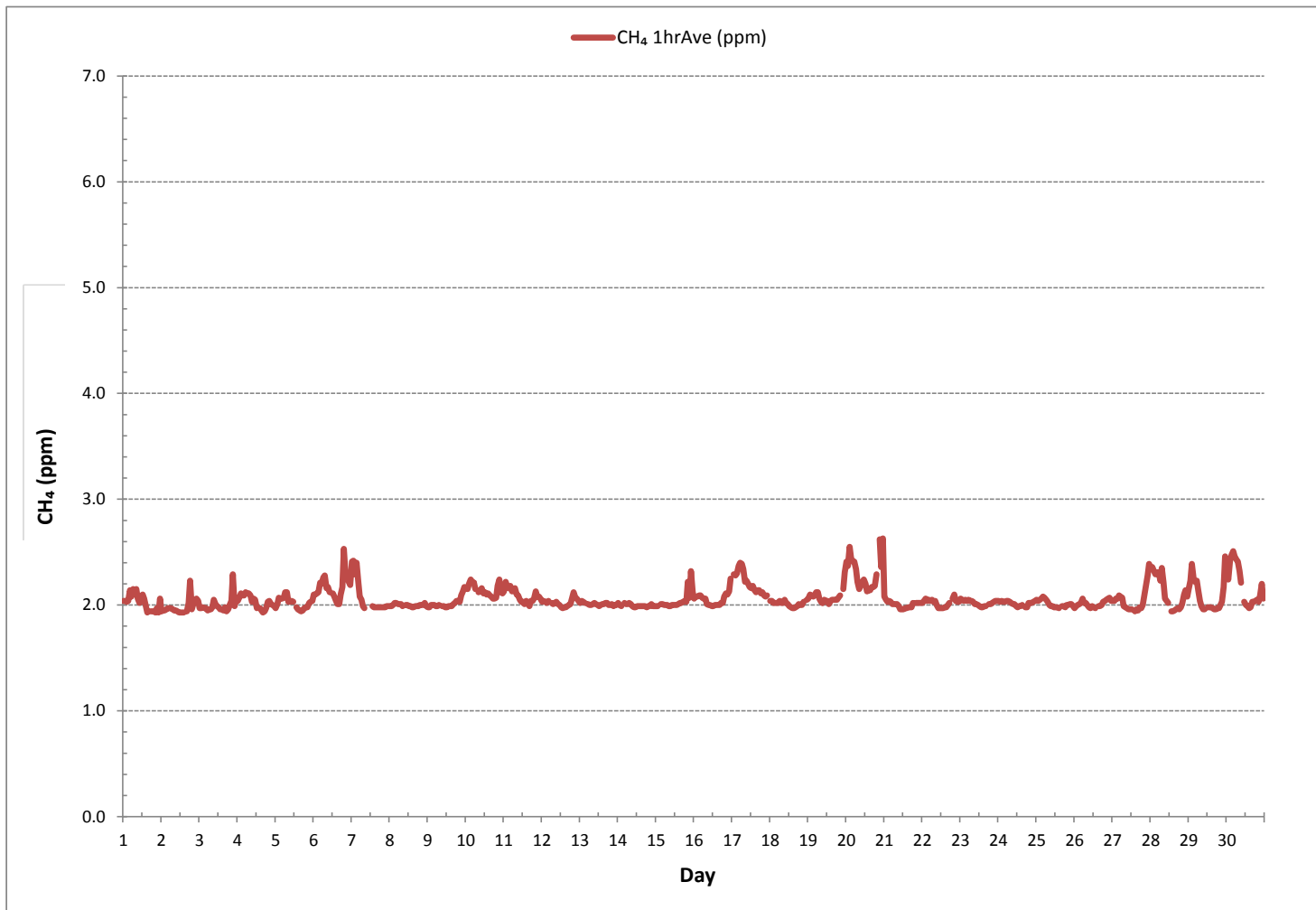
24 HR AVERAGES April 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	686			
MINIMUM 1-HR AVERAGE:	1.92 ppm	@ HOUR	23	ON DAY 1
MAXIMUM 1-HR AVERAGE:	2.63 ppm	@ HOUR	23	ON DAY 20
MAXIMUM 24-HR AVERAGE:	2.30 ppm			ON DAY 20
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	720 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.11	MONTHLY AVERAGE:	2.06 ppm	

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





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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	2.05	2.04	2.04	2.06	2.61	2.41	2.45	2.21	2.29	2.24	2.06	2.11	2.13	2.36	2.10	1.94	S	2.00	1.97	1.95	1.94	2.35	1.99	1.94	1.94	2.61	2.14	24	
2	1.96	1.99	1.96	1.98	2.00	1.99	2.00	1.99	1.96	1.99	1.98	1.94	1.94	1.93	1.94	S	2.01	2.16	2.66	2.10	2.21	2.57	2.25	2.09	1.93	2.66	2.07	24	
3	2.00	1.98	2.00	1.98	1.99	1.98	1.97	1.98	1.99	2.17	2.14	2.10	2.06	2.11	S	2.06	2.18	2.03	2.15	2.15	2.31	3.33	2.20	2.29	1.97	3.33	2.14	24	
4	2.16	2.29	2.21	2.16	2.15	2.50	2.21	2.18	2.12	2.06	2.11	2.13	2.05	S	1.99	2.00	1.95	1.99	2.00	2.33	2.57	2.15	2.08	2.09	1.95	2.57	2.15	24	
5	2.10	2.08	2.14	2.13	2.15	2.12	2.20	2.23	2.06	2.04	2.04	2.05	S	2.00	1.98	1.96	1.96	1.96	1.98	1.98	2.07	2.05	2.05	2.09	1.96	2.23	2.06	24	
6	2.11	2.12	2.12	2.30	2.65	2.39	2.85	2.72	2.18	P	2.14	S	2.14	2.14	2.08	2.06	2.18	2.24	3.01	3.24	2.58	2.57	3.28	2.61	2.06	3.28	2.44	23	
7	3.01	2.97	2.55	3.30	2.65	2.33	2.23	2.11	C	C	C	C	C	C	2.12	2.01	2.00	2.04	2.01	2.09	2.02	2.01	2.02	2.09	2.06	2.00	3.30	2.30	24
8	2.04	2.04	2.09	2.09	2.09	2.04	2.10	2.10	2.02	S	2.04	2.01	2.01	2.11	2.04	2.05	2.02	2.01	2.02	2.03	2.02	2.04	2.04	2.02	2.01	2.11	2.05	24	
9	2.01	2.00	2.03	2.03	2.04	2.02	2.03	2.03	S	2.07	2.03	2.02	2.02	2.04	2.03	2.06	2.06	2.13	2.17	2.07	2.04	2.13	2.17	2.19	2.00	2.19	2.06	24	
10	2.17	2.20	2.60	2.44	2.42	2.34	2.24	S	2.17	2.20	2.37	2.29	2.21	2.22	2.18	2.15	2.12	2.10	2.09	2.21	2.38	2.39	2.26	2.32	2.09	2.60	2.26	24	
11	2.22	2.43	2.31	2.41	2.35	2.26	S	2.32	2.19	2.17	2.14	2.10	2.11	2.06	2.16	2.18	2.12	2.17	2.33	2.22	2.32	2.18	2.20	2.13	2.06	2.43	2.22	24	
12	2.07	2.10	2.11	2.07	2.14	S	2.08	2.05	2.07	2.09	2.04	2.11	2.02	2.02	2.05	2.01	2.03	2.04	2.04	2.16	2.21	2.12	2.10	2.05	2.01	2.21	2.08	24	
13	2.04	2.10	2.10	2.06	S	2.04	2.02	2.03	2.08	2.06	2.04	2.03	2.02	2.04	2.06	2.06	2.05	2.08	2.05	2.04	2.10	2.01	2.06	2.04	2.01	2.10	2.05	24	
14	2.05	2.02	2.01	S	2.05	2.04	2.05	2.04	2.10	2.01	2.00	2.00	2.00	2.01	2.00	2.02	2.01	2.01	2.00	2.01	2.03	2.04	2.03	2.01	2.00	2.10	2.02	24	
15	2.01	2.03	S	2.07	2.04	2.01	2.05	2.01	2.02	2.01	2.02	2.03	2.02	2.03	2.03	2.07	2.05	2.07	2.20	2.06	2.76	2.16	3.23	2.19	2.01	3.23	2.14	24	
16	2.14	S	2.16	2.27	2.28	2.12	2.07	2.10	2.04	2.02	2.07	2.00	2.01	2.02	2.02	2.03	2.08	2.05	2.11	2.13	2.11	2.30	2.46	2.00	2.46	2.11	24		
17	S	2.45	2.50	2.55	2.58	2.50	2.43	2.42	2.34	2.36	2.31	2.25	2.24	2.23	2.18	2.14	2.19	2.20	2.18	2.16	2.17	2.13	2.13	S	2.13	2.58	2.30	24	
18	2.09	2.08	2.05	2.08	2.05	2.05	2.12	2.07	2.06	2.18	2.04	2.04	2.01	2.00	2.00	1.99	2.01	2.03	2.07	2.04	2.06	2.06	S	2.12	1.99	2.18	2.06	24	
19	2.11	2.27	2.17	2.14	2.25	2.60	2.25	2.15	2.16	2.14	2.22	2.43	2.21	2.03	2.06	2.10	2.12	2.08	2.18	2.28	2.20	S	2.37	2.92	2.03	2.92	2.24	24	
20	2.67	2.71	4.14	3.05	2.85	2.56	2.47	2.28	2.21	2.22	2.27	2.28	2.28	2.16	2.21	2.18	2.31	2.23	2.33	2.52	S	2.96	2.58	3.07	2.16	4.14	2.55	24	
21	2.27	2.11	2.08	2.10	2.11	2.04	2.03	2.05	2.10	2.04	2.01	2.01	1.99	1.99	1.98	2.02	1.99	2.02	2.10	S	2.04	2.06	2.05	2.03	1.98	2.27	2.05	24	
22	2.05	2.06	2.12	2.09	2.10	2.08	2.10	2.09	2.08	2.03	1.99	2.06	2.02	2.00	2.01	2.01	2.04	2.06	S	2.11	2.25	2.06	2.06	2.06	1.99	2.25	2.07	24	
23	2.09	2.09	2.08	2.09	2.08	2.08	2.10	2.07	2.06	2.04	2.03	2.03	2.02	2.00	2.00	2.02	2.01	S	2.05	2.03	2.05	2.06	2.06	2.08	2.00	2.10	2.05	24	
24	2.07	2.06	2.09	2.08	2.06	2.06	2.10	2.05	2.07	2.05	2.06	2.01	2.00	2.03	2.02	2.06	S	2.06	2.03	2.08	2.13	2.09	2.09	2.16	2.00	2.16	2.07	24	
25	2.12	2.13	2.15	2.24	2.20	2.17	2.14	2.12	2.02	2.00	2.08	2.03	2.02	2.02	2.00	S	2.06	2.06	2.00	2.02	2.04	2.03	2.04	2.01	2.00	2.24	2.07	24	
26	1.98	2.01	2.10	2.09	2.09	2.20	2.09	2.15	2.11	2.04	2.04	2.06	2.08	2.05	S	2.07	2.06	2.10	2.17	2.10	2.12	2.12	2.12	2.13	1.98	2.20	2.09	24	
27	2.21	2.09	2.11	2.10	2.25	2.18	2.19	2.01	2.00	2.00	2.00	1.99	2.01	S	1.96	1.99	1.98	2.05	2.03	2.24	2.47	2.52	2.65	2.87	1.96	2.87	2.17	24	
28	2.53	3.15	2.48	2.39	2.37	2.38	2.32	2.60	2.33	2.13	2.17	2.05	S	1.96	1.95	1.96	1.97	1.98	1.98	2.00	2.10	2.24	2.24	2.13	1.95	3.15	2.24	24	
29	2.19	3.36	3.43	2.29	2.25	2.84	2.27	2.12	2.02	2.00	2.07	S	2.00	2.00	2.01	1.98	1.99	1.99	2.00	2.01	2.04	2.26	2.54	3.24	1.98	3.43	2.30	24	
30	2.86	2.40	2.78	2.90	2.64	2.52	2.62	2.50	2.39	2.38	S	2.08	2.09	2.08	2.03	1.99	2.18	2.14	2.12	2.20	2.39	2.54	2.64	2.16	1.99	2.90	2.38	24	
HOURLY MAX	3.01	3.36	4.14	3.30	2.85	2.84	2.85	2.72	2.39	2.38	2.37	2.43	2.28	2.36	2.21	2.18	2.31	2.24	3.01	3.24	2.76	3.33	3.28	3.24					
HOURLY AVG	2.19	2.25	2.30	2.26	2.26	2.24	2.20	2.16	2.12	2.10	2.09	2.08	2.06	2.06	2.04	2.04	2.06	2.07	2.14	2.15	2.20	2.25	2.27	2.26					

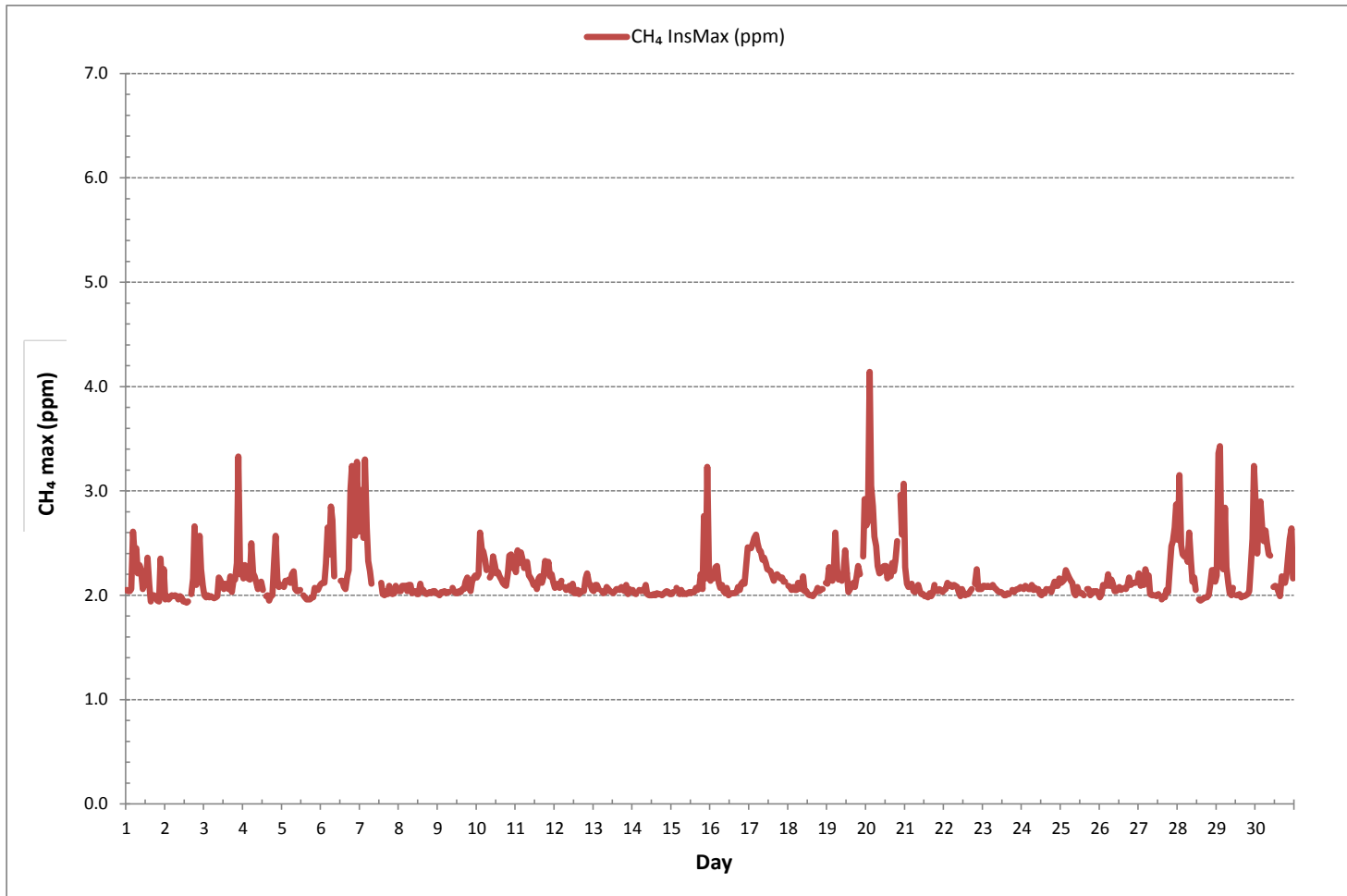
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	684
MAXIMUM INSTANTANEOUS VALUE:	4.14 ppm @ HOUR 2 ON DAY 20
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0.24
OPERATIONAL TIME:	719 hrs

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



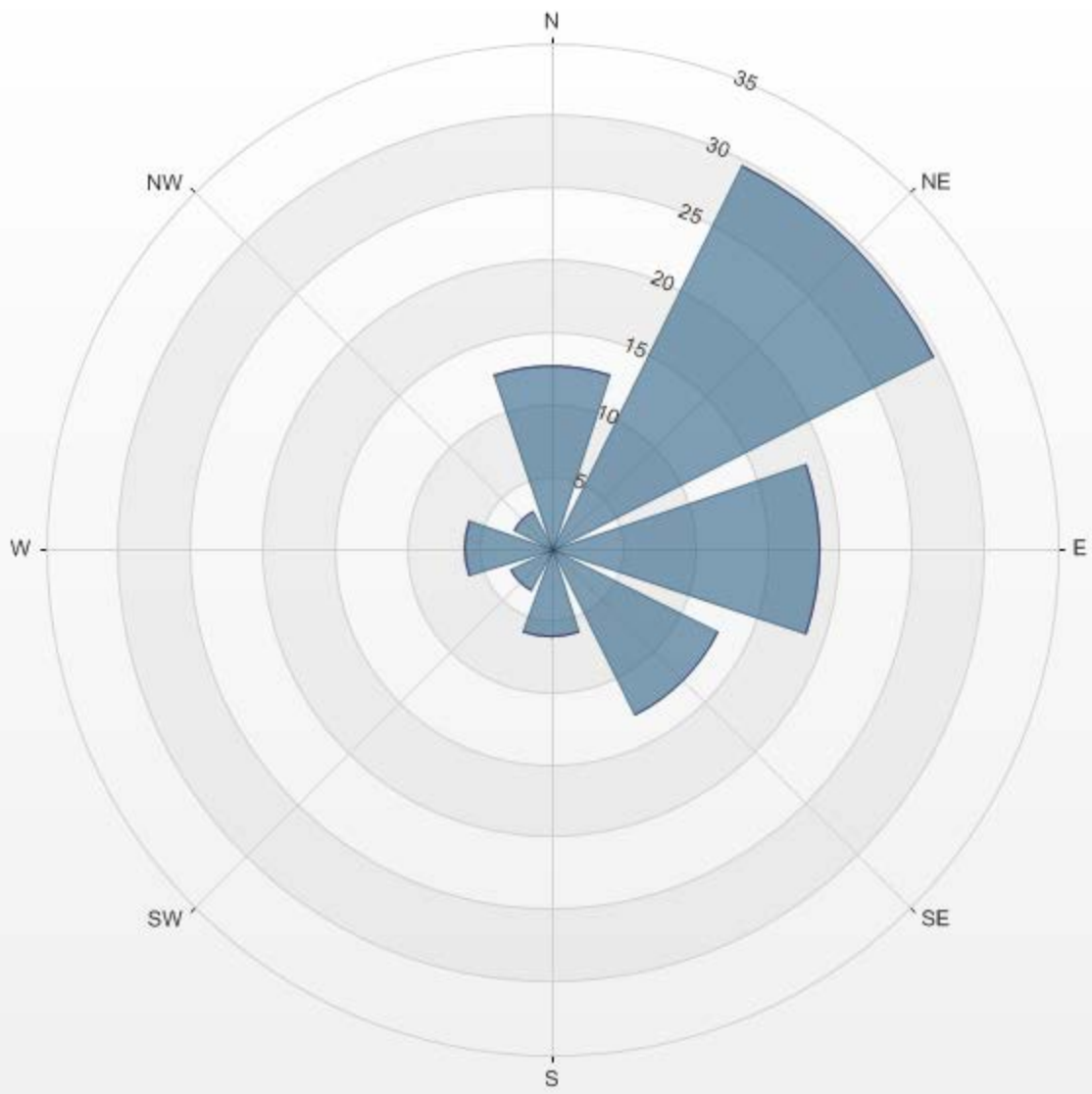
Wind: LICA Bonnyville  
 Poll.: LICA Bonnyville-CH4[ppm]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 8.03% Calm Avg: 2.15 [ppm]

Direction	0.0-0.9	0.9-1.8	1.8-2.6	>2.6	Total
N	0.0	0.0	12.7	0.0	12.7
NE	0.0	0.0	29.6	0.0	29.6
E	0.0	0.0	18.5	0.0	18.5
SE	0.0	0.0	12.9	0.0	12.9
S	0.0	0.0	6.1	0.0	6.1
SW	0.0	0.0	3.2	0.0	3.2
W	0.0	0.0	6.0	0.0	6.0
NW	0.0	0.0	2.9	0.0	2.9
Summary	0.0	0.0	92.0	0.0	92.0

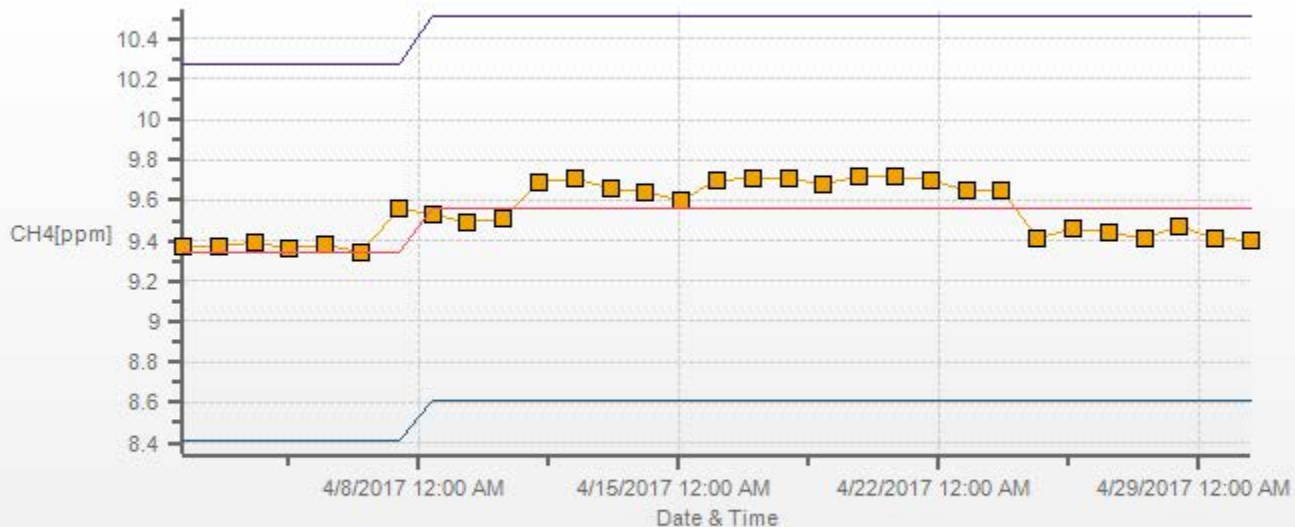
% Icon Classes (ppm) 0 0.0-0.9 0 0.9-1.8 92 1.8-2.6 0 >2.6

LICA Bonnyville Poll.: LICA Bonnyville-CH4[ppm] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 8.03% Calm Poll Avg: 2.15[ppm]





CH4[ppm] Calibration: LICA Bonnyville Monthly: 2017/04 Type: Span



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

***NON-METHANE HYDROCARBON***



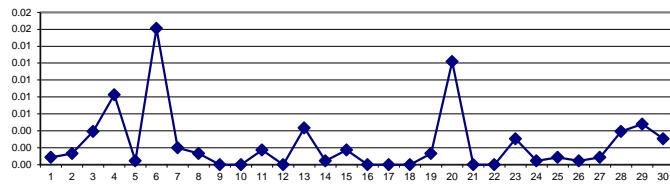
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

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

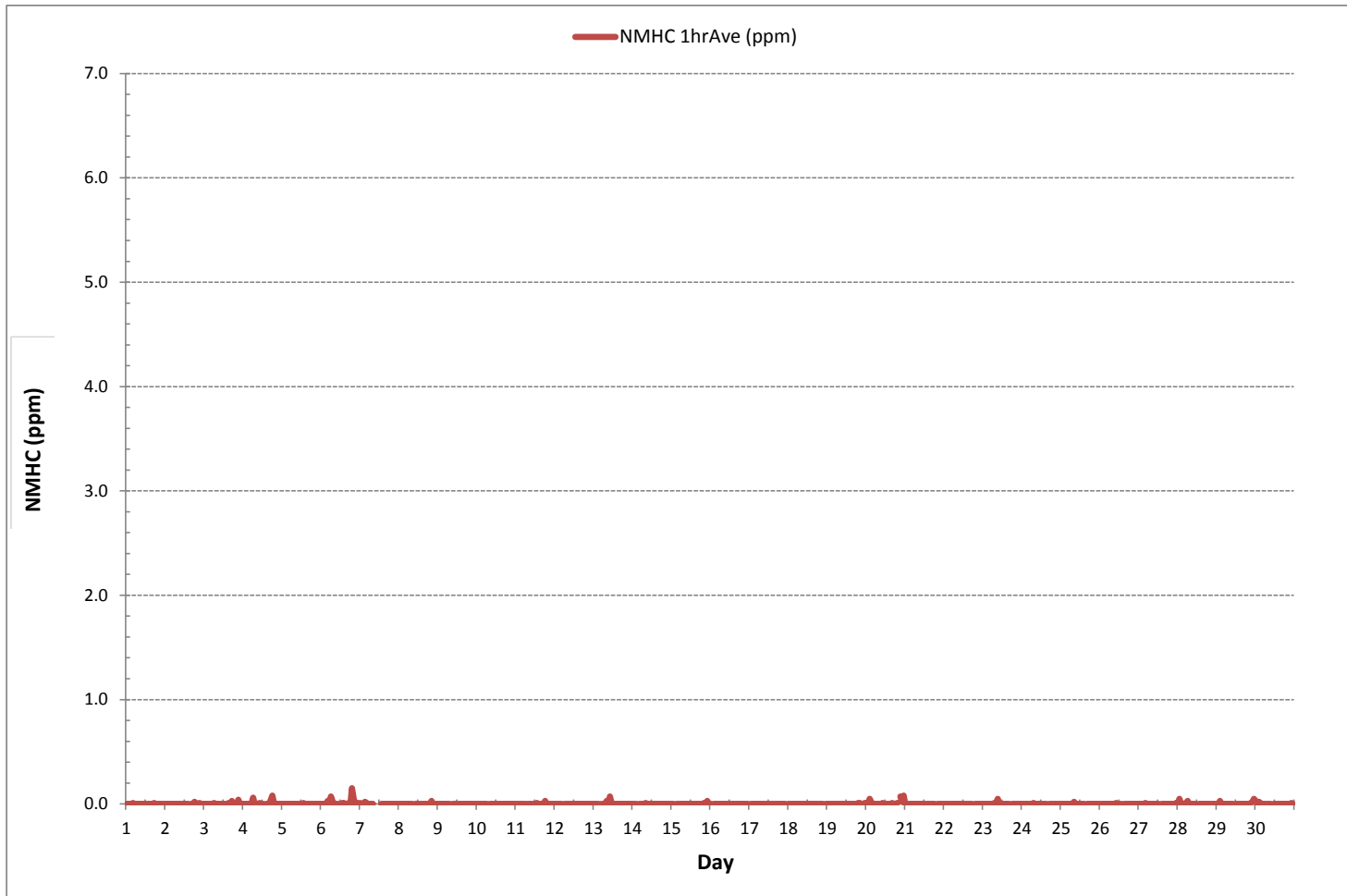
24 HR AVERAGES April 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	64				
MINIMUM 1-HR AVERAGE:	0.00	ppm @ HOUR	0	ON DAY	
MAXIMUM 1-HR AVERAGE:	0.15	ppm @ HOUR	19	ON DAY	
MAXIMUM 24-HR AVERAGE:	0.02	ppm		ON DAY	
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	720	hrs
MONTHLY CALIBRATION TIME:	4	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.01		MONTHLY AVERAGE:	0.00	ppm

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville Continuous Monitoring Station - April 2017

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	0.00	0.00	0.00	0.00	0.11	0.00	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.59	0.21	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.59	0.05	24
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.10	0.00	0.00	0.22	0.00	0.00	0.00	0.22	0.01	24
3	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.39	0.00	0.50	0.00	0.00	0.19	0.00	0.05	0.00	0.00	0.50	0.06	24
4	0.05	0.00	0.00	0.00	0.00	0.16	0.79	0.00	0.00	0.00	0.47	0.00	0.00	S	0.00	0.15	0.00	1.44	0.72	0.00	0.10	0.04	0.00	0.00	0.00	1.44	0.17	24
5	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	S	0.33	0.00	0.10	0.00	0.15	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.33	0.03	24
6	0.00	0.00	0.00	0.00	0.59	0.07	0.32	0.26	0.00	P	0.13	S	0.00	0.29	0.33	0.00	0.16	0.28	0.14	0.42	0.43	0.07	0.20	0.05	0.00	0.59	0.17	23
7	0.13	0.11	0.09	0.18	0.12	0.04	0.00	0.00	C	C	C	C	C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.04	24
8	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	0.31	0.00	0.00	0.00	0.00	0.31	0.01	24
9	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	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.01	24
10	0.00	0.00	0.05	0.00	0.00	0.00	0.00	S	0.00	0.00	0.05	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.04	0.00	0.00	0.00	0.13	0.01	24
11	0.00	0.06	0.03	0.00	0.01	0.06	S	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.05	0.00	0.10	0.67	0.00	0.02	0.00	0.00	0.00	0.00	0.67	0.05	24
12	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	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.01	24
13	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.44	0.00	0.37	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.04	24
14	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.02	24
15	0.00	0.00	S	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.16	0.00	0.00	0.16	0.02	24
16	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
17	S	0.04	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.11	0.01	24
18	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.11	0.00	0.00	0.00	0.00	S	0.00	0.00	0.12	0.01	24	
19	0.00	0.00	0.00	0.00	0.00	0.08	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.05	0.14	0.14	S	0.09	0.11	0.00	0.14	0.03	24	
20	0.09	0.15	0.41	0.15	0.06	0.00	0.00	0.00	0.00	0.16	0.11	0.14	0.00	0.00	0.15	0.00	0.30	0.00	0.00	0.17	S	0.21	0.16	0.24	0.00	0.41	0.11	24
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.01	24
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.31	0.35	0.16	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	0.35	0.04	24
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.01	24
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03	0.00	0.00	0.08	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	1.03	0.05	24
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	S	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.02	24
27	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.08	0.11	0.00	0.26	0.03	24
28	0.00	0.23	0.04	0.00	0.05	0.15	0.41	0.07	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.04	24
29	0.00	0.16	0.18	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	S	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.05	0.01	0.25	0.15	0.17	0.00	0.25	0.05	24
30	0.18	0.09	0.10	0.11	0.00	0.09	0.00	0.03	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.08	0.09	0.00	0.00	0.18	0.04	24
HOURLY MAX	0.18	0.23	0.41	0.18	0.59	0.16	0.79	0.26	1.03	0.35	0.47	0.14	0.11	0.33	0.33	0.39	0.30	1.44	0.72	0.42	0.43	0.25	0.20	0.24				
HOURLY AVG	0.02	0.03	0.03	0.02	0.04	0.03	0.07	0.03	0.09	0.02	0.06	0.02	0.01	0.04	0.03	0.03	0.03	0.11	0.07	0.03	0.04	0.04	0.03	0.03				

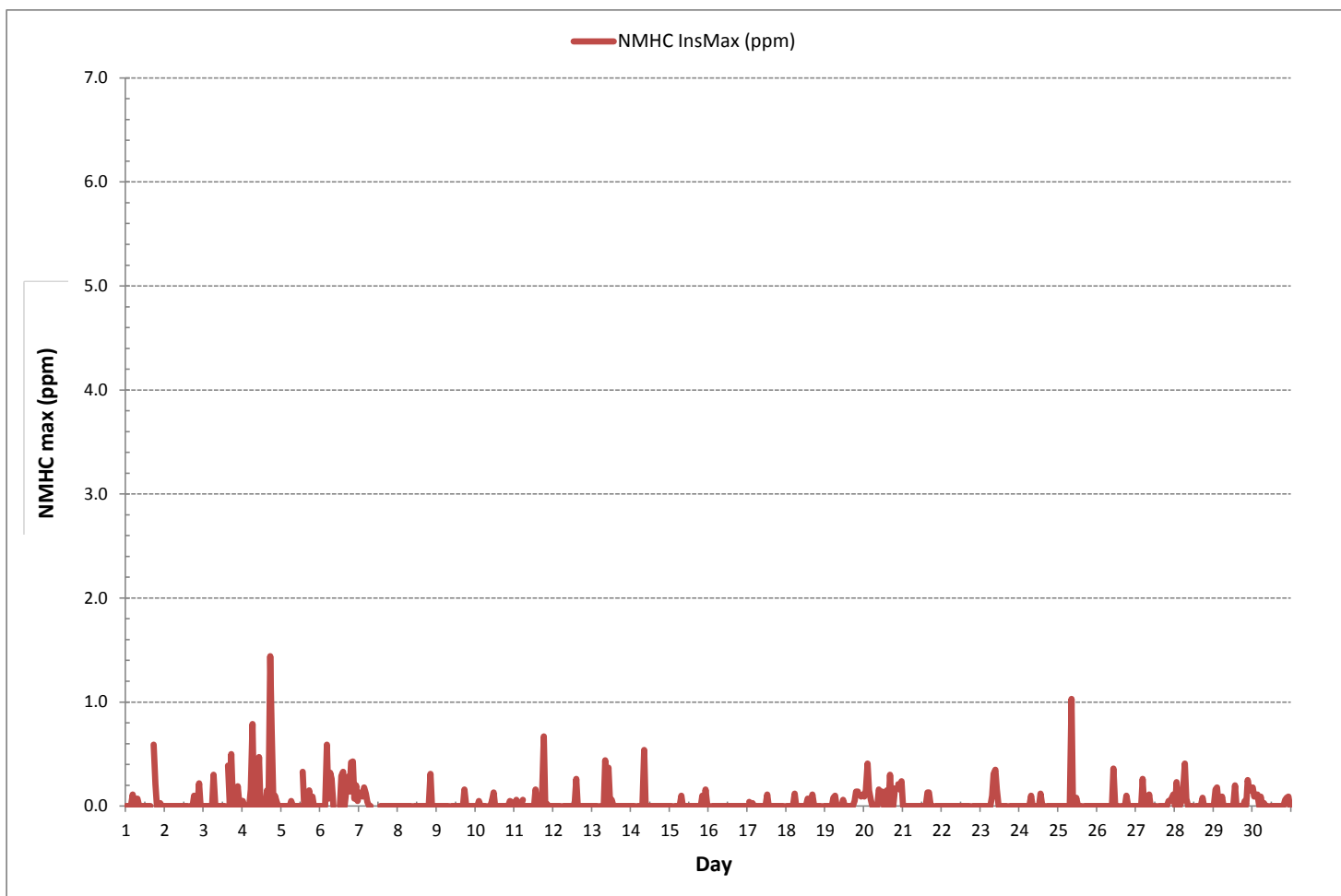
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	143
MAXIMUM INSTANTANEOUS VALUE:	1.44 ppm @ HOUR 17 ON DAY 4
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0.12
OPERATIONAL TIME:	719 hrs

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)



Wind: LICA Bonnyville  
 Poll.: LICA Bonnyville-NMHC[ppm]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

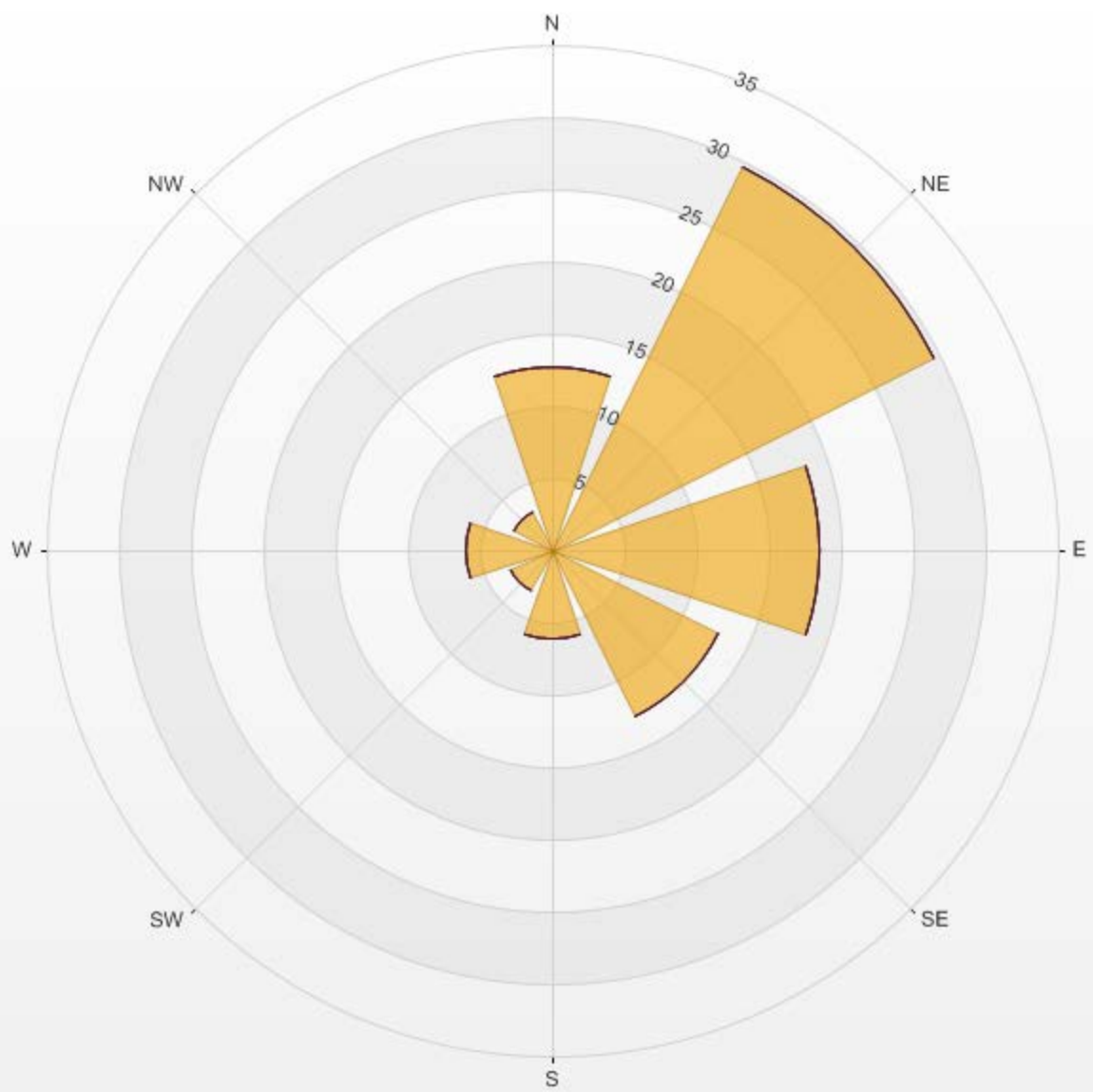
Calm: 8.03%

Calm Avg: 0.01 [ppm]

Direction	0.0-0.4	0.4-0.8	0.8-1.1	1.1-1.5	1.5-1.9	>1.9	Total
<b>N</b>	12.7	0.0	0.0	0.0	0.0	0.0	12.7
<b>NE</b>	29.6	0.0	0.0	0.0	0.0	0.0	29.6
<b>E</b>	18.5	0.0	0.0	0.0	0.0	0.0	18.5
<b>SE</b>	12.9	0.0	0.0	0.0	0.0	0.0	12.9
<b>S</b>	6.1	0.0	0.0	0.0	0.0	0.0	6.1
<b>SW</b>	3.2	0.0	0.0	0.0	0.0	0.0	3.2
<b>W</b>	6.0	0.0	0.0	0.0	0.0	0.0	6.0
<b>NW</b>	2.9	0.0	0.0	0.0	0.0	0.0	2.9
<b>Summary</b>	92.0	0.0	0.0	0.0	0.0	0.0	92.0

