



Box 8237
5107W-50th Street
Bonnyville, AB T9N 2J5
Phone: (780) 812-2182
Fax: (780) 812-2186
Toll Free: 1-877-737-2182
E-Mail: lica2@lica.ca
Website: <http://www.lica.ca>

Alberta Environment and Parks
Monitoring and Science
Data Management
Floor 11 Oxbridge Place
9820 106 Street
Edmonton Alberta T5K 2J6

October 16, 2016

RE: August 2016 Ambient Air Monitoring Monthly Reports

Attached are the monthly continuous ambient air monitoring reports for the LICA Airshed Zone's Cold Lake South, Maskwa, St. Lina, and Portable Air Monitoring System (located in Bonnyville) stations. These reports also contain complete data tables, sample log sheets, and chain of custody documents for the integrated monitoring programs including volatile organic compounds, polycyclic aromatic hydrocarbons, Partisol sampler (particulate matter mass), and passive samplers.

Should you have any questions, please don't hesitate to contact me directly at (780) 266-7068.

Respectfully,

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

Michael Bisaga

Airshed Program Manager
Lakeland Industry and Community Association

cc (email): LICA Office



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

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

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

JOB #: 2833-2016-08-1-C

August 2016

Prepared for:

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

Attention: MIKE BISAGA

DATE: **October 11, 2016**

Prepared by:

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

Reviewed by:

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

SUMMARY

In August 2016, the Air Services Group of Maxxam Analytics conducted an ambient air monitoring program at the Cold Lake South Site of Lakeland Industry & Community Association, near Cold Lake, Alberta. Sampling was carried out to determine the concentrations of non-compliance parameters, as requested by the Project Coordinator.

All data collected this month were within the objectives outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational uptime for all analyzers and meteorological sensors were above the 90% requirement.

Gas Analyzers: Scheduled annual maintenance was performed on all gas analyzers this month. Due to these events, fourteen hours of downtime was recorded for SO₂, eighteen for TRS, three for THC and five for O₃.

THC: Four hours of downtime were recorded due to an additional calibration performed on August 22 to correct a zero drift trend.

PM_{2.5}: Twenty-two hours of data were invalidated as the data was below $-3 \mu\text{g}/\text{m}^3$ this month.

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 is issuing this completed report to Lakeland Industry & Community Association, Cold Lake South Site.

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
Cold Lake South Site						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-HR	24-HR	1-HR	24-HR									
SO ₂ (ppb)	172	48	0	0	0.1	0.7	24	VAR	VAR	VAR	0.2	15, 24	98.1
TRS (ppb)	-	-	-	-	0.3	2.8	15	6	0.4	NW	0.8	15	97.6
THC (ppm)	-	-	-	-	2.15	3.20	16	6	0.2	ESE	2.45	16	99.1
NO ₂ (ppb)	159	-	0	-	1.9	8.9	24	9	2.7	WSW	3.5	29	100.0
NO (ppb)	-	-	-	-	0.6	10.9	26	7	1.9	WSW	1.6	29	100.0
NO _x (ppb)	-	-	-	-	2.5	17.6	26	7	1.9	WSW	5.1	29	100.0
O ₃ (ppb)	82	-	0	-	16.7	42.4	16	13	9.5	WSW	22.0	10	99.3
PM _{2.5} (µg/m ³)	80	30	0	0	3.3	12.4	11	13	8.4	WNW	6.4	7	97.0
RELATIVE HUMIDITY (%)	-	-	-	-	72	100	11, 12	VAR	VAR	VAR	86	9, 10	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	16.6	29.7	16	14	9.4	SW	19.8	7	100.0
VECTOR WS (kph)	-	-	-	-	5.0	20.3	14	17	-	NNW	9.6	1, 22	100.0
VECTOR WD (sec)	-	-	-	-	-	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedance Summary Report

SO₂ 1- Hour Exceedances

No Exceedances Recorded During the Month

SO₂ 24- Hour Exceedances

No Exceedances Recorded During the Month

NO₂ 1- Hour Exceedances

No Exceedances Recorded During the Month

PM_{2.5} 1- Hour Exceedances

No Exceedances Recorded During the Month

PM_{2.5} 24- Hour Exceedances

No Exceedances Recorded During the Month

O₃ 1- Hour Exceedances

No Exceedances Recorded During the Month

Volatile Organics (VOCs) Data Summary

Sample Collection Date	Maximum reading (ppb)	Volatile Organic Compound
August 4, 2016	3.2	Acetone
August 10, 2016	5.7	Acetone
August 16, 2016	4.7	Acetone
August 22, 2016	3.7	Acetone
August 28, 2016	1.9	Acetone

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collection Date	Maximum reading (μg)	Semi-Volatile Organic
August 4, 2016	0.34	Phenanthrene
August 10, 2016	0.17	Phenanthrene
August 16, 2016	0.30	Phenanthrene
August 22, 2016	0.15	Phenanthrene
August 28, 2016	0.10	Phenanthrene

Note: NA

Partisol Sampler Summary

Sample Collection Date	Concentration (mg)
August 4, 2016	0.045
August 10, 2016	0.052
August 16, 2016	0.085
August 22, 2016	0.040
August 28, 2016	0.020

Note: NA

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
SUMMARY	1
MONTHLY CONTINUOUS DATA SUMMARY REPORT	2
EXCEEDANCE SUMMARY REPORT	3
VOC SAMPLE SUMMARY REPORT	4
PAH SAMPLE SUMMARY REPORT	5
PARTISOL SAMPLE SUMMARY REPORT	6
TABLE OF CONTENTS	7
1.0 Discussion	9
2.0 Project Personnel	12
3.0 Plant Monthly Required AMD Summary	12
4.0 Calculations and Results	12
5.0 Methods and Procedures	13
Appendix I	Continuous Monitoring Data Results 16
	Sulphur Dioxide 17
	Total Reduced Sulphur 25
	Total Hydrocarbon 33
	Oxides of Nitrogen 41
	Nitric Oxides 49
	Nitrogen Dioxide 56
	Ozone 64
	Particulate Matter 2.5 72
	Wind Speed 77
	Wind Direction 84
	Standard Deviation Wind Direction 87
	Relative Humidity 90
	Ambient Temperature 93
Appendix II	Non-Continuous Monitoring Data Results 96
	VOC Results 97
	PAH Results 113
	Partisol Results 124
Appendix III	Equipment Calibration Results 131
	Sulphur Dioxide 132
	Total Reduced Sulphur 137
	Total Hydrocarbon 141
	Nitrogen Dioxide 147

	Ozone	153
	Particulate Matter	157
	Wind System	160
	Calibrators	162
	Calibration Gases	165
Appendix IV	Analytical Results	170
	VOCs Samples	171
	PAHs Samples	197
	Partisol Samples	208
Appendix V	Report Certification Form	214
Appendix IV	Data Validation Certification Form	216

1.0 Discussion

This monthly report consists of data for parameters Sulphur Dioxide (SO₂), Total Reduced Sulphur (TRS), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃) Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD). The results for the non-continuous Partisol, VOCs, PAHs and Passive monitoring program are also included in this report.

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

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

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

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

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

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time (minimum), on a monthly basis.

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

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

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

SULPHUR DIOXIDE (SO₂)

Annual maintenance was performed on the analyzer on August 4 following a shut-down calibration. The analyzer was allowed time to stabilize overnight and a post-repair calibration was completed on August 5. Both the shut-down and post-repair calibration results met AMD requirements. Fourteen hours of downtime were recorded due to this event.

TOTAL REDUCED SULPHUR (TRS)

Annual maintenance was performed on the analyzer on August 4 following a shut-down calibration. The analyzer was allowed time to stabilize overnight and a post-repair calibration was completed on August 5. Both the shut-down and post-repair calibration results met AMD requirements. Eighteen hours of downtime were recorded due to this event.

TOTAL HYDROCARBONS (THC)

Annual maintenance was performed on the analyzer on August 5 following a shut-down calibration. A post-repair calibration was completed afterwards. Both the shut-down and post-repair calibration results met AMD requirements. Three hours of downtime were recorded due to this event. Four hours of downtime were recorded due to an additional calibration performed on August 22 to correct a zero drift trend. Maximum instantaneous data collected on August 9, at hour 09:00, was invalidated as the data was anomalous.

NITROGEN DIOXIDE (NO₂)

Annual maintenance, including sample pump replacement, was performed on the analyzer on August 10 following a shut-down calibration. A post-repair calibration was completed afterwards. Both the shut-down and post-repair calibration results met AMD requirements.

OZONE (O₃)

Annual maintenance, including sample pump replacement, was performed on the analyzer on August 5 following a shut-down calibration. A post-repair calibration was completed afterwards. Both the shut-down and post-repair calibration results met AMD requirements. Five hours of downtime were recorded due to this event.

PARTICULATE MATTER 2.5 (LESS THAN 2.5 MICRONS) (PM_{2.5})

Two routine TEOM audits were performed this month: one was completed on August 8 and the other audit was performed on August 19. Both the inlet filter and the FDMS filter were replaced on August 8.

Data was corrected using Alberta Air Quality guideline. Data between 0 and -3 µg/m³ was corrected to 0 µg/m³. Data below -3 µg/m³ was invalidated. Twenty-two hours of data were invalidated as the data was below -3 µg/m³.

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

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was coming from.

No operational issues were identified this month.

RELATIVE HUMIDITY (RH)

No operational issues were identified this month.

AMBIENT TEMPERATURE (TPX)

No operational issues were identified this month.

VOC SAMPLES

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

Samples were collected on August 4, 10, 16, 22 and 28. Analytical results are included in this report. VOC values are reported in ppb.

PAH SAMPLES

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

Samples were collected on August 4, 10, 16, 22 and 28. Analytical results are included in this report. PAH values are reported in µg/p.

PARTISOL SAMPLES

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

Samples were collected on August 4, 10, 16, 22 and 28. Analytical results are included in this report. Partisol values are reported in mg.

PASSIVE SAMPLES

No samples were collected this month as the samples are scheduled to be collected every two months.

2.0 Project Personnel

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

3.0 Plant Monthly Required AMD Summary

All data collected this month were within the objectives outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational uptime for all analyzers and meteorological system 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 test program:

- Maxxam AIR SOP-00210: Ambient TRS Monitoring
- Maxxam AIR SOP-00211: Ambient SO₂ Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canister and Xontech

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

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

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

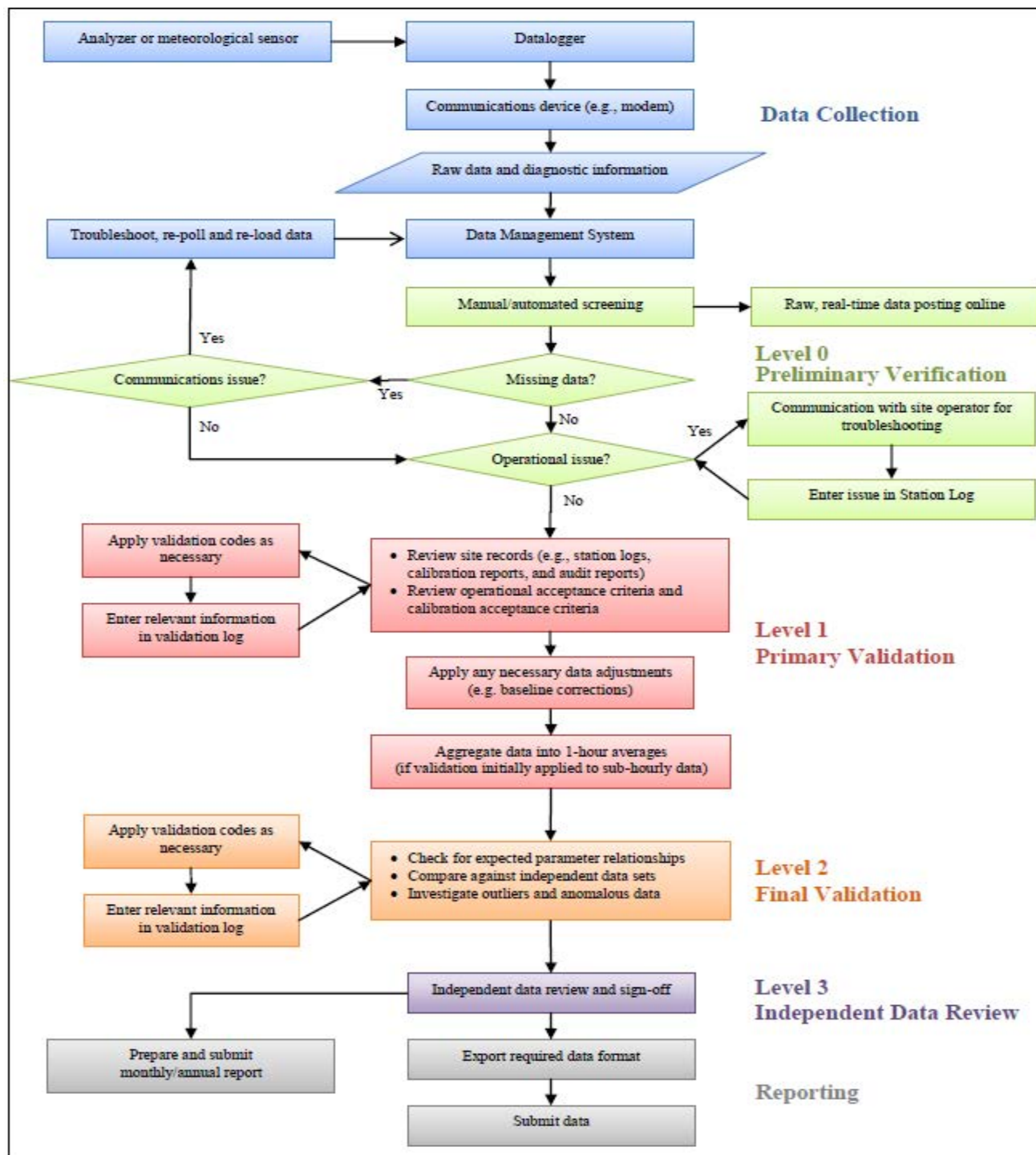
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE (SO₂) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.			
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.				
DAY	1	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	S	0.0	0.1	0.0	24			
	2	0.1	0.0	0.0	0.1	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	S	0.0	0.0	0.1	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	0.1	S	0.1	0.0	0.0	0.1	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	C	C	Y	Y	Y	Y	0.0	0.0	0.0	20		
	5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	0.2	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.2	0.0	0.0	14		
	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.2	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	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	S	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
	9	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	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	S	0.0	0.0	0.0	0.0	0.0	24		
	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	S	0.1	0.0	0.0	0.1	0.0	0.1	0.0	24	
	12	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.0	S	0.0	0.0	0.0	0.0	0.3	0.1	0.0	24	
	13	0.0	0.0	0.0	0.0	0.1	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	S	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	24	
	14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	S	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.1	0.1	0.0	24	
	15	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.3	S	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.6	0.2	0.0	24	
	16	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.2	S	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.6	0.1	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	S	0.0	0.0	0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.4	0.0	0.0	24		
	18	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.4	0.3	0.3	0.2	0.3	S	0.3	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.4	0.1	0.1	0.0	24	
	19	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	S	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.3	0.1	0.0	24	
	20	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	S	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	24	
	22	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	S	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.0	24	
	23	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	S	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	24	
	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	S	0.7	0.7	0.5	0.7	0.6	0.4	0.3	0.3	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.7	0.2	0.0	0.0	24	
	25	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.1	0.1	0.5	0.3	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.1	0.0	24	
	26	0.0	0.0	0.0	0.0	0.1	0.0	S	0.2	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.4	0.1	0.1	0.0	24	
	27	0.1	0.1	0.0	0.1	0.0	S	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	24	
	28	0.0	0.0	0.0	0.0	S	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	0.1	0.0	0.0	0.0	24	
	29	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.3	0.1	0.0	24	
	30	0.1	0.1	S	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	24	
	31	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.0	24	
HOURLY MAX		0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.7	0.7	0.5	0.7	0.6	0.4	0.3	0.3	0.6	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	24	
HOURLY AVG		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	24

STATUS FLAG CODES

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

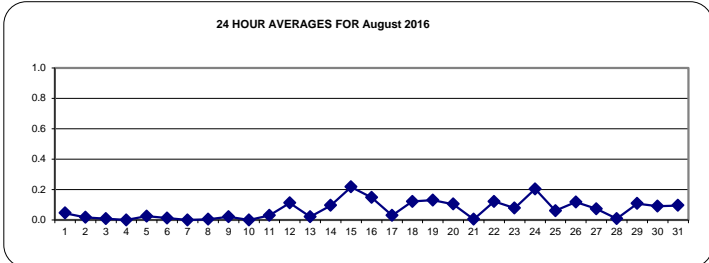
OBJECTIVE LIMIT:

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

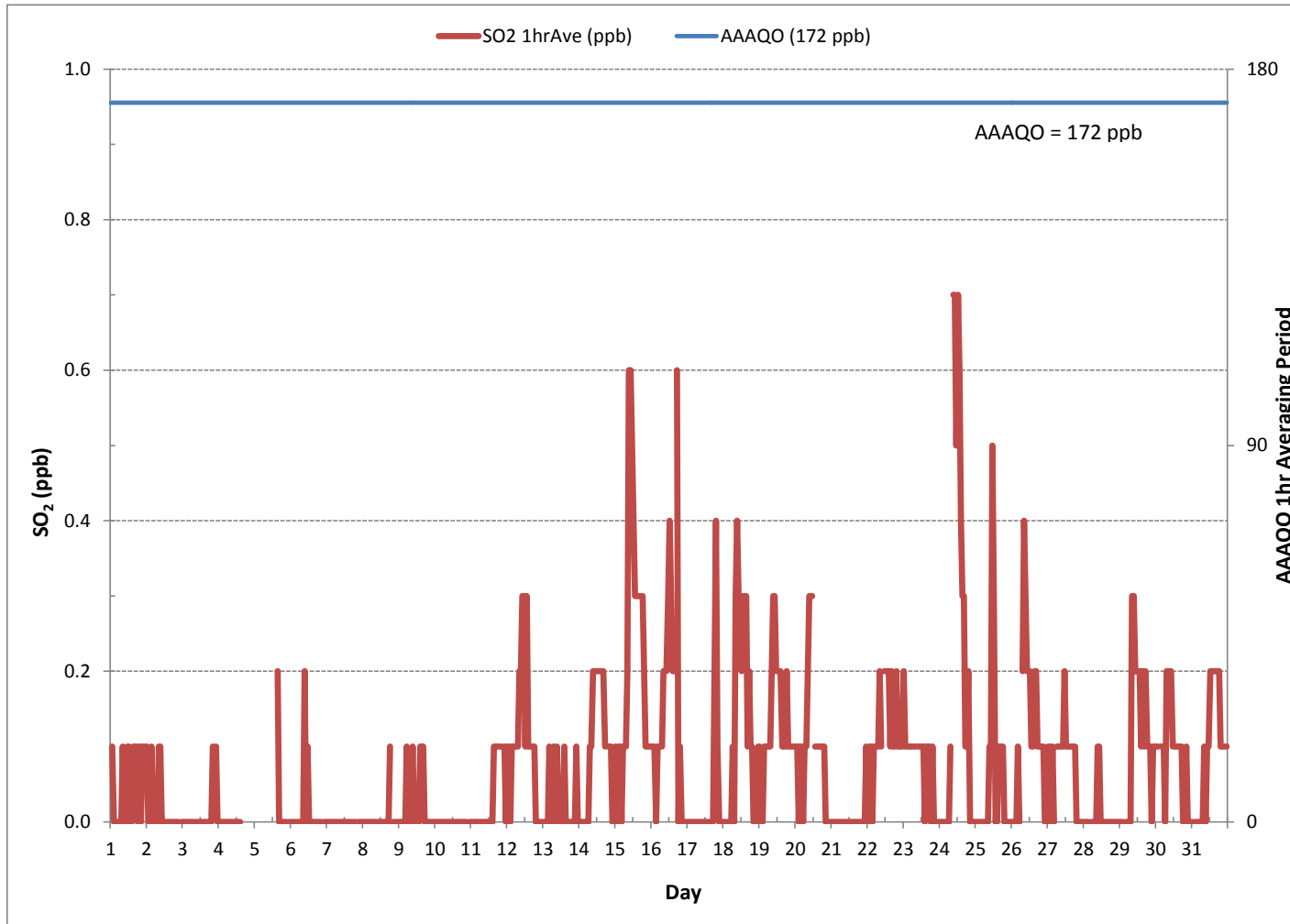
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0					
NUMBER OF 24-HR EXCEEDENCES:	0					
NUMBER OF NON-ZERO READINGS:	301					
MINIMUM 1-HR AVERAGE:	0.0	PPB	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	0.7	PPB	@ HOUR(S)	VAR	ON DAY(S)	24
MAXIMUM 24-HR AVERAGE:	0.2	PPB			ON DAY(S)	15, 24
					VAR-VARIOUS	
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	730	HRS	
MONTHLY CALIBRATION TIME:	10	HRS	AMD OPERATION UPTIME:	98.1	%	
STANDARD DEVIATION:	0.11		MONTHLY AVERAGE:	0.1	PPB	

24 HOUR AVERAGES FOR August 2016



SULPHUR DIOXIDE (SO₂) hourly averages in ppb





SULPHUR DIOXIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR		
DAY	MIN.	MAX.	AVG.	RDGS.																										
1	S	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.5	0.3	0.3	0.5	0.5	0.3	0.3	0.3	0.5	0.5	0.5	0.3	0.3	0.3	0.5	S	0.3	0.5	0.4	24		
2		0.5	0.3	0.3	0.3	0.3	0.3	0.5	0.3	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.5	0.4	0.3	0.3	S	0.3	0.3	0.5	0.4	24	
3		0.3	0.3	0.5	0.5	0.4	0.3	0.5	0.3	0.3	0.5	0.5	0.3	0.3	0.4	0.3	0.3	0.5	0.3	0.3	0.3	0.5	S	0.5	0.5	0.3	0.5	0.4	24	
4		0.3	0.5	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.6	0.3	0.3	0.3	0.5	0.5	C	C	C	C	C	C	Y	Y	Y	Y	0.3	0.6	0.4	20
5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	0.5	0.6	0.6	0.6	0.5	0.6	S	0.5	0.5	0.6	0.6	14	
6		0.6	0.6	0.4	0.4	0.6	0.4	0.4	0.5	0.5	0.7	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.6	S	0.5	0.5	0.4	0.7	0.5	24
7		0.5	0.4	0.6	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	S	0.5	0.5	0.4	0.4	0.6	0.5	24
8		0.5	0.5	0.3	0.5	0.3	0.4	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.6	S	0.5	0.3	0.5	0.5	0.3	0.6	0.5	24	
9		0.3	0.5	0.3	0.4	0.3	0.6	0.5	0.4	0.3	0.5	0.3	0.5	0.5	0.5	0.6	0.5	0.5	0.4	S	0.3	0.5	0.3	0.3	0.4	0.3	0.6	0.4	24	
10		0.3	0.4	0.4	0.4	0.4	0.3	0.5	0.3	0.4	0.3	0.3	0.3	0.4	0.5	0.4	0.5	0.5	0.5	0.3	0.4	0.4	0.5	S	0.3	0.3	0.5	0.4	24	
11		0.3	0.5	0.5	0.3	0.5	0.4	0.5	0.3	0.4	0.3	0.5	0.4	0.3	0.5	0.4	0.6	0.5	0.4	0.5	0.3	0.5	S	0.6	0.3	0.3	0.6	0.4	24	
12		0.6	0.5	0.4	0.5	0.3	0.5	0.4	0.5	0.5	0.7	1.0	0.8	0.4	0.7	0.6	0.4	0.5	0.4	0.4	0.4	S	0.4	0.4	0.5	0.3	1.0	0.5	24	
13		0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.3	0.5	0.4	0.4	0.4	0.5	S	0.5	0.4	0.5	0.4	0.3	0.5	0.4	24	
14		0.5	0.4	0.4	0.4	0.3	0.3	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.6	0.5	S	0.5	0.5	0.5	0.5	0.3	0.4	0.3	0.8	0.5	24	
15		0.5	0.3	0.5	0.5	0.4	0.3	0.6	0.5	0.5	1.2	1.3	0.9	0.8	0.6	0.6	0.5	0.5	S	0.5	0.5	0.5	0.3	0.5	0.5	0.3	1.3	0.6	24	
16		0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.9	0.8	0.6	0.9	S	1.3	0.5	0.5	0.3	0.4	0.4	0.3	0.3	1.3	0.6	24	
17		0.3	0.5	0.5	0.5	0.4	0.6	0.4	0.5	0.5	0.5	0.4	0.5	0.6	0.5	0.5	S	0.5	0.4	1.0	1.0	0.5	0.5	0.6	0.6	0.3	1.0	0.5	24	
18		0.4	0.4	0.4	0.3	0.4	0.5	0.6	0.6	0.6	0.8	0.8	0.8	0.6	0.6	S	0.8	0.8	0.6	0.6	0.4	0.5	0.5	0.6	0.3	0.3	0.8	0.6	24	
19		0.4	0.4	0.3	0.5	0.5	0.5	0.6	0.4	0.4	0.7	0.6	0.6	0.6	S	0.5	0.5	0.6	0.5	0.5	0.6	0.4	0.5	0.4	0.5	0.3	0.7	0.5	24	
20		0.5	0.5	0.3	0.5	0.5	0.5	0.4	0.5	0.6	0.7	0.7	0.6	S	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.3	0.4	0.3	0.7	0.5	24
21		0.4	0.4	0.3	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.6	S	0.4	0.3	0.4	0.4	0.5	0.4	0.6	0.4	0.6	0.4	0.3	0.5	0.4	0.3	0.6	0.4	24
22		0.3	0.3	0.5	0.3	0.5	0.3	0.3	0.3	0.4	0.4	S	0.4	0.4	0.4	0.4	0.4	0.6	0.3	0.4	0.4	0.4	0.4	0.3	0.6	0.3	0.6	0.4	24	
23		0.5	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	S	0.4	0.5	0.4	0.6	0.4	0.5	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.6	0.4	24
24		0.5	0.6	0.3	0.4	0.4	0.3	0.6	0.6	S	1.5	1.3	1.0	1.3	1.2	0.9	0.9	0.9	0.5	0.5	0.6	0.4	0.5	0.4	0.4	0.3	1.5	0.7	24	
25		0.4	0.6	0.4	0.4	0.4	0.4	0.5	S	0.4	0.6	0.6	1.0	1.2	0.3	0.6	0.6	0.6	0.6	0.4	0.5	0.6	0.5	0.4	0.4	0.3	1.2	0.5	24	
26		0.4	0.4	0.4	0.5	0.6	0.6	S	0.8	0.9	0.8	0.6	0.7	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.4	0.6	0.4	0.4	0.9	0.6	24	
27		0.4	0.4	0.4	0.5	0.6	S	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.4	0.6	0.6	0.6	0.4	0.4	0.4	0.3	0.3	0.6	0.5	24	
28		0.4	0.4	0.3	0.5	S	0.5	0.6	0.5	0.4	0.5	0.4	0.3	0.4	0.7	0.4	0.4	0.4	0.3	0.4	0.6	0.4	0.4	0.4	0.4	0.3	0.7	0.4	24	
29		0.4	0.6	0.3	S	0.6	0.5	0.5	0.8	0.8	0.8	0.6	0.6	0.6	0.8	0.5	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.4	0.4	0.6	0.3	0.8	0.6	24
30		0.5	0.4	S	0.6	0.6	0.5	0.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.5	0.5	0.6	0.5	0.5	0.6	0.5	0.4	0.5	0.3	0.7	0.5	24	
31		0.4	S	0.5	0.4	0.5	0.4	0.4	0.5	0.6	0.4	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.4	0.6	0.5	24	
HOURLY MAX		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.9	1.5	1.3	1.0	1.3	1.2	0.9	0.9	0.9	1.3	1.0	1.0	0.6	0.6	0.6	0.6					
HOURLY AVG		0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4					

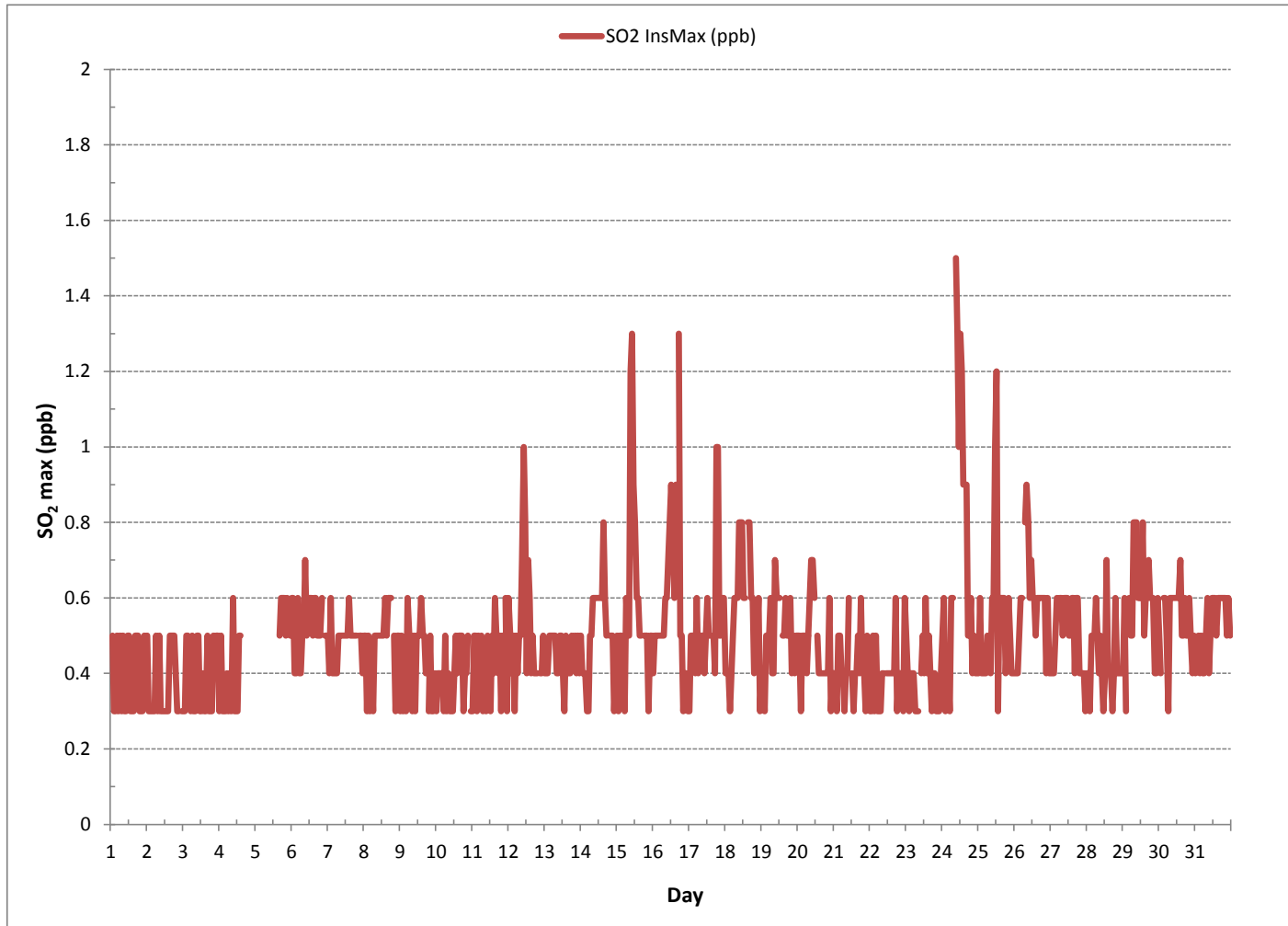
STATUS FLAG CODES

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

MONTHLY SUMMARY

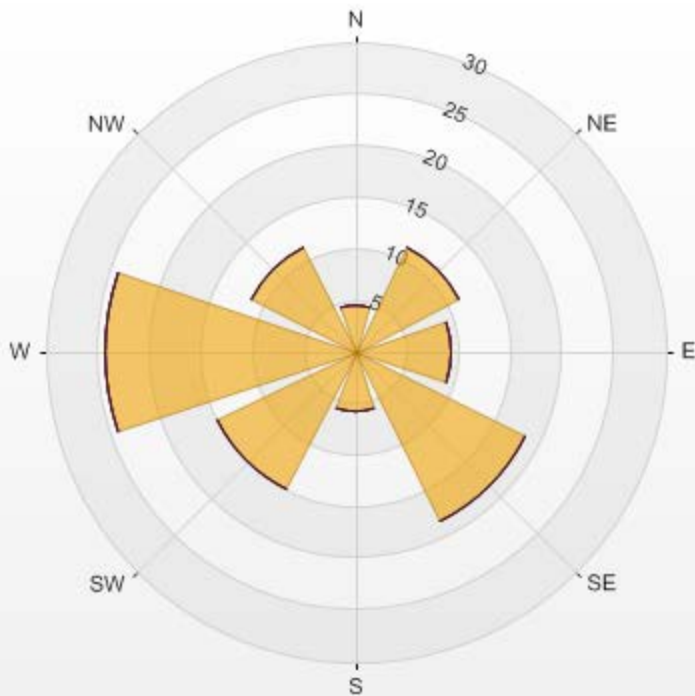
NUMBER OF NON-ZERO READINGS:	688
MAXIMUM INSTANTANEOUS VALUE:	1.5 PPB @ HOUR(S) 9 ON DAY(S) 24
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	11 HRS
OPERATIONAL TIME:	730 HRS
STANDARD DEVIATION:	0.16

SULPHUR DIOXIDE MAX instantaneous maximum in ppb



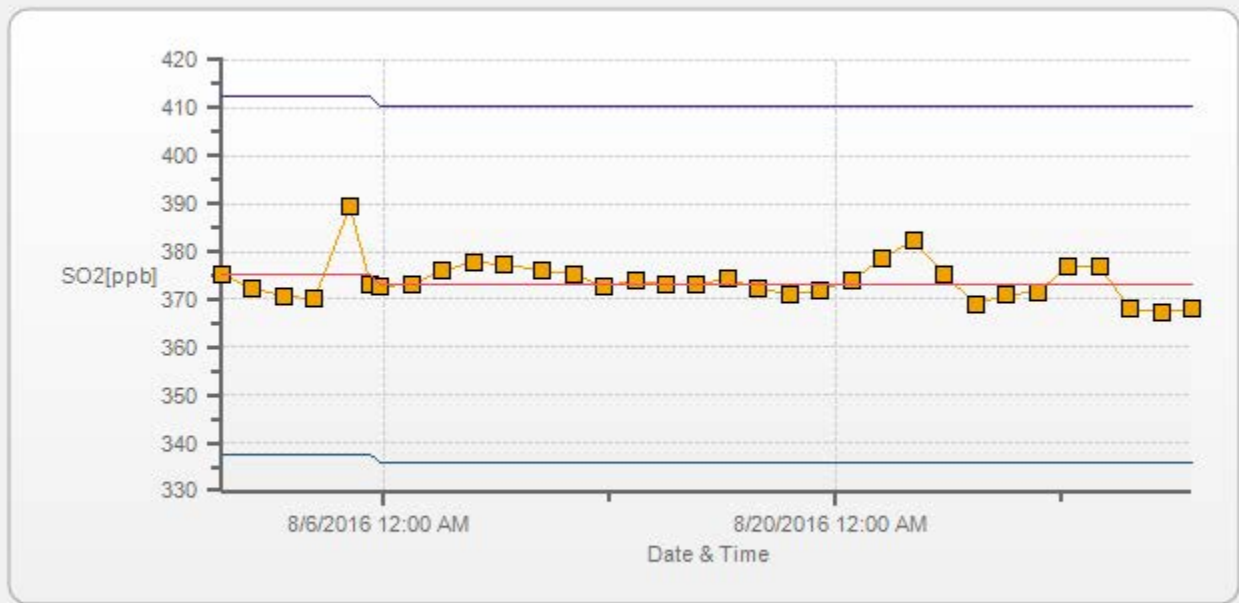
Wind: LICA COLD LAKE SOUTH Monitor: SO2 [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 92.61% Calm Avg: 0.00

Direction	0.0-20.0	20.0-60.0	60.0-110.0	110.0-170.0	170.0-340.0	>340.0	Total
N	4.5	0	0	0	0	0	4.5
NE	11.32	0	0	0	0	0	11.32
E	9.29	0	0	0	0	0	9.29
SE	18.43	0	0	0	0	0	18.43
S	5.81	0	0	0	0	0	5.81
SW	14.95	0	0	0	0	0	14.95
W	24.38	0	0	0	0	0	24.38
NW	11.32	0	0	0	0	0	11.32
Summary	100	0	0	0	0	0	100



% Icon Classes (ppb)	100	0.0-20.0	0	20.0-60.0	0	60.0-110.0	0	110.0-170.0	0	170.0-340.0	0	>340.0
----------------------	-----	----------	---	-----------	---	------------	---	-------------	---	-------------	---	--------

SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 08/2016 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL REDUCED SULPHUR

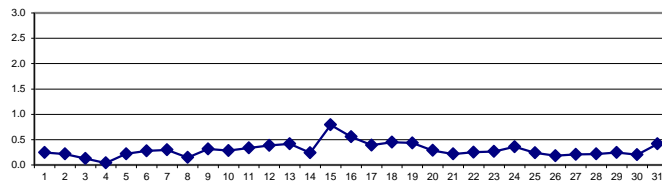
TOTAL REDUCED SULPHUR (TRS) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR					
DAY	MIN.	MAX.	AVG.	RDGS.																													
1	S	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.2	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.4	0.2	S	0.1	0.4	0.2	24				
2	0.3	0.4	0.2	0.3	0.3	0.3	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	S	0.3	0.1	0.4	0.2	24				
3	0.3	0.3	0.3	0.5	0.5	0.3	0.2	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.0	0.0	0.2	0.0	20			
4	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	Y	Y	Y	Y	0.0	0.2	0.0	20			
5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	0.1	0.2	0.2	0.2	S	0.4	0.1	0.4	0.2	10		
6	0.3	0.3	0.3	0.6	0.6	0.5	0.6	0.5	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	S	0.3	0.4	0.1	0.6	0.3	24			
7	0.4	0.3	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	S	0.3	0.3	0.2	0.1	0.5	0.3	24			
8	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	S	0.2	0.2	0.2	0.3	0.0	0.3	0.1	24			
9	0.3	0.3	0.5	0.6	0.6	0.7	1.0	0.4	0.2	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	S	0.2	0.3	0.3	0.3	0.3	0.1	1.0	0.3	24			
10	0.3	0.3	0.3	0.4	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.5	0.2	0.2	0.2	S	0.5	0.2	0.5	0.3	24				
11	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	S	0.4	0.5	0.2	0.5	0.3	24				
12	0.5	0.5	0.4	0.5	0.3	0.4	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	S	0.4	0.4	0.7	0.2	0.7	0.4	24				
13	0.4	0.4	0.3	0.3	1.3	1.5	1.5	1.8	0.8	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	S	0.1	0.1	0.1	0.2	0.0	1.8	0.4	24				
14	0.3	0.4	0.3	0.4	0.5	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	S	0.2	0.2	0.3	0.2	0.4	0.1	0.5	0.2	24				
15	0.5	0.6	0.8	0.7	2.4	2.1	2.8	2.6	1.1	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.2	S	0.3	0.3	0.3	0.3	0.3	0.4	0.2	2.8	0.8	0.8	24				
16	0.7	0.8	0.6	0.7	0.6	0.5	0.8	1.1	1.3	0.8	0.4	0.4	0.3	0.3	0.4	0.4	S	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	1.3	0.6	24			
17	0.5	0.5	0.5	0.4	0.4	0.5	0.7	0.7	0.5	0.4	0.3	0.3	0.3	0.2	0.2	S	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.2	0.7	0.4	24				
18	0.6	0.6	0.8	0.9	1.2	0.9	0.7	0.5	0.3	0.3	0.3	0.3	0.2	0.3	S	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	1.2	0.5	24				
19	0.4	0.3	0.5	0.4	0.3	0.3	1.6	1.2	0.6	0.4	0.5	0.5	S	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	1.6	0.4	24				
20	0.2	0.2	0.3	0.3	0.2	0.2	0.4	0.7	0.8	0.7	0.4	0.2	S	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.8	0.3	24			
21	0.2	0.1	0.3	0.4	0.5	0.3	0.5	0.5	0.1	0.1	0.1	S	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.5	0.2	24			
22	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	S	0.2	0.2	0.2	0.2	0.3	0.3	0.6	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.6	0.3	24				
23	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	S	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	24			
24	0.2	0.5	0.6	0.7	0.4	0.4	0.4	0.5	S	0.5	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.7	0.4	24				
25	0.3	0.3	0.2	0.3	0.3	0.3	0.2	S	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.2	24				
26	0.2	0.2	0.4	0.2	0.3	0.4	S	0.6	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.6	0.2	24				
27	0.0	0.0	0.2	0.1	0.1	S	0.3	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.0	0.4	0.2	24			
28	0.2	0.3	0.2	0.3	S	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.3	0.2	24			
29	0.2	0.2	0.2	S	0.2	0.3	0.3	0.3	0.4	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.2	0.4	0.2	24			
30	0.4	0.3	S	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.4	0.2	24				
31	0.1	S	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.6	0.7	0.1	0.7	0.4	24			
HOURLY MAX	0.7	0.8	0.8	0.9	2.4	2.1	2.8	2.6	1.3	0.8	0.4	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.5	0.6	0.7							
HOURLY AVG	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3								

STATUS FLAG CODES

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

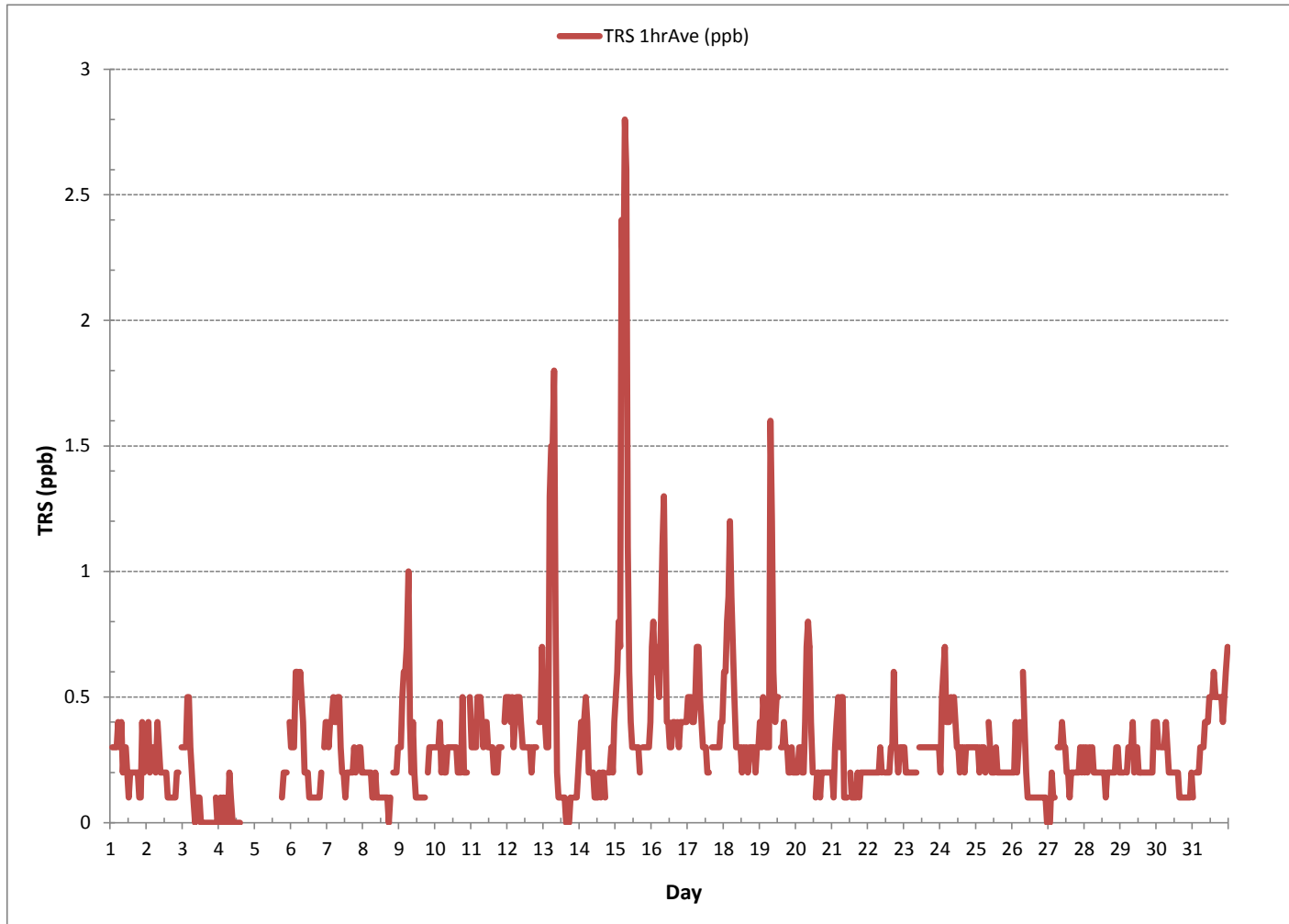
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	658			
MINIMUM 1-HR AVERAGE:	0.0	PPB @ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	2.8	PPB @ HOUR(S)	6	15
MAXIMUM 24-HR AVERAGE:	0.8	PPB		15
				VAR-VARIOUS
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	726
MONTHLY CALIBRATION TIME:	9	HRS	AMD OPERATION UPTIME:	97.6
STANDARD DEVIATION:	0.27		MONTHLY AVERAGE:	0.3
				PPB

TOTAL REDUCED SULPHUR (TRS) hourly averages in ppb



TOTAL REDUCED SULPHUR MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR		
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.	
DAY																														
1	S	0.6	0.7	0.8	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.8	0.5	0.6	0.5	0.7	0.5	0.5	0.6	0.5	0.5	0.8	0.6	S	0.5	0.8	0.6	24		
2		0.6	1.0	0.6	0.7	0.8	0.7	0.6	0.9	0.8	0.8	0.6	0.7	0.8	0.6	0.5	0.6	0.7	0.5	0.7	0.6	0.6	0.8	S	0.7	0.5	1.0	0.7	24	
3		0.9	0.7	1.1	1.0	1.1	0.8	0.7	0.6	0.5	0.6	0.7	0.6	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.6	0.5	S	0.7	0.6	0.5	1.1	0.7	24	
4		0.8	0.8	0.6	0.8	0.9	0.8	0.6	1.1	0.9	0.6	0.5	0.6	0.5	0.6	C	C	C	C	C	C	Y	Y	Y	Y	0.5	1.1	0.7	20	
5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	1.1	1.0	1.0	0.9	S	1.3	0.9	1.3	1.1	10	
6		1.0	1.0	1.1	1.3	1.4	1.6	1.5	1.3	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.8	0.8	0.9	0.7	0.7	0.8	S	1.0	1.0	0.7	1.6	1.0	24	
7		1.1	0.9	1.1	1.0	1.1	1.0	1.0	1.0	1.0	0.9	0.8	0.8	0.8	0.8	0.6	0.5	0.7	0.7	0.8	0.7	S	0.8	0.8	0.8	0.5	1.1	0.9	24	
8		0.7	0.7	0.7	0.6	0.7	0.6	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.7	0.6	0.8	0.6	0.8	S	0.7	0.7	0.8	0.8	0.6	0.8	0.7	24	
9		1.1	0.9	1.1	1.1	1.1	1.3	1.8	1.2	0.9	1.0	0.8	0.7	0.7	0.6	0.5	0.8	0.6	S	0.8	1.0	0.8	0.8	0.8	0.8	0.5	1.8	0.9	24	
10		0.8	0.8	0.8	1.0	0.7	0.8	0.8	0.7	0.9	0.7	0.8	0.8	0.8	0.9	0.8	0.7	0.8	1.6	0.7	0.7	0.7	S	1.0	0.7	1.6	0.8	24		
11		0.7	0.8	0.9	0.8	1.0	1.0	1.1	1.0	0.7	0.8	1.0	0.8	0.7	0.9	0.7	0.6	0.6	0.7	0.6	0.7	0.8	S	0.8	0.9	0.6	1.1	0.8	24	
12		0.8	0.9	0.8	1.1	0.8	0.8	1.1	1.1	0.8	1.0	0.8	0.9	0.7	0.8	0.7	0.7	0.7	0.7	0.8	0.7	S	0.9	1.0	1.4	0.7	1.4	0.9	24	
13		1.2	1.0	0.9	0.9	2.2	2.6	2.6	2.6	1.7	0.8	0.8	0.6	0.8	0.7	1.0	0.7	0.6	0.8	0.8	S	0.7	0.7	0.8	0.8	0.6	2.6	1.1	24	
14		1.1	1.1	1.1	1.1	1.4	1.1	0.8	0.9	0.8	0.7	0.8	0.8	0.6	0.8	0.8	0.7	0.8	0.6	S	0.8	0.7	1.1	0.6	0.9	0.6	1.4	0.9	24	
15		1.0	1.2	1.5	2.1	3.6	2.8	3.7	3.8	1.8	1.2	1.0	0.7	0.6	0.8	0.7	0.8	0.7	S	0.6	0.6	1.0	0.7	0.9	0.8	0.6	3.8	1.4	24	
16		1.1	1.2	1.1	1.1	1.0	0.8	1.2	1.5	2.0	1.1	0.9	0.7	0.8	0.6	0.6	0.7	S	0.8	0.7	0.9	0.8	0.7	0.7	0.7	0.6	2.0	0.9	24	
17		0.8	0.9	0.9	0.7	0.8	1.1	1.2	1.2	1.0	0.8	0.8	0.8	0.6	0.7	0.7	S	0.7	0.7	0.7	0.7	0.7	0.9	1.0	0.8	0.6	1.2	0.8	24	
18		1.0	1.1	1.4	1.5	1.8	1.6	1.2	1.1	0.7	0.8	0.9	0.8	0.6	0.7	S	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.7	0.8	0.6	1.8	0.9	24	
19		1.0	0.7	1.2	1.1	0.8	0.7	1.0	2.6	1.8	1.3	0.8	1.0	1.0	S	0.7	0.8	0.9	0.7	0.7	0.7	0.8	1.0	0.6	0.8	0.6	2.6	1.0	24	
20		0.7	0.8	0.8	0.8	0.8	0.8	1.0	1.7	1.9	1.3	1.0	0.8	S	0.6	0.7	0.9	0.7	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.6	1.9	0.9	24	
21		0.9	0.8	0.8	1.0	1.0	1.0	1.2	1.0	0.8	0.7	0.7	S	0.7	0.7	0.8	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.8	0.7	0.6	1.2	0.8	24	
22		0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.6	0.7	0.7	S	0.7	0.7	0.6	0.6	0.6	1.6	1.7	0.7	0.9	0.6	0.8	0.6	0.7	0.6	1.7	0.8	24	
23		0.8	0.6	0.7	0.5	0.5	0.6	0.6	0.6	0.7	S	0.7	0.8	0.7	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.5	0.8	0.6	24	
24		0.5	0.9	1.1	1.4	0.8	0.8	0.8	0.7	S	1.0	0.8	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.7	0.8	0.8	0.7	0.7	0.7	0.9	0.5	1.4	0.8	24
25		0.8	0.8	0.7	0.8	0.8	0.8	0.7	S	0.8	0.8	0.7	0.6	0.8	0.8	0.6	0.8	0.7	0.6	0.6	0.8	0.8	0.7	0.7	0.7	0.6	0.8	0.7	24	
26		0.7	0.8	1.1	0.7	0.8	1.0	S	1.1	0.9	1.0	0.6	0.7	0.5	0.7	0.7	0.6	0.8	0.6	0.6	0.7	0.6	0.8	0.6	0.7	0.5	1.1	0.8	24	
27		0.6	0.6	0.8	0.7	0.8	S	0.9	0.9	0.9	1.0	1.0	0.8	0.8	0.9	0.7	0.7	0.8	0.9	0.7	0.7	0.6	0.7	0.8	0.7	0.6	1.0	0.8	24	
28		0.7	0.7	0.8	0.9	S	0.7	0.6	0.5	0.6	0.5	0.6	0.7	0.6	0.6	0.7	0.6	0.7	0.6	0.6	0.7	0.6	0.8	0.9	0.7	0.5	0.9	0.7	24	
29		0.7	0.7	0.8	S	0.7	0.8	0.7	0.7	0.8	0.7	0.7	0.8	0.6	0.7	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.8	1.0	0.5	1.0	0.7	24
30		0.8	0.8	S	0.8	0.8	0.8	1.1	0.7	0.7	0.7	0.7	0.6	0.7	0.8	0.7	0.6	0.7	0.8	0.6	0.5	0.6	0.5	0.7	0.7	0.5	1.1	0.7	24	
31		0.7	S	0.7	0.7	0.8	0.9	0.8	0.7	0.7	0.8	0.8	1.0	0.9	0.9	0.9	0.8	0.7	0.8	0.9	0.8	0.8	0.9	0.9	1.0	0.7	1.0	0.8	24	
HOURLY MAX		1.2	1.2	1.5	2.1	3.6	2.8	3.7	3.8	2.0	1.3	1.0	1.0	1.0	0.9	1.0	0.9	1.6	1.7	1.6	1.0	1.0	1.1	1.0	1.4					
HOURLY AVG		0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.1	1.0	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8					

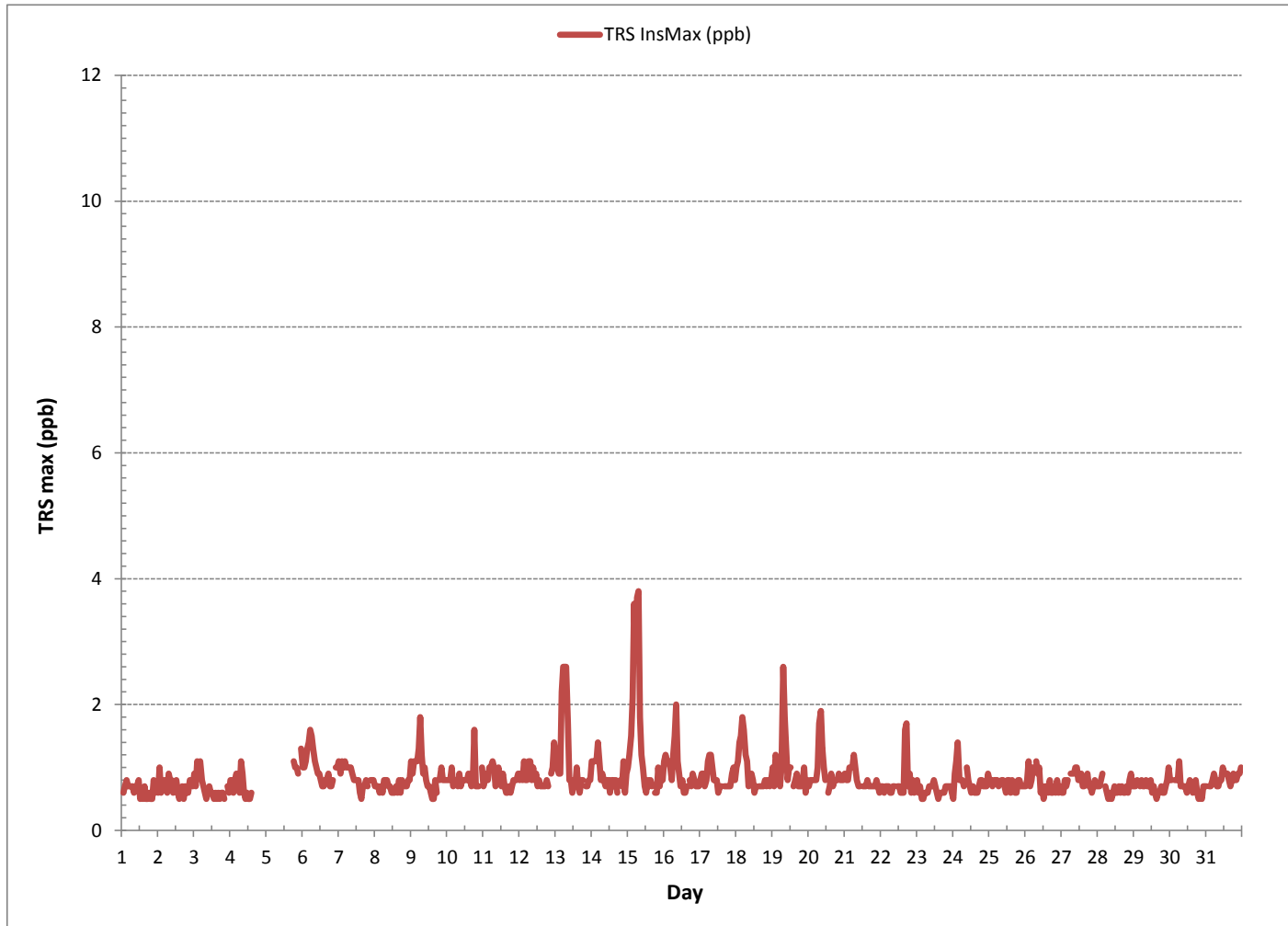
STATUS FLAG CODES

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

MONTHLY SUMMARY

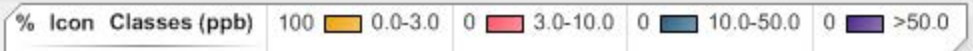
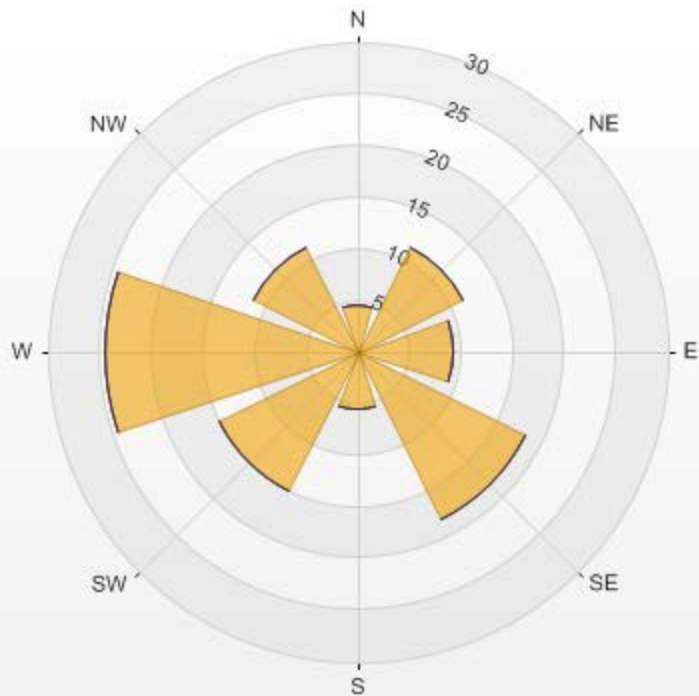
NUMBER OF NON-ZERO READINGS:	686
MAXIMUM INSTANTANEOUS VALUE:	3.8 PPB @ HOUR(S) 7 ON DAY(S) 15
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	9 HRS
STANDARD DEVIATION:	0.34
OPERATIONAL TIME:	726 HRS

TOTAL REDUCED SULPHUR MAX instantaneous maximum in ppb



Wind: LICA COLD LAKE SOUTH Monitor: TRS [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 92.20% Calm Avg: 0.00

Direction	0.0-3.0	3.0-10.0	10.0-50.0	>50.0	Total
N	4.52	0	0	0	4.52
NE	11.37	0	0	0	11.37
E	9.33	0	0	0	9.33
SE	18.22	0	0	0	18.22
S	5.69	0	0	0	5.69
SW	15.01	0	0	0	15.01
W	24.49	0	0	0	24.49
NW	11.37	0	0	0	11.37
Summary	100	0	0	0	100



TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 08/2016 Type: Span



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

TOTAL HYDROCARBON

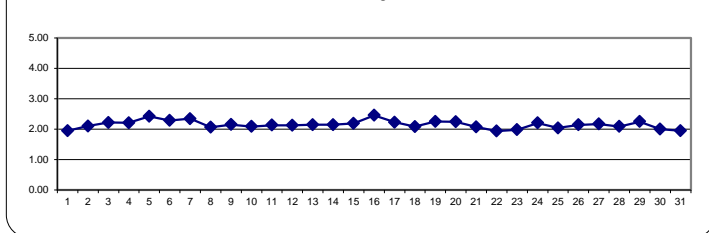
TOTAL HYDROCARBONS (THC) hourly averages in ppm

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.	
DAY	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.
1	S	1.94	1.95	1.96	1.93	1.94	1.98	1.95	1.93	1.98	1.90	1.89	1.91	1.92	1.93	1.94	1.96	1.96	1.97	1.97	2.02	1.99	2.01	S	1.89	2.02	1.95	24		
2		2.06	2.12	2.16	2.12	2.11	2.16	2.23	2.21	2.16	2.12	2.09	2.04	2.00	2.01	2.05	2.01	1.99	1.97	1.99	2.02	2.08	2.23	S	2.41	1.97	2.41	2.10	24	
3		2.57	2.57	2.91	2.94	2.78	2.73	2.24	2.00	1.99	1.98	1.99	1.99	1.98	1.98	2.00	1.99	1.97	1.98	2.01	2.03	2.17	S	2.06	2.17	1.97	2.94	2.22	24	
4		2.18	2.26	2.28	2.41	2.41	2.47	2.59	2.57	2.30	2.11	2.03	2.02	2.02	2.02	2.06	2.16	2.14	2.13	2.07	2.04	2.11	2.14	2.30	S	2.02	2.59	2.21	24	
5		2.38	2.35	2.51	2.53	2.52	2.68	2.74	2.42	C	C	C	Y	Y	Y	C	C	C	C	2.15	2.11	2.31	2.34	S	2.46	2.11	2.74	2.42	21	
6		2.45	2.35	2.46	2.66	2.65	2.64	2.67	2.56	2.30	2.20	2.16	2.12	2.10	2.06	2.05	2.08	2.04	2.03	2.04	2.13	2.16	S	2.32	2.38	2.03	2.67	2.29	24	
7		2.41	2.51	2.61	2.72	2.89	3.10	2.95	2.76	2.37	2.21	2.18	2.12	2.10	2.11	2.11	2.11	2.11	2.11	2.20	2.13	S	2.09	2.06	1.97	1.97	3.10	2.34	24	
8		1.95	1.96	2.01	2.05	2.02	2.04	2.02	2.03	2.04	2.08	2.08	2.06	2.08	2.01	1.99	2.00	2.00	1.99	1.99	S	2.18	2.30	2.24	2.31	1.95	2.31	2.06	24	
9		2.38	2.43	2.44	2.38	2.19	2.17	2.26	2.21	2.13	2.15	2.09	2.06	2.03	2.03	2.02	2.01	2.04	2.06	S	2.03	2.04	2.09	2.11	2.11	2.01	2.44	2.15	24	
10		2.03	2.01	2.10	2.04	2.05	2.05	2.04	2.06	2.10	2.08	2.18	2.15	2.11	2.13	2.19	2.17	2.10	2.04	2.05	2.04	2.10	2.11	S	2.05	2.01	2.19	2.09	24	
11		2.06	2.20	2.26	2.26	2.21	2.18	2.15	2.20	2.23	2.24	2.25	2.22	2.14	2.16	2.14	2.00	1.98	1.94	1.95	1.99	2.06	S	2.09	2.10	1.94	2.26	2.13	24	
12		2.14	2.08	2.08	2.22	2.20	2.25	2.57	2.32	2.14	2.12	2.01	1.98	1.94	1.96	1.96	1.94	1.93	1.95	1.93	2.07	S	2.25	2.32	2.44	1.93	2.57	2.12	24	
13		2.35	2.40	2.30	2.34	2.48	2.38	2.33	2.24	2.14	2.15	2.07	1.99	2.01	1.99	1.96	1.95	1.94	1.96	2.14	S	1.94	2.01	2.17	2.13	1.94	2.48	2.15	24	
14		2.24	2.39	2.39	2.37	2.36	2.42	2.26	2.22	2.17	2.13	2.09	2.05	2.02	2.01	2.02	1.97	1.95	1.90	S	1.92	2.02	2.07	2.11	2.22	1.90	2.42	2.14	24	
15		2.24	2.33	2.46	2.40	2.48	2.50	2.57	2.34	2.10	2.06	2.00	1.99	1.97	1.98	2.03	2.01	1.96	S	1.95	2.07	2.05	2.18	2.24	2.41	1.95	2.57	2.19	24	
16		2.54	2.75	2.83	3.04	3.11	3.08	3.20	2.86	2.46	2.40	2.17	2.02	2.02	2.04	2.06	2.04	S	1.99	2.03	2.09	2.40	2.59	2.46	2.27	1.99	3.20	2.45	24	
17		2.31	2.56	2.61	2.57	2.49	2.60	2.58	2.43	2.27	2.20	2.11	2.04	2.00	2.00	1.99	S	1.95	1.98	1.98	2.05	2.08	2.13	2.12	2.18	1.95	2.61	2.23	24	
18		2.21	2.16	2.17	2.17	2.17	2.15	2.19	2.12	2.04	2.02	1.97	1.99	1.96	1.95	S	1.92	1.96	1.97	2.02	2.05	2.14	2.15	2.15	2.23	1.92	2.23	2.08	24	
19		2.31	2.30	2.36	2.41	2.41	2.52	2.84	2.88	2.49	2.27	2.05	2.03	1.90	S	1.90	2.04	1.95	2.08	2.08	2.25	2.05	2.18	2.17	2.30	1.90	2.88	2.25	24	
20		2.20	2.34	2.37	2.48	2.50	2.50	2.81	2.58	2.56	2.49	2.23	2.20	S	2.04	2.01	1.92	2.02	1.99	2.04	2.18	2.00	2.06	1.96	2.05	1.92	2.81	2.24	24	
21		2.15	2.05	2.18	2.19	2.22	2.34	2.36	2.08	2.00	2.05	1.97	S	1.99	1.89	1.96	1.98	1.90	1.99	1.98	1.99	2.15	2.17	2.06	2.04	1.89	2.36	2.07	24	
22		1.94	1.98	2.06	1.92	1.95	2.00	1.92	1.97	1.97	1.91	S	1.83	1.72	1.77	C1	C1	C1	C1	1.98	2.04	1.95	1.93	2.02	2.00	1.72	2.06	1.94	20	
23		1.93	1.93	1.87	1.90	1.92	1.87	1.90	1.99	1.96	S	1.99	1.92	1.94	2.02	1.98	2.00	2.06	2.03	2.01	2.08	2.07	1.99	2.10	2.07	1.87	2.10	1.98	24	
24		2.16	2.34	2.36	2.54	2.63	2.72	2.59	2.25	S	2.21	2.15	2.07	2.03	2.06	1.98	1.97	2.04	1.97	2.00	2.13	2.09	2.18	2.15	2.06	1.97	2.72	2.20	24	
25		2.03	2.02	1.98	2.12	2.11	2.04	2.08	S	2.00	1.99	2.03	1.93	1.95	2.08	2.01	1.96	2.00	1.91	1.94	2.03	2.09	2.10	2.23	2.24	1.91	2.24	2.04	24	
26		2.27	2.29	2.33	2.23	2.27	2.40	S	2.19	2.20	2.10	2.10	2.08	1.98	2.02	2.08	2.00	2.00	2.01	2.04	2.10	2.13	2.11	2.15	2.18	1.98	2.40	2.14	24	
27		2.20	2.26	2.31	2.35	2.20	S	2.31	2.28	2.29	2.24	2.03	1.98	1.98	1.99	1.98	1.94	2.02	2.22	2.09	2.13	2.29	2.28	2.15	2.33	1.94	2.35	2.17	24	
28		2.30	2.15	2.04	2.05	S	1.97	2.03	2.00	2.00	1.96	2.03	2.05	2.04	2.08	2.07	2.09	2.11	2.07	2.07	2.01	2.10	2.24	2.33	2.27	1.96	2.33	2.09	24	
29		2.39	2.51	2.53	S	2.59	2.73	2.64	2.57	2.29	2.17	2.21	2.16	2.08	2.06	2.08	2.05	2.07	2.07	2.06	2.05	2.08	2.04	2.08	2.17	2.04	2.73	2.25	24	
30		2.32	2.36	S	1.95	2.02	2.07	2.01	1.93	2.01	2.04	2.03	1.99	1.99	1.97	1.96	1.96	1.95	1.92	1.92	1.97	1.96	1.93	1.90	1.90	1.90	2.36	2.00	24	
31		1.90	S	1.89	1.89	1.93	1.94	1.92	1.92	1.87	1.90	1.93	1.96	1.96	1.96	1.93	1.93	1.95	1.94	1.97	1.99	2.01	1.98	2.00	2.04	1.87	2.04	1.94	24	
HOURLY MAX		2.57	2.75	2.91	3.04	3.11	3.10	3.20	2.88	2.56	2.49	2.25	2.22	2.14	2.16	2.19	2.17	2.14	2.22	2.20	2.25	2.40	2.59	2.46	2.46					
HOURLY AVG		2.22	2.26	2.29	2.31	2.33	2.35	2.37	2.27	2.16	2.12	2.07	2.03	2.00	2.01	2.02	2.01	2.00	2.01	2.02	2.06	2.10	2.14	2.15	2.19					

STATUS FLAG CODES

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

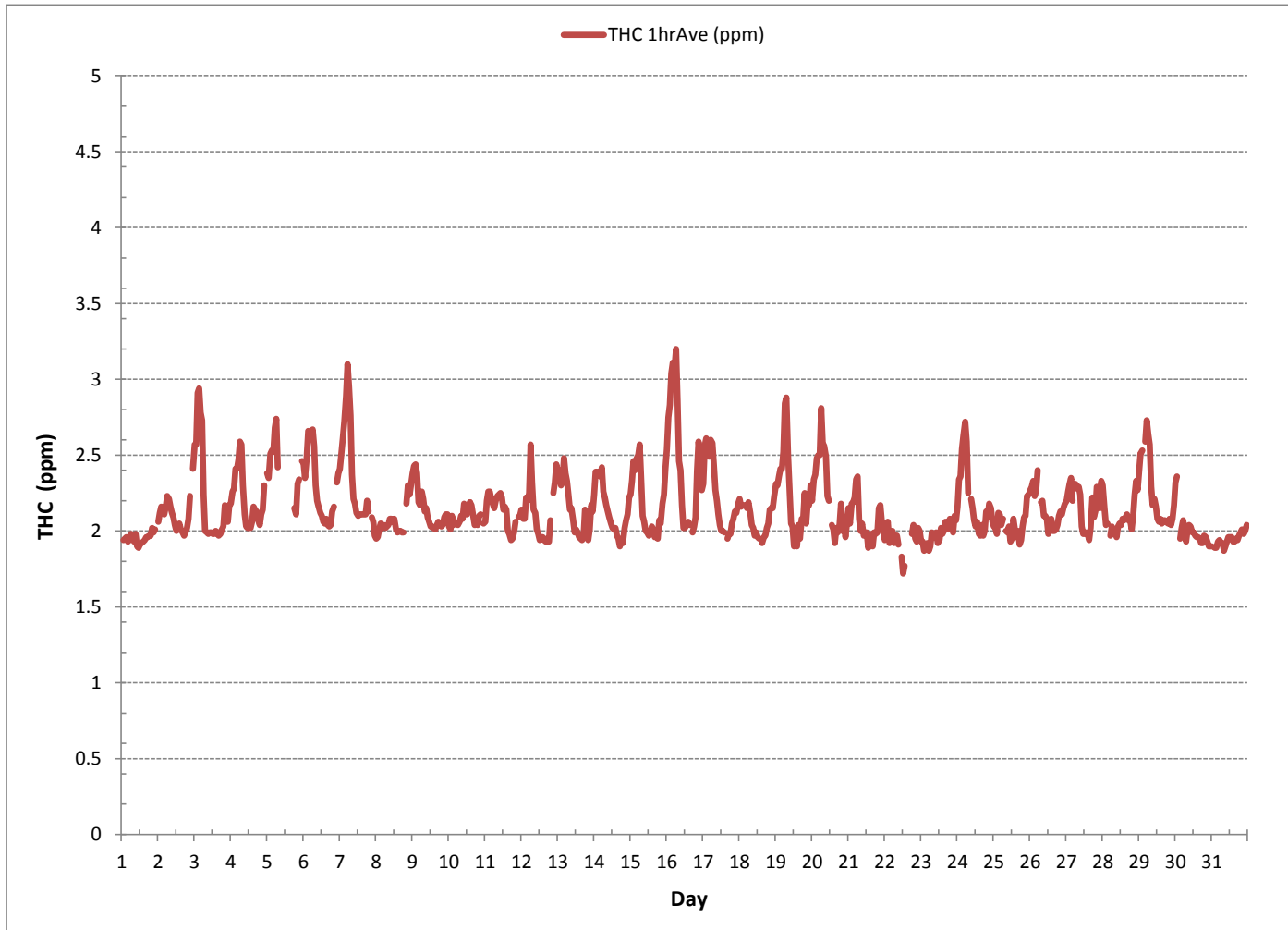
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	698		
MINIMUM 1-HR AVERAGE:	1.72 PPM	@ HOUR(S)	12 ON DAY(S) 22
MAXIMUM 1-HR AVERAGE:	3.20 PPM	@ HOUR(S)	6 ON DAY(S) 16
MAXIMUM 24-HR AVERAGE:	2.45 PPM		ON DAY(S) 16
			VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS	OPERATIONAL TIME:	737 HRS
MONTHLY CALIBRATION TIME:	7 HRS	AMD OPERATION UPTIME:	99.1 %
STANDARD DEVIATION:	0.22	MONTHLY AVERAGE:	2.15 PPM

TOTAL HYDROCARBONS (THC) hourly averages in ppm





TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.
DAY																													
1	S	2.07	2.08	2.10	2.08	2.08	2.11	2.08	2.04	2.11	1.99	1.97	1.98	1.99	2.01	2.04	2.05	2.06	2.05	2.07	2.18	2.13	2.11	S	1.97	2.18	2.06	24	
2		2.21	2.26	2.33	2.30	2.26	2.32	2.39	2.35	2.30	2.26	2.23	2.20	2.11	2.16	2.17	2.11	2.10	2.14	2.20	2.45	2.77	S	2.76	2.10	2.77	2.28	24	
3		2.91	2.97	3.36	3.38	3.16	3.10	2.73	2.13	2.16	2.11	2.11	2.11	2.23	2.23	2.11	2.10	2.11	2.17	2.17	2.23	2.42	S	2.23	2.63	2.10	3.38	2.47	24
4		2.57	2.72	2.67	2.62	2.82	2.80	2.83	2.88	2.70	2.29	2.21	2.18	2.20	2.19	2.24	2.42	2.38	2.39	2.33	3.06	2.39	2.51	2.63	S	2.18	3.06	2.52	24
5		2.76	2.60	2.70	2.77	2.73	2.99	3.00	2.70	C	C	C	Y	Y	Y	C	C	C	C	2.23	2.08	2.38	2.39	S	2.57	2.08	3.00	2.61	21
6		2.45	2.39	2.60	2.67	2.70	2.67	2.67	2.60	2.33	2.14	2.08	2.13	2.32	2.02	1.99	2.05	1.98	1.97	2.07	2.26	2.33	S	2.63	2.53	1.97	2.70	2.33	24
7		2.51	2.59	2.79	2.90	3.03	3.22	3.10	2.85	2.38	2.20	2.10	2.01	2.05	1.97	1.97	1.95	1.95	2.02	2.05	1.99	S	1.95	1.92	1.80	1.80	3.22	2.32	24
8		1.76	1.79	1.85	1.86	1.86	1.91	1.83	1.83	1.89	1.92	1.92	1.86	2.10	1.83	1.77	1.80	1.80	1.80	1.80	S	2.24	2.42	2.44	2.35	1.76	2.44	1.94	24
9		2.42	2.48	2.42	2.30	2.12	2.08	2.14	2.08	1.98	X	1.92	1.94	1.86	1.86	1.85	1.83	1.88	1.91	S	1.88	2.04	1.97	1.97	1.97	1.83	2.48	2.04	23
10		1.94	1.97	2.00	1.94	1.98	1.98	1.89	2.01	1.97	1.97	2.05	2.00	1.95	2.13	2.05	2.02	2.00	1.86	1.88	1.86	2.11	1.98	S	1.91	1.86	2.13	1.98	24
11		1.95	2.79	2.64	2.46	2.11	2.05	2.01	2.11	2.11	2.15	2.13	2.14	2.02	2.08	2.08	1.89	1.91	1.91	1.91	1.97	2.12	S	2.08	2.02	1.89	2.79	2.11	24
12		2.23	2.23	2.11	2.42	2.17	2.20	16.72	3.48	2.20	2.42	1.95	1.94	1.88	1.89	1.91	1.89	1.94	1.96	1.88	2.36	S	2.39	2.57	2.54	1.88	16.72	2.84	24
13		2.48	2.42	2.42	2.57	2.57	2.50	2.39	2.19	2.08	2.05	2.02	1.89	1.97	1.86	1.83	1.95	1.83	1.86	2.38	S	1.86	2.14	2.30	2.29	1.83	2.57	2.17	24
14		2.32	2.54	2.48	2.48	2.38	2.60	2.24	2.14	2.05	2.05	2.65	1.95	1.94	2.05	2.01	1.89	1.86	1.80	S	1.86	2.00	2.12	2.14	2.23	1.80	2.65	2.16	24
15		2.42	2.50	2.60	2.57	2.57	2.51	2.54	2.48	2.01	2.00	1.98	1.89	1.86	1.88	1.97	1.94	1.86	S	1.88	2.14	2.11	2.18	2.48	2.42	1.86	2.60	2.21	24
16		2.73	2.82	2.92	3.19	3.16	3.12	3.16	3.07	2.42	2.30	2.08	1.89	1.86	1.91	1.95	2.02	S	1.85	2.23	2.45	2.98	3.50	2.88	2.30	1.85	3.50	2.56	24
17		2.30	2.76	2.88	2.60	2.54	2.72	2.53	2.50	2.17	2.10	2.11	1.98	1.89	1.88	1.88	S	1.86	1.89	1.91	2.05	2.05	2.17	2.11	2.17	1.86	2.88	2.22	24
18		2.17	2.14	2.17	2.17	2.17	2.12	2.20	2.14	2.01	2.00	1.97	1.97	1.95	2.10	S	1.94	1.97	1.97	2.05	2.10	2.21	2.20	2.20	2.20	1.94	2.21	2.09	24
19		2.38	2.41	2.36	2.47	2.48	2.56	2.95	3.00	2.60	2.30	2.13	2.05	1.89	S	1.95	2.04	1.91	2.04	2.08	2.33	2.02	2.15	2.14	2.27	1.89	3.00	2.28	24
20		2.14	2.48	2.42	2.64	2.53	2.51	2.91	2.48	2.57	3.07	2.15	2.08	S	2.00	1.83	1.77	1.83	1.86	1.92	2.39	1.83	1.85	1.77	2.09	1.77	3.07	2.22	24
21		2.10	1.95	2.02	2.05	2.21	2.26	2.35	1.86	1.74	2.05	1.74	S	1.77	1.65	1.68	1.71	1.61	1.70	1.73	1.89	1.91	1.91	1.77	1.73	1.61	2.35	1.89	24
22		1.71	1.71	1.87	1.69	1.65	1.71	1.62	1.68	1.68	1.62	S	2.04	1.65	1.74	C1	C1	C1	C1	2.17	2.26	2.12	2.11	2.20	2.19	1.62	2.26	1.86	20
23		2.14	2.14	2.11	2.10	2.17	2.15	2.18	2.27	2.24	S	2.27	2.23	2.23	2.35	2.32	2.33	2.38	2.38	2.39	2.45	2.51	2.39	2.53	2.48	2.10	2.53	2.29	24
24		2.56	2.88	2.75	2.97	3.12	3.19	3.12	2.72	S	2.63	2.57	2.48	2.45	2.45	2.39	2.38	2.42	2.38	2.48	2.70	2.67	2.77	2.57	2.51	2.38	3.19	2.66	24
25		2.45	2.42	2.45	2.54	2.53	2.47	2.47	S	2.39	2.39	2.39	2.33	2.35	2.45	2.51	2.35	2.36	2.32	2.30	2.42	2.66	2.50	2.57	2.64	2.30	2.66	2.45	24
26		2.80	2.75	2.88	2.63	2.80	2.76	S	2.56	2.59	2.44	2.50	2.39	2.29	2.30	2.36	2.30	2.26	2.30	2.35	2.51	2.54	2.44	2.44	2.45	2.26	2.88	2.51	24
27		2.48	2.54	2.56	2.63	2.45	S	2.54	2.53	2.51	2.53	2.26	2.20	2.17	2.26	2.14	2.30	2.44	2.63	2.39	2.82	2.62	2.62	2.39	2.53	2.14	2.82	2.46	24
28		2.54	2.36	2.18	2.20	S	2.15	2.20	2.23	2.30	2.23	2.41	2.35	2.35	2.41	2.38	2.42	2.45	2.42	2.44	2.38	2.45	2.66	2.73	2.73	2.15	2.73	2.39	24
29		2.80	2.92	2.95	S	3.03	3.16	3.16	3.03	2.85	2.66	2.67	2.67	2.57	2.56	2.59	2.56	2.57	2.60	2.67	2.63	2.70	2.63	2.64	2.88	2.56	3.16	2.76	24
30		2.92	2.94	S	2.51	2.60	2.63	2.56	2.54	2.60	2.73	2.63	2.56	2.57	2.53	2.51	2.53	2.51	2.48	2.53	2.57	2.56	2.63	2.48	2.51	2.48	2.94	2.59	24
31		2.53	S	2.48	2.48	2.51	2.51	2.50	2.45	2.54	2.45	2.42	2.39	2.38	2.35	2.32	2.29	2.30	2.35	2.29	2.30	2.32	2.29	2.32	2.32	2.29	2.54	2.40	24
HOURLY MAX		2.92	2.97	3.36	3.38	3.16	3.22	16.72	3.48	2.85	3.07	2.67	2.67	2.57	2.56	2.59	2.56	2.57	2.63	2.67	3.06	2.98	3.50	2.88	2.88				
HOURLY AVG		2.39	2.45	2.47	2.47	2.48	2.50	2.97	2.43	2.26	2.26	2.19	2.13	2.10	2.11	2.10	2.10	2.09	2.11	2.16	2.28	2.30	2.35	2.33	2.35				

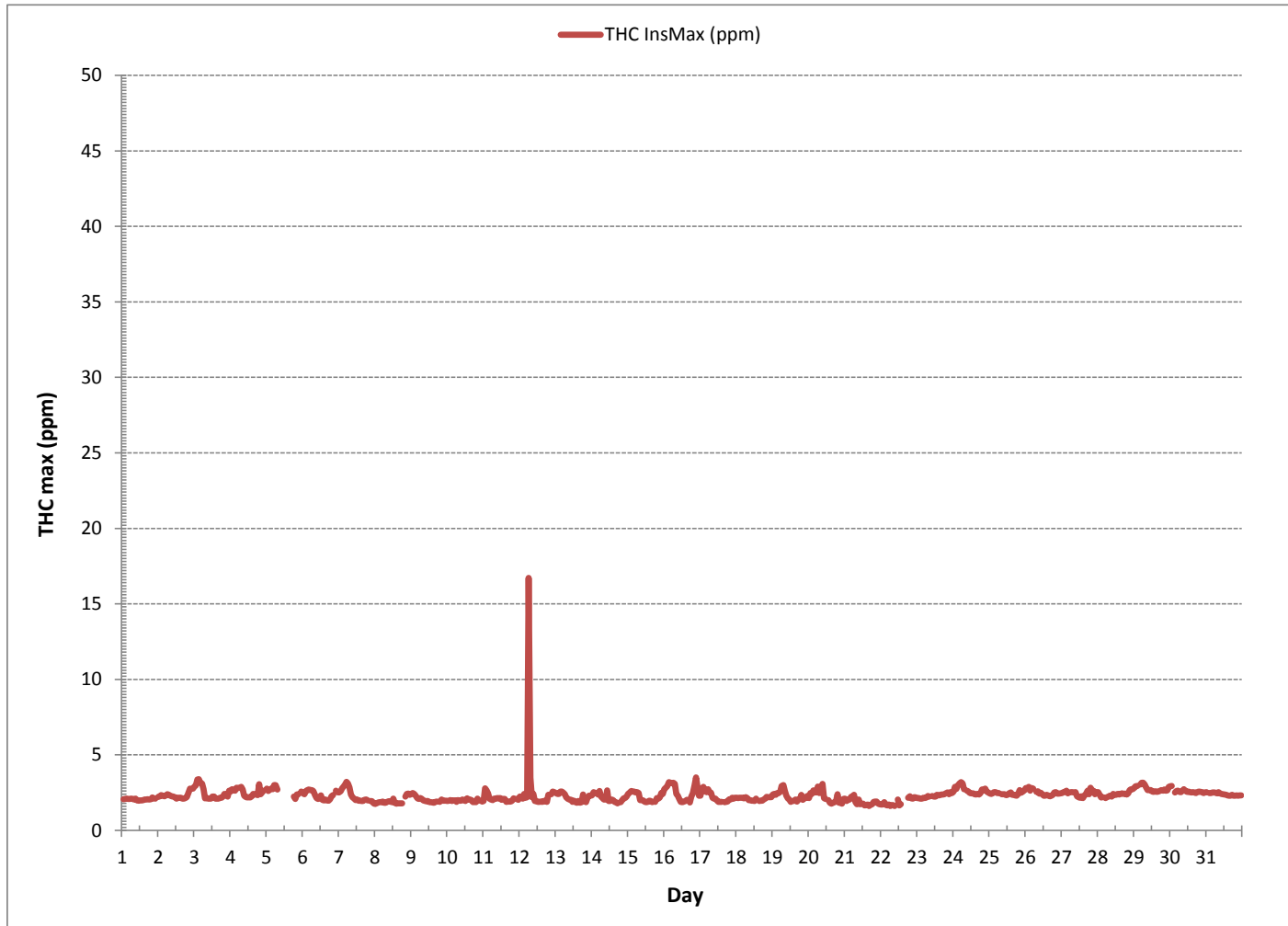
STATUS FLAG CODES

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

MONTHLY SUMMARY

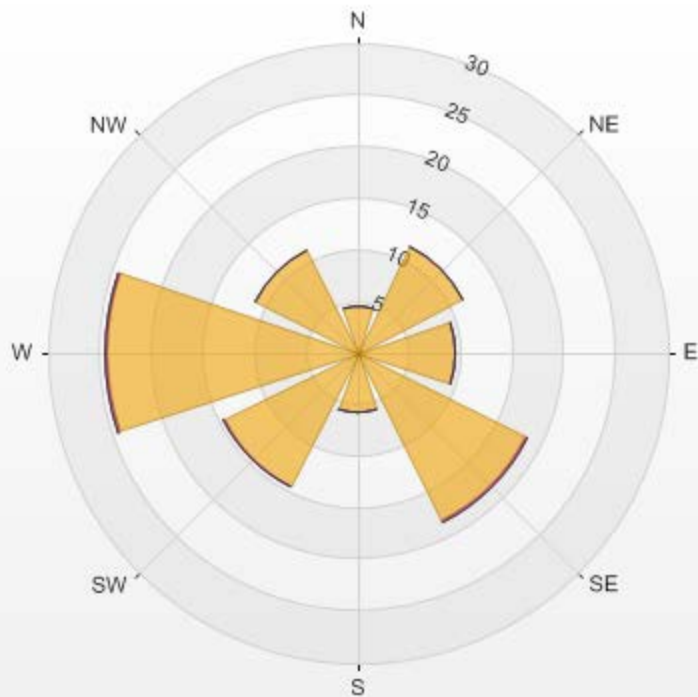
NUMBER OF NON-ZERO READINGS:	697
MAXIMUM INSTANTANEOUS VALUE:	16.72 PPM @ HOUR(S) 6 ON DAY(S) 12
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	7 HRS
OPERATIONAL TIME:	736 HRS
STANDARD DEVIATION:	0.64

TOTAL HYDROCARBONS MAX instantaneous maximum in ppm



Wind: LICA COLD LAKE SOUTH Monitor: THC [ppm] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.82% Calm Avg: 0.00

Direction	0.0-3.0	3.0-10.0	10.0-50.0	>50.0	Total
N	4.58	0	0	0	4.58
NE	11.46	0	0	0	11.46
E	9.46	0	0	0	9.46
SE	18.19	0.14	0	0	18.33
S	5.73	0.14	0	0	5.87
SW	14.47	0.14	0	0	14.61
W	24.21	0.29	0	0	24.5
NW	11.17	0	0	0	11.17
Summary	99.27	0.71	0	0	100



% Icon Classes (ppm)		99	1	0	0
0.0-3.0	3.0-10.0	10.0-50.0	>50.0		

OXIDES OF NITROGEN

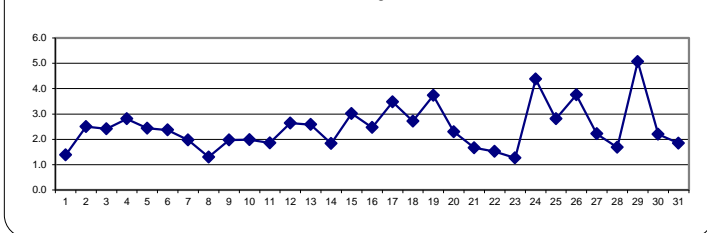
OXIDES OF NITROGEN (NOx) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.		
DAY	MIN.	MAX.	AVG.																									MIN.	MAX.	AVG.	RDGS.
1	S	2.8	2.0	2.0	1.6	1.9	2.4	2.9	2.3	1.9	0.8	0.5	0.5	0.4	0.5	0.5	0.5	0.7	0.8	0.6	1.6	1.8	1.3	S	0.4	2.9	1.4	24			
2	4.6	3.9	4.4	4.4	3.6	4.7	5.4	4.3	3.2	2.2	1.4	0.9	0.5	0.4	0.4	0.4	0.4	0.5	1.5	2.6	3.0	S	4.3	0.4	5.4	2.5	24				
3	3.3	3.0	4.5	3.7	3.7	5.9	4.2	2.0	1.2	0.6	0.6	0.5	2.9	5.9	0.7	0.9	0.8	0.9	1.4	1.1	2.3	S	2.9	2.4	0.5	5.9	2.4	24			
4	2.0	2.1	2.2	2.8	5.0	6.4	7.8	10.1	4.6	3.4	1.4	0.7	0.5	0.6	0.4	0.7	0.9	0.8	0.8	4.3	2.2	2.0	2.8	S	0.4	10.1	2.8	24			
5	4.2	4.0	3.1	1.9	4.8	4.1	8.0	4.3	1.9	1.2	1.0	1.2	0.8	0.7	0.7	1.0	0.8	1.1	1.7	1.3	2.3	2.3	S	3.6	0.7	8.0	2.4	24			
6	2.4	1.8	2.2	2.1	1.8	2.2	4.5	8.8	4.2	2.0	1.0	0.7	0.6	0.8	0.5	0.5	1.1	1.0	2.6	3.1	2.8	S	4.3	3.4	0.5	8.8	2.4	24			
7	3.1	3.0	2.5	2.5	3.2	3.7	4.1	5.4	2.4	1.4	0.9	0.7	0.7	0.8	0.7	0.7	0.6	0.8	1.8	1.5	S	2.5	1.6	0.8	0.6	5.4	2.0	24			
8	0.6	0.8	0.7	1.3	1.9	3.2	1.2	1.0	1.3	1.1	0.8	0.6	1.1	0.8	0.6	0.7	1.0	0.8	0.7	S	3.0	2.8	2.0	1.9	0.6	3.2	1.3	24			
9	1.9	1.6	1.7	1.7	2.2	1.9	2.3	2.4	2.4	2.4	1.2	2.2	1.4	1.2	1.0	1.3	1.7	1.8	S	4.0	2.6	1.9	1.9	2.6	1.0	4.0	2.0	24			
10	1.9	1.4	1.5	1.8	2.4	2.5	2.5	1.6	C	C	C	C	C	C	C	C	C	3.1	2.8	1.2	1.5	1.3	S	2.2	1.2	3.1	2.0	24			
11	1.4	1.4	1.6	1.3	1.1	1.4	1.4	1.9	1.7	3.4	1.9	1.9	1.6	1.9	2.0	0.9	1.0	1.3	1.6	1.4	1.5	S	4.1	5.0	0.9	5.0	1.9	24			
12	3.5	3.2	3.9	2.6	3.6	4.6	5.7	4.9	4.1	3.7	1.6	1.1	0.8	0.9	0.7	0.5	0.5	0.8	0.9	1.5	S	4.0	4.7	2.9	0.5	5.7	2.6	24			
13	3.0	2.8	2.4	2.2	3.0	3.5	4.5	3.7	3.3	4.9	2.5	3.2	2.3	2.4	1.5	1.0	0.7	1.0	1.5	S	2.8	2.7	2.0	2.4	0.7	4.9	2.6	24			
14	2.2	1.7	2.0	2.5	2.1	1.6	2.0	1.9	2.0	1.9	2.1	1.5	1.0	0.8	1.0	0.9	1.0	1.0	S	2.8	2.7	2.2	2.1	3.1	0.8	3.1	1.8	24			
15	3.1	2.6	2.6	2.3	3.3	4.4	4.8	6.8	5.3	5.5	3.0	2.1	1.4	1.3	1.8	1.4	0.8	S	2.4	3.1	3.6	2.9	3.0	1.9	0.8	6.8	3.0	24			
16	1.8	1.5	1.8	1.8	1.7	4.7	7.4	5.7	4.0	3.1	2.0	1.4	1.4	1.1	0.9	1.3	S	3.3	1.6	1.4	1.8	1.7	2.3	3.0	0.9	7.4	2.5	24			
17	4.6	5.0	4.6	5.9	6.9	7.8	7.6	5.9	4.7	3.8	2.7	1.3	0.8	0.8	0.4	S	1.6	1.0	1.5	2.9	2.0	1.8	2.0	4.2	0.4	7.8	3.5	24			
18	4.9	4.0	3.3	3.2	3.6	3.7	3.6	3.0	2.5	1.7	1.2	1.5	1.5	9.0	S	2.0	1.6	1.5	1.4	1.3	1.4	1.5	2.2	2.8	1.2	9.0	2.7	24			
19	2.0	1.6	1.6	1.8	3.5	4.5	11.0	12.1	7.7	2.5	1.7	1.1	1.1	S	2.1	2.9	3.1	2.9	7.1	6.2	3.8	2.5	1.6	1.4	1.1	12.1	3.7	24			
20	1.4	1.4	1.4	1.5	2.2	4.0	5.4	3.1	4.7	4.7	2.4	2.4	S	2.4	1.3	1.0	0.9	1.4	2.7	2.7	1.5	1.2	1.3	1.8	0.9	5.4	2.3	24			
21	1.6	1.1	2.1	1.5	1.7	3.2	2.4	2.3	2.5	2.1	1.7	S	2.1	1.1	1.0	1.0	0.9	0.9	1.6	2.8	1.7	1.1	0.9	0.9	0.9	3.2	1.7	24			
22	0.9	0.8	0.8	0.9	0.9	0.8	0.8	2.0	1.4	1.2	S	2.4	1.9	1.7	2.1	1.6	1.8	1.9	2.1	4.5	0.9	1.0	1.0	1.5	0.8	4.5	1.5	24			
23	1.2	1.0	0.5	0.5	0.5	0.5	0.5	1.0	S	2.8	1.9	3.5	2.5	1.8	1.8	0.7	0.4	1.2	1.0	0.4	1.3	0.9	2.8	1.6	0.4	3.5	1.3	24			
24	1.5	1.8	2.3	2.7	3.8	5.8	10.3	15.4	S	16.7	10.0	4.0	2.8	1.8	1.0	1.1	1.3	0.8	2.3	2.2	2.7	3.2	3.4	3.6	0.8	16.7	4.4	24			
25	2.1	2.7	2.9	3.9	3.4	3.2	3.7	S	5.1	3.3	3.5	3.0	2.0	2.8	2.7	1.1	1.0	1.0	1.0	1.3	3.0	3.4	4.5	4.0	1.0	5.1	2.8	24			
26	3.1	2.5	4.1	5.4	9.4	5.7	S	17.6	11.0	6.3	3.3	2.9	1.3	1.2	1.0	1.0	0.9	0.7	1.0	2.5	1.5	1.4	1.3	1.1	0.7	17.6	3.7	24			
27	1.0	1.0	1.3	1.1	1.0	S	3.0	2.5	2.2	1.9	3.0	1.4	0.9	1.0	1.2	1.9	2.3	2.5	2.7	3.6	3.8	3.6	3.6	4.5	0.9	4.5	2.2	24			
28	4.1	3.8	2.1	2.7	S	3.1	2.3	0.9	0.7	0.5	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.4	0.6	2.2	4.9	4.0	4.0	0.2	4.9	1.7	24				
29	5.6	7.8	6.2	S	5.0	7.6	13.0	16.0	12.6	6.0	4.5	2.4	2.0	1.4	1.4	1.3	1.0	1.0	2.5	4.0	4.1	5.0	3.1	2.9	1.0	16.0	5.1	24			
30	2.5	3.6	S	2.4	3.6	5.8	5.0	3.8	1.9	1.7	1.1	1.5	0.9	0.8	1.1	1.7	1.8	3.5	2.7	2.3	1.3	0.6	0.5	0.5	0.5	5.8	2.2	24			
31	0.6	S	2.2	1.3	1.3	1.3	2.7	3.4	3.7	4.4	3.8	1.3	1.4	1.3	1.2	1.1	1.6	1.5	2.3	2.2	1.2	0.9	0.9	0.8	0.6	4.4	1.8	24			
HOURLY MAX	5.6	7.8	6.2	5.9	9.4	7.8	13.0	17.6	12.6	16.7	10.0	4.0	3.5	9.0	2.7	2.9	3.1	3.5	7.1	6.2	4.1	5.0	4.7	5.0							
HOURLY AVG	2.5	2.5	2.5	2.4	3.1	3.8	4.7	5.2	3.6	3.3	2.2	1.6	1.4	1.7	1.1	1.1	1.1	1.4	1.8	2.3	2.3	2.3	2.4	2.6							

STATUS FLAG CODES

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

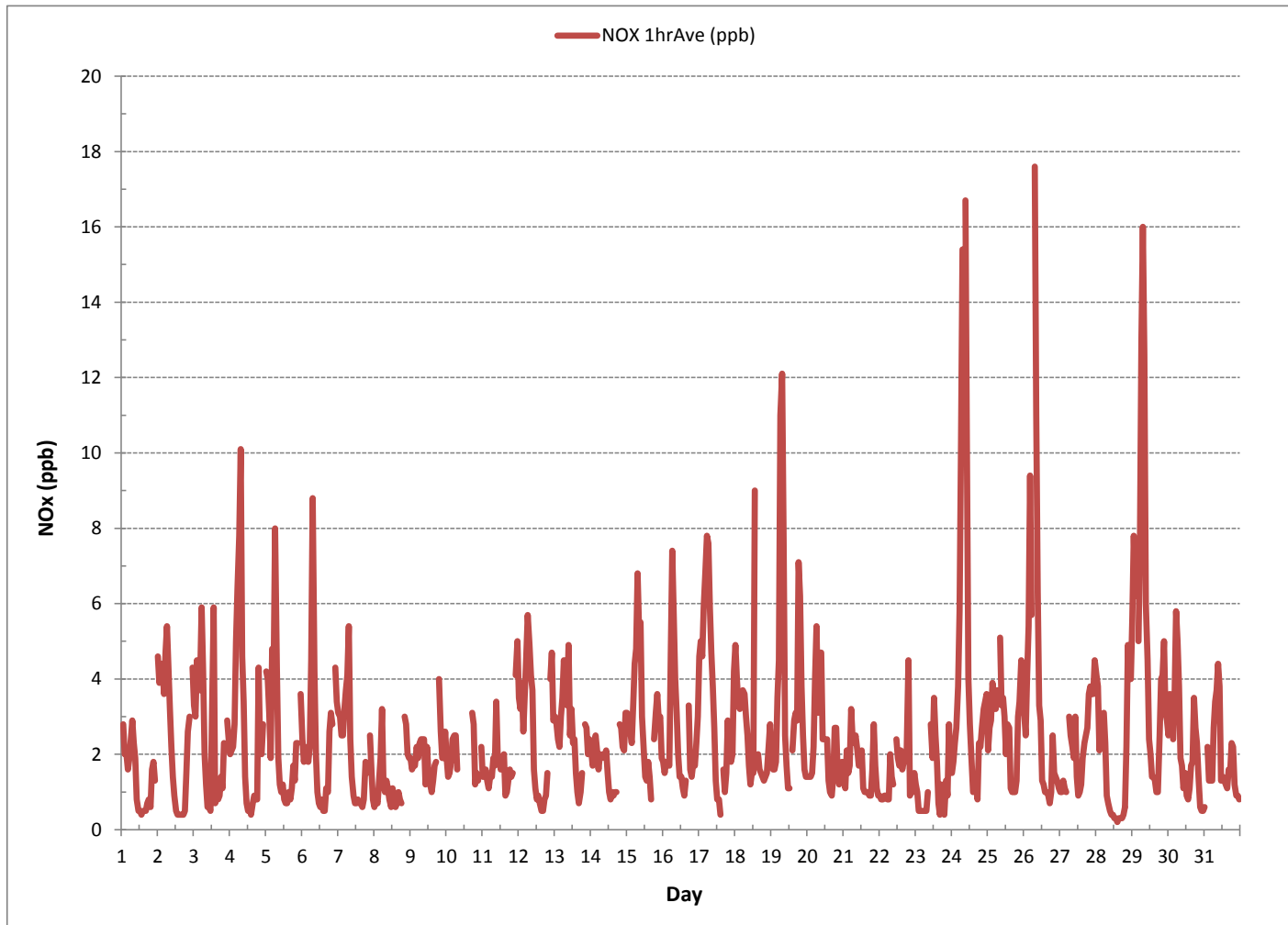
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	703		
MINIMUM 1-HR AVERAGE:	0.2 PPB	@ HOUR(S)	14 ON DAY(S) 28
MAXIMUM 1-HR AVERAGE:	17.6 PPB	@ HOUR(S)	7 ON DAY(S) 26
MAXIMUM 24-HR AVERAGE:	5.1 PPB		ON DAY(S) 29
			VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS	OPERATIONAL TIME:	744 HRS
MONTHLY CALIBRATION TIME:	9 HRS	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	2.09	MONTHLY AVERAGE:	2.5 PPB

OXIDES OF NITROGEN (NOx) hourly averages in ppb





OXIDES OF NITROGEN MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR		
DAY	MIN.	MAX.	AVG.	RDGS.																										
1	S	4.5	2.4	2.8	2.1	2.4	4.3	4.7	2.8	3.2	1.8	0.8	0.7	0.7	1.0	1.0	0.8	1.6	1.6	1.1	2.9	2.3	2.6	S	0.7	4.7	2.2	24		
2		5.9	6.0	5.6	5.6	4.5	5.5	7.9	5.6	3.8	3.4	2.4	1.6	0.9	0.8	2.0	0.7	0.7	1.1	2.6	4.2	3.8	S	5.9	0.7	7.9	3.5	24		
3		4.1	3.9	6.3	5.4	6.9	12.5	8.1	6.4	9.9	2.1	3.0	0.9	41.6	55.3	1.5	2.0	2.0	3.8	2.8	2.9	3.3	S	5.8	3.7	0.9	55.3	8.4	24	
4		4.6	2.9	3.0	4.0	10.5	13.9	11.3	12.5	8.6	4.8	6.0	1.6	1.2	2.4	0.9	1.9	1.6	1.5	2.0	40.9	3.6	2.9	3.9	S	0.9	40.9	6.4	24	
5		6.7	4.6	4.2	2.5	13.1	6.8	10.5	10.5	6.0	2.5	3.3	3.8	2.4	1.7	1.6	5.5	1.8	3.7	7.4	2.5	4.7	4.8	S	5.2	1.6	13.1	5.0	24	
6		3.2	2.6	2.8	2.8	2.4	3.7	6.7	14.8	6.7	4.2	1.7	2.9	1.7	2.8	1.6	1.2	4.7	1.9	4.1	4.3	3.7	S	6.1	4.2	1.2	14.8	3.9	24	
7		3.7	3.7	3.4	3.8	5.0	4.8	5.6	7.3	5.2	7.3	1.6	1.5	3.2	3.5	1.2	2.8	1.1	2.1	2.5	2.3	S	6.3	2.1	1.3	1.1	7.3	3.5	24	
8		1.2	2.0	1.6	6.0	3.1	6.3	2.8	1.7	4.2	4.1	2.0	3.9	10.7	5.4	1.0	3.9	5.9	1.6	1.9	S	4.4	3.9	2.5	2.9	1.0	10.7	3.6	24	
9		2.4	2.2	2.9	2.4	7.9	3.7	3.8	5.1	7.7	6.8	3.2	18.2	6.0	1.7	2.1	5.2	5.5	3.0	S	6.0	3.9	2.5	2.9	3.4	1.7	18.2	4.7	24	
10		2.6	2.0	2.1	2.8	3.7	6.7	4.2	C	C	C	C	C	C	C	C	C	C	C	7.7	13.1	3.1	4.1	2.0	S	4.3	2.0	13.1	4.5	24
11		2.0	2.3	2.5	2.4	1.8	4.5	4.4	5.0	2.3	32.5	6.7	2.8	2.3	3.0	2.9	1.6	2.1	5.5	4.2	2.6	2.1	S	4.7	6.0	1.6	32.5	4.6	24	
12		4.4	4.3	4.3	3.4	5.1	5.6	7.9	6.4	5.1	9.7	2.3	1.9	1.3	1.6	1.2	0.7	1.2	1.2	3.3	S	7.5	7.1	4.1	0.7	9.7	3.9	24		
13		5.2	3.6	3.2	2.9	3.8	4.1	7.2	5.2	7.1	17.8	11.9	13.4	6.1	13.7	11.2	5.1	1.2	1.8	2.5	S	5.6	4.2	2.9	3.0	1.2	17.8	6.2	24	
14		4.1	2.4	4.1	3.7	5.2	2.2	3.0	2.5	2.8	3.0	2.9	4.1	2.1	1.3	2.3	1.3	2.0	2.0	S	4.3	7.7	2.9	2.9	3.7	1.3	7.7	3.2	24	
15		3.9	3.6	4.1	3.8	4.0	9.9	6.9	10.0	7.5	7.1	6.8	4.8	2.0	2.0	3.0	2.9	1.2	S	3.8	4.1	5.1	4.6	8.1	2.5	1.2	10.0	4.9	24	
16		2.4	2.3	2.5	2.5	3.4	8.8	10.3	10.0	5.8	4.4	3.4	3.3	2.5	1.6	1.3	2.4	S	5.2	2.0	1.9	2.6	2.3	3.7	3.6	1.3	10.3	3.8	24	
17		5.9	5.9	5.6	6.4	7.6	9.9	8.1	8.0	6.8	4.7	4.8	2.0	2.0	1.9	0.9	S	2.8	1.5	3.2	4.3	3.9	2.5	3.0	5.5	0.9	9.9	4.7	24	
18		6.8	4.3	4.1	3.7	4.3	4.6	4.6	4.2	3.0	2.5	2.4	3.7	4.4	46.7	S	3.4	2.6	2.8	2.8	1.7	2.0	2.1	3.6	3.7	1.7	46.7	5.4	24	
19		2.9	2.4	2.3	2.8	6.0	12.7	16.4	14.0	11.9	3.4	2.9	3.2	4.5	S	4.3	15.2	19.5	20.4	24.8	25.8	12.1	9.3	2.3	1.9	1.9	25.8	9.6	24	
20		1.9	1.9	2.0	2.0	4.8	6.7	10.1	4.5	7.5	6.9	3.9	3.2	S	4.3	2.4	2.9	1.2	1.9	6.4	3.5	2.2	1.6	2.1	2.5	1.2	10.1	3.8	24	
21		2.4	1.9	2.7	1.9	2.4	6.8	3.0	3.0	3.9	3.7	3.4	S	4.0	1.9	1.5	3.0	1.5	1.3	1.6	2.3	12.3	3.2	1.6	2.3	1.3	12.3	3.1	24	
22		4.2	1.8	1.3	1.6	2.3	1.3	1.3	5.4	10.4	3.5	S	4.2	3.2	3.8	12.1	2.9	3.4	5.8	3.2	59.5	1.5	1.5	1.6	2.1	1.3	59.5	6.0	24	
23		2.1	1.6	0.9	0.7	1.1	1.5	1.1	1.0	9.4	S	17.5	15.6	25.7	20.2	26.9	2.9	1.8	4.4	3.4	1.1	4.7	1.5	5.6	2.5	0.7	26.9	6.7	24	
24		2.0	2.6	5.2	3.8	6.1	7.5	17.0	17.9	S	22.3	15.1	5.9	3.8	4.3	1.7	2.1	3.0	2.1	4.5	3.3	4.1	4.2	4.2	4.5	1.7	22.3	6.4	24	
25		3.8	6.7	4.5	4.5	3.8	4.1	5.1	S	6.8	4.3	4.2	4.8	3.0	3.5	3.6	2.1	1.7	2.1	1.9	2.6	3.7	4.3	5.3	5.2	1.7	6.8	4.0	24	
26		4.1	3.6	5.9	11.3	12.3	6.7	S	22.1	15.5	11.4	7.4	4.2	2.3	4.5	4.2	3.2	5.5	1.2	2.0	10.4	2.8	1.8	2.0	1.5	1.2	22.1	6.3	24	
27		1.3	1.3	1.9	1.8	1.3	S	4.7	3.2	3.0	2.8	19.3	3.8	2.0	2.3	3.6	28.7	23.6	4.0	4.4	5.2	6.2	5.6	7.2	5.9	1.3	28.7	6.2	24	
28		5.4	5.0	3.2	3.8	S	5.8	3.4	1.6	1.1	0.8	0.8	1.0	0.6	0.7	0.6	0.7	0.7	0.7	0.8	1.3	3.6	8.8	5.8	5.2	0.6	8.8	2.7	24	
29		6.7	11.3	10.8	S	6.7	17.4	19.9	19.4	19.4	10.4	6.2	4.1	2.5	2.9	3.7	2.6	2.3	1.6	3.9	5.9	5.6	6.4	5.0	3.7	1.6	19.9	7.8	24	
30		3.8	5.0	S	3.8	19.3	11.6	8.0	8.8	4.3	15.8	2.7	3.0	2.8	1.5	3.7	3.7	3.8	7.6	4.8	3.8	2.0	1.0	0.9	1.0	0.9	19.3	5.3	24	
31		1.0	S	4.1	3.0	3.4	4.3	5.0	8.5	7.7	7.7	5.8	4.4	6.7	3.3	2.8	2.8	5.0	5.6	4.2	3.0	2.5	1.3	1.5	1.2	1.0	8.5	4.1	24	
HOURLY MAX		6.8	11.3	10.8	11.3	19.3	17.4	19.9	22.1	19.4	32.5	19.3	18.2	41.6	55.3	26.9	28.7	23.6	20.4	24.8	59.5	12.3	9.3	8.1	6.0					
HOURLY AVG		3.7	3.6	3.7	3.6	5.5	6.7	7.1	7.9	6.8	7.3	5.4	4.4	5.2	6.9	3.7	3.9	3.8	3.5	4.2	7.4	4.4	3.8	3.8	3.5					

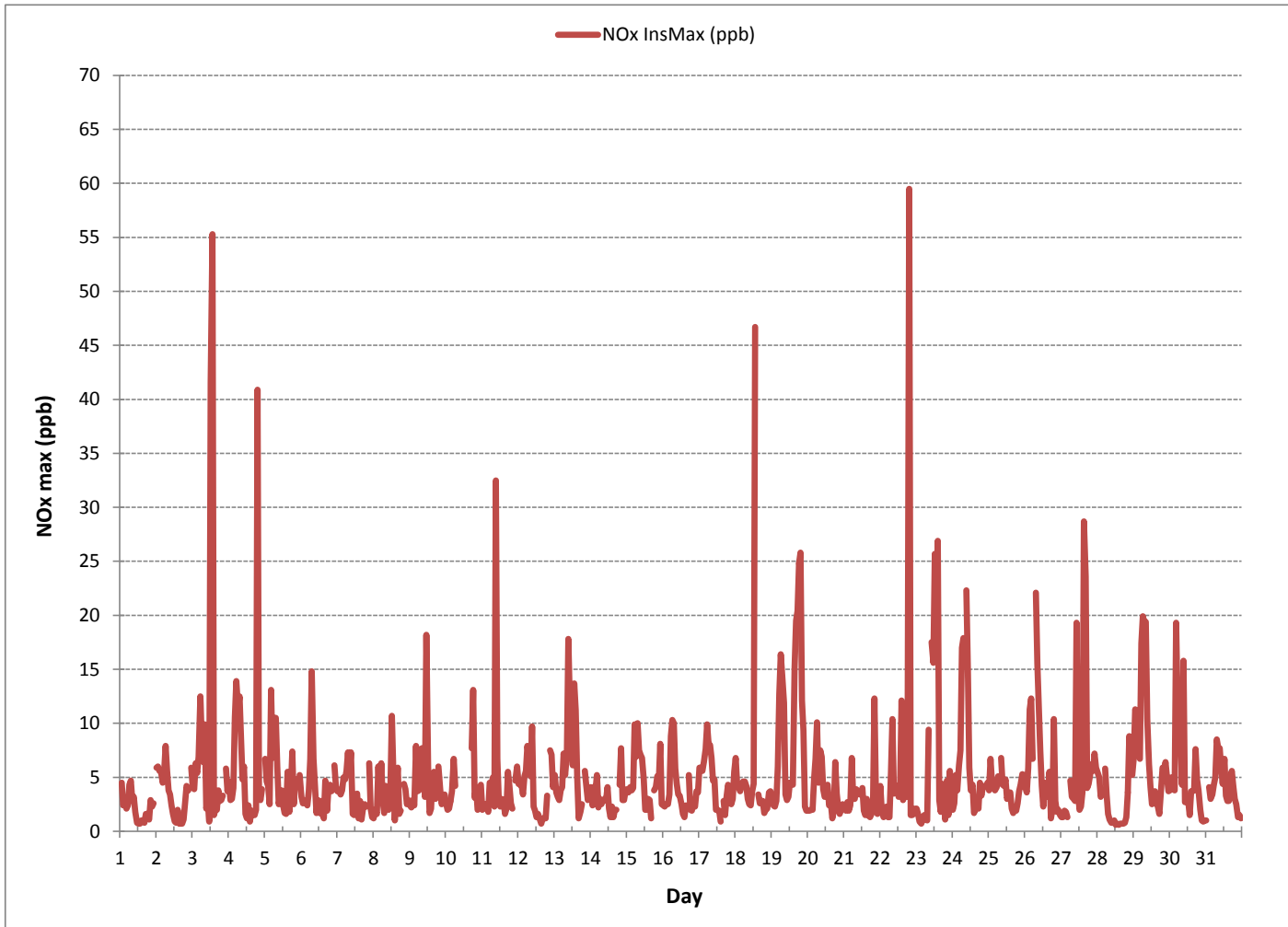
STATUS FLAG CODES

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

MONTHLY SUMMARY

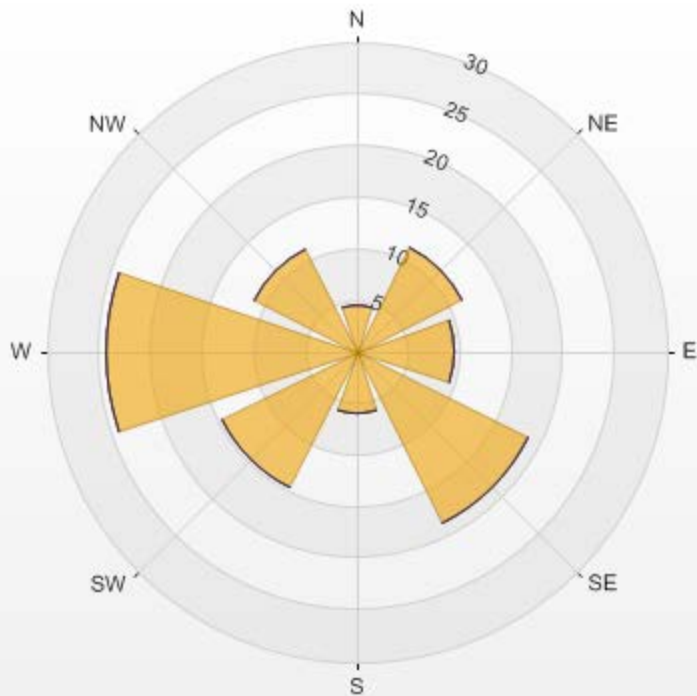
NUMBER OF NON-ZERO READINGS:	702
MAXIMUM INSTANTANEOUS VALUE:	59.5 PPB @ HOUR(S) 19 ON DAY(S) 22
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	10 HRS
STANDARD DEVIATION:	5.65
OPERATIONAL TIME:	744 HRS

OXIDES OF NITROGEN MAX instantaneous maximum in ppb



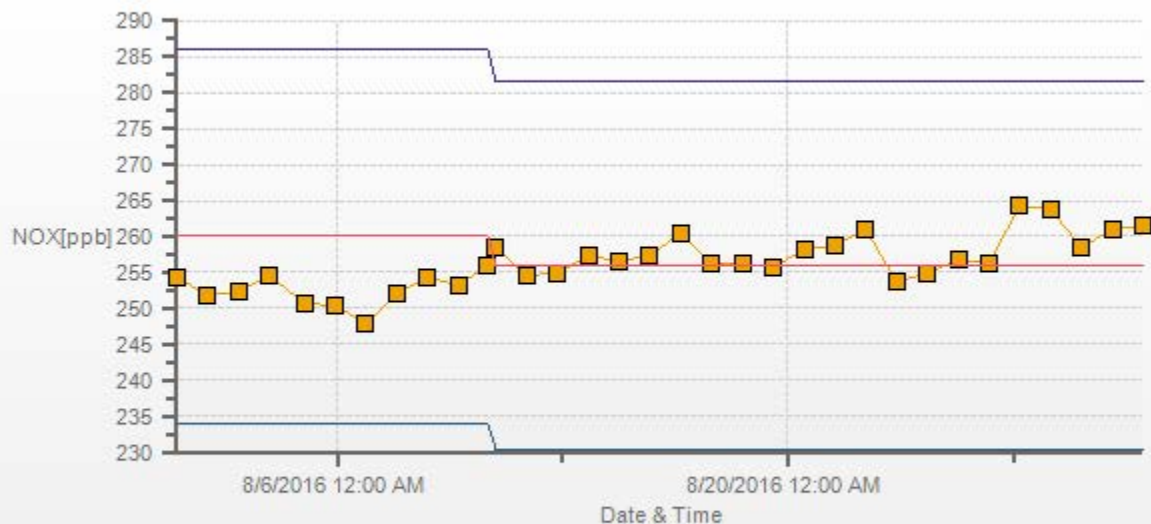
Wind: LICA COLD LAKE SOUTH Monitor: NOX [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	4.55	0	0	0	4.55
NE	11.38	0	0	0	11.38
E	9.53	0	0	0	9.53
SE	18.49	0	0	0	18.49
S	5.97	0	0	0	5.97
SW	14.65	0	0	0	14.65
W	24.32	0	0	0	24.32
NW	11.1	0	0	0	11.1
Summary	100	0	0	0	100



% Icon Classes (ppb) 100 0.0-50.0 0 50.0-110.0 0 110.0-210.0 0 >210.0

NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 08/2016 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES

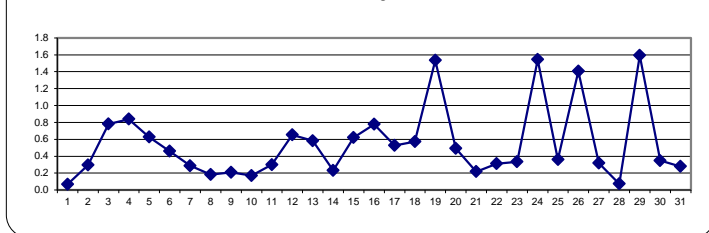
NITRIC OXIDE (NO) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.		
DAY	MIN.	MAX.	AVG.																									MIN.	MAX.	AVG.	RDGS.
1	S	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	S	0.0	0.4	0.1	24		
2	0.0	0.1	0.1	0.1	0.1	0.7	1.7	1.4	1.0	0.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	S	0.3	0.0	1.7	0.3	24			
3	0.3	0.5	1.1	0.7	1.9	3.3	1.3	0.7	0.5	0.1	0.1	0.0	1.5	4.9	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	S	0.0	0.1	0.0	4.9	0.8	24		
4	0.1	0.2	0.1	0.3	1.4	3.1	3.7	4.9	1.9	1.0	0.4	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	1.0	0.1	0.1	S	0.1	0.1	4.9	0.8	24			
5	0.3	0.5	0.4	0.3	2.6	2.4	4.8	1.3	0.4	0.1	0.1	0.2	0.1	0.0	0.0	0.2	0.0	0.1	0.2	0.0	0.1	0.1	S	0.2	0.0	4.8	0.6	24			
6	0.2	0.1	0.1	0.2	0.4	0.8	2.8	4.0	0.8	0.3	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	S	0.1	0.2	0.0	4.0	0.5	24			
7	0.1	0.2	0.2	0.3	0.6	1.4	1.6	1.7	0.3	0.1	0.0	0.0	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	1.7	0.3	24			
8	0.0	0.1	0.0	0.2	0.1	0.4	0.2	0.2	0.5	0.3	0.2	0.2	0.3	0.2	0.1	0.3	0.3	0.1	0.1	S	0.1	0.1	0.1	0.1	0.1	0.0	0.5	0.2	24		
9	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.3	0.4	0.5	0.2	0.7	0.3	0.2	0.2	0.3	0.3	0.2	S	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.7	0.2	24		
10	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	C	C	C	C	C	C	C	C	C	0.4	0.7	0.1	0.1	0.1	S	0.1	0.0	0.7	0.2	24			
11	0.1	0.2	0.3	0.3	0.1	0.4	0.4	0.6	0.4	1.5	0.4	0.3	0.2	0.3	0.2	0.1	0.1	0.3	0.2	0.2	0.1	S	0.1	0.1	0.1	1.5	0.3	24			
12	0.3	0.3	0.4	0.8	1.1	1.2	2.5	2.4	1.7	1.6	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	S	0.4	0.7	0.5	0.0	2.5	0.7	24			
13	0.7	0.6	0.7	0.8	0.5	0.7	1.7	1.2	1.0	1.8	0.5	0.8	0.5	0.7	0.3	0.2	0.1	0.1	0.1	S	0.1	0.1	0.1	0.1	0.1	1.8	0.6	24			
14	0.2	0.2	0.3	0.2	0.3	0.2	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	S	0.1	0.1	0.3	0.2	0.3	0.3	0.1	0.4	0.2	24			
15	0.2	0.3	0.3	0.4	0.2	1.5	2.2	3.1	1.9	1.5	0.5	0.2	0.1	0.1	0.1	0.2	0.1	S	0.1	0.2	0.2	0.3	0.4	0.2	0.1	3.1	0.6	24			
16	0.3	0.3	0.5	0.7	0.8	3.4	5.8	2.8	0.8	0.5	0.2	0.1	0.1	0.1	0.1	S	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.1	5.8	0.8	24			
17	0.2	0.3	0.3	0.2	0.3	1.4	2.5	2.4	1.6	1.1	0.6	0.2	0.1	0.1	0.1	S	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	2.5	0.5	24		
18	0.1	0.1	0.1	0.1	0.1	0.4	1.2	1.1	0.9	0.6	0.4	0.5	0.6	5.0	S	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.3	0.4	0.2	0.1	5.0	0.6	24		
19	0.4	0.5	0.5	0.6	2.0	3.2	8.3	7.8	4.0	0.7	0.3	0.2	0.2	S	0.1	0.7	1.1	0.9	1.4	1.3	0.6	0.4	0.0	0.1	0.0	8.3	1.5	24			
20	0.1	0.1	0.1	0.1	0.3	1.8	3.1	1.0	1.4	1.3	0.4	0.4	S	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	3.1	0.5	24		
21	0.1	0.1	0.1	0.1	0.1	0.8	0.5	0.3	0.4	0.4	0.4	S	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.1	0.1	0.1	0.8	0.2	24		
22	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.7	0.4	0.6	S	0.2	0.3	0.2	0.5	0.3	0.2	0.3	0.2	2.0	0.1	0.1	0.1	0.1	0.1	0.1	2.0	0.3	24		
23	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.3	S	0.7	0.7	2.3	1.7	0.7	0.2	0.0	0.3	0.1	0.0	0.0	0.1	0.1	0.2	0.0	2.3	0.3	24			
24	0.3	0.3	0.6	0.5	1.3	3.4	5.7	8.8	S	7.8	3.5	1.0	0.6	0.3	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	8.8	1.5	24			
25	0.1	0.2	0.1	0.1	0.1	0.3	0.8	S	1.4	0.9	1.0	0.8	0.2	0.3	0.7	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	1.4	0.4	24			
26	0.4	0.6	0.6	1.2	4.0	2.7	S	10.9	6.0	2.7	1.1	0.8	0.2	0.2	0.1	0.1	0.2	0.0	0.4	0.0	0.0	0.0	0.1	0.0	0.0	10.9	1.4	24			
27	0.0	0.0	0.0	0.0	0.0	S	0.2	0.2	0.3	0.3	2.0	0.2	0.2	0.2	0.1	0.2	0.6	0.3	0.3	0.4	0.3	0.8	0.5	0.3	0.1	0.0	2.0	0.3	24		
28	0.1	0.1	0.1	0.1	S	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	24		
29	0.1	0.5	0.7	S	0.7	3.4	7.5	9.4	7.0	2.5	1.6	0.7	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.1	9.4	1.6	24			
30	0.3	0.7	S	0.1	0.5	0.7	0.7	1.0	0.5	0.3	0.3	0.4	0.2	0.2	0.2	0.4	0.4	0.6	0.3	0.1	0.1	0.0	0.0	0.0	0.0	1.0	0.3	24			
31	0.0	S	0.1	0.1	0.1	0.1	0.3	0.6	0.9	0.9	1.1	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	1.1	0.3	24			
HOURLY MAX	0.7	0.7	1.1	1.2	4.0	3.4	8.3	10.9	7.0	7.8	3.5	1.0	2.3	5.0	0.7	0.7	1.1	0.9	1.4	2.0	0.8	0.5	0.7	0.5							
HOURLY AVG	0.2	0.2	0.3	0.3	0.7	1.3	2.0	2.3	1.3	1.1	0.6	0.3	0.3	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1						

STATUS FLAG CODES

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

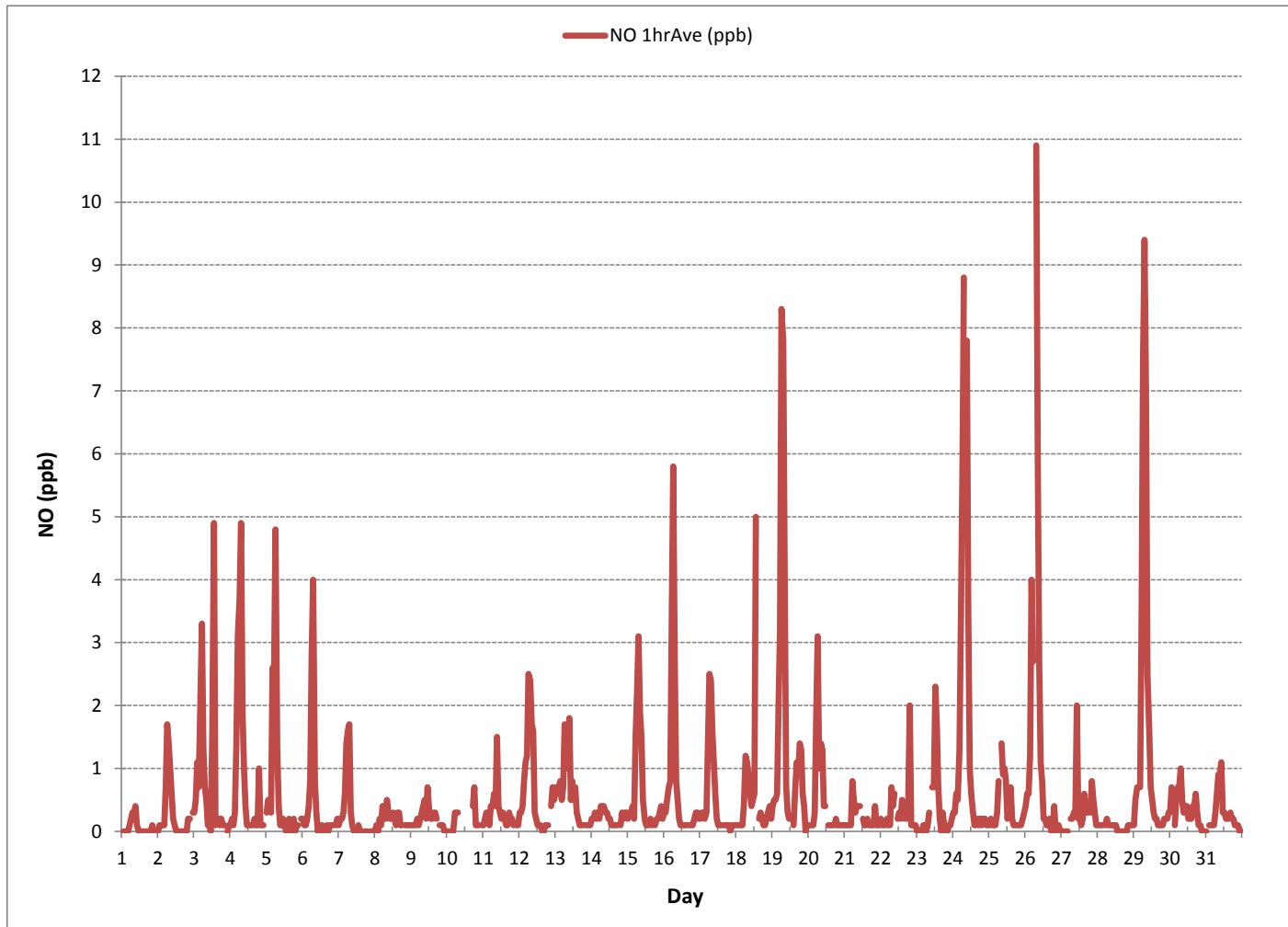
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	612			
MINIMUM 1-HR AVERAGE:	0.0	PPB @ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	10.9	PPB @ HOUR(S)	7	26
MAXIMUM 24-HR AVERAGE:	1.6	PPB		29
				VAR-VARIOUS
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	744
MONTHLY CALIBRATION TIME:	9	HRS	AMD OPERATION UPTIME:	100.0
				%
STANDARD DEVIATION:	1.17		MONTHLY AVERAGE:	0.6
				PPB

NITRIC OXIDE (NO) hourly averages in ppb



NITRIC OXIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	S	0.3	0.3	0.3	0.2	0.3	0.9	0.9	0.5	1.1	0.7	0.3	0.3	0.2	0.3	0.5	0.3	0.2	0.4	0.3	0.4	0.2	0.3	S	0.2	1.1	0.4	24	
2	0.3	0.4	0.4	0.3	0.4	1.3	3.1	2.1	1.4	1.0	0.7	0.7	0.3	0.3	0.8	0.2	0.1	0.1	0.2	0.3	0.5	0.7	S	0.8	0.1	3.1	0.7	24	
3	1.1	1.4	1.7	1.5	5.2	9.0	3.5	4.9	9.0	1.0	0.5	0.3	33.0	48.4	0.5	0.9	0.7	1.1	0.9	0.4	0.5	S	0.2	0.3	0.2	48.4	5.5	24	
4	0.7	0.5	0.5	0.8	4.5	11.1	5.3	6.4	3.9	1.9	2.2	0.4	0.5	1.1	0.4	0.4	0.5	0.3	1.0	10.3	0.3	0.4	0.3	S	0.3	11.1	2.3	24	
5	0.6	0.9	1.0	0.8	9.7	5.0	6.7	4.5	3.1	0.8	0.7	1.9	1.8	0.5	0.3	3.2	0.4	2.4	2.9	0.5	0.8	0.5	S	0.8	0.3	9.7	2.2	24	
6	0.6	0.5	0.6	0.8	0.9	2.3	4.8	8.6	1.9	4.3	0.3	1.5	0.7	1.1	0.5	0.7	1.3	0.4	0.4	0.4	0.3	S	0.4	0.5	0.3	8.6	1.5	24	
7	0.4	0.5	0.9	1.0	1.8	2.1	2.3	3.0	1.3	2.4	0.4	0.4	1.0	1.5	0.3	1.3	0.3	0.8	0.3	0.3	S	0.9	0.2	0.3	0.2	3.0	1.0	24	
8	0.4	0.9	0.4	5.0	0.6	2.3	0.8	0.6	3.1	1.4	0.9	3.5	3.5	1.3	0.4	3.4	3.3	0.5	0.3	S	0.3	0.4	0.3	0.4	0.3	5.0	1.5	24	
9	0.3	0.3	0.6	0.4	2.3	0.4	0.6	1.5	2.9	2.7	1.3	10.4	3.4	0.4	0.9	3.6	3.8	1.4	S	1.4	0.5	0.4	0.5	0.3	0.3	10.4	1.8	24	
10	0.3	0.3	0.3	0.8	0.4	5.8	1.5	C	C	C	C	C	C	C	C	C	C	C	2.2	7.0	0.5	0.5	0.2	S	0.3	0.2	7.0	1.5	24
11	0.3	0.4	0.7	0.8	0.3	2.7	0.8	4.6	0.5	21.4	3.1	0.5	0.4	0.5	0.4	0.3	0.4	1.5	1.1	0.7	0.3	S	0.2	0.3	0.2	21.4	1.8	24	
12	0.7	0.4	0.8	1.5	2.6	2.2	3.5	3.4	2.1	14.5	0.4	0.4	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.3	S	4.4	1.5	0.8	0.2	14.5	1.8	24	
13	3.1	1.1	1.0	1.1	1.2	1.3	2.8	2.1	3.4	8.7	4.5	5.0	1.9	8.7	4.4	1.7	0.4	0.2	0.3	S	0.3	0.4	0.3	0.3	0.2	8.7	2.4	24	
14	0.7	0.5	1.0	0.4	3.6	0.4	0.8	0.5	0.5	0.6	0.4	1.8	2.1	0.2	0.3	0.2	0.3	0.4	S	1.5	3.5	0.5	0.5	0.5	0.2	3.6	0.9	24	
15	0.4	0.5	0.5	1.1	0.4	5.3	3.4	5.2	3.2	2.2	1.9	1.0	0.3	0.2	0.4	1.4	0.2	S	0.2	0.3	0.3	0.4	1.9	0.5	0.2	5.3	1.4	24	
16	0.8	0.7	1.1	1.3	1.9	7.2	8.4	7.6	1.2	0.9	0.5	0.8	0.5	0.3	0.3	0.3	S	0.2	0.2	0.2	0.2	0.4	0.6	0.5	0.3	0.2	8.4	1.6	24
17	0.3	0.7	0.7	0.4	0.5	4.8	3.2	3.4	2.6	1.4	1.3	0.3	1.0	0.5	0.4	S	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	4.8	1.0	24	
18	0.2	0.2	0.2	0.2	0.3	0.7	1.7	1.5	1.2	0.9	1.1	3.5	2.3	31.5	S	0.4	0.4	0.6	0.3	0.3	0.4	0.5	0.5	0.5	0.2	31.5	2.1	24	
19	0.9	0.8	1.0	0.9	4.3	9.0	14.5	10.1	7.0	1.2	1.5	1.5	1.3	S	0.8	6.2	7.4	11.2	9.4	15.4	4.5	6.2	0.2	0.4	0.2	15.4	5.0	24	
20	0.3	0.3	0.3	0.3	1.3	4.0	6.7	1.3	2.2	2.2	0.9	0.6	S	0.2	0.4	0.4	0.2	0.3	1.0	0.3	0.3	0.2	0.2	0.4	0.2	6.7	1.1	24	
21	0.2	0.2	0.2	0.2	0.3	2.4	0.8	0.6	0.7	0.8	0.8	S	0.4	0.3	0.3	1.3	0.2	0.2	0.2	0.2	6.8	0.2	0.2	1.3	0.2	6.8	0.8	24	
22	1.7	0.5	0.2	0.5	0.8	0.3	0.4	1.7	2.6	5.6	S	0.8	0.9	0.9	2.8	1.0	0.7	2.8	0.3	47.3	0.2	0.4	0.3	0.3	0.2	47.3	3.2	24	
23	0.3	0.2	0.2	0.2	0.5	0.5	0.3	0.3	4.4	S	10.3	8.8	31.1	28.7	14.6	3.4	0.4	1.7	1.3	0.3	0.4	0.2	0.4	0.5	0.2	31.1	4.7	24	
24	0.5	0.7	2.3	1.0	3.1	4.6	9.9	10.7	S	11.6	6.4	1.7	0.9	0.9	0.2	0.3	0.9	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.2	11.6	2.5	24	
25	0.2	1.7	0.2	0.3	0.3	0.7	1.7	S	1.8	1.3	1.3	1.4	0.7	0.5	1.0	0.4	0.3	0.4	0.7	0.3	0.3	0.3	0.5	0.7	0.2	1.8	0.7	24	
26	0.9	1.4	1.2	4.1	5.0	3.4	S	14.6	9.3	6.0	5.8	1.3	0.7	2.2	1.7	0.8	4.0	0.2	0.2	5.3	0.5	0.2	0.3	0.2	0.2	14.6	3.0	24	
27	0.2	0.2	0.2	0.2	0.2	S	1.0	0.8	0.7	0.9	22.5	1.4	2.3	0.7	1.7	17.5	12.8	0.7	1.5	0.8	2.1	0.9	0.9	0.4	0.2	22.5	3.1	24	
28	0.3	0.3	0.3	0.3	S	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.1	0.3	0.2	24
29	0.2	1.7	1.3	S	2.3	12.2	14.6	12.2	12.1	4.9	2.2	1.5	0.7	0.8	1.5	0.9	0.8	0.1	0.4	0.3	0.7	0.8	0.4	0.8	0.1	14.6	3.2	24	
30	0.8	1.4	S	0.3	6.3	4.6	1.5	2.8	1.5	1.3	0.8	1.0	1.9	0.5	1.1	2.2	1.4	1.7	0.7	0.3	0.3	0.2	0.1	0.2	0.1	6.3	1.4	24	
31	0.3	S	1.0	0.5	0.9	1.7	1.4	5.2	2.2	5.8	1.9	1.8	3.2	1.3	2.3	0.5	2.2	2.0	1.1	0.5	0.3	0.2	0.1	0.3	0.1	5.8	1.6	24	
HOURLY MAX	3.1	1.7	2.3	5.0	9.7	12.2	14.6	14.6	12.1	21.4	22.5	10.4	33.0	48.4	14.6	17.5	12.8	11.2	9.4	47.3	6.8	6.2	1.9	1.3					
HOURLY AVG	0.6	0.7	0.7	0.9	2.1	3.6	3.6	4.2	3.0	3.8	2.6	1.9	3.4	4.6	1.4	1.9	1.5	1.1	1.1	3.1	0.9	0.8	0.4	0.5					

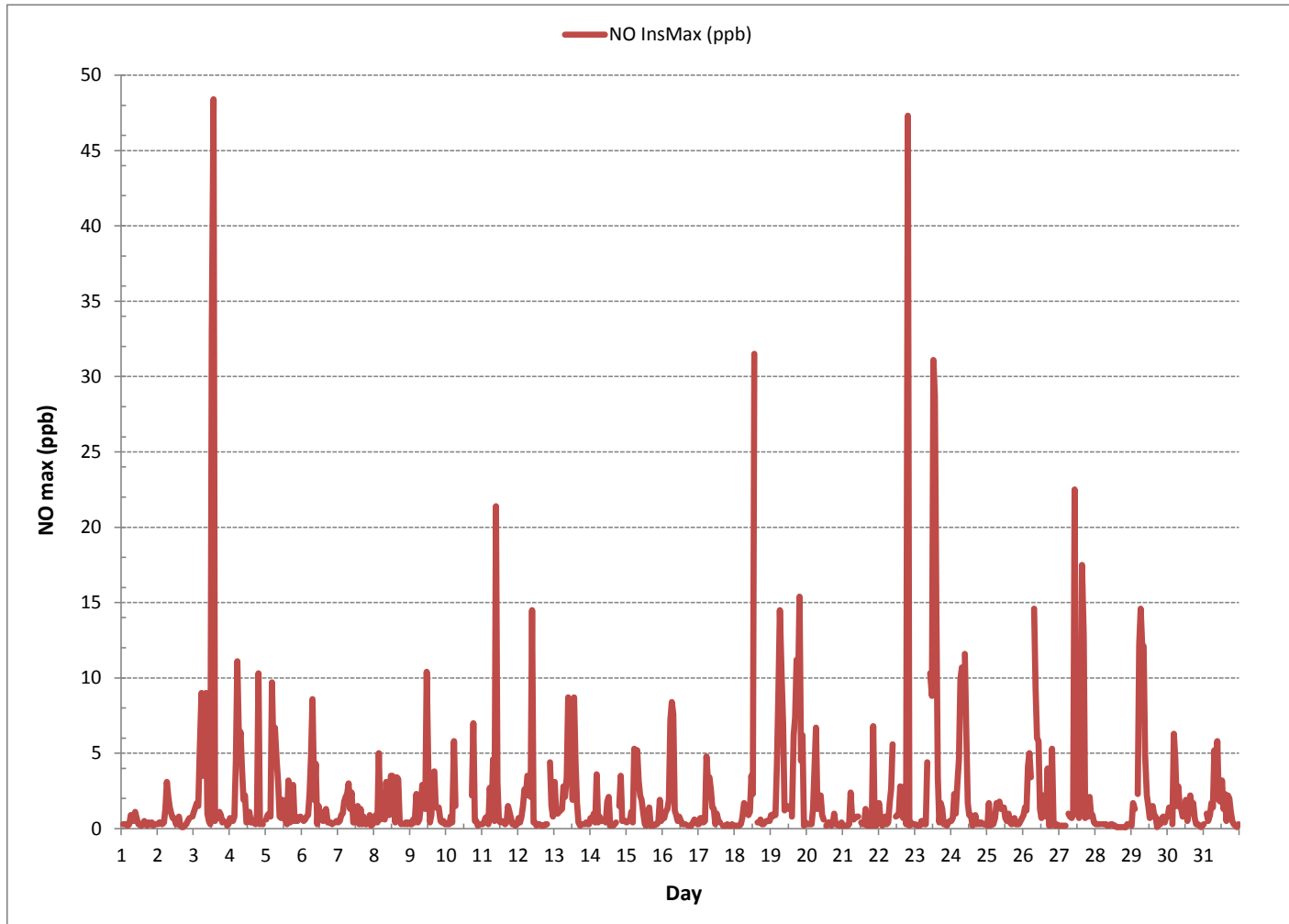
STATUS FLAG CODES

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

MONTHLY SUMMARY

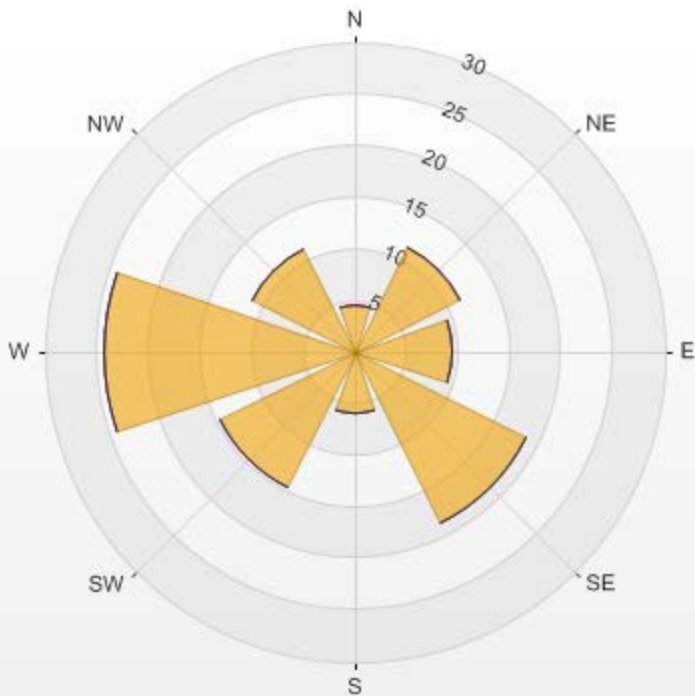
NUMBER OF NON-ZERO READINGS:	702
MAXIMUM INSTANTANEOUS VALUE:	48.4 PPB @ HOUR(S) 13 ON DAY(S) 3
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	10 HRS
STANDARD DEVIATION:	4.31
OPERATIONAL TIME:	744 HRS

NITRIC OXIDE MAX instantaneous maximum in ppb



Wind: LICA COLD LAKE SOUTH Monitor: NO [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	4.55	0	0	0	4.55
NE	11.38	0	0	0	11.38
E	9.53	0	0	0	9.53
SE	18.49	0	0	0	18.49
S	5.97	0	0	0	5.97
SW	14.65	0	0	0	14.65
W	24.32	0	0	0	24.32
NW	11.1	0	0	0	11.1
Summary	100	0	0	0	100



% Icon Classes (ppb)					
100		0.0-50.0	0		50.0-110.0
0		110.0-210.0	0		>210.0

NITROGEN DIOXIDE

NITROGEN DIOXIDE (NO₂) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY	HR	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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		S	2.8	2.0	2.0	1.6	1.9	2.2	2.6	2.0	1.5	0.7	0.5	0.5	0.4	0.5	0.5	0.5	0.7	0.8	0.6	1.5	1.8	1.3	S	0.4	2.8	1.3	24
2		4.6	3.8	4.2	4.4	3.4	4.0	3.6	2.8	2.2	1.6	1.2	0.8	0.5	0.4	0.4	0.4	0.4	0.4	0.5	1.4	2.5	2.8	S	4.0	0.4	4.6	2.2	24
3		3.0	2.4	3.5	2.9	1.8	2.5	2.9	1.3	0.7	0.5	0.5	0.4	1.4	1.0	0.5	0.7	0.6	0.7	1.3	1.1	2.1	S	2.9	2.4	0.4	3.5	1.6	24
4		1.9	1.9	2.1	2.5	3.6	3.3	4.1	5.2	2.7	2.4	1.0	0.6	0.4	0.4	0.3	0.6	0.8	0.7	0.7	3.3	2.1	1.9	2.6	S	0.3	5.2	2.0	24
5		3.9	3.5	2.6	1.6	2.2	1.7	3.2	3.0	1.5	1.1	1.0	1.0	0.7	0.7	0.7	0.8	0.8	1.0	1.6	1.3	2.2	2.2	S	3.4	0.7	3.9	1.8	24
6		2.2	1.7	2.1	1.9	1.5	1.4	1.7	4.8	3.4	1.7	1.0	0.6	0.6	0.7	0.5	0.5	1.0	0.9	2.5	3.0	2.7	S	4.2	3.2	0.5	4.8	1.9	24
7		3.0	2.8	2.3	2.2	2.6	2.3	2.5	3.7	2.1	1.3	0.9	0.7	0.6	0.7	0.7	0.6	0.6	0.8	1.8	1.5	S	2.4	1.6	0.8	0.6	3.7	1.7	24
8		0.6	0.7	0.7	1.1	1.8	2.8	1.0	0.8	0.8	0.6	0.5	0.8	0.6	0.5	0.4	0.7	0.7	0.6	S	2.9	2.7	1.8	1.8	0.4	2.9	1.1	24	
9		1.7	1.5	1.5	1.6	2.1	1.8	2.1	2.1	2.0	1.9	1.0	1.5	1.1	1.0	0.8	1.0	1.4	1.6	S	3.9	2.5	1.8	1.9	2.6	0.8	3.9	1.8	24
10		1.9	1.4	1.5	1.8	2.3	2.2	2.3	1.3	C	C	C	C	C	C	C	C	C	2.7	2.1	1.1	1.3	1.2	S	2.1	1.1	2.7	1.8	24
11		1.3	1.2	1.2	0.9	1.0	1.0	1.0	1.3	1.2	1.9	1.6	1.6	1.3	1.6	1.7	0.8	0.9	1.1	1.4	1.3	1.4	S	3.9	4.9	0.8	4.9	1.5	24
12		3.2	2.9	3.5	1.8	2.5	3.4	3.2	2.5	2.4	2.1	1.3	1.0	0.7	0.7	0.6	0.5	0.5	0.7	0.8	1.4	S	3.5	4.0	2.5	0.5	4.0	2.0	24
13		2.3	2.2	1.7	1.4	2.6	2.7	2.8	2.4	2.4	3.1	2.0	2.4	1.8	1.7	1.2	0.9	0.6	0.9	1.4	S	2.7	2.6	1.8	2.3	0.6	3.1	2.0	24
14		2.0	1.5	1.7	2.3	1.8	1.3	1.6	1.5	1.6	1.7	1.8	1.3	0.9	0.8	0.9	0.8	0.9	0.9	S	2.6	2.5	2.0	1.8	2.9	0.8	2.9	1.6	24
15		2.8	2.4	2.3	1.8	3.2	2.8	2.6	3.7	3.4	3.9	2.5	1.9	1.3	1.2	1.6	1.3	0.8	S	2.3	2.9	3.4	2.7	2.7	1.6	0.8	3.9	2.4	24
16		1.5	1.2	1.3	1.1	1.0	1.4	1.6	2.9	3.2	2.6	1.8	1.3	1.2	1.1	0.8	1.2	S	3.2	1.5	1.3	1.7	1.4	1.9	2.8	0.8	3.2	1.7	24
17		4.5	4.8	4.3	5.7	6.6	6.4	5.0	3.5	3.0	2.7	2.1	1.2	0.6	0.7	0.4	S	1.5	0.9	1.4	2.8	2.0	1.7	1.9	4.1	0.4	6.6	2.9	24
18		4.8	3.9	3.2	3.1	3.5	3.3	2.4	1.8	1.7	1.1	0.8	1.0	0.9	4.0	S	1.8	1.3	1.2	1.2	1.1	1.3	1.2	1.9	2.6	0.8	4.8	2.1	24
19		1.6	1.1	1.1	1.2	1.5	1.3	2.6	4.3	3.8	1.7	1.3	0.9	0.9	S	2.0	2.2	2.0	2.0	5.7	4.9	3.1	2.1	1.6	1.3	0.9	5.7	2.2	24
20		1.3	1.3	1.3	1.4	1.9	2.2	2.3	2.2	3.4	2.0	2.0	S	2.3	1.2	0.9	0.8	1.3	2.5	2.6	1.4	1.1	1.2	1.7	0.8	3.4	1.8	24	
21		1.5	1.0	2.0	1.4	1.5	2.4	1.9	1.9	2.1	1.6	1.3	S	1.9	1.0	0.9	0.9	0.9	0.8	0.9	1.4	2.4	1.6	1.0	0.7	0.7	2.4	1.4	24
22		0.8	0.7	0.7	0.8	0.7	0.7	0.7	1.3	1.0	0.6	S	2.2	1.6	1.5	1.6	1.3	1.6	1.6	1.9	2.5	0.8	0.9	0.9	1.4	0.6	2.5	1.2	24
23		1.2	1.0	0.4	0.5	0.5	0.4	0.4	0.5	0.7	S	2.1	1.2	1.1	0.8	1.0	0.6	0.4	0.9	0.9	0.4	1.2	0.9	2.7	1.4	0.4	2.7	0.9	24
24		1.2	1.5	1.7	2.1	2.5	2.4	4.6	6.6	S	8.9	6.5	3.0	2.3	1.6	0.9	0.9	1.1	0.8	2.1	2.1	2.6	3.0	3.3	3.5	0.8	8.9	2.8	24
25		2.0	2.5	2.8	3.8	3.2	2.9	2.9	S	3.8	2.4	2.5	2.2	1.7	2.5	2.0	0.9	0.8	0.9	0.9	1.2	2.9	3.3	4.3	3.6	0.8	4.3	2.4	24
26		2.7	1.9	3.5	4.2	5.4	3.0	S	6.7	5.0	3.6	2.2	2.1	1.1	1.0	0.9	0.9	0.8	0.7	1.0	2.1	1.5	1.4	1.2	1.1	0.7	6.7	2.3	24
27		1.0	1.0	1.3	1.1	1.0	S	2.8	2.2	2.0	1.6	1.1	1.2	0.8	0.9	1.0	1.3	2.0	2.3	2.4	3.3	3.0	3.1	3.4	4.3	0.8	4.3	1.9	24
28		4.0	3.6	2.0	2.6	S	2.9	2.1	0.8	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.6	2.1	4.7	3.9	3.8	0.2	4.7	1.6	24
29		5.5	7.3	5.5	S	4.2	4.2	5.5	6.5	5.7	3.5	2.9	1.7	1.5	1.1	1.2	1.1	0.9	0.9	2.4	3.9	3.9	4.8	2.9	2.6	0.9	7.3	3.5	24
30		2.2	2.9	S	2.3	3.1	5.1	4.4	2.8	1.4	1.4	0.8	1.1	0.6	0.7	0.9	1.3	1.4	2.9	2.5	2.2	1.2	0.6	0.5	0.5	0.5	5.1	1.9	24
31		0.6	S	2.1	1.2	1.2	1.2	2.4	2.8	2.8	3.5	2.7	1.0	1.1	1.1	1.0	1.0	1.3	1.3	2.1	2.1	1.2	0.9	0.9	0.8	0.6	3.5	1.6	24
HOURLY MAX		5.5	7.3	5.5	5.7	6.6	6.4	5.5	6.7	5.7	8.9	6.5	3.0	2.3	4.0	2.0	2.2	2.0	3.2	5.7	4.9	3.9	4.8	4.3	4.9				
HOURLY AVG		2.4	2.3	2.2	2.1	2.4	2.5	2.6	2.9	2.4	2.2	1.6	1.3	1.0	1.1	0.9	0.9	1.0	1.2	1.6	2.1	2.1	2.2	2.3	2.4				

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

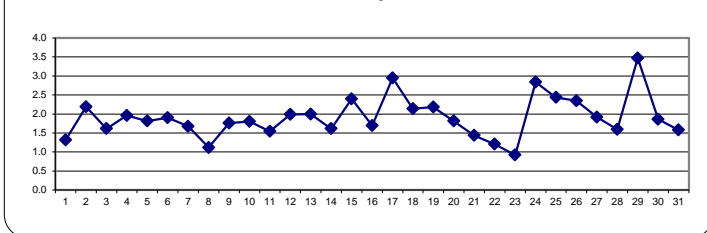
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 PPB

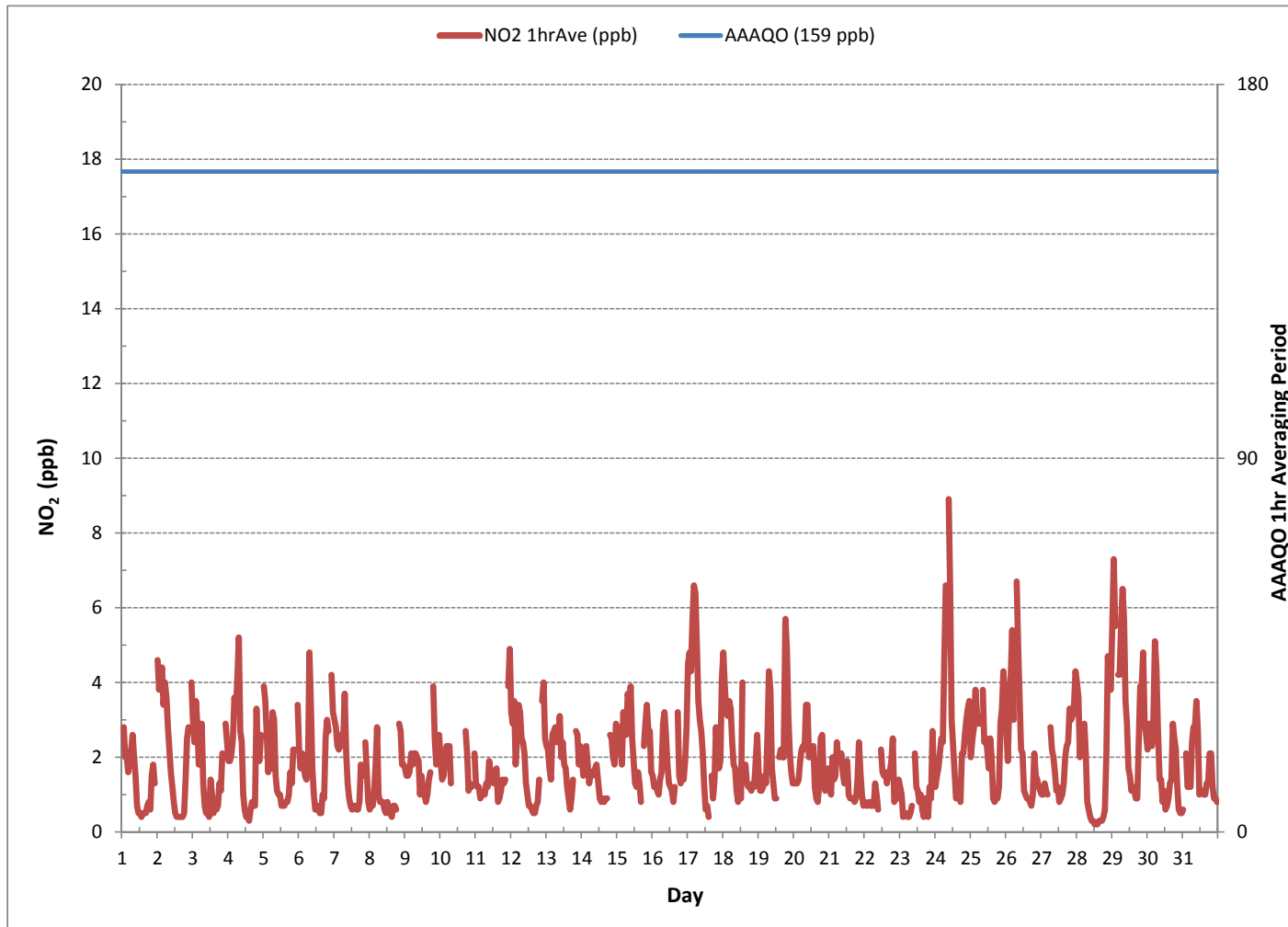
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0			
NUMBER OF NON-ZERO READINGS:	703			
MINIMUM 1-HR AVERAGE:	0.2 PPB	@ HOUR(S)	VAR	ON DAY(S) 28
MAXIMUM 1-HR AVERAGE:	8.9 PPB	@ HOUR(S)	9	ON DAY(S) 24
MAXIMUM 24-HR AVERAGE:	3.5 PPB			ON DAY(S) 29
				VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS	OPERATIONAL TIME:	744 HRS	
MONTHLY CALIBRATION TIME:	9 HRS	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	1.24	MONTHLY AVERAGE:	1.9 PPB	

24 HOUR AVERAGES FOR August 2016



NITROGEN DIOXIDE (NO₂) hourly averages in ppb





NITROGEN DIOXIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.
DAY	MIN.	MAX.	AVG.																										
1	S	4.3	2.3	2.5	2.0	2.0	3.5	3.9	2.3	2.0	1.1	0.6	0.6	0.5	0.6	0.7	0.6	1.2	1.2	0.8	2.7	2.0	2.4	S	0.5	4.3	1.8	24	
2	5.6	5.7	5.3	5.3	4.3	4.8	4.8	3.5	2.5	2.3	1.9	1.1	0.8	0.5	1.1	0.5	0.5	0.5	0.9	2.3	3.6	3.3	S	5.5	0.5	5.7	2.9	24	
3	3.5	2.7	4.8	4.6	2.4	5.1	4.8	3.9	3.5	1.0	2.4	0.6	15.8	10.1	1.1	1.4	1.4	2.7	2.2	2.4	3.1	S	5.5	3.3	0.6	15.8	3.8	24	
4	3.9	2.4	2.8	3.6	6.0	4.5	5.9	6.0	4.8	3.3	4.0	1.1	0.6	1.0	0.6	1.2	1.0	1.1	1.6	30.5	3.3	2.5	3.6	S	0.6	30.5	4.1	24	
5	6.3	3.9	3.2	2.0	3.8	2.4	5.3	6.0	2.9	1.8	2.9	2.5	1.5	1.2	1.1	3.3	1.4	1.4	5.2	2.2	3.9	4.5	S	5.1	1.1	6.3	3.2	24	
6	2.8	2.3	2.4	2.0	1.6	1.6	2.2	7.3	4.9	2.0	1.4	1.4	1.1	2.0	1.0	0.7	3.9	1.4	3.8	4.0	3.5	S	5.9	4.0	0.7	7.3	2.7	24	
7	3.5	3.5	2.8	3.1	3.3	3.1	3.3	4.4	3.9	5.2	1.1	1.1	2.2	2.2	0.9	1.6	1.0	1.6	2.3	2.0	S	5.3	1.9	1.1	0.9	5.3	2.6	24	
8	0.7	1.1	1.1	1.6	2.7	4.0	1.9	1.1	1.5	2.8	1.0	0.9	9.3	4.2	0.6	1.9	3.9	1.1	1.5	S	4.1	3.6	2.2	2.4	0.6	9.3	2.4	24	
9	2.2	1.8	2.3	1.9	5.5	3.3	3.1	3.6	6.0	4.0	1.6	8.5	2.5	1.2	1.2	1.6	3.1	2.3	S	5.9	3.9	2.2	2.5	3.1	1.2	8.5	3.2	24	
10	2.4	1.6	1.8	2.3	3.3	3.6	3.5	C	C	C	C	C	C	C	C	C	C	5.5	7.8	2.4	3.5	1.8	S	4.1	1.6	7.8	3.4	24	
11	1.8	1.9	2.0	1.5	1.5	1.9	3.6	1.9	1.7	13.3	3.9	2.3	1.9	2.4	2.4	1.2	1.6	3.9	3.1	1.9	1.8	S	4.4	5.9	1.2	13.3	2.9	24	
12	4.3	3.9	3.9	2.8	3.3	3.8	4.3	2.9	2.9	4.9	1.8	1.4	1.1	1.2	1.0	0.7	1.0	1.1	1.0	3.1	S	5.5	5.5	3.5	0.7	5.5	2.8	24	
13	3.1	2.5	2.3	1.9	3.5	3.3	4.3	3.2	4.1	10.1	7.4	9.7	4.3	6.4	7.2	3.8	1.1	1.5	2.2	S	5.5	3.9	2.5	3.0	1.1	10.1	4.2	24	
14	3.5	1.9	3.0	3.3	3.1	1.8	2.3	1.9	2.2	2.4	2.4	2.5	1.5	1.1	1.9	1.1	1.7	1.5	S	4.1	4.7	2.3	2.5	3.3	1.1	4.7	2.4	24	
15	3.7	3.1	3.9	3.6	3.8	4.4	3.7	4.9	4.3	4.9	4.9	3.9	1.8	1.8	2.5	1.8	1.0	S	3.6	3.9	4.9	4.3	6.4	2.0	1.0	6.4	3.6	24	
16	1.9	1.5	1.5	1.3	1.4	2.3	2.4	3.9	4.5	3.6	2.8	2.5	2.2	1.5	1.1	2.2	S	5.1	1.8	1.7	2.3	2.0	3.3	3.3	1.1	5.1	2.4	24	
17	5.7	5.7	5.5	6.1	7.5	7.3	5.7	4.6	4.4	3.2	4.0	1.6	1.5	1.4	0.6	S	2.7	1.2	2.9	4.3	3.9	2.3	2.8	5.3	0.6	7.5	3.9	24	
18	6.7	4.2	3.9	3.5	4.3	4.2	2.9	2.5	1.9	1.6	1.5	2.9	2.4	37.0	S	3.2	2.3	2.3	2.4	1.5	1.7	1.7	3.4	3.5	1.5	37.0	4.4	24	
19	2.2	1.6	1.4	1.9	1.9	4.4	4.1	4.9	5.2	2.2	2.4	1.8	3.2	S	3.6	9.8	14.0	9.3	15.8	15.0	7.6	3.6	2.2	1.6	1.4	15.8	5.2	24	
20	1.7	1.6	1.6	1.8	3.5	3.3	4.4	3.1	5.3	4.7	2.9	2.5	S	4.1	1.9	2.7	1.1	1.8	5.5	3.2	1.9	1.4	2.0	2.2	1.1	5.5	2.8	24	
21	2.2	1.6	2.4	1.8	2.0	4.9	2.4	2.4	3.2	2.8	2.7	S	3.6	1.5	1.2	1.6	1.2	1.1	1.4	2.0	6.0	2.9	1.5	1.4	1.1	6.0	2.3	24	
22	2.4	1.2	1.1	1.4	1.4	1.1	1.1	3.9	8.0	1.8	S	3.9	2.7	2.8	9.2	1.9	2.8	2.8	2.8	20.1	1.2	1.2	1.2	1.8	1.1	20.1	3.4	24	
23	1.8	1.5	0.8	0.6	0.7	0.9	0.9	0.7	6.0	S	7.4	7.8	9.3	7.0	12.2	1.2	1.4	2.7	2.4	0.8	4.4	1.2	5.5	2.2	0.6	12.2	3.5	24	
24	1.6	2.3	2.8	2.7	3.6	3.3	7.1	7.2	S	10.9	8.7	4.3	2.8	3.6	1.5	1.8	2.3	1.8	4.1	2.9	3.6	4.0	4.0	4.1	1.5	10.9	4.0	24	
25	3.6	5.1	4.3	4.4	3.6	3.5	3.5	S	5.9	2.9	2.8	3.3	2.3	2.9	2.5	1.6	1.2	1.6	1.4	2.4	3.5	4.1	4.9	4.9	1.2	5.9	3.3	24	
26	3.6	2.6	5.3	7.3	7.5	3.8	S	7.6	6.1	5.5	4.0	2.8	1.8	2.4	2.4	2.3	3.2	1.0	1.8	5.6	2.2	1.8	1.8	1.3	1.0	7.6	3.6	24	
27	1.3	1.2	1.7	1.5	1.3	S	4.5	2.7	2.4	2.2	9.3	2.7	1.2	1.5	1.8	11.0	10.6	3.2	3.1	4.9	5.2	5.2	6.4	5.9	1.2	11.0	3.9	24	
28	5.2	4.8	2.9	3.6	S	5.5	3.1	1.2	0.9	0.7	0.7	0.7	0.5	0.5	0.5	0.6	0.6	0.5	0.8	1.2	3.3	8.5	5.4	5.2	0.5	8.5	2.5	24	
29	6.6	9.7	9.6	S	5.7	6.4	7.3	7.6	7.3	5.5	4.0	2.5	1.9	2.0	3.1	1.9	1.5	1.4	3.6	5.7	5.3	5.9	4.6	3.2	1.4	9.7	4.9	24	
30	2.9	3.9	S	3.7	13.2	8.2	6.6	5.9	2.8	15.0	1.9	1.9	1.6	1.1	3.3	2.5	2.8	6.0	4.0	3.6	1.9	0.8	0.6	0.8	0.6	15.0	4.1	24	
31	0.9	S	3.9	2.3	2.4	2.5	4.3	4.9	5.7	6.2	4.1	2.7	3.8	2.0	1.9	2.2	3.8	3.5	2.9	2.7	2.2	1.1	1.2	1.0	0.9	6.2	3.0	24	
HOURLY MAX	6.7	9.7	9.6	7.3	13.2	8.2	7.3	7.6	8.0	15.0	9.3	9.7	15.8	37.0	12.2	11.0	14.0	9.3	15.8	30.5	7.6	8.5	6.4	5.9					
HOURLY AVG	3.3	3.0	3.1	2.9	3.7	3.9	4.1	4.0	4.4	3.3	2.8	3.0	3.7	2.4	2.3	2.6	2.4	3.2	4.9	3.6	3.2	3.4	3.2						

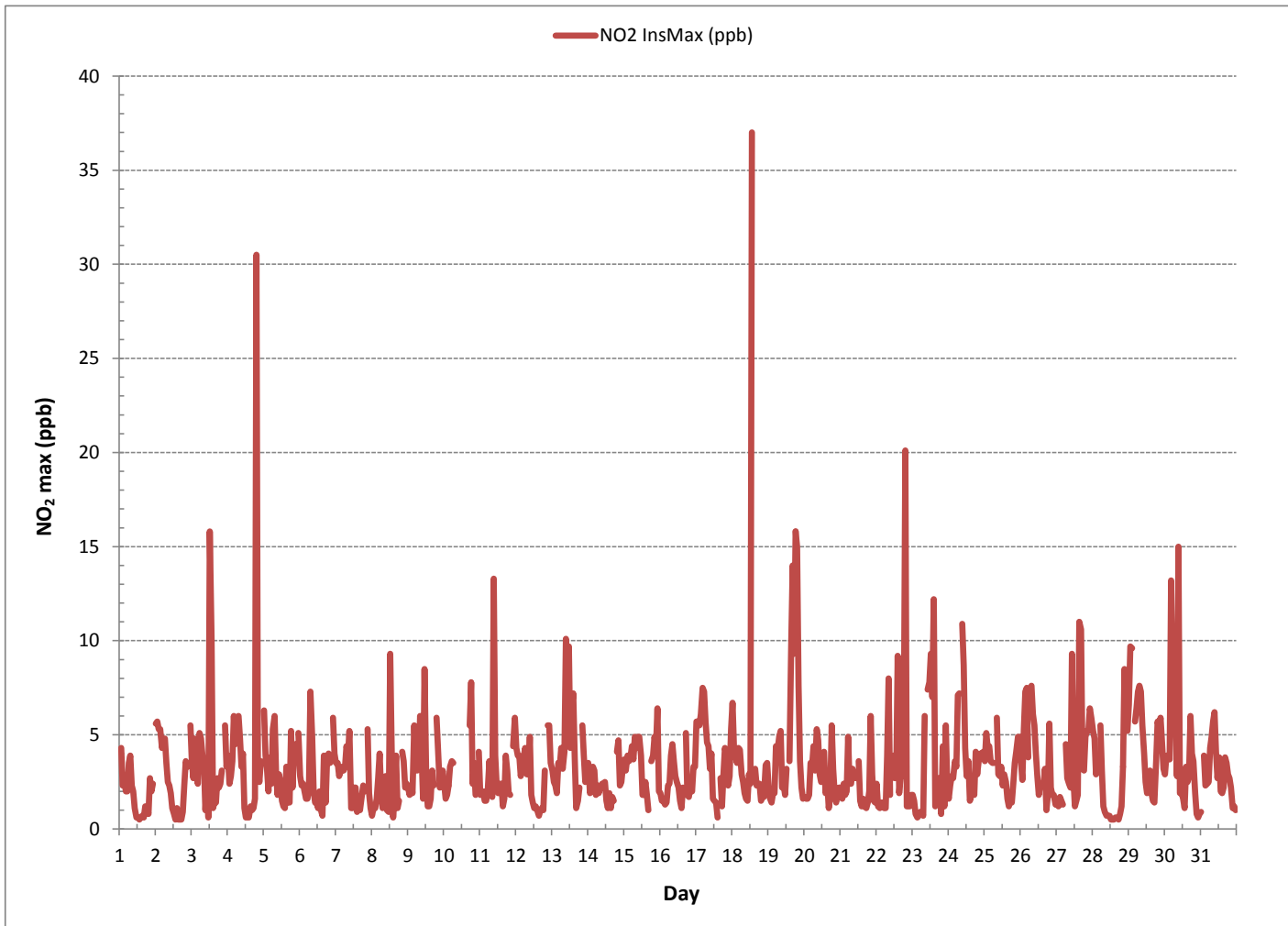
STATUS FLAG CODES

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

MONTHLY SUMMARY

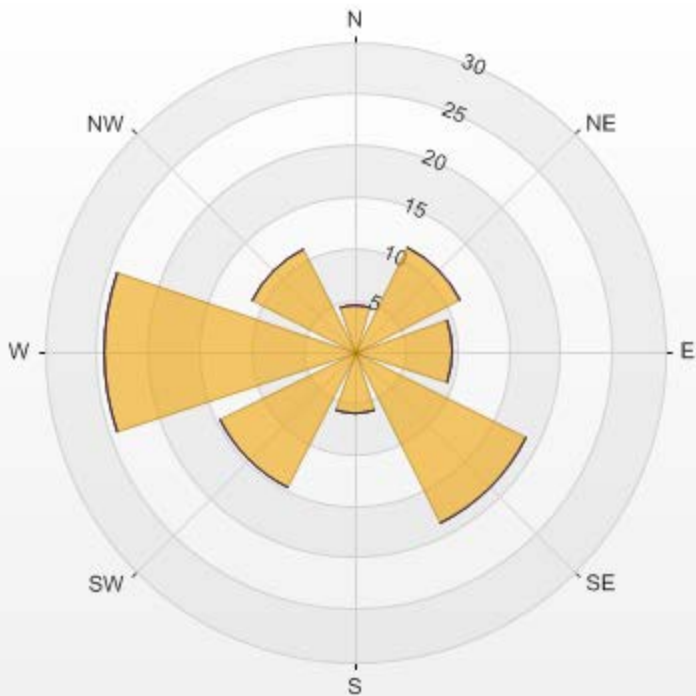
NUMBER OF NON-ZERO READINGS:	702
MAXIMUM INSTANTANEOUS VALUE:	37.0 PPB @ HOUR(S) 13 ON DAY(S) 18
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	10 HRS
OPERATIONAL TIME:	744 HRS
STANDARD DEVIATION:	2.87

NITROGEN DIOXIDE MAX instantaneous maximum in ppb



Wind: LICA COLD LAKE SOUTH Monitor: NO2 [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	4.55	0	0	0	4.55
NE	11.38	0	0	0	11.38
E	9.53	0	0	0	9.53
SE	18.49	0	0	0	18.49
S	5.97	0	0	0	5.97
SW	14.65	0	0	0	14.65
W	24.32	0	0	0	24.32
NW	11.1	0	0	0	11.1
Summary	100	0	0	0	100



% Icon Classes (ppb)	
100	0.0-50.0
0	50.0-110.0
0	110.0-210.0
0	>210.0

NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 08/2016 Type: Span



Span Meas Span Ref Span Low Span High

OZONE

OZONE (O₃) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY	HOURLY MAX	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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	S	11.6	10.5	9.7	11.1	10.1	8.8	11.9	13.4	12.9	16.8	20.0	19.7	20.0	20.4	21.5	21.5	19.3	17.8	17.7	10.1	13.3	14.8	S	8.8	21.5	15.1	24	
2	11.8	10.1	8.1	9.0	8.2	7.9	9.2	14.6	17.0	19.9	22.8	24.3	24.5	25.8	25.0	24.6	25.8	26.8	25.9	22.5	10.9	5.9	S	2.2	2.2	26.8	16.6	24	
3	1.4	0.7	0.5	0.6	0.5	1.5	11.6	17.7	20.4	23.3	24.8	24.4	25.8	27.0	29.3	28.7	28.8	28.7	24.9	20.3	14.4	S	19.2	12.0	0.5	29.3	16.8	24	
4	6.6	5.1	3.7	2.6	1.3	0.8	1.7	3.6	9.7	16.5	23.8	24.4	24.1	25.6	27.4	27.9	28.9	29.5	29.0	24.1	13.6	10.6	5.6	S	0.8	29.5	15.0	24	
5	2.0	1.6	1.2	1.1	0.8	0.8	3.4	14.4	C	C	C	Y	Y	Y	Y	Y	C	C	C	C	10.1	9.6	S	4.5	0.8	14.4	4.5	19	
6	4.1	3.8	2.5	1.6	1.0	1.1	1.5	7.5	22.0	28.1	28.4	27.3	28.7	29.4	30.8	31.8	31.5	33.0	30.5	22.5	14.0	S	9.7	7.1	1.0	33.0	17.3	24	
7	4.5	2.9	1.9	1.2	0.7	1.0	3.7	10.9	21.5	26.3	28.3	30.5	32.0	32.3	32.3	31.5	30.7	30.5	26.8	23.2	S	21.6	21.5	20.0	0.7	32.3	18.9	24	
8	21.3	21.2	19.3	15.5	12.4	11.4	15.5	17.5	17.6	17.5	19.1	21.2	16.3	16.3	19.0	21.3	24.2	27.0	27.0	S	13.2	9.9	9.9	7.7	7.7	27.0	17.4	24	
9	6.2	5.2	6.3	6.3	11.5	11.1	8.3	13.0	15.5	14.5	15.7	16.3	22.7	25.4	27.1	26.4	21.9	19.1	S	20.1	15.7	12.9	18.0	16.6	5.2	27.1	15.5	24	
10	22.5	21.3	17.9	21.8	18.5	18.2	20.0	22.3	21.1	18.8	17.5	18.7	24.4	24.6	24.2	26.4	25.3	26.0	26.6	27.9	26.0	22.0	S	15.1	15.1	27.9	22.0	24	
11	14.2	8.2	5.0	5.2	7.1	6.7	6.9	7.6	8.4	14.0	21.9	26.3	27.5	28.2	25.8	26.0	23.7	26.2	19.3	18.9	12.2	S	8.6	7.4	5.0	28.2	15.4	24	
12	4.3	5.0	3.2	0.8	1.9	2.7	3.4	5.7	10.8	16.0	21.1	23.9	22.7	24.6	25.9	25.9	27.5	21.0	21.3	16.8	S	6.2	2.5	1.3	0.8	27.5	12.8	24	
13	1.4	1.2	0.8	0.8	3.5	3.2	5.4	11.0	16.7	22.0	27.6	30.1	32.4	31.0	29.4	28.3	28.6	27.5	21.0	S	26.8	23.8	14.8	9.3	0.8	32.4	17.2	24	
14	5.2	3.7	3.3	8.8	7.7	5.2	13.9	17.8	24.9	30.2	36.7	38.1	38.4	36.9	35.9	36.1	35.8	27.5	S	19.0	10.2	5.4	3.9	4.4	3.3	38.4	19.5	24	
15	4.0	2.3	2.4	1.6	5.4	1.7	3.6	7.4	13.4	21.2	30.0	31.4	32.3	34.9	35.5	36.0	30.1	S	26.7	16.7	10.2	7.2	4.9	3.9	1.6	36.0	15.8	24	
16	1.8	1.0	0.4	0.3	0.2	0.2	0.3	9.3	18.2	24.1	36.6	39.8	42.2	42.4	40.7	39.8	S	38.6	25.2	18.7	10.2	5.4	5.8	8.7	0.2	42.4	17.8	24	
17	7.0	3.6	3.7	4.7	4.4	3.6	5.6	8.9	14.5	19.4	25.8	31.4	28.6	27.7	28.8	S	24.9	24.2	23.7	23.0	21.1	16.9	12.6	11.2	3.6	31.4	16.3	24	
18	10.9	10.5	9.8	8.8	7.1	6.3	7.0	9.7	13.4	16.7	19.1	19.1	19.7	18.2	S	20.6	18.7	18.2	19.2	12.7	7.7	2.8	3.0	4.0	2.8	20.6	12.3	24	
19	1.4	0.9	0.6	0.4	0.3	0.4	1.1	3.7	9.4	17.8	24.2	28.4	30.9	S	29.8	26.7	26.6	23.9	19.5	16.5	16.9	17.9	18.9	17.6	0.3	30.9	14.5	24	
20	15.8	12.7	8.4	10.4	5.6	1.8	3.1	12.8	18.4	21.1	28.9	32.4	S	33.7	28.3	27.3	26.9	27.0	22.1	16.6	17.3	18.7	19.9	14.2	1.8	33.7	18.4	24	
21	16.8	14.8	14.5	12.3	8.5	3.6	5.4	13.1	17.3	19.0	21.7	S	29.7	31.3	33.2	32.3	32.3	31.0	26.7	16.6	13.1	16.0	16.2	16.8	3.6	33.2	19.2	24	
22	16.2	16.3	13.7	15.0	16.8	16.4	16.4	18.9	20.9	22.0	S	26.3	24.6	24.4	22.6	24.0	20.5	16.3	10.9	17.7	18.7	18.8	18.2	12.0	10.9	26.3	18.6	24	
23	23.9	26.1	17.4	16.5	17.8	18.3	18.6	19.2	19.7	S	21.7	22.9	28.5	27.4	26.6	26.4	25.9	27.7	26.9	27.5	19.1	17.1	11.0	5.4	5.4	28.5	21.4	24	
24	3.4	2.6	1.6	1.2	0.5	0.3	1.6	3.9	S	8.9	20.0	26.3	30.4	31.4	31.4	31.6	31.9	29.6	22.7	15.8	12.7	11.7	15.2	13.8	0.3	31.9	15.2	24	
25	18.3	15.1	12.4	9.4	9.1	7.5	7.5	S	8.6	10.4	11.1	20.0	22.5	15.2	16.7	23.8	25.3	24.0	20.6	15.4	10.7	8.5	6.0	3.0	3.0	25.3	14.0	24	
26	0.9	0.5	1.0	0.7	0.5	0.6	S	3.6	7.9	14.7	19.8	23.3	26.7	28.0	29.8	30.9	29.6	28.3	25.7	19.2	20.3	20.6	20.4	19.9	0.5	30.9	16.2	24	
27	19.5	18.7	17.8	17.0	17.2	S	15.9	15.4	15.4	18.1	20.5	23.4	26.5	24.3	24.8	26.0	21.4	9.5	5.4	3.3	1.3	3.0	4.4	6.1	1.3	26.5	15.4	24	
28	8.5	8.9	10.9	8.5	S	6.8	10.6	15.5	17.6	18.4	19.4	19.9	21.1	20.9	22.5	23.0	25.6	25.5	24.9	21.9	16.8	10.9	7.2	5.0	5.0	25.6	16.1	24	
29	5.6	3.3	0.9	S	0.6	0.5	2.9	4.9	9.4	16.3	20.1	23.6	26.1	29.2	30.4	31.3	32.0	32.5	28.2	16.8	10.6	6.3	6.1	3.3	0.5	32.5	14.8	24	
30	2.0	1.2	S	18.2	17.0	13.5	18.3	21.1	23.7	24.2	24.1	23.9	24.3	25.3	26.3	24.8	24.0	22.4	22.2	22.5	22.5	21.7	20.6	19.9	1.2	26.3	20.2	24	
31	20.5	S	20.2	19.9	20.3	20.8	18.3	17.1	17.3	15.3	15.4	18.4	19.9	20.9	21.5	23.4	23.8	22.2	20.2	19.7	20.9	21.1	20.5	20.4	15.3	23.8	19.9	24	
HOURLY MAX	23.9	26.1	20.2	21.8	20.3	20.8	20.0	22.3	24.9	30.2	36.7	39.8	42.2	42.4	40.7	39.8	35.8	38.6	30.5	27.9	26.8	23.8	21.5	20.4					
HOURLY AVG	9.4	8.0	7.3	7.7	7.3	6.1	8.3	12.0	16.0	18.9	22.9	25.4	26.7	27.0	27.6	27.7	26.7	25.6	22.9	19.1	14.7	13.1	12.1	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