% Icon Classes (ppm) 92 0.0-0.4 0 0.4-0.8 0 0.8-1.1 0 1.1-1.5 0 1.5-1.9 0 >1.9

LICA Bonnyville Poll.: LICA Bonnyville-NMHC[ppm] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 8.03% Calm Poll Avg: 0.01[ppm]





NMHC[ppm] Calibration: LICA Bonnyville Monthly: 2017/04 Type: Span



Span Meas Span Ref Span Low Span High

## ***OXIDES OF NITROGEN***



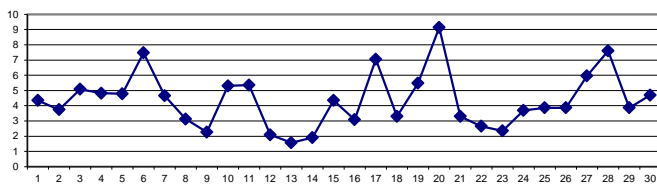
OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)

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

STATUS FLAG CODES

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

24 HR AVERAGES April 2017



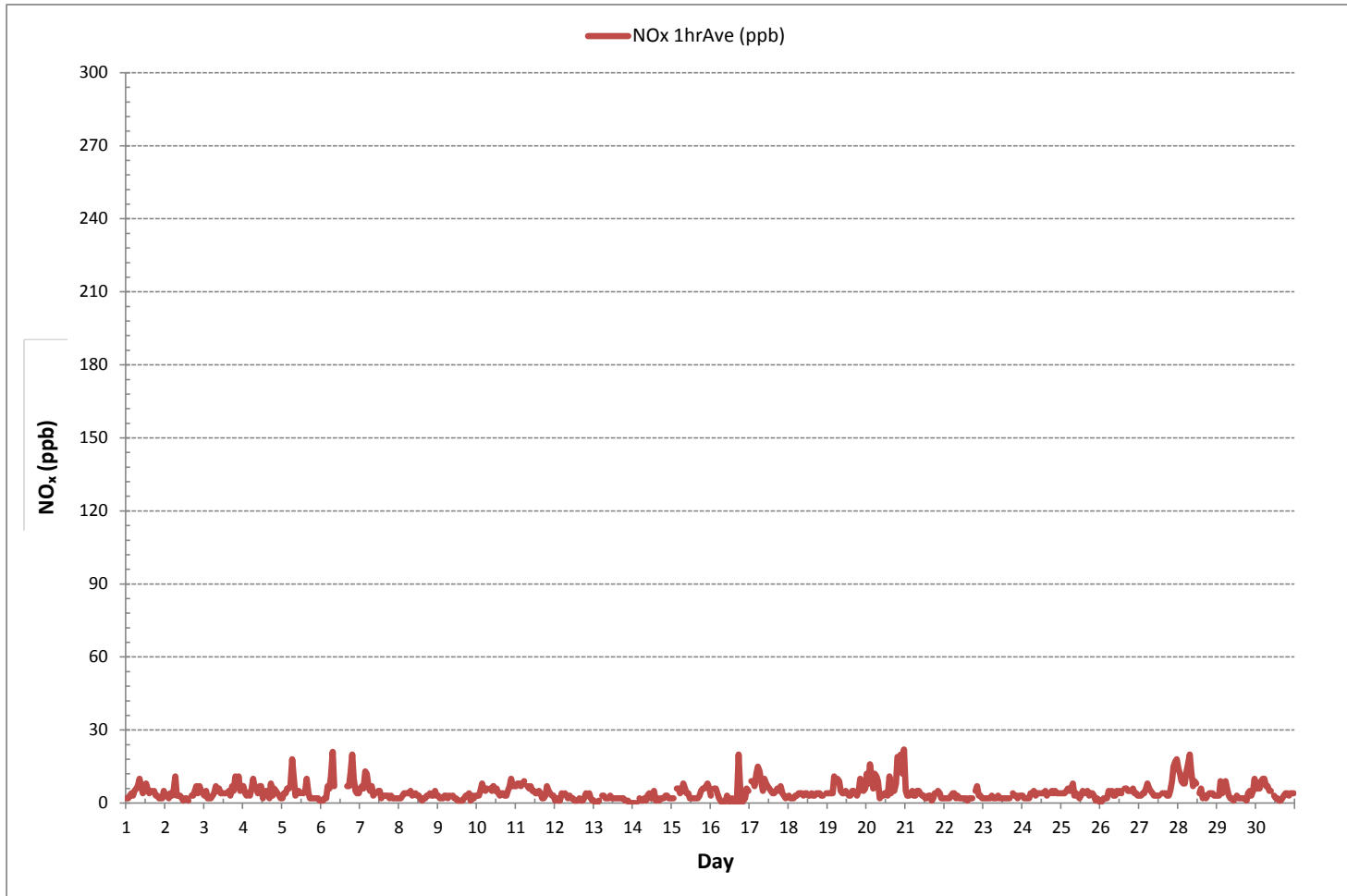
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	669			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	1	ON DAY 13
MAXIMUM 1-HR AVERAGE:	22 ppb	@ HOUR	23	ON DAY 20
MAXIMUM 24-HR AVERAGE:	9 ppb			ON DAY 20
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	720 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	3	MONTHLY AVERAGE:	4	ppb



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville Continuous Monitoring Station - April 2017

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





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville Continuous Monitoring Station - April 2017

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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY																												
1	2	3	9	6	31	6	9	28	75	17	6	10	23	11	7	7	S	33	42	14	2	3	4	4	2	75	15	24
2	5	4	3	5	5	14	23	4	5	4	3	2	2	2	2	S	5	5	40	56	6	41	9	5	2	56	11	24
3	5	6	4	5	5	8	6	11	7	7	5	7	8	31	S	9	4	70	8	70	31	19	8	10	4	70	15	24
4	13	12	9	9	7	11	58	11	16	5	71	34	20	S	22	25	14	54	11	9	7	4	6	3	3	71	19	24
5	3	5	5	11	9	23	35	41	5	8	35	11	S	15	45	35	22	18	6	4	37	3	3	2	2	45	17	24
6	2	2	3	5	12	27	22	40	16	C	C	C	C	C	C	C	15	34	18	49	16	8	7	6	2	49	17	24
7	9	10	9	19	21	10	8	11	5	6	S	7	7	4	4	5	5	3	3	4	3	4	3	2	2	21	7	24
8	3	3	4	5	7	5	6	6	4	S	5	4	4	2	2	29	29	5	5	7	4	8	7	5	2	29	7	24
9	6	2	3	2	7	5	3	4	S	6	4	3	23	2	1	2	4	22	7	13	17	5	5	4	1	23	7	24
10	4	4	8	10	8	23	34	S	32	18	28	21	15	15	5	6	5	4	5	9	10	13	10	11	4	34	13	24
11	11	11	13	10	10	14	S	12	9	40	11	11	16	9	8	8	4	4	6	15	10	7	8	7	4	40	11	24
12	3	5	3	4	15	S	8	8	5	6	6	6	4	3	4	4	3	3	4	7	5	7	4	3	3	15	5	24
13	3	1	2	3	S	5	4	4	4	5	4	4	4	6	4	3	4	4	4	2	3	2	2	1	1	6	3	24
14	1	1	1	S	4	3	3	4	3	9	10	4	5	8	4	7	4	4	5	5	6	5	5	4	1	10	5	24
15	5	4	S	9	8	8	15	16	12	7	8	5	5	4	7	4	4	10	11	10	11	11	12	11	4	16	9	24
16	5	S	9	8	6	43	4	2	27	7	21	8	10	4	20	4	17	187	169	1	26	6	25	8	1	187	27	24
17	S	13	14	14	16	18	16	14	35	19	11	20	9	9	7	6	7	8	8	10	8	5	3	S	3	35	12	24
18	4	2	3	3	4	5	6	6	4	5	5	5	6	5	4	5	7	6	5	5	3	S	5	5	2	7	5	24
19	5	5	5	6	24	42	14	13	12	5	6	6	6	4	30	22	57	28	20	15	37	S	11	8	4	57	17	24
20	17	18	36	23	9	17	35	32	20	18	5	8	33	22	66	26	8	7	33	89	S	27	41	35	5	89	27	24
21	6	6	4	4	8	6	6	7	8	5	4	10	3	13	24	24	1	31	33	S	6	5	2	2	1	33	9	24
22	1	2	3	3	3	4	5	2	3	2	2	4	3	12	2	3	11	3	S	9	11	4	3	2	1	12	4	24
23	2	2	2	2	2	3	3	3	3	4	3	3	3	2	3	3	3	S	5	4	3	3	3	3	2	5	3	24
24	3	2	3	2	3	5	4	11	5	4	5	5	4	4	33	16	S	6	21	16	8	5	5	5	2	33	8	24
25	4	6	5	6	7	6	30	33	11	23	20	6	27	20	29	S	24	8	27	21	19	2	3	1	1	33	15	24
26	0	2	2	3	2	19	5	18	5	4	27	6	14	13	S	36	30	44	22	6	8	4	4	3	0	44	12	24
27	3	3	4	4	10	9	8	5	5	4	3	4	6	S	5	6	7	5	4	7	11	17	20	21	3	21	7	24
28	19	15	15	12	11	57	32	24	19	9	38	29	S	15	37	31	24	15	34	6	5	39	6	5	5	57	22	24
29	3	5	11	6	8	39	40	6	14	16	4	S	12	3	14	4	17	2	1	16	32	15	6	59	1	59	14	24
30	10	20	8	12	12	12	8	7	6	32	S	4	3	2	1	1	4	4	4	5	4	8	6	5	1	32	8	24
HOURLY MAX	19	20	36	23	31	57	58	41	75	40	71	34	33	31	66	36	57	187	169	89	37	41	41	59				
HOURLY AVG	5	6	7	7	9	15	16	13	13	11	13	9	10	9	15	12	12	22	19	17	12	10	8	8				

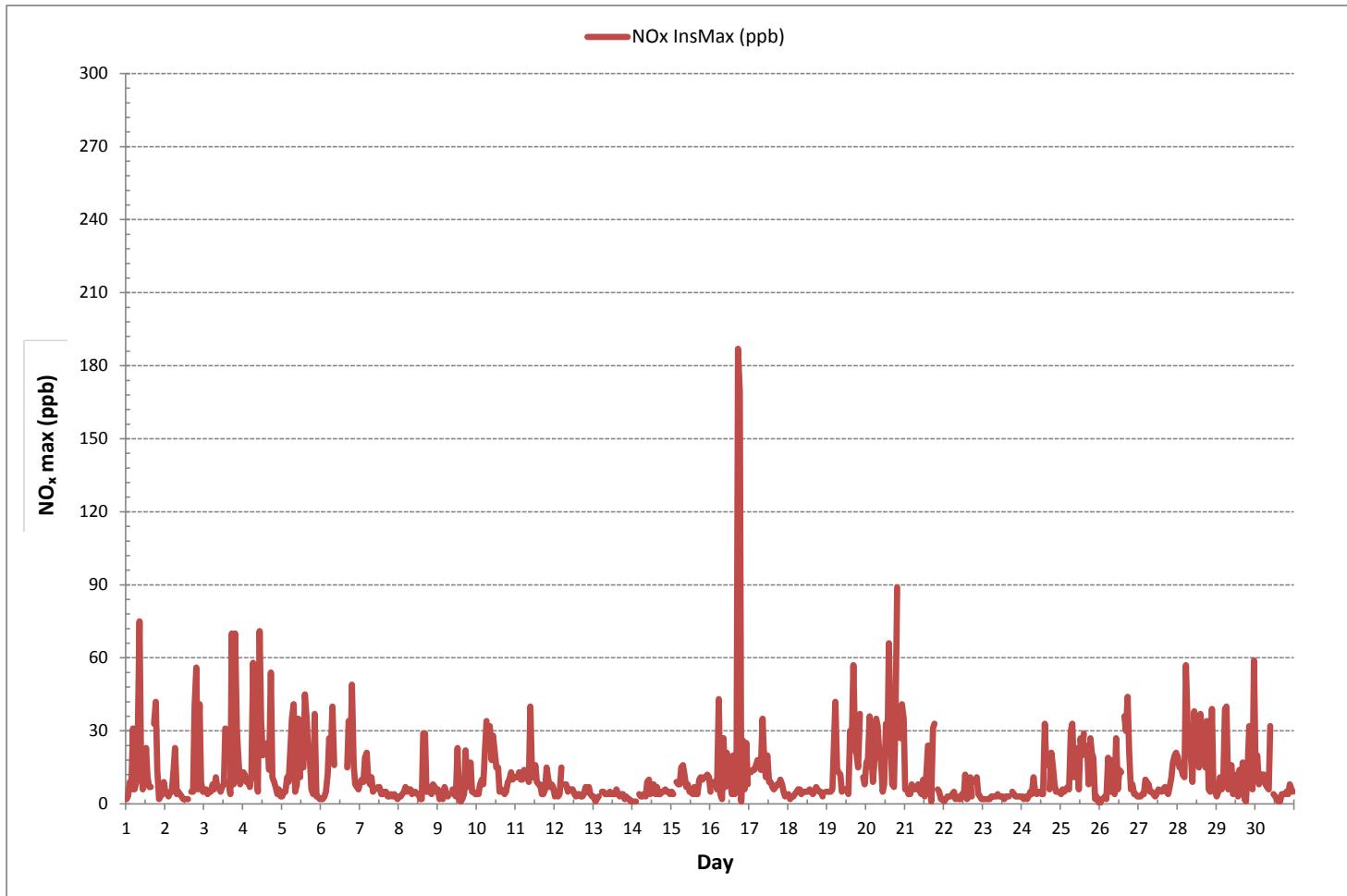
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	682
MAXIMUM INSTANTANEOUS VALUE:	187 ppb @ HOUR 17 ON DAY 16
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	15
OPERATIONAL TIME:	720 hrs

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



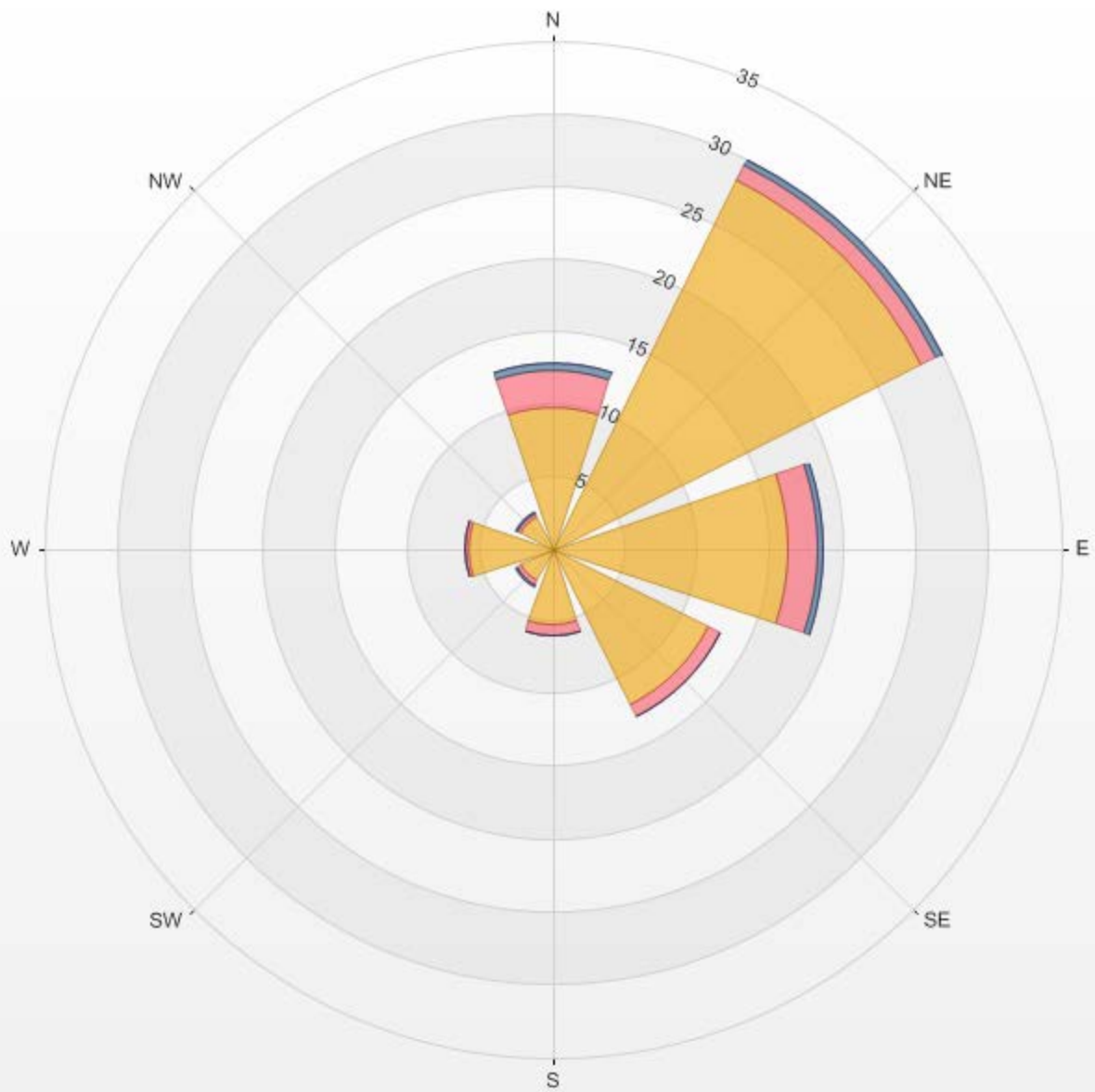
Wind: LICA Bonnyville  
 Poll.: LICA Bonnyville-NOX[ppb]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 7.76% Calm Avg: 6.44 [ppb]

Direction	0.0-7.3	7.3-14.7	14.7-22.0	>22.0	Total
N	9.8	2.5	0.6	0.0	12.9
NE	28.4	1.2	0.4	0.0	30.0
E	16.3	2.1	0.3	0.0	18.6
SE	12.0	0.9	0.0	0.0	12.9
S	5.3	0.7	0.0	0.0	6.0
SW	2.5	0.3	0.2	0.0	2.9
W	5.9	0.2	0.0	0.0	6.0
NW	2.5	0.3	0.2	0.0	2.9
Summary	82.6	8.1	1.6	0.0	92.3

% Icon Classes (ppb) 83 0.0-7.3 8 7.3-14.7 2 14.7-22.0 0 >22.0

LICA Bonnyville Poll.: LICA Bonnyville-NOX[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 7.76% Calm Poll Avg: 6.44[ppb]





NOX[ppb] Calibration: LICA Bonnyville Monthly: 2017/04 Type: Span



Span Meas Span Ref Span Low Span High

***NITRIC OXIDES***

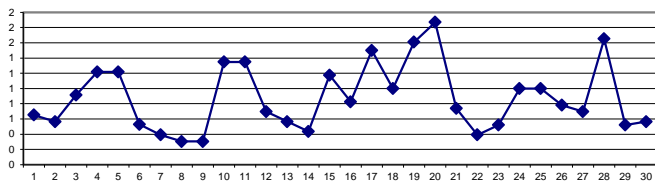
**NITRIC OXIDE Hourly Averages (NO ppb)**

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

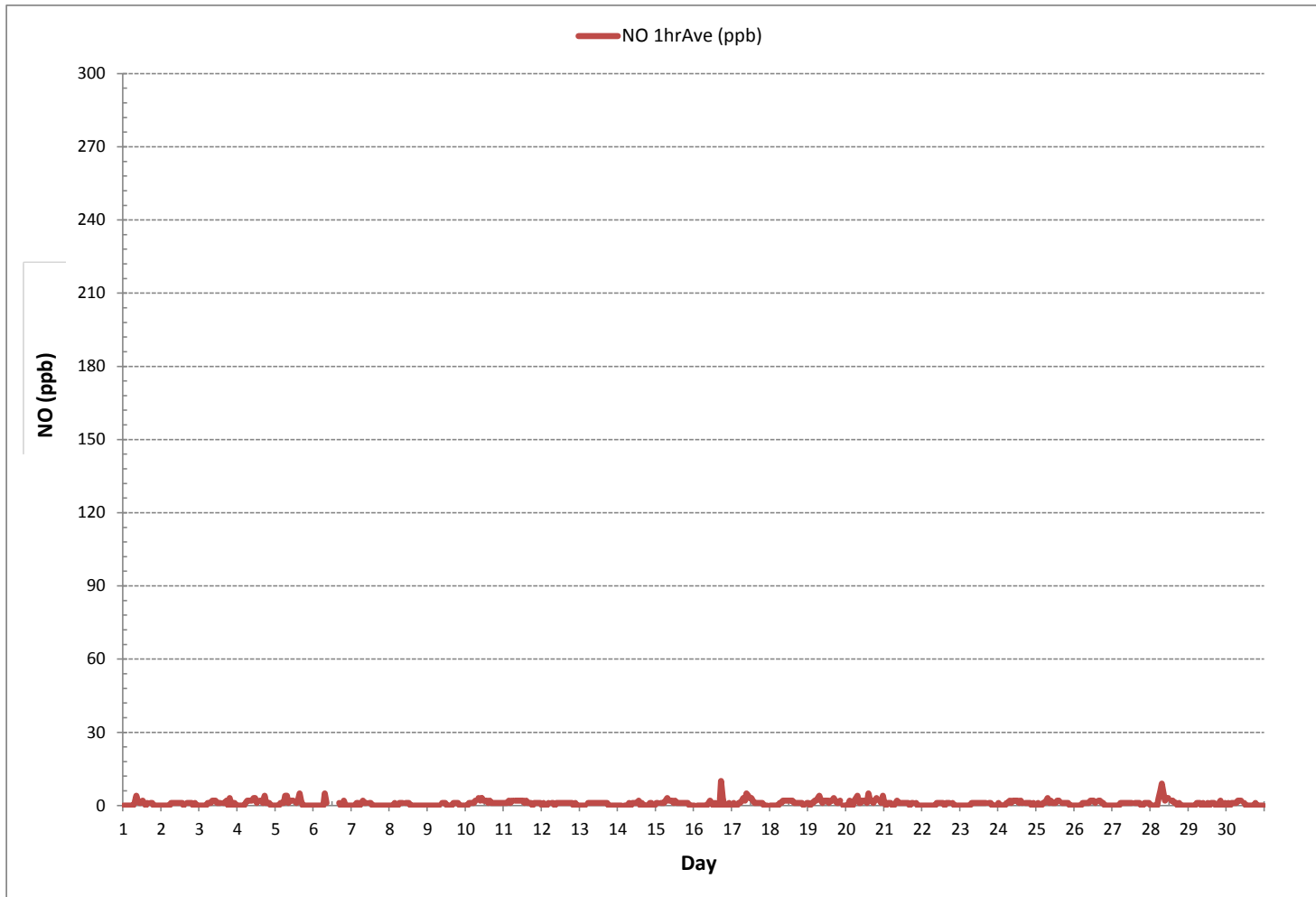
**24 HR AVERAGES April 2017**



**MONTHLY SUMMARY**

NUMBER OF NON-ZERO READINGS:	406			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	10 ppb	@ HOUR	16	ON DAY 16
MAXIMUM 24-HR AVERAGE:	2 ppb			ON DAY 20
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	720 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1	ppb

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville Continuous Monitoring Station - April 2017

NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1	1	3	1	19	1	2	17	55	5	3	3	13	3	2	2	S	16	20	10	1	1	1	2	1	55	8	24	
2	1	1	1	1	1	1	4	2	2	2	2	1	1	1	1	S	2	2	27	24	1	17	1	1	1	27	4	24	
3	1	1	1	2	2	4	2	4	3	3	3	3	4	17	S	4	2	29	2	46	14	4	3	1	1	46	7	24	
4	2	3	1	1	2	3	31	5	12	3	6	22	12	S	16	17	8	29	9	2	1	1	2	1	1	31	8	24	
5	1	1	1	2	2	15	21	25	3	5	21	7	S	5	27	19	9	3	3	2	22	1	1	1	1	27	9	24	
6	1	1	1	1	2	16	5	23	9	C	C	C	C	C	C	C	5	12	2	28	2	1	1	1	1	28	7	24	
7	2	2	1	3	4	2	2	3	2	3	S	3	2	2	1	1	1	1	1	2	1	1	1	1	1	4	2	24	
8	1	1	2	2	2	2	2	2	S	2	2	2	1	1	3	2	2	2	2	2	1	3	2	2	1	3	2	24	
9	2	1	1	1	2	2	1	2	S	4	2	3	13	1	1	2	3	10	3	6	14	2	1	1	1	14	3	24	
10	1	1	3	3	2	14	17	S	25	10	17	14	9	8	3	3	2	2	2	3	2	2	2	2	1	25	6	24	
11	2	2	3	4	3	4	S	4	3	15	4	5	7	3	3	3	1	2	1	6	3	2	2	2	1	15	4	24	
12	2	2	1	1	3	S	2	3	2	3	7	4	2	1	2	2	2	1	1	1	1	1	2	1	1	7	2	24	
13	1	0	1	1	S	1	1	1	1	2	2	2	3	2	2	2	1	1	1	1	1	1	1	1	1	0	3	1	24
14	1	1	0	S	1	1	1	1	1	4	5	1	2	3	2	3	1	1	1	1	1	1	1	1	0	5	2	24	
15	2	1	S	2	2	2	6	6	5	3	4	2	3	2	3	2	2	4	3	2	2	2	2	1	1	6	3	24	
16	1	S	2	1	1	10	1	1	16	4	13	4	8	3	15	2	9	86	92	0	15	2	12	1	0	92	13	24	
17	S	2	2	1	2	3	4	4	22	9	5	8	4	4	3	2	2	2	1	1	1	1	1	S	1	22	4	24	
18	1	0	1	1	1	1	1	2	2	2	3	3	3	3	2	2	2	2	2	1	1	0	S	1	0	3	2	24	
19	1	1	1	1	5	24	6	7	5	2	3	3	3	2	19	16	51	25	8	3	20	S	1	0	0	51	9	24	
20	1	2	6	2	1	5	7	18	12	8	4	4	23	9	25	13	3	2	16	50	S	4	27	10	1	50	11	24	
21	1	1	1	1	2	1	1	2	3	2	2	4	2	11	14	11	1	17	17	S	1	1	0	0	0	17	4	24	
22	0	0	1	0	1	1	1	1	1	1	1	2	1	1	1	1	9	1	S	1	1	0	1	1	0	9	1	24	
23	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	S	2	1	1	1	1	1	1	1	2	1	24	
24	1	1	1	1	1	2	1	2	2	3	3	3	2	2	18	5	S	4	11	11	3	2	1	1	1	18	4	24	
25	1	2	1	1	2	2	14	17	6	12	15	3	18	13	21	S	6	9	13	8	7	1	1	0	0	21	8	24	
26	0	1	0	0	1	10	2	7	2	2	7	3	8	8	S	19	19	17	14	1	1	0	0	1	0	19	5	24	
27	1	1	1	1	1	1	2	2	2	2	2	2	S	2	2	5	2	1	1	2	2	1	2	1	2	1	5	2	24
28	1	2	1	1	3	37	16	12	11	4	21	17	S	9	11	16	12	5	21	1	0	16	0	0	0	37	9	24	
29	0	0	0	0	0	13	19	2	8	10	2	S	5	3	7	2	8	1	0	6	18	8	1	28	0	28	6	24	
30	1	13	1	2	1	2	2	3	2	15	S	2	1	1	1	1	1	1	1	1	1	1	1	0	0	15	2	24	
HOURLY MAX	2	13	6	4	19	37	31	25	55	15	21	22	23	17	27	19	51	86	92	50	22	17	27	28					
HOURLY AVG	1	2	1	1	2	6	6	6	8	5	6	5	6	4	8	6	6	10	10	8	5	3	2	2					

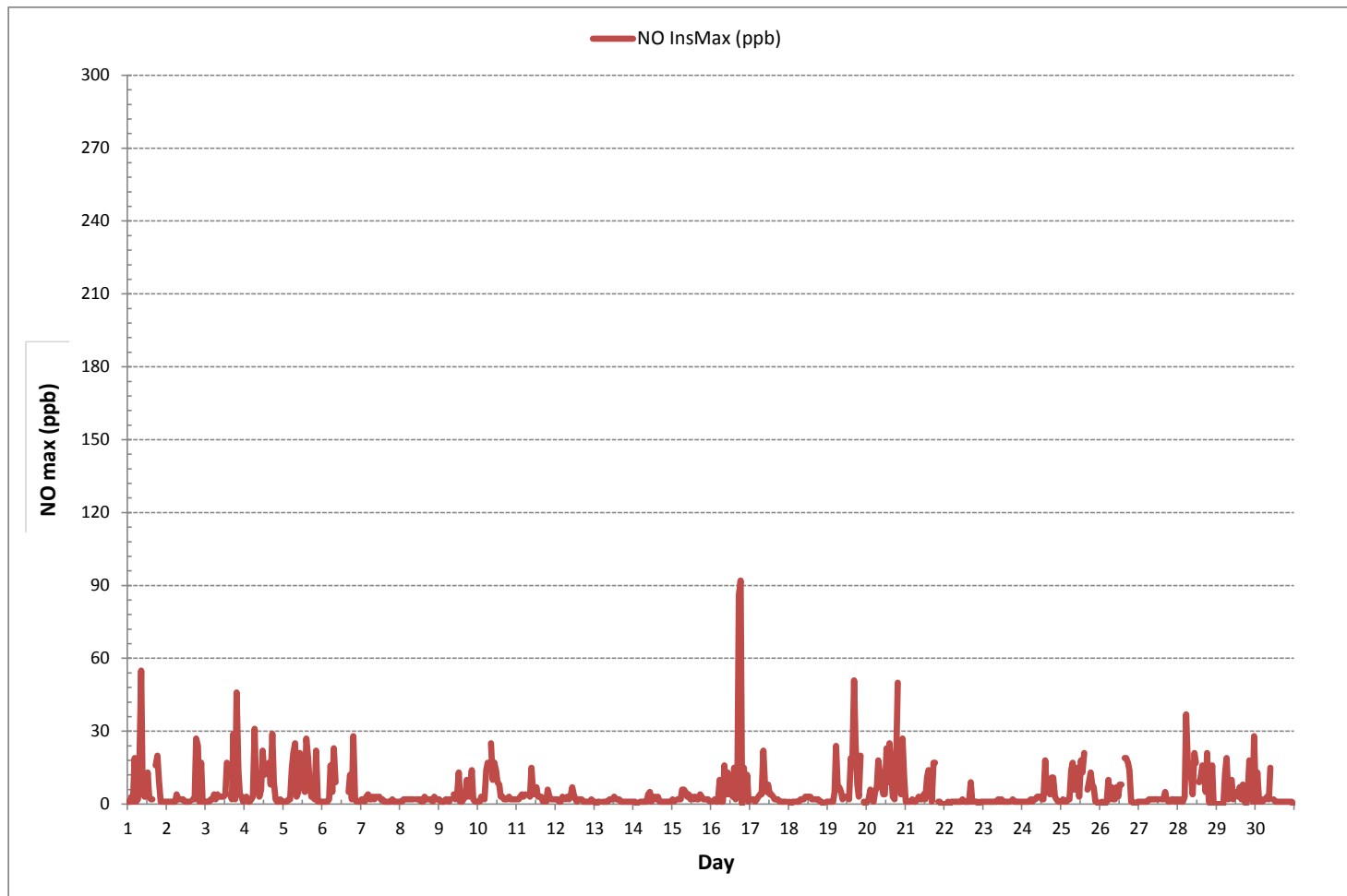
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	655
MAXIMUM INSTANTANEOUS VALUE:	92 ppb @ HOUR 18 ON DAY 16
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	8
OPERATIONAL TIME:	720 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



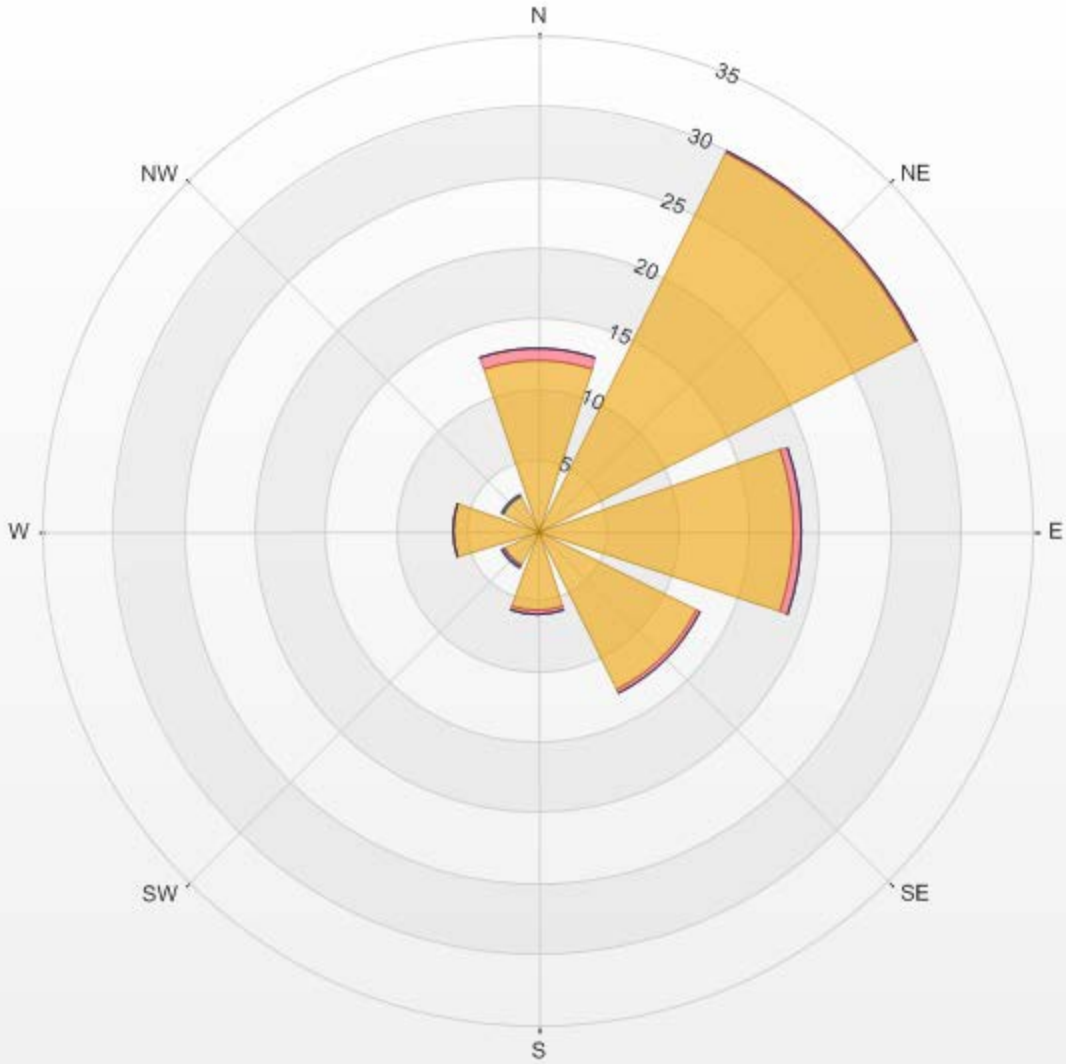
Wind: LICA Bonnyville  
 Poll.: LICA Bonnyville-NO[ppb]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 7.76% Calm Avg: 0.97 [ppb]

Direction	0.0-3.3	3.3-6.7	6.7-10.0	>10.0	Total
N	12.2	0.7	0.0	0.0	12.9
NE	29.9	0.2	0.0	0.0	30.0
E	18.2	0.4	0.0	0.0	18.6
SE	12.6	0.3	0.0	0.0	12.9
S	5.7	0.3	0.0	0.0	6.0
SW	2.6	0.2	0.2	0.0	2.9
W	6.0	0.0	0.0	0.0	6.0
NW	2.8	0.0	0.2	0.0	2.9
Summary	89.9	2.1	0.3	0.0	92.3

% Icon Classes (ppb) 90 0.0-3.3 2 3.3-6.7 0 6.7-10.0 0 >10.0

LICA Bonnyville Poll.: LICA Bonnyville-NO[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 7.76% Calm Poll Avg: 0.97[ppb]





***NITROGEN DIOXIDE***

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

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

STATUS FLAG CODES

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

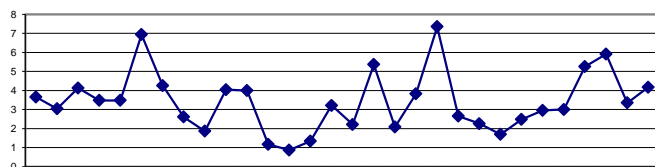
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	657			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 12
MAXIMUM 1-HR AVERAGE:	18 ppb	@ HOUR	19	ON DAY 6
MAXIMUM 24-HR AVERAGE:	7 ppb			ON DAY 6
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	720 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	3	MONTHLY AVERAGE:	3 ppb	

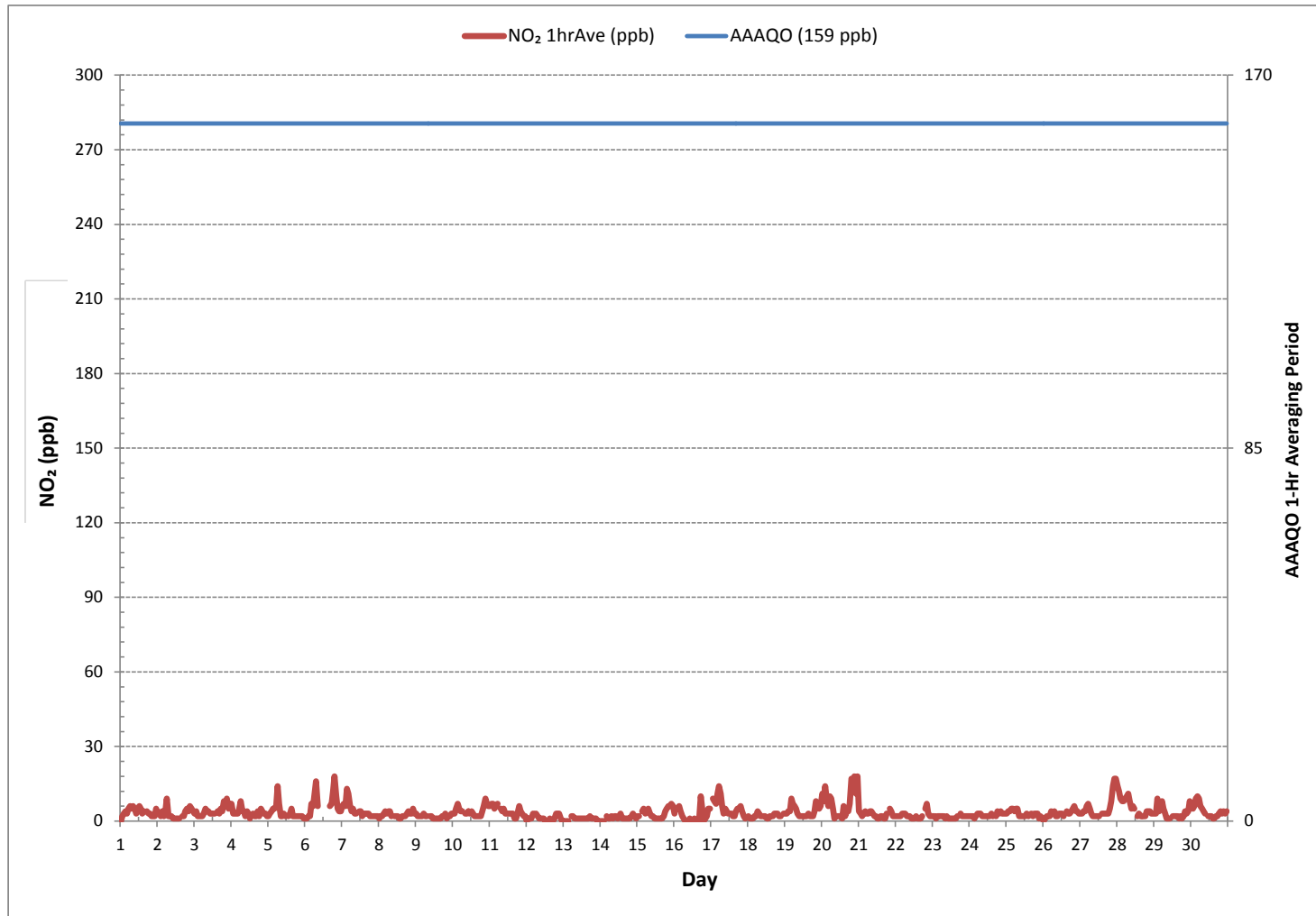
24 HR AVERAGES April 2017





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville Continuous Monitoring Station - April 2017

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





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville Continuous Monitoring Station - April 2017

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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	2	3	7	6	16	5	8	14	21	12	4	6	14	8	6	6	S	20	22	5	2	3	3	3	2	22	9	24	
2	4	4	3	5	4	13	20	4	3	3	2	1	1	1	2	S	3	3	21	33	5	25	9	5	1	33	8	24	
3	5	6	3	3	4	5	5	8	5	4	3	4	5	15	S	6	3	42	7	43	22	15	6	10	3	43	10	24	
4	11	9	8	8	6	9	31	6	9	3	66	12	11	S	21	12	6	31	5	8	7	4	5	3	3	66	13	24	
5	3	4	5	10	7	16	20	18	3	5	14	6	S	12	20	23	13	15	5	2	19	2	3	2	2	23	10	24	
6	2	2	2	5	11	14	18	23	10	C	C	C	C	C	C	C	10	22	17	26	14	7	6	6	2	26	11	24	
7	8	8	8	17	18	10	6	8	3	4	S	5	5	3	3	3	4	3	3	2	3	2	3	2	2	2	18	6	24
8	2	2	3	4	6	5	5	5	3	S	3	2	2	1	1	26	26	4	3	5	3	5	6	5	1	26	6	24	
9	5	2	2	2	6	4	2	3	S	3	2	2	11	1	1	1	3	12	4	9	3	3	4	4	1	12	4	24	
10	4	3	6	8	6	13	17	S	14	14	12	10	7	7	3	3	3	3	3	5	8	10	9	9	3	17	8	24	
11	9	10	11	7	7	11	S	9	6	27	6	6	9	5	6	6	3	3	5	10	7	6	6	5	3	27	8	24	
12	2	3	2	3	11	S	6	5	3	4	4	3	2	2	2	2	3	2	4	6	4	6	3	2	2	11	4	24	
13	2	1	1	2	S	3	3	2	2	3	3	2	2	3	3	3	3	3	3	1	2	2	1	1	1	3	2	24	
14	1	1	1	S	4	2	2	3	2	5	5	3	3	5	3	3	3	3	4	3	4	4	3	3	1	5	3	24	
15	3	3	S	6	6	6	9	9	7	4	4	2	2	3	4	2	3	6	8	8	9	10	10	10	2	10	6	24	
16	4	S	7	7	6	33	3	1	14	3	11	4	5	2	5	2	9	121	115	1	12	5	18	7	1	121	17	24	
17	S	12	13	13	15	16	14	10	12	10	6	13	5	5	5	5	6	7	7	9	7	5	3	S	3	16	9	24	
18	3	2	2	2	4	4	5	5	3	3	3	3	3	3	3	3	4	6	5	4	4	3	S	4	2	6	4	24	
19	4	4	4	5	18	18	9	7	7	3	4	4	4	3	12	9	7	8	14	12	21	S	10	8	3	21	8	24	
20	16	16	30	21	8	12	28	17	12	11	3	6	12	15	50	16	6	6	20	41	S	23	23	25	3	50	18	24	
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23	2	2	1	2	2	2	2	2	2	3	2	2	2	1	2	2	2	S	4	3	3	2	3	2	1	4	2	24	
24	2	2	2	1	2	3	4	9	3	2	3	3	2	3	15	12	S	3	16	9	6	4	4	4	1	16	5	24	
25	4	4	4	6	6	5	17	17	7	12	7	4	12	9	14	S	18	5	15	18	12	2	2	1	1	18	9	24	
26	1	2	2	3	3	12	5	11	4	3	22	3	7	6	S	19	15	28	10	5	8	4	4	3	1	28	8	24	
27	3	3	4	4	9	8	7	3	3	3	2	3	5	S	3	5	5	4	4	7	10	17	19	20	2	20	7	24	
28	19	15	14	12	9	21	17	14	11	6	19	18	S	7	34	16	16	10	21	7	6	22	6	5	5	34	14	24	
29	4	5	11	6	8	26	24	5	11	6	2	S	7	2	10	3	10	3	2	10	17	10	6	31	2	31	10	24	
30	8	10	8	11	11	11	7	6	4	19	S	3	3	3	1	1	3	3	3	5	4	9	6	5	1	19	6	24	
HOURLY MAX	19	16	30	21	18	33	31	23	21	27	66	18	14	15	50	26	26	121	115	43	22	25	23	31					
HOURLY AVG	5	5	6	6	8	10	10	8	7	6	8	5	5	5	9	8	7	14	13	11	8	8	6	7					

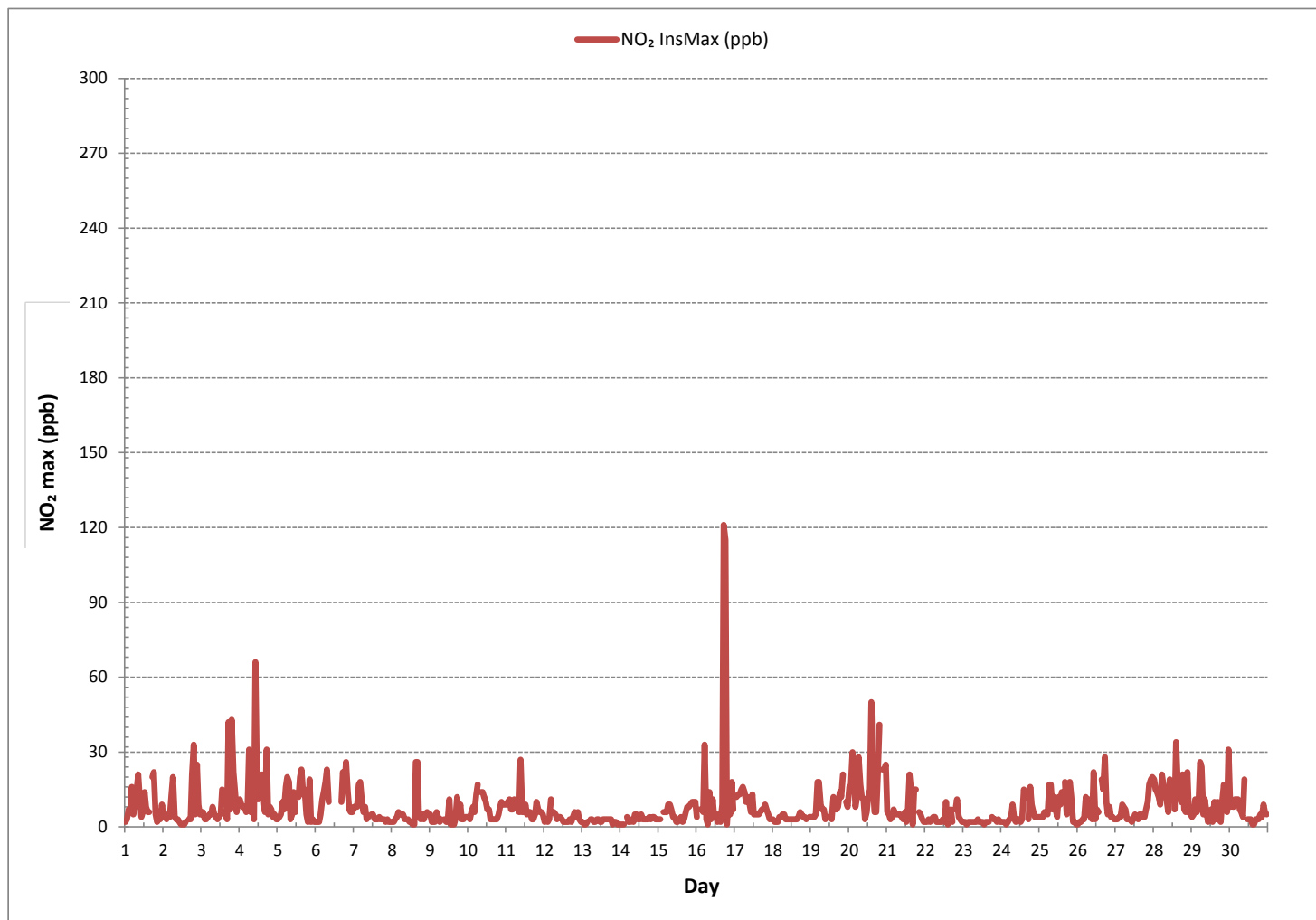
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	683
MAXIMUM INSTANTANEOUS VALUE:	121 ppb @ HOUR 17 ON DAY 16
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	9
OPERATIONAL TIME:	720 hrs

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



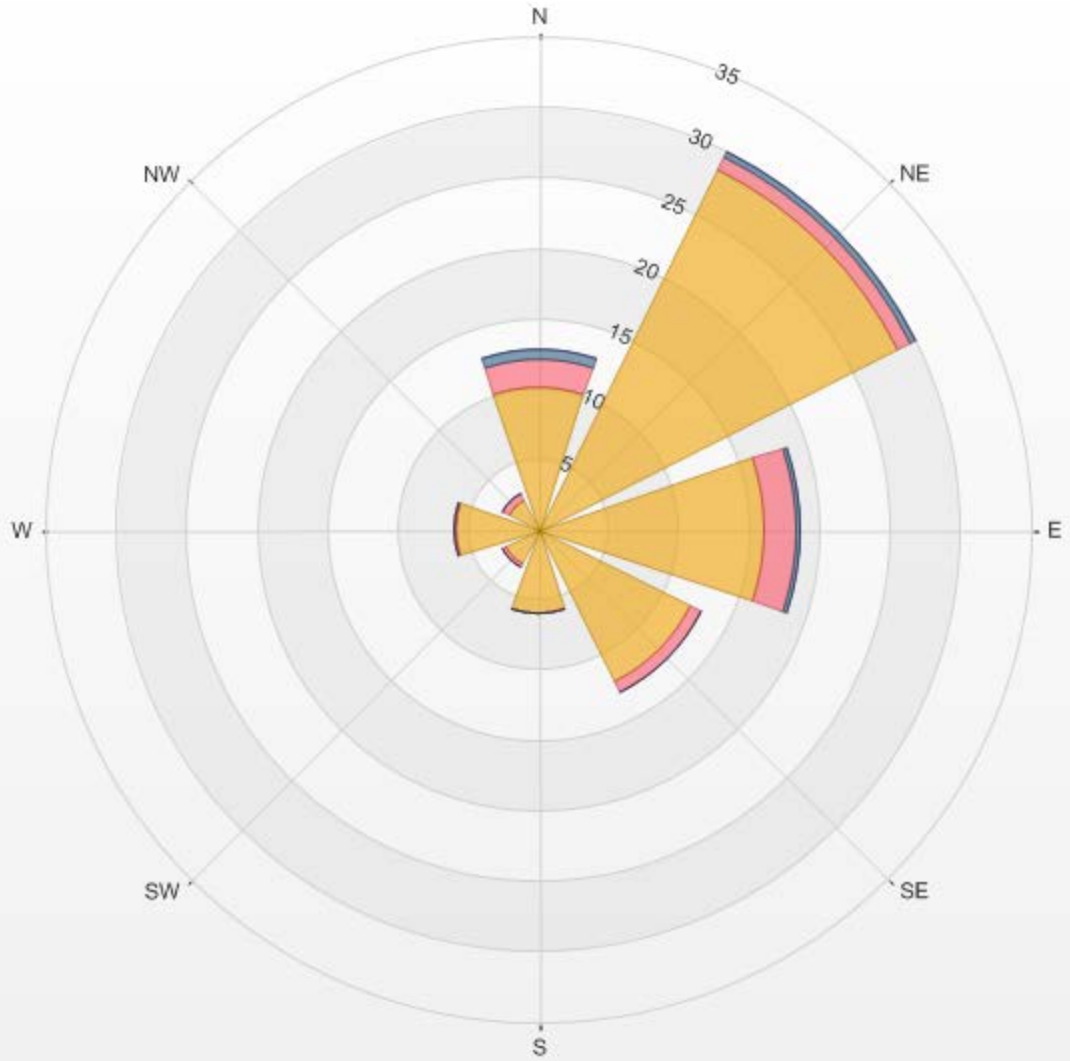
Wind: LICA Bonnyville  
 Poll.: LICA Bonnyville-NO2[ppb]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 7.76% Calm Avg: 5.46 [ppb]

Direction	0.0-6.1	6.1-12.3	12.3-18.4	>18.4	Total
N	10.1	2.1	0.7	0.0	12.9
NE	28.6	1.0	0.4	0.0	30.0
E	16.1	2.2	0.3	0.0	18.6
SE	12.0	0.9	0.0	0.0	12.9
S	6.0	0.0	0.0	0.0	6.0
SW	2.6	0.3	0.0	0.0	2.9
W	5.9	0.2	0.0	0.0	6.0
NW	2.3	0.6	0.0	0.0	2.9
Summary	83.6	7.2	1.5	0.0	92.3

% Icon Classes (ppb) 84 0.0-6.1 7 6.1-12.3 1 12.3-18.4 0 >18.4

LICA Bonnyville Poll.: LICA Bonnyville-NO2[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 7.76% Calm Poll Avg: 5.46[ppb]



NO2[ppb] Calibration: LICA Bonnyville Monthly: 2017/04 Type: Span



Span Meas Span Ref Span Low Span High



# ***OZONE***



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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY 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	31.2	29.4	28.8	27.4	25.3	22.9	23.7	20.6	23.4	27.5	31.4	30.8	28.5	34.1	37.4	40.1	S	35.3	34.5	33.7	34.6	42.5	38.6	37.9	20.6	42.5	31.3	24		
2	35.0	32.9	32.2	29.2	29.2	28.4	24.6	30.3	32.4	33.8	35.7	37.3	38.8	39.9	41.0	S	42.9	41.4	39.0	35.7	32.2	27.5	29.0	31.3	24.6	42.9	33.9	24		
3	34.1	32.8	32.9	30.9	32.1	30.8	29.6	27.5	28.5	30.7	32.9	34.2	37.6	36.9	S	39.9	39.9	39.6	35.9	30.8	32.2	27.4	27.9	20.9	20.9	39.9	32.4	24		
4	18.0	18.4	19.6	19.6	19.4	16.4	15.8	21.1	21.8	24.1	23.2	26.8	37.9	S	39.4	41.9	44.6	43.5	43.0	37.6	35.8	35.0	39.1	42.2	15.8	44.6	29.7	24		
5	44.6	41.0	38.8	37.4	34.0	29.6	21.5	25.7	30.3	31.4	34.3	36.8	S	42.8	46.6	47.2	46.7	47.6	45.4	46.2	46.0	45.8	45.6	44.6	21.5	47.6	39.6	24		
6	40.0	37.4	34.4	31.7	26.2	26.5	21.8	17.3	26.7	27.7	28.3	S	34.0	38.0	40.5	43.1	41.0	40.4	33.1	22.4	28.1	31.6	33.8	30.6	17.3	43.1	31.9	24		
7	25.6	25.2	25.8	19.8	22.0	29.6	32.8	34.1	37.1	C	C	C	C	39.3	38.6	37.7	36.9	36.0	36.4	35.3	36.4	36.1	35.2	35.2	19.8	39.3	32.8	24		
8	35.5	35.6	35.7	34.7	34.3	33.9	33.2	30.6	29.5	S	32.7	35.6	37.7	39.1	40.6	40.1	38.6	37.1	34.5	32.5	32.1	31.1	27.2	29.0	27.2	40.6	34.4	24		
9	30.6	32.6	33.0	32.5	30.9	30.8	31.4	30.1	S	30.4	30.0	30.8	31.4	32.1	33.1	33.9	34.7	35.1	33.2	30.9	30.3	29.0	27.3	26.4	26.4	35.1	31.3	24		
10	24.8	24.0	22.2	19.5	20.5	20.4	20.9	S	22.0	22.3	21.5	22.7	22.4	25.3	26.0	28.1	27.5	27.4	26.6	23.9	20.5	17.7	18.9	19.4	17.7	28.1	22.8	24		
11	18.8	17.6	17.1	18.1	18.2	17.5	S	21.3	22.9	24.3	26.6	27.7	28.5	29.4	27.8	30.8	34.5	33.7	32.6	28.5	29.7	31.2	32.1	30.8	17.1	34.5	26.1	24		
12	27.2	25.6	27.6	27.7	25.6	S	30.3	31.8	32.0	31.6	33.0	34.2	35.6	35.2	35.3	34.6	34.9	34.7	35.1	33.2	30.9	30.3	29.5	27.0	27.8	30.0	30.3	25.6	31.1	24
13	31.8	31.2	30.1	30.6	S	31.1	31.2	31.6	31.2	31.9	32.5	34.1	35.5	35.0	34.9	33.9	32.6	31.4	31.2	31.7	31.2	34.0	37.7	39.0	30.1	39.0	32.8	24		
14	38.4	37.8	37.6	S	35.4	35.7	36.3	37.0	38.7	37.7	37.4	37.9	36.7	34.8	36.2	36.6	36.8	35.9	36.2	36.8	36.5	36.5	39.3	40.3	34.8	40.3	37.1	24		
15	40.2	40.1	S	38.7	38.1	39.6	39.5	39.8	41.2	41.8	41.2	41.4	41.4	40.7	40.3	39.2	38.5	37.3	36.2	35.3	33.7	32.6	31.0	33.1	31.0	41.8	38.3	24		
16	37.4	S	34.6	33.7	35.0	36.8	36.4	37.0	37.7	38.3	39.1	42.2	43.9	45.2	47.4	46.8	47.8	41.1	42.8	41.6	41.8	43.9	40.9	38.7	33.7	47.8	40.4	24		
17	S	35.7	34.9	35.1	30.0	26.6	28.2	31.1	33.5	31.3	33.4	36.2	38.4	41.4	41.5	43.7	42.9	42.0	39.1	36.3	38.5	32.4	31.1	S	26.6	43.7	35.6	24		
18	30.1	30.9	31.6	33.2	32.6	32.7	31.9	32.9	33.2	32.9	32.7	33.2	33.8	34.2	33.9	34.2	33.1	31.3	29.5	28.9	27.4	26.9	S	26.8	26.8	34.2	31.6	24		
19	26.5	25.8	24.4	22.9	17.6	18.1	16.5	18.2	20.8	23.4	24.1	26.4	30.6	33.7	33.5	35.4	37.8	40.2	39.7	36.3	32.4	S	32.4	30.8	16.5	40.2	28.2	24		
20	24.3	26.4	18.4	23.9	24.3	19.8	22.2	23.4	26.4	27.2	28.6	28.9	29.8	30.6	27.7	30.3	29.9	30.7	28.0	17.4	S	10.4	12.5	11.2	10.4	30.7	24.0	24		
21	25.3	29.3	30.4	29.9	30.4	34.9	38.2	40.4	39.8	40.9	41.8	43.0	44.2	45.4	45.8	45.2	44.9	44.4	43.0	S	38.6	39.9	39.2	39.0	25.3	45.8	38.9	24		
22	38.5	37.6	37.6	37.2	37.2	36.9	37.2	40.0	39.7	39.7	39.5	40.0	41.4	41.5	41.4	41.1	41.7	42.3	S	38.7	34.9	35.9	35.2	35.0	34.9	42.3	38.7	24		
23	34.7	34.2	33.7	33.2	32.3	31.4	31.4	30.8	30.6	30.1	30.6	31.4	32.5	34.0	33.9	34.5	36.4	S	35.5	35.7	34.9	32.7	31.2	30.7	30.1	36.4	32.9	24		
24	30.1	29.3	29.1	29.2	28.3	26.7	25.9	25.4	25.5	25.3	25.5	25.6	25.3	25.5	27.1	29.6	S	28.8	29.0	28.7	27.5	27.5	26.5	24.9	24.9	30.1	27.2	24		
25	24.1	23.7	24.3	24.3	24.4	25.6	27.1	28.7	36.6	38.6	38.4	40.0	38.0	39.0	40.7	S	36.8	36.4	35.3	34.4	34.3	33.6	31.8	32.2	23.7	40.7	32.5	24		
26	33.6	32.0	31.1	30.6	30.4	28.6	29.7	29.4	31.9	34.3	36.4	36.2	35.9	34.9	S	31.8	29.7	29.5	29.2	29.2	28.9	29.5	29.1	30.3	28.6	36.4	31.4	24		
27	29.8	29.6	29.3	29.4	28.1	25.6	28.0	30.3	32.4	34.6	36.5	36.3	37.8	S	37.8	36.9	41.1	41.5	40.2	37.8	32.2	25.0	22.0	19.8	19.8	41.5	32.3	24		
28	18.5	15.7	16.3	12.2	10.4	11.5	13.0	16.1	25.2	35.8	37.0	39.4	S	47.7	47.3	48.1	48.0	48.4	48.7	44.0	43.6	39.4	36.4	36.2	10.4	48.7	32.1	24		
29	34.5	33.9	23.9	26.5	25.9	25.0	31.0	39.6	44.7	45.5	46.8	S	46.5	45.8	46.0	45.7	46.6	44.0	45.1	43.8	40.4	39.3	34.5	30.3	23.9	46.8	38.5	24		
30	32.1	32.8	30.1	25.4	23.4	24.4	26.8	26.6	29.0	33.3	S	44.6	45.3	45.3	46.4	46.5	46.1	45.4	44.3	41.9	42.7	39.0	39.3	35.8	23.4	46.5	36.8	24		
HOURLY MAX	44.6	41.0	38.8	38.7	38.1	39.6	39.5	40.4	44.7	45.5	46.8	44.6	46.5	47.7	47.4	48.1	48.0	48.4	48.7	46.2	46.0	45.8	45.6	44.6						
HOURLY AVG	30.9	30.3	29.2	28.4	27.6	27.5	28.1	29.3	31.2	32.4	33.3	34.6	35.9	37.4	38.1	38.5	39.0	38.0	36.6	34.0	33.9	32.5	32.2	31.5						

STATUS FLAG CODES

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

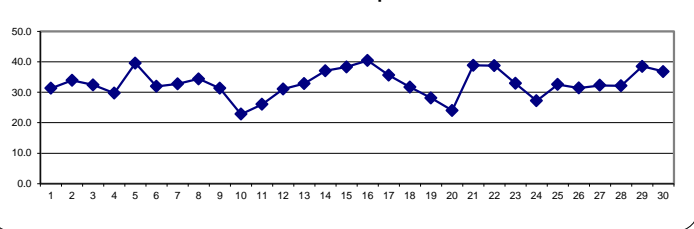
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

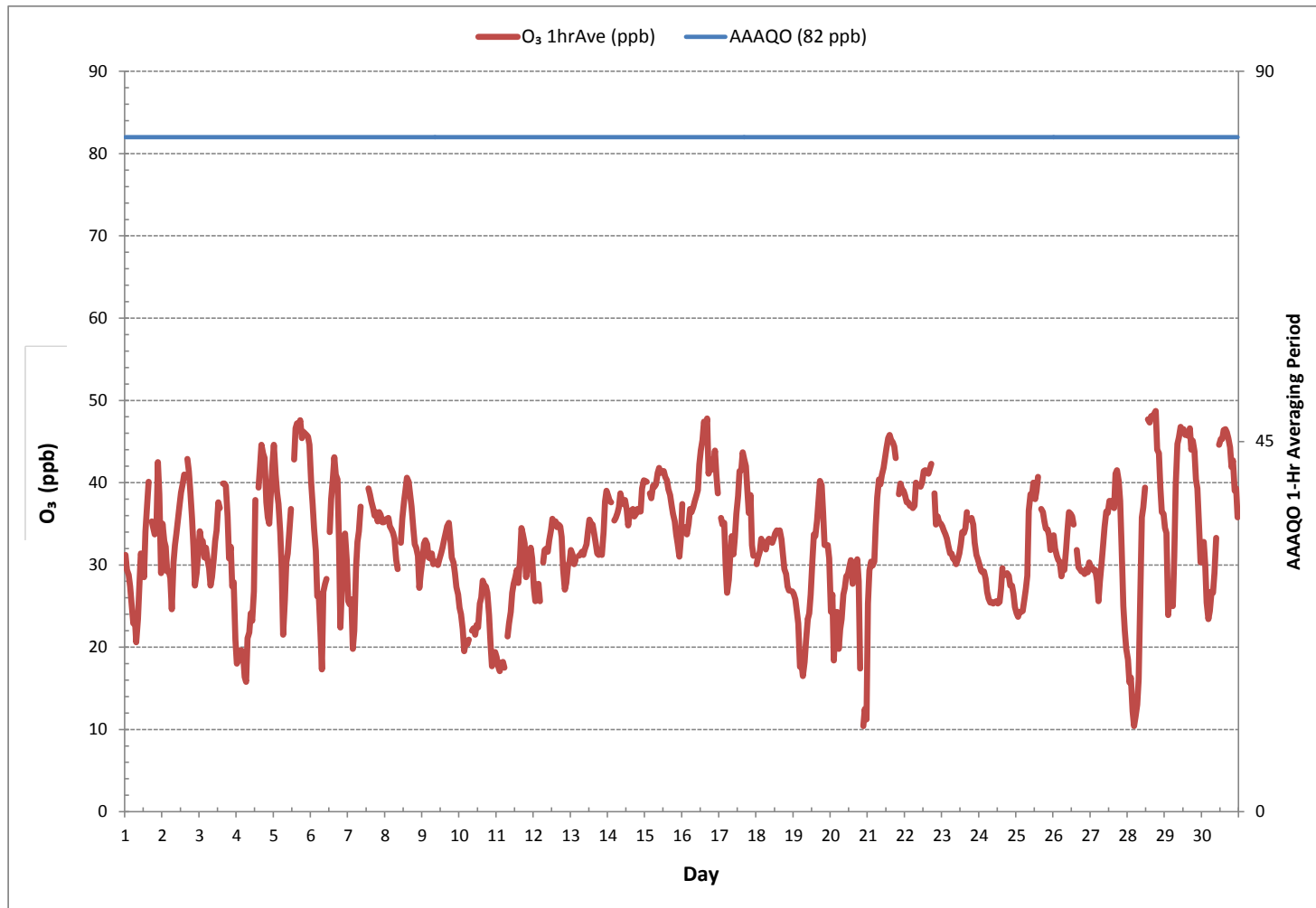
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	686			
MINIMUM 1-HR AVERAGE:	10.4	ppb @ HOUR	21	ON DAY
MAXIMUM 1-HR AVERAGE:	48.7	ppb @ HOUR	18	ON DAY
MAXIMUM 24-HR AVERAGE:	40.4	ppb		ON DAY
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	720
MONTHLY CALIBRATION TIME:	4	hrs	AMD OPERATION UPTIME:	100.0
STANDARD DEVIATION:	7.2		MONTHLY AVERAGE:	32.9
				ppb

24 HR AVERAGES April 2017



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





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville Continuous Monitoring Station - April 2017

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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY 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	33.1	30.9	30.6	29.8	27.5	24.8	27.2	22.5	28.2	30.3	33.2	32.1	30.7	46.8	44.6	43.2	S	37.5	37.1	36.3	37.2	45.4	41.8	39.2	22.5	46.8	34.3	24	
2	36.8	34.4	33.1	32.1	30.4	30.9	29.8	31.3	34.1	35.0	36.8	38.6	40.0	40.7	42.6	S	43.8	43.0	41.6	39.7	35.7	33.8	31.5	32.6	29.8	43.8	36.0	24	
3	36.5	35.4	33.8	32.6	33.1	32.6	30.9	30.4	30.3	32.6	33.9	37.8	39.6	39.4	S	42.0	41.7	44.1	40.5	35.0	36.8	32.1	31.2	26.7	26.7	44.1	35.2	24	
4	21.1	20.4	20.7	20.7	21.3	19.5	20.8	23.2	23.7	26.0	24.8	34.8	41.1	S	41.2	44.8	46.2	46.8	45.3	44.2	38.6	38.1	43.5	43.9	19.5	46.8	32.6	24	
5	50.1	42.8	42.3	40.3	37.6	33.8	25.8	29.6	31.3	33.1	36.5	38.8	S	44.2	49.5	50.1	49.4	49.7	49.2	47.3	47.1	46.8	46.8	46.5	25.8	50.1	42.1	24	
6	41.9	39.1	36.2	33.8	32.1	29.5	29.1	24.4	28.8	P	30.6	S	35.9	40.8	44.1	46.2	45.2	43.8	39.9	33.8	33.8	35.4	39.4	35.3	24.4	46.2	36.3	23	
7	28.1	26.9	29.1	23.8	25.1	32.3	34.7	37.4	C	C	C	C	C	C	40.7	40.1	39.0	38.8	37.2	37.9	36.5	37.8	37.6	37.1	36.6	23.8	40.7	34.6	24
8	36.8	37.6	37.4	37.4	37.2	34.9	35.0	33.2	30.6	S	34.7	37.9	39.2	41.1	42.2	41.7	40.1	39.2	36.6	35.3	34.0	32.8	29.6	32.0	29.6	42.2	36.4	24	
9	33.5	33.8	34.0	33.8	32.3	32.0	32.5	31.7	S	31.7	31.0	31.7	32.9	33.1	34.3	35.0	36.1	37.2	35.3	32.8	31.5	31.0	28.7	28.2	28.2	37.2	32.8	24	
10	25.4	25.4	24.5	22.1	22.8	22.1	22.1	S	23.4	23.4	22.8	24.0	24.5	27.4	27.8	29.1	28.7	28.8	28.4	26.3	22.9	20.4	21.0	21.3	20.4	29.1	24.5	24	
11	21.5	19.8	19.7	19.8	19.8	20.1	S	24.1	25.3	26.4	29.7	29.4	30.4	32.0	30.1	34.6	36.2	35.3	35.0	32.9	31.9	33.4	35.0	36.1	19.7	36.2	28.6	24	
12	29.4	27.4	28.7	29.0	28.5	S	32.3	33.5	33.4	33.1	35.1	35.7	36.9	36.1	36.2	36.1	36.2	36.1	35.6	31.3	29.0	30.7	31.0	31.7	27.4	36.9	32.7	24	
13	32.5	32.5	31.2	31.6	S	32.2	32.8	33.1	32.5	33.1	33.8	35.6	36.9	36.3	36.6	36.1	33.7	32.5	32.3	32.6	32.9	36.6	40.2	40.1	31.2	40.2	34.2	24	
14	39.2	38.7	38.4	S	36.2	36.8	37.2	38.1	39.5	39.5	38.9	38.8	37.7	36.2	37.4	38.0	38.7	37.2	37.7	38.3	38.1	39.6	41.1	41.6	36.2	41.6	38.4	24	
15	41.4	41.1	S	40.5	40.4	41.1	42.2	42.2	44.4	43.2	42.8	42.9	43.1	42.5	41.7	40.2	39.8	39.2	38.7	38.3	37.2	36.2	34.7	38.0	34.7	44.4	40.5	24	
16	38.8	S	36.6	36.1	36.6	38.3	38.0	37.8	38.7	39.3	41.4	43.5	44.8	47.8	48.2	47.9	48.5	47.0	44.4	43.2	44.3	45.8	45.2	41.4	36.1	48.5	42.3	24	
17	S	39.3	39.6	39.8	33.2	29.2	30.6	33.5	35.2	34.9	35.1	38.8	40.0	43.5	43.9	45.0	44.4	43.8	41.4	38.8	40.8	37.1	32.6	S	29.2	45.0	38.2	24	
18	31.0	31.9	33.5	34.1	34.1	34.3	33.9	34.9	34.1	34.3	33.7	34.1	34.9	35.4	35.3	35.3	34.4	33.5	30.9	30.3	28.5	28.0	S	27.7	27.7	35.4	33.0	24	
19	27.7	26.8	25.4	24.8	23.8	21.9	19.1	19.7	23.4	26.9	25.3	29.4	32.5	35.9	35.1	37.8	39.9	42.3	42.3	39.8	35.5	S	35.9	33.7	19.1	42.3	30.6	24	
20	28.4	31.0	30.4	27.7	27.4	24.3	24.7	27.0	27.3	28.2	29.7	30.2	31.7	31.6	30.6	31.6	34.6	32.6	31.2	29.6	S	15.7	16.7	24.5	15.7	34.6	28.1	24	
21	27.0	32.6	31.6	30.9	33.4	36.5	40.8	42.6	41.7	42.5	43.3	44.8	45.7	46.7	47.3	47.3	45.9	46.2	45.0	S	40.5	41.4	40.5	39.8	27.0	47.3	40.6	24	
22	39.8	39.0	38.9	38.4	38.3	39.2	40.4	41.4	41.0	40.8	40.2	41.4	42.6	42.6	43.0	42.5	43.5	43.8	S	40.5	38.4	36.8	36.2	36.1	36.1	43.8	40.2	24	
23	35.6	35.0	34.6	34.3	33.4	32.3	32.3	31.9	31.5	30.9	31.5	34.7	33.8	35.3	35.6	36.5	37.8	S	38.6	36.7	36.6	34.4	32.2	31.6	30.9	38.6	34.2	24	
24	31.0	30.2	30.0	30.0	29.4	28.0	27.3	26.9	26.4	26.3	26.3	26.7	26.3	27.0	29.7	31.2	S	30.6	30.9	30.4	29.2	29.1	28.1	26.6	26.3	31.2	28.6	24	
25	25.4	25.7	26.1	26.0	25.8	27.0	29.1	32.0	39.5	40.2	40.2	41.9	38.8	42.1	42.9	S	38.5	38.6	36.8	35.9	35.9	34.9	32.9	33.8	25.4	42.9	34.3	24	
26	34.2	33.5	32.2	31.7	31.5	30.5	31.5	31.0	34.4	36.1	38.7	37.9	37.6	36.5	S	33.7	31.5	31.0	30.9	30.4	31.2	30.7	30.3	31.0	30.3	38.7	33.0	24	
27	30.6	30.4	30.3	30.9	30.9	27.5	30.0	31.9	34.3	37.2	37.8	38.8	39.4	S	39.4	38.7	43.5	43.3	41.7	41.1	36.6	30.7	28.0	24.0	24.0	43.5	34.7	24	
28	21.6	21.0	20.4	14.3	13.2	14.9	15.1	22.6	32.7	37.5	39.6	43.6	S	49.5	49.8	49.7	49.7	50.1	50.7	48.8	46.2	43.4	39.6	39.3	13.2	50.7	35.4	24	
29	37.1	36.2	34.0	31.5	29.8	31.2	36.3	44.2	46.2	47.0	47.7	S	48.0	46.8	47.6	47.3	47.7	46.5	46.7	46.4	43.9	42.6	37.4	33.4	29.8	48.0	41.5	24	
30	34.7	34.6	33.5	30.4	25.1	27.7	28.3	31.8	31.5	36.8	S	46.8	47.4	46.8	48.1	47.6	47.8	47.6	46.0	48.2	46.2	41.6	41.7	37.9	25.1	48.2	39.5	24	
HOURLY MAX	50.1	42.8	42.3	40.5	40.4	41.1	42.2	44.2	46.2	47.0	47.7	46.8	48.0	49.5	49.8	50.1	49.7	50.1	50.7	48.8	47.1	46.8	46.8	46.5					
HOURLY AVG	32.8	32.2	31.6	30.6	30.0	29.8	30.7	31.9	33.0	34.3	34.8	36.7	37.5	39.5	40.2	40.3	40.8	40.2	38.9	37.3	36.5	35.2	34.8	34.2					

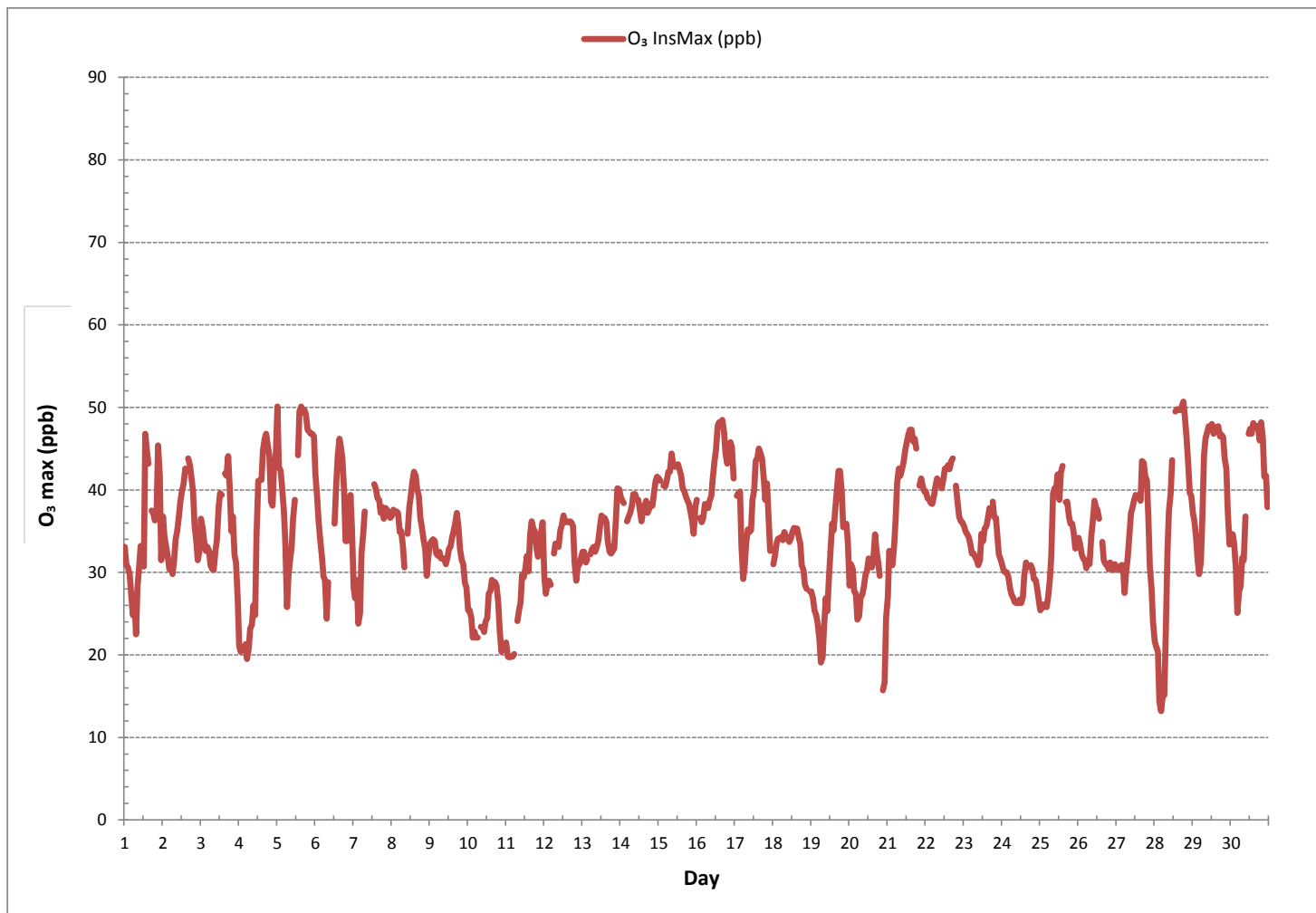
STATUS FLAG CODES

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:	684
MAXIMUM INSTANTANEOUS VALUE:	50.7 ppb @ HOUR 18 ON DAY 28
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	7.0
OPERATIONAL TIME:	719 hrs