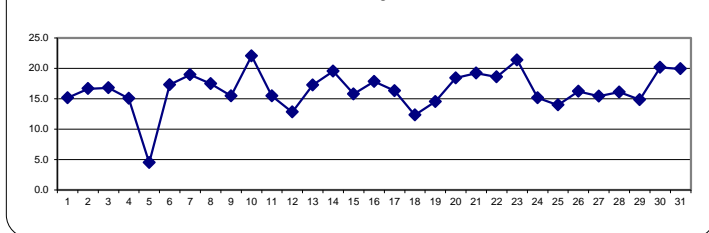
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 PPB

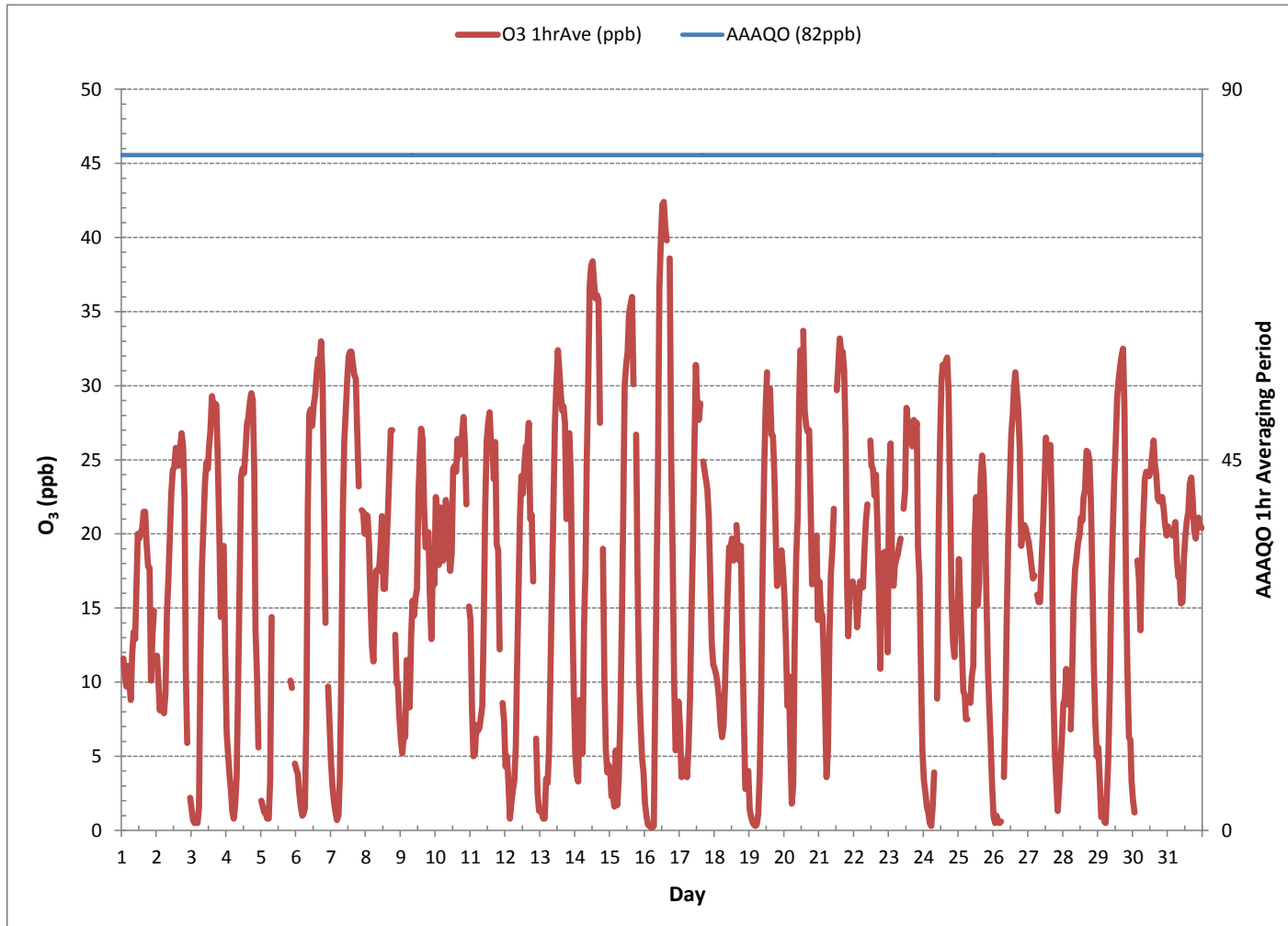
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0				
NUMBER OF NON-ZERO READINGS:	700				
MINIMUM 1-HR AVERAGE:	0.2 PPB	@ HOUR(S)	4, 5	ON DAY(S)	16, 16
MAXIMUM 1-HR AVERAGE:	42.4 PPB	@ HOUR(S)	13	ON DAY(S)	16
MAXIMUM 24-HR AVERAGE:	22.0 PPB			ON DAY(S)	10
				VAR-VARIOUS	
IZS CALIBRATION TIME:	32 HRS	OPERATIONAL TIME:	739 HRS		
MONTHLY CALIBRATION TIME:	7 HRS	AMD OPERATION UPTIME:	99.3 %		
STANDARD DEVIATION:	9.75	MONTHLY AVERAGE:	16.7 PPB		

24 HOUR AVERAGES FOR August 2016



OZONE (O₃) hourly averages in ppb





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - August 2016

OZONE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR					
DAY	MIN.	MAX.	AVG.	RDGS.																													
1	S	12.3	11.3	11.3	11.7	10.6	9.4	14.8	14.5	14.5	18.1	21.0	20.6	21.1	21.5	22.4	22.4	22.1	18.6	19.5	15.9	14.5	15.4	S	9.4	22.4	16.5	24					
2	14.7	12.0	9.3	10.2	9.4	8.5	13.4	16.5	18.6	23.4	24.6	26.0	27.3	28.0	26.2	26.2	27.4	27.7	26.9	25.3	15.4	8.7	S	4.9	4.9	28.0	18.7	24					
3	2.3	1.3	0.6	0.9	0.9	6.1	16.0	19.9	21.9	25.7	26.9	25.5	27.7	29.5	30.2	29.5	30.2	30.0	26.8	23.6	18.4	S	20.3	18.1	0.6	30.2	18.8	24					
4	8.7	7.6	6.0	5.2	2.3	1.3	3.1	6.1	14.2	22.1	26.0	26.0	25.1	26.6	28.7	28.7	30.8	30.8	30.0	28.7	19.6	13.9	9.8	S	1.3	30.8	17.4	24					
5	2.9	1.8	1.5	1.3	0.8	0.8	7.4	18.6	C	C	C	Y	Y	Y	Y	Y	C	C	C	C	15.0	13.6	S	7.9	0.8	18.6	6.5	19					
6	6.0	5.5	3.6	2.1	1.0	1.2	3.2	15.3	26.6	30.5	30.2	27.8	29.5	29.8	31.3	32.3	32.4	34.2	33.4	28.4	16.0	S	14.4	10.2	1.0	34.2	19.3	24					
7	5.5	3.6	3.1	1.7	0.7	1.3	4.9	17.5	25.0	27.1	29.5	31.7	33.3	33.1	33.3	33.1	32.7	32.4	28.6	24.4	S	23.4	23.4	20.2	0.7	33.3	20.4	24					
8	21.9	21.9	20.9	16.9	13.4	13.1	16.2	18.1	17.8	17.8	20.9	23.3	17.4	18.0	20.8	22.8	25.7	28.1	27.5	S	16.5	12.8	12.0	11.1	11.1	28.1	18.9	24					
9	8.8	7.3	7.7	8.7	14.7	12.9	9.9	15.4	16.2	15.6	16.2	19.5	24.5	27.1	29.3	29.5	24.5	20.6	S	25.1	18.1	15.6	20.4	19.5	7.3	29.5	17.7	24					
10	26.6	26.8	21.9	24.5	22.4	20.4	23.0	23.7	23.4	20.7	18.9	23.0	27.8	29.8	28.6	30.2	29.8	35.2	34.5	34.2	31.5	26.0	S	15.6	15.6	35.2	26.0	24					
11	15.9	11.3	7.3	8.3	8.0	7.3	7.3	8.2	11.9	18.8	26.9	27.4	29.5	29.8	26.8	27.1	27.1	27.5	25.4	24.4	14.7	S	10.6	8.2	7.3	29.8	17.8	24					
12	5.8	5.8	4.0	1.2	2.6	2.8	3.9	8.0	12.8	18.8	24.2	24.8	23.9	25.5	28.7	28.0	30.6	22.5	21.8	21.2	S	8.2	3.9	2.5	1.2	30.6	14.4	24					
13	1.9	1.2	1.0	0.6	5.2	4.7	8.5	13.2	21.3	25.3	30.2	32.4	35.1	33.3	31.4	29.0	29.5	29.2	26.3	S	28.3	27.2	21.3	12.5	0.6	35.1	19.5	24					
14	7.3	6.1	4.9	13.7	11.6	11.6	16.2	20.9	28.3	33.1	39.3	39.5	39.9	38.5	37.4	37.4	37.8	32.7	S	22.5	16.9	8.6	6.7	6.6	4.9	39.9	22.5	24					
15	7.3	4.9	5.2	6.1	6.7	3.2	6.0	10.9	15.9	29.5	31.5	32.6	33.3	36.6	38.1	38.2	31.6	S	28.1	23.0	12.5	8.8	8.0	5.5	3.2	38.2	18.4	24					
16	2.4	1.7	0.4	0.2	0.0	0.2	0.6	111.2	21.9	31.4	39.1	41.6	43.9	43.4	41.2	41.3	S	44.3	33.9	21.2	16.7	8.8	8.3	9.8	0.0	111.2	24.5	24					
17	8.5	5.5	5.8	5.2	4.7	5.3	6.7	11.5	16.5	21.3	30.0	32.6	31.1	28.9	30.9	S	25.6	24.9	25.1	25.9	22.2	19.9	13.4	13.2	4.7	32.6	18.0	24					
18	11.9	11.3	10.1	9.4	8.0	7.4	7.9	11.9	14.7	18.7	20.0	20.1	20.4	20.2	S	21.8	21.8	22.8	24.0	16.6	11.7	3.9	4.5	5.3	3.9	24.0	14.1	24					
19	2.6	1.3	0.6	0.3	0.4	0.5	1.8	5.8	13.9	21.8	27.2	30.3	32.3	S	31.3	30.0	29.2	27.8	22.8	19.0	18.1	18.9	19.3	18.1	0.3	32.3	16.2	24					
20	16.5	15.1	11.6	12.8	9.4	4.5	9.4	16.7	19.6	24.1	31.3	34.5	S	35.5	30.8	28.7	28.7	28.9	27.2	20.9	18.7	21.6	21.6	18.3	4.5	35.5	21.1	24					
21	20.2	19.8	16.5	14.7	11.3	7.0	9.8	17.2	19.2	20.4	23.7	S	31.3	33.3	34.3	33.4	33.1	32.3	29.7	22.1	19.1	19.0	17.0	17.8	7.0	34.3	21.8	24					
22	16.3	16.6	15.9	16.9	17.4	18.1	18.6	20.3	22.5	22.8	S	27.2	25.9	25.3	23.6	24.8	23.9	21.2	13.9	23.4	20.1	19.5	19.5	18.0	13.9	27.2	20.5	24					
23	30.5	28.6	18.9	16.9	18.0	18.6	19.0	19.6	20.6	S	22.4	24.5	29.8	29.6	28.3	27.5	26.3	31.4	28.9	28.0	25.6	11.5	16.6	9.8	9.8	31.4	23.5	24					
24	6.6	4.9	3.1	2.3	0.8	0.5	2.9	4.5	S	13.8	23.9	29.2	32.3	32.6	32.3	32.7	34.3	32.6	26.2	24.0	16.2	16.0	16.6	17.8	0.5	34.3	17.7	24					
25	19.2	16.5	13.5	10.7	9.8	7.9	8.7	S	9.2	11.3	14.5	24.5	26.0	17.5	19.6	25.7	25.6	25.5	23.4	18.6	14.1	9.4	7.9	4.2	4.2	26.0	15.8	24					
26	1.0	0.5	1.5	0.8	0.6	0.8	S	5.6	12.6	19.0	21.5	24.8	27.7	28.7	31.8	32.0	30.8	28.9	27.5	21.5	21.3	21.0	20.5	19.9	0.5	32.0	17.4	24					
27	19.9	18.7	18.3	17.2	17.4	S	16.2	15.6	15.7	19.7	22.5	23.9	27.5	25.3	26.8	27.2	26.5	13.4	11.1	6.4	2.8	6.1	5.6	7.2	2.8	27.5	17.0	24					
28	9.0	10.1	12.2	9.3	S	7.3	13.5	17.5	18.4	19.0	20.2	21.2	21.5	21.9	22.8	24.1	27.5	26.2	25.7	24.2	18.4	16.0	9.8	7.2	7.2	27.5	17.5	24					
29	7.4	4.7	1.2	S	1.0	0.6	4.9	5.8	12.9	19.2	21.9	25.0	28.3	30.3	31.3	32.6	33.4	33.6	32.6	24.1	16.8	9.1	9.4	7.2	0.6	33.6	17.1	24					
30	4.0	1.7	S	19.7	19.3	16.9	21.3	22.8	24.7	24.7	24.5	24.4	25.3	26.5	26.9	25.9	24.8	23.9	23.3	23.1	22.8	22.4	20.7	20.0	1.7	26.9	21.3	24					
31	20.6	S	20.6	20.0	20.8	21.6	20.0	18.3	19.0	16.3	15.9	19.5	21.2	21.4	22.7	24.4	24.4	23.3	20.8	19.8	21.2	21.2	20.8	20.7	15.9	24.4	20.6	24					
HOURLY MAX	30.5	28.6	21.9	24.5	22.4	21.6	23.0	111.2	28.3	33.1	39.3	41.6	43.9	43.4	41.2	41.3	37.8	44.3	34.5	34.2	31.5	27.2	23.4	20.7									
HOURLY AVG	11.1	9.5	8.6	9.0	8.3	7.4	10.3	17.7	18.3	21.6	24.9	27.0	28.3	28.5	29.2	29.2	28.6	28.1	25.9	22.8	18.1	15.6	14.2	12.3									

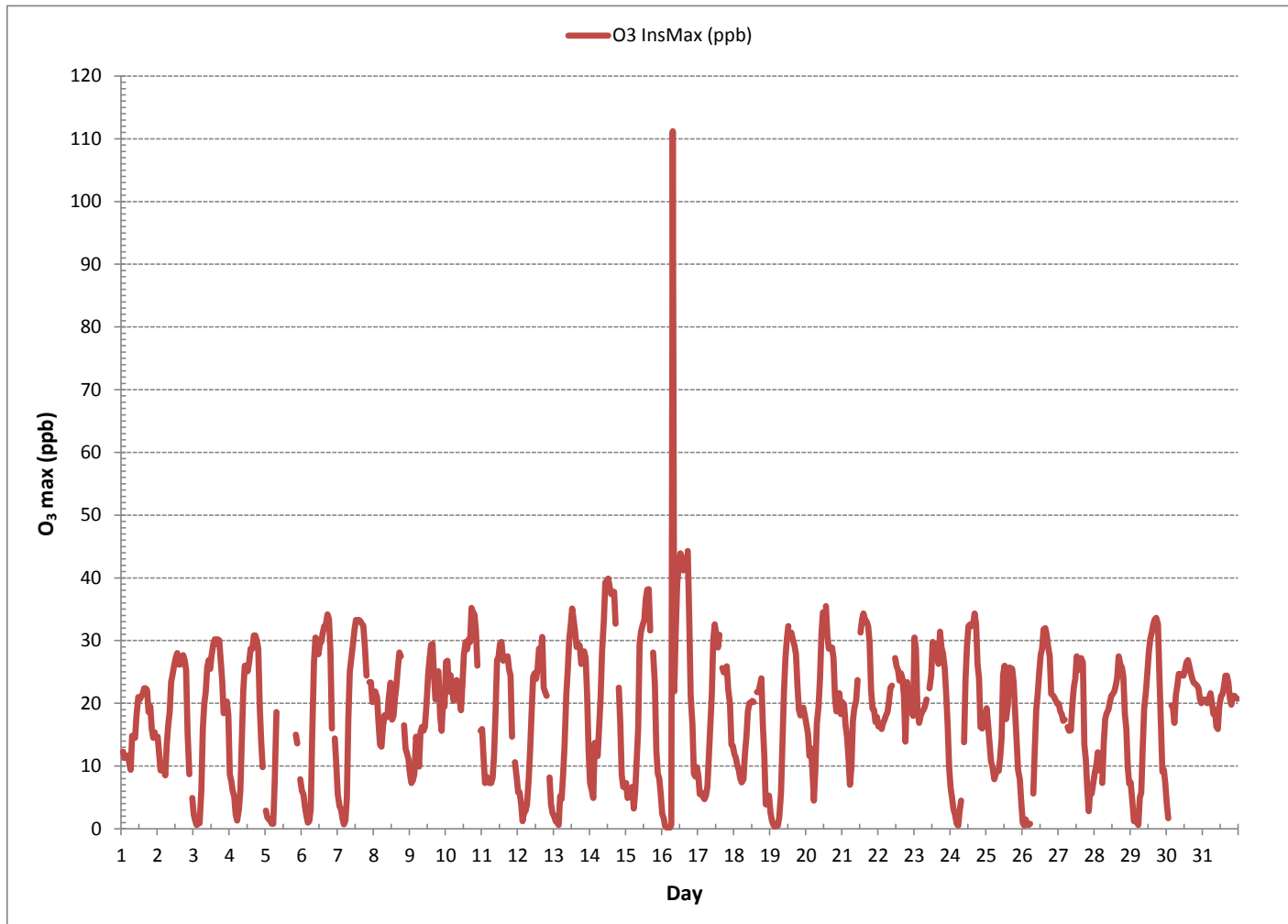
STATUS FLAG CODES

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

MONTHLY SUMMARY

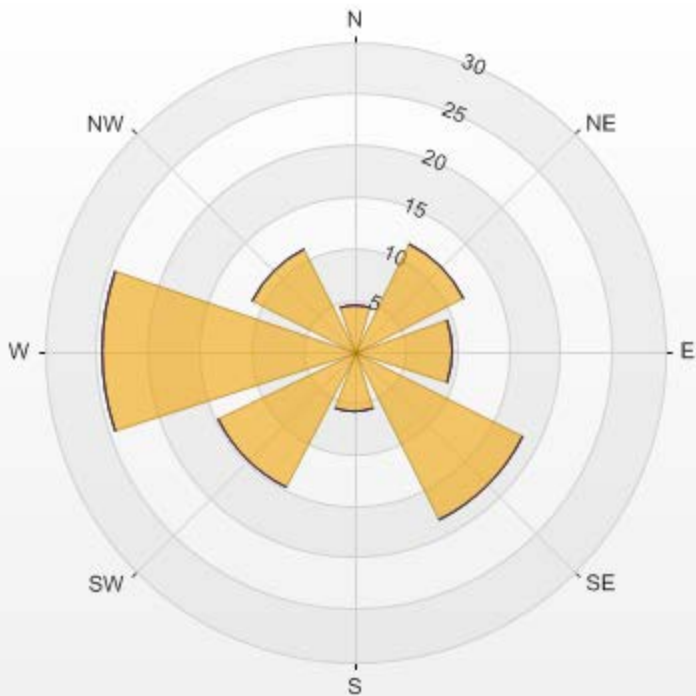
NUMBER OF NON-ZERO READINGS:	699
MAXIMUM INSTANTANEOUS VALUE:	111.2 PPB @ HOUR(S) 7 ON DAY(S) 16
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	7 HRS
OPERATIONAL TIME:	739 HRS
STANDARD DEVIATION:	10.52

OZONE MAX instantaneous maximum in ppb



Wind: LICA COLD LAKE SOUTH Monitor: O3 [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.09% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	4.57	0	0	0	4.57
NE	11.71	0	0	0	11.71
E	9.57	0	0	0	9.57
SE	18	0	0	0	18
S	5.86	0	0	0	5.86
SW	14.71	0	0	0	14.71
W	24.43	0	0	0	24.43
NW	11.14	0	0	0	11.14
Summary	100	0	0	0	100



% Icon Classes (ppb)	
100	0.0-50.0
0	50.0-110.0
0	110.0-210.0
0	>210.0

PARTICULATE MATTER 2.5

PARTICULATE MATTER 2.5 (LESS THAN 2.5 MICRONS) (PM_{2.5}) hourly averages in µg/m³

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.	
DAY	DAY	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.	
1	1	2.2	2.5	2.3	4.4	0.0	0.0	0.4	1.9	7.9	3.9	8.9	5.5	7.9	8.4	2.4	2.4	2.9	6.9	1.5	2.9	2.9	5.4	3.4	2.0	0.0	8.9	3.7	24	
2	2	3.9	2.9	5.4	4.4	0.4	0.4	6.4	4.9	1.9	3.4	4.4	3.9	0.4	3.4	2.9	2.9	4.9	3.4	4.4	2.4	3.9	6.9	5.4	6.4	0.4	6.9	3.7	24	
3	3	4.4	7.9	2.4	7.9	2.9	2.4	4.4	3.4	3.9	2.9	1.0	2.4	2.4	1.5	2.9	2.9	2.4	3.9	3.4	1.4	2.4	5.9	4.9	6.4	1.0	7.9	3.6	24	
4	4	1.4	8.4	5.9	5.9	5.4	6.9	2.9	1.9	6.9	6.9	4.4	4.9	5.5	1.0	4.9	5.9	5.4	10.4	4.4	6.4	5.4	7.5	3.4	7.5	1.0	10.4	5.4	24	
5	5	4.9	6.9	5.9	1.9	1.9	4.4	3.4	8.9	9.4	4.4	6.4	7.9	0.0	0.0	2.5	1.4	0.4	6.4	2.4	7.5	4.4	6.4	5.4	7.5	0.0	9.4	4.6	24	
6	6	4.9	4.9	8.9	9.9	3.9	5.4	6.4	10.4	2.9	2.9	2.9	3.4	6.4	2.9	5.9	6.4	3.9	3.4	6.9	11.9	7.5	8.4	10.9	8.4	2.9	11.9	6.2	24	
7	7	9.9	9.9	8.4	8.4	9.4	9.4	8.4	8.9	5.9	4.9	4.4	4.4	2.9	3.4	3.4	8.9	4.4	3.9	4.4	3.4	7.5	5.4	5.9	6.9	2.9	9.9	6.4	24	
8	8	6.4	3.9	6.9	7.5	5.9	4.4	5.9	5.5	7.5	4.9	C	C	C	C	3.9	3.0	4.4	5.4	7.5	9.9	10.8	8.6	4.7	8.0	3.0	10.8	6.3	24	
9	9	5.9	7.9	4.4	5.1	0.0	2.2	1.6	8.6	7.1	7.9	4.5	7.4	3.0	3.5	0.8	4.4	5.8	7.8	4.4	3.8	3.6	7.6	0.0	7.5	0.0	8.6	4.8	24	
10	10	0.0	1.3	3.9	0.1	0.0	X	X	0.0	0.0	2.2	2.3	2.2	0.4	5.4	3.1	10.1	7.7	8.9	8.7	6.6	3.9	4.2	2.6	2.7	0.0	10.1	3.5	22	
11	11	9.1	4.7	2.0	2.2	1.0	6.3	0.1	2.9	3.9	5.4	3.9	0.0	5.3	12.4	5.5	6.7	X	4.8	6.9	5.7	2.2	1.1	0.1	3.3	0.0	12.4	4.2	23	
12	12	2.9	0.2	0.0	0.0	2.6	5.9	5.9	4.7	6.4	3.4	5.5	4.6	7.2	X	1.6	1.8	X	4.8	1.4	0.1	0.0	0.0	0.4	2.3	0.0	7.2	2.8	22	
13	13	0.6	1.0	3.8	4.9	1.1	8.2	0.0	5.4	4.4	4.4	6.5	3.8	3.1	5.4	4.9	0.0	0.0	0.0	2.9	1.7	0.0	5.5	2.3	3.0	0.0	8.2	3.0	24	
14	14	4.9	3.4	8.0	4.9	5.5	3.9	3.9	2.4	3.8	3.4	2.0	3.9	7.4	6.8	4.1	7.5	10.9	1.9	0.0	0.0	0.0	0.4	1.4	3.4	0.0	10.9	3.9	24	
15	15	0.0	0.0	0.4	2.9	1.5	2.4	X	4.9	5.9	7.5	5.9	8.9	5.9	5.5	1.0	4.4	4.4	1.9	5.9	4.4	5.9	0.4	4.4	4.4	0.0	8.9	3.9	23	
16	16	0.0	2.9	4.4	1.4	3.4	4.9	4.9	3.4	4.4	4.9	2.9	4.4	8.9	7.5	4.4	1.4	1.4	3.9	0.0	3.9	1.0	0.0	0.4	0.0	0.0	8.9	3.1	24	
17	17	1.4	1.9	2.4	3.4	5.9	3.9	2.9	5.4	8.4	0.4	1.9	0.0	1.4	1.9	0.0	0.4	2.4	6.4	5.4	4.4	4.4	1.0	0.0	3.4	0.0	8.4	2.9	24	
18	18	1.4	1.4	1.9	0.0	0.4	2.9	4.9	5.9	2.4	3.4	2.4	2.0	3.4	0.0	X	2.9	4.4	0.0	3.9	2.9	1.9	1.4	1.0	1.4	0.0	5.9	2.3	23	
19	19	1.0	1.4	1.4	2.4	2.9	0.4	4.4	3.4	7.5	C	C	1.0	3.9	2.4	2.4	1.9	0.0	2.4	11.9	12.0	1.9	0.0	1.4	0.0	0.0	12.0	3.0	24	
20	20	2.0	1.4	1.4	1.4	1.4	2.4	2.0	3.9	3.9	0.0	1.9	4.9	4.4	4.9	3.9	2.9	1.9	2.9	3.9	2.4	1.9	6.4	4.9	1.9	0.0	6.4	2.9	24	
21	21	0.4	1.9	2.0	0.0	1.4	1.0	1.0	1.4	0.0	0.4	0.0	4.9	0.4	0.0	1.4	2.9	6.9	4.4	4.9	4.9	6.9	5.5	5.9	1.9	0.0	6.9	2.5	24	
22	22	5.4	1.0	4.9	3.9	4.9	1.4	1.4	1.0	0.0	2.0	6.4	3.4	4.9	3.4	2.4	3.4	5.4	4.9	1.4	1.4	2.0	4.9	3.4	1.4	0.0	6.4	3.1	24	
23	23	0.0	0.0	4.4	0.0	0.4	0.0	3.4	0.0	0.0	2.4	2.4	1.4	5.5	1.4	0.0	X	0.0	0.0	6.9	3.9	1.4	0.0	0.4	0.0	0.0	6.9	1.5	23	
24	24	0.0	1.0	2.0	1.4	2.5	2.9	0.4	X	5.4	2.9	2.4	4.4	4.4	2.5	2.9	0.4	0.0	5.9	3.9	1.4	4.4	0.0	1.0	2.4	0.0	5.9	2.4	23	
25	25	0.0	0.0	1.9	0.4	0.0	0.0	0.0	2.4	3.4	1.4	4.4	4.4	6.4	5.9	5.9	2.9	4.9	0.4	1.9	3.9	3.4	1.4	5.5	2.9	0.0	6.4	2.7	24	
26	26	3.4	2.4	2.9	2.9	1.9	2.9	2.4	3.9	1.0	1.9	0.0	3.4	1.9	1.0	4.4	2.9	0.0	1.9	2.4	3.9	0.0	3.4	1.4	0.0	0.0	4.4	2.2	24	
27	27	0.0	0.4	1.9	2.4	0.0	3.4	1.9	1.9	0.0	1.0	6.4	2.9	3.9	3.9	3.9	1.9	2.9	4.9	3.4	3.9	1.0	1.4	3.4	2.9	0.0	6.4	2.5	24	
28	28	0.0	1.4	0.0	0.4	0.0	X	X	X	0.0	X	0.0	0.0	X	0.0	0.0	0.0	X	0.0	0.0	0.0	X	0.0	0.0	X	0.0	0.0	1.4	0.1	17
29	29	0.0	0.0	0.0	2.9	0.0	X	X	0.0	3.9	X	1.0	0.0	0.0	1.4	X	X	1.0	2.4	0.0	6.4	1.4	1.4	3.4	0.0	0.0	6.4	1.3	19	
30	30	3.4	2.5	0.0	0.0	1.0	0.0	0.0	0.0	3.9	4.9	0.0	0.0	0.0	0.0	1.0	0.0	2.9	1.9	3.4	1.0	0.0	0.0	X	0.4	0.0	4.9	1.1	23	
31	31	3.9	2.4	1.9	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.4	0.0	3.9	2.4	2.9	1.9	3.9	4.4	5.4	2.9	2.9	3.9	9.9	0.0	9.9	2.3	24	
HOURLY MAX		9.9	9.9	8.9	9.9	9.4	9.4	8.4	10.4	9.4	7.9	8.9	8.9	8.9	12.4	5.9	10.1	10.9	10.4	11.9	12.0	10.8	8.6	10.9	9.9					
HOURLY AVG		2.7	2.8	3.3	3.0	2.2	3.0	2.9	3.7	3.9	3.4	3.3	3.4	3.7	3.4	2.9	3.3	3.3	3.9	4.0	4.2	3.2	3.3	3.0	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

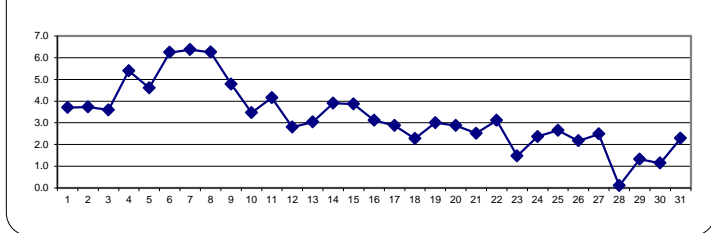
OBJECTIVE LIMIT:

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

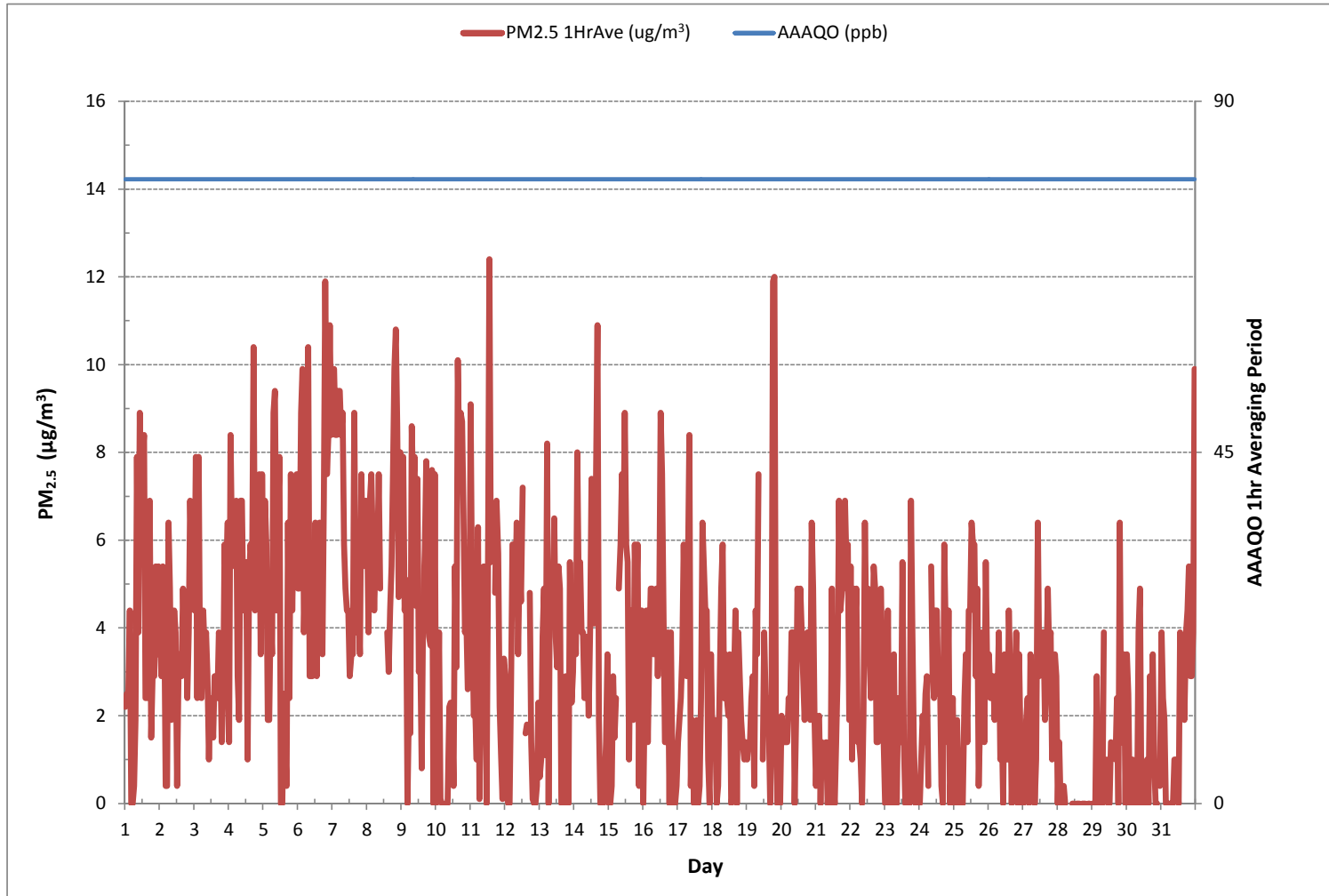
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0
NUMBER OF 24-HR EXCEEDENCES:	0
NUMBER OF NON-ZERO READINGS:	603
MINIMUM 1-HR AVERAGE:	0.0 µg/m ³ @ HOUR(S) VAR ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	12.4 µg/m ³ @ HOUR(S) 13 ON DAY(S) 11
MAXIMUM 24-HR AVERAGE:	6.4 µg/m ³ 7 ON DAY(S) 7
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	6 HRS
	OPERATIONAL TIME: 722 HRS
	AMD OPERATION UPTIME: 97.0 %
STANDARD DEVIATION:	2.64
	MONTHLY AVERAGE: 3.3 µg/m ³

24 HOUR AVERAGES FOR August 2016

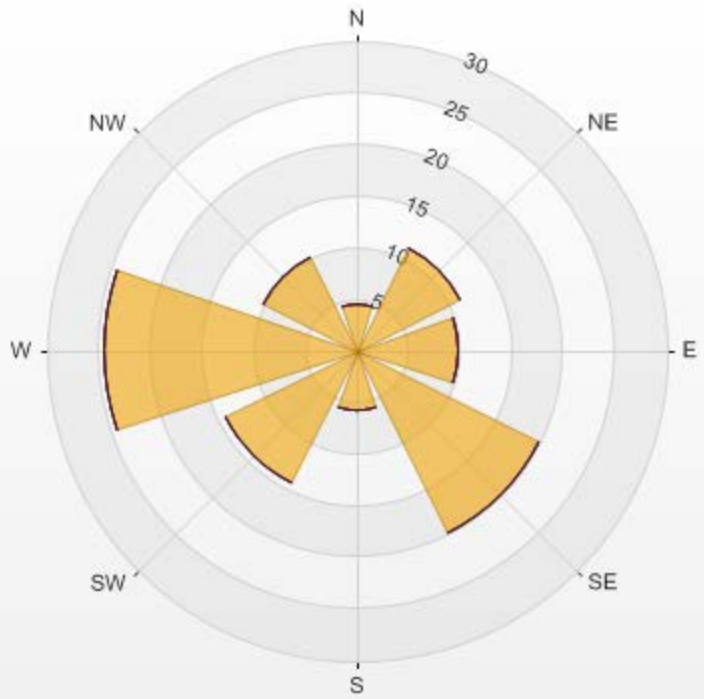








PARTICULATE MATTER 2.5 (LESS THAN 2.5 MICRONS) (PM_{2.5}) hourly averages in µg/m³



Wind: LICA COLD LAKE SOUTH Monitor: PM2.5 [ug/m3(L)] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 96.24% Calm Avg: 0.00

Direction	0.0-30.0	30.0-60.0	60.0-80.0	80.0-120.0	120.0-240.0	>240.0	Total
N	4.61	0	0	0	0	0	4.61
NE	11.17	0	0	0	0	0	11.17
E	9.92	0	0	0	0	0	9.92
SE	19.69	0	0	0	0	0	19.69
S	5.73	0	0	0	0	0	5.73
SW	14.25	0	0	0	0	0	14.25
W	24.44	0	0	0	0	0	24.44
NW	10.2	0	0	0	0	0	10.2
Summary	100	0	0	0	0	0	100



% Icon Classes (ug/m3(L))	100	0	0	0	0	0
	 0.0-30.0	 30.0-60.0	 60.0-80.0	 80.0-120.0	 120.0-240.0	 >240.0

WIND SPEED

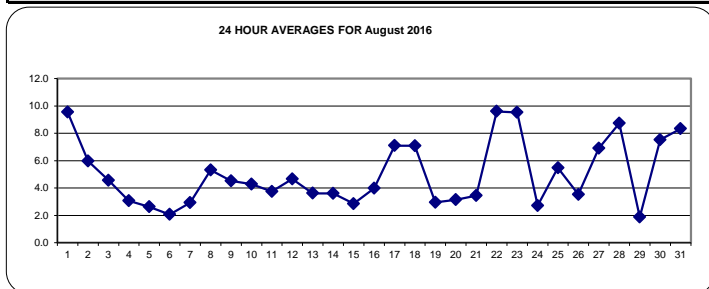
WIND SPEED (WS) hourly averages in kph

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	5.6	6.2	7.0	6.0	7.7	7.8	8.7	10.0	11.7	12.5	13.6	16.3	15.0	15.7	13.0	12.1	12.0	14.3	6.6	5.6	3.8	4.4	6.8	6.9	3.8	16.3	9.6	24	
2	6.3	5.2	4.5	5.7	5.6	5.9	5.9	7.9	6.3	7.4	7.6	9.3	11.1	11.1	8.4	7.3	8.7	8.4	5.2	3.1	0.9	0.9	0.5	0.3	0.3	0.3	11.1	6.0	24
3	0.1	0.3	0.9	0.5	0.4	1.8	3.7	4.2	4.9	7.8	8.4	7.6	7.8	8.5	10.4	8.9	8.4	6.0	3.4	2.2	2.6	5.7	4.3	0.7	0.1	10.4	4.6	24	
4	1.4	2.0	0.5	2.3	0.9	0.3	1.7	1.9	2.0	4.3	2.3	6.6	7.9	7.3	7.8	7.2	7.0	3.9	1.8	2.1	0.8	0.7	0.6	0.5	0.3	7.9	3.1	24	
5	0.4	0.9	1.6	0.2	1.0	0.9	0.5	1.9	5.7	6.0	4.4	3.8	4.3	4.4	3.9	4.6	4.3	2.9	4.2	3.3	1.5	0.6	1.0	0.8	0.2	6.0	2.6	24	
6	0.5	0.4	0.8	0.4	0.9	0.8	0.5	2.0	0.8	1.8	2.4	4.4	4.6	3.1	5.1	1.7	6.2	5.6	2.6	1.1	1.2	0.7	0.7	1.4	0.4	6.2	2.1	24	
7	0.5	0.8	0.3	0.3	0.5	1.0	0.8	0.6	0.3	1.6	4.2	4.5	4.3	4.3	3.1	7.7	6.6	1.7	4.5	3.9	2.3	3.8	6.3	6.3	0.3	7.7	2.9	24	
8	7.3	6.1	6.7	3.3	3.0	2.9	5.8	6.5	5.9	5.5	6.9	8.4	10.5	9.8	10.6	9.4	7.3	4.6	4.3	1.2	0.7	0.1	0.5	0.5	0.1	10.6	5.3	24	
9	0.4	0.7	0.6	0.4	3.2	3.5	4.1	6.1	6.1	5.9	7.3	7.2	7.1	8.2	9.7	8.8	8.4	7.7	2.6	2.7	2.8	1.8	1.5	1.8	0.4	9.7	4.5	24	
10	2.2	2.3	0.9	2.8	1.2	4.1	3.9	5.5	6.7	4.9	7.9	6.4	6.3	4.8	2.7	5.7	4.3	2.7	8.7	6.3	1.3	2.3	3.6	5.3	0.9	8.7	4.3	24	
11	5.4	1.8	1.7	3.8	4.5	6.0	5.0	3.3	2.0	1.4	2.7	4.2	5.7	8.4	6.0	4.9	0.6	6.4	0.7	1.3	2.2	3.2	4.6	4.3	0.6	8.4	3.8	24	
12	2.5	3.7	2.6	1.3	3.5	3.7	4.3	3.3	4.3	5.2	7.9	9.8	7.9	9.3	7.9	11.2	6.0	5.5	4.8	1.7	2.7	1.9	0.3	0.6	0.3	11.2	4.7	24	
13	0.7	0.4	0.3	0.4	3.8	2.1	3.3	4.9	4.3	4.7	5.7	6.9	7.0	5.7	5.4	6.3	7.2	5.3	1.9	1.1	6.2	2.6	0.4	0.3	0.3	7.2	3.6	24	
14	1.0	0.9	0.4	1.5	0.6	1.8	1.6	1.0	3.1	1.7	1.1	3.3	2.7	3.9	6.4	9.1	8.7	20.3	7.6	2.7	1.3	0.9	2.2	2.7	0.4	20.3	3.6	24	
15	1.4	0.7	1.9	1.8	2.7	0.5	0.4	2.8	3.1	1.6	2.9	4.3	5.3	5.4	6.0	5.6	4.0	6.5	4.9	2.5	1.3	1.8	0.7	0.5	0.4	6.5	2.9	24	
16	0.5	0.2	0.5	0.4	0.6	0.5	0.2	1.9	4.5	5.1	5.8	6.3	8.0	9.5	9.4	8.0	9.2	11.1	2.2	1.7	1.3	1.1	3.4	4.5	0.2	11.1	4.0	24	
17	3.7	2.9	3.4	4.0	4.3	2.9	2.3	3.1	5.3	6.2	7.2	10.9	11.6	11.1	13.7	14.3	12.8	11.7	12.7	6.9	7.2	3.2	4.0	5.0	2.3	14.3	7.1	24	
18	6.0	4.9	5.1	5.3	4.3	4.3	3.5	6.7	10.4	12.7	14.6	12.7	11.1	10.7	11.5	14.2	8.5	7.4	3.2	2.5	1.9	2.1	3.2	3.5	1.9	14.6	7.1	24	
19	0.4	0.6	0.6	1.0	0.8	0.2	0.5	1.5	2.0	3.0	2.9	4.6	4.6	5.4	5.6	2.6	2.4	1.9	4.0	3.0	4.6	5.7	6.9	5.9	0.2	6.9	2.9	24	
20	5.0	3.0	0.7	2.3	1.0	0.6	0.9	2.6	4.0	3.2	3.6	4.3	6.5	5.4	4.7	4.7	3.9	1.2	2.0	2.8	4.8	4.3	1.3	2.8	0.6	6.5	3.2	24	
21	2.5	1.7	2.5	1.5	1.1	0.8	2.0	4.4	4.1	4.6	5.9	6.9	6.1	4.6	5.2	3.9	4.6	4.7	2.5	0.4	2.4	2.0	3.9	4.5	0.4	6.9	3.5	24	
22	7.6	6.4	3.3	10.8	9.7	11.7	9.3	15.1	17.1	17.2	16.1	18.7	13.1	11.7	13.0	13.6	6.3	1.5	2.5	7.4	6.9	5.1	4.2	2.2	1.5	18.7	9.6	24	
23	2.7	8.0	11.6	12.9	13.3	12.4	11.8	12.4	11.9	12.0	11.9	12.1	13.6	12.6	12.3	11.1	14.5	10.1	6.1	6.9	2.0	3.1	1.6	1.7	1.6	14.5	9.5	24	
24	1.6	1.6	1.1	1.3	1.1	0.7	2.5	3.3	2.9	2.7	3.8	4.2	3.1	5.8	4.8	3.2	0.6	3.1	1.6	1.4	2.4	2.7	5.2	4.6	0.6	5.8	2.7	24	
25	6.6	3.8	4.1	3.5	4.5	3.8	5.5	6.7	5.6	6.8	7.4	6.2	6.3	4.3	9.0	11.7	9.3	6.4	4.5	2.9	3.4	3.9	3.0	2.1	2.1	11.7	5.5	24	
26	1.1	0.9	3.5	2.6	1.8	2.4	1.6	1.9	0.5	1.9	2.8	3.1	3.6	3.4	2.4	5.2	4.2	3.2	3.9	4.7	6.3	7.4	7.3	9.0	0.5	9.0	3.5	24	
27	8.6	7.5	7.5	7.2	8.8	9.7	9.9	9.1	11.2	11.0	13.6	14.2	15.0	9.4	3.0	4.8	2.1	0.9	0.5	0.3	1.0	2.2	4.3	3.9	0.3	15.0	6.9	24	
28	5.9	3.9	4.3	3.7	5.6	11.3	11.2	13.6	12.9	12.3	12.8	12.4	14.5	14.7	14.1	11.5	10.5	8.9	6.6	3.9	4.1	4.0	3.3	3.7	3.3	14.7	8.7	24	
29	4.3	4.1	1.0	0.6	1.2	1.3	3.0	1.4	1.3	1.4	2.4	1.7	2.9	3.1	2.1	3.6	2.3	2.0	2.0	0.5	0.7	0.9	0.4	0.7	0.4	4.3	1.9	24	
30	0.3	1.2	3.5	4.2	3.7	4.1	6.1	7.9	9.7	10.0	9.5	11.5	10.8	10.1	10.8	9.2	9.2	8.1	9.1	7.9	9.0	8.8	8.7	7.4	0.3	11.5	7.5	24	
31	6.8	5.3	5.2	5.7	7.7	5.9	5.5	9.1	12.9	8.1	10.4	12.4	10.4	9.8	11.6	11.6	9.5	8.0	6.5	6.6	7.0	8.1	8.0	7.8	5.2	12.9	8.3	24	
HOURLY MAX	8.6	8.0	11.6	12.9	13.3	12.4	11.8	15.1	17.1	17.2	16.1	18.7	15.0	15.7	14.1	14.3	14.5	20.3	12.7	7.9	9.0	8.8	8.7	9.0					
HOURLY AVG	3.2	2.9	2.9	3.2	3.5	3.7	4.1	5.2	5.9	6.1	7.0	7.9	8.0	7.8	7.7	7.9	6.8	6.2	4.3	3.2	3.1	3.1	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

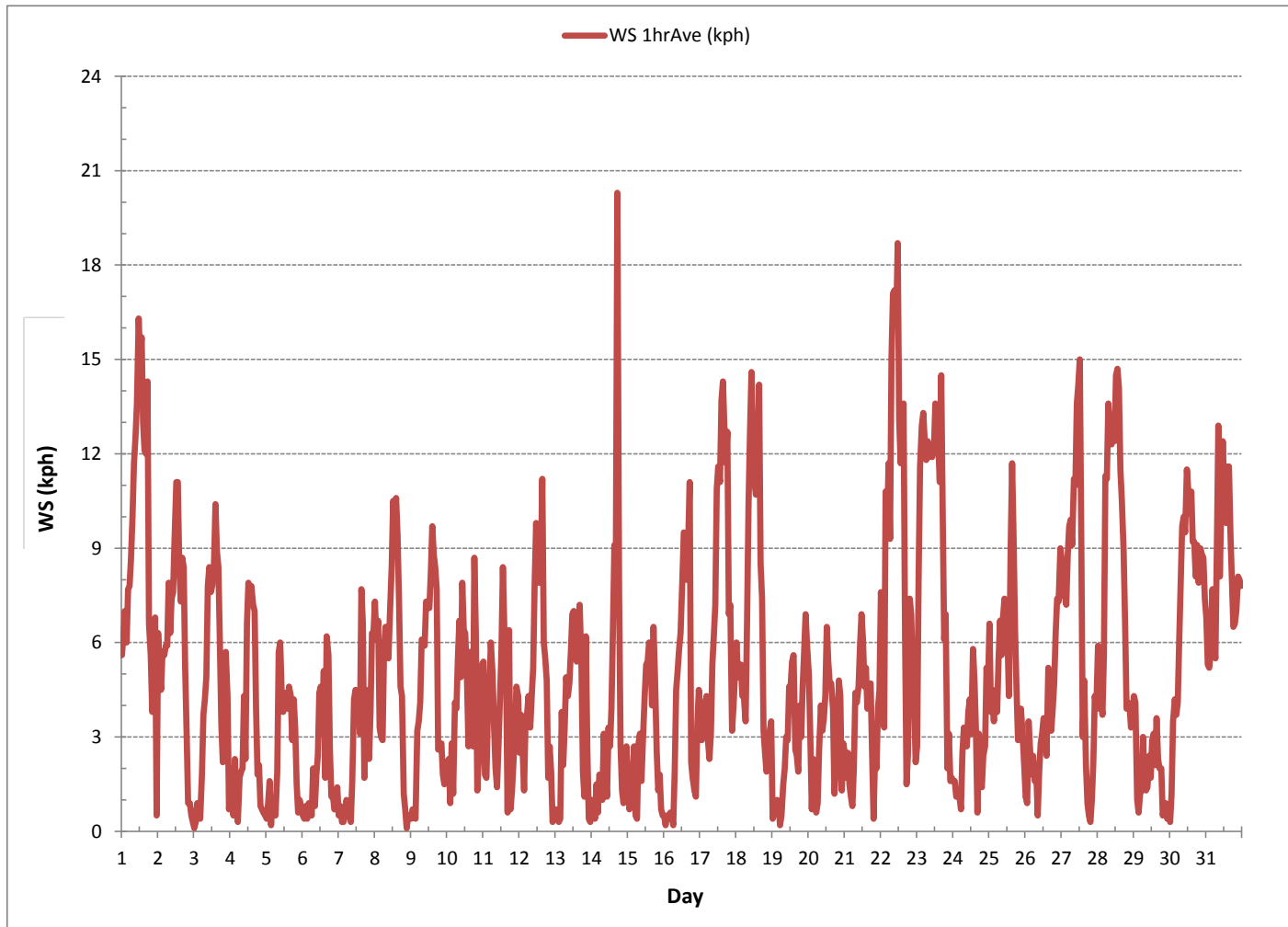
LAST CALIBRATION:	April 1, 2015
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MINIMUM 1-HR AVERAGE:	0.1 kph @ HOUR(S) 0 , 21 ON DAY(S) 3 , 8
MAXIMUM 1-HR AVERAGE:	20.3 kph @ HOUR(S) 17 ON DAY(S) 14
MAXIMUM 24-HR AVERAGE:	9.6 kph ON DAY(S) 1, 22
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 HRS
OPERATIONAL TIME:	744 HRS
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3.80
MONTHLY AVERAGE:	5.0 koh

WIND SPEED (WS) hourly averages in kph





VECTOR WIND SPEED MAX instantaneous maximum in kph

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
HOURLY MAX	HOURLY AVG	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.
DAY																													
1		9.7	12.4	11.9	10.5	13.0	12.6	12.6	14.2	16.8	19.6	19.0	28.6	22.2	32.0	27.2	19.1	22.6	25.2	11.3	10.6	8.1	7.3	11.2	12.7	7.3	32.0	16.3	24
2		9.7	9.3	7.3	9.0	9.8	9.3	10.4	11.2	11.5	12.5	12.9	19.7	17.4	17.8	15.6	15.1	14.0	16.1	9.0	5.7	3.1	3.2	2.0	2.5	2.0	19.7	10.6	24
3		2.8	3.0	2.2	5.4	4.4	4.5	7.6	8.5	9.3	12.5	13.9	14.5	15.7	13.7	16.2	15.4	14.9	10.7	6.5	4.4	7.3	9.0	10.7	4.1	2.2	16.2	9.1	24
4		3.9	4.1	4.2	5.1	3.2	2.5	4.9	5.6	5.6	8.0	10.4	12.9	13.6	12.1	14.4	12.8	10.6	7.9	6.4	5.9	2.4	3.5	1.9	2.5	1.9	14.4	6.9	24
5		2.0	2.2	3.1	2.4	1.9	2.4	2.6	4.7	9.9	10.2	10.3	11.3	11.5	14.0	11.8	13.0	10.8	6.9	6.8	5.1	2.6	1.8	3.0	3.4	1.8	14.0	6.4	24
6		3.4	3.3	2.2	2.7	2.0	2.8	2.4	4.6	5.2	6.3	10.1	12.0	12.4	10.2	15.3	8.4	10.5	8.4	6.1	4.2	4.1	5.7	6.7	3.3	2.0	15.3	6.3	24
7		6.5	3.4	2.1	3.1	2.1	3.3	3.1	3.7	3.5	6.3	10.2	13.9	9.7	12.4	11.6	13.8	15.1	8.5	10.7	6.5	4.8	6.6	12.2	10.5	2.1	15.1	7.7	24
8		11.7	12.2	11.6	5.7	4.7	5.5	10.4	14.9	11.8	10.9	11.8	17.1	15.4	15.9	17.7	14.7	12.9	8.0	6.8	3.5	2.8	2.0	2.2	1.9	1.9	17.7	9.7	24
9		2.0	2.4	2.6	2.5	5.3	5.0	10.2	9.0	9.2	10.2	11.7	12.7	12.2	16.4	16.7	13.8	15.5	14.2	14.0	10.6	9.4	6.3	5.6	4.0	2.0	16.7	9.2	24
10		5.8	5.8	3.3	6.1	2.7	8.1	7.6	10.1	13.9	10.8	13.7	11.8	13.5	10.8	10.1	12.9	12.1	8.9	14.8	12.7	3.9	4.3	5.8	8.3	2.7	14.8	9.1	24
11		9.1	4.9	3.9	6.9	9.2	11.6	8.8	7.9	4.5	6.0	7.4	10.8	12.2	13.6	13.1	9.3	8.5	18.4	9.3	13.8	5.8	5.3	8.8	9.1	3.9	18.4	9.1	24
12		5.5	6.2	6.0	3.0	6.2	6.7	8.7	6.5	8.0	13.2	14.9	24.9	14.1	18.1	18.0	27.0	24.1	12.5	10.2	3.7	3.5	3.5	1.7	1.6	1.6	27.0	10.3	24
13		1.8	1.8	2.4	2.1	6.1	4.8	6.9	8.7	8.2	10.1	12.7	12.8	11.9	12.1	11.3	14.4	12.8	10.4	4.9	16.9	12.5	6.3	2.7	2.7	1.8	16.9	8.2	24
14		3.2	3.4	3.0	10.0	4.7	5.6	6.4	4.7	5.3	6.3	6.3	9.9	8.8	11.5	12.8	16.5	25.5	32.3	18.5	5.6	3.6	3.6	4.7	5.0	3.0	32.3	9.1	24
15		4.9	4.4	4.1	6.3	5.6	2.9	2.7	6.3	6.5	6.1	8.6	10.0	13.8	12.4	12.2	15.1	9.3	11.4	10.5	4.0	3.5	2.9	2.0	1.6	1.6	15.1	7.0	24
16		2.0	1.2	1.4	1.3	1.9	2.3	1.1	4.5	9.2	10.7	11.9	12.5	14.2	19.3	16.4	17.5	14.0	21.8	11.6	6.7	7.0	2.6	4.8	6.3	1.1	21.8	8.4	24
17		5.7	5.8	6.0	6.5	7.3	4.8	4.7	8.6	9.5	11.9	13.6	17.0	18.7	20.0	24.5	23.5	20.4	26.1	26.6	13.0	11.3	8.0	6.5	7.1	4.7	26.6	12.8	24
18		9.0	8.3	7.5	8.9	6.4	6.8	7.4	12.0	17.2	22.2	27.2	20.6	17.2	24.1	21.6	23.0	19.1	12.9	14.2	5.2	3.5	4.0	4.7	5.2	3.5	27.2	12.8	24
19		2.0	2.3	2.7	2.7	2.8	1.7	1.5	4.0	4.8	8.7	8.5	10.5	10.1	10.8	12.3	7.1	7.2	4.9	5.5	5.5	7.8	8.6	9.2	9.7	1.5	12.3	6.3	24
20		7.7	6.2	3.9	5.2	3.6	3.1	3.3	5.5	7.8	7.5	8.6	10.9	14.6	12.5	11.1	8.8	9.5	4.0	4.2	11.4	8.4	8.7	10.3	7.3	3.1	14.6	7.7	24
21		8.2	4.8	4.9	4.1	3.0	3.6	5.4	8.6	8.8	9.3	12.1	13.2	11.9	11.6	11.1	8.2	10.6	9.4	6.8	2.0	8.6	3.4	7.4	8.8	2.0	13.2	7.7	24
22		12.0	11.1	16.5	18.2	16.1	19.4	14.6	23.6	24.3	27.7	26.3	27.0	20.0	17.6	18.9	19.2	14.2	11.8	7.7	16.4	10.8	8.6	8.0	9.0	7.7	27.7	16.6	24
23		19.5	16.8	18.8	18.4	20.6	19.4	18.4	21.1	18.5	18.7	17.4	18.8	20.6	21.7	17.1	17.1	23.9	16.7	12.0	11.4	6.8	7.2	5.5	4.4	4.4	23.9	16.3	24
24		4.8	5.3	4.0	4.9	2.3	4.6	5.7	5.4	5.4	6.3	9.7	9.5	12.8	12.5	12.8	9.8	10.5	11.3	3.8	3.1	4.8	4.3	8.9	9.5	2.3	12.8	7.2	24
25		9.6	6.5	6.3	5.5	7.2	6.0	9.0	10.3	9.6	10.8	13.4	12.1	18.6	6.8	16.1	20.6	14.0	12.3	9.4	4.8	4.8	5.8	4.8	4.0	4.0	20.6	9.5	24
26		2.7	4.0	6.2	6.0	5.7	3.7	4.3	4.4	2.8	7.6	9.0	8.9	11.2	8.3	8.3	10.3	9.9	10.4	7.4	7.0	8.4	9.3	9.7	10.9	2.7	11.2	7.4	24
27		10.8	9.2	9.2	10.1	12.0	12.8	12.9	12.4	15.1	18.4	21.6	19.1	23.1	16.0	6.7	9.9	5.7	3.8	2.5	2.8	4.2	8.2	7.9	6.9	2.5	23.1	10.9	24
28		8.9	7.3	7.2	8.9	12.6	21.4	18.0	24.0	23.0	19.8	20.0	22.9	25.7	19.7	23.7	17.1	17.5	15.1	12.0	6.4	5.6	5.7	4.9	5.0	4.9	25.7	14.7	24
29		5.4	5.7	2.9	2.3	3.6	3.4	5.9	3.7	4.2	6.3	8.7	9.5	10.3	9.5	8.5	7.7	9.1	6.0	6.1	2.4	2.7	2.8	1.6	1.9	1.6	10.3	5.4	24
30		3.4	3.4	7.1	7.2	6.3	7.0	10.3	13.3	16.3	16.0	18.9	18.9	19.8	19.5	20.6	15.5	15.0	13.9	15.5	13.4	16.6	14.9	14.7	10.8	3.4	20.6	13.3	24
31		11.5	8.2	8.2	9.1	12.9	14.3	9.6	15.1	19.9	15.6	14.5	18.7	20.1	15.7	21.1	25.2	15.2	14.6	11.9	9.7	10.9	13.2	14.8	13.7	8.2	25.2	14.3	24
HOURLY MAX		19.5	16.8	18.8	18.4	20.6	21.4	18.4	24.0	24.3	27.7	27.2	28.6	25.7	32.0	27.2	27.0	25.5	32.3	26.6	16.9	16.6	14.9	14.8	13.7				
HOURLY AVG		6.6	6.0	5.9	6.5	6.6	7.2	7.7	9.6	10.5	11.8	13.4	15.3	15.3	15.1	15.3	14.9	14.0	12.7	9.8	7.6	6.4	6.0	6.6	6.2				

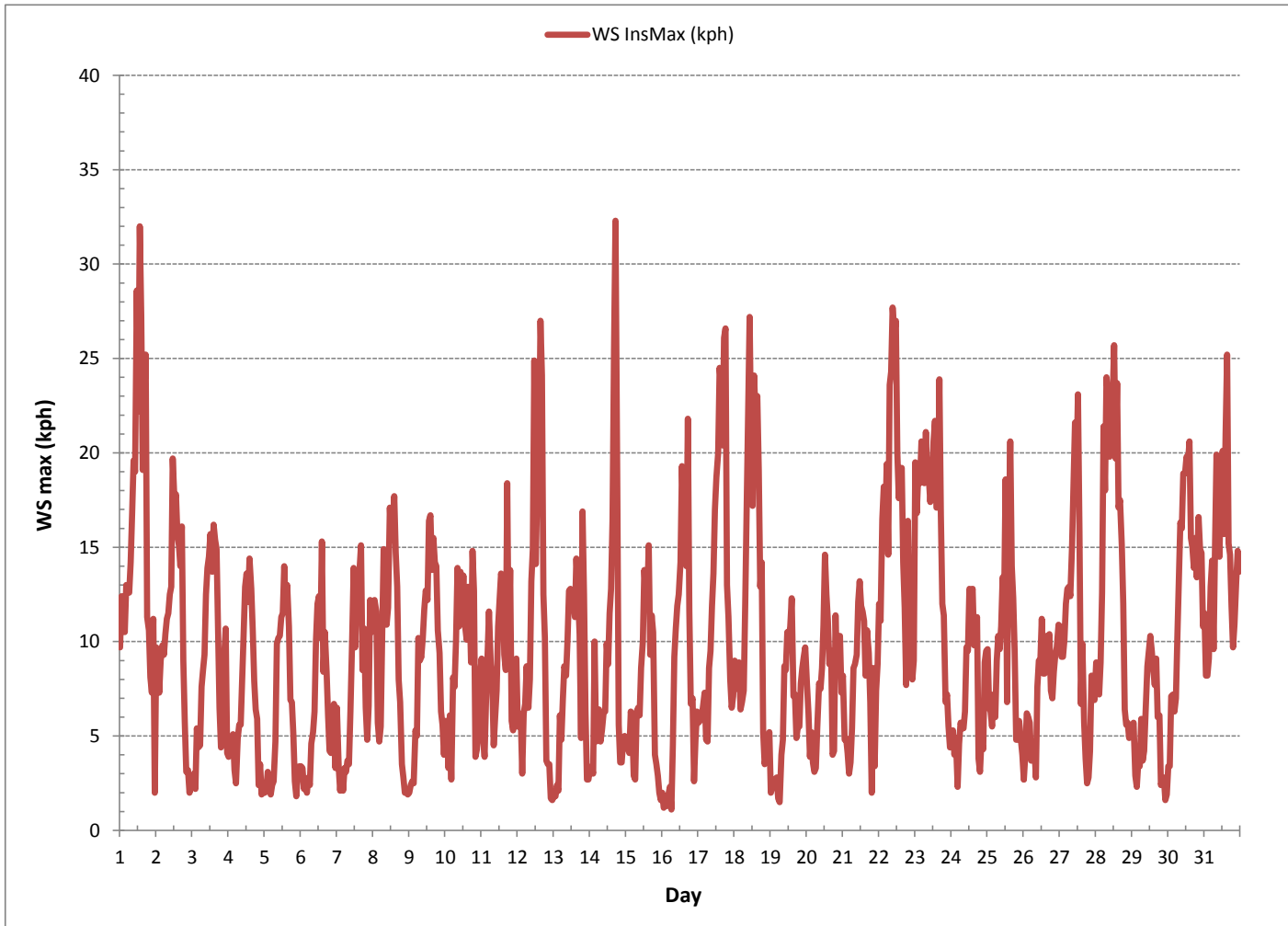
STATUS FLAG CODES

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

MONTHLY SUMMARY

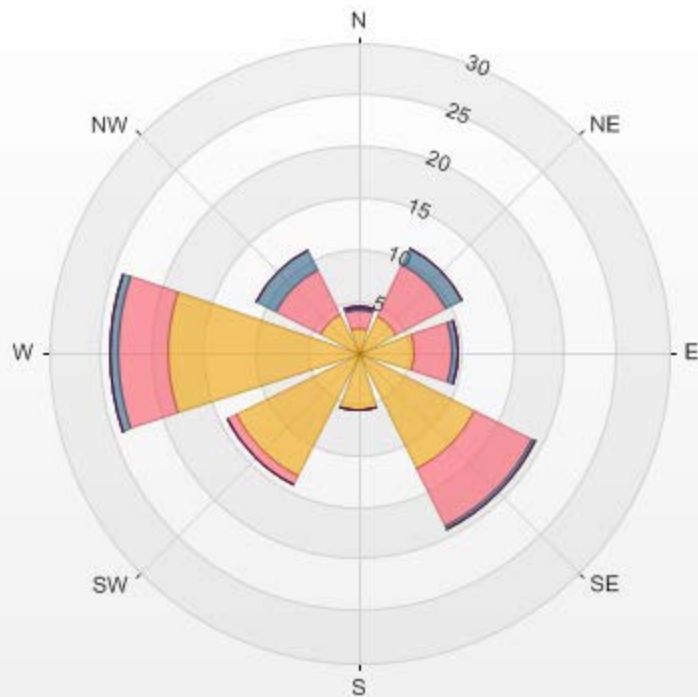
MAXIMUM INSTANTANEOUS VALUE:	32.3	kph	@ HOUR(S)	17	ON DAY(S)	14
					VAR-VARIOUS	
OPERATIONAL TIME:					744	HRS

VECTOR WIND SPEED MAX instantaneous maximum in kph



Wind: LICA COLD LAKE SOUTH Monitor: WSP [kph] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 100.00% Calm Avg: 0.00

Direction	0.0-6.0	6.0-12.0	12.0-20.0	20.0-29.0	29.0-39.0	>39.0	Total
N	2.42	1.75	0.27	0.13	0	0	4.57
NE	4.03	5.51	1.75	0	0	0	11.29
E	5.51	3.63	0.54	0	0	0	9.68
SE	12.5	6.18	0.54	0	0	0	19.22
S	5.65	0	0	0	0	0	5.65
SW	13.31	0.94	0	0	0	0	14.25
W	18.41	4.84	0.94	0	0	0	24.19
NW	4.17	4.84	2.15	0	0	0	11.16
Summary	66	27.69	6.19	0.13	0	0	100



% Icon Classes (kph)	66	0.0-6.0	28	6.0-12.0	6	12.0-20.0	0	20.0-29.0	0	29.0-39.0	0	>39.0
----------------------	----	---------	----	----------	---	-----------	---	-----------	---	-----------	---	-------

WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - August 2016

WIND DIRECTION (WD) hourly averages

MST

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

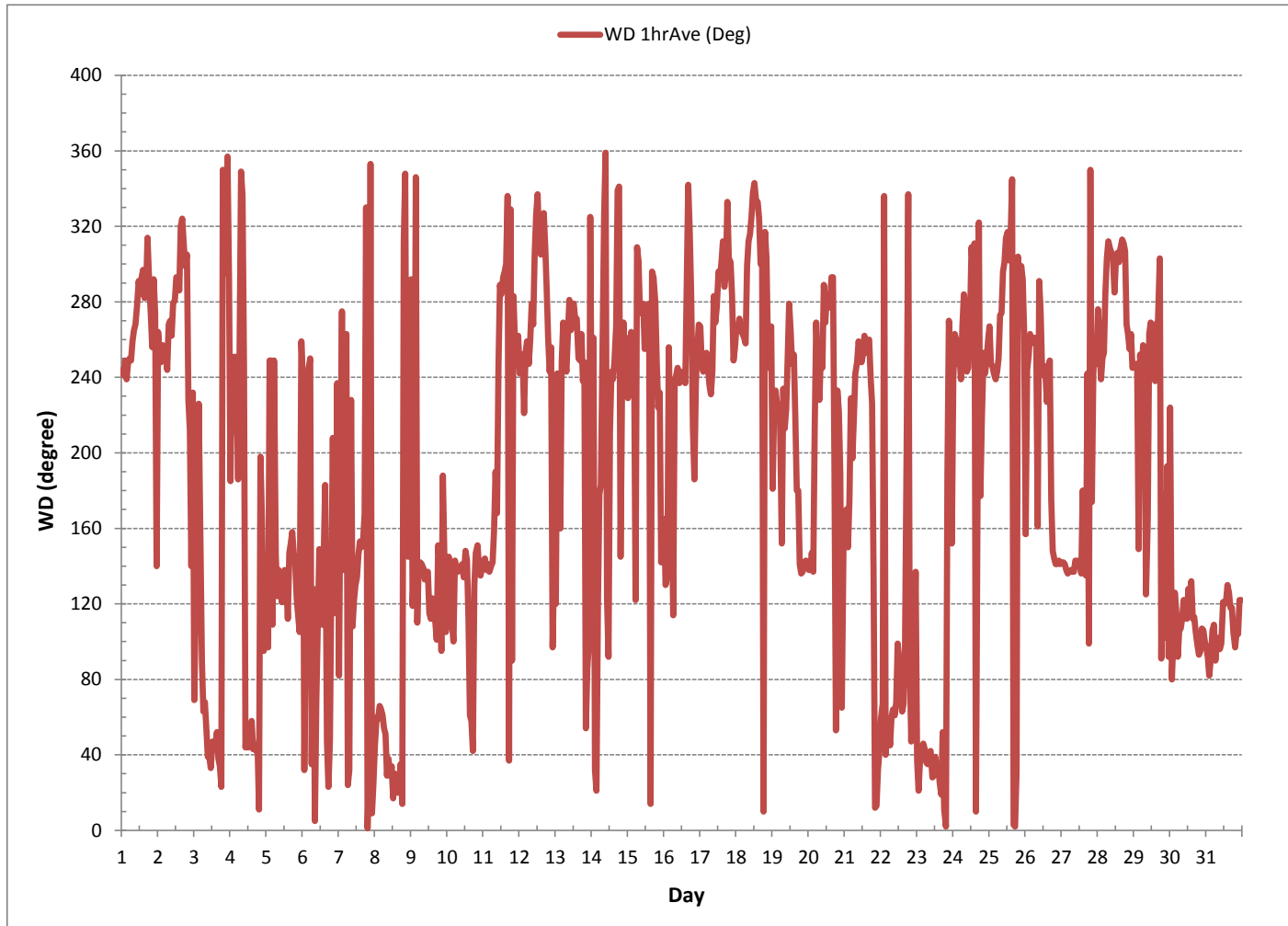
STATUS FLAG CODES

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 1, 2015
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	HRS	OPERATIONAL TIME:	744	HRS
STANDARD DEVIATION:	92.34		AMD OPERATION UPTIME:	100.0	%

WIND DIRECTION (WD) hourly averages



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - August 2016

STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	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.	
HOUR START	HOUR END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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		23	23	23	24	23	24	22	21	20	21	23	23	24	22	22	23	24	23	22	21	27	24	20	18	24	
2		17	15	19	18	17	19	22	22	26	27	29	28	25	25	31	28	21	18	20	26	49	41	61	72	24	
3		72	45	34	47	46	31	20	31	33	27	28	33	30	29	26	25	33	25	23	20	31	14	19	48	24	
4		38	43	27	26	58	78	34	41	49	30	70	34	26	29	33	32	29	39	65	44	31	32	48	45	24	
5		50	43	34	57	27	46	60	47	21	27	47	64	57	50	41	60	32	29	15	13	20	60	36	44	24	
6		61	64	38	45	53	48	48	30	59	55	70	43	44	47	53	68	27	20	35	35	28	41	50	45	24	
7		50	46	48	53	54	55	65	52	52	64	44	56	42	37	52	26	32	39	18	19	23	24	18	25	24	
8		23	20	19	26	29	24	23	24	27	31	27	30	22	25	24	24	25	27	16	34	65	75	45	56	24	
9		47	41	43	58	22	16	31	14	15	21	17	18	24	27	25	25	25	20	43	33	47	39	48	37	24	
10		28	44	64	29	46	20	21	25	24	24	20	22	21	36	60	34	39	43	22	29	45	21	15	12	24	
11		14	59	38	30	14	20	21	30	42	69	45	46	33	24	22	33	78	34	63	60	44	12	17	34	24	
12		33	18	27	25	17	17	21	33	34	36	26	30	26	28	23	22	38	25	21	33	10	42	68	41	24	
13		40	65	60	51	16	26	30	23	29	36	40	28	34	34	37	31	27	23	30	36	21	32	60	63	24	
14		35	62	53	59	64	37	43	65	30	57	78	46	68	54	35	26	28	18	39	39	47	46	19	22	24	
15		43	52	30	46	39	72	71	39	39	57	53	43	43	42	38	38	44	22	19	10	37	23	24	45	24	
16		37	41	34	51	48	46	80	33	26	29	34	31	29	27	30	24	21	20	29	46	51	36	14	16	24	
17		18	18	21	17	18	25	36	30	28	27	32	26	24	22	23	21	22	24	18	18	18	21	18	16	24	
18		17	17	18	17	18	21	29	22	21	22	19	21	22	21	22	21	23	27	26	27	16	29	9	13	24	
19		42	36	46	29	49	73	55	36	43	49	63	42	41	27	25	41	50	39	13	19	11	10	11	11	24	
20		12	17	63	43	53	44	44	36	33	48	50	53	37	39	32	30	28	39	34	27	25	37	60	46	24	
21		48	47	37	48	54	31	42	26	24	27	28	29	36	39	32	44	36	26	30	45	37	34	25	23	24	
22		16	19	47	25	21	20	21	19	20	19	21	21	23	22	20	20	31	39	46	26	20	23	23	33	24	
23		38	20	22	21	22	26	23	23	23	23	22	23	23	24	24	22	21	20	22	17	54	40	36	34	24	
24		41	44	53	48	45	61	24	22	32	35	37	38	67	35	33	43	65	34	30	36	27	21	17	19	24	
25		17	20	22	21	18	20	21	22	26	24	25	28	35	22	18	19	20	21	24	21	16	13	15	25	24	
26		32	45	12	32	49	14	37	39	60	63	51	67	59	56	62	40	45	41	15	10	10	12	13	12	24	
27		12	12	11	10	11	12	13	14	13	15	16	15	15	21	37	27	38	56	61	29	40	31	19	24	24	
28		20	20	23	23	22	21	21	19	20	20	23	22	21	22	23	20	22	20	19	16	15	11	13	10	24	
29		12	11	53	40	40	41	22	42	74	66	57	82	62	63	63	44	64	41	40	47	45	39	65	32	24	
30		48	22	19	20	15	17	22	25	24	26	27	26	25	27	25	29	26	24	21	18	20	24	24	22	24	
31		22	21	23	23	24	49	27	22	21	24	23	25	25	25	24	24	24	24	21	20	23	21	24	23	24	

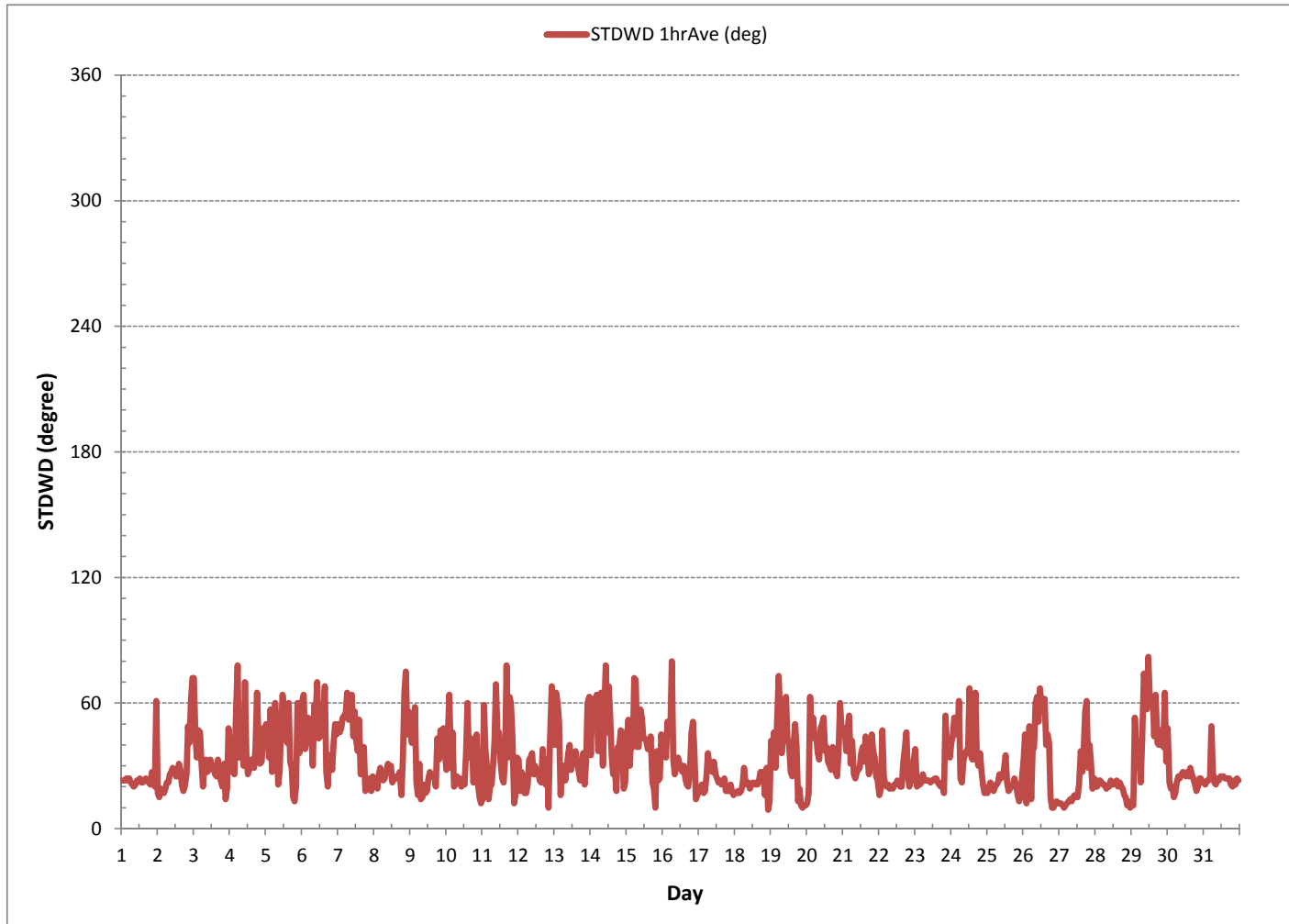
STATUS FLAG CODES

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: 744 HRS

STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees



RELATIVE HUMIDITY

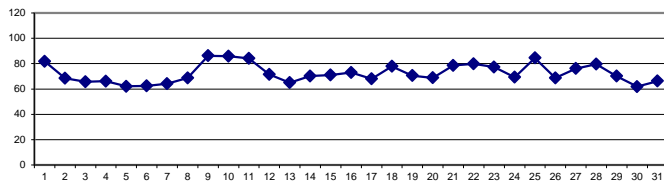
RELATIVE HUMIDITY (RH) hourly averages in %

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY	DAY	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.
1	1	88	91	94	95	94	95	96	95	96	92	77	64	60	59	62	63	51	76	86	80	90	84	86	89	51	96	82	24
2	2	90	91	95	94	95	93	86	80	72	64	58	51	43	38	39	42	41	40	41	49	74	84	89	92	38	95	68	24
3	3	94	95	95	95	96	92	78	71	63	55	50	49	45	41	39	39	39	41	49	58	71	69	71	80	39	96	66	24
4	4	87	91	92	94	94	93	92	86	79	69	49	46	46	41	35	34	34	33	34	43	67	78	82	87	33	94	66	24
5	5	88	88	91	93	93	91	73	65	54	47	41	38	34	35	35	33	37	43	46	51	69	76	82	86	33	93	62	24
6	6	90	89	90	92	94	94	91	72	56	47	43	39	36	35	32	31	35	34	39	50	69	76	77	85	31	94	62	24
7	7	88	90	93	94	93	94	80	66	57	49	45	39	37	38	38	40	43	45	57	64	68	71	73	78	37	94	64	24
8	8	79	82	85	88	90	89	80	74	67	63	56	50	59	60	54	51	49	48	48	65	75	78	78	81	48	90	69	24
9	9	84	83	84	91	84	85	90	94	95	95	90	90	82	75	69	67	70	72	79	95	99	99	99	99	67	99	86	24
10	10	98	98	98	99	99	99	98	90	87	87	86	81	76	74	70	68	70	71	76	82	85	87	90	92	68	99	86	24
11	11	93	96	97	99	100	100	100	100	100	100	84	73	67	65	69	56	65	57	74	76	82	89	88	87	56	100	84	24
12	12	93	96	97	97	99	100	93	80	71	63	55	44	43	40	43	39	47	53	52	59	82	87	89	93	39	100	71	24
13	13	94	94	95	94	96	95	84	70	62	54	46	41	38	38	37	35	40	53	65	59	66	79	87	35	96	65	24	
14	14	90	94	95	90	89	92	76	64	59	53	45	43	40	39	39	38	39	65	71	84	91	94	96	97	38	97	70	24
15	15	97	97	97	97	98	97	90	82	74	63	59	55	49	45	47	47	40	38	39	58	75	84	84	89	38	98	71	24
16	16	90	93	93	94	95	95	92	79	66	61	50	44	36	34	33	38	45	49	86	91	95	97	98	98	33	98	73	24
17	17	98	98	98	98	98	97	91	81	73	65	52	45	41	39	29	32	34	35	50	58	69	77	86	85	29	98	68	24
18	18	85	87	89	91	93	94	85	80	73	64	58	56	52	64	51	50	72	69	86	89	92	95	96	96	50	96	78	24
19	19	96	96	96	96	97	97	98	94	79	67	56	46	41	40	40	45	46	51	58	66	71	72	71	74	40	98	71	24
20	20	76	81	87	85	90	94	84	69	63	59	53	47	42	44	45	43	43	50	57	74	89	92	91	92	42	94	69	24
21	21	91	93	93	95	95	96	97	96	90	84	76	69	61	57	53	53	52	55	63	76	82	85	86	87	52	97	79	24
22	22	88	87	90	94	92	90	88	79	73	68	65	59	62	63	65	63	78	89	94	84	83	86	84	89	59	94	80	24
23	23	91	89	88	90	89	86	83	81	78	75	74	74	66	65	63	61	59	62	63	63	80	90	91	94	59	94	77	24
24	24	95	95	95	96	96	96	96	85	81	70	53	45	41	37	34	34	33	36	47	69	78	81	83	85	33	96	69	24
25	25	87	89	91	93	94	95	93	87	86	81	81	70	79	94	86	67	64	67	74	82	89	92	92	94	64	95	84	24
26	26	95	95	97	97	97	96	96	82	69	61	53	49	45	45	43	40	41	43	51	64	68	73	74	74	40	97	69	24
27	27	75	77	77	78	77	76	77	76	76	71	65	59	53	56	58	56	66	87	91	94	96	96	95	94	53	96	76	24
28	28	96	97	97	97	97	95	90	83	79	79	78	79	74	72	68	66	57	55	54	65	74	80	87	91	54	97	80	24
29	29	91	91	92	93	94	94	93	79	71	61	53	47	45	43	42	41	42	42	51	71	80	85	89	91	41	94	70	24
30	30	92	92	87	77	78	81	71	64	58	54	51	48	46	46	44	44	46	48	50	55	59	61	64	67	44	92	62	24
31	31	67	68	70	71	70	70	76	72	74	71	62	59	57	55	52	52	52	57	62	67	69	70	71	71	52	76	66	24
HOURLY MAX		98	98	98	99	100	100	100	100	100	100	90	90	82	94	86	68	78	89	94	95	99	99	99	99				
HOURLY AVG		89.2	90.4	91.5	92.2	92.5	92.3	87.6	80.0	73.5	67.6	60.4	54.9	51.5	50.9	48.9	47.4	49.2	53.3	60.7	69.3	78.4	82.4	84.5	87.2				

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

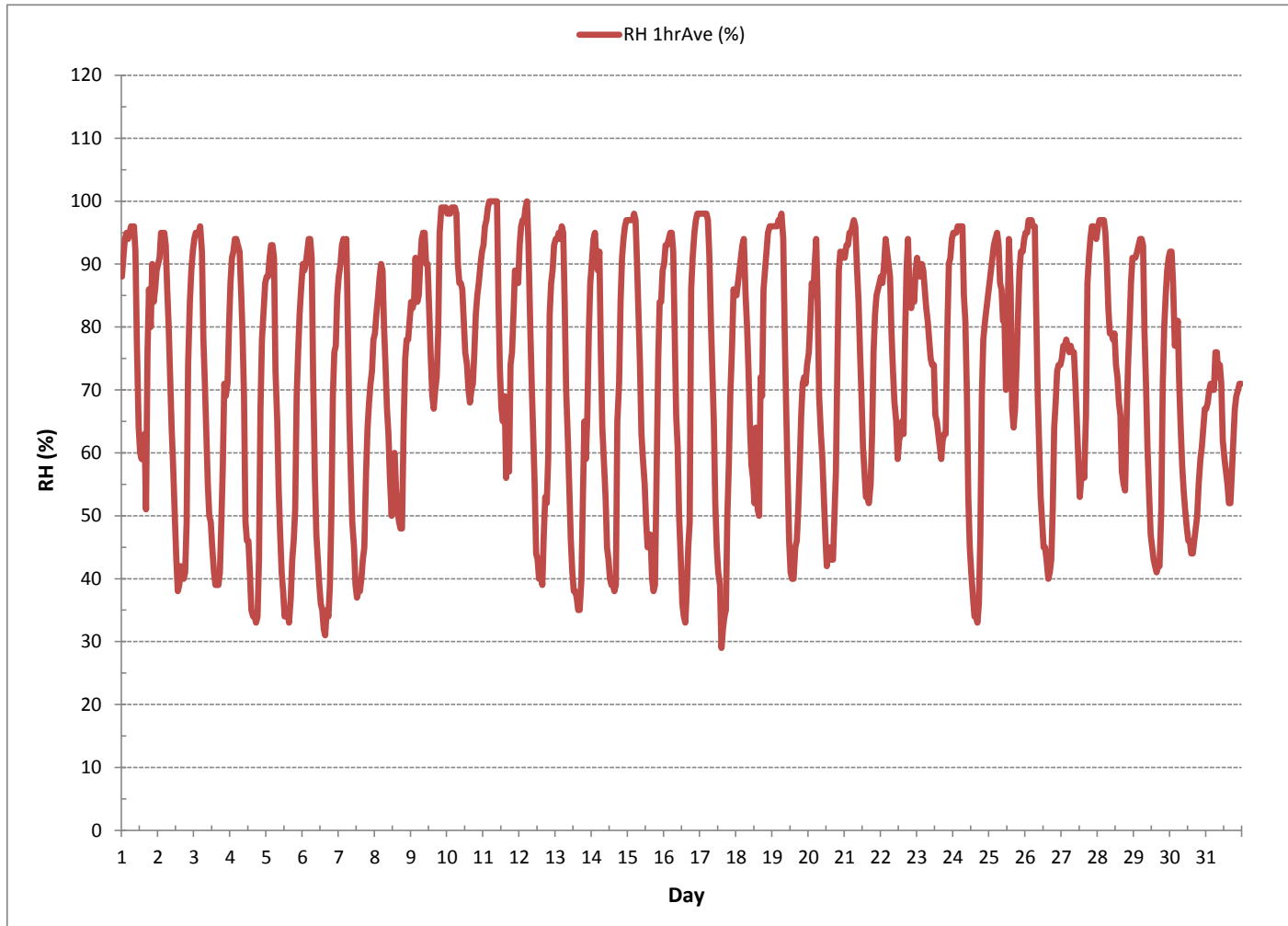
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	29	%	@ HOUR(S)	14	ON DAY(S)	17
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR(S)	VAR	ON DAY(S)	11, 12
MAXIMUM 24-HR AVERAGE:	86	%			ON DAY(S)	9, 10
					VAR-VARIOUS	
OPERATIONAL TIME:						744 HRS
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	19.99					
MONTHLY AVERAGE:						72 %

RELATIVE HUMIDITY (RH) hourly averages in %



AMBIENT TEMPERATURE

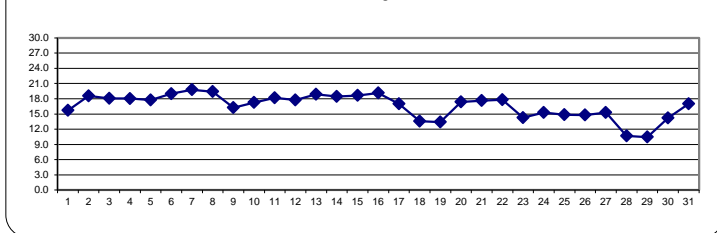
AMBIENT TEMPERATURE (AmbTPX) hourly averages in Degrees Celsius

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.
DAY	MIN.	MAX.	AVG.																										
1	12.3	11.5	11.0	10.6	11.0	11.5	11.9	12.6	13.5	15.1	17.7	19.8	20.3	20.6	20.4	20.4	22.8	18.2	16.5	17.3	15.5	15.6	15.5	14.9	10.6	22.8	15.7	24	
2	14.7	14.3	13.0	12.8	12.5	13.2	14.6	16.1	18.5	20.6	21.8	22.7	23.4	23.9	24.5	24.0	24.2	24.2	24.0	22.3	17.7	15.3	14.0	12.8	12.5	24.5	18.5	24	
3	12.0	11.1	10.6	10.1	9.6	10.8	15.7	17.9	19.5	20.4	21.1	21.7	22.6	23.5	23.7	23.9	24.0	23.1	22.3	21.0	18.2	17.6	17.3	15.9	9.6	24.0	18.1	24	
4	14.3	13.4	12.8	12.5	12.8	13.2	14.0	15.8	17.8	20.2	22.0	22.4	22.5	23.1	23.8	23.7	23.3	23.6	23.6	21.9	16.9	14.3	13.1	11.9	11.9	23.8	18.0	24	
5	11.0	10.4	9.3	8.9	8.5	9.1	14.5	17.8	19.7	21.0	22.8	23.4	24.2	24.5	24.2	24.9	23.9	23.1	22.4	21.4	18.0	15.8	14.3	13.3	8.5	24.9	17.8	24	
6	12.5	12.3	11.5	10.6	9.8	9.8	11.2	16.2	20.5	23.1	24.3	25.3	25.5	25.9	26.8	27.1	26.1	25.7	24.3	22.1	18.4	16.6	15.7	14.3	9.8	27.1	19.0	24	
7	13.3	12.5	11.7	11.1	10.7	11.3	15.9	20.0	22.4	23.8	24.3	25.4	25.5	25.4	26.2	25.5	24.9	24.3	22.4	21.1	20.2	19.4	18.5	18.5	10.7	26.2	19.8	24	
8	18.3	17.6	17.1	16.2	15.2	15.5	17.6	18.8	20.4	21.6	22.8	23.8	22.6	22.2	22.8	22.4	22.1	21.8	21.7	18.9	17.0	16.6	16.3	15.9	15.2	23.8	19.4	24	
9	15.4	15.4	15.3	14.8	15.4	15.1	14.8	14.3	14.3	14.9	15.8	16.3	17.8	18.7	20.0	20.1	19.7	19.3	18.2	15.5	15.4	15.1	14.3	14.1	14.1	20.1	16.3	24	
10	14.0	13.8	14.1	14.1	14.0	13.8	14.3	16.0	17.0	17.1	17.5	18.2	18.6	19.2	20.6	21.4	21.4	21.4	20.4	18.6	17.7	17.2	17.2	16.7	13.8	21.4	17.3	24	
11	16.1	15.5	14.7	14.2	14.2	14.1	14.3	15.1	15.9	17.1	19.2	21.4	22.7	22.9	21.9	23.7	23.2	22.7	20.9	20.0	18.3	16.6	16.0	15.7	14.1	23.7	18.2	24	
12	14.3	13.7	13.4	12.1	12.1	12.8	14.2	16.8	18.6	20.9	21.8	23.1	23.1	24.0	22.1	23.9	20.9	21.4	21.4	20.4	15.6	14.1	13.0	11.7	11.7	24.0	17.7	24	
13	10.9	10.1	9.7	9.4	10.6	10.8	13.9	17.2	20.0	21.9	23.9	24.9	25.8	26.0	26.5	27.2	26.8	25.3	23.9	20.7	19.8	18.2	15.7	13.8	9.4	27.2	18.9	24	
14	12.6	11.6	11.2	12.5	13.0	12.4	15.9	19.4	20.8	22.7	24.2	25.1	26.3	27.2	27.5	27.4	26.9	19.3	17.5	16.4	15.0	13.5	12.4	12.2	11.2	27.5	18.5	24	
15	11.9	11.2	10.7	10.3	11.2	10.6	13.7	16.4	18.6	21.3	22.8	24.2	25.5	25.8	24.6	25.4	26.7	26.7	26.1	22.2	17.7	15.7	14.7	13.5	10.3	26.7	18.6	24	
16	12.8	12.3	11.8	11.3	10.8	11.0	12.6	17.1	20.2	22.8	25.8	27.4	28.7	29.3	29.7	28.5	26.6	23.7	17.7	17.3	16.8	15.6	14.5	14.7	10.8	29.7	19.1	24	
17	14.4	13.4	12.3	12.2	11.6	11.2	13.4	15.9	17.9	19.6	21.7	22.9	22.7	22.1	23.8	22.6	21.8	22.0	18.4	16.6	15.0	13.5	11.7	11.5	11.2	23.8	17.0	24	
18	11.3	10.7	10.4	10.1	9.9	9.8	12.2	13.5	15.0	16.5	17.0	17.2	18.3	17.0	19.1	18.8	15.1	16.2	13.1	13.3	12.5	10.6	9.3	9.0	9.0	19.1	13.6	24	
19	7.7	6.5	5.4	4.6	4.0	4.0	6.2	10.4	14.4	16.7	17.9	19.0	19.6	19.4	19.2	18.7	18.8	18.0	16.9	15.8	15.1	14.7	14.6	14.3	4.0	19.6	13.4	24	
20	14.0	12.8	12.0	12.5	10.8	9.3	12.5	16.1	17.3	19.0	20.9	22.0	22.9	23.0	23.0	22.9	22.9	22.2	21.0	18.6	15.9	15.2	15.0	14.9	9.3	23.0	17.4	24	
21	14.3	13.3	13.0	12.8	12.8	12.6	13.2	14.4	16.0	17.0	18.5	19.9	21.4	22.1	23.0	23.1	23.4	22.7	21.2	18.8	17.7	17.6	17.1	17.0	12.6	23.4	17.6	24	
22	16.4	16.1	15.9	15.3	15.7	15.9	16.4	17.5	18.6	19.8	20.5	20.7	20.1	20.1	20.2	20.6	19.0	18.4	17.3	17.4	17.1	16.5	16.4	15.7	15.3	20.7	17.8	24	
23	14.4	14.4	14.8	14.1	13.8	13.9	14.0	14.2	14.4	14.7	15.2	15.5	16.7	16.7	15.8	16.1	16.7	15.6	15.3	14.9	12.1	10.5	10.0	8.8	8.8	16.7	14.3	24	
24	8.3	7.6	6.9	6.3	5.7	5.4	7.9	12.1	13.7	16.5	20.0	21.2	22.1	23.1	23.4	23.0	23.6	23.0	21.0	17.2	15.2	14.1	14.3	14.5	5.4	23.6	15.3	24	
25	14.6	14.4	14.1	13.4	12.8	12.2	12.9	14.0	14.5	15.6	15.8	17.9	16.8	15.0	16.3	18.1	18.0	17.6	16.8	15.5	13.9	13.0	11.8	11.1	11.1	18.1	14.8	24	
26	10.5	8.7	8.3	7.7	7.3	5.8	8.2	12.1	15.2	17.1	18.2	19.2	20.1	20.6	21.2	21.6	21.3	20.6	19.0	16.1	15.1	14.4	13.6	13.0	5.8	21.6	14.8	24	
27	12.3	11.7	11.6	11.2	11.3	11.5	11.6	12.2	13.0	14.5	16.1	17.8	18.8	19.2	19.8	20.3	19.6	17.8	17.3	16.6	16.0	15.4	15.5	15.1	11.2	20.3	15.3	24	
28	14.5	14.1	13.7	13.2	13.5	12.4	10.4	9.8	9.5	9.3	9.5	9.5	10.0	10.3	11.0	11.3	12.7	12.7	12.8	10.6	8.4	7.1	5.6	4.6	4.6	14.5	10.7	24	
29	4.8	4.3	3.0	1.7	1.0	1.1	3.7	8.2	10.4	12.6	14.2	15.3	16.4	17.0	18.0	18.7	18.4	18.4	16.5	12.9	10.5	9.0	7.7	6.8	1.0	18.7	10.4	24	
30	5.8	5.4	6.9	8.9	8.5	7.8	10.0	11.8	13.8	15.2	16.4	17.4	18.4	19.1	19.8	20.2	19.9	19.4	18.7	17.1	16.1	15.4	14.6	13.8	5.4	20.2	14.2	24	
31	13.6	12.9	12.3	12.0	11.8	12.1	11.6	12.0	13.2	13.3	14.6	18.0	19.9	21.4	22.5	23.4	24.0	23.0	21.5	20.2	19.3	18.8	18.4	18.3	11.6	24.0	17.0	24	
HOURLY MAX	18.3	17.6	17.1	16.2	15.7	15.9	17.6	20.0	22.4	23.8	25.8	27.4	28.7	29.3	29.7	28.5	26.9	26.7	26.1	22.3	20.2	19.4	18.5	18.5					
HOURLY AVG	12.7	12.0	11.6	11.2	11.0	11.0	12.7	14.9	16.6	18.1	19.5	20.6	21.3	21.6	22.0	22.2	21.9	21.0	19.7	18.0	16.1	14.9	14.1	13.5					

STATUS FLAG CODES

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

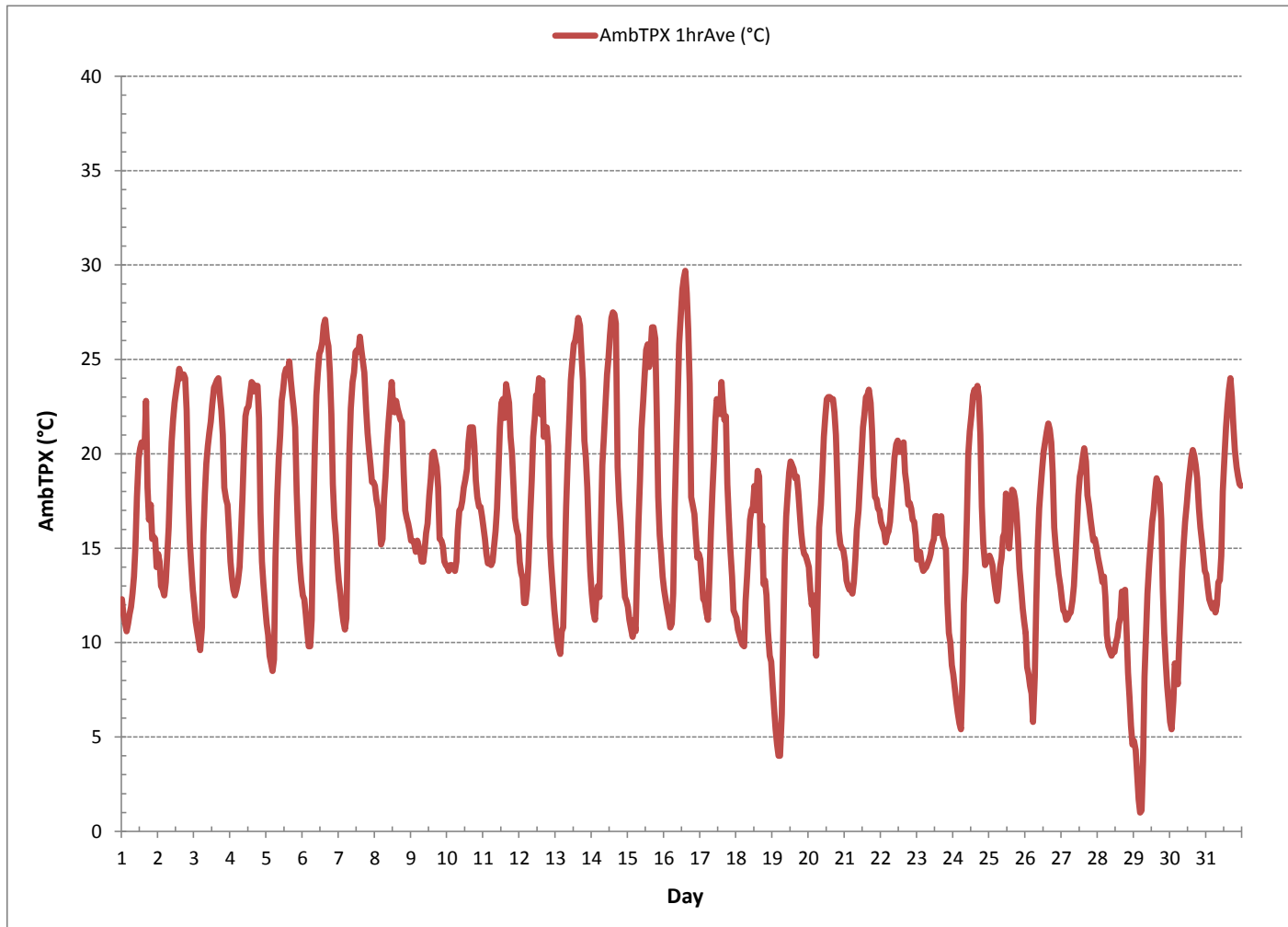
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	1.0 °C	@ HOUR(S)	4	ON DAY(S)	29
MAXIMUM 1-HR AVERAGE:	29.7 °C	@ HOUR(S)	14	ON DAY(S)	16
MAXIMUM 24-HR AVERAGE:	19.8 °C			ON DAY(S)	7
				VAR-VARIOUS	
OPERATIONAL TIME:				744	HRS
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	5.14	MONTHLY AVERAGE:		16.6	°C

AMBIENT TEMPERATURE (AmbTPX) hourly averages in Degrees Celsius



APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

VOC RESULTS

Maxxam Analytics

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

Client: LICA Sampler S/N: 6167
 Location: Cold Lake South Canister ID: 14714
 Station ID: LICA 01 Installation Date/Time (mst): Aug 2, 2016 @ 08:51
 Sample ID: LICA/VOC/CLS/Aug 4, 2016 Removal Date/Time (mst): Aug 8, 2016 @ 09:40

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Aug 4, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Aug 5, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.2</u>	<u>+23.1</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24</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: June 1, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 3, 2016 (due every 6 months)

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

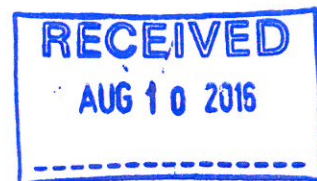
Comments: Date of last audit : June 1, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Aug 8, 2016

Sample ID: 16080076-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Aug 4, 2016



Volatile Organics Data Results

Date: August 4, 2016
Canister ID: 14714

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	< 0.01
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	0.03
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	< 0.01
2-Methylpentane	0.05
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.02
Acetone	3.2
Acrolein	< 0.3
Benzene	0.05
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.13
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.49
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.02
Cyclopentane	0.01
Dibromochloromethane	< 0.01
Ethanol	0.9
Ethyl acetate	< 0.4
Ethylbenzene	0.06
Freon-11	0.25

Volatile Organics Data Results

Date: August 4, 2016
Canister ID: 14714

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	< 0.02
Freon-12	0.54
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.16
Isopentane	0.23
Isoprene	0.89
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.13
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	0.02
Methylcyclopentane	0.03
Methylene chloride	< 0.3
n-Butane	0.20
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.03
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	0.6
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	0.16
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: 14713
 Station ID: LICA 01 Installation Date/Time (mst): Aug 8, 2016 @ 09:40
 Sample ID: LICA/CLS/VOC/ Aug 10, 2016 Removal Date/Time (mst): Aug 11, 2016 @ 10:58

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Aug 10, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Aug 11, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.0</u>	<u>+22.9</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24</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: June 1, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 3, 2016 (due every 6 months)

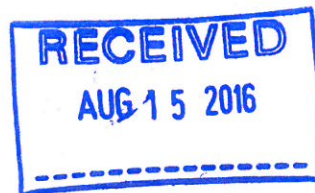
Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: Date of last audit : June 1, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Aug 11, 2016

Sample ID: 16080119-003
 Customer ID: LICA
 Cust Samp ID: LICA/CLS/VOC/Aug 10, 2016



Volatile Organics Data Results

Date: August 10, 2016
Canister ID: 14713

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
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	0.05
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	0.03
3-Methylheptane	< 0.02
3-Methylhexane	0.02
3-Methylpentane	0.02
Acetone	5.7
Acrolein	< 0.3
Benzene	0.03
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.10
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	< 0.02
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	1.1
Ethyl acetate	< 0.4
Ethylbenzene	0.01
Freon-11	0.26

Volatile Organics Data Results

Date: August 10, 2016
Canister ID: 14713

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	< 0.02
Freon-12	0.56
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.22
Isopentane	0.30
Isoprene	0.23
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	0.31
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.02
n-Hexane	0.04
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	< 0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.04
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.02
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Maxxam Analytics

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

Client: LICA Sampler S/N: 6167
 Location: Cold Lake South Canister ID: 15004
 Station ID: LICA 01 Installation Date/Time (mst): Aug 11, 2016 @ 10:58
 Sample ID: LICA/VOC/CLS/Aug 16, 2016 Removal Date/Time (mst): Aug 19, 2016 @ 08:35

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Aug 16, 2016</u>	<u>00:00</u>	<u>00:00 Aug 17, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.6</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</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: June 1, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 3, 2016 (due every 6 months)

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

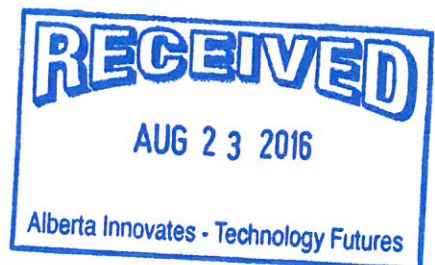
Comments: Date of last audit: June 1, 2016
NO pressure gauge. The data was taken from the pressure gauge of the sampler.

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Aug 19, 2016

Sample ID: 16080238-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Aug 16, 2016



Volatile Organics Data Results

Date: August 16, 2016
Canister ID: 15004

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	< 0.01
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	0.06
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	4.7
Acrolein	< 0.3
Benzene	0.03
Benzyl chloride	< 0.4
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	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.03
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	0.7
Ethyl acetate	< 0.4
Ethylbenzene	0.01
Freon-11	0.25

Volatile Organics Data Results

Date: August 16, 2016
Canister ID: 15004

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.58
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.25
Isopentane	0.24
Isoprene	1.08
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	0.03
Methylcyclopentane	0.04
Methylene chloride	< 0.3
n-Butane	0.32
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.02
n-Hexane	0.05
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	0.06
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

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: S 5649
 Station ID: LICA 01 Installation Date/Time (mst): Aug 19, 2016 @ 08:35
 Sample ID: LICA/VOC/CLS/Aug 22, 2016 Removal Date/Time (mst): Aug 23, 2016 @ 08:07

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Aug 22, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Aug 23, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>- 27.2</u>	<u>+ 25.0</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24</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: June 1, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 3, 2016 (due every 6 months)

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

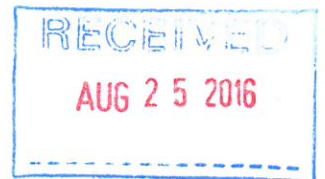
Comments: Date of last audit : June 1, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Aug 23, 2016

Sample ID: 16080288-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Aug 22, 2016



Volatile Organics Data Results

Date: August 22, 2016
Canister ID: S5649

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
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	0.03
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	0.04
2-Methylpentane	0.03
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.02
Acetone	3.7
Acrolein	< 0.3
Benzene	0.03
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	0.08
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.53
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	1.2
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.29

Volatile Organics Data Results

Date: August 22, 2016
Canister ID: S5649

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.67
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.17
Isopentane	0.21
Isoprene	0.63
Isopropyl alcohol	1.6
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	< 0.01
Methylcyclopentane	0.02
Methylene chloride	< 0.3
n-Butane	0.27
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	0.02
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.08
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Maxxam Analytics

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

Client: LICA
 Location: Cold Lake South
 Station ID: LICA 01
 Sample ID: LICA/VOC/CLS/Aug 28, 2016

Sampler S/N: 6167
 Canister ID: S 5632
 Installation Date/Time (mst): Aug 23, 2016 @ 08:07
 Removal Date/Time (mst): Aug 31, 2016 @ 08:44

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Aug 28, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Aug 29, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.4</u>	<u>+22.9</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24</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: June 1, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 3, 2016 (due every 6 months)

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

Comments: Date of last audit: June 1, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Aug 31, 2016

Sample ID: 16090012-004
 Customer ID: LICA
 Cust Samp ID: LICAVOC/CLS/Aug 28, 2016



Volatile Organics Data Results

Date: August 28, 2016
Canister ID: S5632

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
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	0.02
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	0.03
2-Methylpentane	0.04
3-Methylheptane	< 0.02
3-Methylhexane	0.02
3-Methylpentane	0.03
Acetone	1.9
Acrolein	< 0.3
Benzene	0.11
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.49
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.03
Cyclopentane	0.02
Dibromochloromethane	< 0.01
Ethanol	0.4
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.32

Volatile Organics Data Results

Date: August 28, 2016
Canister ID: S5632

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.71
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.15
Isopentane	0.19
Isoprene	0.08
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	0.04
Methylcyclopentane	0.04
Methylene chloride	< 0.3
n-Butane	0.18
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	0.19
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: 16080076-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Aug 4, 2016

Priority: Normal

TISCH PUF PLUS Sample Collection Data Sheet			
Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-05</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>Aug 2, 2016 / 09:02</u>
Field Sample ID:	<u>LICA/PUF/CLS/Aug 4, 2016</u>	Removal Date/Time:	<u>Aug 8, 2016 / 09:46</u>
Sample Data Collection Information			
Sample Date:	<u>Aug 04, 2016</u>	Average Pressure (mmHg)	<u>712</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>22.9</u>
End Time (mst):	<u>00:00 Aug 05, 2016</u>	Average Temperature (°C)	<u>20.1</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.21</u>
Sample Recovery Checklist			
(circle one)			
Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO	
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO	
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO	
Any error messages? (if yes list below)	<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>June 1, 2016</u>		
Other observations?			
Deployed By:	<u>Alex Yakupov</u>		
Collected By:	<u>Alex Yakupov</u>	Date:	<u>Aug 8, 2016</u>

RECEIVED
 AUG 10 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: August 4, 2016
PUF S/N: TE05

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.10
2-Methylnaphthalene	0.18
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.05
Acenaphthylene	0.02
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	0.04
Fluorene	0.07
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.09
Perylene	< 0.01
Phenanthrene	0.34
Pyrene	0.02
Retene	0.02

Sample ID: 16080119-004

AI Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Aug 10, 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-06</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>Aug 8, 2016/09:48</u>
Field Sample ID:	<u>LICA/PUF/CLS/Aug 10, 2016</u>	Removal Date/Time:	<u>Aug 11, 2016/10:49</u>

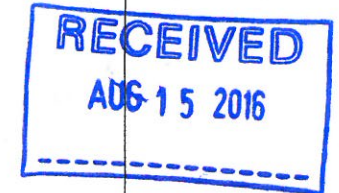
Sample Data Collection Information

Sample Date:	<u>Aug 10, 2016</u>	Average Pressure (mmHg)	<u>708</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>18.7°</u>
End Time (mst):	<u>00:00 Aug 11, 2016</u>	Average Temperature (°C)	<u>229</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.21</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	<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>June 1, 2016</u>	
Other observations?	_____	



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Aug 11, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: August 10, 2016
PUF S/N: TE06

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	< 0.01
2-Methylnaphthalene	0.02
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	0.03
Fluorene	0.02
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	< 0.01
Perylene	< 0.01
Phenanthrene	0.17
Pyrene	0.01
Retene	< 0.01

Sample ID: 16080238-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Aug 16, 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-08</u>
Location:	<u>Cold Lake South</u>	Motor S/N:	<u>1138/ 100-1020</u>
Station ID:	<u>LICA 01</u>	Installation Date/Time:	<u>Aug 11, 2016/ 10:49</u>
Field Sample ID:	<u>LICA/PUF/CLS/Aug 16, 2016</u>	Removal Date/Time:	<u>Aug 19, 2016/ 08:42</u>

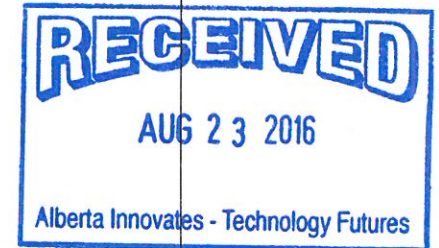
Sample Data Collection Information

Sample Date:	<u>Aug 16, 2016</u>	Average Pressure (mmHg)	<u>711</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>Aug 17, 2016, 00:00</u>	Average Temperature (°C)	<u>21.0°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.20</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<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>June 1, 2016</u>	
Other observations?		



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Aug 19, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: August 16, 2016
PUF S/N: TE08

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.02
2-Methylnaphthalene	0.04
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.04
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	0.04
Fluorene	0.05
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.02
Perylene	< 0.01
Phenanthrene	0.30
Pyrene	0.02
Retene	< 0.01

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Aug 22, 2016

TISCH PUF PLUS Sample Collection Data Shee

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>Aug 19, 2016/08:42</u>
Field Sample ID:	<u>LICA/PUF/CLS/Aug 22, 2016</u>	Removal Date/Time:	<u>Aug 23, 2016/07:54</u>

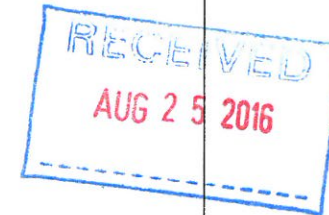
Sample Data Collection Information

Sample Date:	<u>Aug 22, 2016</u>	Average Pressure (mmHg)	<u>701</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Aug 23, 2016</u>	Average Temperature (°C)	<u>18.5°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (Vstd m ³)	<u>330.20</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	NO
Date of last calibration/audit:	<u>June 1, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	Date: <u>Aug 23, 2016</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: August 22, 2016
PUF S/N: TE02

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	< 0.01
2-Methylnaphthalene	0.02
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	0.01
Perylene	< 0.01
Phenanthrene	0.15
Pyrene	0.02
Retene	0.01

Sample ID: 16090012-005

Customer ID: LICA
 Cust Samp ID: LICA/PUF/CLS/Aug 28, 2016

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>Aug 23, 2016/07:54</u>
Field Sample ID:	<u>LICA/PUF/CLS/Aug 28, 2016</u>	Removal Date/Time:	<u>Aug 31, 2016/08:52</u>

Sample Data Collection Information

Sample Date:	<u>Aug 28, 2016</u>	Average Pressure (mmHg)	<u>710</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Aug 29, 2016</u>	Average Temperature (°C)	<u>11.6°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.19</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	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>June 1, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Aug 31, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: August 28 , 2016
PUF S/N: TE04

PARAMETERS	CONCENTRATION (UG)
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	0.02
Fluorene	0.04
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.03
Perylene	< 0.01
Phenanthrene	0.10
Pyrene	0.01
Retene	0.03

PARTISOL RESULTS

Partisol Sample Data Sheet



Date Sampled: Aug 04, 2016
Location: Cold Lake South
Parameter: TSP PM10
Filter #: P6024414

PM2.5

Sample ID: 16080075-001

Start Time: 00:00 Aug 04, 2016
End Time: 00:00 Aug 05, 2016
Status: OK
Std Vol: 23.166
Valid Time: 24.00
Total Time: 24.0

Customer ID: LICA
Cust Samp ID: LICA #P6024414

Priority: Normal

Comments: Weather Conditions, etc.

Sample inlet head cleaned on July 8, 2016
Date of last calibration: July 8, 2016

Technician Signature:

Alex Yaklevov
Date: Aug 8, 2016
Time: 10:07

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: Aug 10, 2016
 Location: Cold Lake South
 Parameter: TSP PM10
 Filter #: P 602 44 15

PM2.5

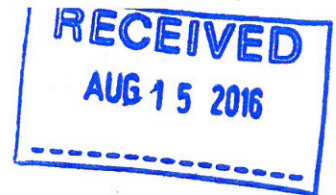
Sample ID: 16080120-001

Customer ID: LICA

Cust Samp ID: LICA Filt #P6024415

Priority: Normal

Start Time 00:00 Aug 10, 2016
 End Time 00:00 Aug 11, 2016
 Status OK
 Std Vol 23.098
 Valid Time 24:00
 Total Time 24.0



Comments: Weather Conditions, etc.

Sample inlet head cleaned on July 8, 2016
Date of last calibration : July 8, 2016

Technician Signature: Alex Yakupov
 Date: Aug 11, 2016
 Time: 11:12

Programming

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

Note: Beginning & End
 Date should be same date

Sample ID: 16080237-001

AIR FCD-01318/2

Customer ID: LICA

Partisol Sample Data Sheet

Cust Samp ID: P6029152

Priority: Normal

Date Sampled: Aug 16, 2016

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P 602 91 52

Start Time 00:00 Aug 16, 2016

End Time 00:00 Aug 17, 2016

Status OK

Std Vol 23.055

Valid Time 24:00

Total Time 24.0



Comments: Weather Conditions, etc.

Sample inlet head cleaned on July 8, 2016
Date of last calibration: July 8, 2016

Technician Signature: Alex YAKUPOV

Date: Aug 19, 2016

Time: 08:58

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: 16080286-001

Customer ID: LICA
Cust Samp ID: P6029151

Partisol Sample Data She

Priority: Normal

Date Sampled: Aug 22, 2016

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P602 91 51

Start Time 00:00 Aug 22, 2016

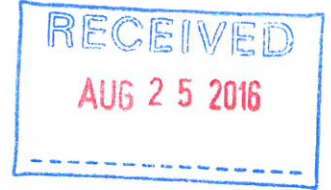
End Time 00:00 Aug 23, 2016

Status OK

Std Vol 22.823

Valid Time 24:00

Total Time 24.0



Comments: Weather Conditions, etc.

Sample inlet head cleaned on July 8, 2016
Date of last calibration: July 8, 2016

Technician Signature: Alex Yakupov
Date: Aug 23, 2016
Time: 08:21

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

Note: Beginning & End Date should be same date

Sample ID: 16090010-001

Customer ID: LICA

AIR FCD-01318/2

Cust Samp ID: P6028886

Priority: Normal

Date Sampled: Aug 28, 2016

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P 602 88 86

Start Time 00:00 Aug 28, 2016

End Time 00:00 Aug 29, 2016

Status OK

Std Vol 23.730

Valid Time 24:00

Total Time 24.0



Comments: Weather Conditions, etc.

Sample inlet head cleaned on July 8, 2016
Date of last calibration: July 8, 2016

Technician Signature: Alex Yakupov
Date: Aug 31, 2016
Time: 08:31

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

Date	Filter NO.	Concentration (mg)
August 4	P6024414	0.045
August 10	P6024415	0.052
August 16	P6029152	0.085
August 22	P6029151	0.040
August 28	P6028886	0.020

APPENDIX III
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date: August 4, 2016	Barometric Pressure: 0.934 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Cold Lake South	Weather Conditions: Mainly sunny
Parameter: Sulphur Dioxide	Calibration Purpose: shut down
Start Time 24 hr. (mst): 15:04	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 18:30	Cal Gas Expiry Date: December 2, 2023
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	
Serial Number: 806528242	Range ppb: 500
Last Calibration Date: July 7, 2016	As Found C.F.: 0.997
Previous C.F.: 0.999	New C.F.: n/a

Calibrator:		Standard Calibration Points for Ranges								
Flow Meter ID's: n/a		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</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	Sulphur Dioxide Standard Calibration Points	High	380	Mid	180	Low	90
Point	Sulphur Dioxide Standard Calibration Points									
High	380									
Mid	180									
Low	90									
Make & Model: API 700										
Serial #: 627										
Cal Gas Cylinder I.D. #: LL119346										
Cal Gas Conc. (ppm): 50.0										

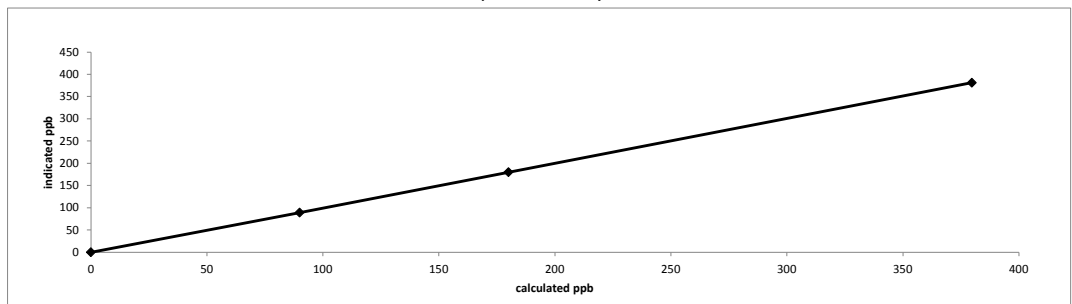
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	5000	0.00	5000	0.0	0.0	N/A
as found high	4965	38.00	5003	379.8	381.0	0.997
mid	4982	18.00	5000	180.0	180.0	1.000
low	4992	9.00	5001	90.0	89.0	1.011
Average C.F. =						1.003

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS > or = 0.995
Slope = 0.996	0.90-1.10
b (Intercept as % of full scale) = 0.13%	± 3% F.S.
% change in C.F. from last cal = 0.22%	± 10%

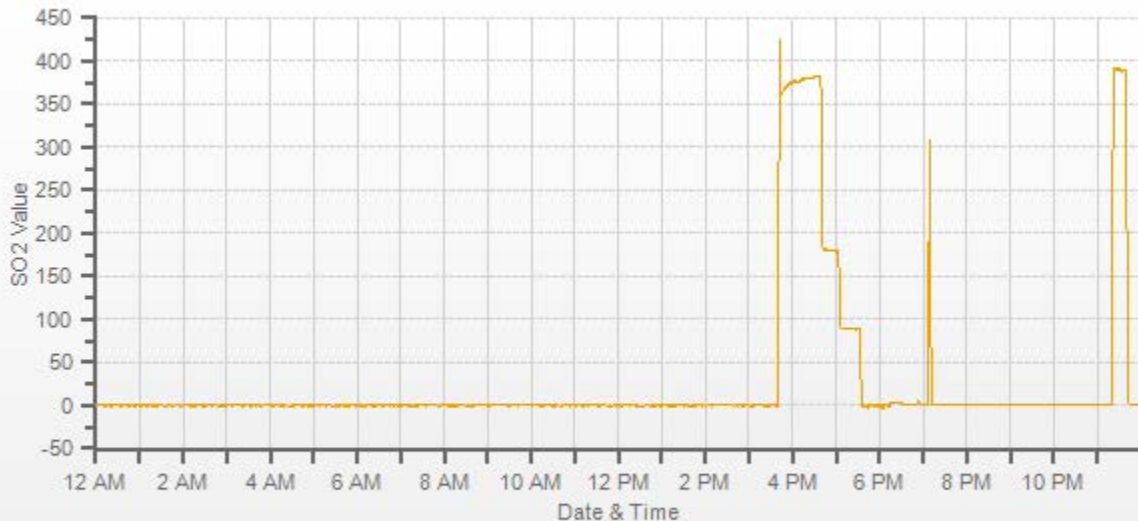
Thermo 43i Sulphur Dioxide Analyzer Calibration



<p style="text-align: center;">As found:</p> BKG: 7.7 COEF: 1.006 PMT: -624.2 FLASH: 751 INTERNAL: 26.7 CHAMBER: 45.2 PERM OVEN GAS: 45.0 PERM OVEN HEATER: 44.18 PRESSURE: 682.5 SAMPLE FLOW: 0.477 LAMP INTENSITY: 97 CONVERTER: n/a CONVERTER SET: n/a Internal Span: 375	<p style="text-align: center;">As left:</p> BKG: n/a COEF: n/a PMT: n/a FLASH: n/a INTERNAL: n/a CHAMBER: n/a PERM OVEN GAS: n/a PERM OVEN HEATER: n/a PRESSURE: n/a SAMPLE FLOW: n/a LAMP INTENSITY: n/a CONVERTER: n/a CONVERTER SET: n/a Internal Span: n/a
--	--

Comments:

No zero or high point adjustment made. Shutdown calibration completed to conduct annual maintenance.



— SO2[ppb]



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date: August 5, 2016	Barometric Pressure: 0.949 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Cold Lake South	Weather Conditions: Mainly sunny
Parameter: Sulphur Dioxide	Calibration Purpose: post repair
Start Time 24 hr. (mst): 10:49	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 15:13	Cal Gas Expiry Date: December 2, 2023
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	
Serial Number: 806528242	Range ppb: 500
Last Calibration Date: n/a	As Found C.F.: n/a
Previous C.F.: n/a	New C.F.: 0.997

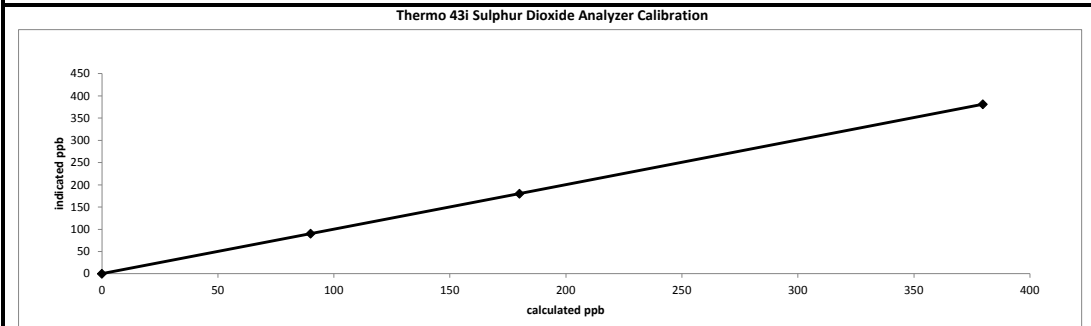
Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>Sulphur Dioxide Standard Calibration Points</th></tr> <tr><td>High</td><td>380</td></tr> <tr><td>Mid</td><td>180</td></tr> <tr><td>Low</td><td>90</td></tr> </table>	Point	Sulphur Dioxide Standard Calibration Points	High	380	Mid	180	Low	90
Point	Sulphur Dioxide Standard Calibration Points								
High	380								
Mid	180								
Low	90								
Make & Model: API 700									
Serial #: 627									
Cal Gas Cylinder I.D. #: LL119346									
Cal Gas Conc. (ppm): 50.0									

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	4965	38.00	5003	379.8	381.0	0.997
mid	4982	18.00	5000	180.0	180.0	1.000
low	4992	9.00	5001	90.0	90.0	1.000
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F.=						0.999

Linear Regression/Calibration Results:

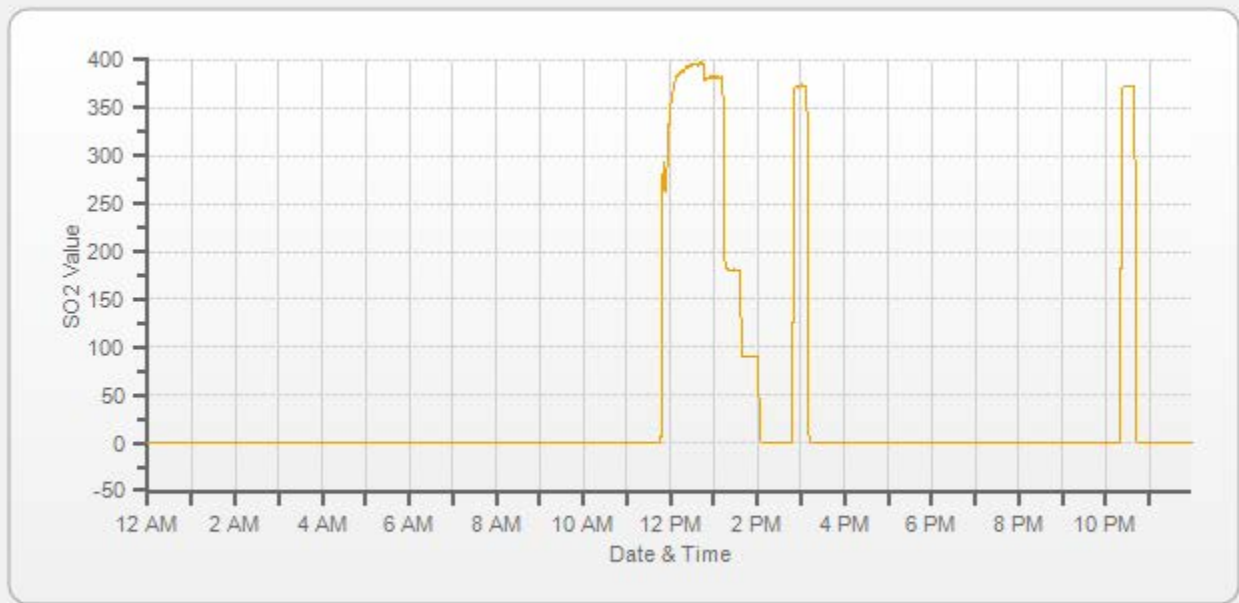
Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.997</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.05%</u>	.95-1.05
% change in C.F. from last cal = <u>n/a</u>	± 3% F.S.
	± 10%



As found:	As left:
BKG: <u>n/a</u>	BKG: <u>7.8</u>
COEF: <u>n/a</u>	COEF: <u>0.964</u>
PMT: <u>n/a</u>	PMT: <u>-624.2</u>
FLASH: <u>n/a</u>	FLASH: <u>772</u>
INTERNAL: <u>n/a</u>	INTERNAL: <u>27.8</u>
CHAMBER: <u>n/a</u>	CHAMBER: <u>44.9</u>
PERM OVEN GAS: <u>n/a</u>	PERM OVEN GAS: <u>45.0</u>
PERM OVEN HEATER: <u>n/a</u>	PERM OVEN HEATER: <u>40.20</u>
PRESSURE: <u>n/a</u>	PRESSURE: <u>684.9</u>
SAMPLE FLOW: <u>n/a</u>	SAMPLE FLOW: <u>0.477</u>
LAMP INTENSITY: <u>n/a</u>	LAMP INTENSITY: <u>96</u>
CONVERTER: <u>n/a</u>	CONVERTER: <u>n/a</u>
CONVERTER SET: <u>n/a</u>	CONVERTER SET: <u>n/a</u>
Internal Span: <u>n/a</u>	Internal Span: <u>373</u>

Comments:

Sample inlet filter changed. Annual maintenance completed. The analyzer cleaned and pump checked. Permeation tube checked.



— SO2[ppb]

TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date: August 4, 2016	Barometric Pressure: 0.934 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Cold Lake South	Weather Conditions: Mainly sunny
Parameter: Total Reduced Sulphur	Calibration Purpose: shut down
Start Time 24 hr. (mst): 15:04	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 18:30	Cal Gas Expiry Date: July 15, 2017
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): CDNova CDN-101 #501

Analyzer:	
Serial Number: 812728560	Range ppb: 100
Last Calibration Date: July 7, 2016	As Found C.F.: 1.068
Previous C.F.: 1.000	New C.F.: n/a

Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Total Reduced Sulphur Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td style="text-align: center;">78</td> </tr> <tr> <td>Mid</td> <td style="text-align: center;">38</td> </tr> <tr> <td>Low</td> <td style="text-align: center;">19</td> </tr> </tbody> </table>	Point	Total Reduced Sulphur Standard Calibration Points	High	78	Mid	38	Low	19
Point		Total Reduced Sulphur Standard Calibration Points							
High		78							
Mid		38							
Low	19								
Make & Model: SABIO 2010 D									
Serial #: 11900613									
Cal Gas Cylinder I.D. #: LL36837									
Cal Gas Conc. (ppm): 10.0									

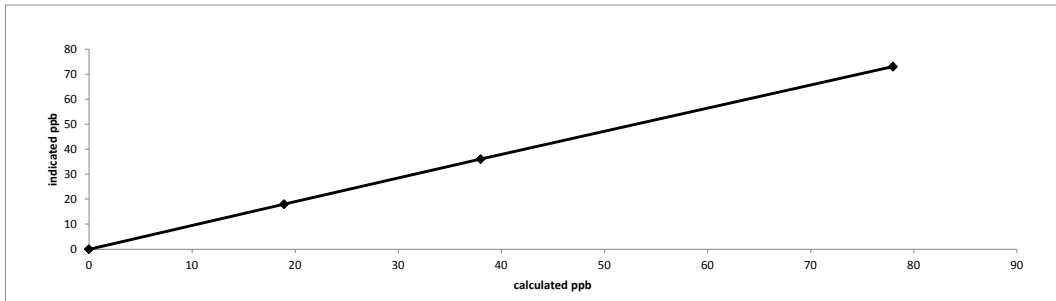
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	7500	0.00	7500	0.0	0.0	N/A
as found high	7443	58.50	7502	78.0	73.0	1.068
mid	7472	28.50	7501	38.0	36.0	1.055
low	7486	14.20	7500	18.9	18.0	1.052
Average C.F. =						1.059

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS > or = 0.995
Slope = <u>1.069</u>	0.90-1.10
b (Intercept as % of full scale) = <u>-0.21%</u>	± 3% F.S.
% change in C.F. from last cal = <u>-6.83%</u>	± 10%

Thermo 450i Total Reduced Sulphur Analyzer Calibration



As found:	As left:
BKG: <u>13.2</u>	BKG: <u>n/a</u>
COEF: <u>0.909</u>	COEF: <u>n/a</u>
PMT: <u>-651.2</u>	PMT: <u>n/a</u>
FLASH: <u>741</u>	FLASH: <u>n/a</u>
INTERNAL: <u>29.9</u>	INTERNAL: <u>n/a</u>
CHAMBER: <u>45.2</u>	CHAMBER: <u>n/a</u>
CONVERTER TEMP: <u>810</u>	CONVERTER TEMP: <u>n/a</u>
CONVERTER SET: <u>810</u>	CONVERTER SET: <u>n/a</u>
PERM OVEN GAS: <u>45.0</u>	PERM OVEN GAS: <u>n/a</u>
PERM OVEN HTR: <u>44.38</u>	PERM OVEN HTR: <u>n/a</u>
PRESSURE: <u>661.7</u>	PRESSURE: <u>n/a</u>
SAMPLE FLOW: <u>0.513</u>	SAMPLE FLOW: <u>n/a</u>
LAMP INTENSITY: <u>91</u>	LAMP INTENSITY: <u>n/a</u>
Internal Span: <u>31.5</u>	Internal Span: <u>n/a</u>

Comments:

No zero or high point adjustment made. Shutdown calibration completed to conduct annual maintenance.



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date: August 5, 2016	Barometric Pressure: 0.949 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Cold Lake South	Weather Conditions: Mainly sunny
Parameter: Total Reduced Sulphur	Calibration Purpose: post repair
Start Time 24 hr. (mst): 14:19	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 17:16	Cal Gas Expiry Date: July 15, 2017
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): CDNova CDN-101 #501

Analyzer:	
Serial Number: 812728560	Range ppb: 100
Last Calibration Date: n/a	As Found C.F.: n/a
Previous C.F.: n/a	New C.F.: 0.996

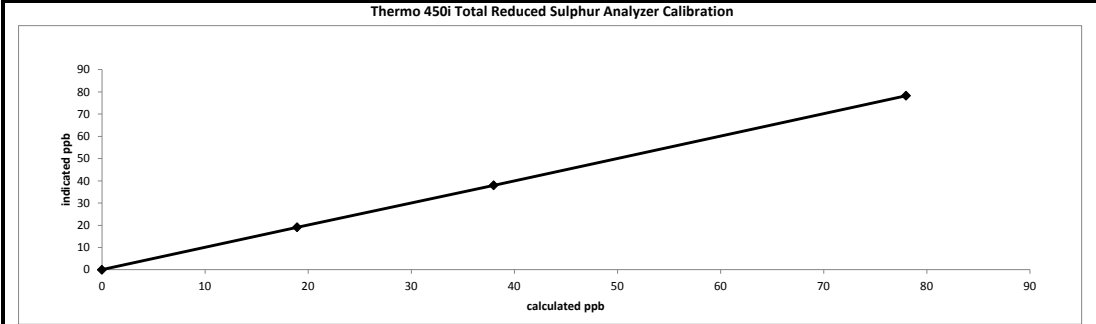
Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="margin-left: auto; margin-right: auto;"><tr><th>Point</th><th>Total Reduced Sulphur Standard Calibration Points</th></tr><tr><td>High</td><td>78</td></tr><tr><td>Mid</td><td>38</td></tr><tr><td>Low</td><td>19</td></tr></table>	Point	Total Reduced Sulphur Standard Calibration Points	High	78	Mid	38	Low	19
Point	Total Reduced Sulphur Standard Calibration Points								
High	78								
Mid	38								
Low	19								
Make & Model: SABIO 2010 D									
Serial #: 11900613									
Cal Gas Cylinder I.D. #: LL36837									
Cal Gas Conc. (ppm): 10.0									

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	7443	58.50	7502	78.0	78.3	0.996
mid	7472	28.50	7501	38.0	38.0	1.000
low	7486	14.20	7500	18.9	19.1	0.991
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						0.996

Linear Regression/Calibration Results:

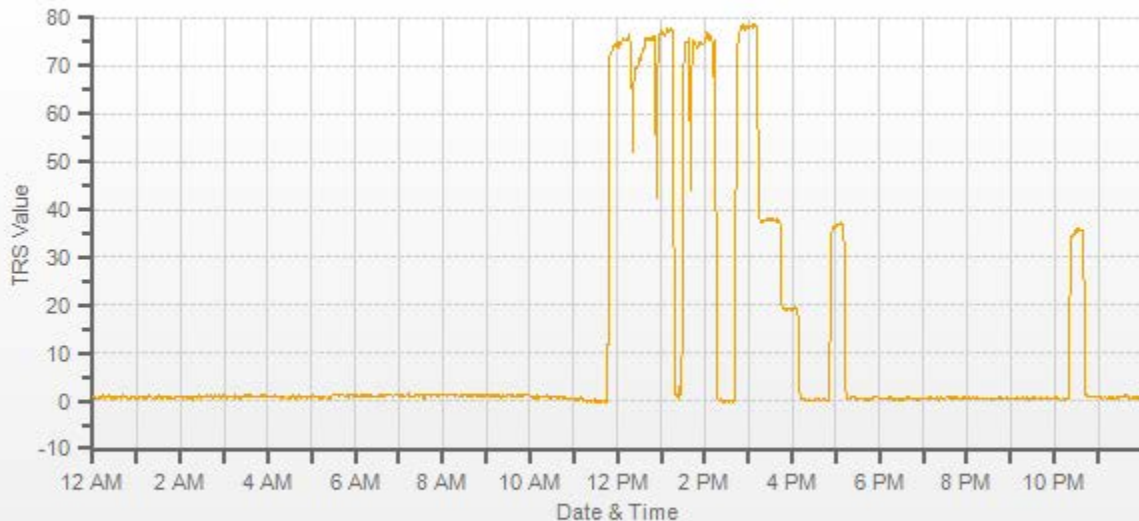
Correlation Coefficient = 1.000	LIMITS
Slope = 0.997	> or = 0.995
b (Intercept as % of full scale) = 0.00%	.95-1.05
% change in C.F. from last cal = n/a	± 3% F.S.
	± 10%



As found:	As left:
BKG: n/a	BKG: 13.8
COEF: n/a	COEF: 0.936
PMT: n/a	PMT: -651.2
FLASH: n/a	FLASH: 738
INTERNAL: n/a	INTERNAL: 30.3
CHAMBER: n/a	CHAMBER: 45.0
CONVERTER TEMP: n/a	CONVERTER TEMP: 825
CONVERTER SET: n/a	CONVERTER SET: 825
PERM OVEN GAS: n/a	PERM OVEN GAS: 44.99
PERM OVEN HTR: n/a	PERM OVEN HTR: 44.38
PRESSURE: n/a	PRESSURE: 661.1
SAMPLE FLOW: n/a	SAMPLE FLOW: 0.512
LAMP INTENSITY: n/a	LAMP INTENSITY: 92
Internal Span: n/a	Internal Span: 35.6

Comments:

Sample inlet filter changed. Annual maintenance completed. The analyzer was cleaned, pump checked. Converter tubing checked and the chamber cleaned. Converter temperature adjusted to 825 degrees.



— TRS[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	August 5, 2016	Barometric Pressure:	0.949 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	Cold Lake South	Weather Conditions:	Mainly sunny
Parameter:	Total Hydrocarbon	Calibration Purpose:	shut down
Start/End Time 24 hr. (mst):	8:26 / 10:35	Performed By/Reviewer:	Alex Yakupov / Tom Bourque
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023

Analyzer:	Serial Number:	427408718	Range ppm:	50
	Last Calibration Date:	July 8, 2016	As Found C.F.:	1.005
	Previous Cal High Point C.F.:	1.000	New C.F.:	n/a

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 ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	606.0	212.0		
	CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0	1189.0		

Point	Target ppm
High	38
Mid	18
Low	9

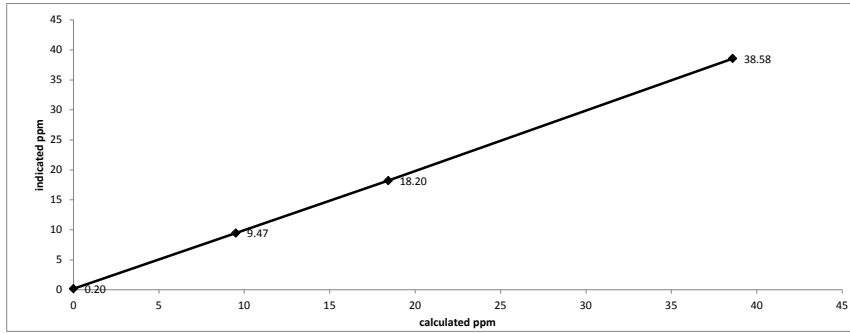
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	1999	0.00	1999	0.0	0.20	n/a
as found high	1938	65.00	2003	38.58	38.58	1.005
mid	1969	31.00	2000	18.43	18.20	1.024
low	1985	16.00	2001	9.51	9.47	1.026
Average C.F. =						1.018

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 LIMITS > or = 0.995
Slope = 1.004 .95-1.05
b (Intercept as % of full scale) = -0.11% ± 3% F.S.
% change in C.F. from last cal = -0.53% ± 10%

Thermo 51C Total Hydrocarbon Analyzer Calibration



As found:

H2 cylinder (psi): 700
H2 cylinder reg set (psi): 22
Span Cylinder (psi): 200
Span Cylinder Reg Set (psi): 22
Zero Air Gen Pressure: 34
measurement alarms: None
service alarms: None
cnt: 1618
rng: 1
try: 1
flm: 183.7
det: 125.3
Flame: 183
Filter: 125
Base: 125
Sample psi: 06.52
Internal Air Pressure: 20
Internal Fuel Pressure: 14
Intenal Pressure Gauge psi: 27
Internal Span: 27.57

As left:

H2 cylinder (psi): n/a
H2 cylinder reg set (psi): n/a
Span Cylinder (psi): n/a
Span Cylinder Reg Set (psi): n/a
Zero Air Gen Pressure: n/a
measurement alarms: n/a
service alarms: n/a
cnt: n/a
rng: n/a
try: n/a
flm: n/a
det: n/a
Flame: n/a
Filter: n/a
Base: n/a
Sample psi: n/a
Internal Air Pressure: n/a
Internal Fuel Pressure: n/a
Intenal Pressure Gauge psi: n/a
Internal Span: n/a

Comments:

No zero or high point adjustment made. Shutdown calibration completed to conduct annual maintenance.



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	August 5, 2016	Barometric Pressure:	0.949 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	Cold Lake South	Weather Conditions:	Mainly sunny
Parameter:	Total Hydrocarbon	Calibration Purpose:	post repair
Start/End Time 24 hr. (mst):	14:31 / 17:27	Performed By/Reviewer:	Alex Yakupov Tom Bourque
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023

Analyzer:	
Serial Number:	427408718
Last Calibration Date:	n/a
Previous Cal High Point C.F.:	n/a
Range ppm:	50
As Found C.F.:	n/a
New C.F.:	1.000

Calibrator:	
Flow Meter ID's:	n/a
Make & Model:	API 700
Serial #:	627
Cal Gas Cylinder I.D. #:	LL165372
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm):	606.0 212.0
CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0 1189.0

Standard Calibration Points for a Range of 50 ppm	
Point	Target ppm
High	38
Mid	18
Low	9

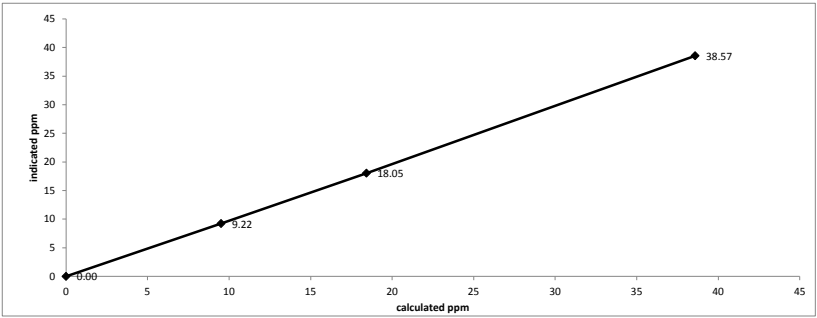
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)	
adjusted zero	1999	0.00	1999	0.0	0.00	n/a
adjusted high	1938	65.00	2003	38.58	38.57	1.000
mid	1969	31.00	2000	18.43	18.05	1.021
low	1985	16.00	2001	9.51	9.22	1.031
calibrator zero	1999	0.00	1999	0.00	0.00	n/a
Average C.F.=						1.018

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		.95-1.05
b (Intercept as % of full scale)=	0.39%		± 3% F.S.
% change in C.F. from last cal=	n/a		± 10%

Thermo 51C Total Hydrocarbon Analyzer Calibration



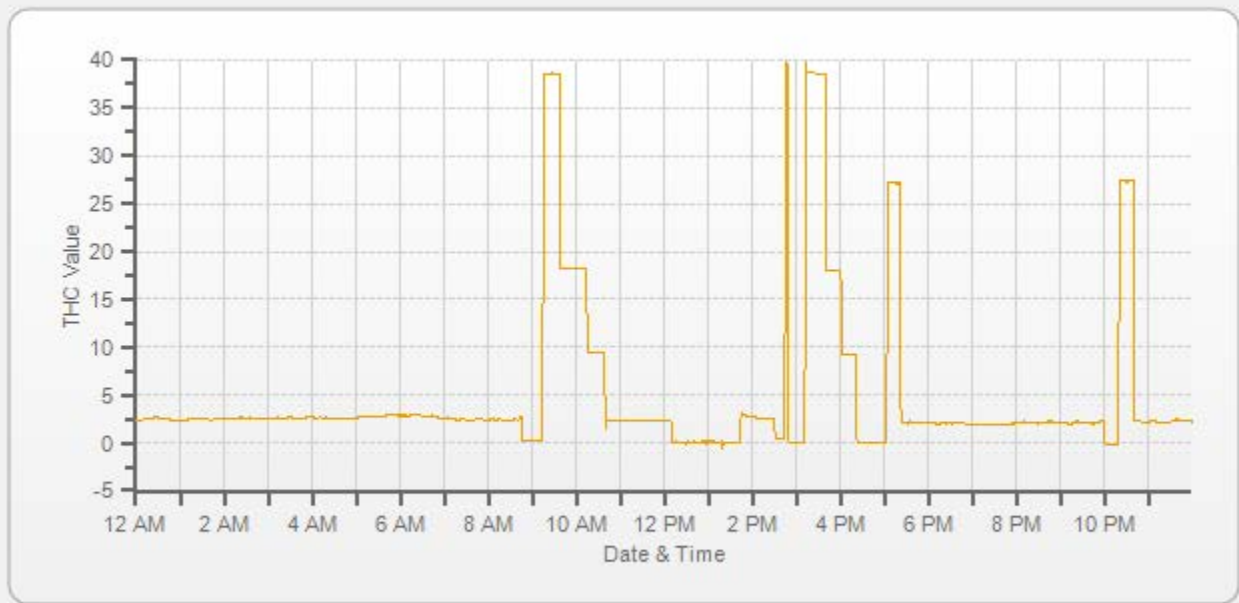
As found:

- H2 cylinder (psi): n/a
- H2 cylinder reg set (psi): n/a
- Span Cylinder (psi): n/a
- Span Cylinder Reg Set (psi): n/a
- Zero Air Gen Pressure: n/a
- measurement alarms: n/a
- service alarms: n/a
- cnt: n/a
- rng: n/a
- try: n/a
- flm: n/a
- det: n/a
- Flame: n/a
- Filter: n/a
- Base: n/a
- Sample psi: n/a
- Internal Air Pressure: n/a
- Internal Fuel Pressure: n/a
- Intenal Pressure Gauge psi: n/a
- Internal Span: n/a

As left:

- H2 cylinder (psi): 700
- H2 cylinder reg set (psi): 22
- Span Cylinder (psi): 2000
- Span Cylinder Reg Set (psi): 22
- Zero Air Gen Pressure: 34
- measurement alarms: None
- service alarms: None
- cnt: 1705
- rng: 1
- try: 1
- flm: 182.3
- det: 125.8
- Flame: 182
- Filter: 125
- Base: 125
- Sample psi: 06.51
- Internal Air Pressure: 20
- Internal Fuel Pressure: 14
- Intenal Pressure Gauge psi: 27
- Internal Span: 27.1

Comments:
Sample inlet filter changed. Annual maintenance completed. Sample pump checked.



— THC[ppm]



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: August 22, 2016
 Company/Airshed: LICA
 Location/Station Name: Cold Lake South
 Parameter: Total Hydrocarbon
 Start/End Time 24 hr. (mst): 14:22 / 17:42
 Calibration Method: Gas Dilution
 Barometric Pressure: 0.906 atm
 Station Temperature °C: 22
 Weather Conditions: A few clouds
 Calibration Purpose: repeat
 Performed By/Reviewer: Alex Yakupov / Tom Bourque
 Cal Gas Expiry Date: November 25, 2023

Analyzer:
 Serial Number: 427408718
 Last Calibration Date: August 5, 2016
 Previous Cal High Point C.F.: 1.000
 Range ppm: 50
 As Found C.F.: 0.989
 New C.F.: 1.000

Calibrator:
 Flow Meter ID's: n/a
 Make & Model: API 700
 Serial #: 627
 Cal Gas Cylinder I.D. #: LL165372
 CH₄/C₂H₆ Cylinder Conc. (ppm): 606.0 / 212.0
 CH₄ as propane/total CH₄ equivalents (ppm): 583.0 / 1189.0
Standard Calibration Points for a Range of 50 ppm

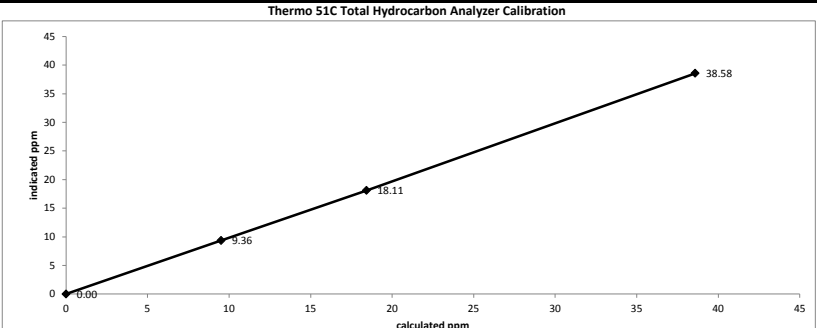
Point	Target ppm
High	38
Mid	18
Low	9

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

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	1999	0.00	1999	0.0	-0.36	n/a
as found high	1938	65.00	2003	38.58	38.66	0.989
adjusted zero	1999	0.00	1999	0.00	0.00	n/a
adjusted high	1938	65.00	2003	38.58	38.58	1.000
mid	1969	31.00	2000	18.43	18.11	1.018
low	1985	16.00	2001	9.51	9.36	1.016
calibrator zero	1999	0.00	1999	0.0	0.00	n/a

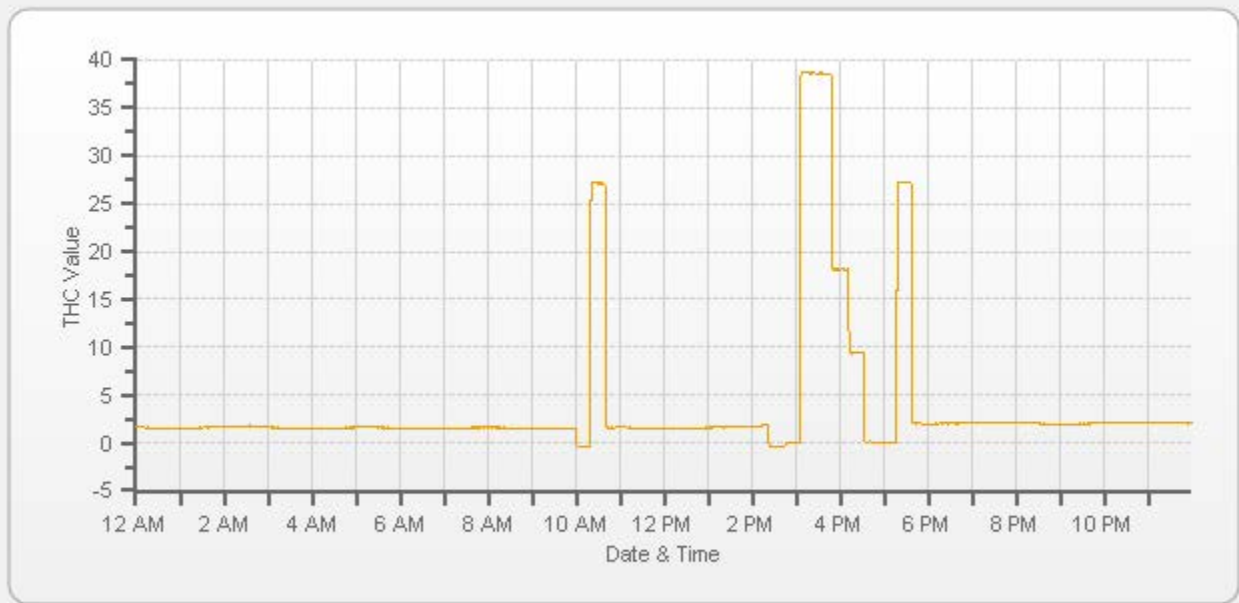
Average C.F.= 1.011

Linear Regression/Calibration Results:
 Correlation Coefficient = 1.000
 Slope = 0.999
 b (Intercept as % of full scale) = 0.25%
 % change in C.F. from last cal = 1.12%
LIMITS
 > or = 0.995
 .95-1.05
 ± 3% F.S.
 ± 10%



As found: H2 cylinder (psi): 1900 H2 cylinder reg set (psi): 21 Span Cylinder (psi): 1700 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 34 measurement alarms: None service alarms: None cnt: 1555 rng: 1 try: 1 flm: 179.0 det: 125.2 Flame: 179 Filter: 125 Base: 125 Sample psi: 06.51 Internal Air Pressure: 20 Internal Fuel Pressure: 14 Internal Pressure Gauge psi: 27 Internal Span: 27.1	As left: H2 cylinder (psi): 1900 H2 cylinder reg set (psi): 21 Span Cylinder (psi): 1700 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 34 measurement alarms: None service alarms: None cnt: 1590 rng: 1 try: 1 flm: 179.7 det: 125.4 Flame: 179 Filter: 125 Base: 125 Sample psi: 06.51 Internal Air Pressure: 20 Internal Fuel Pressure: 14 Internal Pressure Gauge psi: 27 Internal Span: 27.2
--	---

Comments:
 Repeat calibration completed to correct ZERO drift.



— THC[ppm]

NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: August 10, 2016	Barometric Pressure: 0.934 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Cold Lake South	Weather Conditions: Mainly sunny
Start/End Time 24 hr. (mst): 7:49 / 11:21	Calibration Purpose: shut down
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 2, 2023

Analyzer: Serial Number: 1505664393 Last Calibration Date: July 7, 2016 Range ppb: 500	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td></td> <td>Previous C.F.:</td> <td>As Found C.F.:</td> <td>New C.F.:</td> </tr> <tr> <td>NO =</td> <td>0.999</td> <td>1.015</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.012</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>0.999</td> <td>1.018</td> <td>n/a</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	1.015	n/a	NO ₂ =	1.000	1.012	n/a	NOx =	0.999	1.018	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	0.999	1.015	n/a														
NO ₂ =	1.000	1.012	n/a														
NOx =	0.999	1.018	n/a														

Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL119346 NO/NOx Gas Conc. (ppm): 50.0 50.0	Standard Calibration Points for a Range of: 500 ppb <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td>380</td> <td>250</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>145</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>50</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	380	250	n/a	Mid	180	145	n/a	Low	90	50	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	380	250	n/a																						
Mid	180	145	n/a																						
Low	90	50	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	0.0	n/a	n/a
as found high	4966	38.00	5004	379.7	379.7	374.0	373.0	1.015	1.018
mid	4982	18.00	5000	180.0	180.0	178.0	178.0	1.011	1.011
low	4992	9.00	5001	90.0	90.0	89.0	89.0	1.011	1.011
Average C.F.=								1.013	1.013

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4966	38.00	5004	0.0	374.0	374.0	0.0	0.0	0.0	
as found high NO2	4839	38.00	4877	240.0	127.0	371.0	244.0	247.0	244.0	1.012
gpt mid	4839	38.00	4877	135.0	231.0	372.0	141.0	143.0	141.0	1.014
gpt low	4839	38.00	4877	45.0	321.0	374.0	53.0	53.0	53.0	1.000
Average NO₂ C.F.=									1.009	

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.015	1.018	1.014	0.90-1.10
b (Intercept as % of full scale)=	0.06%	0.10%	0.05%	± 3% F.S.
% change in C.F. from last cal=	-1.62%	-1.23%	-1.90%	± 10%
NO ₂ converter efficiency			1.01	0.96 to 1.04

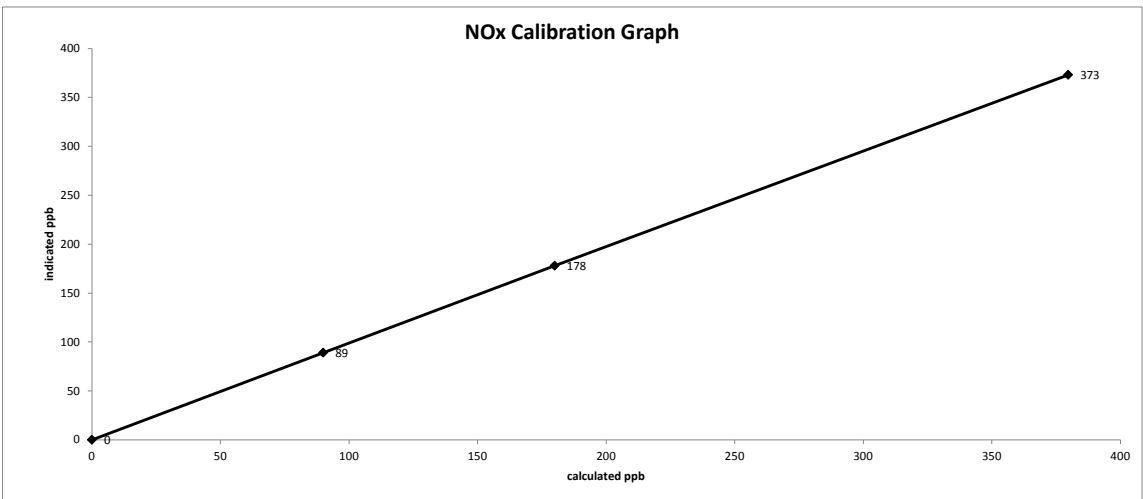
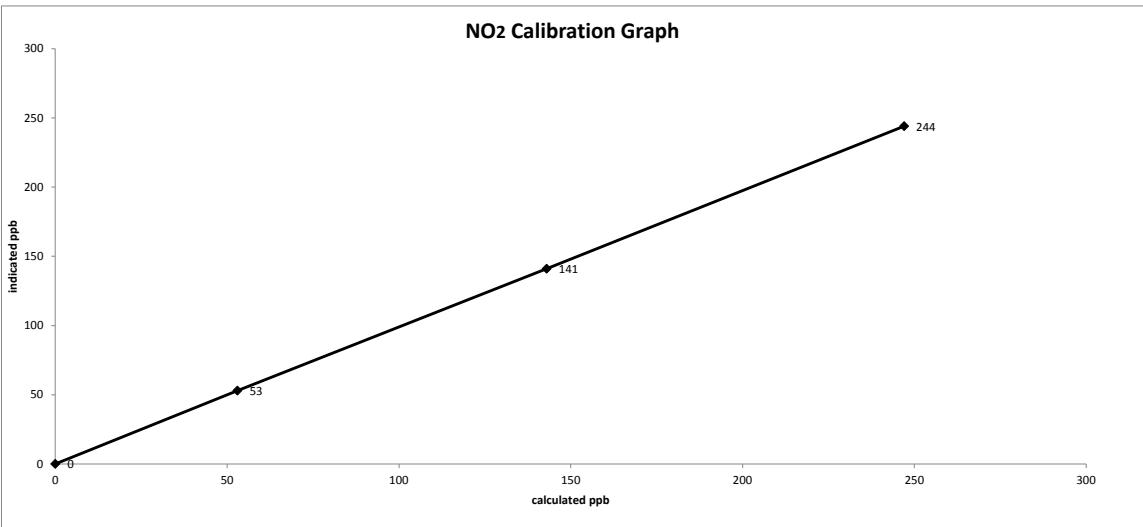
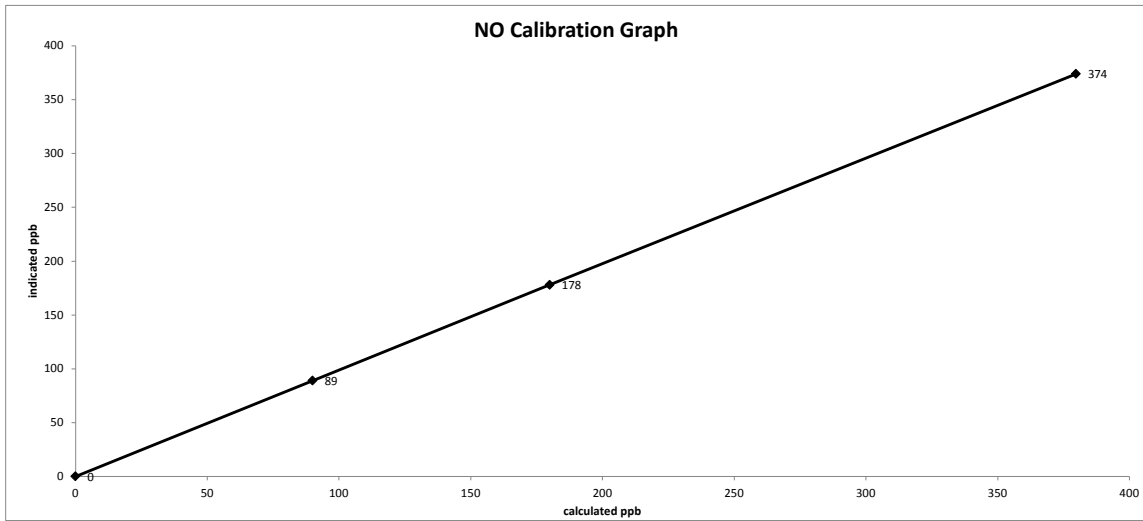
As found: NO Bkg: 3.4 NOx Bkg: 3.5 NO Coef: 1.025 NO ₂ Coef: 1.000 NOx Coef: 0.998 PMT: -854.7 Internal: 24.4 Chamber: 50.5 Cooler: -3.0 NO ₂ Converter: 323.7 NO ₂ Converter Set: 325.0 Pressure: 191.3 Flow: 0.770 Ozonator Flow: OK Internal Span NO: 2.3 Internal Span NO ₂ : 257 Internal Span NOx: 260	As left: NO Bkg: n/a NOx Bkg: n/a NO Coef: n/a NO ₂ Coef: n/a NOx Coef: n/a PMT: n/a Internal: n/a Chamber: n/a Cooler: n/a NO ₂ Converter: n/a NO ₂ Converter Set: n/a Pressure: n/a Flow: n/a Ozonator Flow: n/a Internal Span NO: n/a Internal Span NO ₂ : n/a Internal Span NOx: n/a
--	--

Comments:

 Shutdown calibration completed for annual maintenance/to rebuild a sample pump. No ZERO adjustment made. No High Point adjustment made. No NO₂ adjustment made.

Date: August 10, 2016
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 7:49 / 11:21
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration





Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: August 10, 2016	Barometric Pressure: 0.934 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Cold Lake South	Weather Conditions: Mainly sunny
Start/End Time 24 hr. (mst): 11:52 / 16:45	Calibration Purpose: post repair
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 2, 2023

Analyzer:	Correction Factors:																
Serial Number: 1505664393	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%; text-align: center;">Previous C.F.:</td> <td style="width: 33%; text-align: center;">As Found C.F.:</td> <td style="width: 33%; text-align: center;">New C.F.:</td> </tr> <tr> <td>NO =</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">0.999</td> </tr> <tr> <td>NO₂ =</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">1.004</td> </tr> <tr> <td>NOx =</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">0.999</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	n/a	n/a	0.999	NO ₂ =	n/a	n/a	1.004	NOx =	n/a	n/a	0.999
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	n/a	n/a	0.999														
NO ₂ =	n/a	n/a	1.004														
NOx =	n/a	n/a	0.999														
Last Calibration Date: n/a																	
Range ppb: 500																	

Calibrator:	Standard Calibration Points for a Range of: 500 ppb																								
Flow Meter ID's: n/a																									
Make & Model: API 700																									
Serial #: 627																									
Cal Gas Cylinder I.D. #: LL119346																									
NO/NOx Gas Conc. (ppm): 50.0 50.0																									
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td style="text-align: center;">380</td> <td style="text-align: center;">250</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Mid</td> <td style="text-align: center;">180</td> <td style="text-align: center;">145</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Low</td> <td style="text-align: center;">90</td> <td style="text-align: center;">50</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 ₂ (ppb)	Cc Ozone ?	High	380	250	n/a	Mid	180	145	n/a	Low	90	50	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	380	250	n/a																						
Mid	180	145	n/a																						
Low	90	50	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
adjusted zero	5000	0.0	5000	0	0	0.0	0.0	n/a	n/a
adjusted high	4966	38.00	5004	379.7	379.7	380.0	380.0	0.999	0.999
mid	4982	18.00	5000	180.0	180.0	180.0	180.0	1.000	1.000
low	4992	9.00	5001	90.0	90.0	90.0	90.0	1.000	1.000
calibrator zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
Average C.F.=								1.000	1.000

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4966	38.00	5004	0.0	380.0	380.0	0.0	0.0	0.0	n/a
adjusted high NO2	4839	38.00	4877	240.0	128.0	379.0	251.0	252.0	251.0	1.004
gpt mid	4839	38.00	4877	140.0	234.0	380.0	146.0	146.0	146.0	1.000
gpt low	4839	38.00	4877	42.0	334.0	381.0	46.0	46.0	46.0	1.000
Average NO₂ C.F.=										1.001

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.999	1.004	.95-1.05
b (Intercept as % of full scale)=	-0.01%	-0.01%	0.03%	± 3% F.S.
% change in C.F. from last cal=	n/a	n/a	n/a	± 10%
NO2 converter efficiency	n/a	n/a	1.00	0.96 to 1.04

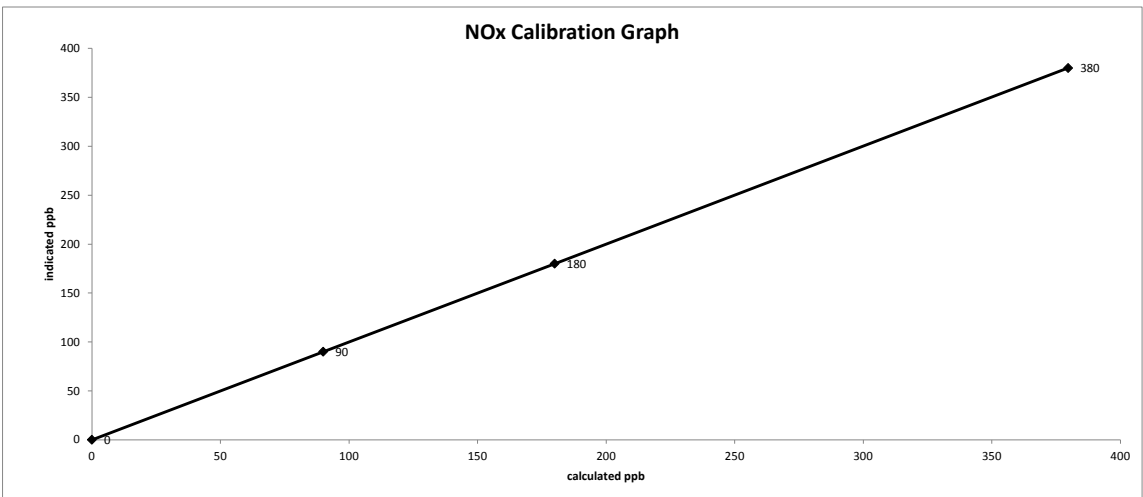
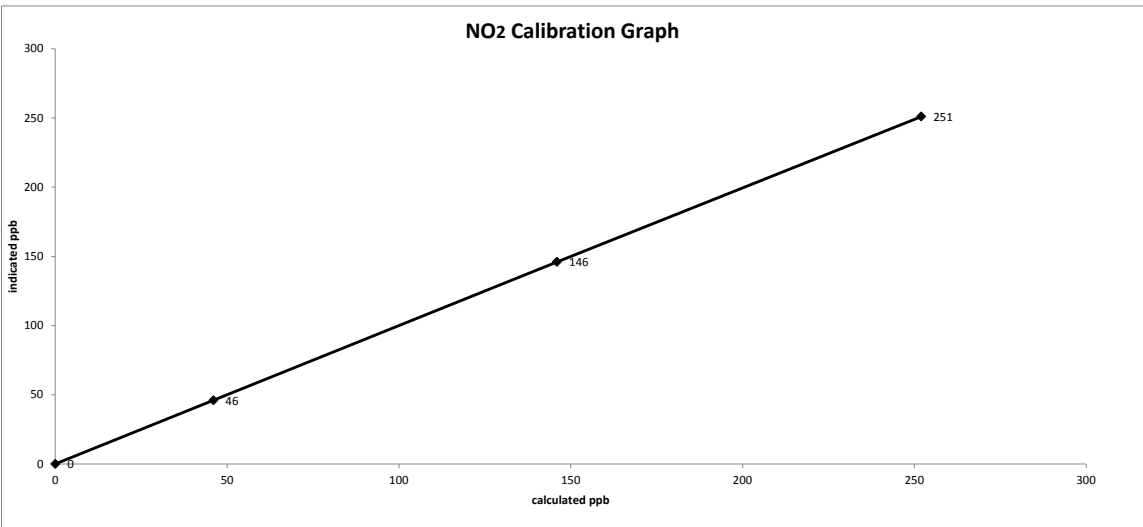
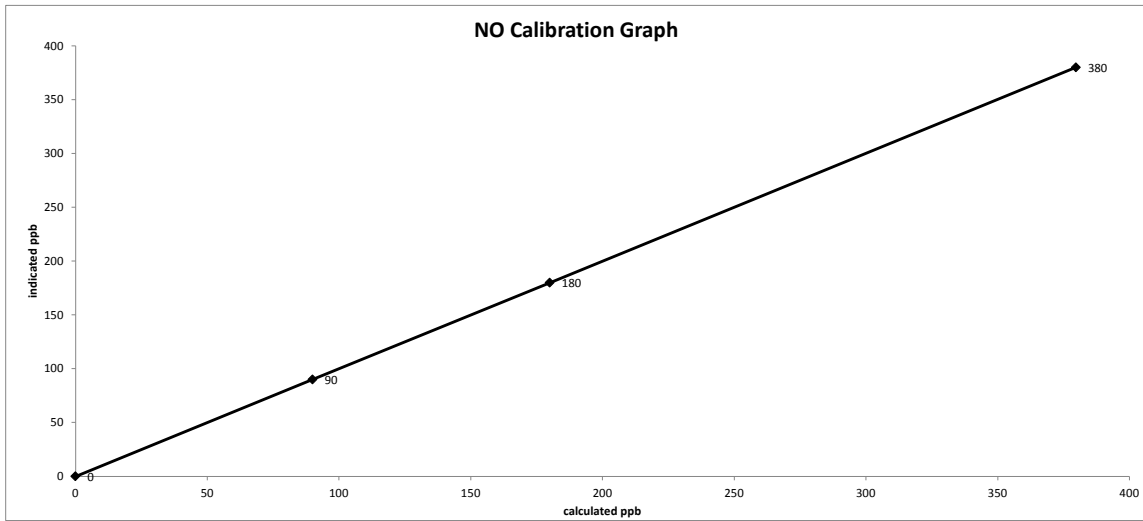
As found:	As left:
NO Bkg: n/a	NO Bkg: 3.4
NOx Bkg: n/a	NOx Bkg: 3.5
NO Coef: n/a	NO Coef: 0.994
NO2 Coef: n/a	NO2 Coef: 1.000
NOx Coef: n/a	NOx Coef: 1.000
PMT: n/a	PMT: -854.7
Internal: n/a	Internal: 23.7
Chamber: n/a	Chamber: 50.6
Cooler: n/a	Cooler: -3.0
NO2 Converter: n/a	NO2 Converter: 325.0
NO2 Converter Set: n/a	NO2 Converter Set: 325.0
Pressure: n/a	Pressure: 184.1
Flow: n/a	Flow: 0.799
Ozonator Flow: n/a	Ozonator Flow: OK
Internal Span NO: n/a	Internal Span NO: 2.4
Internal Span NO2: n/a	Internal Span NO2: 253
Internal Span NOx: n/a	Internal Span NOx: 256

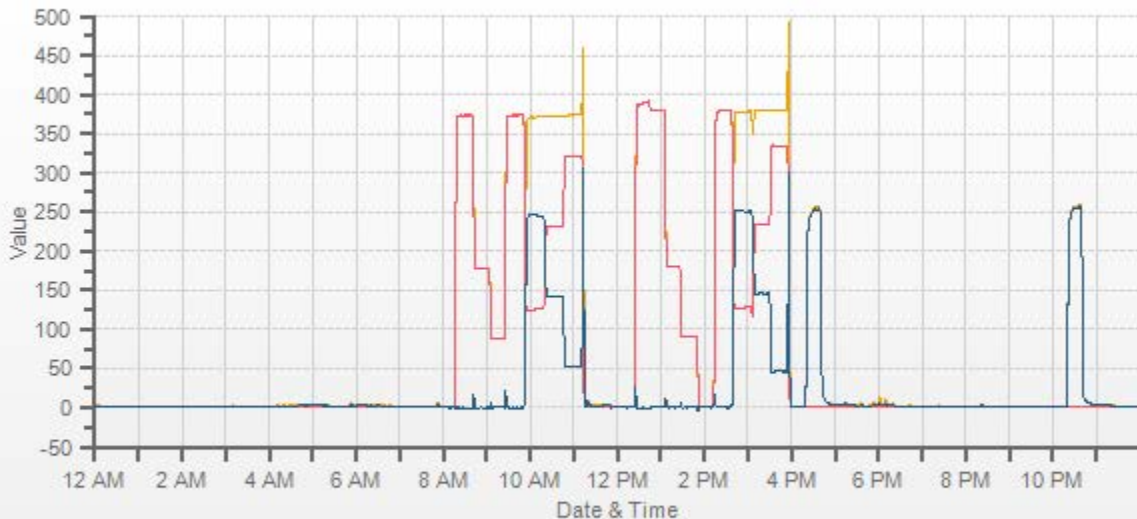
Comments:

Sample pump was rebuilt and post-repair calibration completed. Sample inlet filter changed.

Date: August 10, 2016
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 11:52 / 16:45
Calibration Purpose: post repair
Calibration Method: Gas Dilution & Gas Phase Titration





— NOx[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date:	August 5, 2016	Barometric Pressure:	0.949 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	Cold Lake South	Weather Conditions:	Mainly sunny
Start/End Time 24 hr. (mst):	8:26 / 10:35	Calibration Purpose:	shut down
Ozone Calibration Method:	Varying UV Lamp Power	Performed By/Reviewer:	Alex Yakupov Tom Bourque
G.P.T. Date:	n/a-done by Varying UV Lamp Power	Cal Gas Expiry Date:	n/a

Analyzer:	Serial Number:	700419951	Ozone Range ppb:	500
	Last Calibration Date:	July 8, 2016	As Found C.F.:	0.964
	Previous Cal High Point C.F.:	0.997	New C.F.:	n/a

Calibrator:	Flow Meter ID's:	n/a	Point	AMD Required Range of Ozone Calibration Points
	Make & Model:	SABIO 2010 D	High	300-400 ppb
	Serial #:	11900613	Mid	150-200 ppb
	Cal Gas Cylinder I.D. #:	n/a	Low	50-75 ppb

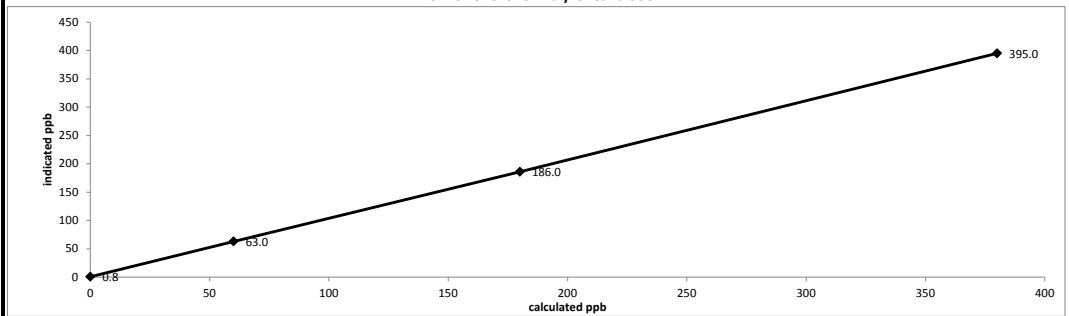
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	0.8	n/a
as found high	5000	5000	380.0	380.0	395.0	0.964
mid	5000	5000	180.0	180.0	186.0	0.972
low	5000	5000	60.0	60.0	63.0	0.965
Average C.F. =						0.967

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.964		0.90-1.10
b (Intercept as % of full scale) =	-0.09%		± 3% F.S.
% change in C.F. from last cal =	3.31%		± 10%

Thermo 49i Ozone Analyzer Calibration



As found:

- O3 Bkg: 0.1
- O3 Coef: 1.049
- Photo Lamp: 8.7
- O3 Lamp: 9.0
- Bench: 26.9
- Bench Lamp: 53.4
- O3 Lamp: 67.3
- Pressure: 713.8
- Cell A lpm: 0.722
- Cell B lpm: 0.760
- O3 ppb: 1.9
- Cell A ppb: 4.4
- Cell B ppb: -0.6
- Cell A int: 53955
- Cell B int: 54811
- Internal Span: 263

As left:

- O3 Bkg: n/a
- O3 Coef: n/a
- Photo Lamp: n/a
- O3 Lamp: n/a
- Bench: n/a
- Bench Lamp: n/a
- O3 Lamp: n/a
- Pressure: n/a
- Cell A lpm: n/a
- Cell B lpm: n/a
- O3 ppb: n/a
- Cell A ppb: n/a
- Cell B ppb: n/a
- Cell A int: n/a
- Cell B int: n/a
- Internal Span: n/a

Comments:

No zero or high point adjustment made. Shutdown calibration completed to conduct annual maintenance.

Maxxam Thermo 49i Ozone Analyzer Calibration

A Bureau Veritas Group Company

Date: August 5, 2016
 Company/Airshed: LICA
 Location/Station Name: Cold Lake South
 Start/End Time 24 hr. (mst): 16:10 / 19:34
 Ozone Calibration Method: Varying UV Lamp Power
 G.P.T. Date: n/a-done by Varying UV Lamp Power

Barometric Pressure: 0.949 atm
 Station Temperature °C: 22
 Weather Conditions: Mainly sunny
 Calibration Purpose: post repair
 Performed By/Reviewer: Alex Yakupov / Tom Bourque
 Cal Gas Expiry Date: n/a

Analyzer:
 Serial Number: 700419951
 Last Calibration Date: n/a
 Previous Cal High Point C.F.: n/a

Ozone Range ppb: 500
 As Found C.F.: n/a
 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

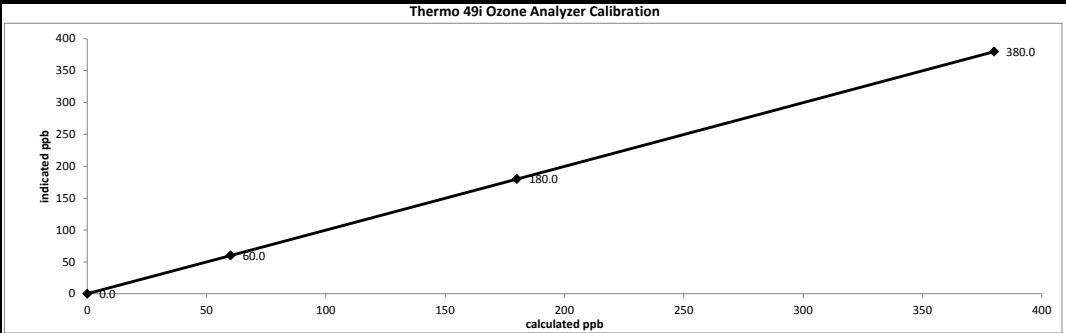
Point	AMD Required Range of Ozone Calibration Points
High	300-400 ppb
Mid	150-200 ppb
Low	50-75 ppb

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)	
adjusted zero	5000	5000	0.0	n/a	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	0.0	0.0	n/a
Average C.F. =						1.000

Linear Regression/Calibration Results:

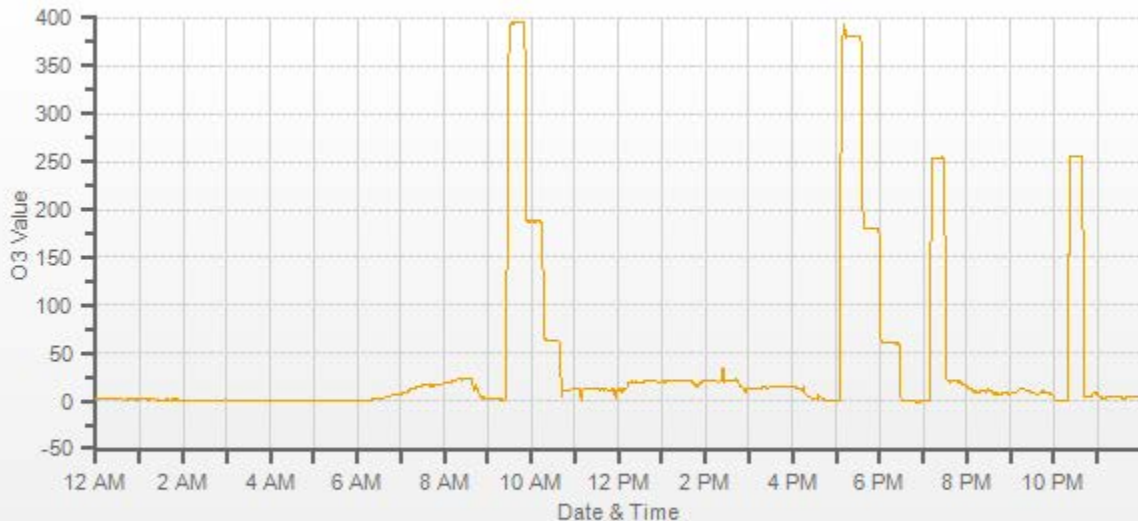
Correlation Coefficient = 1.000 > or = 0.995
 Slope = 1.000 .95-1.05
 b (Intercept as % of full scale) = 0.00% ± 3% F.S.
 % change in C.F. from last cal = n/a ± 10%



As found:	As left:
O3 Bkg: n/a	O3 Bkg: 0.2
O3 Coef: n/a	O3 Coef: 1.007
Photo Lamp: n/a	Photo Lamp: 9.6
O3 Lamp: n/a	O3 Lamp: 9.0
Bench: n/a	Bench: 27.1
Bench Lamp: n/a	Bench Lamp: 53.4
O3 Lamp: n/a	O3 Lamp: 67.3
Pressure: n/a	Pressure: 711.0
Cell A lpm: n/a	Cell A lpm: 0.720
Cell B lpm: n/a	Cell B lpm: 0.759
O3 ppb: n/a	O3 ppb: 0.8
Cell A ppb: n/a	Cell A ppb: 1.3
Cell B ppb: n/a	Cell B ppb: 0.4
Cell A int: n/a	Cell A int: 90333
Cell B int: n/a	Cell B int: 91334
Internal Span: n/a	Internal Span: 255

Comments:

Post-repair calibration completed after annual maintenance. Sample pump rebuilt. Sample inlet filter changed.



— O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: August 8, 2016
 Company: LICA
 Station Name/Location: Cold Lake South
 Previous Audit Date: July 26, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
 Start Time (mst): 10:27
 End Time (mst): 13:00
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Mainly sunny

1400A Information and Status:

Serial Number: 1405A201620804 As Found Filter Loading %: 24.30
 Ko Factor: 14578 As Left Filter Loading %: 16.95
 Ambient Temperature °C: 23.33 As Found Noise: 0.004
 Ambient Pressure atm: 0.933 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>#2</u>	<u>130168457</u>	<u>ID# 4295</u>
Calibration Date:	<u>January 15, 2016</u>	<u>February 7, 2016</u>	<u>November 1, 2015</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.11	0.12	0.46
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.16	0.00	0.51
	limit	0.60	0.60	0.60	0.60

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.13	0.01	0.13
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.21	0.00	0.21
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>23.3</u>	1405F pressure atm: <u>0.938</u>
reference temperature °C: <u>23.9</u>	reference pressure: <u>0.933</u>
difference °C: <u>0.6</u>	difference: <u>0.005</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>23.9</u>	1405F pressure atm: <u>0.933</u>
reference temperature °C: <u>23.9</u>	reference pressure: <u>0.933</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>3.04</u>	reference total/aux flow lpm: <u>16.84</u>
difference lpm: <u>0.04</u>	difference lpm: <u>0.17</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>13.68</u>
difference lpm: <u>0.00</u>	difference lpm: <u>0.01</u>

K_o Audit:

Last K_o audit date: August 8, 2016
 1405F K_o factor: 14578
 Measured K_o factor: 14731.5000
 % difference: 1.05

Comments:

47 mm FDMS filter was changed and TEOM sample filter was changed. PM 2.5/10 sample inlet head was cleaned. Because the reference leak check was close to the limit the valve was checked for leaks and re-installed. Ko audit completed and PM 2.5/10 sample inlet head cleaned. Flows audited and adjusted.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: August 19, 2016
 Company: LICA
 Station Name/Location: Cold Lake South
 Previous Audit Date: August 8, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
 Start Time (mst): 9:11
 End Time (mst): 10:16
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: Mainly sunny

1400A Information and Status:

Serial Number: 1405A201620804 As Found Filter Loading %: 33.08
 Ko Factor: 14578 As Left Filter Loading %: 26.75
 Ambient Temperature °C: 17.82 As Found Noise: 0.003
 Ambient Pressure atm: 0.944 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.31
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#2</u>	<u>130168457</u>	<u>ID# 4295</u>
Calibration Date:	<u>January 15, 2016</u>	<u>February 7, 2016</u>	<u>November 1, 2015</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.12	0.01	0.13
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.20	0.00	0.20
	limit	0.60	0.60	0.60	0.60

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.12	0.01	0.13
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.20	0.00	0.20
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>17.8</u>	1405F pressure atm: <u>0.944</u>
reference temperature °C: <u>18.4</u>	reference pressure: <u>0.944</u>
difference °C: <u>0.6</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>18.4</u>	1405F pressure atm: <u>0.944</u>
reference temperature °C: <u>18.4</u>	reference pressure: <u>0.944</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>16.49</u>
difference lpm: <u>-0.06</u>	difference lpm: <u>-0.18</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>16.49</u>
difference lpm: <u>-0.06</u>	difference lpm: <u>-0.18</u>

K_o Audit:

Last K_o audit date: August 8, 2016
 1405F K_o factor: 14578
 Measured K_o factor: 14731.5000
 % difference: 1.05

Comments:

47 mm FDMS filter was changed. PM 2.5/10 sample inlet head was cleaned.

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



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-119

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>627</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 1 2015</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</u>		

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5007	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5003	77.5	0.779	0.779	0.787	-0.001	0.786	1%	1%
5004	37.8	0.380	0.380	0.383	0.000	0.383	1%	1%
5001	18.9	0.190	0.190	0.191	0.000	0.191	1%	1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NOx			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	1.0106	0.90-1.10		m (Slope)=	1.0092		
b (Intercept % of FS)=	-0.0566	± 3% F.S.		b (Intercept % of FS)=	-0.0368		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5003	0	0.000	0.787	0.001	0.788	NO ₂	% Diff. Limit
5003	0.5	0.493	0.294	0.498	0.792	1%	± 10%
5003	0.25	0.256	0.531	0.262	0.792	2%	± 10%
5003	0.1	0.108	0.679	0.110	0.789	1%	± 10%
Absolute Average Percent Difference						1.2%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	1.0089	0.90-1.10					
b (Intercept % of FS)=	0.1591	± 3% F.S.					

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model	<u>Thermo 146i</u>
Serial/AMU Number	<u>1809</u>
	Make/Model <u>Thermo 42i</u>
	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>February 1, 2016</u>
	Full Scale (ppm) <u>1</u>

COMMENTS: Flows not manually measured - calibration system audited as it is currently being operated.

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 3, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-165

Company Maxxam Operator: Chris Wesson

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

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

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

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
<u>NO</u>		<u>LIMITS</u>		<u>NOx</u>			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	0.9950	0.90-1.10		m (Slope)=	0.9946		
b (Intercept % of FS)=	-0.0773	± 3% F.S.		b (Intercept % of FS)=	-0.0167		

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5001	0	0.000	0.772	0.000	0.772	NO ₂	% Diff. Limit
5001	0.51	0.507	0.265	0.506	0.772	0%	± 10%
5001	0.25	0.252	0.520	0.254	0.773	1%	± 10%
5001	0.1	0.110	0.662	0.109	0.772	-1%	± 10%
Absolute Average Percent Difference						0.1%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
<u>NO₂</u>		<u>LIMITS</u>					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9992	0.90-1.10					
b (Intercept % of FS)=	0.0171	± 3% F.S.					

AENV Standards		NO _x Analyzer	
Audit Calibrator			
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
		Last Calibration Date	<u>March 28, 2016</u>
		Full Scale (ppm)	<u>1</u>

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

Auditor: Shea Beaton
 Operator Signature:

Date: March 31, 2016
 Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-116CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: LL119346 **Concentration PPM:** 50.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>Thermo146i</u>	Make/Model: <u>Bios DC-2</u>
Serial Number: <u>1809</u>	Serial Number: <u>Bios D</u>
Last Verification Date: <u>February 2, 2016</u>	Temp. °C: <u>24.5</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>702mmHg</u>
Cylinder Number: <u>CAL016625</u>	

Reference Analyzer:
 Make/Model: Thermo 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 8.7 Span: 1.027 Range: 1.0
 Last Calibration: Date: 1-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4952	0.0	0.000	0.01608	62.183	49.3
4946	79.54	0.793	0.01608	62.183	49.3
4941	39.35	0.396	0.00796	125.565	49.7
4940	19.57	0.195	0.00396	252.427	49.2
Average Cylinder Concentration:					49.4

Previous Stated Concentration PPM: 50.0

Percent variance from Stated: 1.2

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO blend 50.0ppm NO
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
 Operator Signature: *[Signature]*

Date: February 2, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam Operator's Name: Limin Li
 Cylinder #: LL36837 Concentration PPM: 10.0 Tolerance(%): 2 Certified By: Air Liquide

Reference Calibrator and Gas:
 Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: December 15, 2014
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:
 Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P.: 702 mmhg

Reference Analyzer:
 Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
 Last Calibration: Date: Dec15/14 C.F.: 1.000 Done By: Al Clark

Calibrator Flows (scem)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	10000.0	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

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: December 16, 2014
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

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

Reference Calibrator and Gas:

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

Flow Measurement Device:

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

Reference Analyzer:

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

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

CH4	C3H8
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. 2015-115CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL119346 **Conc (PPM)** 50.0/50.0 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Thermo 146i</u>			Make/Model	<u>Bios DC-2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>Bios D</u>
Last Verification Date	<u>February 2, 2016</u>			Temp. °C	<u>24.5</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>702mmHg</u>
Cylinder Number	<u>CAL018024</u>				

Reference Analyzer:

Make/Model	<u>Thermo 42i</u>	Serial/AMU Number:	<u>1868</u>
Instrument Settings	Zero: <u>4.2</u>	Span:	<u>1.014</u> Range: <u>1.0</u>
Last Calibration:	Date: <u>02-Feb-16</u>	C.F.	<u>1.000</u> Done By: <u>SB</u>

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
4952	0.0	0.000	0.000				
4946	79.54	0.809	0.809	0.01608	62.183	50.3	50.3
4941	39.35	0.403	0.402	0.00796	125.565	50.6	50.5
4940	19.57	0.200	0.200	0.00396	252.427	50.5	50.5
Average Cylinder Concentration:						50.5	50.4

NO	NOx
Previous Stated Concentration PPM: <u>50.0</u>	<u>50.0</u>
Percent variance from Stated: <u>0.9</u>	<u>0.8</u>

Cylinder gas tolerances based on NO only

- Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS: SO2/NO Blend 50.0PPM SO2**
- < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
- > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: February 2, 2016
 Operator Signature: [Signature] Location: McIntyre Center Edmonton

APPENDIX IV
ANALYTICAL RESULTS

VOCS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 4, 2016	14714	Ambient Air	04-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080076	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080076-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	17-Aug-16
16080076-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	17-Aug-16
16080076-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	17-Aug-16
16080076-001	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	17-Aug-16
16080076-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	17-Aug-16
16080076-001	1,2-Dichloroethane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	17-Aug-16
16080076-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Aug-16
16080076-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Aug-16
16080076-001	1-Butene	I	0.03	ppbv	0.02	AC-058	17-Aug-16
16080076-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	1-Pentene	I	0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	2,2,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	17-Aug-16
16080076-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	2,3-Dimethylpentane	I	0.02	ppbv	0.02	AC-058	17-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Aug 4, 2016	14714	Ambient Air	04-Aug-16 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16080076	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080076-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	2-Methylpentane	I	0.05	ppbv	0.01	AC-058	17-Aug-16
16080076-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	3-Methylpentane	I	0.02	ppbv	0.01	AC-058	17-Aug-16
16080076-001	Acetone		3.2	ppbv	0.4	AC-058	17-Aug-16
16080076-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	17-Aug-16
16080076-001	Benzene	I	0.05	ppbv	0.01	AC-058	17-Aug-16
16080076-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Aug-16
16080076-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	Carbon disulfide	I	0.13	ppbv	0.01	AC-058	17-Aug-16
16080076-001	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	17-Aug-16
16080076-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	Chloroform	I	0.03	ppbv	0.02	AC-058	17-Aug-16
16080076-001	Chloromethane		0.49	ppbv	0.02	AC-058	17-Aug-16
16080076-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	17-Aug-16
16080076-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	Cyclohexane	I	0.02	ppbv	0.02	AC-058	17-Aug-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, September 16, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Aug 4, 2016	14714	Ambient Air	04-Aug-16 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16080076	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080076-001	Cyclopentane	I	0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	Ethanol		0.9	ppbv	0.3	AC-058	17-Aug-16
16080076-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Aug-16
16080076-001	Ethylbenzene	I	0.06	ppbv	0.01	AC-058	17-Aug-16
16080076-001	Freon-11	I	0.25	ppbv	0.02	AC-058	17-Aug-16
16080076-001	Freon-113	I	0.07	ppbv	0.01	AC-058	17-Aug-16
16080076-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	Freon-12		0.54	ppbv	0.02	AC-058	17-Aug-16
16080076-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	17-Aug-16
16080076-001	Isobutane	I	0.16	ppbv	0.02	AC-058	17-Aug-16
16080076-001	Isopentane	I	0.23	ppbv	0.03	AC-058	17-Aug-16
16080076-001	Isoprene		0.89	ppbv	0.01	AC-058	17-Aug-16
16080076-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Aug-16
16080076-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	m,p-Xylene	I	0.13	ppbv	0.03	AC-058	17-Aug-16
16080076-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	17-Aug-16
16080076-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	17-Aug-16
16080076-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	17-Aug-16
16080076-001	Methyl ethyl ketone		0.4	ppbv	0.3	AC-058	17-Aug-16
16080076-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Aug-16
16080076-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	17-Aug-16
16080076-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	17-Aug-16
16080076-001	Methylcyclohexane	I	0.02	ppbv	0.01	AC-058	17-Aug-16
16080076-001	Methylcyclopentane	I	0.03	ppbv	0.02	AC-058	17-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 4, 2016	14714	Ambient Air	04-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080076	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080076-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	17-Aug-16
16080076-001	n-Butane	I	0.20	ppbv	0.03	AC-058	17-Aug-16
16080076-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	17-Aug-16
16080076-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Aug-16
16080076-001	n-Heptane	I	0.03	ppbv	0.01	AC-058	17-Aug-16
16080076-001	n-Hexane	I	0.04	ppbv	0.01	AC-058	17-Aug-16
16080076-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	n-Pentane	I	0.2	ppbv	0.1	AC-058	17-Aug-16
16080076-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	17-Aug-16
16080076-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	17-Aug-16
16080076-001	Naphthalene		0.6	ppbv	0.5	AC-058	17-Aug-16
16080076-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	o-Xylene	I	0.03	ppbv	0.01	AC-058	17-Aug-16
16080076-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	17-Aug-16
16080076-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	17-Aug-16
16080076-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	17-Aug-16
16080076-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	17-Aug-16
16080076-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Aug-16
16080076-001	Toluene	I	0.16	ppbv	0.01	AC-058	17-Aug-16
16080076-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	17-Aug-16
16080076-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080076-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16
16080076-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	17-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 4, 2016	14714	Ambient Air	04-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080076	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080076-001	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Aug-16
16080076-001	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Aug-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, September 16, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA/CLS/VOC/Aug 10, 2016</p> <p>CANISTER ID 14713</p> <p>Matrix Ambient Air</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 10-Aug-16 0:00</p> <p>REPORT CREATED: 16-Sep-16</p> <p>DATE RECEIVED: 15-Aug-16</p> <p>REPORT NUMBER: 16080119</p> <p>VERSION: Version 01</p>
--	--

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080119-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080119-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Aug-16
16080119-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	25-Aug-16
16080119-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080119-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080119-003	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	1,2-Dichloropropane	I	0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Aug-16
16080119-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080119-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080119-003	1-Butene	I	0.05	ppbv	0.02	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/CLS/VOC/Aug 10, 2016	14713	Ambient Air	10-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080119	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080119-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	1-Pentene	I	0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	2,2,4-Trimethylpentane	I	0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	2-Methylpentane	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080119-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	3-Methylhexane	I	0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	3-Methylpentane	I	0.02	ppbv	0.01	AC-058	25-Aug-16
16080119-003	Acetone		5.7	ppbv	0.4	AC-058	25-Aug-16
16080119-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Aug-16
16080119-003	Benzene	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080119-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080119-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	Bromomethane	I	0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	25-Aug-16
16080119-003	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	25-Aug-16
16080119-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/CLS/VOC/Aug 10, 2016	14713	Ambient Air	10-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080119	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080119-003	Chloroform	I	0.03	ppbv	0.02	AC-058	25-Aug-16
16080119-003	Chloromethane		0.59	ppbv	0.02	AC-058	25-Aug-16
16080119-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080119-003	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	Ethanol		1.1	ppbv	0.3	AC-058	25-Aug-16
16080119-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080119-003	Ethylbenzene	I	0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	Freon-11	I	0.26	ppbv	0.02	AC-058	25-Aug-16
16080119-003	Freon-113	I	0.08	ppbv	0.01	AC-058	25-Aug-16
16080119-003	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	Freon-12		0.56	ppbv	0.02	AC-058	25-Aug-16
16080119-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Aug-16
16080119-003	Isobutane	I	0.22	ppbv	0.02	AC-058	25-Aug-16
16080119-003	Isopentane	I	0.30	ppbv	0.03	AC-058	25-Aug-16
16080119-003	Isoprene	I	0.23	ppbv	0.01	AC-058	25-Aug-16
16080119-003	Isopropyl alcohol		0.4	ppbv	0.4	AC-058	25-Aug-16
16080119-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080119-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080119-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/CLS/VOC/Aug 10, 2016	14713	Ambient Air	10-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080119	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080119-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Aug-16
16080119-003	Methyl ethyl ketone		0.3	ppbv	0.3	AC-058	25-Aug-16
16080119-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080119-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Aug-16
16080119-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080119-003	Methylcyclohexane	I	0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	Methylcyclopentane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Aug-16
16080119-003	n-Butane		0.31	ppbv	0.03	AC-058	25-Aug-16
16080119-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	25-Aug-16
16080119-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080119-003	n-Heptane	I	0.02	ppbv	0.01	AC-058	25-Aug-16
16080119-003	n-Hexane	I	0.04	ppbv	0.01	AC-058	25-Aug-16
16080119-003	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	25-Aug-16
16080119-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Aug-16
16080119-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080119-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080119-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080119-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Aug-16
16080119-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080119-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/CLS/VOC/Aug 10, 2016	14713	Ambient Air	10-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080119	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080119-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080119-003	Toluene	I	0.04	ppbv	0.01	AC-058	25-Aug-16
16080119-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080119-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080119-003	trans-2-Butene	I	0.02	ppbv	0.01	AC-058	25-Aug-16
16080119-003	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080119-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080119-003	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080119-003	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, September 16, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 16, 2016	15004	Ambient Air	16-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Aug-16
16080238-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	25-Aug-16
16080238-001	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-001	1,2-Dichloroethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Aug-16
16080238-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-001	1-Butene	I	0.06	ppbv	0.02	AC-058	25-Aug-16
16080238-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	1-Pentene	I	0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	2,2,4-Trimethylpentane	I	0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Aug 16, 2016	15004	Ambient Air	16-Aug-16 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	2-Methylpentane	I	0.04	ppbv	0.01	AC-058	25-Aug-16
16080238-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	3-Methylhexane	I	0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	3-Methylpentane	I	0.02	ppbv	0.01	AC-058	25-Aug-16
16080238-001	Acetone		4.7	ppbv	0.4	AC-058	25-Aug-16
16080238-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Aug-16
16080238-001	Benzene	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080238-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	Bromomethane	I	0.02	ppbv	0.01	AC-058	25-Aug-16
16080238-001	Carbon disulfide	I	0.04	ppbv	0.01	AC-058	25-Aug-16
16080238-001	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	25-Aug-16
16080238-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	Chloroform	I	0.03	ppbv	0.02	AC-058	25-Aug-16
16080238-001	Chloromethane		0.64	ppbv	0.02	AC-058	25-Aug-16
16080238-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	Cyclohexane	I	0.03	ppbv	0.02	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 16, 2016	15004	Ambient Air	16-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	Ethanol		0.7	ppbv	0.3	AC-058	25-Aug-16
16080238-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-001	Ethylbenzene	I	0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	Freon-11	I	0.25	ppbv	0.02	AC-058	25-Aug-16
16080238-001	Freon-113	I	0.08	ppbv	0.01	AC-058	25-Aug-16
16080238-001	Freon-114	I	0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	Freon-12		0.58	ppbv	0.02	AC-058	25-Aug-16
16080238-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Aug-16
16080238-001	Isobutane	I	0.25	ppbv	0.02	AC-058	25-Aug-16
16080238-001	Isopentane	I	0.24	ppbv	0.03	AC-058	25-Aug-16
16080238-001	Isoprene		1.08	ppbv	0.01	AC-058	25-Aug-16
16080238-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	25-Aug-16
16080238-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Aug-16
16080238-001	Methyl ethyl ketone		0.4	ppbv	0.3	AC-058	25-Aug-16
16080238-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Aug-16
16080238-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-001	Methylcyclohexane	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080238-001	Methylcyclopentane	I	0.04	ppbv	0.02	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 16, 2016	15004	Ambient Air	16-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Aug-16
16080238-001	n-Butane		0.32	ppbv	0.03	AC-058	25-Aug-16
16080238-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	25-Aug-16
16080238-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-001	n-Heptane	I	0.02	ppbv	0.01	AC-058	25-Aug-16
16080238-001	n-Hexane	I	0.05	ppbv	0.01	AC-058	25-Aug-16
16080238-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	25-Aug-16
16080238-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Aug-16
16080238-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080238-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080238-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Aug-16
16080238-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-001	Toluene	I	0.06	ppbv	0.01	AC-058	25-Aug-16
16080238-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-001	trans-2-Butene	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080238-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 16, 2016	15004	Ambient Air	16-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-001	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-001	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, September 16, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 22, 2016	S5649	Ambient Air	22-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080288	REPORT CREATED:	22-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080288-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16
16080288-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Sep-16
16080288-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	03-Sep-16
16080288-001	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Sep-16
16080288-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Sep-16
16080288-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Sep-16
16080288-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-001	1-Butene	I	0.03	ppbv	0.02	AC-058	03-Sep-16
16080288-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	1-Pentene	I	0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	2,2,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	03-Sep-16
16080288-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	2,3-Dimethylpentane	I	0.02	ppbv	0.02	AC-058	03-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Thursday, September 22, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 22, 2016	S5649	Ambient Air	22-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080288	REPORT CREATED:	22-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080288-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	2-Methylhexane	I	0.04	ppbv	0.01	AC-058	03-Sep-16
16080288-001	2-Methylpentane	I	0.03	ppbv	0.01	AC-058	03-Sep-16
16080288-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	3-Methylpentane	I	0.02	ppbv	0.01	AC-058	03-Sep-16
16080288-001	Acetone		3.7	ppbv	0.4	AC-058	03-Sep-16
16080288-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Sep-16
16080288-001	Benzene	I	0.03	ppbv	0.01	AC-058	03-Sep-16
16080288-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	Bromomethane	I	0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	Carbon disulfide	I	0.08	ppbv	0.01	AC-058	03-Sep-16
16080288-001	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	03-Sep-16
16080288-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	Chloroform	I	0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	Chloromethane		0.53	ppbv	0.02	AC-058	03-Sep-16
16080288-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16
16080288-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Thursday, September 22, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 22, 2016	S5649	Ambient Air	22-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080288	REPORT CREATED:	22-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080288-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	Ethanol		1.2	ppbv	0.3	AC-058	03-Sep-16
16080288-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-001	Ethylbenzene	I	0.02	ppbv	0.01	AC-058	03-Sep-16
16080288-001	Freon-11	I	0.29	ppbv	0.02	AC-058	03-Sep-16
16080288-001	Freon-113	I	0.08	ppbv	0.01	AC-058	03-Sep-16
16080288-001	Freon-114	I	0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	Freon-12		0.67	ppbv	0.02	AC-058	03-Sep-16
16080288-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Sep-16
16080288-001	Isobutane	I	0.17	ppbv	0.02	AC-058	03-Sep-16
16080288-001	Isopentane	I	0.21	ppbv	0.03	AC-058	03-Sep-16
16080288-001	Isoprene		0.63	ppbv	0.01	AC-058	03-Sep-16
16080288-001	Isopropyl alcohol		1.6	ppbv	0.4	AC-058	03-Sep-16
16080288-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	m,p-Xylene	I	0.05	ppbv	0.03	AC-058	03-Sep-16
16080288-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16
16080288-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	03-Sep-16
16080288-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Sep-16
16080288-001	Methyl ethyl ketone		0.3	ppbv	0.3	AC-058	03-Sep-16
16080288-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Sep-16
16080288-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Sep-16
16080288-001	Methylcyclohexane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	Methylcyclopentane	I	0.02	ppbv	0.02	AC-058	03-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Thursday, September 22, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 22, 2016	S5649	Ambient Air	22-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080288	REPORT CREATED:	22-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080288-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Sep-16
16080288-001	n-Butane	I	0.27	ppbv	0.03	AC-058	03-Sep-16
16080288-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Sep-16
16080288-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-001	n-Heptane	I	0.02	ppbv	0.01	AC-058	03-Sep-16
16080288-001	n-Hexane	I	0.03	ppbv	0.01	AC-058	03-Sep-16
16080288-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	03-Sep-16
16080288-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Sep-16
16080288-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Sep-16
16080288-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Sep-16
16080288-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	o-Xylene	I	0.02	ppbv	0.01	AC-058	03-Sep-16
16080288-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16
16080288-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Sep-16
16080288-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16
16080288-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16
16080288-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-001	Toluene	I	0.08	ppbv	0.01	AC-058	03-Sep-16
16080288-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16
16080288-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Thursday, September 22, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 22, 2016	S5649	Ambient Air	22-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080288	REPORT CREATED:	22-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16080288-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Sep-16
16080288-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Thursday, September 22, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 28, 2016	S5632	Ambient Air	28-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16	REPORT REVISED: 30-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-004	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16
16090012-004	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	04-Sep-16
16090012-004	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	04-Sep-16
16090012-004	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-004	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-004	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Sep-16
16090012-004	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-004	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-004	1-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	2,2-Dimethylbutane	I	0.02	ppbv	0.01	AC-058	04-Sep-16
16090012-004	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16

Report certified by:	Graham Knox, Team Lead	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services	
Date:	September-30-16	Inquiries:	(780) 632 8455	E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 28, 2016	S5632	Ambient Air	28-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16	REPORT REVISED: 30-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-004	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	2-Methylhexane	I	0.03	ppbv	0.01	AC-058	04-Sep-16
16090012-004	2-Methylpentane	I	0.04	ppbv	0.01	AC-058	04-Sep-16
16090012-004	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	3-Methylhexane	I	0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	3-Methylpentane	I	0.03	ppbv	0.01	AC-058	04-Sep-16
16090012-004	Acetone		1.9	ppbv	0.4	AC-058	04-Sep-16
16090012-004	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Sep-16
16090012-004	Benzene	I	0.11	ppbv	0.01	AC-058	04-Sep-16
16090012-004	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-004	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	Bromomethane	I	0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	04-Sep-16
16090012-004	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	04-Sep-16
16090012-004	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	Chloroform	I	0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	Chloromethane		0.49	ppbv	0.02	AC-058	04-Sep-16
16090012-004	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16
16090012-004	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	Cyclohexane	I	0.03	ppbv	0.02	AC-058	04-Sep-16

Report certified by:	Graham Knox, Team Lead	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services	
Date:	September-30-16	Inquiries:	(780) 632 8455	E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 28, 2016	S5632	Ambient Air	28-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16	REPORT REVISED: 30-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-004	Cyclopentane	I	0.02	ppbv	0.01	AC-058	04-Sep-16
16090012-004	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	Ethanol		0.4	ppbv	0.3	AC-058	04-Sep-16
16090012-004	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-004	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	Freon-11		0.32	ppbv	0.02	AC-058	04-Sep-16
16090012-004	Freon-113	I	0.08	ppbv	0.01	AC-058	04-Sep-16
16090012-004	Freon-114	I	0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	Freon-12		0.71	ppbv	0.02	AC-058	04-Sep-16
16090012-004	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	04-Sep-16
16090012-004	Isobutane	I	0.15	ppbv	0.02	AC-058	04-Sep-16
16090012-004	Isopentane	I	0.19	ppbv	0.03	AC-058	04-Sep-16
16090012-004	Isoprene	I	0.08	ppbv	0.01	AC-058	04-Sep-16
16090012-004	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-004	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-004	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16
16090012-004	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	04-Sep-16
16090012-004	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	04-Sep-16
16090012-004	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Sep-16
16090012-004	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-004	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Sep-16
16090012-004	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-004	Methylcyclohexane	I	0.04	ppbv	0.01	AC-058	04-Sep-16
16090012-004	Methylcyclopentane	I	0.04	ppbv	0.02	AC-058	04-Sep-16

Report certified by:	Graham Knox, Team Lead	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services	
Date:	September-30-16	Inquiries:	(780) 632 8455	E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 28, 2016	S5632	Ambient Air	28-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16	REPORT REVISED: 30-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-004	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Sep-16
16090012-004	n-Butane	I	0.18	ppbv	0.03	AC-058	04-Sep-16
16090012-004	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	04-Sep-16
16090012-004	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-004	n-Heptane	I	0.02	ppbv	0.01	AC-058	04-Sep-16
16090012-004	n-Hexane	I	0.03	ppbv	0.01	AC-058	04-Sep-16
16090012-004	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	04-Sep-16
16090012-004	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	04-Sep-16
16090012-004	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	04-Sep-16
16090012-004	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	04-Sep-16
16090012-004	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16
16090012-004	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Sep-16
16090012-004	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16
16090012-004	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16
16090012-004	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-004	Toluene	I	0.19	ppbv	0.01	AC-058	04-Sep-16
16090012-004	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16
16090012-004	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-004	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-004	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16

Report certified by:	Graham Knox, Team Lead	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services	
Date:	September-30-16	Inquiries:	(780) 632 8455	E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Aug 28, 2016	S5632	Ambient Air	28-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16	REPORT REVISED: 30-Sep-16
				VERSION: Version 02

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090012-004	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	04-Sep-16
16090012-004	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	04-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: September-30-16	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

PAHS SAMPLES

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA/PUF/CLS/Aug 4, 2016</p> <p>CANISTER ID TE-05</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 04-Aug-16 0:00</p> <p>REPORT CREATED: 16-Sep-16</p> <p>DATE RECEIVED: 10-Aug-16</p> <p>REPORT NUMBER: 16080076</p> <p>VERSION: Version 01</p>
--	--

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080076-002	1-Methylnaphthalene		0.10	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	2-Methylnaphthalene		0.18	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Acenaphthene		0.05	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Acenaphthylene		0.02	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Anthracene		0.03	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Aug 4, 2016	TE-05	Air Filter	04-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080076	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080076-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Fluoranthene		0.04	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Fluorene		0.07	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Naphthalene		0.09	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Phenanthrene		0.34	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Pyrene		0.02	ug/puf	0.01	NA-017	02-Sep-16
16080076-002	Retene		0.02	ug/puf	0.01	NA-017	02-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, September 16, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Aug 10, 2016	TE06	Air Filter	10-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080119	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080119-004	1-Methylnaphthalene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	2-Methylnaphthalene		0.02	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Acenaphthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Acenaphthylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Anthracene		0.02	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Fluoranthene		0.03	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Fluorene		0.02	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Naphthalene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Phenanthrene		0.17	ug/puf	0.01	NA-017	02-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Aug 10, 2016	TE06	Air Filter	10-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080119	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080119-004	Pyrene		0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-004	Retene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, September 16, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/CLS/Aug 16, 2016	TE-08	Air Filter	16-Aug-16 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-002	1-Methylnaphthalene		0.02	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	2-Methylnaphthalene		0.04	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Acenaphthene		0.04	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Acenaphthylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Anthracene		0.02	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Fluoranthene		0.04	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Fluorene		0.05	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Naphthalene		0.02	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Phenanthrene		0.30	ug/puf	0.01	NA-017	02-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Aug 16, 2016	TE-08	Air Filter	16-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-002	Pyrene		0.02	ug/puf	0.01	NA-017	02-Sep-16
16080238-002	Retene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, September 16, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Aug 22, 2016	TE-02	Air Filter	22-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080288	REPORT CREATED:	22-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080288-002	1-Methylnaphthalene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	2-Methylnaphthalene		0.02	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Acenaphthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Acenaphthylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Anthracene		0.02	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Fluoranthene		0.02	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Fluorene		0.03	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Naphthalene		0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Phenanthrene		0.15	ug/puf	0.01	NA-017	13-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Thursday, September 22, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Aug 22, 2016	TE-02	Air Filter	22-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16080288	REPORT CREATED:	22-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080288-002	Pyrene		0.02	ug/puf	0.01	NA-017	13-Sep-16
16080288-002	Retene		0.01	ug/puf	0.01	NA-017	13-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Thursday, September 22, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Aug 28, 2016	TE04	Air Filter	28-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16	REPORT REVISED: 30-Sep-16
				VERSION: Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-005	1-Methylnaphthalene		0.03	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	2-Methylnaphthalene		0.06	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Acenaphthene		0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Acenaphthylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Anthracene		0.02	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Fluoranthene		0.02	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Fluorene		0.04	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Naphthalene		0.03	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Phenanthrene		0.10	ug/puf	0.01	NA-017	13-Sep-16

Report certified by:	Graham Knox, Team Lead	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services	
Date:	September-30-16	Inquiries:	(780) 632 8455	E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Aug 28, 2016	TE04	Air Filter	28-Aug-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16	REPORT REVISED: 30-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090012-005	Pyrene		0.01 ug/puf	0.01	NA-017	13-Sep-16
16090012-005	Retene		0.03 ug/puf	0.01	NA-017	13-Sep-16

Report certified by:	Graham Knox, Team Lead	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services		
Date:	September-30-16	Inquiries:	(780) 632 8455	E-mail:	EAS.Results@albertainnovates.ca

PARTISOL SAMPLES

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA #P6024414</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 04-Aug-16 0:00</p> <p>REPORT CREATED: 17-Aug-16</p> <p>DATE RECEIVED: 10-Aug-16</p> <p>REPORT NUMBER: 16080075</p> <p>VERSION: Version 01</p>
--	--

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16080075-001	Particulate Weight		0.045 mg	0.004	AC-029	16-Aug-16

Report certified by: Graham Knox, Team Lead **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: August 17, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA Filt #P6024415</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 10-Aug-16 0:00</p> <p>REPORT CREATED: 17-Aug-16</p> <p>DATE RECEIVED: 15-Aug-16</p> <p>REPORT NUMBER: 16080120</p> <p>VERSION: Version 01</p>
---	--

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16080120-001	Particulate Weight		0.052 mg	0.004	AC-029	16-Aug-16

Report certified by: Graham Knox, Team Lead **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: August 17, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID P6029152</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION:</p> <p>DATE SAMPLED: 16-Aug-16 0:00 DATE RECEIVED: 23-Aug-16</p> <p>REPORT CREATED: 22-Sep-16 REPORT NUMBER: 16080237</p> <p>VERSION: Version 01</p>
--	--

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16080237-001	Particulate Weight		0.085 mg	0.004	AC-029	25-Aug-16

Report certified by: Graham Knox, Team Lead **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: Thursday, September 22, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID P6029151</p> <p>CANISTER ID</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 22-Aug-16 0:00</p> <p>REPORT CREATED: 22-Sep-16</p>	<p>Matrix Air Filter</p> <p>DATE RECEIVED: 25-Aug-16</p> <p>REPORT NUMBER: 16080286</p> <p>VERSION: Version 01</p>	<p>Priority Normal</p>
--	---	--	-----------------------------------

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16080286-001	Particulate Weight		0.040 mg	0.004	AC-029	30-Aug-16

Report certified by: Graham Knox, Team Lead **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: Thursday, September 22, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID P6028886</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 28-Aug-16 0:00</p> <p>REPORT CREATED: 06-Oct-16</p> <p>DATE RECEIVED: 01-Sep-16</p> <p>REPORT NUMBER: 16090010</p> <p>VERSION: Version 01</p>
--	--

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090010-001	Particulate Weight		0.020 mg	0.004	AC-029	02-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October-06-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

APPENDIX V
REPORT CERTIFICATION FORM

Report Certification Form

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

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



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

06-10-2016




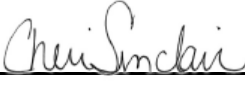
Report Issued Date (dd-mm-yyyy)

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



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2016-08-1- C</u>
Site: <u>Cold Lake South Site</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u></u>	Date <u>28-Sep-2016</u>
Level 1 Primary Validation	<u></u>	Date <u>28-Sep-2016</u>
Level 2 Final Validation	<u></u>	Date <u>06-Oct-2016</u>
Level 3 Independent Data Review	<u></u>	Date <u>06-Oct-2016</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

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



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

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

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

JOB #: 2833-2016-08-30-C

August 2016

Prepared for:

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

Attention: MIKE BISAGA

DATE: **September 28, 2016**

Prepared by: 

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

Reviewed by: 

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

SUMMARY

In August 2016, the Air Services Group of Maxxam Analytics managed the ambient air quality monitoring and maintenance activities on the Maskwa Site at Lakeland Industry & Community Association, near Cold Lake, Alberta. Sampling was carried out to determine the concentrations of non-compliance parameters, as requested by the Project Coordinator.

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 and meteorological sensors were above the 90% requirement.

- SO₂: Twelve hours of downtime were recorded this month due to additional quality checks performed to address a zero drift trend.
- H₂S: Twelve hours of downtime were recorded this month due to additional quality checks performed to address a zero drift trend.
- NO₂: Fourteen hours of downtime were recorded this month. Nine hours were attributed to additional quality checks performed to address a zero drift trend and five hours were incurred to reinstate the LICA owned analyzer. The resident analyzer was removed in July for off site maintenance and was re-installed following the required repairs.

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 is issuing this completed report to Lakeland Industry & Community Association, Maskwa Site.

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 (%)
Maskwa Site						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-HR	24-HR	1-HR	24-HR									
SO ₂ (ppb)	172	48	0	0	0.4	9.5	12	3	3.5	WNW	2.3	31	98.4
H ₂ S (ppb)	10	3	0	0	0.4	4.0	20	5	0.8	S	2.0	20	98.4
THC (ppm)	-	-	-	-	2.06	2.64	15, 20	6	2.7 1.3	SSW W	2.19	19	100.0
NO ₂ (ppb)	159	-	0	-	2.2	12.5	11, 28	23, 8	4.0 9.3	WNW	5.6	17	98.0
NO (ppb)	-	-	-	-	0.9	23.6	12	3	3.5	WNW	3.9	12	98.1
NO _x (ppb)	-	-	-	-	3.1	35.3	12	3	3.5	WNW	8.6	17	98.1
RELATIVE HUMIDITY (%)	-	-	-	-	73	94	VAR	VAR	VAR	VAR	89	9	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	943	954	30	10	7.1	ESE	952	30	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	16.0	29.7	16	13	8.1	SW	19.1	7	100.0
PRECIPITATION (mm)	-	-	-	-	0.2	24.2	22	18	10.6	ENE	2.9	22	100.0
VECTOR WS (kph)	-	-	-	-	4.6	20.2	22	10	-	NE	11.3	22	100.0
VECTOR WD (sec)	-	-	-	-	-	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedance Summary Report

SO₂ 1- Hour Exceedances

No Exceedances Recorded During the Month

SO₂ 24- Hour Exceedances

No Exceedances Recorded During the Month

H₂S 1- Hour Exceedances

No Exceedances Recorded During the Month

H₂S 24- Hour Exceedances

No Exceedances Recorded During the Month

NO₂ 1- Hour Exceedances

No Exceedances Recorded During the Month

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
SUMMARY	1
MONTHLY CONTINUOUS DATA SUMMARY REPORT	2
EXCEEDANCE SUMMARY REPORT	3
TABLE OF CONTENTS	4
1.0 Discussion	5
2.0 Project Personnel	8
3.0 Plant Monthly Required AMD Summary	8
4.0 Calculations and Results	8
5.0 Methods and Procedures	9
Appendix I	Continuous Monitoring Data Results 12
	Sulphur Dioxide 13
	Hydrogen Sulphide 21
	Total Hydrocarbon 29
	Oxides of Nitrogen 37
	Nitric Oxides 45
	Nitrogen Dioxide 52
	Wind Speed 60
	Wind Direction 67
	Standard Deviation Wind Direction 70
	Relative Humidity 73
	Barometric Pressure 76
	Ambient Temperature 79
	Precipitation 82
Appendix II	Equipment Calibration Results 85
	Sulphur Dioxide 86
	Hydrogen Sulphide 95
	Total Hydrocarbon 100
	Nitrogen Dioxide 103
	Wind System 114
	Meteorological System Check 116
	Calibrators 118
	Calibration Gases 122
Appendix III	Report Certification Form 128
Appendix IV	Data Validation Certification Form 130

1.0 Discussion

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

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

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

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

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

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

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time (minimum), on a monthly basis.

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

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

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

Trailer inspection was conducted on August 12. No issues were identified.

SULPHUR DIOXIDE (SO₂)

The routine monthly calibration was performed on August 4. To address a zero drift issue, the calibration was repeated on August 12 and August 24 and an as-found response check was completed on August 29. As all calibration results met AMD requirements, no data was discarded due to this issue. However, twelve hours of downtime were recorded due to the additional quality checks. Maximum instantaneous data collected on August 13, at hour 13:00, was invalidated due to a brief power outage.

HYDROGEN SULPHIDE (H₂S)

The daily zero reading drifted low on August 14. The zero check was repeated on August 15 as a corrective action. The routine monthly calibration was performed on August 15. The zero drift issue returned on August 25. A repeat calibration was successfully completed on August 26 following several troubleshooting activities. As both calibration results met AMD requirements, no data was discarded due to this issue. However, twelve hours of downtime were recorded due to the additional quality checks. Maximum instantaneous data collected on August 13, at hour 13:00, was invalidated due to a brief power outage.

TOTAL HYDROCARBONS (THC)

No operational issues were identified this month. The routine monthly calibration was performed on August 17, during which the Hydrogen fuel gas cylinder was replaced. Maximum instantaneous data collected on August 13, at hour 13:00, was invalidated due to a brief power outage.

NITROGEN DIOXIDE (NO₂)

The analyzer spanned low on August 12. The span check was repeated but the result was outside acceptance limits. An as-found response check was performed on August 13, confirming analyzer performance. The routine monthly calibration was performed on August 15. Following a successful shut-down calibration on August 17, the Maxxam-supplied API 200A (S/N: 2166) was replaced with the LICA-owned API 200A (S/N: 2051) after the latter had undergone maintenance at Maxxam's facility. An installation calibration was completed afterwards. Fourteen hours of downtime were recorded due to the additional quality checks and the analyzer replacement event. Maximum instantaneous data collected on August 13, at hour 13:00, was invalidated due to a brief power outage.

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

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was blowing from.

No operational issues were identified this month. Maximum instantaneous data collected on August 13, at hour 13:00, was invalidated due to a brief power outage.

RELATIVE HUMIDITY (RH)

No operational issues were identified this month.

BAROMETRIC PRESSURE (BP)

No operational issues were identified this month.

PRECIPITATION

No operational issues were identified this month. A quality check was performed on the precipitation sensor on August 15.

AMBIENT TEMPERATURE (AmbTPX)

No operational issues were identified this month.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technicians were Limin Li and 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 and meteorological sensors 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 test program:

- Maxxam AIR SOP-00209: Ambient H₂S Monitoring
- Maxxam AIR SOP-00211: Ambient SO₂ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00242: Precipitation Collector Installation /Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

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

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

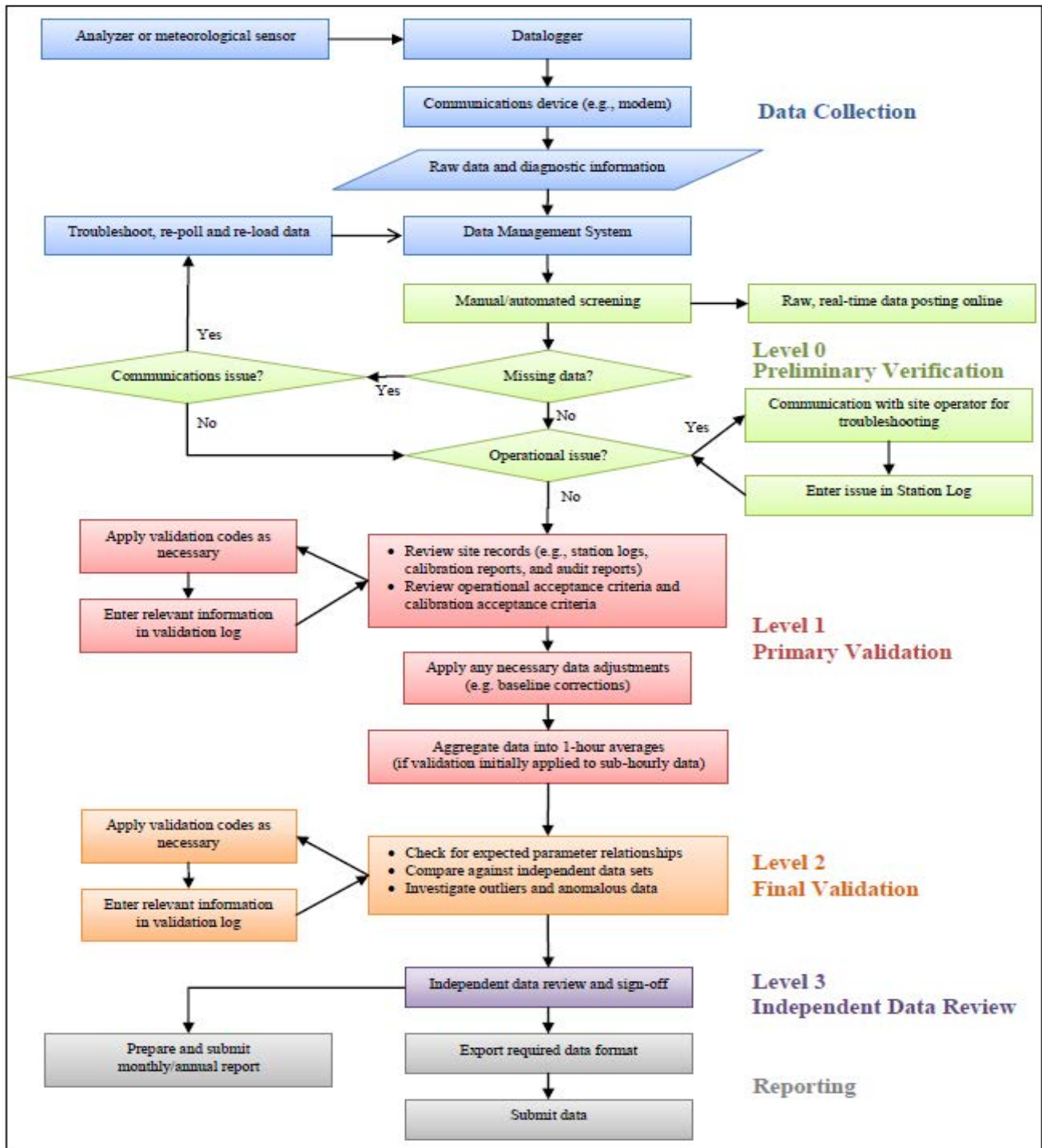
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE (SO₂) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.	
DAY	MIN.	MAX.	AVG.																											
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	0.3	0.9	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.1	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	1.5	0.7	0.8	1.1	1.5	1.3	1.0	1.0	0.5	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.4	24
3	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0	3.2	0.1	24	
4	0.0	0.0	0.0	0.0	S	0.1	0.8	1.1	1.5	1.8	2.1	2.4	2.8	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.7	24	
5	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24	
6	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.1	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	2.1	0.1	24	
7	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1	24	
8	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.1	S	0.0	1.1	0.1	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	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.3	0.0	24	
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	3.3	0.0	0.0	0.0	0.6	0.5	0.0	0.0	0.0	0.4	S	0.0	0.0	0.0	5.0	5.0	0.5	24	
12	1.6	0.9	3.6	9.5	2.0	2.7	4.7	4.3	4.7	3.8	C1	C1	C1	C1	C1	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	9.5	2.1	19	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	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	0.2	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	1.8	0.1	24	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	2.5	0.2	24	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.3	0.1	0.0	0.0	0.5	2.4	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.2	24	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.5	2.3	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.4	0.0	S	4.9	3.7	0.0	0.0	0.0	0.0	0.0	4.9	0.7	24	
18	0.4	4.2	6.1	1.4	1.7	0.9	5.6	1.8	0.2	0.2	0.5	0.0	2.7	1.4	0.0	0.0	0.5	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	1.2	24	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.5	0.0	0.0	24	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
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	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
24	0.3	0.0	0.5	0.1	0.0	0.0	1.9	4.0	3.2	1.2	5.1	S	0.8	1.9	C1	C1	C1	C1	0.0	0.0	0.1	2.3	0.0	0.0	0.0	0.0	5.1	1.1	20	
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.2	0.0	S	0.9	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	1.1	0.1	24	
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	S	0.7	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	0.2	0.7	0.1	24	
27	0.4	0.2	0.2	0.4	0.6	0.5	0.3	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.2	24	
28	0.0	0.0	0.0	0.0	0.3	2.9	0.9	S	3.0	2.4	3.0	3.3	2.5	4.1	1.6	2.6	2.7	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	1.3	24	
29	0.0	0.0	0.0	0.0	0.0	0.0	S	S1	0.0	1.1	C1	C1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.1	21	
30	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.9	0.6	0.4	0.0	0.4	0.0	0.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.1	24	
31	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	1.8	0.3	1.8	3.1	2.4	3.4	3.5	3.7	5.3	4.1	2.7	5.1	7.0	5.5	4.3	0.0	7.0	2.3	24		
HOURLY MAX	1.6	4.2	6.1	9.5	2.0	2.9	5.6	4.3	4.7	3.8	5.1	3.3	3.1	4.1	3.4	3.5	3.7	5.3	4.1	4.9	5.1	7.0	5.5	5.0						
HOURLY AVG	0.1	0.2	0.3	0.4	0.2	0.2	0.5	0.6	0.6	0.7	0.7	0.4	0.5	0.4	0.3	0.4	0.3	0.3	0.2	0.3	0.4	0.4	0.2	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

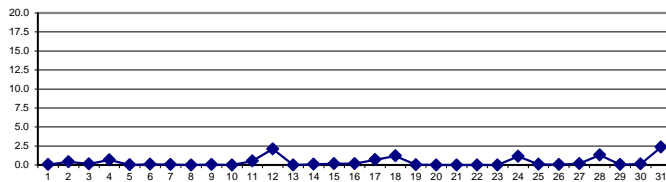
OBJECTIVE LIMIT:

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

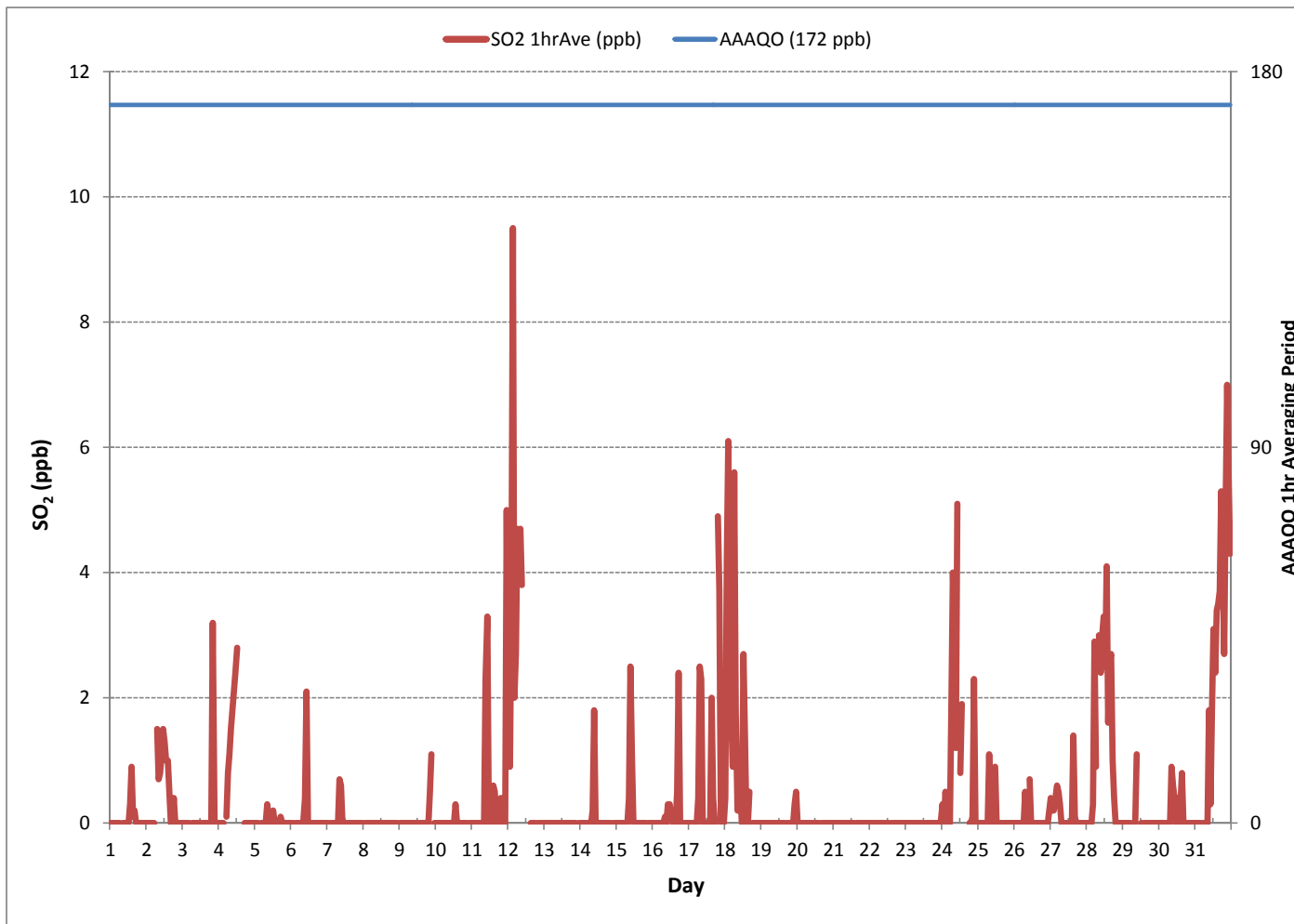
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	147			
MINIMUM 1-HR AVERAGE	0.0 PPB @ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	9.5 PPB @ HOUR(S)	3	ON DAY(S)	12
MAXIMUM 24-HR AVERAGE:	2.3 PPB		ON DAY(S)	31
			VAR-VARIOUS	
IZS CALIBRATION TIME:	32 HRS	OPERATIONAL TIME:	732 HRS	
MONTHLY CALIBRATION TIME:	4 HRS	AMD OPERATION UPTIME:	98.4 %	
STANDARD DEVIATION:	1.05	MONTHLY AVERAGE:	0.4 PPB	

24 HOUR AVERAGES FOR August 2016



SULPHUR DIOXIDE (SO₂) hourly averages in ppb



SULPHUR DIOXIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR		
DAY	MIN.	MAX.	AVG.	RDGS.																										
1	4.4	4.5	4.5	4.5	4.7	4.6	4.5	S	4.4	4.6	5.7	5.7	4.7	7.1	9.0	6.3	9.3	7.8	4.7	4.7	4.7	4.5	4.4	4.4	4.4	4.4	4.4	9.3	5.4	24
2	4.4	4.4	4.5	4.4	4.4	4.9	S	8.4	7.3	8.0	10.2	14.8	9.3	8.5	8.6	11.4	4.9	6.0	7.4	5.5	5.5	5.1	4.8	4.7	4.4	14.8	6.8	24		
3	4.7	4.7	4.9	4.8	4.9	S	4.7	5.0	5.1	5.0	5.0	5.0	5.0	5.0	4.9	4.9	5.2	5.0	5.3	5.3	15.6	5.5	5.6	5.2	4.7	15.6	5.5	24		
4	5.2	5.2	5.2	5.2	S	5.2	5.5	5.3	5.3	5.4	5.3	5.2	C	C	C	C	C	2.6	1.0	1.0	1.0	1.0	0.8	0.8	0.8	5.5	3.7	24		
5	0.7	0.9	0.8	S	1.0	0.8	0.9	1.0	2.4	2.4	1.5	1.4	2.5	1.6	1.8	1.5	1.3	3.2	1.2	1.2	1.1	1.1	1.0	1.0	0.7	3.2	1.4	24		
6	1.3	1.0	S	1.2	1.2	1.2	1.1	1.2	1.8	6.0	5.7	2.3	1.4	1.5	1.6	1.7	2.8	2.1	1.5	1.5	1.5	1.5	1.5	1.6	1.0	6.0	1.9	24		
7	1.5	S	1.6	1.5	1.7	1.7	1.8	1.8	4.5	3.5	2.6	2.4	2.2	2.0	2.2	2.2	2.2	2.0	2.3	2.4	2.3	2.3	2.4	2.6	1.5	4.5	2.2	24		
8	S	2.2	2.2	2.2	2.4	2.4	2.4	2.4	2.3	2.6	2.6	2.5	2.5	2.6	2.6	2.6	2.7	2.6	2.6	2.6	2.6	2.6	4.1	2.8	S	2.2	4.1	2.6	24	
9	2.5	2.5	2.6	2.6	2.6	3.3	2.9	3.0	2.6	2.5	2.5	2.6	3.6	3.7	3.0	3.7	2.9	2.9	2.9	3.6	4.9	5.4	S	3.2	2.5	5.4	3.1	24		
10	3.0	2.9	3.0	3.0	3.0	3.1	2.8	3.2	3.2	3.2	3.2	3.2	3.3	4.6	4.1	3.7	3.8	3.4	3.2	3.2	3.2	S	3.2	3.3	2.8	4.6	3.3	24		
11	3.2	3.2	3.2	3.4	3.2	3.3	3.4	3.7	3.9	8.5	8.6	4.6	3.7	3.5	8.0	5.2	4.4	3.9	4.4	5.0	S	3.7	3.4	12.8	3.2	12.8	4.8	24		
12	6.9	4.4	10.8	13.6	8.2	7.1	8.2	9.9	9.7	11.3	C1	C1	C1	C1	C1	1.5	2.2	1.4	1.5	S	1.6	1.6	1.5	1.6	1.4	13.6	5.7	19		
13	1.5	1.5	1.5	1.5	1.5	1.5	1.8	1.8	1.8	1.8	1.8	1.8	2.1	P	1.8	1.8	1.9	2.0	1.9	2.1	2.0	2.0	S	2.0	1.5	2.1	1.8	23		
14	2.0	1.9	1.8	2.0	2.0	2.1	2.1	2.3	3.1	6.9	3.6	2.5	2.5	2.5	2.3	2.5	2.5	2.4	3.3	2.4	2.3	S	2.0	2.2	1.8	6.9	2.6	24		
15	2.2	2.2	2.0	2.3	2.2	2.3	2.4	2.6	4.8	6.3	4.3	3.5	2.8	4.6	3.5	4.7	4.1	3.9	2.4	2.3	S	2.3	2.3	2.4	2.0	6.3	3.1	24		
16	2.3	2.2	2.3	2.7	2.6	2.7	2.7	2.9	3.5	3.5	4.1	3.6	3.5	2.8	3.9	3.1	5.5	14.8	3.1	S	2.8	2.8	2.8	2.6	2.2	14.8	3.6	24		
17	2.8	2.8	2.8	2.8	2.9	4.9	6.8	8.8	3.1	2.9	2.9	3.0	2.9	17.3	15.8	3.4	S	15.1	14.0	3.9	3.4	3.9	2.8	17.3	5.7	24				
18	7.1	13.1	17.8	5.8	6.0	5.3	13.6	10.2	4.6	5.9	7.7	5.8	17.0	12.6	3.0	5.8	5.4	S	3.1	3.1	2.9	4.1	4.7	3.2	2.9	17.8	7.3	24		
19	2.9	3.0	2.9	2.8	2.8	2.8	2.9	3.1	3.2	3.4	3.6	3.6	3.6	3.4	3.6	3.5	S	3.3	3.4	3.4	3.5	3.6	4.5	4.8	2.8	4.8	3.4	24		
20	4.5	3.7	3.6	3.6	3.6	3.6	3.6	4.1	4.3	4.5	4.2	4.3	4.5	4.1	4.3	S	4.1	4.1	4.3	4.3	4.2	4.2	4.3	4.3	3.6	4.5	4.1	24		
21	4.3	4.3	4.2	4.3	4.3	4.5	4.5	4.7	4.8	4.5	4.5	4.7	4.7	4.8	S	4.5	4.7	4.8	4.6	4.8	4.8	4.7	4.8	4.7	4.2	4.8	4.6	24		
22	4.7	4.8	4.7	4.8	4.7	4.9	5.0	5.0	5.0	5.0	5.1	5.1	5.0	S	5.0	5.0	5.1	5.0	5.0	4.8	4.8	4.8	4.8	4.8	4.7	5.1	4.9	24		
23	4.7	4.7	4.7	4.7	4.8	4.7	4.8	4.6	4.6	4.5	4.5	4.4	S	4.1	4.1	4.1	4.3	4.3	4.1	4.2	4.0	4.2	4.2	5.7	4.0	5.7	4.5	24		
24	6.3	4.6	5.8	5.0	4.4	4.2	9.1	11.0	10.2	9.8	14.9	S	7.0	9.4	C1	C1	C1	C1	1.5	1.6	4.5	7.4	3.8	2.0	1.5	14.9	6.4	20		
25	1.7	1.6	1.8	1.6	1.8	1.6	2.1	5.6	3.8	2.0	S	6.1	2.0	2.2	2.1	2.1	2.2	1.9	1.8	2.0	2.0	1.8	2.1	1.6	6.1	2.3	24			
26	1.9	2.1	2.0	2.2	2.2	2.0	2.5	4.1	2.5	S	4.6	3.0	2.6	2.9	2.5	2.7	2.6	2.7	2.7	3.8	3.1	3.3	3.4	3.6	1.9	4.6	2.8	24		
27	3.7	3.5	3.6	3.9	3.9	4.2	3.9	3.6	S	3.1	3.1	3.4	3.5	3.3	3.5	6.2	4.6	3.3	3.2	3.2	3.2	3.2	3.2	3.2	3.1	6.2	3.6	24		
28	3.4	3.2	3.2	3.4	5.2	8.5	7.6	S	9.3	9.0	9.5	9.6	8.2	11.5	10.3	10.3	11.6	5.8	4.4	3.6	2.7	2.7	2.6	2.4	2.4	11.6	6.4	24		
29	2.4	2.4	2.3	2.3	2.1	2.2	S	S1	2.3	7.6	C1	C1	C1	2.9	3.0	3.3	3.3	2.6	2.5	2.5	2.4	2.3	2.4	2.3	2.1	7.6	2.8	20		
30	2.4	2.3	2.4	2.3	2.3	S	3.4	2.4	6.6	5.8	4.8	3.6	5.5	3.9	4.9	6.6	4.3	3.1	2.6	3.8	2.6	2.9	2.7	2.7	2.3	6.6	3.6	24		
31	2.9	2.9	2.8	2.9	S	2.8	2.9	3.1	3.2	7.4	3.3	7.0	7.7	7.7	7.4	7.8	8.5	10.1	7.7	7.1	10.7	11.6	10.0	10.0	2.8	11.6	6.4	24		
HOURLY MAX	7.1	13.1	17.8	13.6	8.2	8.5	13.6	11.0	10.2	11.3	14.9	14.8	17.0	12.6	10.3	17.3	15.8	14.8	7.7	15.1	15.6	11.6	10.0	12.8						
HOURLY AVG	3.4	3.4	3.9	3.6	3.3	3.5	4.1	4.4	4.6	5.2	5.0	4.5	4.6	4.7	4.2	4.9	4.7	4.2	3.3	3.8	4.2	3.7	3.4	3.7						

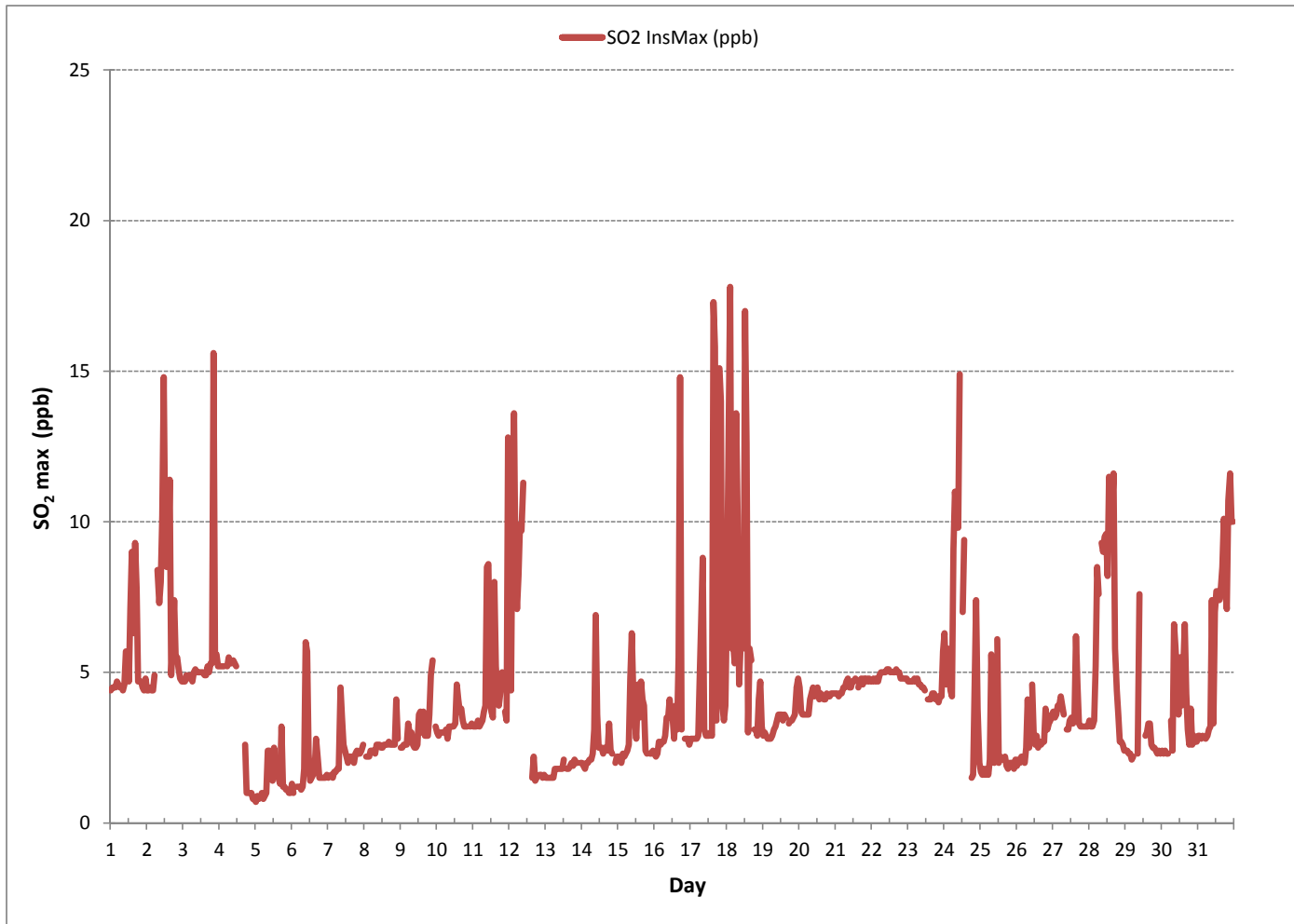
STATUS FLAG CODES

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

MONTHLY SUMMARY

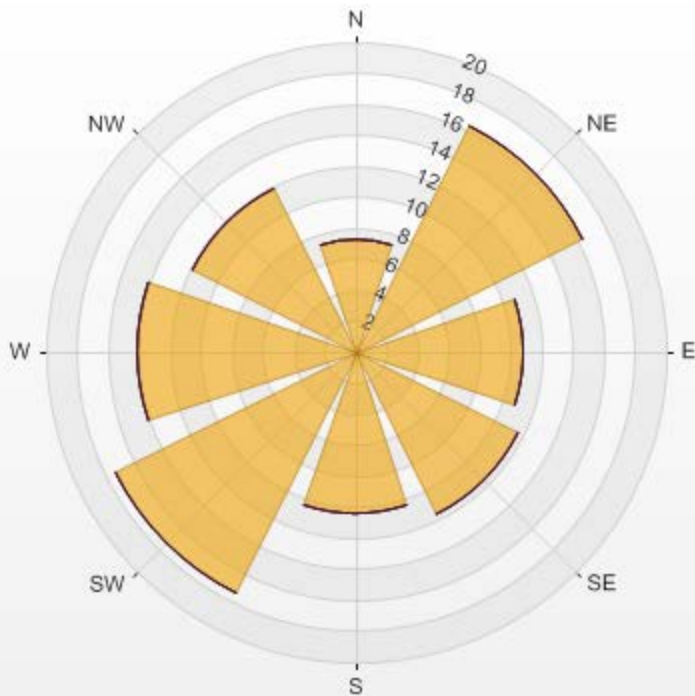
NUMBER OF NON-ZERO READINGS:	693
MAXIMUM INSTANTANEOUS VALUE:	17.8 PPB @ HOUR(S) 2 ON DAY(S) 18
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	2.59
OPERATIONAL TIME:	730 HRS

SULPHUR DIOXIDE MAX instantaneous maximum in ppb



Wind: LICA MASKWA Monitor: SO2 [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.55% Calm Avg: 0

Direction	0.0-20.0	20.0-60.0	60.0-110.0	110.0-170.0	170.0-340.0	>340.0	Total
N	7.33	0	0	0	0	0	7.33
NE	16.38	0	0	0	0	0	16.38
E	10.78	0	0	0	0	0	10.78
SE	11.78	0	0	0	0	0	11.78
S	10.49	0	0	0	0	0	10.49
SW	17.39	0	0	0	0	0	17.39
W	14.08	0	0	0	0	0	14.08
NW	11.78	0	0	0	0	0	11.78
Summary	100	0	0	0	0	0	100



% Icon Classes (ppb) 100 0.0-20.0 0 20.0-60.0 0 60.0-110.0 0 110.0-170.0 0 170.0-340.0 0 >340.0

SO2[ppb] Calibration: LICA MASKWA Monthly: 08/2016 Type: Span



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

HYDROGEN SULPHIDE



HYDROGEN SULPHIDE (H₂S) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.				
DAY																																	
1		0.0	0.3	0.3	0.0	0.1	0.2	0.0	S	0.2	0.1	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.7	0.1	24			
2		0.0	0.0	0.0	0.0	0.6	0.7	S	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.7	0.1	24			
3		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	0.2	0.0	0.3	0.0	0.0	0.5	0.4	0.0	0.0	0.3	0.0	0.0	0.5	0.1	24			
4		0.5	1.0	0.8	0.0	S	0.0	0.8	0.7	0.8	0.6	0.0	0.3	0.4	0.1	0.8	0.0	0.0	0.2	0.6	0.7	0.5	0.0	0.6	0.7	0.0	0.0	1.0	0.4	24			
5		1.4	0.9	0.0	S	0.0	0.0	0.1	0.4	0.0	0.0	0.2	0.0	0.2	0.1	0.4	0.4	0.0	0.0	0.7	0.1	0.0	0.3	0.9	0.6	0.0	0.0	1.4	0.3	24			
6		0.9	0.5	S	0.5	0.6	1.2	0.6	1.4	1.8	0.2	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.8	0.4	24				
7		0.8	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.8	0.0	24			
8		S	0.0	0.4	0.1	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.3	0.2	0.0	0.0	0.4	0.6	0.0	0.0	S	0.0	0.0	0.0	0.6	0.1	24			
9		3.4	1.7	0.3	1.3	0.4	0.0	1.2	0.0	0.1	0.0	0.0	0.0	1.2	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	3.4	0.4	24			
10		0.7	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.1	0.1	1.9	2.0	1.1	S	0.0	0.0	0.0	2.0	0.3	24				
11		0.9	0.2	1.4	0.1	0.7	0.0	0.1	0.6	0.0	0.9	0.9	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.0	S	0.5	0.0	1.0	0.0	0.0	1.4	0.3	24			
12		0.0	0.1	0.0	0.9	0.0	0.5	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.1	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.1	0.0	24			
14		0.0	1.0	0.2	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	1.0	0.1	24			
15		0.0	0.0	0.0	0.4	0.0	0.0	0.0	S1	0.0	0.3	C	C	C	C	C	0.3	0.0	0.0	0.3	0.0	S	0.6	1.1	1.0	0.0	0.0	1.1	0.2	23			
16		0.5	0.0	0.4	1.1	1.0	0.0	1.2	1.5	1.8	1.2	0.3	0.9	1.5	0.9	2.2	1.9	1.5	2.4	1.0	S	1.1	2.9	1.5	1.4	0.0	0.0	2.9	1.2	24			
17		0.7	0.6	2.3	2.0	1.5	1.6	1.7	1.4	2.1	2.3	0.0	0.4	1.4	2.0	1.6	0.6	0.3	2.1	S	1.9	1.7	1.2	1.3	1.1	0.0	0.0	2.3	1.4	24			
18		1.4	2.1	1.4	0.9	1.5	0.6	1.7	0.2	0.1	0.7	0.9	0.3	0.9	0.1	0.0	0.0	0.0	S	0.2	0.0	0.0	0.0	0.4	0.0	0.0	0.0	2.1	0.6	24			
19		0.0	0.0	0.5	0.0	0.0	0.7	0.0	0.5	0.3	0.1	0.4	0.6	0.1	0.0	0.2	0.4	S	0.6	0.0	0.6	1.1	1.5	1.0	1.1	0.0	0.0	1.5	0.4	24			
20		1.5	2.2	1.2	1.0	3.2	4.0	2.9	2.4	2.1	1.5	1.9	1.7	2.3	2.4	0.6	S	1.7	2.5	1.6	2.8	1.1	1.7	2.3	0.6	0.6	0.6	4.0	2.0	24			
21		0.9	0.8	0.8	0.8	1.7	2.1	1.4	0.9	0.7	0.6	0.3	0.5	0.3	0.1	S	0.6	1.0	0.9	0.4	1.0	0.4	0.0	0.3	0.2	0.0	0.0	2.1	0.7	24			
22		0.0	0.0	0.1	0.5	0.0	0.6	0.4	0.0	0.0	0.0	0.0	0.2	0.0	S	0.0	0.0	0.2	0.5	0.9	0.0	0.5	0.0	0.5	0.0	0.0	0.0	0.9	0.2	24			
23		0.4	0.7	0.2	0.0	0.0	0.9	1.0	0.9	0.0	0.9	1.4	0.0	S	0.6	0.7	1.0	0.8	0.4	0.5	0.5	0.3	0.0	0.0	0.5	0.0	0.0	1.4	0.5	24			
24		0.0	0.0	0.0	0.1	0.7	0.0	0.3	0.0	0.3	0.4	0.1	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1	24			
25		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
26		0.0	0.5	0.0	0.0	0.0	0.5	0.8	S1	S1	S	0.0	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	1.7	1.5	1.6	1.1	0.0	0.0	1.7	0.6	13
27		1.7	2.2	1.5	2.0	0.7	1.4	2.0	1.7	S	0.9	1.3	1.0	1.5	0.9	1.2	1.9	0.3	0.0	0.8	0.8	0.9	0.9	0.7	0.4	0.0	0.0	2.2	1.2	24			
28		0.6	1.0	0.7	1.0	1.6	1.0	1.3	S	1.1	1.4	1.3	1.3	1.2	1.6	0.5	1.3	1.3	0.8	0.6	0.2	0.7	0.2	0.6	0.6	0.2	0.2	1.6	1.0	24			
29		0.4	0.1	0.0	0.0	0.1	0.9	S	0.0	0.4	0.2	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.0	2.0	0.3	0.0	0.0	0.0	2.0	0.3	24			
30		0.0	0.0	0.5	1.4	0.0	S	0.1	0.0	0.0	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.1	24			
31		0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.5	0.0	0.8	0.5	0.2	0.7	0.0	1.0	0.7	0.0	0.7	1.1	1.5	0.8	1.9	0.0	0.0	1.9	0.5	24			
HOURLY MAX		3.4	2.2	2.3	2.0	3.2	4.0	2.9	2.4	2.1	2.3	1.9	1.7	2.3	2.4	2.2	1.9	1.7	2.5	1.9	2.8	1.7	2.9	2.3	1.9	0.0							
HOURLY AVG		0.6	0.5	0.4	0.5	0.5	0.6	0.6	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.5	0.4	0.5	0.6	0.5	0.0						

STATUS FLAG CODES

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

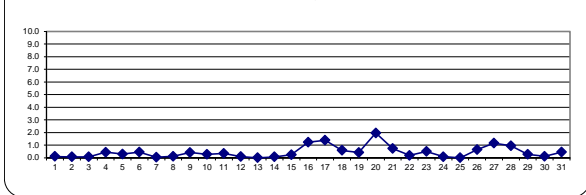
OBJECTIVE LIMIT:

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

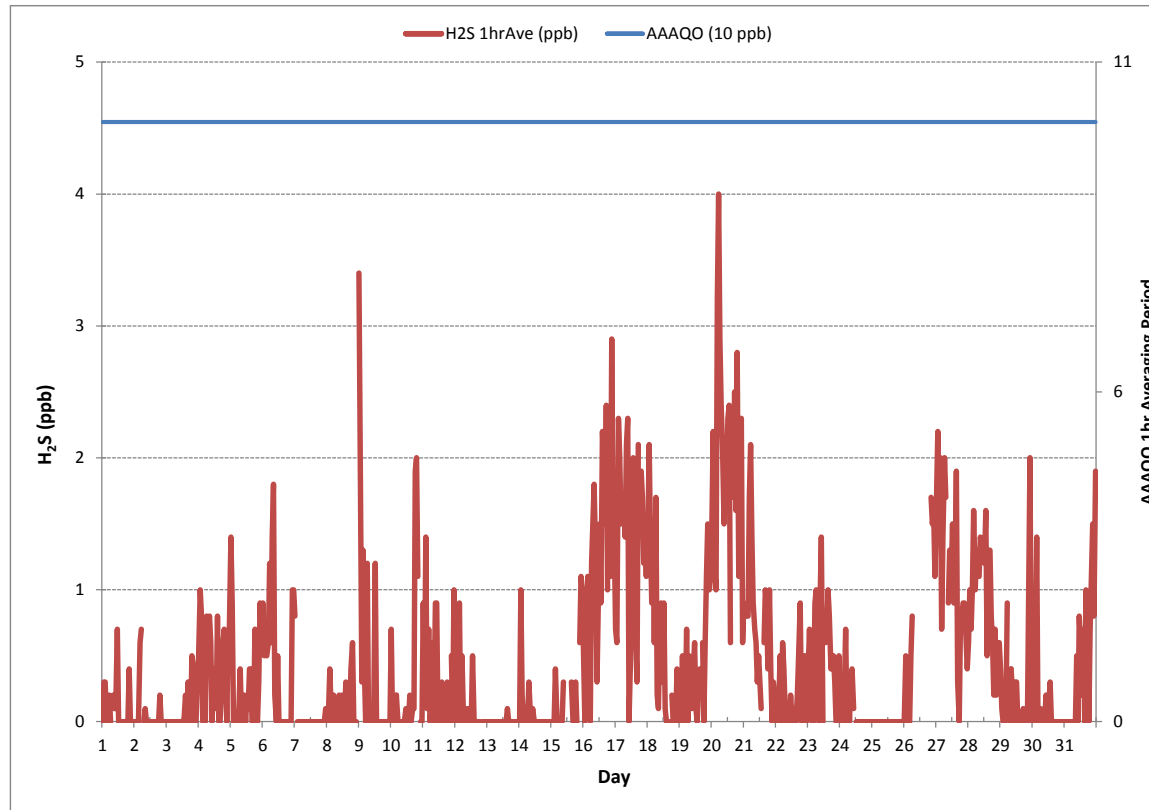
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0					
NUMBER OF 24-HR EXCEEDENCES:	0					
NUMBER OF NON-ZERO READINGS:	356					
MINIMUM 1-HR AVERAGE:	0.0	PPB	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	4.0	PPB	@ HOUR(S)	5	ON DAY(S)	20
MAXIMUM 24-HR AVERAGE:	2.0	PPB			ON DAY(S)	20
					VAR-VARIOUS	
I2S CALIBRATION TIME:	33	HRS	OPERATIONAL TIME:	732	HRS	
MONTHLY CALIBRATION TIME:	4	HRS	AMD OPERATION UPTIME:	98.4	%	
STANDARD DEVIATION:	0.64		MONTHLY AVERAGE:	0.4	PPB	

24 HOUR AVERAGES FOR August 2016



HYDROGEN SULPHIDE (H₂S) hourly averages in ppb



HYDROGEN SULPHIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR				
DAY	MIN.	MAX.	AVG.	RDGS.																												
1	0.7	1.2	1.4	0.3	0.9	1.3	0.3	S	2.2	1.3	1.5	1.6	0.9	0.6	1.7	1.0	0.7	0.6	0.5	0.6	1.5	0.4	0.2	0.8	0.2	2.2	1.0	24				
2	0.4	0.7	0.5	0.5	1.4	1.3	S	0.6	1.4	0.5	1.3	1.0	0.0	0.0	0.6	0.9	0.6	0.3	0.6	1.3	1.2	0.0	0.0	0.3	0.0	1.4	0.7	24				
3	0.3	0.1	0.0	1.2	0.8	S	0.3	1.1	1.2	0.6	0.2	0.2	0.0	0.4	1.1	0.2	1.4	0.0	0.0	1.2	1.3	0.7	0.3	0.7	0.0	1.4	0.6	24				
4	1.0	1.3	1.5	0.2	S	0.0	1.4	0.9	1.7	3.0	1.0	0.8	1.1	1.8	1.3	0.5	0.7	0.8	0.7	1.3	0.9	0.4	1.0	1.6	0.0	3.0	1.1	24				
5	1.8	1.9	0.1	S	0.4	0.3	1.1	1.4	0.0	0.4	0.4	0.0	0.0	0.2	0.3	0.2	0.0	0.1	0.6	0.0	0.0	0.4	1.0	0.4	0.0	1.9	0.5	24				
6	0.7	0.2	S	0.4	1.0	1.3	0.6	2.4	2.5	0.5	1.1	1.0	0.4	0.0	0.0	0.6	0.9	0.2	0.3	0.3	0.6	2.8	2.7	0.0	2.8	0.9	24					
7	2.2	S	0.8	0.7	0.9	0.2	0.8	0.7	0.8	0.7	0.8	0.4	0.5	0.6	0.5	0.0	0.0	3.0	0.8	0.7	0.2	0.4	0.7	1.0	0.0	3.0	0.8	24				
8	S	0.9	2.1	1.4	0.9	1.5	1.1	0.8	0.3	0.9	1.0	1.3	1.0	0.9	1.1	1.2	0.5	0.6	1.2	2.1	0.4	0.9	1.4	S	0.3	2.1	1.1	24				
9	4.7	4.3	2.8	2.7	2.9	0.1	4.2	1.2	1.4	1.5	1.2	4.5	7.3	1.4	0.9	0.9	1.0	1.2	0.5	1.2	1.9	2.4	S	1.8	0.1	7.3	2.3	24				
10	2.7	2.7	1.3	1.7	2.4	1.5	2.2	1.9	1.2	1.0	1.2	1.3	0.7	1.2	1.5	1.0	1.1	2.1	6.5	6.0	3.6	S	0.4	1.1	0.4	6.5	2.0	24				
11	1.8	1.7	2.9	1.8	2.1	1.6	1.2	3.3	0.8	1.7	1.7	0.9	1.5	0.0	1.3	1.1	0.8	0.4	1.9	0.2	S	1.3	0.7	1.7	0.0	3.3	1.4	24				
12	1.4	2.4	1.5	2.6	1.3	1.8	1.6	0.6	1.8	2.1	2.1	1.5	2.7	2.8	2.4	1.0	1.8	0.2	2.3	S	0.2	0.4	0.9	1.2	0.2	2.8	1.6	24				
13	0.4	1.0	1.5	0.4	1.0	1.3	1.1	1.6	2.2	0.6	1.5	1.7	1.6	P	2.1	1.8	1.6	1.6	1.4	3.7	0.0	0.6	S	3.4	0.0	3.7	1.5	23				
14	3.7	3.5	1.8	1.8	0.0	0.7	0.6	2.2	1.8	0.9	1.6	2.4	1.4	1.1	1.0	1.0	0.9	0.3	1.3	1.3	0.5	S	0.0	0.3	0.0	3.7	1.3	24				
15	1.3	1.3	1.9	2.0	1.1	0.8	1.2	S1	1.6	2.0	C	C	C	C	C	2.9	1.4	1.2	3.1	1.5	S	2.5	2.8	2.8	0.8	3.1	1.8	23				
16	3.1	2.3	3.3	2.7	3.0	0.9	2.7	2.6	3.4	4.3	0.9	1.6	2.2	2.7	3.2	2.7	2.4	3.2	3.1	S	2.1	4.3	4.0	3.6	0.9	4.3	2.8	24				
17	2.1	2.6	3.2	3.0	2.2	3.0	2.6	2.0	2.6	3.1	2.4	2.6	1.8	2.7	3.8	1.3	2.0	3.4	S	3.1	2.4	2.3	2.1	2.2	1.3	3.8	2.5	24				
18	3.4	3.7	3.8	2.4	2.8	2.4	3.6	2.0	1.9	2.4	2.7	6.6	3.2	2.3	1.3	1.8	1.4	S	2.5	1.2	1.5	2.2	2.0	1.5	1.2	6.6	2.5	24				
19	0.6	1.7	2.1	1.9	2.1	2.2	2.0	2.1	1.8	1.8	1.9	1.9	2.8	1.4	1.8	1.7	S	1.7	3.1	1.8	2.5	2.9	2.4	2.4	0.6	3.1	2.0	24				
20	2.6	3.3	2.5	3.7	6.0	6.0	3.9	3.1	3.0	2.0	2.5	2.5	2.9	2.9	1.4	S	2.0	3.1	2.9	5.6	2.0	2.7	3.5	2.7	1.4	6.0	3.2	24				
21	2.5	2.3	2.3	3.0	3.3	3.5	2.7	3.0	3.8	2.7	2.0	2.4	2.4	2.8	S	3.5	3.3	3.3	2.7	3.1	3.6	1.8	2.8	2.7	1.8	3.8	2.8	24				
22	1.7	2.2	2.3	3.4	2.2	4.5	3.3	1.7	2.0	2.5	2.7	3.4	3.0	S	2.6	2.1	2.9	3.7	3.7	2.0	3.0	2.4	2.6	1.9	1.7	4.5	2.7	24				
23	1.9	2.4	2.0	1.5	1.5	2.4	2.4	2.3	1.5	2.4	2.7	1.6	S	2.1	1.6	2.1	2.6	2.0	2.3	1.7	1.8	1.5	1.1	2.2	1.1	2.7	2.0	24				
24	1.9	1.8	2.0	3.4	3.4	2.2	2.9	2.8	3.1	2.6	2.4	S	2.0	1.6	2.5	2.3	1.3	1.6	2.4	2.9	1.3	1.9	1.7	1.0	1.0	3.4	2.2	24				
25	1.3	0.9	1.2	1.8	1.9	1.5	2.0	3.0	2.1	2.6	S	2.2	2.4	2.2	2.7	2.6	1.8	3.1	1.0	3.3	3.2	2.1	1.6	1.2	0.9	3.3	2.1	24				
26	1.9	2.8	2.0	2.6	1.4	2.2	2.6	S1	S1	S	2.3	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	3.0	2.9	3.1	3.3	1.4	3.3	2.5	13			
27	3.3	4.0	3.4	3.8	2.6	3.8	4.2	4.2	S	3.1	3.3	3.5	3.9	2.9	8.0	8.1	2.4	2.5	3.2	4.1	3.8	3.6	3.5	4.7	2.4	8.1	3.9	24				
28	3.7	4.0	3.2	3.5	4.3	3.8	4.6	S	5.0	4.0	3.9	4.3	4.3	4.7	4.1	4.3	4.5	3.2	3.5	3.1	3.0	2.4	2.9	3.3	2.4	5.0	3.8	24				
29	3.1	2.3	2.2	2.1	2.9	3.2	S	2.2	2.9	2.7	1.9	3.1	3.3	3.5	3.2	2.4	2.7	2.3	2.1	1.4	3.2	5.2	5.6	3.1	1.4	5.6	2.9	24				
30	2.3	1.5	3.8	5.0	2.7	S	3.8	2.8	2.0	2.6	3.2	2.2	3.6	3.7	2.9	3.5	2.7	2.7	3.3	2.6	3.3	4.0	2.5	2.4	1.5	5.0	3.0	24				
31	2.8	2.6	2.5	3.2	S	2.9	3.2	3.8	2.7	4.0	2.7	4.5	4.4	4.0	4.0	2.4	4.0	3.4	2.7	3.4	3.7	4.0	3.3	4.3	2.4	4.5	3.4	24				
HOURLY MAX	4.7	4.3	3.8	5.0	6.0	6.0	4.6	4.2	5.0	4.3	3.9	6.6	7.3	4.7	8.0	8.1	4.5	3.7	6.5	6.0	3.8	5.2	5.6	4.7								
HOURLY AVG	2.0	2.1	2.1	2.2	2.0	2.0	2.2	2.1	2.0	2.0	1.9	2.2	2.2	1.9	2.1	1.9	1.7	1.8	2.1	2.2	1.9	2.0	2.0	2.1								

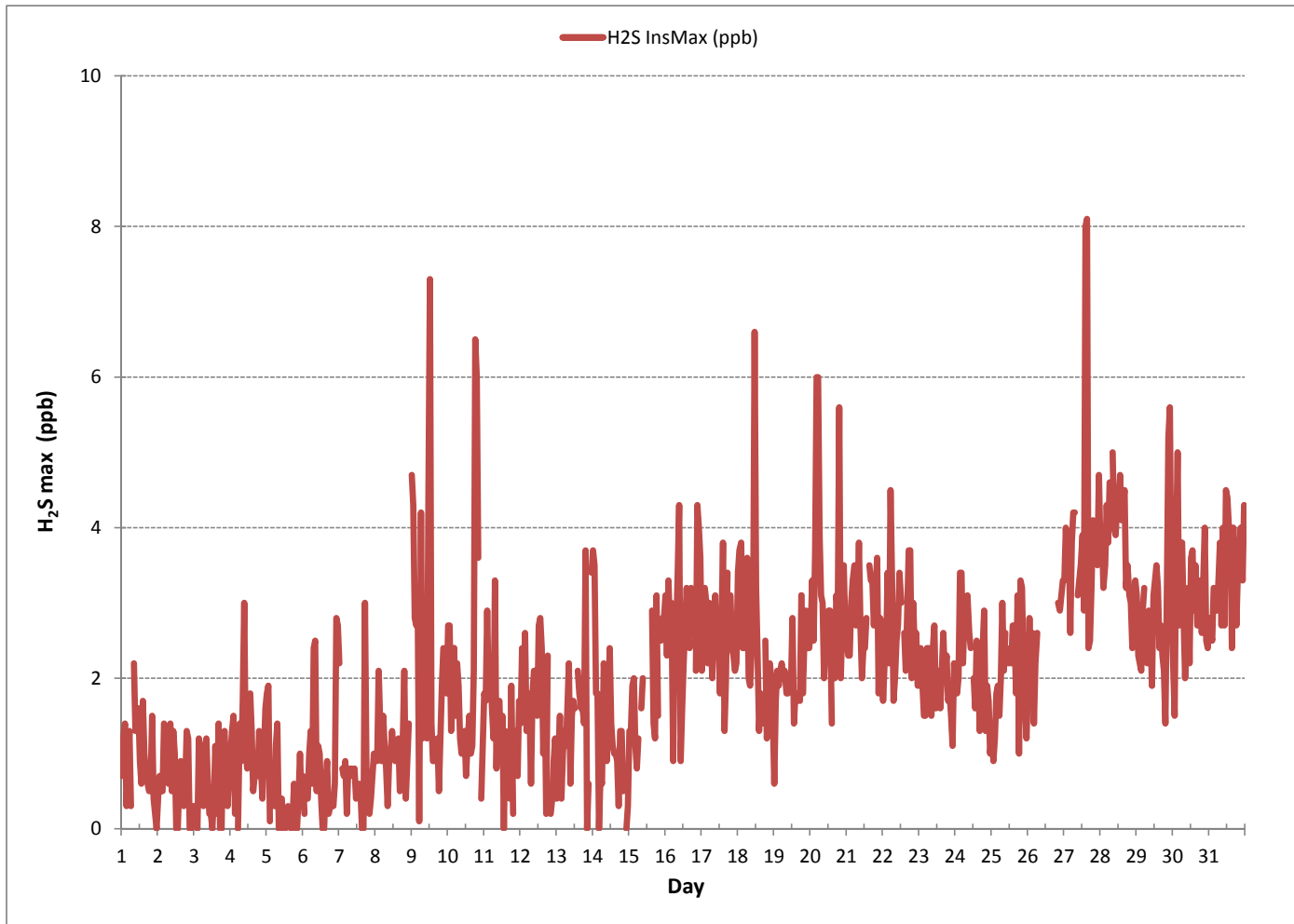
STATUS FLAG CODES

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

MONTHLY SUMMARY

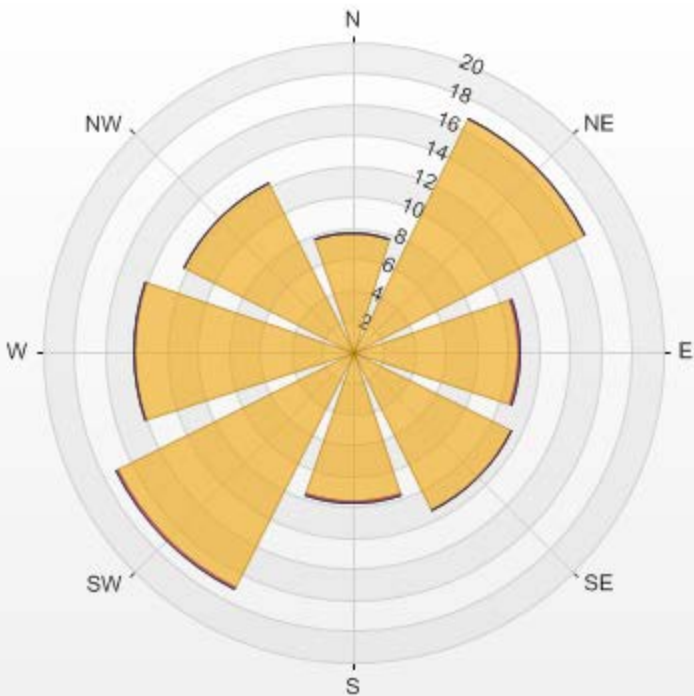
NUMBER OF NON-ZERO READINGS:	671
MAXIMUM INSTANTANEOUS VALUE:	8.1 PPB @ HOUR(S) 15 ON DAY(S) 27
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	1.27
OPERATIONAL TIME:	731 HRS

HYDROGEN SULPHIDE MAX instantaneous maximum in ppb



Wind: LICA MASKWA Monitor: H2S [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.41% Calm Avg: 0.00

Direction	0.0-3.0	3.0-10.0	10.0-50.0	>50.0	Total
N	7.63	0	0	0	7.63
NE	16.83	0	0	0	16.83
E	10.65	0.14	0	0	10.79
SE	11.51	0	0	0	11.51
S	9.64	0.14	0	0	9.78
SW	16.98	0.14	0	0	17.12
W	14.1	0	0	0	14.1
NW	12.23	0	0	0	12.23
Summary	100	0.42	0	0	100



H2S[ppb] Calibration: LICA MASKWA Monthly: 08/2016 Type: Span



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

TOTAL HYDROCARBON

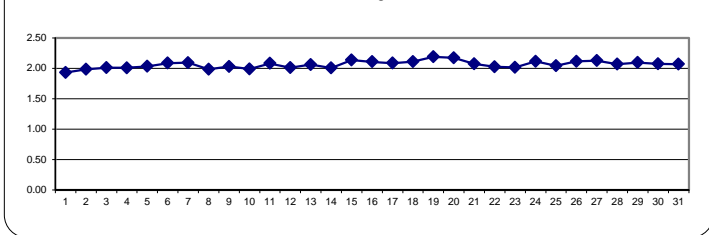
TOTAL HYDROCARBONS (THC) hourly averages in ppm

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.		
DAY	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	RDGS.
1	2.01	2.04	1.99	1.96	1.96	1.96	1.95	S	1.90	1.88	1.92	1.92	1.89	1.93	1.92	1.94	1.94	1.91	1.89	1.89	1.89	1.90	1.90	1.90	1.90	1.88	2.04	1.93	24		
2	1.93	1.94	1.98	2.00	2.01	2.02	S	2.00	1.97	1.98	2.02	1.97	1.97	1.96	1.96	1.96	1.96	1.95	1.96	1.98	1.97	1.99	2.16	1.93	2.16	1.98	24	24			
3	2.17	2.36	2.25	2.09	2.15	S	2.15	1.99	1.96	1.93	1.93	1.93	1.93	1.93	1.93	1.92	1.92	1.92	1.93	1.97	1.99	1.95	1.95	1.95	1.92	2.36	2.01	24	24		
4	1.95	1.98	2.00	2.02	S	2.10	2.25	2.14	2.00	1.96	1.94	1.94	1.94	1.94	1.94	1.95	1.95	1.96	1.98	1.98	1.98	2.00	2.12	2.15	1.94	2.25	2.01	24	24		
5	2.15	2.13	2.09	S	2.10	2.16	2.20	2.15	1.98	1.99	1.99	1.98	1.97	1.97	1.98	1.98	1.99	1.98	1.98	1.97	1.97	2.00	2.05	1.97	2.00	2.05	2.03	24	24		
6	2.09	2.10	S	2.13	2.21	2.22	2.16	2.23	2.20	2.06	2.03	1.99	1.98	1.98	1.99	1.98	1.98	1.99	2.01	2.02	2.08	2.18	2.21	2.15	1.98	2.23	2.09	24	24		
7	2.20	S	2.17	2.29	2.31	2.22	2.23	2.15	2.12	2.09	2.00	1.99	2.03	2.02	2.02	2.02	2.01	2.00	2.23	2.08	2.04	1.99	1.98	1.95	1.95	2.31	2.09	24	24		
8	S	1.94	2.00	2.02	1.99	2.03	2.00	2.02	2.00	1.99	1.96	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.95	1.97	2.11	2.15	S	1.94	2.15	1.98	24	24		
9	2.03	2.25	2.20	2.12	2.05	2.02	2.01	2.03	2.03	1.99	2.00	2.03	2.05	1.97	1.97	1.95	1.93	1.93	1.99	2.01	2.06	2.07	S	2.00	1.93	2.25	2.03	24	24		
10	2.03	2.05	2.00	2.00	2.03	1.98	1.95	1.96	1.95	1.95	1.96	1.98	1.96	1.97	1.97	1.98	1.99	2.00	2.02	2.01	2.02	S	1.98	1.99	1.95	2.05	1.99	24	24		
11	2.01	2.04	2.09	2.17	2.28	2.20	2.18	2.21	2.25	2.24	2.12	2.07	2.06	2.01	1.99	1.91	1.93	1.95	1.95	S	1.94	1.98	2.05	1.91	2.28	2.08	24	24			
12	2.05	1.99	2.22	2.14	2.10	2.04	2.14	2.04	2.01	1.98	1.96	1.96	1.95	1.93	1.94	1.91	1.95	1.90	1.91	S	2.01	2.03	2.03	2.07	1.90	2.22	2.01	24	24		
13	2.09	2.11	2.12	2.16	2.32	2.41	2.46	2.36	2.18	2.01	1.96	1.93	1.94	1.94	1.92	1.92	1.94	1.94	1.94	1.95	1.90	1.90	S	1.99	1.90	2.46	2.06	24	24		
14	2.02	2.08	2.10	1.94	2.08	2.11	2.15	2.07	2.09	2.10	2.01	1.99	1.96	1.95	1.96	1.96	1.94	1.86	1.87	1.88	1.93	S	1.98	2.09	1.86	2.15	2.01	24	24		
15	2.17	2.22	2.26	2.27	2.32	2.37	2.64	2.35	2.46	2.24	2.09	2.10	2.12	1.98	1.91	1.93	1.93	1.92	1.91	1.92	S	1.95	2.00	2.06	1.91	2.64	2.14	24	24		
16	2.16	2.23	2.20	2.26	2.19	2.34	2.42	2.39	2.26	2.15	2.15	2.10	2.00	1.93	1.95	1.93	1.96	1.94	1.87	S	1.93	2.03	2.05	2.02	1.87	2.42	2.11	24	24		
17	2.00	2.08	2.08	2.06	2.10	2.17	2.17	2.12	2.06	C	C	C	C	2.08	2.08	2.10	2.04	2.04	S	2.16	2.16	2.04	2.04	2.04	2.00	2.17	2.09	24	24		
18	2.18	2.33	2.36	2.26	2.23	2.15	2.33	2.06	2.03	2.02	2.03	2.00	2.04	2.02	2.00	2.03	2.04	S	2.01	2.01	2.04	2.09	2.12	2.11	2.00	2.36	2.11	24	24		
19	2.14	2.23	2.24	2.20	2.23	2.34	2.38	2.46	2.11	2.16	2.24	2.21	2.17	2.18	2.13	2.08	S	2.06	2.06	2.08	2.13	2.14	2.19	2.23	2.06	2.46	2.19	24	24		
20	2.24	2.31	2.31	2.33	2.53	2.54	2.64	2.53	2.27	2.22	2.09	2.03	2.01	2.00	1.98	S	1.98	1.98	1.98	1.99	1.99	1.99	2.01	1.98	2.64	2.17	24	24			
21	2.02	2.04	2.01	2.04	2.14	2.27	2.40	2.43	2.29	2.13	2.10	1.98	1.95	1.95	S	1.93	1.94	1.95	1.98	1.99	2.00	2.05	2.06	2.05	1.93	2.43	2.07	24	24		
22	2.02	2.01	2.06	2.03	2.04	2.04	2.02	1.99	2.00	2.03	2.05	2.03	2.02	S	2.02	2.00	2.00	2.02	2.04	2.02	2.04	2.04	2.02	2.02	1.99	1.99	2.06	2.02	24	24	
23	2.02	2.03	1.98	1.99	1.99	1.99	1.99	1.99	2.00	1.99	1.98	1.97	S	2.00	2.00	2.00	2.01	2.01	2.02	2.02	2.05	2.05	2.09	2.14	1.97	2.14	2.01	24	24		
24	2.17	2.16	2.19	2.19	2.18	2.20	2.29	2.23	2.17	2.12	2.12	S	2.05	2.07	2.08	2.07	2.06	2.05	2.04	2.02	2.05	2.10	2.00	1.99	1.99	2.29	2.11	24	24		
25	1.99	2.03	2.09	2.07	2.15	2.10	2.04	2.05	2.02	2.01	S	2.00	2.01	2.02	2.00	2.00	2.00	2.00	2.01	2.04	2.07	2.08	2.11	2.10	1.99	2.15	2.04	24	24		
26	2.11	2.12	2.16	2.22	2.25	2.28	2.28	2.34	2.14	S	2.01	2.01	2.02	2.05	2.05	2.07	2.02	2.00	2.00	2.02	2.08	2.08	2.13	2.17	2.00	2.34	2.11	24	24		
27	2.20	2.22	2.25	2.27	2.28	2.30	2.32	2.34	S	2.26	2.17	2.08	2.03	2.01	1.99	2.03	1.98	1.96	1.96	2.03	2.01	2.04	2.07	2.11	1.96	2.34	2.13	24	24		
28	2.09	2.04	2.02	1.99	2.03	2.05	2.06	S	2.08	2.11	2.08	2.09	2.11	2.12	2.08	2.09	2.07	2.09	2.07	2.06	2.05	2.05	2.06	2.08	1.99	2.12	2.07	24	24		
29	2.08	2.08	2.08	2.11	2.18	2.26	S	2.20	2.10	2.11	2.06	2.04	2.06	2.02	2.02	2.03	2.04	2.06	2.06	2.07	2.10	2.13	2.17	2.16	2.02	2.26	2.10	24	24		
30	2.15	2.17	2.13	2.12	2.12	S	2.14	2.08	2.11	2.07	2.05	2.03	2.03	2.05	2.07	2.07	2.05	2.03	2.03	2.03	2.02	2.03	2.02	2.03	2.02	2.02	2.17	2.07	24	24	
31	2.03	2.03	2.03	2.04	S	2.05	2.05	2.04	2.03	2.10	2.05	2.10	2.13	2.13	2.10	2.08	2.09	2.08	2.06	2.04	2.07	2.11	2.09	2.08	2.03	2.13	2.07	24	24		
HOURLY MAX	2.24	2.36	2.36	2.33	2.53	2.54	2.64	2.53	2.46	2.26	2.24	2.21	2.17	2.18	2.13	2.10	2.09	2.09	2.23	2.16	2.16	2.18	2.21	2.23							
HOURLY AVG	2.08	2.11	2.12	2.12	2.16	2.17	2.21	2.17	2.09	2.06	2.04	2.02	2.01	2.00	2.00	1.99	1.99	1.98	1.99	2.01	2.02	2.03	2.05	2.06							

STATUS FLAG CODES

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

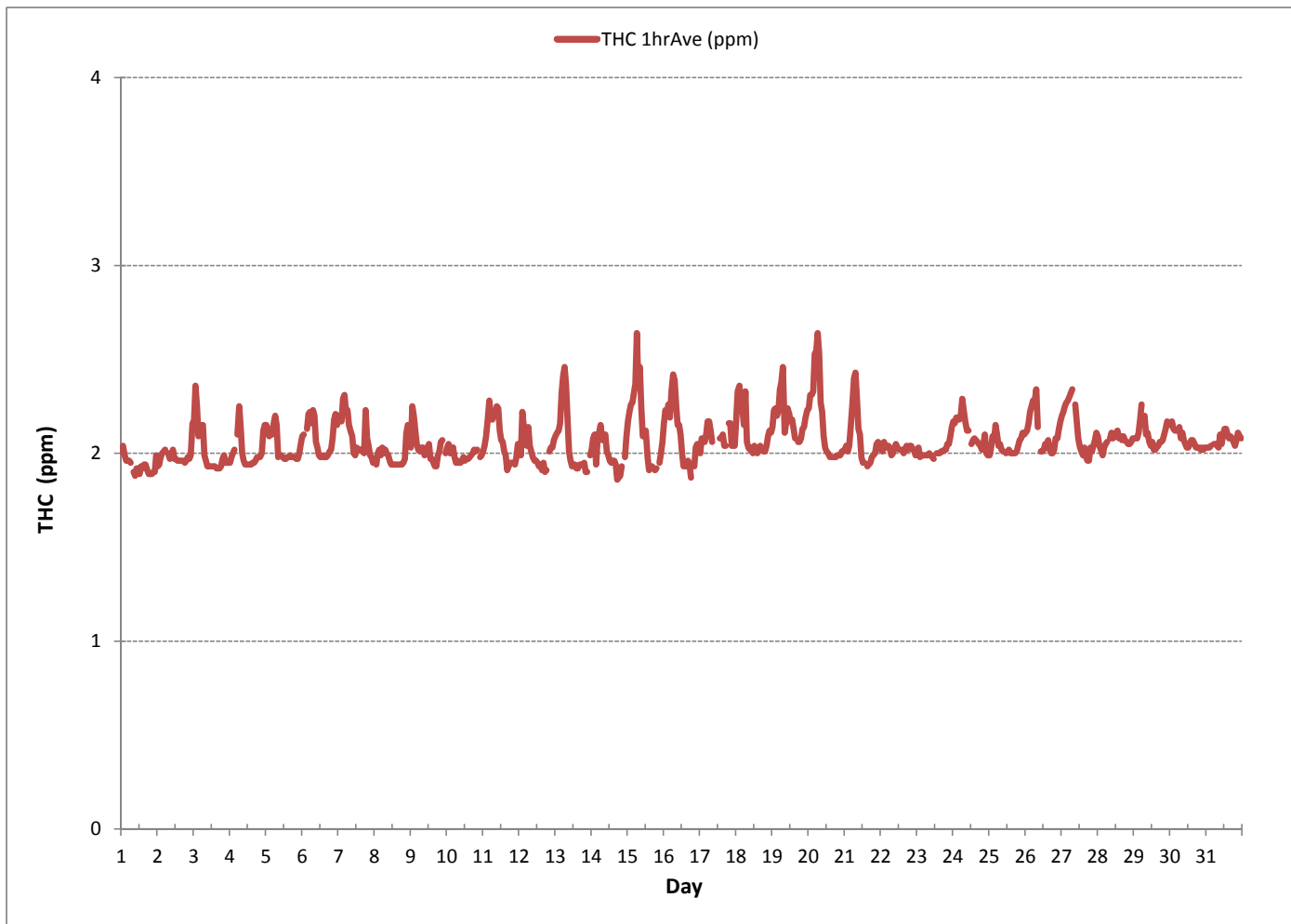
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	708			
MINIMUM 1-HR AVERAGE:	1.86 PPM	@ HOUR(S)	17	ON DAY(S) 14
MAXIMUM 1-HR AVERAGE:	2.64 PPM	@ HOUR(S)	6 , 6	ON DAY(S) 15 , 20
MAXIMUM 24-HR AVERAGE:	2.19 PPM			ON DAY(S) 19
				VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS	OPERATIONAL TIME:	744 HRS	
MONTHLY CALIBRATION TIME:	4 HRS	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.12	MONTHLY AVERAGE:	2.06 PPM	

TOTAL HYDROCARBONS (THC) hourly averages in ppm



TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.
DAY	1	1.99	2.03	1.97	1.93	1.94	1.93	1.93	S	1.88	1.86	2.22	2.02	1.88	2.03	2.24	2.01	2.12	1.94	1.88	1.88	1.88	1.90	1.88	1.91	1.86	2.24	1.97	24
2	1.93	1.94	2.00	2.02	2.08	2.09	S	2.09	2.03	2.12	2.55	2.08	2.09	2.05	2.03	2.03	2.05	2.02	1.97	2.00	2.00	1.97	2.06	2.40	1.93	2.55	2.07	24	
3	2.37	2.53	2.46	2.19	2.27	S	2.22	2.03	1.97	1.94	1.94	1.94	1.94	1.94	1.94	1.93	1.93	1.93	1.96	2.02	2.06	1.97	1.97	1.97	1.93	2.53	2.06	24	
4	1.97	2.00	2.02	2.09	S	2.15	2.39	2.30	2.03	1.99	1.96	1.96	1.97	1.96	1.97	1.97	1.99	1.97	1.99	1.97	2.00	2.00	2.03	2.37	2.21	1.96	2.39	2.06	24
5	2.22	2.21	2.13	S	2.16	2.31	2.34	2.40	2.00	2.02	2.03	2.00	2.00	1.99	2.00	2.00	2.00	2.00	2.02	2.00	2.00	2.00	2.00	2.03	2.08	1.99	2.40	2.08	24
6	2.16	2.13	S	2.19	2.31	2.37	2.28	2.31	2.31	2.12	2.08	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.03	2.06	2.05	2.25	2.25	2.61	2.22	2.00	2.61	2.16	24
7	2.25	S	2.25	2.46	2.42	2.39	2.36	2.29	2.12	2.12	2.03	2.00	2.03	2.02	2.02	2.00	2.00	2.00	2.00	2.68	2.12	2.03	1.97	1.97	1.94	1.94	2.68	2.15	24
8	S	1.91	2.09	2.03	2.00	2.09	1.99	2.02	2.03	1.97	1.96	1.93	1.93	1.93	1.91	1.93	1.93	1.91	1.92	1.93	1.97	2.31	2.22	S	1.91	2.31	2.00	24	
9	2.19	2.39	2.33	2.31	2.15	2.09	2.03	2.03	2.03	1.97	1.97	2.00	2.25	2.03	1.97	1.94	1.88	1.91	1.97	2.00	2.06	2.50	S	2.01	1.88	2.50	2.09	24	
10	2.09	2.03	1.99	2.00	2.04	1.97	1.97	1.94	1.92	1.91	1.91	1.94	1.92	1.94	1.94	1.94	1.94	1.97	1.97	1.99	1.97	2.00	S	1.97	2.28	1.91	2.28	1.98	24
11	2.03	2.02	2.12	2.55	2.46	2.19	2.16	2.19	2.19	2.24	2.25	2.12	2.06	2.06	2.09	2.03	1.94	1.94	2.00	2.02	S	1.94	1.97	2.15	1.94	2.55	2.12	24	
12	2.16	2.06	2.40	2.22	2.27	2.12	2.31	2.22	2.21	2.18	2.03	2.00	2.19	2.01	1.97	1.96	2.05	1.89	1.91	S	2.00	2.03	2.05	2.08	1.89	2.40	2.10	24	
13	2.08	2.10	2.10	2.21	2.37	2.42	2.55	2.46	2.28	2.05	2.03	2.00	1.97	P	1.91	1.91	1.99	1.93	1.94	2.01	1.88	1.90	S	2.02	1.88	2.55	2.10	23	
14	2.06	2.12	2.62	2.00	2.19	2.13	2.22	2.06	2.12	2.15	2.00	1.97	1.94	1.91	1.94	1.97	2.06	1.83	1.83	1.85	1.91	S	1.97	2.15	1.83	2.62	2.04	24	
15	2.16	2.21	2.24	2.27	2.31	2.43	2.65	2.59	2.56	2.28	2.13	2.12	2.12	2.19	1.93	1.96	1.94	1.99	1.88	1.88	S	1.94	2.00	2.09	1.88	2.65	2.17	24	
16	2.22	2.25	2.25	2.55	2.22	2.40	2.42	2.39	2.28	2.13	2.13	2.13	2.00	1.91	1.99	1.92	2.03	2.09	1.85	S	1.94	2.03	2.03	2.00	1.85	2.55	2.14	24	
17	1.99	2.22	2.19	2.04	2.10	2.34	2.31	2.21	2.12	C	C	C	C	2.16	2.13	2.22	2.19	2.19	S	2.39	2.31	2.07	2.07	2.21	1.99	2.39	2.18	24	
18	2.77	2.60	2.83	2.47	2.58	2.31	2.73	2.25	2.06	2.28	2.47	2.09	2.31	2.18	2.03	2.37	2.22	S	2.03	2.03	2.08	2.19	2.18	2.13	2.03	2.83	2.31	24	
19	2.18	2.37	2.29	2.22	2.31	2.39	2.52	2.64	2.15	2.22	2.31	2.29	2.22	2.21	2.18	2.10	S	2.08	2.08	2.12	2.16	2.16	2.29	2.24	2.08	2.64	2.25	24	
20	2.29	2.77	2.36	2.43	2.65	2.62	2.83	2.64	2.37	2.24	2.13	2.09	2.02	2.02	2.00	S	2.03	1.99	2.02	2.00	2.00	2.00	2.09	2.01	1.99	2.83	2.24	24	
21	2.01	2.06	2.03	2.06	2.16	2.31	2.40	2.42	2.40	2.13	2.09	2.00	1.93	1.93	S	1.91	1.94	1.91	2.04	1.99	1.99	2.05	2.05	2.00	1.91	2.42	2.08	24	
22	2.00	1.97	2.09	2.00	2.00	1.99	1.99	1.94	1.94	1.97	1.97	1.97	1.96	S	1.97	1.94	1.97	2.00	2.02	2.03	2.00	2.02	2.03	1.97	1.94	2.09	1.99	24	
23	2.00	2.03	1.97	1.97	1.97	1.99	1.97	1.99	2.00	2.00	1.99	1.99	S	2.00	2.02	2.03	2.03	2.03	2.03	2.05	2.08	2.12	2.13	2.25	1.97	2.25	2.03	24	
24	2.28	2.22	2.25	2.22	2.21	2.28	2.40	2.50	2.25	2.19	2.24	S	2.13	2.22	2.50	2.21	2.12	2.09	2.08	2.06	2.15	2.22	2.05	2.04	2.04	2.50	2.21	24	
25	2.00	2.06	2.12	2.10	2.34	2.16	2.07	2.16	2.03	2.03	S	2.07	2.03	2.03	2.00	2.02	2.00	2.02	2.05	2.06	2.09	2.10	2.12	2.12	2.00	2.34	2.08	24	
26	2.12	2.13	2.19	2.26	2.29	2.31	2.34	2.50	2.18	S	2.06	2.03	2.03	2.05	2.06	2.09	2.02	2.00	1.99	2.02	2.06	2.08	2.12	2.16	1.99	2.50	2.13	24	
27	2.16	2.19	2.22	2.24	2.24	2.25	2.28	2.29	S	2.22	2.19	2.06	2.00	1.97	1.97	2.03	1.99	1.94	1.94	2.06	2.00	2.09	2.06	2.12	1.94	2.29	2.11	24	
28	2.10	2.06	2.02	2.00	2.24	2.16	2.19	S	2.19	2.24	2.22	2.26	2.22	2.30	2.22	2.28	2.21	2.22	2.21	2.16	2.09	2.09	2.10	2.12	2.00	2.30	2.17	24	
29	2.12	2.12	2.12	2.25	2.33	2.39	S	2.29	2.18	2.22	2.16	2.09	2.19	2.06	2.06	2.09	2.09	2.09	2.10	2.12	2.16	2.19	2.26	2.22	2.06	2.39	2.17	24	
30	2.19	2.21	2.19	2.16	S	2.25	2.15	2.24	2.15	2.16	2.09	2.10	2.12	2.12	2.12	2.12	2.09	2.06	2.06	2.08	2.03	2.06	2.05	2.05	2.03	2.25	2.13	24	
31	2.05	2.06	2.05	2.06	S	2.08	2.06	2.06	2.05	2.19	2.06	2.25	2.19	2.25	2.19	2.09	2.09	2.09	2.06	2.06	2.03	2.08	2.10	2.09	2.09	2.03	2.25	2.10	24
HOURLY MAX		2.77	2.77	2.83	2.55	2.65	2.62	2.83	2.64	2.56	2.28	2.55	2.29	2.31	2.30	2.50	2.37	2.22	2.22	2.68	2.39	2.31	2.50	2.61	2.40				
HOURLY AVG		2.14	2.17	2.20	2.18	2.23	2.23	2.28	2.25	2.14	2.11	2.11	2.05	2.06	2.05	2.04	2.03	2.03	2.00	2.02	2.03	2.04	2.08	2.10	2.11				

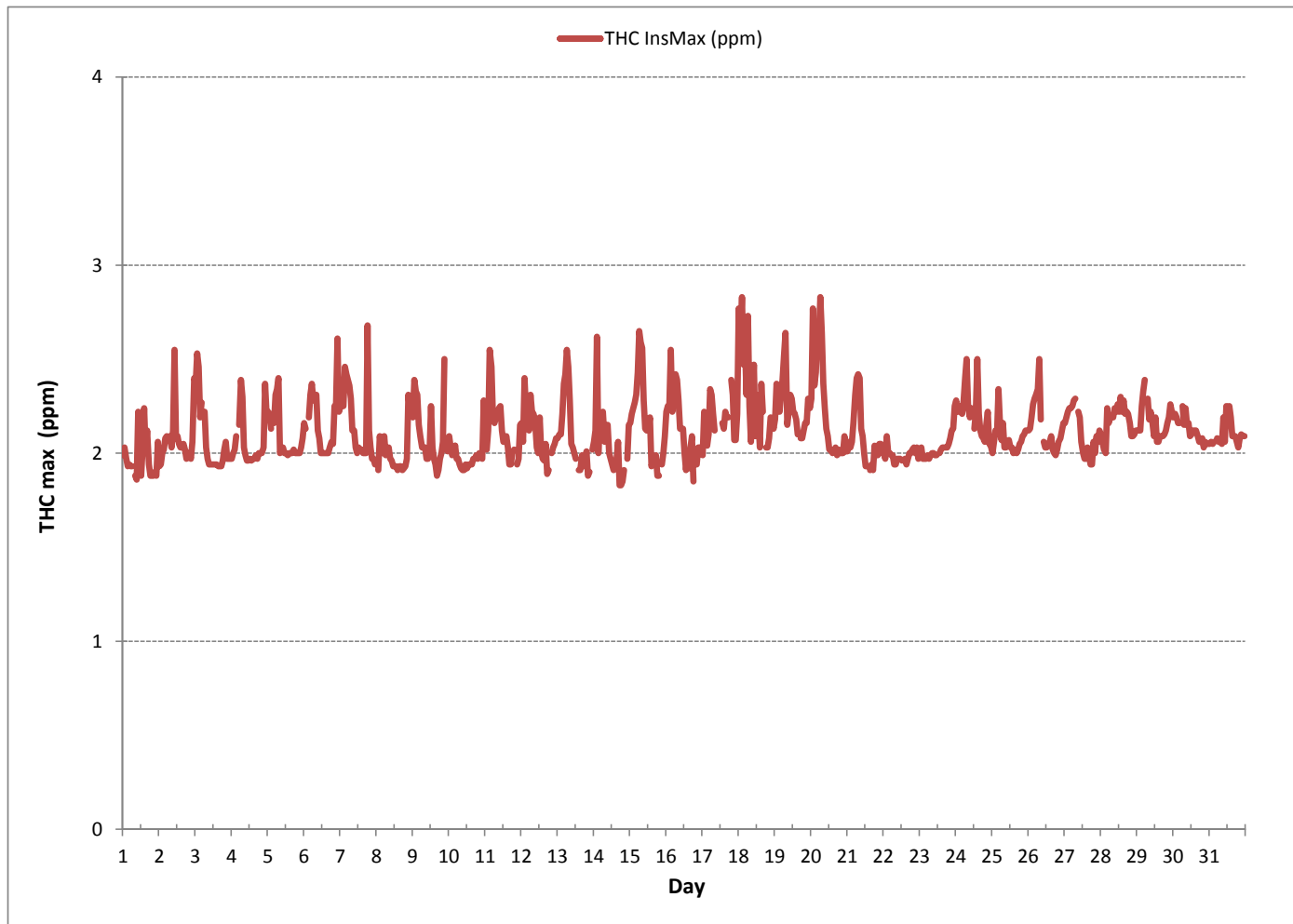
STATUS FLAG CODES

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

MONTHLY SUMMARY

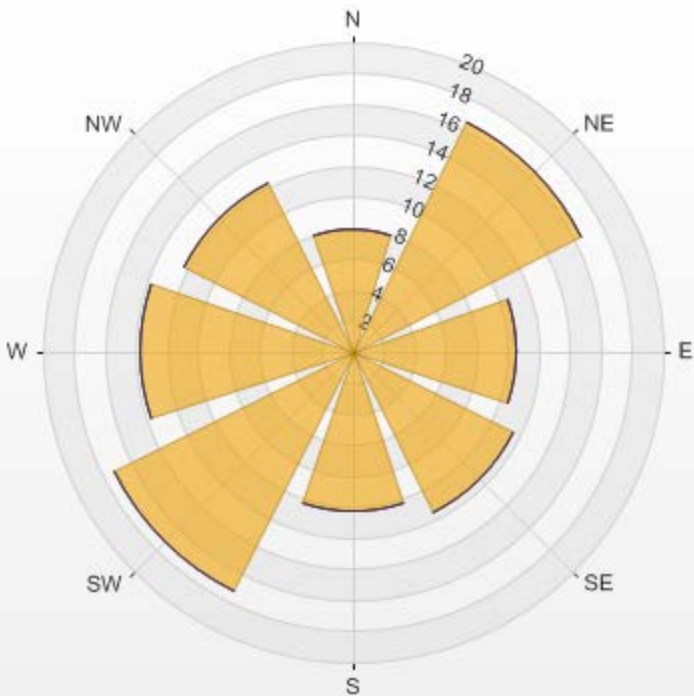
NUMBER OF NON-ZERO READINGS:	707
MAXIMUM INSTANTANEOUS VALUE:	2.83 PPM @ HOUR(S) 2, 6 ON DAY(S) 18, 20
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	4 HRS
OPERATIONAL TIME:	743 HRS
STANDARD DEVIATION:	0.17

TOTAL HYDROCARBONS MAX instantaneous maximum in ppm



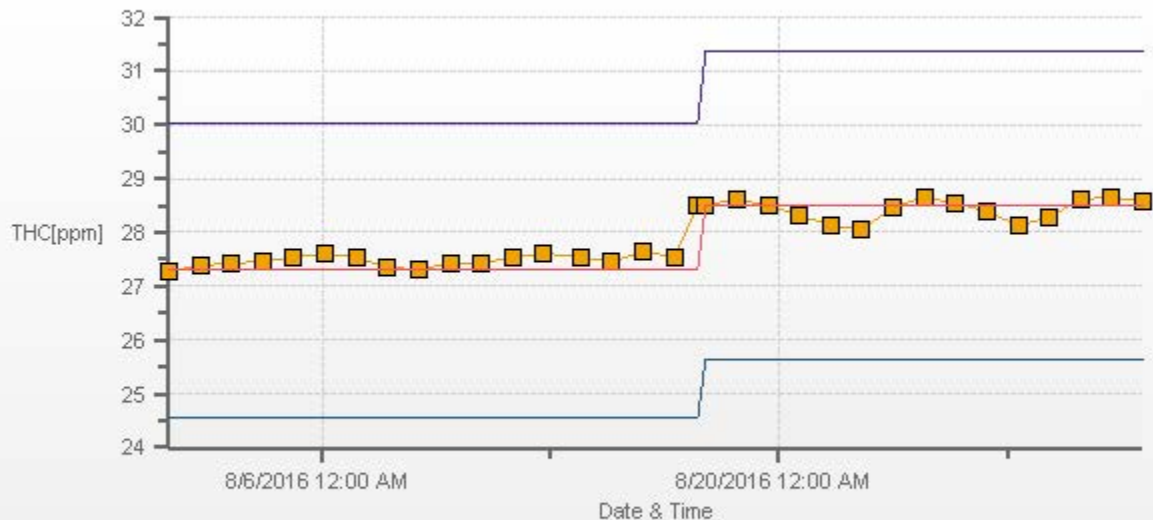
Wind: LICA MASKWA Monitor: THC [ppm] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.16% Calm Avg: 0.00

Direction	0.0-3.0	3.0-10.0	10.0-50.0	>50.0	Total
N	7.91	0	0	0	7.91
NE	16.53	0	0	0	16.53
E	10.59	0	0	0	10.59
SE	11.58	0	0	0	11.58
S	10.31	0	0	0	10.31
SW	17.23	0	0	0	17.23
W	13.7	0	0	0	13.7
NW	12.15	0	0	0	12.15
Summary	100	0	0	0	100



% Icon Classes (ppm)	100	0.0-3.0	0	3.0-10.0	0	10.0-50.0	0	>50.0
----------------------	-----	---------	---	----------	---	-----------	---	-------

THC[ppm] Calibration: LICA MASKWA Monthly: 08/2016 Type: Span



Span Meas Span Ref Span Low Span High

OXIDES OF NITROGEN

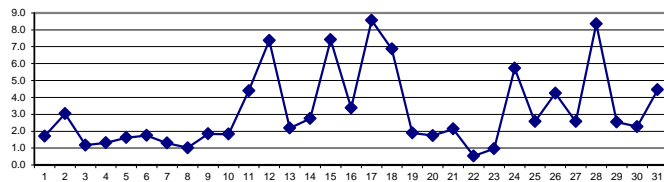
OXIDES OF NITROGEN (NOx) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY	HOURLY MAX	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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	1.9	3.6	1.2	0.8	0.9	1.4	1.4	S	0.6	0.6	1.9	2.1	0.9	6.4	4.5	2.5	2.9	1.7	0.6	1.3	0.0	1.2	0.5	0.4	0.0	6.4	1.7	24	
2	0.6	0.6	0.8	1.0	0.8	19.3	S	8.2	5.2	3.6	3.0	4.1	3.5	2.9	3.1	3.0	1.6	1.3	1.8	1.1	1.7	1.1	0.7	0.9	0.6	19.3	3.0	24	
3	1.0	1.9	0.9	0.4	0.2	S	0.5	1.0	1.1	1.4	1.6	1.3	1.1	1.1	1.0	0.8	0.6	0.6	0.6	0.6	7.3	0.7	0.9	0.4	0.2	7.3	1.2	24	
4	0.2	1.0	1.1	2.6	S	2.1	4.1	2.0	1.2	1.6	2.2	1.2	1.1	1.1	1.2	1.1	1.2	1.6	1.1	0.8	0.5	0.4	0.4	0.4	0.2	4.1	1.3	24	
5	0.3	0.2	0.0	S	2.3	3.0	2.3	1.8	2.7	2.4	2.2	2.5	3.1	1.9	2.1	1.7	1.5	2.0	0.9	0.8	1.0	0.9	0.9	0.8	0.0	3.1	1.6	24	
6	0.9	0.6	S	1.4	2.6	2.6	2.2	2.0	2.4	2.8	6.8	2.5	1.4	1.5	1.7	1.3	2.2	1.8	0.9	0.7	0.7	0.6	0.4	0.2	0.2	6.8	1.7	24	
7	0.2	S	0.9	2.3	2.4	2.1	1.4	0.7	3.0	3.9	0.9	0.9	1.0	0.9	0.8	0.6	1.1	0.7	0.5	0.6	1.4	1.2	0.4	1.9	0.2	3.9	1.3	24	
8	S	0.6	1.5	1.8	1.6	1.3	1.1	0.9	0.6	0.6	1.2	0.6	0.3	0.9	0.5	0.6	0.6	0.6	0.6	0.6	0.7	2.3	2.9	S	0.3	2.9	1.0	24	
9	0.6	0.9	1.1	1.1	1.2	2.7	1.8	2.6	1.6	1.2	1.2	0.9	3.4	1.2	0.4	0.9	0.5	0.5	0.4	2.7	6.0	6.8	S	2.8	0.4	6.8	1.8	24	
10	4.8	4.4	3.1	3.0	2.7	2.3	2.1	1.7	1.3	1.3	1.5	1.2	1.1	2.6	1.4	1.2	1.3	0.7	0.5	0.5	0.4	S	1.0	1.9	0.4	4.8	1.8	24	
11	2.2	2.4	2.1	2.3	2.3	2.2	2.6	3.6	5.1	12.7	14.6	3.0	1.0	0.2	4.6	2.9	0.5	0.4	1.6	5.7	S	1.9	4.0	23.2	0.2	23.2	4.4	24	
12	8.7	7.4	24.3	35.3	6.5	20.1	26.2	8.2	7.8	5.0	4.3	1.0	1.6	2.2	1.1	0.5	2.4	0.0	0.0	S	0.9	1.9	2.1	2.0	0.0	35.3	7.4	24	
13	1.6	1.7	2.5	0.9	2.1	4.0	S1	S1	4.1	3.2	2.6	2.2	1.8	C1	C1	C1	1.4	0.9	0.7	0.9	0.8	0.4	S	7.6	0.4	7.6	2.2	19	
14	5.5	3.9	2.6	1.9	2.4	2.6	2.9	1.7	1.9	4.1	1.2	1.0	1.1	0.7	1.0	1.2	1.3	1.4	3.7	3.7	2.3	S	7.1	8.0	0.7	8.0	2.7	24	
15	7.4	6.4	6.2	5.2	4.9	5.8	11.6	10.5	12.9	17.6	C	C	C	C	C	C	C	C	C	0.4	S	7.9	3.9	3.1	0.4	17.6	7.4	24	
16	3.4	3.0	2.5	2.0	2.0	5.6	6.3	6.5	5.6	3.3	2.3	1.9	1.1	1.1	1.1	0.9	2.9	10.9	1.2	S	2.0	4.5	4.6	3.1	0.9	10.9	3.4	24	
17	2.6	2.5	2.5	2.3	2.2	4.5	11.9	20.4	15.9	C1	C1	C1	C1	C1	C1	C1	C1	S	20.2	14.8	4.7	5.7	9.6	2.2	20.4	8.6	15		
18	11.9	19.8	26.2	9.3	14.9	7.2	24.1	5.4	1.3	1.6	3.4	0.9	8.5	4.0	0.0	1.5	6.1	S	0.0	0.0	0.3	2.3	6.0	3.1	0.0	26.2	6.9	24	
19	2.5	2.1	3.5	1.3	0.4	0.6	1.6	2.5	0.9	1.8	3.4	2.4	1.5	1.0	1.0	0.0	S	1.6	2.1	2.2	2.3	1.8	3.0	4.0	0.0	4.0	1.9	24	
20	3.1	1.7	1.4	0.9	0.5	2.3	1.5	3.2	4.4	1.6	1.8	1.6	1.2	0.4	0.4	S	1.3	2.2	2.0	1.8	1.8	1.3	1.8	0.4	4.4	1.7	24		
21	1.8	0.9	0.5	0.8	1.5	4.5	6.2	8.0	5.9	3.0	2.2	1.2	1.0	1.1	S	0.5	1.2	1.7	1.7	2.0	1.0	1.0	0.7	0.6	0.5	8.0	2.1	24	
22	0.6	0.3	1.3	1.0	0.2	0.2	0.5	0.2	0.1	0.0	0.0	0.0	0.0	S	0.2	0.9	1.2	1.1	0.9	1.0	0.7	0.6	0.6	0.6	0.0	1.3	0.5	24	
23	0.6	0.3	0.0	0.1	0.4	0.4	0.4	0.1	0.0	0.0	0.0	0.0	S	2.4	2.7	2.0	1.5	1.0	0.7	0.3	0.5	0.9	2.9	5.0	0.0	5.0	1.0	24	
24	6.7	5.9	9.2	6.2	4.0	2.6	13.8	14.7	11.1	5.3	11.3	S	6.1	4.6	3.2	2.1	3.3	2.7	1.9	0.8	3.8	7.2	2.2	3.1	0.8	14.7	5.7	24	
25	1.3	0.9	1.3	0.9	0.8	1.6	3.9	8.1	2.8	1.1	S	7.3	4.6	5.6	4.1	2.2	2.0	1.1	1.2	1.2	1.2	1.0	1.8	2.9	0.8	8.1	2.6	24	
26	2.2	3.1	3.6	4.1	5.0	5.3	7.5	15.0	7.8	S	14.4	5.0	2.9	2.5	2.1	1.9	1.3	1.0	0.9	2.6	1.8	2.2	2.8	2.6	0.9	15.0	4.2	24	
27	2.8	2.5	2.7	2.9	3.3	3.2	2.7	2.0	S	8.7	4.9	3.0	2.4	2.2	2.4	4.6	1.9	1.1	0.9	1.3	0.6	0.5	0.8	1.6	0.5	8.7	2.6	24	
28	2.0	1.3	1.0	1.3	7.8	18.6	8.3	S	20.9	16.1	15.8	15.4	12.4	15.6	10.8	10.8	9.9	5.9	11.6	6.4	0.0	0.0	0.0	0.0	0.0	20.9	8.3	24	
29	0.0	0.0	0.0	0.2	1.8	3.7	S	9.8	4.5	8.9	6.4	7.0	5.4	2.1	1.1	1.7	2.8	1.0	0.6	0.9	0.6	0.1	0.0	0.0	0.0	9.8	2.5	24	
30	0.0	0.0	0.0	0.0	0.0	S	22.9	4.6	4.6	3.5	3.3	1.2	2.7	2.1	1.9	2.3	1.0	0.5	0.3	0.8	0.3	0.1	0.2	0.0	0.0	22.9	2.3	24	
31	0.0	0.2	0.0	0.1	S	11.3	4.4	2.8	2.0	5.0	1.6	4.0	5.8	3.9	4.9	4.9	4.9	6.3	5.2	4.0	6.6	9.7	8.2	6.6	0.0	11.3	4.5	24	
HOURLY MAX	11.9	19.8	26.2	35.3	14.9	20.1	26.2	20.4	20.9	17.6	15.8	15.4	12.4	15.6	10.8	10.8	9.9	10.9	11.6	20.2	14.8	9.7	8.2	23.2					
HOURLY AVG	2.6	2.7	3.5	3.1	2.7	4.9	6.3	5.3	4.6	4.2	4.1	2.7	2.8	2.7	2.2	2.0	2.2	1.9	1.6	2.3	2.1	2.3	2.3	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

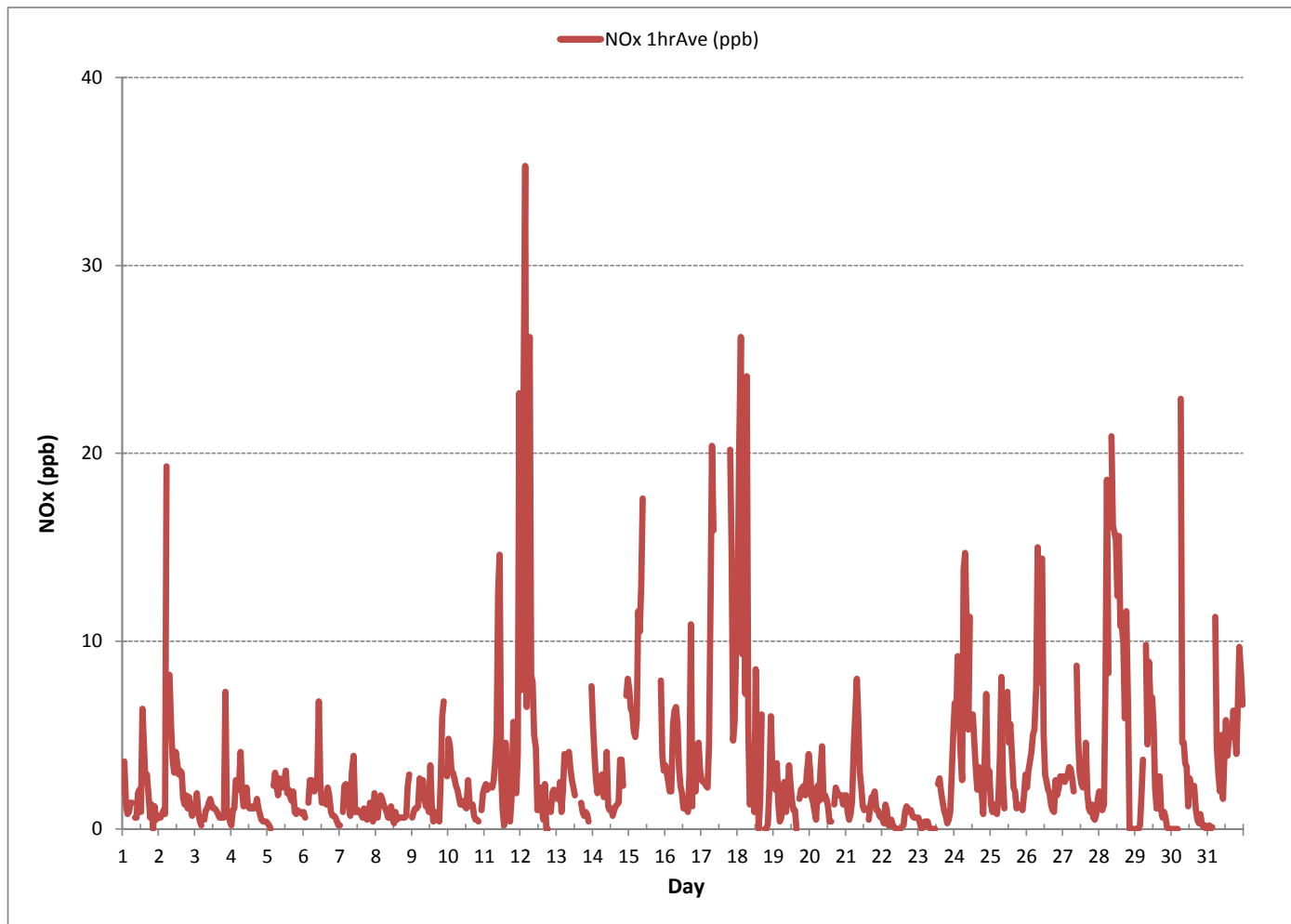
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	655			
MINIMUM 1-HR AVERAGE:	0.0	PPB @ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	35.3	PPB @ HOUR(S)	3	12
MAXIMUM 24-HR AVERAGE:	8.6	PPB		17
				VAR-VARIOUS
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	730
MONTHLY CALIBRATION TIME:	9	HRS	AMD OPERATION UPTIME:	98.1
				%
STANDARD DEVIATION:	4.16		MONTHLY AVERAGE:	3.1
				PPB

OXIDES OF NITROGEN (NOx) hourly averages in ppb



OXIDES OF NITROGEN MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR				
DAY	MIN.	MAX.	AVG.	RDGS.																												
1	3.0	6.5	2.4	1.8	1.8	3.6	3.6	S	1.3	1.8	7.6	8.2	3.0	16.5	17.0	8.2	17.0	14.7	4.1	5.3	1.3	5.3	1.8	1.3	1.3	17.0	6.0	24				
2	1.3	1.3	1.8	1.8	3.6	28.8	S	13.0	7.7	7.7	8.2	14.2	7.7	7.1	7.1	8.8	3.6	3.0	4.7	3.6	4.1	2.4	1.8	1.8	1.3	28.8	6.3	24				
3	2.4	3.0	2.4	1.2	1.2	S	1.8	1.8	1.8	2.5	2.4	2.4	2.4	2.5	1.8	1.8	1.8	1.8	1.8	1.8	1.8	20.0	1.8	3.6	1.3	1.2	20.0	2.8	24			
4	1.3	2.4	2.4	11.2	S	6.5	10.6	4.1	2.4	2.5	36.4	2.4	2.4	1.8	2.4	2.4	3.6	4.1	2.4	1.8	1.8	1.3	1.8	1.3	1.3	36.4	4.8	24				
5	1.3	1.3	1.2	S	3.6	4.1	3.6	3.0	4.1	4.7	4.1	4.7	4.7	3.6	3.6	3.6	2.4	5.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	5.3	2.9	24				
6	1.3	1.2	S	2.4	3.0	3.0	2.4	2.4	3.6	7.7	11.8	5.9	2.4	3.0	2.4	2.4	6.5	3.0	1.8	1.3	1.3	1.3	1.3	1.3	1.2	11.8	3.2	24				
7	1.3	S	2.4	3.0	3.0	3.0	2.4	1.8	5.9	7.1	1.8	1.8	1.8	1.8	1.8	1.3	2.4	2.4	1.8	1.8	3.6	3.0	1.8	4.1	1.3	7.1	2.7	24				
8	S	1.8	2.4	3.0	2.4	2.4	1.8	1.8	1.8	1.8	2.4	2.4	1.2	1.8	1.3	1.3	1.3	1.3	1.8	1.8	1.8	8.2	5.3	S	1.2	8.2	2.3	24				
9	1.3	2.4	2.4	2.4	2.4	5.9	3.6	4.7	3.0	2.4	2.4	3.0	6.5	5.3	1.8	4.1	1.3	1.3	1.3	6.5	11.8	11.8	S	4.7	1.3	11.8	4.0	24				
10	5.9	5.3	4.1	4.7	4.1	4.1	3.5	2.5	2.5	2.5	3.0	2.4	2.4	5.9	4.1	4.1	4.1	1.8	1.3	1.8	1.3	S	2.4	3.0	1.3	5.9	3.3	24				
11	3.5	3.5	3.5	4.1	3.5	4.1	4.1	7.1	7.6	20.6	20.0	10.6	3.0	1.8	28.2	7.1	3.5	2.4	10.0	11.8	S	4.1	7.1	38.2	1.8	38.2	9.1	24				
12	21.2	13.0	34.1	42.3	22.9	35.8	35.8	17.6	13.5	17.6	33.5	4.1	8.8	6.5	8.2	3.5	7.1	2.4	1.2	S	3.0	3.5	4.1	4.1	1.2	42.3	14.9	24				
13	3.5	4.7	6.5	3.0	4.7	7.7	S1	S1	6.5	6.5	5.3	4.7	4.7	C1	C1	C1	3.5	3.0	3.0	3.5	3.5	2.5	S	10.7	2.5	10.7	4.9	19				
14	8.2	6.5	4.7	3.5	4.7	4.7	7.1	3.5	4.1	10.7	4.1	3.0	2.5	2.4	2.4	2.4	3.5	3.0	11.8	4.7	3.5	S	8.8	10.6	2.4	11.8	5.2	24				
15	9.5	7.7	7.7	7.1	6.5	8.2	14.2	21.7	20.0	23.5	C	C	C	C	C	C	C	C	C	3.5	S	14.2	8.2	5.3	3.5	23.5	11.2	24				
16	5.9	5.9	5.3	7.1	5.3	13.0	8.8	10.0	10.7	7.1	3.5	3.5	2.4	4.7	3.5	1.8	8.2	34.7	1.8	S	3.0	5.3	5.3	4.1	1.8	34.7	7.0	24				
17	3.0	3.0	4.7	4.1	3.5	10.6	18.2	34.6	29.9	C1	C1	C1	C1	C1	C1	C1	C1	C1	S	41.4	36.1	16.8	18.5	22.7	3.0	41.4	17.7	15				
18	25.6	45.4	59.5	17.3	22.1	14.5	39.0	31.4	4.4	9.8	22.6	7.4	53.0	24.4	1.5	8.6	13.9	S	1.6	1.6	1.6	9.8	16.2	5.0	1.5	59.5	19.0	24				
19	3.9	4.4	5.6	5.6	2.1	2.7	6.8	4.4	2.7	3.9	5.6	5.0	3.9	2.8	3.3	2.1	S	3.9	3.9	3.9	4.5	3.9	5.0	6.2	2.1	6.8	4.2	24				
20	5.6	3.3	2.8	2.7	2.1	12.1	3.8	9.8	13.3	4.4	4.4	5.0	5.6	3.3	3.3	S	2.8	3.3	3.3	2.8	3.3	3.3	2.1	3.3	2.1	13.3	4.6	24				
21	3.3	2.1	1.6	1.6	3.3	6.2	7.4	10.4	9.1	4.4	3.3	2.1	1.6	2.1	S	1.5	2.1	2.7	2.7	3.3	2.1	1.6	1.6	1.6	1.5	10.4	3.4	24				
22	1.6	1.5	4.4	4.4	1.5	1.0	1.6	0.9	0.9	0.9	0.9	1.0	0.9	S	1.6	2.1	2.7	2.1	2.1	2.1	2.1	2.1	1.6	1.6	0.9	4.4	1.8	24				
23	1.6	1.6	0.9	1.6	1.6	2.1	1.6	1.5	1.5	1.0	1.0	1.0	S	4.5	3.9	3.3	2.8	2.1	2.1	1.6	1.6	3.9	5.0	10.9	0.9	10.9	2.6	24				
24	11.5	10.9	13.3	8.6	8.6	5.0	24.4	23.8	18.5	15.6	24.4	S	8.6	9.1	8.6	5.6	10.4	15.6	12.1	2.1	10.9	14.4	9.8	6.2	2.1	24.4	12.1	24				
25	3.3	2.1	2.1	2.1	3.3	5.6	9.1	17.3	10.9	3.9	S	14.4	6.8	8.6	8.0	3.3	3.3	2.1	2.1	2.1	2.1	2.1	2.8	4.4	2.1	17.3	5.3	24				
26	3.3	5.6	5.0	5.6	6.8	7.4	11.5	34.9	16.2	S	20.3	9.8	3.9	3.9	2.8	2.8	2.8	2.1	1.6	5.0	4.4	3.9	4.4	3.9	1.6	34.9	7.3	24				
27	3.9	3.9	3.9	3.9	4.5	5.0	3.9	3.3	S	11.5	7.4	4.5	3.9	3.9	3.9	9.2	4.5	2.1	1.6	5.0	1.5	1.6	1.6	2.8	1.5	11.5	4.2	24				
28	2.8	2.7	1.6	5.6	17.3	32.0	33.7	S	36.1	27.9	28.5	25.5	19.1	30.2	35.5	23.2	25.0	10.4	17.3	12.7	2.7	0.9	0.9	0.9	0.9	36.1	17.1	24				
29	0.9	0.4	0.4	3.3	5.6	S	16.2	8.0	20.9	14.4	10.4	9.1	5.0	3.3	5.0	5.0	3.3	2.1	2.1	1.6	0.9	0.9	0.4	0.4	0.4	20.9	5.5	24				
30	0.9	0.9	0.4	0.4	0.4	S	164.8	8.0	8.6	8.0	6.8	3.3	6.8	5.6	4.5	6.8	3.9	1.6	0.9	3.3	1.0	1.5	1.0	0.9	0.4	164.8	10.4	24				
31	0.9	0.9	0.9	1.0	S	20.9	6.2	3.9	2.7	11.5	2.7	8.6	8.6	6.2	6.8	6.8	7.4	8.5	7.4	6.2	10.3	12.1	11.5	11.5	0.9	20.9	7.1	24				
HOURLY MAX	25.6	45.4	59.5	42.3	22.9	35.8	164.8	34.9	36.1	27.9	36.4	25.5	53.0	30.2	35.5	23.2	25.0	34.7	17.3	41.4	36.1	16.8	18.5	38.2								
HOURLY AVG	4.8	5.2	6.3	5.5	5.4	9.2	15.5	10.6	8.6	8.6	10.3	6.1	6.7	6.5	6.4	4.9	5.6	5.1	3.8	5.0	5.1	5.0	4.7	5.9								

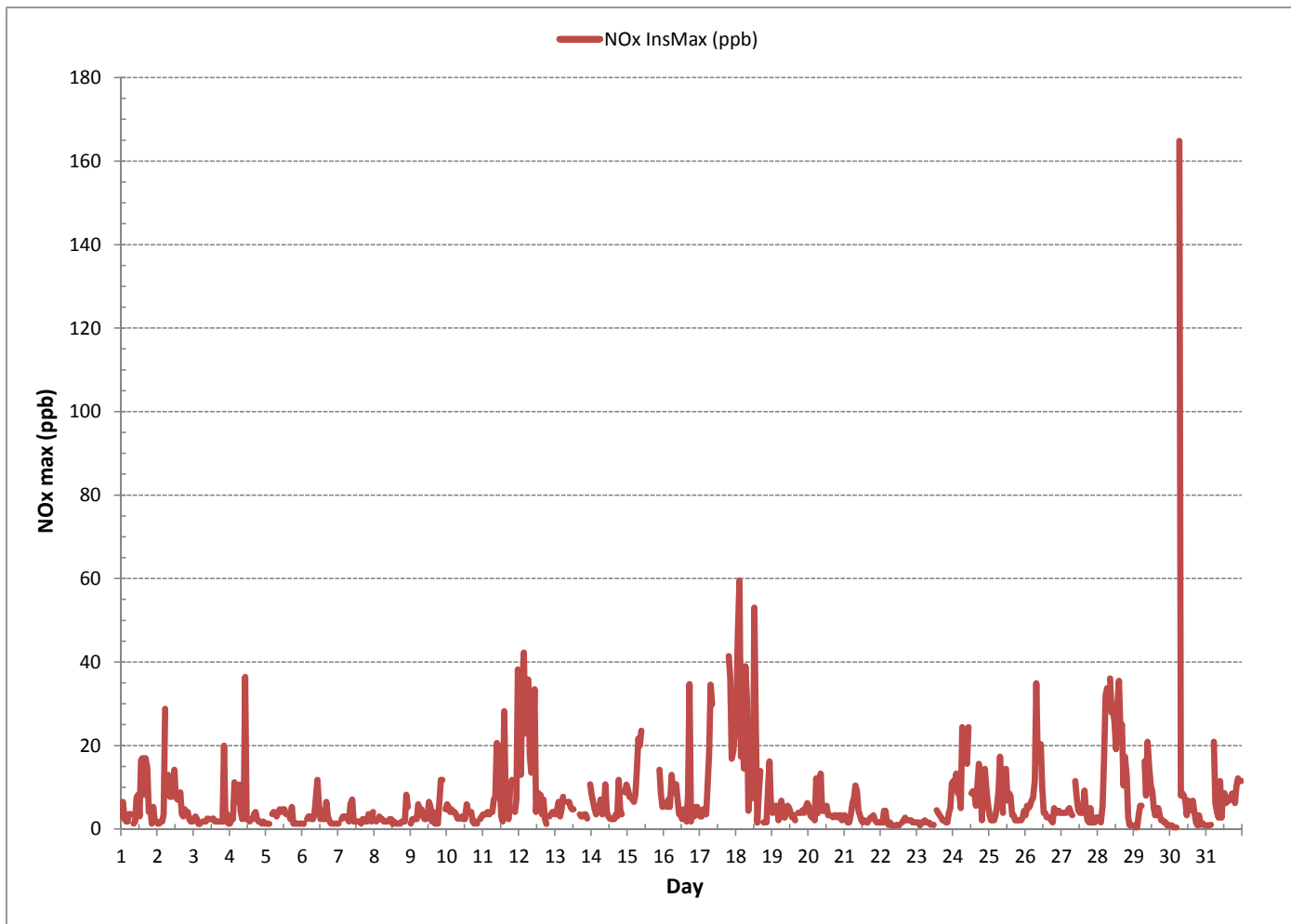
STATUS FLAG CODES

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

MONTHLY SUMMARY

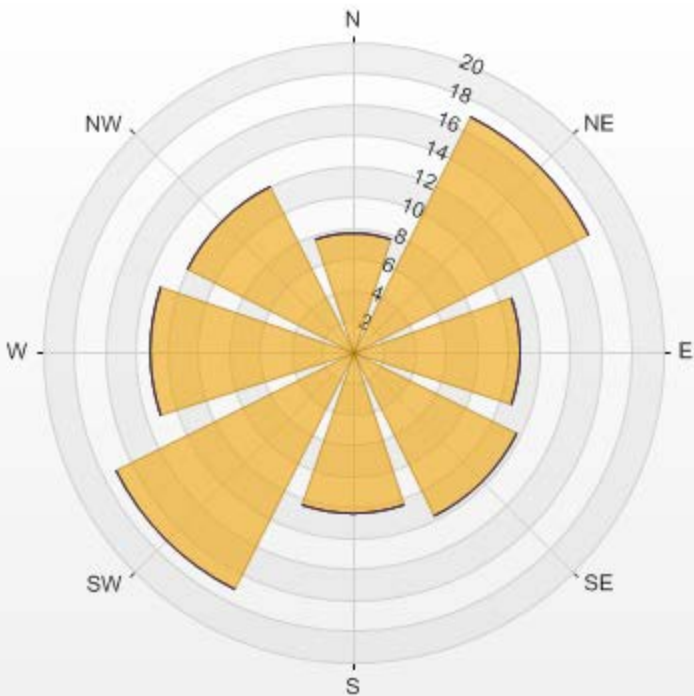
NUMBER OF NON-ZERO READINGS:	689
MAXIMUM INSTANTANEOUS VALUE:	164.8 PPB @ HOUR(S) 6 ON DAY(S) 30
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	9 HRS
OPERATIONAL TIME:	730 HRS
STANDARD DEVIATION:	9.87

OXIDES OF NITROGEN MAX instantaneous maximum in ppb



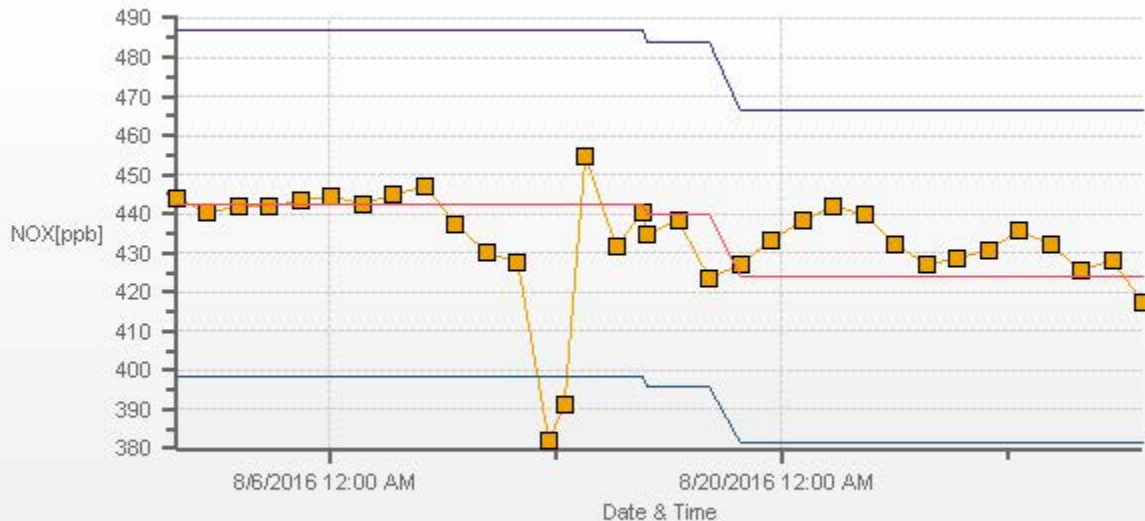
Wind: LICA MASKWA Monitor: NOX [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 92.61% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	7.69	0	0	0	7.69
NE	16.98	0	0	0	16.98
E	10.89	0	0	0	10.89
SE	11.9	0	0	0	11.9
S	10.45	0	0	0	10.45
SW	17.13	0	0	0	17.13
W	13.06	0	0	0	13.06
NW	11.9	0	0	0	11.9
Summary	100	0	0	0	100



% Icon Classes (ppb) 100 0-50.0 0 50.0-110.0 0 110.0-210.0 0 >210.0

NOX[ppb] Calibration: LICA MASKWA Monthly: 08/2016 Type: Span



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

NITRIC OXIDES

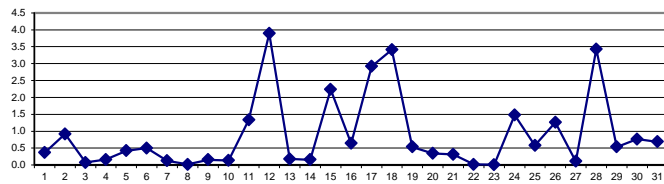
NITRIC OXIDE (NO) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.		
DAY	MIN.	MAX.	AVG.																									MIN.	MAX.	AVG.	RDGS.
1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	S	0.0	0.1	0.6	0.5	0.0	2.6	1.9	0.9	0.9	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.4	24	
2	0.0	0.0	0.0	0.2	0.0	9.3	S	3.5	1.8	1.2	0.7	1.2	0.9	0.5	0.6	0.7	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	0.9	24	
3	0.0	0.0	0.1	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.2	0.0	0.0	0.0	1.2	0.1	24		
4	0.0	0.0	0.0	1.0	S	0.6	0.8	0.3	0.0	0.0	0.5	0.0	0.1	0.0	0.1	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.2	24		
5	0.0	0.1	0.0	S	0.2	0.3	0.2	0.2	0.6	0.6	0.5	0.6	1.0	0.5	0.7	0.4	0.4	0.6	0.4	0.3	0.5	0.5	0.5	0.6	0.0	0.0	1.0	0.4	24		
6	0.6	0.6	S	0.7	0.6	0.5	0.5	0.5	0.6	1.0	2.2	0.8	0.4	0.4	0.4	0.3	0.6	0.3	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	2.2	0.5	24		
7	0.0	S	0.1	0.1	0.1	0.1	0.1	0.0	1.0	1.0	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	0.0	0.0	0.0	1.0	0.1	24		
8	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	S	0.0	0.1	0.0	24		
9	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	1.0	0.2	0.1	0.1	0.1	0.0	0.0	0.3	0.7	0.7	S	0.2	0.0	1.0	0.2	24			
10	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.2	0.2	0.2	0.2	0.1	0.1	0.0	S	0.1	0.1	0.0	0.5	0.1	24		
11	0.0	0.3	0.2	0.1	0.2	0.3	0.3	0.7	1.0	4.7	6.0	1.1	0.3	0.0	2.0	1.0	0.1	0.1	0.5	0.7	S	0.3	0.1	10.7	0.0	10.7	1.3	24			
12	1.9	1.1	13.4	23.6	2.4	12.1	17.5	4.4	4.3	2.8	2.3	0.4	0.6	0.8	0.7	0.2	0.7	0.0	0.0	S	0.2	0.1	0.1	0.0	0.0	23.6	3.9	24			
13	0.1	0.1	0.1	0.2	0.1	1.2	S1	S1	0.9	0.3	0.0	0.0	0.0	C1	C1	C1	0.2	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	1.2	0.2	19			
14	0.1	0.0	0.0	0.0	0.0	0.2	0.7	0.3	0.4	1.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	S	0.2	0.2	0.0	1.3	0.2	24			
15	0.1	0.2	0.2	0.2	0.3	1.2	5.6	5.4	7.6	9.6	C	C	C	C	C	C	C	C	C	0.1	S	0.4	0.0	0.4	0.0	9.6	2.2	24			
16	0.2	0.1	0.4	0.7	0.2	1.3	1.9	2.8	2.1	1.0	0.6	0.4	0.1	0.3	0.0	0.1	0.2	2.3	0.0	S	0.0	0.0	0.0	0.0	0.0	2.8	0.6	24			
17	0.0	0.1	0.1	0.1	0.1	0.9	4.6	10.4	8.0	C1	C1	C1	C1	C1	C1	C1	C1	C1	S	8.1	5.5	0.3	0.9	1.8	0.0	10.4	2.9	15			
18	3.0	10.8	17.3	3.1	5.5	3.5	17.0	3.4	0.8	1.2	1.9	0.5	5.1	2.2	0.0	0.4	2.5	S	0.0	0.0	0.0	0.0	0.3	0.0	0.0	17.3	3.4	24			
19	0.2	0.1	0.4	0.2	0.1	0.4	1.6	1.9	0.6	0.9	1.4	1.1	0.7	0.5	0.6	0.0	S	0.2	0.3	0.1	0.1	0.4	0.2	0.3	0.0	1.9	0.5	24			
20	0.3	0.1	0.1	0.0	0.2	1.8	0.8	1.3	1.6	0.3	0.4	0.4	0.2	0.1	0.0	S	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	1.8	0.3	24			
21	0.1	0.0	0.0	0.1	0.0	0.2	0.7	2.3	1.7	0.7	0.5	0.2	0.1	0.1	S	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.3	24			
22	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	S	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	24		
24	0.6	0.3	1.4	0.8	0.1	0.2	7.3	7.5	5.6	2.3	5.8	S	0.2	0.4	0.1	0.1	0.3	0.2	0.1	0.0	0.0	0.7	0.0	0.1	0.0	7.5	1.5	24			
25	0.1	0.2	0.2	0.0	0.2	0.5	1.6	3.7	1.3	0.4	S	1.0	0.3	1.4	1.0	0.3	0.1	0.0	0.1	0.2	0.3	0.1	0.1	0.2	0.0	3.7	0.6	24			
26	0.2	0.3	0.4	0.4	0.7	1.3	4.4	10.6	5.0	S	4.6	0.5	0.1	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6	1.3	24			
27	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.1	0.1	0.1	0.0	0.2	0.7	0.2	0.1	0.1	0.4	0.2	0.1	0.0	0.0	0.0	0.7	0.1	24			
28	0.1	0.3	0.1	0.2	2.7	12.3	4.6	S	8.4	6.4	7.1	6.7	5.5	7.8	4.6	4.2	4.0	1.6	1.9	0.3	0.0	0.0	0.0	0.0	0.0	12.3	3.4	24			
29	0.0	0.0	0.0	0.0	0.0	0.3	S	0.9	0.5	3.4	2.1	2.3	1.6	0.4	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.5	24			
30	0.0	0.0	0.0	0.0	0.0	S	11.2	0.6	1.0	0.7	0.8	0.2	0.8	0.5	0.6	0.7	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	11.2	0.8	24			
31	0.0	0.1	0.0	0.1	S	0.7	0.2	0.1	0.0	0.9	0.1	1.3	1.5	1.2	1.5	1.5	1.3	1.4	0.6	0.2	0.6	1.3	0.9	0.3	0.0	1.5	0.7	24			
HOURLY MAX	3.0	10.8	17.3	23.6	5.5	12.3	17.5	10.6	8.4	9.6	7.1	6.7	5.5	7.8	4.6	4.2	4.0	2.3	1.9	8.1	5.5	1.3	0.9	10.7							
HOURLY AVG	0.3	0.5	1.2	1.1	0.5	1.7	2.9	2.2	1.8	1.4	1.4	0.7	0.7	0.8	0.6	0.5	0.5	0.3	0.2	0.4	0.3	0.2	0.1	0.5							

STATUS FLAG CODES

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

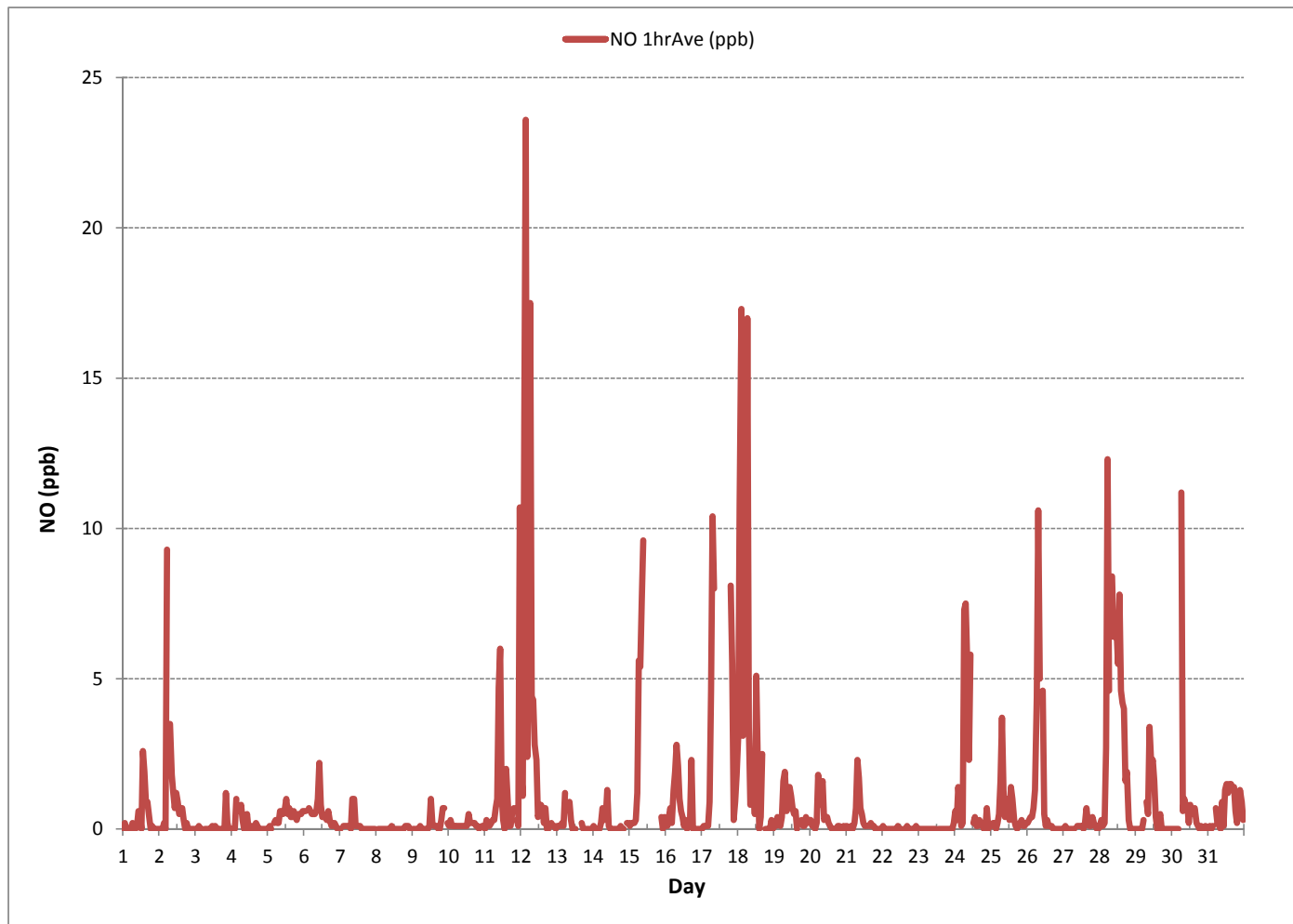
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	439			
MINIMUM 1-HR AVERAGE:	0.0	PPB @ HOUR(S)	VAR	ON DAY(S) ALL
MAXIMUM 1-HR AVERAGE:	23.6	PPB @ HOUR(S)	3	ON DAY(S) 12
MAXIMUM 24-HR AVERAGE:	3.9	PPB		ON DAY(S) 12
				VAR-VARIOUS
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	730
MONTHLY CALIBRATION TIME:	9	HRS	AMD OPERATION UPTIME:	98.1
				%
STANDARD DEVIATION:	2.27		MONTHLY AVERAGE:	0.9
				PPB

NITRIC OXIDE (NO) hourly averages in ppb



NITRIC OXIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR		
HOURLY MAX	HOURLY AVG	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.	
DAY																														
1		0.2	0.8	0.2	0.8	0.8	0.8	0.8	S	0.8	0.8	3.2	3.2	0.8	9.0	8.4	3.8	7.2	6.0	0.8	1.4	0.2	0.2	0.2	0.2	0.2	0.2	9.0	2.2	24
2		0.2	0.2	0.2	0.8	0.8	16.6	S	6.6	3.2	3.2	3.2	7.2	2.6	2.6	2.0	3.2	0.8	0.8	0.8	0.8	0.2	0.2	0.2	0.2	0.2	0.2	16.6	2.5	24
3		0.2	0.8	0.8	0.2	0.2	S	0.8	0.2	0.2	0.2	0.2	0.8	0.2	0.8	0.2	0.2	0.8	0.2	0.2	0.2	4.9	0.8	0.2	0.2	0.2	0.2	4.9	0.6	24
4		0.2	0.2	0.2	7.2	S	3.2	2.6	0.8	0.2	0.8	26.6	0.2	0.8	0.2	0.8	0.8	0.8	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	26.6	2.1	24
5		0.2	0.8	0.2	S	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	1.4	0.8	0.8	0.8	0.8	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.4	0.6	24
6		0.2	0.2	S	0.8	0.8	0.2	0.2	0.8	0.8	2.6	3.8	2.0	0.2	0.8	0.8	0.8	1.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.8	0.8	24
7		0.2	S	0.2	0.2	0.2	0.2	0.8	0.2	2.0	2.0	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.8	0.2	0.2	0.2	0.8	0.2	0.2	0.2	2.0	0.5	24
8		S	0.2	0.2	0.8	0.8	0.2	0.2	0.2	0.8	0.2	0.8	0.2	0.2	0.8	0.2	0.2	0.8	0.2	0.8	0.8	0.8	0.8	0.8	0.8	S	0.2	0.8	0.5	24
9		0.2	0.2	0.2	0.2	0.2	0.8	0.2	0.8	0.8	0.2	0.2	0.8	2.0	1.4	0.8	0.8	0.8	0.2	0.2	1.4	2.0	2.0	S	0.8	0.2	2.0	0.7	24	
10		0.2	0.8	0.2	0.2	0.2	0.2	0.8	0.8	0.4	0.2	0.8	0.2	0.8	1.4	0.8	0.8	0.8	0.8	0.2	0.8	0.2	S	0.8	0.2	0.2	1.4	0.5	24	
11		0.2	0.8	0.2	0.2	0.8	0.8	0.8	1.4	1.4	8.4	8.4	7.8	0.8	0.2	19.6	2.0	0.8	0.2	2.0	1.4	S	0.8	0.2	20.8	0.2	20.8	3.5	24	
12		6.1	3.2	21.3	27.8	12.5	24.9	24.9	9.6	7.3	9.6	21.4	0.8	2.6	1.4	3.2	0.2	2.0	0.8	0.2	S	0.2	0.2	0.2	0.2	0.2	0.2	27.8	7.9	24
13		0.8	0.8	0.8	0.8	0.8	3.2	S1	S1	1.4	1.4	0.8	0.2	0.8	C1	C1	C1	0.8	0.8	0.8	0.2	0.2	0.8	S	0.8	0.2	3.2	0.9	19	
14		0.8	0.8	0.8	0.2	0.2	0.8	2.6	0.8	0.8	4.3	0.8	0.8	0.2	0.2	0.2	0.2	0.8	0.2	1.4	0.8	0.2	S	0.8	0.8	0.2	4.3	0.8	24	
15		0.2	0.8	0.8	0.2	0.8	2.6	6.6	12.5	10.8	13.7	C	C	C	C	C	C	C	C	C	0.2	S	0.2	0.0	0.2	0.0	13.7	3.5	24	
16		0.2	0.2	0.2	2.0	0.2	5.5	2.6	4.3	4.9	2.0	0.8	0.2	0.2	2.0	0.2	0.2	0.8	10.2	0.2	S	0.2	0.2	0.2	0.2	0.2	10.2	1.6	24	
17		0.2	0.2	0.2	0.8	0.2	3.2	7.8	20.8	17.2	C1	C1	C1	C1	C1	C1	C1	C1	C1	S	21.3	17.1	1.9	4.8	6.6	0.2	21.3	7.3	15	
18		11.9	29.4	42.9	8.4	10.1	7.8	30.0	20.7	2.5	6.0	15.9	4.8	35.9	15.9	0.8	3.1	6.6	S	0.7	0.7	0.7	1.3	2.5	0.8	0.7	42.9	11.3	24	
19		0.8	0.8	1.3	0.8	0.8	1.3	5.4	3.1	1.3	1.9	1.9	1.9	1.3	0.8	1.3	0.8	S	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	5.4	1.3	24
20		0.8	0.8	0.7	0.8	0.8	10.1	1.9	4.2	6.0	1.3	1.3	1.9	1.9	0.8	1.3	S	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	10.1	1.8	24	
21		0.8	0.8	0.8	0.8	0.7	1.3	1.9	4.2	3.6	1.9	1.3	0.7	0.8	0.8	S	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.8	0.8	0.7	4.2	1.2	24
22		0.8	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.7	0.8	0.8	S	0.8	0.8	0.7	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	24
23		0.8	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	S	0.8	0.8	0.7	0.8	0.7	0.8	0.7	0.8	0.7	0.8	0.7	2.5	0.7	2.5	0.8	24
24		3.1	1.9	3.6	2.5	1.9	1.3	14.2	14.8	10.1	8.9	14.2	S	1.9	2.5	2.5	1.3	2.5	6.0	3.1	0.8	1.3	2.5	0.8	0.8	0.8	14.8	4.5	24	
25		0.8	0.8	0.8	0.7	1.9	3.1	4.2	9.5	6.6	1.3	S	4.8	1.9	3.6	3.1	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	9.5	2.2	24	
26		0.8	0.8	0.8	0.8	1.9	3.1	7.2	27.1	11.3	S	7.2	2.5	0.8	0.8	0.7	0.8	0.8	0.7	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.7	27.1	3.2	24
27		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	S	0.8	0.8	0.8	0.8	0.8	0.8	1.9	0.8	0.7	0.8	3.1	0.7	0.8	0.8	0.8	0.8	0.7	3.1	0.9	24
28		0.8	0.8	0.7	0.8	10.1	22.4	21.3	S	20.1	13.7	14.8	13.1	9.5	16.5	18.3	10.7	11.9	3.6	3.6	1.3	0.8	0.8	0.8	0.8	0.8	0.7	22.4	8.6	24
29		0.8	0.7	0.7	0.8	1.3	1.3	S	1.9	1.9	10.1	6.6	4.2	3.1	1.9	1.3	1.9	1.3	0.8	0.8	0.7	0.8	0.8	0.8	0.7	0.7	10.1	2.0	24	
30		0.7	0.7	0.2	0.8	0.8	S	126.7	1.9	2.5	2.5	1.9	0.8	2.5	1.9	1.9	2.5	1.3	0.8	0.2	0.8	0.7	0.7	0.8	0.2	0.2	126.7	6.7	24	
31		0.7	0.8	0.2	0.8	S	3.1	0.8	0.8	0.2	2.5	0.8	3.1	3.1	1.9	2.5	2.5	2.5	2.5	1.3	0.7	1.3	1.9	1.9	0.8	0.2	3.1	1.6	24	
HOURLY MAX		11.9	29.4	42.9	27.8	12.5	24.9	126.7	27.1	20.1	13.7	26.6	13.1	35.9	16.5	19.6	10.7	11.9	10.2	3.6	21.3	17.1	2.5	4.8	20.8					
HOURLY AVG		1.2	1.7	2.7	2.1	1.8	4.2	9.6	5.4	4.0	3.6	5.0	2.4	2.8	2.6	2.8	1.6	1.8	1.5	0.9	1.5	1.3	0.8	0.8	1.5					

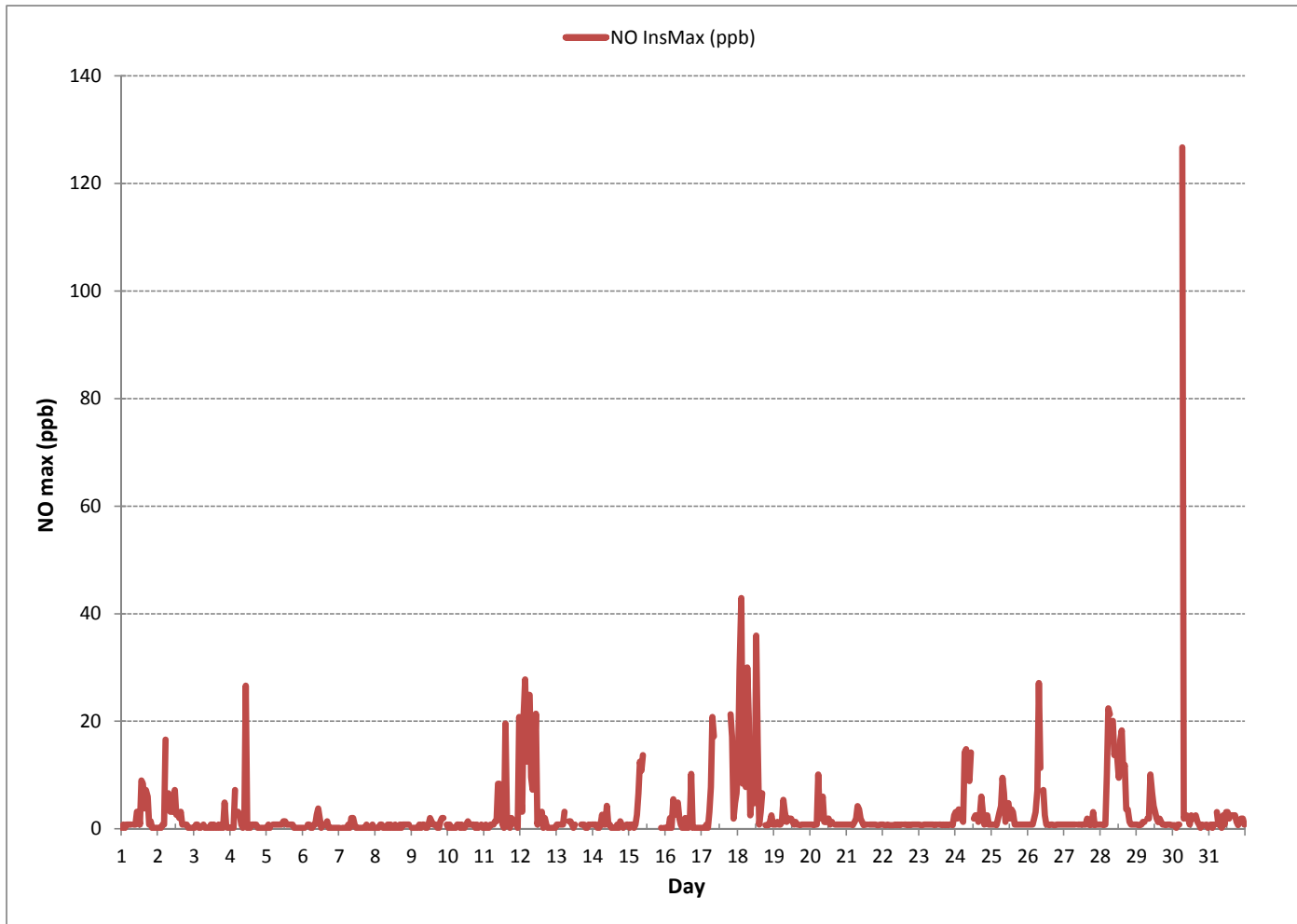
STATUS FLAG CODES

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:	688
MAXIMUM INSTANTANEOUS VALUE:	126.7 PPB @ HOUR(S) 6 ON DAY(S) 30
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	9 HRS
STANDARD DEVIATION:	6.80
OPERATIONAL TIME:	730 HRS

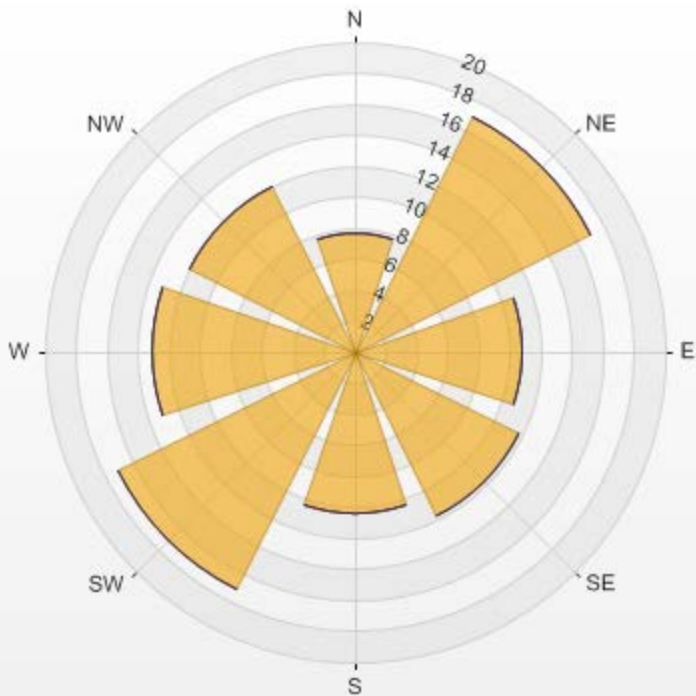
NITRIC OXIDE MAX instantaneous maximum in ppb



Wind: LICA MASKWA Monitor: NO [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.