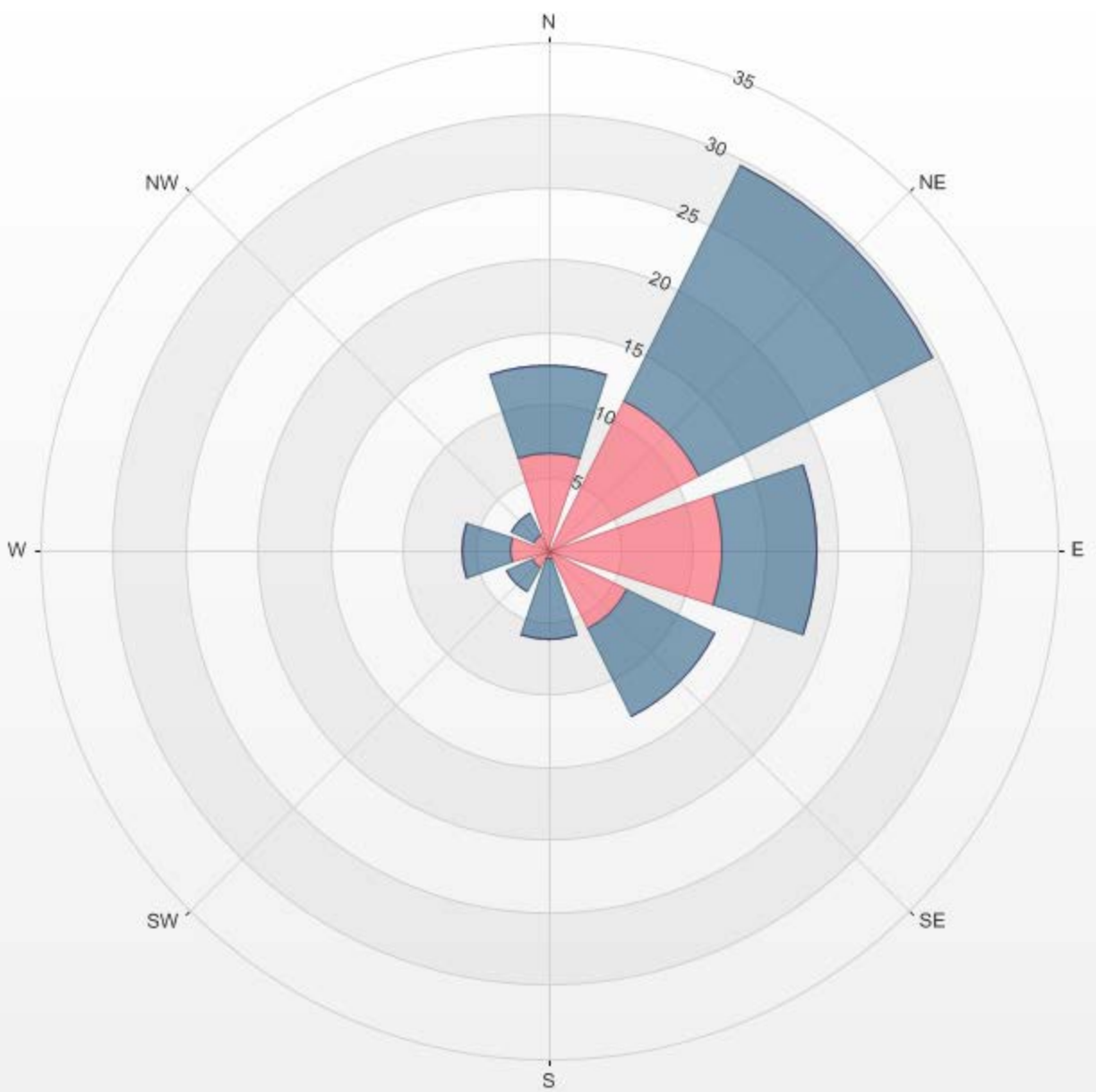
OZONE Instantaneous Maximum (O<sub>3</sub> ppb)





% Icon Classes (ppb) 0 0.0-16.3 42 16.3-32.5 50 32.5-48.8 0 >48.8

LICA Bonnyville Poll.: LICA Bonnyville-O3[ppb] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 8.03% Calm Poll Avg: 27.40[ppb]



O3[ppb] Calibration: LICA Bonnyville Monthly: 2017/04 Type: Span



Span Meas Span Ref Span Low Span High



***PARTICULATE MATTER 2.5***



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

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

STATUS FLAG CODES

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

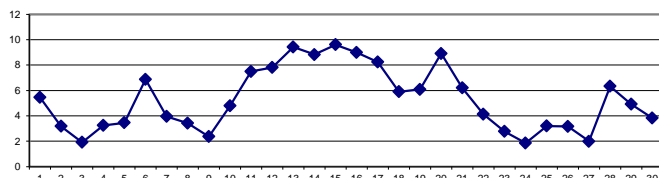
OBJECTIVE LIMIT:

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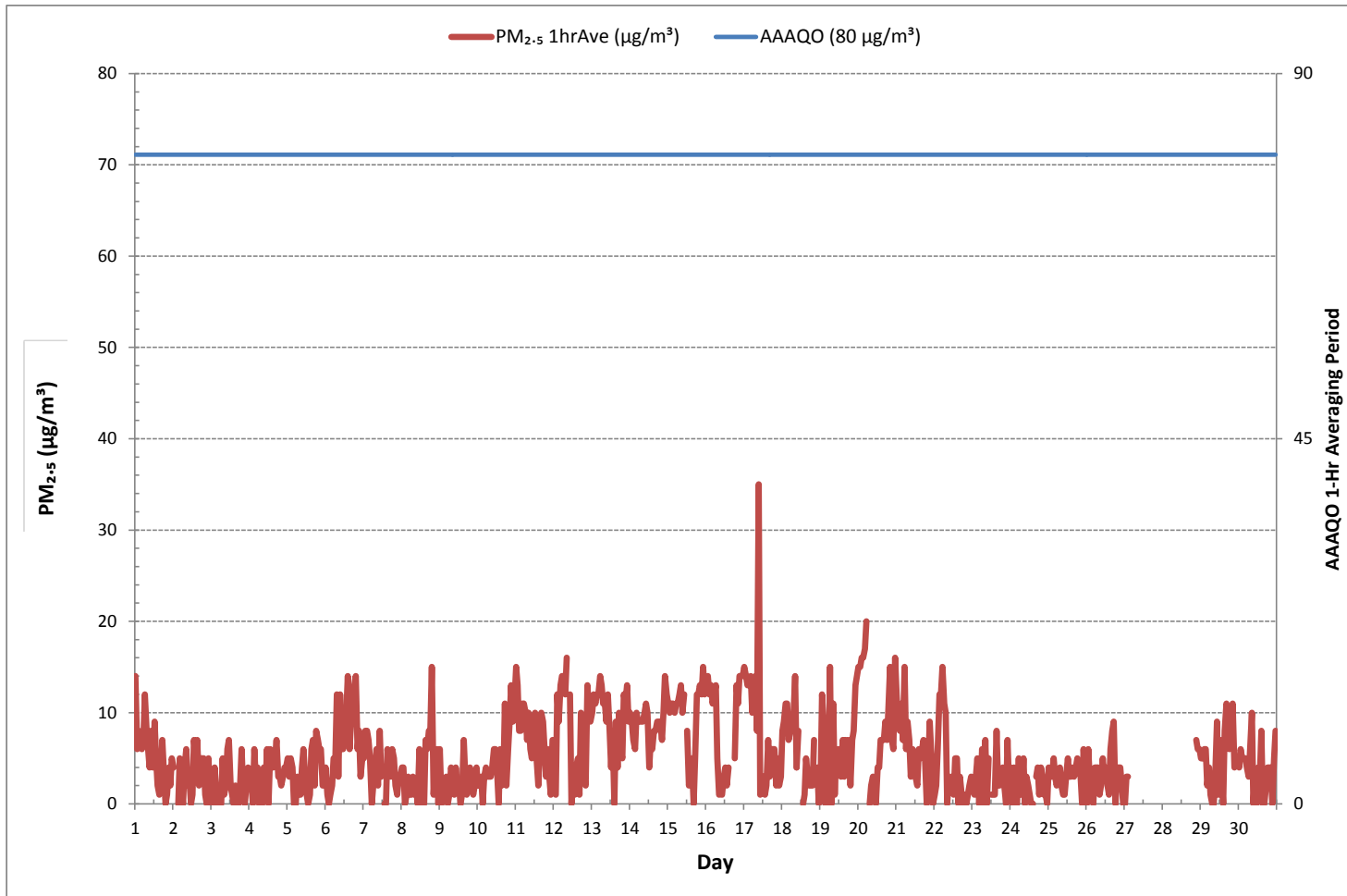
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	586				
MINIMUM 1-HR AVERAGE:	0 µg/m <sup>3</sup> @ HOUR	19	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	35 µg/m <sup>3</sup> @ HOUR	9	ON DAY	17	
MAXIMUM 24-HR AVERAGE:	10 µg/m <sup>3</sup>		ON DAY	15	
MONTHLY CALIBRATION TIME:	2	hrs	OPERATIONAL TIME:	664	hrs
STANDARD DEVIATION:	4		AMD OPERATION UPTIME:	92.2	%
			MONTHLY AVERAGE:	5	µg/m <sup>3</sup>

24 HR AVERAGES April 2017



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



Wind: LICA Bonnyville  
 Poll.: LICA Bonnyville-PM25[ug/m3(L)]  
 Monthly: 17/04  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

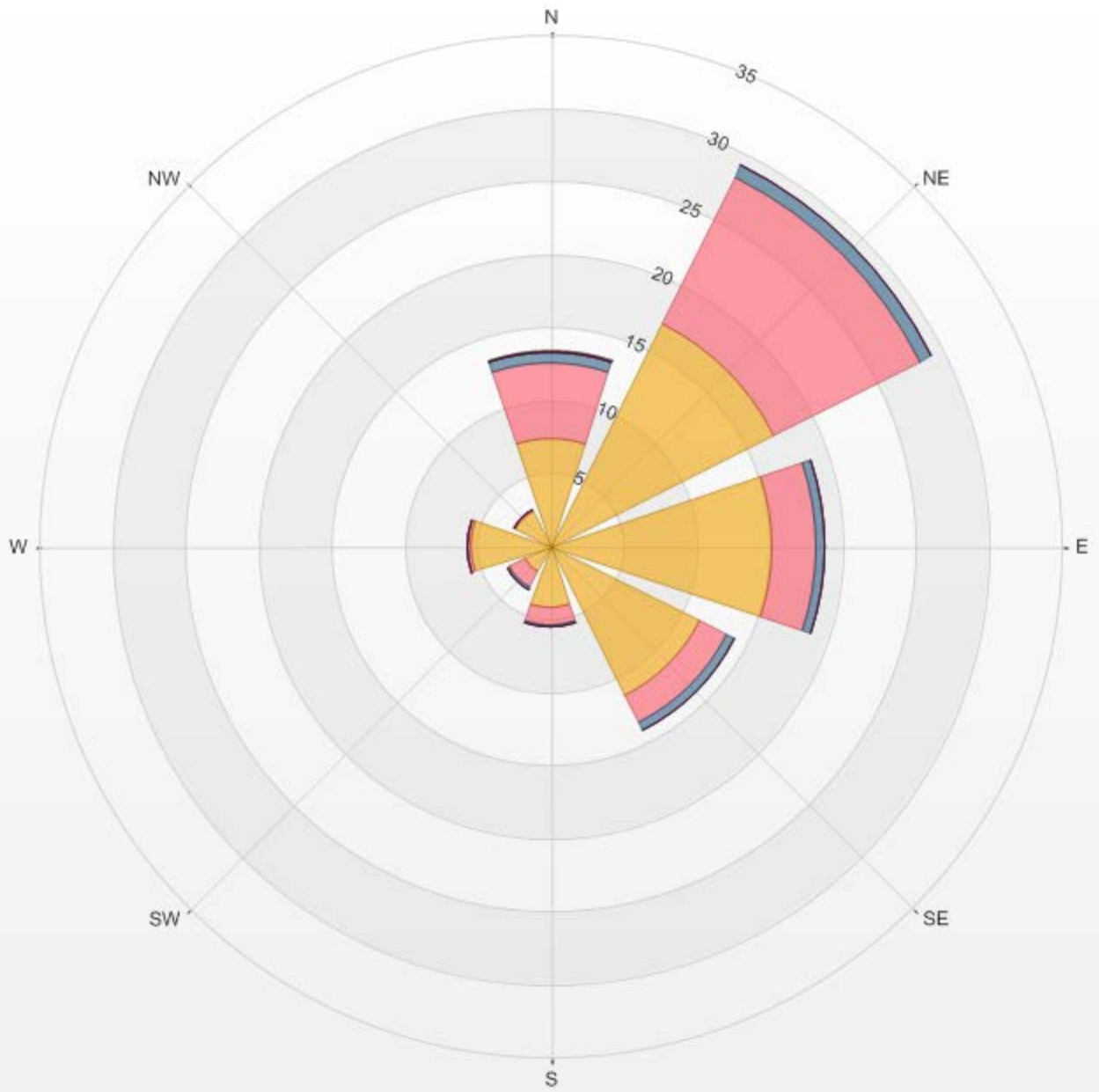
Calm: 6.96%

Calm Avg: 5.45 [ug/m3(L)]

Direction	0.0-7.0	7.0-14.0	14.0-21.1	21.1-28.1	28.1-35.1	>35.1	Total
N	7.4	5.1	0.8	0.0	0.0	0.2	13.5
NE	17.1	11.2	0.9	0.0	0.0	0.0	29.2
E	15.1	3.0	0.6	0.0	0.0	0.0	18.8
SE	11.5	2.0	0.6	0.0	0.0	0.0	14.1
S	4.2	1.2	0.2	0.0	0.0	0.0	5.6
SW	2.0	1.2	0.2	0.0	0.0	0.0	3.3
W	5.5	0.3	0.0	0.0	0.0	0.0	5.8
NW	2.7	0.2	0.0	0.0	0.0	0.0	2.9
Summary	65.5	24.2	3.2	0.0	0.0	0.2	93.1

% Icon Classes (ug/m3(L)) 66 0.0-7.0 24 7.0-14.0 3 14.0-21.1 0 21.1-28.1 0 28.1-35.1 0 >35.1

LICA Bonnyville Poll.: LICA Bonnyville-PM25[ug/m3(L)] 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 6.96% Calm Poll Avg: 5.45[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	10.7	8.4	7.4	3.5	0.9	2.4	0.5	1.1	5.5	5.3	6.9	8.4	2.6	2.0	3.7	6.2	8.3	10.7	7.7	5.6	10.9	9.4	9.6	9.1	0.5	10.9	5.6	24	
2	8.8	6.9	7.2	4.2	6.3	5.5	4.5	6.1	7.0	9.0	10.8	11.5	12.7	12.8	13.6	14.2	14.3	10.0	3.6	2.0	1.9	3.6	3.5	6.4	1.9	14.3	7.1	24	
3	6.5	4.5	4.9	3.8	6.4	4.9	6.2	5.5	6.3	7.8	7.0	5.8	6.7	9.1	7.4	3.2	14.4	8.1	2.3	5.0	3.1	4.8	4.7	0.9	0.9	14.4	4.1	24	
4	0.8	0.6	1.1	0.2	0.7	0.2	1.4	3.8	3.9	1.3	1.5	1.7	3.3	0.9	7.8	10.6	21.4	12.5	9.6	3.5	8.7	8.3	7.9	12.7	0.2	21.4	2.8	24	
5	8.9	6.8	7.2	6.4	5.8	5.1	5.3	7.0	11.9	12.4	15.3	23.3	24.2	24.4	26.0	23.0	21.0	17.6	12.7	14.3	17.1	23.3	21.5	27.5	5.1	27.5	14.0	24	
6	25.0	23.6	16.2	5.7	1.9	6.2	1.4	3.4	0.4	0.3	1.2	3.9	4.6	5.5	4.2	1.5	1.2	3.2	4.0	2.1	4.3	0.7	2.8	6.9	0.3	25.0	3.8	24	
7	6.0	5.6	5.1	6.5	5.1	10.7	12.3	11.5	12.4	10.3	8.0	5.0	6.6	6.0	10.3	13.2	14.4	11.6	13.4	13.0	13.5	10.8	9.9	10.2	5.0	14.4	8.5	24	
8	10.3	13.2	14.2	13.7	13.7	14.6	13.1	11.7	14.5	16.3	14.5	15.3	12.1	13.9	13.8	12.4	13.2	12.3	10.0	10.5	10.4	7.4	4.7	6.6	4.7	16.3	11.7	24	
9	7.6	9.2	8.3	8.3	8.2	7.7	8.0	7.7	7.8	8.5	7.3	5.9	2.9	4.6	5.0	3.0	5.7	5.8	5.5	8.4	10.8	9.9	9.3	10.0	2.9	10.8	5.9	24	
10	8.7	8.4	3.8	5.2	5.9	7.9	9.1	9.6	10.0	8.0	8.5	9.3	8.2	7.7	7.0	8.8	9.3	12.1	10.2	7.6	8.7	7.0	8.2	8.4	3.8	12.1	5.2	24	
11	8.0	7.1	4.6	6.3	7.5	8.4	8.0	9.0	10.6	11.8	9.8	10.2	10.9	8.4	6.9	6.6	7.0	5.6	4.1	4.8	6.6	7.7	7.0	6.7	4.1	11.8	7.1	24	
12	8.7	7.8	9.1	9.1	7.1	8.5	8.3	10.0	9.1	9.1	9.4	9.6	9.8	10.7	11.5	9.9	11.4	11.9	10.4	8.0	6.8	8.4	9.3	11.9	6.8	11.9	9.2	24	
13	13.6	12.7	13.1	13.5	13.8	16.6	17.7	19.3	17.1	18.0	21.1	21.8	20.3	19.8	18.8	18.9	18.0	13.7	15.4	17.9	11.9	15.3	14.4	17.2	11.9	21.8	16.5	24	
14	15.8	20.2	20.1	16.9	15.0	17.1	16.7	13.8	12.7	11.0	13.2	14.7	11.6	11.1	13.1	13.2	12.2	11.4	12.2	10.4	10.5	10.8	12.2	12.3	10.4	20.2	13.0	24	
15	11.5	11.5	10.3	10.8	10.3	10.1	9.9	11.0	10.8	11.9	10.9	10.6	7.9	7.3	6.3	7.7	7.6	8.4	7.6	4.1	3.6	1.5	3.7	5.8	1.5	11.9	8.1	24	
16	5.2	3.7	4.6	2.6	2.5	0.4	0.7	1.0	0.6	1.0	2.3	0.3	0.2	0.9	3.5	3.0	3.5	11.7	14.3	11.8	7.5	9.1	9.9	6.5	0.2	14.3	2.5	24	
17	3.6	5.6	3.8	4.8	4.2	2.3	4.3	3.4	4.2	3.3	6.5	5.5	8.0	8.9	8.7	8.4	7.1	6.1	6.2	5.0	5.9	7.3	7.1	8.7	2.3	8.9	4.7	24	
18	10.9	10.1	10.7	10.9	11.3	11.3	10.2	11.5	13.1	10.3	11.7	11.7	13.9	12.9	12.5	13.1	11.5	9.3	7.3	7.9	7.3	7.5	6.6	6.5	6.5	13.9	10.4	24	
19	6.0	5.2	4.6	3.4	3.7	3.7	5.8	5.8	4.0	2.3	2.5	2.7	2.3	3.7	0.4	3.1	6.6	8.8	7.2	4.7	3.9	4.6	2.5	1.8	0.4	8.8	2.2	24	
20	0.8	4.4	2.2	4.9	1.9	3.9	6.6	7.6	10.0	11.5	12.1	8.8	10.6	10.9	4.5	1.8	4.7	2.3	0.9	1.4	2.5	0.7	0.9	8.0	0.7	12.1	3.3	24	
21	12.0	13.3	12.8	9.9	10.9	11.8	10.1	10.0	8.4	9.3	7.8	6.2	3.7	3.3	5.3	2.1	3.2	1.0	3.6	7.0	8.5	8.7	11.2	11.6	1.0	13.3	6.5	24	
22	9.4	9.6	9.0	8.9	9.0	8.5	7.1	9.3	10.0	10.3	10.5	10.5	9.1	8.9	10.0	9.6	10.6	9.2	9.2	6.1	5.8	10.6	11.7	12.6	5.8	12.6	9.1	24	
23	12.5	12.4	13.3	13.3	11.5	10.7	12.7	12.4	10.7	11.2	12.3	12.2	14.6	17.8	15.9	15.4	17.1	15.3	13.8	13.8	11.8	10.6	8.9	8.8	8.8	8.8	17.8	12.8	24
24	9.2	9.0	9.5	10.0	9.1	11.5	10.5	10.9	11.5	10.8	13.0	13.2	11.8	10.5	9.2	9.6	8.6	9.6	8.1	8.5	7.6	6.9	7.5	7.4	6.9	13.2	9.3	24	
25	7.2	6.6	6.7	5.9	7.1	8.3	7.9	9.2	12.6	12.6	11.0	12.2	11.1	12.5	12.2	10.7	9.1	8.3	9.1	7.6	9.1	10.6	11.4	12.7	5.9	12.7	9.1	24	
26	11.3	10.1	9.7	11.6	11.1	7.2	7.8	8.2	10.9	10.3	11.6	11.4	11.3	12.5	11.6	12.0	11.9	9.8	6.7	5.0	5.9	6.3	6.9	6.4	5.0	12.5	8.8	24	
27	5.9	5.7	6.4	5.6	6.1	7.6	7.4	9.1	9.6	10.3	11.6	11.2	13.5	13.5	12.3	10.0	11.2	8.9	5.4	3.5	3.8	5.1	5.3	5.6	3.5	13.5	7.2	24	
28	0.9	0.3	0.1	0.6	0.9	0.5	1.5	2.6	1.4	2.8	2.0	5.8	6.1	5.6	6.3	6.4	5.1	3.7	0.9	3.3	3.2	2.2	0.3	2.1	0.1	6.4	1.3	24	
29	1.2	0.4	0.3	2.2	1.5	0.7	0.2	2.0	3.4	7.3	10.5	11.2	13.1	12.4	11.0	14.8	16.2	10.5	20.6	15.9	7.4	6.9	5.6	3.2	0.2	20.6	6.5	24	
30	6.4	7.2	3.4	3.9	5.2	5.2	3.7	3.7	5.8	5.6	3.5	1.1	2.0	1.1	3.0	7.5	8.7	8.6	7.0	6.1	4.0	4.2	5.4	7.2	1.1	8.7	1.9	24	
HOURLY MAX	25.0	23.6	20.1	16.9	15.0	17.1	17.7	19.3	17.1	18.0	21.1	23.3	24.2	24.4	26.0	23.0	21.4	17.6	20.6	17.9	17.1	23.3	21.5	27.5					
HOURLY AVG	3.8	4.6	4.7	4.7	4.5	5.0	5.2	5.1	4.6	4.7	4.7	4.5	4.1	3.7	4.2	4.0	4.1	4.8	4.2	3.8	3.5	3.7	3.8	4.4					

STATUS FLAG CODES

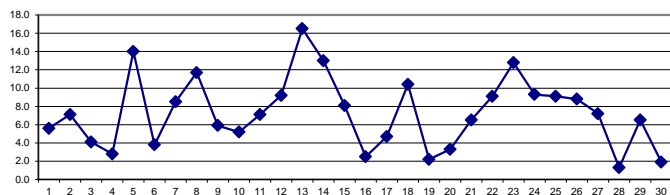
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	March 3, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

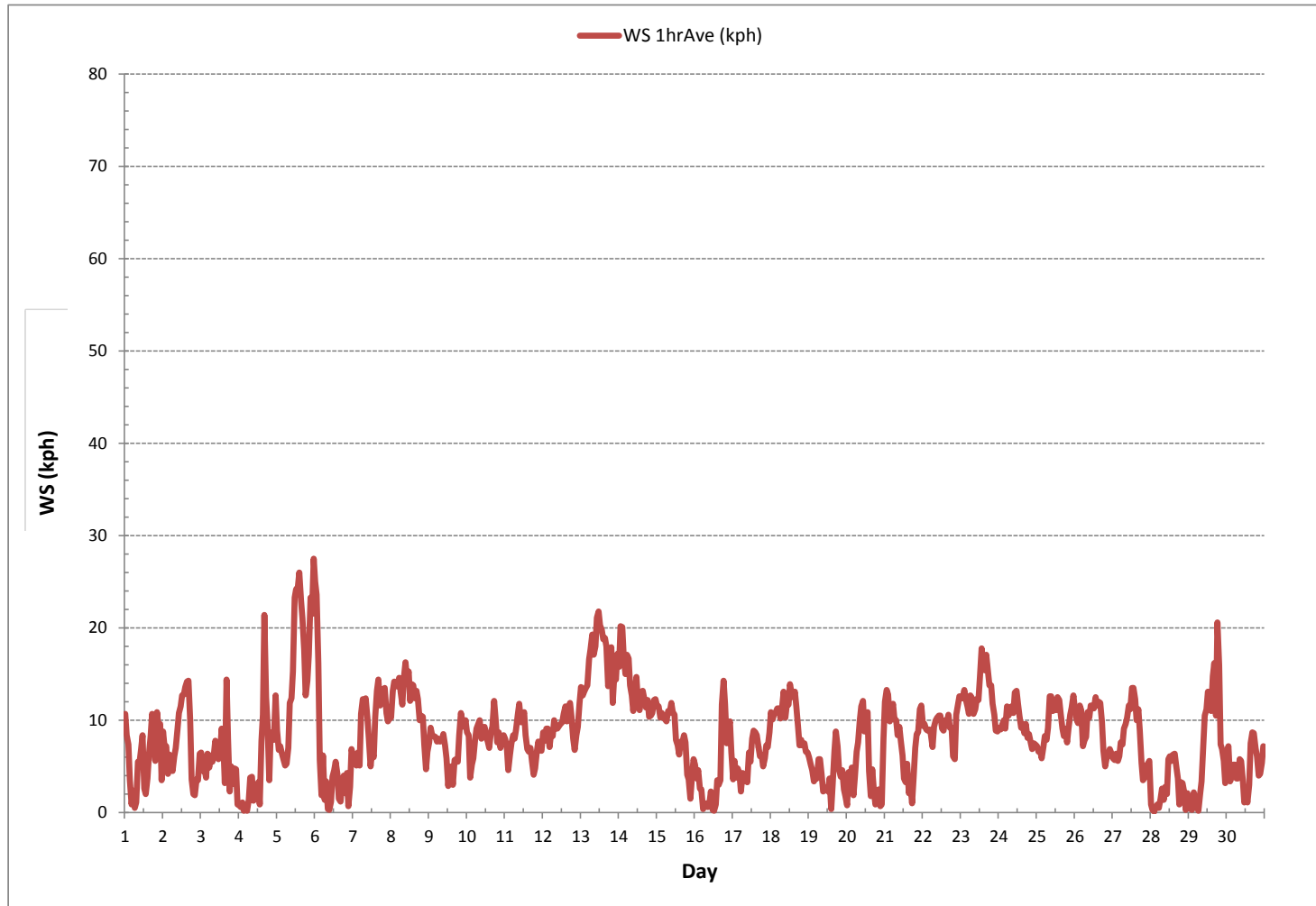
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	720
MINIMUM 1-HR AVERAGE	0.1 kph @ HOUR 2 ON DAY 28
MAXIMUM 1-HR AVERAGE:	27.5 kph @ HOUR 23 ON DAY 5
MAXIMUM 24-HR AVERAGE:	16.5 kph ON DAY 13
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	720 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	4.7
MONTHLY AVERAGE:	4.3 kph

24 HR AVERAGES April 2017



WIND SPEED Hourly Averages (WS kph)







LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville Continuous Monitoring Station - April 2017

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	20.0	11.8	11.6	11.1	8.5	6.6	6.9	5.9	9.7	9.1	16.6	19.5	10.5	11.8	21.8	19.3	14.4	18.7	14.0	13.6	34.9	31.2	19.0	19.2	5.9	34.9	15.2	24
2	19.2	16.3	14.9	11.2	13.0	12.8	12.0	14.0	20.8	20.9	23.9	23.7	29.3	29.3	31.4	33.0	35.4	26.0	13.6	12.4	9.8	13.0	8.6	16.0	8.6	35.4	19.2	24
3	14.2	11.6	12.3	10.8	12.4	12.9	12.8	14.3	14.8	17.9	15.6	16.9	18.9	31.8	25.4	29.7	30.8	19.6	14.2	16.2	9.3	11.3	13.3	5.4	5.4	31.8	16.4	24
4	4.7	4.4	7.1	2.4	5.8	2.5	6.7	10.1	8.2	6.1	10.4	12.9	8.2	6.6	18.7	35.7	37.2	27.7	25.3	19.7	23.1	17.9	25.7	28.4	2.4	37.2	14.8	24
5	28.1	14.9	15.0	14.5	13.7	11.7	11.9	17.4	21.7	24.3	37.1	39.2	41.4	42.3	46.0	43.1	39.0	33.8	26.8	30.0	37.5	39.0	44.5	47.2	11.7	47.2	30.0	24
6	38.3	38.6	32.4	18.4	11.0	14.9	8.1	11.9	5.3	P	6.5	14.8	14.2	15.0	11.4	5.8	11.4	9.4	9.1	8.4	14.3	18.8	15.0	16.1	5.3	38.6	15.2	23
7	20.2	12.5	15.8	13.2	13.3	25.3	28.3	26.9	24.5	25.5	23.3	17.2	15.7	17.3	25.7	29.5	34.0	26.1	32.5	27.7	35.6	28.2	24.6	27.9	12.5	35.6	23.8	24
8	24.1	31.1	31.2	33.4	34.0	30.8	27.3	26.8	29.6	31.4	29.2	33.5	31.2	32.9	28.8	29.2	33.5	27.3	26.9	27.6	23.7	18.5	10.8	17.4	10.8	34.0	27.9	24
9	21.7	22.7	17.2	18.6	22.4	16.9	17.4	17.3	18.3	19.6	19.2	17.2	17.5	19.4	16.4	16.0	16.3	15.1	12.0	19.4	18.4	17.6	21.7	21.1	12.0	22.7	18.3	24
10	19.9	18.2	10.1	11.9	13.5	19.9	19.2	18.0	17.5	16.8	15.7	20.0	17.9	17.4	22.2	19.2	18.2	28.4	21.7	17.3	17.6	15.5	17.1	16.9	10.1	28.4	17.9	24
11	16.1	14.7	9.5	11.9	16.6	16.4	19.5	19.6	24.3	22.4	22.4	21.3	21.8	19.5	14.9	20.1	15.7	14.2	11.3	10.4	13.9	14.3	15.4	18.2	9.5	24.3	16.9	24
12	20.0	16.6	18.7	18.8	17.2	20.8	19.2	24.5	19.4	21.2	21.0	21.0	23.8	26.2	26.1	25.5	27.5	26.6	24.3	17.1	17.2	23.1	21.8	24.2	16.6	27.5	21.7	24
13	32.6	28.8	28.2	29.1	31.6	36.7	37.1	43.7	38.9	40.1	49.8	47.0	43.8	46.6	40.8	47.6	41.0	34.6	33.5	43.4	35.1	40.5	35.5	39.8	28.2	49.8	38.6	24
14	35.3	45.0	45.9	38.9	33.7	41.1	34.3	35.4	30.3	37.8	26.9	29.5	29.4	26.1	31.5	36.6	35.0	30.5	28.6	25.1	23.1	21.9	26.3	29.9	21.9	45.9	32.4	24
15	24.6	24.8	22.0	27.1	21.8	29.5	26.1	26.6	27.9	29.2	23.9	26.9	19.6	15.6	13.5	20.1	19.0	18.1	18.5	9.6	8.8	5.7	9.3	16.7	5.7	29.5	20.2	24
16	11.8	8.2	9.0	8.2	8.1	5.9	2.4	2.7	2.7	8.6	9.2	3.5	4.6	5.6	10.9	8.7	11.4	18.5	22.2	19.7	15.5	15.7	20.0	12.3	2.4	22.2	10.2	24
17	10.1	10.2	15.6	14.0	10.3	7.9	9.7	9.0	13.0	10.2	11.8	11.0	16.7	17.0	18.3	16.2	14.8	14.8	14.5	10.5	13.7	18.9	18.0	21.1	7.9	21.1	13.6	24
18	23.9	24.0	25.5	24.4	26.6	28.4	24.7	28.6	26.8	22.4	22.4	21.9	26.6	25.6	25.5	25.7	23.7	22.4	18.5	17.6	15.8	15.2	15.4	14.3	14.3	28.6	22.7	24
19	13.2	12.1	10.2	8.3	8.3	9.1	11.1	11.3	9.7	6.5	6.7	10.2	7.9	7.3	5.7	10.5	13.1	14.5	12.9	9.0	8.3	9.9	7.8	7.4	5.7	14.5	9.6	24
20	5.8	9.8	9.6	13.0	14.6	11.3	12.9	14.1	19.2	22.6	22.2	19.9	19.5	22.3	10.9	10.4	9.4	8.2	4.3	4.0	5.6	3.0	5.9	26.1	3.0	26.1	12.7	24
21	25.6	28.5	29.2	20.6	25.7	26.4	24.0	23.1	19.4	18.8	17.6	16.2	12.9	11.5	8.7	11.3	8.7	11.1	11.4	18.5	20.4	20.2	25.3	26.7	8.7	29.2	19.2	24
22	24.9	25.8	22.5	18.8	18.4	20.6	18.9	20.4	19.5	22.0	21.3	21.5	21.8	20.6	24.9	21.1	23.8	21.9	18.6	13.0	17.1	26.7	25.3	27.3	13.0	27.3	21.5	24
23	27.2	32.0	33.2	29.9	24.4	24.6	30.2	25.9	23.5	25.8	26.7	27.9	33.9	37.3	37.0	37.1	37.1	33.7	28.8	27.6	25.7	25.5	20.1	23.5	20.1	37.3	29.1	24
24	20.1	20.8	25.3	24.1	23.1	23.0	26.8	24.5	25.5	26.0	27.1	26.3	24.2	24.3	24.9	19.7	17.2	20.3	16.9	18.8	15.7	17.2	17.4	14.6	14.6	27.1	21.8	24
25	14.2	16.5	14.9	11.8	14.5	15.1	16.8	21.0	24.4	23.0	20.9	23.3	21.7	21.6	20.2	20.3	19.8	18.9	17.2	16.2	19.4	18.8	23.9	22.7	11.8	24.4	19.0	24
26	21.3	21.9	19.2	19.9	23.6	15.0	18.4	19.0	20.0	23.7	23.9	23.5	24.2	25.4	23.5	28.6	25.4	23.2	21.2	13.0	12.9	15.0	16.2	16.0	12.9	28.6	20.6	24
27	15.9	13.8	13.2	13.8	12.8	15.3	16.9	17.7	19.0	20.4	25.4	31.5	36.0	32.0	25.4	23.7	24.0	21.8	14.1	9.4	8.8	10.5	8.7	10.0	8.7	36.0	18.3	24
28	5.7	4.9	2.3	2.6	2.8	2.5	6.6	7.1	13.1	10.5	7.0	9.9	14.1	13.2	12.0	12.5	11.2	9.3	6.8	9.4	8.1	7.5	6.5	7.4	2.3	14.1	8.0	24
29	7.3	6.5	7.1	6.6	7.8	6.1	6.9	7.2	8.2	15.9	21.9	22.0	25.4	23.0	22.8	29.5	26.3	29.1	39.6	33.3	15.1	12.3	11.0	9.2	6.1	39.6	16.7	24
30	13.4	15.3	10.3	11.4	13.7	13.3	10.5	9.7	14.9	15.1	14.9	12.1	17.7	13.3	14.3	21.7	23.0	17.7	15.5	17.7	14.6	13.6	15.0	17.9	9.7	23.0	14.9	24
HOURLY MAX	38.3	45.0	45.9	38.9	34.0	41.1	37.1	43.7	38.9	40.1	49.8	47.0	43.8	46.6	46.0	47.6	41.0	34.6	39.6	43.4	37.5	40.5	44.5	47.2				
HOURLY AVG	19.3	18.7	18.0	16.6	16.8	17.4	17.5	18.5	19.0	20.5	20.7	21.4	21.7	21.9	22.0	23.6	23.2	21.4	19.2	17.9	18.0	18.2	18.2	20.0				

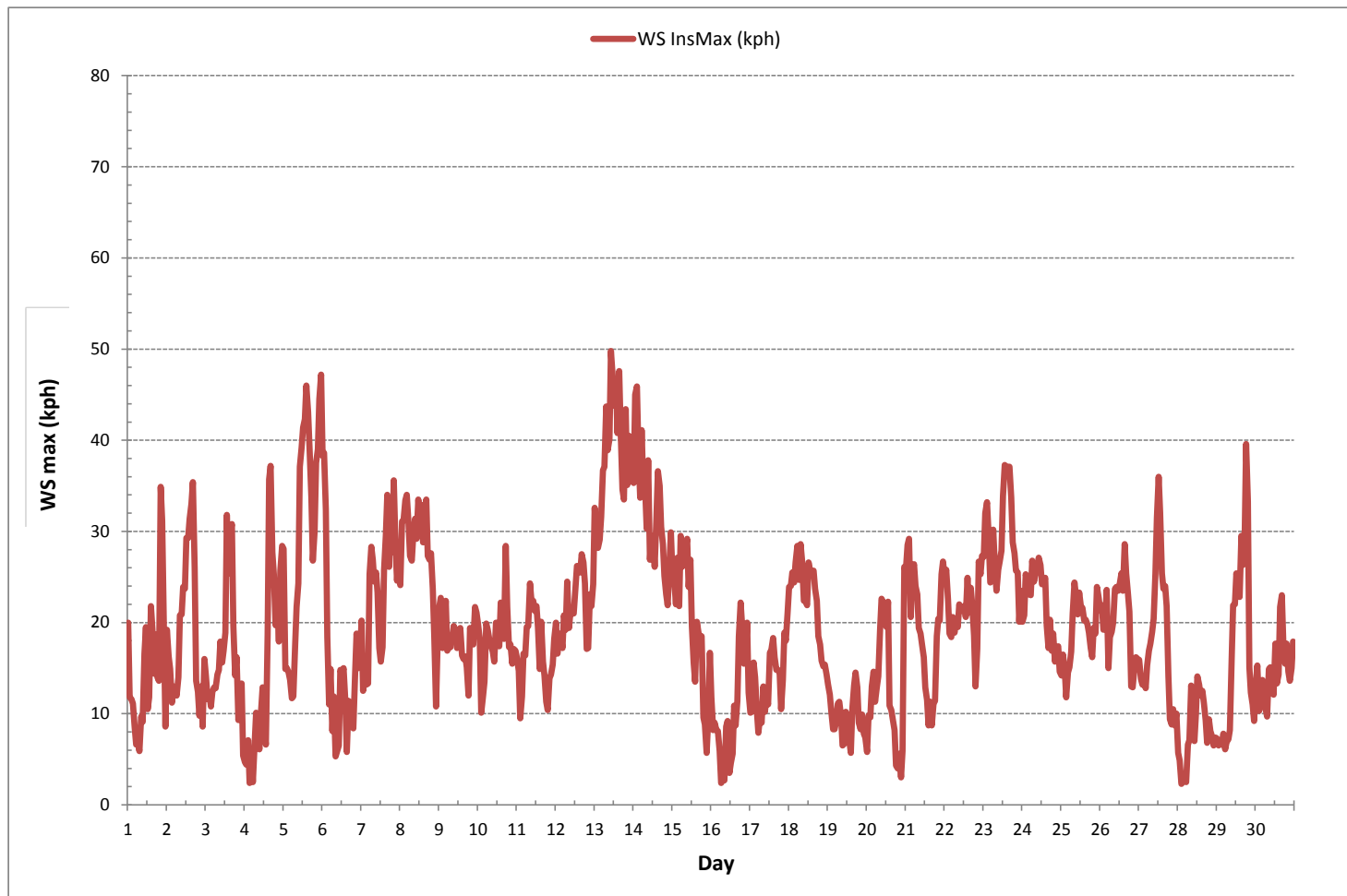
STATUS FLAG CODES

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

MONTHLY SUMMARY

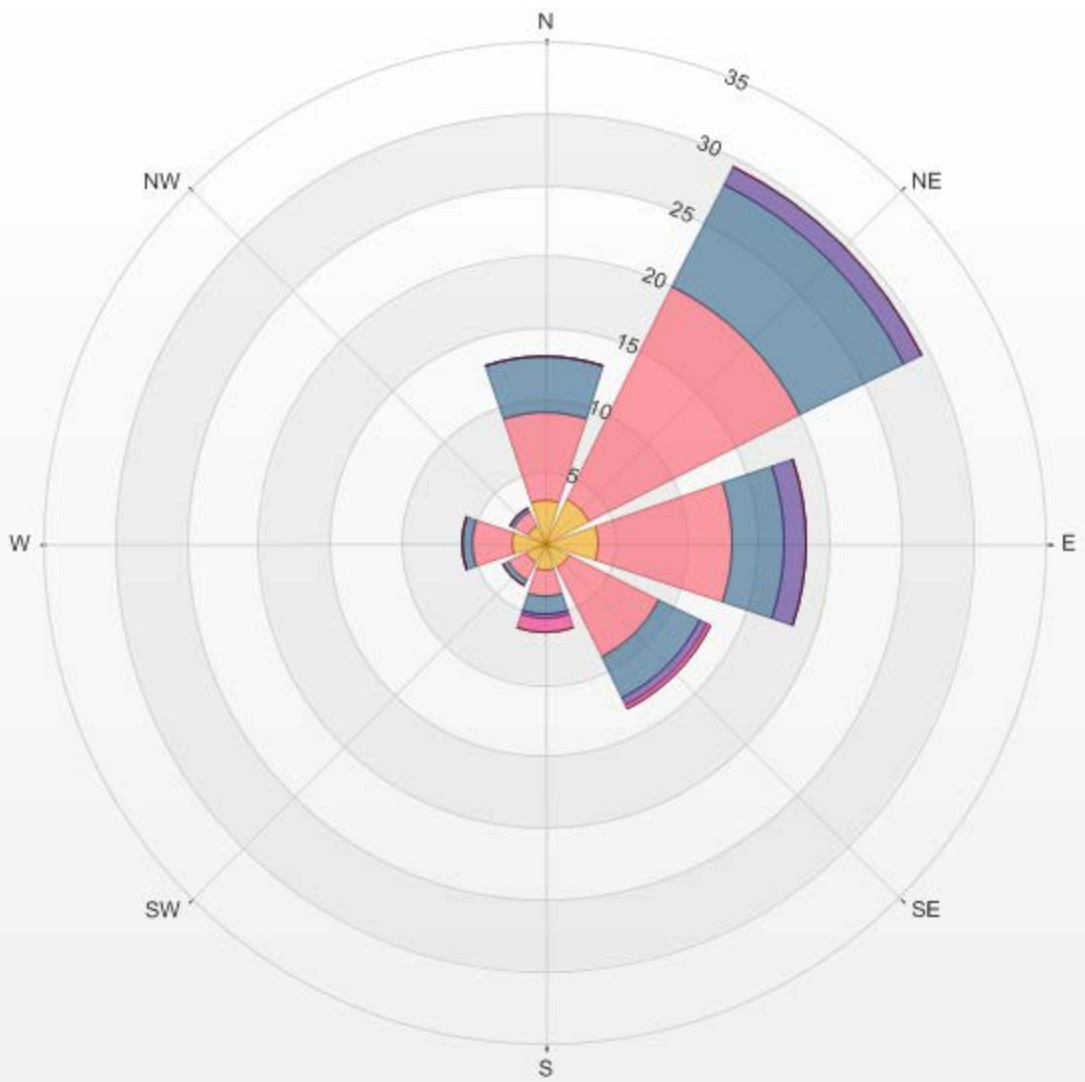
MAXIMUM INSTANTANEOUS VALUE:	49.8	kph	@ HOUR	10	ON DAY	13	
OPERATIONAL TIME:						719	hrs