Calm: 0.00% Valid Data: 92.61% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	7.69	0	0	0	7.69
NE	16.98	0	0	0	16.98
E	10.89	0	0	0	10.89
SE	11.9	0	0	0	11.9
S	10.45	0	0	0	10.45
SW	17.13	0	0	0	17.13
W	13.06	0	0	0	13.06
NW	11.9	0	0	0	11.9
Summary	100	0	0	0	100



NITROGEN DIOXIDE

NITROGEN DIOXIDE (NO2) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.	
DAY	HR	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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	1	1.9	3.4	1.2	0.8	0.9	1.4	1.2	S	0.5	0.5	1.3	1.6	0.9	3.7	2.6	1.6	2.0	1.3	0.6	1.1	0.0	1.2	0.5	0.4	0.0	3.7	1.3	24	
2	2	0.6	0.6	0.8	0.8	0.8	10.0	S	4.7	3.3	2.4	2.3	2.9	2.6	2.4	2.5	2.3	1.4	1.3	1.6	1.1	1.7	1.1	0.7	0.9	0.6	10.0	2.1	24	
3	3	1.0	1.9	0.8	0.4	0.2	S	0.5	1.0	1.1	1.4	1.6	1.3	1.1	1.0	1.0	0.8	0.6	0.6	0.6	0.6	6.1	0.5	0.9	0.4	0.2	6.1	1.1	24	
4	4	0.2	1.0	1.1	1.6	S	1.5	3.3	1.7	1.2	1.6	1.7	1.2	1.0	1.1	1.1	1.0	1.0	1.5	1.1	0.8	0.5	0.4	0.4	0.4	0.2	3.3	1.1	24	
5	5	0.3	0.2	0.0	S	2.2	2.7	2.1	1.7	2.2	1.8	1.7	1.9	2.1	1.4	1.4	1.3	1.0	1.4	0.5	0.5	0.5	0.4	0.4	0.2	0.0	2.7	1.2	24	
6	6	0.3	0.0	S	0.7	2.1	2.1	1.7	1.4	1.8	1.9	4.7	1.7	1.0	1.1	1.3	0.9	1.6	1.5	0.8	0.6	0.5	0.5	0.4	0.2	0.0	4.7	1.3	24	
7	7	0.2	S	0.8	2.2	2.2	2.0	1.3	0.7	2.1	2.9	0.8	0.9	1.0	0.9	0.7	0.6	1.1	0.6	0.5	0.6	1.4	1.2	0.4	1.9	0.2	2.9	1.2	24	
8	8	S	0.6	1.5	1.8	1.6	1.3	1.1	0.9	0.6	0.6	1.1	0.6	0.3	0.8	0.5	0.6	0.6	0.6	0.6	0.6	0.7	2.3	2.8	S	0.3	2.8	1.0	24	
9	9	0.5	0.9	1.1	1.1	1.2	2.6	1.8	2.6	1.6	1.2	1.1	0.9	2.5	0.9	0.4	0.8	0.5	0.5	0.4	2.4	5.3	6.0	S	2.6	0.4	6.0	1.7	24	
10	10	4.7	4.1	3.0	2.9	2.6	2.2	2.0	1.6	1.3	1.2	1.4	1.1	1.0	2.1	1.2	1.0	1.1	0.5	0.4	0.3	0.4	S	0.9	1.8	0.3	4.7	1.7	24	
11	11	2.1	2.1	2.0	2.2	2.2	1.8	2.3	2.9	4.2	8.0	8.6	1.8	0.7	0.2	2.5	1.9	0.4	0.3	1.2	5.0	S	1.6	3.9	12.5	0.2	12.5	3.1	24	
12	12	6.8	6.3	10.9	11.8	4.1	7.9	8.7	3.8	3.5	2.3	2.0	0.6	1.0	1.4	0.4	0.2	1.7	0.0	0.0	S	0.7	1.8	2.0	2.0	0.0	11.8	3.5	24	
13	13	1.4	1.6	2.4	0.7	2.0	2.8	S1	S1	3.2	2.9	2.5	2.2	1.8	C1	C1	C1	1.2	0.8	0.6	0.9	0.8	0.4	S	7.6	0.4	7.6	2.0	19	
14	14	5.5	3.9	2.6	1.9	2.4	2.4	2.2	1.5	1.5	2.8	1.2	1.0	1.1	0.7	1.0	1.2	1.3	1.4	3.6	3.7	2.3	S	6.9	7.8	0.7	7.8	2.6	24	
15	15	7.3	6.2	6.0	5.1	4.6	4.6	6.1	5.1	5.3	8.0	C	C	C	C	C	C	C	C	C	C	0.3	S	7.4	3.9	2.6	0.3	8.0	5.2	24
16	16	3.2	2.9	2.1	1.3	1.8	4.2	4.4	3.7	3.5	2.3	1.7	1.6	1.0	0.8	1.1	0.8	2.7	8.7	1.2	S	2.0	4.5	4.6	3.1	0.8	8.7	2.7	24	
17	17	2.6	2.4	2.4	2.1	2.1	3.6	7.3	9.9	7.9	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	12.2	9.3	4.4	4.8	7.8	2.1	12.2	5.6	14
18	18	8.9	9.1	9.0	6.2	9.4	3.7	7.1	2.0	0.6	0.5	1.5	0.4	3.4	1.8	0.0	1.1	3.6	S	0.0	0.0	0.3	2.3	5.7	3.1	0.0	9.4	3.5	24	
19	19	2.3	2.0	3.1	1.1	0.2	0.3	0.0	0.6	0.3	0.8	2.0	1.3	0.8	0.5	0.5	0.0	S	1.3	1.7	2.0	2.2	1.4	2.7	3.8	0.0	3.8	1.3	24	
20	20	2.8	1.6	1.3	0.9	0.3	0.5	0.7	1.9	2.8	1.3	1.4	1.2	1.0	0.4	0.4	S	1.3	2.2	1.9	1.7	1.8	1.8	1.2	1.8	0.3	2.8	1.4	24	
21	21	1.7	0.9	0.5	0.7	1.5	4.3	5.5	5.6	4.2	2.3	1.8	1.0	0.9	1.0	S	0.5	1.0	1.6	1.6	2.0	1.0	1.0	0.7	0.6	0.5	5.6	1.8	24	
22	22	0.5	0.3	1.3	1.0	0.2	0.2	0.5	0.2	0.1	0.0	0.0	0.0	0.0	S	0.2	0.9	1.1	1.1	0.9	1.0	0.7	0.6	0.5	0.6	0.0	1.3	0.5	24	
23	23	0.6	0.3	0.0	0.1	0.4	0.4	0.4	0.1	0.0	0.0	0.0	0.0	S	2.4	2.7	2.0	1.5	1.0	0.7	0.3	0.5	0.9	2.9	4.8	0.0	4.8	1.0	24	
24	24	6.1	5.6	7.8	5.5	3.9	2.4	6.5	7.2	5.5	3.0	5.6	S	5.9	4.2	3.0	2.0	3.0	2.6	1.8	0.8	3.8	6.5	2.2	3.0	0.8	7.8	4.3	24	
25	25	1.2	0.8	1.1	0.9	0.6	1.1	2.3	4.4	1.5	0.8	S	6.3	4.3	4.2	3.1	1.9	1.9	1.1	1.2	1.0	0.9	1.0	1.8	2.7	0.6	6.3	2.0	24	
26	26	2.1	2.8	3.2	3.7	4.3	4.0	3.2	4.4	2.8	S	9.9	4.6	2.8	2.2	2.0	1.7	1.2	1.0	0.9	2.6	1.8	2.2	2.8	2.6	0.9	9.9	3.0	24	
27	27	2.7	2.4	2.7	2.9	3.3	3.2	2.7	2.0	S	8.6	4.8	2.9	2.3	2.2	2.2	3.9	1.7	1.0	0.8	0.9	0.4	0.5	0.8	1.6	0.4	8.6	2.5	24	
28	28	1.8	1.0	0.9	1.1	5.1	6.3	3.7	S	12.5	9.8	8.7	8.7	7.0	7.8	6.2	6.6	6.0	4.4	9.6	6.2	0.0	0.0	0.0	0.0	0.0	12.5	4.9	24	
29	29	0.0	0.0	0.0	0.2	1.8	3.4	S	8.9	4.0	5.5	4.3	4.7	3.8	1.6	1.1	1.4	2.3	1.0	0.6	0.9	0.6	0.1	0.0	0.0	0.0	8.9	2.0	24	
30	30	0.0	0.0	0.0	0.0	0.0	S	11.7	4.0	3.6	2.8	2.5	1.1	1.9	1.6	1.3	1.6	0.8	0.4	0.3	0.8	0.3	0.1	0.1	0.0	0.0	11.7	1.5	24	
31	31	0.0	0.1	0.0	0.0	S	10.6	4.2	2.7	2.0	4.1	1.5	2.7	4.3	2.7	3.4	3.4	3.5	4.9	4.6	3.8	6.0	8.3	7.3	6.3	0.0	10.6	3.8	24	
HOURLY MAX		8.9	9.1	10.9	11.8	9.4	10.6	11.7	9.9	12.5	9.8	9.9	8.7	7.0	7.8	6.2	6.6	6.0	8.7	9.6	12.2	9.3	8.3	7.3	12.5					
HOURLY AVG		2.3	2.2	2.3	2.1	2.2	3.2	3.4	3.1	2.8	2.8	2.8	2.0	2.1	1.9	1.6	1.6	1.7	1.6	1.4	1.9	1.8	2.1	2.1	2.8					

STATUS FLAG CODES

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

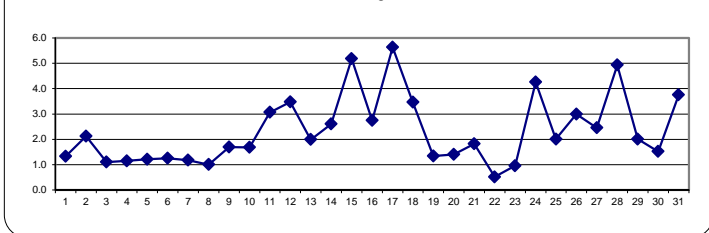
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 PPB

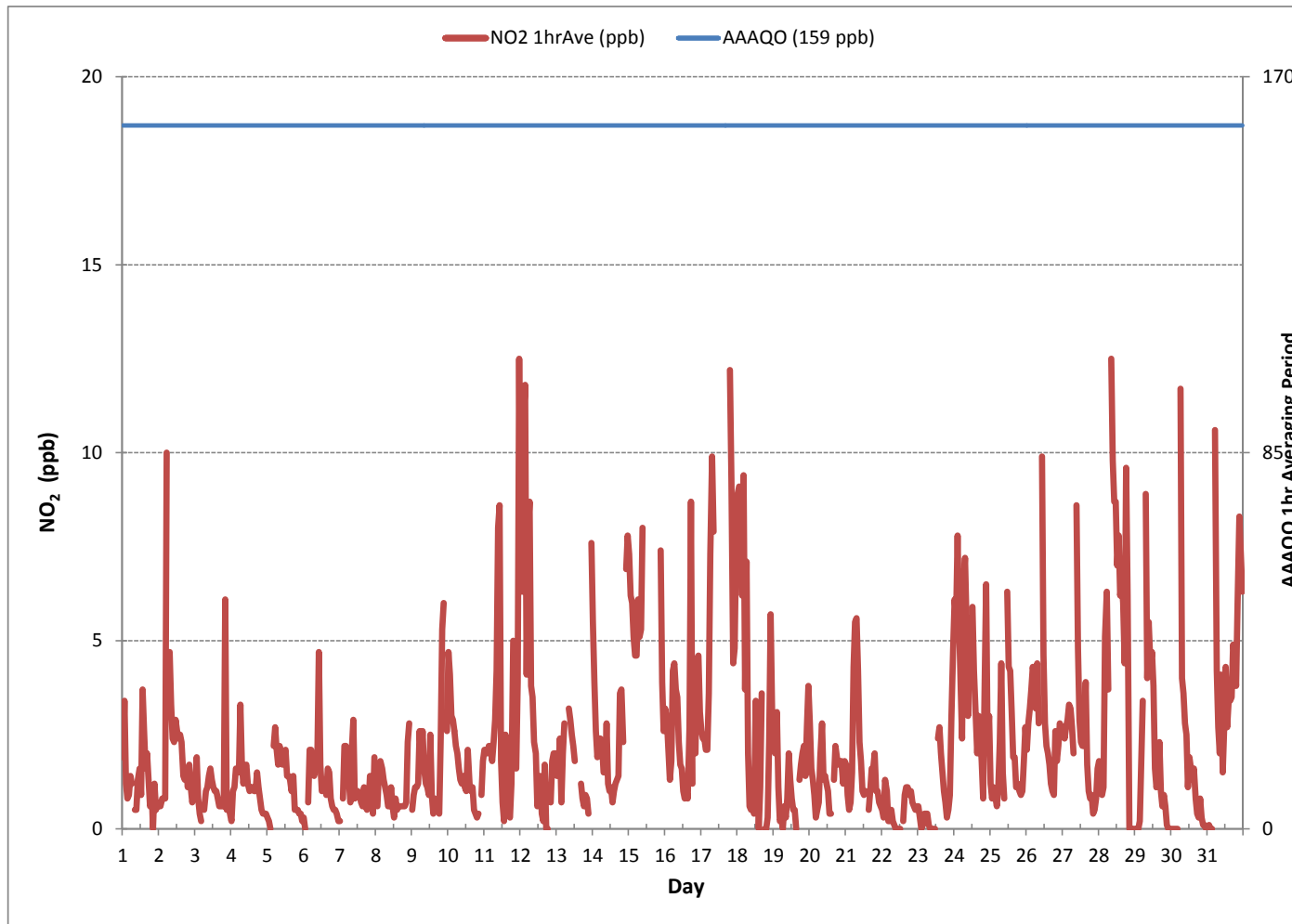
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0				
NUMBER OF NON-ZERO READINGS:	652				
MINIMUM 1-HR AVERAGE:	0.0	PPB	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	12.5	PPB	@ HOUR(S)	23 , 8	ON DAY(S)
MAXIMUM 24-HR AVERAGE:	5.6	PPB			ON DAY(S)
					VAR-VARIOUS
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	729	HRS
MONTHLY CALIBRATION TIME:	9	HRS	AMD OPERATION UPTIME:	98.0	%
STANDARD DEVIATION:	2.28		MONTHLY AVERAGE:	2.2	PPB

24 HOUR AVERAGES FOR August 2016



NITROGEN DIOXIDE (NO₂) hourly averages in ppb



NITROGEN DIOXIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR				
DAY	MIN.	MAX.	AVG.	RDGS.																												
1	3.1	6.0	1.9	1.9	1.3	3.1	3.1	S	1.3	1.3	4.2	4.8	2.5	7.7	8.3	4.2	9.5	8.9	3.1	4.2	0.8	4.8	1.3	1.3	0.8	9.5	3.9	24				
2	1.3	1.3	1.3	1.3	3.0	13.6	S	6.5	4.8	4.8	4.8	7.1	4.8	4.2	5.4	6.0	2.5	2.5	3.7	3.1	3.7	2.5	1.3	1.9	1.3	13.6	4.0	24				
3	2.5	3.1	2.5	1.3	1.3	S	1.3	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.3	1.3	1.3	1.3	1.9	15.3	1.3	3.1	1.3	1.3	1.3	15.3	2.4	24				
4	1.3	1.9	1.9	4.2	S	3.7	7.7	3.1	1.9	2.5	13.6	1.9	1.9	1.9	1.9	1.9	2.5	3.1	1.9	1.9	1.3	1.3	1.3	1.3	1.3	13.6	2.9	24				
5	1.3	0.8	1.3	S	3.1	3.7	3.1	2.5	3.7	3.7	3.1	3.7	3.1	2.5	3.1	2.5	1.9	4.2	1.3	1.3	1.3	1.3	1.3	0.7	4.2	2.4	24					
6	0.7	0.8	S	1.9	3.1	3.1	2.5	2.5	3.1	5.4	7.7	4.2	1.9	2.5	1.9	1.9	4.8	2.5	1.3	1.3	1.3	1.3	1.3	1.3	0.7	7.7	2.5	24				
7	0.8	S	2.5	3.1	3.1	2.5	1.9	1.3	4.2	5.3	1.9	1.9	1.3	1.3	1.9	1.3	1.9	1.9	1.3	1.3	3.1	2.5	1.3	3.7	0.8	5.3	2.2	24				
8	S	1.3	2.5	2.5	2.5	1.9	1.9	1.3	1.3	1.9	1.9	1.3	1.9	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	7.7	4.8	S	1.3	7.7	2.1	24				
9	1.3	1.9	1.9	1.9	2.5	5.4	3.1	4.2	2.5	2.5	1.9	2.5	4.2	3.7	1.3	3.6	1.3	1.3	1.3	5.4	9.5	9.5	S	4.8	1.3	9.5	3.4	24				
10	5.4	5.4	4.2	4.8	4.2	3.6	3.1	2.5	1.9	1.9	2.5	2.5	1.9	4.2	3.1	3.6	3.1	1.9	1.3	1.3	1.3	S	1.9	3.0	1.3	5.4	3.0	24				
11	3.6	3.6	3.1	3.6	3.1	3.1	4.2	6.0	6.0	13.1	11.9	6.5	2.5	1.3	11.9	5.4	3.0	1.9	8.3	10.1	S	3.6	6.5	17.7	1.3	17.7	6.1	24				
12	14.7	10.7	13.6	14.7	10.1	11.3	11.3	7.7	6.5	8.3	13.1	3.0	6.0	4.8	5.9	3.1	5.4	1.9	1.3	S	3.1	3.6	3.6	3.6	1.3	14.7	7.3	24				
13	3.1	4.2	5.4	2.5	4.2	4.8	S1	S1	5.4	5.4	4.8	4.2	4.2	C1	C1	C1	3.1	2.5	2.5	3.1	3.1	2.5	S	10.1	2.5	10.1	4.2	19				
14	7.7	6.0	4.2	3.6	4.8	4.2	4.8	2.5	3.1	6.5	3.0	2.5	1.9	1.9	1.9	2.5	3.1	2.5	10.1	4.8	3.1	S	8.3	10.1	1.9	10.1	4.5	24				
15	9.5	7.1	7.1	7.1	5.4	6.0	7.7	8.9	8.9	10.1	C	C	C	C	C	C	C	C	C	3.6	S	13.6	8.3	5.4	3.6	13.6	7.8	24				
16	6.0	5.4	5.4	5.4	4.8	7.7	6.5	6.0	6.5	4.8	3.1	3.1	2.5	3.1	3.1	1.3	7.7	24.7	1.9	S	3.1	5.4	5.4	4.2	1.3	24.7	5.5	24				
17	3.1	3.1	4.1	3.6	3.1	7.7	10.1	13.6	13.6	C1	C1	C1	C1	C1	C1	C1	C1	C1	S	20.8	19.0	14.9	13.7	16.0	3.1	20.8	10.5	15				
18	14.8	16.6	16.6	9.6	12.0	7.3	9.6	11.4	2.0	3.7	7.9	3.2	19.0	8.4	0.2	6.1	7.3	S	0.8	0.8	1.4	8.4	13.7	4.3	0.2	19.0	8.0	24				
19	3.2	3.8	4.9	4.9	1.4	2.0	1.4	2.0	1.4	2.6	3.7	3.7	2.6	2.0	2.6	1.4	S	3.2	3.2	3.7	3.7	3.2	4.3	5.5	1.4	5.5	3.1	24				
20	5.5	3.2	2.6	2.0	1.4	2.6	2.0	5.5	7.3	3.2	3.2	3.2	2.0	2.6	S	2.6	3.2	2.6	2.6	2.6	2.6	2.6	2.0	2.6	1.4	7.3	3.1	24				
21	2.6	1.4	0.8	1.4	3.2	5.5	6.1	6.1	6.1	2.6	2.0	1.4	1.4	2.0	S	0.8	1.4	2.0	2.0	3.2	1.4	1.4	1.4	0.8	0.8	6.1	2.5	24				
22	0.8	0.8	3.7	3.7	0.8	0.8	0.8	0.8	0.8	0.8	0.2	0.2	0.2	S	1.4	2.0	2.0	2.0	2.0	2.0	1.4	1.4	0.8	1.4	0.2	3.7	1.3	24				
23	1.4	1.4	0.8	1.4	1.4	1.4	1.4	0.8	1.4	0.8	0.8	0.2	S	4.3	3.7	3.2	2.0	2.0	1.4	1.4	0.8	3.7	4.3	8.4	0.2	8.4	2.1	24				
24	9.6	9.0	9.6	6.7	6.1	3.8	9.6	9.6	8.4	7.3	9.6	S	7.9	6.7	6.1	4.3	7.9	9.6	9.0	1.4	9.6	12.0	9.6	6.1	1.4	12.0	7.8	24				
25	2.6	1.4	2.0	1.4	1.4	3.2	4.9	7.9	4.3	2.0	S	11.4	5.5	5.5	5.5	2.6	2.6	2.0	1.4	2.0	2.0	1.4	2.0	3.7	1.4	11.4	3.4	24				
26	3.2	4.9	4.3	4.9	4.9	4.9	4.3	7.8	6.1	S	13.1	7.3	3.7	3.2	2.6	2.6	2.0	1.4	1.4	4.9	3.7	3.2	3.7	3.2	1.4	13.1	4.4	24				
27	3.7	3.2	3.2	3.7	4.3	4.3	3.7	2.6	S	11.4	6.7	3.7	3.2	3.2	3.2	6.7	3.7	1.4	1.4	2.0	1.4	1.4	2.6	1.4	1.4	11.4	3.6	24				
28	2.6	2.0	1.4	4.3	9.6	9.6	13.7	S	19.0	14.3	14.3	12.5	10.2	13.7	17.8	13.2	13.1	6.7	13.7	11.4	2.0	0.2	0.2	0.8	0.2	19.0	9.0	24				
29	0.2	0.2	0.2	2.6	4.9	4.9	S	14.3	6.1	10.8	7.9	6.7	5.5	3.1	2.6	3.2	3.2	2.6	1.4	1.4	1.4	0.8	0.8	0.8	0.2	14.3	3.7	24				
30	0.8	0.8	0.2	0.2	0.2	S	38.3	6.1	6.1	5.5	4.9	2.6	4.3	3.7	3.2	4.3	2.6	1.4	0.8	2.6	0.8	0.8	0.8	0.8	0.2	38.3	4.0	24				
31	0.2	0.8	0.8	0.2	S	19.6	6.1	3.7	2.6	9.0	2.0	5.4	6.1	4.3	4.9	4.8	4.9	6.1	6.1	6.1	9.0	9.6	9.6	10.8	0.2	19.6	5.8	24				
HOURLY MAX	14.8	16.6	16.6	14.7	12.0	19.6	38.3	14.3	19.0	14.3	14.3	12.5	19.0	13.7	17.8	13.2	13.1	24.7	13.7	20.8	19.0	14.9	13.7	17.7								
HOURLY AVG	3.9	3.7	3.8	3.7	3.8	5.4	6.2	5.3	4.9	5.3	5.6	4.0	4.1	3.9	4.0	3.5	3.8	3.8	3.1	3.8	3.8	4.3	4.1	4.6								

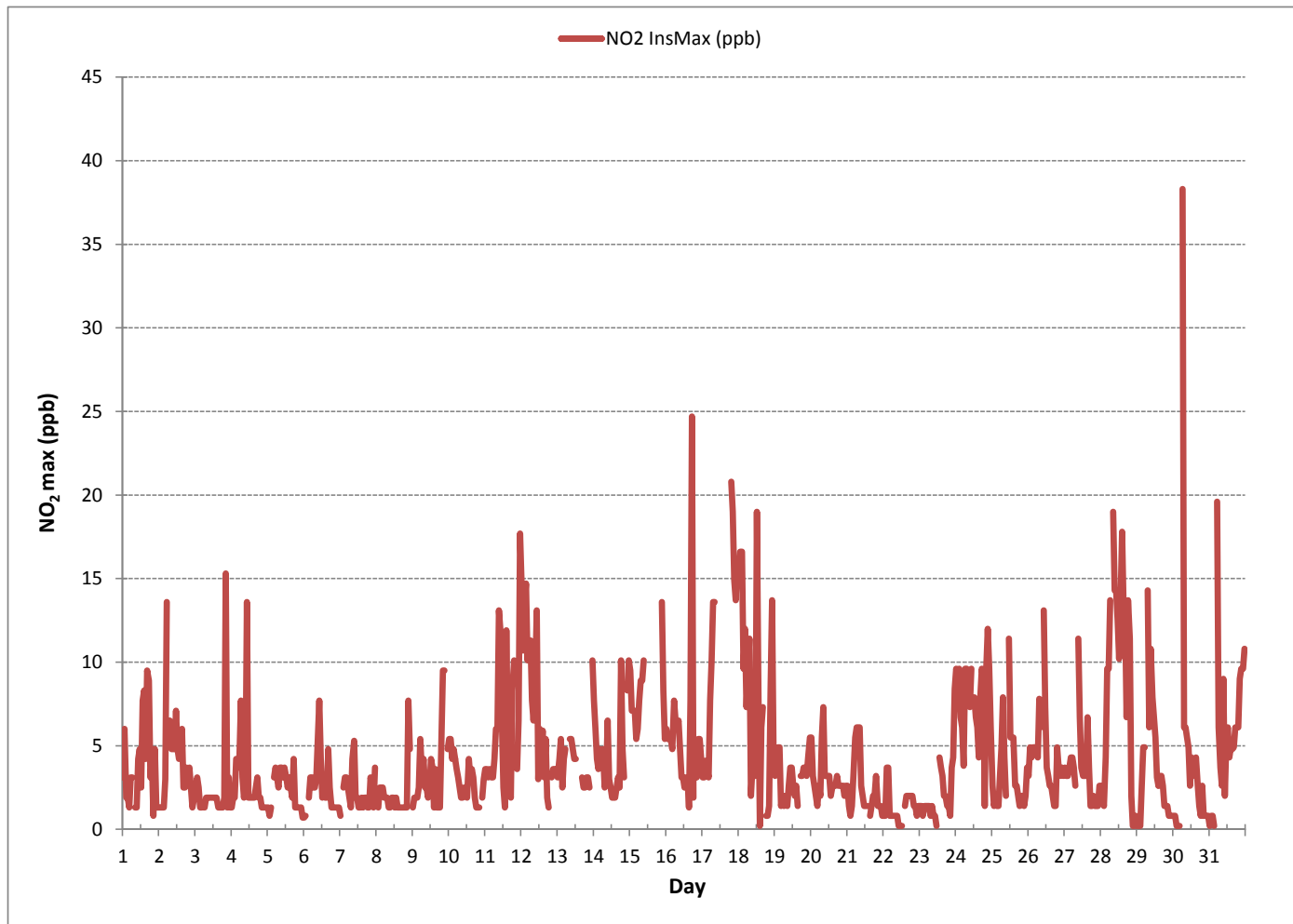
STATUS FLAG CODES

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

MONTHLY SUMMARY

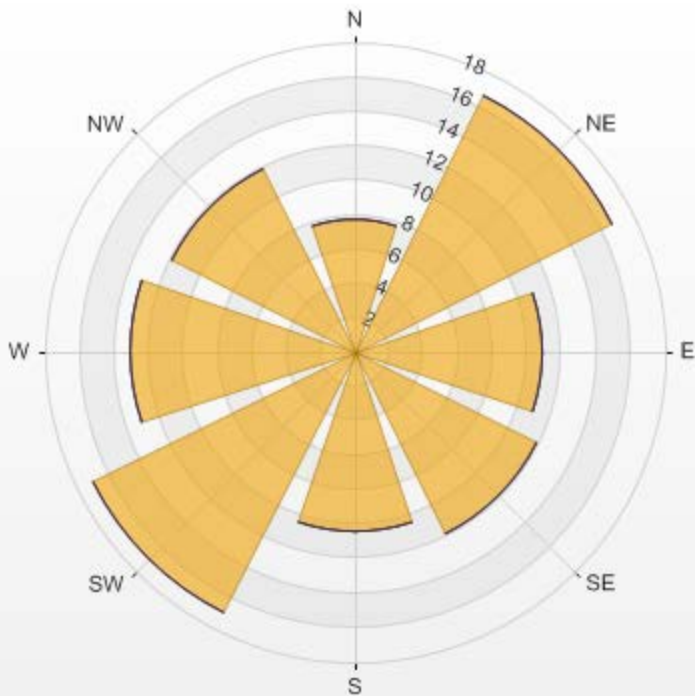
NUMBER OF NON-ZERO READINGS:	689
MAXIMUM INSTANTANEOUS VALUE:	38.3 PPB @ HOUR(S) 6 ON DAY(S) 30
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	9 HRS
OPERATIONAL TIME:	730 HRS
STANDARD DEVIATION:	3.90

NITROGEN DIOXIDE MAX instantaneous maximum in ppb



Wind: LICA MASKWA Monitor: NO2 [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.44% Valid Data: 92.61% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	7.69	0	0	0	7.69
NE	16.69	0	0	0	16.69
E	10.89	0	0	0	10.89
SE	11.9	0	0	0	11.9
S	10.45	0	0	0	10.45
SW	16.98	0	0	0	16.98
W	13.06	0	0	0	13.06
NW	11.9	0	0	0	11.9
Summary	100	0	0	0	100



% Icon Classes (ppb) 100 0.0-50.0 0 50.0-110.0 0 110.0-210.0 0 >210.0

WIND SPEED

WIND SPEED (WS) hourly averages in km/hr

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR		
DAY	MIN.	MAX.	AVG.	RDGS.																										
1	4.3	4.5	5.1	5.4	4.9	5.9	4.9	4.7	4.8	8.3	10.6	11.7	10.5	7.3	8.0	11.1	8.0	4.7	5.6	5.6	4.4	5.7	5.7	4.9	4.3	11.7	6.5	24		
2	4.5	3.2	2.6	3.1	3.9	4.7	4.9	5.0	5.3	6.1	7.2	6.0	6.1	6.2	6.0	5.6	6.0	4.5	4.3	1.6	0.6	1.2	1.9	1.0	0.6	7.2	4.2	24		
3	1.5	1.5	2.2	2.3	3.2	2.7	5.0	6.4	6.6	6.6	6.6	8.8	9.4	8.5	9.8	10.4	10.4	9.4	5.2	1.8	4.0	4.1	3.3	3.5	1.5	10.4	5.6	24		
4	0.8	0.7	0.9	0.2	0.6	0.4	0.8	5.5	4.6	4.1	3.9	6.5	5.7	5.8	7.9	5.8	3.4	2.7	1.9	1.8	1.4	0.9	1.6	1.5	0.2	7.9	2.9	24		
5	1.6	0.5	0.5	0.8	0.9	0.9	0.7	1.4	4.1	5.4	5.2	3.3	6.6	5.1	4.4	3.3	3.3	2.8	2.2	3.6	3.2	2.7	1.4	0.9	0.5	6.6	2.7	24		
6	0.6	1.1	1.2	1.3	0.6	0.7	0.2	1.3	2.8	1.7	3.2	5.2	5.5	4.3	3.6	2.1	2.6	1.8	1.4	0.7	1.8	1.1	1.3	0.5	0.2	5.5	1.9	24		
7	0.2	1.4	0.2	0.9	1.8	2.5	2.7	4.5	2.1	2.3	4.3	5.4	3.7	4.6	3.5	4.7	4.4	5.0	0.5	1.7	3.6	5.9	5.9	5.2	0.2	5.9	3.2	24		
8	3.4	4.2	2.3	1.3	3.1	3.4	5.3	7.5	7.1	8.1	10.8	8.9	9.5	11.1	8.6	7.4	7.8	4.1	2.1	1.3	1.5	1.8	1.5	1.4	1.3	11.1	5.1	24		
9	0.5	2.0	1.2	2.2	3.1	3.0	4.3	5.6	5.8	5.8	4.0	3.4	4.6	6.2	7.0	6.4	4.3	2.9	4.4	5.2	5.3	4.0	4.1	0.7	0.5	7.0	4.0	24		
10	2.1	2.3	2.7	1.5	2.2	1.9	2.5	2.7	3.9	2.5	4.1	3.6	3.5	4.0	4.0	5.8	4.8	3.9	3.4	3.0	2.2	3.2	3.0	1.7	1.5	5.8	3.1	24		
11	0.4	1.0	1.4	0.2	0.8	0.7	0.9	1.5	2.5	2.6	2.7	3.3	2.8	3.7	2.1	4.1	5.3	3.3	7.9	3.9	1.4	0.9	2.2	4.0	0.2	7.9	2.5	24		
12	3.2	4.5	5.4	3.5	3.5	4.4	4.8	4.4	4.4	5.2	6.5	6.5	6.2	4.9	7.3	2.3	2.1	3.9	0.2	3.5	3.0	1.9	2.0	1.4	0.2	7.3	4.0	24		
13	1.8	1.0	2.4	2.3	3.7	2.8	2.3	2.4	3.2	3.3	4.7	5.7	4.4	4.7	5.5	3.6	4.6	3.8	2.4	3.7	2.6	2.0	1.4	0.6	0.6	5.7	3.1	24		
14	0.9	1.9	2.3	1.5	1.6	1.5	1.1	3.4	1.7	1.4	0.9	1.7	3.0	6.0	6.7	5.2	7.0	8.1	0.4	1.3	1.5	1.2	2.8	3.9	0.4	8.1	2.8	24		
15	1.5	2.7	1.5	2.0	1.9	0.9	2.7	2.2	1.2	1.3	4.7	4.4	5.3	4.3	8.0	2.9	3.3	4.7	3.6	1.3	2.0	2.3	2.1	2.9	0.9	8.0	2.9	24		
16	2.0	1.5	1.7	2.7	3.0	3.8	5.2	5.6	5.5	7.5	6.5	8.1	7.5	8.1	5.9	5.6	5.4	5.2	4.1	4.7	4.7	5.8	3.0	2.3	1.5	8.1	4.8	24		
17	2.5	3.4	2.7	3.6	3.2	2.3	2.9	2.9	3.9	4.4	7.0	8.5	10.2	10.2	10.1	8.0	5.8	8.7	6.1	6.3	6.6	4.6	4.7	4.7	2.3	10.2	5.6	24		
18	6.1	5.7	5.6	6.3	6.1	6.3	6.4	6.6	7.1	9.0	8.5	9.3	8.1	8.9	8.6	6.7	5.9	6.8	10.0	6.5	2.5	1.9	1.8	2.0	1.8	10.0	6.4	24		
19	1.4	1.9	1.8	1.6	1.2	1.3	0.2	1.1	5.6	6.5	5.4	4.6	3.2	5.2	4.1	5.1	3.8	2.5	3.4	2.3	2.8	5.8	5.2	3.4	0.2	6.5	3.3	24		
20	1.1	0.6	0.6	0.7	0.8	0.8	1.3	1.8	2.5	3.6	3.3	4.6	4.7	5.4	5.0	3.1	1.8	1.6	2.6	4.1	7.3	4.5	1.4	2.5	0.6	7.3	2.7	24		
21	1.0	0.6	2.5	2.4	2.3	5.3	3.9	2.9	3.1	3.7	4.4	4.8	5.7	3.7	3.8	4.5	4.9	4.1	1.5	4.8	6.0	5.0	7.9	5.8	0.6	7.9	3.9	24		
22	8.6	8.6	3.6	12.9	9.5	10.3	11.1	14.6	16.0	16.8	20.2	18.3	14.7	10.7	13.7	15.0	13.9	12.3	10.6	4.7	4.6	5.0	5.9	9.2	3.6	20.2	11.3	24		
23	5.1	8.1	14.7	14.7	14.7	14.1	14.7	13.8	14.0	14.8	15.9	16.8	16.0	16.2	15.1	12.1	13.0	10.6	6.6	5.2	1.7	0.8	2.1	1.9	0.8	16.8	10.9	24		
24	2.1	2.1	2.1	1.9	2.4	2.0	2.0	3.5	2.2	0.2	1.5	5.5	4.9	4.7	4.6	5.1	4.0	2.6	3.0	3.0	4.3	2.5	3.4	3.2	0.2	5.5	3.0	24		
25	2.9	2.8	2.7	2.8	3.4	2.9	3.5	4.3	5.2	5.2	4.3	5.9	7.6	6.5	8.0	8.1	7.4	6.4	2.1	1.3	1.3	1.8	1.9	2.3	1.3	8.1	4.2	24		
26	1.4	1.4	1.4	2.0	2.1	2.1	1.4	0.7	1.4	1.1	2.6	3.2	1.6	5.0	5.6	6.1	6.3	6.0	4.1	5.5	6.4	7.1	8.1	8.9	0.7	8.9	3.8	24		
27	9.1	9.1	8.5	8.1	8.3	7.4	7.0	6.4	5.2	6.3	8.4	8.6	8.8	6.1	3.6	2.4	1.5	1.7	1.5	1.1	0.2	2.0	2.7	2.7	0.2	9.1	5.3	24		
28	2.7	2.3	3.6	3.7	7.2	9.6	6.5	8.9	9.3	9.5	10.4	9.9	10.2	11.0	9.4	7.8	8.6	8.3	6.7	4.1	3.3	2.9	3.0	2.9	2.3	11.0	6.7	24		
29	3.2	2.7	2.3	1.8	2.0	1.4	0.1	2.8	2.8	1.7	3.1	2.0	1.0	3.2	2.3	2.6	3.2	5.4	3.5	2.7	1.5	1.5	2.6	2.7	0.1	5.4	2.4	24		
30	3.6	3.5	3.5	3.7	3.6	4.6	3.9	4.9	7.2	7.1	7.1	9.0	9.3	6.6	8.1	7.2	6.5	6.1	6.1	5.2	6.7	6.4	4.0	3.9	3.5	9.3	5.7	24		
31	4.2	4.2	4.5	4.2	4.6	2.8	4.7	4.7	8.4	6.8	8.9	8.8	7.4	7.6	10.0	8.9	7.9	7.5	7.1	7.8	7.0	7.3	6.6	4.6	2.8	10.0	6.5	24		
HOURLY MAX	9.1	9.1	14.7	14.7	14.7	14.1	14.7	14.6	16.0	16.8	20.2	18.3	16.0	16.2	15.1	15.0	13.9	12.3	10.6	7.8	7.3	7.3	8.1	9.2						
HOURLY AVG	2.7	2.9	3.0	3.3	3.6	3.7	3.8	4.6	5.1	5.4	6.4	6.8	6.7	6.6	6.8	6.1	5.7	5.2	4.0	3.5	3.4	3.3	3.4	3.1						

STATUS FLAG CODES

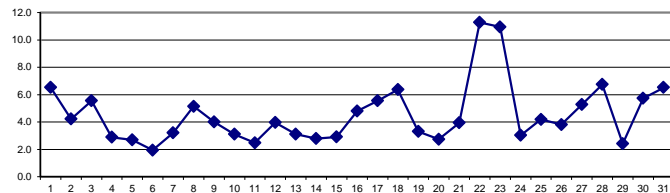
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

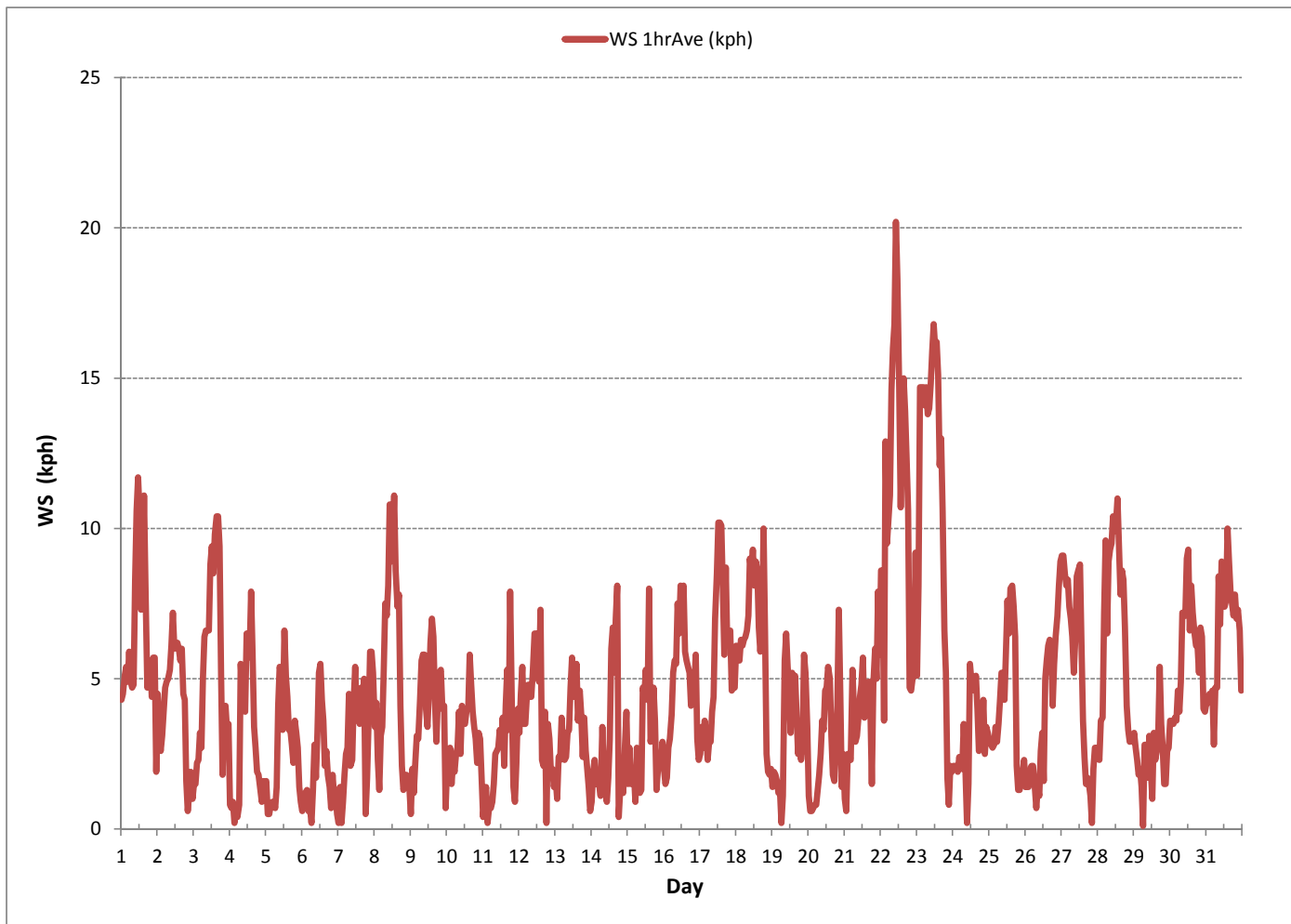
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MINIMUM 1-HR AVERAGE:	0.1 kph @ HOUR(S) 6 ON DAY(S) 29
MAXIMUM 1-HR AVERAGE:	20.2 kph @ HOUR(S) 10 ON DAY(S) 22
MAXIMUM 24-HR AVERAGE:	11.3 kph ON DAY(S) 22
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 HRS
OPERATIONAL TIME:	744 HRS
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3.22
MONTHLY AVERAGE:	4.6 kph

24 HOUR AVERAGES FOR August 2016



WIND SPEED (WS) hourly averages in kph





VECTOR WIND SPEED MAX instantaneous maximum in km/hr

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR		
HOURLY MAX	HOURLY AVG	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.	
DAY																														
1		15.9	16.6	16.3	17.7	17.9	21.0	20.5	22.3	19.6	37.8	35.8	48.7	39.3	46.8	32.6	36.9	38.4	26.2	21.4	23.6	14.9	25.2	21.9	17.1	14.9	48.7	26.4	24	
2		18.6	12.5	9.3	9.8	18.8	19.0	19.4	15.7	19.4	22.2	31.0	20.9	34.1	22.9	28.4	36.0	27.3	17.6	16.8	9.3	7.4	4.5	5.0	4.5	4.5	36.0	17.9	24	
3		5.4	3.4	6.3	8.9	8.9	6.9	10.0	14.4	15.7	19.9	21.7	23.9	26.5	26.9	33.3	31.9	29.2	31.4	19.8	11.3	21.1	17.4	13.3	14.1	3.4	33.3	17.6	24	
4		5.0	5.0	5.0	4.5	3.9	3.4	5.2	12.6	13.7	16.1	21.6	21.1	27.7	24.4	29.5	26.4	23.6	10.6	8.7	4.8	4.5	2.8	6.5	4.3	2.8	29.5	12.1	24	
5		7.4	3.9	3.3	2.9	4.8	5.6	3.0	10.6	14.6	19.8	16.1	22.9	26.8	25.7	27.0	26.0	27.3	12.0	8.0	14.6	9.5	6.9	5.0	3.6	2.9	27.3	12.8	24	
6		3.2	3.4	5.8	4.8	4.1	4.1	3.6	5.6	9.1	12.4	14.8	25.7	19.8	28.6	17.1	12.3	21.2	12.3	8.1	2.9	4.4	12.8	4.3	4.5	2.9	28.6	10.2	24	
7		2.8	4.1	3.6	4.5	5.8	8.0	7.8	10.0	13.3	10.2	14.1	20.9	24.6	17.0	20.7	24.4	25.7	20.1	11.5	5.6	15.9	18.1	15.9	13.9	2.8	25.7	13.3	24	
8		8.5	12.0	10.4	6.1	10.4	9.4	20.4	19.5	16.9	25.4	27.6	19.9	24.2	29.7	24.0	22.2	20.1	19.2	8.5	6.3	4.5	12.2	5.8	5.0	4.5	29.7	15.3	24	
9		3.2	5.6	4.1	9.1	11.5	10.9	15.0	16.6	20.3	20.5	13.9	13.9	17.9	29.0	28.6	26.6	15.9	8.9	15.7	21.0	28.2	20.3	13.8	7.0	3.2	29.0	15.7	24	
10		6.6	6.8	8.3	8.9	7.1	9.1	10.0	12.2	14.4	10.6	14.8	13.3	13.3	14.8	15.7	27.1	22.7	19.2	15.7	8.7	6.3	10.2	10.9	8.7	6.3	27.1	12.3	24	
11		5.2	5.4	6.7	6.1	4.3	3.6	5.2	5.4	6.9	8.0	17.9	15.2	19.6	12.4	16.8	25.5	26.0	27.9	32.6	21.8	11.8	6.8	14.0	19.5	3.6	32.6	13.5	24	
12		16.0	21.1	17.0	14.1	16.8	16.1	14.6	19.2	17.4	17.6	27.1	28.1	47.8	28.6	33.4	41.3	22.5	24.0	7.4	8.2	6.1	5.8	7.1	5.8	5.8	47.8	19.3	24	
13		5.0	5.8	5.8	7.4	10.9	10.0	8.0	9.1	13.5	15.7	20.6	24.5	26.0	P	23.1	20.7	23.5	25.1	13.9	28.1	8.7	6.9	9.6	5.4	5.0	28.1	14.2	23	
14		4.8	5.8	26.5	16.9	14.9	7.8	4.3	8.5	7.1	15.9	8.0	12.4	15.2	25.7	24.4	24.2	36.0	35.2	15.9	8.0	5.2	4.3	8.9	12.4	4.3	36.0	14.5	24	
15		6.9	9.1	7.6	8.7	12.4	6.5	9.3	8.2	8.0	12.0	13.9	15.0	20.9	25.1	32.1	13.9	13.5	18.0	14.7	6.8	4.0	5.5	4.8	6.3	4.0	32.1	11.8	24	
16		6.3	8.0	6.7	8.2	7.8	10.4	15.2	13.5	16.3	19.4	17.0	20.7	26.2	33.4	44.1	21.3	32.3	33.4	13.7	19.6	13.5	11.8	8.7	11.1	6.3	44.1	17.4	24	
17		11.8	11.5	11.5	7.8	10.2	13.9	11.8	14.1	13.9	17.9	32.6	40.1	40.3	38.1	42.5	37.2	35.3	40.7	33.3	25.3	24.4	16.4	17.7	20.1	7.8	42.5	23.7	24	
18		21.1	19.6	20.5	22.9	23.8	18.8	24.2	22.5	32.8	35.0	33.2	29.9	31.2	34.3	33.9	40.6	21.8	34.3	27.7	27.7	10.7	11.1	6.3	6.1	6.1	40.6	24.6	24	
19		5.0	4.8	4.6	3.6	3.6	3.4	2.3	9.8	13.7	15.0	17.7	16.1	13.9	17.0	16.6	13.1	12.8	8.7	8.5	6.5	7.1	15.2	14.8	11.5	2.3	17.7	10.2	24	
20		6.5	3.2	3.2	3.2	3.4	3.7	4.6	7.7	11.1	13.1	15.5	18.1	24.4	20.7	18.1	13.9	6.5	6.3	8.2	16.1	20.3	22.3	9.8	8.0	3.2	24.4	11.2	24	
21		7.6	8.0	8.0	8.0	7.4	12.6	9.1	11.3	10.7	12.4	15.7	18.3	21.6	15.9	30.1	17.7	23.5	14.8	8.9	14.8	18.1	12.4	17.2	12.5	7.4	30.1	14.0	24	
22		26.5	21.9	25.6	29.7	25.8	37.8	32.8	42.0	46.8	50.0	49.2	50.9	47.7	45.0	47.7	40.0	50.0	50.0	38.9	43.7	31.2	21.4	16.1	35.0	29.1	16.1	50.9	37.0	24
23		15.0	31.7	37.4	35.2	36.5	37.4	36.3	33.2	37.8	40.9	38.7	39.3	43.7	33.3	40.1	34.2	36.4	32.9	23.4	17.7	6.3	6.1	8.0	8.2	6.1	43.7	29.6	24	
24		8.9	6.5	9.3	7.6	4.8	5.8	6.7	10.4	7.4	7.4	16.3	20.3	20.7	26.4	19.8	18.8	17.2	10.6	14.4	13.1	21.1	12.2	17.4	13.1	4.8	26.4	13.2	24	
25		10.1	9.0	9.9	8.8	8.7	8.0	15.9	17.0	18.8	20.5	16.8	21.8	32.3	23.1	39.1	30.6	26.0	24.9	9.6	7.8	6.7	7.1	9.3	10.9	6.7	39.1	16.4	24	
26		11.1	4.3	7.1	6.3	5.4	6.6	4.2	4.4	5.6	8.2	12.6	15.0	22.7	19.0	19.8	22.0	19.4	19.2	12.6	13.9	15.5	23.1	25.1	27.5	4.2	27.5	13.8	24	
27		29.3	25.3	24.0	23.4	22.7	20.3	22.0	18.5	15.3	21.0	26.4	35.0	34.5	21.8	12.2	11.5	4.5	6.1	4.7	4.6	5.3	12.7	7.7	12.1	4.5	35.0	17.5	24	
28		12.9	7.1	10.2	21.1	36.1	43.7	33.4	36.7	36.1	42.0	44.0	47.7	42.4	41.1	38.0	35.2	35.8	38.9	33.7	15.3	11.1	13.3	13.8	11.6	7.1	47.7	29.2	24	
29		13.1	9.6	8.3	5.6	6.7	5.2	5.6	7.8	10.2	12.2	13.5	15.9	13.3	16.6	13.9	16.6	12.0	14.6	8.2	5.8	4.5	5.1	7.0	6.9	4.5	16.6	9.9	24	
30		11.3	9.3	10.4	8.5	9.8	10.7	8.5	17.0	29.1	35.6	33.4	35.4	37.1	34.7	30.4	35.8	27.7	26.6	23.8	19.9	24.7	28.8	15.9	11.3	8.5	37.1	22.3	24	
31		14.1	12.1	17.1	12.5	12.7	12.5	16.8	22.0	33.2	29.7	41.7	34.7	35.0	35.4	41.9	36.0	33.0	31.4	29.0	31.2	32.6	30.4	25.8	23.8	12.1	41.9	26.9	24	
HOURLY MAX		29.3	31.7	37.4	35.2	36.5	43.7	36.3	42.0	46.8	50.0	49.2	50.9	47.8	47.7	44.1	50.0	50.0	40.7	43.7	31.2	32.6	30.4	35.0	29.1					
HOURLY AVG		10.5	10.1	11.3	11.1	12.2	12.7	13.1	15.4	17.7	20.8	23.3	25.3	28.0	27.2	28.0	26.8	24.7	22.3	16.8	14.6	12.8	13.0	12.5	11.5					

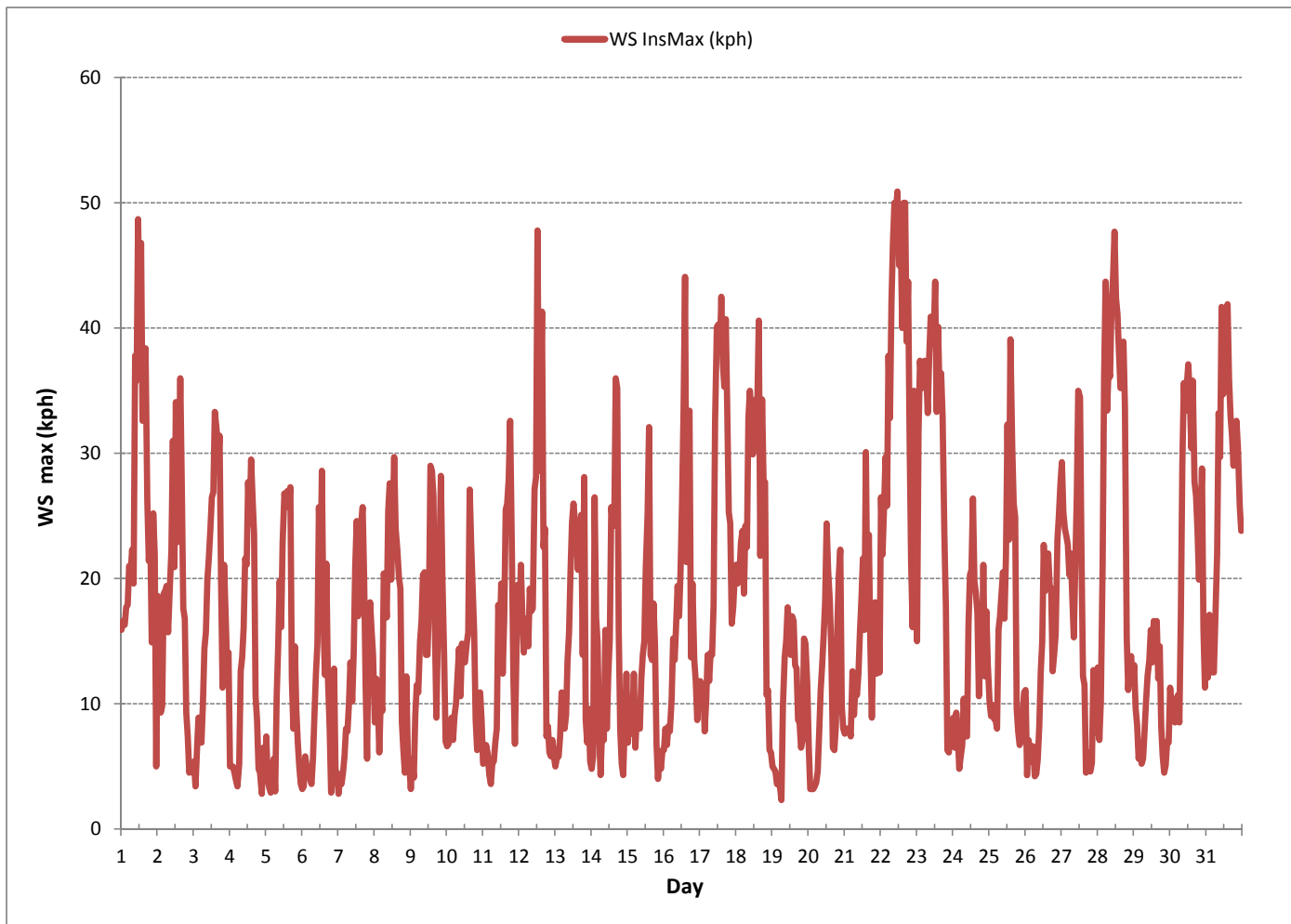
STATUS FLAG CODES

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

MONTHLY SUMMARY

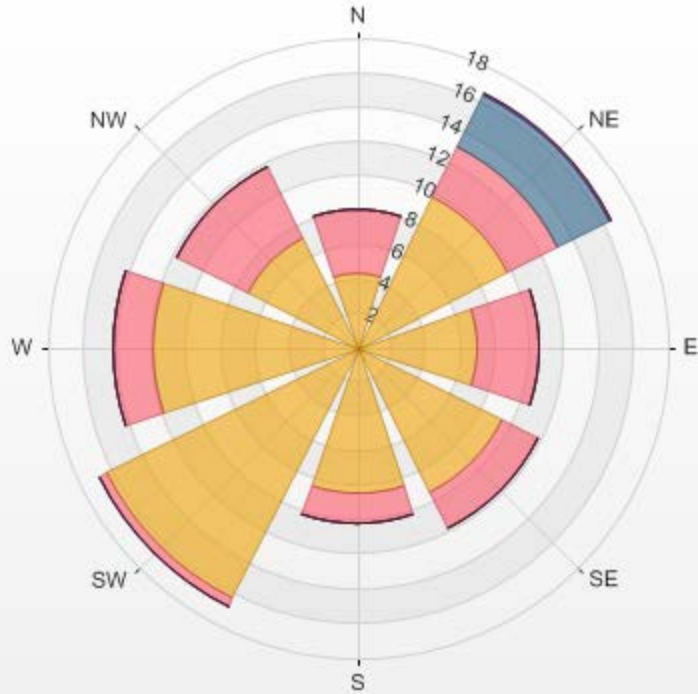
MAXIMUM INSTANTANEOUS VALUE:	50.9	kph	@ HOUR(S)	11	ON DAY(S)	22
					VAR-VARIOUS	
OPERATIONAL TIME:					743	HRS

VECTOR WIND SPEED MAX instantaneous maximum in kph



Wind: LICA MASKWA Monitor: WSP [kph] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 100.00% Calm Avg: 0.00

Direction	0.0-6.0	6.0-12.0	12.0-20.0	20.0-29.0	29.0-39.0	>39.0	Total
N	4.3	3.76	0	0	0	0	8.06
NE	9.81	3.23	3.36	0.13	0	0	16.53
E	6.99	3.63	0	0	0	0	10.62
SE	9.41	2.28	0	0	0	0	11.69
S	8.47	1.75	0	0	0	0	10.22
SW	16.26	0.54	0	0	0	0	16.8
W	11.96	2.28	0	0	0	0	14.24
NW	7.12	4.7	0	0	0	0	11.82
Summary	74.32	22.17	3.36	0.13	0	0	100



% Icon Classes (kph)	74	22	3	0	0	0
0.0-6.0	74	22	3	0	0	0
6.0-12.0		22	3	0	0	0
12.0-20.0			3	0	0	0
20.0-29.0				0	0	0
29.0-39.0				0	0	0
>39.0				0	0	0

WIND DIRECTION



WIND DIRECTION (WD) hourly averages

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

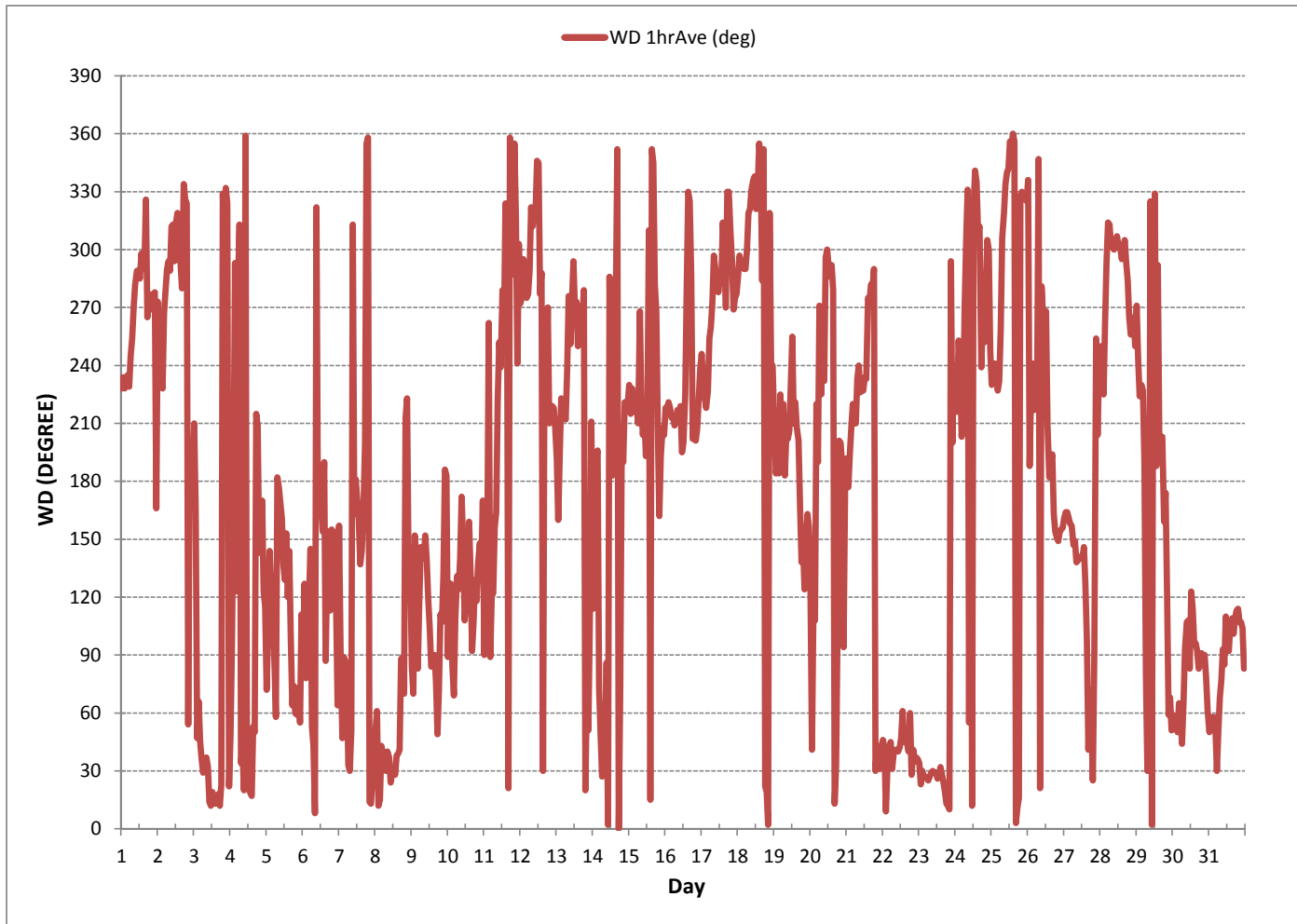
STATUS FLAG CODES

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:	744	HRS
STANDARD DEVIATION:	101.51		AMD OPERATION UPTIME:	100.0	%

WIND DIRECTION (WD) hourly averages



STANDARD DEVIATION WIND DIRECTION

STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	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.	
HOUR START	HOUR END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59		
DAY																											
1		29	34	31	28	34	28	40	39	39	36	34	33	34	40	35	34	38	38	37	33	31	31	28	27	24	
2		30	28	27	24	33	34	34	37	39	44	43	39	48	43	42	44	39	40	40	44	45	25	25	60	24	
3		23	29	25	25	24	32	11	17	28	32	40	33	29	29	29	24	26	26	21	48	43	40	40	31	24	
4		50	61	51	63	65	45	36	14	32	55	44	39	47	45	34	36	61	57	54	28	42	38	41	37	24	
5		49	47	44	50	38	38	48	31	42	41	46	49	43	53	58	58	39	44	26	25	18	20	30	51	24	
6		58	37	34	49	51	61	36	41	36	50	62	49	48	57	53	51	61	36	30	59	52	53	36	55	24	
7		62	24	46	46	31	27	45	17	60	63	49	50	62	42	57	39	40	33	60	36	29	26	14	20	24	
8		19	20	29	53	24	21	22	19	26	33	21	19	21	19	25	34	28	32	26	46	20	26	48	31	24	
9		48	37	34	29	26	28	23	24	26	29	40	39	35	33	34	31	27	21	29	34	33	38	29	41	24	
10		23	31	26	53	32	27	34	45	44	49	34	40	43	38	44	39	39	41	24	22	29	26	29	54	24	
11		28	33	50	66	56	72	43	33	37	32	49	58	51	39	50	53	37	38	33	38	56	42	34	46	24	
12		39	37	32	44	34	31	28	40	36	42	40	42	43	37	36	41	57	38	47	13	17	28	15	42	24	
13		27	45	15	24	16	22	52	44	41	49	45	48	46	46	43	49	43	44	41	27	37	32	25	56	24	
14		51	53	52	58	67	50	52	14	62	57	70	71	60	43	39	46	40	31	35	44	41	50	23	21	24	
15		55	37	43	36	44	63	27	34	61	76	36	50	41	50	31	39	46	43	38	43	26	13	17	15	24	
16		26	30	25	21	19	19	17	20	23	20	30	24	33	34	44	40	39	33	20	21	14	12	24	33	24	
17		35	28	30	20	22	43	41	41	45	40	36	42	38	38	40	39	39	39	42	34	29	30	31	30	24	
18		28	33	31	30	28	31	32	41	43	40	41	38	40	39	36	40	40	40	19	18	36	46	33	28	24	
19		32	18	32	26	33	26	46	66	24	29	35	44	53	34	38	22	29	26	26	27	18	17	20	28	24	
20		30	50	64	59	51	61	32	48	44	46	61	48	49	43	36	46	37	34	19	17	21	24	58	39	24	
21		52	67	30	27	25	14	17	39	37	34	37	43	38	53	43	44	43	34	58	24	20	15	12	19	24	
22		22	18	58	13	19	22	20	20	21	20	21	22	24	28	23	23	23	20	45	44	41	23	19	16	24	
23		22	19	15	15	16	16	16	16	16	17	15	16	16	15	18	17	18	21	21	19	30	61	33	45	24	
24		35	28	44	40	17	28	34	28	52	61	73	38	44	44	43	35	37	33	29	32	38	40	39	37	24	
25		30	29	34	30	20	25	33	37	40	41	44	31	34	39	36	36	35	38	36	48	43	36	38	47	24	
26		58	41	33	29	27	25	34	56	44	73	55	47	44	47	48	35	29	26	17	12	17	21	23	22	24	
27		23	23	22	21	22	23	24	27	30	35	29	32	32	29	25	31	26	28	30	35	57	38	15	31	24	
28		31	29	26	32	35	36	41	34	35	37	38	39	36	35	36	37	37	33	31	32	32	32	33	35	24	
29		33	31	30	33	27	21	61	29	47	68	58	72	72	66	56	56	44	26	17	15	20	22	19	17	24	
30		19	18	18	15	16	15	16	26	37	38	40	36	35	45	37	36	37	33	29	31	30	31	31	24	24	
31		20	21	19	21	26	49	29	35	33	34	31	38	34	32	37	36	35	36	33	36	35	33	33	34	24	

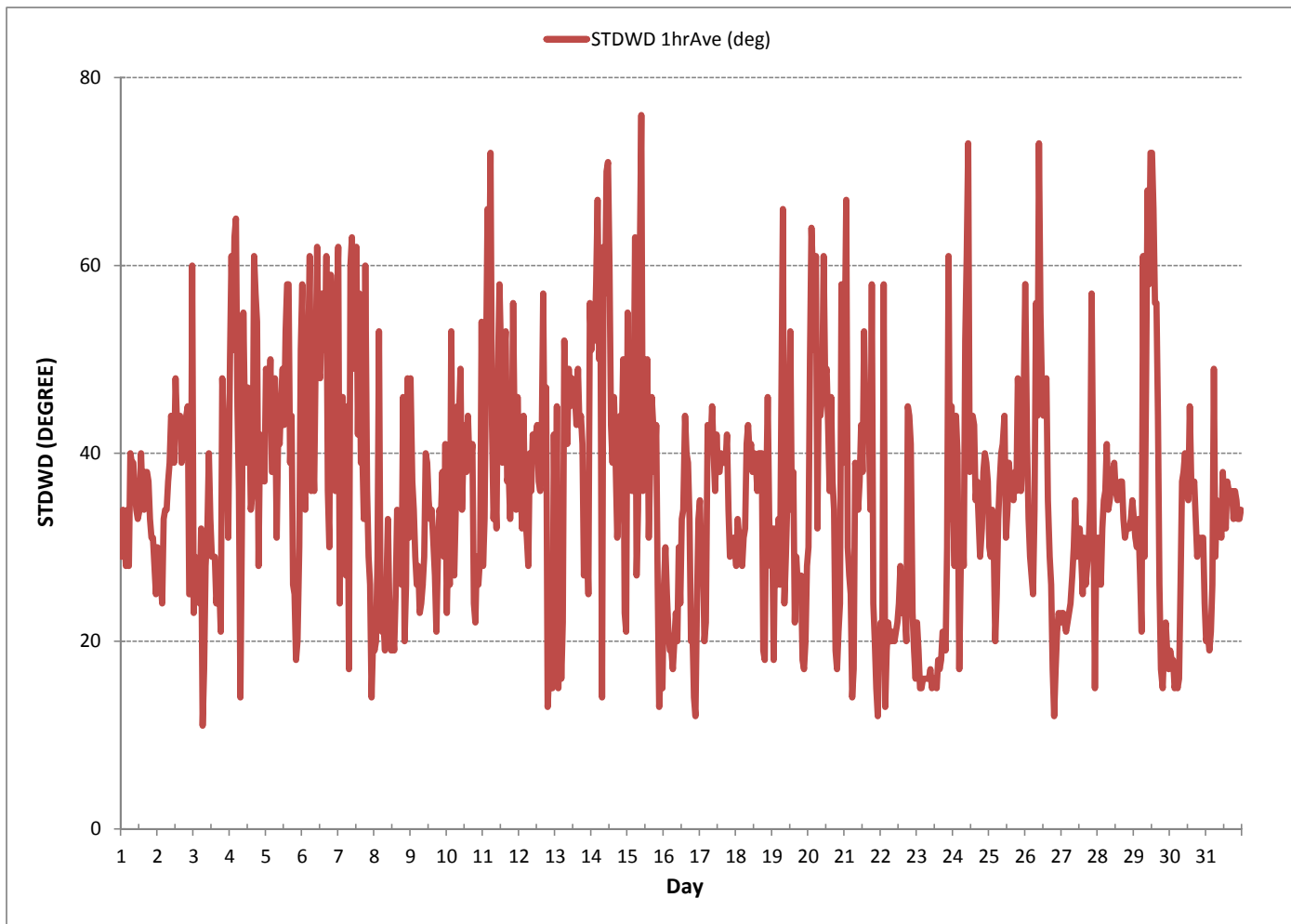
STATUS FLAG CODES

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

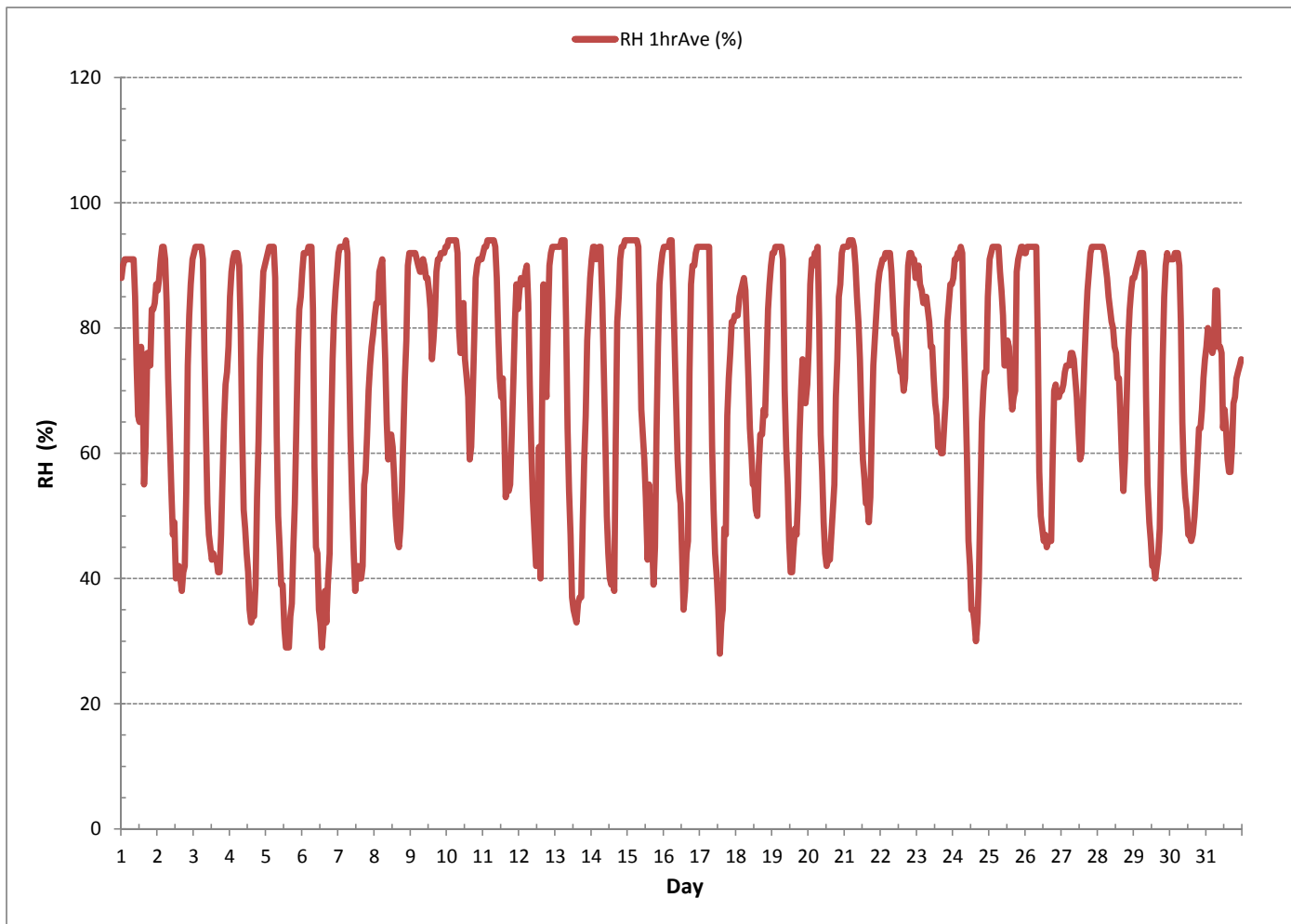
CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 744 HRS

STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees



RELATIVE HUMIDITY

RELATIVE HUMIDITY (RH) hourly averages in %



BAROMETRIC PRESSURE

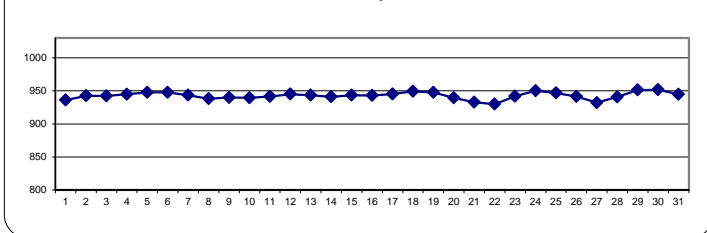
BAROMETRIC PRESSURE (BP) hourly averages in millibar

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

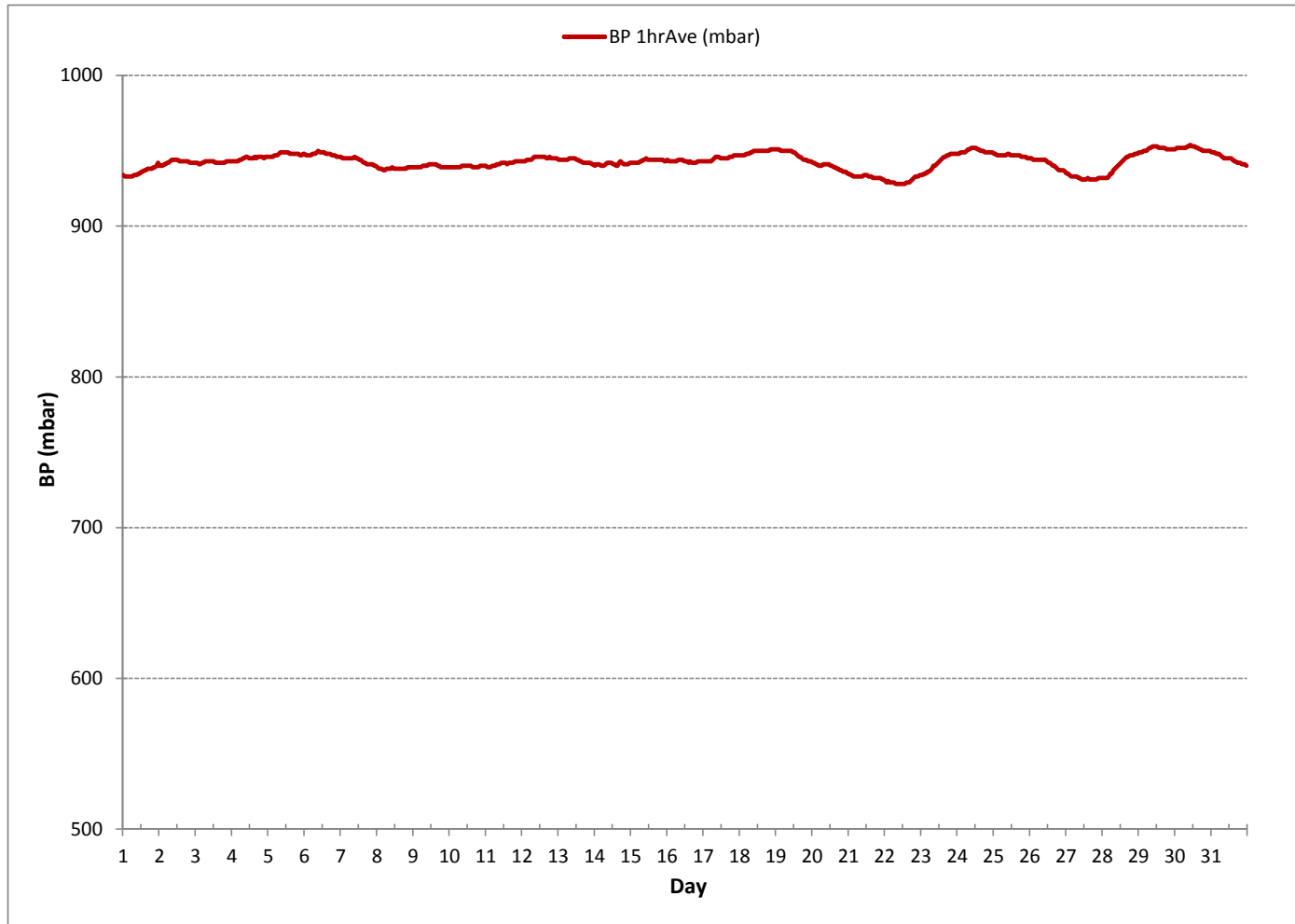
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	928	MB	@ HOUR(S)	VAR	ON DAY(S)	22
MAXIMUM 1-HR AVERAGE:	954	MB	@ HOUR(S)	10	ON DAY(S)	30
MAXIMUM 24-HR AVERAGE:	952	MB			ON DAY(S)	30
					VAR-VARIOUS	
				OPERATIONAL TIME:		744 HRS
				AMD OPERATION UPTIME:		100.0 %
STANDARD DEVIATION:	5.61			MONTHLY AVERAGE:		943 MB

BAROMETRIC PRESSURE (BP) hourly averages in millibar



AMBIENT TEMPERATURE

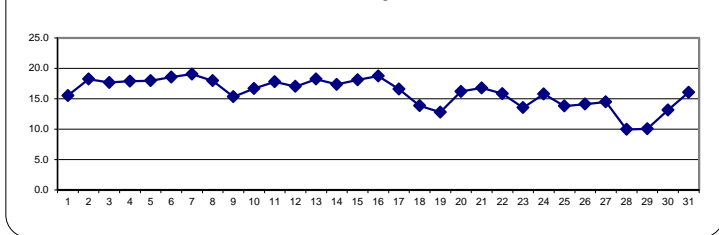
AMBIENT TEMPERATURE (AmbTPX) hourly averages in Degrees Celsius

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.																									
DAY	MIN.	MAX.	AVG.																									MIN.	MAX.	AVG.																								
1	12.1	11.3	10.8	10.8	11.1	11.4	11.9	12.5	13.6	15.8	18.2	19.8	19.9	18.3	19.5	22.8	20.6	17.5	17.3	17.5	15.7	15.1	14.9	14.1	10.8	22.8	15.5	24																										
2	14.0	13.0	11.7	11.6	11.8	12.8	14.6	17.5	20.3	22.2	23.3	23.0	24.7	24.6	23.8	24.3	25.2	23.9	23.7	20.3	15.3	13.1	11.9	10.7	10.7	25.2	18.2	24																										
3	10.1	9.8	8.6	8.9	8.4	9.6	12.4	16.7	19.5	21.7	22.8	23.5	23.8	23.5	23.6	23.7	24.2	23.5	21.8	20.1	18.7	17.2	16.4	15.5	8.4	24.2	17.7	24																										
4	14.0	13.0	12.3	12.0	11.9	12.2	13.4	15.3	19.6	22.0	22.4	23.7	23.9	25.1	25.3	24.3	24.3	23.9	21.9	19.7	15.2	12.5	11.0	9.9	9.9	25.3	17.9	24																										
5	9.1	8.3	7.9	8.0	8.3	8.9	11.6	18.5	21.8	23.1	24.4	24.8	26.5	26.4	26.7	26.7	24.8	24.1	22.1	20.8	17.4	14.9	13.3	12.8	7.9	26.7	18.0	24																										
6	11.7	11.2	11.1	10.3	9.2	9.8	10.5	15.2	21.3	24.9	25.3	27.1	27.2	28.2	27.4	25.3	27.6	25.0	23.5	19.3	16.0	14.0	12.6	11.6	9.2	28.2	18.6	24																										
7	11.0	10.5	10.2	9.4	9.4	10.5	13.1	17.7	22.1	25.4	26.4	26.9	26.8	26.1	27.0	26.4	25.5	21.6	21.1	19.9	18.3	18.0	17.3	16.7	9.4	27.0	19.1	24																										
8	15.3	14.2	13.7	12.3	12.0	11.8	15.2	17.2	20.3	22.4	21.4	20.2	21.3	22.5	22.5	23.6	23.3	21.9	20.2	18.1	16.6	15.9	14.5	14.2	11.8	23.6	17.9	24																										
9	14.1	14.1	14.3	14.3	13.8	13.7	14.2	14.1	14.1	14.5	15.9	16.1	17.2	17.7	19.4	18.0	16.9	15.9	15.8	15.7	15.3	15.1	14.9	13.0	13.0	19.4	15.3	24																										
10	11.5	11.2	11.9	11.9	12.1	12.6	13.2	15.2	18.7	19.5	18.4	17.5	19.5	20.2	20.9	23.0	22.9	21.1	18.9	16.8	16.0	15.7	15.5	15.6	11.2	23.0	16.7	24																										
11	15.3	13.9	13.5	12.7	12.2	13.6	15.0	15.4	16.2	17.3	19.5	21.3	22.3	21.1	22.5	24.9	23.4	23.9	22.6	19.6	17.6	15.0	13.5	14.9	12.2	24.9	17.8	24																										
12	13.8	13.6	14.2	13.7	12.4	12.0	13.7	17.1	20.2	22.3	23.2	24.1	24.5	20.5	25.0	18.9	16.5	17.7	20.0	16.5	13.6	12.2	11.6	10.8	10.8	25.0	17.0	24																										
13	9.6	9.0	9.0	8.9	9.2	9.6	11.1	15.9	20.6	23.5	24.2	26.3	26.8	27.7	27.7	26.1	26.2	26.4	22.7	19.9	17.5	14.4	13.1	12.1	8.9	27.7	18.2	24																										
14	10.8	10.2	11.2	12.7	11.9	10.9	11.9	15.9	20.2	23.4	25.8	26.9	27.8	28.1	26.9	27.6	21.4	15.7	15.0	14.3	12.7	11.4	11.3	12.2	10.2	28.1	17.3	24																										
15	11.6	11.1	10.4	10.1	9.9	10.1	12.5	15.3	18.4	22.3	22.9	24.4	25.8	26.6	23.8	25.3	26.0	26.8	24.7	20.0	16.3	14.4	13.0	12.3	9.9	26.8	18.1	24																										
16	12.1	11.9	11.3	11.3	12.1	12.9	14.8	17.4	19.7	22.2	25.0	26.5	28.4	29.7	29.4	26.4	25.2	19.3	17.5	17.0	16.4	15.4	14.3	12.8	11.3	29.7	18.7	24																										
17	11.9	11.5	10.6	10.4	10.4	10.0	11.5	15.6	19.7	22.3	23.3	24.0	24.9	25.7	23.2	22.6	20.4	19.4	16.0	15.1	13.8	12.2	11.6	11.4	10.0	25.7	16.6	24																										
18	11.3	11.4	10.8	10.5	10.2	9.9	11.0	13.3	15.3	16.5	17.2	18.3	18.3	19.4	18.9	17.6	17.4	16.7	15.2	14.6	12.3	9.9	8.9	7.7	7.7	19.4	13.9	24																										
19	6.4	5.2	4.8	4.3	3.6	3.0	4.8	9.6	14.5	16.4	17.9	19.5	19.8	19.3	18.9	18.4	18.3	17.6	15.7	14.2	13.1	13.6	14.3	13.8	3.0	19.8	12.8	24																										
20	12.5	9.6	9.0	9.3	7.4	6.8	8.6	13.8	17.4	19.5	22.1	23.5	24.6	24.0	23.2	22.2	21.6	20.9	18.1	16.9	15.4	14.7	14.0	13.4	6.8	24.6	16.2	24																										
21	12.8	11.4	11.0	11.4	11.6	12.1	12.5	13.8	15.2	16.3	18.3	20.4	22.3	22.8	23.2	23.5	23.7	22.4	19.8	17.8	16.7	15.2	14.4	13.9	11.0	23.7	16.8	24																										
22	14.0	13.9	14.5	14.0	14.1	14.3	14.4	15.0	16.7	17.8	17.6	18.4	18.3	18.2	18.6	19.6	19.4	17.1	14.0	13.8	14.7	14.1	13.7	13.8	13.7	19.6	15.8	24																										
23	13.3	13.2	13.3	13.0	12.9	12.6	12.7	12.8	13.2	14.4	14.6	15.7	16.3	16.1	15.9	15.7	16.1	15.9	14.8	13.7	10.5	9.6	8.9	9.3	8.9	16.3	13.5	24																										
24	8.6	7.3	7.7	7.1	6.1	6.1	9.1	11.8	13.9	18.0	21.8	21.4	23.6	23.8	24.2	24.8	23.6	22.1	19.6	16.7	16.0	15.7	15.7	13.9	6.1	24.8	15.8	24																										
25	13.1	13.0	12.4	11.8	11.4	11.5	12.4	13.3	13.8	14.7	17.2	17.0	15.9	16.0	17.6	17.9	17.3	16.9	14.1	13.2	11.1	9.8	9.6	9.9	9.6	17.9	13.8	24																										
26	8.6	7.2	6.5	6.0	5.1	4.8	5.7	9.5	14.3	18.3	19.7	20.4	21.3	21.1	21.4	20.8	20.7	20.5	17.2	14.2	13.8	14.1	14.2	13.7	4.8	21.4	14.1	24																										
27	13.3	12.8	12.3	11.9	11.9	12.0	12.0	12.5	13.0	14.1	15.2	17.2	18.6	18.4	17.8	17.4	17.1	16.2	15.3	14.3	13.9	13.8	13.2	13.3	11.9	18.6	14.5	24																										
28	13.4	13.0	12.9	12.6	13.0	10.3	9.2	8.6	8.5	8.7	9.0	9.3	9.2	10.2	10.5	11.5	12.8	13.2	11.6	9.2	7.0	5.8	5.0	4.3	4.3	13.4	10.0	24																										
29	4.1	3.6	2.6	2.0	1.8	1.2	1.9	6.1	10.6	13.9	15.0	16.4	17.7	17.7	18.9	18.5	18.3	17.5	14.5	11.2	8.7	6.9	6.4	5.4	1.2	18.9	10.0	24																										
30	5.5	5.0	5.0	4.7	4.2	4.5	5.4	9.7	14.0	16.2	17.9	18.2	19.2	20.5	20.6	20.4	19.7	18.3	16.9	15.3	14.8	14.1	13.1	12.2	4.2	20.6	13.1	24																										
31	11.7	10.9	10.8	10.8	11.6	11.7	10.1	11.1	13.3	13.2	14.1	18.0	17.6	19.5	21.6	22.9	23.1	22.3	19.9	19.4	18.6	18.0	17.7	17.3	10.1	23.1	16.1	24																										
HOURLY MAX	15.3	14.2	14.5	14.3	14.1	14.3	15.2	18.5	22.1	25.4	26.4	27.1	28.4	29.7	29.4	27.6	27.6	26.8	24.7	20.8	18.7	18.0	17.7	17.3																														
HOURLY AVG	11.5	10.8	10.5	10.3	10.0	10.1	11.3	14.0	16.8	18.8	20.0	21.0	21.7	21.9	22.1	22.0	21.4	20.2	18.4	16.6	14.8	13.6	12.9	12.3																														

STATUS FLAG CODES

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

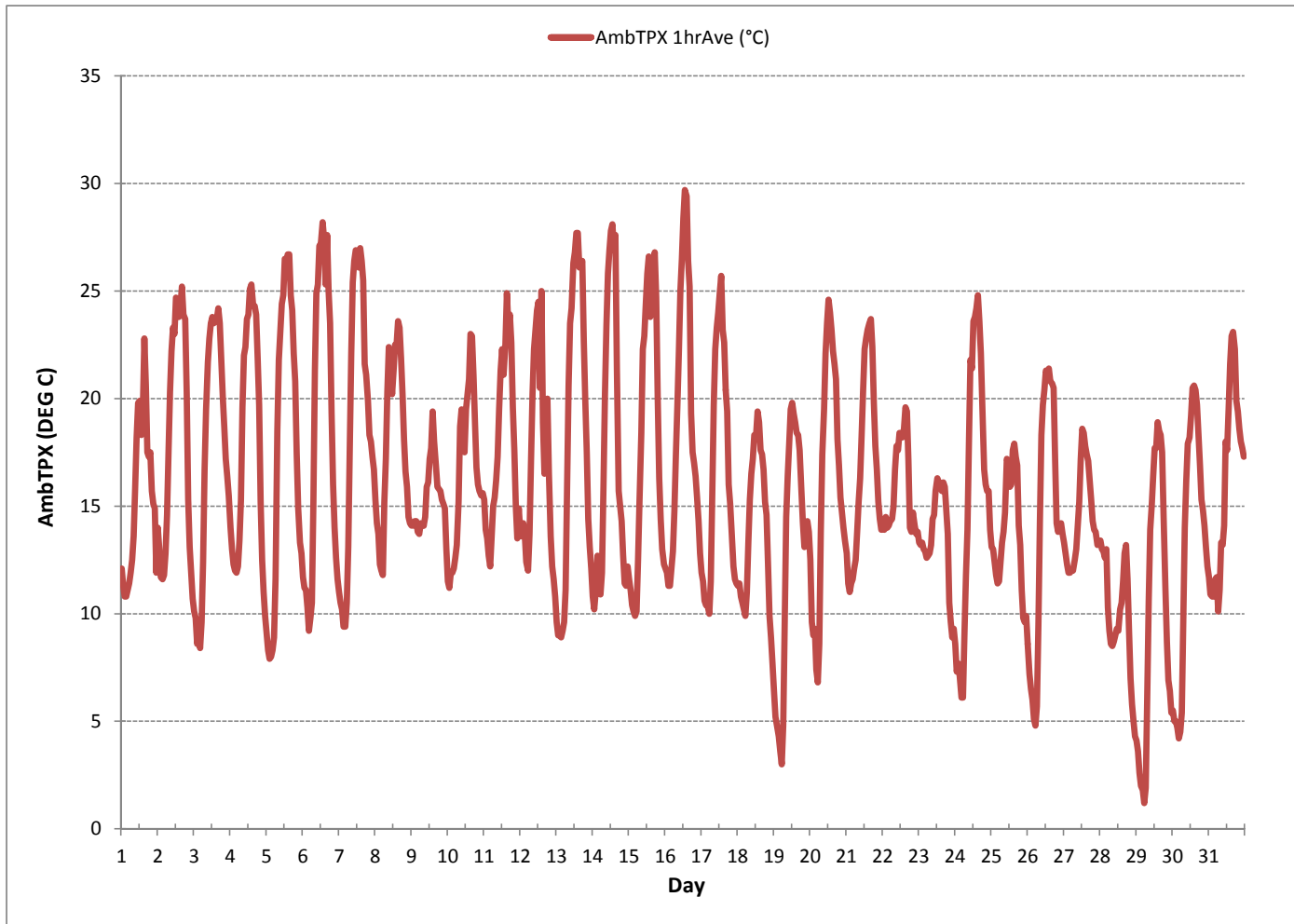
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	1.2	°C	@ HOUR(S)	5	ON DAY(S)	29
MAXIMUM 1-HR AVERAGE:	29.7	°C	@ HOUR(S)	13	ON DAY(S)	16
MAXIMUM 24-HR AVERAGE:	19.1	°C			ON DAY(S)	7
					VAR-VARIOUS	
OPERATIONAL TIME:					744	HRS
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	5.61		MONTHLY AVERAGE:		16.0	°C

AMBIENT TEMPERATURE (AmbTPX) hourly averages in Degrees Celsius



PRECIPITATION

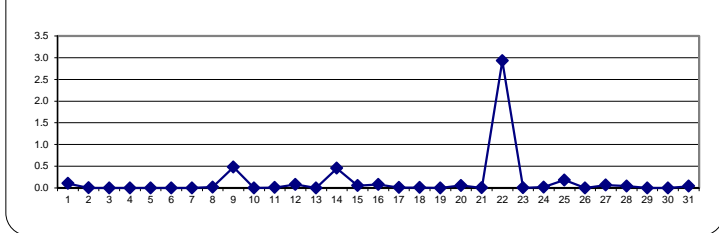
PRECIPITATION hourly averages (mm)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.	
DAY	MIN.	MAX.	AVG.																											
1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.9	0.2	0.0	0.0	0.0	0.0	1.3	0.1	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
2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.3	0.0	24
9	0.0	0.0	0.1	0.2	0.4	0.0	0.0	0.9	0.6	0.9	0.1	0.5	0.2	0.0	0.0	0.0	0.2	1.3	1.4	2.0	2.0	0.8	0.0	0.0	0.0	0.0	2.0	0.5	24	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
11	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	24
12	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	1.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.1	24	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	0.0	6.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	1.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.5	24	
15	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1	24	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	1.8	0.1	24	
17	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	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
18	0.0	0.0	0.0	0.0	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	0.0	0.0	0.3	0.0	24	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.1	0.5	0.8	0.0	0.0	0.0	0.8	0.1	24	
21	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
22	0.0	0.0	5.1	1.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.3	24.2	21.4	0.0	0.0	0.0	0.0	0.0	0.0	24.2	2.9	24	
23	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
25	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.2	24	
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.7	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.7	0.1	24	
28	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	24	
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
31	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	24
HOURLY MAX	1.0	0.1	6.1	1.0	0.4	0.3	0.6	0.9	0.6	0.9	0.1	1.0	0.4	1.3	0.2	1.3	3.2	18.3	24.2	21.4	2.0	0.8	0.2	0.5	0.0	0.6	0.0	0.0	24	
HOURLY AVG	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.8	0.9	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24

STATUS FLAG CODES

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

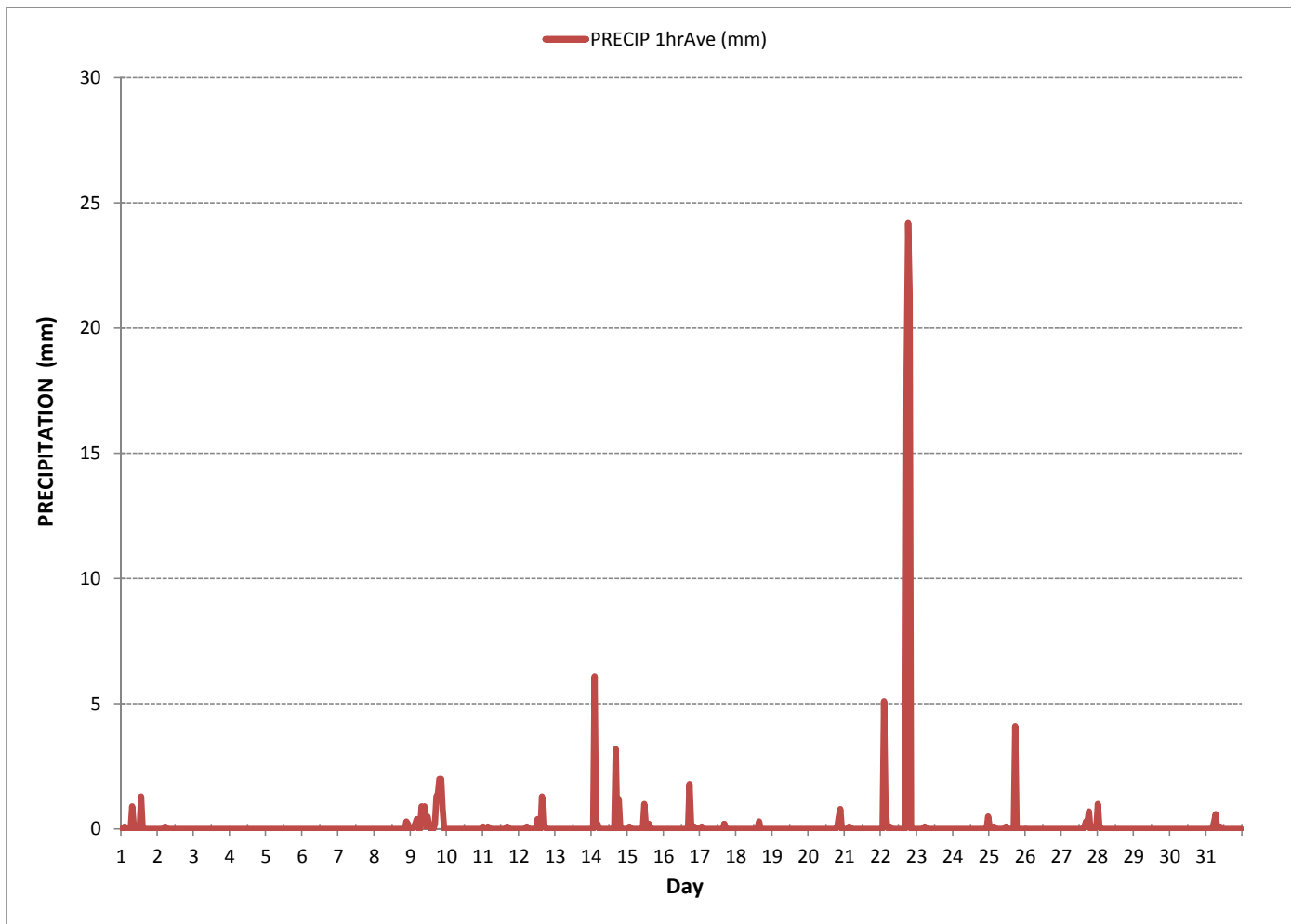
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0 mm	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	24.2 mm	@ HOUR(S)	18	ON DAY(S)	22
MAXIMUM 24-HR AVERAGE:	2.9 mm			ON DAY(S)	22
MONTHLY TOTAL	112.3 mm			VAR-VARIOUS	
OPERATIONAL TIME:				744 HRS	
AMD OPERATION UPTIME:				100.0 %	
STANDARD DEVIATION:	1.41	MONTHLY AVERAGE:		0.2 mm	

PRECIPITATION hourly averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 101E Sulphur Dioxide Analyzer Calibration

Date: August 4, 2016	Barometric Pressure: 27.87 inHg
Company/Airshed: LICA	Station Temperature °C: 23
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 13:00	Performed By/Reviewer: Limin Li / Tom Bourque
End Time 24 hr. (mst): 16:35	Cal Gas Expiry Date: December 25, 2018
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

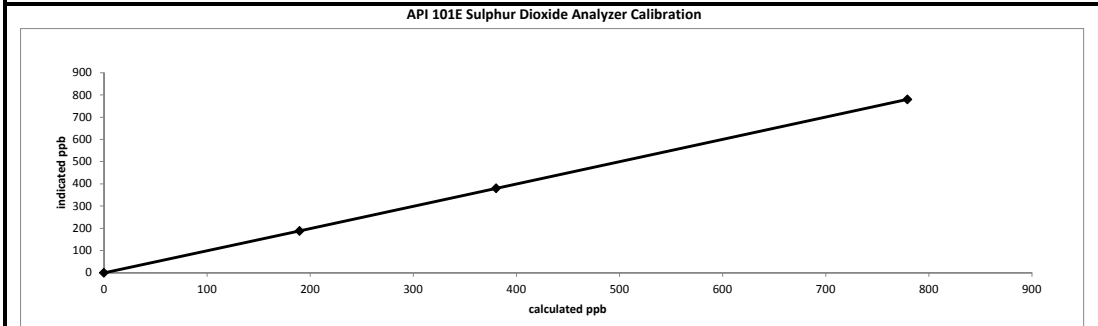
Analyzer:	Range ppb: 1000
Serial Number: 508	As Found C.F.: 0.982
Last Calibration Date: July 21, 2016	New C.F.: 1.000
Previous C.F.: 1.000	

Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> </tr> <tr> <td>Mid</td> <td>380</td> </tr> <tr> <td>Low</td> <td>190</td> </tr> </tbody> </table>	Point	Sulphur Dioxide Standard Calibration Points	High	780	Mid	380	Low	190
Point		Sulphur Dioxide Standard Calibration Points							
High		780							
Mid		380							
Low	190								
Make & Model: API700									
Serial #: 829									
Cal Gas Cylinder I.D. #: BLM002756T									
Cal Gas Conc. (ppm): 49.9									

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	4998	0.00	4998	0.0	4.3	N/A		
as found high	4923	78.10	5001	779.3	798.2	0.982		
adjusted zero	4998	0.00	4998	0.0	0.0	n/a		
adjusted high	4923	78.10	5001	779.3	779.3	1.000		
mid	4960	38.10	4998	380.4	380.1	1.001		
low	4979	19.00	4998	189.7	187.5	1.012		
calibrator zero	4998	0.00	4998	0.0	-0.3	n/a		
Average C.F.=						1.004		

Linear Regression/Calibration Results:		LIMITS
Correlation Coefficient =	1.000	> or = 0.995
Slope =	0.999	.95-1.05
b (Intercept as % of full scale)=	0.09%	± 3% F.S.
% change in C.F. from last cal=	1.84%	± 10%

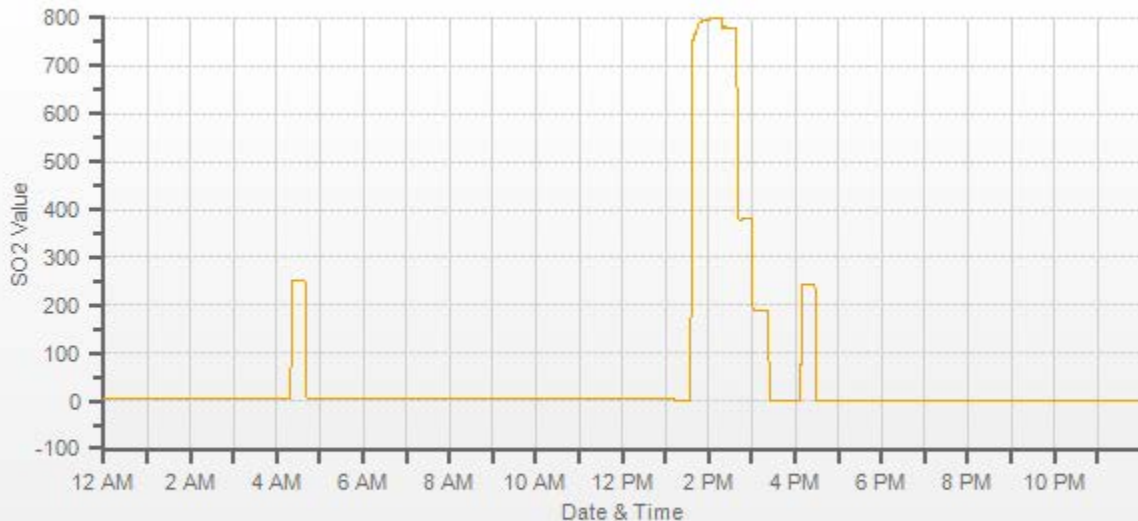


As found:		As left:	
SLOPE:	0.981	SLOPE:	0.961
OFFSET:	74.4	OFFSET:	83.6
HVPS:	467	HVPS:	467
RCELL TEMP:	50	RCELL TEMP:	50.0
BOX TEMP:	27.6	BOX TEMP:	26.8
PMT TEMP:	7.6	PMT TEMP:	7.7
IZS TEMP:	45	IZS TEMP:	45.0
Converter Temp:	n/a	Converter Temp:	n/a
PRES:	24.7	PRES:	24.7
SAMP FL:	624	SAMP FL:	625
UV LAMP:	3698	UV LAMP:	3696
LAMP RATIO:	101.4	LAMP RATIO:	101.4
STR. LGT	36.5	STR. LGT	40.2
DRK PMT:	9.4	DRK PMT:	10.2
DRK LMP:	-0.2	DRK LMP:	-0.2
Internal Span:	252.3	Internal Span:	241.4

Comments:

Sample filter changed, this calibration was expedited as a result of the elevated zero.

SO2[ppb] Station: LICA MASKWA Daily: 2016/08/04 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]



API 101E Sulphur Dioxide Analyzer Calibration

Date: August 12, 2016	Barometric Pressure: 0.933 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Parameter: Sulphur Dioxide	Calibration Purpose: repeat
Start Time 24 hr. (mst): 10:39	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 14:34	Cal Gas Expiry Date: December 2, 2023
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	Range ppb: 1000
Serial Number: 508	As Found C.F.: 1.043
Last Calibration Date: July 21, 2016	New C.F.: 0.998
Previous C.F.: 1.000	

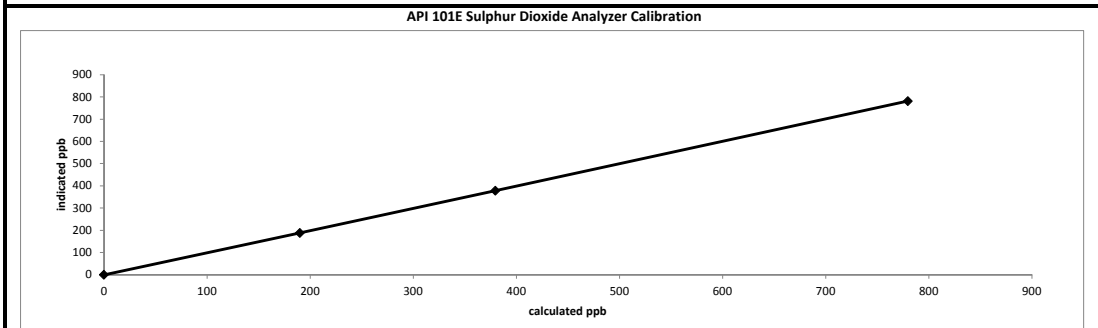
Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> </tr> <tr> <td>Mid</td> <td>380</td> </tr> <tr> <td>Low</td> <td>190</td> </tr> </tbody> </table>	Point	Sulphur Dioxide Standard Calibration Points	High	780	Mid	380	Low	190
Point		Sulphur Dioxide Standard Calibration Points							
High		780							
Mid		380							
Low		190							
Make & Model: API 700									
Serial #: 627									
Cal Gas Cylinder I.D. #: LL119346									
Cal Gas Conc. (ppm): 50.0									

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

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.00	5000	0.0	2.5	N/A
as found high	4924	78.00	5002	779.7	750.0	1.043
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4924	78.00	5002	779.7	781.0	0.998
mid	4966	38.00	5004	379.7	378.0	1.004
low	4981	19.00	5000	190.0	188.0	1.011
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F.=						1.004

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 0.998	> or = 0.995
b (Intercept as % of full scale) = 0.14%	.95-1.05
% change in C.F. from last cal = -4.31%	± 3% F.S.
	± 10%

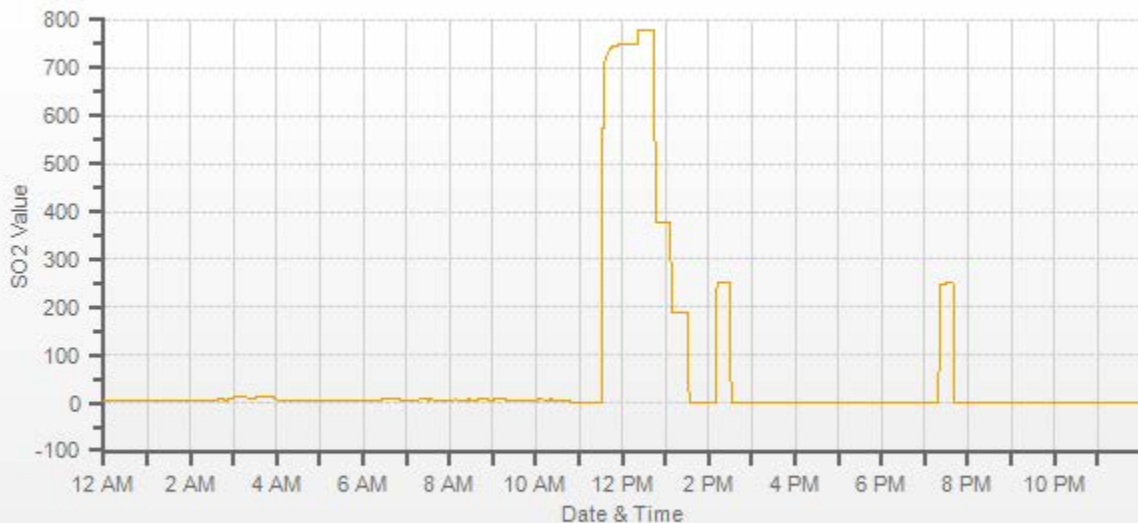


<p style="text-align: center;">As found:</p> SLOPE: 0.981 OFFSET: 74.4 HVPS: 467 RCCELL TEMP: 50.0 BOX TEMP: 30.2 PMT TEMP: 7.7 IZS TEMP: 45.0 Converter Temp: n/a PRES: 24.7 SAMP FL: 626 UV LAMP: 3574.0 LAMP RATIO: 98.1 STR. LGT: 42.4 DRK PMT: 9.9 DRK LMP: -0.2 Internal Span: 241.4	<p style="text-align: center;">As left:</p> SLOPE: 1.002 OFFSET: 88.1 HVPS: 467 RCCELL TEMP: 50.0 BOX TEMP: 30.6 PMT TEMP: 7.7 IZS TEMP: 45.0 Converter Temp: n/a PRES: 24.7 SAMP FL: 627 UV LAMP: 3574.5 LAMP RATIO: 98.1 STR. LGT: 44.2 DRK PMT: 10.5 DRK LMP: -0.2 Internal Span: 252
--	--

Comments:

Sample inlet filter changed.

SO2[ppb] Station: LICA MASKWA Daily: 2016/08/12 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]



API 100E Sulphur Dioxide Analyzer Calibration

Date: August 24, 2016	Barometric Pressure: 0.938 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Parameter: Sulphur Dioxide	Calibration Purpose: repeat
Start Time 24 hr. (mst): 14:09	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 17:52	Cal Gas Expiry Date: December 2, 2023
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer: Serial Number: 508	Range ppb: 1000
Last Calibration Date: August 12, 2016	As Found C.F.: 1.001
Previous C.F.: 0.998	New C.F.: 1.000

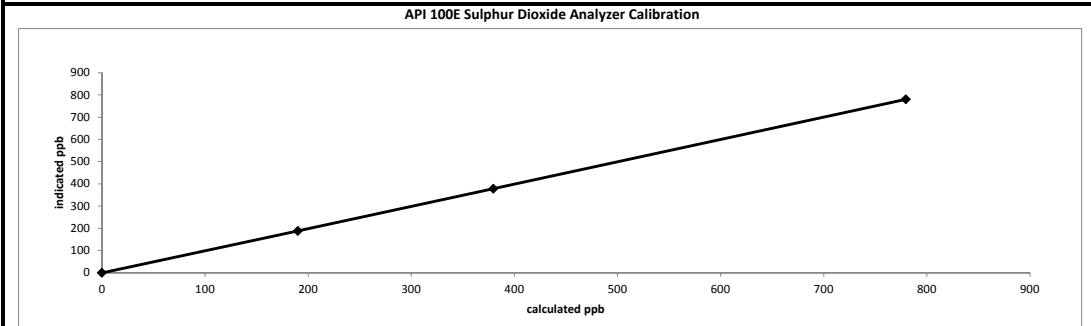
Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL119346 Cal Gas Conc. (ppm): 50.0	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> </tr> <tr> <td>Mid</td> <td>380</td> </tr> <tr> <td>Low</td> <td>190</td> </tr> </tbody> </table>	Point	Sulphur Dioxide Standard Calibration Points	High	780	Mid	380	Low	190
Point	Sulphur Dioxide Standard Calibration Points								
High	780								
Mid	380								
Low	190								

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

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.00	5000	0.0	3.2	N/A
as found high	4924	78.00	5002	779.7	782.0	1.001
adjusted zero	5000	0.00	5000	0.0	0.0	N/A
adjusted high	4924	78.00	5002	779.7	780.0	1.000
mid	4966	38.00	5004	379.7	378.0	1.004
low	4981	19.00	5000	190.0	188.0	1.011
calibrator zero	5000	0.00	5000	0.0	0.0	N/A
Average C.F.=						1.005

Linear Regression/Calibration Results:

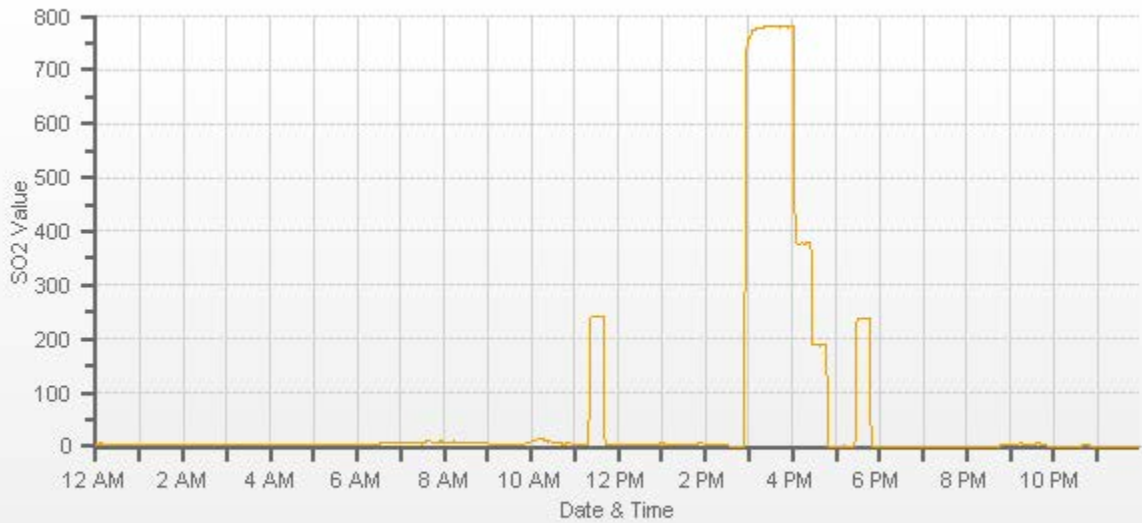
Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.999</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.12%</u>	.95-1.05
% change in C.F. from last cal = <u>-0.31%</u>	± 3% F.S.
	± 10%



As found: SLOPE: <u>1.002</u> OFFSET: <u>88.1</u> HVPS: <u>467</u> RCELL TEMP: <u>50.0</u> BOX TEMP: <u>29.1</u> PMT TEMP: <u>7.7</u> IZS TEMP: <u>45.0</u> PRES: <u>24.8</u> SAMP FL: <u>627</u> NORM PMT: <u>94.3</u> UV LAMP: <u>3442.1</u> LAMP RATIO: <u>94.4</u> STR. LGT: <u>44.2</u> DRK PMT: <u>9.9</u> DRK LMP: <u>-0.3</u> Internal Span: <u>252</u>	As left: SLOPE: <u>1.003</u> OFFSET: <u>93.7</u> HVPS: <u>467</u> RCELL TEMP: <u>50.0</u> BOX TEMP: <u>29.6</u> PMT TEMP: <u>7.7</u> IZS TEMP: <u>45.0</u> PRES: <u>24.8</u> SAMP FL: <u>628</u> NORM PMT: <u>94.5</u> UV LAMP: <u>3432.9</u> LAMP RATIO: <u>94.3</u> STR. LGT: <u>47.0</u> DRK PMT: <u>10.3</u> DRK LMP: <u>-0.3</u> Internal Span: <u>237</u>
--	--

Comments:

Repeat calibration completed to correct ZERO drift.



— SO2[ppb]



API 100E Sulphur Dioxide Analyzer Calibration

Date:	August 29, 2016	Barometric Pressure:	0.940 atm
Company/Airshed:	LICA	Station Temperature °C:	21
Location/Station Name:	Maskwa	Weather Conditions:	Mainly sunny
Parameter:	Sulphur Dioxide	Calibration Purpose:	as found
Start Time 24 hr. (mst):	10:34	Performed By/Reviewer:	Alex Yakupov Tom Bourque
End Time 24 hr. (mst):	12:09	Cal Gas Expiry Date:	December 2, 2023
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a

Analyzer:	
Serial Number:	508
Last Calibration Date:	August 24, 2016
Previous C.F.:	1.000
Range ppb:	1000
As Found C.F.:	1.003
New C.F.:	n/a

Calibrator:		Standard Calibration Points for Ranges	
Flow Meter ID's:	n/a	Point	Sulphur Dioxide Standard Calibration Points
Make & Model:	API 700	High	780
Serial #:	627	Mid	380
Cal Gas Cylinder I.D. #:	LL119346	Low	190
Cal Gas Conc. (ppm):	50.0		

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	1.2	N/A
as found high	4924	78.00	5002	779.7	778.7	1.003
Average C.F.=						n/a

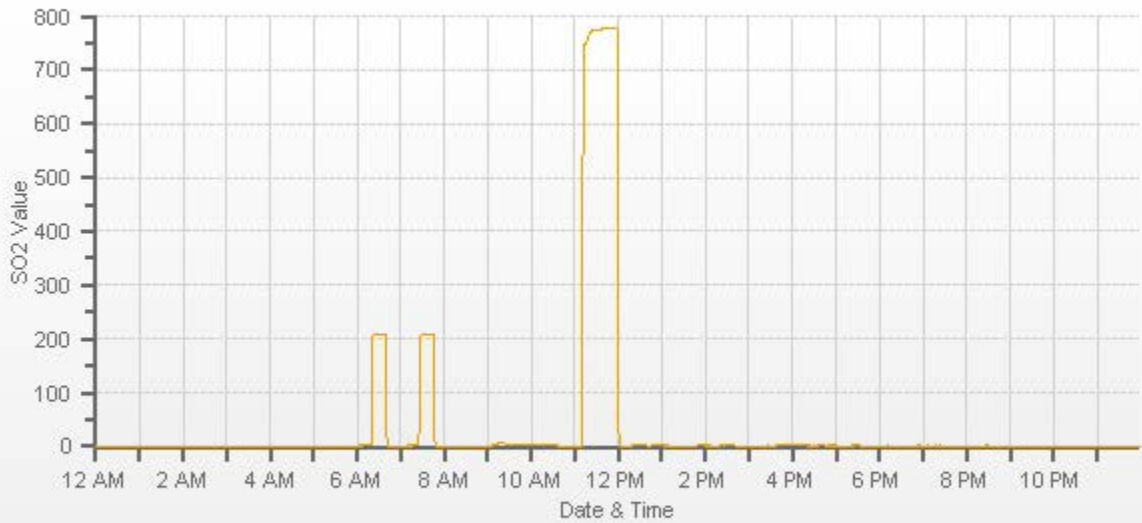
Linear Regression/Calibration Results:

Correlation Coefficient =	n/a	LIMITS
Slope =	n/a	> or = 0.995
b (Intercept as % of full scale)=	n/a	.95-1.05
% change in C.F. from last cal=	-0.28%	± 3% F.S.
		± 10%

As found:		As left:	
SLOPE:	1.003	SLOPE:	1.003
OFFSET:	93.7	OFFSET:	93.7
HVPS:	467	HVPS:	467
RCCELL TEMP:	50.0	RCCELL TEMP:	50.0
BOX TEMP:	30.4	BOX TEMP:	31.7
PMT TEMP:	7.6	PMT TEMP:	7.7
IZS TEMP:	45.0	IZS TEMP:	45.0
PRES:	24.9	PRES:	24.9
SAMP FL:	630	SAMP FL:	630
NORM PMT:	98.0	NORM PMT:	87.5
UV LAMP:	3375.9	UV LAMP:	3377.7
LAMP RATIO:	92.8	LAMP RATIO:	92.7
STR. LGT	47.0	STR. LGT	47.0
DRK PMT:	9.8	DRK PMT:	11.2
DRK LMP:	-0.3	DRK LMP:	-0.3
Internal Span:	237	Internal Span:	237

Comments:

As found performed because of an elevated zero on the daily zero/span. Analyzer okay, full calibration needs to be performed soon.



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: August 15, 2016	Barometric Pressure: 0.933 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Parameter: Hydrogen Sulphide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 10:42	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 14:59	Cal Gas Expiry Date: July 15, 2017
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer: Serial Number: 511	Range ppb: 100
Last Calibration Date: July 21, 2016	As Found C.F.: 1.003
Previous C.F.: 0.999	New C.F.: 1.006

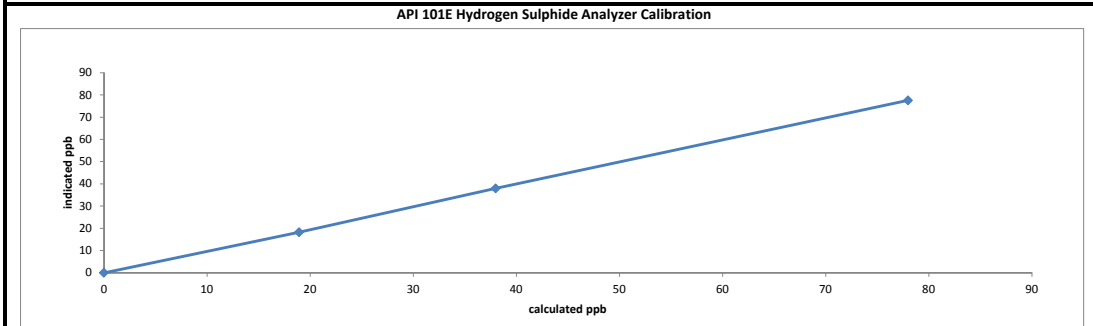
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: LL36837 Cal Gas Conc. (ppm): 10.0	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Hydrogen Sulphide Standard Calibration Points</th> </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	Hydrogen Sulphide Standard Calibration Points	High	78	Mid	38	Low	19
Point	Hydrogen Sulphide Standard Calibration Points								
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)	
as found zero	7500	0.00	7500	0.0	-0.8	N/A
as found high	7442	58.50	7501	78.0	77.0	1.003
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7442	58.50	7501	78.0	77.5	1.006
mid	7471	28.50	7500	38.0	37.9	1.003
low	7487	14.20	7501	18.9	18.2	1.040
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						1.016

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>1.003</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.22%</u>	.95-1.05
% change in C.F. from last cal = <u>-0.35%</u>	± 3% F.S.
	± 10%

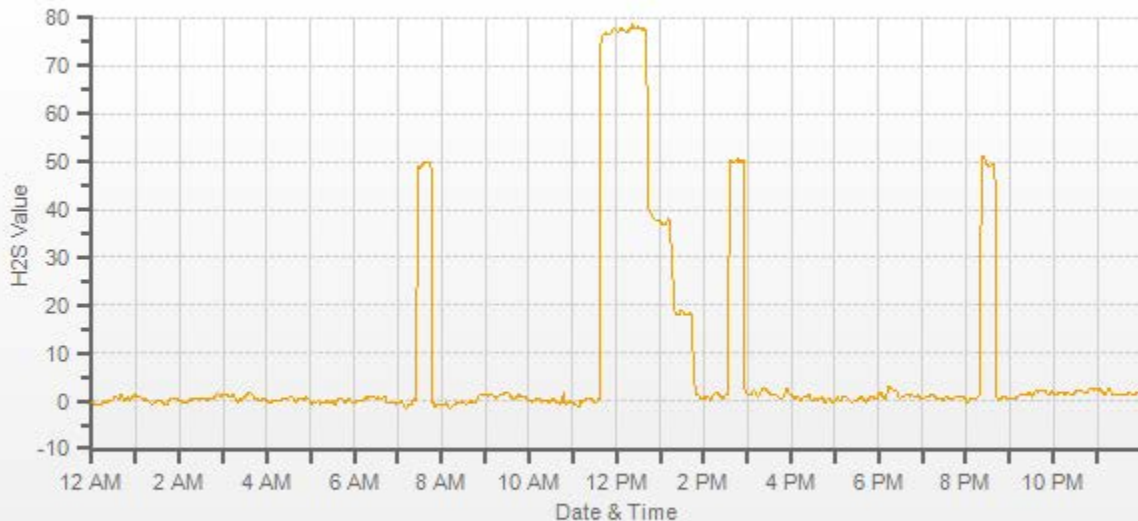


As found: SLOPE: <u>0.999</u> OFFSET: <u>50.8</u> HVPS: <u>600</u> RCELL TEMP: <u>50.0</u> BOX TEMP: <u>30.7</u> PMT TEMP: <u>7.8</u> IZS TEMP: <u>45.0</u> Converter Temp: <u>314.7</u> PRES: <u>21.9</u> SAMP FL: <u>578</u> UV LAMP: <u>3404.7</u> LAMP RATIO: <u>101.1</u> STR. LGT: <u>25.4</u> DRK PMT: <u>38.2</u> DRK LMP: <u>6.9</u> Internal Span: <u>49.55</u>	As left: SLOPE: <u>0.987</u> OFFSET: <u>48.5</u> HVPS: <u>600</u> RCELL TEMP: <u>50.0</u> BOX TEMP: <u>30.7</u> PMT TEMP: <u>7.8</u> IZS TEMP: <u>45.0</u> Converter Temp: <u>315.4</u> PRES: <u>21.8</u> SAMP FL: <u>577</u> UV LAMP: <u>3406.3</u> LAMP RATIO: <u>101.2</u> STR. LGT: <u>23.9</u> DRK PMT: <u>38.3</u> DRK LMP: <u>6.9</u> Internal Span: <u>50.1</u>
--	--

Comments:

Sample inlet filter changed.

H2S[ppb] Station: LICA MASKWA Daily: 2016/08/15 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]



API 101E Hydrogen Sulphide Analyzer Calibration

Date: August 26, 2016	Barometric Pressure: 0.935 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Parameter: Hydrogen Sulphide	Calibration Purpose: repeat
Start Time 24 hr. (mst): 15:52	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 19:30	Cal Gas Expiry Date: July 15, 2017
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer: Serial Number: 511	Range ppb: 100
Last Calibration Date: August 15, 2016	As Found C.F.: 1.064
Previous C.F.: 1.006	New C.F.: 1.006

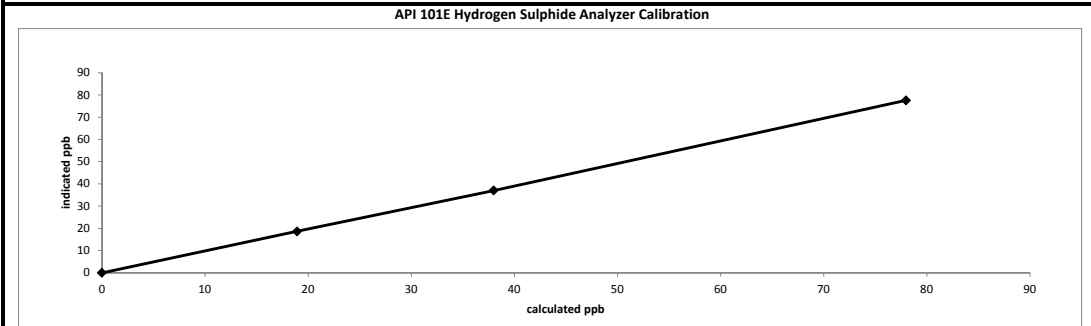
Calibrator: Flow Meter ID's: n/a	Standard Calibration Points for Ranges								
Make & Model: SABIO 2010 D	<table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Hydrogen Sulphide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>78</td> </tr> <tr> <td>Mid</td> <td>38</td> </tr> <tr> <td>Low</td> <td>19</td> </tr> </tbody> </table>	Point	Hydrogen Sulphide Standard Calibration Points	High	78	Mid	38	Low	19
Point	Hydrogen Sulphide Standard Calibration Points								
High	78								
Mid	38								
Low	19								
Serial #: 11900613									
Cal Gas Cylinder I.D. #: LL36837									
Cal Gas Conc. (ppm): 10.0									

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	3.1	N/A
as found high	7442	58.50	7501	78.0	76.4	1.064
adjusted zero	7500	0.00	7500	0.0	0.0	N/A
adjusted high	7442	58.50	7501	78.0	77.5	1.006
mid	7471	28.50	7500	38.0	37.0	1.027
low	7485	14.20	7499	18.9	18.6	1.018
calibrator zero	7500	0.00	7500	0.0	0.0	N/A
Average C.F.=						1.017

Linear Regression/Calibration Results:

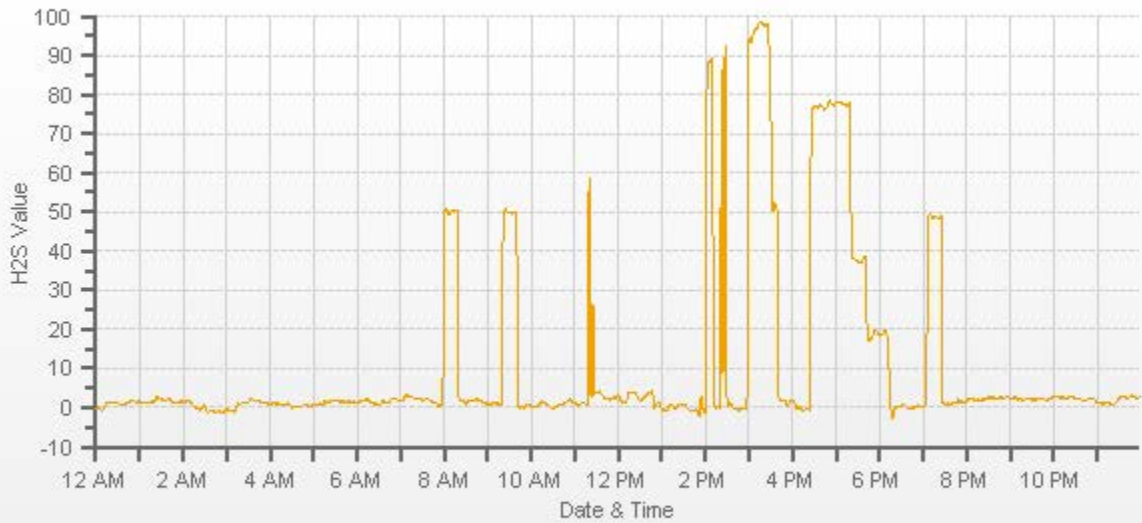
Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>1.006</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.25%</u>	.95-1.05
% change in C.F. from last cal = <u>-5.77%</u>	± 3% F.S.
	± 10%



<p style="text-align: center; font-weight: bold; font-size: small;">As found:</p> SLOPE: <u>0.987</u> OFFSET: <u>48.5</u> HVPS: <u>600</u> RCCELL TEMP: <u>50.0</u> BOX TEMP: <u>31.4</u> PMT TEMP: <u>7.9</u> IZS TEMP: <u>45.0</u> Converter Temp: <u>315.2</u> PRES: <u>21.9</u> SAMP FL: <u>577</u> UV LAMP: <u>2855.0</u> LAMP RATIO: <u>84.8</u> STR. LGT: <u>23.9</u> DRK PMT: <u>42.3</u> DRK LMP: <u>7.1</u> Internal Span: <u>50.1</u>	<p style="text-align: center; font-weight: bold; font-size: small;">As left:</p> SLOPE: <u>0.847</u> OFFSET: <u>52.9</u> HVPS: <u>600</u> RCCELL TEMP: <u>50.0</u> BOX TEMP: <u>31.2</u> PMT TEMP: <u>7.9</u> IZS TEMP: <u>45.0</u> Converter Temp: <u>315.7</u> PRES: <u>21.7</u> SAMP FL: <u>573</u> UV LAMP: <u>2858.2</u> LAMP RATIO: <u>84.9</u> STR. LGT: <u>26.1</u> DRK PMT: <u>41.7</u> DRK LMP: <u>6.8</u> Internal Span: <u>48.5</u>
---	--

Comments:

Repeat calibration completed to correct zero drift.



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	August 17, 2016	Barometric Pressure:	0.933 atm
Company/Airshed:	LICA	Station Temperature °C:	23
Location/Station Name:	Maskwa	Weather Conditions:	Mainly sunny
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly
Start/End Time 24 hr. (mst):	9:32 / 12:56	Performed By/Reviewer:	Alex Yakupov Tom Bourque
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023

Analyzer:	Serial Number: 436609738	Range ppm:	50	
	Last Calibration Date: July 21, 2016	As Found C.F.:	1.030	
	Previous Cal High Point C.F.:	1.002	New C.F.:	0.998

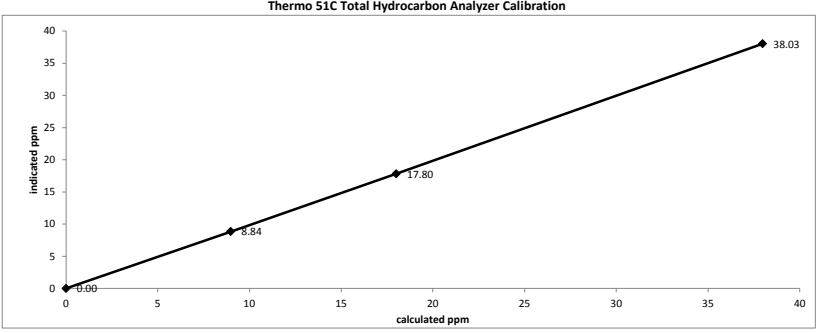
Calibrator:	Flow Meter ID's:	n/a	Standard Calibration Points for a Range of 50 ppm	
	Make & Model:	SABIO 2010 D		
	Serial #:	11900613		
	Cal Gas Cylinder I.D. #:	LL165372		
	CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	606.0 212.0	Point	Target ppm
	CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0 1189.0	High	38
			Mid	18
			Low	9

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

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	1999	0.00	1999	0.0	-0.02	n/a
as found high	1937	63.90	2001	37.97	36.85	1.030
adjusted zero	1999	0.00	1999	0.00	0.00	n/a
adjusted high	1937	63.90	2001	37.97	38.03	0.998
mid	1971	30.30	2001	18.00	17.80	1.011
low	1985	15.10	2000	8.98	8.84	1.015
calibrator zero	1999	0.00	1999	0.0	0.00	n/a
Average C.F. =						1.008

Linear Regression/Calibration Results:

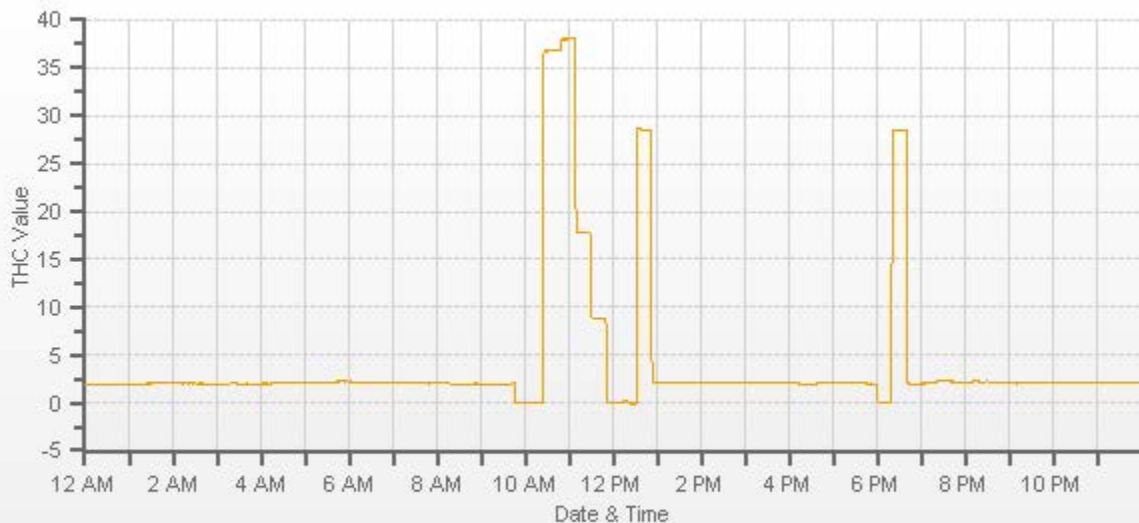
LIMITS
 Correlation Coefficient = 1.000 > or = 0.995
 Slope = 0.998 .95-1.05
 b (Intercept as % of full scale) = 0.22% ± 3% F.S.
 % change in C.F. from last cal = -2.78% ± 10%



As found:	As left:
H2 cylinder (psi): 200	H2 cylinder (psi): 2000
H2 cylinder reg set (psi): 22	H2 cylinder reg set (psi): 22
Span Cylinder (psi): 800	Span Cylinder (psi): 800
Span Cylinder Reg Set (psi): 23	Span Cylinder Reg Set (psi): 23
Zero Air Gen Pressure: 35	Zero Air Gen Pressure: 35
measurement alarms: None	measurement alarms: None
service alarms: None	service alarms: None
cnt: 1107	cnt: 1103
rng: 1	rng: 1
try: 5	try: 5
flm: 187.4	flm: 186.9
det: 125.4	det: 125.4
Flame: 187	Flame: 186
Filter: 125	Filter: 125
Base: 125	Base: 125
Sample psi: 07.51	Sample psi: 07.51
Internal Air Pressure: 20	Internal Air Pressure: 20
Internal Fuel Pressure: 12	Internal Fuel Pressure: 12
Intenal Pressure Gauge psi: 28	Intenal Pressure Gauge psi: 28
Internal Span: 27.3	Internal Span: 28.5

Comments:

Sample inlet filter changed. Installed new H2 cylinder.



— THC[ppm]

NITROGEN DIOXIDE



API 200A NO-NO2-NOx Analyzer Calibration

Date: August 13, 2016	Barometric Pressure: 0.932 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Start/End Time 24 hr. (mst): 13:19 / 15:15	Calibration Purpose: as found
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 2, 2023

Analyzer: Serial Number: 2166 Last Calibration Date: July 25, 2016 Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.001</td> <td>1.006</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.002</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>1.001</td> <td>1.005</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.001	1.006	n/a	NO ₂ =	1.000	1.002	n/a	NOx =	1.001	1.005	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.001	1.006	n/a														
NO ₂ =	1.000	1.002	n/a														
NOx =	1.001	1.005	n/a														

Calibrator: Flow Meter ID's: n/a Make & Model: API Model 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL119346 NO/NOx Gas Conc. (ppm): 50.0 50.0	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	2.0	n/a	n/a
as found high	4924	78.0	5002	779.7	779.7	775.0	778.0	1.006	1.005
Average C.F.=								n/a	n/a

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

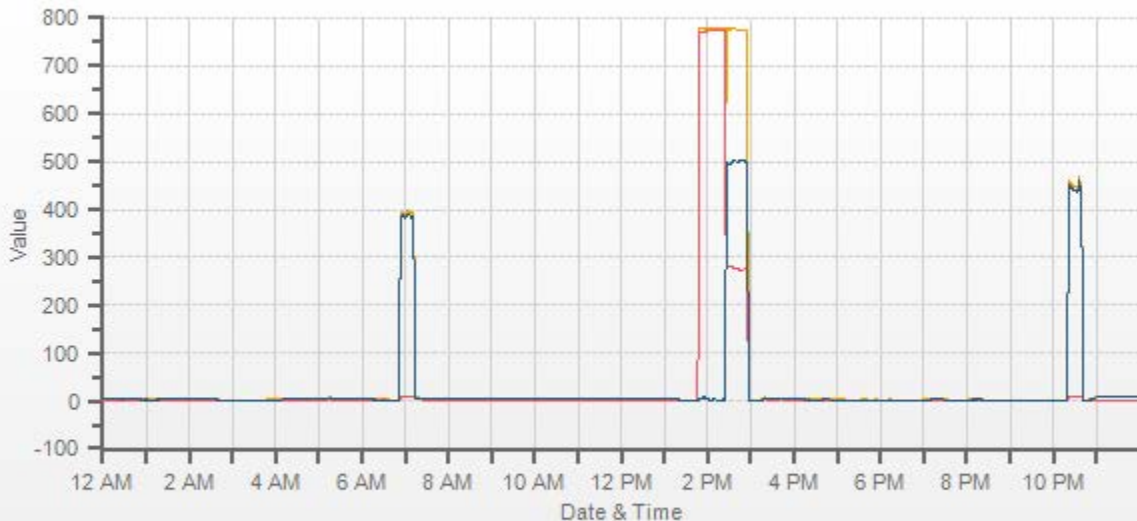
Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	78.00	5002	0.0	775.0	778.0	778.0	3.0	0.0	3.0
as found high NO2	4798	78.00	4876	490.0	279.0	778.0	498.0	496.0	495.0	1.002
Average NO ₂ C.F.=										n/a

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	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=	-0.50%	-0.20%	-0.37%	± 10%
NO2 converter efficiency			1.00	0.96 to 1.04

As found:	As left:
NOx SLOPE: 1.025	NOx SLOPE: 1.025
NOx OFFS: -1.1	NOx OFFS: -1.1
NO SLOPE: 1.011	NO SLOPE: 1.011
NO OFFS: -2.0	NO OFFS: -2.0
SAMP FLW: 515	SAMP FLW: 516
OZONE FL: 77	OZONE FL: 77
NORM PMT: 0.6	NORM PMT: 1.9
AZERO: 14.4	AZERO: 14.5
HVPS: 716	HVPS: 716
DCPS: 2621	DCPS: 2621
RCELL: 49.9	RCELL: 49.8
BOX TEMP: 27.4	BOX TEMP: 28.1
IZS TEMP: 45.1	IZS TEMP: 45.2
MOLY TEMP: 315.8	MOLY TEMP: 315.0
RCEL: 5.0	RCEL: 5.0
SAMP: 27.8	SAMP: 27.9
Internal Span NO: 7.2	Internal Span NO: 7.2
Internal Span NO2: 435.2	Internal Span NO2: 435.2
Internal Span NOx: 442.6	Internal Span NOx: 442.6

Comments:
 As Found calibration completed because daily check span value was > 10%. As found was excellent, problem with zero span system. Analyzer will be watched closely and replaced as soon as a spare is available.



— NOX[ppb] — NO[ppb] — NO2[ppb]



API 200A NO-NO2-NOx Analyzer Calibration

Date: August 15, 2016	Barometric Pressure: 0.933 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Start/End Time 24 hr. (mst): 10:42 / 17:25	Calibration Purpose: routine monthly
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 2, 2023

Analyzer:	Correction Factors:												
Serial Number: 2166	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 33%;">Previous C.F.:</th> <th style="width: 33%;">As Found C.F.:</th> <th style="width: 33%;">New C.F.:</th> </tr> <tr> <td>NO = 1.001</td> <td>1.016</td> <td>1.000</td> </tr> <tr> <td>NO₂ = 1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx = 1.001</td> <td>1.013</td> <td>0.999</td> </tr> </table>	Previous C.F.:	As Found C.F.:	New C.F.:	NO = 1.001	1.016	1.000	NO ₂ = 1.000	1.000	1.000	NOx = 1.001	1.013	0.999
Previous C.F.:	As Found C.F.:	New C.F.:											
NO = 1.001	1.016	1.000											
NO ₂ = 1.000	1.000	1.000											
NOx = 1.001	1.013	0.999											
Last Calibration Date: July 25, 2016													
Range ppb: 1000													

Calibrator:	Standard Calibration Points for a Range of: 1000 ppb																								
Flow Meter ID's: n/a																									
Make & Model: API Model 700																									
Serial #: 627																									
Cal Gas Cylinder I.D. #: LL119346																									
NO/NOx Gas Conc. (ppm): 50.0 50.0																									
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	1.0	n/a	n/a
as found high	4922	78.0	5000	780.0	780.0	768.0	771.0	1.016	1.013
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4922	78.00	5000	780.0	780.0	780.0	781.0	1.000	0.999
mid	4966	38.00	5004	379.7	379.7	376.0	375.0	1.010	1.013
low	4981	19.00	5000	190.0	190.0	185.0	185.0	1.027	1.027
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.012	1.013

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	78.00	5002	0.0	783.0	779.0	-4.0	0.0	-4.0	
as found high NO2	4799	78.00	4877	490.0	275.0	779.0	504.0	508.0	508.0	1.000
adjusted high NO2	4799	78.00	4877	490.0	275.0	779.0	504.0	508.0	508.0	1.000
gpt mid	4799	78.00	4877	265.0	505.0	781.0	275.0	278.0	279.0	0.996
gpt low	4799	78.00	4877	100.0	680.0	779.0	99.0	103.0	103.0	1.000
Average NO₂ C.F.=								0.999		

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.997	0.994	.95-1.05
b (Intercept as % of full scale)=	-0.28%	-0.32%	-0.22%	± 3% F.S.
% change in C.F. from last cal=	-1.46%	-1.20%	0.00%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

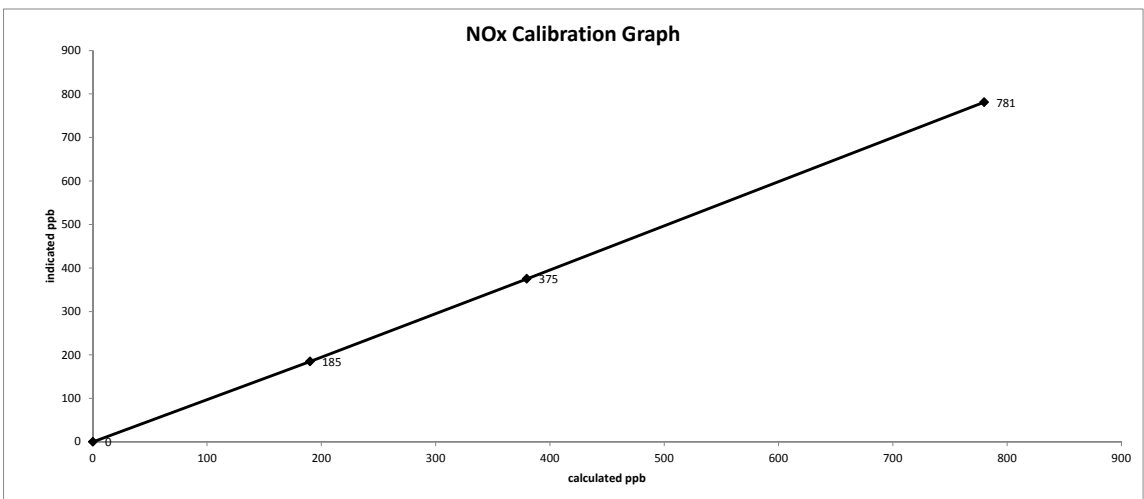
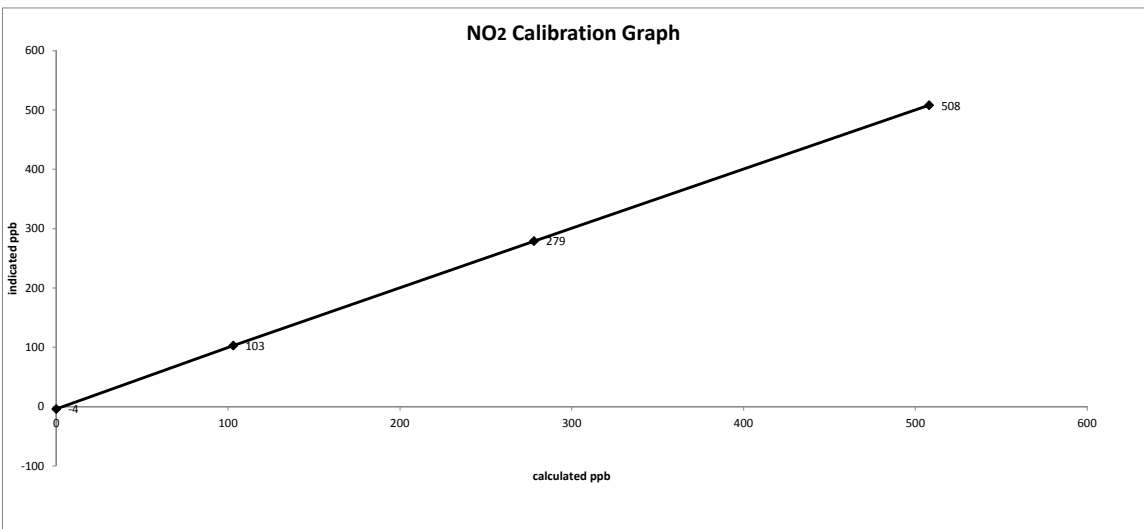
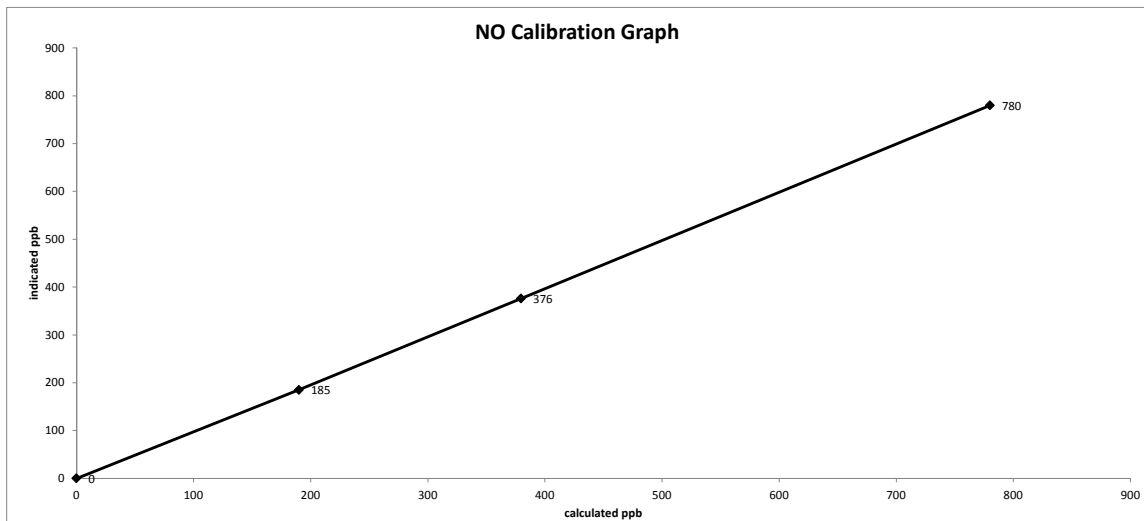
As found:	As left:
NOx SLOPE: 1.025	NOx SLOPE: 1.039
NOx OFFS: -1.1	NOx OFFS: -0.4
NO SLOPE: 1.011	NO SLOPE: 1.027
NO OFFS: -2.0	NO OFFS: -1.9
SAMP FLW: 517	SAMP FLW: 518
OZONE FL: 77	OZONE FL: 77
NORM PMT: 4.0	NORM PMT: 1.8
AZERO: 14.4	AZERO: 14.7
HVPS: 716	HVPS: 716
DCPS: 2622	DCPS: 2628
RCELL: 50.4	RCELL: 49.8
BOX TEMP: 28.5	BOX TEMP: 28.2
IZS TEMP: 45.2	IZS TEMP: 45.2
MOLY TEMP: 315.0	MOLY TEMP: 315.9
RCEL: 5.0	RCEL: 5.0
SAMP: 27.9	SAMP: 28.0
Internal Span NO: 7.2	Internal Span NO: 8.1
Internal Span NO ₂ : 435.2	Internal Span NO ₂ : 432
Internal Span NOx: 442.6	Internal Span NOx: 440

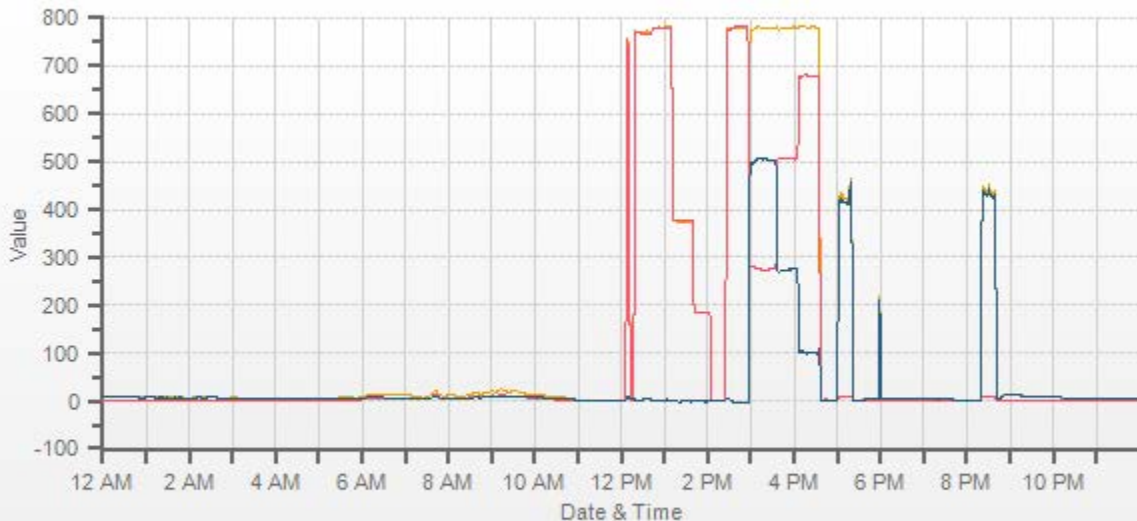
Comments:

Sample inlet filter changed. No NO2 adjustment required/made.

Date: August 15, 2016
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 10:42 / 17:25
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]



API 200A NO-NO2-NOx Analyzer Calibration

Date: August 17, 2016	Barometric Pressure: 0.933 atm
Company/Airshed: LICA	Station Temperature °C: 23
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Start/End Time 24 hr. (mst): 9:32 / 13:12	Calibration Purpose: shut down
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 2, 2023

Analyzer:	Correction Factors:																
Serial Number: 2166	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;"></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>NO =</td> <td style="text-align: center;">1.001</td> <td style="text-align: center;">0.994</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>NO₂ =</td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>NOx =</td> <td style="text-align: center;">1.001</td> <td style="text-align: center;">0.995</td> <td style="text-align: center;">n/a</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.001	0.994	n/a	NO₂ =	1.000	1.000	n/a	NOx =	1.001	0.995	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.001	0.994	n/a														
NO₂ =	1.000	1.000	n/a														
NOx =	1.001	0.995	n/a														
Last Calibration Date: August 15, 2016																	
Range ppb: 1000																	

Calibrator:	Standard Calibration Points for a Range of: 1000 ppb																								
Flow Meter ID's: n/a	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td 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 ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						
Make & Model: API Model 700																									
Serial #: 627																									
Cal Gas Cylinder I.D. #: LL119346																									
NO/NOx Gas Conc. (ppm): 50.0 50.0																									

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	3.0	n/a	n/a
as found high	4922	78.0	5000	780.0	780.0	785.0	787.0	0.994	0.995
mid	4966	38.00	5004	379.7	379.7	377.0	377.0	1.007	1.015
low	4981	19.00	5000	190.0	190.0	186.0	187.0	1.022	1.033
Average C.F.=								1.007	1.014

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	78.00	5002	0.0	785.0	783.0	783.0	-2.0	0.0	-2.0
as found high NO2	4799	78.00	4877	490.0	277.0	783.0	506.0	508.0	508.0	1.000
gpt mid	4799	78.00	4877	265.0	509.0	783.0	274.0	276.0	276.0	1.000
gpt low	4799	78.00	4877	100.0	684.0	784.0	100.0	101.0	102.0	0.990
Average NO₂ C.F.=										0.997

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.992	0.993	0.998	0.90-1.10
b (Intercept as % of full scale)=	-0.31%	-0.14%	-0.07%	± 3% F.S.
% change in C.F. from last cal=	0.74%	0.00%	0.61%	± 10%
NO2 converter efficiency	 	 	1.00	0.96 to 1.04

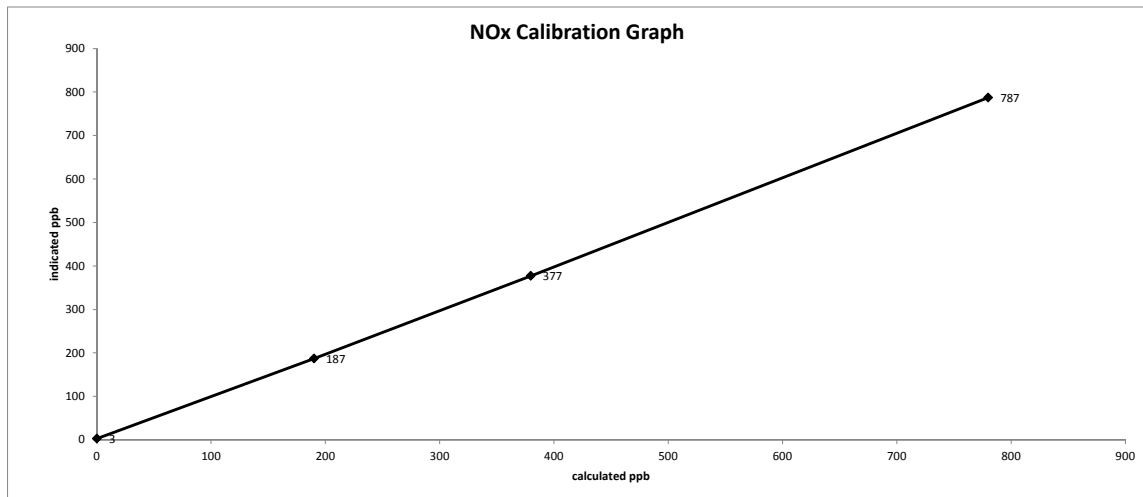
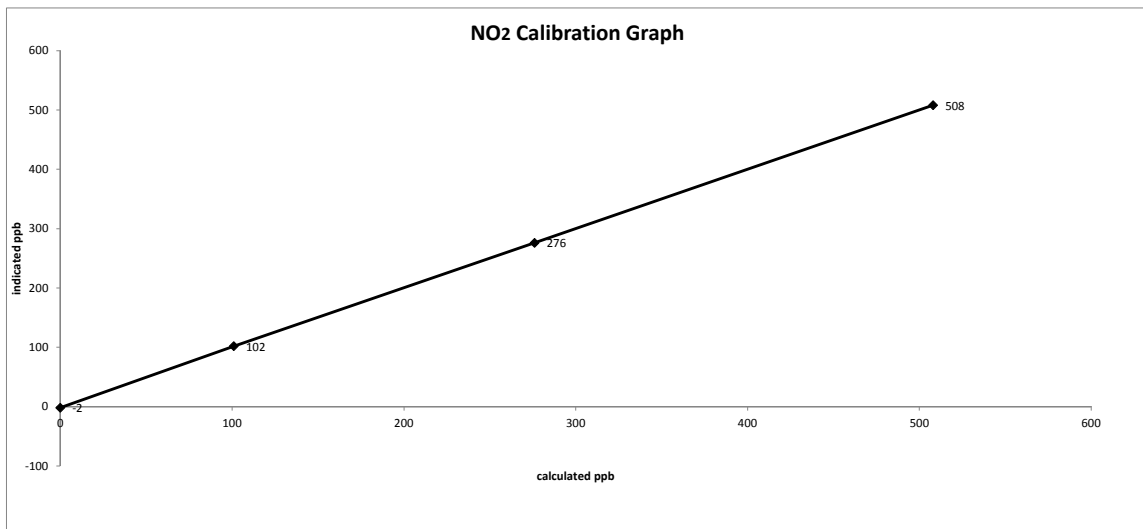
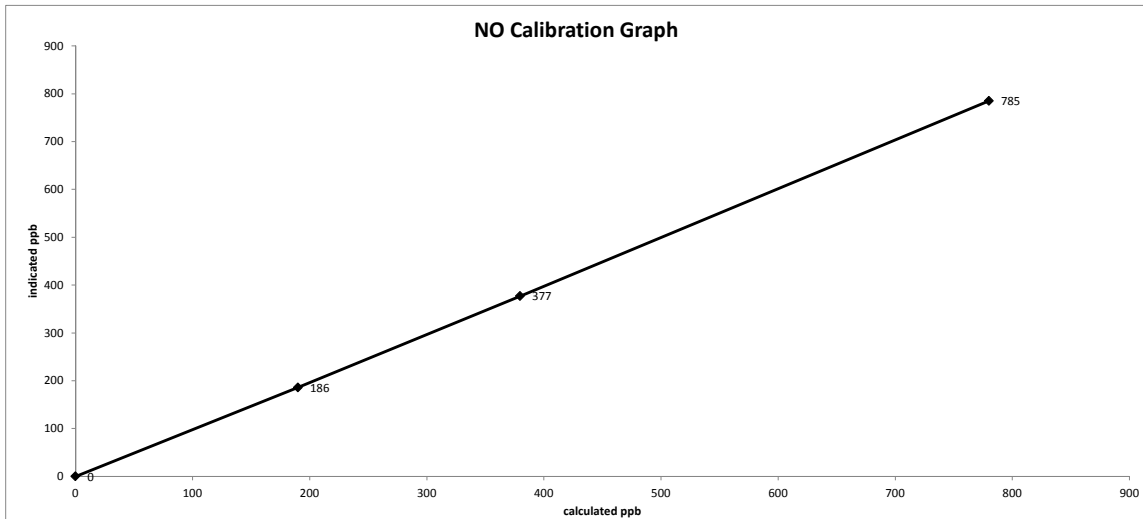
As found:	As left:
NOx SLOPE: 1.039	NOx SLOPE: n/a
NOx OFFS: -0.4	NOx OFFS: n/a
NO SLOPE: 1.027	NO SLOPE: n/a
NO OFFS: -1.9	NO OFFS: n/a
SAMP FLW: 515	SAMP FLW: n/a
OZONE FL: 78	OZONE FL: n/a
NORM PMT: -1.0	NORM PMT: n/a
AZERO: 14.5	AZERO: n/a
HVPS: 716	HVPS: n/a
DCPS: 2621	DCPS: n/a
RCELL: 50.4	RCELL: n/a
BOX TEMP: 27.2	BOX TEMP: n/a
IZS TEMP: 45.0	IZS TEMP: n/a
MOLY TEMP: 316.0	MOLY TEMP: n/a
RCEL: 5.0	RCEL: n/a
SAMP: 27.9	SAMP: n/a
Internal Span NO: 8.1	Internal Span NO: n/a
Internal Span NO2: 432	Internal Span NO2: n/a
Internal Span NOx: 440	Internal Span NOx: n/a

Comments:

No zero, high, or NO2 adjustment made. Shutdown calibration completed prior to re-installation of repaired LICA owned analyzer.

Date: August 17, 2016
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 9:32 / 13:12
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration





API 200A NO-NO2-NOx Analyzer Calibration

Date: August 17, 2016	Barometric Pressure: 0.933 atm
Company/Airshed: LICA	Station Temperature °C: 23
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Start/End Time 24 hr. (mst): 13:35 / 18:51	Calibration Purpose: installation
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 2, 2023

Analyzer:	Correction Factors:												
Serial Number: 2051	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Previous C.F.:</td> <td style="text-align: center;">As Found C.F.:</td> <td style="text-align: center;">New C.F.:</td> </tr> <tr> <td style="text-align: center;">NO =</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">1.000</td> </tr> <tr> <td style="text-align: center;">NO₂ =</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">1.004</td> </tr> <tr> <td style="text-align: center;">NOx =</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">1.000</td> </tr> </table>	Previous C.F.:	As Found C.F.:	New C.F.:	NO =	n/a	1.000	NO ₂ =	n/a	1.004	NOx =	n/a	1.000
Previous C.F.:	As Found C.F.:	New C.F.:											
NO =	n/a	1.000											
NO ₂ =	n/a	1.004											
NOx =	n/a	1.000											
Last Calibration Date: n/a													
Range ppb: 1000													

Calibrator:	Standard Calibration Points for a Range of: 1000 ppb																								
Flow Meter ID's: n/a																									
Make & Model: API Model 700																									
Serial #: 627																									
Cal Gas Cylinder I.D. #: LL119346																									
NO/NOx Gas Conc. (ppm): 50.0 50.0																									
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td 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 ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
adjusted zero	5000	0.0	5000	0	0	0.0	0.0	n/a	n/a
adjusted high	4924	78.0	5002	779.7	779.7	780.0	780.0	1.000	1.000
mid	4966	38.00	5004	379.7	379.7	374.0	373.0	1.015	1.018
low	4981	19.00	5000	190.0	190.0	184.0	183.0	1.033	1.038
calibrator zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
Average C.F.=								1.016	1.019

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	78.00	5002	0.0	778.0	779.0	1.0	0.0	1.0	n/a
adjusted high NO2	4798	78.00	4876	500.0	263.0	777.0	514.0	515.0	513.0	1.004
gpt mid	4798	78.00	4876	265.0	504.0	778.0	274.0	274.0	273.0	1.004
gpt low	4798	78.00	4876	100.0	678.0	780.0	101.0	100.0	100.0	1.000
Average NO₂ C.F.=										1.003

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.997	1.006	.95-1.05
b (Intercept as % of full scale)=	-0.36%	-0.42%	0.08%	± 3% F.S.
% change in C.F. from last cal=	n/a	n/a	n/a	± 10%
NO2 converter efficiency	n/a	n/a	1.00	0.96 to 1.04

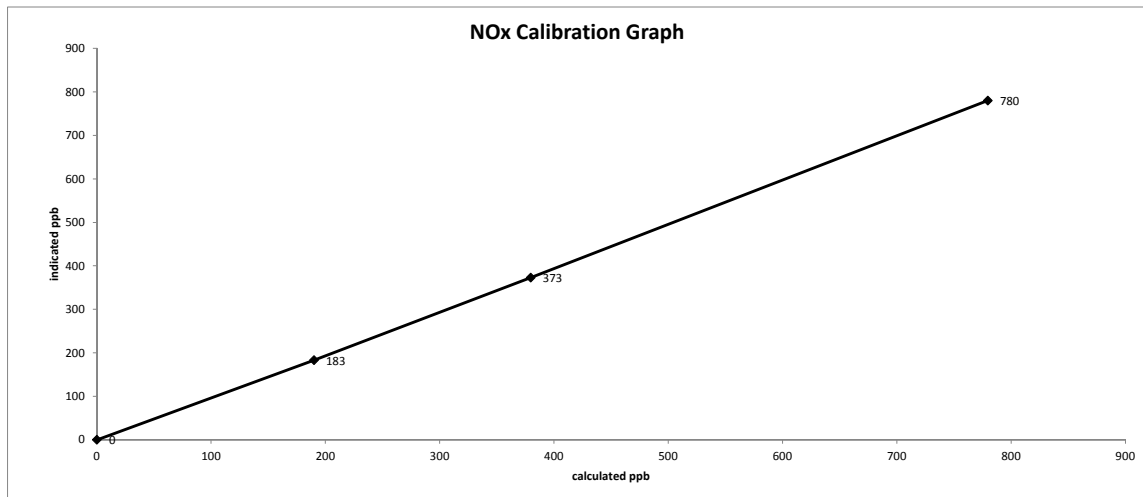
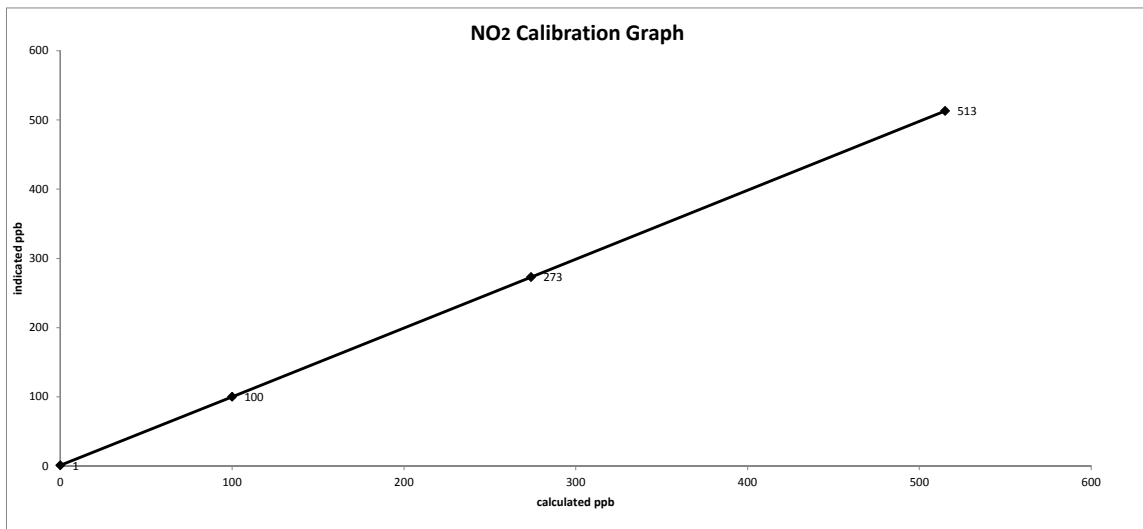
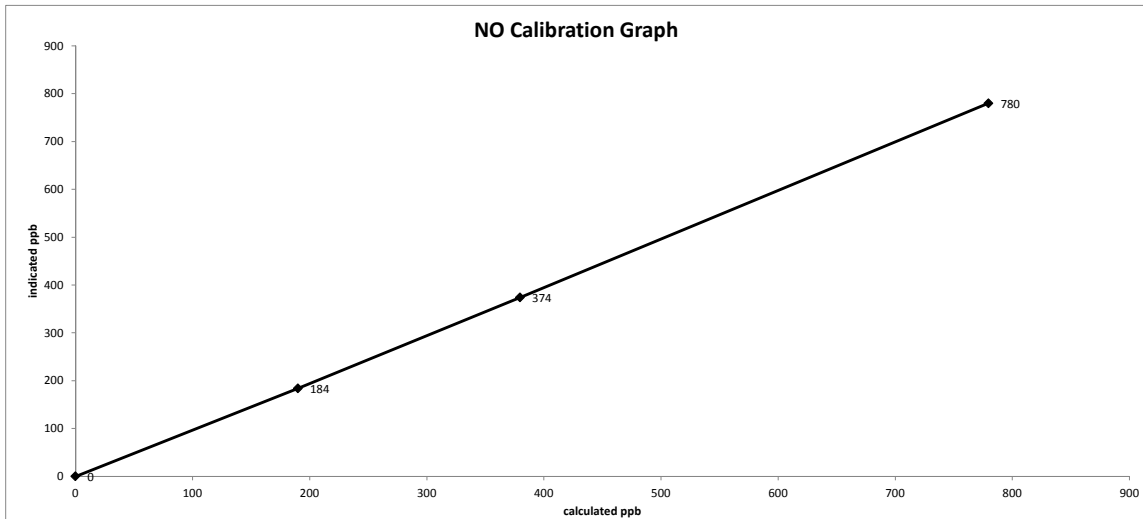
As found:	As left:
NOx SLOPE: n/a	NOx SLOPE: 1.178
NOx OFFS: n/a	NOx OFFS: -0.5
NO SLOPE: n/a	NO SLOPE: 1.179
NO OFFS: n/a	NO OFFS: -1.9
SAMP FLW: n/a	SAMP FLW: 502
OZONE FL: n/a	OZONE FL: 81
NORM PMT: n/a	NORM PMT: -2.2
AZERO: n/a	AZERO: 51.7
HVPS: n/a	HVPS: 707
DCPS: n/a	DCPS: 2576
RCELL: n/a	RCELL: 50.6
BOX TEMP: n/a	BOX TEMP: 29.2
IZS TEMP: n/a	IZS TEMP: 45.1
MOLY TEMP: n/a	MOLY TEMP: 315.1
RCEL: n/a	RCEL: 5.1
SAMP: n/a	SAMP: 27.1
Internal Span NO: n/a	Internal Span NO: 9.5
Internal Span NO2: n/a	Internal Span NO2: 414
Internal Span NOx: n/a	Internal Span NOx: 424

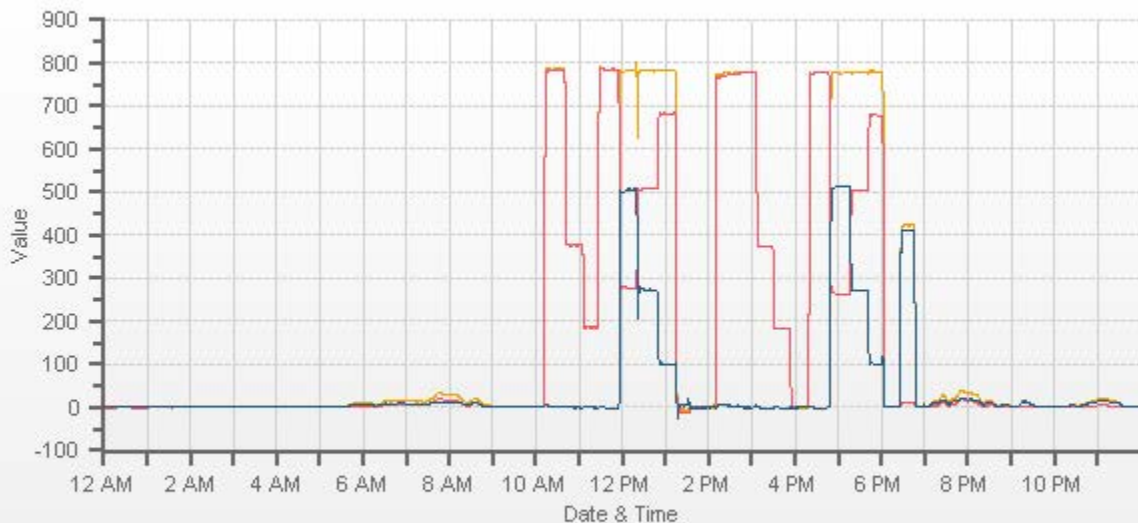
Comments:

Installation calibration completed to re-install repaired LICA owned analyzer. Sample inlet filter changed. A new permeation tube installed.

Date: August 17, 2016
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 13:35 / 18:51
Calibration Purpose: installation
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

WIND SYSTEM

METEOROLOGICAL SYSTEM CHECK

Meteorological System Checklist

Performed by: Alex Yakupov
 Station: **Maskwa**
 Start: 11:13 End: 11:34

PRECIPITATION SENSOR CHECK

	YES	NO
Is the sensor Level?	YES	
Is the heater operating properly?	YES	
Are the bucket drain holes clean?	YES	
Is the inner screen on the housing? (screen should be on between July and September	YES	
Is the upper screen on the housing? (screen should be on between July and September)	YES	
Is the housing clean?	YES	
Is the area around the housing clean and free from obstacle?	YES	
Is the tipping sensor working properly?	YES	
Test with water (11:29 - test: 1.0 mm)	PASS	

Comments: the rain gauge has been tested with water. Response is timely and accurate.

No issues.

Field Technician: Alexander Yakupov August 15, 2016

CALIBRATORS

Company Maxxam Operator: Chris Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>829</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 1, 2015</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
Pt. #3	<u>5000</u>		
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>37.7</u>
Pt. #3	<u>18.8</u>		

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4995	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5000	77.5	0.780	0.780	0.795	0.000	0.795	2%	2%
5001	37.7	0.379	0.379	0.388	0.001	0.389	2%	3%
4997	18.8	0.189	0.189	0.193	0.000	0.193	2%	2%
Absolute Average Percent Difference							2%	2%

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

NO	LIMITS	NO _x
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0193	0.90-1.10	m (Slope)= 1.0194
b (Intercept % of FS)= 0.0501	± 3% F.S.	b (Intercept % of FS)= 0.0709

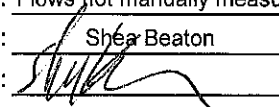
Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5000	0	0.000	0.793	0.001	0.794	NO ₂	% Diff. Limit
5000	0.5	0.533	0.260	0.537	0.797	1%	± 10%
5000	0.25	0.277	0.516	0.280	0.796	1%	± 10%
5000	0.095	0.115	0.678	0.114	0.792	-2%	± 10%
Absolute Average Percent Difference						0%	± 10%

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

NO ₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 1.0077	0.90-1.10
b (Intercept % of FS)= -0.0025	± 3% F.S.

AENV Standards Audit Calibrator	NO _x Analyzer
Make/Model <u>Thermo 146i</u>	Make/Model <u>Thermo 42i</u>
Serial/AMU Number <u>1809</u>	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>February 1, 2016</u>
	Full Scale (ppm) <u>1</u>

 COMMENTS: Flows not manually measured - calibration system audited as it is currently being operated.

 Auditor: Shea Beaton
 Operator Signature: 

 Date: February 3, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-119

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>627</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 1 2015</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</u>		

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5007	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5003	77.5	0.779	0.779	0.787	-0.001	0.786	1%	1%
5004	37.8	0.380	0.380	0.383	0.000	0.383	1%	1%
5001	18.9	0.190	0.190	0.191	0.000	0.191	1%	1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NOx			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	1.0106	0.90-1.10		m (Slope)=	1.0092		
b (Intercept % of FS)=	-0.0566	± 3% F.S.		b (Intercept % of FS)=	-0.0368		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5003	0	0.000	0.787	0.001	0.788	NO ₂	% Diff. Limit
5003	0.5	0.493	0.294	0.498	0.792	1%	± 10%
5003	0.25	0.256	0.531	0.262	0.792	2%	± 10%
5003	0.1	0.108	0.679	0.110	0.789	1%	± 10%
Absolute Average Percent Difference						1.2%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	1.0089	0.90-1.10					
b (Intercept % of FS)=	0.1591	± 3% F.S.					

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model <u>Thermo 146i</u>	Make/Model <u>Thermo 42i</u>
Serial/AMU Number <u>1809</u>	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>February 1, 2016</u>
	Full Scale (ppm) <u>1</u>

COMMENTS: Flows not manually measured - calibration system audited as it is currently being operated.

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 3, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-165

Company Maxxam Operator: Chris Wesson

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

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

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

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
<u>NO</u>		<u>LIMITS</u>		<u>NOx</u>			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	0.9950	0.90-1.10		m (Slope)=	0.9946		
b (Intercept % of FS)=	-0.0773	± 3% F.S.		b (Intercept % of FS)=	-0.0167		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5001	0	0.000	0.772	0.000	0.772	NO ₂	% Diff. Limit
5001	0.51	0.507	0.265	0.506	0.772	0%	± 10%
5001	0.25	0.252	0.520	0.254	0.773	1%	± 10%
5001	0.1	0.110	0.662	0.109	0.772	-1%	± 10%
Absolute Average Percent Difference						0.1%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
<u>NO₂</u>		<u>LIMITS</u>					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9992	0.90-1.10					
b (Intercept % of FS)=	0.0171	± 3% F.S.					

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
		Last Calibration Date	<u>March 28, 2016</u>
		Full Scale (ppm)	<u>1</u>

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

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: March 31, 2016
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-116CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: LL119346 **Concentration PPM:** 50.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: Thermo146i
Serial Number: 1809
Last Verification Date: February 2, 2016
Gas Type: SO2 **Conc.** 98.07
Cylinder Number: CAL016625

Flow Measurement Device:

Make/Model: Bios DC-2
Serial Number: Bios D
Temp.°C: 24.5
B.P. 702mmHg

Reference Analyzer:

Make/Model: Thermo 43C **Serial/AMU Number:** 1623
Instrument Settings: **Zero:** 8.7 **Span:** 1.027 **Range:** 1.0
Last Calibration: **Date:** 1-Feb-16 **C.F.** 1.000 **Done By:** SB

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4952	0.0	0.000	0.01608	62.183	49.3
4946	79.54	0.793	0.01608	62.183	49.3
4941	39.35	0.396	0.00796	125.565	49.7
4940	19.57	0.195	0.00396	252.427	49.2
Average Cylinder Concentration:					49.4

Previous Stated Concentration PPM: 50.0

Percent variance from Stated: 1.2

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO blend 50.0ppm NO
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: February 2, 2016
Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam Operator's Name: Limin Li
 Cylinder #: LL36837 Concentration PPM: 10.0 Tolerance(%): 2 Certified By: Air Liquide

Reference Calibrator and Gas:
 Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: December 15, 2014
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:
 Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P.: 702 mmhg

Reference Analyzer:
 Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
 Last Calibration: Date: Dec15/14 C.F.: 1.000 Done By: Al Clark

Calibrator Flows (scem)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.00755	132.442	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

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: December 16, 2014
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

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

Reference Calibrator and Gas:

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

Flow Measurement Device:

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

Reference Analyzer:

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

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

CH4	C3H8
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



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-115CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL119346 **Conc (PPM)** 50.0/50.0 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Thermo 146i</u>			Make/Model	<u>Bios DC-2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>Bios D</u>
Last Verification Date	<u>February 2, 2016</u>			Temp. °C	<u>24.5</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>702mmHg</u>
Cylinder Number	<u>CAL018024</u>				

Reference Analyzer:
 Make/Model Thermo 42i Serial/AMU Number: 1868
 Instrument Settings Zero: 4.2 Span: 1.014 Range: 1.0
 Last Calibration: Date: 02-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
4952	0.0	0.000	0.000				
4946	79.54	0.809	0.809	0.01608	62.183	50.3	50.3
4941	39.35	0.403	0.402	0.00796	125.565	50.6	50.5
4940	19.57	0.200	0.200	0.00396	252.427	50.5	50.5
Average Cylinder Concentration:						50.5	50.4

	<u>NO</u>		<u>NOx</u>
Previous Stated Concentration PPM:	<u>50.0</u>		<u>50.0</u>
Percent variance from Stated:	<u>0.9</u>		<u>0.8</u>

Cylinder gas tolerances based on NO only

- Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS: SO2/NO Blend 50.0PPM SO2**
- < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
- > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: February 2, 2016
 Operator Signature: [Signature] Location: McIntyre Center Edmonton

***APPENDIX III
REPORT CERTIFICATION FORM***

Report Certification Form

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

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

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

28-09-2016





Report Issued Date (dd-mm-yyyy)

APPENDIX IV
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2016-08-30-C</u>
Site: <u>Maskwa Site</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u></u>	Date <u>14-Sep-2016</u>
Level 1 Primary Validation	<u></u>	Date <u>14-Sep-2016</u>
Level 2 Final Validation	<u></u>	Date <u>28-Sep-2016</u>
Level 3 Independent Data Review	<u></u>	Date <u>30-Sep-2016</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

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

AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
ST. LINA SITE

JOB #: 2833-2016-08-31-C

August 2016

Prepared for:

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

Attention: MIKE BISAGA

DATE: **September 30, 2016**

Prepared by: 

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

Reviewed by: 

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

SUMMARY

In August 2016, the Air Services Group of Maxxam Analytics conducted an ambient air monitoring program at the St. Lina Site of Lakeland Industry & Community Association, near St. Paul. Sampling was carried out to determine the concentrations of non-compliance parameters, as requested by the Project Coordinator.

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 and meteorological sensors were above the 90% requirement.

- **PM_{2.5}:** Eight hours of data collected on August 22 were discarded due to an electronic error in the TEOM unit. Fourteen hours of data were recorded at concentrations less than 3 µg/m³, rendering the data invalid.
- **Wind System:** The MetOne wind sensor (S/N: H12635) was replaced with the RM Young sensor (S/N: 124638) on August 24 for maintenance purposes.

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 is issuing this completed report to Lakeland Industry & Community Association, St. Lina Site.

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association St. Lina Site						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-HR	24-HR	1-HR	24-HR				HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	0.0	1.3	19	14	7.7	SSW	0.1	16, 19	100.0
H ₂ S (ppb)	10	3	0	0	0.1	3.7	19	6	4.8	SSW	0.5	15	100.0
THC (ppm)	-	-	-	-	1.82	2.37	10	20	3.8	SSW	1.99	10	100.0
NO ₂ (ppb)	159	-	0	-	0.8	6.5	3	3	7.4	NE	2.1	3	100.0
NO (ppb)	-	-	-	-	0.1	2.0	3	7	4.8	NE	0.3	16	100.0
NO _x (ppb)	-	-	-	-	0.8	6.8	3	6	5.4	NE	2.3	3	100.0
O ₃ (ppb)	82	-	0	-	21.9	48.7	16	14	9.3	NW	30.5	7	100.0
PM _{2.5} (µg/M ³)	80	30	0	0	3.8	18.4	13	20	7.5	S	7.2	16	97.0
RELATIVE HUMIDITY (%)	-	-	-	-	70	91	VAR	VAR	VAR	VAR	85	9	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	932	942	24, 29	VAR	VAR	VAR	940	24, 29	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	16.6	29.5	16	13	13.4	SW	20.4	15	100.0
PRECIPITATION (mm)	-	-	-	-	0.1	10.0	14	17	13.3	N	0.9	22	100.0
VECTOR WS (kph)	-	-	-	-	8.3	23.9	22	8	-	NE	13.8	28	100.0
VECTOR WD (sec)	-	-	-	-	-	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedance Summary Report

SO₂ 1- Hour Exceedances

No Exceedances Recorded During the Month

SO₂ 24- Hour Exceedances

No Exceedances Recorded During the Month

H₂S 1- Hour Exceedances

No Exceedances Recorded During the Month

H₂S 24- Hour Exceedances

No Exceedances Recorded During the Month

NO₂ 1- Hour Exceedances

No Exceedances Recorded During the Month

PM_{2.5} 1- Hour Exceedances

No Exceedances Recorded During the Month

PM_{2.5} 24- Hour Exceedances

No Exceedances Recorded During the Month

O₃ 1- Hour Exceedances

No Exceedances Recorded During the Month

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
SUMMARY	1
MONTHLY CONTINUOUS DATA SUMMARY REPORT	2
EXCEEDANCE SUMMARY REPORT	3
TABLE OF CONTENTS	4
1.0 Discussion	6
2.0 Project Personnel	9
3.0 Plant Monthly Required AMD Summary	9
4.0 Calculations and Results	9
5.0 Methods and Procedures	10
Appendix I	Continuous Monitoring Data Results 13
	Sulphur Dioxide 14
	Hydrogen Sulphide 22
	Total Hydrocarbon 30
	Oxides of Nitrogen 38
	Nitric Oxides 46
	Nitrogen Dioxide 53
	Ozone 61
	Particulate Matter 2.5 69
	Wind Speed 74
	Wind Direction 81
	Standard Deviation Wind Direction 84
	Relative Humidity 87
	Barometric Pressure 90
	Ambient Temperature 93
	Precipitation 96
Appendix II	Equipment Calibration Results 99
	Sulphur Dioxide 100
	Hydrogen Sulphide 103
	Total Hydrocarbon 106
	Nitrogen Dioxide 109
	Ozone 113
	Particulate Matter 116
	Wind System 118
	Meteorological System Check 121
	Calibrators 123
	Calibration Gases 126

Appendix III

Report Certification Form 131

Appendix IV

Data Validation Certification Form 133

1.0 Discussion

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

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

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

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

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

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

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time (minimum), on a monthly basis.

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

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

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

Trailer inspection was conducted on August 16. No issues were identified.

SULPHUR DIOXIDE (SO₂)

The routine monthly calibration was performed on August 18. No operational issues were identified this month. Maximum instantaneous data collected on August 9, at hour 15:00, was invalidated due to a brief power outage.

HYDROGEN SULPHIDE (H₂S)

The routine monthly calibration was performed on August 16. No operational issues were identified this month. Maximum instantaneous data collected on August 9, at hour 15:00, was invalidated due to a brief power outage.

TOTAL HYDROCARBONS (THC)

The routine monthly calibration was performed on August 16. No operational issues were identified this month. The span gas cylinder was replaced on August 24. Maximum instantaneous data collected on August 9, at hour 15:00, was invalidated due to a brief power outage.

NITROGEN DIOXIDE (NO₂)

The routine monthly calibration was performed on August 18. No operational issues were identified this month. Maximum instantaneous data collected on August 9, at hour 15:00, was invalidated due to a brief power outage.

OZONE (O₃)

The routine monthly calibration was performed on August 18. No operational issues were identified this month. Maximum instantaneous data collected on August 9, at hour 15:00, was invalidated due to a brief power outage.

PARTICULATE MATTER 2.5 (LESS THAN 2.5 MICRONS) (PM_{2.5})

Two routine audits were performed this month: one was completed on August 16 and the other audit was performed on August 22. On August 16, the inlet and the FDMS filters were replaced and a new dryer was installed. The TEOM unit was found electronically locked up upon arrival at the station on August 22. The unit was restarted and the audit was completed. Eight hours of data were discarded due to this event.

Data was corrected using Alberta Air Quality Guidelines. Data between 0 and -3 µg/m³ was corrected to 0 µg/m³. Data that was below -3 µg/m³ was invalidated. Fourteen hours of data were invalidated as the data was below -3 µg/m³ this month.

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

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was coming from.

No operational issues were identified this month. The Met One wind sensor (S/N: H12635) was removed from site on August 24 and sent to the manufacturer for scheduled maintenance. The RM Young (S/N: 124638) was installed as a replacement. Maximum instantaneous data collected on August 9, at hour 15:00, was invalidated due to a brief power outage.

RELATIVE HUMIDITY (RH)

No operational issues were identified this month.

BAROMETRIC PRESSURE (BP)

No operational issues were identified this month.

PRECIPITATION

A precipitation sensor check was performed on August 16. No issues were identified.

AMBIENT TEMPERATURE (AmbTPX)

No operational issues were identified this month.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field sampling 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 and meteorological sensors 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 test program:

- Maxxam AIR SOP-00208: RM Young Monitor Calibration
- Maxxam AIR SOP-00209: Ambient H₂S Monitoring
- Maxxam AIR SOP-00211: Ambient SO₂ Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00242: Precipitation Collector Installation /Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - R&P 1405F Teom Unit Wind System - RM Young Unit
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

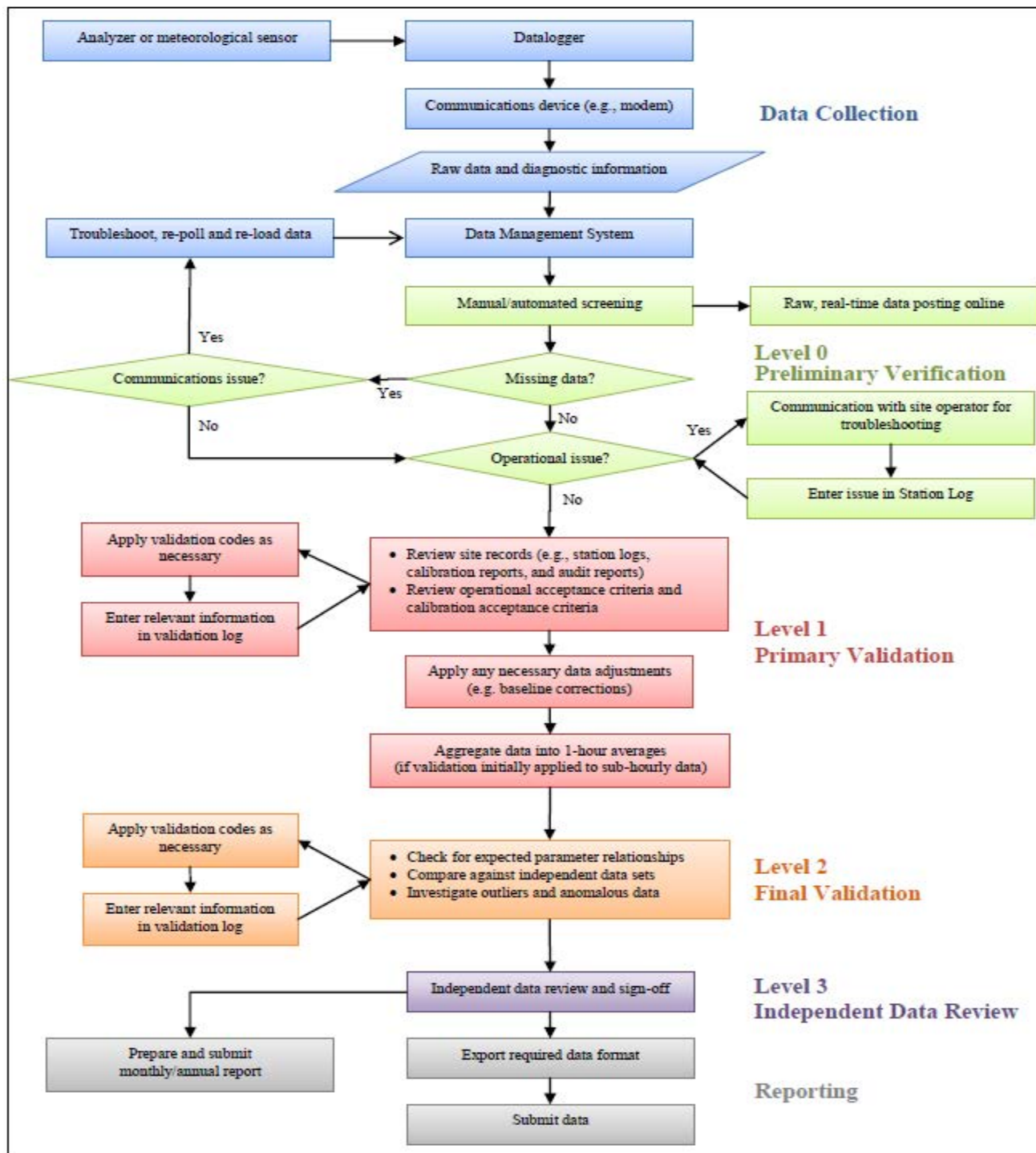
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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

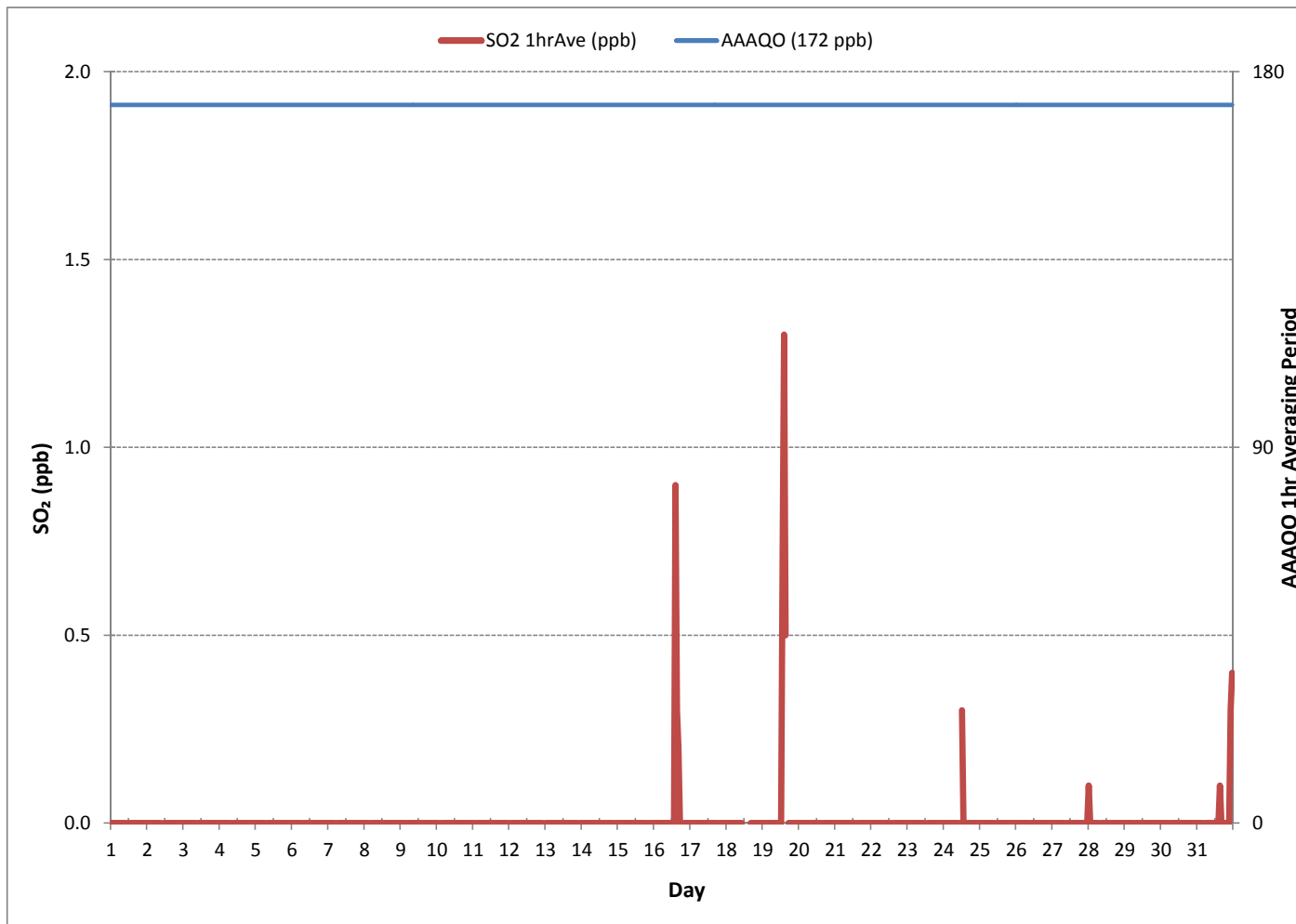


Source: Air Monitoring Directive (Aug 3, 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE (SO₂) hourly averages in ppb





SULPHUR DIOXIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	2.1	2.3	2.1	2.1	2.1	2.1	2.2	2.0	2.0	2.2	2.1	S	2.1	2.1	1.9	2.0	1.9	1.9	1.9	1.9	1.8	1.9	1.6	1.7	1.6	2.3	2.0	24	
2	1.6	1.7	1.6	1.6	1.9	1.5	1.7	1.5	1.5	1.6	S	1.5	1.7	1.8	1.8	1.7	1.8	1.8	1.6	1.6	1.9	2.1	1.8	1.8	1.9	1.5	2.1	1.7	24
3	1.9	1.9	1.9	2.1	2.0	1.9	2.3	2.3	2.0	S	2.1	2.0	2.3	1.8	1.8	1.8	1.8	1.6	1.7	1.8	1.5	1.6	1.7	1.7	1.5	2.3	1.9	24	
4	1.7	1.7	1.7	1.8	1.6	1.4	1.5	1.5	S	1.6	1.5	1.5	1.9	1.9	1.7	1.7	1.6	1.6	1.5	1.6	1.6	1.6	1.6	1.6	1.4	1.9	1.6	24	
5	1.6	1.6	1.6	1.5	1.5	1.5	1.5	S	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.6	1.5	1.5	1.5	1.7	1.7	1.6	1.5	1.7	1.4	1.4	1.7	24	
6	1.7	1.7	1.5	1.6	1.5	1.6	S	1.5	1.7	1.4	1.4	1.5	1.6	1.6	1.6	1.7	1.7	1.7	1.6	1.7	1.6	1.7	1.6	1.7	1.9	1.4	1.9	24	
7	1.9	1.7	1.7	1.8	1.9	S	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.0	2.2	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.2	1.7	2.2	24	
8	2.1	2.3	2.3	2.3	S	2.4	2.4	2.4	2.6	2.4	2.3	2.5	2.7	2.5	2.6	2.5	2.4	2.3	2.2	2.3	2.3	2.2	2.4	2.3	2.1	2.7	2.4	24	
9	2.2	2.2	2.2	S	2.2	2.3	2.2	2.3	2.3	2.5	2.2	2.4	2.4	2.4	P	2.2	2.2	2.5	2.3	2.4	2.2	2.2	2.2	2.2	2.2	2.5	2.3	23	
10	2.5	2.3	S	2.3	2.7	2.4	2.6	2.4	2.5	2.7	2.6	2.5	2.7	2.5	2.5	2.8	2.6	2.4	2.5	2.5	2.5	2.4	2.4	2.4	2.3	2.8	2.5	24	
11	2.3	S	2.1	2.3	2.3	2.5	2.3	2.2	2.4	2.2	2.3	2.2	2.4	2.3	2.5	2.5	2.3	2.6	2.5	2.5	2.2	2.1	2.3	2.3	2.1	2.6	2.3	24	
12	S	2.0	1.9	2.2	1.9	2.2	1.9	2.1	2.1	2.0	2.1	2.0	1.8	1.8	1.9	2.0	2.1	2.1	1.9	2.0	1.9	1.8	1.9	S	1.8	2.2	2.0	24	
13	1.9	1.9	2.0	2.1	1.9	2.0	2.2	2.1	2.2	2.2	2.5	2.2	2.4	2.4	2.5	2.6	2.4	2.4	2.2	2.5	2.5	2.5	S	2.5	1.9	2.6	2.3	24	
14	2.3	2.5	2.8	2.5	2.5	2.6	2.7	2.7	2.7	2.5	2.7	3.0	2.7	2.5	2.7	2.6	2.5	2.2	2.5	2.5	2.5	S	2.2	2.3	2.2	3.0	2.6	24	
15	2.3	2.4	2.5	2.3	2.5	2.5	2.5	2.7	2.5	2.3	2.5	2.5	2.5	2.2	2.5	2.5	2.5	2.4	2.4	2.5	S	2.4	2.2	2.1	2.1	2.7	2.4	24	
16	2.5	2.5	2.5	2.4	2.5	2.5	2.7	2.7	2.7	3.1	2.8	2.7	2.7	3.8	3.9	3.4	3.4	2.5	2.5	S	2.7	2.4	2.4	2.6	2.4	3.9	2.8	24	
17	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.1	2.1	2.2	2.1	2.1	2.1	S	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.4	2.2	24
18	1.6	1.9	1.9	1.8	1.7	1.9	1.7	1.7	1.8	1.7	1.8	C	C	C	C	C	C	2.1	1.9	1.9	1.9	1.7	1.6	1.9	1.6	2.1	1.8	24	
19	1.8	1.6	1.7	1.9	1.8	2.1	2.1	1.9	2.1	2.0	1.8	2.2	3.1	3.8	4.3	3.7	S	2.2	2.5	2.4	2.3	2.3	2.5	2.6	1.6	4.3	2.4	24	
20	2.6	2.6	2.7	2.6	2.7	2.8	2.9	3.0	3.0	2.9	2.8	2.7	2.8	3.1	2.9	S	3.1	3.1	3.2	3.1	3.0	3.0	3.1	3.2	2.6	3.2	2.9	24	
21	2.9	3.2	2.9	3.2	3.2	3.2	3.3	3.2	3.3	3.2	3.2	3.2	3.2	3.2	S	3.3	3.4	3.3	3.4	3.4	3.3	3.4	3.3	3.4	3.5	3.5	3.3	24	
22	3.6	3.6	3.8	3.8	3.7	3.8	3.8	3.8	3.9	4.2	3.9	3.8	3.8	S	3.8	3.8	3.8	3.8	3.8	3.5	3.4	3.3	3.3	3.4	3.1	3.1	4.2	3.7	24
23	3.4	3.3	3.1	3.1	3.0	2.9	2.9	2.9	2.6	2.6	2.8	S	2.6	2.5	2.4	2.4	2.2	2.4	2.1	2.1	2.3	2.2	2.3	2.1	3.4	2.6	2.4	24	
24	2.1	2.1	2.0	2.2	2.3	2.2	2.3	2.2	1.8	2.1	2.1	1.9	S	3.2	3.1	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	1.8	3.2	2.2	24
25	2.3	2.2	2.1	2.3	2.5	2.4	2.4	2.5	2.2	2.6	S	2.5	2.4	2.4	2.3	2.5	2.4	2.4	2.3	2.3	2.3	2.5	2.3	2.4	2.1	2.6	2.4	24	
26	2.4	2.5	2.6	2.5	2.5	2.7	2.6	2.7	2.7	S	3.0	3.0	3.0	3.1	3.0	3.1	3.2	3.3	3.3	3.3	3.6	3.5	3.3	3.5	2.4	3.6	3.0	24	
27	3.5	3.5	3.9	3.8	3.7	3.7	3.7	3.7	S	4.0	3.9	3.8	4.0	4.1	3.9	3.8	3.9	4.1	3.8	3.9	3.8	3.7	3.8	3.8	3.5	4.1	3.8	24	
28	3.9	3.9	3.7	3.6	3.7	3.4	3.3	S	3.0	2.9	2.8	2.9	2.9	2.8	2.7	2.7	2.6	2.5	2.7	2.5	2.4	2.4	2.3	2.3	2.3	3.9	3.0	24	
29	2.3	2.4	2.1	2.2	2.2	2.3	S	2.3	2.4	2.3	2.5	2.7	2.5	2.3	2.5	2.5	2.4	2.3	2.5	2.4	2.4	2.3	2.3	2.4	2.1	2.7	2.4	24	
30	2.5	2.4	2.3	2.3	2.3	S	2.3	2.5	2.4	2.5	2.5	2.7	2.5	2.7	2.6	2.7	2.9	2.7	2.7	2.5	2.5	2.7	2.5	2.3	2.9	2.5	2.5	24	
31	2.7	2.7	2.7	2.6	S	2.9	2.8	2.9	2.9	3.0	3.2	3.4	3.7	3.6	3.7	4.1	3.8	3.8	3.8	3.6	3.5	3.8	4.5	4.5	2.6	4.5	3.4	24	
HOURLY MAX	3.9	3.9	3.9	3.8	3.7	3.8	3.8	3.8	3.9	4.2	3.9	3.8	4.0	4.1	4.3	4.1	3.9	4.1	3.8	3.9	3.8	3.8	4.5	4.5					
HOURLY AVG	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.6	2.6	2.6	2.6	2.5	2.4	2.5	2.4	2.4	2.4	2.4	2.4					

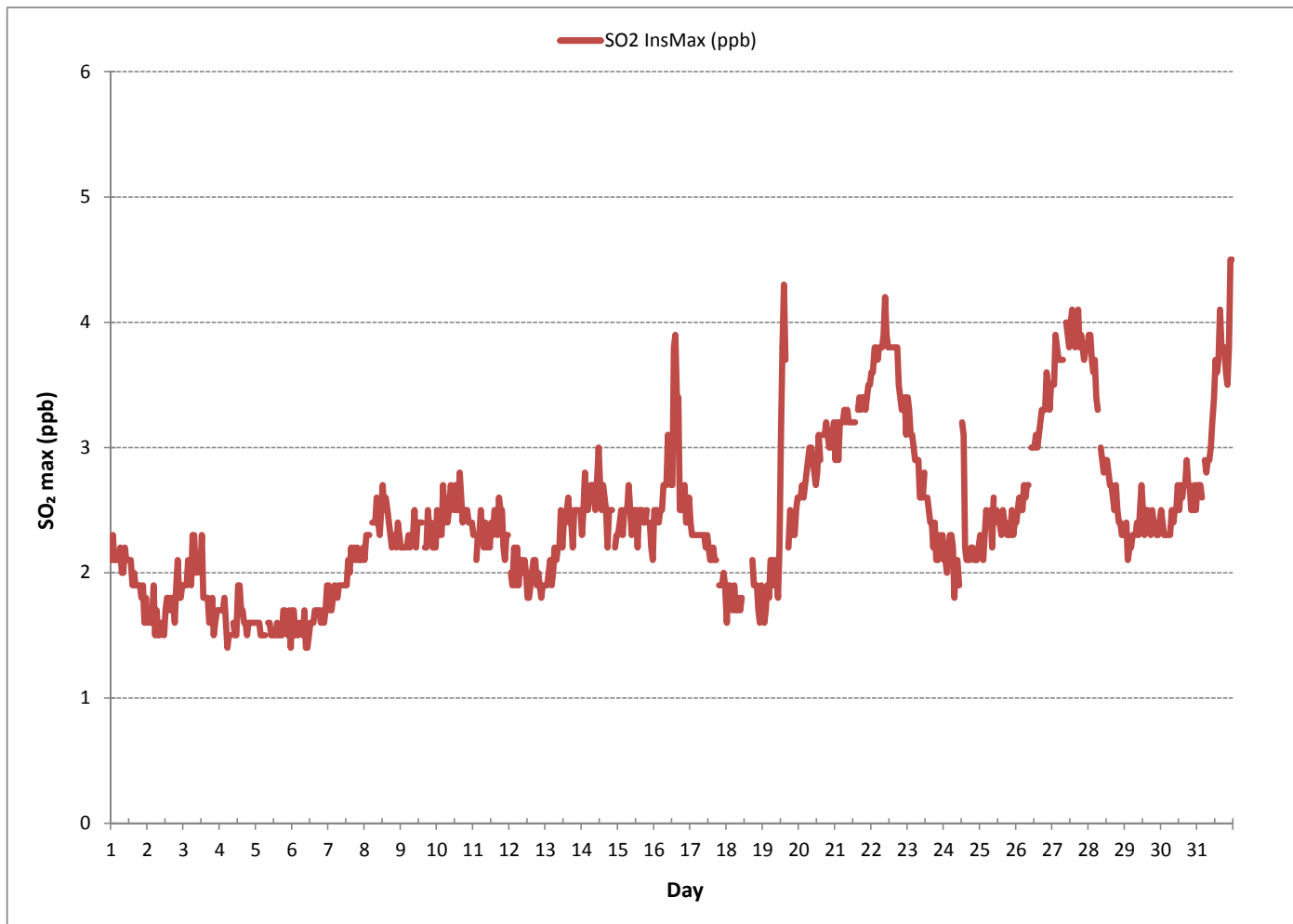
STATUS FLAG CODES

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

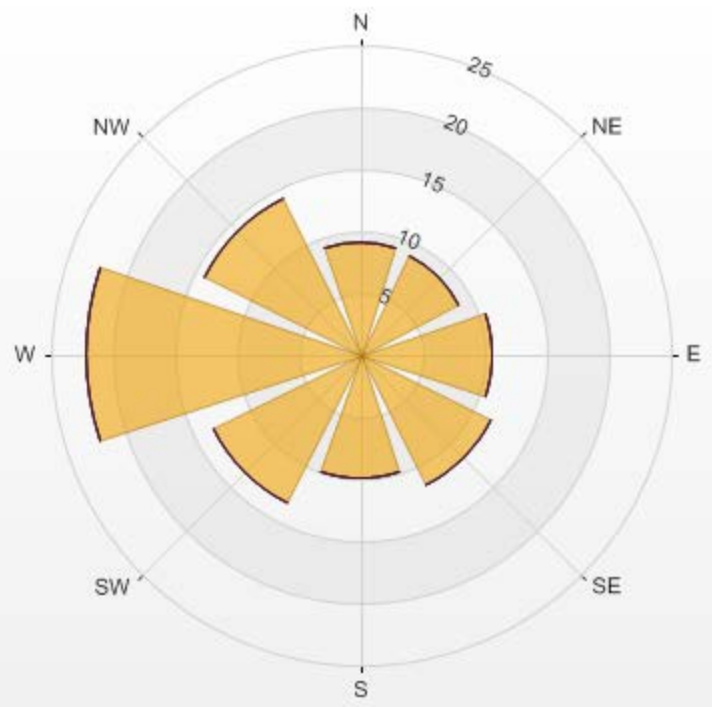
NUMBER OF NON-ZERO READINGS:	706
MAXIMUM INSTANTANEOUS VALUE:	4.5 PPB @ HOUR(S) 22, 23 ON DAY(S) 31
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	6 HRS
OPERATIONAL TIME:	743 HRS
STANDARD DEVIATION:	0.63

SULPHUR DIOXIDE MAX instantaneous maximum in ppb



Wind: LICA ST. LINA Monitor: SO2 [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.89% Calm Avg: 0.00

Direction	0.0-20.0	20.0-60.0	60.0-110.0	110.0-170.0	170.0-340.0	>340.0	Total
N	9.07	0	0	0	0	0	9.07
NE	8.92	0	0	0	0	0	8.92
E	10.62	0	0	0	0	0	10.62
SE	11.76	0	0	0	0	0	11.76
S	10.06	0	0	0	0	0	10.06
SW	13.31	0	0	0	0	0	13.31
W	22.1	0	0	0	0	0	22.1
NW	14.16	0	0	0	0	0	14.16
Summary	100	0	0	0	0	0	100



% Icon Classes (ppb)	100	0	0	0	0	0	0
0.0-20.0	20.0-60.0	60.0-110.0	110.0-170.0	170.0-340.0	>340.0		

SO2[ppb] Calibration: LICA ST. LINA Monthly: 08/2016 Type: Span



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

HYDROGEN SULPHIDE



HYDROGEN SULPHIDE (H₂S) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.	
HOUR START	HOUR END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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	0.1	0.1	0.2	0.9	0.5	0.0	0.1	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.1	24
2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
4	0.0	0.1	0.0	0.0	0.3	0.2	0.1	0.6	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	24
5	0.0	0.0	0.9	0.2	0.0	0.3	0.1	S	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.1	24	
6	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.2	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
8	0.0	0.0	0.0	0.0	S	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24	
9	0.0	0.1	0.0	S	0.3	0.3	0.7	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.7	0.1	24	
10	0.0	0.0	S	0.1	0.4	0.5	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.7	0.0	0.7	0.1	24	
11	0.1	S	0.5	0.9	1.4	1.6	0.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.3	24	
12	S	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	S	0.0	0.4	0.1	24		
13	0.5	0.1	0.0	1.1	0.9	1.8	1.7	0.8	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	1.8	0.3	24		
14	0.0	0.0	0.7	0.4	0.6	0.9	0.8	2.6	2.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	S	0.2	0.3	2.6	0.4	24		
15	0.5	0.5	0.7	1.6	1.2	1.8	1.8	1.3	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	S	0.0	0.0	0.0	1.8	0.5	24		
16	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.1	0.0	24		
17	0.0	0.0	0.3	0.2	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	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24		
18	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
19	0.0	0.0	0.0	0.0	0.0	1.5	3.7	2.4	1.2	0.6	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	0.0	3.7	0.4	24		
20	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	24		
21	0.1	0.0	0.0	0.3	0.0	0.0	0.3	0.6	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	0.0	0.0	0.0	0.6	0.1	24		
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
24	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.3	0.1	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
26	0.0	0.1	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	24		
27	0.0	0.0	0.0	0.0	0.4	0.1	0.1	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.4	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	0.0	0.0	0.0	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	0.2	0.0	0.0	S	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24		
30	0.0	0.0	0.0	0.1	0.1	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
31	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
HOURLY MAX	0.5	0.5	0.9	1.6	1.4	1.8	3.7	2.4	2.6	2.1	0.3	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.1	0.2	0.4	0.7					
HOURLY AVG	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.3	0.2	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					

STATUS FLAG CODES

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

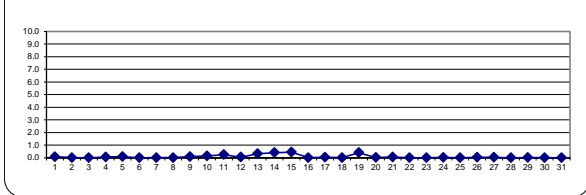
OBJECTIVE LIMIT:

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

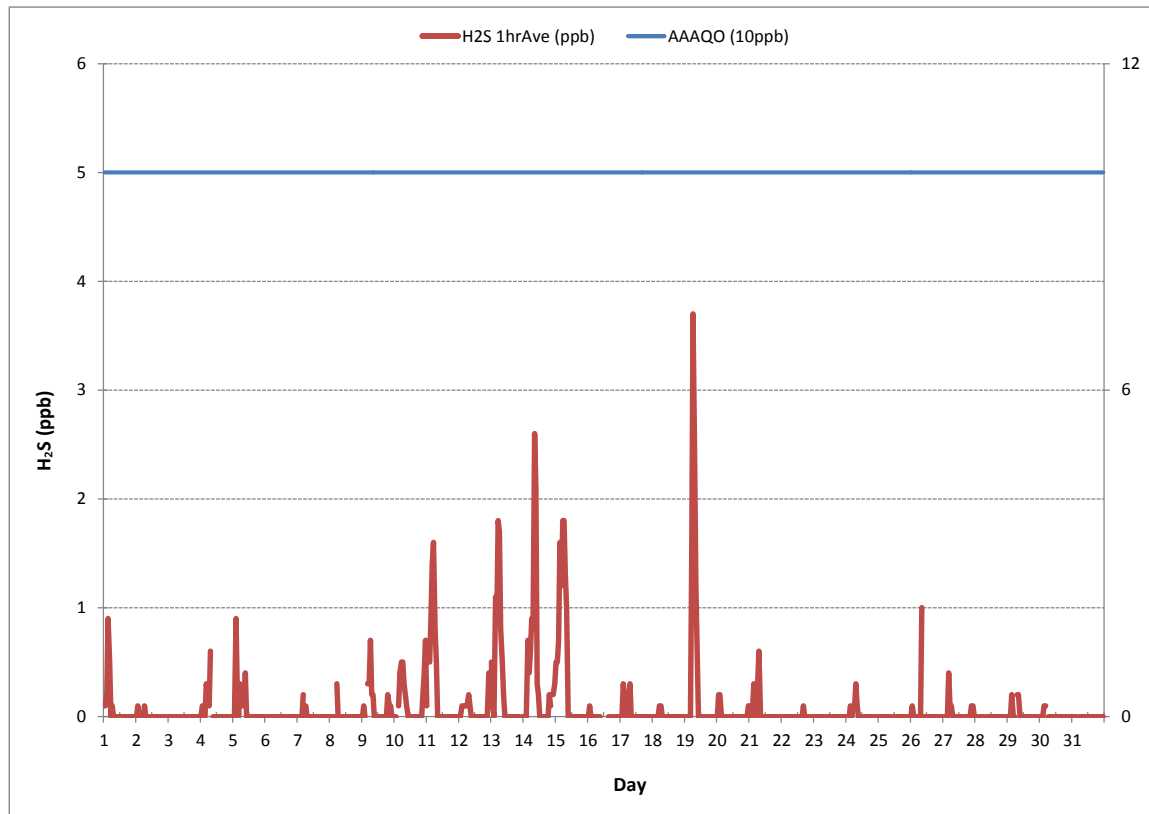
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	124				
MINIMUM 1-HR AVERAGE:	0.0	PPB	@ HOUR(S)	VAR	ON DAY(S) ALL
MAXIMUM 1-HR AVERAGE:	3.7	PPB	@ HOUR(S)	6	ON DAY(S) 19
MAXIMUM 24-HR AVERAGE:	0.5	PPB			ON DAY(S) 15
					VAR-VARIOUS
I2S CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	744	HRS
MONTHLY CALIBRATION TIME:	5	HRS	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.31		MONTHLY AVERAGE:	0.1	PPB

24 HOUR AVERAGES FOR August 2016



HYDROGEN SULPHIDE (H₂S) hourly averages in ppb





HYDROGEN SULPHIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.		
DAY	MIN.	MAX.	AVG.																									MIN.	MAX.	AVG.	RDGS.
1	0.4	0.6	0.3	2.2	1.9	0.0	1.4	1.2	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.3	24	
2	0.0	0.1	0.0	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	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	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
4	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.5	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	24	
5	0.0	0.0	1.1	0.1	0.0	0.0	0.0	S	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.1	24	
6	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
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	0.0	0.0	0.0	0.0	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	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
9	0.0	0.0	0.0	S	0.7	0.3	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1	23		
10	0.0	0.0	S	0.0	0.2	0.3	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.7	0.0	0.7	0.1	24		
11	0.1	S	0.5	1.0	1.7	1.9	1.0	0.7	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	1.9	0.3	24		
12	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	24		
13	0.3	0.0	0.0	1.6	1.4	1.7	1.5	0.8	0.2	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	S	0.0	1.7	0.3	24		
14	0.0	0.0	0.0	0.4	0.0	0.4	0.7	0.7	3.8	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	3.8	0.4	24		
15	0.3	0.0	0.4	1.8	1.2	1.6	1.9	1.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	1.9	0.4	24		
16	0.3	0.5	0.4	0.6	0.7	0.9	0.6	0.7	0.6	0.1	C	C	C	C	C	1.0	1.0	1.0	1.0	S	1.0	1.5	1.1	1.1	0.1	1.5	0.8	24			
17	1.2	1.3	2.0	1.5	1.4	1.3	1.8	1.9	1.1	1.0	0.7	0.8	0.8	0.8	0.7	0.8	0.8	0.7	S	0.8	0.8	0.9	0.7	0.8	0.7	2.0	1.1	24			
18	0.8	0.9	0.9	0.9	1.1	1.0	1.0	0.9	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	S	0.6	0.6	0.7	0.7	0.6	0.6	0.6	1.1	0.7	24			
19	0.9	0.9	0.9	0.6	1.9	3.4	7.0	6.8	2.5	2.2	0.7	0.8	0.7	0.8	1.0	1.0	S	0.9	1.0	0.9	1.0	1.2	1.2	1.3	0.6	7.0	1.7	24			
20	1.2	1.5	1.6	1.4	1.2	1.2	1.2	1.4	1.3	1.2	1.1	1.1	1.1	1.1	S	1.1	1.1	1.1	1.3	1.2	1.3	1.3	1.3	1.4	1.7	1.1	1.7	1.3	24		
21	1.6	1.5	1.4	2.1	1.6	1.4	2.1	2.6	1.5	1.4	1.3	1.2	1.4	1.3	S	1.2	1.3	1.3	1.4	1.5	1.3	1.4	1.4	1.5	1.2	2.6	1.5	24			
22	1.6	1.5	1.6	1.7	1.5	1.6	1.6	1.6	1.7	1.6	1.7	1.6	1.5	S	1.5	1.9	1.9	1.5	1.4	1.5	1.5	1.4	1.4	1.4	1.4	1.9	1.6	24			
23	1.3	1.3	1.3	1.2	1.1	1.2	1.1	1.1	1.1	1.0	1.0	1.0	S	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.7	0.9	1.1	0.7	1.3	1.0	24		
24	1.2	1.0	0.9	1.3	1.1	1.2	1.2	1.4	1.2	0.9	0.7	S	0.8	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.9	0.8	0.8	1.0	0.7	1.4	0.9	24			
25	1.1	1.1	0.9	0.9	0.9	1.0	1.1	1.1	1.1	1.0	S	0.9	1.0	0.9	0.9	0.8	0.9	1.0	0.9	1.0	0.9	1.0	1.1	1.3	0.8	1.3	1.0	24			
26	1.2	1.6	1.4	1.4	1.4	1.4	1.5	1.3	3.0	S	1.4	1.1	1.1	1.1	1.3	1.2	1.2	1.2	1.3	1.3	1.5	1.5	1.4	1.1	3.0	1.4	24				
27	1.5	1.7	1.6	1.8	2.2	2.0	1.9	1.9	S	1.9	1.9	1.8	1.7	1.7	1.8	1.7	1.7	1.7	1.7	1.7	1.6	1.7	2.0	1.7	1.6	1.5	2.2	1.8	24		
28	1.6	1.7	1.5	1.5	1.4	1.5	1.4	S	1.2	1.2	1.1	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.8	1.0	0.9	0.9	0.8	1.7	1.1	24			
29	0.9	1.0	0.9	1.6	0.9	0.9	S	1.7	1.4	0.8	0.7	0.8	0.8	0.7	0.8	0.8	0.9	0.7	0.8	0.9	0.8	0.9	1.0	0.9	0.7	1.7	0.9	24			
30	1.0	0.9	0.9	1.5	1.5	S	1.1	1.1	1.1	1.2	1.0	0.8	0.8	0.7	0.9	0.9	0.8	1.2	1.0	0.9	1.1	1.1	1.2	0.7	1.5	1.0	24				
31	1.2	1.1	1.1	1.1	S	1.1	1.3	1.3	1.3	1.3	1.4	1.4	1.3	1.4	1.3	1.4	1.4	1.4	1.5	1.5	1.4	1.5	1.5	1.5	1.1	1.5	1.3	24			
HOURLY MAX	1.6	1.7	2.0	2.2	2.2	3.4	7.0	6.8	3.8	3.4	1.9	1.8	1.7	1.7	1.8	1.9	1.9	1.7	1.7	1.7	1.6	1.7	2.0	1.7	1.7						
HOURLY AVG	0.7	0.7	0.7	0.9	0.9	0.9	1.2	1.1	0.9	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7						

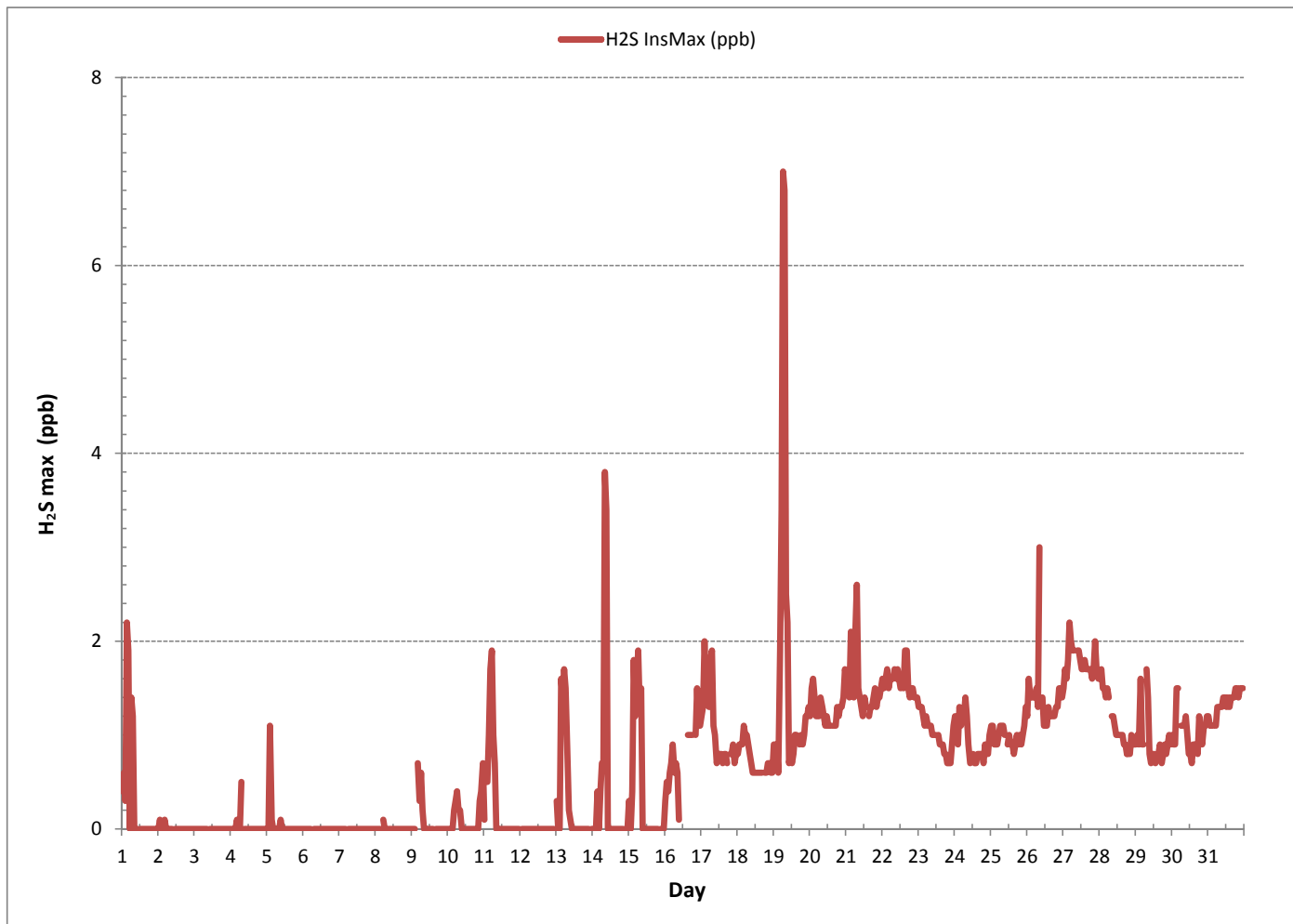
STATUS FLAG CODES

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

MONTHLY SUMMARY

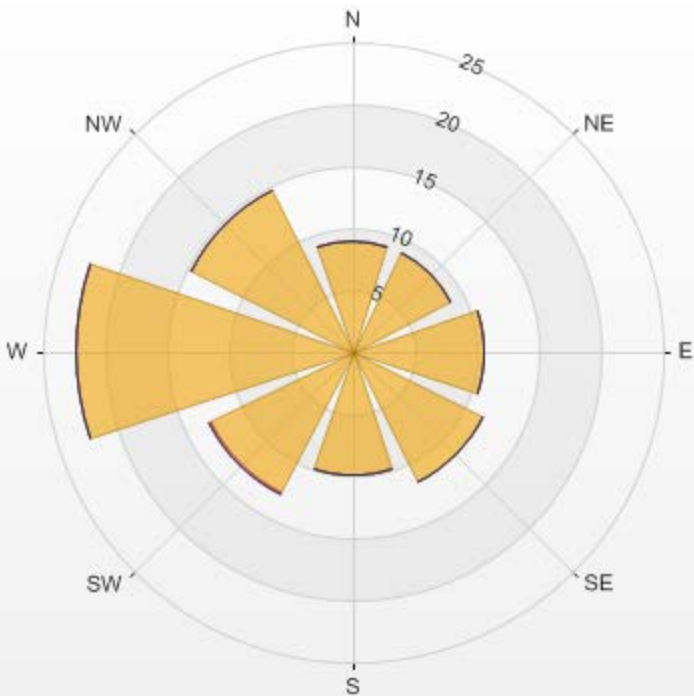
NUMBER OF NON-ZERO READINGS:	419
MAXIMUM INSTANTANEOUS VALUE:	7.0 PPB @ HOUR(S) 6 ON DAY(S) 19
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	5 HRS
OPERATIONAL TIME:	743 HRS
STANDARD DEVIATION:	0.75

HYDROGEN SULPHIDE MAX instantaneous maximum in ppb

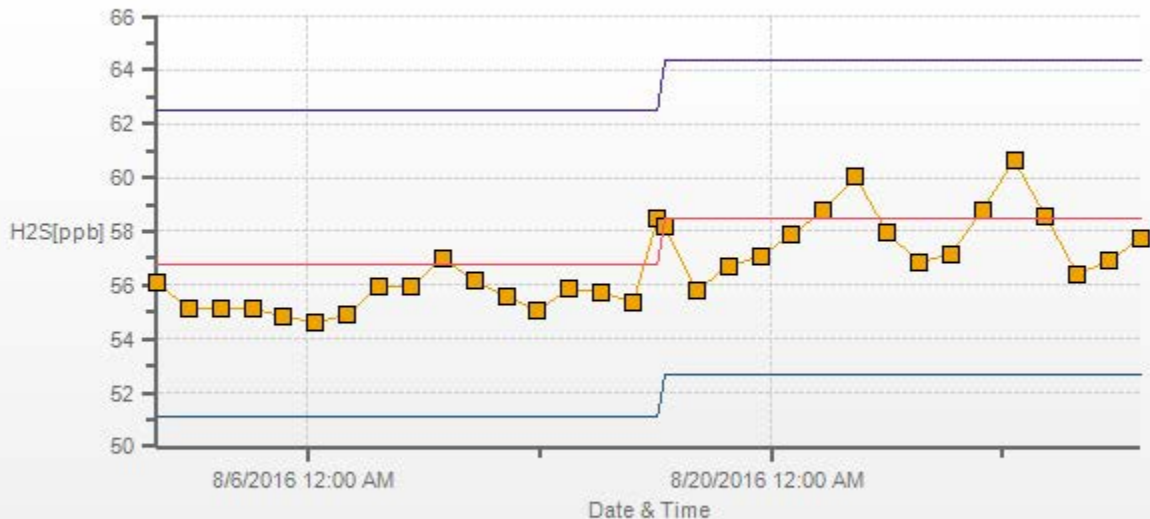


Wind: LICA ST. LINA Monitor: H2S [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00

Direction	0.0-3.0	3.0-10.0	10.0-50.0	>50.0	Total
N	8.94	0	0	0	8.94
NE	8.94	0	0	0	8.94
E	10.64	0	0	0	10.64
SE	11.77	0	0	0	11.77
S	9.93	0	0	0	9.93
SW	12.77	0.14	0	0	12.91
W	22.27	0	0	0	22.27
NW	14.61	0	0	0	14.61
Summary	100	0.14	0	0	100



H2S[ppb] Calibration: LICA ST. LINA Monthly: 08/2016 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON

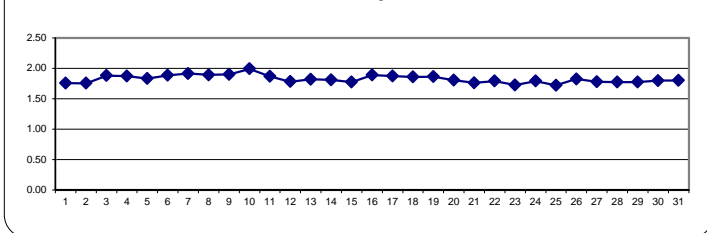
TOTAL HYDROCARBONS (THC) hourly averages in ppm

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY	HR	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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		1.72	1.69	1.70	1.73	1.77	1.76	1.77	1.76	1.74	1.74	1.74	S	1.79	1.96	1.78	1.74	1.75	1.74	1.76	1.75	1.74	1.76	1.75	1.69	1.96	1.76	24	
2		1.76	1.78	1.76	1.75	1.75	1.76	1.78	1.79	1.77	1.78	S	1.74	1.75	1.73	1.71	1.71	1.71	1.70	1.72	1.81	1.82	1.75	1.76	1.77	1.70	1.82	1.75	24
3		1.78	1.83	1.91	1.96	1.95	1.98	2.03	2.08	2.06	S	1.91	1.83	1.77	1.73	1.71	1.74	1.75	1.78	1.74	1.72	2.02	2.18	1.85	1.91	1.71	2.18	1.88	24
4		1.99	1.86	1.89	1.93	1.93	1.88	1.99	1.93	S	1.79	1.74	1.73	1.72	1.73	1.71	1.72	1.81	1.79	1.75	2.10	2.05	1.95	2.30	1.79	1.71	2.30	1.87	24
5		1.80	1.89	2.23	1.97	1.80	1.82	1.80	S	1.85	1.86	1.82	1.82	1.81	1.87	1.82	1.76	1.76	1.73	1.73	1.78	1.80	1.79	1.80	1.81	1.73	2.23	1.83	24
6		1.85	2.01	2.08	1.95	1.93	1.91	S	2.01	1.94	1.86	1.80	1.76	1.80	1.83	1.78	1.75	1.73	1.75	1.81	1.86	1.90	2.05	1.98	2.04	1.73	2.08	1.89	24
7		2.11	2.05	1.95	1.91	2.04	S	2.05	1.87	1.81	1.78	1.77	1.75	1.77	1.86	1.82	1.78	1.81	1.81	1.82	1.89	1.97	1.98	2.23	2.16	1.75	2.23	1.91	24
8		2.06	2.09	1.90	1.96	S	2.13	1.95	1.82	1.83	1.84	1.87	1.86	1.79	1.75	1.78	1.78	1.77	1.84	2.00	1.84	1.88	1.86	1.94	1.97	1.75	2.13	1.89	24
9		1.92	1.89	1.83	S	1.94	1.97	1.95	1.92	1.89	1.91	2.03	1.94	1.90	1.89	1.86	1.67	1.91	1.87	1.93	1.86	1.87	1.91	1.94	1.90	1.67	2.03	1.90	24
10		1.87	1.83	S	1.98	1.91	1.88	1.88	2.03	2.06	2.05	2.00	2.02	1.94	1.91	1.89	1.88	1.86	1.90	1.92	1.94	2.37	2.34	2.15	2.19	1.83	2.37	1.99	24
11		1.95	S	1.99	2.06	2.17	2.21	2.09	2.01	1.96	1.87	1.80	1.77	1.73	1.71	1.72	1.76	1.73	1.73	1.75	1.77	1.79	1.79	1.84	1.71	2.21	1.87	24	
12		S	1.80	1.78	1.79	1.80	1.79	1.80	1.83	1.83	1.78	1.80	1.78	1.76	1.73	1.72	1.76	1.74	1.75	1.82	1.77	1.75	1.76	1.83	S	1.72	1.83	1.78	24
13		1.83	1.81	1.78	1.90	1.98	2.15	2.05	1.89	2.00	1.88	1.75	1.71	1.69	1.68	1.65	1.68	1.73	1.78	1.83	1.77	1.75	1.70	S	1.87	1.65	2.15	1.82	24
14		1.86	1.78	1.79	1.91	1.84	1.84	1.85	1.91	2.03	2.02	1.93	1.84	1.76	1.70	1.65	1.66	1.70	1.77	1.74	1.74	1.84	S	1.74	1.74	1.65	2.03	1.81	24
15		1.75	1.75	1.77	1.79	1.82	1.91	1.92	1.88	1.86	1.82	1.80	1.76	1.71	1.68	1.67	1.65	1.67	1.69	1.67	1.72	S	1.82	1.77	1.88	1.65	1.92	1.77	24
16		1.98	1.99	1.99	2.04	2.06	2.06	2.11	2.13	2.10	2.01	C	C	C	C	1.72	1.64	1.68	1.67	1.69	S	1.71	1.76	1.78	1.80	1.64	2.13	1.89	24
17		1.85	1.90	1.94	1.94	1.95	1.98	1.99	1.95	1.93	1.85	1.81	1.80	1.77	1.76	1.77	1.75	1.75	1.78	S	1.83	1.92	1.93	1.97	1.91	1.75	1.99	1.87	24
18		1.93	1.98	1.99	1.97	2.00	2.00	2.01	2.01	1.99	1.93	1.83	1.75	1.72	1.73	1.73	1.70	1.71	S	1.75	1.77	1.80	1.83	1.79	1.84	1.70	2.01	1.86	24
19		1.97	1.85	1.95	1.97	1.89	1.97	2.04	2.06	1.89	1.84	1.85	1.81	1.80	1.81	1.80	1.78	S	1.74	1.76	1.85	1.80	1.82	1.83	1.79	1.74	2.06	1.86	24
20		1.78	1.82	1.81	1.76	1.94	2.10	1.86	1.97	1.93	1.89	1.85	1.80	1.77	1.72	1.74	S	1.73	1.71	1.74	1.74	1.71	1.70	1.73	1.74	1.70	2.10	1.81	24
21		1.74	1.73	1.72	1.74	1.73	1.76	1.74	1.75	1.73	1.68	1.68	1.68	1.68	1.71	S	1.71	1.71	1.75	1.73	1.75	1.81	1.98	2.05	1.93	1.68	2.05	1.76	24
22		1.87	1.83	1.79	1.80	1.77	1.79	1.78	1.78	1.76	1.78	1.75	1.76	1.82	S	1.74	1.79	1.81	1.73	1.76	1.80	1.83	1.84	1.80	1.80	1.73	1.87	1.79	24
23		1.78	1.80	1.74	1.70	1.70	1.71	1.70	1.71	1.70	1.71	1.70	1.69	S	1.68	1.71	1.72	1.72	1.73	1.73	1.75	1.75	1.72	1.75	1.79	1.68	1.80	1.73	24
24		1.76	1.78	1.87	1.91	1.94	1.96	1.96	1.90	1.84	1.86	1.81	S	1.76	1.77	1.75	1.77	1.75	1.73	1.70	1.67	1.66	1.70	1.66	1.65	1.65	1.96	1.79	24
25		1.66	1.68	1.66	1.67	1.62	1.62	1.67	1.62	1.73	1.71	S	1.73	1.69	1.71	1.67	1.69	1.69	1.70	1.69	1.84	1.84	1.94	1.85	1.84	1.62	1.94	1.72	24
26		2.02	1.90	1.93	1.83	1.77	1.77	2.09	1.81	1.83	S	1.81	1.78	1.78	1.76	1.76	1.76	1.75	1.75	1.75	1.82	1.83	1.84	1.82	1.80	1.75	2.09	1.82	24
27		1.76	1.80	1.77	1.77	1.87	1.90	1.88	1.85	S	1.73	1.69	1.71	1.81	1.84	1.82	1.79	1.76	1.74	1.73	1.76	1.79	1.78	1.70	1.69	1.69	1.90	1.78	24
28		1.75	1.76	1.73	1.75	1.74	1.75	1.75	S	1.77	1.76	1.78	1.77	1.73	1.77	1.82	1.84	1.83	1.80	1.82	1.77	1.77	1.78	1.77	1.78	1.73	1.84	1.77	24
29		1.77	1.77	1.84	1.85	1.81	1.90	S	1.86	1.95	1.80	1.74	1.69	1.69	1.68	1.69	1.75	1.83	1.79	1.71	1.72	1.74	1.77	1.77	1.68	1.95	1.77	24	
30		1.78	1.77	1.77	1.80	1.94	S	1.92	1.83	1.77	1.80	1.77	1.78	1.80	1.79	1.77	1.78	1.76	1.75	1.76	1.80	1.79	1.80	1.82	1.75	1.94	1.80	24	
31		1.81	1.81	1.81	1.81	S	1.77	1.78	1.82	1.84	1.84	1.84	1.85	1.83	1.78	1.77	1.78	1.79	1.76	1.76	1.76	1.78	1.80	1.82	1.82	1.76	1.85	1.80	24
HOURLY MAX		2.11	2.09	2.23	2.06	2.17	2.21	2.11	2.13	2.10	2.05	2.03	2.02	1.94	1.96	1.89	1.88	1.91	1.90	2.00	2.10	2.37	2.34	2.30	2.19				
HOURLY AVG		1.85	1.84	1.86	1.86	1.87	1.90	1.90	1.89	1.88	1.83	1.81	1.78	1.77	1.77	1.75	1.74	1.75	1.76	1.77	1.80	1.84	1.85	1.86	1.85				

STATUS FLAG CODES

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

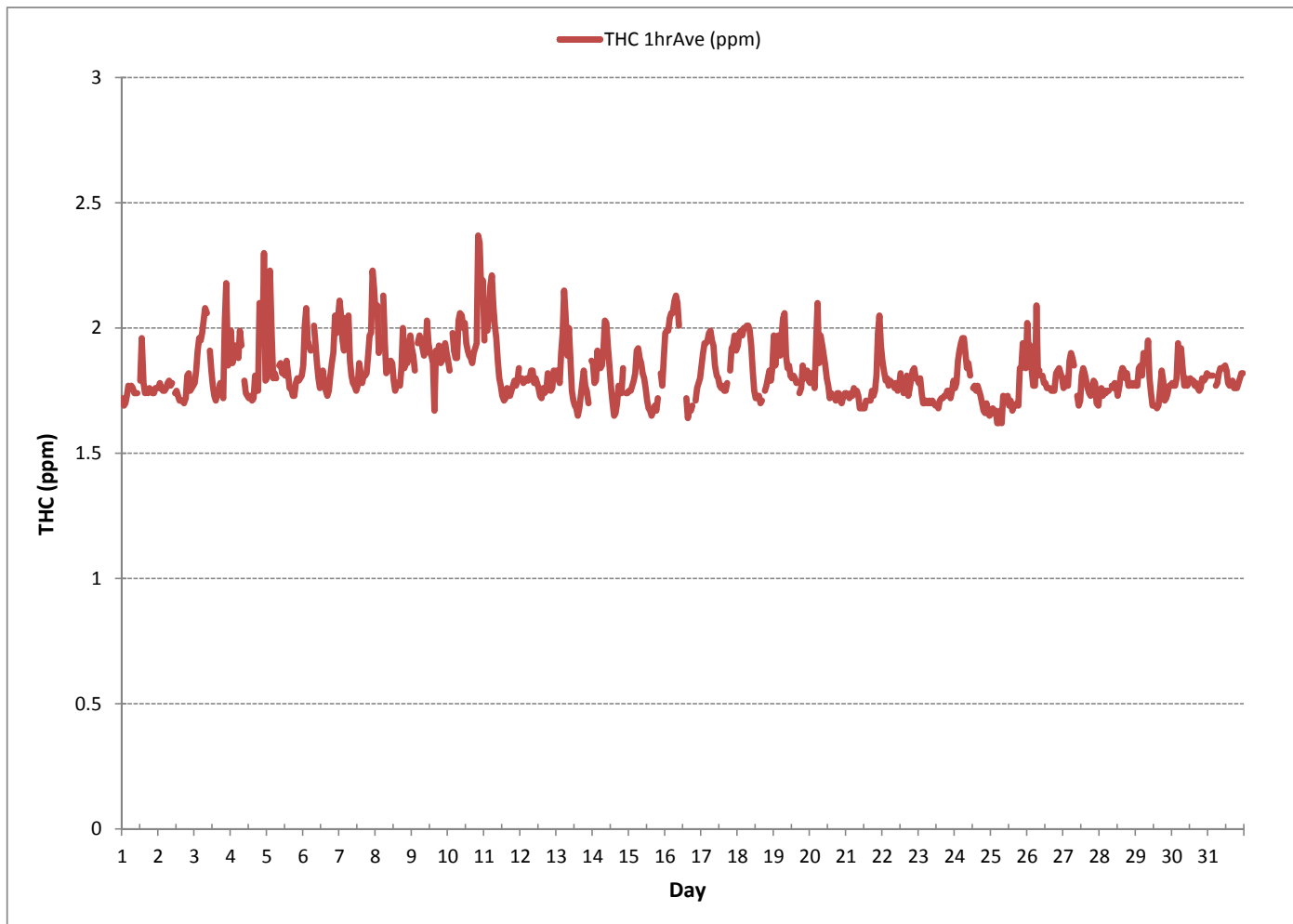
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	708			
MINIMUM 1-HR AVERAGE:	1.62	PPM @ HOUR(S)	VAR	ON DAY(S) 25
MAXIMUM 1-HR AVERAGE:	2.37	PPM @ HOUR(S)	20	ON DAY(S) 10
MAXIMUM 24-HR AVERAGE:	1.99	PPM		ON DAY(S) 10
				VAR-VARIOUS
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	744
MONTHLY CALIBRATION TIME:	4	HRS	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.11		MONTHLY AVERAGE:	1.82
				PPM

TOTAL HYDROCARBONS (THC) hourly averages in ppm





TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.	
HOUR START	HOUR END	0:00	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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		2.08	2.02	2.03	2.09	2.11	2.11	2.11	2.11	2.09	2.09	2.08	S	2.70	2.60	2.18	2.14	2.11	2.14	2.14	2.17	2.12	2.12	2.15	2.17	2.02	2.70	2.16	24	
2		2.17	2.20	2.20	2.17	2.17	2.20	2.23	2.26	2.23	2.25	S	2.20	2.21	2.18	2.17	2.15	2.17	2.14	2.20	2.39	2.30	2.26	2.23	2.25	2.14	2.39	2.21	24	
3		2.23	2.32	2.39	2.41	2.42	2.45	2.53	2.54	2.51	S	2.38	2.29	2.23	2.17	2.15	2.20	2.23	2.32	2.23	2.17	3.53	3.34	2.41	2.51	2.15	3.53	2.43	24	
4		2.63	2.42	2.73	2.51	2.53	2.50	2.66	2.51	S	2.29	2.23	2.23	2.20	2.20	2.20	2.21	2.75	2.54	2.38	3.12	3.20	2.83	3.62	2.39	2.20	3.62	2.56	24	
5		2.42	2.44	3.03	2.79	2.42	2.39	2.36	S	2.40	2.42	2.41	2.41	2.33	2.38	2.38	2.27	2.27	2.23	2.26	2.32	2.32	2.32	2.32	2.35	2.23	3.03	2.40	24	
6		2.41	2.56	2.63	2.51	2.45	2.45	S	2.54	2.51	2.38	2.35	2.29	2.32	2.33	2.30	2.26	2.23	2.26	2.38	2.38	2.47	2.62	2.54	2.66	2.23	2.66	2.43	24	
7		2.67	2.57	2.51	2.45	2.56	S	2.60	2.44	2.29	2.26	2.23	2.21	2.24	2.33	2.27	2.26	2.26	2.26	2.25	2.32	2.44	2.56	2.69	2.63	2.21	2.69	2.40	24	
8		2.57	2.57	2.32	2.38	S	2.54	2.44	2.23	2.23	2.26	2.26	2.26	2.20	2.14	2.20	2.17	2.17	2.32	2.51	2.32	2.54	2.38	2.69	2.45	2.14	2.69	2.35	24	
9		2.33	2.32	2.26	S	2.35	2.39	2.38	2.32	2.29	2.27	2.44	2.35	2.26	2.26	2.23	P	2.26	2.26	2.35	2.21	2.23	2.23	2.26	2.26	2.21	2.44	2.30	23	
10		2.20	2.14	S	2.38	2.23	2.20	2.24	2.35	2.38	2.38	2.36	2.36	2.29	2.26	2.23	2.20	2.20	2.27	2.26	2.29	4.25	3.57	3.07	2.76	2.14	4.25	2.47	24	
11		2.32	S	2.41	2.44	2.57	2.64	2.63	2.41	2.38	2.26	2.20	2.14	2.11	2.08	2.09	2.14	2.11	2.15	2.14	2.17	2.21	2.17	2.18	2.26	2.08	2.64	2.27	24	
12		S	2.21	2.18	2.20	2.20	2.20	2.21	2.26	2.26	2.23	2.20	2.20	2.17	2.14	2.14	2.18	2.15	2.23	2.26	2.26	2.18	2.26	2.27	S	2.14	2.27	2.21	24	
13		2.27	2.26	2.20	2.51	2.51	2.60	2.56	2.33	2.45	2.35	2.20	2.12	2.09	2.08	2.06	2.09	2.14	2.33	2.29	2.20	2.14	2.11	S	2.30	2.06	2.60	2.27	24	
14		2.29	2.21	2.27	2.33	2.33	2.30	2.26	2.36	2.44	2.43	2.30	2.27	2.14	2.12	2.04	2.02	2.14	2.14	2.11	2.14	2.35	S	2.12	2.14	2.02	2.44	2.23	24	
15		2.14	2.14	2.14	2.20	2.21	2.32	2.32	2.29	2.26	2.23	2.20	2.15	2.11	2.07	2.06	2.06	2.08	2.14	2.11	2.14	S	2.27	2.17	2.32	2.06	2.32	2.18	24	
16		2.36	2.35	2.36	2.39	2.41	2.40	2.43	2.44	2.47	2.97	C	C	C	C	2.02	1.98	2.40	2.20	2.32	S	2.17	2.39	2.26	2.17	1.98	2.97	2.35	24	
17		2.25	2.30	2.35	2.35	2.44	2.39	2.39	2.44	2.45	2.38	2.32	2.35	2.32	2.32	2.32	2.25	2.32	2.33	S	2.54	2.62	2.54	2.60	2.44	2.25	2.62	2.39	24	
18		2.38	2.54	2.69	2.71	2.63	2.63	2.63	2.63	2.59	2.51	2.41	2.30	2.26	2.23	2.20	2.21	2.26	S	2.17	2.20	2.21	2.26	2.21	2.26	2.17	2.71	2.40	24	
19		3.54	2.38	3.91	6.28	2.54	2.42	2.64	2.57	2.33	2.26	2.26	2.47	2.20	2.21	2.20	2.17	S	2.11	2.15	2.26	2.17	2.20	2.20	2.17	2.11	6.28	2.59	24	
20		2.15	2.17	2.48	2.14	3.29	4.01	3.07	3.03	2.50	2.51	2.29	2.26	2.41	2.11	2.29	S	2.01	2.00	2.08	2.05	2.01	1.98	2.01	2.01	1.98	4.01	2.39	24	
21		2.01	2.00	1.98	2.01	2.73	3.88	2.01	2.01	2.77	1.95	1.95	2.08	2.08	2.59	S	2.11	2.20	2.64	2.00	2.06	2.12	2.25	2.29	2.14	1.95	3.88	2.25	24	
22		2.57	2.20	2.00	2.01	1.95	1.95	1.95	1.95	1.91	1.95	1.91	1.91	2.17	S	1.90	2.02	2.00	1.95	2.48	2.17	2.08	2.08	2.04	2.08	1.90	2.57	2.05	24	
23		2.05	2.08	2.04	2.00	2.00	2.01	2.02	2.04	2.04	2.05	2.05	2.06	S	2.06	2.09	2.11	2.11	2.11	2.12	2.23	2.17	3.14	2.44	2.48	2.00	3.14	2.15	24	
24		2.41	2.36	2.57	2.83	2.72	2.86	2.79	2.80	2.63	2.70	2.72	S	2.61	2.45	2.45	2.50	2.61	2.66	3.47	3.07	2.17	2.69	2.11	2.11	2.11	3.47	2.62	24	
25		2.09	2.11	2.12	2.11	2.06	2.34	2.37	2.21	2.37	2.27	S	2.47	2.32	2.34	2.11	2.35	2.12	2.23	2.51	2.66	2.54	2.83	2.75	2.83	2.06	2.83	2.35	24	
26		2.95	2.85	2.77	2.79	2.69	2.32	4.74	2.23	2.23	S	2.11	2.08	2.08	2.05	2.04	2.04	2.01	2.01	2.00	2.12	2.11	2.11	2.06	2.04	2.00	4.74	2.37	24	
27		2.00	2.02	1.98	1.98	2.12	2.11	2.09	2.05	S	1.92	1.90	1.96	2.04	2.05	2.02	2.01	2.00	1.97	1.95	2.43	2.03	2.04	1.94	1.94	1.90	2.43	2.02	24	
28		2.01	2.01	2.09	2.20	2.08	2.15	2.11	S	2.20	2.15	2.20	2.23	2.18	2.26	2.23	2.32	2.29	2.34	2.69	2.39	2.20	2.15	2.14	2.17	2.01	2.69	2.21	24	
29		2.17	2.17	2.65	3.12	2.45	5.46	S	2.57	2.47	2.35	2.21	2.14	2.14	2.14	2.12	2.14	2.21	2.29	2.29	2.21	2.20	2.21	2.23	2.25	2.12	5.46	2.44	24	
30		2.24	2.23	2.26	2.26	2.53	S	2.38	2.30	2.26	2.23	2.21	2.21	2.23	2.21	2.21	2.20	2.20	2.17	2.15	2.17	2.20	2.17	2.17	2.20	2.15	2.53	2.23	24	
31		2.18	2.20	2.18	2.20	S	2.14	2.14	2.53	2.20	2.18	2.18	2.20	2.18	2.11	2.11	2.11	2.11	2.08	2.08	2.08	2.11	2.11	2.12	2.12	2.08	2.53	2.16	24	
HOURLY MAX		3.54	2.85	3.91	6.28	3.29	5.46	4.74	3.03	2.77	2.97	2.72	2.47	2.70	2.60	2.45	2.50	2.75	2.66	3.47	3.12	4.25	3.57	3.62	2.83					
HOURLY AVG		2.34	2.28	2.39	2.49	2.40	2.56	2.46	2.37	2.35	2.29	2.23	2.22	2.24	2.22	2.17	2.17	2.20	2.23	2.28	2.31	2.38	2.41	2.34	2.30					

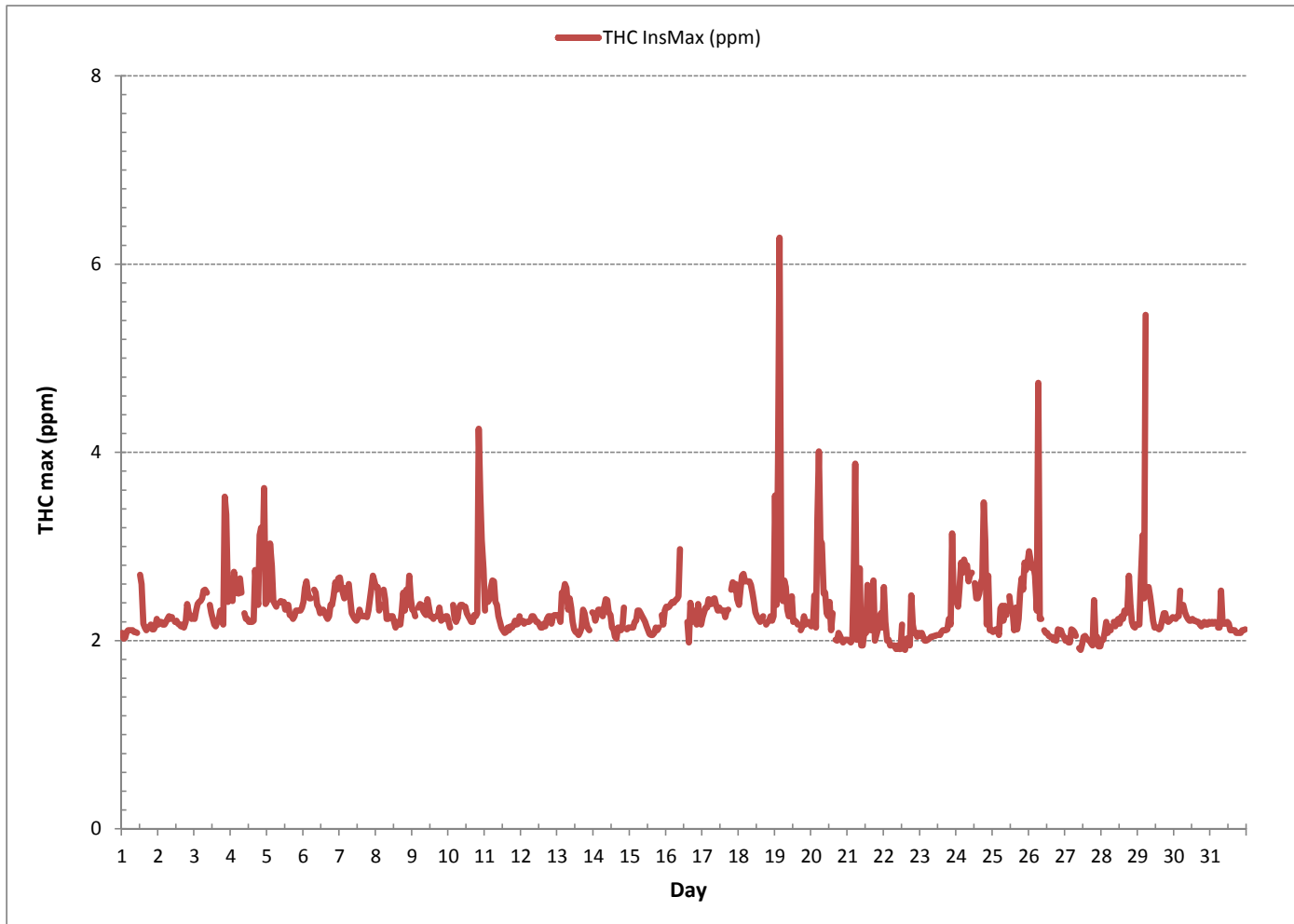
STATUS FLAG CODES

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

MONTHLY SUMMARY

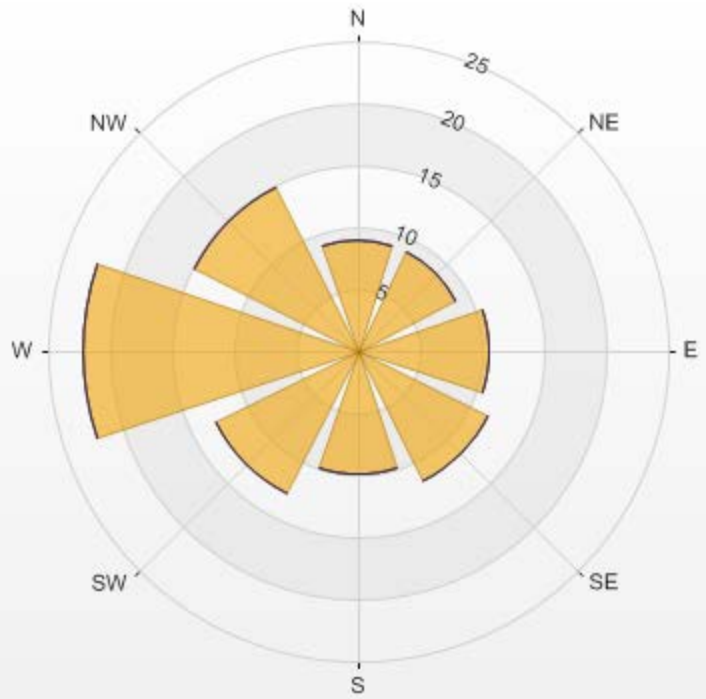
NUMBER OF NON-ZERO READINGS:	707
MAXIMUM INSTANTANEOUS VALUE:	6.28 PPM @ HOUR(S) 3 ON DAY(S) 19
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	4 HRS
OPERATIONAL TIME:	743 HRS
STANDARD DEVIATION:	0.35

TOTAL HYDROCARBONS MAX instantaneous maximum in ppm



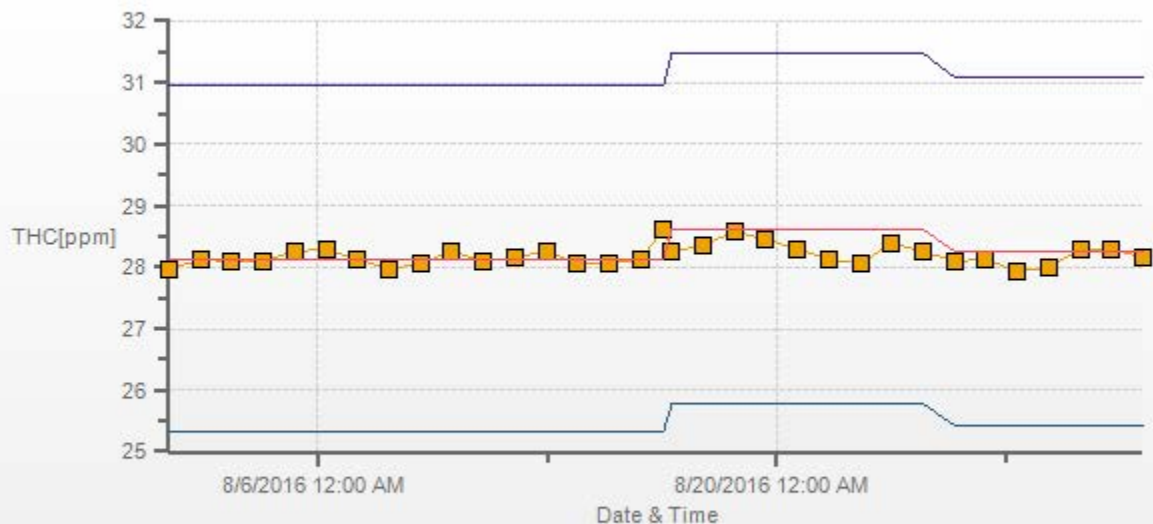
Wind: LICA ST. LINA Monitor: THC [ppm] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.89% Calm Avg: 0.00

Direction	0.0-3.0	3.0-10.0	10.0-50.0	>50.0	Total
N	8.92	0	0	0	8.92
NE	8.92	0	0	0	8.92
E	10.62	0	0	0	10.62
SE	11.76	0	0	0	11.76
S	9.92	0	0	0	9.92
SW	12.89	0	0	0	12.89
W	22.24	0	0	0	22.24
NW	14.73	0	0	0	14.73
Summary	100	0	0	0	100



% Icon Classes (ppm)					
100	0.0-3.0	0	3.0-10.0	0	10.0-50.0
				0	>50.0

THC[ppm] Calibration: LICA ST. LINA Monthly: 08/2016 Type: Span



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

OXIDES OF NITROGEN

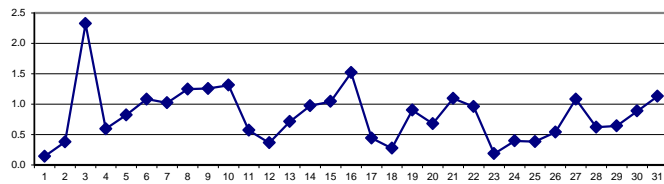
OXIDES OF NITROGEN (NOx) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.	
DAY	HR	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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	1	0.3	0.3	0.3	0.3	0.1	0.4	0.1	0.0	0.1	0.1	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.5	0.3	0.3	0.0	0.5	0.1	24	
2	2	0.3	0.5	0.4	0.4	0.5	0.7	0.6	0.8	0.4	0.3	S	0.6	0.3	0.2	0.1	0.4	0.3	0.2	0.1	0.5	0.8	0.0	0.1	0.2	0.0	0.8	0.4	24	
3	3	0.9	2.6	4.8	6.5	6.1	5.6	6.8	5.8	4.4	S	2.0	1.3	1.1	0.4	0.5	0.7	0.4	0.4	0.5	0.2	0.6	0.5	0.6	0.7	0.2	6.8	2.3	24	
4	4	0.6	0.5	0.6	0.4	0.5	0.9	1.0	1.2	S	0.7	0.4	0.3	0.3	0.6	0.4	0.3	0.5	0.5	0.6	0.9	0.5	0.8	0.8	0.4	0.3	1.2	0.6	24	
5	5	0.6	1.4	1.6	0.8	0.7	0.7	0.9	S	0.8	0.8	0.8	0.7	0.8	0.8	0.5	0.2	0.4	0.3	0.6	0.6	0.7	0.9	1.2	2.1	0.2	2.1	0.8	24	
6	6	2.2	2.5	2.4	1.6	1.6	1.6	S	1.8	1.2	0.9	0.3	0.3	0.6	0.7	0.4	0.4	0.3	0.5	0.6	0.8	0.8	1.0	1.0	1.4	0.3	2.5	1.1	24	
7	7	1.3	2.0	2.2	1.9	2.9	S	1.5	0.5	0.4	0.3	0.1	0.2	0.3	0.5	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	2.4	2.4	0.1	2.9	1.0	24	
8	8	2.6	2.0	1.9	3.0	S	3.1	1.7	0.7	1.2	0.9	0.9	1.0	0.5	0.3	0.7	0.5	0.6	1.0	0.7	0.3	1.1	1.9	1.4	0.7	0.3	3.1	1.2	24	
9	9	0.7	0.8	0.5	S	1.2	1.8	2.7	1.3	1.2	1.6	2.0	0.9	0.9	0.6	0.8	1.1	1.0	1.4	0.9	1.3	1.0	1.2	2.0	2.0	0.5	2.7	1.3	24	
10	10	2.0	2.0	S	1.6	1.7	2.1	1.9	2.1	2.0	1.9	1.1	1.1	0.7	0.6	0.5	0.5	0.4	0.6	1.0	1.2	1.7	1.2	1.2	1.1	0.4	2.1	1.3	24	
11	11	1.0	S	1.0	1.0	1.1	1.5	0.8	0.8	0.7	0.3	0.3	0.1	0.2	0.3	0.2	0.3	0.4	0.5	0.7	0.4	0.2	0.4	0.5	0.4	0.1	1.5	0.6	24	
12	12	S	0.3	0.3	0.4	0.1	0.6	0.4	0.4	0.3	0.2	0.3	0.3	0.1	0.1	0.1	0.5	0.1	0.0	0.1	0.5	0.4	1.3	1.2	S	0.0	1.3	0.4	24	
13	13	2.1	1.1	1.2	1.1	1.0	1.9	1.8	0.8	0.7	0.7	0.1	0.0	0.2	0.3	0.5	0.1	0.2	0.2	0.2	0.8	0.4	0.1	S	0.9	0.0	2.1	0.7	24	
14	14	2.1	1.1	0.9	1.0	1.6	1.2	2.0	1.9	1.8	1.3	1.2	0.6	0.4	0.3	0.1	0.2	0.2	0.6	0.4	0.4	1.1	S	1.1	0.9	0.1	2.1	1.0	24	
15	15	0.9	1.1	1.2	1.3	1.7	2.1	2.0	2.6	1.7	0.9	0.6	0.7	0.3	0.3	0.3	0.5	0.2	0.3	0.4	1.8	S	0.5	0.9	1.7	0.2	2.6	1.0	24	
16	16	1.1	1.2	1.2	1.9	2.1	3.8	2.5	3.8	3.1	3.3	1.6	1.0	1.3	1.0	1.8	0.6	0.9	0.5	0.2	S	0.4	0.4	0.8	0.4	0.2	3.8	1.5	24	
17	17	0.4	0.6	0.5	0.6	0.5	0.8	0.7	1.1	0.8	0.8	0.6	0.4	0.2	0.5	0.1	0.1	0.2	0.2	S	0.4	0.4	0.2	0.1	0.0	0.0	1.1	0.4	24	
18	18	0.1	0.4	0.4	0.5	0.4	0.6	0.3	0.2	0.2	0.0	0.0	C	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.1	1.5	0.0	1.5	0.3	24
19	19	0.2	0.3	0.2	0.0	0.0	3.5	1.3	0.9	1.6	0.7	0.2	0.2	0.9	1.3	1.9	0.8	S	0.4	0.4	1.3	1.0	1.7	1.0	0.9	0.0	3.5	0.9	24	
20	20	0.8	0.8	0.8	1.1	0.8	1.3	0.7	1.2	0.9	0.5	0.2	0.0	0.2	0.1	0.2	S	0.5	0.3	0.6	1.0	0.6	1.0	0.8	1.2	0.0	1.3	0.7	24	
21	21	1.0	0.8	0.7	0.7	0.5	0.6	0.8	1.1	0.8	0.4	0.2	0.4	0.0	0.3	S	0.5	0.3	1.1	0.5	0.3	1.2	4.4	4.2	4.4	0.0	4.4	1.1	24	
22	22	3.1	2.2	1.3	1.6	1.0	1.4	1.3	0.7	0.5	0.6	0.2	0.1	0.8	S	0.2	0.4	0.6	0.4	0.4	0.5	1.3	1.3	0.9	1.3	0.1	3.1	1.0	24	
23	23	0.9	1.1	0.4	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.0	0.2	0.3	0.6	0.0	1.1	0.2	24	
24	24	0.5	0.4	0.3	0.3	0.7	0.6	0.7	0.8	0.6	0.6	0.3	S	0.7	0.4	0.4	0.2	0.2	0.2	0.2	0.4	0.1	0.3	0.1	0.1	0.2	0.1	0.8	0.4	24
25	25	0.5	0.6	0.5	0.5	0.6	0.4	0.3	0.3	0.3	0.2	S	0.7	0.8	0.6	0.3	0.2	0.2	0.2	0.1	0.3	0.3	0.5	0.0	0.4	0.2	0.0	0.8	0.4	24
26	26	0.3	0.3	0.2	0.4	0.5	0.4	0.6	1.0	0.8	S	1.2	0.6	0.9	0.4	0.2	0.2	0.4	0.3	0.3	0.4	0.7	0.8	0.7	0.8	0.2	1.2	0.5	24	
27	27	0.7	0.5	0.7	0.8	1.1	0.9	1.1	1.4	S	1.2	0.9	0.6	0.9	0.9	1.0	0.7	1.0	1.5	1.5	1.8	1.6	1.3	1.1	1.7	0.5	1.8	1.1	24	
28	28	4.3	3.5	1.3	0.6	0.3	0.3	0.0	S	0.3	0.2	0.3	0.1	0.3	0.2	0.1	0.2	0.2	0.3	0.1	0.3	0.2	0.4	0.3	0.5	0.0	4.3	0.6	24	
29	29	0.3	0.4	0.6	0.6	0.6	0.7	S	0.6	1.1	0.5	0.3	0.4	0.6	0.2	0.2	0.3	0.6	1.0	0.9	0.5	0.9	1.1	1.4	1.0	0.2	1.4	0.6	24	
30	30	1.5	1.2	1.0	1.4	3.1	S	2.3	1.4	1.1	0.6	0.4	0.2	0.2	0.5	0.4	0.6	0.5	0.5	0.5	0.5	0.4	0.7	0.7	0.7	0.2	3.1	0.9	24	
31	31	0.8	1.6	1.4	1.3	S	0.7	0.9	0.8	1.2	1.2	1.3	1.3	0.9	0.9	0.9	0.9	1.1	1.0	0.9	1.0	1.1	1.3	1.7	1.8	0.7	1.8	1.1	24	
HOURLY MAX		4.3	3.5	4.8	6.5	6.1	5.6	6.8	5.8	4.4	3.3	2.0	1.3	1.3	1.3	1.9	1.1	1.1	1.5	1.5	1.8	1.7	4.4	4.2	4.4					
HOURLY AVG		1.1	1.1	1.0	1.1	1.1	1.4	1.3	1.2	1.0	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.9	1.0	1.1					

STATUS FLAG CODES

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

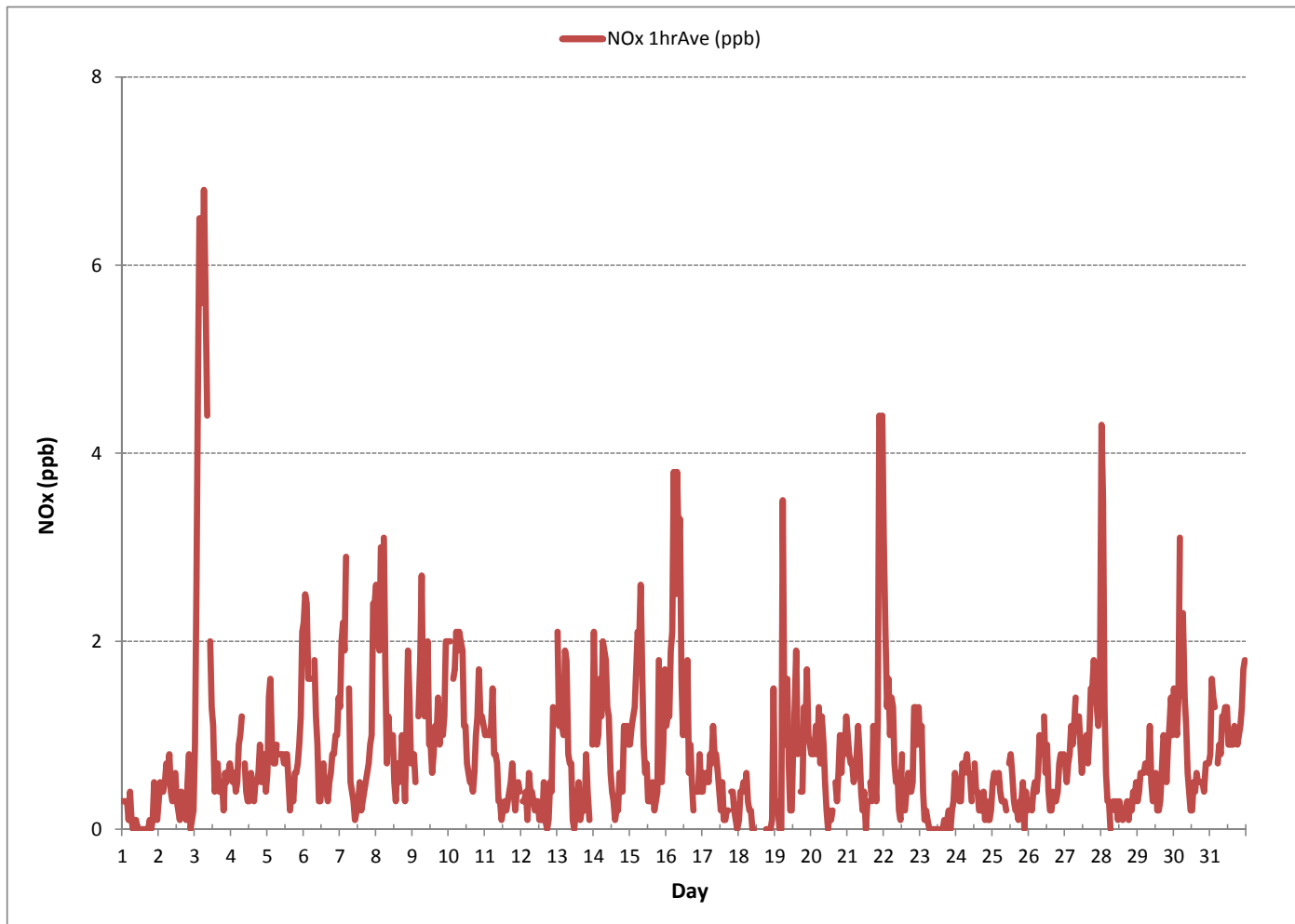
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	670				
MINIMUM 1-HR AVERAGE:	0.0	PPB @ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	6.8	PPB @ HOUR(S)	6	ON DAY(S)	3
MAXIMUM 24-HR AVERAGE:	2.3	PPB		ON DAY(S)	3
				VAR-VARIOUS	
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	744	HRS
MONTHLY CALIBRATION TIME:	7	HRS	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.85		MONTHLY AVERAGE:	0.8	PPB

OXIDES OF NITROGEN (NOx) hourly averages in ppb





OXIDES OF NITROGEN MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR					
DAY	MIN.	MAX.	AVG.	RDGS.																													
1	1.1	1.1	1.0	1.0	0.9	1.9	0.9	0.8	1.1	1.3	1.0	S	1.0	1.8	0.8	1.0	1.0	0.8	2.4	1.6	1.6	3.3	2.4	1.0	0.8	3.3	1.3	24					
2	1.3	1.3	1.1	1.2	1.5	1.5	1.6	3.1	1.5	1.9	S	3.8	1.4	1.4	1.1	1.7	1.3	0.8	0.8	1.7	5.1	0.5	0.7	0.8	0.5	5.1	1.6	24					
3	2.0	3.6	6.6	7.1	6.7	6.7	7.8	7.6	5.0	S	3.5	2.2	2.2	1.1	1.3	2.2	1.7	1.2	1.3	0.9	1.4	1.1	1.1	1.1	0.9	7.8	3.3	24					
4	1.2	0.9	1.1	0.9	1.3	1.6	3.7	4.5	S	1.3	1.1	0.8	0.9	3.8	1.2	0.9	1.8	1.9	3.5	5.2	2.1	2.9	2.8	1.2	0.8	5.2	2.0	24					
5	2.0	3.2	3.4	1.7	1.5	1.4	1.7	S	1.9	1.7	2.1	1.5	1.5	1.7	1.4	0.8	1.1	1.1	1.1	1.4	1.4	1.6	1.9	3.5	0.8	3.5	1.8	24					
6	3.0	3.5	3.5	2.2	2.2	S	2.6	2.0	1.7	1.2	0.9	2.0	1.4	1.1	1.0	0.9	1.2	1.2	1.4	1.5	1.7	2.2	2.2	0.9	3.5	1.9	24						
7	1.9	3.3	3.0	2.9	3.6	S	2.4	1.7	1.1	0.8	0.8	1.1	1.0	1.2	0.8	0.9	1.0	1.1	1.5	1.5	1.5	2.2	3.6	3.1	0.8	3.6	1.8	24					
8	3.3	2.7	2.8	4.0	S	4.1	3.2	1.4	2.2	1.6	1.8	2.1	1.1	1.1	1.7	1.3	1.1	2.6	1.5	1.1	2.6	6.6	3.5	1.3	1.1	6.6	2.4	24					
9	1.3	1.5	1.1	S	2.0	4.7	38.4	2.6	2.5	2.4	2.8	1.7	1.5	1.2	1.7	P	1.6	3.0	1.8	1.9	1.7	2.2	2.8	2.8	1.1	38.4	3.8	23					
10	2.8	2.6	S	2.4	2.4	2.9	2.9	3.2	2.8	2.8	2.4	1.7	1.3	1.4	1.1	1.1	1.1	1.3	1.6	2.2	4.1	2.1	3.5	1.7	1.1	4.1	2.2	24					
11	1.6	S	1.7	1.7	3.1	3.5	1.7	1.9	2.0	1.2	0.9	1.1	1.0	1.4	1.5	1.1	1.4	2.0	4.1	1.1	1.1	1.1	1.1	1.1	0.9	4.1	1.7	24					
12	S	1.1	1.1	1.1	0.8	1.4	1.4	1.2	1.4	1.6	1.6	2.1	2.6	1.2	1.4	2.8	1.4	0.9	1.4	3.1	3.0	5.8	4.2	S	0.8	5.8	1.9	24					
13	45.4	2.0	2.2	2.2	1.9	6.8	7.6	3.4	3.1	1.9	1.3	1.0	1.2	1.3	4.0	1.7	1.5	1.9	2.2	3.0	1.5	1.2	S	2.5	1.0	45.4	4.4	24					
14	3.6	2.0	1.8	1.7	2.8	2.3	3.5	2.9	3.1	2.3	2.0	1.6	1.3	1.3	1.4	1.3	1.5	1.2	1.0	1.1	2.4	S	1.7	1.7	1.0	3.6	2.0	24					
15	1.5	1.7	1.7	2.0	5.2	4.5	3.1	5.5	3.3	2.2	1.3	2.2	1.3	1.1	12.1	1.9	1.0	1.4	2.3	8.0	S	1.3	1.8	5.6	1.0	12.1	3.1	24					
16	1.9	1.9	1.9	2.6	3.4	34.1	4.1	9.2	4.4	4.6	3.1	1.7	4.1	2.1	2.7	1.3	1.9	2.2	1.1	S	1.0	0.9	4.4	1.0	0.9	34.1	4.2	24					
17	0.9	1.1	1.1	1.5	1.1	2.0	1.3	15.5	2.1	1.7	2.3	1.1	0.9	2.5	0.6	0.9	0.7	0.8	S	1.0	1.7	0.9	0.7	0.8	0.6	15.5	1.9	24					
18	1.0	1.2	1.1	1.1	1.3	1.8	1.2	1.8	1.5	0.7	0.7	C	C	C	C	C	C	C	1.0	1.2	1.9	1.5	1.9	2.4	0.7	2.4	1.4	24					
19	2.4	1.3	1.2	0.6	0.9	41.2	5.2	3.9	4.2	1.6	2.4	2.5	1.7	2.0	3.5	1.7	S	1.4	0.7	2.9	2.1	4.9	1.6	1.4	0.6	41.2	4.0	24					
20	1.4	1.3	1.3	1.7	1.3	2.9	1.1	2.3	1.9	0.9	0.7	0.6	1.8	1.2	0.7	S	1.5	0.9	1.5	1.5	1.2	1.5	1.4	3.2	0.6	3.2	1.5	24					
21	1.6	1.4	1.3	1.3	1.0	1.3	1.3	2.9	1.9	1.5	0.8	1.1	0.6	1.5	0.7	S	3.4	1.3	2.3	1.1	1.0	3.1	6.1	4.8	5.1	6.1	2.1	24					
22	4.2	3.2	2.0	2.2	1.8	2.6	2.4	1.3	1.1	1.2	0.7	0.7	25.3	S	1.1	1.2	1.2	1.1	1.2	1.3	2.2	2.2	1.5	2.2	0.7	25.3	2.8	24					
23	1.7	2.1	1.8	0.6	0.7	0.7	0.7	0.4	0.5	0.4	0.5	0.7	S	0.7	0.7	0.7	0.5	0.4	0.7	2.2	1.9	0.8	0.9	1.3	0.4	2.2	0.9	24					
24	1.2	0.9	0.8	1.1	1.4	1.4	1.7	2.2	2.6	2.8	1.5	S	1.5	1.6	1.6	1.2	1.3	1.0	1.9	0.7	0.9	0.7	0.4	0.7	0.4	2.8	1.4	24					
25	1.0	1.2	1.3	1.0	1.2	1.4	0.6	1.4	1.2	0.7	S	1.3	2.4	3.5	0.9	0.7	0.8	0.9	1.0	1.5	2.9	0.4	1.0	0.7	0.4	3.5	1.3	24					
26	0.7	0.6	0.7	1.2	1.1	1.1	2.2	4.3	2.3	S	1.2	1.3	22.6	2.6	0.7	0.7	1.4	1.0	0.9	0.9	1.3	1.4	1.1	1.2	0.6	22.6	2.3	24					
27	1.2	0.9	1.2	1.4	1.6	1.4	1.5	2.0	S	1.6	1.4	1.1	2.2	1.3	3.1	1.4	2.0	2.9	4.6	5.5	2.9	1.7	1.5	3.4	0.9	5.5	2.1	24					
28	4.8	4.8	2.5	1.0	0.7	0.6	0.4	S	0.8	0.6	0.6	0.4	0.9	1.2	0.6	0.7	1.9	2.0	0.4	1.5	0.6	0.6	0.6	0.9	0.4	4.8	1.3	24					
29	0.7	0.7	1.0	0.9	1.2	S	1.2	4.3	0.9	0.8	0.7	3.3	0.6	0.6	0.6	0.6	0.9	1.5	1.3	1.0	1.5	1.6	2.2	1.4	0.6	4.3	1.3	24					
30	2.1	1.5	1.5	2.1	4.9	S	3.4	2.0	1.9	1.1	0.9	0.7	0.7	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.7	1.1	1.1	1.1	0.7	4.9	1.4	24					
31	1.5	2.1	1.8	1.6	S	1.5	1.3	1.7	2.3	1.8	1.8	1.7	1.3	1.3	1.5	1.5	1.5	1.5	1.5	1.7	1.8	2.1	2.2	2.6	1.3	2.6	1.7	24					
HOURLY MAX	45.4	4.8	6.6	7.1	6.7	41.2	38.4	15.5	5.0	4.6	3.5	3.8	25.3	3.8	12.1	3.4	2.0	3.0	4.6	8.0	5.1	6.6	4.8	5.6									
HOURLY AVG	3.3	1.9	1.8	1.8	2.1	4.9	3.7	3.3	2.3	1.6	1.5	1.4	3.1	1.6	1.8	1.3	1.3	1.4	1.6	2.0	2.0	2.1	2.0	2.0									

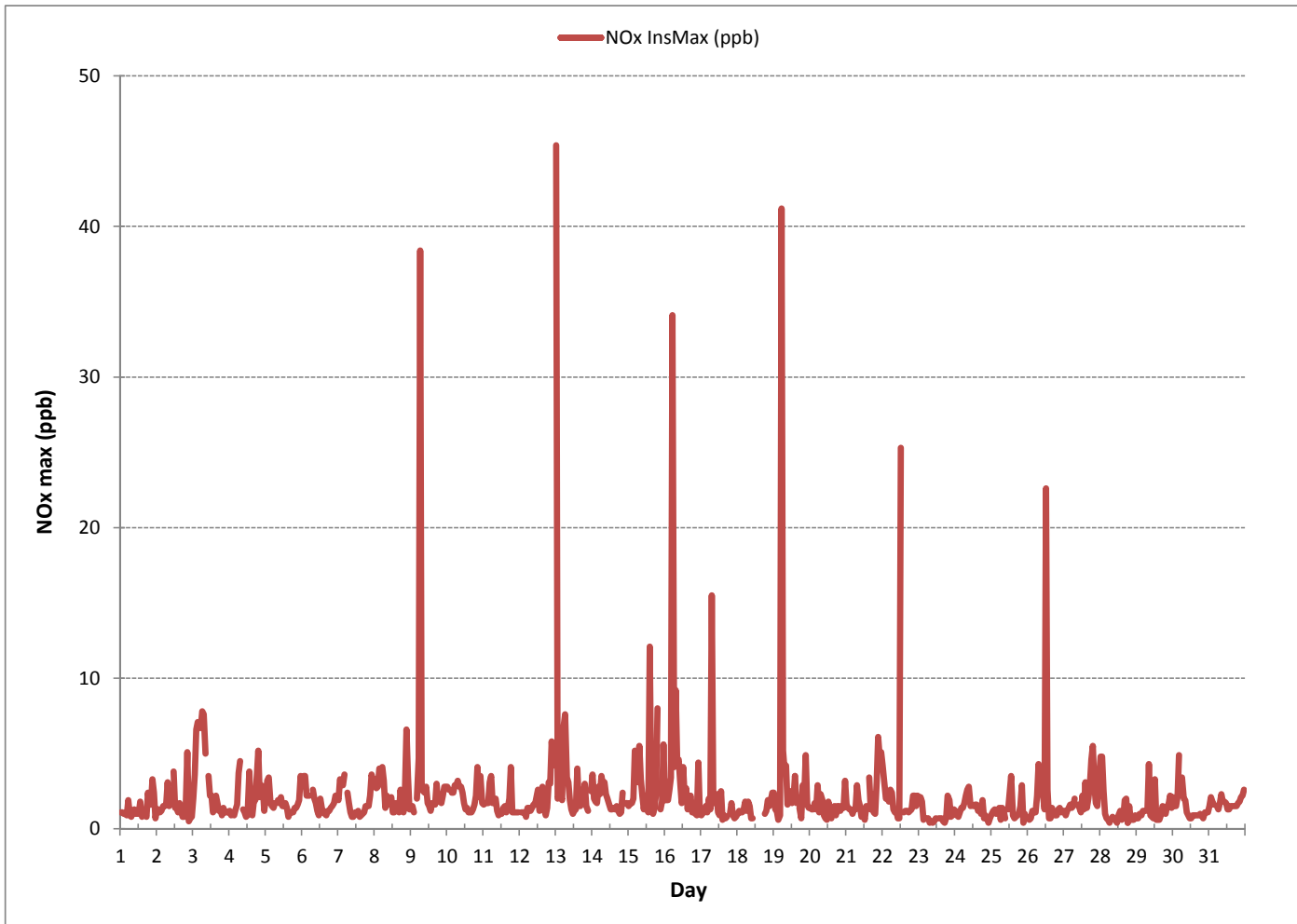
STATUS FLAG CODES

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

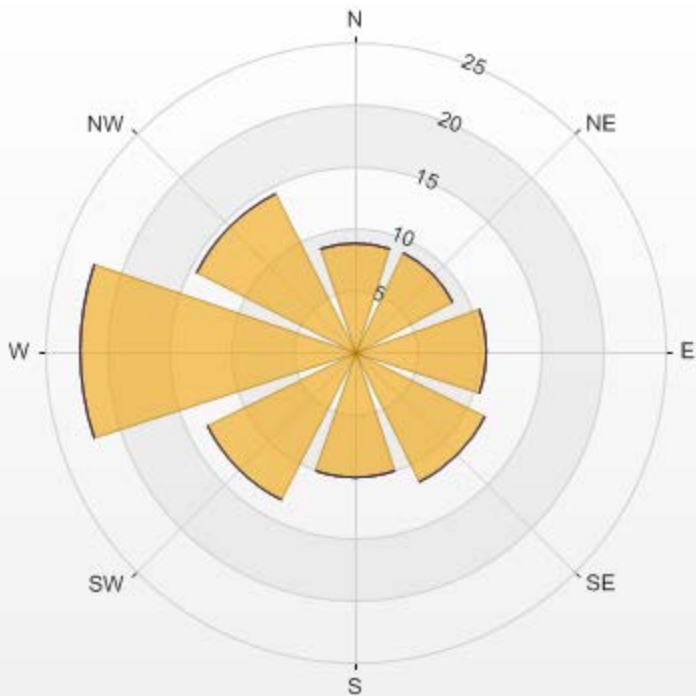
NUMBER OF NON-ZERO READINGS:	705
MAXIMUM INSTANTANEOUS VALUE:	45.4 PPB @ HOUR(S) 0 ON DAY(S) 13
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	7 HRS
STANDARD DEVIATION:	3.38
OPERATIONAL TIME:	743 HRS

OXIDES OF NITROGEN MAX instantaneous maximum in ppb



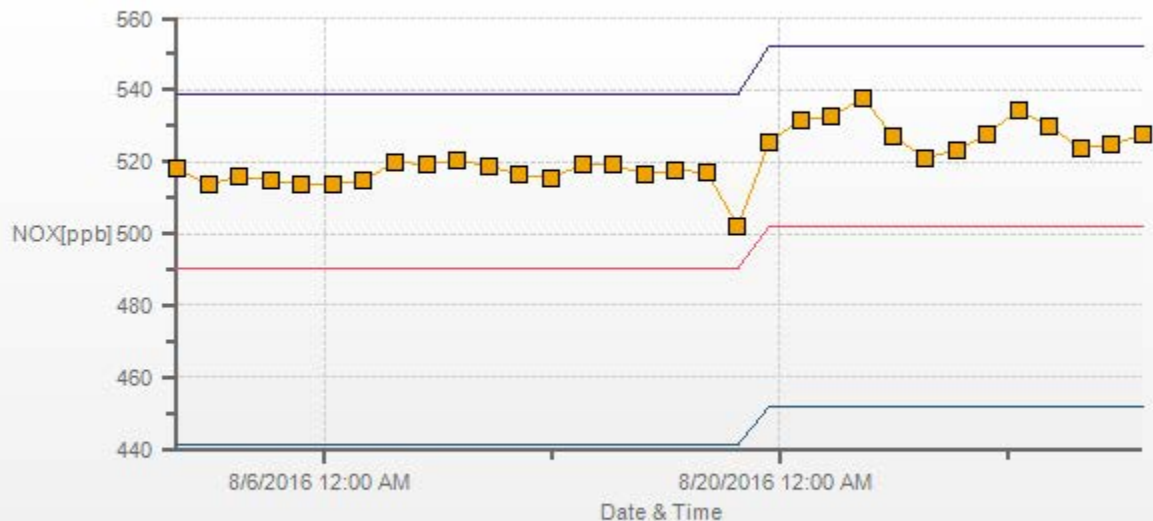
Wind: LICA ST. LINA Monitor: NOX [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.62% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	8.81	0	0	0	8.81
NE	8.95	0	0	0	8.95
E	10.65	0	0	0	10.65
SE	11.79	0	0	0	11.79
S	10.09	0	0	0	10.09
SW	13.35	0	0	0	13.35
W	22.16	0	0	0	22.16
NW	14.2	0	0	0	14.2
Summary	100	0	0	0	100



% Icon Classes (ppb) 100 0.0-50.0 0 50.0-110.0 0 110.0-210.0 0 >210.0

NOX[ppb] Calibration: LICA ST. LINA Monthly: 08/2016 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES

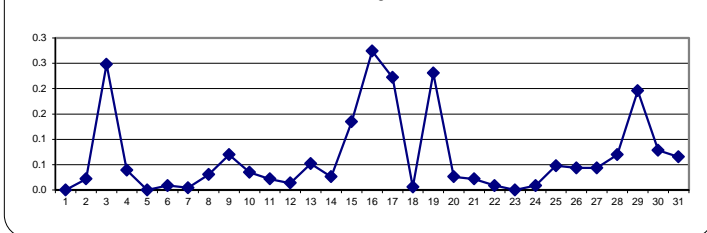
NITRIC OXIDE (NO) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.		
DAY	HR	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
2	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	S	0.2	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	24	
3	3	0.0	0.0	0.0	0.0	0.0	0.4	1.3	2.0	1.2	S	0.4	0.0	0.1	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.2	24	
4	4	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.4	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.0	24	
5	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
6	6	0.0	0.0	0.0	0.0	0.0	S	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	24	
7	7	0.0	0.0	0.0	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	24	
8	8	0.0	0.0	0.0	S	0.2	0.1	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	0.2	0.0	0.0	0.2	0.0	0.0	24	
9	9	0.0	0.0	S	0.0	0.1	0.7	0.1	0.0	0.2	0.3	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	0.7	0.1	0.0	24	
10	10	0.0	0.0	S	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	24	
11	11	0.0	S	0.0	0.0	0.0	0.2	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	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	24	
12	12	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	S	0.0	0.2	0.0	0.0	24	
13	13	0.6	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.6	0.1	0.0	24	
14	14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.0	0.0	0.3	0.0	0.0	24	
15	15	0.0	0.0	0.0	0.0	0.2	0.6	0.5	0.9	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	S	0.0	0.0	0.1	0.0	0.9	0.1	0.0	24	
16	16	0.0	0.0	0.0	0.1	0.0	1.2	0.6	1.4	0.9	0.7	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	S	0.2	0.2	0.3	0.1	0.0	1.4	0.3	0.0	24	
17	17	0.3	0.3	0.2	0.3	0.4	0.6	0.4	0.7	0.6	0.5	0.3	0.2	0.0	0.2	0.0	0.0	0.0	0.0	S	0.0	0.1	0.0	0.0	0.0	0.0	0.7	0.2	0.0	24	
18	18	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	24	
19	19	0.0	0.0	0.0	0.0	0.0	1.8	0.5	0.3	0.6	0.0	0.0	0.1	0.3	0.1	0.3	0.1	S	0.2	0.2	0.2	0.0	0.3	0.1	0.2	0.0	1.8	0.2	0.0	24	
20	20	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	24	
21	21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.1	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	24	
22	22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	24	
23	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
24	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	24	
25	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	S	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	24	
26	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	S	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	24	
27	27	0.0	0.0	0.0	0.0	0.0	0.0	0.1	S	0.3	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	24	
28	28	0.0	0.0	0.0	0.0	0.0	0.0	S	0.2	0.1	0.2	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.0	0.1	0.2	0.0	0.1	0.0	0.2	0.1	0.2	0.0	0.0	24	
29	29	0.1	0.1	0.2	0.1	0.2	0.3	S	0.5	0.8	0.2	0.2	0.4	0.4	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.8	0.2	0.0	24	
30	30	0.0	0.0	0.1	0.0	0.1	S	0.5	0.4	0.4	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.0	24	
31	31	0.0	0.2	0.0	0.2	S	0.0	0.1	0.1	0.2	0.3	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	24
HOURLY MAX		0.6	0.3	0.2	0.3	0.4	1.8	1.3	2.0	1.2	0.7	0.4	0.4	0.4	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2					
HOURLY AVG		0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.2	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	0.0	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

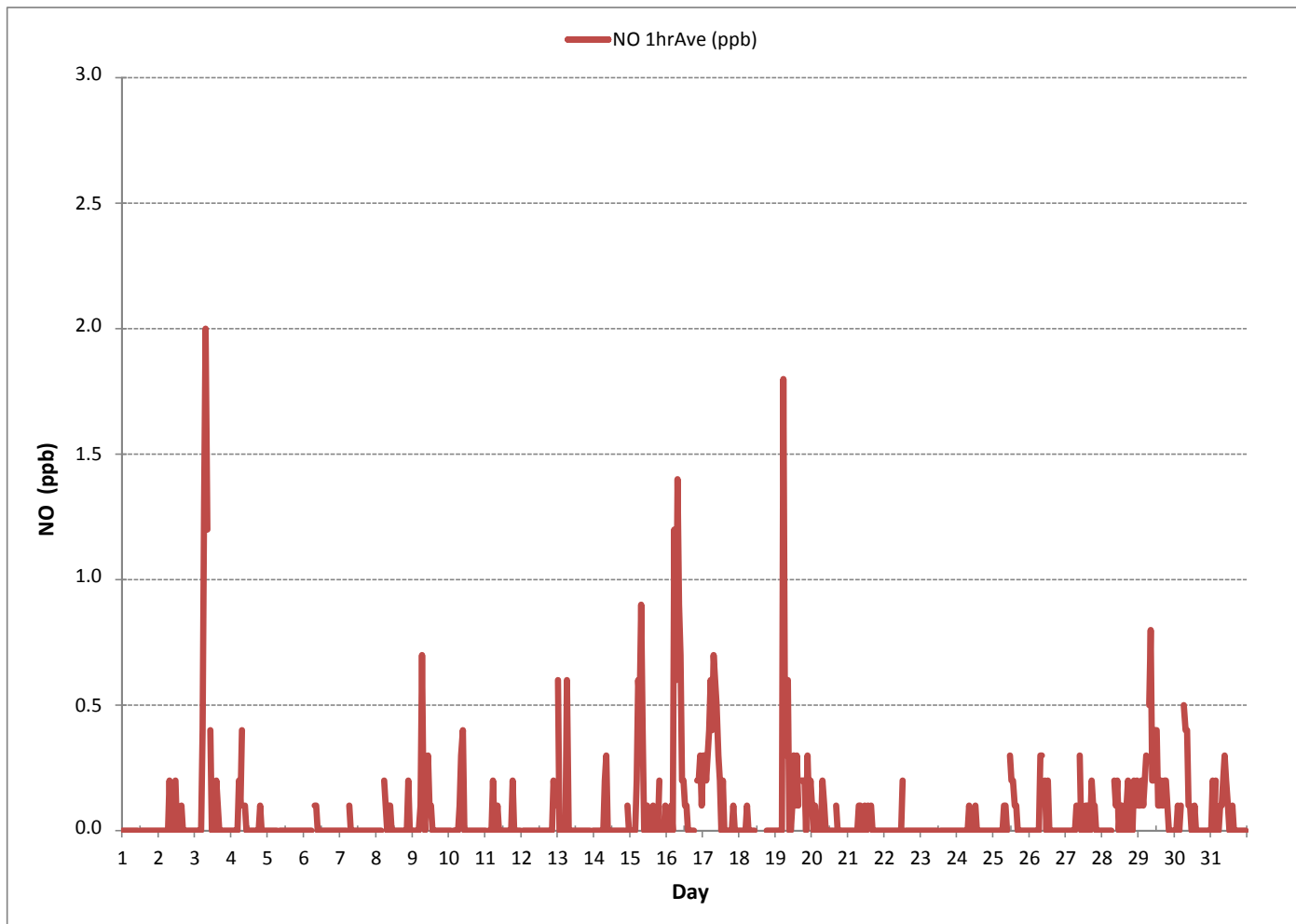
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	175				
MINIMUM 1-HR AVERAGE:	0.0	PPB @ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	2.0	PPB @ HOUR(S)	7	ON DAY(S)	3
MAXIMUM 24-HR AVERAGE:	0.3	PPB		ON DAY(S)	16
				VAR-VARIOUS	
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	744	HRS
MONTHLY CALIBRATION TIME:	7	HRS	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.18		MONTHLY AVERAGE:	0.1	PPB

NITRIC OXIDE (NO) hourly averages in ppb





NITRIC OXIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR		
DAY	MIN.	MAX.	AVG.	RDGS.																										
1	1.1	1.3	1.1	1.2	1.1	1.8	1.1	1.1	1.5	1.4	1.6	S	1.5	2.1	1.1	1.3	1.4	1.2	2.7	1.4	1.4	2.5	1.6	1.1	1.1	1.1	1.1	2.7	1.5	24
2	1.1	1.1	1.1	1.1	1.2	1.2	1.4	2.3	1.6	1.7	S	2.9	1.7	1.4	1.5	1.5	1.4	1.2	1.2	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.1	2.9	1.4	24
3	1.1	1.2	1.1	1.4	1.4	2.1	3.4	3.7	2.7	S	2.0	1.6	1.4	1.2	1.5	1.9	1.5	1.2	1.3	1.1	1.2	1.1	1.1	1.1	1.2	1.1	3.7	1.6	24	
4	1.2	0.9	1.2	1.1	1.2	1.3	2.1	3.2	S	1.3	1.1	1.1	1.4	2.7	1.1	1.1	1.3	1.6	2.0	3.1	1.1	1.1	1.4	1.2	0.9	3.2	1.5	24		
5	1.2	1.2	1.2	1.3	1.2	1.4	1.4	S	1.5	1.4	1.5	1.5	1.5	1.2	1.2	0.9	1.4	1.1	1.2	1.1	1.1	1.1	1.3	1.4	0.9	1.5	1.3	24		
6	1.1	1.1	1.0	1.1	1.1	1.3	S	1.7	1.5	1.4	1.3	1.3	1.5	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.3	1.0	1.7	1.2	24	
7	1.2	1.1	1.1	1.3	1.1	S	1.3	1.4	1.2	1.3	1.1	1.3	1.0	1.4	1.1	1.1	1.0	1.2	1.3	1.2	1.2	1.3	1.4	1.2	1.0	1.4	1.2	24		
8	1.4	1.2	1.2	1.2	S	1.6	1.5	1.4	1.5	1.5	1.4	1.3	1.1	1.1	1.6	1.1	1.2	1.3	1.1	1.1	1.4	3.0	1.9	1.0	1.0	3.0	1.4	24		
9	1.1	1.1	1.1	S	1.3	2.3	24.7	1.5	1.4	1.5	1.7	1.3	1.3	1.2	1.1	P	1.2	1.3	1.2	1.1	1.1	1.3	1.4	1.1	1.1	24.7	2.4	23		
10	1.2	1.3	S	1.2	0.9	1.1	1.2	1.4	1.7	1.8	1.4	1.3	1.1	1.3	1.1	1.1	1.1	1.0	1.3	1.2	1.4	1.1	1.1	1.1	0.9	1.8	1.2	24		
11	1.3	S	1.4	1.2	1.9	2.2	1.7	1.5	2.0	1.5	1.3	1.2	1.4	1.4	1.5	1.4	1.5	2.0	3.6	1.2	1.1	1.1	1.1	1.4	1.1	3.6	1.6	24		
12	S	1.2	1.3	1.4	1.1	1.3	1.4	1.4	1.7	1.7	1.7	2.4	2.5	1.3	1.5	2.0	1.5	1.5	1.5	2.2	1.9	3.8	2.5	S	1.1	3.8	1.8	24		
13	37.2	1.3	1.2	1.3	1.1	3.9	5.9	2.4	2.4	1.5	1.4	1.4	1.2	2.2	1.3	1.3	1.2	1.5	1.7	1.3	1.3	S	1.5	1.1	37.2	3.3	24			
14	1.4	1.2	1.1	1.2	1.4	1.6	2.0	1.9	2.2	1.4	1.5	1.2	1.2	1.4	1.4	1.4	1.4	1.2	1.1	1.1	1.7	S	1.5	1.5	1.1	2.2	1.4	24		
15	1.3	1.3	1.3	1.3	3.6	3.0	2.0	3.8	2.2	1.7	1.5	1.8	1.7	1.3	10.5	1.9	1.4	1.6	1.4	2.7	S	1.4	1.2	2.4	1.2	10.5	2.3	24		
16	1.1	1.4	1.0	1.2	1.4	23.5	2.4	4.7	2.4	1.9	1.3	1.1	2.2	1.4	0.9	0.7	0.7	1.3	0.8	S	1.2	1.1	2.8	1.3	0.7	23.5	2.5	24		
17	1.2	1.3	1.4	1.4	1.5	1.9	1.6	11.1	2.1	2.0	1.8	1.5	1.4	2.6	1.3	1.2	1.2	1.5	S	1.6	1.9	1.5	1.5	1.4	1.2	11.1	2.0	24		
18	1.5	1.5	1.5	1.5	1.6	2.0	1.8	2.0	2.0	1.5	1.7	C	C	C	C	C	C	C	C	1.6	1.5	1.6	1.3	1.5	1.2	2.0	1.6	24		
19	1.2	1.2	1.2	1.1	1.1	35.4	3.4	3.3	3.5	1.4	2.2	2.3	1.6	1.3	1.9	1.1	S	1.3	1.3	1.1	1.3	1.7	1.2	1.1	1.1	35.4	3.1	24		
20	1.3	1.1	1.2	1.1	1.1	1.3	1.1	1.5	1.6	1.1	1.2	1.3	1.6	1.3	1.1	S	1.5	1.3	1.1	1.0	1.0	1.1	1.1	1.9	1.0	1.9	1.3	24		
21	1.3	1.1	1.1	0.9	0.8	1.1	1.1	1.9	1.4	1.6	1.3	1.4	1.1	1.6	S	2.0	1.3	1.1	1.1	1.1	1.1	1.2	1.0	1.3	0.8	2.0	1.3	24		
22	1.0	1.1	1.1	1.0	1.1	1.1	1.3	1.3	1.3	1.3	1.3	1.1	19.3	S	1.5	1.2	1.1	1.1	1.0	0.9	1.0	1.3	1.0	1.0	0.9	19.3	1.9	24		
23	1.1	1.3	1.3	1.1	1.0	1.2	1.0	1.3	1.2	1.1	1.1	1.1	S	1.4	1.2	1.3	1.2	1.2	1.1	1.6	1.4	1.0	1.0	1.1	1.0	1.6	1.2	24		
24	1.3	1.0	1.1	1.1	1.4	1.2	1.4	2.4	2.4	2.4	1.5	S	1.5	1.2	1.3	1.3	1.1	1.1	1.1	0.8	0.9	0.7	0.8	0.8	0.7	2.4	1.3	24		
25	1.1	0.8	0.8	1.0	1.2	1.4	0.9	1.8	1.5	1.1	S	1.3	1.4	2.7	1.1	1.1	0.9	1.1	1.1	1.1	1.1	1.9	0.8	1.1	0.8	2.7	1.2	24		
26	0.7	0.9	0.7	1.0	1.0	1.0	1.9	3.6	2.2	S	2.0	1.2	10.5	2.5	1.1	0.9	1.1	0.8	0.9	0.8	0.8	0.8	0.7	1.1	0.7	10.5	1.7	24		
27	1.1	0.9	0.7	0.9	1.0	0.7	1.0	1.3	S	1.3	1.1	0.7	1.6	1.1	1.7	0.9	1.3	1.6	2.2	2.6	1.5	1.0	0.9	1.3	0.7	2.6	1.2	24		
28	0.8	1.0	0.9	0.9	1.1	1.2	1.0	S	1.4	1.0	1.3	1.1	1.3	1.3	1.1	1.0	1.7	2.0	0.9	1.1	1.0	1.1	0.9	1.2	0.8	2.0	1.1	24		
29	1.3	1.0	1.0	1.1	1.0	1.2	S	1.5	3.7	1.3	1.1	1.3	2.8	1.0	0.9	1.1	1.2	1.0	1.1	1.2	0.9	0.6	0.8	0.8	0.6	3.7	1.3	24		
30	0.9	0.9	0.9	0.9	0.9	S	1.4	1.7	1.4	1.2	1.0	1.0	0.9	1.1	1.1	1.0	1.1	1.1	0.8	0.8	0.8	0.8	0.8	0.9	0.8	1.7	1.0	24		
31	0.9	1.3	1.1	1.2	S	1.2	1.1	1.4	1.7	1.4	1.4	1.2	1.0	1.0	1.2	1.0	1.0	1.1	1.1	0.8	0.7	1.0	0.8	0.9	0.9	0.7	1.7	1.1	24	
HOURLY MAX	37.2	1.5	1.5	1.5	3.6	35.4	24.7	11.1	3.7	2.4	2.2	2.9	19.3	2.7	10.5	2.0	1.7	2.0	3.6	3.1	1.9	3.8	2.8	2.4						
HOURLY AVG	2.4	1.1	1.1	1.2	1.3	3.5	2.5	2.4	1.9	1.5	1.4	1.4	2.4	1.5	1.6	1.3	1.3	1.3	1.4	1.4	1.3	1.3	1.3	1.2						

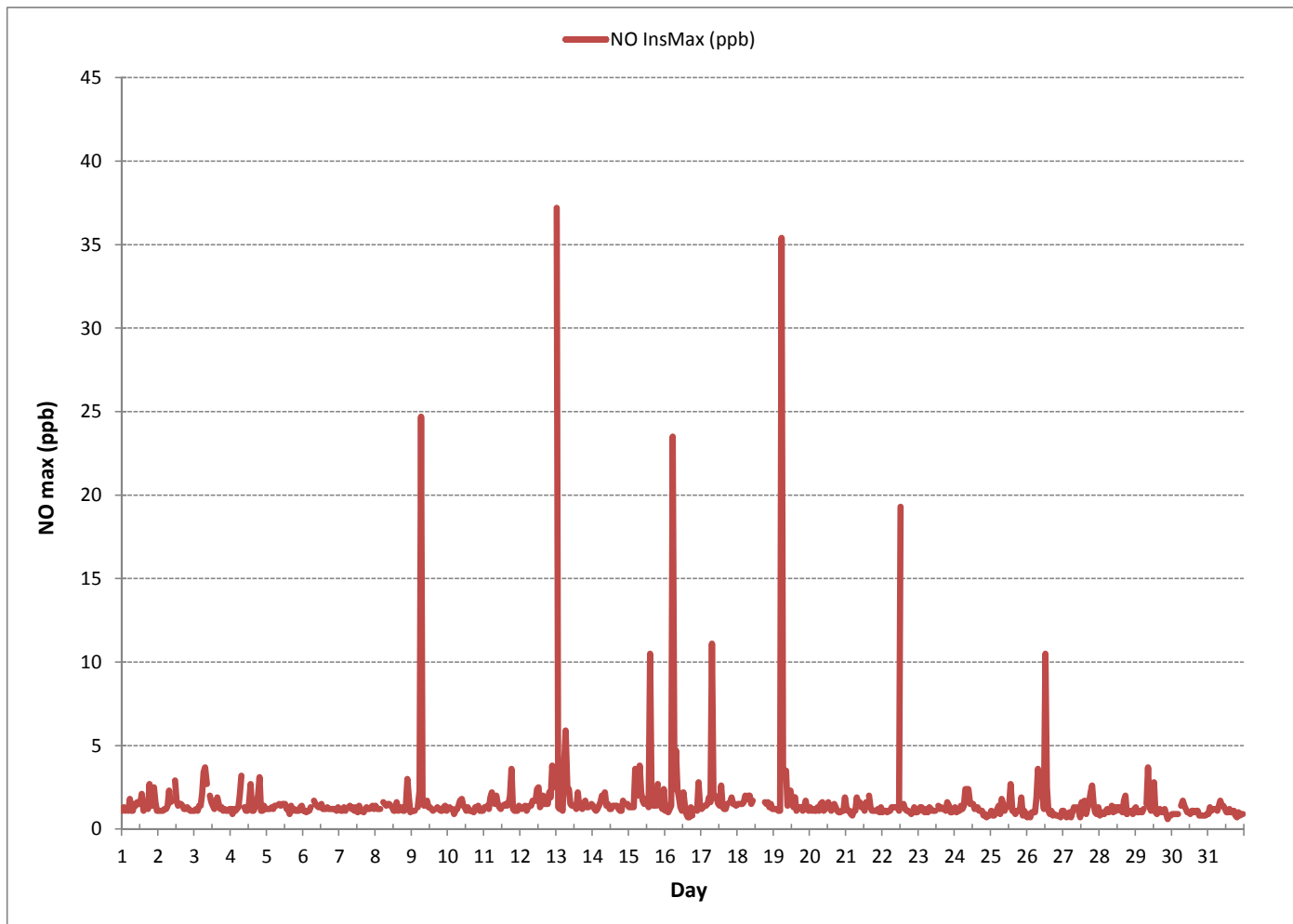
STATUS FLAG CODES

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

MONTHLY SUMMARY

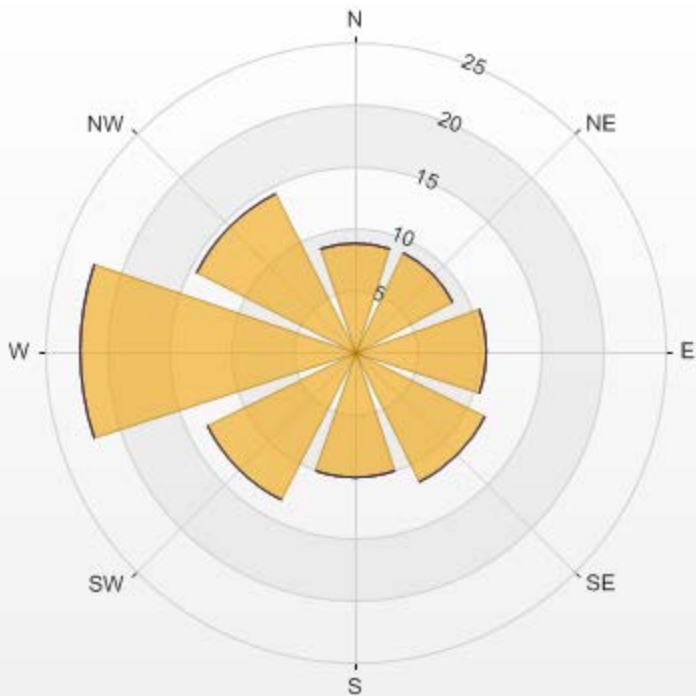
NUMBER OF NON-ZERO READINGS:	705
MAXIMUM INSTANTANEOUS VALUE:	37.2 PPB @ HOUR(S) 0 ON DAY(S) 13
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	7 HRS
STANDARD DEVIATION:	2.45
OPERATIONAL TIME:	743 HRS

NITRIC OXIDE MAX instantaneous maximum in ppb



Wind: LICA ST. LINA Monitor: NO [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.62% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	8.81	0	0	0	8.81
NE	8.95	0	0	0	8.95
E	10.65	0	0	0	10.65
SE	11.79	0	0	0	11.79
S	10.09	0	0	0	10.09
SW	13.35	0	0	0	13.35
W	22.16	0	0	0	22.16
NW	14.2	0	0	0	14.2
Summary	100	0	0	0	100



NITROGEN DIOXIDE

NITROGEN DIOXIDE (NO₂) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY	DAY	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.
1	1	0.3	0.3	0.3	0.3	0.1	0.4	0.1	0.0	0.1	0.1	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.5	0.3	0.3	0.0	0.5	0.1	24
2	2	0.3	0.5	0.4	0.4	0.5	0.7	0.6	0.6	0.4	0.3	S	0.4	0.3	0.2	0.1	0.4	0.3	0.2	0.1	0.5	0.8	0.0	0.1	0.2	0.0	0.8	0.4	24
3	3	0.9	2.6	4.8	6.5	6.1	5.2	5.5	3.8	3.2	S	1.7	1.3	1.0	0.4	0.3	0.6	0.4	0.4	0.5	0.2	0.6	0.5	0.6	0.7	0.2	6.5	2.1	24
4	4	0.6	0.5	0.5	0.4	0.5	0.8	0.9	0.8	S	0.6	0.4	0.3	0.3	0.6	0.4	0.3	0.5	0.5	0.6	0.9	0.5	0.8	0.8	0.4	0.3	0.9	0.6	24
5	5	0.6	1.4	1.6	0.8	0.7	0.7	0.9	S	0.8	0.8	0.8	0.7	0.8	0.8	0.5	0.2	0.4	0.3	0.6	0.6	0.7	0.9	1.2	2.1	0.2	2.1	0.8	24
6	6	2.2	2.5	2.4	1.6	1.6	1.6	S	1.7	1.2	0.9	0.3	0.3	0.6	0.7	0.4	0.4	0.3	0.5	0.6	0.8	0.8	1.0	1.0	1.4	0.3	2.5	1.1	24
7	7	1.3	2.0	2.2	1.9	2.9	S	1.5	0.5	0.4	0.3	0.1	0.2	0.3	0.5	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	2.4	2.4	0.1	2.9	1.0	24
8	8	2.6	2.0	1.9	3.0	S	2.9	1.6	0.7	1.1	0.9	0.9	1.0	0.5	0.3	0.7	0.5	0.6	1.0	0.7	0.3	1.1	1.7	1.4	0.7	0.3	3.0	1.2	24
9	9	0.7	0.8	0.5	S	1.2	1.7	2.0	1.2	1.2	1.4	1.7	0.9	0.8	0.6	0.8	1.1	1.0	1.4	0.9	1.3	1.0	1.2	2.0	2.0	0.5	2.0	1.2	24
10	10	2.0	2.0	S	1.6	1.7	2.1	1.9	2.0	1.7	1.5	1.1	1.1	0.7	0.6	0.5	0.5	0.4	0.6	1.0	1.2	1.7	1.2	1.2	1.1	0.4	2.1	1.3	24
11	11	1.0	S	1.0	1.0	1.1	1.4	0.8	0.8	0.6	0.3	0.3	0.1	0.2	0.3	0.2	0.3	0.4	0.5	0.5	0.4	0.2	0.4	0.5	0.4	0.1	1.4	0.6	24
12	12	S	0.3	0.3	0.4	0.1	0.6	0.4	0.4	0.3	0.2	0.3	0.3	0.1	0.1	0.1	0.5	0.1	0.0	0.1	0.5	0.4	1.1	1.1	S	0.0	1.1	0.4	24
13	13	1.5	1.1	1.2	1.1	1.0	1.8	1.2	0.8	0.7	0.7	0.1	0.0	0.2	0.3	0.5	0.1	0.2	0.2	0.2	0.8	0.4	0.1	S	0.9	0.0	1.8	0.7	24
14	14	2.1	1.1	0.9	1.0	1.6	1.2	2.0	1.8	1.5	1.3	1.2	0.6	0.4	0.3	0.1	0.2	0.2	0.6	0.4	0.4	1.1	S	1.0	0.9	0.1	2.1	1.0	24
15	15	0.9	1.1	1.2	1.3	1.5	1.5	1.5	1.7	1.3	0.9	0.6	0.6	0.3	0.2	0.2	0.4	0.2	0.3	0.4	1.6	S	0.4	0.9	1.6	0.2	1.7	0.9	24
16	16	1.1	1.1	1.2	1.8	2.1	2.6	2.0	2.4	2.1	2.5	1.4	0.9	1.2	0.9	1.8	0.6	0.9	0.5	0.2	S	0.2	0.2	0.5	0.3	0.2	2.6	1.2	24
17	17	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.1	0.1	0.2	0.2	S	0.3	0.3	0.2	0.1	0.0	0.0	0.4	0.2	24
18	18	0.1	0.4	0.4	0.5	0.4	0.5	0.3	0.2	0.1	0.0	0.0	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.1	1.5	0.0	1.5	0.3	24
19	19	0.2	0.3	0.2	0.0	0.0	1.7	0.8	0.6	1.0	0.7	0.2	0.1	0.6	1.1	1.5	0.7	S	0.2	0.3	1.2	0.9	1.4	0.9	0.7	0.0	1.7	0.7	24
20	20	0.7	0.8	0.7	1.0	0.8	1.3	0.7	1.0	0.8	0.5	0.2	0.0	0.2	0.1	0.2	S	0.4	0.3	0.6	1.0	0.6	1.0	0.8	1.2	0.0	1.3	0.6	24
21	21	1.0	0.8	0.7	0.7	0.5	0.6	0.8	1.0	0.6	0.4	0.2	0.3	0.0	0.2	S	0.4	0.3	1.1	0.5	0.3	1.2	4.4	4.2	4.4	0.0	4.4	1.1	24
22	22	3.1	2.2	1.3	1.6	1.0	1.4	1.3	0.7	0.5	0.6	0.2	0.1	0.6	S	0.2	0.4	0.6	0.4	0.4	0.5	1.3	1.3	0.9	1.3	0.1	3.1	1.0	24
23	23	0.9	1.1	0.4	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.0	0.2	0.3	0.6	0.0	1.1	0.2	24
24	24	0.5	0.4	0.3	0.3	0.7	0.6	0.7	0.7	0.5	0.6	0.3	S	0.6	0.4	0.4	0.2	0.2	0.2	0.4	0.1	0.3	0.1	0.1	0.2	0.1	0.7	0.4	24
25	25	0.5	0.6	0.5	0.5	0.6	0.4	0.3	0.2	0.2	0.2	S	0.5	0.5	0.5	0.3	0.1	0.2	0.1	0.2	0.3	0.5	0.0	0.4	0.2	0.0	0.6	0.3	24
26	26	0.3	0.3	0.2	0.4	0.5	0.4	0.6	0.7	0.5	S	0.9	0.6	0.7	0.4	0.2	0.2	0.4	0.3	0.3	0.4	0.7	0.8	0.7	0.8	0.2	0.9	0.5	24
27	27	0.7	0.5	0.7	0.8	1.1	0.9	1.1	1.3	S	0.9	0.9	0.6	0.9	0.8	0.9	0.7	1.0	1.4	1.5	1.7	1.6	1.3	1.1	1.7	0.5	1.7	1.0	24
28	28	4.3	3.5	1.3	0.6	0.3	0.2	0.0	S	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.4	0.0	4.3	0.6	24
29	29	0.2	0.3	0.4	0.4	0.4	0.4	S	0.1	0.3	0.3	0.1	0.0	0.2	0.0	0.1	0.1	0.4	0.8	0.7	0.5	0.9	1.1	1.4	1.0	0.0	1.4	0.4	24
30	30	1.5	1.2	1.0	1.4	3.0	S	1.8	1.1	0.8	0.5	0.3	0.2	0.2	0.4	0.4	0.6	0.5	0.5	0.5	0.5	0.4	0.7	0.7	0.7	0.2	3.0	0.8	24
31	31	0.8	1.4	1.4	1.1	S	0.7	0.8	0.7	1.1	1.0	1.0	1.2	0.9	0.9	0.8	0.9	1.1	1.0	0.9	1.0	1.1	1.3	1.7	1.8	0.7	1.8	1.1	24
HOURLY MAX		4.3	3.5	4.8	6.5	6.1	5.2	5.5	3.8	3.2	2.5	1.7	1.3	1.2	1.1	1.8	1.1	1.1	1.4	1.5	1.7	1.7	4.4	4.2	4.4				
HOURLY AVG		1.1	1.1	1.0	1.1	1.1	1.2	1.1	1.0	0.8	0.7	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8	1.0	1.1				

STATUS FLAG CODES

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

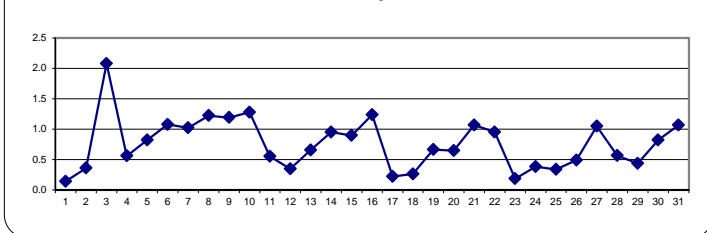
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 PPB

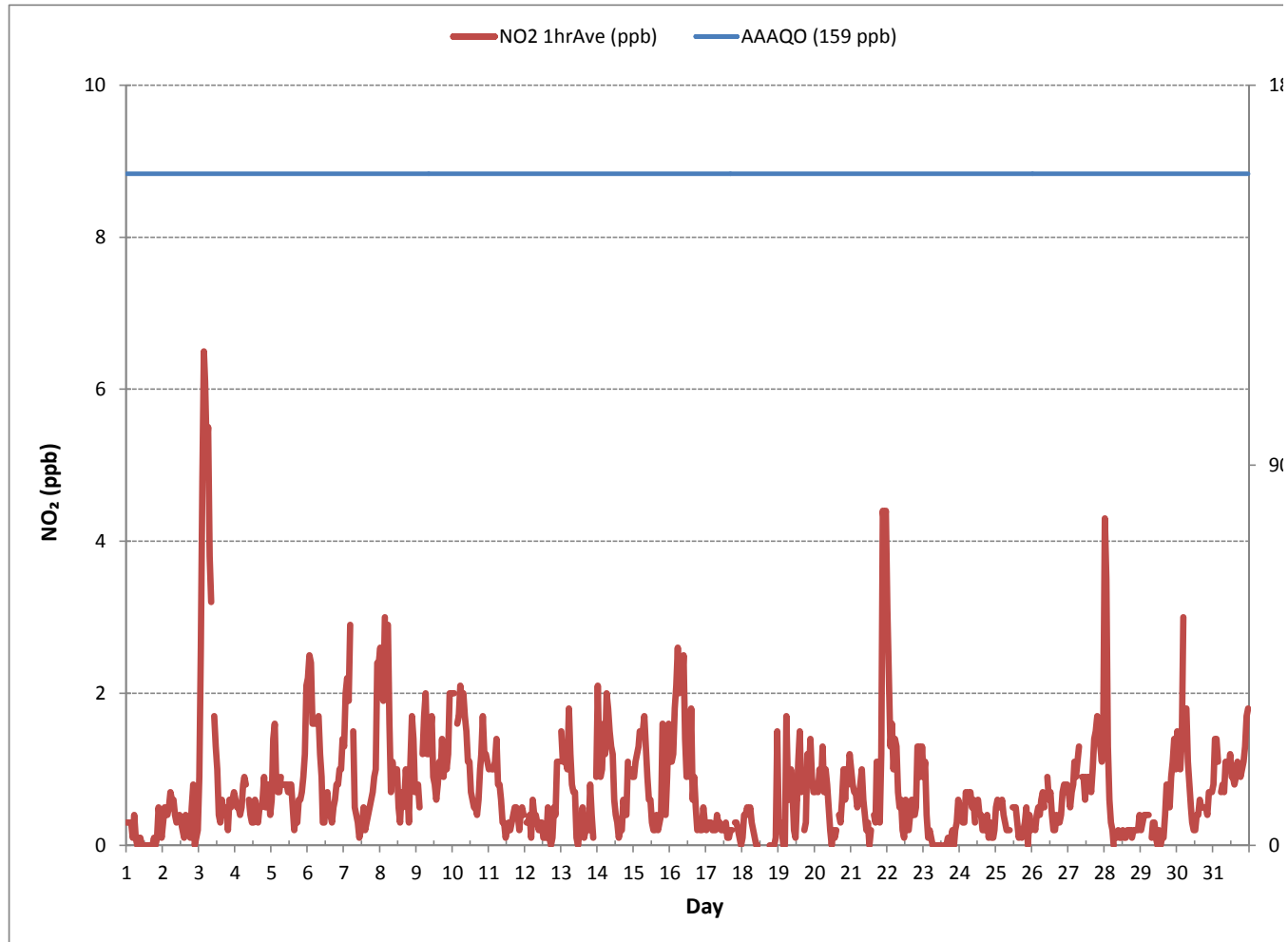
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0			
NUMBER OF NON-ZERO READINGS:	668			
MINIMUM 1-HR AVERAGE:	0.0 PPB	@ HOUR(S)	VAR	ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	6.5 PPB	@ HOUR(S)	3	ON DAY(S) 3
MAXIMUM 24-HR AVERAGE:	2.1 PPB			ON DAY(S) 3
				VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS	OPERATIONAL TIME:	744 HRS	
MONTHLY CALIBRATION TIME:	7 HRS	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.78	MONTHLY AVERAGE:	0.8 PPB	

24 HOUR AVERAGES FOR August 2016



NITROGEN DIOXIDE (NO₂) hourly averages in ppb





NITROGEN DIOXIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	0.8	0.7	0.7	0.7	0.5	0.7	0.5	0.5	0.5	0.5	0.5	0.5	S	0.2	0.4	0.2	0.4	0.2	0.2	0.4	0.7	0.9	1.3	1.2	1.0	0.2	1.3	0.6	24
2	1.0	1.0	0.8	0.9	1.0	1.0	0.9	1.4	0.8	0.7	S	1.2	0.6	0.5	0.4	0.7	0.5	0.4	0.4	1.1	4.7	0.2	0.4	0.4	0.2	4.7	0.9	24	
3	1.9	3.3	6.1	7.0	6.5	5.4	5.7	4.5	3.2	S	2.0	1.7	1.2	0.4	0.5	1.1	1.0	0.7	0.6	0.5	0.8	1.1	0.7	0.8	0.4	7.0	2.5	24	
4	0.8	0.8	0.7	0.7	0.8	1.1	2.0	1.7	S	0.7	0.6	0.4	0.4	1.5	0.7	0.4	1.0	1.1	2.6	2.6	1.7	2.1	2.0	0.6	0.4	2.6	1.2	24	
5	1.3	3.0	3.2	1.3	0.8	0.8	1.1	S	1.1	1.0	1.3	1.0	1.0	1.0	1.0	0.7	0.7	0.5	0.7	0.9	1.0	1.1	1.5	2.9	0.5	3.2	1.3	24	
6	2.5	3.0	3.1	2.0	1.8	1.7	S	1.8	1.0	1.0	0.6	0.6	1.4	0.8	0.8	0.7	0.5	0.8	1.1	1.1	1.1	1.5	1.6	1.7	0.5	3.1	1.4	24	
7	1.5	2.9	2.9	2.6	3.2	S	1.7	0.9	0.6	0.4	0.4	0.4	0.7	0.9	0.7	0.7	0.7	0.7	0.7	0.8	1.1	1.7	2.9	2.9	0.4	3.2	1.4	24	
8	2.9	2.2	2.3	3.4	S	3.2	2.6	0.9	1.3	1.1	1.0	1.2	0.6	0.7	0.7	0.7	0.8	1.9	1.1	0.7	1.6	4.3	2.6	1.3	0.6	4.3	1.7	24	
9	1.0	1.0	0.7	S	1.5	3.2	17.3	1.8	1.5	1.8	2.1	1.1	1.0	0.8	1.3	P	1.0	2.0	1.2	1.5	1.3	1.6	2.1	2.3	0.7	17.3	2.2	23	
10	2.1	2.1	S	1.7	2.1	2.2	2.0	2.2	1.8	1.6	1.5	1.3	0.9	1.0	0.9	0.7	0.7	0.9	1.2	1.6	3.2	1.7	2.8	1.3	0.7	3.2	1.6	24	
11	1.3	S	1.0	1.0	2.0	2.0	0.8	1.0	0.7	0.5	0.6	0.5	0.3	0.6	0.5	0.4	0.5	0.6	1.1	0.7	0.8	0.7	0.7	0.8	0.3	2.0	0.8	24	
12	S	0.4	0.6	0.7	0.7	0.7	0.5	0.4	0.6	0.4	0.6	0.4	0.6	0.5	0.5	1.5	0.7	0.3	0.5	1.5	2.9	2.2	S	0.3	2.9	0.9	24		
13	14.0	1.5	1.7	1.9	1.9	3.3	2.5	1.4	1.3	1.3	0.6	0.4	0.7	0.6	2.2	0.7	0.7	1.2	1.2	2.0	1.0	0.8	S	1.6	0.4	14.0	1.9	24	
14	3.2	1.5	1.5	1.3	2.3	1.5	1.9	1.6	1.7	1.5	1.4	1.1	0.9	0.7	0.8	0.6	0.5	0.9	0.8	0.7	1.3	S	1.0	1.0	0.5	3.2	1.3	24	
15	1.1	1.3	1.3	1.6	2.2	1.9	1.6	2.3	1.7	1.2	0.9	1.2	0.5	0.5	3.9	1.1	0.3	0.5	1.4	5.8	S	0.4	1.3	3.7	0.3	5.8	1.6	24	
16	1.3	1.2	1.5	1.8	2.3	13.6	2.3	5.1	2.4	3.3	2.2	1.1	1.7	1.7	2.3	1.0	1.5	1.1	0.6	S	0.2	0.6	2.1	0.6	0.2	13.6	2.2	24	
17	0.4	0.7	0.7	0.8	0.8	0.8	0.9	5.6	1.1	0.9	1.4	0.6	0.3	0.9	0.3	0.5	0.2	0.2	S	0.4	0.7	0.6	0.4	0.4	0.2	5.6	0.9	24	
18	0.4	0.6	0.7	0.9	0.7	0.9	0.7	1.0	0.6	0.3	0.3	C	C	C	C	C	C	C	0.0	0.7	0.9	0.6	1.5	2.0	0.0	2.0	0.8	24	
19	1.9	0.9	0.6	0.3	0.3	16.4	2.2	1.1	1.4	0.7	0.8	0.7	0.7	1.3	2.2	1.1	S	0.6	0.3	1.9	1.7	4.1	1.2	0.8	0.3	16.4	1.9	24	
20	0.9	0.8	0.8	1.3	1.1	1.9	0.9	1.3	1.1	0.6	0.3	0.1	0.6	0.3	0.3	S	0.5	0.3	1.1	1.4	1.1	1.1	1.1	1.9	0.1	1.9	0.9	24	
21	0.9	0.9	0.9	0.9	0.8	0.7	0.9	1.7	1.1	0.7	0.4	0.4	0.1	0.6	0.6	S	1.7	0.6	1.8	0.7	0.5	2.6	5.7	4.6	4.6	0.1	5.7	1.5	24
22	3.8	2.6	1.4	1.9	1.5	1.9	1.7	0.7	0.6	0.6	0.3	0.3	6.4	S	0.2	0.8	0.7	0.7	0.8	1.5	1.6	1.3	1.7	0.2	6.4	1.5	24		
23	1.2	1.3	1.0	0.2	0.5	0.2	0.0	0.0	0.0	0.1	0.0	0.2	S	0.1	0.1	0.1	0.1	0.1	0.4	1.1	1.0	0.1	0.4	0.6	0.0	1.3	0.4	24	
24	0.2	0.2	0.2	0.4	0.5	0.4	0.5	0.3	0.5	1.1	0.5	S	0.6	0.8	0.6	0.3	0.4	0.4	1.2	0.4	0.5	0.3	0.2	0.3	0.2	1.2	0.5	24	
25	0.5	0.6	0.6	0.6	0.6	0.6	0.3	0.1	0.2	0.3	S	0.7	1.2	0.9	0.1	0.2	0.1	0.1	0.4	0.6	1.2	0.1	0.3	0.3	0.1	1.2	0.5	24	
26	0.3	0.4	0.3	0.6	0.5	0.7	0.5	0.9	0.4	S	1.0	0.6	12.9	0.4	0.1	0.3	0.6	0.4	0.4	0.6	0.6	0.8	0.8	0.8	0.1	12.9	1.1	24	
27	0.5	0.6	0.8	1.0	0.8	0.7	1.0	1.0	S	0.7	0.7	0.7	1.0	0.9	1.7	0.8	1.1	1.6	2.3	3.7	1.7	1.4	1.1	2.9	0.5	3.7	1.2	24	
28	4.6	4.4	1.7	0.6	0.2	0.0	0.0	S	0.1	0.0	0.0	0.1	0.0	0.2	0.1	0.3	0.5	0.4	0.0	0.7	0.0	0.0	0.2	0.2	0.0	4.6	0.6	24	
29	0.1	0.2	0.3	0.5	0.6	0.6	S	0.1	0.9	0.3	0.1	0.0	0.9	0.1	0.1	0.2	0.5	1.0	1.0	0.6	1.0	1.3	1.4	1.1	0.0	1.4	0.6	24	
30	1.5	1.3	1.1	1.5	4.6	S	2.1	1.1	0.7	0.6	0.3	0.3	0.5	0.4	0.3	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.3	4.6	0.9	24	
31	1.2	1.7	1.6	1.1	S	0.7	0.8	0.7	1.1	0.9	0.9	0.9	1.0	0.8	0.6	1.0	1.1	0.8	1.0	1.1	1.3	1.4	1.7	1.9	0.6	1.9	1.1	24	
HOURLY MAX	14.0	4.4	6.1	7.0	6.5	16.4	17.3	5.6	3.2	3.3	2.2	1.7	12.9	1.7	3.9	1.7	1.5	2.0	2.6	5.8	4.7	5.7	4.6	4.6					
HOURLY AVG	1.8	1.4	1.4	1.4	1.5	2.4	1.9	1.5	1.0	0.9	0.8	0.7	1.3	0.7	0.8	0.7	0.6	0.8	0.9	1.2	1.3	1.4	1.4	1.4					

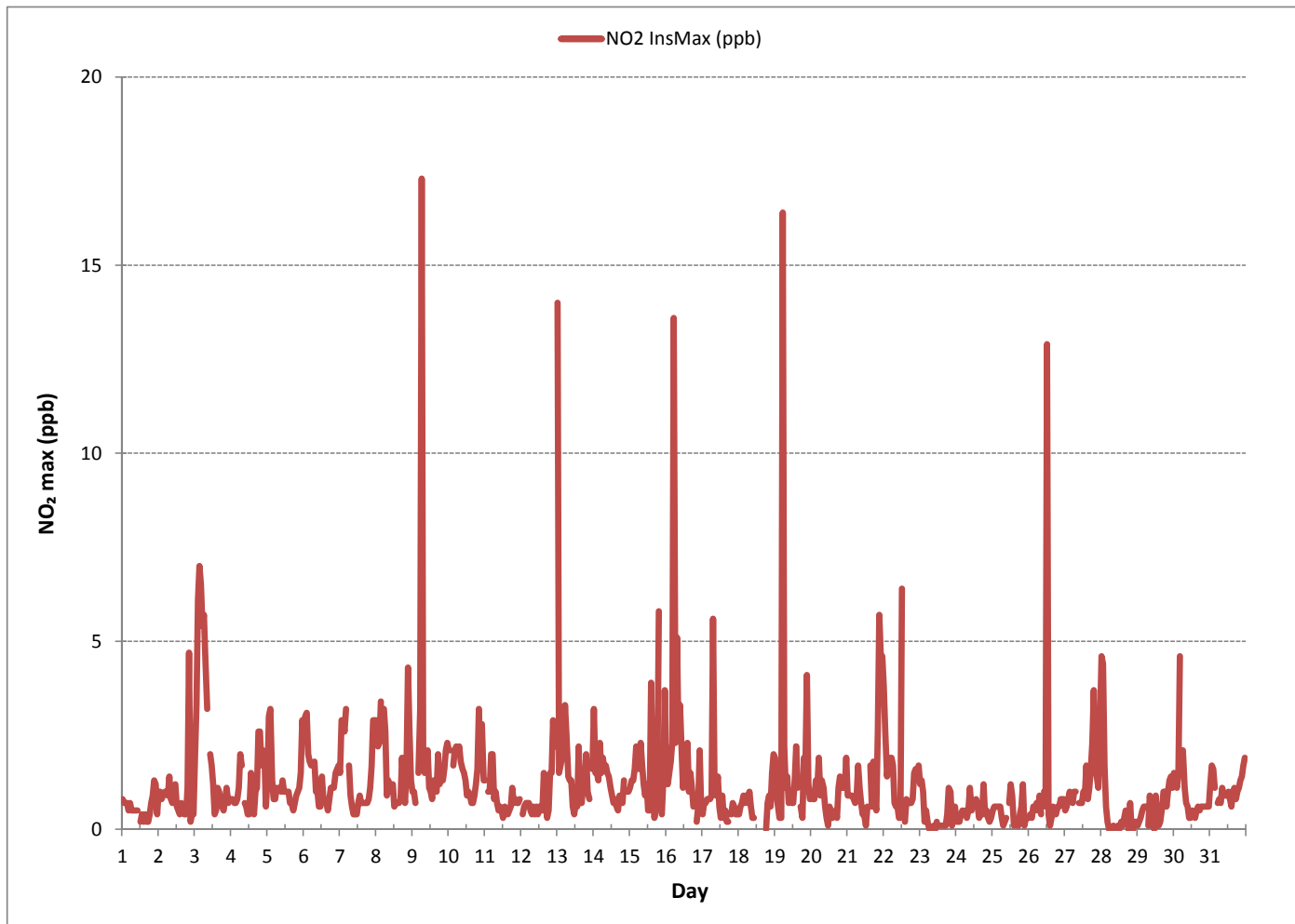
STATUS FLAG CODES

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

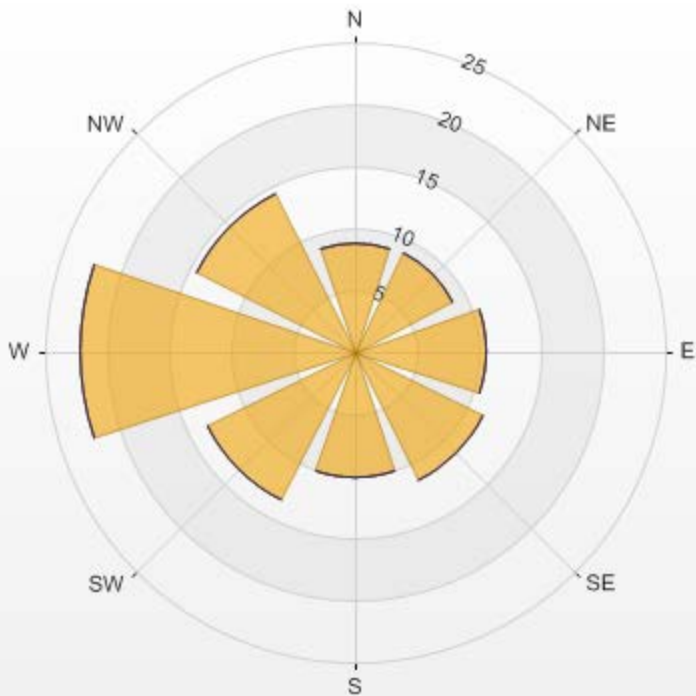
NUMBER OF NON-ZERO READINGS:	691
MAXIMUM INSTANTANEOUS VALUE:	17.3 PPB @ HOUR(S) 6 ON DAY(S) 9
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	7 HRS
STANDARD DEVIATION:	1.53
OPERATIONAL TIME:	743 HRS

NITROGEN DIOXIDE MAX instantaneous maximum in ppb



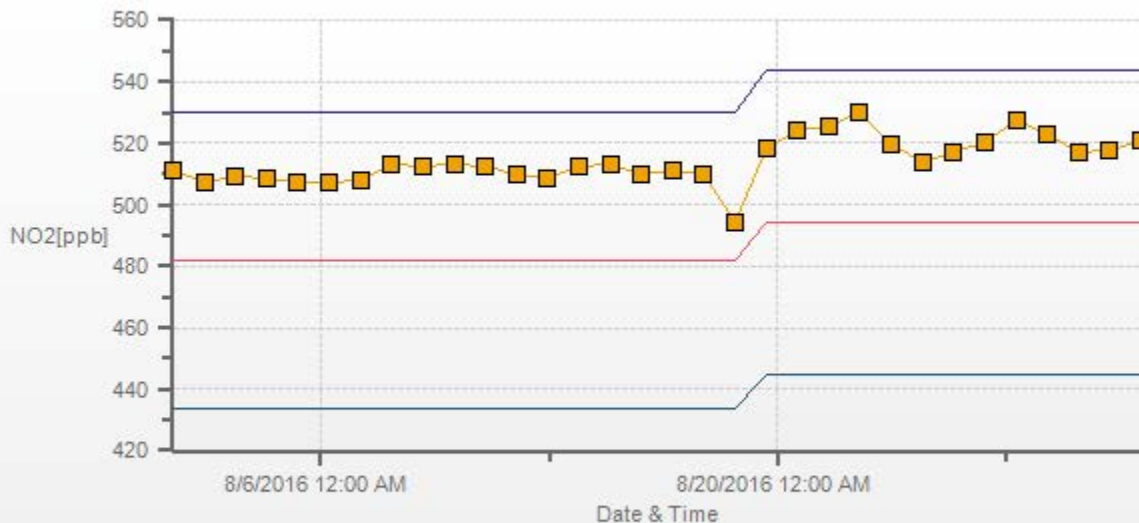
Wind: LICA ST. LINA Monitor: NO2 [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.14% Valid Data: 94.62% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	8.81	0	0	0	8.81
NE	8.95	0	0	0	8.95
E	10.65	0	0	0	10.65
SE	11.65	0	0	0	11.65
S	10.09	0	0	0	10.09
SW	13.35	0	0	0	13.35
W	22.16	0	0	0	22.16
NW	14.2	0	0	0	14.2
Summary	100	0	0	0	100