WIND SPEED Instantaneous Maximum (WS kph)



% Icon	Classes (kph)	19		1.8-5.5	46		5.5-11.0	22		11.0-16.6	4		16.6-22.1	1		22.1-27.6	0		>27.6
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LICA Bonnyville 2017/04/01 00:00 - 2017/04/30 23:00 Calm: 7.92% Calm Wind Avg Speed: 0.86(kph)



Wind: LICA Bonnyville  
 Monitor: WSP [kph]  
 Monthly: 17/04  
 Type: WindRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 7.92%

Calm Avg: 0.00 [kph]

Direction	1.8-5.5	5.5-11.0	11.0-16.6	16.6-22.1	22.1-27.6	>27.6	Total
<b>N</b>	3.1	6.1	3.9	0.0	0.0	0.0	13.1
<b>NE</b>	3.5	16.5	8.1	1.4	0.0	0.0	29.5
<b>E</b>	3.8	9.4	3.6	1.5	0.0	0.0	18.3
<b>SE</b>	1.9	6.9	3.3	0.6	0.3	0.0	13.1
<b>S</b>	1.9	1.8	1.3	0.3	1.0	0.0	6.3
<b>SW</b>	1.5	1.4	0.4	0.0	0.0	0.0	3.3
<b>W</b>	2.4	2.8	0.7	0.0	0.0	0.0	5.8
<b>NW</b>	1.4	1.1	0.3	0.0	0.0	0.0	2.8
<b>Summary</b>	19.4	46.1	21.5	3.8	1.3	0.0	92.1

***WIND DIRECTION***



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville Continuous Monitoring Station - April 2017

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.
DAY																										
1	SW	SW	SW	W	W	SSW	WNW	SW	SW	SW	SW	SSW	SW	SSW	WSW	WNW	SW	SW	SW	WSW	WSW	WNW	WSW	WSW	WSW	24
2	W	W	W	W	W	W	W	W	WNW	WNW	W	WSW	W	W	W	WNW	NW	N	NNW	S	W	W	W	W	W	24
3	W	WNW	W	WSW	W	WSW	W	W	WNW	NW	NW	WNW	WNW	W	N	ENE	NNW	SE	NW	NNW	N	NW	WNW	NNW	WNW	24
4	NNW	NNW	WNW	NNW	NNW	NNE	W	WSW	SSW	SSE	E	E	SSW	SSW	SSE	S	SSW	SSE	SSE	NNW	N	E	ESE	ESE	SSE	24
5	SE	E	ENE	ENE	E	ENE	ENE	ESE	SE	SE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SE	SE	SSE	SSE	SSE	SSE	SE	24
6	SSE	SSE	SSE	SSE	ESE	SE	E	E	WSW	SSE	SW	SSW	SW	S	SW	ESE	ESE	ENE	NNE	NNE	WNW	ENE	NE	SSE	24	
7	N	NNE	NNE	N	NW	NW	NNW	NNW	N	N	NNE	ENE	ENE	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	24
8	NNE	NNE	NNE	N	N	N	N	NNW	NNW	N	N	N	N	NNW	NNW	NNW	N	NNE	NNE	NNE	NNE	NNE	NNE	NNE	N	24
9	NE	ENE	ENE	ENE	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	ESE	ESE	E	E	SE	SSE	SE	SE	SE	E	24
10	SE	SE	E	ESE	ESE	ESE	ESE	ESE	SE	SE	ESE	SE	E	ESE	SE	ENE	NE	NE	NNE	N	N	NNW	NNW	E	24	
11	N	N	NNW	NNW	NNW	NNW	N	N	N	N	N	NNE	N	NNE	NNE	NNE	NE	E	NE	NNE	NNE	NNE	NNE	NNE	NNE	24
12	NE	NNE	NE	NE	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	NE	ENE	NE	NE	NE	ENE	ENE	ENE	ENE	ENE	NE	24
13	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	NE	NE	ENE	NE	ENE	ENE	ENE	24
14	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	NNE	N	N	NNE	NE	24
15	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NE	NNE	NE	NE	NE	NE	NE	NE	NE	NNE	NNW	N	N	NNE	NNE	24
16	NE	NNE	NNE	NE	E	ENE	NNE	NE	NE	NE	ENE	NE	NE	SSE	SSW	SSW	SSW	S	SSE	SSE	SSE	SE	ESE	SSE	SSE	24
17	ESE	E	ESE	SE	ENE	ENE	ENE	E	SSE	N	N	N	NNE	N	NE	NE	NE	ENE	NE	NE	NE	NE	NE	NE	NE	24
18	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	NE	NE	NE	NE	NE	NE	24
19	NE	NE	NNE	NE	NNE	N	N	NNE	NE	NNE	NNW	NNW	NNW	S	SE	ESE	SE	ESE	ESE	ESE	SE	SE	SE	SE	ENE	24
20	ENE	SE	NE	ESE	ESE	ENE	ESE	ESE	SE	SSE	SSE	SSE	SSE	SSE	ESE	ENE	NNE	N	NNE	N	N	N	N	N	SE	24
21	N	NNE	NNE	NNE	NNE	NNE	NE	NE	NNE	NNE	NNE	NE	NE	SSW	S	ESE	S	S	ENE	ENE	ENE	ENE	ENE	ENE	NE	24
22	NE	ENE	ENE	ENE	ENE	ENE	ENE	E	ENE	NE	NE	NE	NE	NE	NE	ENE	ENE	E	E	E	E	ENE	NE	ENE	ENE	24
23	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
24	ENE	E	E	E	E	ENE	ENE	E	E	E	ENE	ENE	ENE	ENE	ENE	ESE	ESE	ESE	ESE	SE	ESE	E	ESE	E	E	24
25	E	E	E	E	E	E	ESE	ESE	SE	SE	SE	SE	SE	SSE	SSE	SE	ESE	SE	SE	SE	SE	SSE	SE	SE	SE	24
26	SSE	SE	SE	ESE	ESE	ESE	E	E	E	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	ENE	ENE	NE	ENE	ENE	ESE	24
27	ENE	ENE	ENE	ENE	ENE	NE	NE	ENE	NE	NE	ENE	ENE	E	E	ENE	NE	ESE	E	ENE	NNE	N	N	N	N	ENE	24
28	N	NE	N	NNE	N	NNW	NW	NNW	WNW	N	S	SSE	S	S	S	S	SSE	S	SW	WNW	WNW	WNW	W	W	SSW	24
29	W	W	NNW	WSW	WSW	W	WSW	SSE	SSE	S	S	S	SSW	SSE	SSE	SSW	SSW	SW	SSW	S	SSE	SE	SE	ESE	S	24
30	SE	SE	ESE	E	E	ENE	ENE	NE	ENE	ENE	ESE	S	N	WSW	SW	SW	NW	N	N	N	N	NNW	NW	NW	NNE	24

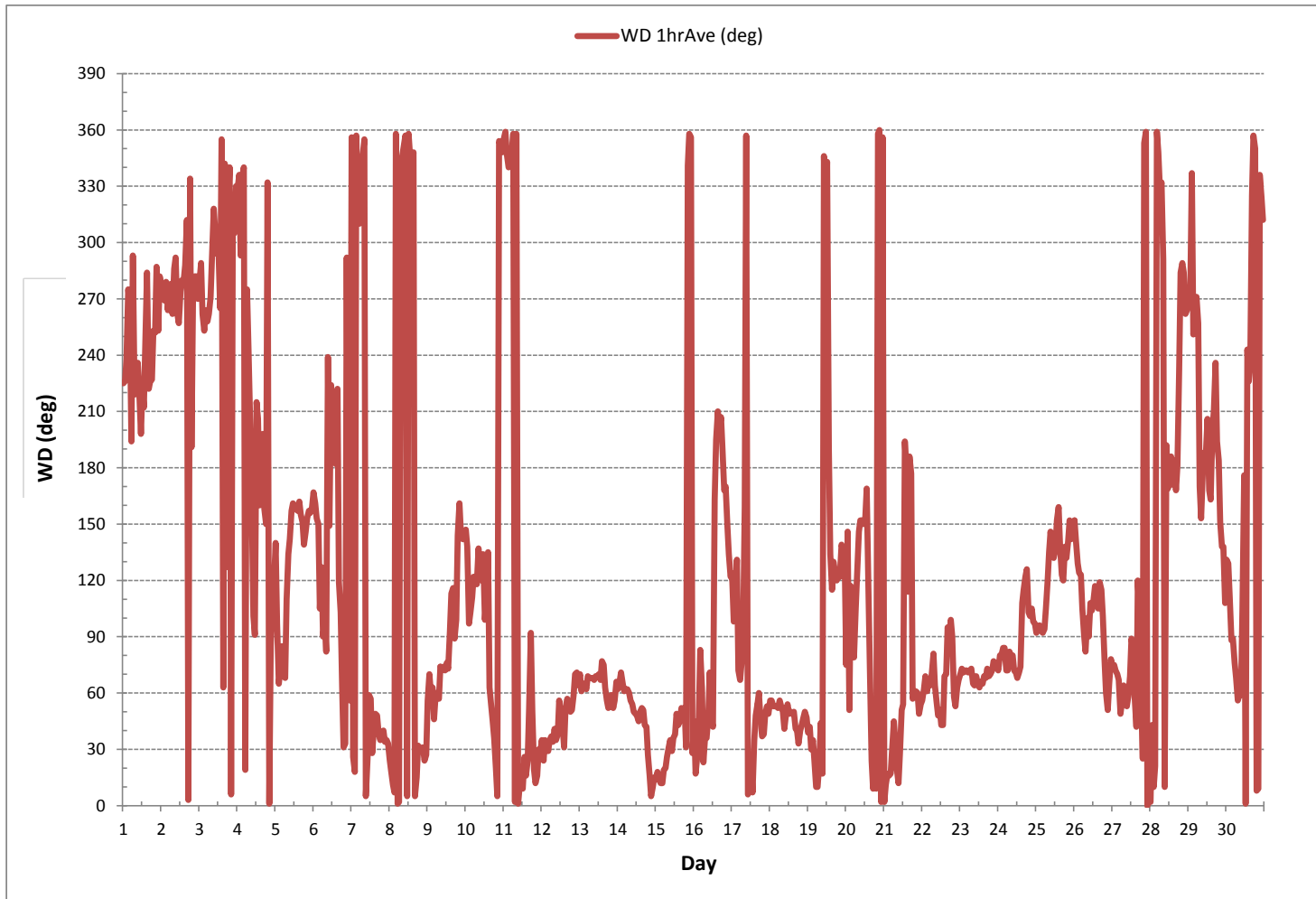
STATUS FLAG CODES

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

LAST CALIBRATION:	March 3, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	720	hrs
STANDARD DEVIATION:	100		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	68	(ENE)

WIND DIRECTION Hourly Averages (WD)



***STANDARD DEVIATION WIND DIRECTION***





**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**  
**Bonnyville Continuous Monitoring Station - April 2017**

**STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	RDGS.	
DAY																										
1	8	7	12	18	39	28	23	42	22	18	15	24	41	44	37	20	18	10	12	17	14	27	15	16	24	
2	16	17	17	18	16	17	20	21	20	19	17	20	20	20	19	18	20	14	35	47	27	21	16	15	24	
3	18	19	17	20	15	18	16	22	20	18	22	31	27	23	19	42	15	41	32	14	19	13	15	10	24	
4	12	24	19	10	30	25	26	31	36	75	43	64	51	68	44	16	10	12	23	29	16	16	23	14	24	
5	30	20	16	18	17	16	13	19	14	15	14	9	11	11	11	12	12	13	13	12	9	10	9	24		
6	8	9	13	43	56	17	21	29	42	65	62	55	50	35	40	46	39	25	15	10	37	34	40	25	24	
7	22	14	25	14	22	16	15	15	16	20	25	34	23	23	21	17	17	19	20	18	19	20	18	18	24	
8	18	18	18	17	17	15	16	15	15	16	17	20	22	19	19	19	18	19	19	19	19	17	15	14	17	24
9	15	18	17	18	17	18	17	20	22	26	26	34	59	52	43	65	37	26	24	13	9	12	15	13	24	
10	15	15	29	18	21	16	15	16	16	17	17	18	20	27	28	20	17	17	18	16	13	13	13	13	24	
11	13	12	10	11	14	13	13	14	14	15	18	18	17	19	16	18	21	25	21	13	14	16	16	17	24	
12	17	16	17	16	16	17	17	18	17	19	18	19	22	21	22	23	20	18	17	16	19	17	18	16	24	
13	17	18	18	18	18	16	18	17	17	18	17	18	19	18	19	18	18	21	17	17	21	17	19	18	24	
14	20	18	17	17	19	18	17	16	17	19	16	15	18	18	17	19	20	18	18	19	18	15	17	19	24	
15	17	17	17	16	16	18	18	18	19	19	19	19	18	18	17	18	17	16	16	13	14	16	15	15	24	
16	14	12	11	17	22	30	18	10	17	38	51	34	43	56	59	50	45	8	7	7	9	10	10	12	24	
17	24	16	30	23	20	19	18	24	30	18	15	17	18	15	17	15	16	17	15	15	14	16	17	17	24	
18	17	18	18	17	17	17	18	17	15	17	16	17	14	16	16	15	16	17	18	16	14	14	15	15	24	
19	14	14	13	12	12	10	12	14	16	14	16	32	49	43	53	37	22	12	13	17	20	18	36	32	24	
20	13	21	43	41	38	21	14	15	14	13	13	18	14	13	23	52	14	12	7	5	7	6	10	12	24	
21	15	17	19	17	18	18	16	19	18	18	23	23	29	24	19	57	57	69	43	17	17	18	16	17	24	
22	17	18	17	17	16	17	20	20	17	18	18	17	20	22	21	23	21	22	17	17	17	18	17	16	24	
23	17	19	17	17	18	17	18	17	19	19	19	19	18	18	18	19	17	18	17	16	18	19	19	20	24	
24	18	20	21	21	20	16	19	21	20	21	18	17	18	20	21	19	18	15	16	16	15	19	15	15	24	
25	15	16	14	15	14	14	17	17	15	15	17	16	18	14	13	15	18	17	14	15	13	11	14	13	24	
26	12	14	13	11	13	16	17	18	17	21	19	18	19	17	18	17	15	17	19	20	17	17	16	20	24	
27	20	21	17	18	14	14	16	16	16	16	18	19	23	20	17	19	21	18	20	13	10	10	9	9	24	
28	8	15	2	11	17	14	19	17	47	33	72	12	19	40	17	22	28	37	37	25	19	19	24	30	24	
29	15	21	44	31	30	53	46	58	37	23	16	16	14	13	12	10	8	18	16	13	12	13	17	23	24	
30	15	14	25	21	17	17	20	18	20	25	49	65	50	41	38	43	24	16	15	16	16	20	16	13	24	

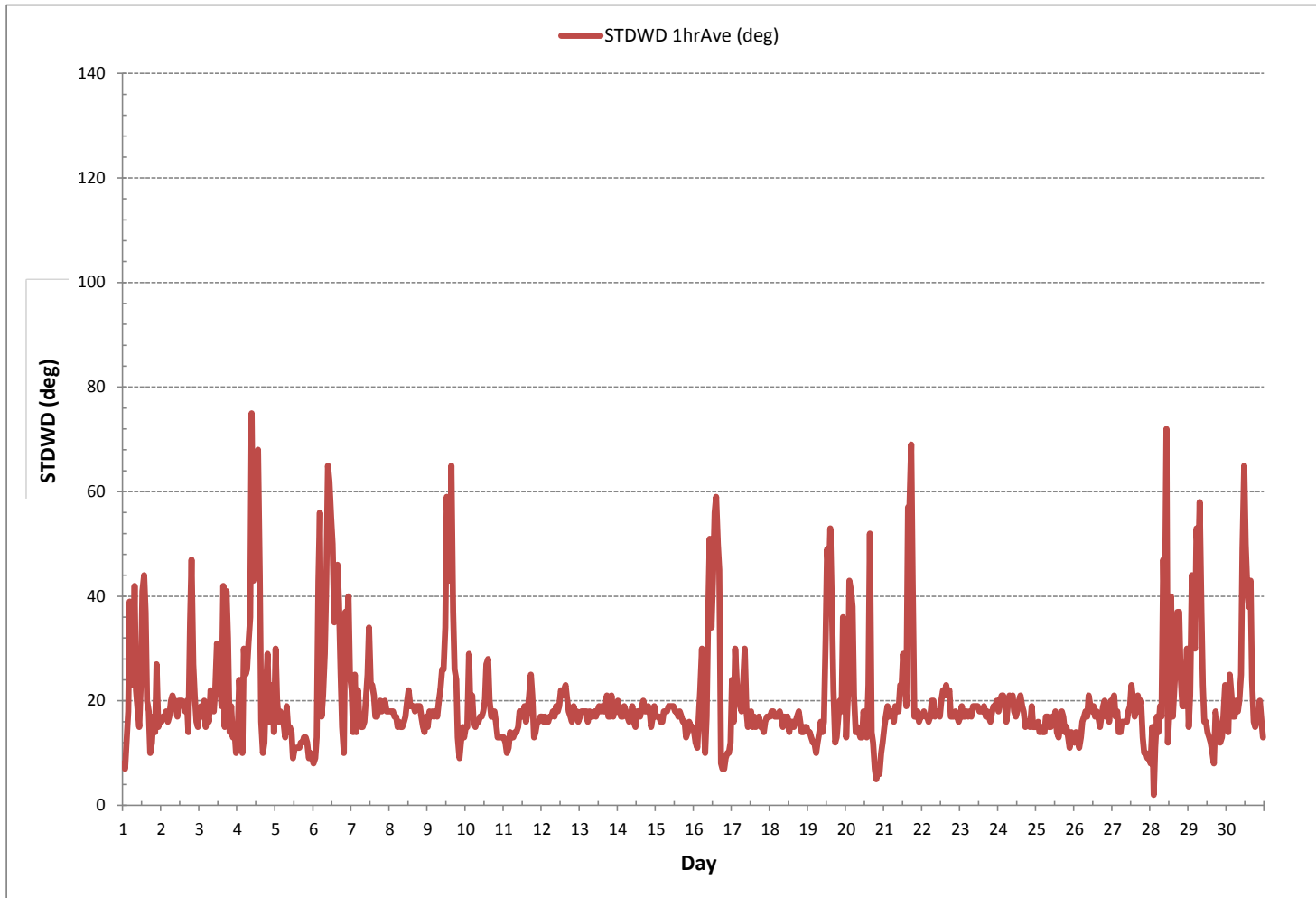
**STATUS FLAG CODES**

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

LAST CALIBRATION: March 3, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 720 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



***APPENDIX II***  
***NON-CONTINUOUS MONITORING DATA RESULTS***

## ***VOC RESULTS***

Sample ID: 17040067-001

Customer ID: LICA

Cust Samp ID: LICAVOC/Bonnyville/April 01, 2017

Maxxam Analytics



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

Client: LICA Sampler S/N: 6200  
 Location: Bonnyville - AER Canister ID: 2653  
 Station ID: LICA 37 Installation Date/Time (mst): Mar 27, 2017 @ 11:34  
 Sample ID: LICA/VOC/Bonnyville/April 01, 2017 Removal Date/Time (mst): April 05, 2017 @ 13:03

Date and Time Information

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

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.7</u>	<u>+19.2</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>27.5</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst  
 Final leak check deployment vacuum (in. Hg) = - @ - mst  
 Total leak rate = - psi over - minutes  
 Timer reset to zero prior to sampling? YES (yes/no)  
 Date of last flow calibration: Jan 27, 2017 (due every 3 months)  
 Last date of sample line & fitting replacement: April 05, 2017 (due every 6 months)

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

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Apr 05, 2017

## Volatile Organics Data Results

Date: April 1, 2017  
Canister ID: 2653

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.05
1-Hexene	< 0.02
1-Pentene	0.01
2,2,4-Trimethylpentane	0.02
2,2-Dimethylbutane	0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	0.01
2-Methylhexane	0.02
2-Methylpentane	0.12
3-Methylheptane	< 0.02
3-Methylhexane	0.03
3-Methylpentane	0.05
Acetone	2.1
Acrolein	< 0.3
Benzene	0.13
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.02
Carbon disulfide	0.36
Carbon tetrachloride	0.13
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.59
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.04
Cyclopentane	0.02
Dibromochloromethane	< 0.01
Ethanol	0.9
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.29
Freon-113	0.13

## Volatile Organics Data Results

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Date: April 1, 2017  
Canister ID: 2653

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.56
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.36
Isopentane	0.28
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.06
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.05
Methylcyclopentane	0.05
Methylene chloride	< 0.3
n-Butane	0.71
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.04
n-Hexane	0.07
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.2
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.02
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.09
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Customer ID: LICA  
 Cust Samp ID: LICA/VOC/Bonnyville/Apr 7, 2017

Maxxam Analytics

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

Client: LICA Sampler S/N: 6200  
 Location: Bonnyville - AER Canister ID: 2660  
 Station ID: LICA 37 Installation Date/Time (mst): Apr 05, 2017 @ 13:03  
 Sample ID: LICA/VOC/Bonnyville/Apr 7, 2017 Removal Date/Time (mst): Apr 10, 2017 @ 13:53

Date and Time Information

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

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.7</u>	<u>+19.5</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>27.5</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = -27.7 @ Apr 5/17 - 13:03 mst  
 Final leak check deployment vacuum (in. Hg) = -27.7 @ Apr 6/17 - 13:41 mst  
 Total leak rate = 0.0 psi over 24 hours 38 minutes  
 Timer reset to zero prior to sampling? YES (yes/no)  
 Date of last flow calibration: Jan 27, 2017 (due every 3 months)  
 Last date of sample line & fitting replacement: April 05, 2017 (due every 6 months)

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

Comments: Leak check conducted on April 06, 2017.  
No leaks detected.

Deployment Technician Signature: Alex Yakupov  
 Collection Technician Signature: Alex Yakupov Date: Apr 10, 2017



## Volatile Organics Data Results

Date: April 7, 2017  
Canister ID: 2660

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	< 0.02
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.02
2,2-Dimethylbutane	0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.03
2,3-Dimethylpentane	0.02
2,4-Dimethylpentane	0.01
2-Methylheptane	0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.06
3-Methylheptane	< 0.02
3-Methylhexane	0.03
3-Methylpentane	0.04
Acetone	4.1
Acrolein	< 0.3
Benzene	0.1
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	< 0.02
Chloromethane	0.6
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.06
Cyclopentane	0.03
Dibromochloromethane	< 0.01
Ethanol	2.3
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.22
Freon-113	0.09

## Volatile Organics Data Results

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Date: April 7, 2017  
Canister ID: 2660

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.42
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.93
Isopentane	0.46
Isoprene	< 0.01
Isopropyl alcohol	0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.05
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	0.5
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.09
Methylcyclopentane	0.07
Methylene chloride	< 0.3
n-Butane	0.78
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.03
n-Hexane	0.07
n-Nonane	0.01
n-Octane	< 0.02
n-Pentane	0.3
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.02
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.11
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 17040201-001

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/Apr 13, 2017



Maxxam Analytics

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

Client: LICA Sampler S/N: 6200  
 Location: Bonnyville - AER Canister ID: 14988  
 Station ID: LICA 37 Installation Date/Time (mst): Apr 10, 2017 @ 13:53  
 Sample ID: LICA/VOC/Bonnyville/Apr 13, 2017 Removal Date/Time (mst): Apr 18, 2017 @ 17:39

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Apr 13, 2017</u>	<u>00:00</u>	<u>00:00</u> <u>Apr 14, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-28.0</u>	<u>+18.5</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>27.5</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst  
 Final leak check deployment vacuum (in. Hg) = - @ - mst  
 Total leak rate = - psi over - minutes  
 Timer reset to zero prior to sampling? YES (yes/no)  
 Date of last flow calibration: Apr 6, 2017 (due every 3 months)  
 Last date of sample line & fitting replacement: April 5, 2017 (due every 6 months)

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

Comments: Leak check conducted on April 06, 2017. No leaks detected.

Deployment Technician Signature: Alex Yakupov  
 Collection Technician Signature: Alex Yakupov Date: Apr 18, 2017

## Volatile Organics Data Results

Date: April 13, 2017  
Canister ID: 14988

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	< 0.02
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.03
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.03
2,3-Dimethylpentane	0.03
2,4-Dimethylpentane	0.01
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.11
3-Methylheptane	< 0.02
3-Methylhexane	0.02
3-Methylpentane	0.12
Acetone	3.0
Acrolein	< 0.3
Benzene	0.06
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.02
Carbon disulfide	0.04
Carbon tetrachloride	0.1
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.64
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	0.01
Dibromochloromethane	< 0.01
Ethanol	1.5
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.26
Freon-113	0.1

## Volatile Organics Data Results

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Date: April 13, 2017  
Canister ID: 14988

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.47
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.39
Isopentane	0.38
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	< 0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.03
Methylcyclopentane	0.09
Methylene chloride	< 0.3
n-Butane	0.99
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.01
n-Hexane	0.23
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.2
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	< 0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.14
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/Apr 19, 2017

Maxxam Analytics

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

Client: LICA Sampler S/N: 6200  
 Location: Bonnyville - AER Canister ID: 6108  
 Station ID: LICA 37 Installation Date/Time (mst): Apr 18, 2017 @ 17:39  
 Sample ID: LICA/VOC/Bonnyville/Apr 19, 2017 Removal Date/Time (mst): Apr 24, 2017 @ 14:27

Date and Time Information

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

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.7</u>	<u>+19.0</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>27.5</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst  
 Final leak check deployment vacuum (in. Hg) = - @ - mst  
 Total leak rate = - psi over - minutes  
 Timer reset to zero prior to sampling? YES (yes/no)  
 Date of last flow calibration: Apr 06, 2017 (due every 3 months)  
 Last date of sample line & fitting replacement: Apr 05, 2017 (due every 6 months)

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

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Apr 24, 2017



## Volatile Organics Data Results

Date: April 19, 2017  
Canister ID: 6108

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.04
1-Hexene	< 0.02
1-Pentene	0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.04
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	0.04
2-Methylpentane	< 0.01
3-Methylheptane	< 0.02
3-Methylhexane	0.03
3-Methylpentane	0.02
Acetone	2.7
Acrolein	< 0.3
Benzene	0.1
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	< 0.01
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	< 0.02
Chloromethane	0.55
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.56
Cyclopentane	0.02
Dibromochloromethane	< 0.01
Ethanol	0.9
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.26
Freon-113	0.09

## Volatile Organics Data Results

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Date: April 19, 2017  
Canister ID: 6108

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.43
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.39
Isopentane	0.33
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	< 0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.03
Methylcyclopentane	0.03
Methylene chloride	< 0.3
n-Butane	0.6
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.02
n-Hexane	0.03
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.05
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02



**Maxxam Analytics**

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

Client: LICA Sampler S/N: 6200  
 Location: Bonnyville - AER Canister ID: 23715  
 Station ID: LICA 37 Installation Date/Time (mst): Apr 24, 2017 @ 14:27  
 Sample ID: LICA/VOC/Bonnyville/Apr 25, 2017 Removal Date/Time (mst): Apr 26, 2017 @ 16:22

**Date and Time Information**

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

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.1</u>	<u>+19.5</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>27.5</u>

**Deployment/Collection and Maintenance Checklist**

Initial leak check deployment vacuum (in. Hg) = - @ - mst  
 Final leak check deployment vacuum (in. Hg) = - @ - mst  
 Total leak rate = - psi over - minutes  
 Timer reset to zero prior to sampling? YES (yes/no)  
 Date of last flow calibration: Apr 06, 2017 (due every 3 months)  
 Last date of sample line & fitting replacement: Apr 05, 2017 (due every 6 months)

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

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov

Date: Apr 26, 2017

**Sample ID: 17040271-001**

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/Apr 25, 2017



## Volatile Organics Data Results

Date: April 25, 2017  
Canister ID: 23715

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	< 0.02
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.04
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	0.04
2-Methylpentane	< 0.01
3-Methylheptane	< 0.02
3-Methylhexane	0.02
3-Methylpentane	0.02
Acetone	1.4
Acrolein	< 0.3
Benzene	0.07
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	< 0.01
Carbon tetrachloride	0.07
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	< 0.02
Chloromethane	0.48
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.37
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	0.8
Ethyl acetate	< 0.4
Ethylbenzene	0.03
Freon-11	0.21
Freon-113	0.07

## Volatile Organics Data Results

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Date: April 25, 2017  
Canister ID: 23715

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.37
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.08
Isopentane	0.11
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.05
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.03
Methylcyclopentane	0.03
Methylene chloride	< 0.3
n-Butane	0.12
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.02
n-Hexane	0.02
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.02
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.1
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

## ***PAH RESULTS***

Sample ID: 17040067-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/April 01, 2017



### TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-08</u>
Location:	<u>Bonnyville -AER</u>	Motor S/N:	<u>1139/100-1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Mar 27, 2017/11:39</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Apr 01, 2017</u>	Removal Date/Time:	<u>Apr 05, 2017/13:15</u>

### Sample Data Collection Information

Sample Date:	<u>Apr 01, 2017</u>	Average Pressure (mmHg)	<u>698</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q <sub>std</sub> )	<u>229</u>
End Time (mst):	<u>00:00 Apr 2, 2017</u>	Average Temperature (°C)	<u>+3.8°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (Vstd m <sup>3</sup> )	<u>330.18</u>

### Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	<input type="radio"/> YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	<u>Jan 27, 2017</u>	
Other observations?	<u>n/a</u>	

Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	Date: <u>Apr 05, 2017</u>

## Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

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Date: April 1, 2017  
PUF S/N: TE08

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.02
2-Methylnaphthalene	0.04
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.03
Fluorene	0.04
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.02
Perylene	< 0.01
Phenanthrene	0.12
Pyrene	0.03
Retene	0.02



## Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: April 7, 2017  
PUF S/N: TE-03

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.03
2-Methylnaphthalene	0.05
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	0.02
Benzo(a)pyrene	0.01
Benzo(b,j,k)fluoranthene	0.02
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	0.02
Fluoranthene	0.04
Fluorene	0.05
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.03
Perylene	< 0.01
Phenanthrene	0.14
Pyrene	0.03
Retene	0.02



Sample ID: 17040201-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Apr 13, 2017



TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-06</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139 / 100 - 1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Apr 18, 2017 / 14:05</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Apr 13, 2017</u>	Removal Date/Time:	<u>Apr 18, 2017 / 17:33</u>

Sample Data Collection Information

Sample Date:	<u>Apr 13, 2017</u>	Average Pressure (mmHg)	<u>705</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q <sub>std</sub> )	<u>229</u>
End Time (mst):	<u>00:00 Apr 14, 2017</u>	Average Temperature (°C)	<u>+1.1°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V <sub>std</sub> m <sup>3</sup> )	<u>330.15</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	<u>Jan 27, 2017</u>	
Other observations?	<u>n/a</u>	

Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Apr 18, 2017

## Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: April 13, 2017  
PUF S/N: TE-06

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.03
2-Methylnaphthalene	0.06
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.05
Fluorene	0.04
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.06
Perylene	< 0.01
Phenanthrene	0.12
Pyrene	0.03
Retene	0.01

Sample ID: 17040252-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Apr 19, 2017



### TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-07</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139/100 - 1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Apr 18, 2017 / 17:33</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Apr 19, 2017</u>	Removal Date/Time:	<u>Apr 24, 2017 / 14:37</u>

### Sample Data Collection Information

Sample Date:	<u>Apr 19, 2017</u>	Average Pressure (mmHg)	<u>706</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q <sub>std</sub> )	<u>229</u>
End Time (mst):	<u>00:00 Apr 20, 2017</u>	Average Temperature (°C)	<u>+2.7°</u>
Elapsed Time (Hours):	<u>24:00</u>	Volume (Vstd m <sup>3</sup> )	<u>330.19</u>

### Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	<input type="radio"/> YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	<u>Apr 06, 2017</u>	
Other observations?	<u>n/a</u>	

Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	Date: <u>Apr 24, 2017</u>

## Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

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Date: April 19, 2017  
PUF S/N: TE-07

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.15
2-Methylnaphthalene	0.24
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.04
Acenaphthylene	0.02
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.05
Fluorene	0.09
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.09
Perylene	< 0.01
Phenanthrene	0.19
Pyrene	0.05
Retene	0.08

Sample ID: 17040271-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Apr 25, 2017

**TISCH PUF PLUS Sample Collection Data Sheet**

Client:	<u>LICA</u>	Puf+ S/N:	<u>P13-01</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139 / 100-1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Apr 25, 2017 / 14:37</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Apr 25, 2017</u>	Removal Date/Time:	<u>Apr 26, 2017 / 16:32</u>

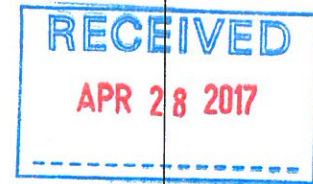
**Sample Data Collection Information**

Sample Date:	<u>Apr 25, 2017</u>	Average Pressure (mmHg)	<u>704</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q <sub>std</sub> )	<u>229</u>
End Time (mst):	<u>00:00 Apr 26, 2017</u>	Average Temperature (°C)	<u>+0.6°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (Vstd m <sup>3</sup> )	<u>330.22</u>

**Sample Recovery Checklist**

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<u>YES</u>	NO
Average temperature appears correct?	<u>YES</u>	NO
Average pressure appears correct?	<u>YES</u>	NO
Any error messages? (if yes list below)	YES	<u>NO</u>
Sample duration 24 hours?	<u>YES</u>	NO
Date of last calibration/audit:	<u>Apr 06, 2017</u>	
Other observations?	<u>n/a</u>	



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Apr 26, 2017

## Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

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Date: April 25 , 2017  
PUF S/N: P13-01

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.1
2-Methylnaphthalene	0.17
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.05
Acenaphthylene	0.02
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.05
Fluorene	0.07
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.06
Perylene	< 0.01
Phenanthrene	0.16
Pyrene	0.06
Retene	0.03

***NMHC CANISTER RESULTS***

Sample ID: 17040132-003

AIR FCD-01320/2

Customer ID: LICA

Cust Samp ID: LICA/NMHC/Bonnyville/Apr 6, 2017

# Maxxam

## VOC Sample Collection Data Sheet



Client: LICA Sampler S/N: n/a  
 Location: Bonnyville - AER Canister ID: 55669  
 Station ID: LICA 37 Canister Installation Date/Time: Apr 05, 2017 / 12:44  
 Field Sample ID: LICA/NMHC VOC/Bonnyville/Apr 06, 2017 Canister Removal Date/Time: Apr 07, 2017 / 13:22

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Apr 06, 2017</u>	<u>19:45</u>	<u>n/a</u>	<u>n/a</u>

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
<u>n/a</u>	<u>n/a</u>	<u>n/a</u>

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
<u>-27.7</u>	<u>-1.0</u>

Canister valve open prior to sampling?: YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments: NMHC canister

Technician Signature: Alex Yakupov

Date: April 07, 2017



## Volatile Organics Data Results (NMHC Canister System)

Date: April 6, 2017  
Canister ID: S5669

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.05
1,2,3-Trimethylbenzene	< 0.06
1,2,4-Trichlorobenzene	< 1.0
1,2,4-Trimethylbenzene	< 0.06
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.03
1,2-Dichloropropane	0.02
1,3,5-Trimethylbenzene	0.03
1,3-Butadiene	0.03
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	< 0.02
1-Hexene	< 0.02
1-Pentene	0.03
2,2,4-Trimethylpentane	0.07
2,2-Dimethylbutane	0.05
2,3,4-Trimethylpentane	0.04
2,3-Dimethylbutane	0.09
2,3-Dimethylpentane	0.08
2,4-Dimethylpentane	0.04
2-Methylheptane	0.04
2-Methylhexane	< 0.01
2-Methylpentane	0.16
3-Methylheptane	0.03
3-Methylhexane	0.07
3-Methylpentane	0.11
Acetone	7.8
Acrolein	< 0.4
Benzene	0.16
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.02
Carbon disulfide	0.04
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.64
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.04
cis-2-Pentene	< 0.02
Cyclohexane	0.16
Cyclopentane	0.08
Dibromochloromethane	< 0.01
Ethanol	3.5
Ethyl acetate	< 0.5
Ethylbenzene	0.05
Freon-11	0.24
Freon-113	0.11

## Volatile Organics Data Results (NMHC Canister System)

Date: April 6, 2017  
Canister ID: S5669

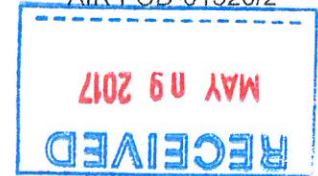
PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.44
Hexachloro-1,3-butadiene	< 0.62
Isobutane	1.5
Isopentane	1
Isoprene	0.02
Isopropyl alcohol	0.7
Isopropylbenzene	0.02
m,p-Xylene	0.12
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.10
Methyl butyl ketone	< 0.62
Methyl ethyl ketone	0.5
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.09
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.2
Methylcyclopentane	0.19
Methylene chloride	< 0.4
n-Butane	2.17
n-Decane	< 0.07
n-Dodecane	< 0.5
n-Heptane	0.07
n-Hexane	0.15
n-Nonane	0.03
n-Octane	0.04
n-Pentane	0.5
n-Propylbenzene	< 0.06
n-Undecane	< 0.6
Naphthalene	< 0.6
o-Ethyltoluene	0.02
o-Xylene	0.05
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.09
Styrene	< 0.05
Tetrachloroethylene	0.17
Tetrahydrofuran	< 0.5
Toluene	0.22
trans-1,2-Dichloroethylene	0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.05
Vinyl acetate	< 0.5
Vinyl chloride	< 0.02

Sample ID: 17050060-001

Customer ID: LICA

Cust Samp ID: LICA/NMHC  
VOC/Bonnyville/Apr 28,  
2017

AIR ECD-01320/2



# Maxxam

## VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: n/a  
 Location: Bonnyville - AER Canister ID: 2442  
 Station ID: LICA 37 Canister Installation Date/Time: Apr 07, 2017 / 13:22  
 Field Sample ID: LICA/NMHC VOC/Bonnyville/ Canister Removal Date/Time: May 04, 2017 / 10:57  
Apr 28, 2017

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Apr 28, 2017</u>	<u>06:50</u>	<u>n/a</u>	<u>n/a</u>

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
<u>n/a</u>	<u>n/a</u>	<u>n/a</u>

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
<u>- 28.1</u>	<u>n/a</u>

*- no pressure gauge*

Canister valve open prior to sampling?:  YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments:

NMHC canister.