% Icon Classes (ppb)					
100		0.0-50.0	0		50.0-110.0
0		110.0-210.0	0		>210.0

NO2[ppb] Calibration: LICA ST. LINA Monthly: 08/2016 Type: Span



Span Meas Span Ref Span Low Span High

OZONE

OZONE (O₃) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY	DAY	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.
1	1	14.0	13.1	11.5	10.1	10.6	10.9	11.4	13.6	15.1	16.6	19.0	S	20.9	21.6	20.9	24.4	22.9	25.6	25.7	24.1	21.6	19.9	19.2	19.0	10.1	25.7	17.9	24
2	2	16.1	14.1	20.0	23.5	21.8	20.3	18.9	21.0	21.1	21.8	S	22.5	23.1	25.2	23.9	24.6	27.0	25.6	22.4	21.0	21.8	24.2	24.1	22.8	14.1	27.0	22.0	24
3	3	20.8	16.9	14.1	11.9	11.9	11.7	10.7	12.2	13.2	S	22.9	28.4	28.6	25.6	25.5	24.2	23.9	22.9	23.5	23.4	20.1	18.3	18.6	17.5	10.7	28.6	19.4	24
4	4	18.9	19.9	19.2	20.1	18.4	16.5	18.6	12.6	S	17.8	24.0	29.6	31.6	30.3	30.2	27.8	21.9	23.6	23.5	21.5	19.3	21.7	21.1	20.5	12.6	31.6	22.1	24
5	5	18.7	16.1	8.8	16.6	21.1	22.5	22.9	S	22.8	22.8	27.7	30.6	35.3	37.3	36.3	34.6	35.7	35.6	34.8	32.6	30.4	29.8	30.2	28.5	8.8	37.3	27.5	24
6	6	27.9	23.2	21.3	24.5	24.6	24.7	S	20.7	24.3	29.4	31.0	33.3	35.9	38.0	37.8	36.5	35.5	34.9	33.0	32.4	30.8	26.9	25.5	24.2	20.7	38.0	29.4	24
7	7	25.3	25.4	26.5	28.6	25.4	S	23.6	26.0	28.1	31.8	34.9	34.9	36.4	37.7	36.2	37.6	39.5	36.6	33.9	32.6	30.7	27.3	21.4	20.5	20.5	39.5	30.5	24
8	8	18.3	17.8	16.7	16.3	S	12.8	13.9	15.3	16.9	19.4	20.4	22.8	23.9	24.9	23.0	29.1	27.4	20.2	19.3	24.6	18.8	14.8	15.8	16.1	12.8	29.1	19.5	24
9	9	16.5	23.9	30.8	S	20.7	17.3	18.6	23.0	17.5	18.9	20.7	24.9	29.6	30.9	28.7	25.7	20.8	24.2	21.4	23.0	22.2	24.8	26.6	27.6	16.5	30.9	23.4	24
10	10	27.8	26.5	S	17.3	19.1	18.6	19.1	18.4	22.2	26.7	31.0	30.1	37.0	38.5	37.0	34.5	39.2	37.6	38.5	34.1	34.2	32.6	31.5	26.0	17.3	39.2	29.5	24
11	11	30.0	S	20.2	16.7	14.3	10.7	10.3	9.4	10.5	16.4	19.4	22.9	26.6	27.5	26.2	23.4	18.8	17.0	17.3	16.3	15.8	14.2	12.4	14.0	9.4	30.0	17.8	24
12	12	S	13.3	13.1	13.1	13.3	13.0	12.8	12.8	14.2	16.9	18.4	19.3	20.7	22.0	23.7	25.6	25.1	24.4	23.3	20.9	20.1	18.1	16.4	S	12.8	25.6	18.2	24
13	13	13.6	15.2	16.4	12.9	13.1	8.1	8.2	11.8	14.3	21.1	24.5	25.4	28.6	34.4	33.7	28.8	28.0	25.3	26.1	23.8	31.3	33.2	S	20.3	8.1	34.4	21.7	24
14	14	22.4	26.5	26.0	21.6	22.2	19.2	14.3	14.1	16.0	21.6	27.8	33.8	32.3	28.6	26.4	26.8	28.4	26.8	23.9	22.5	13.7	S	13.7	14.0	13.7	33.8	22.7	24
15	15	13.7	16.3	12.9	12.4	8.8	7.8	9.0	12.2	16.4	20.4	23.4	24.8	26.8	27.6	28.2	28.1	28.3	28.3	26.0	23.9	S	23.8	23.1	19.1	7.8	28.3	20.1	24
16	16	16.0	15.2	14.0	11.4	10.2	9.2	10.2	14.6	21.2	34.7	38.0	37.8	39.4	41.7	48.7	37.4	40.6	26.5	22.6	S	25.6	21.5	21.3	22.7	9.2	48.7	25.2	24
17	17	20.9	19.8	21.1	23.2	24.8	23.9	21.3	21.4	23.5	26.0	28.3	28.4	29.2	26.6	25.3	24.8	25.4	25.1	S	27.9	26.9	25.4	22.5	21.6	19.8	29.2	24.5	24
18	18	19.9	18.3	16.1	14.0	12.2	10.6	9.6	9.8	11.1	13.9	16.6	C	C	C	C	C	23.1	23.0	23.0	19.6	18.8	19.0	19.2	17.6	9.6	23.1	16.6	24
19	19	19.4	21.3	21.1	24.5	21.0	11.9	10.8	10.9	14.4	21.9	26.0	28.2	31.4	35.2	37.2	33.7	S	30.2	27.5	25.1	24.9	22.1	23.5	24.8	10.8	37.2	23.8	24
20	20	25.2	23.7	24.5	25.1	23.2	19.9	20.4	21.2	21.3	22.5	25.5	27.3	27.1	26.5	S	28.1	28.8	25.8	23.2	22.5	21.4	20.2	17.6	17.6	28.8	23.7	24	
21	21	17.2	18.5	18.6	19.7	24.5	21.7	17.2	16.9	18.8	22.8	24.5	28.5	30.5	29.4	S	26.5	26.5	28.0	20.4	18.7	18.8	16.2	13.0	12.7	12.7	30.5	21.3	24
22	22	14.7	17.5	19.6	18.7	21.3	19.7	20.0	21.7	22.7	22.9	24.2	21.8	17.9	S	23.6	25.8	29.1	34.8	34.3	24.0	18.2	18.2	19.5	15.6	14.7	34.8	22.0	24
23	23	17.7	18.1	15.5	14.4	14.3	15.5	17.1	17.6	18.2	18.0	18.2	20.6	S	24.2	24.1	21.9	21.0	19.9	23.1	24.4	24.2	25.9	21.3	17.3	14.3	25.9	19.7	24
24	24	16.1	17.2	16.2	14.1	13.1	12.0	11.2	10.6	12.8	16.2	19.6	S	29.7	29.9	30.8	31.8	31.8	28.2	26.5	25.9	22.5	23.3	25.8	21.5	10.6	31.8	21.2	24
25	25	17.3	17.0	18.8	16.5	14.3	13.1	12.8	13.1	12.8	16.0	S	16.1	17.2	16.6	19.4	20.8	21.2	19.5	18.0	16.6	16.8	16.4	14.5	12.5	12.5	21.2	16.4	24
26	26	11.2	9.4	9.2	10.9	14.8	14.5	9.9	5.8	6.5	S	20.5	20.3	20.7	20.8	22.5	24.1	26.6	27.9	26.9	24.0	23.7	21.8	20.3	19.9	5.8	27.9	17.9	24
27	27	19.3	19.5	19.2	18.4	16.8	17.6	17.7	18.4	S	21.2	22.0	22.4	20.8	21.5	18.6	18.2	16.0	15.5	13.1	12.3	10.5	12.3	20.0	20.5	10.5	22.4	17.9	24
28	28	13.7	11.0	10.5	9.9	14.2	18.9	20.5	S	21.4	21.6	23.0	23.8	25.6	28.4	28.7	28.0	26.3	24.8	23.5	20.8	19.9	18.5	18.3	17.0	9.9	28.7	20.4	24
29	29	17.3	17.0	17.8	15.5	16.4	19.0	S	12.7	14.0	20.7	23.2	24.7	24.9	25.5	25.3	25.8	29.4	30.4	24.8	22.2	22.2	21.6	20.9	21.7	12.7	30.4	21.4	24
30	30	19.4	19.1	19.0	16.1	12.1	S	11.8	14.4	16.3	19.0	21.3	23.5	24.9	26.2	27.0	26.5	24.9	26.0	23.2	20.8	19.0	19.0	18.5	17.9	11.8	27.0	20.3	24
31	31	17.0	16.0	15.4	15.4	S	15.9	14.4	13.9	11.2	13.0	18.3	24.3	29.7	32.3	33.9	35.9	34.7	33.6	31.3	29.5	28.1	26.3	25.6	24.6	11.2	35.9	23.5	24
HOURLY MAX		30.0	26.5	30.8	28.6	25.4	24.7	23.6	26.0	28.1	34.7	38.0	37.8	39.4	41.7	48.7	37.6	40.6	37.6	38.5	34.1	34.2	33.2	31.5	28.5				
HOURLY AVG		18.9	18.2	17.8	17.1	17.3	15.9	15.1	15.4	17.2	21.1	23.8	26.0	27.8	28.8	28.6	28.0	27.6	26.8	25.2	23.7	22.4	22.0	20.8	19.9				

STATUS FLAG CODES

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

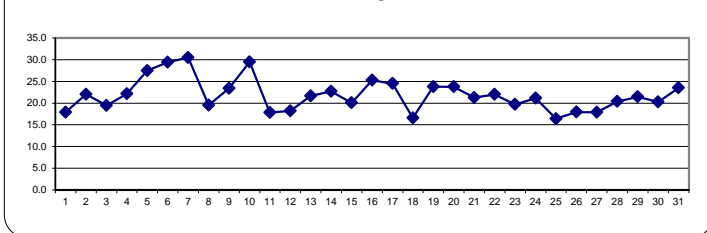
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 PPB

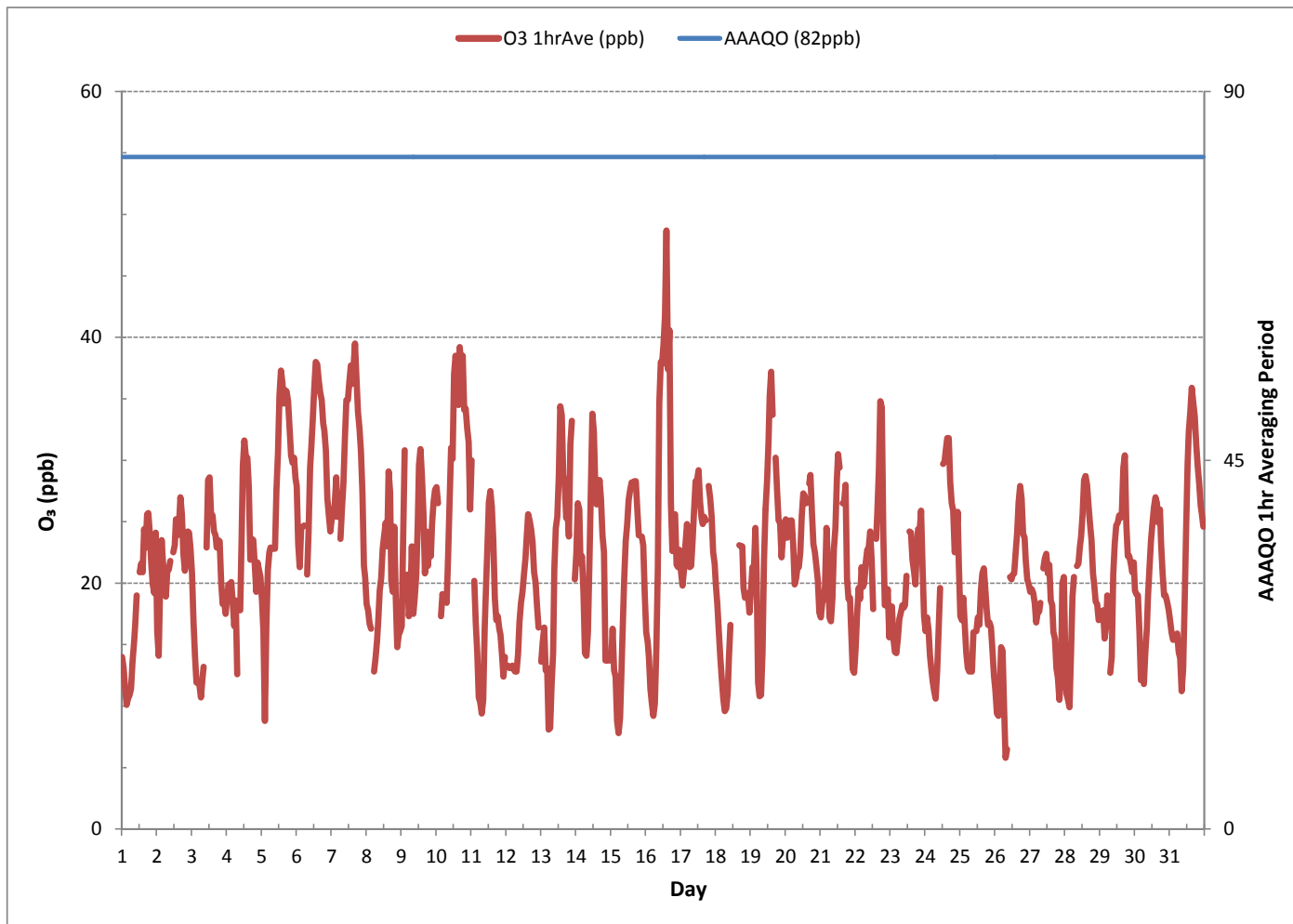
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	708		
MINIMUM 1-HR AVERAGE:	5.8 PPB	@ HOUR(S)	7 ON DAY(S) 26
MAXIMUM 1-HR AVERAGE:	48.7 PPB	@ HOUR(S)	14 ON DAY(S) 16
MAXIMUM 24-HR AVERAGE:	30.5 PPB		ON DAY(S) 7
			VAR-VARIOUS
I2S CALIBRATION TIME:	31 HRS	OPERATIONAL TIME:	744 HRS
MONTHLY CALIBRATION TIME:	5 HRS	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	6.83	MONTHLY AVERAGE:	21.9 PPB

24 HOUR AVERAGES FOR August 2016



OZONE (O₃) hourly averages in ppb





OZONE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	15.1	13.6	12.4	10.6	11.1	11.5	11.8	15.0	15.5	17.9	20.3	S	21.9	23.8	22.3	26.0	25.9	26.8	26.9	25.9	22.6	20.9	21.1	23.4	10.6	26.9	19.2	24	
2	17.8	17.0	21.9	24.9	23.9	21.4	20.6	21.8	21.7	22.7	S	23.4	25.1	26.9	26.4	25.8	29.6	28.6	23.4	22.0	24.3	25.5	25.2	24.0	17.0	29.6	23.6	24	
3	22.4	18.5	15.5	12.4	12.9	12.4	11.8	13.2	15.3	S	25.9	31.5	31.3	26.5	26.7	25.6	25.1	25.8	28.0	25.4	21.1	19.7	20.0	18.3	11.8	31.5	21.1	24	
4	19.6	21.4	21.1	22.5	19.9	20.1	21.8	14.2	S	20.5	28.1	33.7	33.8	31.5	32.5	30.0	25.4	25.4	26.3	23.7	23.7	23.7	21.7	21.4	14.2	33.8	24.4	24	
5	20.0	18.6	15.0	19.9	22.7	24.6	24.7	S	25.3	26.0	30.3	33.9	37.2	38.5	38.1	35.7	36.8	36.3	36.1	33.8	31.7	31.1	30.9	29.7	15.0	38.5	29.4	24	
6	28.7	25.4	23.7	24.9	25.8	26.0	S	22.6	28.8	30.9	31.9	35.1	38.0	39.0	39.4	37.6	36.6	36.0	36.0	33.1	32.9	29.5	29.9	26.4	22.6	39.4	31.2	24	
7	27.3	27.4	30.4	30.3	26.4	S	25.6	27.7	30.0	35.1	36.4	36.0	37.9	39.8	39.2	39.7	41.0	38.5	35.6	33.1	31.9	29.2	22.9	21.7	21.7	41.0	32.3	24	
8	20.3	18.7	17.9	17.3	S	14.5	15.9	16.9	19.8	20.4	21.9	24.2	25.6	26.1	28.3	30.9	30.8	24.1	22.0	26.9	23.4	21.3	19.7	19.9	14.5	30.9	22.0	24	
9	20.4	29.7	34.4	S	23.9	22.6	24.1	26.8	20.8	20.9	23.1	27.9	32.5	32.8	35.2	P	24.0	30.8	28.5	26.4	24.3	27.4	28.3	29.3	20.4	35.2	27.0	23	
10	29.3	28.0	S	19.4	20.5	20.0	20.2	20.5	25.4	31.3	38.8	35.9	40.0	42.1	40.2	37.6	40.9	40.1	41.4	37.1	37.5	35.9	35.6	33.7	19.4	42.1	32.7	24	
11	32.4	S	23.1	19.4	17.3	14.0	11.4	10.1	12.7	18.3	21.8	26.2	28.0	28.5	28.8	25.7	21.3	18.7	18.8	17.8	17.6	15.1	13.1	14.5	10.1	32.4	19.8	24	
12	S	14.0	13.6	14.2	14.1	13.3	13.3	13.6	16.2	17.9	19.6	20.6	22.0	23.0	25.3	27.1	26.1	25.0	25.0	22.0	21.0	19.6	16.9	S	13.3	27.1	19.2	24	
13	14.5	16.1	17.7	17.7	17.6	10.5	11.1	14.0	17.0	25.1	25.8	26.9	32.2	37.5	37.5	31.5	29.3	27.1	30.7	30.8	32.9	34.4	S	22.2	10.5	37.5	24.4	24	
14	28.5	29.2	30.8	23.4	23.8	23.0	17.2	15.2	19.6	26.3	31.2	38.1	36.2	30.8	28.3	27.9	31.8	31.3	26.1	25.6	23.9	S	14.7	16.5	14.7	38.1	26.1	24	
15	15.5	17.2	17.2	14.7	11.5	8.6	12.4	15.3	19.0	23.1	25.3	26.0	28.3	28.4	29.3	28.9	29.7	29.7	28.1	25.9	S	25.4	23.8	21.1	8.6	29.7	21.9	24	
16	17.4	15.7	15.1	12.4	10.6	10.2	13.6	16.5	27.1	42.5	41.0	39.1	41.7	51.5	54.4	40.6	47.2	31.2	24.4	S	26.8	24.1	22.2	23.4	10.2	54.4	28.2	24	
17	21.7	22.2	22.5	23.7	25.6	25.4	22.9	23.5	24.6	29.9	29.3	30.5	27.3	26.4	26.0	26.3	25.6	S	28.8	27.9	26.9	23.8	22.5	21.7	30.5	25.8	24		
18	21.2	19.1	17.6	15.5	13.6	11.8	10.5	11.2	12.8	17.4	18.1	C	C	C	C	C	25.0	27.1	21.3	20.0	21.5	20.5	18.9	10.5	27.1	18.0	24		
19	22.9	22.7	24.2	26.7	23.9	17.5	17.9	16.4	19.1	26.9	28.4	31.1	34.8	38.5	40.1	38.1	S	32.1	29.5	27.2	26.2	24.2	25.6	26.5	16.4	40.1	27.0	24	
20	27.7	26.0	26.0	26.3	26.4	25.4	24.4	22.2	23.7	23.1	25.6	28.0	29.3	29.7	28.8	S	30.3	37.0	34.7	27.6	25.4	23.0	22.1	20.3	20.3	37.0	26.7	24	
21	20.5	20.6	20.5	25.0	26.8	24.7	20.4	20.5	21.3	25.9	26.1	34.2	33.4	31.5	S	28.8	28.8	32.6	24.3	20.2	20.3	18.5	15.0	14.0	14.0	34.2	24.1	24	
22	16.1	19.9	21.3	20.8	23.5	21.3	21.5	23.8	24.2	24.7	25.9	24.2	21.4	S	24.9	30.3	32.6	37.2	39.2	29.1	21.8	20.7	22.8	20.0	16.1	39.2	24.7	24	
23	20.8	21.1	17.7	15.9	16.0	17.2	18.4	19.0	19.6	19.2	20.1	22.1	S	33.0	26.0	26.3	24.3	22.9	23.1	24.7	25.6	27.2	27.4	25.5	19.0	15.9	27.4	21.7	24
24	17.8	18.6	18.2	15.1	14.1	13.2	12.3	11.5	15.3	18.6	23.2	S	33.0	32.1	32.6	33.4	33.5	30.8	28.4	28.5	25.0	28.2	27.9	25.0	11.5	33.5	23.3	24	
25	19.0	18.6	20.1	19.0	15.7	14.6	14.2	14.2	14.6	18.2	S	17.4	19.7	18.5	23.8	23.7	22.9	21.7	20.2	18.5	18.1	17.5	16.4	13.8	13.8	23.8	18.3	24	
26	13.1	10.9	10.1	13.0	17.7	19.9	17.1	10.6	12.3	S	23.5	23.2	23.3	22.5	24.6	26.2	29.2	29.7	30.4	25.2	25.8	23.3	21.7	21.0	10.1	30.4	20.6	24	
27	20.2	20.8	20.5	19.5	18.2	18.8	19.0	20.4	S	22.6	23.9	24.2	23.8	23.4	22.2	20.2	19.0	17.5	16.1	15.6	12.6	18.3	22.6	23.4	12.6	24.2	20.1	24	
28	17.7	12.7	12.0	12.7	17.4	21.1	21.8	S	22.9	23.4	24.6	25.4	28.2	31.1	30.6	29.6	28.2	26.2	25.7	22.9	21.4	19.9	19.2	18.5	12.0	31.1	22.3	24	
29	18.7	18.4	19.9	19.1	19.4	20.5	S	17.8	18.6	24.3	25.0	26.7	26.4	27.0	27.0	27.4	32.5	33.5	29.5	23.9	23.7	23.2	23.0	23.5	17.8	33.5	23.9	24	
30	21.7	20.8	20.6	18.3	16.1	S	13.6	16.6	19.1	21.5	22.9	25.2	26.4	27.7	29.2	29.5	28.4	28.1	25.8	22.5	20.9	20.2	20.0	19.2	13.6	29.5	22.4	24	
31	18.6	17.1	17.4	17.3	S	18.5	16.0	17.8	13.8	17.0	20.2	28.7	32.4	34.6	35.7	37.2	36.4	36.0	32.8	31.5	29.7	27.7	27.2	26.4	13.8	37.2	25.7	24	
HOURLY MAX	32.4	29.7	34.4	30.3	26.8	26.0	25.6	27.7	30.0	42.5	41.0	39.1	41.7	51.5	54.4	40.6	47.2	40.1	41.4	37.1	37.5	35.9	35.6	33.7					
HOURLY AVG	20.9	20.0	19.9	19.1	19.2	18.0	17.4	17.5	19.9	23.8	26.1	28.5	30.1	30.9	31.2	30.2	30.1	29.4	28.2	25.9	24.7	24.1	22.6	21.9					

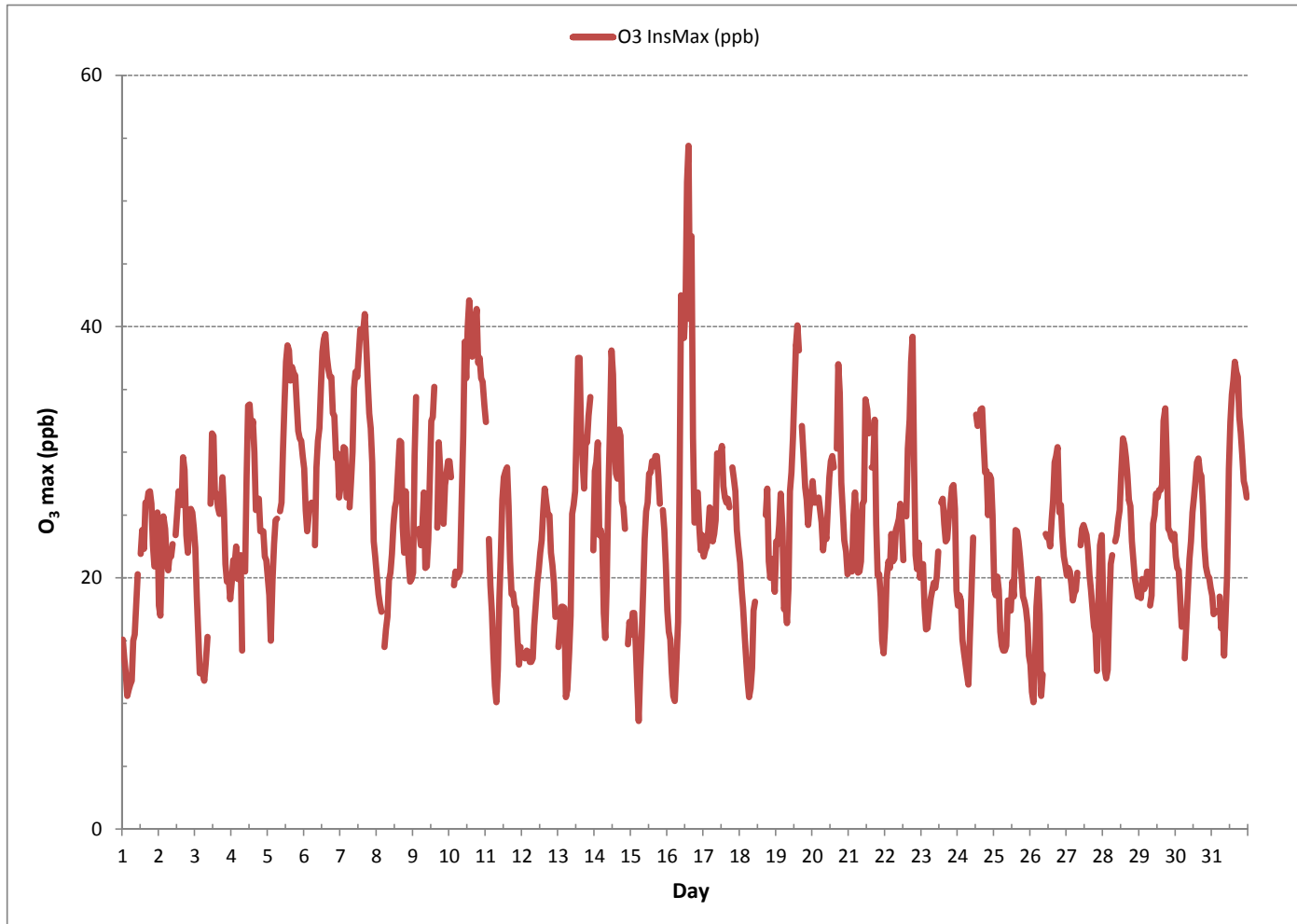
STATUS FLAG CODES

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

MONTHLY SUMMARY

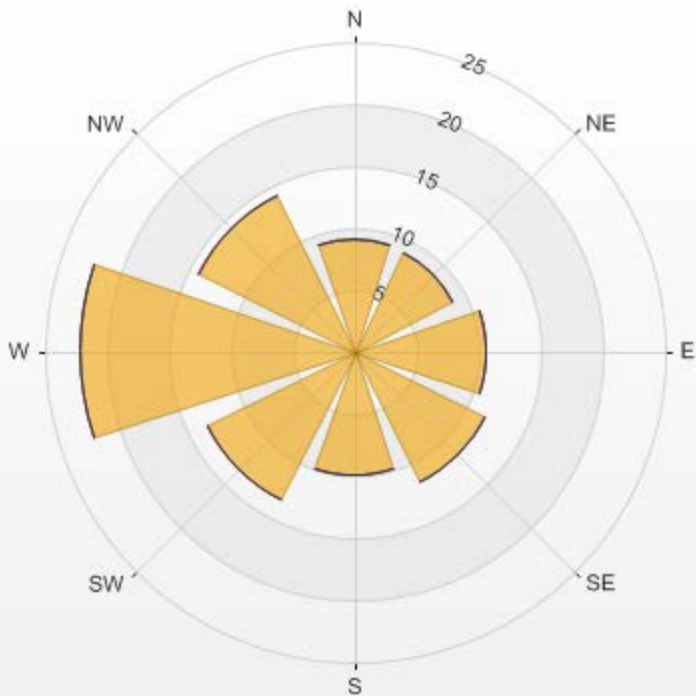
NUMBER OF NON-ZERO READINGS:	706
MAXIMUM INSTANTANEOUS VALUE:	54.4 PPB @ HOUR(S) 14 ON DAY(S) 16
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	6 HRS
STANDARD DEVIATION:	7.10
OPERATIONAL TIME:	743 HRS

OZONE MAX instantaneous maximum in ppb



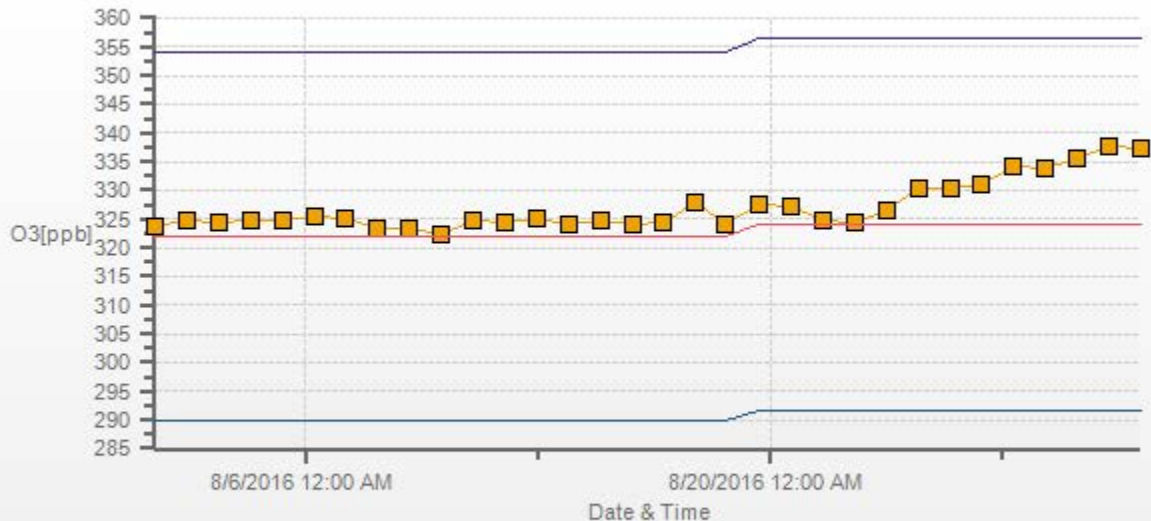
Wind: LICA ST. LINA Monitor: O3 [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.89% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	9.07	0	0	0	9.07
NE	8.92	0	0	0	8.92
E	10.62	0	0	0	10.62
SE	11.76	0	0	0	11.76
S	10.06	0	0	0	10.06
SW	13.31	0	0	0	13.31
W	22.1	0	0	0	22.1
NW	14.16	0	0	0	14.16
Summary	100	0	0	0	100



% Icon Classes (ppb)					
100	0.0-50.0	0	50.0-110.0	0	110.0-210.0
	0		>210.0		

O3[ppb] Calibration: LICA ST. LINA Monthly: 08/2016 Type: Span



Span Meas Span Ref Span Low Span High

PARTICULATE MATTER 2.5

PARTICULATE MATTER 2.5 (LESS THAN 2.5 MICRONS) (PM_{2.5}) hourly averages in µg/m³

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
DAY	HR	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.
1	1	0.0	0.9	6.9	0.9	1.9	2.9	1.9	5.4	0.9	0.9	5.9	5.9	3.4	0.9	0.4	5.0	1.4	0.0	5.0	1.4	1.4	0.4	7.9	5.9	0.0	7.9	2.8	24
2	2	0.0	0.4	3.4	1.4	3.4	4.0	5.9	0.4	1.5	2.9	6.9	3.0	5.4	6.9	5.0	4.0	5.4	5.9	4.0	4.0	1.9	0.9	0.4	0.0	0.0	6.9	3.2	24
3	3	2.9	6.4	5.0	3.4	3.4	2.4	6.9	2.4	6.4	2.4	5.0	5.9	7.9	1.9	5.4	3.4	4.5	7.9	7.5	0.0	3.5	5.0	5.0	5.4	0.0	7.9	4.6	24
4	4	5.0	5.4	5.9	3.4	4.5	5.9	4.5	1.4	1.5	4.0	1.5	3.5	5.9	4.0	4.5	1.9	6.9	5.0	4.0	3.5	0.0	5.0	8.0	5.9	0.0	8.0	4.2	24
5	5	7.5	6.9	2.9	5.9	6.9	5.0	2.9	3.4	7.5	2.4	1.4	9.0	4.0	0.9	3.4	7.9	5.0	6.9	7.5	11.4	X	1.9	4.5	0.0	0.0	11.4	5.0	23
6	6	7.9	7.5	6.4	2.9	6.4	5.9	0.0	4.5	4.0	0.0	2.4	5.9	2.4	4.0	5.4	4.5	5.0	1.4	4.0	7.9	X	14.0	X	7.9	0.0	14.0	5.0	22
7	7	2.9	3.5	4.0	0.0	7.5	X	4.0	2.9	6.4	1.9	6.4	4.5	2.9	0.0	6.4	2.4	4.5	5.0	12.5	3.5	8.4	9.9	0.4	0.0	12.5	4.4	23	
8	8	4.0	4.0	0.9	5.4	3.4	3.0	0.0	0.0	9.9	12.0	4.0	9.9	12.4	8.4	9.0	3.5	5.4	9.0	16.9	9.0	9.5	14.5	X	6.4	0.0	16.9	7.0	23
9	9	X	1.4	9.0	2.9	14.0	0.0	5.9	6.4	0.0	12.9	11.9	6.4	4.0	4.5	4.5	0.0	0.9	3.5	4.0	1.4	0.0	0.4	0.0	0.0	0.0	14.0	4.1	23
10	10	2.9	0.0	5.0	1.4	1.4	1.9	3.9	4.0	5.4	7.9	1.9	2.9	4.0	3.5	5.0	6.4	2.4	2.9	3.0	5.0	4.5	0.9	9.0	4.5	0.0	9.0	3.7	24
11	11	6.4	6.4	4.5	3.4	5.0	1.4	5.0	7.5	2.4	4.0	2.4	5.4	2.4	4.0	0.0	0.0	1.9	2.9	5.4	2.4	7.5	2.4	2.4	0.0	0.0	7.5	3.6	24
12	12	3.0	X	0.0	3.5	1.9	1.4	0.0	0.0	4.0	1.4	0.0	0.9	4.0	2.4	0.4	3.4	0.0	1.4	0.0	2.4	7.9	2.9	0.0	0.0	0.0	7.9	1.8	23
13	13	3.0	5.4	X	0.0	9.5	5.0	12.4	7.5	6.9	1.9	5.9	5.9	6.9	4.5	11.9	2.4	5.0	2.4	7.5	10.9	18.4	0.4	8.4	0.9	0.0	18.4	6.2	23
14	14	5.0	5.0	5.9	6.9	2.9	7.5	9.4	4.4	5.4	5.4	7.5	11.4	9.0	7.5	4.0	7.9	X	7.5	0.9	X	11.4	2.4	4.0	5.0	0.9	11.4	6.2	22
15	15	0.0	0.0	0.4	4.0	5.0	0.0	5.0	2.9	9.9	9.9	9.5	3.9	5.0	6.4	4.5	1.9	3.5	0.4	4.5	4.5	1.4	5.4	11.9	2.9	0.0	11.9	4.3	24
16	16	4.5	5.0	8.4	5.4	6.9	6.4	5.4	8.5	9.9	11.9	10.9	6.4	12.4	14.9	C	C	C	9.4	6.9	4.4	1.9	4.0	3.4	4.0	1.9	14.9	7.2	24
17	17	4.5	5.0	5.0	5.0	2.5	5.9	4.5	0.4	1.5	0.0	5.4	0.0	0.9	2.4	3.5	0.0	2.4	2.4	7.9	2.9	1.9	3.0	4.0	3.0	0.0	7.9	3.1	24
18	18	0.0	4.5	2.0	3.0	4.0	2.4	7.5	9.0	3.0	4.0	3.5	5.4	3.9	0.9	0.0	0.0	0.0	0.0	5.4	3.4	2.9	1.9	2.9	0.9	0.0	9.0	2.9	24
19	19	X	1.4	0.9	3.9	0.9	1.4	0.4	0.0	0.0	2.9	2.4	2.4	X	X	4.0	5.0	0.4	0.0	1.9	1.9	5.0	3.4	3.4	0.0	0.0	5.0	2.0	21
20	20	4.0	2.4	3.9	4.0	1.4	4.5	4.0	2.4	0.0	4.5	5.4	1.9	0.0	2.9	2.4	2.9	2.9	5.9	9.5	4.0	2.9	4.5	4.5	5.0	0.0	9.5	3.6	24
21	21	1.5	3.5	2.4	0.0	3.5	1.9	4.0	3.5	0.0	1.9	1.4	X	0.0	0.0	4.5	0.0	0.0	8.4	6.9	0.0	4.0	4.0	3.0	6.4	0.0	8.4	2.6	23
22	22	4.5	0.0	X	X	X	X	X	X	X	X	C	C	C	2.4	4.5	1.9	9.9	2.4	0.0	2.9	3.5	2.9	5.4	6.4	0.0	9.9	3.6	16
23	23	1.9	5.0	4.5	2.4	5.0	5.9	4.0	2.9	2.9	0.0	5.4	5.4	3.5	4.5	3.9	1.9	4.5	4.0	1.9	2.4	2.9	1.4	1.9	0.9	0.0	5.9	3.3	24
24	24	0.9	2.4	1.4	1.4	3.5	3.9	2.9	2.9	5.9	3.9	3.9	2.4	7.9	6.9	5.4	2.9	5.4	5.4	2.4	1.4	0.9	0.0	0.4	3.5	0.0	7.9	3.2	24
25	25	3.0	0.0	1.9	0.4	2.9	5.0	1.9	6.4	1.9	0.0	1.5	2.9	0.0	2.4	1.9	3.4	4.0	2.4	2.4	1.4	1.9	2.4	3.9	6.9	0.0	6.9	2.5	24
26	26	4.5	4.0	3.4	4.4	5.4	3.5	2.9	3.9	1.9	2.9	5.0	2.4	1.4	3.4	3.4	0.9	0.4	4.5	5.0	0.4	1.5	3.4	1.4	3.4	0.4	5.4	3.1	24
27	27	6.9	2.9	2.4	3.4	7.5	4.4	0.4	4.4	4.4	2.9	3.9	6.4	3.4	2.9	5.4	4.0	5.4	4.5	5.4	5.0	3.4	6.4	3.4	1.9	0.4	7.5	4.2	24
28	28	5.0	3.4	5.0	0.0	3.5	0.0	4.4	0.0	1.5	0.4	2.4	0.0	1.9	2.4	1.9	1.4	0.9	6.4	1.4	2.9	0.0	0.0	0.0	0.9	0.0	6.4	1.9	24
29	29	0.0	0.9	2.4	4.0	2.4	0.9	3.4	2.9	4.4	0.0	0.4	0.4	0.0	2.4	3.4	0.9	2.9	2.4	1.9	0.4	1.4	1.4	0.9	2.4	0.0	4.4	1.8	24
30	30	5.0	1.4	2.9	1.4	0.9	1.9	3.4	0.0	0.0	0.0	0.9	2.4	0.0	3.0	0.9	4.5	2.4	3.4	1.9	2.4	4.0	5.0	3.5	0.9	0.0	5.0	2.2	24
31	31	4.0	0.0	1.5	0.0	2.9	1.9	3.9	1.9	1.4	1.9	3.4	0.0	2.4	9.4	5.9	3.9	6.4	5.0	9.9	4.5	8.4	6.9	7.9	6.9	0.0	9.9	4.2	24
HOURLY MAX		7.9	7.5	9.0	6.9	14.0	7.5	12.4	9.0	9.9	12.9	11.9	11.4	12.4	14.9	11.9	7.9	9.9	9.4	16.9	12.5	18.4	14.5	11.9	7.9				
HOURLY AVG		3.5	3.2	3.7	2.8	4.3	3.3	4.0	3.4	3.7	3.6	4.3	4.2	4.0	4.0	4.0	2.9	3.3	4.1	4.8	4.0	3.9	3.9	4.2	3.3				

STATUS FLAG CODES

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

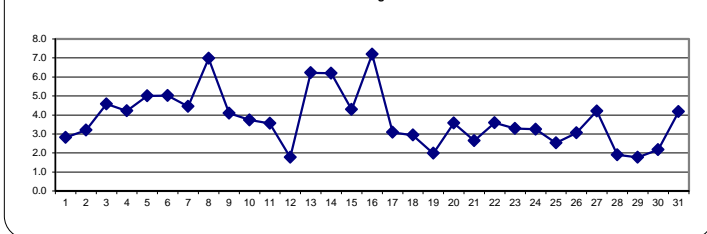
OBJECTIVE LIMIT:

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

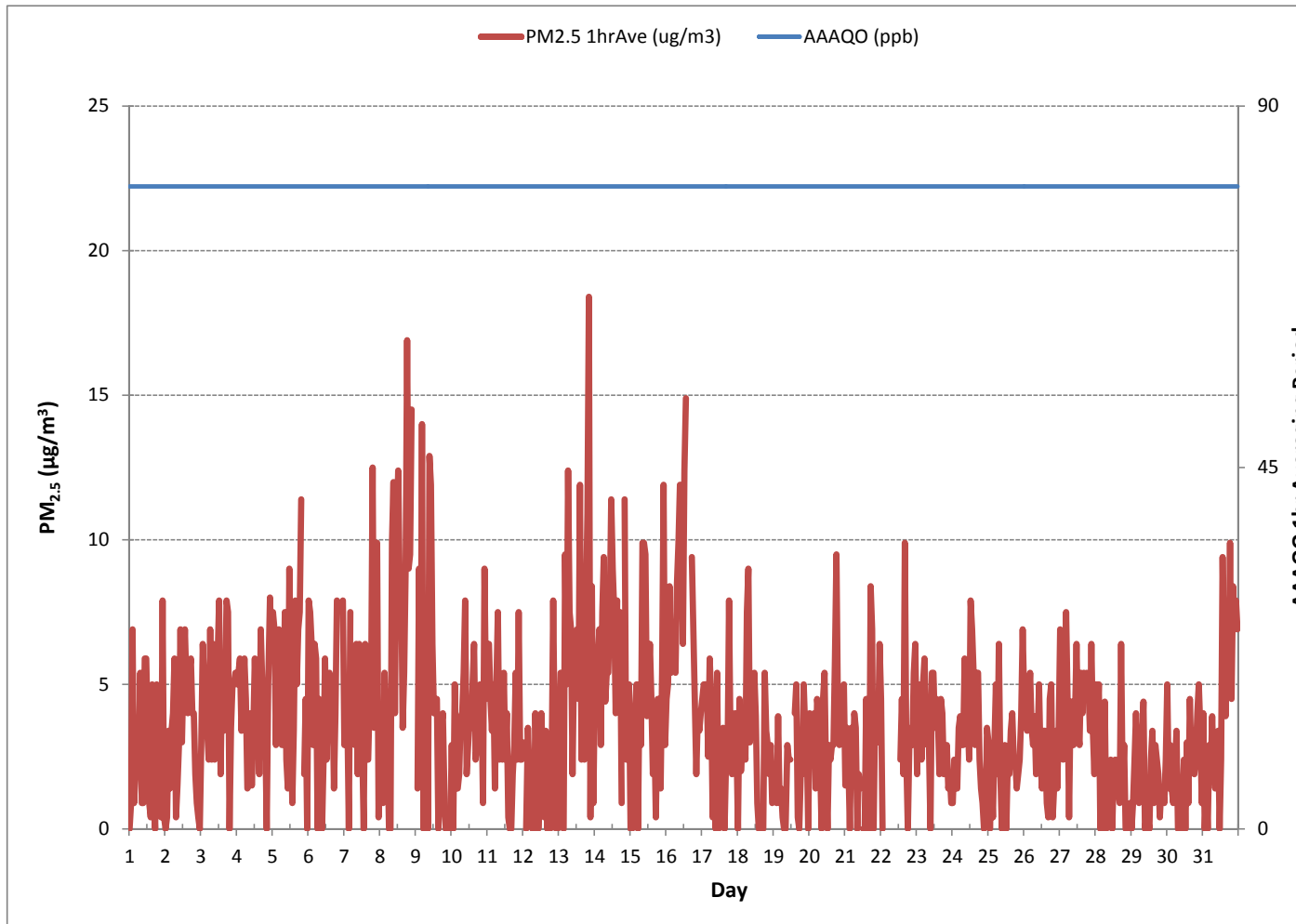
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	637			
MINIMUM 1-HR AVERAGE:	0.0 µg/m ³ @ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	18.4 µg/m ³ @ HOUR(S)	20	ON DAY(S)	13
MAXIMUM 24-HR AVERAGE:	7.2 µg/m ³		ON DAY(S)	16
			VAR-VARIOUS	
MONTHLY CALIBRATION TIME:	6 HRS	OPERATIONAL TIME:	722 HRS	
		AMD OPERATION UPTIME:	97.0 %	
STANDARD DEVIATION:	2.90	MONTHLY AVERAGE:	3.8 µg/m ³	

24 HOUR AVERAGES FOR August 2016

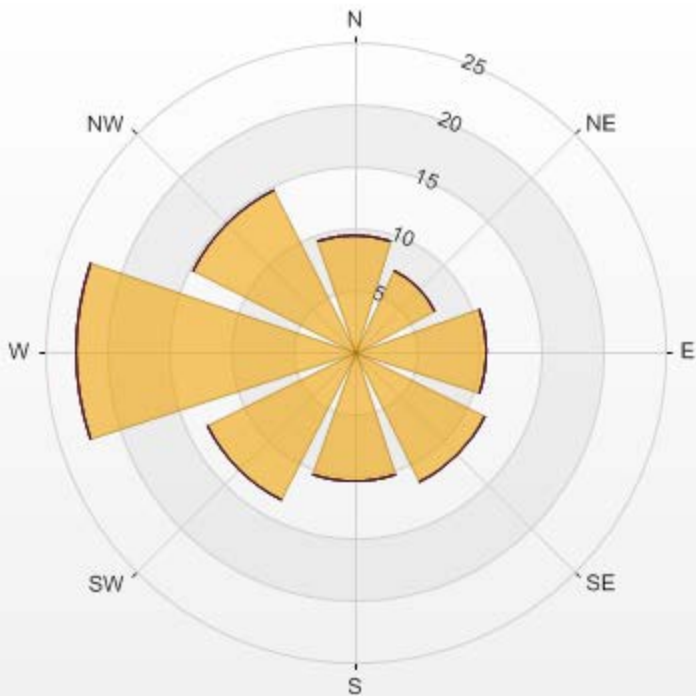


PARTICULATE MATTER 2.55 (LESS THAN 2.5 MICRONS) (PM_{2.5}) hourly averages in $\mu\text{g}/\text{m}^3$



Wind: LICA ST. LINA Monitor: PM2.5 [ug/m3(L)] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.83% Calm Avg: 0.00

Direction	0.0-30.0	30.0-60.0	60.0-80.0	80.0-120.0	120.0-240.0	>240.0	Total
N	9.4	0	0	0	0	0	9.4
NE	7.29	0	0	0	0	0	7.29
E	10.66	0	0	0	0	0	10.66
SE	11.78	0	0	0	0	0	11.78
S	10.52	0	0	0	0	0	10.52
SW	13.32	0	0	0	0	0	13.32
W	22.44	0	0	0	0	0	22.44
NW	14.59	0	0	0	0	0	14.59
Summary	100	0	0	0	0	0	100



% Icon Classes (ug/m3(L))	100	0	0	0	0	0
0.0-30.0	30.0-60.0	60.0-80.0	80.0-120.0	120.0-240.0	>240.0	

WIND SPEED

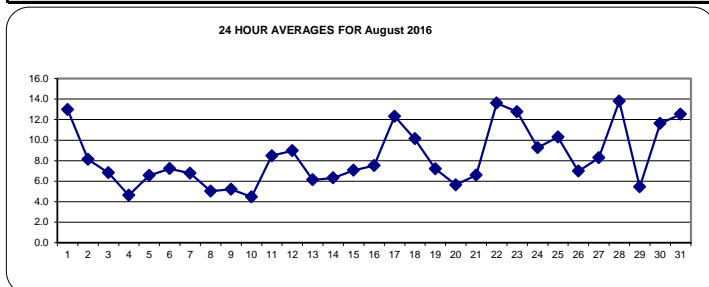
WIND SPEED (WS) hourly averages in kph

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR				
DAY	MIN.	MAX.	AVG.	RDGS.																									MIN.	MAX.	AVG.	RDGS.
1	10.0	10.9	10.5	9.9	12.3	10.7	12.5	13.8	13.6	15.4	19.3	20.3	21.2	16.8	13.0	14.3	16.5	14.5	14.5	10.6	9.0	10.5	6.0	5.2	5.2	21.2	13.0	24				
2	7.3	11.7	11.9	10.6	9.7	9.8	8.4	7.8	8.1	9.0	8.9	9.8	10.4	10.8	9.2	8.0	8.1	6.4	5.5	2.8	4.6	6.1	5.1	5.2	2.8	11.9	8.1	24				
3	6.1	7.9	6.6	7.4	7.5	6.7	5.4	4.8	4.8	6.6	6.1	6.8	6.8	8.3	8.5	8.0	9.5	5.7	7.9	6.3	4.8	8.7	6.6	5.7	4.8	9.5	6.8	24				
4	6.7	6.8	5.2	6.3	7.0	3.8	4.0	5.4	5.0	3.5	1.9	4.5	1.9	1.7	3.0	7.9	3.1	7.8	2.4	5.0	4.4	4.9	4.8	3.9	1.7	7.9	4.6	24				
5	0.7	5.0	3.3	5.5	6.4	7.1	4.7	2.5	4.5	3.4	4.8	5.8	7.8	7.8	8.8	8.5	8.5	9.4	7.5	6.7	8.9	10.8	10.2	9.1	0.7	10.8	6.6	24				
6	7.9	7.7	8.5	9.4	8.8	8.0	6.1	4.9	6.3	6.9	8.5	9.3	8.4	8.3	7.5	6.9	8.6	5.8	4.7	5.5	6.2	7.0	6.0	5.9	4.7	9.4	7.2	24				
7	7.4	6.8	6.2	6.8	6.5	5.5	4.8	4.2	4.2	6.1	8.0	8.3	8.1	9.2	9.0	8.8	10.8	8.3	6.2	5.2	5.3	3.7	6.6	6.4	3.7	10.8	6.8	24				
8	6.1	5.7	4.9	5.1	5.0	6.4	6.2	5.8	7.0	4.7	4.2	5.0	6.8	3.3	4.8	8.9	4.3	1.3	6.7	7.1	3.5	3.8	1.8	2.1	1.3	8.9	5.0	24				
9	3.9	3.3	2.2	3.9	4.7	4.4	2.5	3.9	3.0	6.8	8.9	10.4	11.1	10.3	0.9	2.7	5.5	3.6	4.3	5.9	6.4	5.3	6.0	5.2	0.9	11.1	5.2	24				
10	6.7	6.9	4.0	5.4	5.5	6.0	4.3	2.8	3.4	2.1	1.0	3.3	2.9	2.5	4.4	7.1	5.8	7.2	4.5	4.0	3.8	3.2	4.5	5.7	1.0	7.2	4.5	24				
11	6.4	6.4	5.5	4.5	4.3	4.4	6.5	7.9	6.9	9.4	10.6	10.8	12.0	11.8	14.6	14.5	10.1	7.4	6.5	7.5	8.2	8.5	8.7	10.1	4.3	14.6	8.5	24				
12	7.7	9.8	9.5	10.6	10.2	10.3	8.1	7.2	6.1	8.1	9.1	9.1	10.7	10.3	11.9	11.6	12.2	12.0	7.6	5.6	7.0	6.4	6.9	7.1	5.6	12.2	9.0	24				
13	7.7	8.4	9.0	7.6	7.0	5.1	4.4	3.8	3.4	4.1	3.3	4.5	4.8	6.8	11.5	8.1	7.2	4.5	5.8	6.6	7.5	6.5	3.7	6.0	3.3	11.5	6.1	24				
14	5.4	5.8	6.6	5.5	5.1	4.1	5.4	2.9	3.7	1.5	2.4	3.6	2.7	9.1	10.4	11.9	10.8	13.3	5.7	4.4	5.3	8.5	8.8	8.8	1.5	13.3	6.3	24				
15	9.7	10.0	8.8	7.2	5.1	6.5	5.5	5.5	5.4	4.3	7.6	8.3	10.7	9.0	8.8	9.8	8.1	5.5	5.1	4.0	5.2	6.8	6.5	6.1	4.0	10.7	7.1	24				
16	6.2	5.8	6.0	5.0	5.1	6.0	5.5	4.4	5.2	6.1	9.2	11.9	11.7	13.4	9.3	9.9	11.3	8.5	6.8	5.0	7.5	6.3	6.8	7.4	4.4	13.4	7.5	24				
17	10.1	9.5	10.9	11.3	10.7	9.1	9.9	10.3	8.2	9.0	12.5	14.1	15.4	15.0	17.0	17.1	17.6	18.7	14.5	10.7	9.7	11.1	11.6	11.7	8.2	18.7	12.3	24				
18	11.2	11.1	11.1	10.4	10.2	9.6	10.3	10.0	10.7	12.7	15.0	15.7	14.3	12.1	14.7	13.3	8.4	8.6	10.5	6.0	6.5	6.4	4.3	0.0	0.0	15.7	10.1	24				
19	6.1	7.4	7.6	6.5	6.1	5.2	4.8	4.7	4.5	7.0	10.7	9.0	7.6	9.9	7.7	8.4	9.4	10.6	7.3	6.1	6.0	6.0	7.1	7.3	4.5	10.7	7.2	24				
20	7.0	5.9	2.5	2.1	5.2	5.6	4.4	4.3	2.7	5.3	5.2	5.1	6.9	6.5	4.5	6.8	4.5	5.3	6.4	9.1	9.2	8.5	5.7	6.7	2.1	9.2	5.6	24				
21	6.8	6.5	8.6	10.5	7.6	6.0	6.1	4.1	6.9	8.7	6.4	5.6	5.4	5.8	4.3	3.8	4.0	2.8	3.5	4.9	6.4	8.7	11.2	13.5	2.8	13.5	6.6	24				
22	7.8	11.6	16.0	15.5	17.7	18.1	20.1	22.3	23.9	22.7	19.8	16.5	11.0	13.7	17.6	11.7	9.3	5.5	3.7	7.5	8.6	8.7	8.0	9.2	3.7	23.9	13.6	24				
23	12.7	11.9	13.8	14.6	14.8	13.5	15.3	15.6	14.4	13.1	14.9	16.3	16.2	15.0	14.7	13.6	11.7	10.9	9.5	7.8	8.6	8.2	8.3	10.6	7.8	16.3	12.8	24				
24	10.2	11.4	9.7	9.8	10.5	10.6	10.7	8.9	7.7	C	C	C	8.3	8.4	8.8	7.3	9.3	7.0	6.3	11.1	7.9	11.8	8.6	10.3	6.3	11.8	9.3	24				
25	10.0	11.0	15.5	12.8	11.1	10.9	10.8	11.6	11.2	12.5	12.6	11.2	9.8	9.8	10.0	10.8	11.9	9.8	8.1	6.5	7.0	7.1	7.2	8.2	6.5	15.5	10.3	24				
26	8.2	8.2	10.3	6.9	6.5	3.1	2.6	3.1	3.8	4.6	5.4	4.8	5.6	6.0	5.9	8.3	8.8	9.0	7.2	8.9	9.3	10.5	10.3	10.2	2.6	10.5	7.0	24				
27	9.9	10.6	10.2	10.5	9.5	8.2	7.9	10.6	12.5	12.8	11.4	7.3	4.2	3.7	3.1	5.0	5.8	5.3	4.7	5.0	6.4	12.8	11.5	9.9	3.1	12.8	8.3	24				
28	10.1	13.9	11.5	15.2	17.3	17.4	17.3	18.4	17.6	17.9	18.5	19.0	17.8	16.8	14.1	14.6	13.6	10.4	9.3	6.6	8.1	8.2	8.8	8.4	6.6	19.0	13.8	24				
29	8.1	7.5	6.4	5.4	3.7	4.9	1.0	2.7	2.9	3.7	3.4	3.2	3.3	4.2	5.1	5.9	5.6	4.7	5.5	6.5	7.9	9.2	10.0	9.7	1.0	10.0	5.4	24				
30	10.2	11.1	10.2	8.8	10.3	10.2	11.3	12.0	9.9	11.9	11.2	13.2	14.4	12.7	12.3	11.4	12.6	13.5	12.7	13.3	13.0	11.4	11.1	10.4	8.8	14.4	11.6	24				
31	12.3	11.4	10.4	11.1	15.7	16.8	11.9	3.4	5.4	7.7	7.0	11.9	17.0	17.7	18.4	18.2	12.7	13.2	14.4	14.9	13.6	12.3	12.2	10.8	3.4	18.4	12.5	24				
HOURLY MAX	12.7	13.9	16.0	15.5	17.7	18.1	20.1	22.3	23.9	22.7	19.8	20.3	21.2	17.7	18.4	18.2	17.6	18.7	14.5	14.9	13.6	12.8	12.2	13.5								
HOURLY AVG	8.0	8.6	8.5	8.5	8.6	8.2	7.7	7.4	7.5	8.3	8.9	9.5	9.5	9.6	9.5	9.8	9.2	8.3	7.3	7.0	7.3	8.0	7.6	7.6								

STATUS FLAG CODES

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

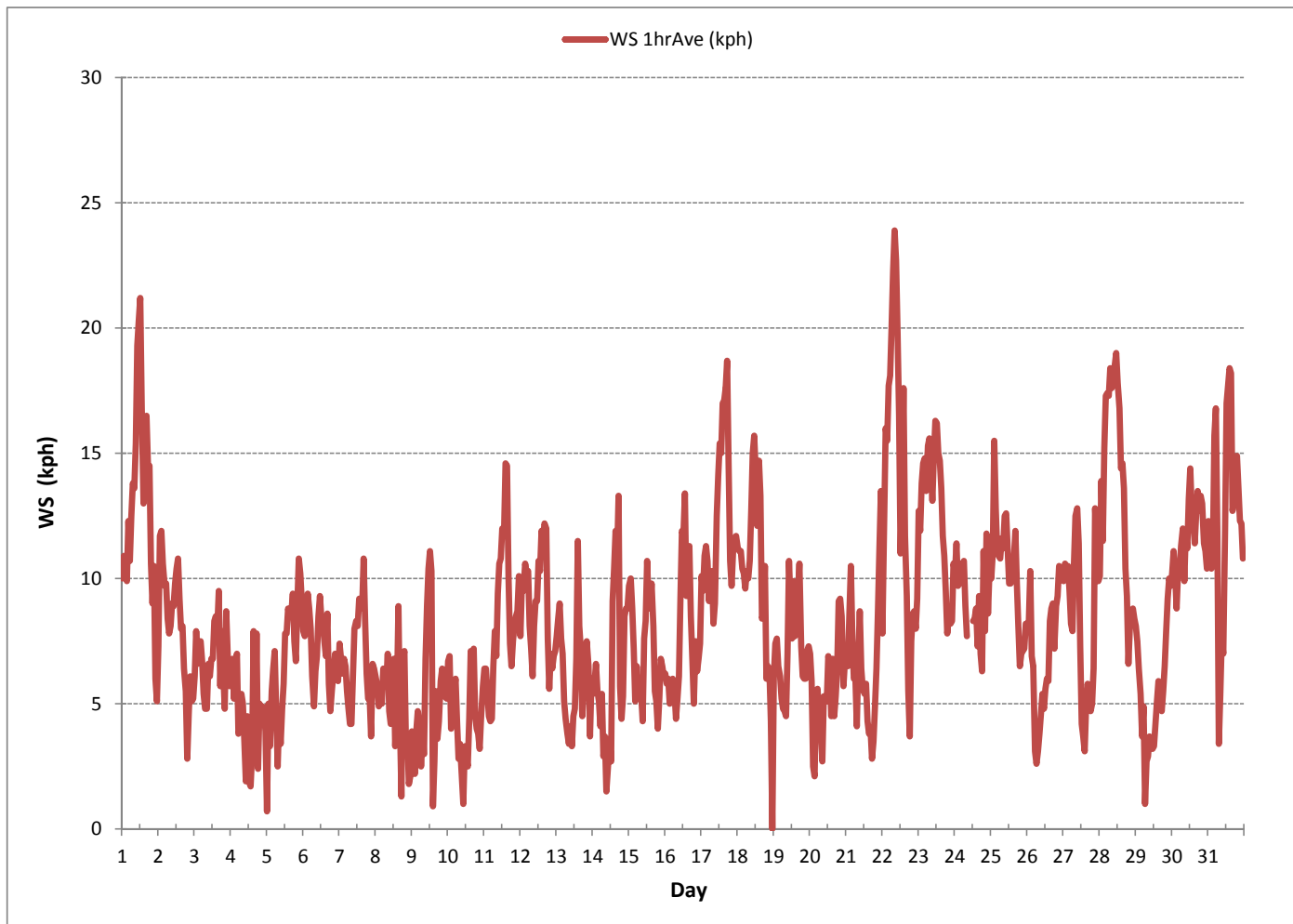
LAST CALIBRATION:	July 7, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	740
MINIMUM 1-HR AVERAGE:	0.0 kph @ HOUR(S) 23 ON DAY(S) 18
MAXIMUM 1-HR AVERAGE:	23.9 kph @ HOUR(S) 8 ON DAY(S) 22
MAXIMUM 24-HR AVERAGE:	13.8 kph ON DAY(S) 28
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	3 HRS
OPERATIONAL TIME:	744 HRS
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3.87
MONTHLY AVERAGE:	8.3 kph

WIND SPEED (WS) hourly averages in kph





VECTOR WIND SPEED MAX instantaneous maximum in kph

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
HOURLY MAX	HOURLY AVG	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.
DAY																													
1		16.7	16.5	17.1	17.1	20.6	21.5	27.2	28.0	27.6	42.4	55.9	53.3	62.3	50.9	37.3	66.3	48.0	37.1	40.8	23.7	18.5	16.5	29.0	12.1	12.1	66.3	32.8	24
2		11.5	22.6	22.0	20.7	14.8	16.7	17.3	16.6	19.9	19.6	21.1	26.2	26.7	32.6	26.2	23.1	22.2	24.7	19.9	8.1	7.3	9.5	9.4	11.7	7.3	32.6	18.8	24
3		10.9	13.7	10.7	12.6	12.5	12.6	17.5	13.0	15.0	19.7	16.8	21.0	29.9	28.2	26.4	21.4	34.1	35.6	35.1	15.7	12.3	20.5	15.0	13.9	10.7	35.6	19.3	24
4		12.8	13.2	11.3	13.7	13.2	12.1	11.5	14.3	13.0	11.9	14.8	15.0	11.6	11.6	13.9	48.1	9.5	14.5	7.6	8.9	8.2	7.1	8.6	10.4	7.1	48.1	13.2	24
5		5.9	7.8	7.6	8.3	8.9	10.6	10.2	7.8	14.4	14.4	18.0	26.2	26.0	23.6	27.8	22.7	25.4	26.2	21.2	13.5	17.2	22.0	19.2	15.9	5.9	27.8	16.7	24
6		15.7	13.9	17.4	17.9	15.9	16.4	14.4	12.5	18.4	20.1	24.2	31.5	25.2	28.7	28.6	22.5	22.1	18.4	12.2	9.1	10.9	10.5	11.4	9.8	9.1	31.5	17.8	24
7		11.4	10.6	10.2	10.2	9.5	9.2	9.8	12.7	10.2	18.6	26.7	22.3	23.4	26.8	24.2	22.9	28.8	24.7	15.5	10.4	9.6	19.9	16.3	13.7	9.2	28.8	16.6	24
8		14.8	14.6	10.8	8.7	10.3	15.2	17.2	17.9	18.8	15.9	13.5	21.6	27.6	15.5	19.6	30.6	15.9	6.4	16.9	18.9	13.7	7.4	12.3	5.2	5.2	30.6	15.4	24
9		6.3	6.3	4.3	7.5	8.8	11.0	11.5	12.8	12.3	17.2	30.5	24.2	34.1	27.3	35.3	P	14.8	13.4	21.6	24.4	16.5	12.8	14.3	11.0	4.3	35.3	16.4	23
10		12.2	14.6	14.9	11.0	12.8	16.6	11.5	8.6	12.2	8.5	14.6	12.0	11.6	11.4	14.0	18.8	17.2	19.9	13.3	7.4	7.6	6.1	9.1	11.1	6.1	19.9	12.4	24
11		10.9	10.1	11.5	9.1	6.0	9.7	13.4	19.8	17.6	27.3	31.3	27.3	33.0	32.1	38.5	38.4	26.1	16.6	15.7	22.4	18.5	16.7	21.1	22.9	6.0	38.5	20.7	24
12		19.1	23.9	19.6	20.0	20.6	18.7	18.1	18.4	16.7	20.7	25.5	29.1	29.0	36.0	38.2	32.7	31.0	29.3	22.0	10.8	10.6	10.2	9.3	9.1	9.1	38.2	21.6	24
13		9.5	11.1	11.8	11.5	12.1	7.5	7.4	9.8	8.5	11.8	18.4	23.0	22.5	24.7	29.3	24.9	19.0	15.9	16.8	26.8	17.4	16.3	17.2	16.8	7.4	29.3	16.3	24
14		8.3	10.4	12.6	11.1	11.3	12.5	10.5	10.4	11.1	13.7	13.3	15.5	15.5	23.3	24.5	28.0	72.0	43.5	25.4	8.6	16.2	16.0	14.9	13.4	8.3	72.0	18.4	24
15		14.5	15.8	14.5	13.2	12.8	13.2	10.4	15.8	11.8	12.6	18.2	24.3	33.9	26.8	32.1	27.5	24.5	14.2	11.9	6.1	8.2	10.9	10.0	10.9	6.1	33.9	16.4	24
16		12.2	10.6	10.6	9.1	10.2	11.5	11.5	10.9	15.5	15.3	26.6	30.7	33.5	40.6	29.0	29.4	52.6	23.1	18.9	14.3	15.2	14.5	12.1	11.7	9.1	52.6	19.6	24
17		18.7	21.3	19.3	18.7	20.0	20.1	16.7	20.3	23.4	31.7	33.9	45.4	41.2	47.0	49.5	52.8	55.0	45.0	26.3	24.1	23.5	25.3	24.9	16.7	16.7	55.0	30.2	24
18		24.8	23.8	22.6	24.7	25.0	22.4	23.5	26.4	27.0	33.7	40.5	41.0	40.8	42.4	41.9	44.2	38.3	27.1	37.4	16.0	14.9	17.8	10.2	3.4	3.4	44.2	27.9	24
19		11.0	13.4	13.8	11.9	12.1	7.3	7.1	9.7	10.8	18.3	22.0	19.2	19.8	23.6	26.2	28.6	30.0	30.4	20.5	12.8	12.6	13.2	16.2	16.8	7.1	30.4	17.0	24
20		12.4	10.7	9.1	4.7	11.1	11.4	11.0	12.6	11.1	14.4	17.3	17.7	19.9	23.2	15.7	18.7	14.8	15.5	15.7	32.9	24.3	21.4	15.5	18.1	4.7	32.9	15.8	24
21		16.8	16.8	14.1	19.4	19.6	11.7	10.9	9.9	15.2	17.8	18.8	15.3	18.1	19.4	15.3	18.7	16.3	8.1	8.3	10.0	13.9	23.4	29.9	29.9	8.1	29.9	16.6	24
22		46.1	33.4	43.9	45.2	44.7	45.2	52.4	59.2	59.0	66.4	56.1	46.3	33.8	40.4	55.0	45.4	29.5	19.7	12.2	25.7	23.1	20.9	23.1	32.1	12.2	66.4	40.0	24
23		37.5	34.9	35.3	40.8	43.8	38.1	41.0	48.8	43.1	38.8	48.4	48.6	49.2	47.3	49.7	43.4	37.1	34.3	31.8	25.0	20.0	17.2	17.8	23.3	17.2	49.7	37.3	24
24		21.9	25.9	27.9	19.1	20.2	20.8	22.4	23.9	17.0	C	C	C	25.8	27.3	28.7	23.1	23.2	18.1	35.9	37.3	19.2	31.9	16.1	16.8	16.1	37.3	23.9	24
25		15.6	18.7	24.5	20.6	18.5	21.8	26.6	29.0	27.1	34.3	28.5	31.4	26.4	26.5	25.1	33.6	28.6	24.5	22.9	15.1	15.5	15.3	15.2	14.4	14.4	34.3	23.3	24
26		14.1	15.2	19.5	15.5	9.2	7.0	5.3	7.2	9.6	12.3	16.0	15.8	16.7	23.7	19.9	23.8	24.3	19.9	13.5	17.7	20.4	19.3	18.6	18.1	5.3	24.3	15.9	24
27		18.8	20.0	18.6	17.2	18.8	17.7	19.8	22.2	29.2	30.0	27.1	21.1	12.6	9.6	8.1	11.8	10.8	12.4	9.3	10.3	10.7	26.3	24.6	18.9	8.1	30.0	17.7	24
28		19.6	24.5	23.7	35.4	44.2	45.7	44.9	45.9	45.2	48.8	45.8	50.7	46.3	41.0	37.1	40.3	36.1	30.3	24.5	10.7	13.7	12.7	13.9	14.5	10.7	50.7	33.1	24
29		13.1	11.6	11.3	8.0	8.9	7.6	7.3	7.3	9.4	15.1	13.0	16.1	15.9	16.0	16.6	18.4	17.7	11.6	13.7	11.0	14.9	21.9	20.1	19.0	7.3	21.9	13.6	24
30		19.1	22.6	22.1	16.4	19.0	20.4	25.1	31.2	30.9	32.1	32.3	32.3	35.2	37.4	32.0	29.5	32.4	34.4	30.1	30.1	29.3	29.8	24.3	21.6	16.4	37.4	27.9	24
31		22.0	22.5	21.2	27.9	34.8	38.3	31.1	23.1	15.1	20.6	20.2	30.6	40.0	39.7	40.1	43.0	32.0	32.3	33.4	32.6	32.9	32.2	30.2	23.5	15.1	43.0	30.0	24
HOURLY MAX		46.1	34.9	43.9	45.2	44.7	45.7	52.4	59.2	59.0	66.4	56.1	53.3	62.3	50.9	55.0	66.3	72.0	55.0	45.0	37.3	32.9	32.2	30.2	32.1				
HOURLY AVG		16.3	17.1	17.2	17.0	17.7	17.8	18.2	19.5	19.8	23.2	26.2	27.4	28.8	29.0	29.1	31.0	28.6	23.8	21.6	17.5	16.0	17.5	17.1	16.0				

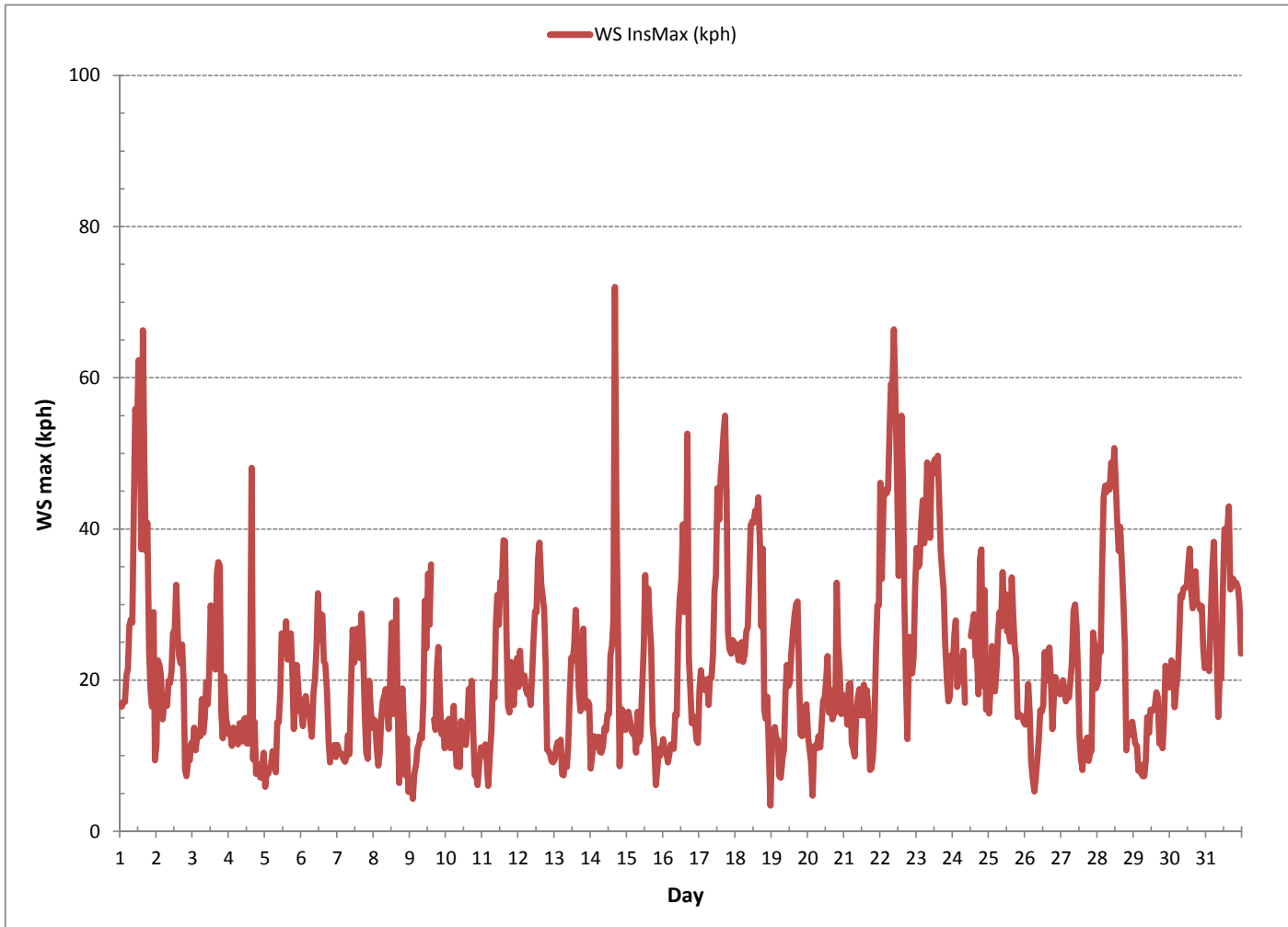
STATUS FLAG CODES

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

MONTHLY SUMMARY

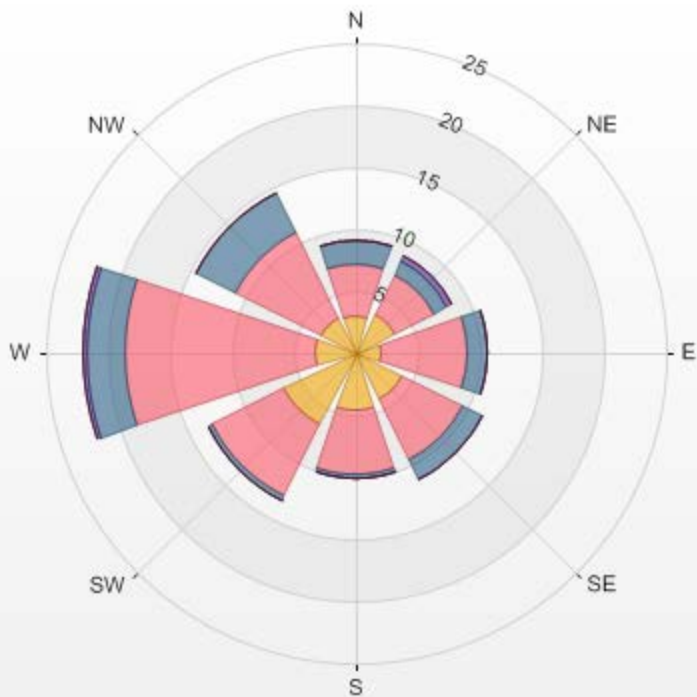
MAXIMUM INSTANTANEOUS VALUE:	72.0	kph	@ HOUR(S)	16	ON DAY(S)	14
					VAR-VARIOUS	
OPERATIONAL TIME:					743	HRS

VECTOR WIND SPEED MAX instantaneous maximum in kph



Wind: LICA ST. LINA Monitor: WSP [kph] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 99.60% Calm Avg: 0.00

Direction	0.0-6.0	6.0-12.0	12.0-20.0	20.0-29.0	29.0-39.0	>39.0	Total
N	2.97	4.18	2.02	0	0	0	9.17
NE	3.51	3.51	1.21	0.54	0	0	8.77
E	2.02	7.02	1.62	0	0	0	10.66
SE	4.18	5.53	1.75	0	0	0	11.46
S	4.72	5.13	0.27	0	0	0	10.12
SW	6.48	6.48	0.4	0	0	0	13.36
W	3.24	15.38	3.1	0.27	0	0	21.99
NW	3.1	7.83	3.51	0	0	0	14.44
Summary	30.22	55.06	13.88	0.81	0	0	100



%	Icon	Classes (kph)
30		0.0-6.0
55		6.0-12.0
14		12.0-20.0
1		20.0-29.0
0		29.0-39.0
0		>39.0

WIND DIRECTION



WIND DIRECTION (WD) hourly averages

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	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	RDGS.	
DAY	HR	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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		
1	1	WSW	WSW	WSW	SW	WSW	WSW	WSW	WSW	WSW	W	W	W	W	WNW	W	W	W	W	W	W	WSW	WSW	NNW	SW	W	24	
2	2	SW	WSW	W	W	WSW	WSW	WSW	W	W	WNW	W	WNW	WNW	NW	NW	NW	N	NNE	N	N	NNW	N	NNE	NNW	W	24	
3	3	NNE	NE	NE	NE	NE	NE	NE	NE	NNE	NNE	NE	NNE	N	NNW	NNW	NW	NW	NNW	N	N	NNW	WNW	NW	NW	N	24	
4	4	WNW	W	WNW	WNW	WNW	NNW	NW	W	N	N	NE	NW	NE	NW	NNW	NNE	N	WSW	NW	NW	NW	NNW	NW	NNW	NW	24	
5	5	ENE	ENE	SE	SSE	SE	SSE	SSE	ESE	ESE	SE	SE	ESE	SE	ESE	ESE	SE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	24	
6	6	ESE	E	E	ESE	SE	ESE	E	E	E	ESE	ESE	SE	SE	SE	E	ESE	ESE	SE	ESE	ESE	ESE	E	E	ENE	ENE	24	
7	7	E	ENE	ESE	SE	SSE	SE	SE	SSE	SSE	SE	SE	ESE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	S	SE	NE	NE	24	
8	8	NE	NE	NNE	NNE	NNW	NNW	NNE	N	NNE	NNE	NNW	NNW	N	NE	NNW	E	SE	WSW	WNW	NW	SW	SW	SW	ENE	N	24	
9	9	ENE	SE	S	SSE	SE	SSW	SW	SSE	SE	ESE	ESE	ESE	ESE	E	SSW	ENE	NE	S	NE	ENE	ENE	SE	SE	SE	SE	24	
10	10	ESE	SE	ESE	ENE	ENE	ENE	SE	S	SSE	SSW	ENE	NE	ENE	NW	NE	ENE	E	SE	SSE	S	SSW	SSW	S	SW	ESE	24	
11	11	WSW	SW	SW	WSW	SW	SW	WSW	WNW	WNW	WNW	W	WNW	WNW	WNW	W	WNW	W	W	WSW	W	W	W	W	WNW	W	24	
12	12	W	W	W	W	W	W	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	WSW	SW	SW	SW	W	24
13	13	SW	WSW	WSW	SW	WSW	SSW	SSW	SSW	SSW	SW	SW	SW	WSW	WSW	WSW	WSW	W	W	WNW	SSW	S	S	W	ENE	SW	24	
14	14	ESE	SSE	SSE	SSE	SE	S	SW	SW	SW	WNW	NW	NW	W	WSW	SW	WSW	NW	N	ENE	E	SW	SW	SW	SW	SW	24	
15	15	SW	WSW	SW	SW	SSW	SW	SW	SW	WSW	W	WSW	WSW	W	WNW	WNW	WNW	WNW	WNW	WSW	SW	S	S	S	SSW	WSW	24	
16	16	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	SSW	SW	NW	NNW	WNW	NW	W	WSW	W	WSW	W	W	SW	24	
17	17	W	W	WSW	W	W	W	WSW	W	WNW	W	W	WNW	W	WNW	WNW	WNW	W	WNW	NNW	NW	WNW	WNW	WNW	W	W	24	
18	18	W	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	NW	NW	NW	NW	WNW	NW	NNW	NW	NNW	N	N	NNW	N	NNE	NNE	NW	24	
19	19	W	WNW	WNW	WNW	W	SW	SSW	SW	SW	SW	WSW	WSW	SW	SW	SSW	S	S	SSE	SSE	SSE	S	S	SSE	S	SSW	24	
20	20	S	SSW	SSW	W	WNW	NW	WNW	WNW	NW	WNW	WNW	W	WNW	W	WSW	SW	SSW	S	ENE	NE	ENE	ESE	SSE	SSW	WSW	24	
21	21	SW	SW	SW	WSW	WSW	WSW	SW	SW	SW	SW	WSW	WSW	SW	WSW	SW	WSW	W	NNW	NNW	N	NE	NE	NE	NNE	NE	W	24
22	22	NE	NE	NE	NE	NE	NE	NE	NNE	NE	NE	ENE	NE	NE	ENE	ENE	ESE	SSE	SSE	NE	NNE	NE	NE	NE	NNE	NE	24	
23	23	NNE	NNE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	NNW	NNW	NW	W	WNW	N	24
24	24	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	C	C	C	NNW	NW	WNW	NW	WNW	WNW	WNW	NNW	W	W	WNW	WNW	W	WNW	21
25	25	WSW	W	W	W	W	WNW	NW	NW	NW	NNW	NNW	NNW	NNW	NNW	N	N	N	NNW	NNW	NW	NW	NW	NW	NW	NW	NW	24
26	26	NW	NW	NW	NW	NNW	NNW	NE	SW	SW	SSW	SSW	SSW	SSW	SSW	S	SSW	S	S	SSE	SSE	S	S	S	SW	SW	24	
27	27	S	S	S	S	SSE	SSE	SSE	SSE	SSE	S	S	SW	S	S	S	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	SSW	24	
28	28	WSW	W	W	NW	NW	NW	NW	NW	NW	WNW	NW	NW	NNW	NW	NW	NW	NW	WNW	WNW	WNW	WNW	WNW	W	WNW	WNW	24	
29	29	WNW	WNW	WNW	WNW	NW	NNW	N	E	SSE	SE	SSE	SSE	SSE	SSE	ESE	SSE	SSE	SE	E	E	E	E	ESE	ESE	E	SE	24
30	30	ESE	ESE	E	E	ENE	ENE	E	E	E	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	E	E	E	E	E	E	24
31	31	E	E	E	E	E	E	E	ESE	ENE	ENE	ESE	SE	SE	SE	SE	SE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	ESE	24

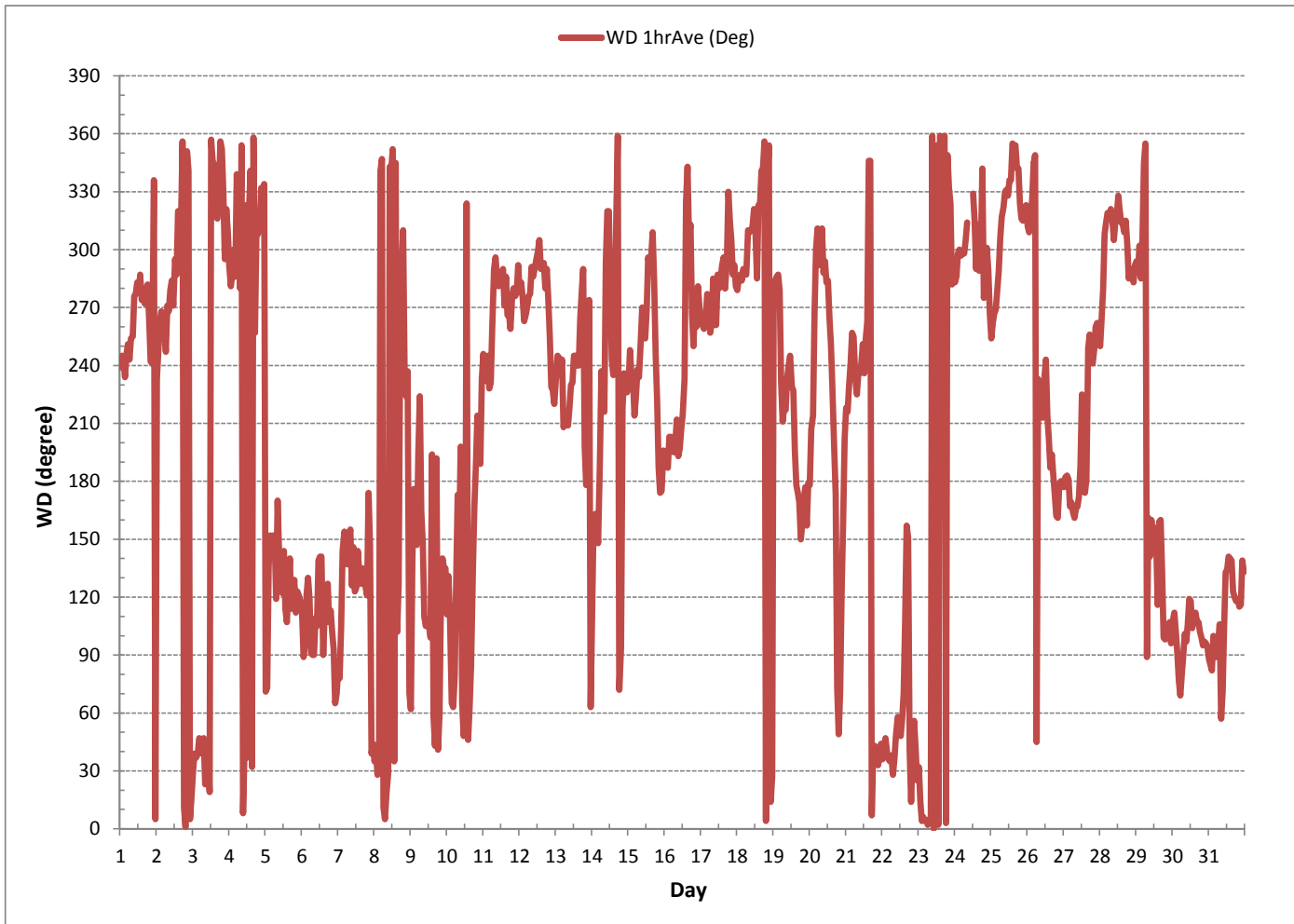
STATUS FLAG CODES

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:	July 7, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	3	HRS	OPERATIONAL TIME:	744	HRS
STANDARD DEVIATION:	98.63		AMD OPERATION UPTIME:	100.0	%

WIND DIRECTION (WD) hourly averages



STANDARD DEVIATION WIND DIRECTION



STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	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.
HOUR START	HOUR END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	
DAY 1		8	6	7	10	10	11	11	13	14	18	20	19	20	19	19	18	19	19	18	15	9	7	18	29	24
2		5	7	11	13	9	10	13	21	23	19	23	24	24	24	24	25	26	25	19	17	7	6	18	9	24
3		9	10	8	7	9	11	23	28	21	22	25	26	25	26	25	18	19	21	18	15	15	15	15	17	24
4		13	13	13	13	12	30	15	20	20	30	44	42	59	77	49	22	21	15	30	10	12	7	10	19	24
5		40	10	15	9	10	7	14	31	28	41	47	39	31	27	26	23	23	20	18	10	9	11	11	9	24
6		10	13	10	10	10	11	15	21	23	24	25	22	30	26	24	26	20	19	11	7	8	6	14	9	24
7		7	7	9	7	6	10	12	22	22	26	26	27	23	22	23	22	22	26	21	15	8	24	15	11	24
8		11	11	11	12	12	13	17	21	23	30	31	27	25	53	24	25	25	31	15	14	28	15	42	14	24
9		9	9	12	10	9	15	29	52	21	20	19	22	20	21	48	23	17	28	35	21	16	16	14	12	24
10		10	12	16	11	14	19	18	30	37	40	52	44	54	38	27	25	28	20	22	15	12	21	13	12	24
11		5	10	10	13	9	9	12	17	21	24	27	24	27	24	19	19	15	17	16	14	15	13	14	15	24
12		13	14	13	10	11	12	15	19	25	24	25	29	24	27	23	21	22	19	17	10	5	5	3	4	24
13		4	4	3	5	8	8	12	11	22	28	59	47	47	40	24	16	18	18	18	27	8	9	36	21	24
14		12	9	8	9	17	15	13	36	25	46	56	48	60	25	18	17	28	21	33	18	34	8	13	9	24
15		5	6	7	10	12	10	10	16	23	26	22	23	25	29	30	24	25	23	10	6	7	6	6	8	24
16		10	10	10	10	10	12	15	21	23	26	21	22	23	27	24	19	19	16	17	21	11	10	11	9	24
17		9	9	7	10	12	12	10	14	20	23	20	24	21	23	19	20	19	19	19	16	16	15	15	15	24
18		15	15	15	15	17	17	16	20	20	22	21	20	23	24	23	22	24	23	20	14	15	17	17	46	24
19		11	10	9	9	9	6	11	12	19	21	16	22	23	18	21	23	21	18	15	13	12	13	12	11	24
20		10	10	50	11	12	10	15	21	37	31	34	37	35	32	33	19	25	32	26	20	19	16	16	18	24
21		14	14	7	10	18	14	10	15	17	17	25	30	33	33	29	34	33	22	14	12	12	14	16	16	24
22		26	32	18	18	17	16	17	17	18	18	19	19	20	19	19	19	21	22	22	15	16	17	19	19	24
23		20	17	17	17	16	18	23	17	17	18	18	19	19	24	20	18	20	18	17	16	17	13	14	14	24
24		14	14	16	13	12	12	12	14	16	C	C	C	28	31	37	32	22	15	27	31	15	18	13	9	24
25		8	8	10	8	13	14	16	20	19	22	19	20	23	22	23	25	24	21	21	16	14	14	14	13	24
26		13	15	13	12	9	30	12	23	20	27	29	37	38	31	34	30	26	17	12	13	14	14	13	13	24
27		15	15	13	12	15	16	19	18	19	19	18	22	27	24	18	14	14	13	16	7	10	8	13	11	24
28		12	12	17	20	19	20	20	20	20	19	20	21	22	22	24	22	21	21	18	11	11	10	9	12	24
29		10	9	10	7	17	11	54	21	33	42	47	58	57	50	37	35	23	18	18	13	13	15	17	16	24
30		16	14	14	14	13	16	18	20	24	23	27	24	22	25	24	23	25	22	21	20	20	19	17	17	24
31		15	16	14	17	18	19	23	46	24	22	24	20	18	20	19	18	19	19	17	17	18	18	19	17	24

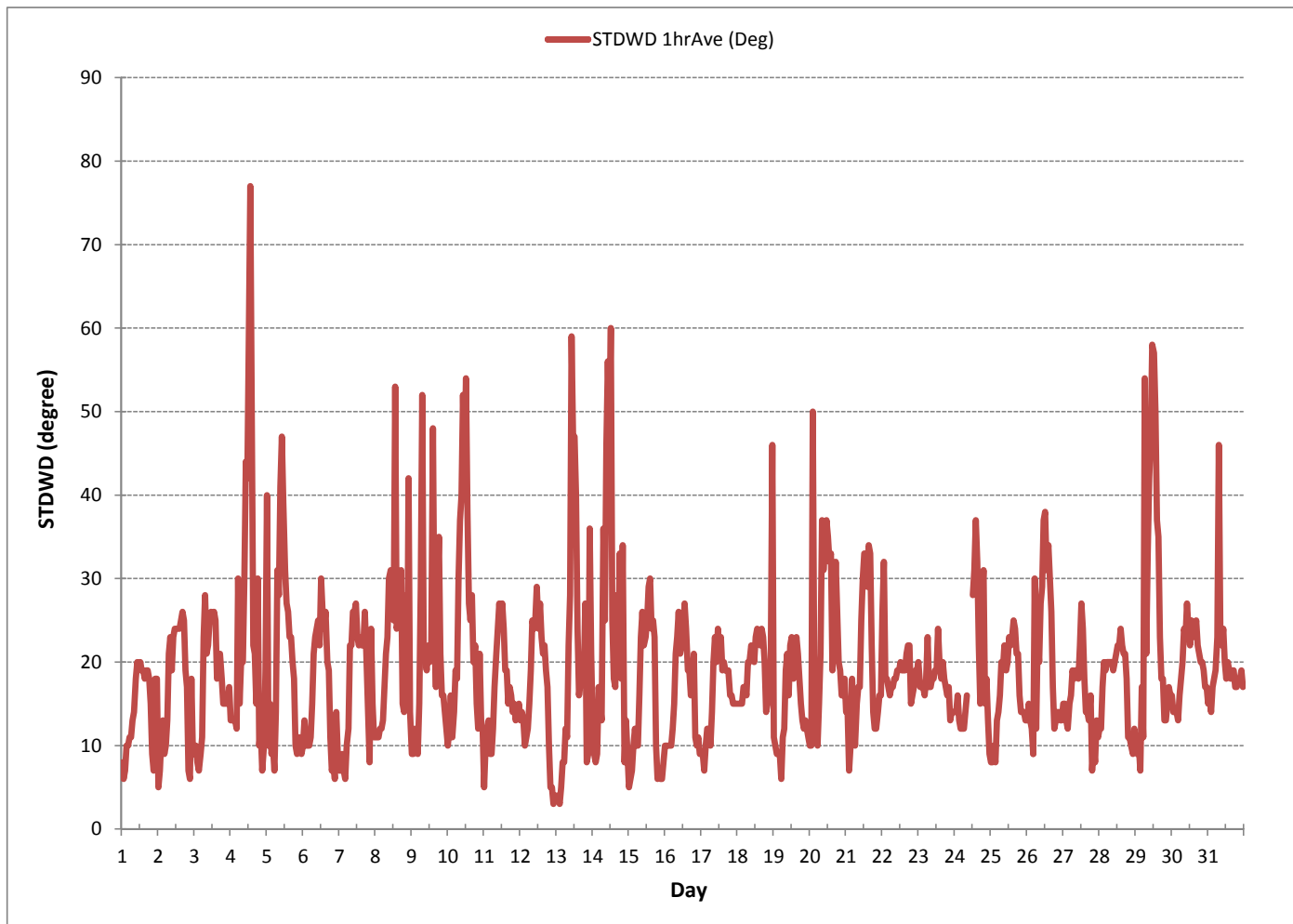
STATUS FLAG CODES

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: July 7, 2016

CALIBRATION TIME: 3 HRS OPERATIONAL TIME: 744 HRS

STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees



RELATIVE HUMIDITY

RELATIVE HUMIDITY (RH) hourly averages in %

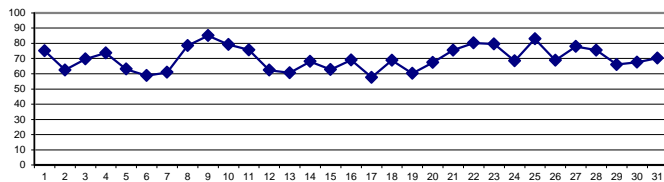
MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HOUR AVG.	RDGS.
DAY	HOURLY MAX	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
1	89	90	90	91	91	91	91	91	91	90	82	69	60	53	59	67	67	57	52	54	61	71	78	78	80	52	91	75	24
2	85	86	82	80	83	82	73	69	65	61	55	51	47	43	46	43	44	49	53	58	62	57	60	64	43	86	62	24	
3	69	73	77	79	80	78	75	72	74	67	61	56	53	50	49	54	55	77	78	76	79	79	80	82	49	82	70	24	
4	82	82	83	82	83	85	85	85	82	77	70	57	51	51	52	65	74	68	64	69	79	78	80	82	51	85	74	24	
5	83	86	88	91	89	84	75	77	66	59	52	49	47	47	46	43	43	44	48	55	61	60	58	61	43	91	63	24	
6	63	73	75	70	70	69	63	61	58	53	49	48	44	42	43	44	42	47	53	58	64	71	72	78	42	78	59	24	
7	76	76	75	68	71	71	69	60	56	51	49	48	49	50	49	44	45	48	52	61	62	65	80	87	44	87	61	24	
8	89	90	91	91	91	91	86	81	73	66	65	62	56	54	63	63	74	82	84	82	86	87	88	88	54	91	78	24	
9	89	85	79	84	86	86	87	86	87	85	83	78	71	69	80	87	89	89	90	90	91	91	90	90	69	91	85	24	
10	91	91	90	91	91	91	91	89	85	74	72	71	63	62	65	66	60	68	71	79	83	85	83	87	60	91	79	24	
11	87	89	90	91	91	91	91	89	83	70	64	56	46	41	48	59	77	75	70	74	79	84	87	84	41	91	76	24	
12	86	85	85	86	86	85	75	70	64	57	50	47	42	38	39	44	40	42	46	54	59	66	72	78	38	86	62	24	
13	81	76	72	78	77	84	73	61	57	48	41	40	39	38	37	43	47	61	62	73	69	54	63	80	37	84	61	24	
14	77	70	71	79	79	81	72	67	64	59	54	47	42	39	39	39	47	85	86	82	87	89	89	89	39	89	68	24	
15	89	89	88	89	89	90	80	70	65	61	54	51	44	39	39	36	36	39	47	54	58	61	64	73	36	90	63	24	
16	78	80	82	86	87	86	83	75	63	56	52	47	43	40	49	49	58	77	76	74	73	80	83	80	40	87	69	24	
17	81	82	79	76	73	72	66	60	57	51	44	43	41	40	34	33	33	33	49	58	64	68	73	75	31	82	58	24	
18	79	82	84	87	88	89	83	79	74	66	59	54	51	54	46	49	53	56	56	69	71	72	75	76	46	89	69	24	
19	78	76	77	72	75	87	75	65	62	50	45	41	41	41	46	45	45	46	53	58	61	67	69	70	41	87	60	24	
20	75	80	82	83	83	84	78	69	60	55	50	42	40	39	42	41	41	52	80	86	88	88	89	89	39	89	67	24	
21	88	87	87	87	87	89	90	89	85	74	69	61	56	55	58	57	55	61	71	76	79	80	84	87	55	90	76	24	
22	87	89	90	90	89	88	87	82	77	75	73	76	82	80	71	69	68	59	64	80	86	86	87	90	59	90	80	24	
23	89	90	90	90	89	88	86	85	83	83	80	73	74	73	73	76	76	75	68	67	70	69	78	84	67	90	80	24	
24	86	85	84	87	88	88	85	81	69	60	52	42	38	38	37	37	38	46	72	81	85	87	87	89	37	89	68	24	
25	90	90	89	89	90	90	86	79	82	78	80	87	85	85	83	74	68	73	75	79	81	84	86	89	68	90	83	24	
26	90	90	91	91	91	89	83	73	75	66	63	55	49	47	49	50	49	50	57	64	65	68	72	74	47	91	69	24	
27	74	74	75	79	81	79	78	75	69	66	65	64	66	71	79	82	84	83	85	87	88	88	89	88	64	89	78	24	
28	89	90	90	89	88	86	87	85	83	86	82	73	67	61	55	53	54	56	59	69	73	76	79	81	53	90	75	24	
29	82	83	83	87	87	85	76	70	67	56	52	48	47	46	45	46	48	55	63	68	72	72	73	73	45	87	66	24	
30	75	76	76	81	85	88	82	76	68	67	58	53	52	51	50	53	52	55	60	65	70	73	76	78	50	88	68	24	
31	80	82	83	84	85	86	87	83	84	79	69	63	59	55	53	51	54	55	60	62	64	68	68	71	51	87	70	24	
HOURLY MAX	91	91	91	91	91	91	91	91	90	86	83	87	85	85	83	87	89	89	90	90	91	91	90	90					
HOURLY AVG	82.5	83.1	83.2	84.1	84.6	84.9	80.6	75.9	71.8	65.7	60.7	56.2	52.8	51.5	52.6	53.6	55.0	59.9	64.7	70.0	73.5	75.2	77.8	80.5					

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

Hour of th
744

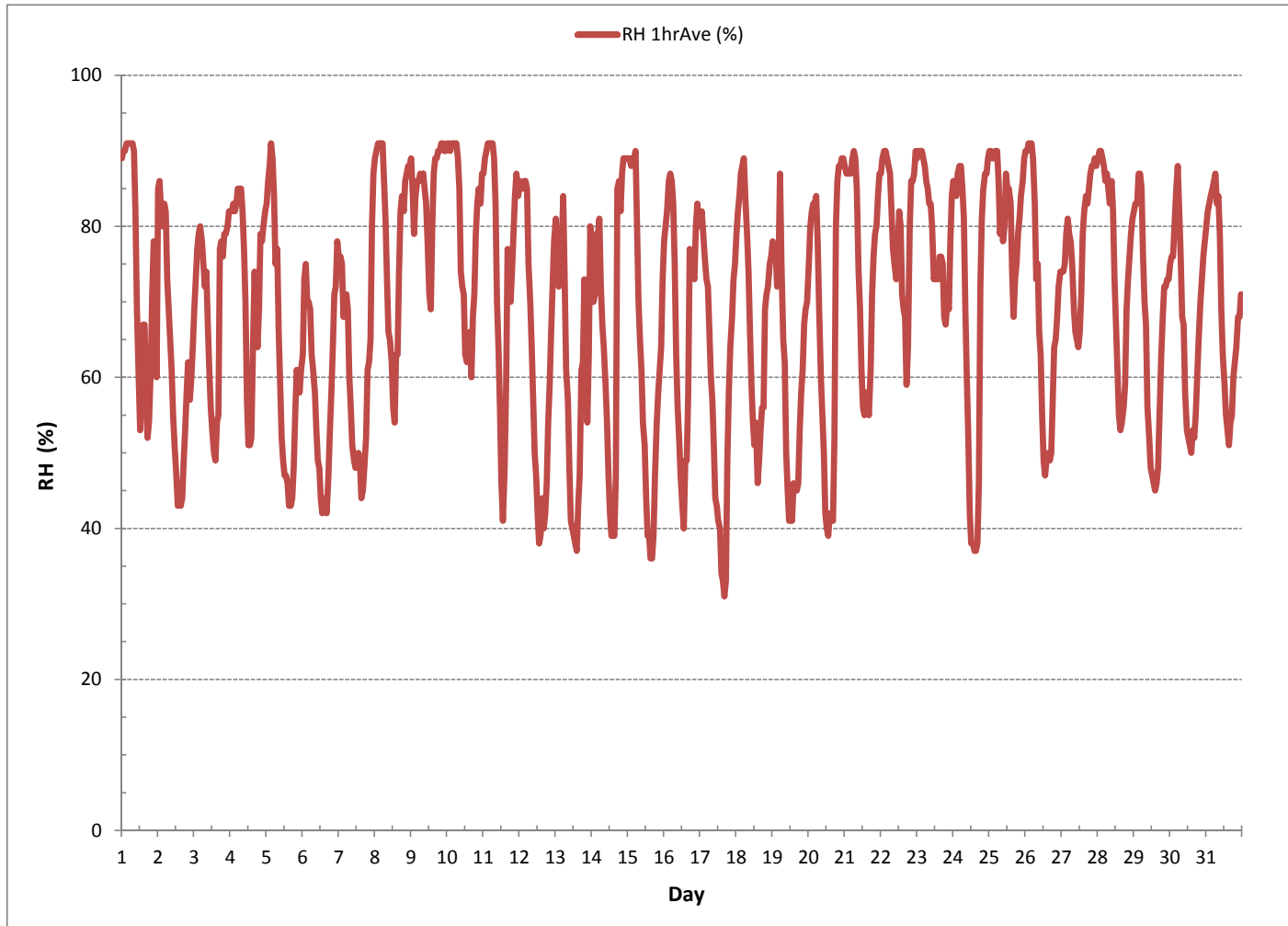
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

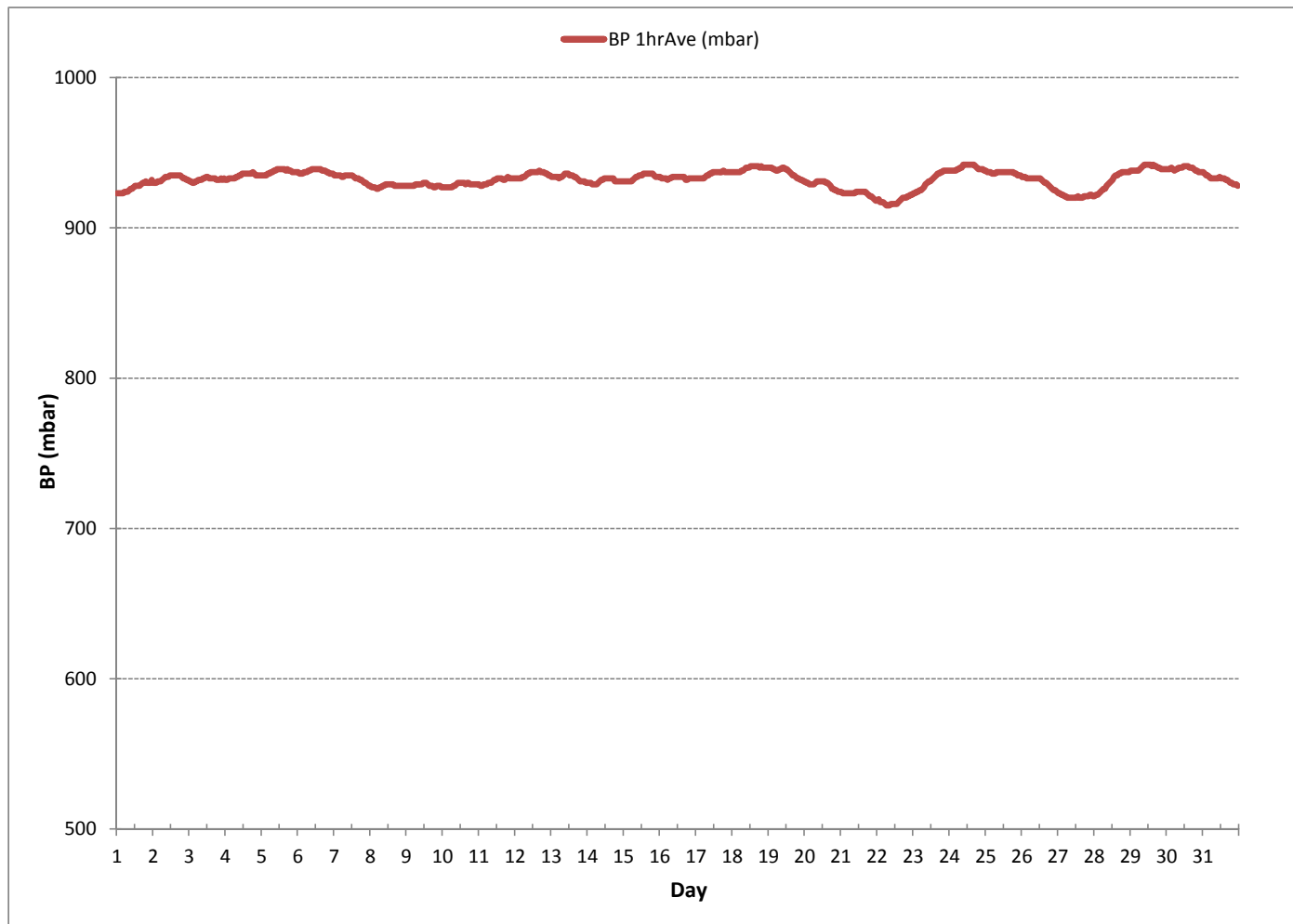
MINIMUM 1-HR AVERAGE:	31	%	@ HOUR(S)	16	ON DAY(S)	17
MAXIMUM 1-HR AVERAGE:	91	%	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 24-HR AVERAGE:	85	%			ON DAY(S)	9
					VAR-VARIOUS	
				OPERATIONAL TIME:		744 HRS
				AMD OPERATION UPTIME:		100.0 %
STANDARD DEVIATION:	15.74			MONTHLY AVERAGE:		70 %

RELATIVE HUMIDITY (RH) hourly averages in %



BAROMETRIC PRESSURE

BAROMETRIC PRESSURE (BP) hourly averages in millibar



AMBIENT TEMPERATURE

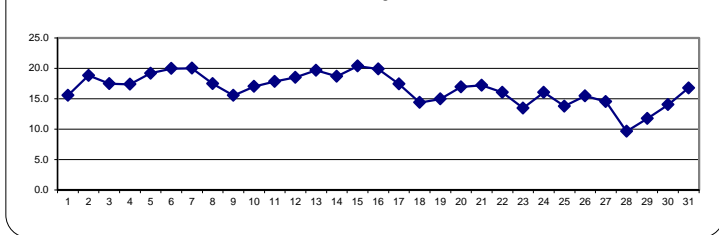
AMBIENT TEMPERATURE (AmbTPX) hourly averages in Degrees Celsius

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.
DAY	MIN.	MAX.	AVG.																										
1	10.2	9.5	9.4	9.5	10.5	11.3	11.9	12.4	13.4	16.0	18.6	19.9	21.4	19.9	19.2	18.1	20.9	21.2	20.3	18.9	16.3	14.8	15.1	14.3	9.4	21.4	15.5	24	
2	13.4	12.7	13.2	13.1	12.2	12.5	15.2	17.3	19.4	20.9	22.2	23.2	23.7	24.7	24.6	24.9	24.1	23.4	21.7	20.2	18.2	18.1	17.0	15.9	12.2	24.9	18.8	24	
3	15.3	14.5	13.6	13.1	12.8	14.0	15.2	16.7	17.2	19.6	21.1	22.2	22.8	22.4	22.8	22.1	21.7	17.4	16.4	16.2	15.8	16.0	15.4	15.0	12.8	22.8	17.5	24	
4	14.9	14.8	14.7	14.7	14.4	13.9	14.3	15.2	16.1	17.5	18.7	21.9	22.7	22.8	22.3	20.3	17.8	19.2	19.5	18.4	16.3	16.0	15.7	15.1	13.9	22.8	17.4	24	
5	14.8	13.7	12.6	13.2	13.6	14.1	16.4	17.1	20.1	21.6	23.0	23.6	23.7	23.5	24.2	24.3	24.0	23.6	22.1	19.9	18.4	18.1	17.8	17.0	12.6	24.3	19.2	24	
6	16.2	14.3	13.6	14.3	14.2	14.8	17.6	19.7	21.4	22.7	23.8	23.1	24.5	25.0	25.1	24.3	24.8	23.6	22.3	21.2	19.7	18.4	17.6	16.6	13.6	25.1	20.0	24	
7	16.4	16.2	15.9	16.5	15.9	16.1	17.3	20.6	21.8	23.3	23.8	24.4	23.7	23.5	23.1	23.9	24.3	23.7	22.3	20.0	19.3	18.1	15.7	14.5	14.5	24.4	20.0	24	
8	13.8	13.4	13.1	13.1	13.0	13.4	15.6	17.0	18.9	20.8	21.5	22.4	24.2	23.6	22.3	21.4	18.5	18.3	17.4	16.2	15.6	15.8	15.2	14.9	13.0	24.2	17.5	24	
9	14.9	15.3	15.7	15.3	14.6	14.5	14.8	15.6	15.8	16.5	17.2	18.5	19.7	20.2	17.2	15.4	15.6	15.1	14.6	14.6	13.8	13.4	12.6	12.0	12.0	20.2	15.5	24	
10	11.8	12.2	12.0	11.1	11.4	11.6	13.1	14.1	15.8	18.8	19.2	20.1	22.1	22.6	21.9	21.9	22.7	20.6	19.8	18.3	17.0	17.0	17.2	16.0	11.1	22.7	17.0	24	
11	15.2	15.0	14.1	13.9	13.4	13.5	14.2	15.2	17.3	21.3	22.4	23.8	24.9	25.6	23.6	21.1	17.5	18.1	19.3	18.4	16.5	15.1	14.4	14.5	13.4	25.6	17.8	24	
12	14.0	13.6	12.9	12.1	11.9	12.2	14.9	17.1	19.7	21.2	22.9	23.6	24.2	24.5	24.4	22.4	23.9	22.8	21.5	19.9	18.1	16.6	15.5	14.1	11.9	24.5	18.5	24	
13	13.4	13.2	13.2	12.5	12.6	12.0	15.5	20.1	22.0	24.5	25.4	26.1	26.9	27.4	27.5	25.6	24.5	21.9	20.7	18.6	17.3	19.2	17.3	14.3	12.0	27.5	19.7	24	
14	15.0	15.7	15.2	14.1	13.6	12.8	16.2	18.7	20.7	23.2	24.8	26.4	27.5	27.9	27.5	27.7	23.9	14.3	14.7	15.5	14.3	13.5	12.9	12.5	12.5	27.9	18.7	24	
15	12.3	12.6	12.4	12.1	11.6	11.8	15.4	19.3	21.5	22.0	24.1	25.6	26.5	27.4	27.5	27.3	26.9	26.3	25.0	22.6	21.3	20.6	19.6	17.5	11.6	27.5	20.4	24	
16	16.5	16.1	15.0	14.0	13.5	13.6	14.3	17.1	22.0	24.3	25.9	27.8	29.0	29.5	27.9	25.5	22.4	18.6	19.0	19.3	17.9	16.6	16.0	15.4	13.5	29.5	19.9	24	
17	14.5	13.4	13.0	12.9	13.0	12.7	15.1	17.3	19.0	21.8	22.9	23.2	22.9	22.7	22.6	21.3	18.0	15.4	13.6	12.8	12.1	11.5	11.5	11.5	23.2	17.4	24		
18	10.9	10.5	10.3	10.0	9.8	9.6	11.2	13.0	14.6	16.8	17.9	18.5	19.1	19.3	19.9	19.1	18.9	17.7	16.6	14.0	13.2	11.8	11.1	11.6	9.6	19.9	14.4	24	
19	10.4	9.7	10.0	9.9	8.8	7.2	10.4	13.8	15.7	19.1	20.0	20.2	20.1	20.9	19.4	18.5	18.1	18.4	16.9	15.9	15.2	14.3	13.3	12.7	7.2	20.9	15.0	24	
20	12.0	11.0	10.6	10.3	10.3	10.0	11.7	15.0	18.9	21.1	22.6	24.3	24.6	25.0	24.7	24.6	23.6	20.6	15.9	14.7	14.1	14.1	13.6	13.5	10.0	25.0	17.0	24	
21	13.0	13.0	13.0	13.4	13.5	13.2	13.4	14.0	15.6	19.0	20.2	21.5	22.7	23.1	22.2	22.4	22.4	21.1	19.0	17.4	16.0	15.3	14.4	14.1	13.0	23.1	17.2	24	
22	14.1	14.2	14.3	14.2	14.3	14.3	14.8	15.7	16.9	17.9	17.7	17.2	16.7	17.3	18.7	18.9	18.5	19.1	17.4	15.1	14.8	14.6	14.1	13.8	13.8	19.1	16.0	24	
23	13.7	13.3	13.1	12.9	12.5	12.2	12.1	12.2	12.8	12.9	14.4	15.3	15.3	15.4	15.7	15.1	14.8	14.7	14.7	13.8	12.5	11.7	11.1	11.0	11.0	11.0	15.7	13.5	24
24	10.7	10.9	10.8	10.0	9.6	9.3	10.4	12.0	16.3	19.4	21.4	22.5	23.1	22.8	23.6	23.8	23.2	21.5	16.6	14.6	13.7	13.3	13.0	12.9	9.3	23.8	16.1	24	
25	12.7	12.6	12.4	11.6	11.1	11.0	12.4	14.9	14.3	15.7	14.9	13.6	14.3	14.3	14.9	16.8	17.4	16.3	16.0	14.7	13.2	12.4	11.9	11.3	11.0	17.4	13.8	24	
26	10.9	10.3	10.0	10.1	10.0	9.6	12.4	14.4	14.4	17.4	18.2	20.4	21.5	21.0	20.0	19.9	20.4	19.5	17.7	15.9	15.2	14.5	13.7	13.4	9.6	21.5	15.5	24	
27	13.3	13.2	12.8	12.4	12.0	12.2	12.5	13.3	15.1	15.8	16.1	16.7	17.4	16.8	16.1	15.9	16.2	16.1	15.4	14.7	14.2	14.2	13.5	12.9	12.0	17.4	14.5	24	
28	12.5	12.2	12.4	11.4	9.0	7.7	6.9	7.0	7.1	6.7	7.4	9.0	10.1	11.3	13.0	12.8	12.4	12.2	11.0	9.2	8.5	7.9	7.2	6.7	6.7	13.0	9.7	24	
29	6.2	5.9	5.7	4.4	4.7	5.1	7.7	10.7	12.1	13.9	15.0	16.0	16.8	17.2	17.9	18.0	17.8	16.3	14.6	12.6	11.4	11.0	10.7	10.4	4.4	18.0	11.8	24	
30	9.8	9.4	9.2	8.0	6.8	6.0	7.9	10.2	13.0	13.4	16.8	17.8	18.6	20.3	21.0	20.2	20.9	19.4	17.8	16.1	14.7	13.8	13.0	12.2	6.0	21.0	14.0	24	
31	11.3	10.5	10.1	10.1	10.3	9.8	10.0	11.8	12.2	14.2	17.2	18.9	21.0	23.1	24.0	24.3	23.4	23.1	21.1	20.0	19.5	18.8	19.2	18.6	9.8	24.3	16.8	24	
HOURLY MAX	16.5	16.2	15.9	16.5	15.9	16.1	17.6	20.6	22.0	24.5	25.9	27.8	29.0	29.5	27.9	27.7	26.9	26.3	25.0	22.6	21.3	20.6	19.6	18.6					
HOURLY AVG	13.0	12.7	12.4	12.1	11.8	11.7	13.3	15.1	16.8	18.7	19.9	20.9	21.7	22.0	21.8	21.3	20.8	19.5	18.2	16.8	15.7	15.1	14.4	13.7					

STATUS FLAG CODES

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

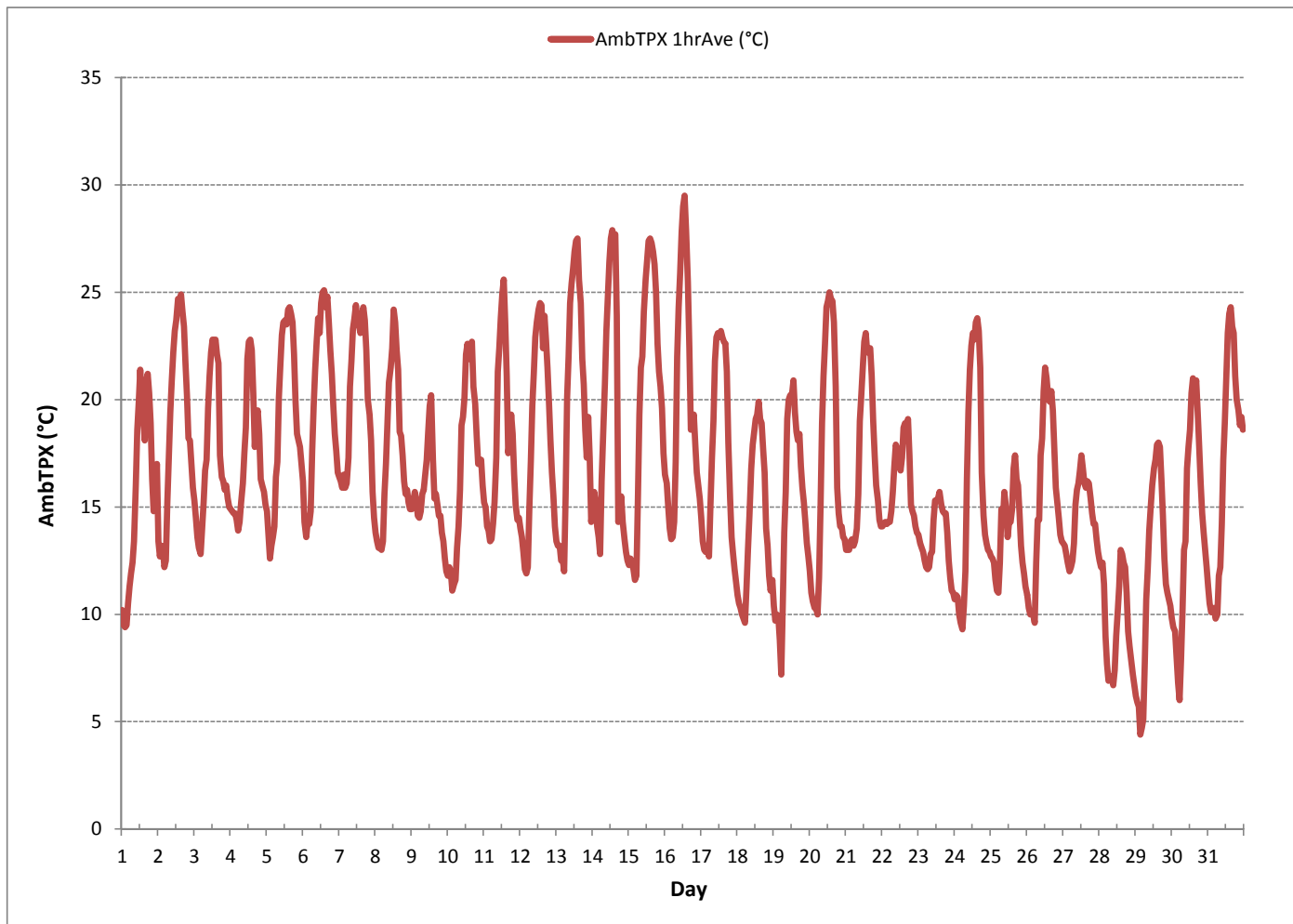
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	4.4 °C	@ HOUR(S)	3	ON DAY(S)	29
MAXIMUM 1-HR AVERAGE:	29.5 °C	@ HOUR(S)	13	ON DAY(S)	16
MAXIMUM 24-HR AVERAGE:	20.4 °C			ON DAY(S)	15
				VAR-VARIOUS	
OPERATIONAL TIME:				744	HRS
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	4.77	MONTHLY AVERAGE:		16.6	°C

AMBIENT TEMPERATURE (AmbTPX) hourly averages in Degrees Celsius



PRECIPITATION

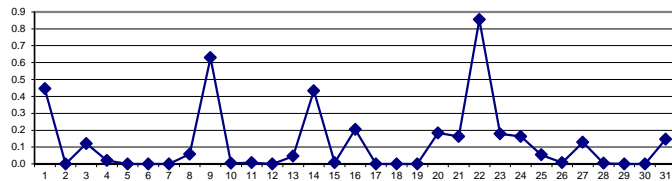
PRECIPITATION hourly averages (mm)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR		
DAY	MIN.	MAX.	AVG.	RDGS.																										
1	0.0	0.1	0.0	0.0	0.5	0.4	2.8	4.6	0.3	0.0	0.1	0.0	0.0	0.3	0.1	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.4	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	2.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.1	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.3	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	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	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	1.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.1	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.7	0.0	0.0	0.0	0.0	0.0	9.2	0.3	0.0	1.2	3.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	9.2	0.6	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	0.1	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	0.1	0.0	24	
11	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	24	
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.4	24	
15	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	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	2.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.2	24	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	2.7	0.2	1.5	0.0	0.0	0.0	0.0	0.0	2.7	0.2	24	
21	0.1	0.0	0.0	0.3	1.8	0.9	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.2	24	
22	0.0	3.9	8.4	1.9	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.3	8.4	0.9	24		
23	2.7	1.4	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	2.7	0.2	24	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.3	2.5	0.4	0.1	0.0	2.5	0.2	24		
25	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	24	
26	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	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	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.9	1.6	0.2	1.6	0.1	24		
28	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
31	0.0	0.0	0.0	2.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.1	24	
HOURLY MAX	2.7	3.9	8.4	2.2	5.1	0.9	2.8	4.6	0.7	0.1	0.3	2.0	0.1	0.3	9.2	1.5	2.9	10.0	3.1	1.5	0.3	2.5	1.6	0.3	0.0	0.0	2.2	0.1	24	
HOURLY AVG	0.1	0.2	0.3	0.1	0.3	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.1	0.1	0.5	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	24

STATUS FLAG CODES

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

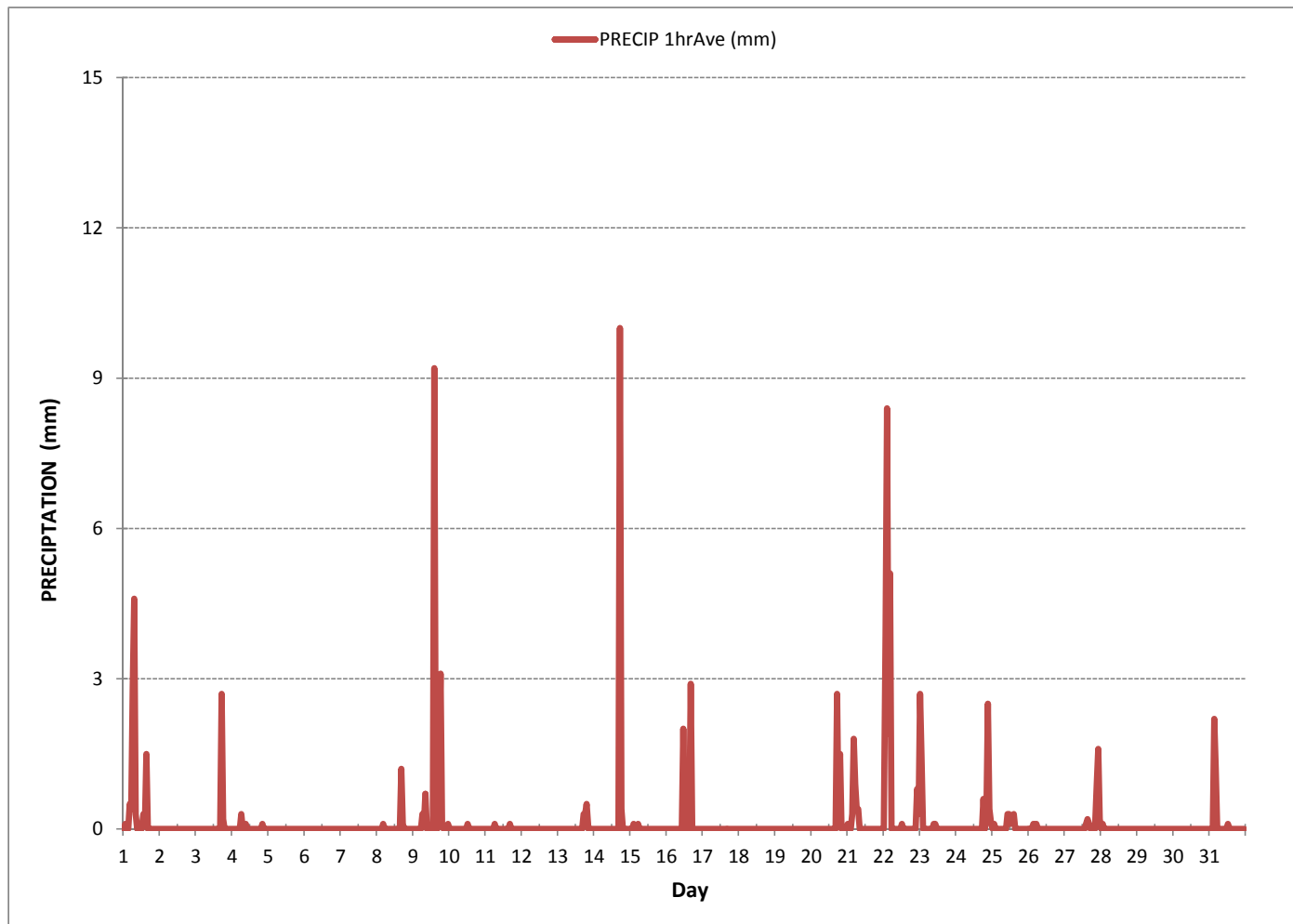
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	MM	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	10.0	MM	@ HOUR(S)	17	ON DAY(S)	14
MAXIMUM 24-HR AVERAGE:	0.9	MM			ON DAY(S)	22
MONTHLY TOTAL	92.7	MM			VAR-VARIOUS	
OPERATIONAL TIME:					744	HRS
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	0.73				MONTHLY AVERAGE:	0.1
						MM

PRECIPITATION hourly averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: August 18, 2016	Barometric Pressure: 0.929 atm
Company/Airshed: LICA	Station Temperature °C: 20
Location/Station Name: St. Lina	Weather Conditions: Mainly sunny
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 11:17	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 16:02	Cal Gas Expiry Date: December 2, 2023
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	
Serial Number: 468	Range ppb: 1000
Last Calibration Date: July 20, 2016	As Found C.F.: 1.006
Previous C.F.: 0.999	New C.F.: 1.001

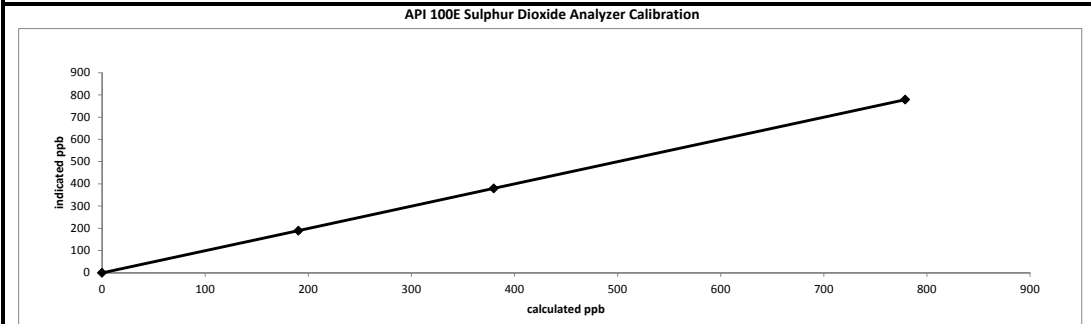
Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> </tr> <tr> <td>Mid</td> <td>380</td> </tr> <tr> <td>Low</td> <td>190</td> </tr> </tbody> </table>	Point	Sulphur Dioxide Standard Calibration Points	High	780	Mid	380	Low	190
Point		Sulphur Dioxide Standard Calibration Points							
High		780							
Mid		380							
Low		190							
Make & Model: API 700									
Serial #: 627									
Cal Gas Cylinder I.D. #: LL119346									
Cal Gas Conc. (ppm): 50.0									

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

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.00	5000	0.0	0.0	N/A
as found high	4924	78.00	5002	779.7	775.0	1.006
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4924	78.00	5002	779.7	779.0	1.001
mid	4966	38.00	5004	379.7	379.0	1.002
low	4981	19.00	5000	190.0	189.0	1.005
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F.=						1.003

Linear Regression/Calibration Results:

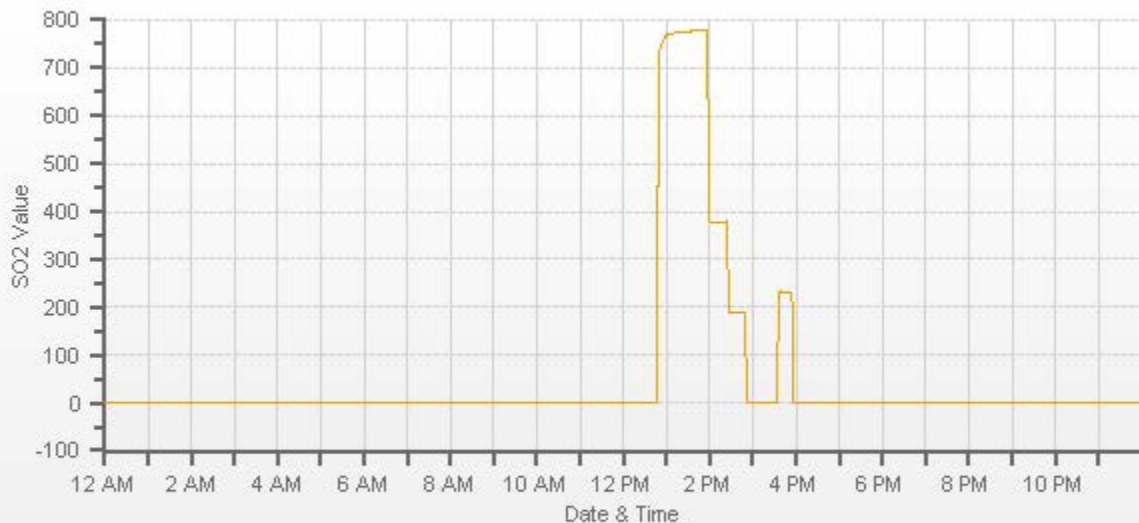
Correlation Coefficient = 1.000	LIMITS
Slope = 1.001	> or = 0.995
b (Intercept as % of full scale)= 0.04%	± 3% F.S.
% change in C.F. from last cal= -0.71%	± 10%



As found: SLOPE: 1.022 OFFSET: 106.2 HVPS: 651 RCELL TEMP: 50.0 BOX TEMP: 26.3 PMT TEMP: 7.8 IZS TEMP: 40.0 PRES: 24.4 SAMP FL: 636 NORM PMT: 106.4 UV LAMP: 3249.0 LAMP RATIO: 99.7 STR. LGT: 54.2 DRK PMT: 4.5 DRK LMP: 7.4 Internal Span: 237	As left: SLOPE: 1.026 OFFSET: 106.2 HVPS: 651 RCELL TEMP: 50.0 BOX TEMP: 28.9 PMT TEMP: 7.8 IZS TEMP: 40.0 PRES: 24.4 SAMP FL: 636 NORM PMT: 106.7 UV LAMP: 3252.3 LAMP RATIO: 99.7 STR. LGT: 54.4 DRK PMT: 5.4 DRK LMP: 7.0 Internal Span: 231
---	--

Comments:

Sample inlet filter changed. No zero adjustment required/made.



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: August 16, 2016	Barometric Pressure: 0.922 atm
Company/Airshed: LICA	Station Temperature °C: 23
Location/Station Name: St. Lina	Weather Conditions: Mainly sunny
Parameter: Hydrogen Sulphide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 10:08	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 14:27	Cal Gas Expiry Date: July 15, 2017
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	Range ppb: 100
Serial Number: 509	As Found C.F.: 1.009
Last Calibration Date: July 20, 2016	New C.F.: 1.000
Previous C.F.: 1.000	

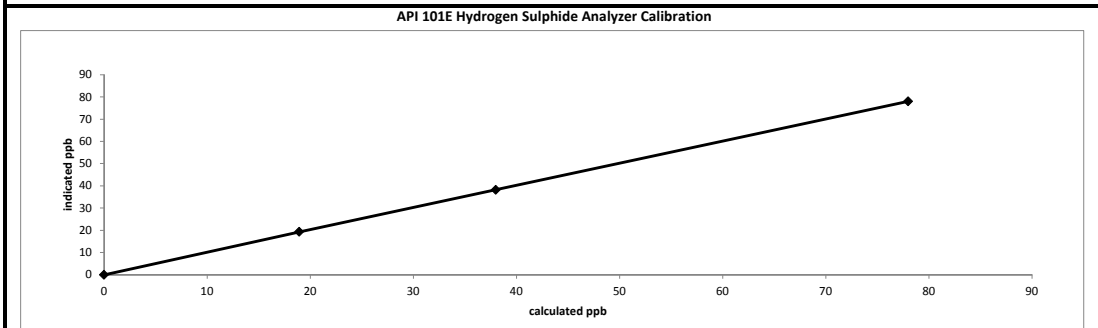
Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Hydrogen Sulphide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>78</td> </tr> <tr> <td>Mid</td> <td>38</td> </tr> <tr> <td>Low</td> <td>19</td> </tr> </tbody> </table>	Point	Hydrogen Sulphide Standard Calibration Points	High	78	Mid	38	Low	19
Point		Hydrogen Sulphide Standard Calibration Points							
High		78							
Mid		38							
Low		19							
Make & Model: SABIO 2010 D									
Serial #: 11900613									
Cal Gas Cylinder I.D. #: LL36837									
Cal Gas Conc. (ppm): 10.0									

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	-1.0	N/A		
as found high	7442	58.50	7501	78.0	76.3	1.009		
adjusted zero	7500	0.00	7500	0.0	0.0	n/a		
adjusted high	7442	58.50	7501	78.0	78.0	1.000		
mid	7472	28.50	7501	38.0	38.2	0.995		
low	7488	14.20	7502	18.9	19.3	0.981		
calibrator zero	7500	0.00	7500	0.0	0.0	n/a		
Average C.F.=						0.992		

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 1.001	> or = 0.995
b (Intercept as % of full scale) = -0.19%	.95-1.05
% change in C.F. from last cal = -0.90%	± 3% F.S.
	± 10%

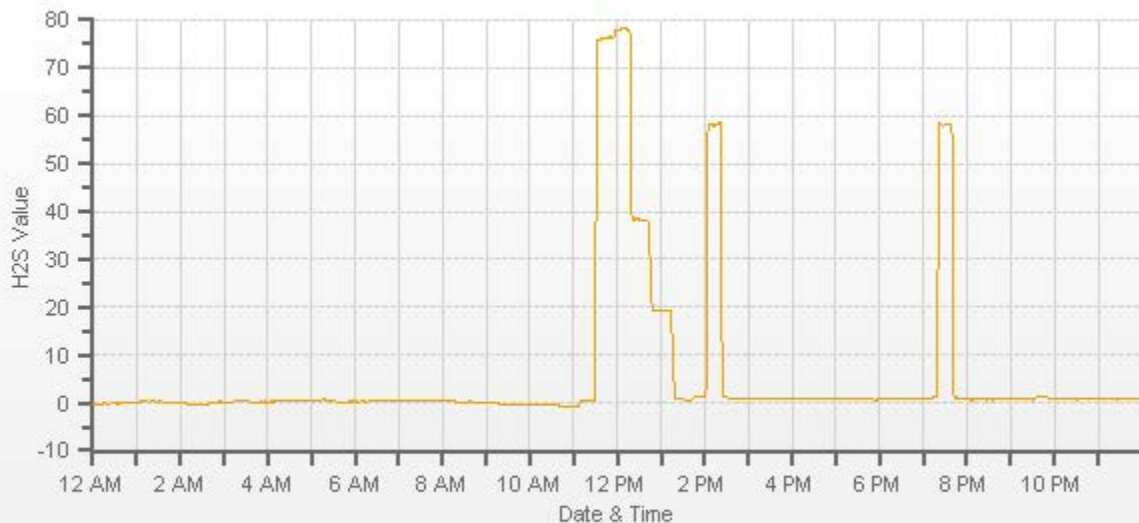


As found:	As left:
SLOPE: 0.940	SLOPE: 0.941
OFFSET: 52.8	OFFSET: 49.6
HVPS: 675	HVPS: 675
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 31.9	BOX TEMP: 35.3
PMT TEMP: 7.9	PMT TEMP: 8.0
IZS TEMP: 48.0	IZS TEMP: 48.0
Converter Temp: 314.8	Converter Temp: 315.3
PRES: 20.6	PRES: 20.5
SAMP FL: 561	SAMP FL: 556
UV LAMP: 3778.2	UV LAMP: 3766.8
LAMP RATIO: 101.1	LAMP RATIO: 100.9
STR. LGT 24.8	STR. LGT 23.4
DRK PMT: 0.2	DRK PMT: 0.4
DRK LMP: 0.6	DRK LMP: 0.9
Internal Span: 56.8	Internal Span: 58.5

Comments:

Sample inlet filter changed.

H2S[ppb] Station: LICA ST. LINA Daily: 2016/08/16 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: August 16, 2016 Barometric Pressure: 0.922 atm
 Company/Airshed: LICA Station Temperature °C: 23
 Location/Station Name: St. Lina Weather Conditions: Mainly sunny
 Parameter: Total Hydrocarbon Calibration Purpose: routine monthly
 Start/End Time 24 hr. (mst): 10:08 / 13:47 Performed By/Reviewer: Alex Yakupov Tom Bourque
 Calibration Method: Gas Dilution Cal Gas Expiry Date: November 25, 2023

Analyzer: Serial Number: 51CLT-77021-384 Range ppm: 50
 Last Calibration Date: July 20, 2016 As Found C.F.: 1.004
 Previous Cal High Point C.F.: 1.002 New C.F.: 0.999

Calibrator: Flow Meter ID's: n/a
 Make & Model: API 700
 Serial #: 627
 Cal Gas Cylinder I.D. #: LL165372
 CH₄/C₂H₆ Cylinder Conc. (ppm): 606.0 212.0
 CH₄ as propane/total CH₄ equivalents (ppm): 583.0 1189.0

Point	Target ppm
High	38
Mid	18
Low	9

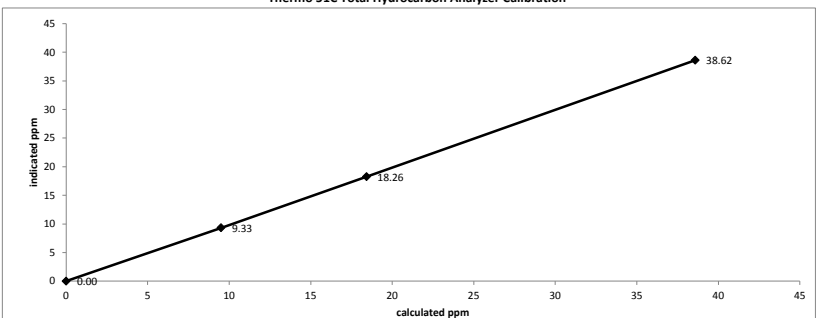
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	0.00	n/a
as found high	1938	65.00	2003	38.58	38.45	1.004
adjusted zero	2000	0.00	2000	0.00	0.00	n/a
adjusted high	1938	65.00	2003	38.58	38.62	0.999
mid	1969	31.00	2000	18.43	18.26	1.009
low	1986	16.00	2002	9.50	9.33	1.018
calibrator zero	2000	0.00	2000	0.0	0.00	n/a

Average C.F.= 1.009

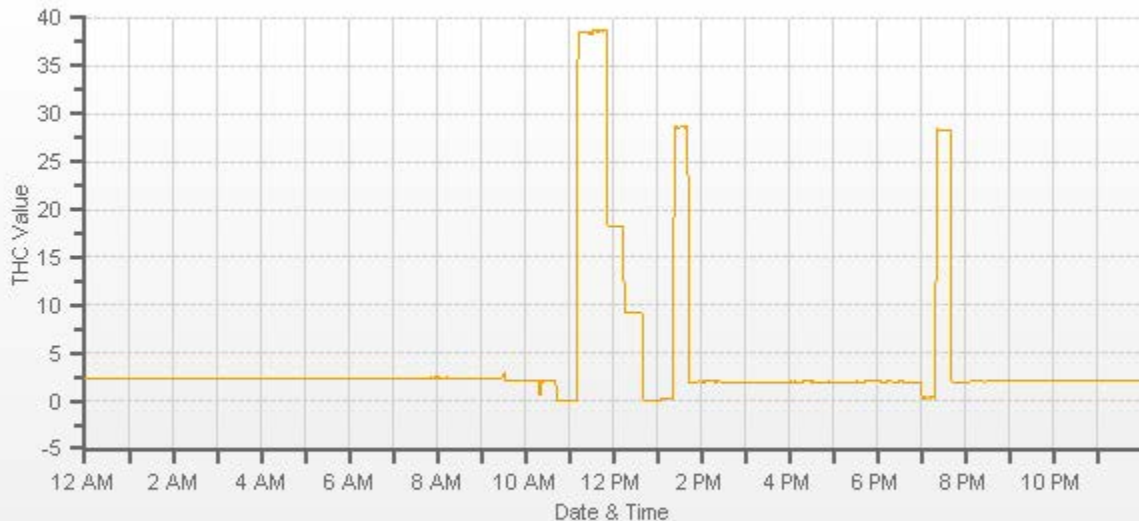
Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 > or = 0.995
 Slope = 0.998 .95-1.05
 b (Intercept as % of full scale) = 0.22% ± 3% F.S.
 % change in C.F. from last cal = -0.15% ± 10%



As found:	As left:
H2 cylinder (psi): 50	H2 cylinder (psi): 2000
H2 cylinder reg set (psi): 22	H2 cylinder reg set (psi): 22
Span Cylinder (psi): 650	Span Cylinder (psi): 650
Span Cylinder Reg Set (psi): 22	Span Cylinder Reg Set (psi): 22
Zero Air Gen Pressure: 45	Zero Air Gen Pressure: 45
measurement alarms: None	measurement alarms: None
service alarms: None	service alarms: None
cnt: 1585	cnt: 1503
rng: 1	rng: 1
try: 1	try: 1
flm: 183.7	flm: 182.7
det: 125.9	det: 125.8
Flame: 183	Flame: 182
Filter: 125	Filter: 125
Base: 125	Base: 125
Sample psi: 06.91	Sample psi: 06.91
Internal Air Pressure: 18	Internal Air Pressure: 18
Internal Fuel Pressure: 13	Internal Fuel Pressure: 13
Intenal Pressure Gauge psi: 27	Intenal Pressure Gauge psi: 27
Internal Span: 28.13	Internal Span: 28.63

Comments: Sample inlet filter changed. A new H2 gas cylinder connected. No zero adjustment required/made.



— THC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: August 18, 2016	Barometric Pressure: 0.929 atm
Company/Airshed: LICA	Station Temperature °C: 20
Location/Station Name: St. Lina	Weather Conditions: Mainly sunny
Start/End Time 24 hr. (mst): 11:17 / 17:45	Calibration Purpose: routine monthly
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 2, 2023

Analyzer: Serial Number: 594 Last Calibration Date: July 19, 2016 Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.000</td> <td>1.025</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.019</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.025	1.000	NO ₂ =	1.000	1.000	1.000	NOx =	1.000	1.019	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.025	1.000														
NO ₂ =	1.000	1.000	1.000														
NOx =	1.000	1.019	1.000														

Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL119346 NO/NOx Gas Conc. (ppm): 50.0 50.0	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	1.0	1.0	n/a	n/a
as found high	4924	78.0	5002	779.7	779.7	762.0	766.0	1.025	1.019
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4924	78.00	5002	779.7	779.7	780.0	780.0	1.000	1.000
mid	4966	38.00	5004	379.7	379.7	380.0	380.0	0.999	0.999
low	4981	19.00	5000	190.0	190.0	190.0	190.0	1.000	1.000
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.000	1.000

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	78.00	5002	0.0	784.0	784.0	0.0	0.0	0.0	
as found high NO2	7498	78.00	7576	490.0	274.0	784.0	510.0	510.0	510.0	1.000
adjusted high NO2	7498	78.00	7576	490.0	274.0	784.0	510.0	510.0	510.0	1.000
gpt mid	7498	78.00	7576	270.0	503.0	783.0	279.0	281.0	279.0	1.007
gpt low	7498	78.00	7576	95.0	685.0	784.0	99.0	99.0	99.0	1.000
Average NO₂ C.F.=										1.002

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	1.000	1.001	.95-1.05
b (Intercept as % of full scale) =	0.00%	0.00%	-0.03%	± 3% F.S.
% change in C.F. from last cal =	-2.46%	-1.92%	0.00%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

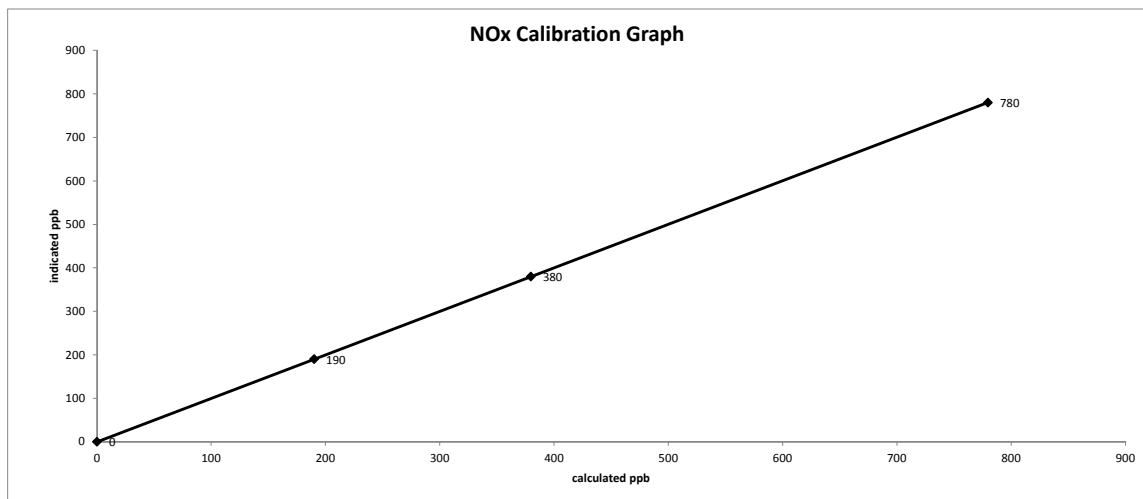
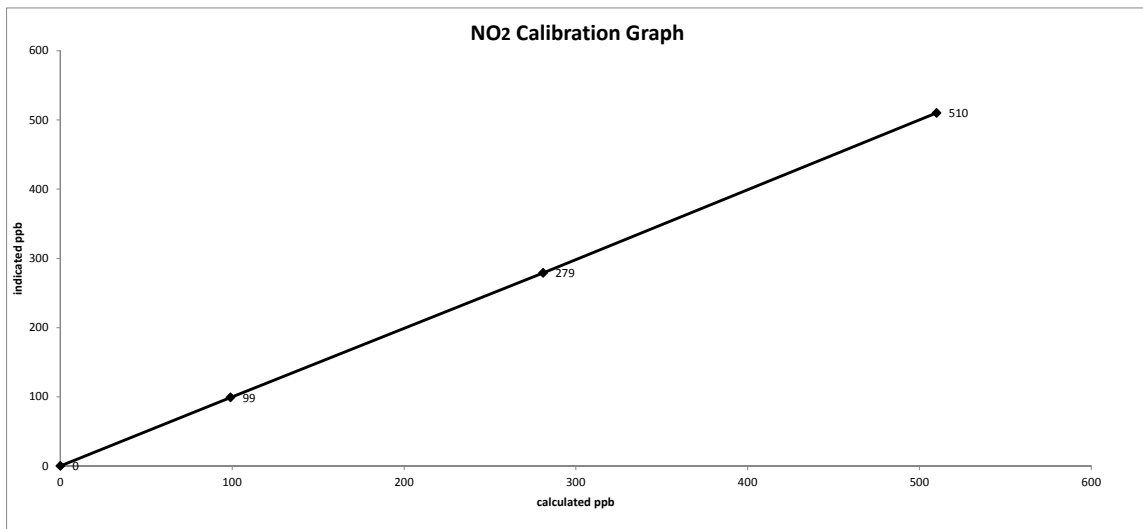
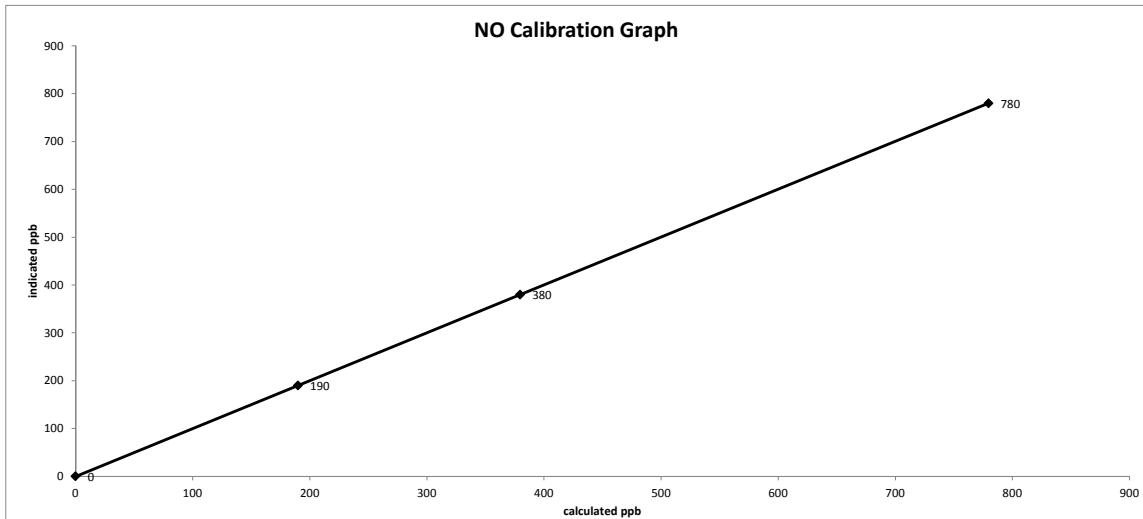
As found:	As left:
NOx SLOPE: 0.958	NOx SLOPE: 0.997
NOx OFFS: 0.5	NOx OFFS: 0.5
NO SLOPE: 0.960	NO SLOPE: 0.980
NO OFFS: -0.8	NO OFFS: -0.8
SAMP FLW: 487	SAMP FLW: 487
OZONE FL: 79	OZONE FL: 79
PMT: 13.7	PMT: 14.5
NORM PMT: -0.3	NORM PMT: 1.3
AZERO: 15.5	AZERO: 16.7
HVPS: 767	HVPS: 767
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 27.7	BOX TEMP: 31.5
PMT TEMP: 6.6	PMT TEMP: 6.7
IZS TEMP: 45.0	IZS TEMP: 45.3
MOLY TEMP: 315.6	MOLY TEMP: 315.9
RCEL: 5.2	RCEL: 5.1
SAMP: 26.8	SAMP: 26.8
Internal Span NO: 8.5	Internal Span NO: 8.5
Internal Span NO ₂ : 482	Internal Span NO ₂ : 494
Internal Span NOx: 490	Internal Span NOx: 502

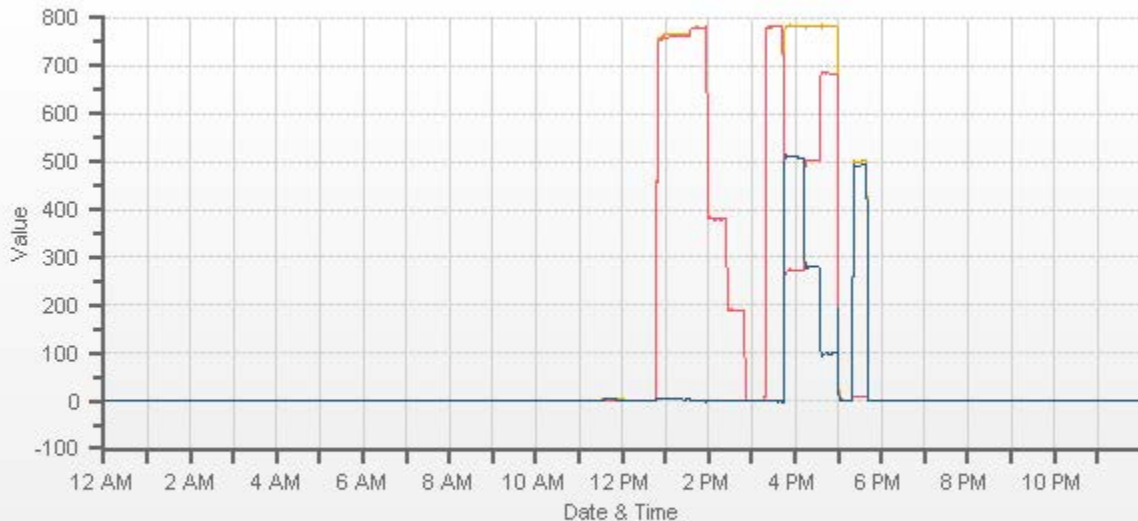
Comments:

Sample inlet filter changed. No NO₂ adjustment required/made.

Date: August 18, 2016
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 11:17 / 17:45
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date:	August 18, 2016	Barometric Pressure:	0.929 atm
Company/Airshed:	LICA	Station Temperature °C:	20
Location/Station Name:	St. Lina	Weather Conditions:	Mainly sunny
Start/End Time 24 hr. (mst):	11:17 / 16:02	Calibration Purpose:	routine monthly
Ozone Calibration Method:	Varying UV Lamp Power	Performed By/Reviewer:	Alex Yakupov Tom Bourque
G.P.T. Date:	n/a-done by Varying UV Lamp Power	Cal Gas Expiry Date:	n/a

Analyzer:	Serial Number:	1002240371	Ozone Range ppb:	500
	Last Calibration Date:	July 20, 2016	As Found C.F.:	0.997
	Previous Cal High Point C.F.:	0.997	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	High	300-400 ppb
	Serial #:	11900613	Mid	150-200 ppb
	Cal Gas Cylinder I.D. #:	n/a	Low	50-75 ppb

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

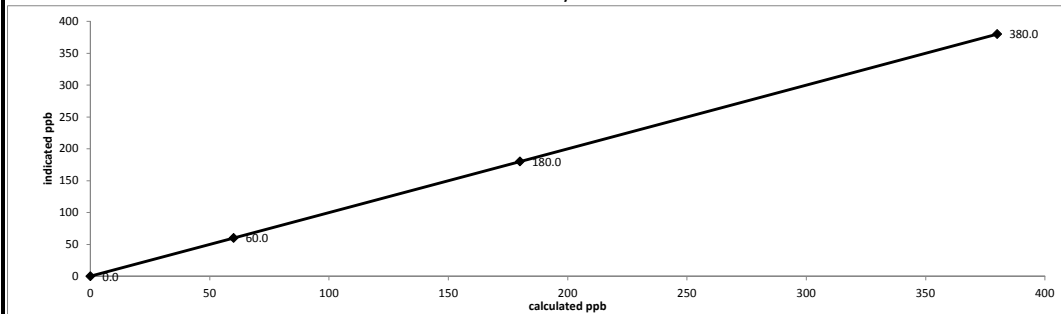
Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	381.0	0.997
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	60.0	60.0	60.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a

Average C.F.= 1.000

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		.95-1.05
b (Intercept as % of full scale)=	0.00%		± 3% F.S.
% change in C.F. from last cal=	-0.04%		± 10%

Thermo 49i Ozone Analyzer Calibration



As found:

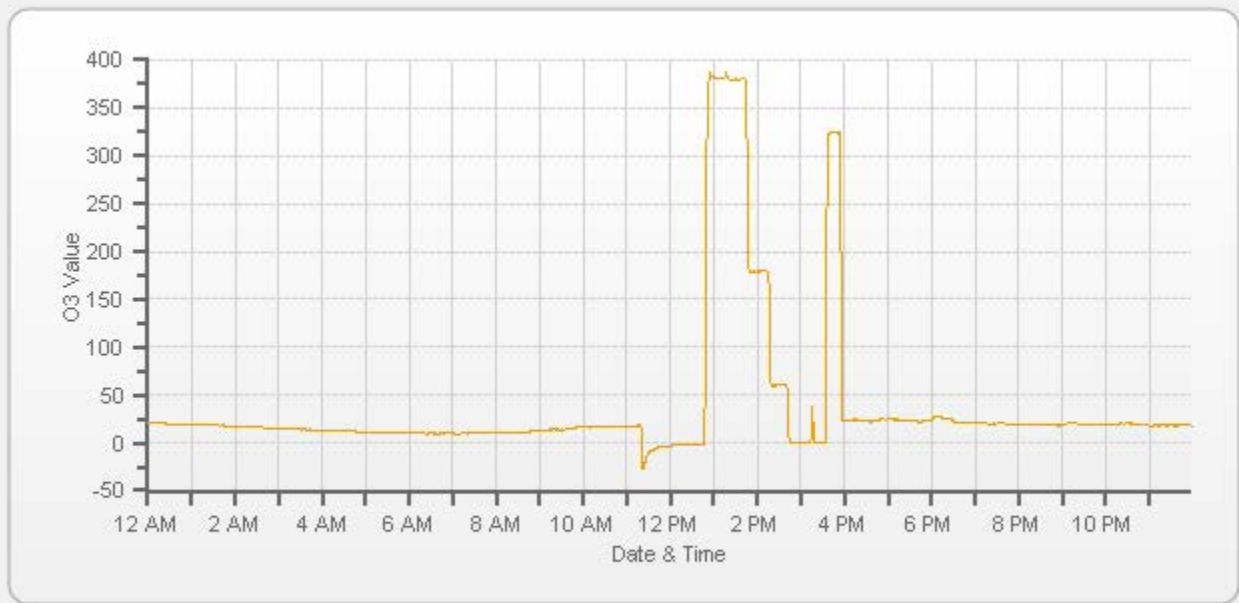
O3 Bkg:	0.0
O3 Coef:	0.970
Photo Lamp:	9.4
O3 Lamp:	7.8
Bench:	24.7
Bench Lamp:	53.6
O3 Lamp:	67.7
Pressure:	683.2
Cell A lpm:	0.730
Cell B lpm:	0.727
O3 ppb:	0.0
Cell A ppb:	0.0
Cell B ppb:	-13.4
Cell A int:	58161
Cell B int:	72775
Internal Span:	322

As left:

O3 Bkg:	-0.7
O3 Coef:	0.966
Photo Lamp:	9.4
O3 Lamp:	7.8
Bench:	27.7
Bench Lamp:	53.6
O3 Lamp:	67.8
Pressure:	682.9
Cell A lpm:	0.730
Cell B lpm:	0.726
O3 ppb:	0.7
Cell A ppb:	0.7
Cell B ppb:	-0.8
Cell A int:	58015
Cell B int:	72660
Internal Span:	324

Comments:

Sample inlet filter changed.



— O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: August 16, 2016
 Company: LICA
 Station Name/Location: St. Lina
 Previous Audit Date: July 20, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
 Start Time (mst): 13:53
 End Time (mst): 16:31
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Mainly sunny

1400A Information and Status:

Serial Number: 1405A208301003 As Found Filter Loading %: 29.61
 Ko Factor: 13125.0 As Left Filter Loading %: 17.36
 Ambient Temperature °C: 28.62 As Found Noise: 0.008
 Ambient Pressure atm: 0.922 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.26
 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>FB 1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#2</u>	<u>130168457</u>	<u>ID# 4295</u>
Calibration Date:	<u>January 15, 2016</u>	<u>February 17, 2016</u>	<u>November 2, 2015</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	-0.17	0.00	-0.17
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	-0.01	-1.72	0.00	-1.73
	limit	0.60	0.60	0.60	0.60

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	-0.06	0.00	-0.06
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	-0.01	-0.97	0.00	-0.98
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>28.6</u>	1405F pressure atm: <u>0.922</u>
reference temperature °C: <u>29.1</u>	reference pressure: <u>0.922</u>
difference °C: <u>0.5</u>	difference: <u>0.000</u>

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>28.0</u>	1405F pressure atm: <u>0.922</u>
reference temperature °C: <u>28.0</u>	reference pressure: <u>0.922</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>16.96</u>
difference lpm: <u>0.03</u>	difference lpm: <u>0.29</u>

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

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.01</u>	reference total/aux flow lpm: <u>16.91</u>
difference lpm: <u>0.01</u>	difference lpm: <u>0.24</u>

K_o Audit:

Last K_o audit date: August 16, 2016
 1405F K_o factor: 13125.0
 Measured K_o factor: 13230.7000
 % difference: 0.81

Comments:

PM 2.5/10 sample inlet head was cleaned. TEOM sample filter was changed and 47 mm FDMS filter was changed. Flows were audited/adjusted. Dryer was exchanged. Ko audit was completed.

WIND SYSTEM

Met One Instruments

3206 Main St., Suite 106
Regional Service Center
Rowlett, TX. 75088

Wind Tunnel Calibration Data Sheet

50.5-6100

NIST Cup Model No. 170.41

Serial No. 3309

NIST Sensor Model No. 50.1B

Serial No. 1263

Average wind speed this test in mps 11.19

WD Setting Degrees	WD Output Volts	WD Reading Degrees	WD Error +/- 3 Deg	WS Standard mps	WS Output Volts	WS Reading mps	WS Error +/- 0.24 MPS
30.0	0.082	29.6	-0.4	11.21	0.224	11.19	-0.02
60.0	0.164	59.0	-1.0	11.17	0.227	11.33	0.16
120.0	0.331	119.1	-0.9	11.08	0.221	11.06	-0.02
150.0	0.420	151.3	1.3	11.29	0.222	11.11	-0.18
210.0	0.582	209.4	-0.6	11.25	0.223	11.16	-0.09
240.0	0.665	239.4	-0.6	11.18	0.226	11.32	0.14
300.0	0.835	300.5	0.5	11.16	0.224	11.18	0.02
330.0	0.917	330.0	0.0	11.18	0.223	11.15	-0.03

Average wind speed this test in mps 2.21

WD Setting Degrees	WD Output Volts	WD Reading Degrees	WD Error +/- 3 Deg	WS Standard mps	WS Output Volts	WS Reading mps	WS Error +/- 0.20 MPS
30.0	0.081	29.3	-0.7	2.18	0.042	2.08	-0.10
60.0	0.163	58.5	-1.5	2.20	0.043	2.14	-0.06
120.0	0.332	119.6	-0.4	2.21	0.042	2.08	-0.13
150.0	0.417	150.3	0.3	2.22	0.042	2.07	-0.15
210.0	0.584	210.1	0.1	2.20	0.042	2.12	-0.08
240.0	0.666	239.8	-0.2	2.23	0.042	2.10	-0.13
300.0	0.835	300.6	0.6	2.22	0.043	2.18	-0.04
330.0	0.917	330.0	0.0	2.21	0.043	2.17	-0.04

Instrument Test Condition As Found As Left

Sensor Model No.: 50.5H

Sensor Serial No.: H12635

Sensor Output Swing: 0V - 1.0V

Sensor Output Range 0 - 50 MPS

Customer: Maxxam Analytics

Sales Order No.: 104703

Tested per PO: 35-56587

Calibration Date: 08/28/2014

Calibrated by: David Frith *DF*

QC Inspection

Dylan Dawson



Meteorological Sensor Audit

Station Information

Company:	<u>LICA</u>	Performed By:	<u>Abid/Limin Li</u>
Location:	<u>St Lina</u>	Reason:	<u>Install</u>
Audit Date:	<u>July 7, 2016</u>	Calibrator Make/Model:	<u>RM Young/18802</u>
Previous Audit Date:	<u>n/a</u>	Calibrator Cert. Date:	<u>Mar 17, 2014</u>

Wind Speed

Sensor make:	<u>RM Young</u>	Sensor height:	<u>10M</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>124638</u>
Calibrator:	<u>RM Young</u>	Variable speed motor:	<u>CA03309</u>
Voltage range:	<u>0-1V</u>	Output signal range:	<u>0-200KPH</u>

Wind Speed Audit Data

RPM	Wind Speed	Indicated WS - CW	Indicated WS-CCW	Correction Factor
0	0.0	0.4	0.4	-
1000	17.6	17.9	17.9	0.98
2000	35.28	35.64	35.62	0.99
3000	52.92	53.4	53.4	0.99
4000	70.56	71.22	71.22	0.99
5000	88.2	89.05	89.06	0.99
6000	105.84	106.9	106.9	0.99
7000	123.48	124.8	124.8	0.99
8000	141.12	142.6	142.6	0.99
9000	158.76	160.6	160.6	0.99
10000	176.4	178.5	178.6	0.99
Average Correction Factor:				0.99

Wind Direction

Sensor make:	<u>RM Young</u>	Sensor height:	<u>10M</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>124638</u>
Calibrator:	<u>RM Young</u>	Variable speed motor:	<u>CA03309</u>
Voltage range:	<u>0-1V</u>	Output signal range:	<u>0-360DEG</u>

Wind Direction Audit Data

Wind Direction	Indicated	Correction Factor
0	0.6	n/a
45	45.2	1.00
90	92.4	0.97
135	136.3	0.99
180	181.2	0.99
225	226.8	0.99
270	271.0	1.00
315	315.7	1.00
355	355.1	1.00
Average Correction Factor:		0.99

Remarks: _____

Audit Performed by: Abid Ashraf

METEOROLOGICAL SYSTEM CHECK

Meteorological System Checklist

Performed by: Alex Yakupov
 Station: **St. Lina**
 Start: 11:38 End: 11:56

PRECIPITATION SENSOR CHECK

	YES	NO
Is the sensor Level?	YES	
Is the heater operating properly?	YES	
Are the bucket drain holes clean?	YES	
Is the inner screen on the housing? (screen should be on between July and September	YES	
Is the upper screen on the housing? (screen should be on between July and September)	YES	
Is the housing clean?	YES	
Is the area around the housing clean and free from obstacle?	YES	
Is the tipping sensor working properly? (test sequence 2.0 mm at 11:54)	YES	
	PASS	

Comments: Rain gauge was tested with water.
 Responce is timely and accurate. No issues.

Field Technician: Alexander Yakupov August 16, 2016

CALIBRATORS



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-119

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>627</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 1 2015</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</u>		

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5007	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5003	77.5	0.779	0.779	0.787	-0.001	0.786	1%	1%
5004	37.8	0.380	0.380	0.383	0.000	0.383	1%	1%
5001	18.9	0.190	0.190	0.191	0.000	0.191	1%	1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NOx			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	1.0106	0.90-1.10		m (Slope)=	1.0092		
b (Intercept % of FS)=	-0.0566	± 3% F.S.		b (Intercept % of FS)=	-0.0368		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5003	0	0.000	0.787	0.001	0.788	NO ₂	% Diff. Limit
5003	0.5	0.493	0.294	0.498	0.792	1%	± 10%
5003	0.25	0.256	0.531	0.262	0.792	2%	± 10%
5003	0.1	0.108	0.679	0.110	0.789	1%	± 10%
Absolute Average Percent Difference						1.2%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	1.0089	0.90-1.10					
b (Intercept % of FS)=	0.1591	± 3% F.S.					

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model	<u>Thermo 146i</u>
Serial/AMU Number	<u>1809</u>
	Make/Model <u>Thermo 42i</u>
	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>February 1, 2016</u>
	Full Scale (ppm) <u>1</u>

COMMENTS: Flows not manually measured - calibration system audited as it is currently being operated.

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 3, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-165

Company Maxxam Operator: Chris Wesson

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

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

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

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NO _x			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	0.9950	0.90-1.10		m (Slope)=	0.9946		
b (Intercept % of FS)=	-0.0773	± 3% F.S.		b (Intercept % of FS)=	-0.0167		

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NO _x	% Diff. Vs Audit gas	
5001	0	0.000	0.772	0.000	0.772	NO ₂	% Diff. Limit
5001	0.51	0.507	0.265	0.506	0.772	0%	± 10%
5001	0.25	0.252	0.520	0.254	0.773	1%	± 10%
5001	0.1	0.110	0.662	0.109	0.772	-1%	± 10%
Absolute Average Percent Difference						0.1%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO ₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9992	0.90-1.10					
b (Intercept % of FS)=	0.0171	± 3% F.S.					

AENV Standards		NO _x Analyzer	
Audit Calibrator			
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
		Last Calibration Date	<u>March 28, 2016</u>
		Full Scale (ppm)	<u>1</u>

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

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: March 31, 2016
 Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-116CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: LL119346 **Concentration PPM:** 50.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>Thermo146i</u>	Make/Model: <u>Bios DC-2</u>
Serial Number: <u>1809</u>	Serial Number: <u>Bios D</u>
Last Verification Date: <u>February 2, 2016</u>	Temp. °C: <u>24.5</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>702mmHg</u>
Cylinder Number: <u>CAL016625</u>	

Reference Analyzer:
 Make/Model: Thermo 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 8.7 Span: 1.027 Range: 1.0
 Last Calibration: Date: 1-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4952	0.0	0.000	0.01608	62.183	49.3
4946	79.54	0.793	0.01608	62.183	49.3
4941	39.35	0.396	0.00796	125.565	49.7
4940	19.57	0.195	0.00396	252.427	49.2
Average Cylinder Concentration:					49.4

Previous Stated Concentration PPM: 50.0
 Percent variance from Stated: 1.2

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO blend 50.0ppm NO
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 2, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam Operator's Name: Limin Li
 Cylinder #: LL36837 Concentration PPM: 10.0 Tolerance(%): 2 Certified By: Air Liquide

Reference Calibrator and Gas:
 Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: December 15, 2014
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:
 Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P.: 702 mmhg

Reference Analyzer:
 Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
 Last Calibration: Date: Dec15/14 C.F.: 1.000 Done By: Al Clark

Calibrator Flows (scem)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	100.000	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

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: December 16, 2014
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

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

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

Flow Measurement Device:
Make/Model Bios DC-2
Serial Number Blos D
Temp. °C 24.5
B.P. 688mmHg

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

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

CH4	C3H8
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



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-115CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL119346 **Conc (PPM)** 50.0/50.0 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Thermo 146i</u>			Make/Model	<u>Bios DC-2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>Bios D</u>
Last Verification Date	<u>February 2, 2016</u>			Temp. °C	<u>24.5</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>702mmHg</u>
Cylinder Number	<u>CAL018024</u>				

Reference Analyzer:

Make/Model	<u>Thermo 42i</u>	Serial/AMU Number:	<u>1868</u>
Instrument Settings	Zero: <u>4.2</u>	Span:	<u>1.014</u> Range: <u>1.0</u>
Last Calibration:	Date: <u>02-Feb-16</u>	C.F.	<u>1.000</u> Done By: <u>SB</u>

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
4952	0.0	0.000	0.000				
4946	79.54	0.809	0.809	0.01608	62.183	50.3	50.3
4941	39.35	0.403	0.402	0.00796	125.565	50.6	50.5
4940	19.57	0.200	0.200	0.00396	252.427	50.5	50.5
Average Cylinder Concentration:						50.5	50.4

NO	NOx
Previous Stated Concentration PPM: <u>50.0</u>	<u>50.0</u>
Percent variance from Stated: <u>0.9</u>	<u>0.8</u>

Cylinder gas tolerances based on NO only

- Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS: SO2/NO Blend 50.0PPM SO2**
- < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
- > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: February 2, 2016
 Operator Signature: [Signature] Location: McIntyre Center Edmonton

***APPENDIX III
REPORT CERTIFICATION FORM***

Report Certification Form

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

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

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

30-09-2016





Report Issued Date (dd-mm-yyyy)

APPENDIX IV
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2016-08-31-C</u>
Site: <u>St. Lina Site</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u></u>	Date <u>22-Sep-16</u>
Level 1 Primary Validation	<u></u>	Date <u>22-Sep-16</u>
Level 2 Final Validation	<u></u>	Date <u>30-Sep-2016</u>
Level 3 Independent Data Review	<u></u>	Date <u>30-Sep-2016</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

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

AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
BONNYVILLE

JOB #: 2833-2016-08-37-C

August 2016

Prepared for:

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

Attention: MIKE BISAGA

DATE: **October 4, 2016**

Prepared by:



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

Reviewed by:



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

SUMMARY

In August 2016, the Air Services Group of Maxxam Analytics conducted an ambient air monitoring program at the Bonnyville station of Lakeland Industry & Community Association, near Bonnyville, AB. Sampling was carried out to determine the concentrations of non-compliance parameters, as requested by the Project Coordinator.

All data collected this month, except H₂S and PM_{2.5}, were within the objectives outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational uptime for all analyzers and meteorological sensors were above the 90% requirement.

- **Exceedances:** Over the course of August, thirty-two 1-hr and six 24-hr exceedances were recorded for H₂S and one 1-hr exceedance was recorded for PM_{2.5}. The exceedances were reported to AEP, in accordance with A Guide To Release Reporting (Alberta Environmental Protection and Enhancement Act). Details are recorded in the Exceedance Summary Report.
- **Gas Analyzers:** Annual maintenance was performed on all gas analyzers this month. Due to these events, eighteen hours of downtime were recorded for SO₂, thirty-six for H₂S, fifteen for THC/CH₄/NMHC and twenty-one for NO_x/NO/NO₂.
- **SO₂:** Five additional hours of downtime were recorded due to a repeat calibration performed to address a zero drift trend.
- **H₂S:** Six additional hours of downtime were recorded due to a repeat calibration performed to address a zero drift trend.
- **THC/CH₄/NMHC:** Nineteen additional hours of data were discarded due to an instrument malfunction which yielded intermittently biased low measurements. The data discarded was based on review of minute data and historical monthly averages. One hour of downtime was due to an additional span check, performed on August 19, to assess analyzer performance. There were 6 canister events recorded between August 4 and August 31.
- **NO_x/NO/NO₂:** Eleven additional hours of downtime were recorded due to a repeat calibration performed to address a span drift trend.
- **PM_{2.5}:** Four hours of data were recorded at concentrations less than -3 µg/m³, rendering the data invalid.

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 is issuing this completed report to Lakeland Industry & Community Association, Bonnyville.

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 Bonnyville						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-HR	24-HR	1-HR	24-HR				HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	0.0	0.5	25, 31	11, VAR	VAR	VAR	0.1	31	96.9
H ₂ S (ppb)	10	3	32	6	1.7	24.5	15	2	6.5	SW	6.0	13	94.4
THC (ppm)	-	-	-	-	2.11	3.32	5	5	0.8	NNE	2.43	5	95.3
CH ₄ (ppm)	-	-	-	-	2.11	3.23	5	5	0.8	NNE	2.39	5	95.3
NMHC (ppm)	-	-	-	-	0.01	0.28	31	13	9.9	ESE	0.03	5, 7	95.3
NO ₂ (ppb)	159	-	0	-	3.1	10.8	26	5	0.8	WNW	4.4	8	95.7
NO (ppb)	-	-	-	-	1.0	13.0	5	6	0.5	N	2.5	26	95.7
NO _x (ppb)	-	-	-	-	4.1	21.3	6	6	0.6	NNW	6.8	26	95.7
O ₃ (ppb)	82	-	0	-	19.7	42.7	16	16	11.0	NNW	26.8	10	100.0
PM _{2.5} (µg/m ³)	80	30	1	0	5.0	82.1	19	7	4.2	SW	10.0	6	99.5
VECTOR WS (kph)	-	-	-	-	6.7	22.7	27	3	-	SSE	11.8	1	100.0
VECTOR WD (sec)	-	-	-	-	-	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedance Summary Report

SO₂ 1- Hour Exceedances

No Exceedances Recorded During the Month

SO₂ 24- Hour Exceedances

No Exceedances Recorded During the Month

H₂S 1- Hour Exceedances

DATE	TIME (MST)	READING (ppb)	WS (kph)	WD (sec)
August 5	3	13.4	0.0	NW
August 5	4	13.4	1.2	NW
August 5	5	10.9	0.8	NNE
August 5	6	10.7	0.5	N
August 7	1	11.9	0.3	SSE
August 7	2	11.7	0.5	NW
August 7	4	15.1	1.8	WSW
August 12	23	11.7	6.0	SW
August 13	0	15.6	5.8	SSW
August 13	1	16.2	5.8	SW
August 13	2	17.0	7.0	SSW
August 13	3	20.5	5.8	SW
August 13	4	21.3	6.0	SW
August 13	5	18.8	6.3	SSW
August 13	6	14.6	6.4	SSW
August 14	5	13.0	1.9	SE
August 14	6	11.8	1.0	WSW
August 15	1	11.4	4.4	SW
August 15	2	24.5	6.5	SW
August 15	3	22.6	6.5	SW
August 15	4	13.6	6.6	SSW
August 15	5	13.6	3.2	SW
August 15	6	12.2	2.0	SW
August 16	0	10.7	3.6	SW
August 16	2	15.8	4.8	SSW
August 16	3	12.4	5.7	SW
August 16	4	19.8	6.2	SSW
August 16	5	22.2	5.3	SW
August 16	6	10.9	6.0	SSW
August 19	5	14.9	5.0	SW
August 19	6	12.2	5.5	SSW
August 27	5	10.3	11.4	SE

H₂S 24- Hour Exceedances

DATE	READING (ppb)	WS (kph)	WD (sec)
August 5	3.3	3.4	E
August 7	3.3	3.5	SW
August 13	6.0	5.8	SW
August 15	5.6	5.2	SW
August 16	5.2	7.6	SW
August 19	3.2	4.9	SSW

NO₂ 1- Hour Exceedances

No Exceedances Recorded During the Month

PM_{2.5} 1- Hour Exceedances

DATE	TIME (MST)	READING (ppb)	WS (kph)	WD (deg)
August 19	7	82.1	4.2	SW

PM_{2.5} 24- Hour Exceedances

No Exceedances Recorded During the Month

O₃ 1- Hour Exceedances

No Exceedances Recorded During the Month

Volatile Organics (VOCs) Data Summary

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
August 4, 2016	173	Acetone
August 10, 2016	98.3	Naphthalene
August 16, 2016	5.4	Acetone
August 22, 2016	3.0	Acetone
August 28, 2016	2.1	Acetone

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collection Date	Maximum reading ($\mu\text{g}/\text{puf}$)	Semi-Volatile Organic
August 4, 2016	0.27	Phenanthrene
August 10, 2016	0.52	Phenanthrene
August 16, 2016	0.62	Retene
August 22, 2016	0.21	Phenanthrene
August 28, 2016	0.12	Phenanthrene

Note: NA

Volatile Organics (VOCs) Data Summary - NMHC Canister System

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
August 4, 2016	94.6	Acetone
August 6, 2016	4.4	Acetone
August 8, 2016	13.3	Isopentane
August 18, 2016	6.1	Acrolein
August 30, 2016	7.49	n-Butane
August 31, 2016	13.9	Acetone

Note: NA

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
SUMMARY	1
MONTHLY CONTINUOUS DATA SUMMARY REPORT	2
EXCEEDENCE SUMMARY REPORT	3
VOC SAMPLE SUMMARY REPORT	5
PAH SAMPLE SUMMARY REPORT	6
NMHC CANISTER SAMPLE SUMMARY REPORT	7
TABLE OF CONTENTS	8
1.0 Discussion	10
.....	
2.0 Project Personnel	14
.....	
3.0 Plant Monthly Required AMD Summary	14
.....	
4.0 Calculations and Results	14
.....	
5.0 Methods and Procedures	15
.....	
Appendix I	Continuous Monitoring Data Results 18
	Sulphur Dioxide 19
	Hydrogen Sulphide 27
	Total Hydrocarbon 35
	Methane 43
	Non-Methane Hydrocarbon 51
	Oxides of Nitrogen 59
	Nitric Oxides 67
	Nitrogen Dioxide 74
	Ozone 82
	Particulate Matter 2.5 90
	Wind Speed 95
	Wind Direction 102
	Standard Deviation Wind Direction 105
Appendix II	Non-Continuous Monitoring Data Results 108
	VOC Results 109
	PAH Results 125
	NMHC Canister Results 136
Appendix III	Equipment Calibration Results 155
	Sulphur Dioxide 156
	Hydrogen Sulphide 163
	Total Hydrocarbon 170

	Nitrogen Dioxide	177
	Ozone	189
	Particulate Matter	192
	Wind System	195
	Calibrators	197
	Calibration Gases	201
Appendix IV	Analytical Results	207
	VOCs Samples	208
	PAHs Samples	234
	NMHC Canister Samples	245
Appendix V	Report Certification Form	276
Appendix VI	Data Validation Certification Form	278

1.0 Discussion

This monthly report consists of data for parameters Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Methane (CH₄), Non-Methane Hydrocarbon (NMHC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Station Temperature (StnTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD). The non-continuous monitoring data results for VOCs, PAHs and NMHC canisters 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 (minimum), on a monthly basis.

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

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

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

SULPHUR DIOXIDE (SO₂)

Annual maintenance was performed on August 2 following a shut-down calibration. The analyzer was allowed time to stabilize overnight and a post-repair calibration was completed on August 3. Eighteen hours of downtime were recorded during the stabilizing period.

Five hours of downtime were recorded due to a repeat calibration that was completed on August 23, to address a zero drift issue.

Maximum instantaneous data collected on August 3, at hour 14:00, was invalidated due to a brief power outage.

HYDROGEN SULPHIDE (H₂S)

Annual maintenance was performed on August 2 following a shut-down calibration. The analyzer was allowed time to stabilize and a post-repair calibration was completed on August 4. Thirty-six hours of downtime were recorded during the stabilizing period.

An additional zero/span check was performed on August 8 following a zero drift on August 7. A repeat calibration was completed on August 29 to address the recurring zero drift issue. The results met AMD requirements. Six hours of downtime were recorded due to the additional quality checks.

Maximum instantaneous data collected on August 3, at hour 14:00, was invalidated due to a brief power outage.

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

The analyzer was recording intermittent low concentrations for CH₄ due to a malfunction of the valve actuator. Annual maintenance was performed on August 2 following a shut-down calibration. The valve actuator was replaced as part of the maintenance. The analyzer was allowed time to stabilize overnight and a post-repair calibration was completed on August 3. Fifteen hours of downtime were recorded during the stabilizing period.

The minute data collected prior to the annual maintenance was reviewed; concentrations less than 1.86 ppm were invalidated. This set point was determined based on historical monthly averages. Hourly averages with less than 75% valid minute data were invalidated. Nineteen hours of data were discarded due to this event.

A zero/span check was triggered after the span gas cylinder was replaced on August 19. The Nitrogen and Hydrogen gas cylinders were replaced on August 29.

Maximum instantaneous data collected on August 3, at hour 14:00, was invalidated due to a brief power outage.

NITROGEN DIOXIDE (NO₂)

Annual maintenance was performed on August 2 following a shut-down calibration. The sample pump was rebuilt. The analyzer was allowed time to stabilize overnight and a post-repair calibration was completed on August 3. Twenty-one hours of downtime were recorded during the stabilizing period.

The analyzer spanned towards the upper acceptance limit on August 5. The span check was repeated and an as-found response check was completed on August 6, confirming analyzer performance. The analyzer spanned high again on August 8 but was still within acceptance limits. For diligence, a repeat calibration was performed on August 9. The results met AMD requirements. As this event impacted only the zero/span system and not analyzer performance, no data was discarded. However, eleven hours of downtime were recorded due to the additional quality checks.

Maximum instantaneous data collected on August 3, at hour 14:00, was invalidated due to a brief power outage.

OZONE (O₃)

The routine monthly calibration was performed on August 3. No operational issues were identified this month.

PARTICULATE MATTER 2.5 (LESS THAN 2.5 MICRONS) (PM_{2.5})

Two routine TEOM audits were performed this month: one was completed on August 4 and the other audit was performed on August 23. Both the inlet filter and the FDMS filter were replaced during the audits. A new dryer was installed on August 4.

Data was corrected using Alberta Air Quality Guidelines. Data 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. Four 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)

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was coming from.

No operational issues were identified this month. Maximum instantaneous data collected on August 3, at hour 14:00, was invalidated due to a brief power outage.

VOC SAMPLES

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

Samples were collected on August 4, 10, 16, 22 and 28. Analytical results are included in this report. VOC values are reported in ppb.

PAH SAMPLES

The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule). Samples were collected on August 4, 10, 16, 22 and 28. Analytical results are included in this report. PAH values are reported in $\mu\text{g}/\text{puf}$.

NMHC CANISTER SAMPLES

The NMHC canister sampler is programmed to trigger a sample-collection event when the 5-minute average concentration of NMHC is above 0.30ppm. Sample is collected over a one-hour period when the canister is triggered.

Six canister events were recorded this month between August 4 and August 31. The date, time and initial 5-min average concentration measurements are as follows:

- August 4 at hour 06:20: 0.34 ppm
- August 6 at hour 21:50: 0.33 ppm
- August 8 at hour 20:50: 0.64 ppm
- August 18 at hour 05:05: 0.58 ppm
- August 30 at hour 07:20: 0.70 ppm
- August 31 at hour 09:15: 0.72 ppm

Five minute averages, recorded on August 19 at hours 07:10 and 07:20, were not considered a sample-collection event as the canister was replaced on the same day.

Analytical results are included in this report. The values for the NMHC canister samples are reported in ppb.

2.0 Project Personnel

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

3.0 Plant Monthly Required AMD Summary

All data collected this month, except H₂S and PM_{2.5}, were within the objectives outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

In the course of the month, thirty-two 1-hr and six 24-hr exceedances were recorded for H₂S and one 1-hr exceedance was recorded for PM_{2.5}. Details are recorded in the Exceedance Summary Report.

The operational uptime for all analyzers and meteorological sensors were above the 90% requirement.

4.0 Calculations and Results

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

5.0 Methods and Procedures

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

- Maxxam AIR SOP-00001 - Methane, Non-Methane Hydrocarbon Analyzer Monitoring
- Maxxam AIR SOP-00208: RM Young Monitor Calibration
- Maxxam AIR SOP-00209: Ambient H₂S Monitoring
- Maxxam AIR SOP-00211: Ambient SO₂ Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00215: TEOM Operation

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_{2.5}) - R&P 1405F TEOM Unit
- Wind System - RM Young Unit
- Datalogger - ESC 8832

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

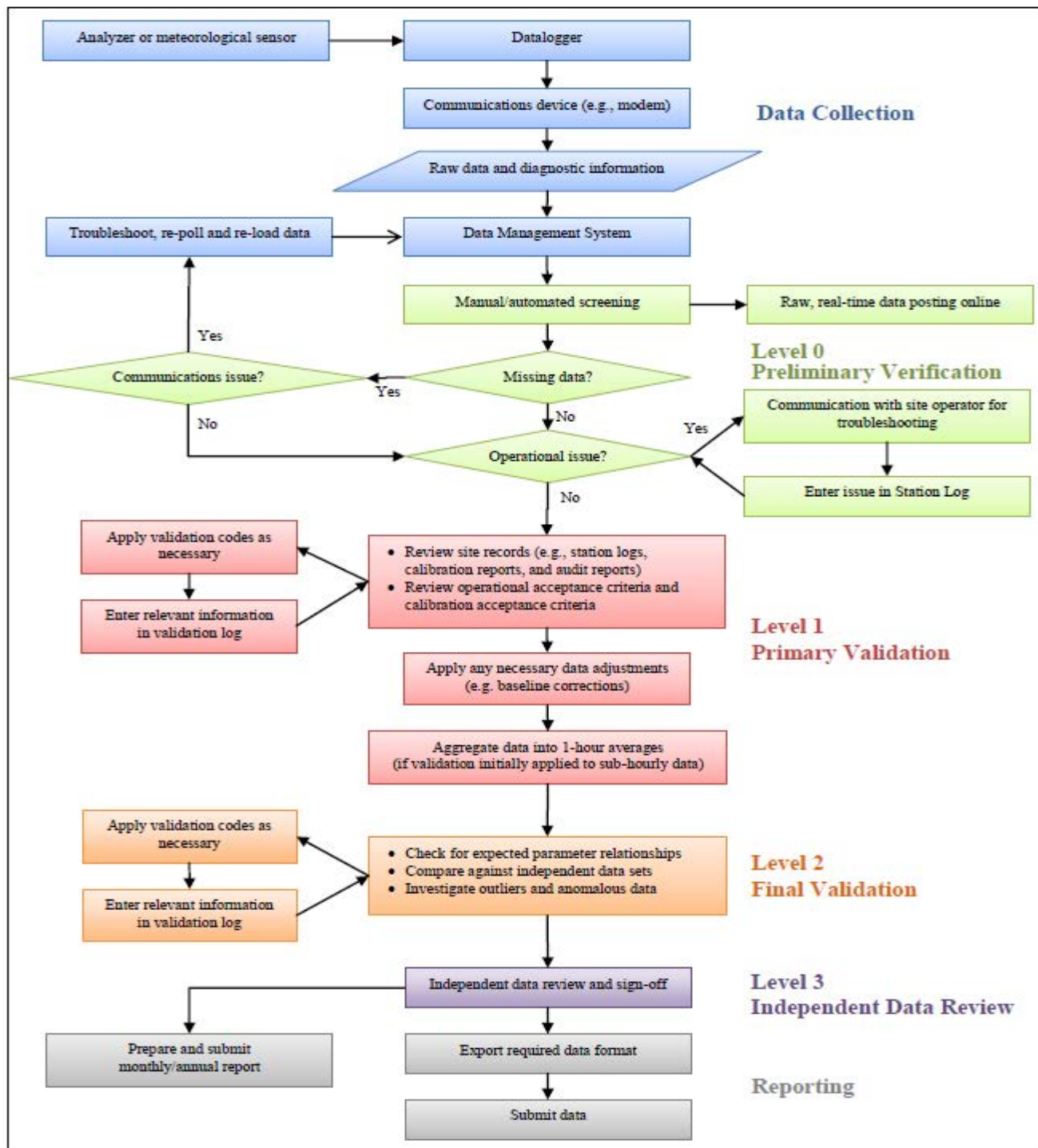
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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

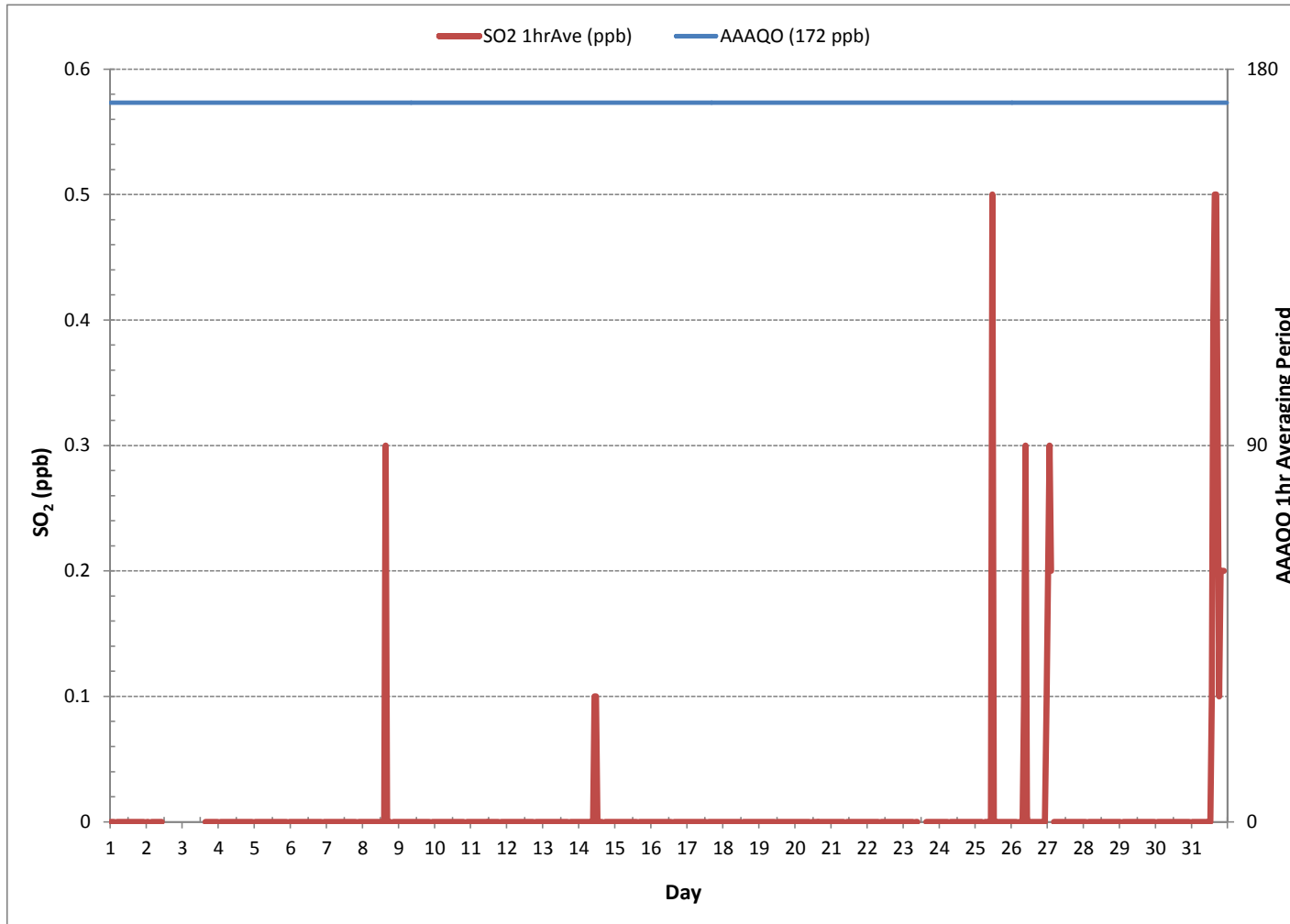


Source: Air Monitoring Directive (Aug 3, 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE (SO₂) hourly averages in ppb





SULPHUR DIOXIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.
DAY	HOUR START	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
1	1.8	1.9	1.9	S	1.5	1.6	1.6	1.7	1.8	1.8	1.8	2.0	1.8	1.7	1.8	1.8	1.8	1.6	1.6	1.7	1.4	1.7	1.8	1.4	1.4	2.0	1.7	24	
2	1.3	1.3	S	1.2	1.4	1.2	1.3	1.2	1.3	1.3	1.2	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	1.2	1.4	1.3	15
3	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	1.5	3.3	1.6	1.4	1.4	1.5	1.4	1.3	1.3	1.3	3.3	1.6	15
4	S	1.2	1.2	1.2	1.1	1.1	1.5	1.4	1.4	1.7	1.4	1.2	1.2	1.5	1.2	1.2	1.2	1.2	1.5	1.1	1.3	1.5	1.2	S	1.1	1.7	1.3	24	
5	1.0	1.1	1.3	1.2	1.2	1.2	1.4	1.3	2.9	2.5	1.7	1.5	1.3	1.3	1.2	1.0	1.2	1.0	1.3	1.2	1.2	1.3	S	1.2	1.0	2.9	1.4	24	
6	1.3	1.2	1.2	1.2	1.2	1.3	1.5	1.5	1.4	1.7	1.1	1.2	1.2	1.3	1.2	1.3	1.1	1.2	1.5	1.4	1.5	S	1.5	1.8	1.1	1.8	1.3	24	
7	1.7	1.7	1.6	1.6	1.5	1.6	1.5	1.7	1.8	1.8	2.1	2.1	2.0	1.8	1.9	1.9	1.9	1.8	2.0	2.1	S	2.0	2.1	2.1	1.5	2.1	1.8	24	
8	2.5	2.2	2.3	2.3	2.5	2.3	2.4	2.5	2.5	2.4	2.3	2.5	2.3	2.3	2.3	5.9	2.3	2.3	2.5	S	2.1	2.1	2.2	2.2	2.1	5.9	2.5	24	
9	2.1	2.3	2.2	2.1	2.1	2.3	2.1	2.3	2.1	2.2	2.2	2.1	2.0	2.1	2.0	2.3	2.3	2.1	2.0	2.3	2.3	S	2.0	2.1	2.0	2.3	2.2	24	
10	2.2	2.4	2.3	2.2	2.1	2.2	2.1	2.4	2.1	2.3	2.1	2.2	2.2	2.4	2.3	2.3	2.3	2.3	2.1	2.4	S	2.1	2.4	2.3	2.1	2.4	2.2	24	
11	2.3	2.2	2.3	2.3	2.3	2.1	2.2	2.2	2.4	2.3	2.1	2.1	2.3	3.1	2.4	2.1	2.1	2.2	2.1	S	1.8	2.2	2.3	1.9	1.8	3.1	2.2	24	
12	1.9	1.9	2.0	1.9	1.8	1.8	1.8	1.9	1.8	1.8	5.6	3.9	2.1	1.8	9.9	6.6	4.2	1.7	S	1.9	1.7	1.9	1.7	1.9	1.7	9.9	2.8	24	
13	2.0	1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.0	2.1	1.9	2.0	2.2	2.1	2.2	S	2.1	2.2	2.2	2.4	2.4	2.4	1.8	2.4	2.1	24	
14	2.2	2.2	2.2	2.1	2.3	2.5	2.4	2.2	2.3	2.7	2.7	2.8	2.7	2.7	2.6	2.3	S	1.8	1.9	2.1	2.2	2.3	2.2	2.0	1.8	2.8	2.3	24	
15	2.3	2.3	2.1	2.1	1.9	2.3	2.5	2.5	2.6	2.5	2.6	2.7	2.5	2.2	2.0	S	1.9	2.2	2.0	2.0	2.1	2.2	2.2	2.0	1.9	2.7	2.2	24	
16	2.0	2.3	2.1	2.1	2.1	2.2	2.2	2.4	2.4	2.3	2.5	2.6	2.5	2.4	S	3.7	3.1	2.6	2.1	2.3	2.2	2.3	2.1	2.1	2.0	3.7	2.4	24	
17	2.1	2.1	2.1	2.2	2.1	1.9	1.9	2.0	1.9	1.9	1.9	2.1	1.9	S	2.2	1.9	2.1	1.9	2.0	1.8	1.8	1.6	1.6	1.7	1.6	2.2	1.9	24	
18	1.9	1.7	1.7	1.7	1.6	1.7	1.7	1.8	1.6	1.7	1.6	2.8	S	1.3	1.6	1.6	1.6	1.3	1.5	1.6	1.4	1.4	1.5	1.3	2.8	1.6	24		
19	1.4	1.5	1.4	1.4	1.4	1.4	1.3	1.5	1.6	1.6	1.6	S	1.9	1.9	1.9	2.6	2.8	2.5	2.6	2.3	2.3	2.2	2.3	2.2	1.3	2.8	1.9	24	
20	2.1	2.3	2.4	2.2	2.1	2.4	2.3	2.5	2.5	2.5	S	2.5	2.6	2.4	2.4	6.1	4.0	2.7	2.7	2.4	2.7	2.9	2.8	2.8	2.1	6.1	2.7	24	
21	2.7	3.0	2.8	2.7	3.0	2.9	2.9	3.0	3.0	S	2.9	3.1	3.0	3.0	3.0	2.9	2.9	3.1	3.1	3.1	3.3	3.3	3.3	3.3	2.7	3.3	3.0	24	
22	3.3	3.3	3.3	3.4	3.6	3.6	3.5	3.5	S	3.7	3.7	3.6	3.6	3.7	3.7	3.7	3.5	3.3	3.4	3.3	3.4	3.1	3.0	3.1	3.0	3.7	3.4	24	
23	3.1	2.9	2.8	2.9	2.9	2.9	S	2.5	2.5	C1	C1	C1	C1	C1	C1	1.3	1.3	1.4	1.0	1.0	0.9	0.9	0.8	0.9	0.8	3.1	1.9	19	
24	0.5	0.8	0.8	0.8	0.6	0.8	S	1.6	1.8	1.0	1.1	0.8	1.2	2.6	2.6	1.2	1.2	1.0	0.9	0.8	0.8	1.0	0.9	0.8	0.5	2.6	1.1	24	
25	1.0	1.1	1.0	1.0	1.1	S	1.0	1.3	2.4	2.7	1.5	3.7	2.1	1.3	1.3	1.2	1.1	1.1	1.2	1.2	1.0	1.1	1.2	1.3	1.0	3.7	1.4	24	
26	1.3	1.2	1.2	1.1	S	1.5	1.5	1.5	2.2	2.5	2.0	1.9	1.9	1.6	1.8	1.9	1.8	1.8	1.9	2.2	2.2	1.9	2.2	2.3	1.1	2.5	1.8	24	
27	2.6	2.5	2.4	S	2.5	2.5	2.7	2.7	2.7	2.7	2.9	2.9	2.6	2.6	2.7	2.7	2.7	2.6	2.8	2.5	2.5	2.6	2.5	2.1	2.1	2.9	2.6	24	
28	2.4	2.7	S	2.2	2.2	2.1	2.1	2.0	2.0	1.6	1.4	1.6	1.4	1.3	1.2	1.0	1.1	1.1	1.2	1.1	1.0	0.8	0.8	0.8	0.8	2.7	1.5	24	
29	0.9	S	0.7	0.8	0.6	0.5	0.5	0.8	1.1	0.6	0.5	0.5	0.8	0.6	0.8	0.8	0.7	0.8	0.9	0.9	0.9	0.8	0.7	0.8	0.8	0.5	1.1	0.7	24
30	S	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1.0	0.8	1.1	1.1	0.8	0.8	S	0.6	1.1	0.8	24
31	0.9	0.9	1.0	1.0	1.0	1.1	1.2	1.3	1.3	1.3	1.4	1.6	1.5	2.0	2.0	2.1	2.4	2.1	1.8	1.9	1.9	2.1	S	1.8	0.9	2.4	1.5	24	
HOURLY MAX	3.3	3.3	3.3	3.4	3.6	3.6	3.5	3.5	3.0	3.7	5.6	3.9	3.6	3.7	9.9	6.6	4.2	3.3	3.4	3.3	3.4	3.3	3.3	3.3	3.3				
HOURLY AVG	1.9	1.9	1.8	1.8	1.8	1.8	1.9	1.9	2.0	2.0	2.0	2.2	2.0	2.0	2.0	2.3	2.1	1.8	1.9	1.8	1.9	1.9	1.9	1.9	1.9				

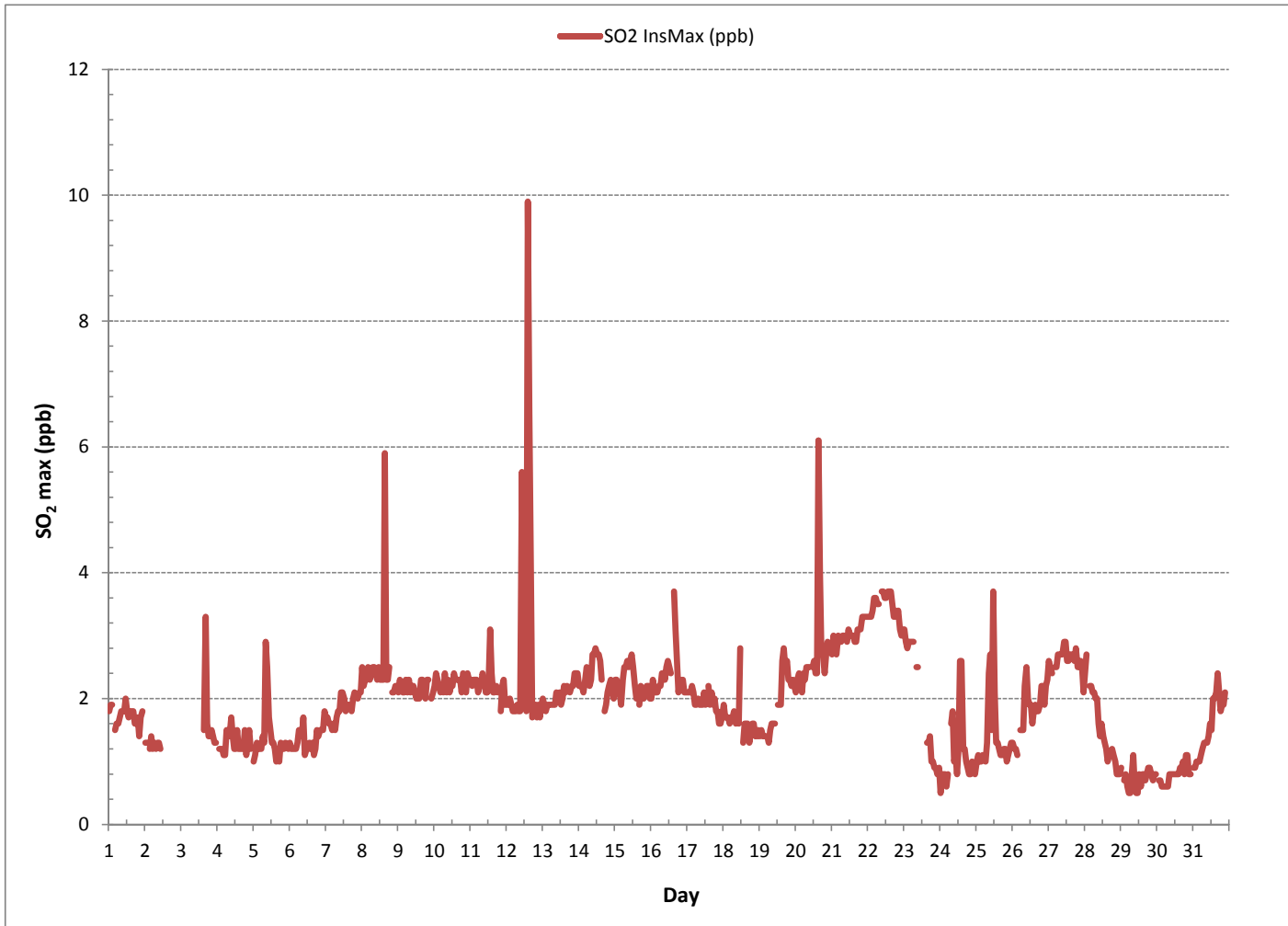
STATUS FLAG CODES

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

MONTHLY SUMMARY

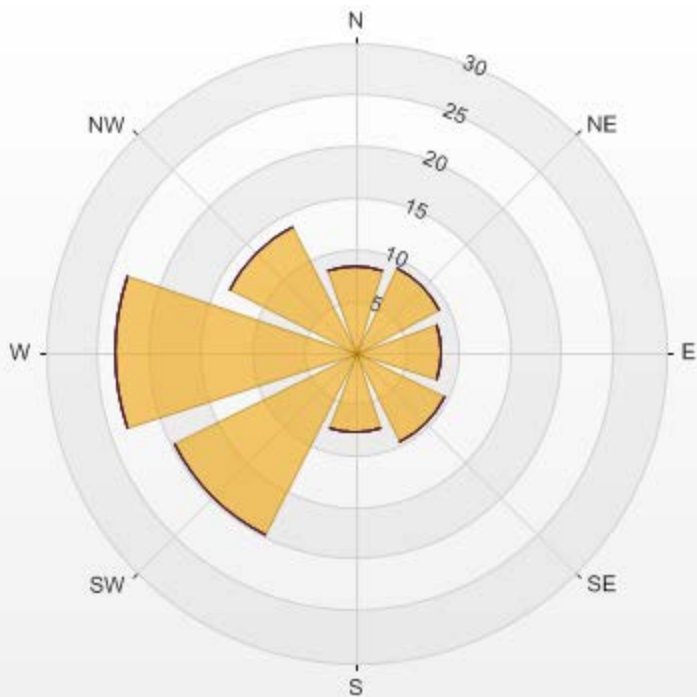
NUMBER OF NON-ZERO READINGS:	679
MAXIMUM INSTANTANEOUS VALUE:	9.9 PPB @ HOUR(S) 14 ON DAY(S) 12
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	10 HRS
OPERATIONAL TIME:	721 HRS
STANDARD DEVIATION:	0.83

SULPHUR DIOXIDE MAX instantaneous maximum in ppb

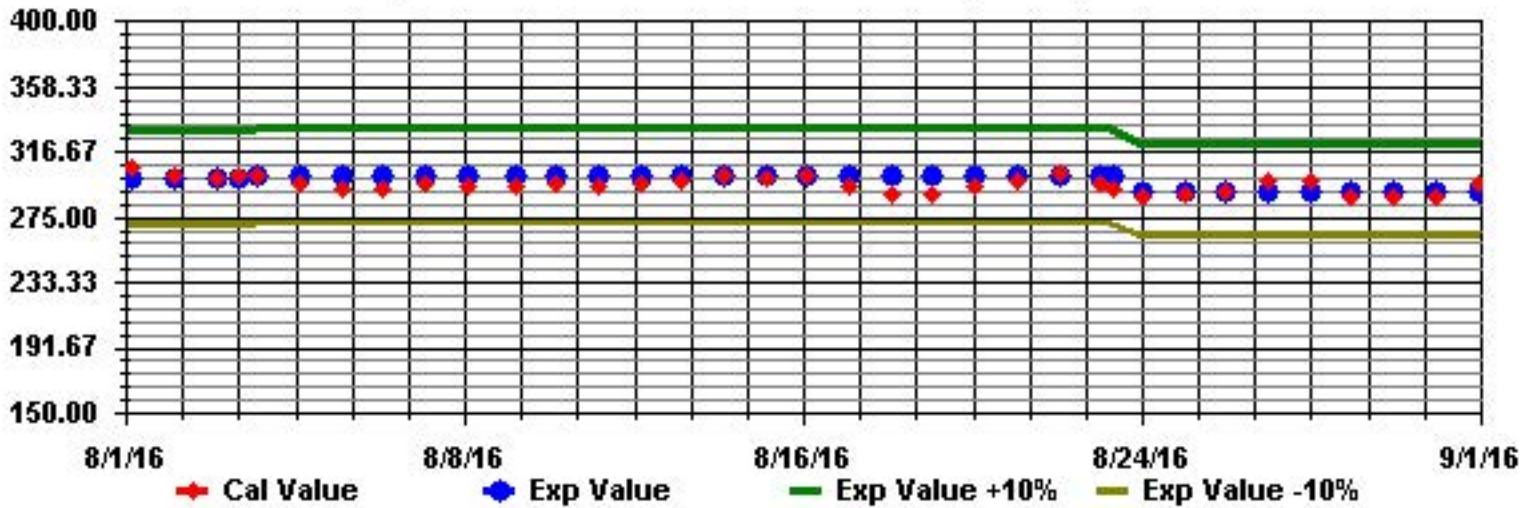


Wind: LICA Bonnyville Monitor: SO2 [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 91.26% Calm Avg: 0.00

Direction	0.0-20.0	20.0-60.0	60.0-110.0	110.0-170.0	170.0-340.0	>340.0	Total
N	8.39	0	0	0	0	0	8.39
NE	9.13	0	0	0	0	0	9.13
E	8.39	0	0	0	0	0	8.39
SE	9.72	0	0	0	0	0	9.72
S	7.81	0	0	0	0	0	7.81
SW	19.73	0	0	0	0	0	19.73
W	23.27	0	0	0	0	0	23.27
NW	13.55	0	0	0	0	0	13.55
Summary	100	0	0	0	0	0	100



Calibration Graph for Site: BONNYVIL Parameter: SO2_ Sequence: SO2 Phase: SPAN



HYDROGEN SULPHIDE

HYDROGEN SULPHIDE (H₂S) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.		
DAY																															
1		1.5	4.6	4.6	S	4.9	1.7	0.9	0.7	0.5	0.3	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	4.9	0.9	24	
2		0.0	1.5	S	0.6	0.9	0.3	0.1	0.1	0.3	0.0	0.0	0.2	0.3	0.2	0.0	C	C	C	C	Y	Y	Y	Y	Y	Y	0.0	1.5	0.3	19	
3		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
4		Y	Y	Y	Y	Y	Y	Y	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	1.9	0.8	S	0.0	0.0	1.9	0.3	17	
5		5.5	8.5	5.8	13.4	13.4	10.9	10.7	4.0	1.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	S	1.3	0.0	0.0	13.4	3.3	24	
6		4.7	1.6	3.4	2.6	2.4	4.6	8.2	6.1	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.2	S	5.7	2.7	0.0	0.0	8.2	2.0	24	
7		1.2	11.9	11.7	3.1	15.1	8.5	2.5	3.8	5.7	2.8	1.3	0.8	0.3	0.1	0.1	0.3	0.6	0.4	0.4	0.0	S	1.9	1.7	1.7	0.0	0.0	15.1	3.3	24	
8		5.5	4.9	4.2	2.8	2.5	1.9	S1	S1	0.2	0.1	0.1	0.1	0.7	1.4	0.6	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	1.7	0.0	0.0	5.5	1.3	22	
9		0.7	0.0	2.3	4.1	2.5	4.1	2.7	2.5	2.3	0.7	0.4	0.0	0.1	0.0	0.0	0.0	0.0	1.0	1.3	0.8	1.4	S	0.7	0.9	0.0	0.0	4.1	1.2	24	
10		0.8	1.1	1.9	0.7	2.3	1.8	2.4	2.0	0.9	0.2	0.5	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	S	0.8	1.4	1.4	0.0	0.0	2.4	0.8	24	
11		2.4	3.6	5.8	3.8	4.9	3.0	2.0	0.8	0.6	0.7	0.4	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.0	S	0.0	0.3	0.2	0.3	0.0	0.0	5.8	1.3	24	
12		0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.3	0.1	0.2	0.1	0.1	0.2	0.1	S	0.0	0.0	1.4	4.7	11.7	0.0	0.0	11.7	1.0	24
13		15.6	16.2	17.0	20.5	21.3	18.8	14.6	6.3	2.2	0.8	0.3	0.0	0.0	0.0	0.0	0.2	0.0	S	0.1	1.9	1.5	1.4	0.0	0.3	0.0	0.0	21.3	6.0	24	
14		2.2	3.8	3.6	2.0	2.4	13.0	11.8	7.2	3.8	2.2	0.7	0.7	0.5	0.3	0.1	0.0	S	0.0	0.0	1.1	3.3	5.1	1.3	3.2	0.0	0.0	13.0	3.0	24	
15		7.4	11.4	24.5	22.6	13.6	13.6	12.2	3.3	2.6	1.0	0.4	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	2.2	3.6	6.5	3.1	0.0	0.0	24.5	5.6	24	
16		10.7	9.4	15.8	12.4	19.8	22.2	10.9	9.7	5.8	1.4	0.1	0.0	0.1	0.0	S	0.0	0.0	0.0	0.0	0.3	0.6	1.0	0.0	0.0	0.0	0.0	22.2	5.2	24	
17		0.0	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.1	24	
18		0.0	0.1	0.0	0.0	0.2	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.1	24
19		0.3	1.4	0.7	6.7	7.1	14.9	12.2	8.7	5.5	2.7	0.1	S	0.0	0.1	0.2	0.3	0.2	0.5	0.8	1.3	1.2	2.3	1.4	4.1	0.0	0.0	14.9	3.2	24	
20		4.0	1.5	2.3	1.6	3.6	2.2	7.0	2.3	1.0	0.2	S	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.9	0.5	1.1	1.1	2.8	0.9	0.0	0.0	7.0	1.5	24	
21		0.6	1.6	4.2	5.5	3.6	4.3	1.2	0.3	0.9	S	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.3	0.6	0.5	0.2	0.3	0.0	0.0	0.0	5.5	1.1	24	
22		0.2	0.9	0.4	0.5	0.5	0.3	0.5	0.4	S	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.8	1.3	4.9	0.0	0.0	4.9	0.5	24	
23		0.1	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.4	0.0	24	
24		0.3	0.8	0.4	0.2	3.4	1.3	S	0.2	0.2	0.8	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	3.4	0.4	24	
25		0.7	0.5	0.0	0.4	0.2	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1	24	
26		0.0	0.8	0.2	0.3	S	1.3	7.5	4.8	2.9	1.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.6	1.0	3.1	4.2	0.0	0.0	7.5	1.2	24		
27		5.0	5.8	5.4	S	6.6	10.3	6.7	1.9	3.9	4.9	2.6	1.0	0.4	0.3	0.0	0.2	0.0	0.0	0.0	0.8	0.1	0.2	0.2	0.0	0.0	0.0	10.3	2.4	24	
28		0.1	0.4	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	24	
29		0.0	S	0.0	2.9	4.9	7.1	5.4	2.8	2.0	0.7	0.0	0.0	0.0	0.0	0.0	C1	C1	C1	0.0	0.0	0.5	1.2	2.3	2.3	0.0	0.0	7.1	1.7	20	
30		S	1.2	0.7	0.6	0.8	0.4	0.5	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	S	0.0	0.0	1.2	0.2	24		
31		0.0	0.1	0.2	0.3	0.2	0.2	0.3	0.4	0.3	0.1	0.3	0.3	0.2	0.3	0.3	0.5	0.9	1.5	0.5	0.4	0.6	1.1	S	0.8	0.0	0.0	1.5	0.4	24	
HOURLY MAX		15.6	16.2	24.5	22.6	21.3	22.2	14.6	9.7	5.8	4.9	2.6	1.0	0.7	1.4	0.6	0.5	0.9	1.5	1.3	1.9	3.3	5.1	6.5	11.7						
HOURLY AVG		2.5	3.4	4.3	4.0	4.9	5.3	4.5	2.6	1.6	0.8	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.6	1.0	1.3	1.7						

STATUS FLAG CODES

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

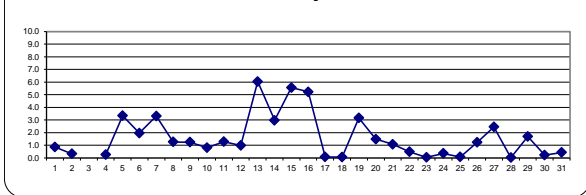
OBJECTIVE LIMIT:

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

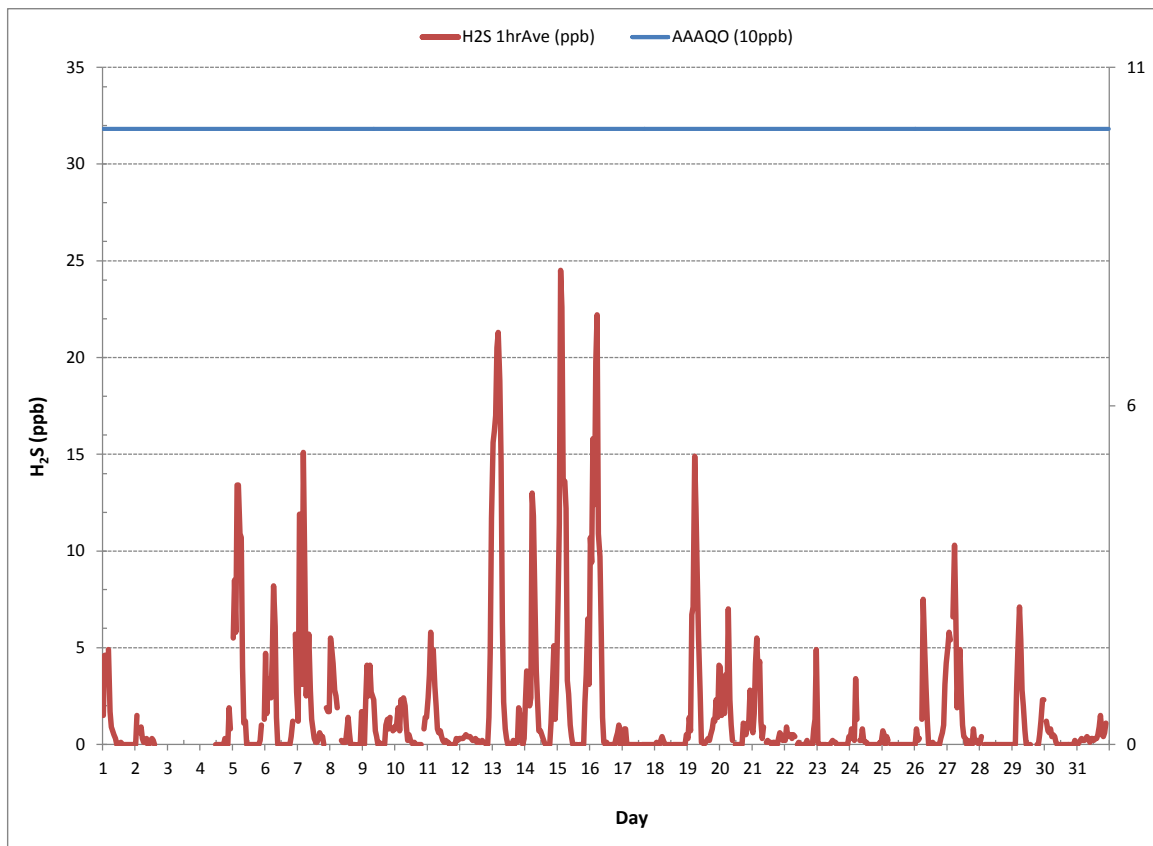
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	32		
NUMBER OF 24-HR EXCEEDANCES:	6		
NUMBER OF NON-ZERO READINGS:	405		
MINIMUM 1-HR AVERAGE:	0.0 PPB @ HOUR(S) VAR ON DAY(S) ALL		
MAXIMUM 1-HR AVERAGE:	24.5 PPB @ HOUR(S) 2 ON DAY(S) 15		
MAXIMUM 24-HR AVERAGE:	6.0 PPB ON DAY(S) 13		
	VAR-VARIOUS		
IZS CALIBRATION TIME:	31 HRS	OPERATIONAL TIME:	702 HRS
MONTHLY CALIBRATION TIME:	8 HRS	AMD OPERATION UPTIME:	94.4 %
STANDARD DEVIATION:	3.52	MONTHLY AVERAGE:	1.7 PPB

24 HOUR AVERAGES FOR August 2016



HYDROGEN SULPHIDE (H₂S) hourly averages in ppb





HYDROGEN SULPHIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.		
DAY	MIN.	MAX.	AVG.																									MIN.	MAX.	AVG.	RDGS.
1	3.3	8.0	7.5	S	7.3	3.9	1.9	1.8	1.4	1.2	0.6	0.6	0.9	1.0	0.6	0.4	0.1	0.2	0.6	0.3	0.3	0.9	0.4	0.7	0.1	8.0	1.9	24			
2	1.7	4.8	S	1.5	1.7	0.8	0.5	0.3	0.8	0.1	0.2	0.3	0.4	0.3	0.4	C	C	C	C	Y	Y	Y	Y	Y	0.1	4.8	1.0	19			
3	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		
4	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	0.7	0.7	0.6	0.4	0.2	0.3	1.2	1.8	0.9	3.0	5.6	3.0	S	0.2	5.6	1.5	17			
5	7.8	10.6	10.0	32.1	27.4	13.0	12.6	10.1	2.8	3.3	1.1	0.0	0.0	0.0	0.0	0.0	1.1	0.4	0.2	0.2	1.9	2.4	S	3.0	0.0	32.1	6.1	24			
6	8.6	3.5	4.3	3.3	2.5	7.4	19.9	19.9	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	3.1	S	12.2	3.8	0.0	19.9	4.1	24		
7	3.0	21.5	19.4	2.8	27.8	22.8	2.7	8.2	8.5	3.3	1.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.9	S	0.0	0.0	0.0	0.0	0.0	27.8	5.4	24		
8	10.3	5.9	8.1	0.6	0.5	0.0	S1	S1	0.0	0.0	0.0	0.0	4.5	4.8	0.2	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	5.2	0.0	10.3	1.9	22		
9	1.6	0.0	6.2	6.3	2.7	7.2	5.0	5.0	4.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	4.4	5.5	2.6	2.7	S	0.9	0.8	0.0	7.2	2.4	24				
10	1.6	1.2	1.8	0.4	4.2	2.9	4.4	4.7	2.3	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.7	1.0	0.9	0.0	4.7	1.2	24			
11	4.1	3.8	16.9	3.9	6.8	3.8	1.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	16.9	1.8	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	S	0.0	0.1	2.9	12.5	17.3	0.0	17.3	1.4	24		
13	21.8	25.4	21.7	33.0	27.2	47.4	19.2	8.6	4.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	3.8	4.3	3.4	0.0	0.0	0.0	0.0	47.4	9.6	24			
14	7.1	9.1	4.2	2.1	4.6	34.5	40.9	16.0	3.9	1.9	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	2.5	3.9	5.4	7.0	3.9	8.4	0.0	40.9	6.8	24			
15	12.3	16.8	38.9	29.5	23.6	19.2	17.7	11.9	6.4	0.9	0.4	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	1.9	2.0	5.4	10.9	3.7	0.0	38.9	8.8	24			
16	14.1	19.2	28.3	24.5	26.1	34.2	24.5	13.9	8.0	2.9	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	1.1	0.7	1.3	0.0	0.0	0.0	34.2	8.6	24		
17	0.0	4.2	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.3	24		
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	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		
19	0.0	1.1	0.0	11.9	9.2	19.4	17.2	10.8	5.0	3.1	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.4	1.5	3.9	1.8	6.4	0.0	19.4	4.1	24			
20	4.8	1.0	1.1	0.8	4.5	10.8	14.8	3.4	1.8	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.7	0.7	2.7	1.4	2.9	1.4	0.0	14.8	2.3	24			
21	0.0	2.4	6.2	7.5	5.7	6.7	2.8	0.3	0.4	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	7.5	1.4	24		
22	0.0	4.9	0.5	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	4.2	11.9	0.0	11.9	1.1	24		
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
24	0.0	1.6	0.4	0.0	6.8	2.8	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.8	0.5	24		
25	1.5	0.9	0.0	0.6	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.1	24		
26	0.0	0.1	0.0	0.0	S	5.3	36.2	11.0	3.4	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	4.0	4.0	0.0	36.2	2.9	24			
27	5.1	6.5	8.4	S	10.5	12.1	10.1	3.1	5.6	5.3	3.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	2.4	0.6	0.0	0.0	12.1	3.3	24			
28	0.0	1.7	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.1	24		
29	0.0	S	0.0	5.7	5.6	8.6	6.3	2.0	1.0	0.2	0.0	0.0	0.0	0.0	C1	C1	C1	C1	C1	0.1	0.3	1.8	2.6	6.2	9.7	0.0	9.7	2.8	19		
30	S	2.2	2.0	1.2	1.4	0.9	0.9	0.8	0.5	0.4	0.2	0.1	0.3	0.3	0.3	0.3	0.1	0.2	0.2	0.3	0.3	0.5	0.7	S	0.1	2.2	0.6	24			
31	0.3	0.5	0.6	0.7	0.5	0.7	0.7	0.7	0.8	0.5	0.7	0.7	0.6	0.8	0.6	1.4	1.6	3.1	2.0	0.9	1.7	2.1	S	1.6	0.3	3.1	1.0	24			
HOURLY MAX	21.8	25.4	38.9	33.0	27.8	47.4	40.9	19.9	8.5	5.3	3.0	1.2	4.5	4.8	0.6	1.4	1.6	4.4	5.5	3.9	5.4	7.0	12.5	17.3							
HOURLY AVG	3.9	5.6	7.0	6.2	7.4	9.4	8.9	4.9	2.3	0.9	0.3	0.1	0.3	0.3	0.1	0.1	0.1	0.4	0.5	0.9	1.3	1.6	2.4	2.9							

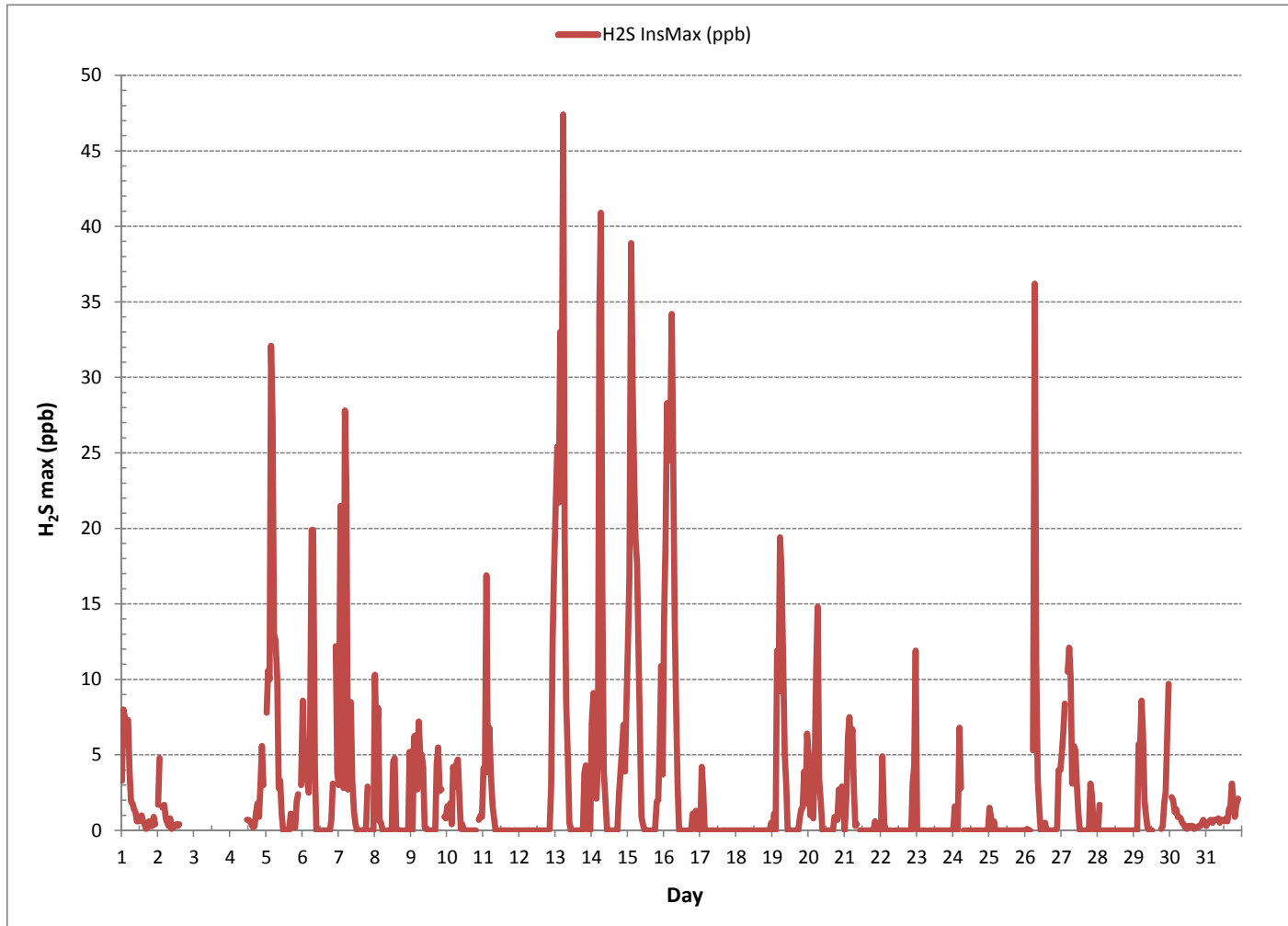
STATUS FLAG CODES

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

MONTHLY SUMMARY

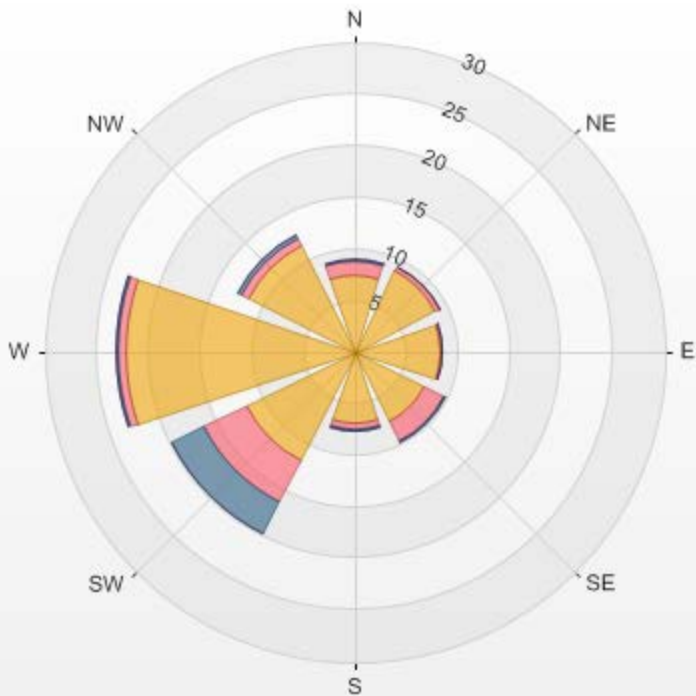
NUMBER OF NON-ZERO READINGS:	340
MAXIMUM INSTANTANEOUS VALUE:	47.4 PPB @ HOUR(S) 5 ON DAY(S) 13
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	8 HRS
OPERATIONAL TIME:	701 HRS
STANDARD DEVIATION:	6.24

HYDROGEN SULPHIDE MAX instantaneous maximum in ppb



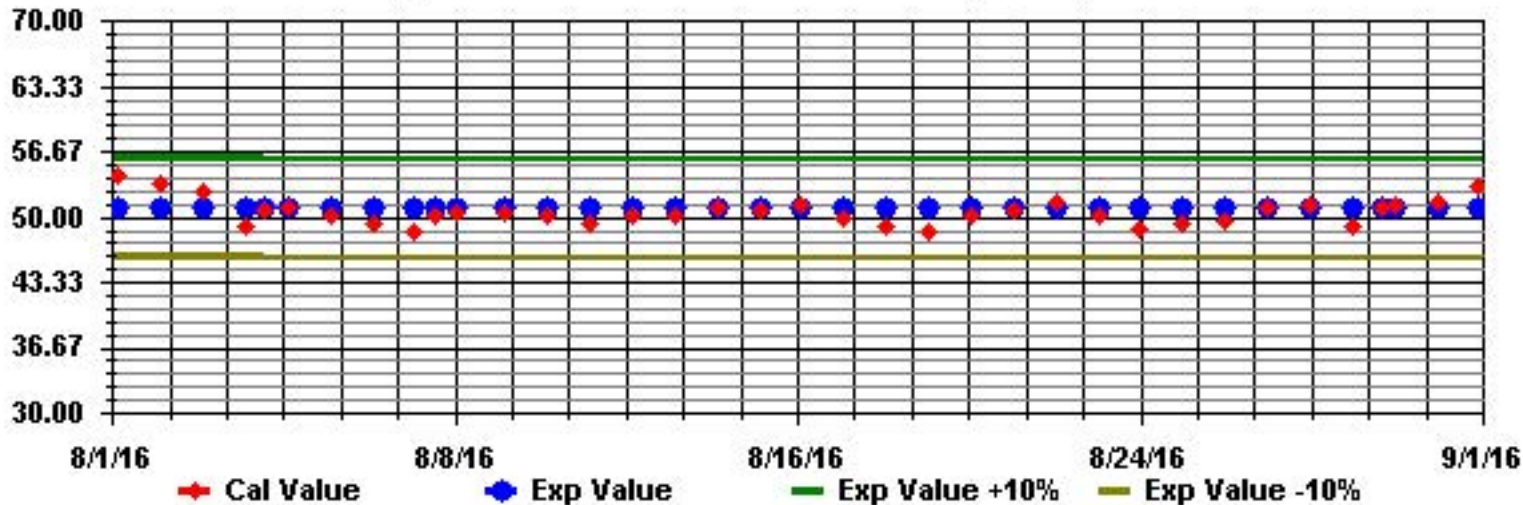
Wind: LICA Bonnyville Monitor: H2S [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 89.11% Calm Avg: 0.00

Direction	0.0-3.0	3.0-10.0	10.0-50.0	>50.0	Total
N	7.39	1.36	0.3	0	9.05
NE	8.75	0.45	0	0	9.2
E	8.3	0.3	0	0	8.6
SE	7.54	2.11	0.3	0	9.95
S	6.94	0.6	0.15	0	7.69
SW	11.76	4.52	3.47	0	19.75
W	22.17	0.75	0.15	0	23.07
NW	11.46	0.75	0.45	0	12.66
Summary	84.31	10.84	4.82	0	100



% Icon Classes (ppb)	84	11	5	0
0.0-3.0	84	11	5	0
3.0-10.0		11		
10.0-50.0			5	
>50.0				0

Calibration Graph for Site: BONNYVIL Parameter: H2S_ Sequence: H2S Phase: SPAN



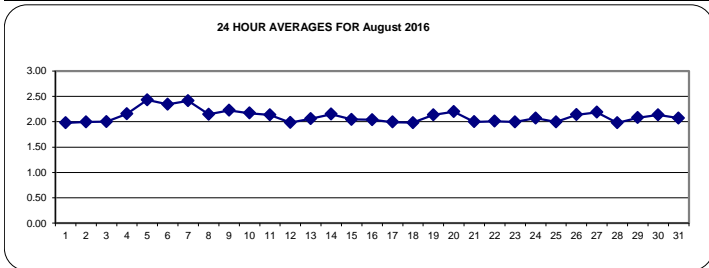
TOTAL HYDROCARBON

TOTAL HYDROCARBONS (THC) hourly averages in ppm

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY	HOURLY MAX	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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	X	X	1.98	S	1.99	2.00	2.00	1.98	X	1.98	X	X	1.98	1.98	1.97	X	X	X	X	1.96	1.92	X	S	X	1.92	2.00	1.98	13	
2	X	X	S	X	X	X	X	X	1.98	2.01	X	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	1.98	2.01	2.00	8
3	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	1.96	1.95	1.95	1.95	1.95	1.96	1.98	1.99	2.01	2.08	2.13	2.09	1.95	2.13	2.00	17
4	S	2.16	2.30	2.27	2.14	2.21	2.52	2.38	2.38	2.12	2.17	2.14	2.07	2.04	2.01	1.99	1.98	1.99	2.01	2.02	2.10	2.19	2.21	S	1.98	2.52	2.15	24	
5	2.78	3.00	3.20	3.08	3.29	3.32	3.22	2.63	2.28	2.12	2.03	2.03	2.01	2.01	2.01	2.00	2.00	2.02	2.01	2.06	2.23	2.23	S	2.28	2.00	3.32	2.43	24	
6	2.15	2.20	2.61	2.75	2.84	3.04	3.14	2.77	2.49	2.22	2.08	2.05	2.02	2.00	1.99	2.00	2.01	2.02	2.03	2.07	2.15	S	2.67	2.63	1.99	3.14	2.34	24	
7	2.83	2.92	2.96	3.02	2.91	2.91	2.82	2.59	2.51	2.37	2.13	2.11	2.05	2.06	2.06	2.08	2.12	2.08	2.09	2.19	S	2.36	2.15	2.18	2.05	3.02	2.41	24	
8	2.20	2.19	2.31	2.34	2.28	2.32	2.42	2.23	2.15	2.08	2.01	2.02	2.00	2.03	2.01	1.98	2.00	2.00	1.98	S	2.17	2.26	2.17	2.18	1.98	2.42	2.14	24	
9	2.18	2.22	2.28	2.32	2.96	2.69	2.57	2.46	2.31	2.25	2.21	2.19	2.11	2.07	2.01	2.00	2.03	2.05	1.99	2.01	2.02	S	2.11	2.15	1.99	2.96	2.23	24	
10	2.20	2.27	2.37	2.32	2.26	2.23	2.23	2.20	2.16	2.18	2.14	2.11	2.12	2.08	2.06	2.03	2.05	2.10	2.13	2.15	S	2.05	2.15	2.29	2.03	2.37	2.17	24	
11	2.35	2.27	2.37	2.36	2.31	2.34	2.37	2.34	2.22	2.25	2.20	2.09	2.06	2.00	1.97	1.92	1.93	1.93	1.95	S	1.96	1.96	1.96	1.95	1.92	2.37	2.13	24	
12	1.98	1.98	1.97	1.98	1.99	2.00	2.00	1.99	1.97	1.96	1.98	1.93	1.93	1.93	1.96	1.93	1.93	1.93	S	1.95	2.00	2.07	2.10	2.17	1.93	2.17	1.98	24	
13	2.16	2.19	2.18	2.23	2.17	2.20	2.16	2.08	2.00	1.99	1.97	1.94	1.94	1.93	1.92	1.93	1.93	S	1.98	2.04	2.11	2.13	2.10	2.11	1.92	2.23	2.06	24	
14	2.33	2.23	2.25	2.39	2.42	2.44	2.32	2.34	2.26	2.20	2.10	2.16	2.10	2.05	1.98	1.97	S	1.90	1.92	1.95	2.00	2.02	2.02	2.09	1.90	2.44	2.15	24	
15	2.09	2.06	2.14	2.14	2.09	2.08	2.08	2.07	2.03	2.03	2.01	1.97	1.96	1.92	1.90	S	1.89	1.89	1.89	2.05	2.19	2.15	2.25	2.12	1.89	2.25	2.04	24	
16	2.13	2.15	2.13	2.18	2.16	2.19	2.16	2.12	2.08	2.01	1.99	1.98	1.96	1.93	S	1.94	1.96	1.91	1.93	1.96	1.97	2.05	2.02	2.00	1.91	2.19	2.04	24	
17	2.01	2.02	2.06	2.03	2.02	2.03	2.03	2.06	2.01	2.00	1.96	1.94	1.95	S	1.94	1.94	1.95	1.96	1.95	1.95	1.99	2.04	1.99	1.99	1.94	2.06	1.99	24	
18	1.98	1.98	1.99	1.99	2.00	2.07	2.01	2.03	1.99	1.96	1.93	1.93	S	1.93	1.92	1.92	1.94	1.94	1.94	1.97	2.01	2.01	2.03	2.08	1.92	2.08	1.98	24	
19	2.15	2.12	2.11	2.21	2.27	2.23	2.20	2.32	2.15	2.05	1.97	S	1.97	1.97	S1	1.98	1.99	2.01	2.03	2.08	2.15	2.29	2.34	2.36	1.97	2.36	2.13	23	
20	2.36	2.48	2.63	2.65	2.72	2.74	2.60	2.37	2.19	2.14	S	2.06	1.99	1.95	1.93	1.92	1.92	1.99	1.99	1.96	1.97	1.97	2.04	2.02	1.92	2.74	2.20	24	
21	2.13	2.16	2.12	2.13	2.03	1.98	1.96	1.93	1.95	S	1.92	1.92	1.89	1.90	1.91	1.91	1.91	1.91	1.91	1.97	2.13	2.13	2.09	2.07	1.89	2.16	2.00	24	
22	2.07	2.04	2.04	2.04	2.02	2.00	2.01	S	1.96	1.95	1.96	1.96	1.96	1.96	1.97	1.98	2.06	2.02	2.01	2.04	2.04	2.09	1.99	1.99	1.95	2.09	2.01	24	
23	2.03	2.00	2.04	1.98	1.97	1.97	1.98	S	1.96	1.96	1.98	1.98	1.97	1.97	1.96	1.95	1.97	1.98	1.98	1.98	2.01	2.02	2.11	2.16	1.95	2.16	2.00	24	
24	2.26	2.27	2.20	2.14	2.16	2.25	S	2.21	2.17	2.12	2.08	2.04	2.05	1.97	1.96	1.97	1.97	1.97	1.97	2.01	2.03	1.95	1.94	1.95	1.96	1.94	2.27	2.07	24
25	1.98	1.97	1.95	1.96	1.97	S	1.97	1.98	2.01	1.96	1.96	1.95	1.96	1.96	1.95	1.96	1.96	1.98	1.97	1.98	2.01	2.05	2.20	2.24	1.95	2.24	1.99	24	
26	2.24	2.30	2.43	2.37	S	2.38	2.32	2.33	2.24	2.07	1.99	1.95	1.95	1.96	1.96	1.95	1.96	1.96	1.97	2.01	2.06	2.15	2.26	2.33	1.95	2.43	2.14	24	
27	2.35	2.37	2.33	S	2.24	2.36	2.32	2.28	2.26	2.23	2.17	2.10	2.07	2.10	2.09	2.09	2.08	2.11	2.17	2.17	2.17	2.18	2.08	1.99	1.99	2.37	2.19	24	
28	1.96	1.96	S	1.98	1.98	1.98	1.99	1.99	1.98	1.98	1.97	1.96	1.96	1.96	1.96	1.96	1.97	1.97	1.98	1.98	2.00	1.99	2.00	2.01	1.96	2.01	1.98	24	
29	2.02	S	2.05	2.08	2.10	2.10	2.09	2.10	2.11	2.01	1.98	1.97	1.97	1.97	1.98	1.99	2.02	2.03	2.06	2.08	2.23	2.28	2.31	2.28	1.97	2.31	2.08	24	
30	S	2.42	2.73	2.34	2.30	2.24	2.17	2.32	2.07	2.06	2.02	2.02	2.02	2.03	2.03	2.01	2.01	2.02	2.02	2.05	2.03	2.04	2.05	S	2.01	2.73	2.14	24	
31	2.06	2.06	2.06	2.08	2.08	2.06	2.08	2.09	2.04	2.11	2.07	2.04	2.04	2.31	2.01	2.03	2.04	2.06	2.04	2.05	2.04	2.06	S	2.10	2.01	2.31	2.07	24	
HOURLY MAX	2.83	3.00	3.20	3.08	3.29	3.32	3.22	2.77	2.51	2.37	2.21	2.19	2.12	2.31	2.09	2.09	2.12	2.11	2.17	2.19	2.23	2.36	2.67	2.63					
HOURLY AVG	2.19	2.22	2.28	2.27	2.27	2.30	2.28	2.22	2.14	2.08	2.04	2.02	2.00	2.00	1.98	1.97	1.98	1.99	2.00	2.03	2.06	2.10	2.13	2.14					

STATUS FLAG CODES

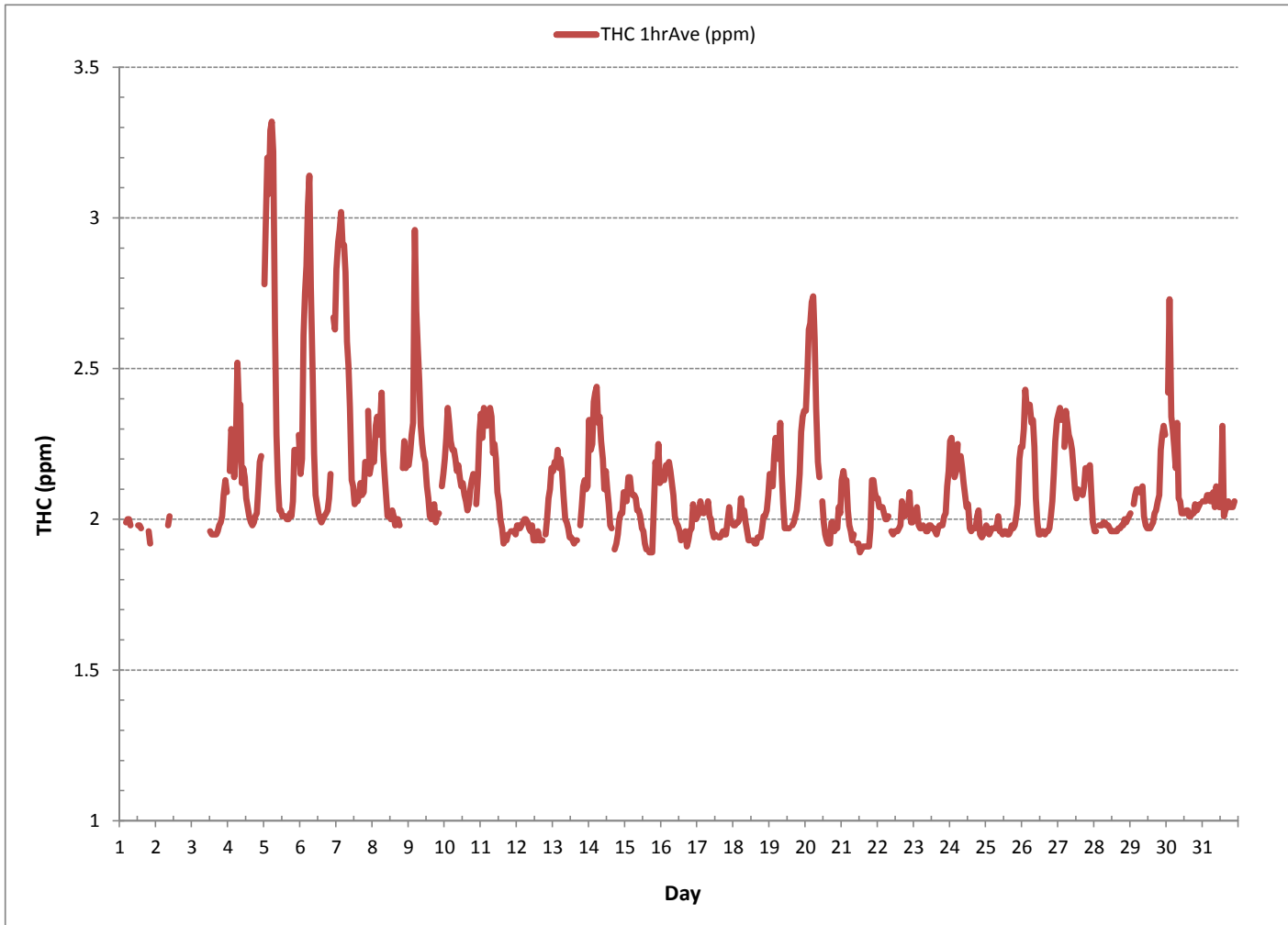
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	666			
MINIMUM 1-HR AVERAGE:	1.89	PPM @ HOUR(S)	VAR , 12	ON DAY(S) 15 , 21
MAXIMUM 1-HR AVERAGE:	3.32	PPM @ HOUR(S)	5	ON DAY(S) 5
MAXIMUM 24-HR AVERAGE:	2.43	PPM		ON DAY(S) 5
				VAR-VARIOUS
IZS CALIBRATION TIME:	33	HRS	OPERATIONAL TIME:	709
MONTHLY CALIBRATION TIME:	10	HRS	AMD OPERATION UPTIME:	95.3
STANDARD DEVIATION:	0.22		MONTHLY AVERAGE:	2.11
				PPM

TOTAL HYDROCARBONS (THC) hourly averages in ppm





TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.
DAY																													
1	X	X	2.09	S	2.09	2.13	2.08	2.10	X	2.04	X	X	2.03	2.02	2.03	X	X	X	X	2.04	2.02	X	S	X	2.02	2.13	2.06	13	
2	X	X	S	X	X	X	X	X	2.10	2.08	X	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	2.08	2.10	2.09	8	
3	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	1.97	1.96	X	1.95	2.04	2.07	2.02	2.02	2.14	2.18	2.33	2.16	1.95	2.33	2.08	16	
4	S	2.25	2.44	2.39	2.19	2.30	2.92	2.59	2.59	2.31	2.20	2.52	2.33	2.29	2.08	2.18	2.02	2.02	2.04	2.08	2.16	2.75	2.76	S	2.02	2.92	2.34	24	
5	3.14	3.34	3.52	3.77	3.63	3.58	3.51	3.14	2.55	2.23	2.13	2.06	2.27	2.07	2.20	2.21	2.07	2.07	2.15	2.53	2.52	2.76	S	2.69	2.06	3.77	2.70	24	
6	2.22	2.59	2.81	3.08	3.01	3.32	3.44	3.20	2.66	2.52	2.33	2.23	2.09	2.08	2.03	2.28	2.05	2.15	2.10	2.18	2.40	S	3.36	3.46	2.03	3.46	2.59	24	
7	3.96	4.05	3.24	3.41	3.92	3.14	3.04	2.73	2.71	2.56	2.38	2.15	2.18	2.34	2.13	2.13	2.33	2.33	2.29	2.33	S	2.54	2.22	2.23	2.13	4.05	2.71	24	
8	2.29	2.42	2.45	2.63	2.39	2.43	2.58	2.38	2.91	2.61	2.16	2.06	2.16	2.16	2.08	2.17	2.09	2.04	2.00	S	3.02	2.88	2.20	2.28	2.00	3.02	2.36	24	
9	2.21	2.50	2.33	2.59	3.23	3.23	2.81	2.68	2.53	2.33	2.35	2.34	2.45	2.16	2.15	2.10	2.20	2.17	2.05	2.09	2.08	S	2.37	2.33	2.05	3.23	2.40	24	
10	2.35	2.54	2.50	2.50	2.44	2.46	2.55	2.92	2.42	2.55	2.46	2.52	2.30	2.30	2.26	2.21	2.23	2.29	2.32	2.41	S	2.20	2.57	2.97	2.20	2.97	2.45	24	
11	2.51	2.45	2.97	2.42	2.37	2.65	2.55	2.48	2.47	2.42	2.40	2.13	2.12	2.13	2.15	1.93	1.94	2.08	1.96	S	1.97	2.13	1.98	1.96	1.93	2.97	2.27	24	
12	1.99	2.00	1.99	2.06	2.00	2.01	2.02	2.00	2.59	2.19	2.01	2.10	2.02	1.94	2.25	2.07	2.04	2.18	S	2.08	2.10	2.13	2.16	2.27	1.94	2.59	2.10	24	
13	2.22	2.27	2.27	2.30	2.24	2.35	2.19	2.16	2.07	2.02	2.05	1.98	1.97	1.96	1.96	1.98	2.00	S	2.09	2.19	2.73	2.73	2.64	2.46	1.96	2.73	2.21	24	
14	3.28	2.78	2.58	2.64	2.83	3.06	2.55	2.50	2.29	2.33	2.20	2.19	2.17	2.47	2.01	2.00	S	1.92	2.04	2.14	2.30	2.22	2.10	2.18	1.92	3.28	2.38	24	
15	2.12	2.09	2.19	2.16	2.13	2.10	2.11	2.28	2.07	2.12	2.08	2.32	2.08	2.00	1.92	S	1.92	1.90	2.03	2.25	2.70	2.31	2.86	2.23	1.90	2.86	2.17	24	
16	2.18	2.23	2.19	2.24	2.19	2.23	2.21	2.16	2.10	2.05	2.04	2.24	1.97	S	2.16	2.31	1.97	2.19	2.00	2.01	2.11	2.11	2.05	1.97	2.01	2.86	2.13	24	
17	2.22	2.10	2.08	2.05	2.12	2.11	2.47	2.28	2.22	2.02	1.97	1.95	1.95	S	1.95	1.95	1.96	1.97	1.96	1.96	2.09	2.08	2.01	2.00	1.95	2.47	2.06	24	
18	1.99	2.00	2.00	2.01	2.02	2.70	2.13	2.06	2.01	2.05	2.15	1.94	S	1.94	1.93	1.93	2.03	1.95	1.95	2.00	2.08	2.06	2.06	2.24	1.93	2.70	2.05	24	
19	2.28	2.20	2.12	2.46	2.56	2.29	2.24	2.70	2.20	2.07	2.02	S	2.12	S1	S1	2.00	2.03	2.28	2.25	2.13	2.23	2.62	2.69	2.42	2.00	2.70	2.28	22	
20	2.42	2.68	2.74	2.80	3.45	2.91	2.74	2.47	2.35	2.18	S	2.13	2.02	1.99	1.97	1.95	2.00	2.08	2.33	2.01	2.10	2.05	2.20	2.50	1.95	3.45	2.35	24	
21	3.08	2.88	2.18	2.19	2.12	2.00	2.00	1.97	1.96	S	1.94	1.94	1.91	1.92	1.93	1.95	2.19	1.93	1.99	2.17	2.28	2.26	2.12	2.08	1.91	3.08	2.13	24	
22	2.10	2.16	2.09	2.12	2.03	2.02	2.02	2.04	S	1.97	2.00	1.98	1.99	2.08	2.06	2.08	2.09	2.08	2.05	2.07	2.07	2.25	2.05	2.17	1.97	2.25	2.07	24	
23	2.08	2.05	2.08	2.02	1.99	1.99	2.00	S	1.97	1.97	2.00	2.00	2.00	2.00	1.97	2.08	2.00	2.00	2.00	2.02	2.05	2.06	2.47	2.18	1.97	2.47	2.04	24	
24	2.30	2.30	2.31	2.30	2.19	2.32	S	2.35	2.25	2.14	2.11	2.08	2.09	2.05	1.97	1.99	1.98	1.98	2.11	2.24	1.98	1.94	1.96	1.96	1.94	2.35	2.13	24	
25	2.01	2.12	1.96	1.98	1.97	S	1.98	2.00	2.04	1.97	2.02	1.96	1.97	2.15	1.96	2.10	1.97	2.21	2.18	2.02	2.02	2.10	2.24	2.26	1.96	2.26	2.05	24	
26	2.27	2.44	2.60	2.46	S	2.58	2.42	2.41	2.33	2.20	2.01	1.98	1.97	2.20	2.08	1.98	2.42	2.02	2.02	2.05	2.23	2.31	2.30	2.38	1.97	2.60	2.25	24	
27	2.39	2.44	2.45	S	2.33	2.42	2.46	2.43	2.50	2.25	2.23	2.13	2.09	2.14	2.24	2.25	2.22	2.18	2.26	2.33	2.29	2.28	2.18	2.02	2.02	2.50	2.28	24	
28	1.98	1.99	S	1.99	2.00	1.99	2.01	2.00	2.16	1.99	1.99	1.98	1.96	1.96	1.96	1.97	1.98	1.97	2.00	2.00	2.02	2.01	2.01	2.02	1.96	2.16	2.00	24	
29	2.04	S	2.07	2.11	2.12	2.18	2.11	2.14	2.17	2.07	2.00	1.99	1.99	1.99	2.04	2.02	2.03	2.11	2.28	2.34	2.52	2.47	2.44	2.48	1.99	2.52	2.16	24	
30	S	2.58	2.94	2.53	2.35	2.30	2.20	3.35	2.12	2.13	2.11	2.11	2.22	2.20	2.18	2.15	2.11	2.19	2.04	2.08	2.06	2.07	2.11	S	2.04	3.35	2.28	24	
31	2.09	2.08	2.08	2.08	2.11	2.08	2.23	2.17	2.12	3.20	2.13	2.12	2.13	3.83	2.08	2.12	2.23	2.47	2.22	2.28	2.17	2.25	S	2.26	2.08	3.83	2.28	24	
HOURLY MAX		3.96	4.05	3.52	3.77	3.92	3.58	3.51	3.35	2.91	3.20	2.46	2.52	2.45	3.83	2.26	2.28	2.42	2.47	2.33	2.53	3.02	2.88	3.36	3.46				
HOURLY AVG		2.37	2.43	2.40	2.42	2.43	2.46	2.41	2.42	2.30	2.23	2.13	2.11	2.10	2.15	2.06	2.07	2.09	2.09	2.10	2.14	2.23	2.29	2.31	2.31				

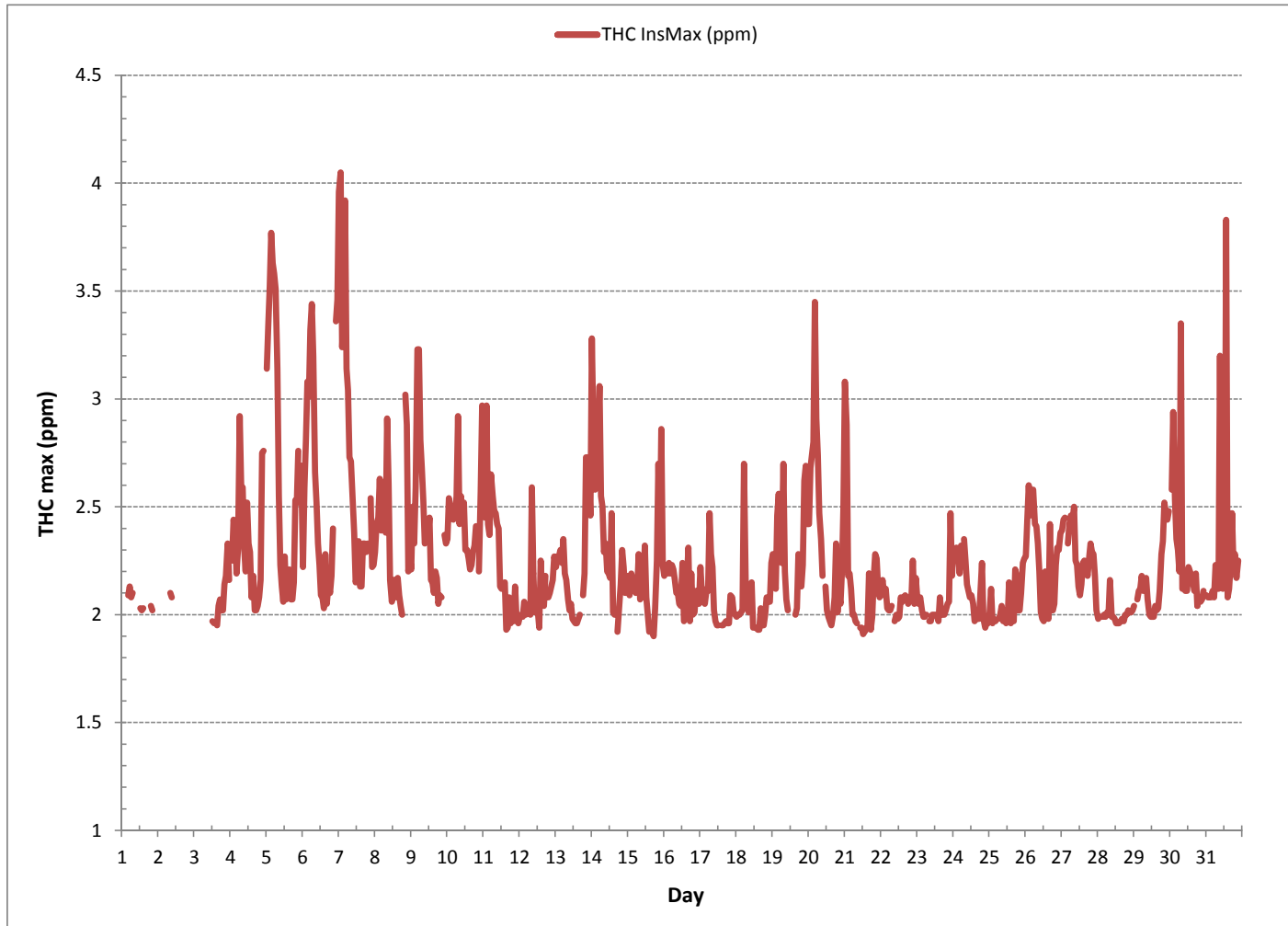
STATUS FLAG CODES

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

MONTHLY SUMMARY

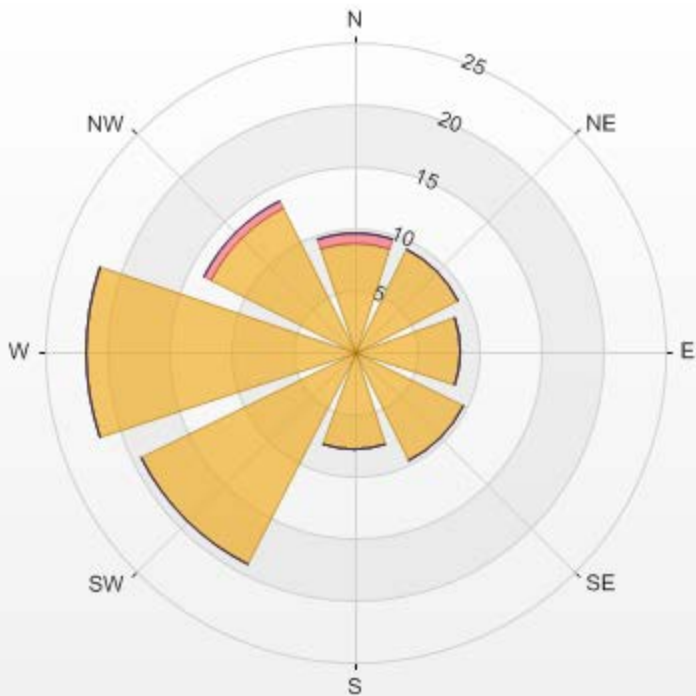
NUMBER OF NON-ZERO READINGS:	664
MAXIMUM INSTANTANEOUS VALUE:	4.05 PPM @ HOUR(S) 1 ON DAY(S) 7
	VAR-VARIOUS
IZS CALIBRATION TIME:	33 HRS
MONTHLY CALIBRATION TIME:	10 HRS
OPERATIONAL TIME:	707 HRS
STANDARD DEVIATION:	0.34

TOTAL HYDROCARBONS MAX instantaneous maximum in ppm



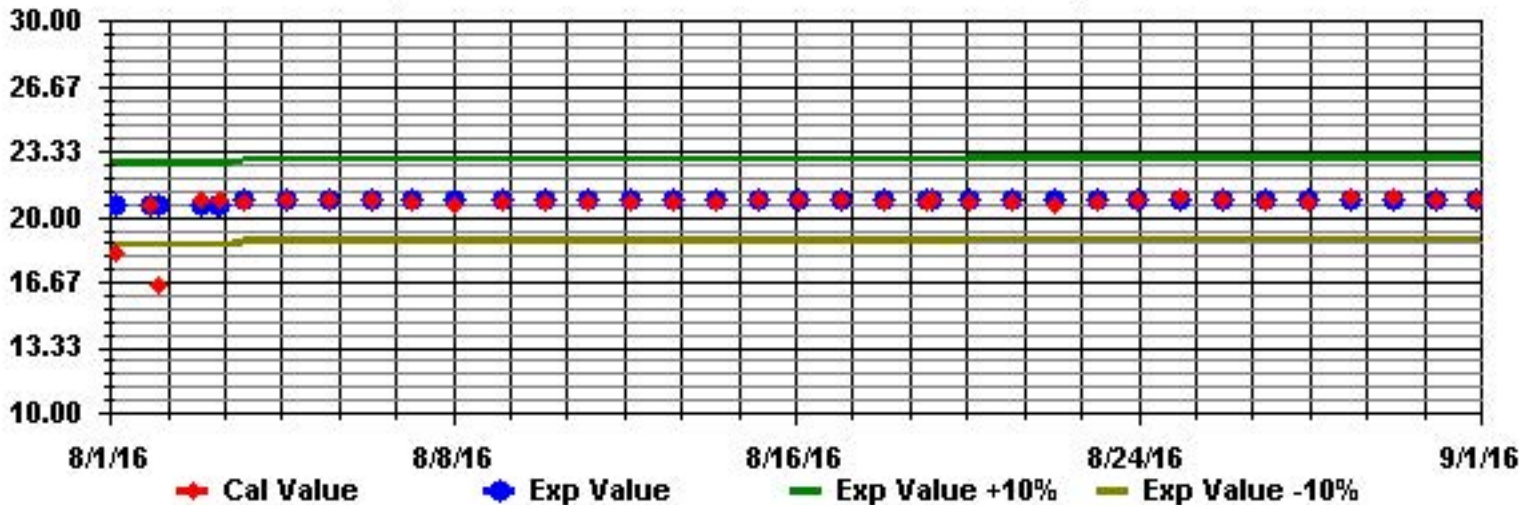
Wind: LICA Bonnyville Monitor: THC55 [ppm] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 89.52% Calm Avg: 0.00

Direction	0.0-3.0	3.0-10.0	10.0-50.0	>50.0	Total
N	8.86	0.75	0	0	9.61
NE	9.31	0	0	0	9.31
E	8.56	0	0	0	8.56
SE	9.91	0	0	0	9.91
S	7.96	0	0	0	7.96
SW	19.22	0	0	0	19.22
W	21.77	0	0	0	21.77
NW	13.06	0.6	0	0	13.66
Summary	98.65	1.35	0	0	100



% Icon Classes (ppm)	
99	0.0-3.0
1	3.0-10.0
0	10.0-50.0
0	>50.0

Calibration Graph for Site: BONNYVIL Parameter: THC55 Sequence: THC55 Phase: SPAN



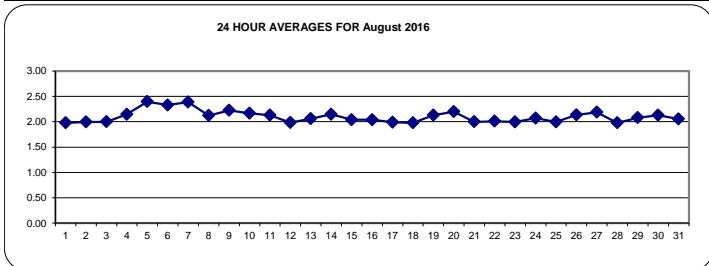
METHANE

METHANE (CH4) hourly averages in ppm

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY	DAY	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.
1	X	X	1.98	S	1.99	2.00	2.00	1.98	X	1.98	X	X	1.98	1.98	1.97	X	X	X	X	1.96	1.92	X	S	X	1.92	2.00	1.98	13	
2	X	X	S	X	X	X	X	X	1.98	2.01	X	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	1.98	2.01	2.00	8	
3	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	1.96	1.95	1.95	1.95	1.95	1.96	1.98	1.99	2.01	2.08	2.11	2.09	1.95	2.11	2.00	17
4	S	2.16	2.30	2.27	2.14	2.21	2.39	2.36	2.38	2.12	2.17	2.13	2.07	2.04	2.01	1.99	1.98	1.99	2.01	2.02	2.10	2.18	2.20	S	1.98	2.39	2.15	24	
5	2.69	2.90	3.08	3.02	3.19	3.23	3.13	2.62	2.28	2.12	2.03	2.03	2.01	2.01	2.01	2.00	2.00	2.02	2.01	2.04	2.17	2.22	S	2.26	2.00	3.23	2.39	24	
6	2.15	2.20	2.61	2.74	2.83	2.99	3.07	2.76	2.49	2.22	2.08	2.05	2.02	2.00	1.99	2.00	2.01	2.02	2.03	2.07	2.13	S	2.53	2.53	1.99	3.07	2.33	24	
7	2.66	2.82	2.84	2.92	2.86	2.86	2.77	2.58	2.51	2.37	2.13	2.11	2.05	2.06	2.06	2.08	2.12	2.08	2.09	2.19	S	2.36	2.15	2.18	2.05	2.92	2.38	24	
8	2.20	2.19	2.27	2.28	2.27	2.32	2.41	2.23	2.12	2.06	2.01	2.02	2.00	2.03	2.01	1.98	2.00	2.00	1.98	S	2.01	2.09	2.17	2.18	1.98	2.41	2.12	24	
9	2.18	2.22	2.28	2.32	2.94	2.68	2.57	2.46	2.31	2.25	2.21	2.19	2.11	2.07	2.01	2.00	2.03	2.05	1.99	2.01	2.02	S	2.11	2.15	1.99	2.94	2.22	24	
10	2.20	2.27	2.37	2.32	2.26	2.23	2.23	2.18	2.16	2.18	2.14	2.10	2.12	2.08	2.06	2.03	2.05	2.10	2.13	2.15	S	2.05	2.15	2.28	2.03	2.37	2.17	24	
11	2.34	2.27	2.36	2.36	2.31	2.31	2.37	2.28	2.21	2.24	2.20	2.09	2.06	2.00	1.97	1.92	1.93	1.93	1.95	S	1.96	1.96	1.96	1.95	1.92	2.37	2.13	24	
12	1.98	1.98	1.97	1.98	1.99	2.00	2.00	1.99	1.97	1.96	1.98	1.93	1.93	1.93	1.93	1.93	1.93	1.93	S	1.95	2.00	2.07	2.10	2.17	1.93	2.17	1.98	24	
13	2.16	2.19	2.18	2.23	2.17	2.20	2.16	2.08	2.00	1.99	1.97	1.94	1.94	1.93	1.92	1.93	1.93	S	1.98	2.04	2.10	2.12	2.07	2.11	1.92	2.23	2.06	24	
14	2.28	2.23	2.25	2.29	2.42	2.44	2.32	2.34	2.26	2.20	2.10	2.16	2.10	2.05	1.98	1.97	S	1.90	1.92	1.95	1.98	2.01	2.02	2.09	1.90	2.44	2.15	24	
15	2.09	2.06	2.14	2.14	2.09	2.08	2.08	2.07	2.03	2.03	2.01	1.97	1.96	1.92	1.90	S	1.89	1.89	1.89	2.04	2.14	2.14	2.21	2.12	1.89	2.21	2.04	24	
16	2.13	2.15	2.13	2.18	2.16	2.19	2.16	2.12	2.08	2.01	1.99	1.98	1.95	1.93	S	1.94	1.96	1.91	1.93	1.96	1.97	2.05	2.02	2.00	1.91	2.19	2.04	24	
17	2.01	2.02	2.06	2.03	2.02	2.03	2.03	2.01	2.00	1.96	1.94	1.95	S	1.94	1.94	1.95	1.95	1.95	1.95	1.99	2.04	1.99	1.99	1.99	1.94	2.06	1.99	24	
18	1.98	1.98	1.99	1.99	2.00	2.01	2.01	2.03	1.99	1.96	1.93	1.93	S	1.93	1.92	1.92	1.94	1.94	1.94	1.97	2.01	2.01	2.03	2.08	1.92	2.08	1.98	24	
19	2.08	2.12	2.11	2.21	2.27	2.23	2.20	2.21	2.15	2.05	1.97	S	1.97	1.97	S1	1.98	1.99	2.01	2.03	2.08	2.15	2.29	2.34	2.36	1.97	2.36	2.13	23	
20	2.36	2.48	2.63	2.65	2.70	2.73	2.60	2.37	2.19	2.14	S	2.06	1.99	1.95	1.93	1.92	1.92	1.99	1.99	1.96	1.97	1.97	2.04	2.02	1.92	2.73	2.20	24	
21	2.13	2.16	2.12	2.13	2.03	1.98	1.96	1.93	1.95	S	1.92	1.92	1.89	1.90	1.91	1.91	1.91	1.91	1.91	1.97	2.13	2.13	2.09	2.07	1.89	2.16	2.00	24	
22	2.07	2.04	2.04	2.04	2.02	2.00	2.00	2.01	S	1.96	1.95	1.96	1.96	1.96	1.97	1.98	2.06	2.02	2.01	2.04	2.04	2.09	1.99	1.99	1.95	2.09	2.01	24	
23	2.03	2.00	2.04	1.98	1.97	1.97	1.98	S	1.96	1.96	1.98	1.98	1.97	1.97	1.96	1.95	1.97	1.98	1.98	1.98	2.01	2.02	2.11	2.16	1.95	2.16	2.00	24	
24	2.26	2.27	2.20	2.14	2.16	2.25	S	2.21	2.17	2.12	2.08	2.04	2.05	1.97	1.96	1.97	1.97	1.97	1.97	2.01	2.03	1.95	1.94	1.95	1.96	1.94	2.27	2.07	24
25	1.98	1.97	1.95	1.96	1.97	S	1.97	1.98	2.01	1.96	1.96	1.95	1.96	1.96	1.95	1.95	1.96	1.97	1.97	1.97	1.98	2.01	2.05	2.20	2.24	1.95	2.24	1.99	24
26	2.24	2.30	2.43	2.37	S	2.38	2.32	2.33	2.24	2.07	1.99	1.95	1.95	1.96	1.96	1.95	1.95	1.96	1.97	2.01	2.06	2.15	2.26	2.33	1.95	2.43	2.14	24	
27	2.35	2.37	2.33	S	2.24	2.36	2.32	2.28	2.26	2.23	2.17	2.10	2.07	2.10	2.09	2.09	2.08	2.11	2.17	2.17	2.17	2.18	2.08	1.99	1.99	2.37	2.19	24	
28	1.96	1.96	S	1.98	1.98	1.98	1.99	1.99	1.98	1.98	1.97	1.96	1.96	1.96	1.96	1.96	1.97	1.97	1.98	1.98	2.00	1.99	2.00	2.01	1.96	2.01	1.98	24	
29	2.02	S	2.05	2.08	2.10	2.10	2.09	2.10	2.11	2.01	1.98	1.97	1.97	1.97	1.98	1.99	2.02	2.03	2.06	2.08	2.23	2.28	2.31	2.28	1.97	2.31	2.08	24	
30	S	2.42	2.73	2.34	2.30	2.24	2.17	2.13	2.07	2.06	2.02	2.02	2.02	2.03	2.03	2.01	2.01	2.02	2.02	2.05	2.03	2.04	2.05	S	2.01	2.73	2.13	24	
31	2.06	2.06	2.06	2.08	2.08	2.06	2.08	2.09	2.04	2.04	2.07	2.04	2.02	2.04	2.03	2.01	2.03	2.04	2.05	2.04	2.05	2.04	2.06	S	2.10	2.01	2.10	2.05	24
HOURLY MAX	2.69	2.90	3.08	3.02	3.19	3.23	3.13	2.76	2.51	2.37	2.21	2.19	2.12	2.10	2.09	2.09	2.12	2.11	2.17	2.19	2.23	2.36	2.53	2.53					
HOURLY AVG	2.18	2.21	2.27	2.26	2.27	2.29	2.26	2.21	2.14	2.08	2.04	2.02	2.00	1.99	1.98	1.97	1.98	1.99	2.00	2.02	2.05	2.10	2.12	2.14					

STATUS FLAG CODES

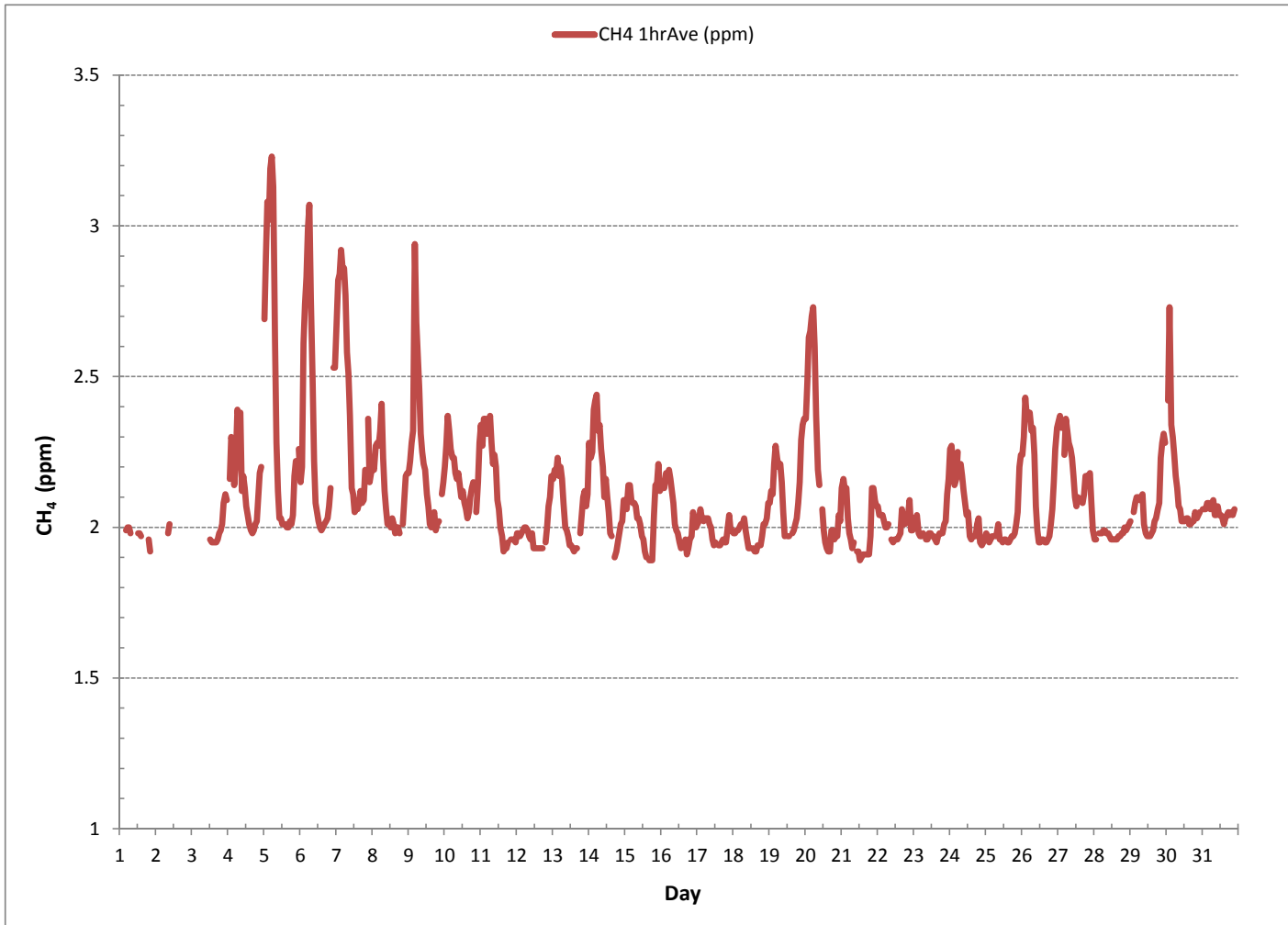
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	666				
MINIMUM 1-HR AVERAGE:	1.89	PPM @ HOUR(S)	VAR , 12	ON DAY(S) 15 , 21	
MAXIMUM 1-HR AVERAGE:	3.23	PPM @ HOUR(S)	5	ON DAY(S) 5	
MAXIMUM 24-HR AVERAGE:	2.39	PPM		ON DAY(S) 5	
				VAR-VARIOUS	
IZS CALIBRATION TIME:	33	HRS	OPERATIONAL TIME:	709	HRS
MONTHLY CALIBRATION TIME:	10	HRS	AMD OPERATION UPTIME:	95.3	%
STANDARD DEVIATION:	0.20		MONTHLY AVERAGE:	2.11	PPM

METHANE (CH₄) hourly averages in ppm





METHANE MAX instantaneous maximum in ppm

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	X	X	2.10	S	2.10	2.10	2.09	2.11	X	2.05	X	X	2.03	2.03	2.03	X	X	X	X	2.04	2.03	X	S	X	2.03	2.11	2.06	13	
2	X	X	S	X	X	X	X	X	2.11	2.09	X	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	2.09	2.11	2.10	8
3	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	1.98	1.97	X	1.95	1.98	1.98	2.02	2.01	2.04	2.16	2.16	2.16	1.95	2.16	2.04	16
4	S	2.26	2.38	2.38	2.19	2.30	2.47	2.51	2.47	2.32	2.20	2.16	2.12	2.08	2.09	2.00	2.03	2.02	2.04	2.05	2.16	2.58	2.61	S	2.00	2.61	2.25	24	
5	2.99	3.14	3.33	3.55	3.49	3.39	3.32	3.00	2.52	2.24	2.07	2.07	2.05	2.07	2.20	2.07	2.07	2.07	2.15	2.33	2.35	2.61	S	2.69	2.05	3.55	2.60	24	
6	2.22	2.49	2.75	2.94	2.91	3.15	3.20	3.07	2.66	2.37	2.35	2.24	2.10	2.09	2.04	2.06	2.05	2.13	2.11	2.14	2.22	S	2.73	3.02	2.04	3.20	2.48	24	
7	3.24	3.67	3.04	3.22	3.67	2.93	2.90	2.71	2.71	2.48	2.31	2.15	2.11	2.15	2.14	2.14	2.19	2.14	2.16	2.31	S	2.46	2.22	2.21	2.11	3.67	2.58	24	
8	2.29	2.23	2.37	2.43	2.39	2.43	2.44	2.37	2.14	2.11	2.14	2.06	2.11	2.16	2.08	1.99	2.10	2.03	2.00	S	2.03	2.15	2.20	2.24	1.99	2.44	2.20	24	
9	2.21	2.34	2.32	2.60	3.12	3.18	2.68	2.60	2.53	2.33	2.36	2.28	2.25	2.16	2.07	2.11	2.11	2.18	2.05	2.10	2.09	S	2.38	2.26	2.05	3.18	2.36	24	
10	2.25	2.54	2.45	2.50	2.43	2.46	2.55	2.31	2.41	2.40	2.33	2.26	2.31	2.25	2.19	2.22	2.23	2.21	2.31	2.29	S	2.20	2.41	2.80	2.19	2.80	2.36	24	
11	2.48	2.42	2.79	2.42	2.36	2.47	2.51	2.44	2.22	2.28	2.27	2.14	2.11	2.07	2.02	1.93	1.94	1.95	1.95	S	1.97	1.98	1.98	1.96	1.93	2.79	2.20	24	
12	1.99	1.99	1.98	1.99	2.00	2.01	2.01	2.01	2.01	1.99	2.01	1.99	1.93	1.94	1.93	1.94	1.94	1.94	S	1.97	2.11	2.14	2.17	2.27	1.93	2.27	2.01	24	
13	2.23	2.26	2.28	2.31	2.24	2.36	2.20	2.16	2.07	2.03	2.05	1.98	1.96	1.96	1.96	1.98	2.01	S	2.04	2.19	2.20	2.25	2.24	2.21	1.96	2.36	2.14	24	
14	2.72	2.78	2.58	2.57	2.72	2.91	2.55	2.51	2.30	2.24	2.17	2.19	2.18	2.14	2.02	2.00	S	1.92	1.98	2.10	2.08	2.05	2.10	2.15	1.92	2.91	2.30	24	
15	2.14	2.10	2.19	2.16	2.14	2.11	2.12	2.12	2.06	2.06	2.07	2.01	2.00	1.96	1.92	S	1.92	1.90	1.92	2.25	2.38	2.26	2.38	2.18	1.90	2.38	2.10	24	
16	2.18	2.24	2.19	2.24	2.19	2.23	2.21	2.16	2.11	2.09	2.03	2.05	2.01	1.97	S	1.99	1.98	1.97	1.98	2.00	2.02	2.12	2.13	2.05	1.97	2.24	2.09	24	
17	2.05	2.11	2.10	2.05	2.04	2.05	2.04	2.04	2.03	2.03	1.98	1.95	1.95	S	1.95	1.96	1.96	1.97	1.96	1.97	2.03	2.08	2.01	2.00	1.95	2.11	2.01	24	
18	1.99	2.00	2.01	2.01	2.02	2.02	2.03	2.06	2.02	2.04	1.95	1.94	S	1.94	1.93	1.93	1.95	1.95	1.95	2.01	2.09	2.05	2.06	2.13	1.93	2.13	2.00	24	
19	2.10	2.16	2.13	2.46	2.56	2.29	2.24	2.31	2.20	2.08	2.03	S	2.00	S1	S1	2.00	2.04	2.19	2.26	2.14	2.24	2.62	2.69	2.41	2.00	2.69	2.25	22	
20	2.41	2.69	2.75	2.77	3.37	2.82	2.74	2.47	2.36	2.18	S	2.14	2.03	1.99	1.97	1.96	1.99	2.09	2.34	2.02	2.11	2.05	2.14	2.50	1.96	3.37	2.34	24	
21	3.00	2.74	2.18	2.19	2.13	2.00	2.01	1.98	1.97	S	1.94	1.94	1.91	1.92	1.93	1.96	1.94	1.93	1.98	2.17	2.29	2.24	2.13	2.09	1.91	3.00	2.11	24	
22	2.11	2.16	2.10	2.13	2.03	2.02	2.02	2.04	S	1.97	2.01	1.98	1.99	1.98	2.05	2.08	2.10	2.08	2.05	2.06	2.06	2.25	2.04	2.17	1.97	2.25	2.06	24	
23	2.08	2.04	2.09	2.01	1.99	1.99	1.99	S	1.97	1.98	2.00	2.00	1.99	2.00	1.98	1.96	2.01	2.00	2.00	2.01	2.05	2.07	2.46	2.19	1.96	2.46	2.04	24	
24	2.30	2.31	2.30	2.17	2.19	2.31	S	2.26	2.22	2.15	2.12	2.09	2.10	2.06	1.97	1.98	1.98	1.98	1.98	2.12	2.18	1.98	1.94	1.96	1.97	1.94	2.31	2.11	24
25	2.02	2.01	1.97	1.98	1.98	S	1.98	2.00	2.04	1.98	2.00	1.96	1.98	1.98	1.96	1.97	1.98	1.99	1.99	2.02	2.02	2.11	2.25	2.27	1.96	2.27	2.02	24	
26	2.27	2.36	2.50	2.41	S	2.58	2.42	2.36	2.30	2.20	2.01	1.98	1.97	2.21	2.09	1.99	2.03	2.02	2.03	2.05	2.13	2.20	2.31	2.37	1.97	2.58	2.21	24	
27	2.38	2.44	2.45	S	2.33	2.42	2.45	2.43	2.36	2.25	2.24	2.15	2.10	2.15	2.23	2.25	2.14	2.18	2.21	2.21	2.30	2.24	2.18	2.01	2.01	2.45	2.27	24	
28	1.98	1.98	S	1.99	2.00	1.99	2.01	2.00	1.99	1.99	1.98	1.97	1.97	1.97	1.97	1.97	1.98	1.98	2.00	2.00	2.02	2.01	2.01	2.02	1.97	2.02	1.99	24	
29	2.03	S	2.07	2.12	2.13	2.12	2.12	2.15	2.12	2.07	1.99	1.98	1.98	1.99	2.03	2.02	2.03	2.12	2.29	2.35	2.52	2.47	2.44	2.48	1.98	2.52	2.16	24	
30	S	2.59	2.94	2.53	2.36	2.30	2.21	2.36	2.13	2.14	2.12	2.12	2.22	2.10	2.18	2.15	2.13	2.19	2.04	2.09	2.06	2.07	2.12	S	2.04	2.94	2.23	24	
31	2.10	2.09	2.09	2.09	2.12	2.09	2.24	2.18	2.13	2.16	2.14	2.13	2.08	2.15	2.08	2.14	2.15	2.34	2.23	2.22	2.15	2.15	S	2.27	2.08	2.34	2.15	24	
HOURLY MAX	3.24	3.67	3.33	3.55	3.67	3.39	3.32	3.07	2.71	2.48	2.36	2.28	2.31	2.25	2.23	2.25	2.23	2.34	2.34	2.35	2.52	2.62	2.73	3.02					
HOURLY AVG	2.30	2.38	2.37	2.38	2.40	2.39	2.35	2.31	2.22	2.15	2.11	2.07	2.05	2.05	2.04	2.03	2.03	2.05	2.08	2.12	2.13	2.20	2.24	2.26					

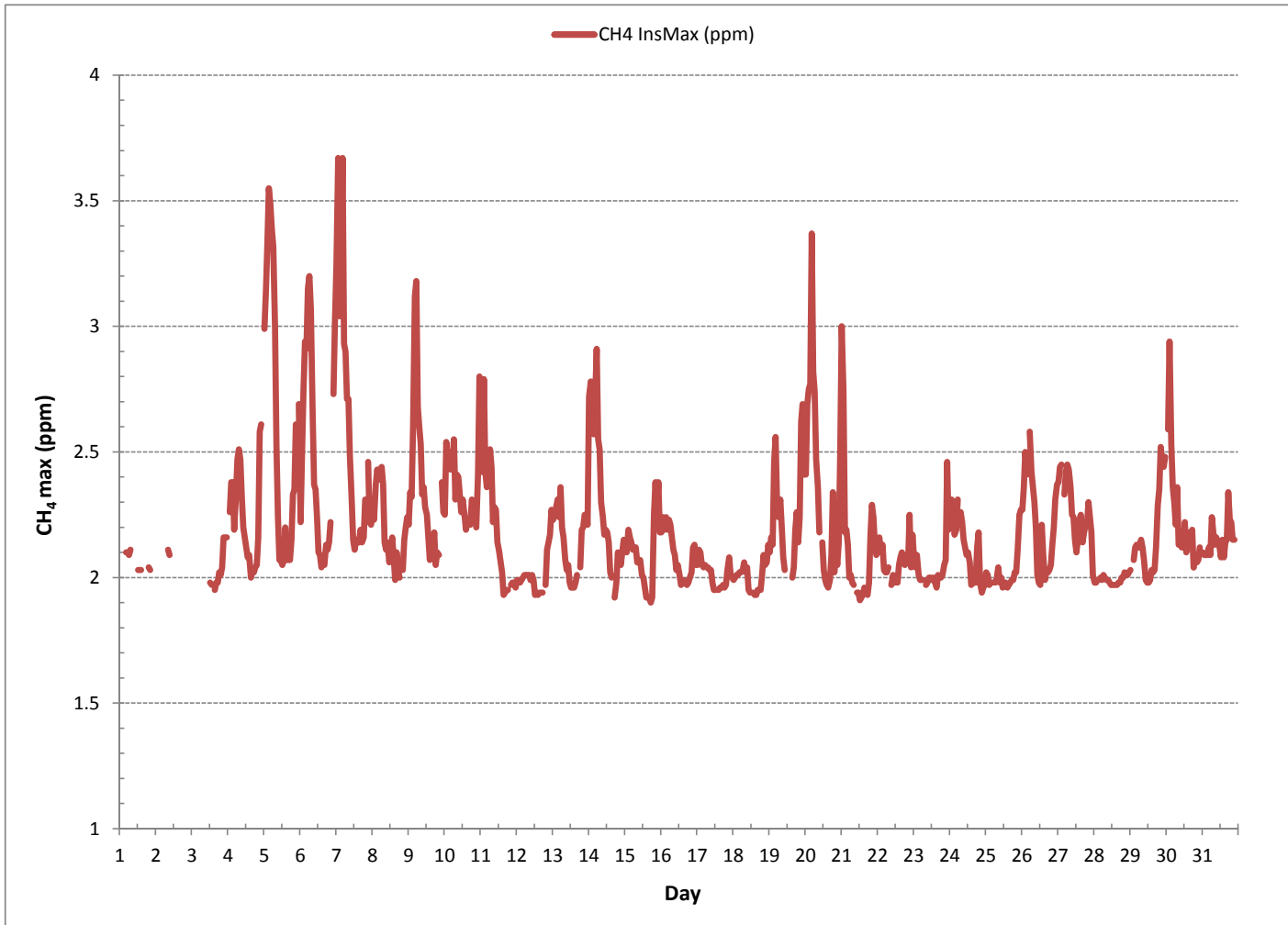
STATUS FLAG CODES

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

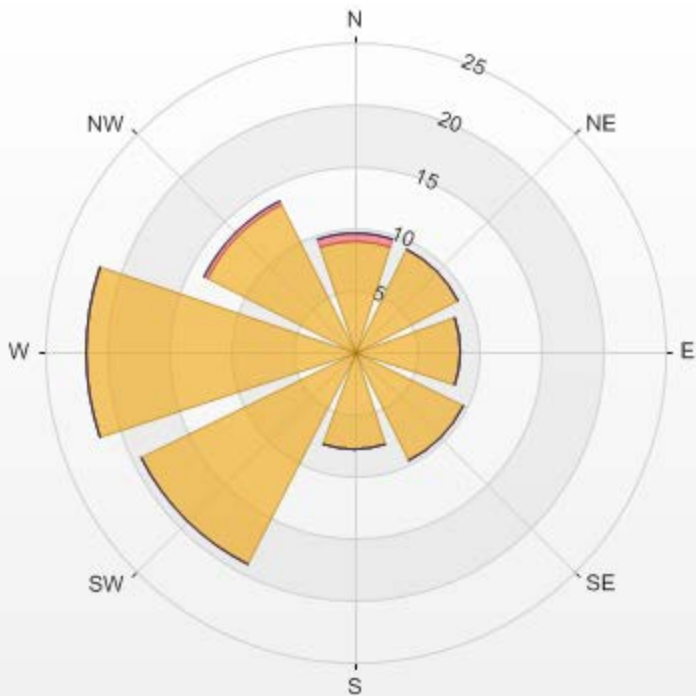
NUMBER OF NON-ZERO READINGS:	664
MAXIMUM INSTANTANEOUS VALUE:	3.67 PPM @ HOUR(S) 1, 4 ON DAY(S) 7
	VAR-VARIOUS
IZS CALIBRATION TIME:	33 HRS
MONTHLY CALIBRATION TIME:	10 HRS
OPERATIONAL TIME:	707 HRS
STANDARD DEVIATION:	0.28

METHANE MAX instantaneous maximum in ppm

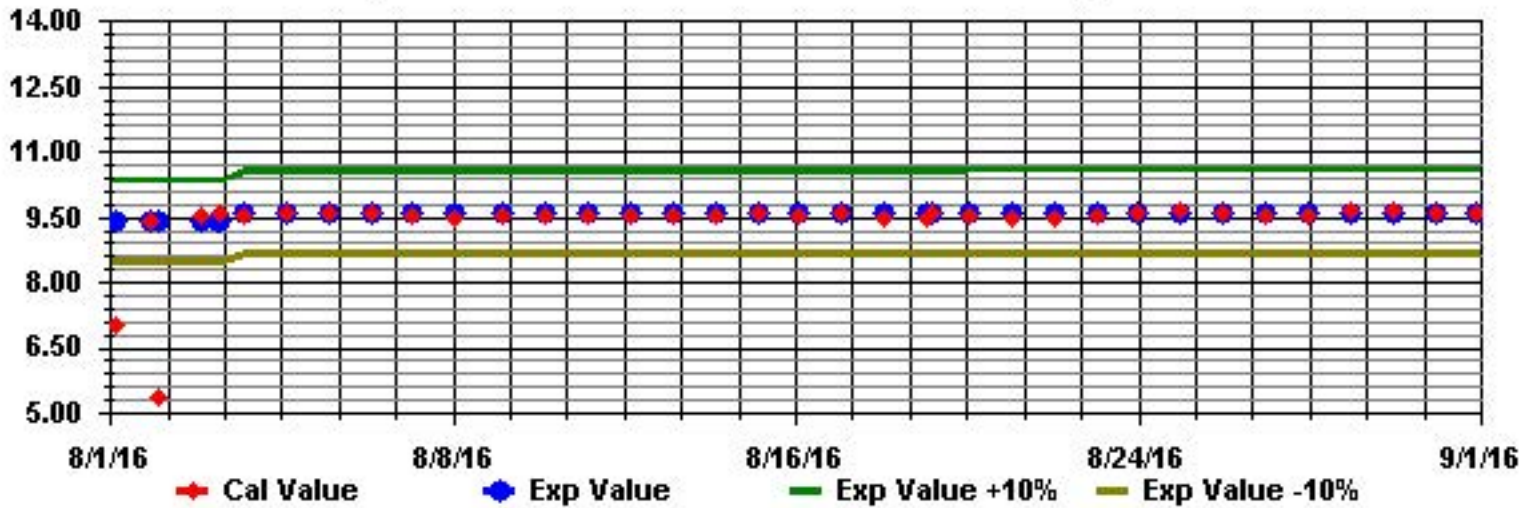


Wind: LICA Bonnyville Monitor: CH4 [ppm] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 89.52% Calm Avg: 0.00

Direction	0.0-3.0	3.0-10.0	10.0-50.0	>50.0	Total
N	9.01	0.6	0	0	9.61
NE	9.31	0	0	0	9.31
E	8.56	0	0	0	8.56
SE	9.91	0	0	0	9.91
S	7.96	0	0	0	7.96
SW	19.22	0	0	0	19.22
W	21.77	0	0	0	21.77
NW	13.36	0.3	0	0	13.66
Summary	99.1	0.9	0	0	100



Calibration Graph for Site: BONNYVIL Parameter: METHANE Sequence: THC55 Phase: SPAN



NON-METHANE HYDROCARBON

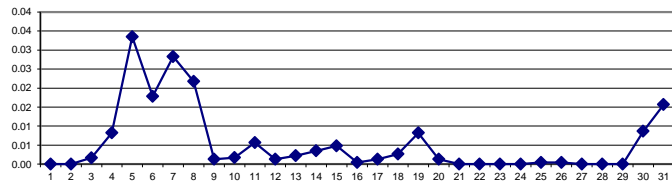
NON-METHANE HYDROCARBONS (NMHC) hourly averages in ppm

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY	HR	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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	X	X	0.00	S	0.00	0.00	0.00	0.00	X	0.00	X	X	0.00	0.00	0.00	X	X	X	X	0.00	0.00	X	S	X	0.00	0.00	0.00	13	
2	X	X	S	X	X	X	X	X	0.00	0.00	X	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	0.00	0.00	0.00	8
3	Y	Y	Y	Y	Y	Y	Y	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	0.02	0.00	0.00	0.02	0.00	0.00	17
4	S	0.00	0.00	0.00	0.00	0.00	0.13	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	S	0.00	0.13	0.01	24
5	0.09	0.10	0.12	0.06	0.10	0.09	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.01	S	0.02	0.00	0.12	0.03	24
6	0.00	0.00	0.00	0.01	0.01	0.05	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	S	0.14	0.10	0.00	0.14	0.02	0.00	24
7	0.17	0.10	0.12	0.10	0.05	0.05	0.05	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	S	0.00	0.00	0.00	0.00	0.00	0.17	0.03	24
8	0.00	0.00	0.04	0.06	0.01	0.00	0.01	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.16	0.17	0.00	0.00	0.00	0.17	0.02	24
9	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.02	0.00	0.00	24
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	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	0.01	0.00	0.02	0.00	0.00	24
11	0.01	0.00	0.01	0.00	0.00	0.03	0.00	0.06	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.06	0.01	24
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	24
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.01	0.01	0.03	0.00	0.00	0.03	0.00	24
14	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.05	0.00	24
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	0.05	0.01	0.04	0.00	0.00	0.05	0.00	24
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
17	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	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	0.03	0.00	24
18	0.00	0.00	0.00	0.00	0.00	0.06	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	0.06	0.00	24
19	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	S	0.00	0.00	S1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.01	23
20	0.00	0.00	0.00	0.00	0.02	0.01	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	0.02	0.00	24
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
23	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
24	0.00	0.00	0.00	0.00	0.00	0.00	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
25	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
26	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	0.01	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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
28	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
29	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
30	S	0.00	0.00	0.00	0.00	0.00	0.00	0.19	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	S	0.00	0.19	0.01	24
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.28	0.00	0.00	0.01	0.01	0.00	0.00	0.02	0.16	0.17	0.14	0.10	0.00	0.28	0.02	24
HOURLY MAX		0.17	0.10	0.12	0.10	0.10	0.09	0.13	0.19	0.03	0.07	0.00	0.01	0.01	0.28	0.03	0.00	0.01	0.01	0.00	0.02	0.16	0.17	0.14	0.10				
HOURLY AVG		0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	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

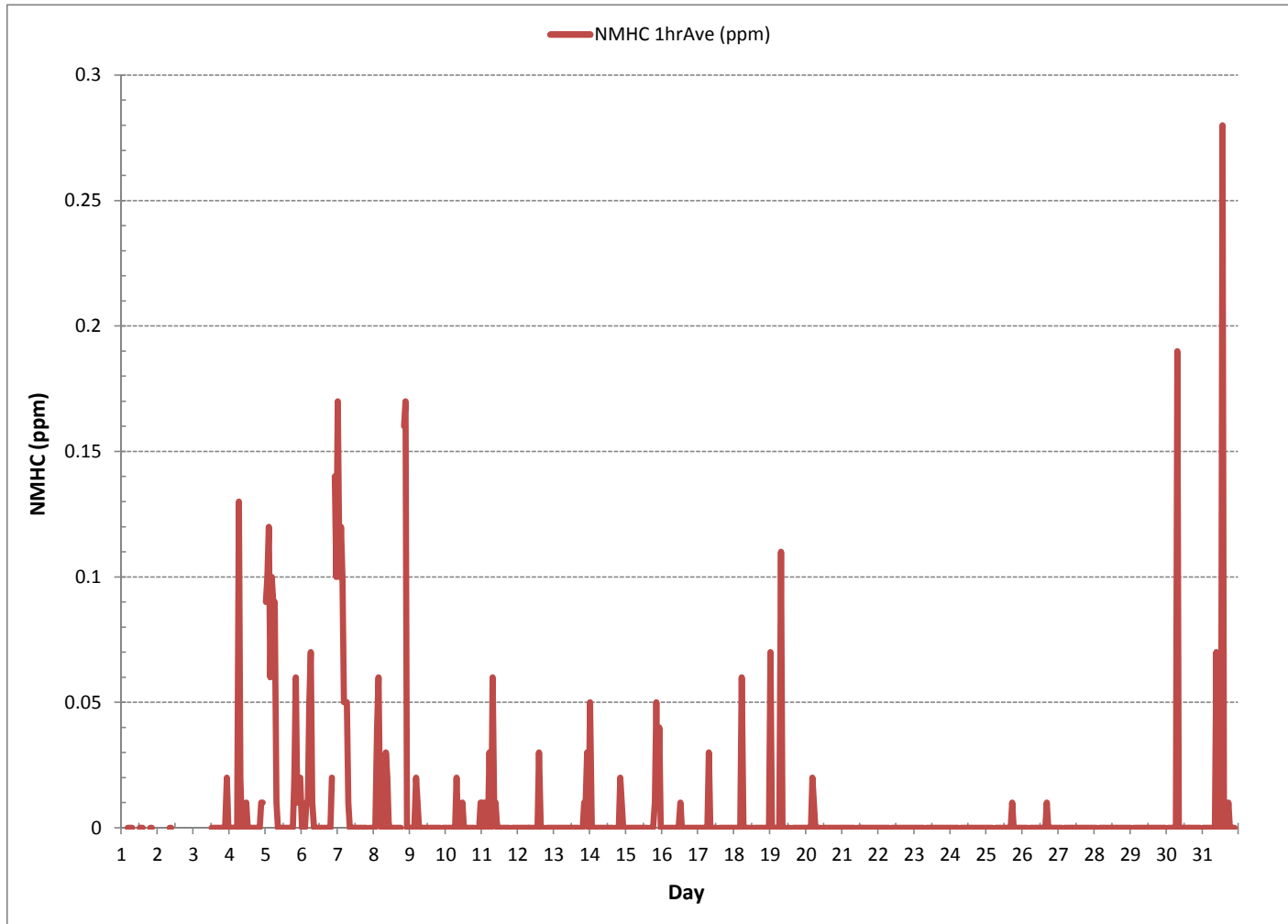
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	77				
MINIMUM 1-HR AVERAGE:	0.00	PPM @ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	0.28	PPM @ HOUR(S)	13	ON DAY(S)	31
MAXIMUM 24-HR AVERAGE:	0.03	PPM		ON DAY(S)	5, 7
				VAR-VARIOUS	
IZS CALIBRATION TIME:	33	HRS	OPERATIONAL TIME:	709	HRS
MONTHLY CALIBRATION TIME:	10	HRS	AMD OPERATION UPTIME:	95.3	%
STANDARD DEVIATION:	0.02		MONTHLY AVERAGE:	0.01	PPM

NON-METHANE HYDROCARBONS (NMHC) hourly averages in ppm





NON-METHANE HYDROCARBONS MAX instantaneous maximum in ppm

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.
DAY	MIN.	MAX.	AVG.	RDGS.	MIN.	MAX.	AVG.	RDGS.	MIN.	MAX.	AVG.	RDGS.	MIN.	MAX.	AVG.	RDGS.	MIN.	MAX.	AVG.	RDGS.	MIN.	MAX.	AVG.	RDGS.	MIN.	MAX.	AVG.	RDGS.	
1	X	X	0.00	S	0.00	0.18	0.00	0.00	X	0.00	X	X	0.00	0.00	0.00	X	X	X	X	0.00	0.00	X	S	X	0.00	0.18	0.02	13	
2	X	X	S	X	X	X	X	X	0.00	0.00	X	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	0.00	0.00	0.00	8	
3	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	0.00	0.00	X	0.00	0.09	0.11	0.00	0.00	0.11	0.10	0.19	0.00	0.00	0.19	0.05	16
4	S	0.00	0.15	0.08	0.05	0.00	0.52	0.22	0.18	0.00	0.00	0.38	0.24	0.23	0.00	0.19	0.00	0.00	0.00	0.06	0.00	0.21	0.18	S	0.00	0.52	0.12	24	
5	0.22	0.21	0.23	0.23	0.21	0.25	0.36	0.19	0.24	0.00	0.07	0.00	0.25	0.00	0.00	0.19	0.00	0.00	0.00	0.43	0.37	0.15	S	0.18	0.00	0.43	0.16	24	
6	0.00	0.10	0.19	0.19	0.16	0.19	0.31	0.18	0.16	0.17	0.10	0.00	0.00	0.00	0.00	0.28	0.00	0.14	0.00	0.10	0.26	S	0.65	0.44	0.00	0.65	0.16	24	
7	0.90	0.42	0.25	0.25	0.26	0.24	0.26	0.17	0.08	0.08	0.11	0.00	0.13	0.27	0.00	0.00	0.15	0.19	0.14	0.14	S	0.17	0.08	0.05	0.00	0.90	0.19	24	
8	0.00	0.18	0.19	0.21	0.14	0.00	0.16	0.15	0.79	0.59	0.14	0.00	0.17	0.00	0.00	0.17	0.04	0.00	0.00	S	1.02	0.84	0.01	0.10	0.00	1.02	0.21	24	
9	0.00	0.20	0.00	0.18	0.17	0.15	0.15	0.15	0.00	0.00	0.00	0.11	0.32	0.00	0.15	0.00	0.19	0.00	0.00	0.00	0.00	S	0.00	0.17	0.00	0.32	0.08	24	
10	0.11	0.07	0.10	0.00	0.00	0.00	0.00	0.71	0.11	0.18	0.13	0.43	0.12	0.14	0.18	0.00	0.00	0.17	0.13	0.16	S	0.00	0.24	0.17	0.00	0.71	0.14	24	
11	0.16	0.14	0.17	0.00	0.00	0.21	0.10	0.24	0.26	0.19	0.15	0.00	0.04	0.18	0.14	0.00	0.00	0.12	0.00	S	0.00	0.19	0.00	0.00	0.00	0.26	0.10	24	
12	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.58	0.22	0.00	0.14	0.08	0.00	0.32	0.14	0.10	0.26	S	0.13	0.00	0.00	0.00	0.00	0.00	0.58	0.09	24	
13	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.09	0.00	0.56	0.56	0.42	0.29	0.00	0.56	0.09	24
14	0.63	0.14	0.12	0.08	0.12	0.15	0.00	0.00	0.00	0.11	0.11	0.00	0.00	0.33	0.00	0.00	S	0.00	0.12	0.21	0.31	0.23	0.12	0.11	0.00	0.63	0.13	24	
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.08	0.05	0.34	0.12	0.09	0.00	S	0.00	0.00	0.14	0.25	0.44	0.17	0.53	0.11	0.00	0.53	0.11	24	
16	0.03	0.00	0.10	0.07	0.00	0.00	0.00	0.00	0.00	0.11	0.08	0.00	0.23	0.00	S	0.20	0.33	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.06	24	
17	0.19	0.00	0.00	0.00	0.12	0.10	0.43	0.26	0.20	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	0.43	0.06	24	
18	0.00	0.00	0.00	0.00	0.00	0.69	0.13	0.00	0.00	0.00	0.24	0.00	S	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.69	0.06	24	
19	0.21	0.12	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.00	S	0.14	S1	S1	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.39	0.05	22	
20	0.00	0.10	0.00	0.08	0.18	0.14	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.11	0.00	0.00	0.11	0.00	0.00	0.00	0.18	0.03	24	
21	0.08	0.15	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	0.26	0.00	0.00	0.00	0.13	0.11	0.00	0.00	0.00	0.26	0.03	24	
22	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	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.01	24	
23	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	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.14	0.01	24	
24	0.00	0.00	0.00	0.16	0.00	0.00	S	0.18	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.02	24	
25	0.00	0.12	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.19	0.00	0.15	0.00	0.24	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.04	24	
26	0.02	0.15	0.12	0.11	S	0.09	0.00	0.09	0.10	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.40	0.00	0.00	0.00	0.18	0.12	0.00	0.00	0.00	0.40	0.07	24	
27	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.14	0.13	0.14	0.11	0.12	0.16	0.10	0.15	0.12	0.00	0.00	0.16	0.06	24	
28	0.00	0.00	S	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.01	24	
29	0.00	S	0.00	0.00	0.00	0.10	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.15	0.00	0.00	0.00	0.15	0.02	24	
30	S	0.00	0.02	0.00	0.00	0.00	0.00	1.21	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	1.21	0.06	24	
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.00	0.00	0.09	1.79	0.00	0.08	0.14	0.38	0.14	0.13	0.13	0.10	S	0.00	0.00	1.79	0.18	24	
HOURLY MAX	0.90	0.42	0.25	0.25	0.26	0.69	0.52	1.21	0.79	1.17	0.24	0.43	0.32	1.79	0.32	0.28	0.40	0.38	0.23	0.43	1.02	0.84	0.65	0.44					
HOURLY AVG	0.10	0.08	0.06	0.06	0.05	0.09	0.09	0.16	0.11	0.10	0.05	0.05	0.07	0.13	0.03	0.06	0.07	0.07	0.05	0.07	0.14	0.12	0.10	0.07					

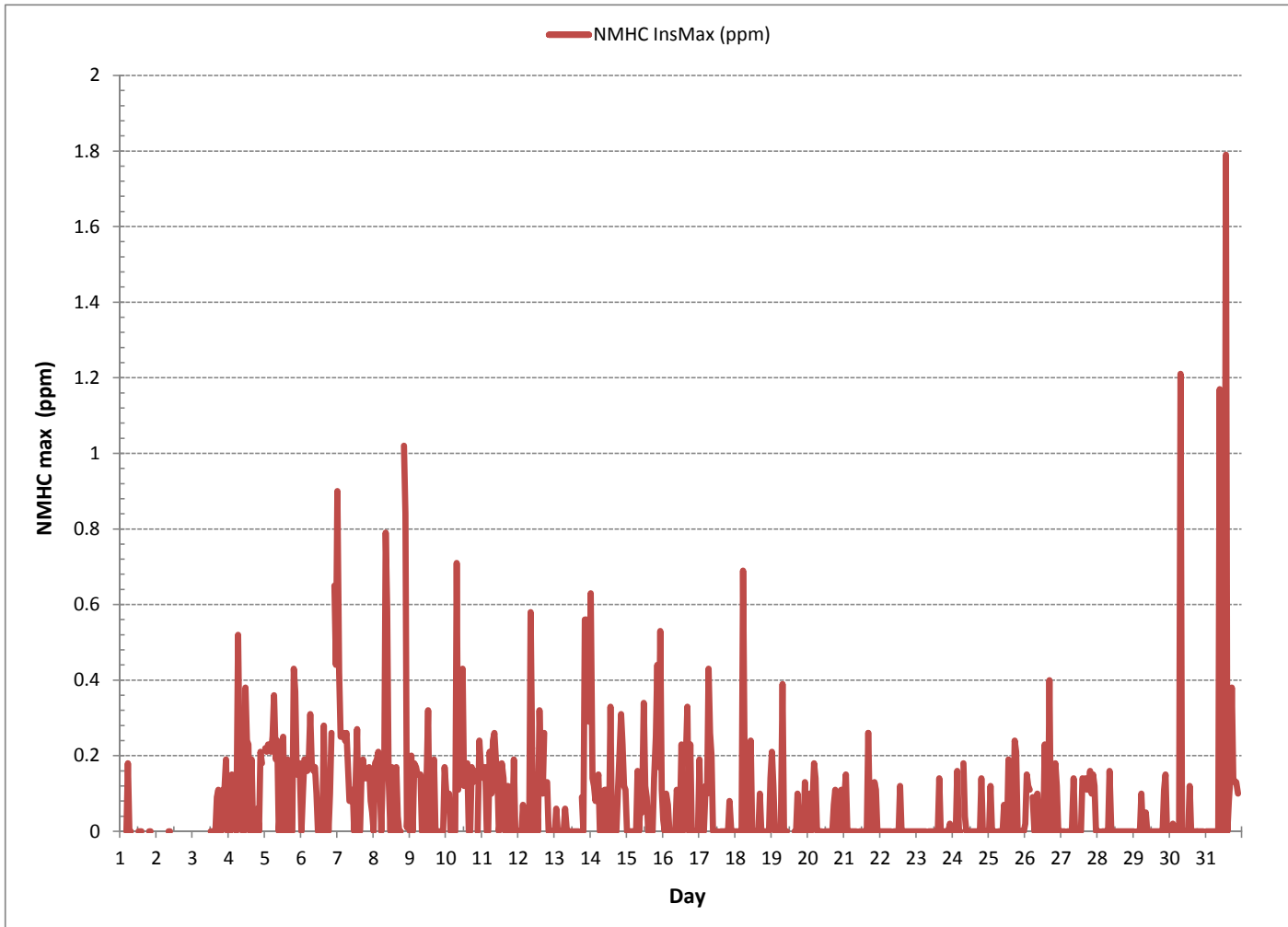
STATUS FLAG CODES

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

MONTHLY SUMMARY

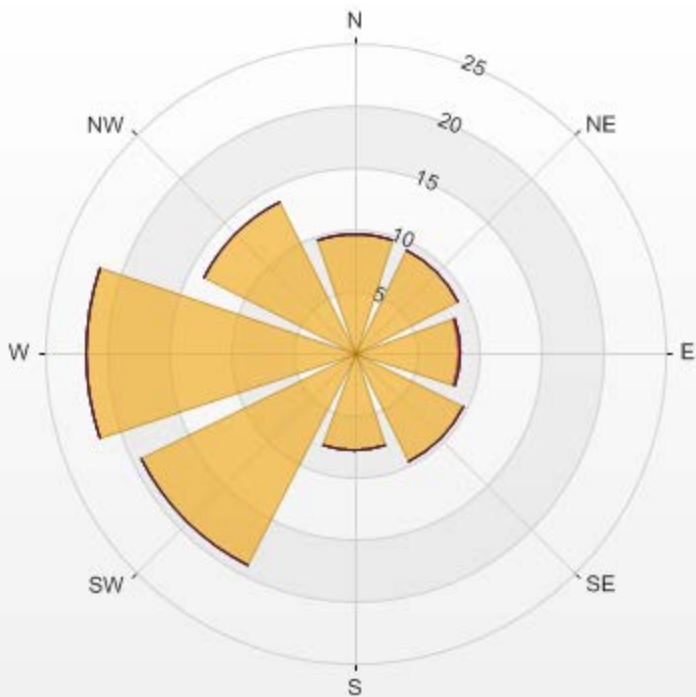
NUMBER OF NON-ZERO READINGS:	263
MAXIMUM INSTANTANEOUS VALUE:	1.79 PPM @ HOUR(S) 13 ON DAY(S) 31
	VAR-VARIOUS
IZS CALIBRATION TIME:	33 HRS
MONTHLY CALIBRATION TIME:	10 HRS
OPERATIONAL TIME:	707 HRS
STANDARD DEVIATION:	0.16

NON-METHANE HYDROCARBONS MAX instantaneous maximum in ppm

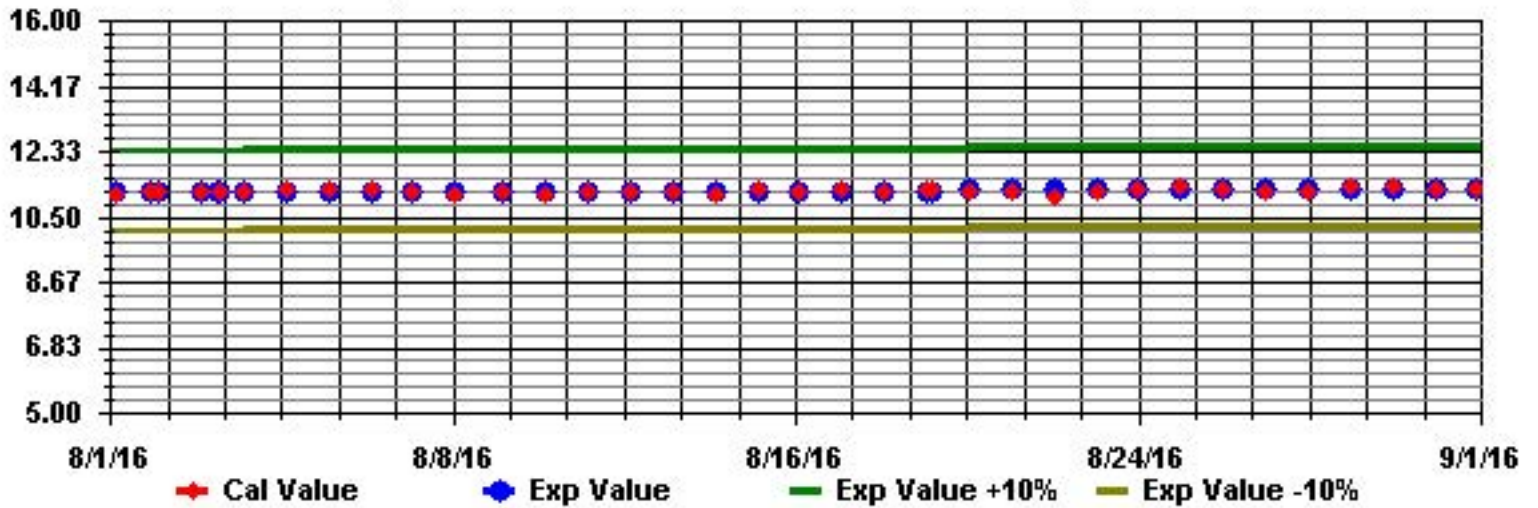


Wind: LICA Bonnyville Monitor: NMHC [ppm] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 89.52% Calm Avg: 0.00

Direction	0.0-0.3	0.3-0.5	0.5-1.0	1.0-2.0	2.0-4.0	>4.0	Total
N	9.61	0	0	0	0	0	9.61
NE	9.31	0	0	0	0	0	9.31
E	8.41	0.15	0	0	0	0	8.56
SE	9.91	0	0	0	0	0	9.91
S	7.96	0	0	0	0	0	7.96
SW	19.22	0	0	0	0	0	19.22
W	21.77	0	0	0	0	0	21.77
NW	13.66	0	0	0	0	0	13.66
Summary	100	0.15	0	0	0	0	100



Calibration Graph for Site: BONNYVIL Parameter: NMHC Sequence: THC55 Phase: SPAN



OXIDES OF NITROGEN

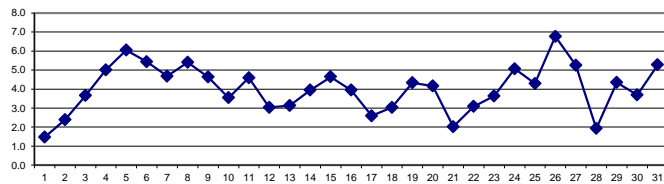
OXIDES OF NITROGEN (NOx) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.	
DAY	HOURLY MAX	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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		0.9	1.1	1.1	S	2.5	1.5	1.5	1.1	1.3	1.7	1.6	1.6	1.5	1.2	1.3	1.1	1.3	1.4	1.5	2.4	1.7	1.1	2.0	1.5	0.9	2.5	1.5	24	
2		1.0	1.0	S	3.0	2.1	2.9	3.2	3.7	2.8	2.2	2.0	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	1.0	3.7	2.4	16	
3		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	2.8	4.6	3.7	4.1	3.1	2.8	4.6	3.7	11	
4		S	5.2	4.7	4.4	5.1	5.8	12.9	14.6	11.0	5.0	5.6	3.5	2.9	1.8	2.7	3.8	2.5	1.4	2.7	2.0	3.1	4.6	4.9	S	1.4	14.6	5.0	24	
5		8.0	7.3	9.4	7.5	13.9	17.1	20.5	10.6	6.2	3.5	3.6	2.3	1.6	1.8	1.5	1.6	1.4	2.3	2.4	3.5	4.3	4.2	S	4.7	1.4	20.5	6.1	24	
6		2.9	2.8	6.8	7.1	7.8	12.4	21.3	7.2	C1	C1	C1	4.9	2.6	1.3	1.7	1.9	1.1	0.8	1.9	1.5	4.7	S	9.2	8.8	0.8	21.3	5.4	21	
7		9.0	5.7	5.7	8.2	6.8	9.7	7.7	5.8	5.3	3.7	3.2	1.5	1.1	2.6	2.6	1.8	2.1	0.8	1.9	4.5	S	8.2	4.0	5.7	0.8	9.7	4.7	24	
8		6.8	8.0	5.2	6.4	7.1	8.1	11.6	7.3	4.3	2.6	3.1	2.7	3.5	3.0	3.0	6.4	8.3	5.3	4.1	S	5.7	3.5	4.8	3.4	2.6	11.6	5.4	24	
9		3.2	4.3	4.5	4.5	9.9	5.1	S1	9.9	6.0	6.8	4.9	C1	C1	C1	C1	C1	C1	C1	2.0	1.6	0.8	S	2.7	3.2	0.8	9.9	4.6	16	
10		3.9	3.6	3.8	2.7	3.2	2.8	5.2	5.6	4.1	4.9	4.3	4.4	5.7	2.5	2.6	1.9	1.4	2.0	2.6	3.8	S	2.0	3.9	4.6	1.4	5.7	3.5	24	
11		5.9	9.8	4.6	6.3	3.3	7.5	11.3	7.6	6.1	6.5	4.2	2.4	2.2	3.7	2.7	2.8	3.5	2.6	2.7	S	3.2	2.8	2.1	1.8	1.8	11.3	4.6	24	
12		1.8	1.7	1.6	1.9	2.7	4.5	4.6	3.7	2.8	2.4	3.5	3.4	2.3	1.8	3.7	3.5	2.5	2.2	S	6.2	4.5	3.7	2.7	2.1	1.6	6.2	3.0	24	
13		1.7	1.8	2.1	2.2	2.4	3.3	2.9	1.7	1.6	2.6	2.4	1.8	1.9	1.3	3.6	1.6	1.6	S	3.5	5.7	8.0	6.7	6.3	5.2	1.3	8.0	3.1	24	
14		7.6	4.4	3.4	5.6	5.1	6.5	6.7	4.7	4.3	4.2	3.2	2.4	2.6	1.7	1.4	1.3	S	3.2	3.3	4.3	4.5	3.4	4.0	2.9	1.3	7.6	3.9	24	
15		4.7	6.4	3.7	3.0	2.8	5.8	6.2	4.7	4.2	4.8	3.1	3.0	2.8	1.9	2.2	S	2.8	2.0	3.9	7.8	12.6	6.5	7.1	4.7	1.9	12.6	4.6	24	
16		4.5	11.4	10.3	3.6	2.8	3.9	5.3	3.9	2.7	2.7	2.3	2.4	2.5	1.4	S	4.8	4.3	3.2	3.4	3.3	2.9	4.3	2.5	2.4	1.4	11.4	3.9	24	
17		2.3	2.2	1.9	1.8	2.8	4.5	4.9	4.3	2.6	2.4	1.9	2.3	2.1	S	3.0	2.4	2.2	1.6	1.7	2.4	3.5	3.3	1.7	1.8	1.6	4.9	2.6	24	
18		1.3	1.3	1.9	1.8	2.8	4.7	3.6	4.0	2.5	1.8	1.9	3.3	S	3.3	2.6	2.7	2.5	1.9	1.9	3.4	4.9	4.4	6.1	5.2	1.3	6.1	3.0	24	
19		3.4	4.9	5.6	5.4	5.5	7.3	5.9	3.5	4.8	3.5	1.7	S	3.1	1.9	3.5	4.7	3.6	3.5	4.2	3.5	3.8	3.9	5.1	7.2	1.7	7.3	4.3	24	
20		7.0	5.3	7.0	9.2	9.4	16.9	5.5	3.6	3.5	3.8	S	2.3	1.2	0.6	1.0	2.0	2.5	1.8	2.4	2.2	3.4	2.4	1.8	1.0	0.6	16.9	4.2	24	
21		2.4	2.6	3.5	1.8	0.8	0.6	0.8	1.4	1.0	S	1.0	0.8	0.5	0.8	0.9	1.5	1.8	1.2	2.1	3.7	9.4	4.3	2.4	1.1	0.5	9.4	2.0	24	
22		1.2	1.0	1.7	2.1	2.1	1.8	2.6	3.9	S	3.0	5.6	5.2	4.7	3.2	2.9	3.2	2.4	3.7	3.8	4.2	2.8	2.9	2.6	4.3	1.0	5.6	3.1	24	
23		2.2	1.8	3.4	1.8	2.2	2.6	2.9	S	3.1	5.0	3.4	3.6	7.0	8.6	3.0	2.9	3.7	3.0	2.8	2.7	3.5	4.3	5.7	4.3	1.8	8.6	3.6	24	
24		6.1	7.4	5.4	5.6	5.1	9.1	S	11.9	8.3	6.0	5.3	4.6	4.9	4.1	4.2	3.2	2.5	3.0	5.4	7.3	1.9	1.7	1.6	1.8	1.6	11.9	5.1	24	
25		1.6	1.4	0.8	1.8	1.6	S	4.4	5.5	5.0	6.1	3.7	6.9	3.7	4.3	3.8	4.4	3.8	4.4	5.2	3.9	5.0	5.6	7.9	7.8	0.8	7.9	4.3	24	
26		10.2	5.9	10.6	9.4	S	15.7	12.4	14.0	18.3	9.8	4.7	3.3	2.3	3.1	4.8	3.3	2.8	3.7	4.0	3.7	3.9	3.3	2.7	3.7	2.3	18.3	6.8	24	
27		3.9	3.5	2.6	S	2.8	4.0	7.8	14.6	5.4	2.5	2.7	4.2	2.2	2.9	9.0	10.2	6.7	6.2	6.7	7.0	8.6	3.9	2.2	1.2	1.2	14.6	5.3	24	
28		1.4	2.9	S	2.4	1.2	1.6	1.8	1.6	1.7	2.0	1.5	1.6	1.4	1.2	1.2	1.5	1.6	2.2	2.7	4.3	2.8	2.1	1.8	1.9	1.2	4.3	1.9	24	
29		1.8	S	3.5	2.8	3.1	6.3	6.6	10.9	11.7	4.8	0.9	1.5	2.5	1.8	1.0	1.6	1.0	3.1	4.9	9.0	7.2	5.3	4.9	3.9	0.9	11.7	4.4	24	
30		S	5.5	5.4	3.9	5.1	5.5	5.2	4.6	2.8	2.9	2.3	3.1	3.7	3.2	3.4	2.9	3.0	4.4	2.8	3.9	2.7	2.6	2.2	S	2.2	5.5	3.7	24	
31		2.7	2.4	1.6	1.8	3.6	3.2	4.0	5.0	4.3	4.4	4.6	4.6	4.0	7.7	5.9	10.6	12.0	10.2	9.7	11.3	2.9	2.4	S	2.3	1.6	12.0	5.3	24	
HOURLY MAX		10.2	11.4	10.6	9.4	13.9	17.1	21.3	14.6	18.3	9.8	5.6	6.9	7.0	8.6	9.0	10.6	12.0	10.2	9.7	11.3	12.6	8.2	9.2	8.8					
HOURLY AVG		3.9	4.2	4.4	4.2	4.3	6.2	6.8	6.2	4.9	4.0	3.2	3.1	2.8	2.7	2.9	3.3	3.1	3.0	3.4	4.4	4.5	3.8	3.9	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

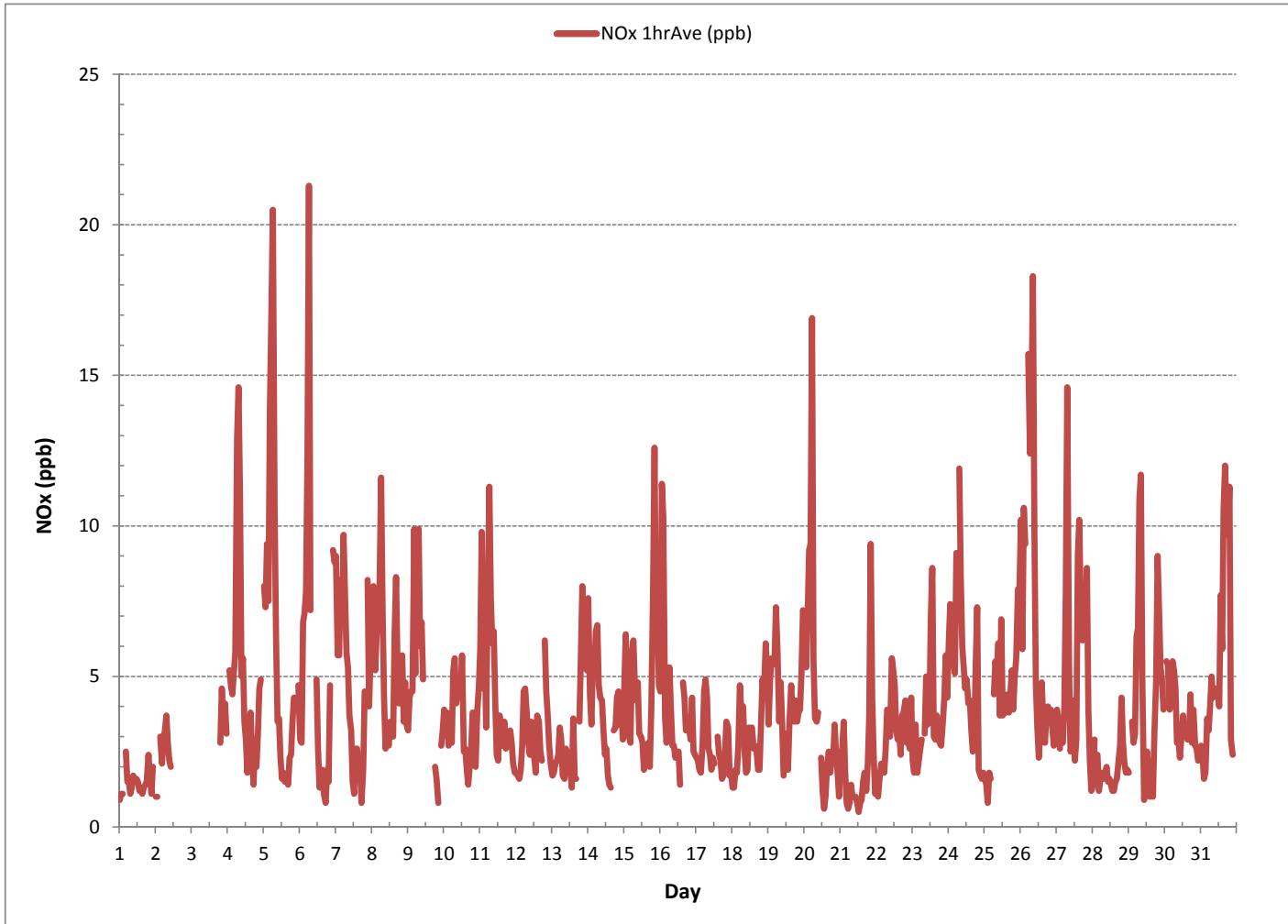
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	669		
MINIMUM 1-HR AVERAGE:	0.5 PPB	@ HOUR(S)	12 ON DAY(S) 21
MAXIMUM 1-HR AVERAGE:	21.3 PPB	@ HOUR(S)	6 ON DAY(S) 6
MAXIMUM 24-HR AVERAGE:	6.8 PPB		ON DAY(S) 26
			VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS	OPERATIONAL TIME:	712 HRS
MONTHLY CALIBRATION TIME:	11 HRS	AMD OPERATION UPTIME:	95.7 %
STANDARD DEVIATION:	2.83	MONTHLY AVERAGE:	4.1 PPB

OXIDES OF NITROGEN (NOx) hourly averages in ppb





OXIDES OF NITROGEN MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.		
DAY	MIN.	MAX.	AVG.																									MIN.	MAX.	AVG.	RDGS.
1	1.4	1.9	1.7	S	4.2	2.4	2.6	2.3	3.0	3.3	3.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.7	5.1	2.9	2.8	3.5	3.1	1.4	5.1	2.8	24			
2	1.8	1.7	S	4.4	3.5	4.5	5.0	5.6	25.7	18.8	5.1	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	1.7	25.7	7.6	16		
3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	4.7	6.5	5.4	6.1	5.9	4.7	6.5	5.7	11		
4	S	7.3	6.2	6.6	8.8	12.7	16.3	22.5	15.6	10.4	26.2	7.4	5.8	4.4	4.5	6.0	6.0	3.5	32.5	3.7	22.4	11.2	9.3	S	3.5	32.5	11.3	24			
5	12.4	9.1	12.1	9.4	22.3	22.8	30.9	17.8	16.8	21.4	15.8	22.9	4.2	10.2	10.7	11.4	3.7	23.4	47.0	28.7	8.0	39.7	S	23.7	3.7	47.0	18.5	24			
6	4.1	5.7	9.6	8.2	9.0	17.9	43.6	12.7	C1	C1	C1	C1	5.4	3.5	50.1	18.2	4.3	2.5	12.3	4.1	29.5	S	41.9	12.5	2.5	50.1	15.5	20			
7	14.3	7.6	8.9	12.0	8.6	20.5	9.4	7.6	27.8	6.1	20.8	2.9	2.5	10.7	11.3	16.1	23.0	1.6	22.0	6.8	S	11.1	5.7	8.0	1.6	27.8	11.5	24			
8	11.7	14.4	6.5	8.4	11.8	10.4	16.9	10.6	14.3	4.8	8.0	4.9	10.4	23.0	22.0	15.2	28.8	9.8	5.9	S	7.6	5.5	6.4	5.5	4.8	28.8	11.4	24			
9	5.0	5.6	5.8	9.3	15.7	8.9	S1	S1	10.0	10.9	18.9	C1	C1	C1	C1	C1	C1	C1	4.5	3.7	3.4	S	3.5	4.5	3.4	18.9	7.8	15			
10	5.5	5.1	4.8	3.7	4.9	5.0	9.3	24.2	18.1	22.7	22.6	38.0	15.7	5.5	10.3	5.6	3.6	19.2	10.0	27.5	S	8.8	23.0	7.3	3.6	38.0	13.1	24			
11	29.5	17.6	8.9	11.0	4.2	19.9	15.9	9.6	7.2	18.8	9.0	3.5	4.2	6.6	4.8	12.6	5.2	3.6	3.4	S	5.5	4.2	2.5	2.6	2.5	29.5	9.1	24			
12	2.2	2.0	2.1	2.5	4.1	6.8	6.8	4.7	3.7	3.7	7.8	5.5	3.3	2.9	10.5	8.1	5.8	3.5	S	8.3	6.4	6.6	5.8	2.7	2.0	10.5	5.0	24			
13	2.0	2.1	2.3	3.2	3.4	6.3	23.5	2.4	2.1	14.0	18.9	14.7	9.5	2.9	55.7	3.2	3.2	S	4.6	33.3	39.8	22.7	9.2	13.4	2.0	55.7	12.7	24			
14	12.2	6.6	5.8	7.0	6.0	17.9	18.1	6.3	5.9	6.7	24.2	3.4	29.5	2.1	1.8	1.7	S	6.2	6.4	8.0	6.4	7.5	5.7	4.1	1.7	29.5	8.7	24			
15	10.4	19.3	5.4	3.8	7.6	9.3	37.6	13.7	12.1	9.7	4.1	22.6	25.7	3.5	3.4	S	4.1	3.6	6.4	13.2	49.9	34.6	19.1	12.9	3.4	49.9	14.4	24			
16	12.1	26.0	23.7	8.3	6.2	7.1	13.0	11.0	3.3	5.0	12.5	15.9	11.1	16.9	S	9.3	5.5	6.1	8.8	7.7	6.0	17.2	3.2	3.9	3.2	26.0	10.4	24			
17	3.5	3.6	2.8	2.5	3.8	7.0	6.1	5.6	3.4	4.5	3.1	3.2	3.1	S	4.0	3.3	4.5	2.9	3.0	3.4	4.7	4.2	2.7	2.5	2.5	7.0	3.8	24			
18	1.9	1.9	2.4	2.3	5.0	6.0	5.6	8.0	3.1	3.5	2.9	8.1	S	5.8	3.6	3.8	3.4	3.1	3.1	5.4	5.6	5.8	7.2	6.4	1.9	8.1	4.5	24			
19	4.0	6.5	11.2	6.7	11.3	16.7	14.2	5.7	29.8	36.5	10.0	S	18.2	3.3	12.9	25.0	18.8	16.3	25.4	34.7	10.6	6.6	8.7	11.1	3.3	36.5	15.0	24			
20	9.0	6.2	10.5	12.1	16.9	23.9	7.5	13.7	4.5	4.4	S	4.7	2.8	2.2	2.7	8.7	6.7	13.1	29.4	4.8	7.5	21.4	5.4	2.0	2.0	29.4	9.6	24			
21	3.6	3.5	12.9	2.9	2.7	1.5	2.0	4.0	2.5	S	2.1	2.5	2.5	12.7	2.8	20.7	5.3	17.6	6.0	6.2	115.8	9.1	7.7	2.1	1.5	115.8	10.8	24			
22	2.1	1.8	3.0	3.9	3.5	3.3	4.5	6.7	S	3.9	33.7	13.1	16.7	4.2	4.3	6.6	5.3	23.2	6.7	8.0	4.3	14.5	10.4	13.8	1.8	33.7	8.6	24			
23	3.9	2.8	5.0	3.1	3.4	3.6	5.0	S	5.8	9.5	6.3	8.4	13.7	20.2	5.2	5.1	5.2	4.5	5.8	4.2	5.0	5.9	10.3	5.6	2.8	20.2	6.4	24			
24	7.9	9.7	8.0	7.5	9.4	22.1	S	18.2	11.2	26.4	20.0	21.0	26.5	8.2	8.8	5.2	4.8	5.1	25.7	24.9	2.6	2.1	1.8	2.2	1.8	26.5	12.1	24			
25	1.8	2.4	1.2	4.2	3.9	S	6.7	7.7	8.5	11.6	5.4	10.0	7.9	6.0	5.6	6.7	5.7	6.0	7.0	6.4	10.7	7.0	9.8	9.4	1.2	11.6	6.6	24			
26	12.9	7.0	16.0	12.2	S	21.2	23.7	47.0	31.3	20.7	16.8	11.3	18.6	14.2	26.0	23.0	24.1	23.6	24.4	9.6	8.0	4.5	3.7	5.1	3.7	47.0	17.6	24			
27	7.4	15.7	3.5	S	3.5	4.8	51.5	45.5	22.9	3.1	20.4	25.9	12.5	24.5	29.8	42.4	9.6	8.2	7.5	10.1	10.7	6.3	3.0	1.5	1.5	51.5	16.1	24			
28	2.0	3.5	S	3.1	1.5	2.3	2.4	1.9	3.1	3.1	2.3	1.8	1.9	1.6	1.7	1.9	2.9	2.8	3.7	5.4	3.8	3.8	2.1	2.4	1.5	5.4	2.7	24			
29	2.1	S	5.5	5.0	4.3	16.8	36.2	39.9	45.8	15.1	2.9	6.4	27.8	26.8	1.9	3.8	2.7	19.2	7.7	48.5	8.0	7.6	8.5	5.0	1.9	48.5	15.1	24			
30	S	6.6	6.3	5.1	6.3	8.3	6.6	5.6	4.3	4.1	3.3	5.2	17.4	13.7	17.6	14.7	4.6	27.6	3.5	5.1	4.3	4.5	3.0	S	3.0	27.6	8.1	24			
31	3.4	5.2	1.7	1.9	6.0	12.5	4.6	20.6	7.4	12.0	10.2	10.3	5.8	15.5	11.4	24.7	48.9	19.8	19.9	23.4	4.7	12.0	S	2.4	1.7	48.9	12.4	24			
HOURLY MAX	29.5	26.0	23.7	12.2	22.3	23.9	51.5	47.0	45.8	36.5	33.7	38.0	29.5	26.8	55.7	42.4	48.9	27.6	47.0	48.5	115.8	39.7	41.9	23.7							
HOURLY AVG	6.8	7.2	6.9	6.1	7.0	11.1	15.2	13.6	12.5	11.2	12.0	10.6	11.3	9.4	12.1	11.3	9.2	10.3	12.3	12.7	14.3	10.5	8.2	6.5							

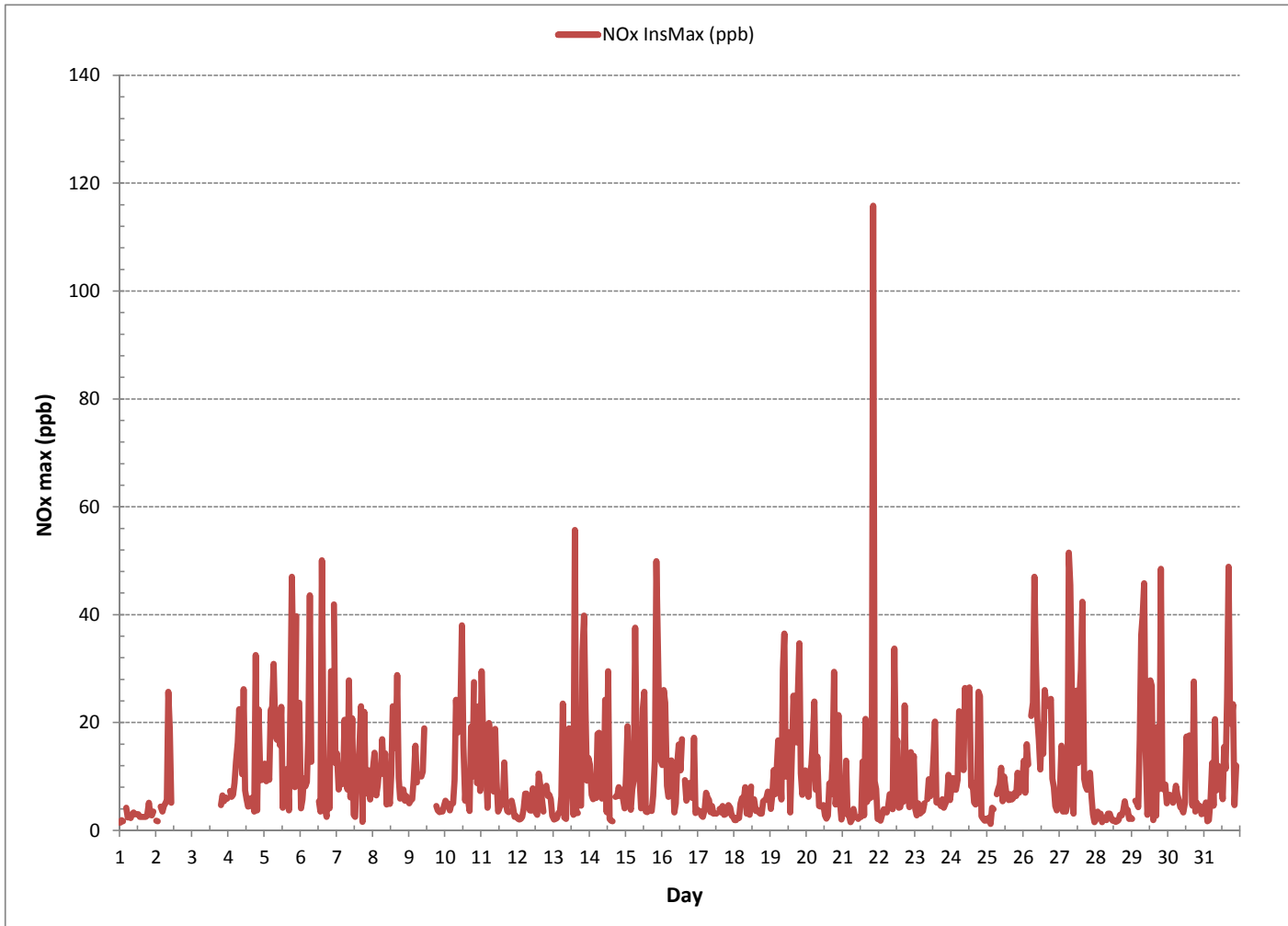
STATUS FLAG CODES

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

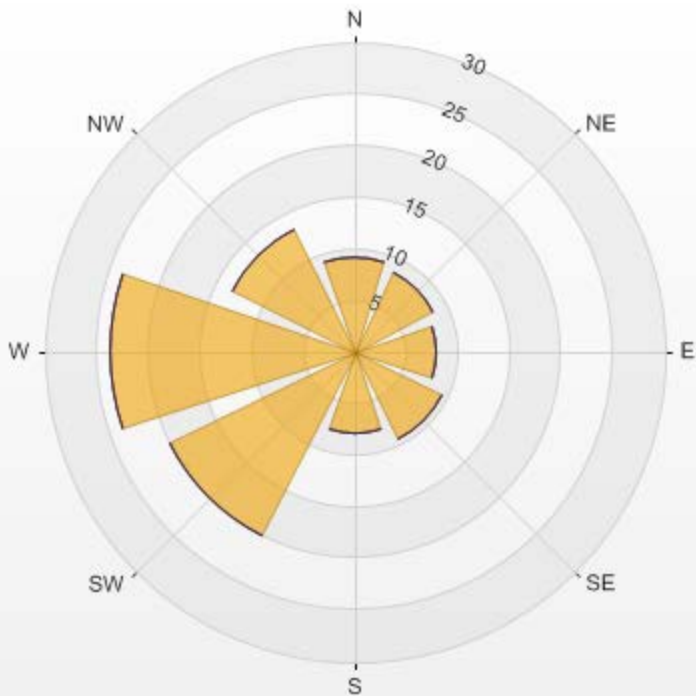
NUMBER OF NON-ZERO READINGS:	667
MAXIMUM INSTANTANEOUS VALUE:	115.8 PPB @ HOUR(S) 20 ON DAY(S) 21
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	11 HRS
STANDARD DEVIATION:	10.25
OPERATIONAL TIME:	710 HRS

OXIDES OF NITROGEN MAX instantaneous maximum in ppb



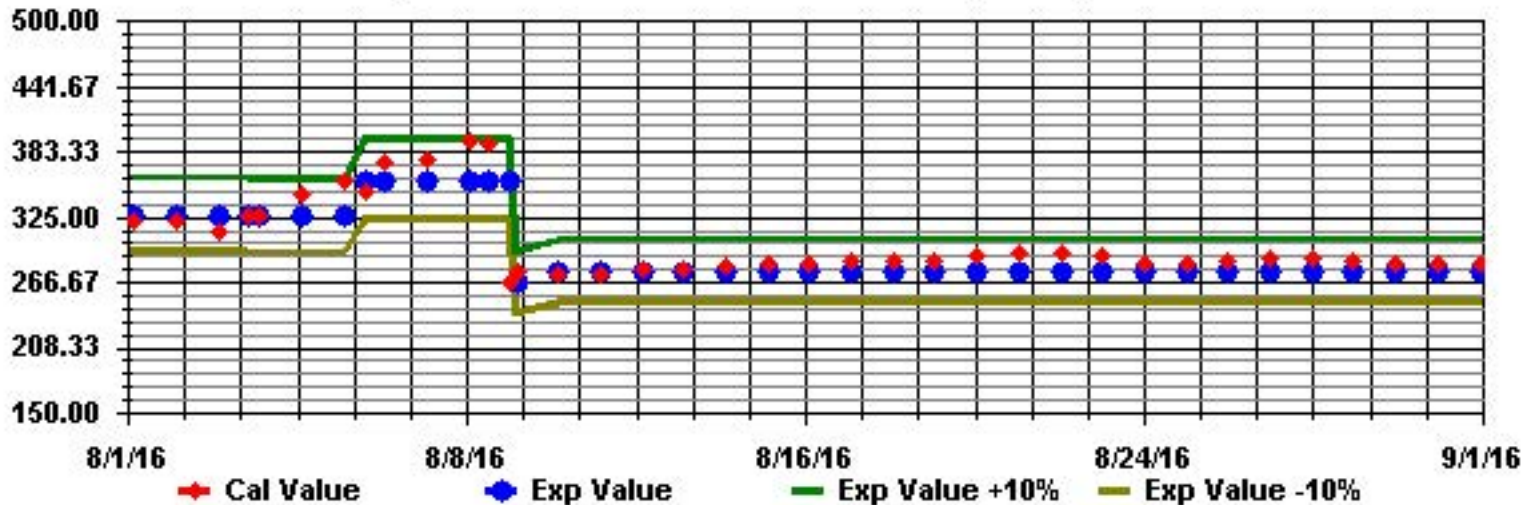
Wind: LICA Bonnyville Monitor: NOX [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 89.92% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	9.12	0	0	0	9.12
NE	8.52	0	0	0	8.52
E	7.92	0	0	0	7.92
SE	9.57	0	0	0	9.57
S	7.92	0	0	0	7.92
SW	20.03	0	0	0	20.03
W	23.62	0	0	0	23.62
NW	13.3	0	0	0	13.3
Summary	100	0	0	0	100



% Icon Classes (ppb)		100	0	0	0
0.0-50.0	50.0-110.0	110.0-210.0	>210.0		

Calibration Graph for Site: BONNYVIL Parameter: NOX_ Sequence: NO2 Phase: SPAN



NITRIC OXIDES

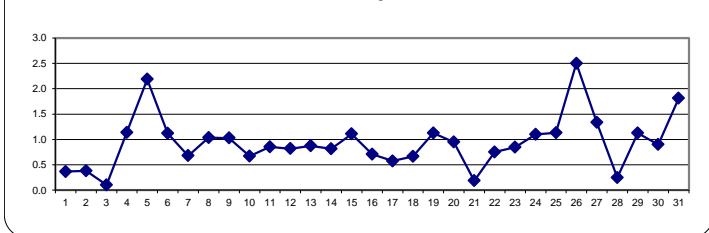
NITRIC OXIDE (NO) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.		
DAY	MIN.	MAX.	AVG.																									MIN.	MAX.	AVG.	RDGS.
1	0.0	0.2	0.1	S	0.3	0.1	0.1	0.1	0.1	0.3	0.5	0.7	0.6	0.7	0.5	0.5	0.4	0.5	0.5	0.6	0.5	0.5	0.4	0.2	0.1	0.0	0.7	0.4	24		
2	0.1	0.1	S	0.0	0.0	0.0	0.4	0.8	0.9	0.8	0.7	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	0.0	0.9	0.4	16		
3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	0.2	0.2	0.1	0.0	0.0	0.0	0.2	0.1	11		
4	S	0.0	0.0	0.0	0.0	0.6	2.5	4.4	4.1	1.4	2.3	1.4	1.2	0.5	0.5	0.7	0.9	0.6	1.3	0.4	0.6	1.0	0.6	S	0.0	4.4	1.1	24			
5	0.5	0.6	1.8	0.4	5.7	8.2	13.0	5.5	2.4	1.5	2.0	1.4	0.8	0.7	0.6	0.5	0.6	0.9	1.2	0.9	0.4	0.7	S	0.0	0.0	13.0	2.2	24			
6	0.0	0.0	0.1	0.0	0.4	3.9	12.4	2.5	C1	C1	C1	0.5	0.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1	S	1.7	0.3	0.0	12.4	1.1	21			
7	0.7	0.0	0.0	0.4	0.3	2.7	2.1	1.6	1.5	0.7	1.1	0.3	0.0	0.6	0.8	0.4	0.4	0.0	0.6	0.7	S	0.5	0.1	0.1	0.0	2.7	0.7	24			
8	0.4	0.3	0.0	0.2	0.6	1.5	3.9	2.8	1.7	0.9	1.3	0.7	0.7	1.1	1.2	2.1	1.9	1.5	0.6	S	0.4	0.0	0.0	0.0	0.0	3.9	1.0	24			
9	0.0	0.0	0.2	0.3	2.8	0.4	S1	4.7	2.3	2.8	1.9	C1	C1	C1	C1	C1	C1	C1	0.0	0.0	0.0	S	0.0	0.0	0.0	4.7	1.0	16			
10	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.9	1.6	1.8	1.4	1.8	2.5	0.8	0.8	0.2	0.0	0.0	0.0	0.5	S	0.4	0.6	0.1	0.0	2.5	0.7	24			
11	0.6	0.4	0.2	0.2	0.1	1.5	2.9	2.3	2.1	3.0	1.8	0.6	0.2	0.8	0.5	0.4	0.1	0.2	S	0.5	0.5	0.1	0.1	0.1	0.1	3.0	0.9	24			
12	0.1	0.1	0.1	0.3	0.4	1.1	1.8	1.8	1.4	1.1	1.4	1.2	0.8	0.5	1.3	1.1	0.4	0.2	S	0.7	0.7	0.9	0.8	0.6	0.1	1.8	0.8	24			
13	0.4	0.4	0.4	0.5	0.5	0.9	1.4	0.8	0.8	1.4	1.3	0.9	1.0	0.5	1.9	0.6	0.2	S	0.3	1.2	1.4	0.8	1.5	1.0	0.2	1.9	0.9	24			
14	1.4	0.6	0.5	0.6	0.4	1.8	2.2	1.8	1.6	1.6	1.0	0.5	0.4	0.1	0.1	0.2	S	0.3	0.4	1.1	0.9	0.6	0.4	0.2	0.1	2.2	0.8	24			
15	0.6	1.5	0.3	0.6	0.5	1.1	2.7	2.2	1.9	2.1	1.2	1.3	0.8	0.6	0.7	S	0.2	0.0	0.1	1.0	3.2	1.5	1.0	0.4	0.0	3.2	1.1	24			
16	0.9	2.6	1.4	0.5	0.1	0.7	1.5	1.3	0.6	0.7	0.6	0.6	0.7	0.1	S	0.5	0.2	0.1	0.4	0.8	0.4	0.9	0.4	0.3	0.1	2.6	0.7	24			
17	0.3	0.6	0.4	0.2	0.2	0.7	1.4	1.6	1.1	1.4	0.8	1.0	0.9	S	0.8	0.6	0.3	0.1	0.2	0.2	0.3	0.1	0.0	0.0	0.0	1.6	0.6	24			
18	0.0	0.0	0.0	0.0	0.3	1.2	1.4	1.9	1.0	0.8	0.9	1.5	S	1.5	1.0	0.8	0.7	0.4	0.3	0.5	0.5	0.3	0.3	0.0	0.0	1.9	0.7	24			
19	0.0	0.1	0.7	0.5	1.0	2.6	2.6	0.9	1.9	1.5	0.4	S	1.4	0.5	1.3	2.3	1.6	0.6	1.5	0.7	0.6	0.5	0.9	1.8	0.0	2.6	1.1	24			
20	1.5	0.3	0.7	1.3	1.9	8.4	1.8	1.4	1.2	1.3	S	0.3	0.0	0.0	0.0	0.1	0.3	0.5	0.1	0.0	0.4	0.3	0.0	0.0	0.0	8.4	0.9	24			
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.3	0.2	0.0	0.0	0.1	0.6	0.5	0.0	0.0	0.0	2.0	0.1	0.5	0.0	0.0	2.0	0.2	24			
22	0.0	0.0	0.1	0.3	0.1	0.3	0.7	1.8	S	1.3	2.6	2.3	1.6	0.9	0.7	1.0	0.7	1.1	0.5	0.5	0.2	0.3	0.1	0.2	0.0	2.6	0.8	24			
23	0.1	0.1	0.0	0.1	0.3	0.4	0.4	S	1.5	2.3	1.3	1.6	2.9	3.7	0.8	1.1	1.2	0.6	0.4	0.1	0.0	0.2	0.3	0.1	0.0	3.7	0.8	24			
24	0.0	0.0	0.1	0.2	0.4	2.4	S	4.9	3.4	2.7	2.4	1.8	1.7	1.3	1.2	0.6	0.1	0.0	0.8	1.3	0.0	0.0	0.0	0.0	0.0	4.9	1.1	24			
25	0.0	0.0	0.0	0.0	0.0	S	1.4	2.3	2.3	2.7	1.4	3.4	1.4	1.6	1.4	1.7	1.3	1.2	1.0	0.3	0.6	0.5	0.9	0.6	0.0	3.4	1.1	24			
26	1.4	0.4	2.0	1.5	S	4.9	6.8	9.1	11.0	5.2	2.2	1.6	1.1	1.2	2.1	1.3	1.1	1.8	1.3	0.7	0.6	0.2	0.0	0.0	0.0	11.0	2.5	24			
27	0.2	0.0	0.0	S	0.2	0.2	3.0	7.6	1.9	0.7	1.0	2.0	0.9	1.1	3.2	3.6	1.4	0.9	0.9	0.7	0.5	0.5	0.2	0.0	0.0	7.6	1.3	24			
28	0.1	0.1	S	0.0	0.1	0.1	0.2	0.2	0.3	0.5	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.6	0.5	0.4	0.1	0.0	0.0	0.0	0.0	0.6	0.2	24			
29	0.0	S	0.1	0.0	0.0	2.1	2.6	6.2	6.9	2.6	0.3	0.4	1.3	0.5	0.1	0.6	0.0	0.4	0.3	0.9	0.3	0.0	0.3	0.0	0.0	6.9	1.1	24			
30	S	0.3	0.1	0.3	0.7	1.2	1.9	1.7	1.1	1.2	0.8	1.3	1.8	1.4	1.4	1.0	1.1	1.3	0.3	0.7	0.1	0.1	0.0	S	0.0	1.9	0.9	24			
31	0.5	0.4	0.2	0.1	0.7	0.6	1.0	1.8	1.5	1.1	2.4	2.1	1.1	2.9	2.4	4.6	5.4	3.5	3.7	4.6	0.5	0.3	S	0.3	0.1	5.4	1.8	24			
HOURLY MAX	1.5	2.6	2.0	1.5	5.7	8.4	13.0	9.1	11.0	5.2	2.6	3.4	2.9	3.7	3.2	4.6	5.4	3.5	3.7	4.6	3.2	1.5	1.7	1.8							
HOURLY AVG	0.4	0.3	0.3	0.3	0.6	1.7	2.6	2.6	2.1	1.6	1.3	1.2	1.0	0.9	1.0	1.0	0.8	0.6	0.6	0.7	0.6	0.4	0.4	0.2							

STATUS FLAG CODES

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

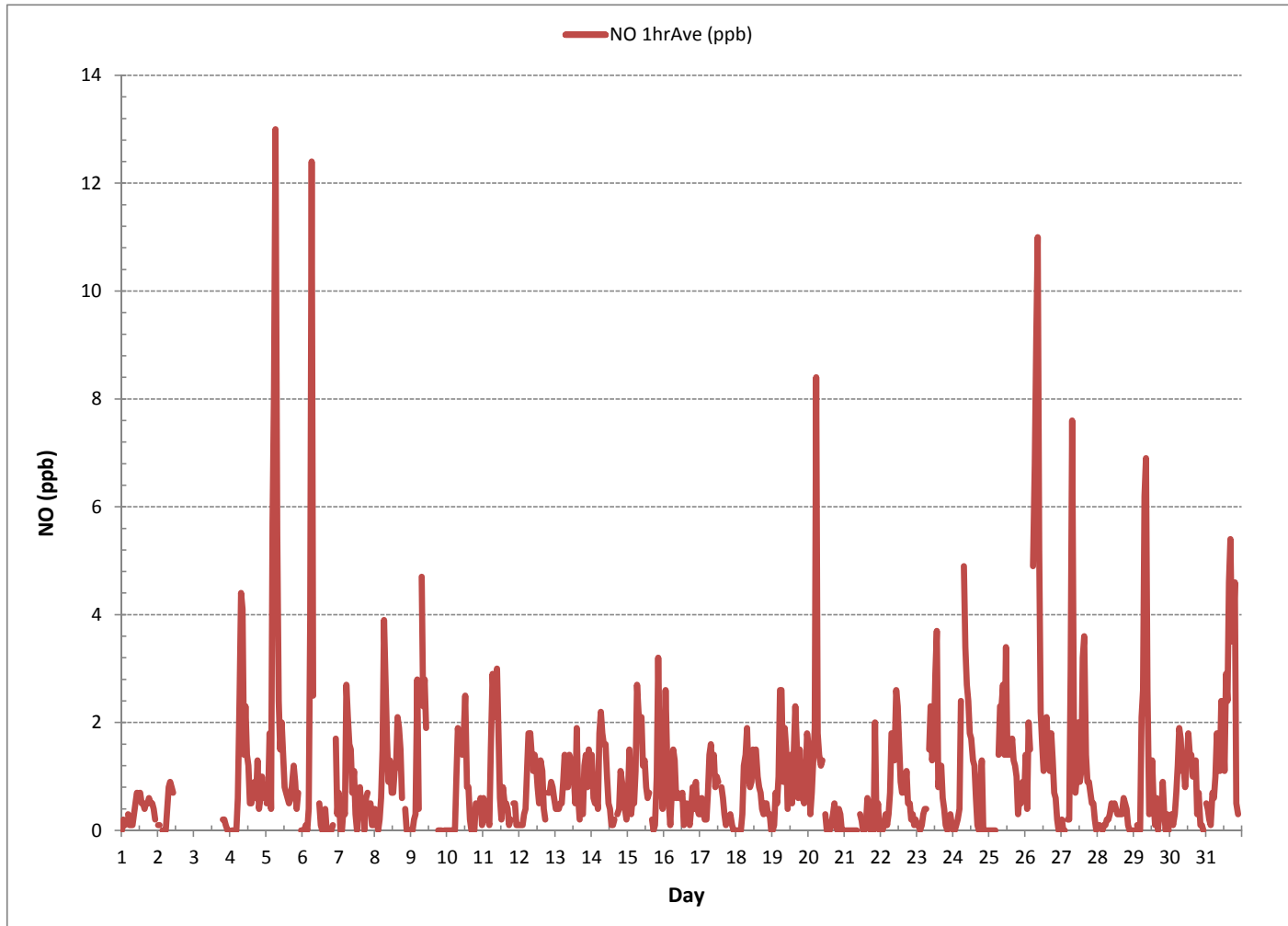
24 HOUR AVERAGES FOR August 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	563			
MINIMUM 1-HR AVERAGE:	0.0	PPB @ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	13.0	PPB @ HOUR(S)	6	5
MAXIMUM 24-HR AVERAGE:	2.5	PPB		26
				VAR-VARIOUS
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	712
MONTHLY CALIBRATION TIME:	11	HRS	AMD OPERATION UPTIME:	95.7
				%
STANDARD DEVIATION:	1.39		MONTHLY AVERAGE:	1.0
				PPB

NITRIC OXIDE (NO) hourly averages in ppb





NITRIC OXIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.		
DAY	MIN.	MAX.	AVG.																									MIN.	MAX.	AVG.	RDGS.
1	0.8	1.0	1.0	S	1.4	1.0	0.8	0.9	1.3	1.5	2.0	1.4	1.7	1.5	1.7	1.5	1.3	1.4	1.5	2.1	1.4	1.7	1.2	1.0	0.8	2.1	1.4	24			
2	1.0	0.8	S	1.3	1.1	1.3	2.0	2.4	11.5	15.5	3.3	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	0.8	15.5	4.0	16			
3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	1.2	1.3	1.2	0.9	1.5	0.9	1.5	1.2	11			
4	S	0.8	0.9	0.6	0.6	2.8	4.1	9.7	6.7	3.5	18.9	4.7	2.7	1.9	1.4	2.0	2.8	1.9	20.4	1.6	11.8	4.0	2.4	S	0.6	20.4	4.8	24			
5	2.3	2.0	3.6	1.3	13.0	13.4	22.2	10.4	4.5	13.4	12.8	16.9	2.5	2.5	10.1	7.1	5.5	15.8	33.1	17.1	2.3	21.2	S	11.6	1.3	33.1	10.6	24			
6	1.1	1.2	2.3	1.6	2.1	9.6	32.7	6.6	C1	C1	C1	C1	2.4	1.0	19.6	13.6	2.2	0.9	4.3	1.3	14.5	S	26.9	1.5	0.9	32.7	7.7	20			
7	2.8	1.3	1.0	3.0	1.4	9.8	3.2	2.9	14.9	2.7	7.4	1.7	1.4	5.1	5.1	7.2	14.4	0.8	18.7	4.0	S	2.9	1.2	1.5	0.8	18.7	5.0	24			
8	2.3	1.6	1.0	1.8	2.7	2.9	7.7	4.3	7.5	2.3	4.2	2.5	3.9	12.8	16.5	5.9	14.4	3.4	1.6	S	2.0	1.3	1.7	1.2	1.0	16.5	4.6	24			
9	1.7	1.3	1.5	3.0	8.8	2.3	S1	S1	5.0	6.0	13.7	C1	C1	C1	C1	C1	C1	C1	1.3	1.0	1.2	S	1.1	0.8	0.8	13.7	3.5	15			
10	0.8	0.9	1.0	1.0	1.6	1.6	4.1	10.9	11.6	12.6	17.7	27.1	12.8	3.0	8.1	2.2	1.7	9.4	5.0	10.4	S	5.2	15.8	1.1	0.8	27.1	7.2	24			
11	14.1	2.7	1.3	1.2	1.4	6.9	5.7	4.3	3.3	11.2	6.7	1.9	1.1	2.5	2.1	10.2	1.6	1.2	1.2	S	1.4	2.0	0.7	0.9	0.7	14.1	3.7	24			
12	1.0	1.0	0.9	1.2	1.2	2.9	3.1	2.7	2.7	2.6	4.3	2.7	2.1	1.5	4.9	3.9	2.3	1.3	S	1.7	1.9	2.7	2.5	2.1	0.9	4.9	2.3	24			
13	0.9	0.8	0.8	1.3	1.4	2.4	15.8	1.7	1.3	8.6	11.5	8.8	8.2	1.5	35.1	2.2	1.3	S	1.3	17.8	29.0	6.0	3.3	5.2	0.8	35.1	7.2	24			
14	4.6	1.8	3.3	2.0	1.0	10.0	7.8	2.8	2.9	3.8	5.3	1.5	10.5	0.7	0.9	1.0	S	2.1	2.2	6.4	3.1	2.3	1.2	0.8	0.7	10.5	3.4	24			
15	2.0	7.9	1.0	1.8	1.5	3.0	30.0	6.5	3.3	5.3	2.5	17.8	5.2	2.2	1.6	S	1.2	1.0	2.0	3.9	28.2	18.8	4.8	1.7	1.0	30.0	6.7	24			
16	6.0	9.0	7.6	4.1	2.1	3.6	4.5	5.0	1.6	1.9	4.3	11.5	8.8	9.0	S	1.5	1.0	1.7	6.8	2.7	1.7	5.1	1.2	1.0	1.0	11.5	4.4	24			
17	0.8	2.8	1.0	0.8	0.9	1.7	2.6	2.9	1.8	3.9	2.0	1.9	1.6	S	2.1	1.7	1.7	1.4	1.1	1.2	1.4	1.2	0.9	1.1	0.8	3.9	1.7	24			
18	1.0	0.7	1.0	1.0	1.7	2.7	3.3	4.7	2.1	2.3	2.3	4.5	S	4.1	2.4	2.1	2.0	1.8	1.7	1.8	1.6	1.2	1.5	1.2	0.7	4.7	2.1	24			
19	0.8	1.3	5.0	2.1	6.1	13.5	9.4	3.3	20.7	20.1	5.0	S	10.1	1.7	6.9	24.5	9.9	5.8	12.3	12.7	3.0	2.5	3.8	4.5	0.8	24.5	8.0	24			
20	3.0	1.4	2.6	3.1	5.9	15.4	3.1	12.7	2.6	2.4	S	2.8	1.3	1.1	1.9	2.7	3.9	17.0	15.1	0.8	2.6	12.3	3.2	1.2	0.8	17.0	5.1	24			
21	0.9	0.6	2.5	0.8	2.3	0.8	0.7	1.1	1.6	S	2.1	1.9	1.4	5.6	1.9	18.7	4.4	9.0	1.9	1.9	74.7	2.1	4.7	1.2	0.6	74.7	6.2	24			
22	0.9	0.9	1.6	2.4	1.6	1.7	2.5	4.7	S	2.7	25.7	12.1	11.7	2.8	2.0	3.6	3.9	16.3	2.1	2.6	1.3	8.4	1.8	2.0	0.9	25.7	5.0	24			
23	1.9	1.4	1.1	1.9	2.0	1.8	2.1	S	3.8	5.6	3.2	4.9	7.3	11.0	2.5	3.2	2.5	2.0	2.5	1.3	1.1	1.3	2.6	1.0	1.0	11.0	3.0	24			
24	0.8	1.1	1.0	2.0	2.8	12.7	S	9.2	5.8	20.8	13.3	13.2	13.6	4.0	4.3	2.1	1.6	1.2	23.2	13.5	0.7	0.8	0.7	0.8	0.7	23.2	6.5	24			
25	0.7	0.8	0.6	1.2	1.2	S	2.7	4.4	5.0	6.4	3.0	6.4	4.6	3.3	2.6	3.6	2.6	2.4	2.4	1.8	3.7	1.5	2.2	1.6	0.6	6.4	2.8	24			
26	3.5	1.5	6.8	3.6	S	11.7	14.3	30.5	19.6	17.6	11.3	8.5	12.3	8.9	13.3	15.3	14.3	10.7	16.1	4.5	3.3	1.5	1.5	2.1	1.5	30.5	10.1	24			
27	3.4	9.1	0.8	S	0.9	1.7	33.1	28.8	10.8	2.0	12.2	15.7	7.6	16.0	24.3	29.5	3.1	2.1	2.1	2.1	1.5	2.5	1.7	0.8	0.8	33.1	9.2	24			
28	1.0	0.8	S	1.1	1.1	1.5	1.3	1.3	1.7	1.9	1.7	1.5	1.6	1.3	1.4	1.3	1.5	1.7	1.9	1.4	1.5	1.2	0.8	0.8	0.8	1.9	1.4	24			
29	0.8	S	1.2	1.2	1.0	8.3	22.1	28.0	28.9	10.9	2.8	2.6	22.1	8.2	1.8	7.8	2.1	11.9	2.5	30.1	1.9	1.5	3.3	1.1	0.8	30.1	8.8	24			
30	S	1.5	1.2	1.9	1.9	3.5	3.8	3.2	3.0	2.8	2.4	3.6	11.4	6.0	10.5	7.6	3.6	10.6	1.6	2.0	1.4	1.2	0.9	S	0.9	11.4	3.9	24			
31	1.4	1.9	1.0	0.8	2.2	2.3	2.1	15.9	3.2	2.2	7.9	7.9	2.6	8.4	5.9	13.5	30.5	8.1	9.0	12.3	2.3	5.4	S	1.4	0.8	30.5	6.4	24			
HOURLY MAX	14.1	9.1	7.6	4.1	13.0	15.4	33.1	30.5	28.9	20.8	25.7	27.1	22.1	16.0	35.1	29.5	30.5	17.0	33.1	30.1	74.7	21.2	26.9	11.6							
HOURLY AVG	2.2	2.1	2.0	1.8	2.5	5.3	8.8	7.9	6.7	6.9	7.5	7.2	6.4	4.7	7.1	7.2	5.1	5.3	7.0	5.8	7.2	4.3	3.4	1.9							

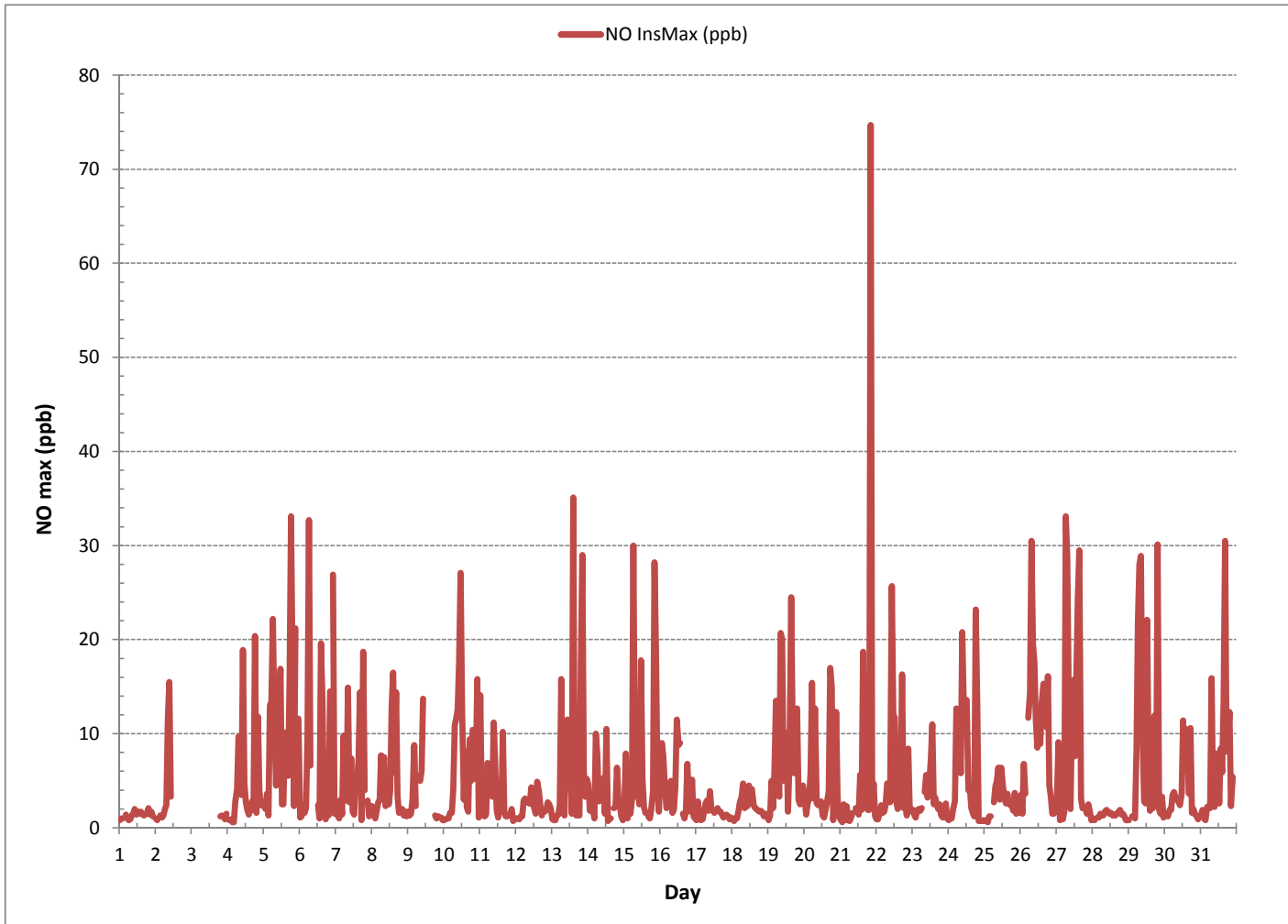
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	667
MAXIMUM INSTANTANEOUS VALUE:	74.7 PPB @ HOUR(S) 20 ON DAY(S) 21
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	11 HRS
STANDARD DEVIATION:	6.79
OPERATIONAL TIME:	710 HRS

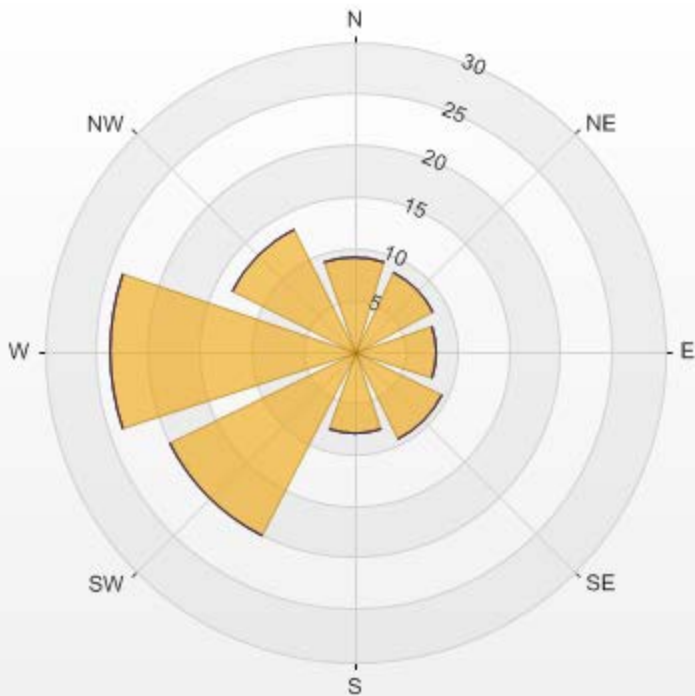
NITRIC OXIDE MAX instantaneous maximum in ppb



Wind: LICA Bonnyville Monitor: NO [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.