*The canister is not equipped with a pressure gauge*

Technician Signature: Alex Yakupov

Date: May 04, 2017

## Volatile Organics Data Results (NMHC Canister System)

Date: April 28, 2017  
Canister ID: 2442

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2,2-Tetrachloroethane	< 0.03
1,1,2-Trichloroethane	< 0.03
1,1-Dichloroethane	< 0.03
1,1-Dichloroethylene	< 0.06
1,2,3-Trimethylbenzene	< 0.07
1,2,4-Trichlorobenzene	< 1.1
1,2,4-Trimethylbenzene	< 0.07
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.03
1,3-Butadiene	< 0.03
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.6
1,4-Dioxane	0.8
1-Butene	0.07
1-Hexene	< 0.03
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.03
2,2-Dimethylbutane	0.04
2,3,4-Trimethylpentane	0.05
2,3-Dimethylbutane	0.15
2,3-Dimethylpentane	0.08
2,4-Dimethylpentane	< 0.01
2-Methylheptane	0.03
2-Methylhexane	0.09
2-Methylpentane	< 0.01
3-Methylheptane	< 0.03
3-Methylhexane	0.08
3-Methylpentane	0.16
Acetone	2
Acrolein	< 0.4
Benzene	0.12
Benzyl chloride	< 0.6
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.01
Carbon disulfide	0.27
Carbon tetrachloride	0.09
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	< 0.03
Chloromethane	0.44
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.06
cis-2-Butene	< 0.03
cis-2-Pentene	< 0.03
Cyclohexane	0.85
Cyclopentane	0.13
Dibromochloromethane	< 0.01
Ethanol	1.5
Ethyl acetate	< 0.6
Ethylbenzene	0.03
Freon-11	0.26
Freon-113	0.09

## Volatile Organics Data Results (NMHC Canister System)

Date: April 28, 2017  
Canister ID: 2442

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.03
Freon-12	0.38
Hexachloro-1,3-butadiene	< 0.70
Isobutane	1.26
Isopentane	1.42
Isoprene	0.03
Isopropyl alcohol	< 0.6
Isopropylbenzene	< 0.01
m,p-Xylene	0.09
m-Diethylbenzene	< 0.06
m-Ethyltoluene	< 0.11
Methyl butyl ketone	< 0.70
Methyl ethyl ketone	< 0.4
Methyl isobutyl ketone	< 0.6
Methyl methacrylate	< 0.10
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.28
Methylcyclopentane	0.33
Methylene chloride	< 0.4
n-Butane	2.72
n-Decane	< 0.08
n-Dodecane	< 0.6
n-Heptane	0.1
n-Hexane	0.26
n-Nonane	0.02
n-Octane	0.04
n-Pentane	0.9
n-Propylbenzene	< 0.07
n-Undecane	< 0.7
Naphthalene	< 0.7
o-Ethyltoluene	< 0.01
o-Xylene	0.03
p-Diethylbenzene	< 0.06
p-Ethyltoluene	< 0.10
Styrene	< 0.06
Tetrachloroethylene	0.13
Tetrahydrofuran	< 0.6
Toluene	0.16
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.06
trans-2-Butene	< 0.01
trans-2-Pentene	0.03
Trichloroethylene	< 0.06
Vinyl acetate	< 0.6
Vinyl chloride	< 0.03

***APPENDIX III***  
***EQUIPMENT CALIBRATION RESULTS***

***SULPHUR DIOXIDE***



## API 100E Sulphur Dioxide Analyzer Calibration

Date: April 6, 2017	Barometric Pressure: 0.924 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Bonnyville - AER	Weather Conditions: Mix of sun and clouds
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 9:31	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 13:44	Cal Gas Expiry Date: July 18, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	
ID# or Serial Number: 467	Range ppb: 1000
Last Calibration Date: March 4, 2017	As Found C.F.: 0.995
Previous C.F.: 1.000	New C.F.: 1.000

Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL104222 Cal Gas Conc. (ppm): 50.6	<b>Standard Calibration Points for Ranges</b> <table border="1" style="margin: auto;"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb								
High	780								
Mid	380								
Low	190								

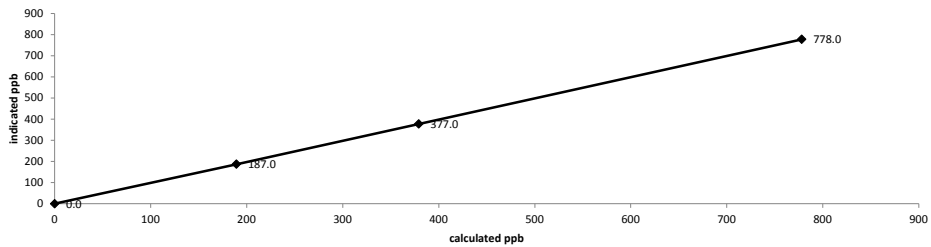
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.00	5000	0.0	0.0	n/a
as found high	4924	76.90	5001	778.1	782.0	0.995
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4924	76.90	5001	778.1	778.0	1.000
mid	4965	37.50	5003	379.3	377.0	1.006
low	4980	18.70	4999	189.3	187.0	1.012
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F. =						1.006

**Linear Regression/Calibration Results:**

Correlation Coefficient = 1.000	LIMITS
Slope = 0.999	> or = 0.995
b (Intercept as % of full scale) = 0.14%	.95-1.05
% change in C.F. from last cal = 0.50%	± 3% F.S.
	± 10%

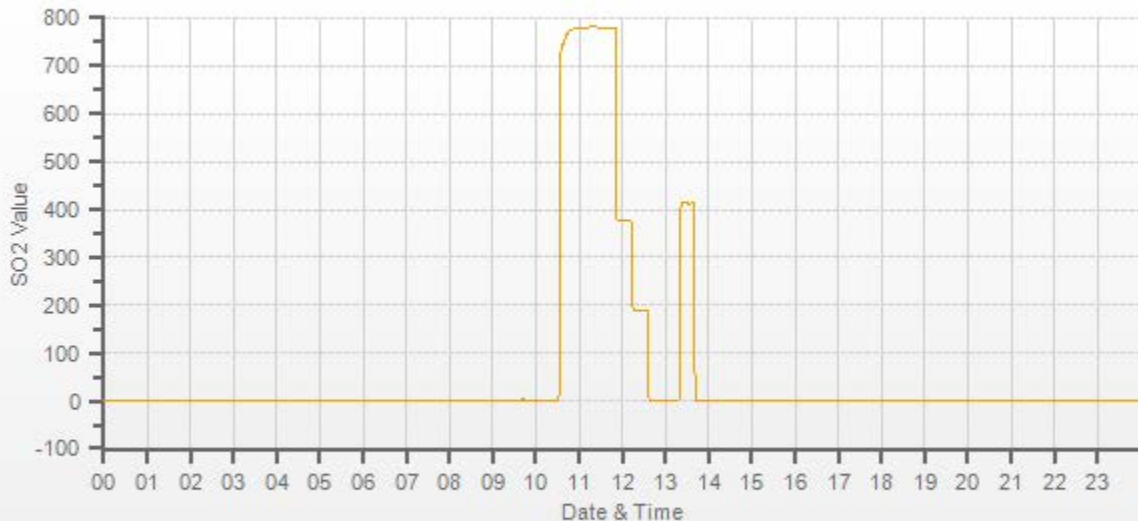
**API 100E Sulphur Dioxide Analyzer Calibration**



<b>As found:</b> SLOPE: 1.047 OFFSET: 117.3 HVPS: 488 RCELL TEMP: 50.0 BOX TEMP: 33.6 PMT TEMP: 8.1 IZS TEMP: 50.0 PRES: 25.1 SAMP FL: 562 NORM PMT: 117.8 UV LAMP: 4115.0 LAMP RATIO: 95.0 STR. LGT: 61.4 DRK PMT: 16.3 DRK LMP: 3.0 Expected Value: 414.5	<b>As left:</b> SLOPE: 1.040 OFFSET: 117.7 HVPS: 488 RCELL TEMP: 50.0 BOX TEMP: 34.2 PMT TEMP: 8.1 IZS TEMP: 50.0 PRES: 25.1 SAMP FL: 562 NORM PMT: 117.3 UV LAMP: 4103.9 LAMP RATIO: 94.7 STR. LGT: 61.2 DRK PMT: 17.1 DRK LMP: 3.1 Expected Value: 413.0
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**Comments:**  
The analyzer sample inlet filter was changed.





— SO2[ppb]

***HYDROGEN SULPHIDE***



## API 101E Hydrogen Sulphide Analyzer Calibration

Date: April 6, 2017	Barometric Pressure: 0.924 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Bonnyville - AER	Weather Conditions: Mix of sun and clouds
Parameter: Hydrogen Sulphide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 9:31	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 13:44	Cal Gas Expiry Date: June 14, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	
ID# or Serial Number: 510	Range ppb: 100
Last Calibration Date: March 4, 2017	As Found C.F.: 1.015
Previous C.F.: 0.999	New C.F.: 1.000

Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: EY0000654 Cal Gas Conc. (ppm): 10.2	<b>Standard Calibration Points for Ranges</b> <table border="1" style="margin: auto;"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	<b>SO2 Scrubber Check (10 mins.)</b> Start/End Time 24 hr.: 10:27/10:37 Target Concentration (ppb): 780 Result (ppb): 0.1 Zero Corrected Result (ppb): 0
Point	ppb									
High	78									
Mid	38									
Low	19									

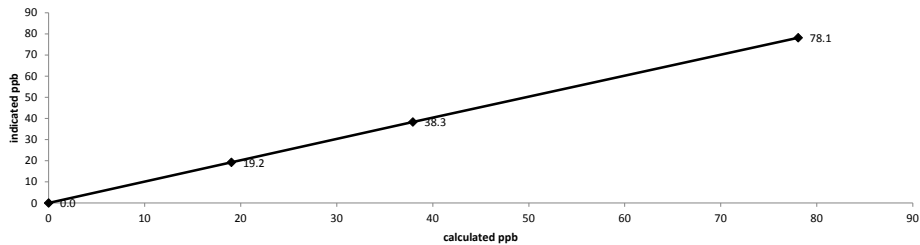
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7500	0.00	7500	0.0	-0.3	n/a
as found high	7442	57.40	7499	78.1	76.6	1.015
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7442	57.40	7499	78.1	78.1	1.000
mid	7472	27.90	7500	37.9	38.3	0.991
low	7486	14.00	7500	19.0	19.2	0.992
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F. =						0.994

**Linear Regression/Calibration Results:**

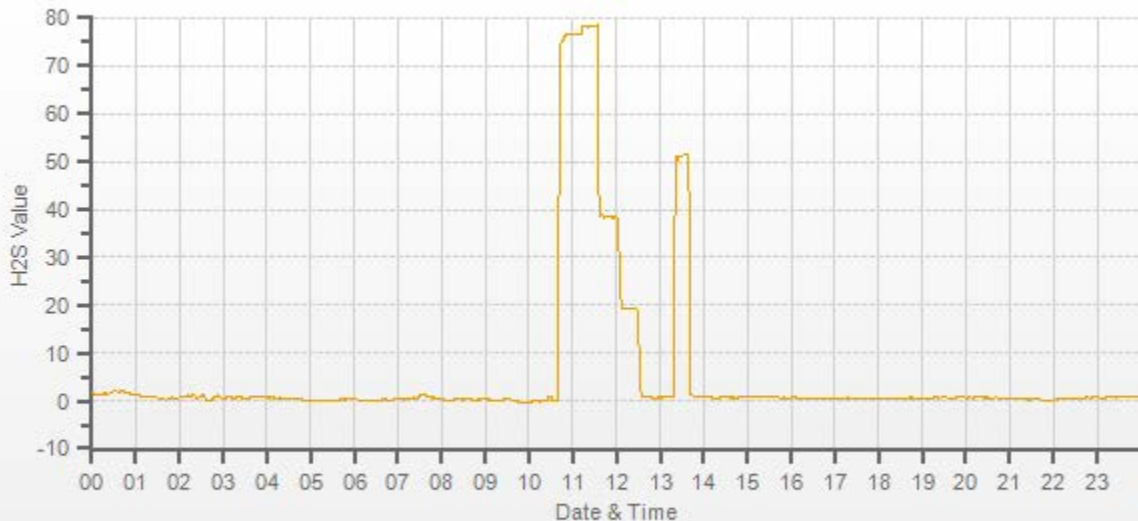
Correlation Coefficient =	1.000	LIMITS
Slope =	1.000	> or = 0.995
b (Intercept as % of full scale) =	-0.13%	.95-1.05
% change in C.F. from last cal =	-1.62%	± 3% F.S.
		± 10%

**API 101E Hydrogen Sulphide Analyzer Calibration**



<b>As found:</b> SLOPE: 1.039 OFFSET: 30.7 HVPS: 530 RCELL TEMP: 50.0 BOX TEMP: 35.4 PMT TEMP: 8.4 IZS TEMP: 45.0 Converter Temp: 315.2 PRES: 20.6 SAMP FL: 532 UV LAMP: 3310.0 LAMP RATIO: 98.3 STR. LGT: 16.0 DRK PMT: 34.9 DRK LMP: -1.9 Expected Value: 49.3	<b>As left:</b> SLOPE: 1.051 OFFSET: 29.6 HVPS: 530 RCELL TEMP: 50.0 BOX TEMP: 36.8 PMT TEMP: 8.4 IZS TEMP: 45.0 Converter Temp: 314.5 PRES: 20.5 SAMP FL: 531 UV LAMP: 3300.1 LAMP RATIO: 98.3 STR. LGT: 15.6 DRK PMT: 35.2 DRK LMP: -1.8 Expected Value: 51.5
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**Comments:**  
The analyzer sample inlet filter was changed.



— H2S[ppb]

***TOTAL HYDROCARBON***



### Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	April 7, 2017	Barometric Pressure:	0.915 atm
Company/Airshed:	LICA	Station Temperature °C:	21
Location/Station Name:	Bonnyville - AER	Weather Conditions:	Mainly sunny
Parameter:	CH <sub>4</sub> / NMHC / THC	Calibration Purpose:	routine monthly
Start/End Time 24 hr. (mst):	8:46 / 12:35	Performed By/Reviewer:	Alex Yakupov   Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023

Analyzer:		Correction Factors:			
ID# or Serial Number:	1236656107	Previous C.F.:	As Found C.F.:	New C.F.:	
Measured Flow:	1.157 lpm	CH <sub>4</sub> =	1.000	1.024	1.000
Last Calibration Date:	March 3, 2017	NMHC =	1.000	1.021	0.998
Range ppm:	20 CH <sub>4</sub> /20 NMHC/40 THC	THC =	1.000	1.021	0.999

Calibrator:		Standard Calibration Points for Analyzer Range of 20/20/40 ppm			
Flow Meter ID's:	n/a	Point	CH <sub>4</sub>	NMHC	THC
Make & Model:	API 700	High	13.00	13.00	26.00
Serial #:	627	Mid	7.00	7.00	14.00
Cal Gas Cylinder I.D. #:	LL165372	Low	3.00	3.00	6.00
CH <sub>4</sub> Cylinder Conc. =	606.0   212.0 =C <sub>2</sub> H <sub>6</sub> Cylinder Conc.				
CH <sub>4</sub> as C <sub>2</sub> H <sub>6</sub> =	583.0   1189.0 =total CH <sub>4</sub> equivalent				

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

Point	Calibrator Flow Rates (cc/min)			Calculated CH <sub>4</sub> (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH <sub>4</sub> (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	Correction Factors:		
	Diluent	Cal Gas	Total Flow							CH <sub>4</sub>	NMHC	THC
as found zero	2000	0.00	2000	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	2000	46.00	2046	13.62	13.11	26.73	13.30	12.84	26.17	1.024	1.021	1.021
adjusted zero	2000	0.00	2000	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	2000	46.00	2046	13.62	13.11	26.73	13.62	13.13	26.76	1.000	0.998	0.999
mid	2000	24.00	2024	7.19	6.91	14.10	7.22	6.92	14.14	0.995	0.999	0.997
low	2000	11.00	2011	3.31	3.19	6.50	3.35	3.21	6.55	0.989	0.993	0.993
calibrator zero	2000	0.00	2000	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
										Average C.F. =		
										0.995	0.997	0.996

Linear Regression/Calibration Results:

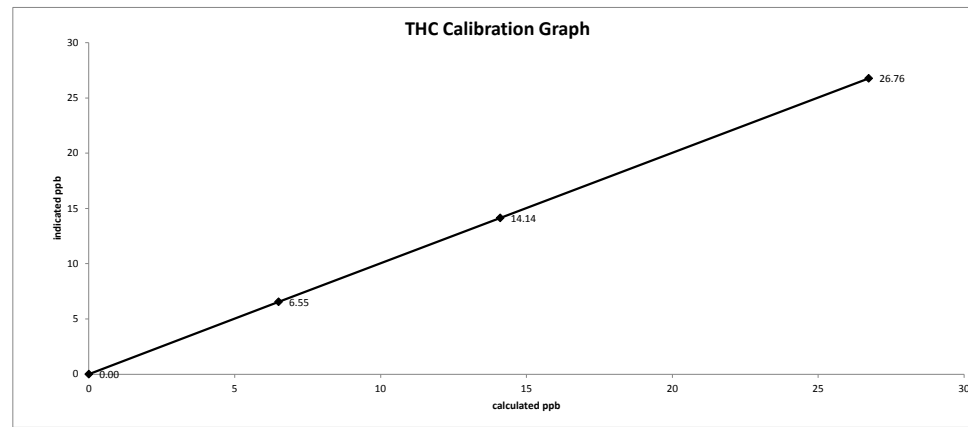
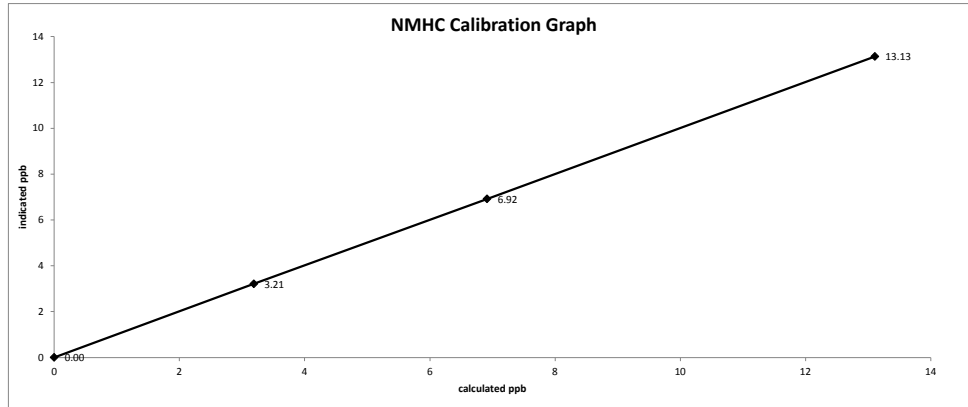
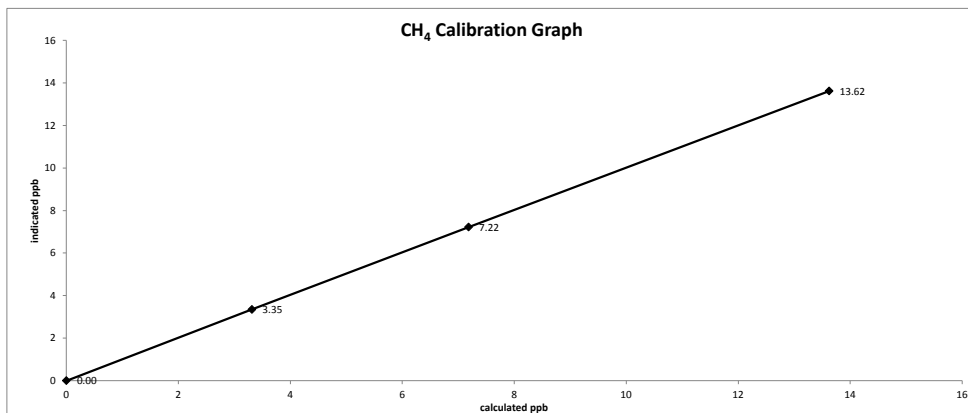
Correlation Coefficient =	CH <sub>4</sub>	NMHC	THC	LIMITS
	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	1.001	1.001	.95-1.05
b (Intercept as % of full scale) =	0.11%	0.03%	0.05%	± 3% F.S.
% change in C.F. from last cal =	-2.44%	-2.08%	-2.15%	± 10%

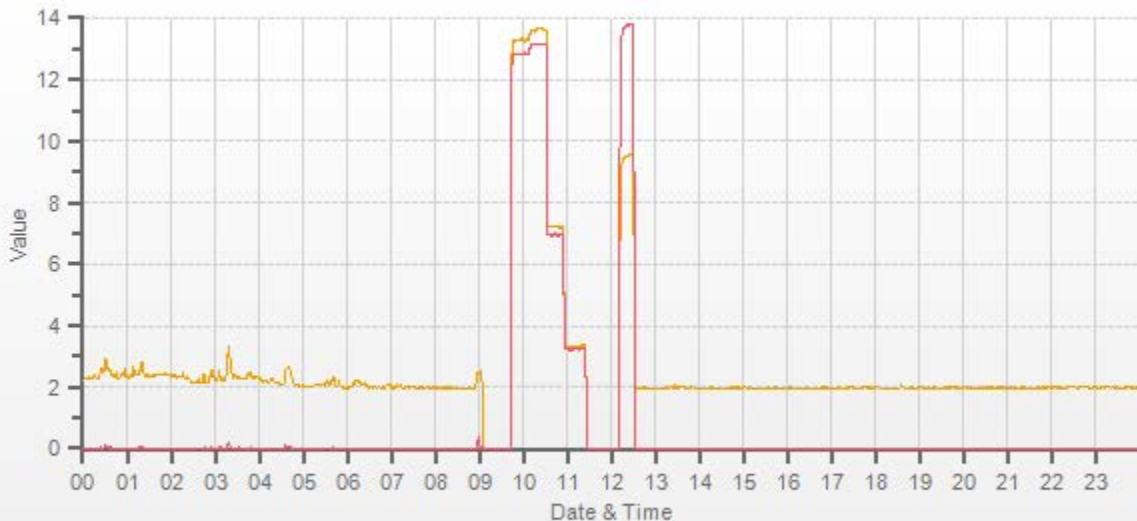
Interface Board Voltages:	Bias Supply:	-292.8	Calibration History cnt'd:	NM Peak Area:	94728
Temperatures:	Detector Oven:	175.0	Crucial Settings:	Methane Start:	n/a
	Filter:	175.0		Methane End:	n/a
	Column Oven:	75.0		Backflush:	n/a
	Internal:	32.4		NMHV Start:	n/a
Cylinder Pressures/reg.:	Carrier:	1000   50	Run History>1:	NMHC End:	n/a
	Fuel:	3000   55		Date:	April 7, 2017
	Span Gas:	600   22		Time:	09:25
	Zero Air Generator:	55		CH <sub>4</sub> PK HT:	0
Internal Pressures:	Carrier:	31.1		CH <sub>4</sub> RT:	8.0
	Fuel:	40.3		CH <sub>4</sub> Baseline:	2396
	Air:	32.2		CH <sub>4</sub> LOD:	57
FID Status:	Status:	LIT		CH <sub>4</sub> SD:	19
	Counts:	27342		CH <sub>4</sub> CONC:	0.00
	Flame:	371		NM PK HT:	0
	Det Base:	175		NM Peak Area:	0
Flame and Power Stats:	Last Power On:	August 3, 2016		NM CONC:	0.00
	Flameouts:	3		NM Base Start:	2338
	Det Oven at Start:	169.0		NM Base End:	2357
	Col Oven at Start:	74.5		NM LOD:	15
Calibration History:	Time:	March 3, 2017 / 13:10		NM Start IDX:	16
	Type:	SPAN		NM End IDX:	96
	Status:	GOOD		NM Max Slope:	9.5e+00
	Check/Adjust:	ADJUST		NM Min Slope:	-2.7e+00
	CH <sub>4</sub> Span Conc:	14.65	Expected Values:	NM PT Count:	0
	CH <sub>4</sub> SP Ratio:	0.000734		Previous CH <sub>4</sub> :	9.34
	CH <sub>4</sub> RT:	13.2		Previous NMHC:	13.77
	CH <sub>4</sub> PK IDX:	26		Previous THC:	23.13
	CH <sub>4</sub> PK HT:	19954		New CH <sub>4</sub> :	9.56
	NM Span Conc:	14.09		New NMHC:	13.80
	NM SP Ratio:	0.000149		New THC:	23.39

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

Date: April 7, 2017  
Company/Airshed: LICA  
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 8:46 / 12:35  
Calibration Purpose: routine monthly  
Calibration Method: Gas Dilution





— CH4[ppm] — NMHC[ppm]



***NITROGEN DIOXIDE***



## API 200E NO-NO2-NOx Analyzer Calibration

Date: April 6, 2017	Barometric Pressure: 0.924 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Bonnyville - AER	Weather Conditions: Mix of sun and clouds
Start/End Time 24 hr. (mst): 9:31 / 15:58	Calibration Purpose: routine monthly
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov   Trina Whitsitt
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: July 18, 2019

<b>Analyzer:</b> ID# or Serial Number: 593 Last Calibration Date: March 3, 2017 Range ppb: 1000	<b>Correction Factors:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.000</td> <td>1.013</td> <td>1.000</td> </tr> <tr> <td>NO<sub>2</sub> =</td> <td>1.002</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.009</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.013	1.000	NO <sub>2</sub> =	1.002	1.000	1.000	NOx =	1.000	1.009	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.013	1.000														
NO <sub>2</sub> =	1.002	1.000	1.000														
NOx =	1.000	1.009	1.000														

<b>Calibrator:</b> Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL104222 NO/NOx Gas Conc. (ppm): 50.7   50.7	<b>Standard Calibration Points for a Range of: 1000 ppb</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO<sub>2</sub> (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO <sub>2</sub> (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO <sub>2</sub> (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	0.0	n/a	n/a
as found high	4924	76.9	5001	779.6	779.6	770.0	773.0	1.013	1.009
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4924	76.90	5001	779.6	779.6	780.0	780.0	1.000	1.000
mid	4965	37.50	5003	380.1	380.1	378.0	378.0	1.005	1.005
low	4980	18.70	4999	189.7	189.7	189.0	189.0	1.004	1.004
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.003	1.003

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO <sub>2</sub>	NO drop	NO <sub>2</sub> gain	NO <sub>2</sub> C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	76.90	5001	0.0	784.0	784.0	0.0	0.0	0.0	
as found high NO <sub>2</sub>	4924	76.90	5001	500.0	278.0	784.0	506.0	506.0	506.0	1.000
adjusted high NO <sub>2</sub>	4924	76.90	5001	500.0	278.0	784.0	506.0	506.0	506.0	1.000
gpt mid	4924	76.90	5001	275.0	505.0	785.0	279.0	279.0	279.0	1.000
gpt low	4924	76.90	5001	100.0	685.0	787.0	99.0	99.0	99.0	1.000
Average NO <sub>2</sub> C.F.=									1.000	

**Linear Regression/Calibration Results:**

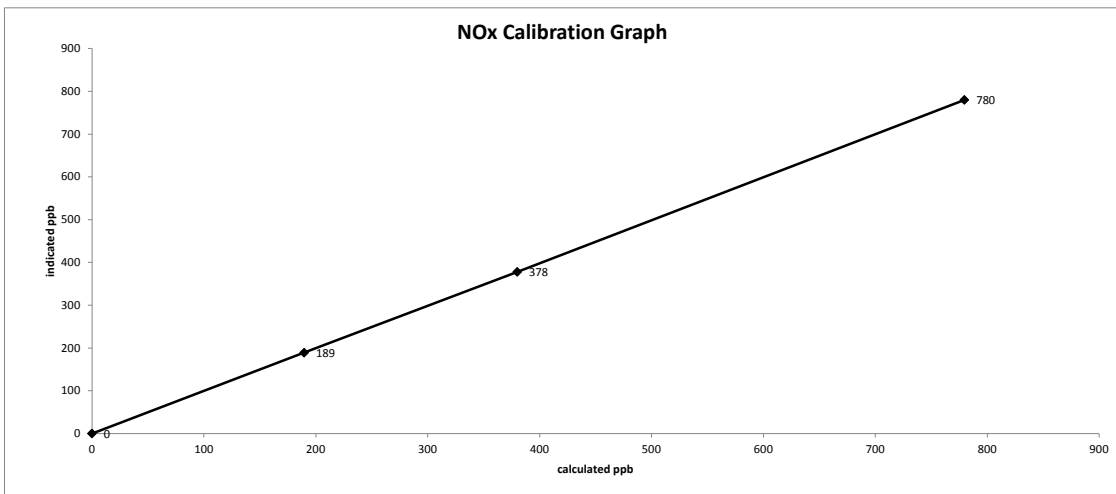
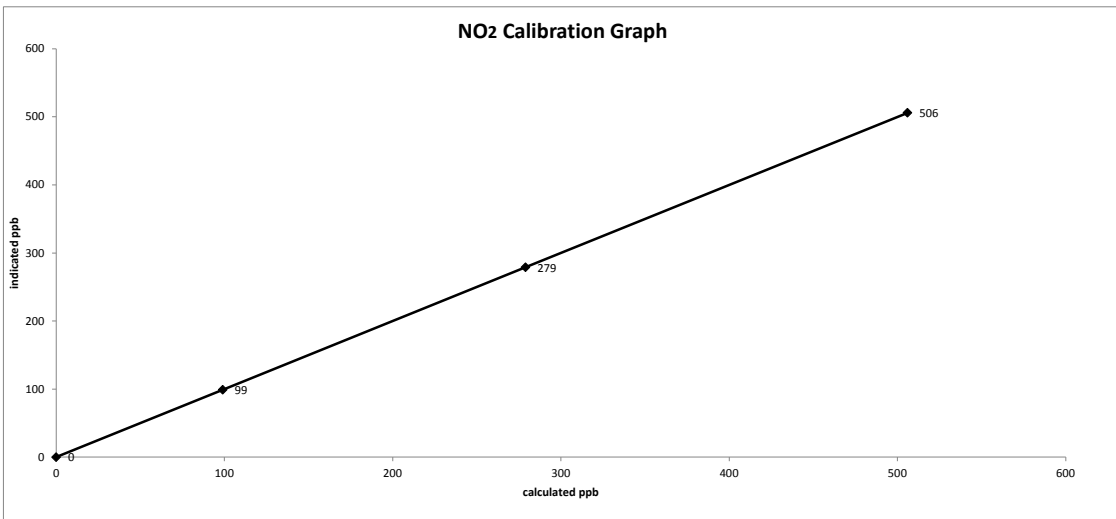
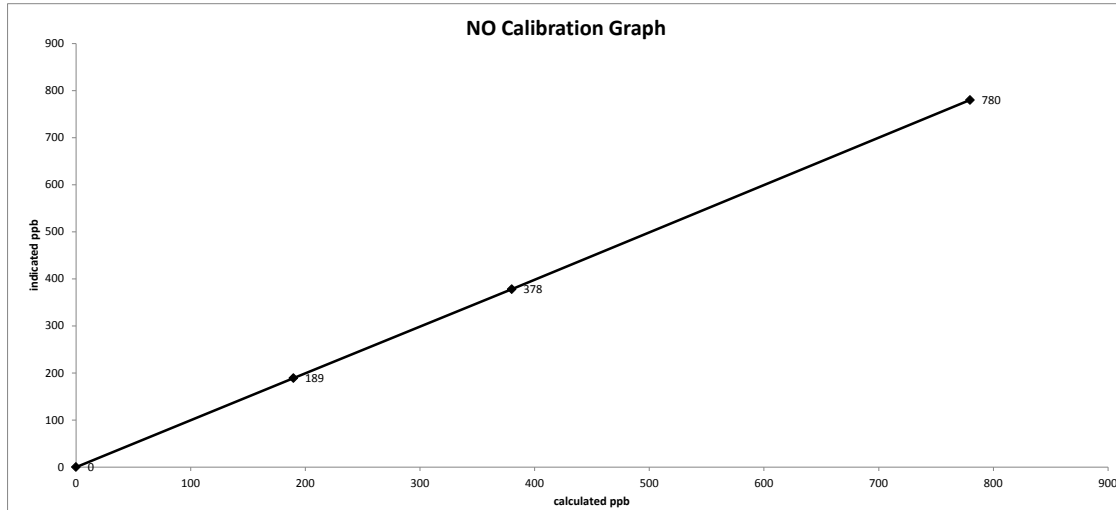
	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.999	1.000	.95-1.05
b (Intercept as % of full scale)=	-0.08%	-0.08%	0.00%	± 3% F.S.
% change in C.F. from last cal=	-1.25%	-0.86%	0.20%	± 10%
NO <sub>2</sub> converter efficiency			1.00	0.96 to 1.04

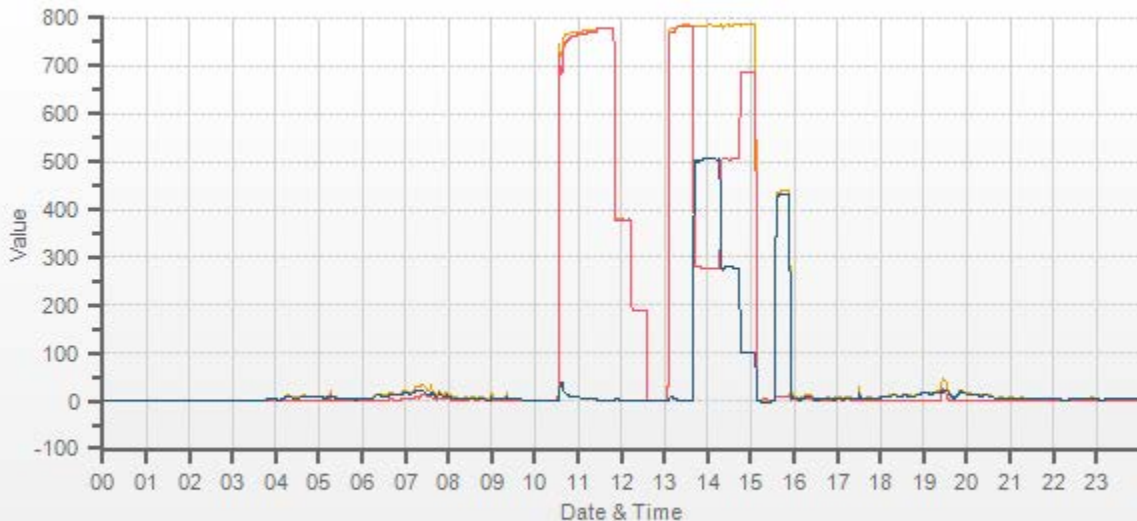
As found:	As left:
NOx SLOPE: 0.881	NOx SLOPE: 0.887
NOx OFFS: 0.5	NOx OFFS: 0.4
NO SLOPE: 0.882	NO SLOPE: 0.890
NO OFFS: -1.6	NO OFFS: -1.5
SAMP FLW: 474	SAMP FLW: 473
OZONE FL: 76	OZONE FL: 76
PMT: 9.4	PMT: 17.9
NORM PMT: -1.3	NORM PMT: -0.3
AZERO: 9.9	AZERO: 9.8
HVPS: 670	HVPS: 670
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 32.0	BOX TEMP: 32.8
PMT TEMP: 6.7	PMT TEMP: 6.7
IZS TEMP: 45.0	IZS TEMP: 45.1
MOLY TEMP: 314.5	MOLY TEMP: 314.9
RCEL: 5.3	RCEL: 5.3
SAMP: 26.7	SAMP: 26.7
Expected Value NO: 8.6	Expected Value NO: 5.4
Expected Value NO <sub>2</sub> : 415.0	Expected Value NO <sub>2</sub> : 434.0
Expected Value NOx: 413.0	Expected Value NOx: 440.0

**Comments:**  
 The analyzer sample inlet filter was changed. No high point NO<sub>2</sub> adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

Date: April 6, 2017  
Company/Airshed: LICA  
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 9:31 / 15:58  
Calibration Purpose: routine monthly  
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

## ***OZONE***

# Maxxam Thermo 49i Ozone Analyzer Calibration

A Bureau Veritas Group Company

Date: April 4, 2017  
 Company/Airshed: LICA  
 Location/Station Name: Bonnyville  
 Start/End Time 24 hr. (mst): 8:46 / 12:35  
 Ozone Calibration Method: Varying UV Lamp Power  
 G.P.T. Date: n/a-done by Varying UV Lamp Power

Barometric Pressure: 0.915 atm  
 Station Temperature °C: 21  
 Weather Conditions: Mainly sunny  
 Calibration Purpose: routine monthly  
 Performed By/Reviewer: Alex Yakupov / Trina Whitsitt  
 Cal Gas Expiry Date: n/a

Analyzer:  
 ID# or Serial Number: 1002240372  
 Last Calibration Date: March 4, 2017  
 Previous Cal High Point C.F.: 1.000

Ozone Range ppb: 500  
 As Found C.F.: 0.992  
 New C.F.: 1.000

Calibrator:  
 Flow Meter ID's: n/a  
 Make & Model: SABIO 2010 D  
 Serial #: 11900613  
 Cal Gas Cylinder I.D. #: n/a

Point	AMD Required Range of Ozone Calibration Points
High	300-400 ppb
Mid	150-200 ppb
Low	50-75 ppb

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

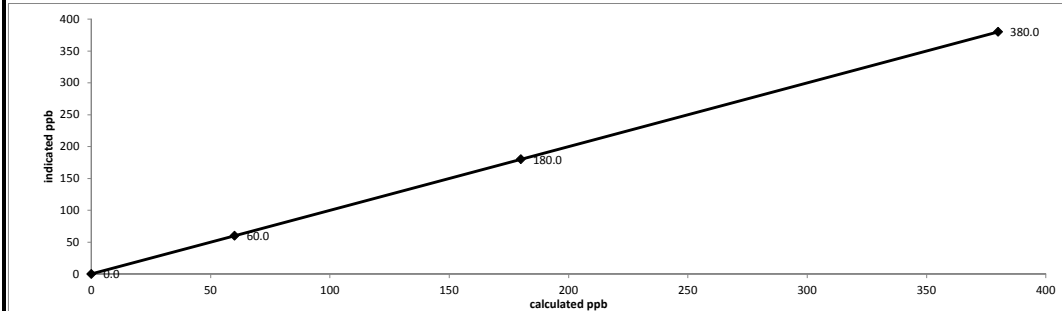
Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	383.0	0.992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

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000  
 Slope = 1.000  
 b (Intercept as % of full scale) = 0.00%  
 % change in C.F. from last cal = 0.78%

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

Thermo 49i Ozone Analyzer Calibration



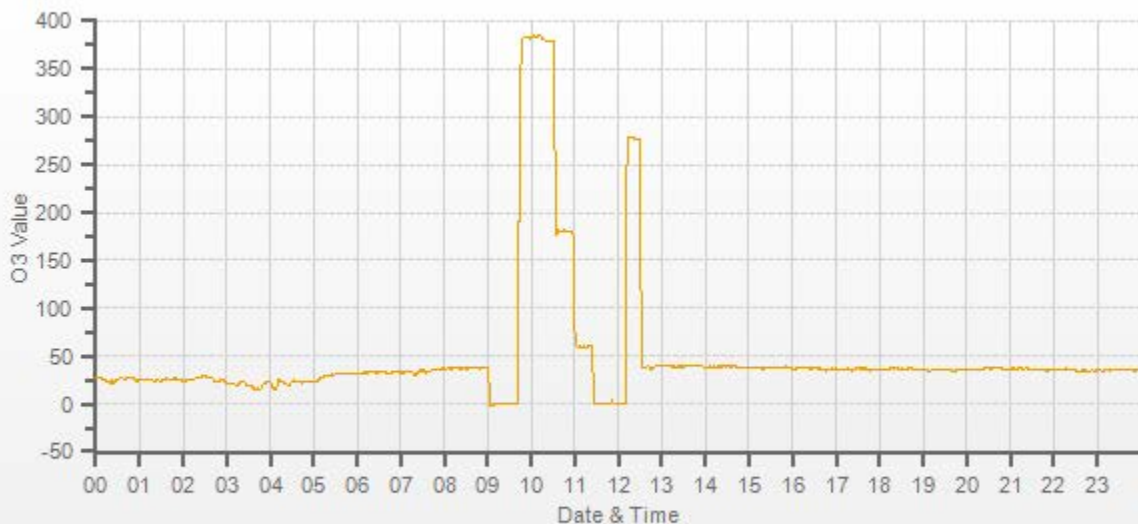
As found:  
 O3 Bkg: -0.2  
 O3 Coef: 1.000  
 Photo Lamp: 14.2  
 O3 Lamp: 5.8  
 Bench: 30.2  
 Bench Lamp: 54.1  
 O3 Lamp: 68.1  
 Pressure: 692.3  
 Cell A lpm: 0.749  
 Cell B lpm: 0.759  
 O3 ppb: 0.0  
 Cell A ppb: -2.0  
 Cell B ppb: 2.0  
 Cell A int: 80972  
 Expected Value: 303.0

As left:  
 O3 Bkg: 0.2  
 O3 Coef: 0.984  
 Photo Lamp: 14.2  
 O3 Lamp: 5.8  
 Bench: 32.2  
 Bench Lamp: 54.1  
 O3 Lamp: 68.2  
 Pressure: 692.6  
 Cell A lpm: 0.748  
 Cell B lpm: 0.760  
 O3 ppb: 0.6  
 Cell A ppb: -0.7  
 Cell B ppb: 1.9  
 Cell A int: 80863  
 Expected Value: 276.0

Comments:

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

No ZERO adjustment made.



— O3[ppb]

***PARTICULATE MATTER***





# R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: April 7, 2017  
 Company: LICA  
 Station Name/Location: Bonnyville - AER  
 Previous Audit Date: March 28, 2017  
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt  
 Start Time (mst): 11:54  
 End Time (mst): 12:59  
 Calibration Purpose: Bi-monthly #1  
 Weather Conditions: Mainly sunny

### 1400A Information and Status:

ID# or Serial Number: 1405A207691003 As Found Filter Loading %: 27.98  
 Ko Factor: 15635 As Left Filter Loading %: 19.61  
 Ambient Temperature °C: 13.12 As Found Noise: 0.004  
 Ambient Pressure atm: 0.916 As Left Noise: 0.000  
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.33  
 Aux Flow Reading lpm: 13.67 Warnings: None

### Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#3</u>	<u>#05544</u>	<u>4295</u>
Calibration Date:	<u>January 1, 2017</u>	<u>December 5, 2016</u>	<u>November 15, 2016</u>

### As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.07	0.00	0.07
	limit	0.15	<del>0.15</del>	0.15	<del>0.15</del>
Bypass Flow	actual	0.00	-0.31	0.00	-0.31
	limit	0.60	<del>0.60</del>	0.60	<del>0.60</del>

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.07	0.00	0.07
	limit	0.15	<del>0.15</del>	0.15	<del>0.15</del>
Bypass Flow	actual	0.00	-0.31	0.00	-0.31
	limit	0.60	<del>0.60</del>	0.60	<del>0.60</del>

### As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>13.1</u>	1405F pressure atm: <u>0.916</u>
reference temperature °C: <u>12.8</u>	reference pressure: <u>0.917</u>
difference °C: <u>-0.3</u>	difference: <u>-0.001</u>

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>12.8</u>	1405F pressure atm: <u>0.917</u>
reference temperature °C: <u>12.8</u>	reference pressure: <u>0.917</u>
difference °C: <u>0.0</u>	difference: <u>0.000</u>

### As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.97</u>	reference total/aux flow lpm: <u>16.02</u>
difference lpm: <u>-0.03</u>	difference lpm: <u>-0.65</u>

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

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

### K<sub>o</sub> Audit:

Last K<sub>o</sub> audit date: February 6, 2017  
 1405F K<sub>o</sub> factor: 15635  
 Measured K<sub>o</sub> factor: 15808.3000  
 % difference: 1.11

### Comments:

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



# R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: April 24, 2017  
 Company: LICA  
 Station Name/Location: Bonnyville - AER  
 Previous Audit Date: April 7, 2017  
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt  
 Start Time (mst): 15:09  
 End Time (mst): 16:00  
 Calibration Purpose: Bi-monthly #2  
 Weather Conditions: Mainly sunny

### 1400A Information and Status:

ID# or Serial Number: 1405A207691003 As Found Filter Loading %: 30.22  
 Ko Factor: 15635 As Left Filter Loading %: 31.08  
 Ambient Temperature °C: 3.32 As Found Noise: 0.002  
 Ambient Pressure atm: 0.930 As Left Noise: 0.000  
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.33  
 Aux Flow Reading lpm: 13.67 Warnings: None

### Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#3</u>	<u>#05544</u>	<u>4295</u>
Calibration Date:	<u>January 1, 2017</u>	<u>December 5, 2016</u>	<u>November 15, 2016</u>

### As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.07	0.00	0.07
	limit	0.15	<del>0.15</del>	0.15	<del>0.15</del>
Bypass Flow	actual	0.00	-0.31	0.00	-0.31
	limit	0.60	<del>0.60</del>	0.60	<del>0.60</del>

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.07	0.00	0.07
	limit	0.15	<del>0.15</del>	0.15	<del>0.15</del>
Bypass Flow	actual	0.00	-0.31	0.00	-0.31
	limit	0.60	<del>0.60</del>	0.60	<del>0.60</del>

### As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>3.3</u>	1405F pressure atm: <u>0.930</u>
reference temperature °C: <u>3.7</u>	reference pressure: <u>0.928</u>
difference °C: <u>0.4</u>	difference: <u>0.002</u>

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>3.7</u>	1405F pressure atm: <u>0.928</u>
reference temperature °C: <u>3.7</u>	reference pressure: <u>0.928</u>
difference °C: <u>0.0</u>	difference: <u>0.000</u>

### As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.97</u>	reference total/aux flow lpm: <u>16.59</u>
difference lpm: <u>-0.03</u>	difference lpm: <u>-0.08</u>

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

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.97</u>	reference total/aux flow lpm: <u>16.59</u>
difference lpm: <u>-0.03</u>	difference lpm: <u>-0.08</u>

### K<sub>o</sub> Audit:

Last K<sub>o</sub> audit date: February 6, 2017  
 1405F K<sub>o</sub> factor: 15635  
 Measured K<sub>o</sub> factor: 15808.3000  
 % difference: 1.11

### Comments:

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

The 47 mm FDMS filter was changed.

## ***WIND SYSTEM***



# Meteorological Sensor Audit/Calibration

## Location Information

Company:	LICA	Performed By:	Alex Yakupov
Audit Location:	Bonnyville - AER	Reviewed By:	Trina Whitsitt
Audit Date:	March 3, 2017	Start /EndTime (mst):	10:11 / 13:14

## Wind Sensor Information

Sensor ID Data:		Sensor Outputs:	
Sensor Make:	R.M. Young	Velocity Voltage Output Range:	0-1
Sensor Model:	5103 VK	Velocity Unit Output Range:	0-200
Serial #:	56589	Direction Voltage Output Range:	0-1
Previous Cal/Audit Date:	January 26, 2016	Direction Unit Output Range:	0-360

## Wind Calibrator Information

Calibrator Make/ Model:	RM Young / Model 18802	Serial #:	CA 03309
Maxxam Unit ID #:	13-3357	Certification Date:	October 6, 2016

## Wind Speed Audit Data **\*\*+/- 2% of the average correction factor is the limit\*\***

RPM	Wind Speed Generated kph	Clockwise Wind Speed kph	Counter Clockwise Wind Speed kph	Correction Factor
0	0	0.0	0.0	-
1000	17.6	17.7	17.6	0.998
2000	35.3	35.3	35.3	0.999
3000	52.9	53.0	53.0	0.999
4000	70.6	70.6	70.7	0.999
5000	88.2	88.3	88.4	0.998
6000	105.8	106.0	106.0	0.998
7000	123.5	123.6	123.7	0.999
8000	141.1	141.3	141.4	0.998
9000	158.8	159.0	159.1	0.998
10000	176.4	176.7	176.7	0.998
The audit meets AMD requirements.			Average Correction Factor=	0.998

## Wind Direction Audit Data **\*\*+/- 5° of the absolute average degrees difference for all points is the limit\*\***

Generated Wind Direction 0-360 (Up)	Generated Wind Direction 360-0 (Down)	Indicated Wind Direction 0-360 (Up)	Indicated Wind Direction 360-0 (Down)	Degrees Difference 0-360 (Up)	Degrees Difference 360-0 (Down)	Average Absolute Degrees Difference
0	355	0	354	0.2	1.3	0.8
30	330	30	329	-0.4	0.9	0.6
60	300	60	300	-0.4	0.3	0.4
90	270	91	271	-0.8	-0.6	0.7
120	240	120	240	0.3	0.4	0.4
150	210	149	210	0.7	-0.3	0.5
180	180	180	181	0.5	-0.9	0.7
210	150	209	150	1.1	-0.2	0.6
240	120	239	121	1.4	-0.5	1.0
270	90	269	90	1.5	-0.2	0.9
300	60	296	60	3.6	0.0	1.8
330	30	325	30	4.7	0.0	2.4
355	0	352	0	3.2	0.2	1.7
The audit meets AMD requirements.				Average Absolute Degrees Difference=		1.0

Comments:

***VOC SAMPLER***

# Maxxam Analytics

## XONTECK FLOW RATE VERIFICATION/CALIBRATION

<b>Client:</b> LICA	<b>Date:</b> April 6, 2017
<b>Location:</b> Bonnyville	<b>Last Cal. Date:</b> January 27, 2017
<b>Station ID:</b> LICA 37	<b>Start Time 24 hr. (mst):</b> 15:25
<b>Sampler s/n:</b> 6200	<b>End Time 24 hr. (mst):</b> 15:50
<b>Purpose:</b> Routine Quarterly	<b>Performed By/Reviewer:</b> Alex Yakupov   Tom Bourque

<b>Pressure Standard:</b>	<b>Flow Standard:</b>
<b>Make/Model:</b> Fisher Scientific/FB61291	Dwyer/Series 475 Mark III
<b>S/N or ID#:</b> ID# 05544	#3
<b>Certification Date:</b> December 5, 2016	January 1, 2017

The desired flow rate can be calculated using the equation provided by USEPA Method T0-14 Section 9.1.3.1.

$$F = \frac{(P \times V)}{(T \times 60)} = \frac{1.62 \times 6000}{24 \times 60} = \boxed{6.73 \text{ cc/min}} = \text{target flow rate}$$

where;

F= flow rate in cc/min  
P= final canister in atmosphere absolute  
V= volume of canister in c.c.  
T= sampling period in hours  
bp= barometric pressure in atmospheres

enter:

bp      0.935      atm  
P=      1.61546      (atm)+.68046  
V=      6000      cubic centimetres  
T=      24      hours

## XONTECK QUARTERLY FLOW VERIFICATION/CALIBRATION

### FLOW RATE VERIFICATION

<b>Volumetric Flow rate</b> = 10.00 (cc/min)	As found pot setting =	4.94
<b>Target Flow Rate (cc/min)</b> = 6.73		

### FLOW RATE CALIBRATION

<b>Volumetric Flow rate</b> = 10.00 (cc/min)	Adjusted pot setting =	4.94
<b>Target Flow Rate (cc/min)</b> = 6.73		

## XONTECK MAINTENANCE

Item:	Most Recent Date Completed:
1. Replace sample line and fittings from sampler to canister every 6 months.	April 5, 2017
2. Purge line from manifold--> sampler with zero air every 6 months.	April 6, 2017
3. Sample system cleaning every 2 years.	March 21, 2015
4. Perform 12 hour leak check procedure every 6 months.	April 6, 2017

### COMMENTS:

The sampling is done from vacuum of about -28 in Hg. The current pump setting creates an adequate flow rate to fill up the sample canister to the pressure required for analysis. Leak check performed: April 5 (13:03) to April 6 (13:41), => total leak rate 0.0. No leaks detected.

***PAH SAMPLER***



**TISCH PUF PLUS SAMPLER AUDIT**

Date:	April 6, 2017	PUF PLUS Serial #:	100-1015
Company/Airshed:	LICA/Bonnyville	Performed By/Reviewer:	Alex Yakupov   Trina Whitsitt
Location/Station Name:	Bonnyville-AER/LICA 37	Weather Conditions:	Mainly sunny
Reference Standards:	Flow:	Pressure:	Temperature:
Make:	Dwyer	Fisher Scientific	FLUKE
Model:	Series 475 Mark III	FB61291	1551A Ex STIK
Serial Number:	#3	ID# 05544	ID# 4295
Calibration Date:	January 1, 2017	December 5, 2016	November 15, 2016

**TISCH PUF PLUS PRESSURE AND TEMPERATURE AUDIT**

AS FOUND Reference Barometric Pressure (mmHg):	700.56	AS FOUND Reference Temperature (°C):	17.8
AS FOUND PUF PLUS Barometric Pressure (mmHg):	696	AS FOUND PUF PLUS Temperature (°C):	17.1
% Difference (+/- 2% max.):	0.65%	% Difference (+/- 2 °C max.):	0.7
<b>**IF THE PRESSURE DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED**</b>		<b>**IF THE TEMPERATURE DEVIATES BY MORE THAN +/- 2 °C A FLOW CALIBRATION IS REQUIRED**</b>	

**TISCH PUF PLUS FLOW AUDIT**

**Flow Audit Calculations:**

Calibrated Orifice Certification Date:	October 20, 2016
Enter Barometric Pressure from reference (inHg)	27.58
Barometric Pressure (mmHg)	700.6
Enter Ambient Temperature from reference °C	17.8
Enter "m" variable from calibrated orifice	6.08663
Enter "b" variable from calibrated orifice	-0.04218
Enter Δp in. H <sub>2</sub> O	1.98
Standardized Flow lpm=	231.57
Flow Set Point lpm=	230.00
% Difference (+/- 2% max.)=	-0.68%
<b>**IF THE FLOW DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED**</b>	

**TISCH PUF PLUS PRESSURE CALIBRATION**

Reference Barometric Pressure AFTER CALIBRATION (mmHg):	n/a
PUF Barometric Pressure AFTER CALIBRATION (mmHg):	n/a
% Difference:	#VALUE! Max 2.0%

Calibration Point (mmHg):	Δp (in. H <sub>2</sub> O) required for target barometric pressure:	As Found barometric pressure (mmHg):	As Left barometric pressure (mmHg):	% Difference vs. Calibration Target:
740.56	1.57	n/a	n/a	n/a
720.56	0.79	n/a	n/a	n/a
700.56	0.00	n/a	n/a	n/a
680.56	-0.79	n/a	n/a	n/a
660.56	-1.57	n/a	n/a	n/a
% Difference (+/- 2% max.)=				n/a

**TISCH PUF PLUS TEMPERATURE CALIBRATION**

Temperature Calibrator Certification Date:	n/a
Reference Temperature AFTER CALIBRATION (°C):	n/a
TISCH PUF PLUS Temperature AFTER CALIBRATION (°C):	n/a
Difference (°C):	#VALUE! Max 2.0 °C

Calibration Point (°C):	As Found (°C)	As Left (°C)	+/- Difference (°C)
20	n/a	n/a	n/a
-20	n/a	n/a	n/a
40	n/a	n/a	n/a
0	n/a	n/a	n/a
-30	n/a	n/a	n/a
% Difference (+/- 2 °C max.)			n/a

**TISCH PUF PLUS FLOW CALIBRATION**

**Flow Calibration Calculations:**

Calibrated Orifice Certification Date:	n/a
Enter Barometric Pressure from reference (inHg)	n/a
Barometric Pressure (mmHg)	n/a
Enter Ambient Temperature from reference °C	n/a
Enter "m" variable from calibrated orifice	n/a
Enter "b" variable from calibrated orifice	n/a
Enter Δp in. H <sub>2</sub> O	n/a
Standardized Flow lpm=	#VALUE!
Flow Set Point lpm=	230.00
% Difference (+/- 2% max.)=	#VALUE!
<b>**IF THE FLOW DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED**</b>	

**R, A1 and A0 Factors:**

	As Found/As Left Pressure:	As Found/As Left Temperature:	As Found/As Left Flow:
A0	15312.7500	-11845.5546	-0.2483
A1	22.5779	0.2990	17.6252
R	0.0000	0.0000	0.0000

**Notes:**

Audit started: 15:29 (SMT), audit finished: 16:02(SMT)



## ***CALIBRATORS***

Company Maxxam/SIA Operator: Chris

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

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

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

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

<u>NO</u>		<u>LIMITS</u>		<u>NOx</u>	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0041	<b>0.90-1.10</b>		m (Slope)=	1.0046
b (Intercept % of FS)=	-0.1118	<b>± 3% F.S.</b>		b (Intercept % of FS)=	-0.0871

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

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

<u>NO<sub>2</sub></u>		<u>LIMITS</u>	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9924	<b>0.90-1.10</b>	
b (Intercept % of FS)=	0.1755	<b>± 3% F.S.</b>	

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

COMMENTS: \_\_\_\_\_

Auditor: Shea Beaton Date: January 27, 2017

Operator Signature: [Signature] Location: McIntyre Center Edmonton

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

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

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

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

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0301	0.90-1.10	m (Slope)= 1.0291
b (Intercept % of FS)= -0.0919	± 3% F.S.	b (Intercept % of FS)= -0.0881

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

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

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

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

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton  
Operator Signature: [Signature]

Date: March 16, 2017  
Location: McIntyre Center Edmonton

## ***CALIBRATION GASES***



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2016-335CGA

**Company:** Maxxam **Operator's Name:** Russell Kirchner  
**Cylinder #:** LL104222 **Concentration PPM:** 50.6 **Tolerance(%)** 1 **Certified By:** Praxair  
**Expiry Date:** July 2019

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

**Reference Analyzer:**  
**Make/Model:** Teco 43C **Serial/AMU Number:** 1623  
**Instrument Settings:** **Zero:** 9.2 **Span:** 1.024 **Range:** 1.0  
**Last Calibration:** **Date:** Oct 19/16 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	<del>0.0000</del>	<del>0.0000</del>	<del>0.0000</del>
4935	82.0	0.830	0.01662	60.183	50.0
4968	40.8	0.412	0.00821	121.765	50.2
4955	20.2	0.203	0.00408	245.297	49.8
Average Cylinder Concentration:					<b>50.0</b>

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 1

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

**Auditor:** Al Clark  
**Operator Signature:** *Al Clark*

**Date:** October 19, 2016  
**Location:** McIntyre Center Edmonton





# Calibration Gas Audit

## CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

Company: Maxxam Operators name: Chris Wesson  
 Cylinder #: LL165372 Conc CH4 (PPM) 606/212 Tolerance (%) 0.5 Certified By: Praxair

**Reference Calibrator and Gas:**

Make/Model R&R MFC 201  
 Serial Number AMU 1698  
 Last Verification Date January 18, 2016  
 Gas Type CH4 Conc. 999.2  
 Cylinder Number D751932  
 Gas Type C3H8 Conc. 246.5  
 Cylinder Number XF0037998

**Flow Measurement Device:**

Make/Model Bios DC-2  
 Serial Number Blos D  
 Temp. °C 24.5  
 B.P. 698mmHg

**Reference Analyzer:**

Make/Model Thermo 55C Serial/AMU Number: 1643  
 Instrument Settings Zero: NA Span: NA Range: 20.0  
 Last Calibration: Date: 18-Jan-16 C.F. 1.000 Done By: SB

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2568	0.00	0.00	0.00	<del>0.02140</del>	<del>46.722</del>	<del>607</del>	<del>214</del>
2630	56.29	12.99	12.62	0.02140	46.722	607	214
2588	19.73	4.62	4.50	0.00762	131.171	606	215
2580	9.69	2.29	2.24	0.00376	266.254	610	217
Average Cylinder Concentration:						<b>608</b>	<b>215</b>

<b>CH4</b>	<b>C3H8</b>
Previous Stated Concentration PPM: <u>606</u>	<u>212</u>
Percent variance from Stated: <u>0.3</u>	<u>1.6</u>

**Cylinder gas tolerances based on CH4 only**

Meets Manufacturer Tolerance. Use manufacturers stated concentration  COMMENTS: \_\_\_\_\_  
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration  C3H8 manufacturers tolerance 1.1%  
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: January 19, 2016  
 Operator Signature: \_\_\_\_\_ Location: McIntyre Center Edmonton



# Calibration Gas Audit

## NO Cylinder Gas

File No. 2016-336CGA

**Company:** Maxxam      **Operators name:** Russell Kirchner

Cylinder #: LL104222    Conc (PPM) 50.7/50.9    Tolerance (%) 1    Certified By: Praxair

Expiry Date: July 2019

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>AMU 1659</u>
Last Verification Date	<u>October 19, 2019</u>			Temp. °C	<u>24.5 C</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>706 mmhg</u>
Cylinder Number	<u>CAL018188</u>				
Expiry Date	<u>March 2019</u>				

**Reference Analyzer:**

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

Instrument Settings    Zero: 4.4      Span: 1.080      Range: 1.0

Last Calibration:      Date: Oct 18/16      C.F. 1.000      Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4935	82.0	0.838	0.837	0.017	60.183	50.4	50.4
4968	40.8	0.417	0.417	0.008	121.765	50.8	50.8
4955	20.2	0.207	0.207	0.004	245.297	50.8	50.8
Average Cylinder Concentration:						<b>50.7</b>	<b>50.6</b>

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.7</u>	<u>50.9</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

**Cylinder gas tolerances based on NO only**

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration  Contains 50.6 ppm SO2.

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

Auditor: Al Clark      Date: October 19, 2016

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



***APPENDIX IV***  
***ANALYTICAL RESULTS***

***VOCS SAMPLES***

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/Bonnyville/April 01, 2017	2653	Ambient Air	01-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040067	<b>REPORT CREATED:</b>	03-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040067-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17
17040067-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	14-Apr-17
17040067-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	14-Apr-17
17040067-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	14-Apr-17
17040067-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	14-Apr-17
17040067-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	14-Apr-17
17040067-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040067-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	14-Apr-17
17040067-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040067-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040067-001	1-Butene		0.05	ppbv	0.02	AC-058	14-Apr-17
17040067-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	1-Pentene		0.01	ppbv	0.01	AC-058	14-Apr-17
17040067-001	2,2,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	14-Apr-17
17040067-001	2,2-Dimethylbutane		0.01	ppbv	0.01	AC-058	14-Apr-17
17040067-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040067-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17

**Report certified by:** Krista Gegolick, Account Coordinator

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

**Date:** May-03-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/Bonnyville/April 01, 2017	2653	Ambient Air	01-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040067	<b>REPORT CREATED:</b>	03-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RD L	Method	Analysis Date
17040067-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040067-001	2-Methylheptane		0.01	ppbv	0.01	AC-058	14-Apr-17
17040067-001	2-Methylhexane		0.02	ppbv	0.01	AC-058	14-Apr-17
17040067-001	2-Methylpentane		0.12	ppbv	0.01	AC-058	14-Apr-17
17040067-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	3-Methylhexane		0.03	ppbv	0.02	AC-058	14-Apr-17
17040067-001	3-Methylpentane		0.05	ppbv	0.01	AC-058	14-Apr-17
17040067-001	Acetone		2.1	ppbv	0.4	AC-058	14-Apr-17
17040067-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	14-Apr-17
17040067-001	Benzene		0.13	ppbv	0.01	AC-058	14-Apr-17
17040067-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040067-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	Bromomethane	I	0.02	ppbv	0.01	AC-058	14-Apr-17
17040067-001	Carbon disulfide		0.36	ppbv	0.01	AC-058	14-Apr-17
17040067-001	Carbon tetrachloride	I	0.13	ppbv	0.01	AC-058	14-Apr-17
17040067-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	Chloroform	I	0.03	ppbv	0.02	AC-058	14-Apr-17
17040067-001	Chloromethane		0.59	ppbv	0.02	AC-058	14-Apr-17
17040067-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040067-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17
17040067-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	Cyclohexane		0.04	ppbv	0.02	AC-058	14-Apr-17

**Report certified by:** Krista Gegolick, Account Coordinator

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

**Date:** May-03-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/Bonnyville/April 01, 2017	2653	Ambient Air	01-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040067	<b>REPORT CREATED:</b>	03-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040067-001	Cyclopentane		0.02	ppbv	0.01	AC-058	14-Apr-17
17040067-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040067-001	Ethanol		0.9	ppbv	0.3	AC-058	14-Apr-17
17040067-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040067-001	Ethylbenzene		0.02	ppbv	0.01	AC-058	14-Apr-17
17040067-001	Freon-11	I	0.29	ppbv	0.02	AC-058	14-Apr-17
17040067-001	Freon-113	I	0.13	ppbv	0.01	AC-058	14-Apr-17
17040067-001	Freon-114	I	0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	Freon-12		0.56	ppbv	0.02	AC-058	14-Apr-17
17040067-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	14-Apr-17
17040067-001	Isobutane		0.36	ppbv	0.02	AC-058	14-Apr-17
17040067-001	Isopentane		0.28	ppbv	0.03	AC-058	14-Apr-17
17040067-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040067-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040067-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040067-001	m,p-Xylene		0.06	ppbv	0.03	AC-058	14-Apr-17
17040067-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17
17040067-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	14-Apr-17
17040067-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	14-Apr-17
17040067-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	14-Apr-17
17040067-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040067-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	14-Apr-17
17040067-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	14-Apr-17
17040067-001	Methylcyclohexane		0.05	ppbv	0.01	AC-058	14-Apr-17
17040067-001	Methylcyclopentane		0.05	ppbv	0.02	AC-058	14-Apr-17

**Report certified by:** Krista Gegolick, Account Coordinator

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

**Date:** May-03-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/Bonnyville/April 01, 2017	2653	Ambient Air	01-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040067	<b>REPORT CREATED:</b>	03-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040067-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	14-Apr-17
17040067-001	n-Butane		0.71	ppbv	0.03	AC-058	14-Apr-17
17040067-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	14-Apr-17
17040067-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040067-001	n-Heptane		0.04	ppbv	0.01	AC-058	14-Apr-17
17040067-001	n-Hexane		0.07	ppbv	0.01	AC-058	14-Apr-17
17040067-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	n-Pentane		0.2	ppbv	0.1	AC-058	14-Apr-17
17040067-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	14-Apr-17
17040067-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	14-Apr-17
17040067-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	14-Apr-17
17040067-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040067-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040067-001	o-Xylene		0.02	ppbv	0.01	AC-058	14-Apr-17
17040067-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17
17040067-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	14-Apr-17
17040067-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17
17040067-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17
17040067-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Apr-17
17040067-001	Toluene		0.09	ppbv	0.01	AC-058	14-Apr-17
17040067-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040067-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17
17040067-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Apr-17
17040067-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Apr-17
17040067-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Apr-17

**Report certified by:** Krista Gegolick, Account Coordinator

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

**Date:** May-03-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca



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**ENVIRONMENTAL ANALYTICAL SERVICES**

TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/Bonnyville/April 01, 2017	2653	Ambient Air	01-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040067	<b>REPORT CREATED:</b>	03-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040067-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Apr-17
17040067-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Apr-17

<b>Report certified by:</b>	Krista Gegolick, Account Coordinator	<b>On behalf of:</b>	PJ Pretorius, Manager, Analysis and Testing Services
<b>Date:</b>	May-03-17	<b>Inquiries:</b>	(780) 632 8455
		<b>E-mail:</b>	EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/Bonnyville/Apr 7, 2017	2660	Ambient Air	07-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040132	<b>REPORT CREATED:</b>	16-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040132-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Apr-17
17040132-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Apr-17
17040132-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	25-Apr-17
17040132-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Apr-17
17040132-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Apr-17
17040132-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	25-Apr-17
17040132-001	1,2-Dichloropropane	I	0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Apr-17
17040132-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Apr-17
17040132-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Apr-17
17040132-001	1-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	2,2,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	25-Apr-17
17040132-001	2,2-Dimethylbutane		0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	2,3-Dimethylbutane		0.03	ppbv	0.02	AC-058	25-Apr-17
17040132-001	2,3-Dimethylpentane		0.02	ppbv	0.02	AC-058	25-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca



<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/Bonnyville/Apr 7, 2017	2660	Ambient Air	07-Apr-17	0:00
<b>DESCRIPTION:</b>	Bonnyville - AER			
<b>REPORT NUMBER:</b>	17040132	<b>REPORT CREATED:</b>	16-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RD L	Method	Analysis Date
17040132-001	2,4-Dimethylpentane		0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	2-Methylheptane		0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	2-Methylpentane		0.06	ppbv	0.01	AC-058	25-Apr-17
17040132-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	3-Methylhexane		0.03	ppbv	0.02	AC-058	25-Apr-17
17040132-001	3-Methylpentane		0.04	ppbv	0.01	AC-058	25-Apr-17
17040132-001	Acetone		4.1	ppbv	0.4	AC-058	25-Apr-17
17040132-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Apr-17
17040132-001	Benzene		0.10	ppbv	0.01	AC-058	25-Apr-17
17040132-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Apr-17
17040132-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	Bromomethane	I	0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	25-Apr-17
17040132-001	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	25-Apr-17
17040132-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	Chloroform	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	Chloromethane		0.60	ppbv	0.02	AC-058	25-Apr-17
17040132-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Apr-17
17040132-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	Cyclohexane		0.06	ppbv	0.02	AC-058	25-Apr-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Tuesday, May 16, 2017

Inquiries: (780) 632 8455

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<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/Bonnyville/Apr 7, 2017	2660	Ambient Air	07-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040132	<b>REPORT CREATED:</b>	16-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040132-001	Cyclopentane		0.03	ppbv	0.01	AC-058	25-Apr-17
17040132-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	Ethanol		2.3	ppbv	0.3	AC-058	25-Apr-17
17040132-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Apr-17
17040132-001	Ethylbenzene		0.02	ppbv	0.01	AC-058	25-Apr-17
17040132-001	Freon-11	I	0.22	ppbv	0.02	AC-058	25-Apr-17
17040132-001	Freon-113	I	0.09	ppbv	0.01	AC-058	25-Apr-17
17040132-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	Freon-12		0.42	ppbv	0.02	AC-058	25-Apr-17
17040132-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Apr-17
17040132-001	Isobutane		0.93	ppbv	0.02	AC-058	25-Apr-17
17040132-001	Isopentane		0.46	ppbv	0.03	AC-058	25-Apr-17
17040132-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	Isopropyl alcohol		0.4	ppbv	0.4	AC-058	25-Apr-17
17040132-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	m,p-Xylene		0.05	ppbv	0.03	AC-058	25-Apr-17
17040132-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Apr-17
17040132-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	25-Apr-17
17040132-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Apr-17
17040132-001	Methyl ethyl ketone		0.5	ppbv	0.3	AC-058	25-Apr-17
17040132-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Apr-17
17040132-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Apr-17
17040132-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Apr-17
17040132-001	Methylcyclohexane		0.09	ppbv	0.01	AC-058	25-Apr-17
17040132-001	Methylcyclopentane		0.07	ppbv	0.02	AC-058	25-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/Bonnyville/Apr 7, 2017	2660	Ambient Air	07-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040132	<b>REPORT CREATED:</b>	16-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040132-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Apr-17
17040132-001	n-Butane		0.78	ppbv	0.03	AC-058	25-Apr-17
17040132-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	25-Apr-17
17040132-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Apr-17
17040132-001	n-Heptane		0.03	ppbv	0.01	AC-058	25-Apr-17
17040132-001	n-Hexane		0.07	ppbv	0.01	AC-058	25-Apr-17
17040132-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	n-Pentane		0.3	ppbv	0.1	AC-058	25-Apr-17
17040132-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Apr-17
17040132-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Apr-17
17040132-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Apr-17
17040132-001	n-Nonane		0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	o-Xylene		0.02	ppbv	0.01	AC-058	25-Apr-17
17040132-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Apr-17
17040132-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Apr-17
17040132-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Apr-17
17040132-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Apr-17
17040132-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Apr-17
17040132-001	Toluene		0.11	ppbv	0.01	AC-058	25-Apr-17
17040132-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Apr-17
17040132-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

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# ENVIRONMENTAL ANALYTICAL SERVICES

## TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/VOC/Bonnyville/Apr 7, 2017	2660	Ambient Air	07-Apr-17	0:00
<b>DESCRIPTION:</b>	Bonnyville - AER			
<b>REPORT NUMBER:</b>	17040132	<b>REPORT CREATED:</b>	16-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040132-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	25-Apr-17
17040132-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	25-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

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<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/Bonnyville/Apr 13, 2017	14988	Ambient Air	13-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040201	<b>REPORT CREATED:</b>	16-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040201-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	27-Apr-17
17040201-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	27-Apr-17
17040201-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	27-Apr-17
17040201-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	27-Apr-17
17040201-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	27-Apr-17
17040201-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	27-Apr-17
17040201-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	27-Apr-17
17040201-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	27-Apr-17
17040201-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	27-Apr-17
17040201-001	1-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	2,2,4-Trimethylpentane		0.03	ppbv	0.01	AC-058	27-Apr-17
17040201-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	2,3-Dimethylbutane		0.03	ppbv	0.02	AC-058	27-Apr-17
17040201-001	2,3-Dimethylpentane		0.03	ppbv	0.02	AC-058	27-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/Bonnyville/Apr 13, 2017	14988	Ambient Air	13-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040201	<b>REPORT CREATED:</b>	16-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040201-001	2,4-Dimethylpentane		0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	2-Methylpentane		0.11	ppbv	0.01	AC-058	27-Apr-17
17040201-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	3-Methylhexane		0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	3-Methylpentane		0.12	ppbv	0.01	AC-058	27-Apr-17
17040201-001	Acetone		3.0	ppbv	0.4	AC-058	27-Apr-17
17040201-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	27-Apr-17
17040201-001	Benzene		0.06	ppbv	0.01	AC-058	27-Apr-17
17040201-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	27-Apr-17
17040201-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	Bromomethane	I	0.02	ppbv	0.01	AC-058	27-Apr-17
17040201-001	Carbon disulfide	I	0.04	ppbv	0.01	AC-058	27-Apr-17
17040201-001	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	27-Apr-17
17040201-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	Chloroform	I	0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	Chloromethane		0.64	ppbv	0.02	AC-058	27-Apr-17
17040201-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	27-Apr-17
17040201-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17

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<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/Bonnyville/Apr 13, 2017	14988	Ambient Air	13-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040201	<b>REPORT CREATED:</b>	16-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040201-001	Cyclopentane		0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	Ethanol		1.5	ppbv	0.3	AC-058	27-Apr-17
17040201-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	27-Apr-17
17040201-001	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	Freon-11	I	0.26	ppbv	0.02	AC-058	27-Apr-17
17040201-001	Freon-113	I	0.10	ppbv	0.01	AC-058	27-Apr-17
17040201-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	Freon-12		0.47	ppbv	0.02	AC-058	27-Apr-17
17040201-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	27-Apr-17
17040201-001	Isobutane		0.39	ppbv	0.02	AC-058	27-Apr-17
17040201-001	Isopentane		0.38	ppbv	0.03	AC-058	27-Apr-17
17040201-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	27-Apr-17
17040201-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	27-Apr-17
17040201-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	27-Apr-17
17040201-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	27-Apr-17
17040201-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	27-Apr-17
17040201-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	27-Apr-17
17040201-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	27-Apr-17
17040201-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	27-Apr-17
17040201-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	27-Apr-17
17040201-001	Methylcyclohexane		0.03	ppbv	0.01	AC-058	27-Apr-17
17040201-001	Methylcyclopentane		0.09	ppbv	0.02	AC-058	27-Apr-17

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<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/Bonnyville/Apr 13, 2017	14988	Ambient Air	13-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040201	<b>REPORT CREATED:</b>	16-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040201-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	27-Apr-17
17040201-001	n-Butane		0.99	ppbv	0.03	AC-058	27-Apr-17
17040201-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	27-Apr-17
17040201-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	27-Apr-17
17040201-001	n-Heptane		0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	n-Hexane		0.23	ppbv	0.01	AC-058	27-Apr-17
17040201-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	n-Pentane		0.2	ppbv	0.1	AC-058	27-Apr-17
17040201-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	27-Apr-17
17040201-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	27-Apr-17
17040201-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	27-Apr-17
17040201-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	27-Apr-17
17040201-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	27-Apr-17
17040201-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	27-Apr-17
17040201-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	27-Apr-17
17040201-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	27-Apr-17
17040201-001	Toluene		0.14	ppbv	0.01	AC-058	27-Apr-17
17040201-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	27-Apr-17
17040201-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	27-Apr-17
17040201-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	27-Apr-17
17040201-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	27-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

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**ENVIRONMENTAL ANALYTICAL SERVICES**

TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/VOC/Bonnyville/Apr 13, 2017	14988	Ambient Air	13-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040201	<b>REPORT CREATED:</b>	16-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040201-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	27-Apr-17
17040201-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	27-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

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<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
.ICA/VOC/Bonnyville/Apr 19, 2017	6108	Ambient Air	19-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040252	<b>REPORT CREATED:</b>	23-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040252-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17
17040252-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	08-May-17
17040252-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	08-May-17
17040252-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	08-May-17
17040252-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	08-May-17
17040252-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	08-May-17
17040252-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	08-May-17
17040252-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040252-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040252-001	1-Butene		0.04	ppbv	0.02	AC-058	08-May-17
17040252-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	1-Pentene		0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	2,3-Dimethylbutane		0.04	ppbv	0.02	AC-058	08-May-17
17040252-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 23, 2017

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
.ICA/VOC/Bonnyville/Apr 19, 2017	6108	Ambient Air	19-Apr-17	0:00
<b>DESCRIPTION:</b>	Bonnyville - AER			
<b>REPORT NUMBER:</b>	17040252	<b>REPORT CREATED:</b>	23-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040252-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	2-Methylhexane		0.04	ppbv	0.01	AC-058	08-May-17
17040252-001	2-Methylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	3-Methylhexane		0.03	ppbv	0.02	AC-058	08-May-17
17040252-001	3-Methylpentane		0.02	ppbv	0.01	AC-058	08-May-17
17040252-001	Acetone		2.7	ppbv	0.4	AC-058	08-May-17
17040252-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	08-May-17
17040252-001	Benzene		0.10	ppbv	0.01	AC-058	08-May-17
17040252-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040252-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	Carbon disulfide	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	08-May-17
17040252-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	Chloroform	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	Chloromethane		0.55	ppbv	0.02	AC-058	08-May-17
17040252-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17
17040252-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	Cyclohexane		0.56	ppbv	0.02	AC-058	08-May-17

<b>Report certified by:</b>	Rebecca Holgate, Account Coordinator	<b>On behalf of:</b>	PJ Pretorius, Manager, Analysis and Testing Services
<b>Date:</b>	Tuesday, May 23, 2017	<b>Inquiries:</b>	(780) 632 8455
		<b>E-mail:</b>	EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
.ICA/VOC/Bonnyville/Apr 19, 2017	6108	Ambient Air	19-Apr-17	0:00
<b>DESCRIPTION:</b>	Bonnyville - AER			
<b>REPORT NUMBER:</b>	17040252	<b>REPORT CREATED:</b>	23-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040252-001	Cyclopentane		0.02	ppbv	0.01	AC-058	08-May-17
17040252-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	Ethanol		0.9	ppbv	0.3	AC-058	08-May-17
17040252-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040252-001	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	Freon-11	I	0.26	ppbv	0.02	AC-058	08-May-17
17040252-001	Freon-113	I	0.09	ppbv	0.01	AC-058	08-May-17
17040252-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	Freon-12		0.43	ppbv	0.02	AC-058	08-May-17
17040252-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	08-May-17
17040252-001	Isobutane		0.39	ppbv	0.02	AC-058	08-May-17
17040252-001	Isopentane		0.33	ppbv	0.03	AC-058	08-May-17
17040252-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040252-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	08-May-17
17040252-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17
17040252-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	08-May-17
17040252-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	08-May-17
17040252-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	08-May-17
17040252-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040252-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	08-May-17
17040252-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	08-May-17
17040252-001	Methylcyclohexane		0.03	ppbv	0.01	AC-058	08-May-17
17040252-001	Methylcyclopentane		0.03	ppbv	0.02	AC-058	08-May-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 23, 2017

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
.ICA/VOC/Bonnyville/Apr 19, 2017	6108	Ambient Air	19-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040252	<b>REPORT CREATED:</b>	23-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040252-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	08-May-17
17040252-001	n-Butane		0.60	ppbv	0.03	AC-058	08-May-17
17040252-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	08-May-17
17040252-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040252-001	n-Heptane		0.02	ppbv	0.01	AC-058	08-May-17
17040252-001	n-Hexane		0.03	ppbv	0.01	AC-058	08-May-17
17040252-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	n-Pentane		0.1	ppbv	0.1	AC-058	08-May-17
17040252-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	08-May-17
17040252-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	08-May-17
17040252-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	08-May-17
17040252-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	o-Xylene		0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17
17040252-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	08-May-17
17040252-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17
17040252-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17
17040252-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	08-May-17
17040252-001	Toluene		0.05	ppbv	0.01	AC-058	08-May-17
17040252-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17
17040252-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-May-17
17040252-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-May-17
17040252-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-May-17

<b>Report certified by:</b>	Rebecca Holgate, Account Coordinator	<b>On behalf of:</b>	PJ Pretorius, Manager, Analysis and Testing Services
<b>Date:</b>	Tuesday, May 23, 2017	<b>Inquiries:</b>	(780) 632 8455
		<b>E-mail:</b>	EAS.Results@innotechalberta.ca



PO Bag 4000  
 Vegreville, Alberta  
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 (780) 632-8211

# ENVIRONMENTAL ANALYTICAL SERVICES

## TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
.ICA/VOC/Bonnyville/Apr 19, 2017	6108	Ambient Air	19-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040252	<b>REPORT CREATED:</b>	23-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040252-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	08-May-17
17040252-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	08-May-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 23, 2017

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>GROUP SAMPLE ID</b>	<b>Matrix</b>	<b>PROJECT NUMBER</b>	<b>STATION ID</b>	<b>SAMPLER ID</b>
.ICA/VOC/Bonnyville/Apr 25, 2017		Ambient Air			AY
<b>DATE SAMPLED:</b>	25-Apr-17 0:00	<b>STATION DESCRIPTION:</b>			
<b>REPORT NUMBER:</b>	17040271	<b>REPORT CREATED:</b>	23-May-17	<b>VERSION:</b>	Version 01
<b>AGENCY:</b>		<b>MATRIX:</b>	<b>TYPE:</b>	<b>COLLECTION:</b>	

Lab ID	Parameter	Qualifier	Result	Units	RDL	VMV	Method	Analysis Date
17040271-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04		AC-058	08-May-17
17040271-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05		AC-058	08-May-17
17040271-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8		AC-058	08-May-17
17040271-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05		AC-058	08-May-17
17040271-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03		AC-058	08-May-17
17040271-001	1,2-Dichloroethane	I	0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3		AC-058	08-May-17
17040271-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4		AC-058	08-May-17
17040271-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4		AC-058	08-May-17
17040271-001	1-Butene	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	2,2,4-Trimethylpentane		0.04	ppbv	0.01		AC-058	08-May-17
17040271-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-23-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>GROUP SAMPLE ID</b>	<b>Matrix</b>	<b>PROJECT NUMBER</b>	<b>STATION ID</b>	<b>SAMPLER ID</b>
.ICA/VOC/Bonnyville/Apr 25, 2017		Ambient Air			AY
<b>DATE SAMPLED:</b>	25-Apr-17 0:00	<b>STATION DESCRIPTION:</b>			
<b>REPORT NUMBER:</b>	17040271	<b>REPORT CREATED:</b>	23-May-17	<b>VERSION:</b>	Version 01
<b>AGENCY:</b>		<b>MATRIX:</b>	<b>TYPE:</b>	<b>COLLECTION:</b>	

Lab ID	Parameter	Qualifier	Result	Units	RDL	VMV	Method	Analysis Date
17040271-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	2-Methylhexane		0.04	ppbv	0.01		AC-058	08-May-17
17040271-001	2-Methylpentane	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	3-Methylhexane		0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	3-Methylpentane		0.02	ppbv	0.01		AC-058	08-May-17
17040271-001	Acetone		1.4	ppbv	0.4		AC-058	08-May-17
17040271-001	Acrolein	K, T, U	< 0.3	ppbv	0.3		AC-058	08-May-17
17040271-001	Benzene		0.07	ppbv	0.01		AC-058	08-May-17
17040271-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4		AC-058	08-May-17
17040271-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	Bromoform	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	Carbon disulfide	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	Carbon tetrachloride	I	0.07	ppbv	0.01		AC-058	08-May-17
17040271-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	Chloroform	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	Chloromethane		0.48	ppbv	0.02		AC-058	08-May-17
17040271-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04		AC-058	08-May-17
17040271-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: May-23-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



<b>CLIENT SAMPLE ID</b>	<b>GROUP SAMPLE ID</b>	<b>Matrix</b>	<b>PROJECT NUMBER</b>	<b>STATION ID</b>	<b>SAMPLER ID</b>
.ICA/VOC/Bonnyville/Apr 25, 2017		Ambient Air			AY
<b>DATE SAMPLED:</b>	25-Apr-17 0:00	<b>STATION DESCRIPTION:</b>			
<b>REPORT NUMBER:</b>	17040271	<b>REPORT CREATED:</b>	23-May-17	<b>VERSION:</b>	Version 01
<b>AGENCY:</b>		<b>MATRIX:</b>	<b>TYPE:</b>	<b>COLLECTION:</b>	

Lab ID	Parameter	Qualifier	Result	Units	RDL	VMV	Method	Analysis Date
17040271-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	Cyclohexane		0.37	ppbv	0.02		AC-058	08-May-17
17040271-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	Ethanol		0.8	ppbv	0.3		AC-058	08-May-17
17040271-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4		AC-058	08-May-17
17040271-001	Ethylbenzene		0.03	ppbv	0.01		AC-058	08-May-17
17040271-001	Freon-11	I	0.21	ppbv	0.02		AC-058	08-May-17
17040271-001	Freon-113	I	0.07	ppbv	0.01		AC-058	08-May-17
17040271-001	Freon-114	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	Freon-12		0.37	ppbv	0.02		AC-058	08-May-17
17040271-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50		AC-058	08-May-17
17040271-001	Isobutane		0.08	ppbv	0.02		AC-058	08-May-17
17040271-001	Isopentane		0.11	ppbv	0.03		AC-058	08-May-17
17040271-001	Isoprene	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4		AC-058	08-May-17
17040271-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	m,p-Xylene		0.05	ppbv	0.03		AC-058	08-May-17
17040271-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04		AC-058	08-May-17
17040271-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08		AC-058	08-May-17
17040271-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50		AC-058	08-May-17
17040271-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3		AC-058	08-May-17
17040271-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4		AC-058	08-May-17
17040271-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07		AC-058	08-May-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-23-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>GROUP SAMPLE ID</b>	<b>Matrix</b>	<b>PROJECT NUMBER</b>	<b>STATION ID</b>	<b>SAMPLER ID</b>
.ICA/VOC/Bonnyville/Apr 25, 2017		Ambient Air			AY
<b>DATE SAMPLED:</b>	25-Apr-17 0:00	<b>STATION DESCRIPTION:</b>			
<b>REPORT NUMBER:</b>	17040271	<b>REPORT CREATED:</b>	23-May-17	<b>VERSION:</b>	Version 01
<b>AGENCY:</b>		<b>MATRIX:</b>	<b>TYPE:</b>	<b>COLLECTION:</b>	

Lab ID	Parameter	Qualifier	Result	Units	RDL	VMV	Method	Analysis Date
17040271-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03		AC-058	08-May-17
17040271-001	Methylcyclohexane		0.03	ppbv	0.01		AC-058	08-May-17
17040271-001	Methylcyclopentane		0.03	ppbv	0.02		AC-058	08-May-17
17040271-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3		AC-058	08-May-17
17040271-001	n-Butane		0.12	ppbv	0.03		AC-058	08-May-17
17040271-001	n-Decane	K, T, U	< 0.06	ppbv	0.06		AC-058	08-May-17
17040271-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4		AC-058	08-May-17
17040271-001	n-Heptane		0.02	ppbv	0.01		AC-058	08-May-17
17040271-001	n-Hexane		0.02	ppbv	0.01		AC-058	08-May-17
17040271-001	n-Octane	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	n-Pentane	K, T, U	< 0.1	ppbv	0.1		AC-058	08-May-17
17040271-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05		AC-058	08-May-17
17040271-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5		AC-058	08-May-17
17040271-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5		AC-058	08-May-17
17040271-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	o-Xylene		0.02	ppbv	0.01		AC-058	08-May-17
17040271-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04		AC-058	08-May-17
17040271-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07		AC-058	08-May-17
17040271-001	Styrene	K, T, U	< 0.04	ppbv	0.04		AC-058	08-May-17
17040271-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04		AC-058	08-May-17
17040271-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4		AC-058	08-May-17
17040271-001	Toluene		0.10	ppbv	0.01		AC-058	08-May-17
17040271-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-23-17

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# ENVIRONMENTAL ANALYTICAL SERVICES

## TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>GROUP SAMPLE ID</b>	<b>Matrix</b>	<b>PROJECT NUMBER</b>	<b>STATION ID</b>	<b>SAMPLER ID</b>
.ICA/VOC/Bonnyville/Apr 25, 2017		Ambient Air			AY
<b>DATE SAMPLED:</b>	25-Apr-17 0:00	<b>STATION DESCRIPTION:</b>			
<b>REPORT NUMBER:</b>	17040271	<b>REPORT CREATED:</b>	23-May-17	<b>VERSION:</b>	Version 01
<b>AGENCY:</b>		<b>MATRIX:</b>	<b>TYPE:</b>	<b>COLLECTION:</b>	

Lab ID	Parameter	Qualifier	Result	Units	RDL	VMV	Method	Analysis Date
17040271-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04		AC-058	08-May-17
17040271-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01		AC-058	08-May-17
17040271-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17
17040271-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04		AC-058	08-May-17
17040271-001	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4		AC-058	08-May-17
17040271-001	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02		AC-058	08-May-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-23-17

**Inquiries:** (780) 632 8455

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***PAHS SAMPLES***

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/PUF/Bonnyville/April 01, 2017	TE08	Air Filter	01-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040067	<b>REPORT CREATED:</b>	03-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040067-002	1-Methylnaphthalene		0.02 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	2-Methylnaphthalene		0.04 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Acenaphthene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Acenaphthylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Benzo(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Benzo(a)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Benzo(e)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Chrysene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Fluoranthene		0.03 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Fluorene		0.04 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Naphthalene		0.02 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Phenanthrene		0.12 ug/Filter	0.01	NA-017	13-Apr-17

<b>Report certified by:</b>	Krista Gegolick, Account Coordinator	<b>On behalf of:</b>	PJ Pretorius, Manager, Analysis and Testing Services
<b>Date:</b>	May-03-17	<b>Inquiries:</b>	(780) 632 8455
		<b>E-mail:</b>	EAS.Results@innotechalberta.ca



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# ENVIRONMENTAL ANALYTICAL SERVICES

## TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/PUF/Bonnyville/April 01, 2017	TE08	Air Filter	01-Apr-17	0:00
<b>DESCRIPTION:</b>	Bonnyville - AER			
<b>REPORT NUMBER:</b>	17040067	<b>REPORT CREATED:</b>	03-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040067-002	Pyrene		0.03 ug/Filter	0.01	NA-017	13-Apr-17
17040067-002	Retene		0.02 ug/Filter	0.01	NA-017	13-Apr-17

**Report certified by:** Krista Gegolick, Account Coordinator

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

**Date:** May-03-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/PUF/Bonnyville/Apr 7, 2017	TE-03	Air Filter	07-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040132	<b>REPORT CREATED:</b>	16-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040132-002	1-Methylnaphthalene		0.03 ug/Filter	0.01	NA-017	13-May-17
17040132-002	2-Methylnaphthalene		0.05 ug/Filter	0.01	NA-017	13-May-17
17040132-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Acenaphthene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Acenaphthylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Anthracene		0.02 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Benzo(a)anthracene		0.02 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Benzo(a)pyrene		0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Benzo(b,j,k)fluoranthene		0.02 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Benzo(e)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Chrysene		0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Dibenzo(ah)anthracene		0.02 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Fluoranthene		0.04 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Fluorene		0.05 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Naphthalene		0.03 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040132-002	Phenanthrene		0.14 ug/Filter	0.01	NA-017	13-May-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

**Inquiries:** (780) 632 8455

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**ENVIRONMENTAL ANALYTICAL SERVICES**

TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
LICA/PUF/Bonnyville/Apr 7, 2017	TE-03	Air Filter	07-Apr-17	0:00
<b>DESCRIPTION:</b>	Bonnyville - AER			
<b>REPORT NUMBER:</b>	17040132	<b>REPORT CREATED:</b>	16-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040132-002	Pyrene		0.03	ug/Filter	0.01	NA-017	13-May-17
17040132-002	Retene		0.02	ug/Filter	0.01	NA-017	13-May-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

**Inquiries:** (780) 632 8455

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# ENVIRONMENTAL ANALYTICAL SERVICES

## TEST REPORT

<b>RESULTS:</b> Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE  Calgary AB T2E 6P8	<b>CLIENT SAMPLE ID</b> ICA/PUF/Bonnyville/Apr 13, 2017	<b>CANISTER ID</b> TE-06	<b>Matrix</b> Air Filter	<b>Priority</b> Normal
	<b>DESCRIPTION:</b> Bonnyville - AER			
<b>INVOICE:</b> Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	<b>DATE SAMPLED:</b> 13-Apr-17	0:00	<b>DATE RECEIVED:</b> 20-Apr-17	
	<b>REPORT CREATED:</b> 16-May-17		<b>REPORT NUMBER:</b> 17040201	
			<b>VERSION:</b> Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040201-002	1-Methylnaphthalene		0.03	ug/Filter	0.01	NA-017	13-May-17
17040201-002	2-Methylnaphthalene		0.06	ug/Filter	0.01	NA-017	13-May-17
17040201-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040201-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040201-002	Acenaphthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040201-002	Acenaphthylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040201-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040201-002	Anthracene		0.02	ug/Filter	0.01	NA-017	13-May-17
17040201-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040201-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040201-002	Benzo(b,j,k)fluoranthene		0.01	ug/Filter	0.01	NA-017	13-May-17
17040201-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040201-002	Benzo(e)pyrene		0.01	ug/Filter	0.01	NA-017	13-May-17
17040201-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040201-002	Chrysene		0.01	ug/Filter	0.01	NA-017	13-May-17
17040201-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040201-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040201-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/PUF/Bonnyville/Apr 13, 2017	TE-06	Air Filter	13-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040201	<b>REPORT CREATED:</b>	16-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17040201-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040201-002	Fluoranthene		0.05 ug/Filter	0.01	NA-017	13-May-17
17040201-002	Fluorene		0.04 ug/Filter	0.01	NA-017	13-May-17
17040201-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040201-002	Naphthalene		0.06 ug/Filter	0.01	NA-017	13-May-17
17040201-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	13-May-17
17040201-002	Phenanthrene		0.12 ug/Filter	0.01	NA-017	13-May-17
17040201-002	Pyrene		0.03 ug/Filter	0.01	NA-017	13-May-17
17040201-002	Retene		0.01 ug/Filter	0.01	NA-017	13-May-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

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# ENVIRONMENTAL ANALYTICAL SERVICES

## TEST REPORT

<b>RESULTS:</b> Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE  Calgary AB T2E 6P8	<b>CLIENT SAMPLE ID</b> .ICA/PUF/Bonnyville/Apr 19, 2017	<b>CANISTER ID</b> TE-07	<b>Matrix</b> Air Filter	<b>Priority</b> Normal
	<b>DESCRIPTION:</b> Bonnyville - AER			
<b>INVOICE:</b> Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	<b>DATE SAMPLED:</b> 19-Apr-17	0:00	<b>DATE RECEIVED:</b> 26-Apr-17	
	<b>REPORT CREATED:</b> 23-May-17		<b>REPORT NUMBER:</b> 17040252	
			<b>VERSION:</b> Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040252-002	1-Methylnaphthalene		0.15	ug/Filter	0.01	NA-017	13-May-17
17040252-002	2-Methylnaphthalene		0.24	ug/Filter	0.01	NA-017	13-May-17
17040252-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Acenaphthene		0.04	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Acenaphthylene		0.02	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Anthracene		0.02	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Chrysene		0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 23, 2017

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca



PO Bag 4000  
 Vegreville, Alberta  
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**ENVIRONMENTAL ANALYTICAL SERVICES**

TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
LICA/PUF/Bonnyville/Apr 19, 2017	TE-07	Air Filter	19-Apr-17 0:00
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040252	<b>REPORT CREATED:</b>	23-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040252-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Fluoranthene		0.05	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Fluorene		0.09	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Naphthalene		0.09	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Phenanthrene		0.19	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Pyrene		0.05	ug/Filter	0.01	NA-017	13-May-17
17040252-002	Retene		0.08	ug/Filter	0.01	NA-017	13-May-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 23, 2017

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**E-mail:** EAS.Results@innotechalberta.ca

<b>RESULTS:</b> Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE  Calgary AB T2E 6P8	<b>CLIENT SAMPLE ID</b>	<b>GROUP SAMPLE ID</b>	<b>PROJECT NUMBER</b>
	<b>STATION ID</b>	<b>SAMPLER ID</b>	<b>Matrix</b>
<b>INVOICE:</b> Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	<b>STATION DESCRIPTION:</b> DATE SAMPLED: 25-Apr-17 0:00 REPORT CREATED: 23-May-17		AY Air Filter  DATE RECEIVED: 28-Apr-17 REPORT NUMBER: 17040271 VERSION: Version 01
	<b>AGENCY</b>	<b>MATRIX</b>	<b>TYPE</b>
			<b>COLLECTION</b>

Lab ID	Parameter	Qualifier	Result Units	RDL	VMV	Method	Analysis Date
17040271-002	1-Methylnaphthalene		0.10 ug/Filter	0.01		NA-017	14-May-17
17040271-002	2-Methylnaphthalene		0.17 ug/Filter	0.01		NA-017	14-May-17
17040271-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01		NA-017	14-May-17
17040271-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01		NA-017	14-May-17
17040271-002	Acenaphthene		0.05 ug/Filter	0.01		NA-017	14-May-17
17040271-002	Acenaphthylene		0.02 ug/Filter	0.01		NA-017	14-May-17
17040271-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01		NA-017	14-May-17
17040271-002	Anthracene		0.02 ug/Filter	0.01		NA-017	14-May-17
17040271-002	Benzo(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01		NA-017	14-May-17
17040271-002	Benzo(a)pyrene	K, T, U	< 0.01 ug/Filter	0.01		NA-017	14-May-17
17040271-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01 ug/Filter	0.01		NA-017	14-May-17
17040271-002	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/Filter	0.01		NA-017	14-May-17
17040271-002	Benzo(e)pyrene	K, T, U	< 0.01 ug/Filter	0.01		NA-017	14-May-17
17040271-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01		NA-017	14-May-17
17040271-002	Chrysene	K, T, U	< 0.01 ug/Filter	0.01		NA-017	14-May-17
17040271-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01		NA-017	14-May-17
17040271-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01		NA-017	14-May-17
17040271-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01		NA-017	14-May-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: May-23-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>GROUP SAMPLE ID</b>	<b>Matrix</b>	<b>PROJECT NUMBER</b>	<b>STATION ID</b>	<b>SAMPLER ID</b>
.ICA/PUF/Bonnyville/Apr 25, 2017		Air Filter			AY
<b>DATE SAMPLED:</b>	25-Apr-17 0:00	<b>STATION DESCRIPTION:</b>			
<b>REPORT NUMBER:</b>	17040271	<b>REPORT CREATED:</b>	23-May-17	<b>VERSION:</b>	Version 01
<b>AGENCY:</b>		<b>MATRIX:</b>	<b>TYPE:</b>	<b>COLLECTION:</b>	

Lab ID	Parameter	Qualifier	Result	Units	RDL	VMV	Method	Analysis Date
17040271-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01		NA-017	14-May-17
17040271-002	Fluoranthene		0.05	ug/Filter	0.01		NA-017	14-May-17
17040271-002	Fluorene		0.07	ug/Filter	0.01		NA-017	14-May-17
17040271-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01		NA-017	14-May-17
17040271-002	Naphthalene		0.06	ug/Filter	0.01		NA-017	14-May-17
17040271-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01		NA-017	14-May-17
17040271-002	Phenanthrene		0.16	ug/Filter	0.01		NA-017	14-May-17
17040271-002	Pyrene		0.06	ug/Filter	0.01		NA-017	14-May-17
17040271-002	Retene		0.03	ug/Filter	0.01		NA-017	14-May-17

**Report certified by:** Colleen McGerrigle, Account Coordinator

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

**Date:** May-23-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

***NMHC CANISTER SAMPLES***

<p><b>RESULTS:</b> Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p><b>INVOICE:</b> Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p><b>CLIENT SAMPLE ID</b> UICA/NMHC/Bonnyville/Apr 6, 2017</p> <p><b>CANISTER ID</b> S5669</p> <p><b>Matrix</b> Ambient Air</p> <p><b>Priority</b> Normal</p> <p><b>DESCRIPTION:</b> Bonnyville - AER</p> <p><b>DATE SAMPLED:</b> 06-Apr-17 19:45</p> <p><b>REPORT CREATED:</b> 16-May-17</p> <p><b>DATE RECEIVED:</b> 12-Apr-17</p> <p><b>REPORT NUMBER:</b> 17040132</p> <p><b>VERSION:</b> Version 01</p>
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Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040132-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-003	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Apr-17
17040132-003	1,2,3-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	25-Apr-17
17040132-003	1,2,4-Trichlorobenzene	K, T, U	< 1.0	ppbv	1.0	AC-058	25-Apr-17
17040132-003	1,2,4-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	25-Apr-17
17040132-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-003	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Apr-17
17040132-003	1,2-Dichloroethane	I	0.03	ppbv	0.01	AC-058	25-Apr-17
17040132-003	1,2-Dichloropropane	I	0.02	ppbv	0.01	AC-058	25-Apr-17
17040132-003	1,3,5-Trimethylbenzene		0.03	ppbv	0.02	AC-058	25-Apr-17
17040132-003	1,3-Butadiene	I	0.03	ppbv	0.02	AC-058	25-Apr-17
17040132-003	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Apr-17
17040132-003	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Apr-17
17040132-003	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Apr-17
17040132-003	1-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca



<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
.ICA/NMHC/Bonnyville/Apr 6, 2017	S5669	Ambient Air	06-Apr-17	19:45
<b>DESCRIPTION:</b>	Bonnyville - AER			
<b>REPORT NUMBER:</b>	17040132	<b>REPORT CREATED:</b>	16-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040132-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-003	1-Pentene		0.03	ppbv	0.01	AC-058	25-Apr-17
17040132-003	2,2,4-Trimethylpentane		0.07	ppbv	0.01	AC-058	25-Apr-17
17040132-003	2,2-Dimethylbutane		0.05	ppbv	0.01	AC-058	25-Apr-17
17040132-003	2,3,4-Trimethylpentane		0.04	ppbv	0.01	AC-058	25-Apr-17
17040132-003	2,3-Dimethylbutane		0.09	ppbv	0.02	AC-058	25-Apr-17
17040132-003	2,3-Dimethylpentane		0.08	ppbv	0.02	AC-058	25-Apr-17
17040132-003	2,4-Dimethylpentane		0.04	ppbv	0.01	AC-058	25-Apr-17
17040132-003	2-Methylheptane		0.04	ppbv	0.01	AC-058	25-Apr-17
17040132-003	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-003	2-Methylpentane		0.16	ppbv	0.01	AC-058	25-Apr-17
17040132-003	3-Methylheptane		0.03	ppbv	0.02	AC-058	25-Apr-17
17040132-003	3-Methylhexane		0.07	ppbv	0.02	AC-058	25-Apr-17
17040132-003	3-Methylpentane		0.11	ppbv	0.01	AC-058	25-Apr-17
17040132-003	Acetone		7.8	ppbv	0.5	AC-058	25-Apr-17
17040132-003	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Apr-17
17040132-003	Benzene		0.16	ppbv	0.01	AC-058	25-Apr-17
17040132-003	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Apr-17
17040132-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-003	Bromomethane	I	0.02	ppbv	0.01	AC-058	25-Apr-17
17040132-003	Carbon disulfide	I	0.04	ppbv	0.01	AC-058	25-Apr-17
17040132-003	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	25-Apr-17
17040132-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

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<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
.ICA/NMHC/Bonnyville/Apr 6, 2017	S5669	Ambient Air	06-Apr-17	19:45
<b>DESCRIPTION:</b>	Bonnyville - AER			
<b>REPORT NUMBER:</b>	17040132	<b>REPORT CREATED:</b>	16-May-17	<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040132-003	Chloroform	I	0.03	ppbv	0.02	AC-058	25-Apr-17
17040132-003	Chloromethane		0.64	ppbv	0.02	AC-058	25-Apr-17
17040132-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-003	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Apr-17
17040132-003	cis-2-Butene		0.04	ppbv	0.02	AC-058	25-Apr-17
17040132-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-003	Cyclohexane		0.16	ppbv	0.02	AC-058	25-Apr-17
17040132-003	Cyclopentane		0.08	ppbv	0.01	AC-058	25-Apr-17
17040132-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-003	Ethanol		3.5	ppbv	0.4	AC-058	25-Apr-17
17040132-003	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Apr-17
17040132-003	Ethylbenzene		0.05	ppbv	0.01	AC-058	25-Apr-17
17040132-003	Freon-11	I	0.24	ppbv	0.02	AC-058	25-Apr-17
17040132-003	Freon-113	I	0.11	ppbv	0.01	AC-058	25-Apr-17
17040132-003	Freon-114	I	0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-003	Freon-12		0.44	ppbv	0.02	AC-058	25-Apr-17
17040132-003	Hexachloro-1,3-butadiene	K, T, U	< 0.62	ppbv	0.62	AC-058	25-Apr-17
17040132-003	Isobutane		1.50	ppbv	0.02	AC-058	25-Apr-17
17040132-003	Isopentane		1.00	ppbv	0.04	AC-058	25-Apr-17
17040132-003	Isoprene		0.02	ppbv	0.01	AC-058	25-Apr-17
17040132-003	Isopropyl alcohol		0.7	ppbv	0.5	AC-058	25-Apr-17
17040132-003	Isopropylbenzene		0.02	ppbv	0.01	AC-058	25-Apr-17
17040132-003	m,p-Xylene		0.12	ppbv	0.04	AC-058	25-Apr-17
17040132-003	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Apr-17
17040132-003	m-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	25-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

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**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
.ICA/NMHC/Bonnyville/Apr 6, 2017	S5669	Ambient Air	06-Apr-17 19:45
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17040132	<b>REPORT CREATED:</b>	16-May-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040132-003	Methyl butyl ketone	K, T, U	< 0.62	ppbv	0.62	AC-058	25-Apr-17
17040132-003	Methyl ethyl ketone		0.5	ppbv	0.4	AC-058	25-Apr-17
17040132-003	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Apr-17
17040132-003	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	25-Apr-17
17040132-003	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Apr-17
17040132-003	Methylcyclohexane		0.20	ppbv	0.01	AC-058	25-Apr-17
17040132-003	Methylcyclopentane		0.19	ppbv	0.02	AC-058	25-Apr-17
17040132-003	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Apr-17
17040132-003	n-Butane		2.17	ppbv	0.04	AC-058	25-Apr-17
17040132-003	n-Decane	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Apr-17
17040132-003	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Apr-17
17040132-003	n-Heptane		0.07	ppbv	0.01	AC-058	25-Apr-17
17040132-003	n-Hexane		0.15	ppbv	0.01	AC-058	25-Apr-17
17040132-003	n-Octane		0.04	ppbv	0.02	AC-058	25-Apr-17
17040132-003	n-Pentane		0.5	ppbv	0.1	AC-058	25-Apr-17
17040132-003	n-Propylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	25-Apr-17
17040132-003	n-Undecane	K, T, U	< 0.6	ppbv	0.6	AC-058	25-Apr-17
17040132-003	Naphthalene	K, T, U	< 0.6	ppbv	0.6	AC-058	25-Apr-17
17040132-003	n-Nonane		0.03	ppbv	0.01	AC-058	25-Apr-17
17040132-003	o-Ethyltoluene	I	0.02	ppbv	0.01	AC-058	25-Apr-17
17040132-003	o-Xylene		0.05	ppbv	0.01	AC-058	25-Apr-17
17040132-003	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Apr-17
17040132-003	p-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	25-Apr-17
17040132-003	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Apr-17
17040132-003	Tetrachloroethylene	I	0.17	ppbv	0.05	AC-058	25-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

**Inquiries:** (780) 632 8455

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<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>	
.ICA/NMHC/Bonnyville/Apr 6, 2017	S5669	Ambient Air	06-Apr-17	19:45
<b>DESCRIPTION:</b> Bonnyville - AER				
<b>REPORT NUMBER:</b> 17040132	<b>REPORT CREATED:</b> 16-May-17	<b>VERSION:</b> Version 01		

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17040132-003	Tetrahydrofuran	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Apr-17
17040132-003	Toluene		0.22	ppbv	0.01	AC-058	25-Apr-17
17040132-003	trans-1,2-Dichloroethylene	I	0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-003	trans-1,3-Dichloropropylene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Apr-17
17040132-003	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Apr-17
17040132-003	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17
17040132-003	Trichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Apr-17
17040132-003	Vinyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Apr-17
17040132-003	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Apr-17

**Report certified by:** Rebecca Holgate, Account Coordinator

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

**Date:** Tuesday, May 16, 2017

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>RESULTS:</b> Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE  Calgary AB T2E 6P8	<b>CLIENT SAMPLE ID</b> /NMHC VOC/Bonnyville/Apr 28, 2017	<b>CANISTER ID</b> 2442	<b>Matrix</b> Ambient Air	<b>Priority</b> Normal
	<b>DESCRIPTION:</b> Bonnyville - AER			
<b>INVOICE:</b> Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	<b>DATE SAMPLED:</b> 28-Apr-17	6:50	<b>DATE RECEIVED:</b> 09-May-17	
	<b>REPORT CREATED:</b> 01-Jun-17		<b>REPORT NUMBER:</b> 17050060	
			<b>VERSION:</b> Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17050060-001	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	1,1-Dichloroethylene	K, T, U	< 0.06	ppbv	0.06	AC-058	10-May-17
17050060-001	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	10-May-17
17050060-001	1,2,4-Trichlorobenzene	K, T, U	< 1.1	ppbv	1.1	AC-058	10-May-17
17050060-001	1,2,4-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	10-May-17
17050060-001	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-May-17
17050060-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	10-May-17
17050060-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-May-17
17050060-001	1,3,5-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	1,3-Butadiene	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	10-May-17
17050060-001	1,4-Dichlorobenzene	K, T, U	< 0.6	ppbv	0.6	AC-058	10-May-17
17050060-001	1,4-Dioxane		0.8	ppbv	0.6	AC-058	10-May-17
17050060-001	1-Butene		0.07	ppbv	0.03	AC-058	10-May-17

**Report certified by:** Krista Gegolick, Account Coordinator

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

**Date:** June-01-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
√/NMHC VOC/Bonnyville/Apr 28, 2	2442	Ambient Air	28-Apr-17 6:50
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17050060	<b>REPORT CREATED:</b>	01-Jun-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17050060-001	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-May-17
17050060-001	2,2,4-Trimethylpentane		0.03	ppbv	0.01	AC-058	10-May-17
17050060-001	2,2-Dimethylbutane		0.04	ppbv	0.01	AC-058	10-May-17
17050060-001	2,3,4-Trimethylpentane		0.05	ppbv	0.01	AC-058	10-May-17
17050060-001	2,3-Dimethylbutane		0.15	ppbv	0.03	AC-058	10-May-17
17050060-001	2,3-Dimethylpentane		0.08	ppbv	0.03	AC-058	10-May-17
17050060-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-May-17
17050060-001	2-Methylheptane		0.03	ppbv	0.01	AC-058	10-May-17
17050060-001	2-Methylhexane		0.09	ppbv	0.01	AC-058	10-May-17
17050060-001	2-Methylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-May-17
17050060-001	3-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	3-Methylhexane		0.08	ppbv	0.03	AC-058	10-May-17
17050060-001	3-Methylpentane		0.16	ppbv	0.01	AC-058	10-May-17
17050060-001	Acetone		2.0	ppbv	0.6	AC-058	10-May-17
17050060-001	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	10-May-17
17050060-001	Benzene		0.12	ppbv	0.01	AC-058	10-May-17
17050060-001	Benzyl chloride	K, T, U	< 0.6	ppbv	0.6	AC-058	10-May-17
17050060-001	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-May-17
17050060-001	Carbon disulfide	I	0.27	ppbv	0.01	AC-058	10-May-17
17050060-001	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	10-May-17
17050060-001	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: June-01-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
√/NMHC VOC/Bonnyville/Apr 28, 2	2442	Ambient Air	28-Apr-17 6:50
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17050060	<b>REPORT CREATED:</b>	01-Jun-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17050060-001	Chloroform	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	Chloromethane		0.44	ppbv	0.03	AC-058	10-May-17
17050060-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-May-17
17050060-001	cis-1,3-Dichloropropene	K, T, U	< 0.06	ppbv	0.06	AC-058	10-May-17
17050060-001	cis-2-Butene	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	Cyclohexane		0.85	ppbv	0.03	AC-058	10-May-17
17050060-001	Cyclopentane		0.13	ppbv	0.01	AC-058	10-May-17
17050060-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-May-17
17050060-001	Ethanol		1.5	ppbv	0.4	AC-058	10-May-17
17050060-001	Ethyl acetate	K, T, U	< 0.6	ppbv	0.6	AC-058	10-May-17
17050060-001	Ethylbenzene		0.03	ppbv	0.01	AC-058	10-May-17
17050060-001	Freon-11	I	0.26	ppbv	0.03	AC-058	10-May-17
17050060-001	Freon-113	I	0.09	ppbv	0.01	AC-058	10-May-17
17050060-001	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	10-May-17
17050060-001	Freon-12	I	0.38	ppbv	0.03	AC-058	10-May-17
17050060-001	Hexachloro-1,3-butadiene	K, T, U	< 0.70	ppbv	0.70	AC-058	10-May-17
17050060-001	Isobutane		1.26	ppbv	0.03	AC-058	10-May-17
17050060-001	Isopentane		1.42	ppbv	0.04	AC-058	10-May-17
17050060-001	Isoprene		0.03	ppbv	0.01	AC-058	10-May-17
17050060-001	Isopropyl alcohol	K, T, U	< 0.6	ppbv	0.6	AC-058	10-May-17
17050060-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-May-17
17050060-001	m,p-Xylene		0.09	ppbv	0.04	AC-058	10-May-17
17050060-001	m-Diethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	10-May-17
17050060-001	m-Ethyltoluene	K, T, U	< 0.11	ppbv	0.11	AC-058	10-May-17

**Report certified by:** Krista Gegolick, Account Coordinator

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

**Date:** June-01-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
CA/NMHC VOC/Bonnyville/Apr 28,2017	2442	Ambient Air	28-Apr-17 6:50
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17050060	<b>REPORT CREATED:</b>	01-Jun-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17050060-001	Methyl butyl ketone	K, T, U	< 0.70	ppbv	0.70	AC-058	10-May-17
17050060-001	Methyl ethyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	10-May-17
17050060-001	Methyl isobutyl ketone	K, T, U	< 0.6	ppbv	0.6	AC-058	10-May-17
17050060-001	Methyl methacrylate	K, T, U	< 0.10	ppbv	0.10	AC-058	10-May-17
17050060-001	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	10-May-17
17050060-001	Methylcyclohexane		0.28	ppbv	0.01	AC-058	10-May-17
17050060-001	Methylcyclopentane		0.33	ppbv	0.03	AC-058	10-May-17
17050060-001	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	10-May-17
17050060-001	n-Butane		2.72	ppbv	0.04	AC-058	10-May-17
17050060-001	n-Decane	K, T, U	< 0.08	ppbv	0.08	AC-058	10-May-17
17050060-001	n-Dodecane	K, T, U	< 0.6	ppbv	0.6	AC-058	10-May-17
17050060-001	n-Heptane		0.10	ppbv	0.01	AC-058	10-May-17
17050060-001	n-Hexane		0.26	ppbv	0.01	AC-058	10-May-17
17050060-001	n-Octane		0.04	ppbv	0.03	AC-058	10-May-17
17050060-001	n-Pentane		0.9	ppbv	0.1	AC-058	10-May-17
17050060-001	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	10-May-17
17050060-001	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	10-May-17
17050060-001	Naphthalene	K, T, U	< 0.7	ppbv	0.7	AC-058	10-May-17
17050060-001	n-Nonane		0.02	ppbv	0.01	AC-058	10-May-17
17050060-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-May-17
17050060-001	o-Xylene		0.03	ppbv	0.01	AC-058	10-May-17
17050060-001	p-Diethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	10-May-17
17050060-001	p-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	10-May-17
17050060-001	Styrene	K, T, U	< 0.06	ppbv	0.06	AC-058	10-May-17
17050060-001	Tetrachloroethylene	I	0.13	ppbv	0.06	AC-058	10-May-17

**Report certified by:** Krista Gegolick, Account Coordinator

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

**Date:** June-01-17

**Inquiries:** (780) 632 8455

**E-mail:** EAS.Results@innotechalberta.ca





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

**ENVIRONMENTAL ANALYTICAL SERVICES**

TEST REPORT

<b>CLIENT SAMPLE ID</b>	<b>CANISTER ID</b>	<b>Matrix</b>	<b>DATE SAMPLED</b>
CA/NMHC VOC/Bonnyville/Apr 28,017	2442	Ambient Air	28-Apr-17 6:50
<b>DESCRIPTION:</b>	Bonnyville - AER		
<b>REPORT NUMBER:</b>	17050060	<b>REPORT CREATED:</b>	01-Jun-17
			<b>VERSION:</b> Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17050060-001	Tetrahydrofuran	K, T, U	< 0.6 ppbv	0.6	AC-058	10-May-17
17050060-001	Toluene		0.16 ppbv	0.01	AC-058	10-May-17
17050060-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-May-17
17050060-001	trans-1,3-Dichloropropylene	K, T, U	< 0.06 ppbv	0.06	AC-058	10-May-17
17050060-001	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-May-17
17050060-001	trans-2-Pentene		0.03 ppbv	0.03	AC-058	10-May-17
17050060-001	Trichloroethylene	K, T, U	< 0.06 ppbv	0.06	AC-058	10-May-17
17050060-001	Vinyl acetate	K, T, U	< 0.6 ppbv	0.6	AC-058	10-May-17
17050060-001	Vinyl chloride	K, T, U	< 0.03 ppbv	0.03	AC-058	10-May-17

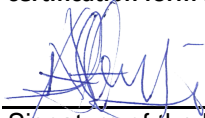
<b>Report certified by:</b>	Krista Gegolick, Account Coordinator	<b>On behalf of:</b>	PJ Pretorius, Manager, Analysis and Testing Services
<b>Date:</b>	June-01-17	<b>Inquiries:</b>	(780) 632 8455
		<b>E-mail:</b>	EAS.Results@innotechalberta.ca

***APPENDIX V***  
***REPORT CERTIFICATION FORM***

### Report Certification Form

<b>Alberta Airshed</b> (if applicable)	<b>EPA Approval or Code of Practice Registration #</b> (if applicable)
YES	NA
<b>Company Name</b> (if applicable)	<b>Industrial Operation Name</b> (if applicable)
Lakeland Industry & Community Association	Bonnyville Continuous Monitoring Station
<b>Name of the Representative of the Person Responsible</b> (Last, First, Middle)	<b>Position / Title of the Representative of the Person Responsible</b>
Bim Adeniji	Supervisor, Ambient Air / Edmonton Operations
<b>Is an External Party Certifying the Report?</b> (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>Name of External Person Certifying the Report</b> (Last, First, Middle)	<b>Position / Title of External Person Certifying the Report</b>
NA	NA
<b>Company Name for the External Person Certifying the Report</b>	<b>Identification of Qualifications / Professional Designations of the External Person Certifying the Report</b>
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.



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

12-06-2017





\_\_\_\_\_  
Report Issued Date (dd-mm-yyyy)

***APPENDIX VI***  
***DATA VALIDATION CERTIFICATION FORM***



### Validation Certificate Form

<b>Client:</b> <u>Lakeland Industry &amp; Community Association</u>	<b>Project #:</b> <u>2833-2017-04-35-C</u>
<b>Site:</b> <u>Bonnyville Continuous Monitoring Station</u>	<b>Contact:</b> <u>Mike Bisaga</u>

<b>Level 0 Preliminary Verification</b>	 _____	<b>Date</b> <u>31-May-2017</u>
<b>Level 1 Primary Validation</b>	 _____	<b>Date</b> <u>31-May-2017</u>
<b>Level 2 Final Validation</b>	 _____	<b>Date</b> <u>12-June-2017</u>
<b>Level 3 Independent Data Review</b>	 _____	<b>Date</b> <u>12-June-2017</u>
<b>Post-Final Validation</b>	<u>NA</u> _____	<b>Date</b> <u>NA</u> _____

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