Calm: 0.00% Valid Data: 89.92% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	9.12	0	0	0	9.12
NE	8.52	0	0	0	8.52
E	7.92	0	0	0	7.92
SE	9.57	0	0	0	9.57
S	7.92	0	0	0	7.92
SW	20.03	0	0	0	20.03
W	23.62	0	0	0	23.62
NW	13.3	0	0	0	13.3
Summary	100	0	0	0	100



% Icon Classes (ppb)		100	0	0	0	0
0.0-50.0	50.0-110.0	110.0-210.0	>210.0			

NITROGEN DIOXIDE

NITROGEN DIOXIDE (NO₂) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.		
DAY	MIN.	MAX.	AVG.																									MIN.	MAX.	AVG.	RDGS.
1	0.9	0.9	1.0	S	2.2	1.4	1.4	1.0	1.0	1.2	0.9	1.0	0.8	0.7	0.8	0.7	0.8	0.9	0.9	1.9	1.2	0.7	1.8	1.4	0.7	2.2	1.1	24			
2	0.9	0.9	S	3.0	2.1	2.9	2.8	2.9	1.9	1.4	1.3	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	0.9	3.0	2.0	16		
3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	2.6	4.4	3.6	4.1	3.1	2.6	4.4	3.6	11			
4	S	5.2	4.7	4.4	5.1	5.2	10.4	10.2	6.9	3.6	3.3	2.1	1.7	1.3	2.2	3.1	1.6	0.8	1.4	1.6	2.5	3.6	4.3	S	0.8	10.4	3.9	24			
5	7.5	6.7	7.6	7.1	8.2	8.9	7.5	5.1	3.8	2.0	1.6	0.9	0.8	1.1	0.9	1.1	0.8	1.4	1.2	2.6	3.9	3.5	S	4.7	0.8	8.9	3.9	24			
6	2.9	2.8	6.7	7.1	7.4	8.5	8.9	4.7	C1	C1	C1	4.4	2.5	1.3	1.7	1.5	1.1	0.8	1.9	1.5	4.6	S	7.5	8.5	0.8	8.9	4.3	21			
7	8.3	5.7	5.7	7.8	6.5	7.0	5.6	4.2	3.8	3.0	2.1	1.2	1.1	2.0	1.8	1.4	1.7	0.8	1.3	3.8	S	7.7	3.9	5.6	0.8	8.3	4.0	24			
8	6.4	7.7	5.2	6.2	6.5	6.6	7.7	4.5	2.6	1.7	1.8	2.0	2.8	1.9	1.8	4.3	6.4	3.8	3.5	S	5.3	3.5	4.8	3.4	1.7	7.7	4.4	24			
9	3.2	4.3	4.3	4.2	7.1	4.7	S1	5.2	3.7	4.0	3.0	C1	C1	C1	C1	C1	C1	C1	2.0	1.6	0.8	S	2.7	3.2	0.8	7.1	3.6	16			
10	3.9	3.6	3.8	2.7	3.2	2.8	4.2	3.7	2.5	3.1	2.9	2.6	3.2	1.7	1.8	1.7	1.4	2.0	2.6	3.3	S	1.6	3.3	4.5	1.4	4.5	2.9	24			
11	5.3	9.4	4.4	6.1	3.2	6.0	8.4	5.3	4.0	3.5	2.4	1.8	2.0	2.9	2.2	2.3	3.1	2.5	2.5	S	2.7	2.3	2.0	1.7	1.7	9.4	3.7	24			
12	1.7	1.6	1.5	1.6	2.3	3.4	2.8	1.9	1.4	1.3	2.1	2.2	1.5	1.3	2.4	2.4	2.1	2.0	S	5.5	3.8	2.8	1.9	1.5	1.3	5.5	2.2	24			
13	1.3	1.4	1.7	1.7	1.9	2.4	1.5	0.9	0.8	1.2	1.1	0.9	0.9	0.8	1.7	1.0	1.4	S	3.2	4.5	6.6	5.9	4.8	4.2	0.8	6.6	2.3	24			
14	6.2	3.8	2.9	5.0	4.7	4.7	4.5	2.9	2.7	2.6	2.2	1.9	2.2	1.6	1.3	1.1	S	2.9	2.9	3.2	3.6	2.8	3.6	2.7	1.1	6.2	3.1	24			
15	4.1	4.9	3.4	2.4	2.3	4.7	3.5	2.5	2.3	2.7	1.9	1.7	2.0	1.3	1.5	S	2.6	2.0	3.8	6.8	9.4	5.0	6.1	4.3	1.3	9.4	3.5	24			
16	3.6	8.8	8.9	3.1	2.7	3.2	3.8	2.6	2.1	2.0	1.7	1.8	1.8	1.3	S	4.3	4.1	3.1	3.0	2.5	2.5	3.4	2.1	2.1	1.3	8.9	3.2	24			
17	2.0	1.6	1.5	1.6	2.6	3.8	3.5	2.7	1.5	1.0	1.1	1.3	1.2	S	2.2	1.8	1.9	1.5	1.5	2.2	3.2	3.2	1.7	1.8	1.0	3.8	2.0	24			
18	1.3	1.3	1.9	1.8	2.5	3.5	2.2	2.1	1.5	1.0	1.0	1.8	S	1.8	1.6	1.9	1.8	1.5	1.6	2.9	4.4	4.1	5.8	5.2	1.0	5.8	2.4	24			
19	3.4	4.8	4.9	4.9	4.5	4.7	3.3	2.6	2.9	2.0	1.3	S	1.7	1.4	2.2	2.4	2.0	2.9	2.7	2.8	3.2	3.4	4.2	5.4	1.3	5.4	3.2	24			
20	5.5	5.0	6.3	7.9	7.5	8.5	3.7	2.2	2.3	2.5	S	2.0	1.2	0.6	1.0	1.9	2.2	1.3	2.3	2.2	3.0	2.1	1.8	1.0	0.6	8.5	3.2	24			
21	2.4	2.6	3.5	1.8	0.8	0.6	0.8	1.4	1.0	S	0.7	0.6	0.5	0.8	0.8	0.9	1.3	1.2	2.1	3.7	7.4	4.2	1.9	1.1	0.5	7.4	1.8	24			
22	1.2	1.0	1.6	1.8	2.0	1.5	1.9	2.1	S	1.7	3.0	2.9	3.1	2.3	2.2	2.2	1.7	2.6	3.3	3.7	2.6	2.6	2.5	4.1	1.0	4.1	2.3	24			
23	2.1	1.7	3.4	1.7	1.9	2.2	2.5	S	1.6	2.7	2.1	2.0	4.1	4.9	2.2	1.8	2.5	2.4	2.4	2.6	3.5	4.1	5.4	4.2	1.6	5.4	2.8	24			
24	6.1	7.4	5.3	5.4	4.7	6.7	S	7.0	4.9	3.3	2.9	2.8	3.2	2.8	3.0	2.6	2.4	3.0	4.6	6.0	1.9	1.7	1.6	1.8	1.6	7.4	4.0	24			
25	1.6	1.4	0.8	1.8	1.6	S	3.0	3.2	2.7	3.4	2.3	3.5	2.3	2.7	2.4	2.7	2.5	3.2	4.2	3.6	4.4	5.1	7.0	7.2	0.8	7.2	3.2	24			
26	8.8	5.5	8.6	7.9	S	10.8	5.6	4.9	7.3	4.6	2.5	1.7	1.2	1.9	2.7	2.0	1.7	1.9	2.7	3.0	3.3	3.1	2.7	3.7	1.2	10.8	4.3	24			
27	3.7	3.5	2.6	S	2.6	3.8	4.8	7.0	3.5	1.8	1.7	2.2	1.3	1.8	5.8	6.6	5.3	5.3	5.8	6.3	8.1	3.4	2.0	1.2	1.2	8.1	3.9	24			
28	1.3	2.8	S	2.4	1.1	1.5	1.6	1.4	1.4	1.5	1.1	1.1	1.0	0.9	0.9	1.2	1.3	1.6	2.2	3.9	2.7	2.1	1.8	1.9	0.9	3.9	1.7	24			
29	1.8	S	3.4	2.8	3.1	4.2	4.0	4.7	4.8	2.2	0.6	1.1	1.2	1.3	0.9	1.0	1.0	2.7	4.6	8.1	6.9	5.3	4.6	3.9	0.6	8.1	3.2	24			
30	S	5.2	5.3	3.6	4.4	4.3	3.3	2.9	1.7	1.7	1.5	1.8	1.9	1.8	2.0	1.9	1.9	3.1	2.5	3.2	2.6	2.5	2.2	S	1.5	5.3	2.8	24			
31	2.2	2.0	1.4	1.7	2.9	2.6	3.0	3.2	2.8	3.3	2.2	2.5	2.9	4.8	3.5	6.0	6.6	6.7	6.0	6.7	6.0	6.7	2.4	2.1	S	2.0	1.4	6.7	3.5	24	
HOURLY MAX	8.8	9.4	8.9	7.9	8.2	10.8	10.4	10.2	7.3	4.6	3.3	4.4	4.1	4.9	5.8	6.6	6.6	6.7	6.0	8.1	9.4	7.7	7.5	8.5							
HOURLY AVG	3.6	3.9	4.0	3.9	3.7	4.5	4.2	3.6	2.8	2.4	1.9	1.9	1.9	1.8	2.0	2.3	2.3	2.4	2.8	3.7	4.0	3.4	3.5	3.4							

STATUS FLAG CODES

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

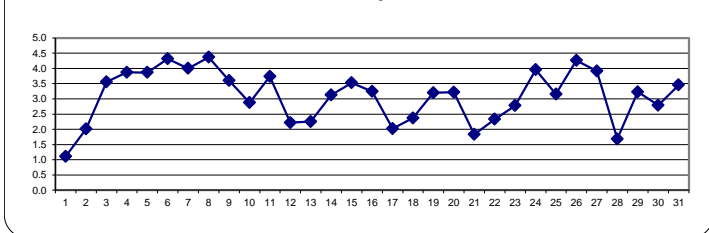
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 PPB

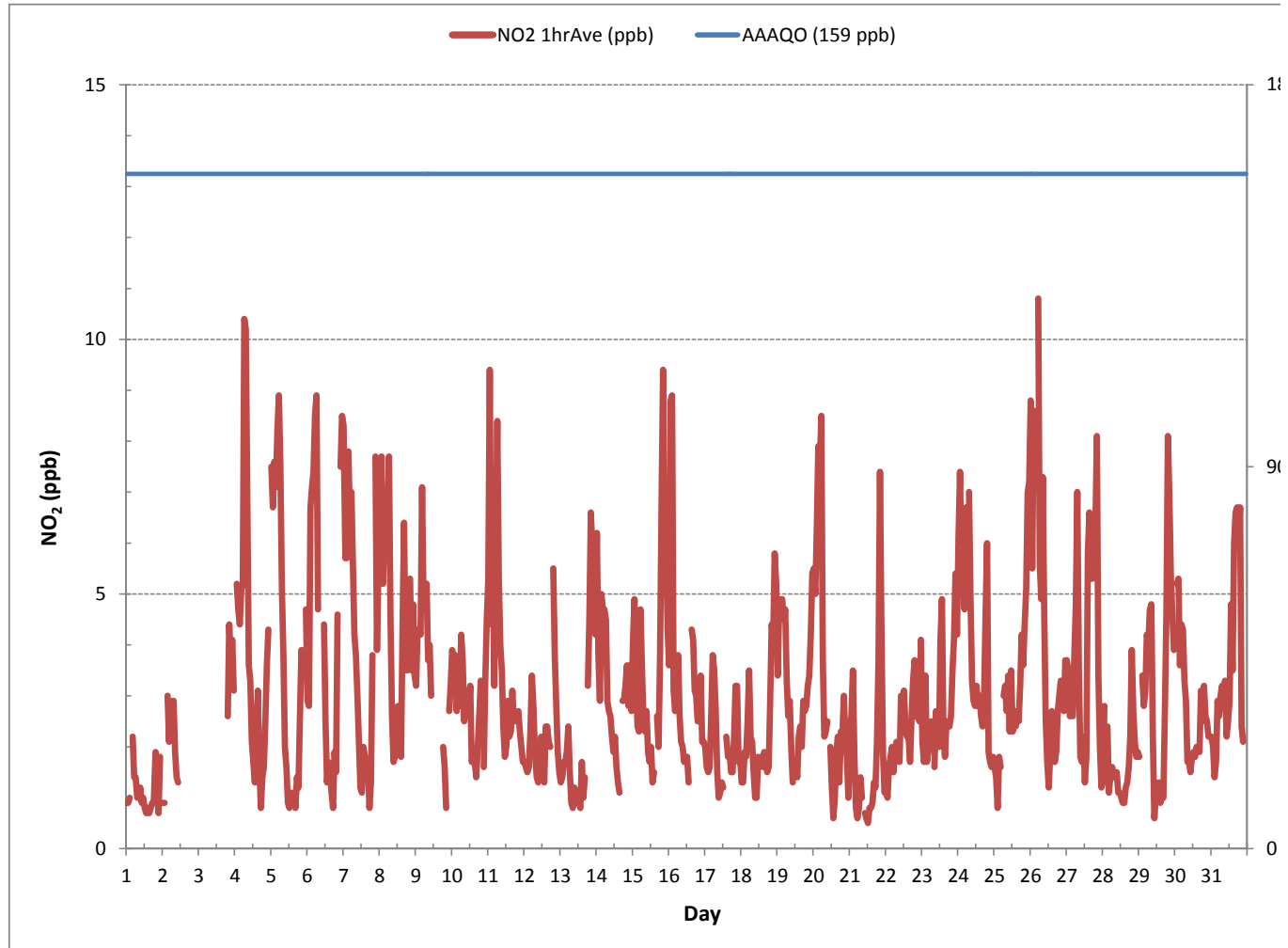
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	669					
MINIMUM 1-HR AVERAGE:	0.5	PPB	@ HOUR(S)	12	ON DAY(S)	21
MAXIMUM 1-HR AVERAGE:	10.8	PPB	@ HOUR(S)	5	ON DAY(S)	26
MAXIMUM 24-HR AVERAGE:	4.4	PPB			ON DAY(S)	8
					VAR-VARIOUS	
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	712	HRS	
MONTHLY CALIBRATION TIME:	11	HRS	AMD OPERATION UPTIME:	95.7	%	
STANDARD DEVIATION:	1.94		MONTHLY AVERAGE:	3.1	PPB	

24 HOUR AVERAGES FOR August 2016



NITROGEN DIOXIDE (NO₂) hourly averages in ppb





NITROGEN DIOXIDE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	RDGS.
DAY	HOUR START	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
1	1.2	1.3	1.1	S	3.2	2.0	2.3	1.7	2.3	2.1	1.7	1.9	1.5	1.6	1.4	1.5	1.7	1.7	1.6	3.3	2.1	1.7	3.5	2.8	1.1	3.5	2.0	24	
2	1.6	1.4	S	4.0	2.9	3.7	3.6	4.1	14.5	7.5	2.7	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	1.4	14.5	4.6	16	
3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	4.4	5.8	5.2	6.1	5.4	4.4	6.1	5.4	11	
4	S	7.4	5.9	6.3	8.4	10.3	12.9	13.9	9.7	7.2	12.4	4.8	3.5	2.9	3.8	5.2	4.4	2.3	12.4	3.5	11.3	8.3	7.4	S	2.3	13.9	7.5	24	
5	10.6	8.0	8.8	8.5	9.5	10.3	11.2	8.0	13.8	9.7	7.1	7.2	2.4	10.0	2.7	4.3	2.4	7.6	17.6	13.9	6.4	18.9	S	13.5	2.4	18.9	9.2	24	
6	3.6	5.7	8.1	7.6	7.6	9.0	11.9	6.8	C1	C1	C1	C1	3.6	2.9	31.8	10.2	2.5	2.0	8.5	3.2	15.3	S	16.0	11.6	2.0	31.8	8.8	20	
7	12.2	7.1	8.8	9.5	8.3	11.3	7.0	5.6	14.1	4.8	14.4	1.9	1.7	6.1	6.6	9.7	9.1	1.5	9.0	6.3	S	9.4	5.6	7.3	1.5	14.4	7.7	24	
8	10.9	13.4	6.1	7.6	9.7	8.1	9.8	6.9	9.6	3.2	4.4	4.1	7.0	13.0	10.1	9.9	14.6	6.7	5.1	S	6.8	5.2	5.7	5.4	3.2	14.6	8.0	24	
9	4.0	5.3	5.4	7.2	8.1	7.4	S1	S1	5.7	6.2	6.0	C1	C1	C1	C1	C1	C1	C1	4.0	3.5	3.3	S	3.4	4.5	3.3	8.1	5.3	15	
10	5.5	4.9	5.1	3.6	4.5	4.3	7.0	16.8	12.6	13.0	10.9	11.0	8.8	3.7	3.1	3.8	2.5	10.7	5.6	19.2	S	8.0	9.2	6.9	2.5	19.2	7.9	24	
11	15.8	15.7	8.6	10.7	4.1	13.5	10.7	6.9	4.9	8.3	3.4	2.2	3.5	4.9	3.4	3.9	4.4	2.9	2.9	S	4.8	3.3	2.7	2.6	2.2	15.8	6.3	24	
12	2.1	2.1	2.1	2.5	3.7	4.5	4.5	2.9	2.1	2.1	4.4	3.7	2.1	1.9	6.2	4.6	4.1	2.8	S	6.9	5.7	4.8	4.6	2.6	1.9	6.9	3.6	24	
13	1.9	2.2	2.5	2.8	3.1	4.6	9.3	1.9	1.7	6.0	10.0	6.3	2.7	1.8	20.8	1.8	2.3	S	3.7	22.0	16.9	18.6	7.7	8.8	1.7	22.0	6.9	24	
14	8.8	5.8	5.2	6.5	6.1	8.4	11.2	4.3	4.1	3.6	19.7	2.6	19.7	1.9	1.7	1.5	S	4.5	5.0	5.9	5.9	6.5	5.6	4.3	1.5	19.7	6.5	24	
15	9.4	12.1	5.4	3.7	6.6	7.0	14.5	8.9	9.9	5.6	2.8	9.0	20.7	2.1	2.4	S	3.3	3.0	5.1	10.1	24.7	19.6	15.1	11.9	2.1	24.7	9.3	24	
16	6.8	17.5	16.5	5.2	5.1	5.1	9.8	9.3	2.9	4.1	8.8	8.8	8.4	8.2	S	8.2	5.2	5.7	6.0	5.8	5.5	12.7	3.2	3.7	2.9	17.5	7.5	24	
17	3.6	3.3	3.0	2.7	3.9	6.2	4.5	3.8	2.6	2.1	1.9	2.2	2.1	S	2.9	2.4	3.3	2.1	2.5	3.2	4.5	4.4	2.9	2.4	1.9	6.2	3.2	24	
18	1.9	2.0	2.3	2.4	4.3	4.5	3.3	4.1	2.3	2.1	1.7	4.4	S	3.0	2.1	2.9	2.5	2.1	2.5	4.5	5.1	5.7	7.0	6.2	1.7	7.0	3.4	24	
19	4.1	6.0	7.1	6.1	6.3	7.6	6.4	3.5	15.9	17.4	8.9	S	9.4	2.1	7.6	13.2	9.6	10.9	13.3	22.2	8.3	4.9	6.0	7.9	2.1	22.2	8.9	24	
20	6.7	6.4	9.0	9.8	11.8	9.2	5.5	3.7	3.1	3.1	S	2.8	2.3	1.5	1.6	6.6	4.4	5.2	16.2	4.8	6.1	9.9	3.5	1.9	1.5	16.2	5.9	24	
21	3.7	3.8	11.1	3.0	1.4	1.5	2.4	3.5	1.7	S	1.7	1.8	1.8	9.6	2.0	9.0	3.6	9.2	5.0	5.3	48.2	7.8	3.7	2.2	1.4	48.2	6.2	24	
22	2.2	1.9	2.5	2.5	2.8	2.4	2.9	2.9	S	2.1	12.1	4.4	10.7	2.9	2.9	4.1	4.7	9.9	5.5	6.2	4.1	10.0	10.0	12.5	1.9	12.5	5.3	24	
23	3.0	2.3	4.6	2.2	2.3	2.7	3.9	S	2.8	5.0	4.0	4.7	7.3	10.1	3.6	2.8	3.9	3.5	4.3	3.9	4.6	5.5	8.4	5.6	2.2	10.1	4.4	24	
24	7.9	9.4	8.1	6.4	7.3	11.3	S	9.4	6.7	8.3	11.8	14.7	14.1	4.6	5.2	3.7	3.9	4.4	10.5	13.5	2.7	2.1	2.0	2.6	2.0	14.7	7.4	24	
25	2.1	2.3	1.3	3.7	3.6	S	5.0	4.7	4.5	6.3	3.7	5.0	4.1	3.8	3.7	4.3	3.9	4.8	5.8	5.5	7.8	6.2	9.0	8.8	1.3	9.0	4.8	24	
26	10.6	6.6	10.0	9.4	S	11.4	10.3	16.7	13.2	10.5	8.4	5.8	7.2	7.4	13.1	11.1	13.6	13.7	10.9	6.0	5.8	3.7	3.6	4.4	3.6	16.7	9.3	24	
27	5.1	7.6	3.8	S	3.4	4.2	19.6	17.1	15.6	2.2	10.7	11.0	6.3	9.2	19.1	16.1	8.0	7.0	6.4	9.0	10.5	5.8	3.0	1.6	1.6	19.6	8.8	24	
28	2.3	3.9	S	2.7	1.2	1.9	2.0	1.7	2.2	2.0	1.6	1.3	1.4	1.2	1.3	1.4	2.1	2.2	3.0	5.4	3.8	3.3	2.2	2.4	1.2	5.4	2.3	24	
29	2.3	S	5.2	4.9	4.1	9.2	15.0	16.2	21.5	10.3	1.2	5.4	8.0	20.0	1.2	2.4	1.7	11.7	6.3	20.2	7.5	7.2	6.7	4.7	1.2	21.5	8.4	24	
30	S	6.0	6.2	4.4	5.6	5.6	4.1	4.2	2.2	2.9	2.1	2.9	6.6	8.6	13.9	7.5	2.5	17.4	3.1	4.2	3.9	4.0	2.9	S	2.1	17.4	5.5	24	
31	3.3	4.3	1.9	2.1	4.6	10.8	3.8	7.4	5.4	10.5	4.3	3.7	3.8	7.4	6.2	14.0	20.4	12.2	11.4	12.5	3.2	7.3	S	2.3	1.9	20.4	7.1	24	
HOURLY MAX	15.8	17.5	16.5	10.7	11.8	13.5	19.6	17.1	21.5	17.4	19.7	14.7	20.7	20.0	31.8	16.1	20.4	17.4	17.6	22.2	48.2	19.6	16.0	13.5					
HOURLY AVG	5.5	6.1	5.9	5.3	5.3	6.8	7.7	7.0	7.4	6.0	6.5	5.1	6.3	5.6	6.7	6.2	5.4	6.2	6.9	8.4	8.6	7.5	6.0	5.6					

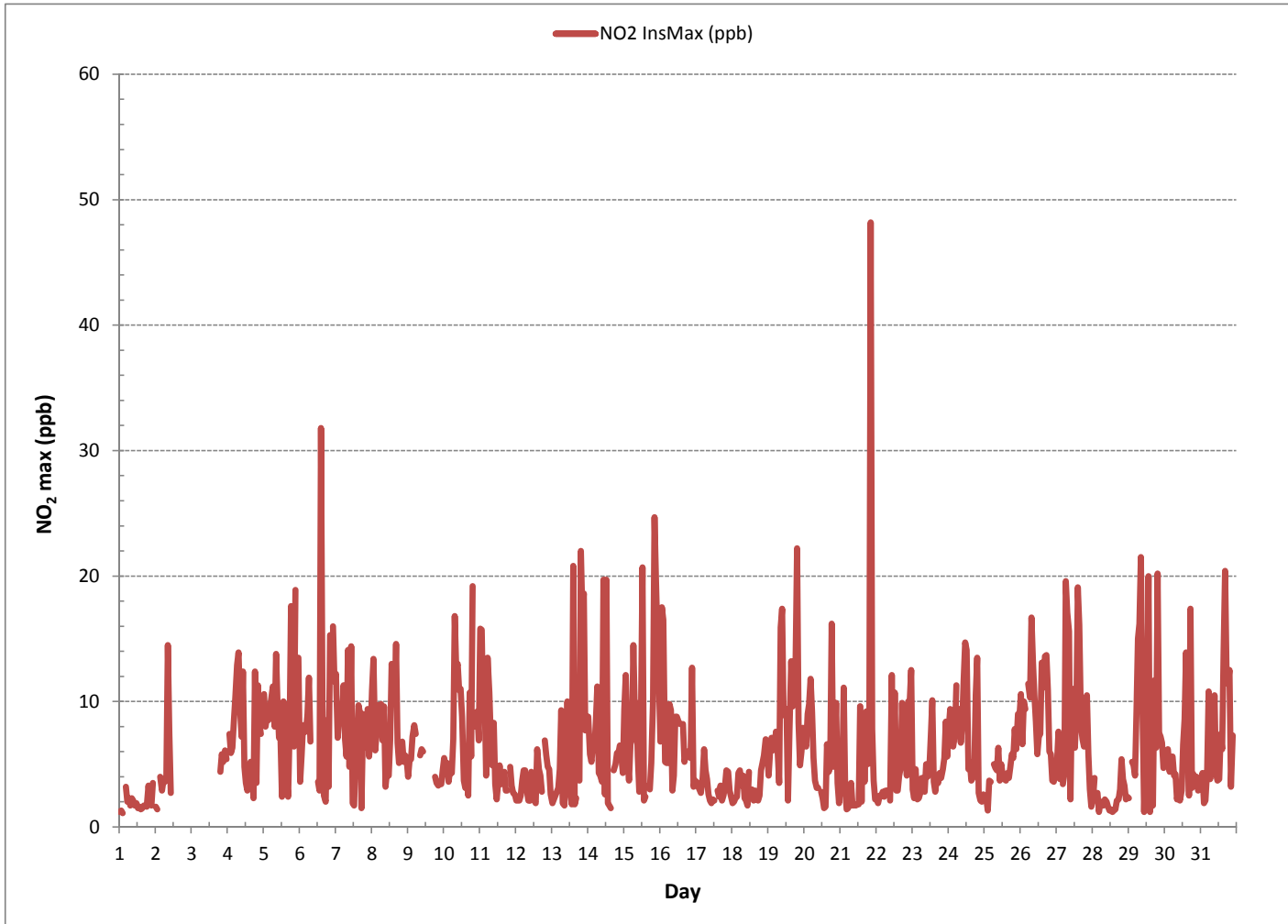
STATUS FLAG CODES

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

MONTHLY SUMMARY

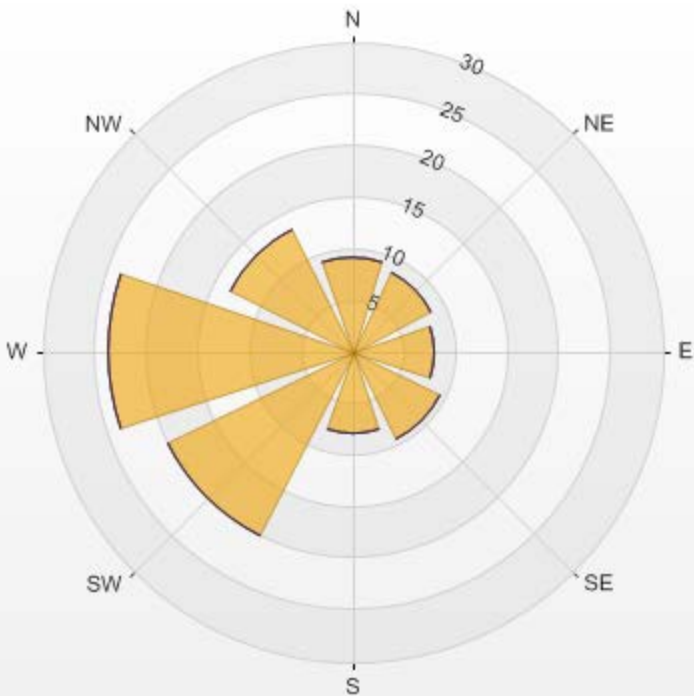
NUMBER OF NON-ZERO READINGS:	667
MAXIMUM INSTANTANEOUS VALUE:	48.2 PPB @ HOUR(S) 20 ON DAY(S) 21
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	11 HRS
OPERATIONAL TIME:	710 HRS
STANDARD DEVIATION:	4.74

NITROGEN DIOXIDE MAX instantaneous maximum in ppb



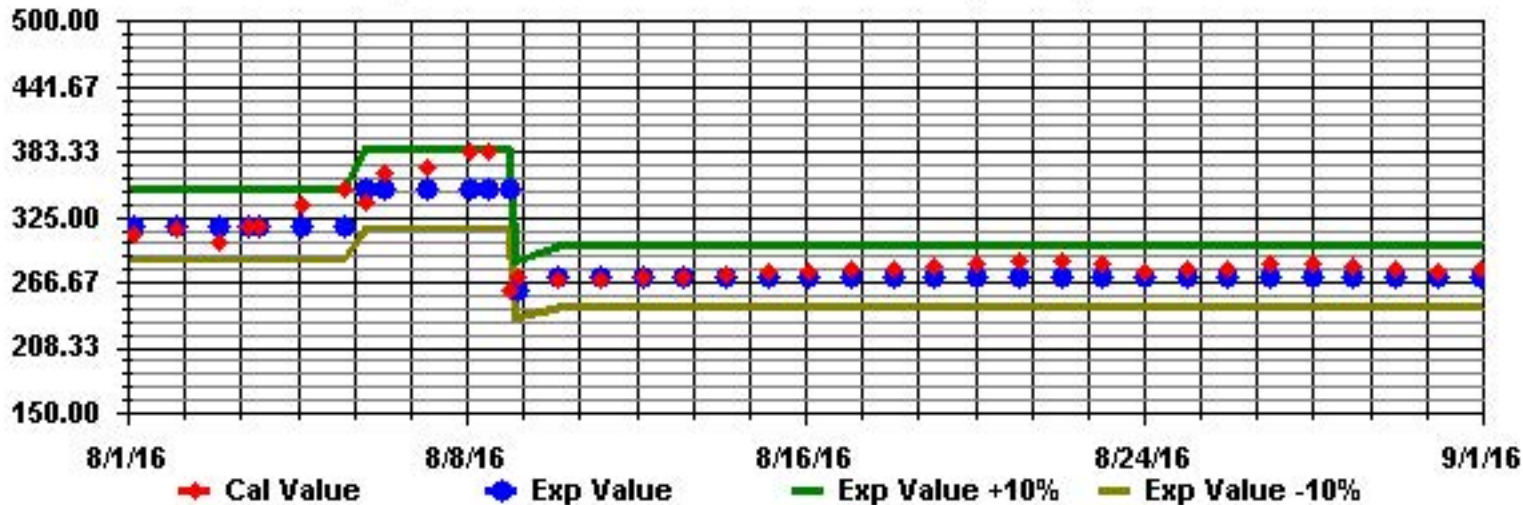
Wind: LICA Bonnyville Monitor: NO2 [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 89.92% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	9.12	0	0	0	9.12
NE	8.52	0	0	0	8.52
E	7.92	0	0	0	7.92
SE	9.57	0	0	0	9.57
S	7.92	0	0	0	7.92
SW	20.03	0	0	0	20.03
W	23.62	0	0	0	23.62
NW	13.3	0	0	0	13.3
Summary	100	0	0	0	100



% Icon Classes (ppb)							
100	 0.0-50.0	0	 50.0-110.0	0	 110.0-210.0	0	 >210.0

Calibration Graph for Site: BONNYVIL Parameter: NO2_ Sequence: NO2 Phase: SPAN



OZONE

OZONE (O₃) hourly averages in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY	1	14.8	14.1	13.3	S	12.9	12.0	13.6	15.1	13.7	14.9	17.3	19.2	21.4	21.3	21.0	22.1	22.6	23.1	22.6	20.9	21.8	19.9	18.1	20.2	12.0	23.1	18.1	24
2	2	19.6	16.4	S	14.9	15.6	19.6	20.0	20.9	21.5	21.9	22.0	22.7	24.3	25.8	27.4	27.5	20.3	24.8	25.5	22.7	15.3	12.7	9.4	8.9	8.9	27.5	20.0	24
3	3	3.7	S	2.1	1.2	0.6	2.3	7.2	12.3	15.5	18.7	C	C	C	C	27.7	26.7	23.3	26.2	23.8	24.6	20.0	18.1	16.7	18.4	0.6	27.7	15.2	24
4	4	S	14.7	10.5	10.9	9.6	9.0	4.6	6.3	10.9	23.7	22.0	29.1	33.4	35.0	31.9	26.6	29.8	29.7	27.9	24.9	18.8	14.5	13.4	S	4.6	35.0	19.9	24
5	5	5.9	3.2	1.5	2.5	1.2	2.3	3.9	10.5	18.3	24.9	26.5	27.3	27.6	28.8	29.3	29.8	30.0	28.2	27.8	25.5	21.0	19.5	S	17.4	1.2	30.0	18.0	24
6	6	19.5	18.3	9.0	7.2	5.0	3.0	4.4	13.3	20.0	27.1	31.2	31.1	31.1	31.1	31.4	31.9	32.1	32.4	31.8	29.1	21.9	S	14.1	10.8	3.0	32.4	21.2	24
7	7	18.7	9.9	5.5	5.3	4.3	3.8	8.1	15.0	22.5	29.6	33.4	33.4	35.0	33.3	32.8	36.0	36.3	32.6	30.8	24.2	S	17.3	20.4	15.9	3.8	36.3	21.9	24
8	8	12.9	9.0	9.1	7.4	7.2	6.7	8.7	14.8	18.7	21.6	22.8	24.7	26.2	24.7	25.4	21.5	17.8	20.9	19.6	S	15.6	13.7	10.7	9.6	6.7	26.2	16.1	24
9	9	9.6	7.2	6.4	5.9	1.0	7.8	10.5	11.3	14.5	17.9	18.2	21.3	24.6	26.5	28.1	26.4	21.7	26.9	39.5	37.5	33.0	S	30.6	28.2	1.0	39.5	19.8	24
10	10	20.4	20.9	18.9	26.1	25.8	25.2	23.6	22.1	20.3	20.1	18.2	19.3	22.9	27.3	33.2	41.6	39.5	35.8	33.9	32.9	S	37.6	29.5	21.4	18.2	41.6	26.8	24
11	11	14.1	13.1	16.2	17.2	17.9	12.3	9.2	10.4	12.5	13.7	18.7	20.0	24.1	23.9	29.4	27.5	24.1	21.0	19.1	S	15.8	14.9	15.0	14.0	9.2	29.4	17.6	24
12	12	11.8	10.7	10.6	9.9	9.9	8.6	9.8	12.0	15.3	18.8	22.8	21.6	23.1	24.9	24.5	25.3	26.0	26.4	S	19.4	17.8	15.5	14.7	13.9	8.6	26.4	17.1	24
13	13	13.2	12.3	11.4	10.8	9.7	9.6	11.1	14.5	19.9	23.4	26.0	26.6	26.9	27.4	28.4	31.8	36.1	S	26.5	21.7	16.8	17.1	23.5	16.6	9.6	36.1	20.1	24
14	14	15.9	16.4	18.5	10.9	11.4	10.4	12.7	16.3	20.7	26.6	35.8	38.6	41.8	42.0	36.0	33.5	S	28.9	25.7	21.8	19.6	15.7	12.8	11.7	10.4	42.0	22.8	24
15	15	10.7	11.7	9.2	9.5	10.6	9.8	11.0	12.6	17.3	21.4	27.0	32.0	31.2	30.4	29.5	S	30.2	30.5	27.8	21.2	13.3	14.9	12.0	13.6	9.2	32.0	19.0	24
16	16	12.3	8.6	10.5	13.6	13.6	13.1	15.9	21.7	26.7	35.6	41.0	42.0	41.7	41.1	S	42.0	42.7	32.7	25.2	21.7	21.1	14.2	15.9	15.9	8.6	42.7	24.7	24
17	17	16.1	17.2	16.9	19.0	18.5	16.5	17.4	19.8	22.3	24.7	28.8	30.3	30.3	S	28.0	27.4	25.6	25.2	23.2	21.9	19.2	19.6	21.3	19.1	16.1	30.3	22.1	24
18	18	18.2	17.0	14.8	13.4	10.8	8.5	9.2	11.0	14.0	16.5	18.2	19.1	S	19.6	20.2	21.2	24.1	26.5	23.1	18.3	14.2	14.5	12.7	12.3	8.5	26.5	16.4	24
19	19	11.8	8.0	6.7	4.4	4.3	6.0	9.3	17.0	14.3	20.8	27.3	S	29.5	30.4	28.9	31.6	33.0	30.0	27.6	28.0	23.8	21.3	18.3	17.7	4.3	33.0	19.6	24
20	20	17.9	12.8	6.7	3.7	3.7	1.9	9.0	13.9	20.7	25.6	S	30.8	31.8	29.9	27.7	27.1	27.1	26.4	23.9	20.9	23.6	25.5	24.4	23.9	1.9	31.8	20.0	24
21	21	14.2	15.6	17.5	15.4	18.5	22.3	22.7	23.7	22.2	S	26.5	29.5	37.0	35.1	33.9	32.4	31.3	30.6	28.4	23.3	16.6	19.1	15.6	15.8	14.2	37.0	23.8	24
22	22	14.4	13.9	14.8	15.5	15.4	16.9	16.5	16.9	S	22.8	26.3	25.4	24.0	23.9	24.6	22.9	29.4	33.8	24.2	20.0	18.6	17.5	29.7	28.5	13.9	33.8	21.6	24
23	23	24.6	29.2	18.6	15.1	15.0	15.6	15.9	S	17.9	17.7	18.1	20.1	22.0	22.4	25.4	26.7	23.9	22.6	23.9	22.6	19.7	19.0	17.6	16.3	15.0	29.2	20.4	24
24	24	13.2	11.1	12.0	10.2	9.6	5.6	S	9.6	12.4	15.4	20.9	27.6	29.8	27.1	28.5	32.0	34.2	33.1	27.3	22.1	25.4	24.1	23.0	20.0	5.6	34.2	20.6	24
25	25	18.1	17.9	18.9	16.6	16.8	S	11.5	10.2	12.7	13.4	19.2	16.4	18.6	20.1	23.0	22.0	23.7	21.7	20.1	17.3	13.9	10.2	6.7	4.9	4.9	23.7	16.3	24
26	26	2.0	3.6	1.5	2.2	S	1.5	3.2	4.6	8.0	15.0	20.6	25.0	25.6	26.1	25.7	26.7	26.0	25.3	24.9	24.7	22.0	22.2	21.8	19.6	1.5	26.7	16.4	24
27	27	18.0	17.5	18.0	S	17.8	15.1	15.6	16.1	18.8	22.3	23.9	26.2	27.5	25.7	23.7	21.4	20.1	13.1	13.3	12.0	11.8	13.7	12.2	17.4	11.8	27.5	18.3	24
28	28	19.7	18.2	S	10.4	10.1	11.8	14.8	17.7	19.0	19.5	21.4	22.5	23.6	25.0	26.4	27.0	27.3	26.4	24.1	20.5	18.9	18.1	17.6	16.2	10.1	27.3	19.8	24
29	29	15.1	S	12.6	10.4	9.0	7.8	8.6	9.0	11.6	17.4	23.0	25.3	26.1	27.0	26.0	25.9	29.2	28.0	24.7	19.4	18.8	17.4	17.4	17.8	7.8	29.2	18.6	24
30	30	S	13.8	8.9	11.9	8.4	7.6	8.5	11.5	17.0	18.5	21.0	22.4	22.7	21.9	20.9	21.2	22.1	20.9	20.3	19.1	20.3	19.7	19.4	S	7.6	22.7	17.2	24
31	31	18.0	17.0	16.6	15.6	13.5	14.7	14.5	13.9	20.3	18.3	18.1	19.7	19.9	25.0	32.7	31.0	30.7	28.8	27.4	24.9	25.2	23.1	S	22.7	13.5	32.7	21.4	24
HOURLY MAX		24.6	29.2	18.9	26.1	25.8	25.2	23.6	23.7	26.7	35.6	41.0	42.0	41.8	42.0	36.0	42.0	42.7	35.8	39.5	37.5	33.0	37.6	30.6	28.5				
HOURLY AVG		14.6	13.8	11.6	10.9	10.9	10.2	11.7	14.1	17.3	20.9	24.0	25.8	27.7	27.7	27.7	28.2	28.0	27.1	25.4	22.9	19.4	18.3	17.7	16.9				

STATUS FLAG CODES

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

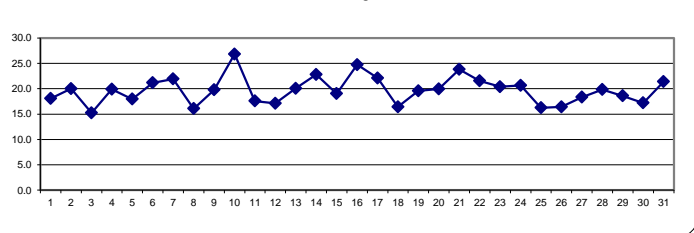
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 PPB

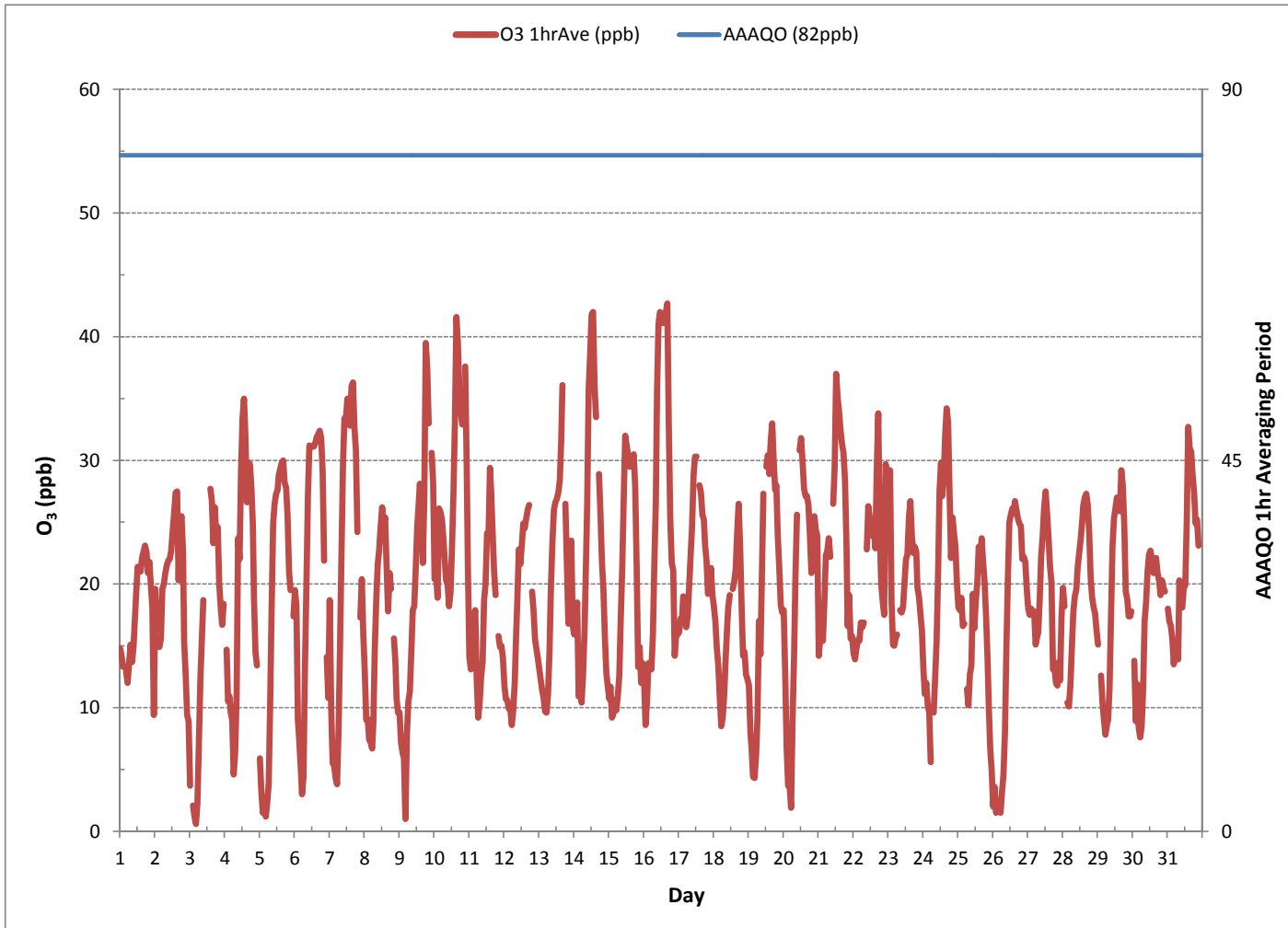
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	707					
MINIMUM 1-HR AVERAGE:	0.6	PPB	@ HOUR(S)	4	ON DAY(S)	3
MAXIMUM 1-HR AVERAGE:	42.7	PPB	@ HOUR(S)	16	ON DAY(S)	16
MAXIMUM 24-HR AVERAGE:	26.8	PPB			ON DAY(S)	10
					VAR-VARIOUS	
IZS CALIBRATION TIME:	33	HRS	OPERATIONAL TIME:	744	HRS	
MONTHLY CALIBRATION TIME:	4	HRS	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	8.24		MONTHLY AVERAGE:	19.7	PPB	

24 HOUR AVERAGES FOR August 2016



OZONE (O₃) hourly averages in ppb





OZONE MAX instantaneous maximum in ppb

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	15.6	15.3	14.5	S	13.7	13.1	18.8	18.9	14.9	16.4	18.5	21.3	22.3	22.2	21.7	22.8	23.4	24.4	24.3	23.7	23.1	21.6	19.7	22.5	13.1	24.4	19.7	24	
2	21.0	18.0	S	15.7	18.2	21.3	21.3	22.2	22.3	22.6	24.1	25.4	26.9	28.8	28.8	28.2	26.3	26.9	24.9	19.8	14.4	12.9	12.1	12.1	12.1	28.8	21.9	24	
3	7.0	S	3.1	2.3	1.1	4.8	10.8	14.4	17.8	21.1	C	C	C	C	C	28.7	25.3	28.8	25.7	26.1	22.2	20.4	18.3	20.7	1.1	28.8	16.6	24	
4	S	17.0	12.7	12.1	12.0	12.4	8.1	15.0	14.5	28.0	25.7	33.2	34.9	36.3	37.0	29.2	32.0	31.5	30.3	28.2	22.8	17.4	15.7	S	8.1	37.0	23.0	24	
5	8.4	6.3	3.7	3.9	3.3	4.8	8.4	17.5	23.6	26.7	28.4	28.4	29.0	30.1	30.6	30.7	31.6	30.3	30.0	29.2	23.8	21.6	S	19.3	3.3	31.6	20.4	24	
6	21.6	21.6	11.1	8.8	5.9	3.7	7.5	19.9	25.1	30.3	33.2	32.5	32.3	32.0	32.6	33.7	33.4	33.5	33.5	31.2	27.3	S	50.4	31.3	3.7	50.4	25.8	24	
7	31.7	20.4	8.1	7.6	7.2	6.5	11.1	18.0	26.0	33.2	35.0	34.9	36.5	35.4	34.7	38.1	38.1	35.0	33.1	31.5	S	20.2	22.6	18.6	6.5	38.1	25.4	24	
8	17.3	13.7	12.1	10.8	10.4	8.9	11.8	18.7	21.1	23.3	25.4	27.0	29.8	27.2	29.5	28.8	21.0	24.9	22.6	S	18.9	18.9	12.6	10.7	8.9	29.8	19.4	24	
9	11.3	9.3	8.9	9.1	2.1	11.8	13.7	13.3	16.7	20.5	20.5	24.3	26.9	27.6	29.5	29.4	24.3	39.0	43.3	40.0	36.3	S	32.3	29.4	2.1	43.3	22.6	24	
10	26.7	24.8	23.9	28.5	27.0	26.4	26.4	25.1	21.9	22.8	21.3	22.0	25.7	30.6	41.0	44.2	42.8	39.0	36.5	37.4	S	40.8	34.0	25.2	21.3	44.2	30.2	24	
11	20.7	19.8	23.3	21.0	19.7	18.5	12.0	13.5	13.3	15.9	22.6	22.5	25.7	28.0	30.9	29.9	25.7	23.0	20.2	S	16.7	15.9	16.0	15.7	12.0	30.9	20.5	24	
12	13.2	11.5	11.1	10.7	11.1	10.1	11.1	13.9	17.4	21.0	25.3	24.3	24.6	26.1	26.3	27.7	28.7	27.7	S	22.1	20.1	17.5	15.6	15.1	10.1	28.7	18.8	24	
13	13.6	13.2	12.6	11.8	11.4	10.6	12.4	17.4	23.1	25.4	27.3	28.2	27.9	28.2	30.2	36.5	38.8	S	30.4	24.6	21.0	31.5	29.4	21.3	10.6	38.8	22.9	24	
14	31.4	20.2	20.8	14.1	13.7	17.1	16.5	19.9	24.1	32.9	38.1	40.6	42.9	43.9	38.3	35.1	S	30.0	29.1	24.1	22.0	20.1	15.2	13.0	13.0	43.9	26.2	24	
15	14.9	17.0	14.8	10.9	12.1	12.4	12.9	16.0	19.7	24.3	30.1	35.7	32.3	32.6	31.3	S	31.9	31.5	30.4	25.4	21.4	18.7	16.3	15.8	10.9	35.7	22.1	24	
16	14.7	14.4	17.0	16.5	14.5	14.4	20.8	25.1	30.5	39.0	43.2	43.8	43.4	42.1	S	43.5	45.6	38.1	28.4	26.0	25.7	16.7	17.7	18.3	14.4	45.6	27.8	24	
17	17.5	18.6	18.3	20.1	19.9	18.8	18.9	22.2	23.5	26.9	31.2	31.3	31.0	S	30.3	29.2	27.8	27.7	24.6	23.1	21.9	20.8	22.6	20.2	17.5	31.3	23.8	24	
18	18.9	18.0	15.9	14.2	12.7	9.9	9.9	13.0	16.0	17.7	19.8	21.6	S	21.6	21.3	24.1	26.3	29.4	24.9	22.6	16.0	15.9	14.5	15.4	9.9	29.4	18.2	24	
19	14.1	10.9	8.4	6.1	8.8	9.4	13.6	30.9	19.7	24.2	29.1	S	30.9	32.1	31.0	35.6	35.3	33.3	31.2	30.5	25.6	24.3	19.5	19.2	6.1	35.6	22.8	24	
20	19.1	18.9	10.1	7.3	7.1	6.5	13.5	17.0	24.4	28.8	S	32.1	33.2	33.8	29.2	29.1	29.2	28.2	27.6	23.5	27.5	28.5	27.0	27.0	6.5	33.8	23.0	24	
21	18.9	23.2	21.4	17.0	23.4	24.4	24.6	25.3	24.0	S	27.6	36.2	38.2	36.8	35.0	33.9	32.6	31.9	30.3	26.3	20.5	21.7	18.1	18.1	17.0	38.2	26.5	24	
22	15.5	15.1	16.2	16.8	16.7	17.8	18.7	18.7	S	27.0	28.0	27.8	25.6	25.2	25.7	25.8	32.1	37.2	36.6	22.0	21.3	21.6	36.9	34.5	15.1	37.2	24.5	24	
23	31.7	36.1	22.5	16.2	15.8	16.7	17.0	S	19.1	19.0	19.3	22.0	26.1	27.0	27.9	28.0	27.0	23.3	24.1	23.5	21.3	20.7	21.6	17.4	15.8	36.1	22.8	24	
24	16.8	12.9	13.3	12.7	11.0	9.2	S	13.8	14.8	18.0	25.8	30.1	32.1	31.3	32.3	34.6	36.1	35.4	31.5	25.7	26.9	24.8	23.8	22.4	9.2	36.1	23.3	24	
25	19.7	19.9	20.2	18.9	17.8	S	12.9	12.0	14.8	16.0	24.6	20.4	21.7	22.2	25.6	24.0	25.8	23.6	22.0	21.0	16.4	12.3	8.9	5.9	5.9	25.8	18.5	24	
26	4.9	4.5	3.1	3.6	S	2.5	4.6	6.4	11.2	22.2	23.2	26.6	26.9	27.5	27.8	28.2	28.4	26.7	26.6	31.0	23.1	24.4	23.3	20.7	2.5	31.0	18.6	24	
27	18.7	18.6	20.4	S	19.4	16.6	18.4	18.9	21.0	23.3	25.8	27.9	28.8	27.6	27.8	24.9	24.3	16.5	15.8	15.9	14.9	16.5	16.0	19.8	14.9	28.8	20.8	24	
28	23.2	22.8	S	11.7	11.1	12.7	17.5	19.3	20.2	20.8	22.6	23.5	24.5	27.6	27.6	28.0	28.5	27.9	26.1	23.2	20.7	19.8	18.4	18.0	11.1	28.5	21.6	24	
29	16.0	S	15.2	14.2	10.3	11.2	10.0	10.4	14.1	20.7	25.1	27.0	27.8	28.5	27.6	27.8	31.0	31.3	28.1	24.2	21.3	19.0	19.2	19.6	10.0	31.3	20.9	24	
30	S	15.7	11.0	13.2	10.6	8.9	10.3	15.5	18.5	20.2	22.2	24.1	24.1	23.5	22.1	22.6	23.4	22.8	21.6	20.5	21.7	20.8	20.8	S	8.9	24.1	18.8	24	
31	19.4	18.1	18.0	17.0	15.7	16.7	15.7	14.8	22.8	19.7	19.7	21.1	21.6	33.8	34.9	34.4	34.1	32.3	31.8	27.9	27.2	24.5	S	24.0	14.8	34.9	23.7	24	
HOURLY MAX	31.7	36.1	23.9	28.5	27.0	26.4	26.4	30.9	30.5	39.0	43.2	43.8	43.4	43.9	41.0	44.2	45.6	39.0	43.3	40.0	36.3	40.8	50.4	34.5					
HOURLY AVG	18.1	17.1	14.2	12.9	12.8	12.6	14.3	17.6	19.9	23.6	26.2	28.1	29.4	29.9	29.9	30.6	30.4	29.7	28.3	26.0	22.3	21.1	21.4	19.7					

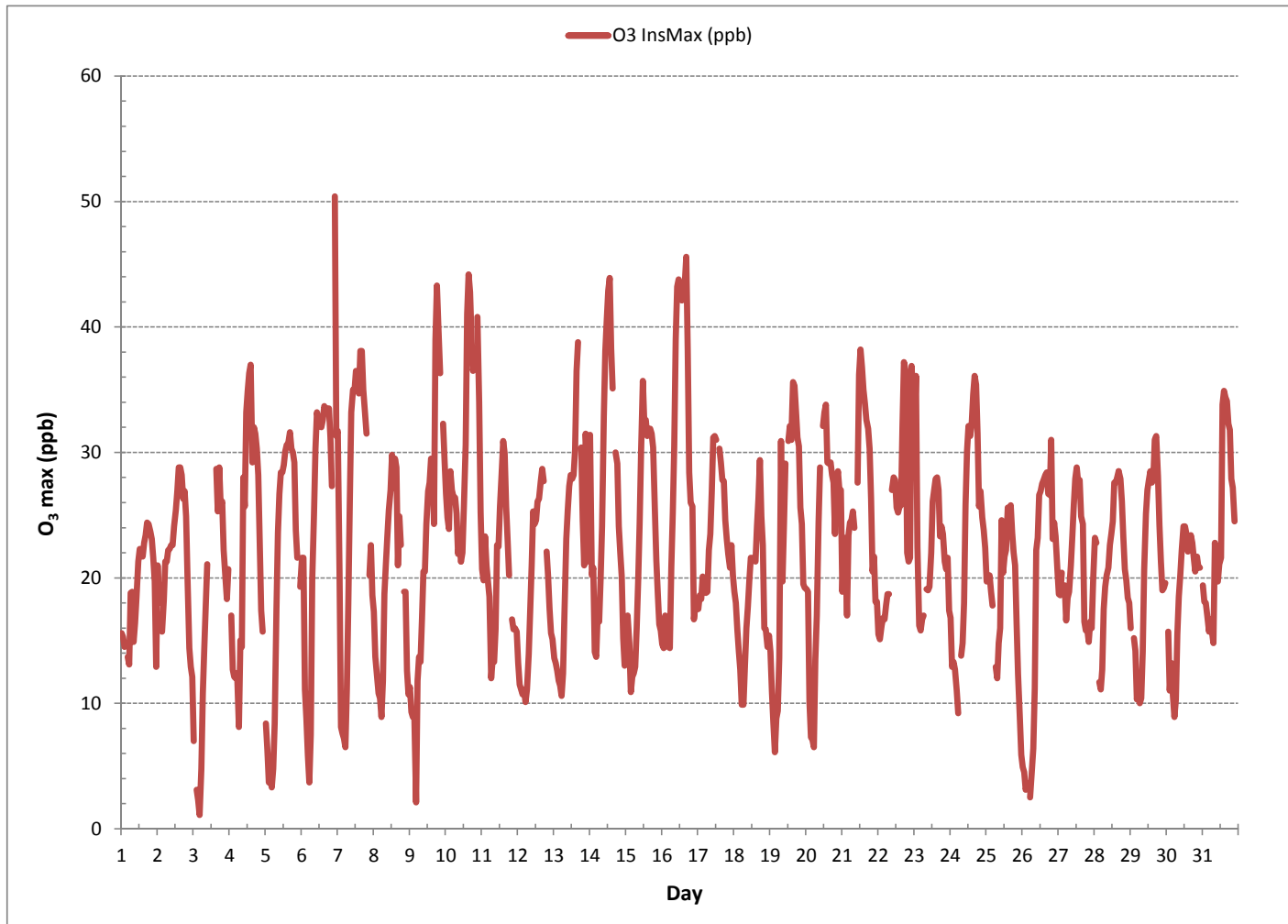
STATUS FLAG CODES

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:	706
MAXIMUM INSTANTANEOUS VALUE:	50.4 PPB @ HOUR(S) 22 ON DAY(S) 6
	VAR-VARIOUS
IZS CALIBRATION TIME:	33 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	8.42
OPERATIONAL TIME:	744 HRS

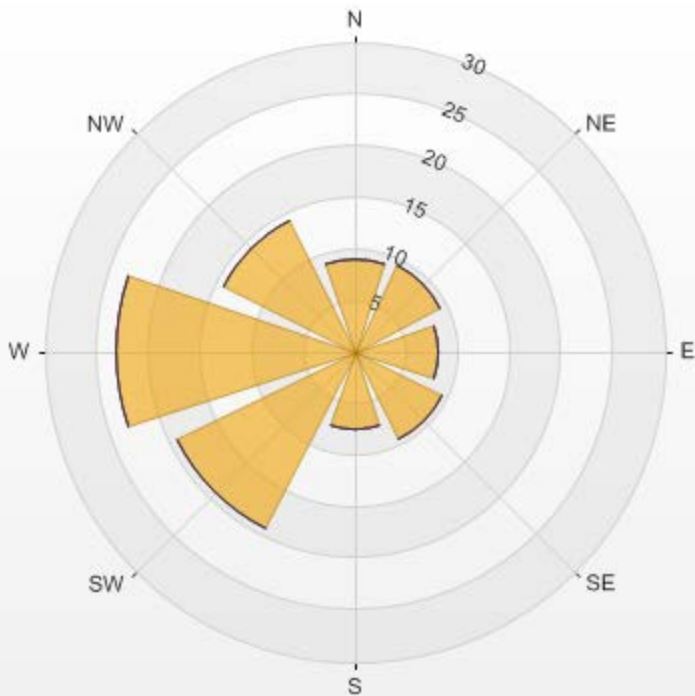
OZONE MAX instantaneous maximum in ppb



Wind: LICA Bonnyville Monitor: O3 [ppb] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.

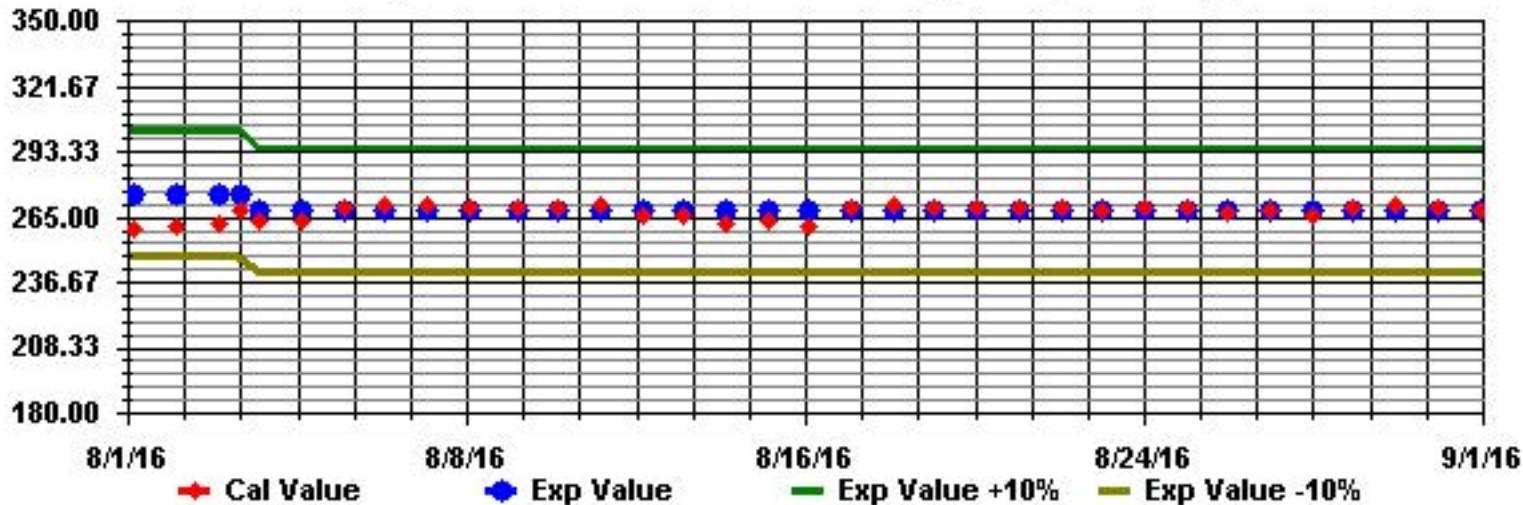
Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00

Direction	0.0-50.0	50.0-110.0	110.0-210.0	>210.0	Total
N	9.05	0	0	0	9.05
NE	9.34	0	0	0	9.34
E	8.06	0	0	0	8.06
SE	9.48	0	0	0	9.48
S	7.5	0	0	0	7.5
SW	19.24	0	0	0	19.24
W	23.06	0	0	0	23.06
NW	14.29	0	0	0	14.29
Summary	100	0	0	0	100



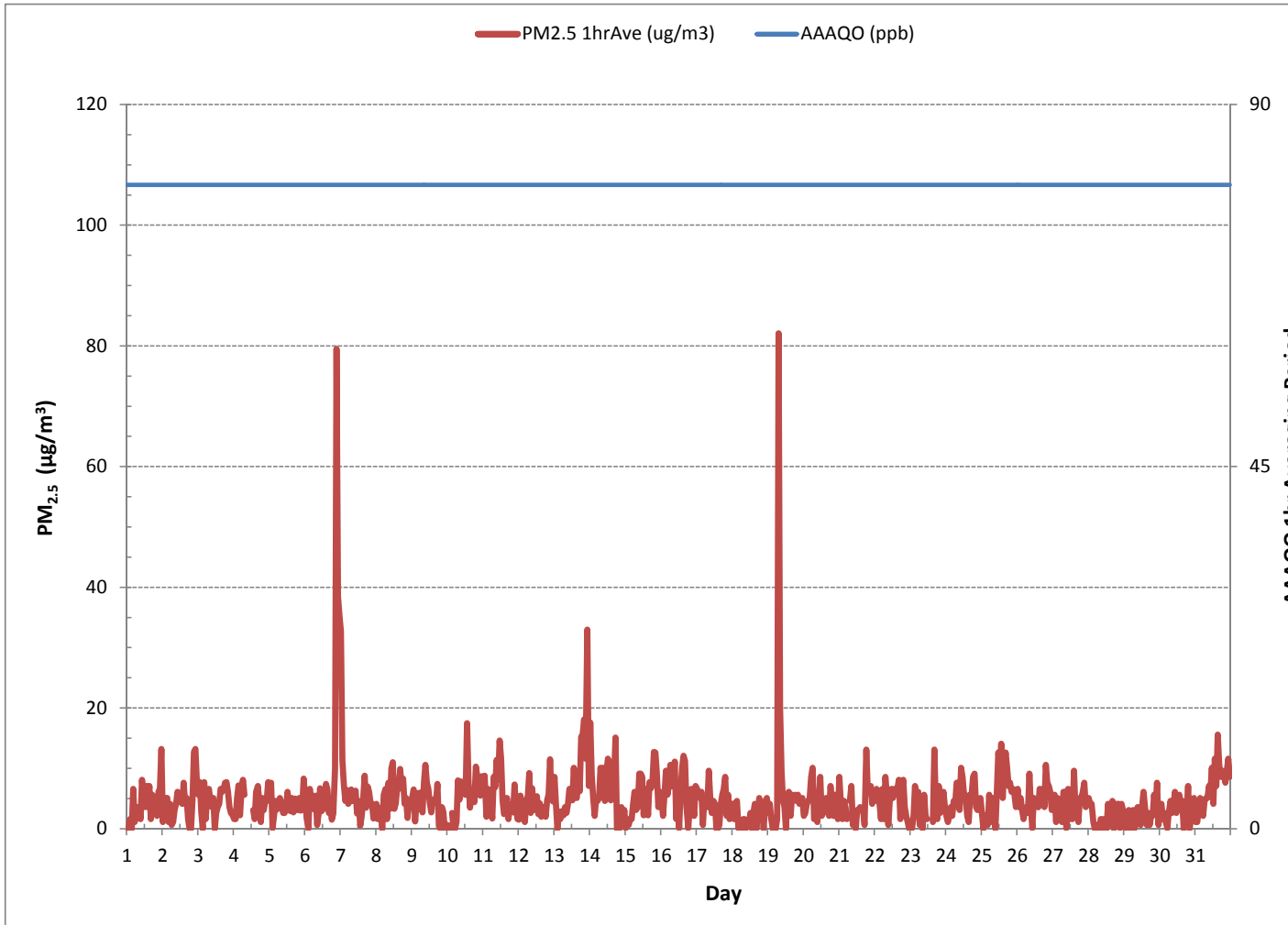
% Icon Classes (ppb)	
100	0.0-50.0
0	50.0-110.0
0	110.0-210.0
0	>210.0

Calibration Graph for Site: BONNYVIL Parameter: O3_ Sequence: O3_NEW Phase: SPAN



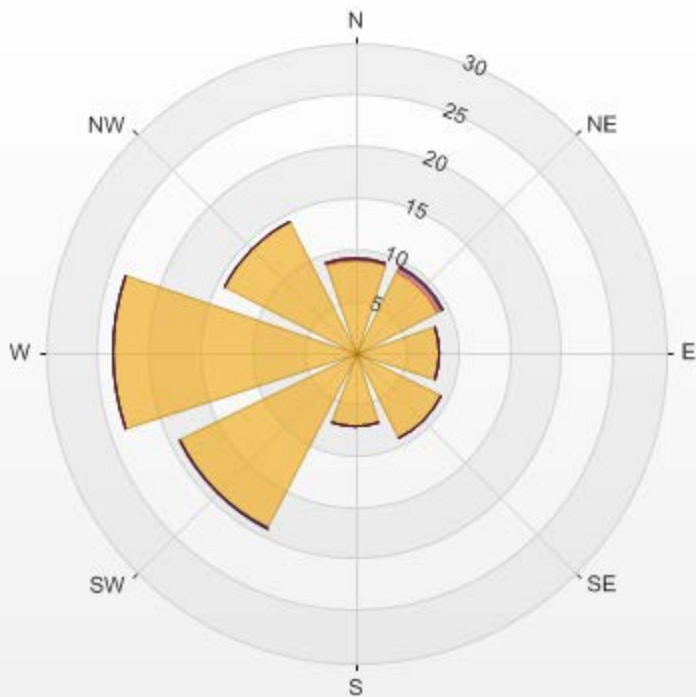
PARTICULATE MATTER 2.5

PARTICULATE MATTER 2.5 (LESS THAN 2.5 MICRONS) (PM_{2.5}) hourly averages in µg/m³



Wind: LICA Bonnyville Monitor: PM25 [ug/m3(L)] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 98.39% Calm Avg: 0.00

Direction	0.0-30.0	30.0-60.0	60.0-80.0	80.0-120.0	120.0-240.0	>240.0	Total
N	9.02	0.14	0	0	0	0	9.16
NE	8.88	0.41	0.14	0	0	0	9.43
E	8.06	0	0	0	0	0	8.06
SE	9.29	0	0	0	0	0	9.29
S	7.24	0	0	0	0	0	7.24
SW	18.99	0	0	0.14	0	0	19.13
W	23.5	0	0	0	0	0	23.5
NW	14.21	0	0	0	0	0	14.21
Summary	99.19	0.55	0.14	0.14	0	0	100



% Icon Classes (ug/m3(L))	99	1	0	0	0	0
0.0-30.0	30.0-60.0	60.0-80.0	80.0-120.0	120.0-240.0	>240.0	

WIND SPEED

WIND SPEED (WS) hourly averages in kph

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	9.4	11.0	8.7	11.0	10.3	10.3	11.3	12.6	11.6	11.9	14.4	16.1	18.1	17.2	15.5	15.9	16.6	15.7	12.0	6.9	8.4	6.0	6.3	6.7	6.0	18.1	11.8	24	
2	6.3	5.9	6.9	6.9	5.7	7.1	6.6	7.5	7.0	7.4	9.1	8.3	9.0	10.8	8.2	8.5	8.1	8.3	5.6	3.9	3.0	1.1	1.2	0.3	0.3	10.8	6.4	24	
3	1.7	2.6	0.2	2.1	0.3	3.2	6.9	7.1	7.5	6.3	6.6	7.1	9.1	12.4	11.7	11.6	7.4	8.3	10.2	9.6	6.6	4.6	2.0	3.5	0.2	12.4	6.2	24	
4	2.6	1.9	2.3	2.3	1.4	2.5	1.6	3.1	3.8	2.3	4.1	6.8	6.0	5.5	3.3	7.3	5.4	5.5	5.2	3.7	3.6	0.1	1.2	0.5	0.1	7.3	3.4	24	
5	0.7	0.1	0.6	0.0	1.2	0.8	0.5	1.8	3.0	6.0	6.2	5.1	3.0	4.7	3.1	4.8	5.9	5.6	7.0	4.5	4.2	4.7	4.1	4.5	0.0	7.0	3.4	24	
6	6.8	3.0	2.7	3.3	2.4	0.2	0.6	2.8	3.0	4.3	4.4	5.3	4.4	4.8	5.4	5.7	7.2	6.5	5.7	4.2	0.2	1.9	0.1	1.4	0.1	7.2	3.6	24	
7	3.0	0.3	0.5	1.9	1.8	1.0	0.7	0.4	1.1	3.1	2.7	4.2	2.3	5.3	7.7	9.1	7.5	6.2	5.3	0.6	3.7	5.1	7.0	3.3	0.3	9.1	3.5	24	
8	0.9	1.1	0.5	1.8	3.6	4.9	4.7	5.3	5.6	5.4	3.8	5.3	5.0	2.7	2.3	6.9	1.5	0.9	2.7	3.0	3.0	3.7	1.1	2.2	0.5	6.9	3.2	24	
9	0.4	0.3	1.2	1.4	2.1	7.5	7.5	6.9	7.0	6.5	7.2	8.2	8.7	11.7	12.3	10.7	9.4	5.8	11.1	6.8	7.7	6.8	5.5	4.2	0.3	12.3	6.5	24	
10	4.3	2.9	4.1	7.1	8.0	6.1	3.6	5.9	4.0	7.1	3.9	4.5	6.3	6.1	5.1	2.5	1.8	4.7	7.1	7.1	8.1	8.5	2.3	0.6	0.6	8.5	5.1	24	
11	0.7	0.1	2.1	4.7	2.8	0.8	2.3	2.5	3.8	2.8	6.7	6.2	6.1	1.7	6.5	10.6	9.8	11.2	8.1	5.7	5.8	6.4	5.0	6.3	0.1	11.2	4.9	24	
12	6.6	7.4	7.5	8.2	6.9	5.7	7.0	7.8	7.0	7.1	8.4	10.6	9.6	9.8	11.1	8.9	10.4	9.6	7.6	5.1	4.0	3.3	4.9	6.0	3.3	11.1	7.5	24	
13	5.8	5.8	7.0	5.8	6.0	6.3	6.4	5.6	4.3	4.7	6.6	8.0	8.8	7.9	6.2	8.1	5.6	5.8	6.1	3.3	0.9	3.9	7.1	3.3	0.9	8.8	5.8	24	
14	1.3	2.9	2.0	4.7	1.6	1.9	1.0	1.6	1.6	2.3	1.5	4.7	3.9	4.0	5.5	9.4	10.1	21.3	5.1	3.2	2.9	3.8	2.2	1.6	1.0	21.3	4.2	24	
15	2.9	4.4	6.5	6.5	6.6	3.2	2.0	4.3	5.1	5.7	6.3	6.8	6.9	7.8	10.4	9.9	8.2	7.6	5.3	1.0	0.4	0.7	2.1	3.3	0.4	10.4	5.2	24	
16	3.6	4.8	4.8	5.7	6.2	5.3	6.0	7.2	8.8	10.6	11.1	12.3	13.3	13.3	11.5	11.5	9.0	11.0	11.5	3.7	5.1	2.2	5.4	4.9	5.9	2.2	13.3	7.6	24
17	4.7	4.5	5.6	6.2	4.7	4.1	5.7	4.8	6.4	8.0	9.3	12.1	12.9	13.3	14.8	17.2	16.1	18.8	15.5	9.3	5.4	6.2	7.7	6.2	4.1	18.8	9.1	24	
18	6.9	6.7	6.7	6.9	8.1	7.3	7.7	11.0	13.0	13.8	15.7	14.0	13.2	12.2	13.9	14.3	14.4	13.3	13.2	6.6	4.2	4.6	3.2	3.4	3.2	15.7	9.8	24	
19	2.3	3.8	3.2	0.6	0.6	5.0	5.5	4.2	3.1	4.1	5.1	6.1	6.0	4.8	4.6	10.6	7.4	4.9	6.3	6.6	7.9	5.0	5.0	5.5	0.6	10.6	4.9	24	
20	5.8	1.6	1.5	1.4	0.7	0.4	2.3	4.4	4.2	3.2	3.5	8.4	6.5	5.5	6.1	3.1	2.2	4.3	2.7	3.8	5.1	9.4	8.7	1.5	0.4	9.4	4.0	24	
21	1.6	3.7	7.0	6.9	8.2	6.7	5.1	4.1	6.3	8.8	7.5	7.2	7.6	6.5	7.0	6.7	4.7	3.9	1.5	1.8	3.7	5.3	8.7	9.3	1.5	9.3	5.8	24	
22	8.2	6.9	12.1	11.1	13.2	13.7	16.9	15.6	18.0	19.0	19.7	15.9	15.7	15.8	13.9	10.6	13.7	10.2	6.9	9.0	7.2	2.1	3.6	0.7	0.7	19.7	11.7	24	
23	8.0	8.0	9.9	16.2	14.4	15.5	14.1	15.4	16.5	16.1	15.7	15.5	14.4	11.6	15.6	15.1	10.9	11.9	10.4	8.4	5.2	4.8	2.6	2.9	2.6	16.5	11.6	24	
24	3.8	0.7	3.4	1.0	3.0	2.9	2.5	5.0	3.3	2.9	4.2	5.1	3.2	9.2	6.8	8.0	7.5	6.2	3.6	4.7	9.3	6.6	7.7	2.9	0.7	9.3	4.7	24	
25	2.5	4.4	6.1	6.6	6.5	6.4	7.5	8.4	9.1	7.1	9.4	12.6	12.9	12.6	12.8	13.7	12.9	10.4	7.8	5.9	4.9	4.6	4.7	4.6	2.5	13.7	8.1	24	
26	2.9	2.0	2.7	2.6	2.8	0.8	2.0	0.4	2.0	3.4	2.6	5.3	3.6	2.9	4.3	5.0	7.1	7.9	6.8	8.3	8.5	9.4	13.1	14.1	0.4	14.1	5.0	24	
27	12.4	15.2	16.1	22.7	15.2	11.4	7.5	8.9	12.9	19.4	16.1	13.8	11.5	4.9	4.2	3.8	2.9	4.6	5.1	3.3	1.5	4.2	6.6	6.3	1.5	22.7	9.6	24	
28	6.0	9.1	9.5	8.2	14.9	13.0	14.5	15.4	15.3	14.2	17.9	19.2	18.5	17.8	16.8	13.7	12.4	11.8	8.4	5.7	5.5	4.7	5.1	4.1	4.1	19.2	11.7	24	
29	4.1	3.2	2.4	4.5	3.9	3.0	2.2	0.1	2.9	4.5	3.6	3.4	3.4	2.4	1.8	3.0	1.0	2.6	3.4	3.0	3.9	3.7	4.8	5.5	0.1	5.5	3.2	24	
30	2.1	3.9	6.1	6.1	5.7	7.8	9.3	8.3	11.2	9.7	12.3	12.7	13.2	12.5	11.6	10.8	11.8	10.6	10.2	10.4	9.4	10.1	8.9	8.1	2.1	13.2	9.3	24	
31	8.1	8.5	9.2	10.0	7.2	11.6	13.0	11.2	9.4	11.7	12.6	11.6	11.9	9.9	17.7	15.3	16.5	11.9	10.9	10.2	8.6	8.7	7.4	8.5	7.2	17.7	10.9	24	
HOURLY MAX	12.4	15.2	16.1	22.7	15.2	15.5	16.9	15.6	18.0	19.4	19.7	19.2	18.5	17.8	17.7	17.2	16.6	21.3	15.5	10.4	9.4	10.1	13.1	14.1					
HOURLY AVG	4.4	4.4	5.1	5.9	5.7	5.7	6.0	6.4	7.0	7.7	8.3	9.1	8.9	8.6	9.0	9.3	8.6	8.6	7.1	5.5	5.0	5.0	5.0	4.4					

STATUS FLAG CODES

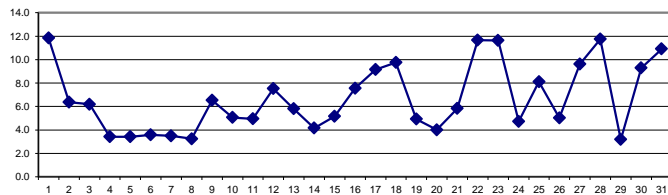
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: January 26, 2016
DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST

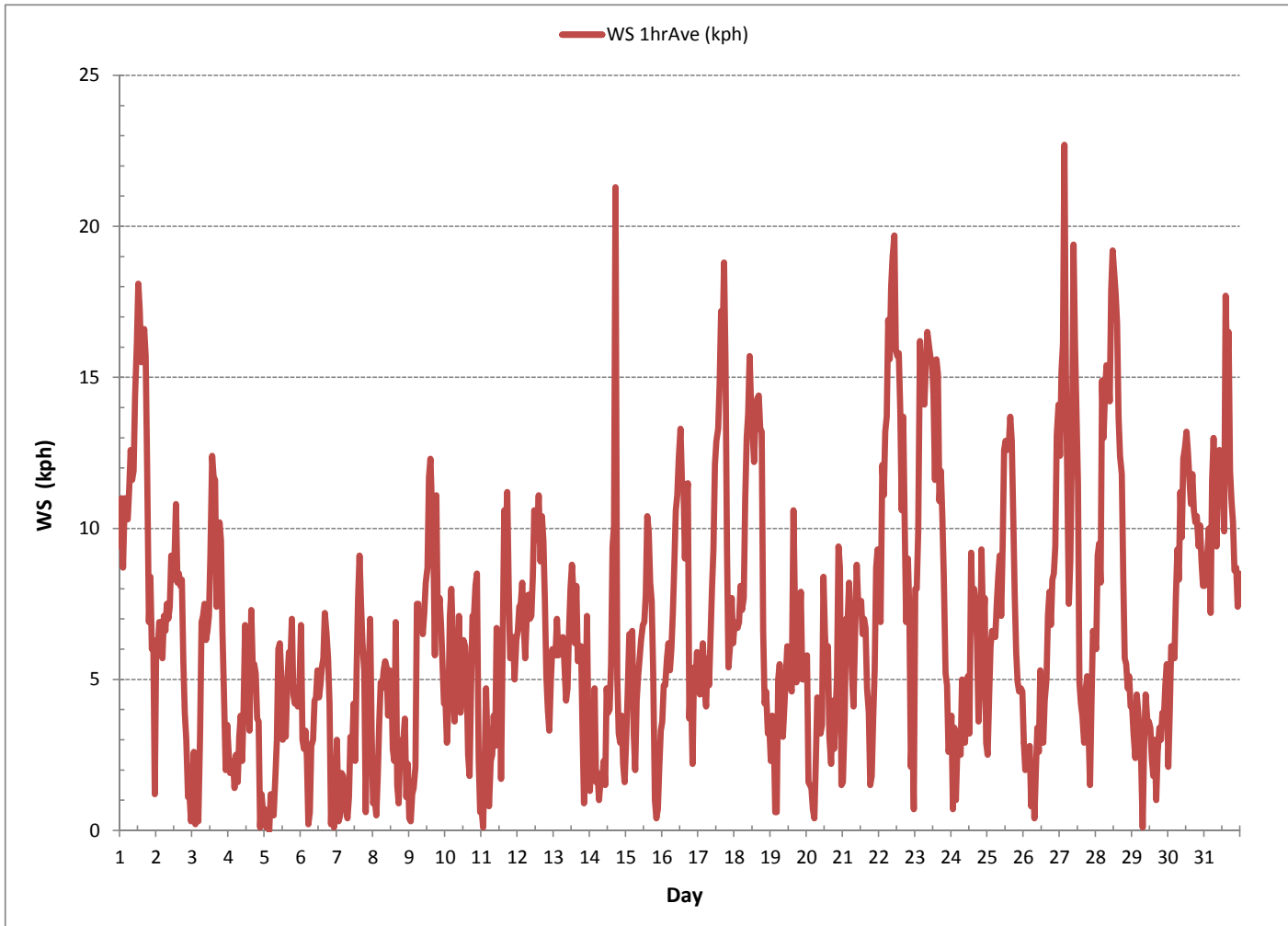
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	743
MINIMUM 1-HR AVERAGE:	0.0 kph @ HOUR(S) 3 ON DAY(S) 5
MAXIMUM 1-HR AVERAGE:	22.7 kph @ HOUR(S) 3 ON DAY(S) 27
MAXIMUM 24-HR AVERAGE:	11.8 kph ON DAY(S) 1
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 HRS
OPERATIONAL TIME:	744 HRS
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	4.30
MONTHLY AVERAGE:	6.7 kph

24 HOUR AVERAGES FOR August 2016



WIND SPEED (WS) hourly averages in kph





VECTOR WIND SPEED MAX instantaneous maximum in kph

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HOUR	
HOURLY MAX	HOURLY AVG	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	RDGS.
DAY																													
1		24.8	22.9	23.2	22.0	23.4	28.8	26.6	32.0	30.9	35.9	46.2	44.7	49.6	48.6	44.6	44.6	44.7	43.9	38.5	21.6	21.7	23.9	23.3	20.1	20.1	49.6	32.8	24
2		17.7	11.8	16.7	19.2	17.4	17.6	16.4	20.1	16.7	16.6	23.8	25.6	23.9	27.8	28.1	22.8	19.9	19.1	13.1	9.0	6.0	6.7	6.7	2.3	2.3	28.1	16.9	24
3		4.6	9.1	5.5	6.1	5.4	9.3	16.0	18.0	17.6	17.7	23.3	17.6	20.7	28.6	P	25.3	16.2	21.4	24.0	22.7	15.5	10.9	9.8	9.5	4.6	28.6	15.4	23
4		9.9	7.2	8.5	6.3	6.0	9.5	9.0	10.4	10.9	7.8	9.5	13.4	12.2	13.6	19.4	19.9	18.6	12.6	10.0	8.0	8.1	5.8	5.3	10.5	5.3	19.9	10.5	24
5		8.7	3.5	5.6	4.3	4.7	5.2	5.7	8.1	11.6	13.9	13.4	13.1	15.7	16.6	14.4	17.6	16.0	12.0	14.9	12.3	7.9	10.4	9.4	11.9	3.5	17.6	10.7	24
6		12.6	10.4	6.8	9.5	8.4	2.9	4.3	7.9	11.4	13.3	21.4	17.6	21.3	18.1	13.1	20.0	16.9	13.4	9.6	9.9	4.3	5.9	3.5	11.9	2.9	21.4	11.4	24
7		9.3	5.9	4.0	4.9	7.3	5.6	4.0	5.8	4.7	6.6	7.0	13.1	8.7	16.1	16.1	21.6	18.9	13.9	9.6	10.0	9.5	13.5	14.6	10.1	4.0	21.6	10.0	24
8		10.1	4.8	4.9	5.0	7.5	11.8	9.8	12.2	14.3	15.0	17.7	29.8	22.8	10.3	24.9	18.8	6.2	6.5	7.5	7.6	9.7	10.1	5.6	11.0	4.8	29.8	11.8	24
9		4.9	3.9	5.3	10.4	8.6	19.2	15.6	15.9	16.9	14.0	17.8	18.1	22.4	26.5	28.7	24.0	23.9	34.1	25.8	18.8	27.8	14.3	14.7	10.3	3.9	34.1	17.6	24
10		10.1	9.3	11.8	16.5	18.4	17.4	12.0	12.8	12.9	15.7	11.6	12.6	14.9	18.5	13.9	14.5	16.1	16.8	15.9	16.1	19.9	19.3	7.9	6.2	6.2	19.9	14.2	24
11		7.2	1.8	9.6	9.4	8.6	5.1	5.8	7.7	8.9	9.3	18.5	17.3	17.3	13.8	31.3	27.5	31.6	32.8	19.2	16.3	16.6	17.6	15.4	16.4	1.8	32.8	15.2	24
12		17.5	18.0	22.4	20.3	17.8	15.3	18.0	17.8	17.4	19.8	22.7	28.8	23.3	24.8	30.3	26.6	25.6	24.9	17.2	14.2	9.7	7.6	8.5	9.2	7.6	30.3	19.1	24
13		8.8	9.0	10.8	10.1	10.7	10.0	10.0	9.1	9.8	11.4	14.5	17.9	22.8	19.7	18.7	19.1	17.7	13.9	16.3	8.6	8.3	18.8	17.7	10.6	8.3	22.8	13.5	24
14		5.7	8.8	9.6	14.4	8.8	6.6	6.5	7.0	7.3	6.4	9.1	10.1	8.2	12.0	15.1	20.0	62.3	63.2	27.1	20.3	8.7	12.8	7.1	8.0	5.7	63.2	15.2	24
15		7.5	9.8	12.7	12.4	13.4	12.0	7.2	10.6	10.6	11.2	11.4	15.9	21.4	23.1	30.9	27.5	24.2	19.5	18.5	6.9	4.4	5.0	5.7	6.3	4.4	30.9	13.7	24
16		7.6	9.6	8.6	10.7	12.2	10.0	12.5	12.2	16.2	19.6	23.4	21.5	26.5	28.0	29.5	28.5	22.8	48.2	19.5	12.8	8.9	9.3	13.1	19.4	7.6	48.2	17.9	24
17		11.1	11.6	13.0	15.6	13.8	13.7	15.2	14.2	13.5	16.1	22.6	34.9	37.7	33.8	42.0	45.8	41.8	47.7	58.9	22.6	14.0	14.8	19.2	19.6	11.1	58.9	24.7	24
18		18.5	18.1	17.1	19.4	18.6	17.1	19.1	27.6	28.3	33.4	37.2	36.3	43.4	33.5	41.5	41.1	39.6	40.0	36.6	25.4	8.3	8.7	6.6	8.1	6.6	43.4	26.0	24
19		6.5	6.8	6.1	6.4	8.3	8.3	10.4	8.6	7.9	9.9	14.5	15.0	16.9	13.2	16.4	20.8	17.5	10.1	14.0	13.9	15.9	12.2	12.1	10.4	6.1	20.8	11.8	24
20		13.0	5.9	5.3	3.9	4.2	3.2	7.2	11.5	10.7	10.4	15.4	17.5	17.7	17.4	17.9	11.2	9.7	10.4	10.5	14.3	14.5	20.4	22.4	12.4	3.2	22.4	12.0	24
21		9.8	13.1	11.8	11.0	17.8	17.0	11.9	12.0	12.7	15.5	16.5	13.7	18.9	18.1	18.8	14.1	10.8	8.4	5.6	5.3	9.5	16.5	18.6	20.6	5.3	20.6	13.7	24
22		21.7	22.2	34.1	29.5	31.9	37.2	44.0	40.1	46.0	47.3	55.7	49.5	36.3	36.9	42.1	41.7	31.2	22.8	20.1	22.8	20.3	18.2	25.0	14.3	14.3	55.7	33.0	24
23		23.1	15.6	26.1	34.9	32.5	39.3	33.6	39.5	34.8	35.3	33.9	37.3	35.3	32.8	38.8	35.9	25.0	25.5	23.3	17.7	10.0	9.4	8.7	10.0	8.7	39.5	27.4	24
24		10.8	4.8	9.2	7.6	7.0	8.3	9.5	11.3	11.9	7.0	10.4	13.6	12.4	24.6	18.8	23.1	19.9	15.3	13.9	15.5	22.6	19.2	21.2	14.7	4.8	24.6	13.9	24
25		12.9	16.7	16.8	20.0	18.8	17.7	21.2	20.5	22.2	20.3	31.5	27.9	27.7	33.2	31.2	34.1	28.8	22.1	18.3	19.1	11.1	10.2	9.7	9.0	9.0	34.1	20.9	24
26		8.7	5.5	8.0	7.8	7.7	5.1	7.8	4.5	6.6	6.8	8.8	12.3	11.6	14.4	16.1	17.9	18.9	18.7	13.0	18.4	18.6	18.9	23.1	26.7	4.5	26.7	12.7	24
27		25.3	28.0	33.9	33.4	29.3	22.5	21.4	23.9	29.5	40.5	35.6	34.0	25.8	15.5	10.3	8.6	8.4	10.2	11.4	7.6	8.3	9.6	21.8	17.6	7.6	40.5	21.4	24
28		16.3	23.8	25.8	22.8	36.6	32.8	35.4	42.1	35.0	36.2	46.7	46.1	46.2	40.5	37.4	34.1	33.4	29.2	21.2	15.3	15.5	14.9	14.4	10.2	10.2	46.7	29.7	24
29		12.0	9.2	10.5	9.0	8.4	7.5	8.0	6.6	7.2	8.3	7.8	8.8	11.4	8.5	8.1	7.7	7.0	9.8	8.6	8.4	8.1	8.6	9.9	11.3	6.6	12.0	8.8	24
30		6.6	8.8	12.9	17.3	14.9	17.7	20.4	18.8	28.6	22.6	33.4	28.4	29.0	27.2	26.2	25.9	27.2	26.5	24.9	23.3	21.7	21.0	18.4	20.1	6.6	33.4	21.7	24
31		19.8	20.8	21.6	26.9	15.7	27.2	31.0	27.2	30.5	28.4	28.4	25.6	34.2	34.9	38.2	36.5	40.6	30.7	32.1	22.3	21.9	22.3	20.4	31.2	15.7	40.6	27.9	24
HOURLY MAX		25.3	28.0	34.1	34.9	36.6	39.3	44.0	42.1	46.0	47.3	55.7	49.5	49.6	48.6	44.6	45.8	62.3	63.2	58.9	25.4	27.8	23.9	25.0	31.2				
HOURLY AVG		12.4	11.5	13.5	14.4	14.3	14.9	15.3	16.6	17.5	18.5	22.2	23.2	23.7	23.6	25.4	25.1	23.9	23.3	19.3	15.1	13.1	13.4	13.5	13.2				

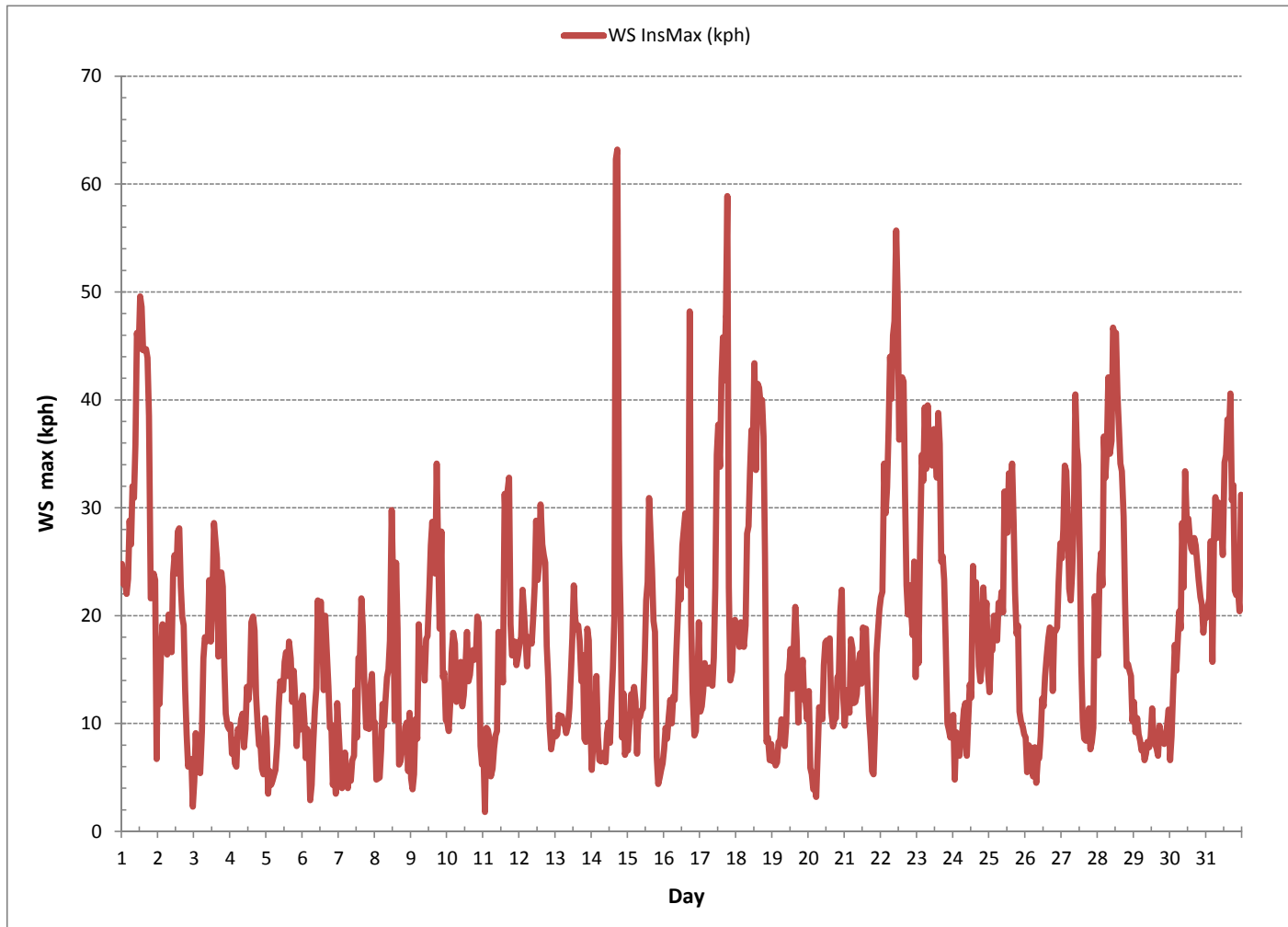
STATUS FLAG CODES

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

MONTHLY SUMMARY

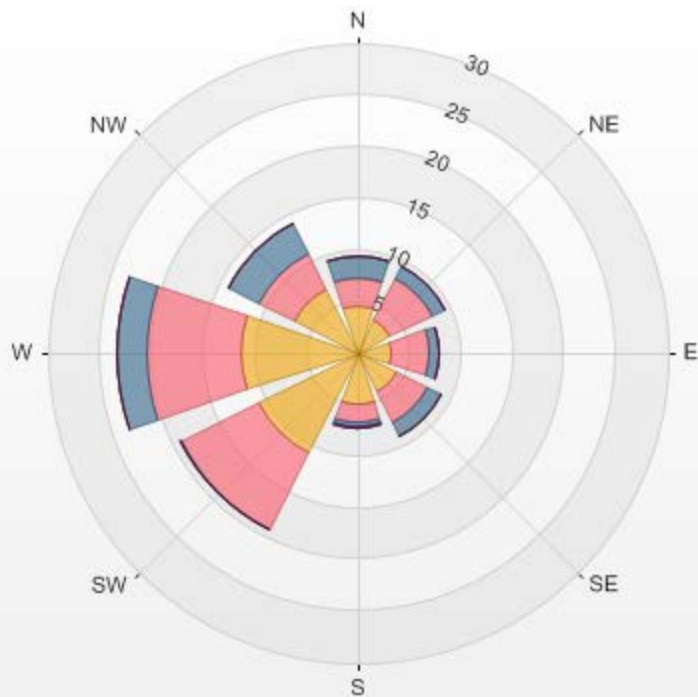
MAXIMUM INSTANTANEOUS VALUE:	63.2 kph	@ HOUR(S)	17	ON DAY(S)	14
				VAR-VARIOUS	
OPERATIONAL TIME:				743	HRS

VECTOR WIND SPEED MAX instantaneous maximum in kph



Wind: LICA Bonnyville Monitor: WSP [kph] Monthly: 08/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 100.00% Calm Avg: 0.00

Direction	0.0-6.0	6.0-12.0	12.0-20.0	20.0-29.0	29.0-39.0	>39.0	Total
N	4.57	2.69	2.15	0	0	0	9.41
NE	3.49	4.57	1.34	0	0	0	9.4
E	3.23	3.76	0.94	0	0	0	7.93
SE	4.3	3.23	1.61	0	0	0	9.14
S	4.97	1.88	0.4	0.13	0	0	7.38
SW	10.75	8.33	0.13	0	0	0	19.21
W	11.29	9.14	2.96	0	0	0	23.39
NW	6.85	3.9	3.23	0.13	0	0	14.11
Summary	49.45	37.5	12.76	0.26	0	0	100



WIND DIRECTION



WIND DIRECTION (WD) hourly averages

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

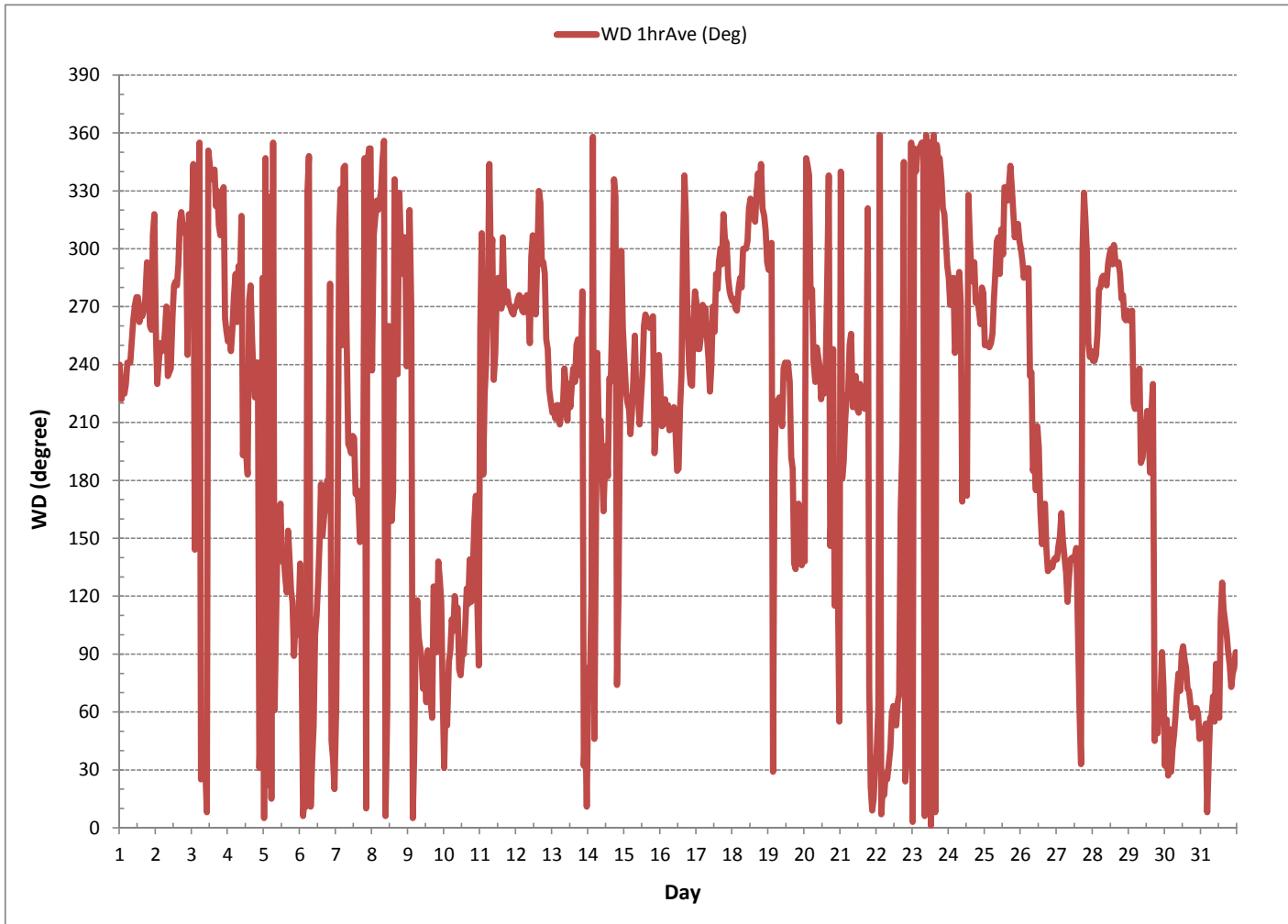
STATUS FLAG CODES

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

LAST CALIBRATION:	January 26, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	HRS	OPERATIONAL TIME:	744	HRS
STANDARD DEVIATION:	96.14		AMD OPERATION UPTIME:	100.0	%

WIND DIRECTION (WD) hourly averages



STANDARD DEVIATION WIND DIRECTION



STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	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.	
HOUR START	HOUR END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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		16	13	16	14	15	20	18	19	21	21	22	22	22	23	22	23	22	22	20	19	19	27	18	18	24	
2		20	13	17	18	17	18	18	20	19	22	20	25	26	22	27	25	23	17	14	9	5	16	24	24	24	
3		3	8	50	12	36	14	21	26	27	30	27	27	21	19	18	18	16	16	16	16	14	16	15	18	24	
4		21	14	13	15	12	15	31	33	23	23	22	15	17	22	43	18	26	20	16	15	15	33	41	21	24	
5		20	13	20	59	10	16	15	55	49	23	24	30	61	47	61	38	29	25	18	28	25	23	22	20	24	
6		14	24	15	17	28	13	15	26	30	35	50	43	59	44	42	43	21	16	13	20	28	28	38	23	24	
7		23	29	9	7	30	11	12	31	42	23	36	24	43	31	18	17	16	16	18	33	17	11	15	13	24	
8		27	16	19	12	9	12	12	18	21	26	44	39	24	52	55	14	19	15	10	8	9	10	14	20	24	
9		8	9	11	14	36	20	17	18	21	25	24	23	26	23	23	22	20	26	18	22	24	18	28	28	24	
10		23	34	24	20	17	35	28	28	48	22	32	32	24	36	48	66	61	30	21	14	14	20	45	40	24	
11		37	12	55	16	17	8	14	16	16	41	20	25	24	48	28	18	21	19	18	17	18	18	17	18	24	
12		19	18	19	17	18	18	20	19	22	23	27	24	23	26	23	19	20	19	15	13	14	12	11	6	24	
13		6	7	7	9	9	9	10	11	18	23	20	20	22	22	30	19	23	20	15	13	41	36	21	21	24	
14		47	28	59	18	51	68	30	24	48	30	57	20	21	32	29	17	29	17	47	45	44	26	20	21	24	
15		20	21	13	13	13	31	22	20	27	24	13	27	27	26	24	23	24	21	17	15	36	16	15	8	24	
16		13	14	10	9	9	10	11	10	10	13	15	13	15	18	19	24	16	19	23	16	27	13	16	16	24	
17		15	15	16	18	16	16	19	22	20	19	21	23	23	22	24	21	19	18	20	15	12	14	18	18	24	
18		19	18	18	19	18	17	18	17	18	21	20	19	19	20	20	19	20	17	17	12	9	9	6	8	24	
19		6	8	6	32	33	12	15	18	24	22	28	28	21	28	23	13	16	24	17	18	14	18	23	16	24	
20		39	11	3	3	12	7	14	18	26	24	35	20	34	29	24	29	41	50	38	19	27	15	16	33	24	
21		36	38	10	10	14	15	19	22	12	14	22	18	21	28	29	20	20	18	20	28	15	17	17	20	24	
22		22	42	21	20	21	21	21	22	22	23	23	22	20	21	22	26	20	17	20	19	19	45	43	69	24	
23		18	13	14	18	17	17	17	17	21	19	16	18	20	16	18	20	17	15	15	12	12	10	18	13	24	
24		15	18	15	14	18	17	14	19	27	46	26	17	47	19	29	25	25	21	17	17	20	20	18	17	24	
25		21	19	20	19	21	20	20	19	19	18	27	18	18	18	19	19	17	15	14	13	11	11	10	9	24	
26		8	6	11	9	9	6	20	22	38	20	44	28	53	48	52	40	32	16	15	14	12	13	13	13	24	
27		13	14	14	9	13	13	22	20	17	15	15	15	16	21	22	18	17	13	13	11	10	19	19	19	24	
28		19	18	20	22	19	19	18	18	18	20	18	18	19	19	19	20	20	16	16	18	16	16	16	14	24	
29		16	13	12	11	14	18	16	46	30	17	21	24	28	49	48	27	36	36	33	27	27	25	21	18	24	
30		25	28	17	20	17	20	20	22	22	23	23	21	21	22	22	23	22	22	19	19	19	18	18	20	24	
31		19	19	21	20	19	19	19	19	27	20	20	20	18	28	17	18	16	18	16	17	21	19	19	25	24	

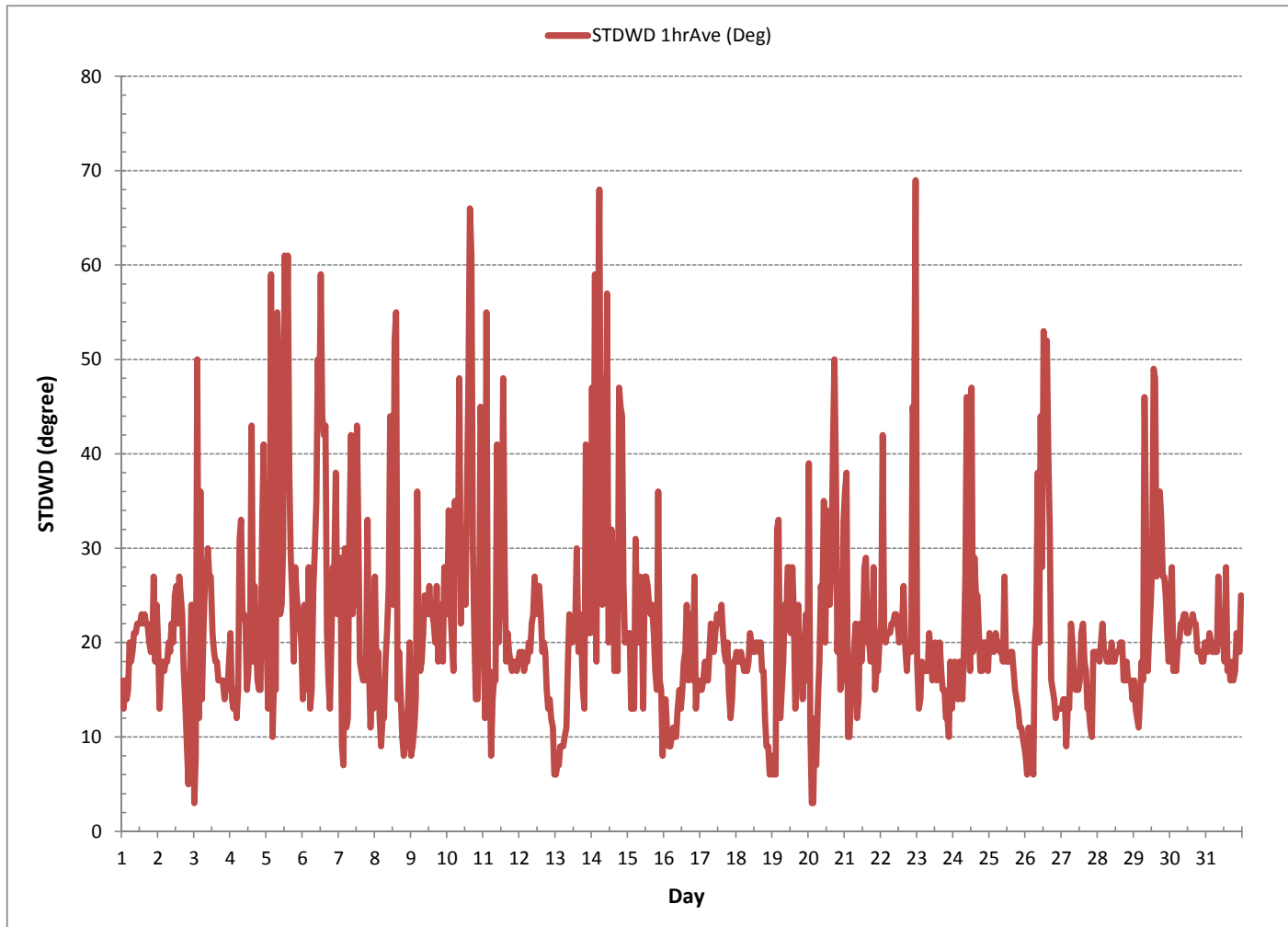
STATUS FLAG CODES

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: January 26, 2016

CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 744 HRS

STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees



APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

VOC RESULTS

Maxxam Analytics

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

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: 2414
 Station ID: LICA-37 Installation Date/Time (mst): Aug 2, 2016 @ 15:45
 Sample ID: LICA/VOC/Bonnyville/Aug 4, 2016 Removal Date/Time (mst): Aug 8, 2016 @ 15:35

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Aug 4, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Aug 5, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.0</u>	<u>+18.5</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: July 4, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: April 5, 2016 (due every 6 months)

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

Comments: Date of last audit: July 4, 2016

The canister does not have a pressure gauge.

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Aug 8, 2016

Sample ID: 16080099-001

Customer ID: LICA
 Cust Samp ID: LICA/NMHC-
 VOC/Bonnyville/Aug 6, 2016



Volatile Organics Data Results

Date: August 4, 2016
Canister ID: 2414

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	3.35
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	0.12
1,2,3-Trimethylbenzene	0.49
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	1.42
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.27
1,3-Butadiene	0.21
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.85
1-Hexene	0.11
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.04
2,3-Dimethylpentane	0.19
2,4-Dimethylpentane	0.04
2-Methylheptane	0.13
2-Methylhexane	0.54
2-Methylpentane	0.40
3-Methylheptane	0.09
3-Methylhexane	0.75
3-Methylpentane	0.26
Acetone	173
Acrolein	< 0.3
Benzene	0.30
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.02
Carbon disulfide	10.2
Carbon tetrachloride	0.07
Chlorobenzene	< 0.02
Chloroethane	0.05
Chloroform	0.02
Chloromethane	0.50
cis-1,2-Dichloroethene	0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.22
cis-2-Pentene	0.21
Cyclohexane	0.47
Cyclopentane	0.05
Dibromochloromethane	< 0.01
Ethanol	77.0
Ethyl acetate	7.5
Ethylbenzene	4.65
Freon-11	0.36

Volatile Organics Data Results

Date: August 4, 2016
Canister ID: 2414

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	< 0.02
Freon-12	0.51
Hexachloro-1,3-butadiene	< 0.50
Isobutane	3.05
Isopentane	2.56
Isoprene	0.53
Isopropyl alcohol	13.4
Isopropylbenzene	0.09
m,p-Xylene	12.6
m-Diethylbenzene	0.05
m-Ethyltoluene	0.61
Methyl butyl ketone	1.37
Methyl ethyl ketone	18.2
Methyl isobutyl ketone	6.6
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.29
Methylcyclopentane	0.40
Methylene chloride	0.9
n-Butane	1.23
n-Decane	0.07
n-Dodecane	< 0.4
n-Heptane	1.02
n-Hexane	0.75
n-Nonane	0.17
n-Octane	0.28
n-Pentane	0.4
n-Propylbenzene	0.21
n-Undecane	< 0.5
Naphthalene	9.0
o-Ethyltoluene	0.33
o-Xylene	3.61
p-Diethylbenzene	0.14
p-Ethyltoluene	0.30
Styrene	0.11
Tetrachloroethylene	7.54
Tetrahydrofuran	< 0.4
Toluene	86.4
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.36
trans-2-Pentene	0.29
Trichloroethylene	6.28
Vinyl acetate	6.8
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: 1519
 Station ID: LICA-37 Installation Date/Time (mst): Aug 8, 2016 @ 15:35
 Sample ID: LICA/VOC/Bonnyville/Aug 10, 2016 Removal Date/Time (mst): Aug 11, 2016 @ 09:19

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Aug 10, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Aug 11, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.1</u>	<u>+20.1</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: July 4, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: April 5, 2016 (due every 6 months)

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

Comments: Date of last audit: July 4, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Aug 11, 2016

Sample ID: 16080119-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Aug 10, 2016



Volatile Organics Data Results

Date: August 10, 2016
Canister ID: 1519

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.09
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.02
1,3-Butadiene	0.06
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.15
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.02
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	0.02
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	0.04
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	0.05
Acetone	10.2
Acrolein	0.4
Benzene	5.19
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.02
Carbon disulfide	2.65
Carbon tetrachloride	0.08
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.74
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	< 0.01
Dibromochloromethane	< 0.01
Ethanol	3.8
Ethyl acetate	< 0.4
Ethylbenzene	0.08
Freon-11	0.24

Volatile Organics Data Results

Date: August 10, 2016
Canister ID: 1519

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	< 0.02
Freon-12	0.52
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.78
Isopentane	0.51
Isoprene	0.17
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.16
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	0.8
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.13
Methylcyclopentane	0.07
Methylene chloride	< 0.3
n-Butane	0.56
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.03
n-Hexane	0.06
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.2
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	98.3
o-Ethyltoluene	0.03
o-Xylene	0.08
p-Diethylbenzene	0.05
p-Ethyltoluene	< 0.07
Styrene	0.56
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.36
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.06
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: S 5673
 Station ID: LICA 37 Installation Date/Time (mst): Aug 11, 2016 @ 09:19
 Sample ID: LICA/VOC/Bonnyville/Aug 16, 2016 Removal Date/Time (mst): Aug 19, 2016 @ 12:59

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Aug 16, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Aug 17, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.8</u>	<u>+19.1</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: July 4, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 5, 2016 (due every 6 months)

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

Comments: Date of last audit: July 4, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Aug 19, 2016

Sample ID: 16080238-003
 Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Aug 16, 2016



Volatile Organics Data Results

Date: August 16, 2016
Canister ID: S5673

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	< 0.01
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	0.06
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	< 0.01
2-Methylpentane	0.03
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.03
Acetone	5.4
Acrolein	< 0.3
Benzene	0.04
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.03
Carbon disulfide	0.33
Carbon tetrachloride	0.10
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	< 0.02
Chloromethane	0.66
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	2.1
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.25

Volatile Organics Data Results

Date: August 16, 2016
Canister ID: S5673

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.58
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.24
Isopentane	0.24
Isoprene	0.81
Isopropyl alcohol	0.5
Isopropylbenzene	< 0.01
m,p-Xylene	0.04
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	0.4
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	0.27
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.01
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	0.08
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: 1531
 Station ID: LICA 37 Installation Date/Time (mst): Aug 19, 2016 @ 12:59
 Sample ID: LICA/VOC/Bonnyville/Aug 22, 2016 Removal Date/Time (mst): Aug 23, 2016 @ 11:21

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Aug 22, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Aug 23, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.2</u>	<u>+17.7</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: July 4, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 5, 2016 (due every 6 months)

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

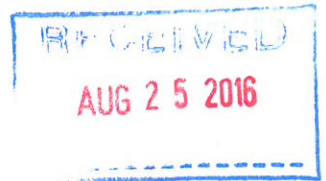
Comments: Date of last audit : July 4, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Aug 23, 2016

Sample ID: 16080288-003

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Aug 22, 2016



Volatile Organics Data Results

Date: August 22, 2016
Canister ID: 1531

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
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	0.03
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	0.03
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	0.05
2-Methylpentane	0.05
3-Methylheptane	< 0.02
3-Methylhexane	0.02
3-Methylpentane	0.03
Acetone	3.0
Acrolein	< 0.3
Benzene	0.03
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	0.16
Carbon tetrachloride	0.11
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	0.03
Cyclopentane	0.01
Dibromochloromethane	< 0.01
Ethanol	1.3
Ethyl acetate	< 0.4
Ethylbenzene	0.01
Freon-11	0.30

Volatile Organics Data Results

Date: August 22, 2016
Canister ID: 1531

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.68
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.30
Isopentane	0.28
Isoprene	0.28
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	0.04
Methylene chloride	< 0.3
n-Butane	0.37
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.01
n-Hexane	0.04
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.06
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: S 5683
 Station ID: LICA 37 Installation Date/Time (mst): Aug 23, 2016 @ 11:21
 Sample ID: LICA/VOC/Bonnyville/Aug 28, 2016 Removal Date/Time (mst): Aug 31, 2016 @ 10:56

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Aug 28, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Aug 29, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.3</u>	<u>+18.5</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: July 4, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 5, 2016 (due every 6 months)

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

Comments: Date of last audit : July 4, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Aug 31, 2016

Sample ID: 16090012-002

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/Aug 28, 2016



Volatile Organics Data Results

Date: August 28, 2016
Canister ID: S5683

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
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	0.03
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	0.03
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	0.05
2-Methylpentane	0.05
3-Methylheptane	< 0.02
3-Methylhexane	0.02
3-Methylpentane	0.03
Acetone	2.1
Acrolein	< 0.3
Benzene	0.03
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	0.08
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.50
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	0.01
Dibromochloromethane	< 0.01
Ethanol	0.9
Ethyl acetate	< 0.4
Ethylbenzene	0.01
Freon-11	0.31

Volatile Organics Data Results

Date: August 28, 2016
Canister ID: S5683

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.71
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.14
Isopentane	0.28
Isoprene	0.10
Isopropyl alcohol	0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.04
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.02
Methylcyclopentane	0.03
Methylene chloride	< 0.3
n-Butane	0.39
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	0.02
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.06
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: 16080099-001

Customer ID: LICA

Cust Samp ID: LICA/NMHC-
VOC/Bonnyville/Aug 6, 2016



TISCH PUF PLUS Sample Collection Data Sheet

Client:	LICA	Puf+ S/N:	9801
Location:	Bonnyville - AER	Motor S/N:	1139/ 100 - 1015
Station ID:	LICA 37	Installation Date/Time:	Aug 2, 2016/ 15:51
Field Sample ID:	LICA/PUF/Bonnyville/Aug 4, 2016	Removal Date/Time:	Aug 2, 2016/ 15:47

Sample Data Collection Information

Sample Date:	Aug 4, 2016	Average Pressure (mmHg)	704
Start Time (mst):	00:00	Average Flow (Q _{std})	229
End Time (mst):	00:00 Aug 5, 2016	Average Temperature (°C)	18.0°
Elapsed Time (Hours):	24.0	Volume (V _{std} m ³)	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:	July 4, 2016	
Other observations?		

Deployed By:	Alex Yakupov	
Collected By:	Alex Yakupov	Date: Aug 8, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: August 4, 2016
PUF S/N: 9801

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.05
2-Methylnaphthalene	0.10
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.01
Acenaphthylene	0.05
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	0.23
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	0.06
Fluorene	0.04
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.05
Perylene	< 0.01
Phenanthrene	0.27
Pyrene	0.06
Retene	0.02

Sample ID: 16080119-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Aug 10, 2016

TISCH PUF PLUS Sample Collection Data Sheet			
Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-03</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139/100-1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Aug 8, 2016/15:47</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Aug 10, 2016</u>	Removal Date/Time:	<u>Aug 11, 2016 / 09:11</u>
Sample Data Collection Information			
Sample Date:	<u>Aug 10, 2016</u>	Average Pressure (mmHg)	<u>700</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>Aug 11, 2016</u>	Average Temperature (°C)	<u>17.6°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.20</u>
Sample Recovery Checklist			
(circle one)			
Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES		<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>July 4, 2016</u>		
Other observations?			
Deployed By:	<u>Alex Yakupov</u>		
Collected By:	<u>Alex Yakupov</u>	<u>Date: Aug 11, 2016</u>	



Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: August 10, 2016
PUF S/N: TE03

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.04
2-Methylnaphthalene	0.10
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	0.02
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	0.12
Fluorene	0.04
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.06
Perylene	< 0.01
Phenanthrene	0.52
Pyrene	0.07
Retene	< 0.01

Sample ID: 16080238-004

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Aug 16, 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-11</u>
Location:	<u>Bonnyville AER</u>	Motor S/N:	<u>1139/100-1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Aug 11, 2016/09:11</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Aug 16, 2016</u>	Removal Date/Time:	<u>Aug 19, 2016 / 12:53</u>

Sample Data Collection Information

Sample Date:	<u>Aug 16, 2016</u>	Average Pressure (mmHg)	<u>703</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Aug 17, 2016</u>	Average Temperature (°C)	<u>20.3°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.18</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<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>July 4, 2016</u>	
Other observations?		



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Aug 19, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: August 16, 2016
PUF S/N: TE11

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.02
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	0.03
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	0.07
Fluorene	0.04
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.02
Perylene	< 0.01
Phenanthrene	0.36
Pyrene	0.05
Retene	0.62

Customer ID: LICA
 Cust Samp ID: LICA/PUF/Bonnyville/Aug 22, 2016

TISCH PUF PLUS Sample Collection Data Sheet			
Client: <u>LICA</u>	Puf+ S/N: <u>TE-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>Aug 19, 2016/12:53</u>		
Field Sample ID: <u>LICA/PUF/Bonnyville/Aug 22, 2016</u>	Removal Date/Time: <u>Aug 23, 2016/10:57</u>		
Sample Data Collection Information			
Sample Date: <u>Aug 22, 2016</u>	Average Pressure (mmHg): <u>693</u>		
Start Time (mst): <u>00:00</u>	Average Flow (Q _{std}): <u>229</u>		
End Time (mst): <u>Aug 23, 2016, 00:00</u>	Average Temperature (°C): <u>17.1°</u>		
Elapsed Time (Hours): <u>24.0</u>	Volume (V _{std} m ³): <u>330.20</u>		
Sample Recovery Checklist			
(circle one)			
Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO	<div style="border: 2px solid blue; padding: 5px; transform: rotate(-2deg); display: inline-block;"> <p style="margin: 0;">RECEIVED</p> <p style="margin: 0; color: red;">AUG 25 2016</p> </div>
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>July 4, 2016</u>		
Other observations?	<u>n/a</u>		
Deployed By:	<u>Alex Yakupov</u>		
Collected By:	<u>Alex Yakupov</u>	Date:	<u>Aug 23, 2016</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: August 22, 2016
PUF S/N: TE01

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.02
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	0.03
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	0.02
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.02
Perylene	< 0.01
Phenanthrene	0.21
Pyrene	0.03
Retene	0.02

Sample ID: 16090012-003

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Aug 28, 2016

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>Aug 23, 2016/ 10:57</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Aug 28, 2016</u>	Removal Date/Time:	<u>Aug 31, 2016/ 11:16</u>

Sample Data Collection Information

Sample Date:	<u>Aug 28, 2016</u>	Average Pressure (mmHg)	<u>702</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Aug 29, 2016</u>	Average Temperature (°C)	<u>10.8°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.19</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	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>July 4, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	Date: <u>Aug 31, 2016</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: August 28, 2016
PUF S/N: P1301

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.02
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	< 0.01
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	0.04
Perylene	< 0.01
Phenanthrene	0.12
Pyrene	0.02
Retene	0.01

NMHC CANISTER RESULTS

Sample ID: 16080050-001

AIR FCD-01320/2

Customer ID: LICA
Cust Samp ID: LICA/NMHC-VOC/
Bonnyville/Aug. 4, 2016



VOC Sample Collection Data Sheet

Client: LICA
Location: Bonnyville- AER
Station ID: LICA 37
Field Sample ID: LICA/NMHC-VOC/Bonnyville/ A.V. Aug Feb 4, 2016
Sampler S/N: n/a
Canister ID: 1522
Canister Installation Date/Time: July 20, 2016 / 18:34
Canister Removal Date/Time: August 4, 2016 / 12:36

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>August 4, 2016</u>	<u>06:25</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 Pressure (psig)
<u>-27.0</u>	<u>-7.3</u>

Canister valve open prior to sampling?: YES / NO
Timer set to 0.00 minutes prior to sampling? YES / NO - n/a
Canister valve closed prior to disconnection?: YES / NO

Comments: NMHC- canister

Technician Signature: Alex Yakupov Date: August 4, 2016

Volatile Organics Data Results (NMHC Canister System)

Date: August 4, 2016
Canister ID: 1522

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2-Tetrachloroethane	< 0.03
1,1,2-Trichloroethane	< 0.03
1,1-Dichloroethane	< 0.03
1,1-Dichloroethylene	< 0.05
1,2,3-Trimethylbenzene	0.96
1,2,4-Trichlorobenzene	< 1.1
1,2,4-Trimethylbenzene	1.98
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.48
1,3-Butadiene	0.07
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	1.75
1-Hexene	0.22
1-Pentene	0.65
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.05
2,3,4-Trimethylpentane	0.25
2,3-Dimethylbutane	0.40
2,3-Dimethylpentane	0.68
2,4-Dimethylpentane	0.12
2-Methylheptane	2.09
2-Methylhexane	0.94
2-Methylpentane	0.84
3-Methylheptane	0.74
3-Methylhexane	2.42
3-Methylpentane	0.66
Acetone	94.6
Acrolein	1.0
Benzene	2.27
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.01
Carbon disulfide	33.8
Carbon tetrachloride	0.08
Chlorobenzene	< 0.03
Chloroethane	0.11
Chloroform	< 0.03
Chloromethane	0.65
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.55
cis-2-Pentene	0.40
Cyclohexane	1.73
Cyclopentane	0.30
Dibromochloromethane	< 0.01
Ethanol	18.3
Ethyl acetate	< 0.5
Ethylbenzene	7.37
Freon-11	0.20

Volatile Organics Data Results (NMHC Canister System)

Date: August 4, 2016
Canister ID: 1522

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.05
Freon-114	< 0.03
Freon-12	0.43
Hexachloro-1,3-butadiene	< 0.66
Isobutane	2.65
Isopentane	4.15
Isoprene	0.39
Isopropyl alcohol	3.0
Isopropylbenzene	0.35
m,p-Xylene	17.6
m-Diethylbenzene	0.06
m-Ethyltoluene	1.93
Methyl butyl ketone	7.86
Methyl ethyl ketone	85.6
Methyl isobutyl ketone	1.1
Methyl methacrylate	< 0.09
Methyl tert butyl ether	< 0.04
Methylcyclohexane	3.83
Methylcyclopentane	1.67
Methylene chloride	< 0.4
n-Butane	4.04
n-Decane	0.19
n-Dodecane	< 0.5
n-Heptane	7.35
n-Hexane	1.44
n-Nonane	1.22
n-Octane	3.98
n-Pentane	2.0
n-Propylbenzene	0.91
n-Undecane	< 0.7
Naphthalene	5.8
o-Ethyltoluene	0.89
o-Xylene	7.08
p-Diethylbenzene	0.22
p-Ethyltoluene	1.14
Styrene	0.07
Tetrachloroethylene	0.06
Tetrahydrofuran	< 0.5
Toluene	41.2
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	0.80
trans-2-Pentene	0.66
Trichloroethylene	< 0.05
Vinyl acetate	9.4
Vinyl chloride	< 0.03

Sample ID: 16080099-001

AIR FCD-01320/2

Customer ID: LICA

Cust Samp ID: LICA/NMHC-
VOC/Bonnyville/Aug 6, 2016

Maxxam

VOC Sample Collection Data Sheet

Client: LICA

Sampler S/N: n/a

Location: Bonnyville - AER

Canister ID: S 5650

Station ID: LICA 37

Canister Installation Date/Time: Aug 4, 2016 / 12:36

Field Sample ID: LICA/NMHC-VOC/Bonnyville/Aug 6, 2016

Canister Removal Date/Time: Aug 8, 2016 / 16:06

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Aug 6, 2016</u>	<u>21:55</u>	<u>n/a</u>	<u>n/a</u>

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
<u>n/a</u>	<u>n/a</u>	<u>n/a</u>

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
<u>-27.5</u>	<u>-3.5</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: Aug 8, 2016

Volatile Organics Data Results (NMHC Canister System)

Date: August 6, 2016
Canister ID: S5650

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	< 1.2
1,2,4-Trimethylbenzene	0.06
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	< 0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.03
1,3-Butadiene	0.25
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.6
1,4-Dioxane	< 0.6
1-Butene	0.37
1-Hexene	0.03
1-Pentene	0.06
2,2,4-Trimethylpentane	0.08
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	0.03
2,3-Dimethylbutane	< 0.03
2,3-Dimethylpentane	0.06
2,4-Dimethylpentane	0.03
2-Methylheptane	0.02
2-Methylhexane	< 0.01
2-Methylpentane	0.19
3-Methylheptane	< 0.03
3-Methylhexane	0.05
3-Methylpentane	0.10
Acetone	4.4
Acrolein	0.8
Benzene	1.14
Benzyl chloride	< 0.6
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.01
Carbon disulfide	0.07
Carbon tetrachloride	0.08
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	< 0.03
Chloromethane	0.47
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.06
cis-2-Butene	0.06
cis-2-Pentene	0.03
Cyclohexane	0.05
Cyclopentane	0.04
Dibromochloromethane	< 0.01
Ethanol	4.3
Ethyl acetate	< 0.6
Ethylbenzene	0.08
Freon-11	0.22

Volatile Organics Data Results (NMHC Canister System)

Date: August 6, 2016
Canister ID: S5650

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.05
Freon-114	< 0.03
Freon-12	0.44
Hexachloro-1,3-butadiene	< 0.74
Isobutane	0.50
Isopentane	0.49
Isoprene	1.90
Isopropyl alcohol	< 0.6
Isopropylbenzene	< 0.01
m,p-Xylene	0.19
m-Diethylbenzene	< 0.06
m-Ethyltoluene	< 0.12
Methyl butyl ketone	< 0.74
Methyl ethyl ketone	0.7
Methyl isobutyl ketone	< 0.6
Methyl methacrylate	< 0.10
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.08
Methylcyclopentane	0.11
Methylene chloride	< 0.4
n-Butane	0.68
n-Decane	< 0.09
n-Dodecane	< 0.6
n-Heptane	0.06
n-Hexane	0.13
n-Nonane	0.02
n-Octane	< 0.03
n-Pentane	0.4
n-Propylbenzene	< 0.07
n-Undecane	< 0.7
Naphthalene	1.9
o-Ethyltoluene	< 0.01
o-Xylene	0.07
p-Diethylbenzene	< 0.06
p-Ethyltoluene	< 0.10
Styrene	< 0.06
Tetrachloroethylene	< 0.06
Tetrahydrofuran	< 0.6
Toluene	0.44
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.06
trans-2-Butene	0.04
trans-2-Pentene	0.06
Trichloroethylene	< 0.06
Vinyl acetate	< 0.6
Vinyl chloride	< 0.03

Sample ID: 16080099-001

AIR FCD-01320/2

Customer ID: LICA
Cust Samp ID: LICA/NMHC-
VOC/Bonnyville/Aug 6, 2016

Maxxam

VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: n/a
 Location: Bonnyville - AER Canister ID: 15005
 Station ID: LICA 37 Canister Installation Date/Time: Aug 8, 2016 / 16:06
 Field Sample ID: LICA/NMHC-BVOC/Bonnyville/ Canister Removal Date/Time: Aug 9, 2016 / 11:41
A.Y. August 8 / 20:55

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Aug 8, 2016	20:55	n/a	n/a

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
n/a	n/a	n/a

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
-27.0	n/a - ?

A.Y.



Canister valve open prior to sampling?: YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments: NMHC canister

Canister does not have a pressure gauge. There is no possibility to record "final canister vacuum"

Technician Signature: Alex Vakupov

Date: August 9, 2016

Volatile Organics Data Results (NMHC Canister System)

Date: August 8, 2016
Canister ID: 15005

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2-Tetrachloroethane	< 0.03
1,1,2-Trichloroethane	< 0.03
1,1-Dichloroethane	< 0.03
1,1-Dichloroethylene	< 0.05
1,2,3-Trimethylbenzene	< 0.07
1,2,4-Trichlorobenzene	< 1.0
1,2,4-Trimethylbenzene	< 0.04
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	< 0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.03
1,3-Butadiene	< 0.03
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.31
1-Hexene	< 0.03
1-Pentene	0.16
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.37
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.27
2,3-Dimethylpentane	0.07
2,4-Dimethylpentane	0.04
2-Methylheptane	0.02
2-Methylhexane	0.23
2-Methylpentane	1.20
3-Methylheptane	< 0.03
3-Methylhexane	0.13
3-Methylpentane	0.61
Acetone	6.4
Acrolein	< 0.4
Benzene	0.19
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.08
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	< 0.03
Chloromethane	0.44
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.33
cis-2-Pentene	0.24
Cyclohexane	0.09
Cyclopentane	0.12
Dibromochloromethane	< 0.01
Ethanol	6.9
Ethyl acetate	< 0.5
Ethylbenzene	0.04
Freon-11	0.22

Volatile Organics Data Results (NMHC Canister System)

Date: August 8, 2016
Canister ID: 15005

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.06
Freon-114	< 0.03
Freon-12	0.42
Hexachloro-1,3-butadiene	< 0.66
Isobutane	7.24
Isopentane	13.3
Isoprene	0.90
Isopropyl alcohol	< 0.5
Isopropylbenzene	< 0.01
m,p-Xylene	0.08
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.10
Methyl butyl ketone	< 0.66
Methyl ethyl ketone	0.5
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.09
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.09
Methylcyclopentane	0.41
Methylene chloride	< 0.4
n-Butane	3.75
n-Decane	< 0.08
n-Dodecane	< 0.5
n-Heptane	0.06
n-Hexane	0.23
n-Nonane	< 0.01
n-Octane	< 0.03
n-Pentane	1.7
n-Propylbenzene	< 0.07
n-Undecane	< 0.7
Naphthalene	< 0.7
o-Ethyltoluene	< 0.01
o-Xylene	0.03
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.09
Styrene	< 0.05
Tetrachloroethylene	< 0.05
Tetrahydrofuran	< 0.5
Toluene	0.27
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	0.45
trans-2-Pentene	0.46
Trichloroethylene	< 0.05
Vinyl acetate	0.9
Vinyl chloride	< 0.03
1,1,1-Trichloroethane	3.35

Maxxam

VOC Sample Collection Data Sheet

Sample ID: 16080238-005

Customer ID: LICA
Cust Samp ID: LICA/NMHC-VOC/Bonnyville/Aug 18, 2016

Client: LICA
Location: Bonnyville - AER
Station ID: LICA 37
Field Sample ID: LICA/NMHC-VOC/Bonnyville/
Aug 18, 2016

Sampler S/N: n/a
Canister ID: 2644
Canister Installation Date/Time: Aug 9, 2016 / 11:53
Canister Removal Date/Time: Aug 19, 2016 / 12:34

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Aug 18, 2016</u>	<u>05:10</u>	n/a	n/a

Flow Settings		
Meter Reading (scm)	Pot Set Pt.	Pump Pressure Setting (psig)
n/a	n/a	n/a

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
<u>-27.4</u>	<u>-4.0</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:** Aug 19, 2016

Volatile Organics Data Results (NMHC Canister System)

Date: August 18, 2016
Canister ID: 2644

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	0.03
1,1,2,2-Tetrachloroethane	< 0.03
1,1,2-Trichloroethane	< 0.03
1,1-Dichloroethane	0.03
1,1-Dichloroethylene	< 0.05
1,2,3-Trimethylbenzene	< 0.07
1,2,4-Trichlorobenzene	< 1.1
1,2,4-Trimethylbenzene	0.05
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.03
1,2-Dichloropropane	0.04
1,3,5-Trimethylbenzene	0.04
1,3-Butadiene	0.06
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.15
1-Hexene	< 0.03
1-Pentene	0.06
2,2,4-Trimethylpentane	0.04
2,2-Dimethylbutane	0.03
2,3,4-Trimethylpentane	0.05
2,3-Dimethylbutane	< 0.03
2,3-Dimethylpentane	0.05
2,4-Dimethylpentane	0.03
2-Methylheptane	0.03
2-Methylhexane	< 0.01
2-Methylpentane	0.12
3-Methylheptane	0.05
3-Methylhexane	0.06
3-Methylpentane	0.07
Acetone	2.5
Acrolein	6.1
Benzene	0.10
Benzyl chloride	< 0.5
Bromodichloromethane	0.03
Bromoform	< 0.03
Bromomethane	0.05
Carbon disulfide	0.22
Carbon tetrachloride	0.11
Chlorobenzene	0.03
Chloroethane	0.04
Chloroform	0.05
Chloromethane	0.60
cis-1,2-Dichloroethene	0.02
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.03
cis-2-Pentene	0.04
Cyclohexane	0.05
Cyclopentane	< 0.01
Dibromochloromethane	0.02
Ethanol	1.5
Ethyl acetate	< 0.5
Ethylbenzene	0.06
Freon-11	0.26

Volatile Organics Data Results (NMHC Canister System)

Date: August 18, 2016
Canister ID: 2644

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.09
Freon-114	0.04
Freon-12	0.53
Hexachloro-1,3-butadiene	< 0.66
Isobutane	0.47
Isopentane	0.83
Isoprene	0.47
Isopropyl alcohol	< 0.5
Isopropylbenzene	0.02
m,p-Xylene	0.11
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.11
Methyl butyl ketone	< 0.66
Methyl ethyl ketone	0.4
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.09
Methyl tert butyl ether	0.04
Methylcyclohexane	0.04
Methylcyclopentane	0.06
Methylene chloride	< 0.4
n-Butane	0.92
n-Decane	< 0.08
n-Dodecane	< 0.5
n-Heptane	0.05
n-Hexane	0.09
n-Nonane	0.03
n-Octane	0.04
n-Pentane	0.2
n-Propylbenzene	< 0.07
n-Undecane	< 0.7
Naphthalene	0.7
o-Ethyltoluene	0.02
o-Xylene	0.06
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.09
Styrene	< 0.05
Tetrachloroethylene	< 0.05
Tetrahydrofuran	< 0.5
Toluene	0.13
trans-1,2-Dichloroethylene	0.03
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	0.05
trans-2-Pentene	0.06
Trichloroethylene	< 0.05
Vinyl acetate	< 0.5
Vinyl chloride	< 0.03

Sample ID: 16090012-001

Maxxam

VOC Sample Collection Data Sheet

Customer ID: LICA
 Cust Samp ID: LICA/NMHC-
 VOC/Bonnyville/Aug 30,
 2016

Client: LICA Sampler S/N: n/a
 Location: Bonnyville - AER Canister ID: 1521
 Station ID: LICA 37 Canister Installation Date/Time: Aug 19, 2016 / 12:34
 Field Sample ID: LICA/NMHC-VOC/Bonnyville/Aug 30, 2016 Canister Removal Date/Time: Aug 30, 2016 / 10:44 A.Y.

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Aug 30, 2016</u>	<u>07:25</u>	<u>n/a</u>	<u>n/a</u>

Flow Settings		
Meter Reading (scm)	Pot Set Pt.	Pump Pressure Setting (psig)
<u>n/a</u>	<u>n/a</u>	<u>n/a</u>

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
<u>-27.5</u>	<u>-2.5</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: Aug 31, 2016

Volatile Organics Data Results (NMHC Canister System)

Date: August 30, 2016
Canister ID: 1521

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	< 0.07
1,2,3-Trimethylbenzene	< 0.08
1,2,4-Trichlorobenzene	< 1.3
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.05
1,2-Dichloroethane	< 0.02
1,2-Dichloropropane	< 0.02
1,3,5-Trimethylbenzene	< 0.03
1,3-Butadiene	0.05
1,3-Dichlorobenzene	< 0.5
1,4-Dichlorobenzene	< 0.7
1,4-Dioxane	< 0.7
1-Butene	0.16
1-Hexene	< 0.03
1-Pentene	0.19
2,2,4-Trimethylpentane	0.07
2,2-Dimethylbutane	0.05
2,3,4-Trimethylpentane	0.04
2,3-Dimethylbutane	0.14
2,3-Dimethylpentane	0.09
2,4-Dimethylpentane	0.04
2-Methylheptane	< 0.02
2-Methylhexane	0.10
2-Methylpentane	0.54
3-Methylheptane	< 0.03
3-Methylhexane	0.07
3-Methylpentane	0.30
Acetone	2.5
Acrolein	< 0.5
Benzene	0.12
Benzyl chloride	< 0.7
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.02
Carbon disulfide	0.11
Carbon tetrachloride	0.10
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	< 0.03
Chloromethane	0.48
cis-1,2-Dichloroethene	< 0.02
cis-1,3-Dichloropropene	< 0.07
cis-2-Butene	0.09
cis-2-Pentene	0.19
Cyclohexane	0.09
Cyclopentane	0.13
Dibromochloromethane	< 0.02
Ethanol	4.3
Ethyl acetate	< 0.7
Ethylbenzene	0.03
Freon-11	0.30

Volatile Organics Data Results (NMHC Canister System)

Date: August 30, 2016
Canister ID: 1521

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	< 0.03
Freon-12	0.69
Hexachloro-1,3-butadiene	< 0.84
Isobutane	1.52
Isopentane	3.76
Isoprene	0.24
Isopropyl alcohol	< 0.7
Isopropylbenzene	< 0.02
m,p-Xylene	0.08
m-Diethylbenzene	< 0.07
m-Ethyltoluene	< 0.13
Methyl butyl ketone	< 0.84
Methyl ethyl ketone	< 0.5
Methyl isobutyl ketone	< 0.7
Methyl methacrylate	< 0.12
Methyl tert butyl ether	< 0.05
Methylcyclohexane	0.06
Methylcyclopentane	0.25
Methylene chloride	< 0.5
n-Butane	7.49
n-Decane	< 0.10
n-Dodecane	< 0.7
n-Heptane	0.06
n-Hexane	0.32
n-Nonane	< 0.02
n-Octane	< 0.03
n-Pentane	1.6
n-Propylbenzene	< 0.08
n-Undecane	< 0.8
Naphthalene	< 0.8
o-Ethyltoluene	< 0.02
o-Xylene	0.04
p-Diethylbenzene	< 0.07
p-Ethyltoluene	< 0.12
Styrene	< 0.07
Tetrachloroethylene	< 0.07
Tetrahydrofuran	< 0.7
Toluene	0.17
trans-1,2-Dichloroethylene	< 0.02
trans-1,3-Dichloropropylene	< 0.07
trans-2-Butene	0.04
trans-2-Pentene	0.33
Trichloroethylene	< 0.07
Vinyl acetate	< 0.7
Vinyl chloride	< 0.03

Sample ID: 16090046-001



Customer ID: LICA
Cust Samp ID: LICA/NMHC-
VOC/Bonnyville/Aug 31,
2016

Maxxam

VOC Sample Collection Data Sheet

Client: LICA
Location: Bonnyville - AER
Station ID: LICA 37
Field Sample ID: LICA/NMHC-VOC/Bonnyville/
Aug 31, 2016

Sampler S/N: n/a
Canister ID: S 5623
Canister Installation Date/Time: Aug 31, 2016 / 10:44
Canister Removal Date/Time: Sept 02, 2016 / 11:44

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Aug 31, 2016</u>	<u>13:15</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>-27.4</u>	<u>-3.9</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: September 02, 2016

Volatile Organics Data Results (NMHC Canister System)

Date: August 31, 2016
Canister ID: S5623

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	< 0.08
1,2,4-Trichlorobenzene	< 1.3
1,2,4-Trimethylbenzene	0.06
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.05
1,2-Dichloroethane	< 0.02
1,2-Dichloropropane	< 0.02
1,3,5-Trimethylbenzene	< 0.03
1,3-Butadiene	0.05
1,3-Dichlorobenzene	< 0.5
1,4-Dichlorobenzene	< 0.6
1,4-Dioxane	< 0.6
1-Butene	0.17
1-Hexene	0.04
1-Pentene	0.28
2,2,4-Trimethylpentane	0.11
2,2-Dimethylbutane	0.07
2,3,4-Trimethylpentane	0.02
2,3-Dimethylbutane	0.33
2,3-Dimethylpentane	0.13
2,4-Dimethylpentane	0.08
2-Methylheptane	0.03
2-Methylhexane	< 0.02
2-Methylpentane	0.92
3-Methylheptane	< 0.03
3-Methylhexane	0.13
3-Methylpentane	0.51
Acetone	13.9
Acrolein	< 0.5
Benzene	0.61
Benzyl chloride	< 0.6
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.02
Carbon disulfide	1.79
Carbon tetrachloride	0.09
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	< 0.03
Chloromethane	0.48
cis-1,2-Dichloroethene	< 0.02
cis-1,3-Dichloropropene	< 0.06
cis-2-Butene	0.12
cis-2-Pentene	0.28
Cyclohexane	0.11
Cyclopentane	0.23
Dibromochloromethane	< 0.02
Ethanol	7.2
Ethyl acetate	< 0.6
Ethylbenzene	0.06
Freon-11	0.27


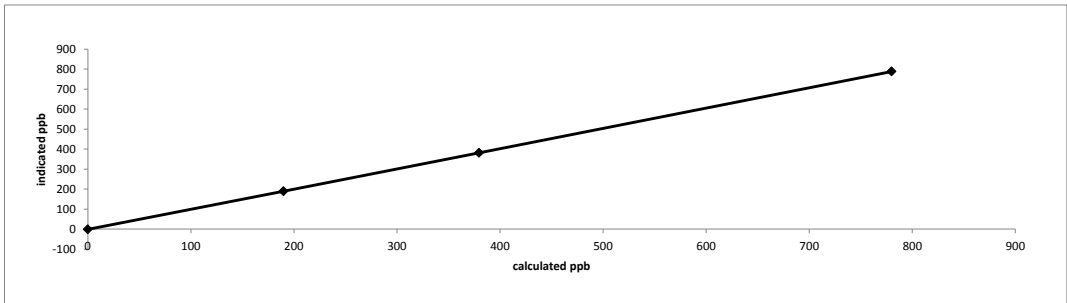
Volatile Organics Data Results (NMHC Canister System)

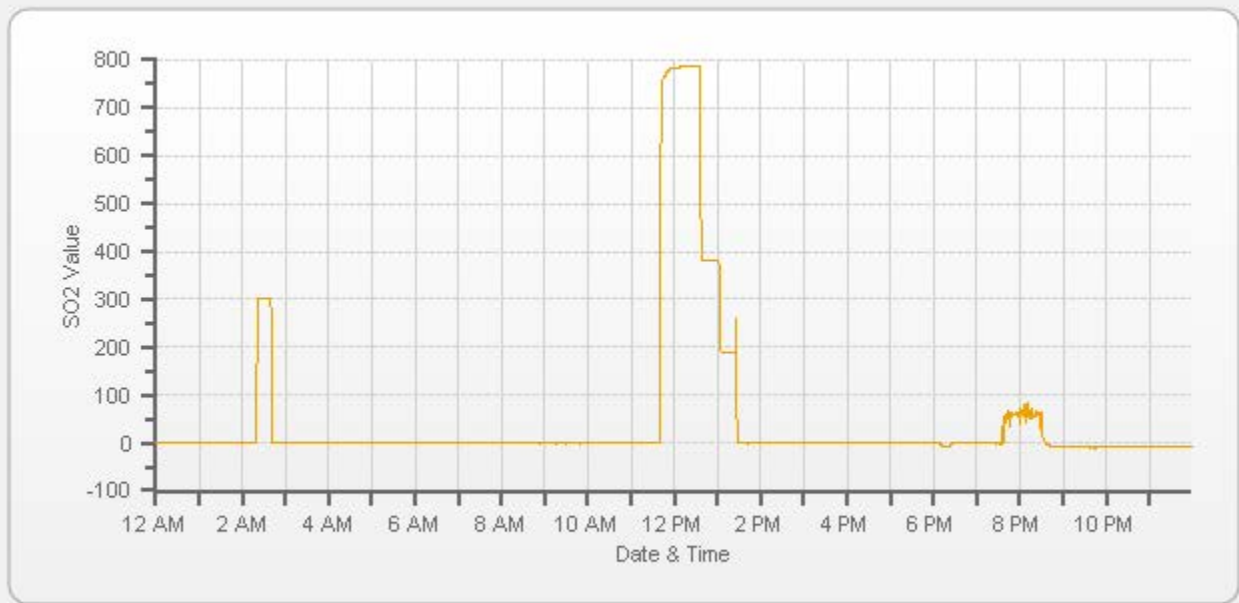
Date: August 31, 2016
Canister ID: S5623

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	< 0.03
Freon-12	0.54
Hexachloro-1,3-butadiene	< 0.81
Isobutane	2.29
Isopentane	6.52
Isoprene	0.53
Isopropyl alcohol	1.5
Isopropylbenzene	< 0.02
m,p-Xylene	0.17
m-Diethylbenzene	< 0.06
m-Ethyltoluene	< 0.13
Methyl butyl ketone	< 0.81
Methyl ethyl ketone	1.5
Methyl isobutyl ketone	< 0.6
Methyl methacrylate	< 0.11
Methyl tert butyl ether	< 0.05
Methylcyclohexane	0.10
Methylcyclopentane	0.41
Methylene chloride	< 0.5
n-Butane	13.8
n-Decane	< 0.10
n-Dodecane	< 0.6
n-Heptane	0.10
n-Hexane	0.57
n-Nonane	0.03
n-Octane	< 0.03
n-Pentane	3.1
n-Propylbenzene	< 0.08
n-Undecane	< 0.8
Naphthalene	< 0.8
o-Ethyltoluene	< 0.02
o-Xylene	0.07
p-Diethylbenzene	< 0.06
p-Ethyltoluene	< 0.11
Styrene	< 0.06
Tetrachloroethylene	< 0.06
Tetrahydrofuran	< 0.6
Toluene	0.54
trans-1,2-Dichloroethylene	< 0.02
trans-1,3-Dichloropropylene	< 0.06
trans-2-Butene	0.07
trans-2-Pentene	0.51
Trichloroethylene	< 0.06
Vinyl acetate	< 0.6
Vinyl chloride	< 0.03

APPENDIX III
EQUIPMENT CALIBRATION RESULTS

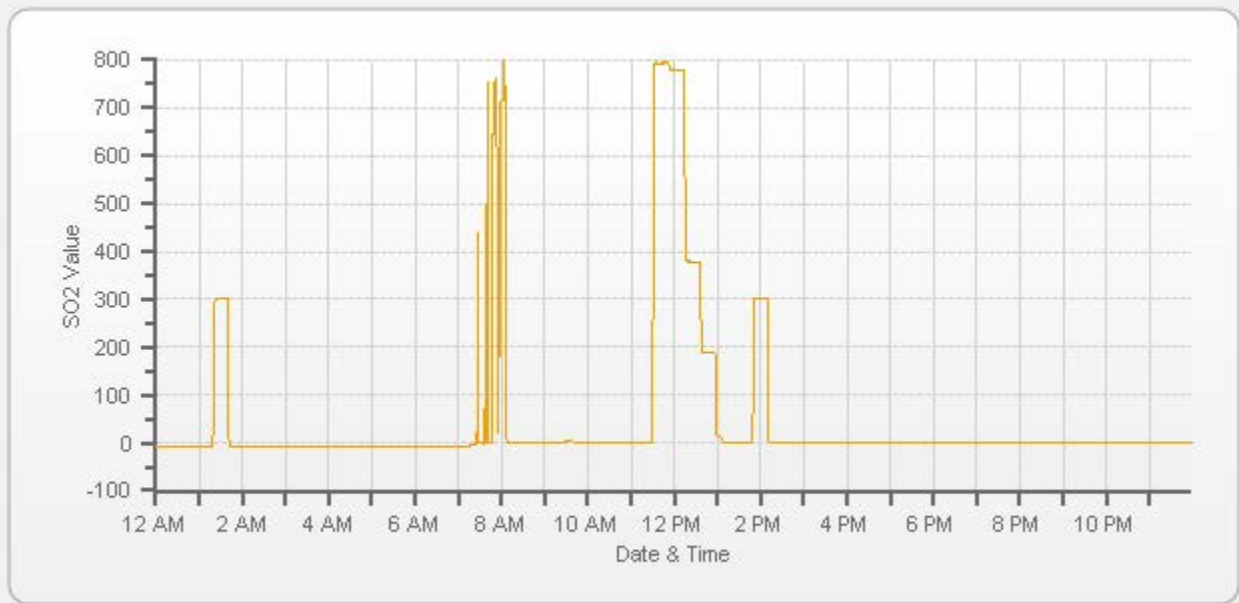
SULPHUR DIOXIDE

 API 100E Sulphur Dioxide Analyzer Calibration																																																		
Date: August 2, 2016 Company/Airshed: LICA Location/Station Name: Bonnyville - AER Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 11:17 End Time 24 hr. (mst): 13:25 Calibration Method: Gas Dilution	Barometric Pressure: 0.937 atm Station Temperature °C: 22 Weather Conditions: Mainly sunny Calibration Purpose: shut down Performed By/Reviewer: Alex Yakupov / Tom Bourque Cal Gas Expiry Date: December 2, 2023 Converter Model & s/n (if applicable): n/a																																																	
Analyzer: Serial Number: 467 Range ppb: 1000 Last Calibration Date: July 12, 2016 As Found C.F.: 0.989 Previous C.F.: 0.996 New C.F.: n/a																																																		
Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL119346 Cal Gas Conc. (ppm): 50.0																																																		
Standard Calibration Points for Ranges																																																		
<table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> </tr> <tr> <td>Mid</td> <td>380</td> </tr> <tr> <td>Low</td> <td>190</td> </tr> </tbody> </table>		Point	Sulphur Dioxide Standard Calibration Points	High	780	Mid	380	Low	190																																									
Point	Sulphur Dioxide Standard Calibration Points																																																	
High	780																																																	
Mid	380																																																	
Low	190																																																	
<i>ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015</i>																																																		
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Calibrator Flow Rates (cc/min)</th> <th>Calculated Concentration:</th> <th>Indicated Concentration:</th> <th>Correction Factors (C.F.):</th> </tr> <tr> <th>Point</th> <th>Diluent</th> <th>Cal Gas</th> <th>Total</th> <th>(ppb)</th> <th>(ppb)</th> <th></th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>5000</td> <td>0.00</td> <td>5000</td> <td>0.0</td> <td>-1.0</td> <td>N/A</td> </tr> <tr> <td>as found high</td> <td>4922</td> <td>78.00</td> <td>5000</td> <td>780.0</td> <td>788.0</td> <td>0.989</td> </tr> <tr> <td>mid</td> <td>4966</td> <td>38.00</td> <td>5004</td> <td>379.7</td> <td>381.0</td> <td>0.994</td> </tr> <tr> <td>low</td> <td>4982</td> <td>19.00</td> <td>5001</td> <td>190.0</td> <td>189.0</td> <td>1.000</td> </tr> <tr> <td colspan="6" style="text-align: right;">Average C.F. =</td> <td>0.994</td> </tr> </tbody> </table>		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	4922	78.00	5000	780.0	788.0	0.989	mid	4966	38.00	5004	379.7	381.0	0.994	low	4982	19.00	5001	190.0	189.0	1.000	Average C.F. =						0.994
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	4922	78.00	5000	780.0	788.0	0.989																																												
mid	4966	38.00	5004	379.7	381.0	0.994																																												
low	4982	19.00	5001	190.0	189.0	1.000																																												
Average C.F. =						0.994																																												
Linear Regression/Calibration Results: Correlation Coefficient = 1.000 LIMITS > or = 0.995 Slope = 0.988 0.90-1.10 b (Intercept as % of full scale) = 0.23% ± 3% F.S. % change in C.F. from last cal = 0.74% ± 10%																																																		
API 100E Sulphur Dioxide Analyzer Calibration																																																		
																																																		
<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: SLOPE: 1.114 OFFSET: 122.2 HVPS: 512 RCELL TEMP: 50.0 BOX TEMP: 30.9 PMT TEMP: 8.1 IZS TEMP: 45.0 PRES: 24.8 SAMP FL: 624 NORM PMT: 122.2 UV LAMP: 2742.1 LAMP RATIO: 91.2 STR. LGT: 68.1 DRK PMT: 14.7 DRK LMP: 2.6 Internal Span: 300 </td> <td style="width:50%; vertical-align: top;"> As left: SLOPE: n/a OFFSET: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a PRES: n/a SAMP FL: n/a NORM PMT: n/a UV LAMP: n/a LAMP RATIO: n/a STR. LGT: n/a DRK PMT: n/a DRK LMP: n/a Internal Span: n/a </td> </tr> </table>		As found: SLOPE: 1.114 OFFSET: 122.2 HVPS: 512 RCELL TEMP: 50.0 BOX TEMP: 30.9 PMT TEMP: 8.1 IZS TEMP: 45.0 PRES: 24.8 SAMP FL: 624 NORM PMT: 122.2 UV LAMP: 2742.1 LAMP RATIO: 91.2 STR. LGT: 68.1 DRK PMT: 14.7 DRK LMP: 2.6 Internal Span: 300	As left: SLOPE: n/a OFFSET: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a PRES: n/a SAMP FL: n/a NORM PMT: n/a UV LAMP: n/a LAMP RATIO: n/a STR. LGT: n/a DRK PMT: n/a DRK LMP: n/a Internal Span: n/a																																															
As found: SLOPE: 1.114 OFFSET: 122.2 HVPS: 512 RCELL TEMP: 50.0 BOX TEMP: 30.9 PMT TEMP: 8.1 IZS TEMP: 45.0 PRES: 24.8 SAMP FL: 624 NORM PMT: 122.2 UV LAMP: 2742.1 LAMP RATIO: 91.2 STR. LGT: 68.1 DRK PMT: 14.7 DRK LMP: 2.6 Internal Span: 300	As left: SLOPE: n/a OFFSET: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a PRES: n/a SAMP FL: n/a NORM PMT: n/a UV LAMP: n/a LAMP RATIO: n/a STR. LGT: n/a DRK PMT: n/a DRK LMP: n/a Internal Span: n/a																																																	
Comments: Shutdown calibration completed to perform annual maintenance. No ZERO adjustment made. No High Point adjustment made.																																																		



— SO2[ppb]

API 100E Sulphur Dioxide Analyzer Calibration																																																									
Date: August 3, 2016 Company/Airshed: LICA Location/Station Name: Bonnyville - AER Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 9:57 End Time 24 hr. (mst): 14:15 Calibration Method: Gas Dilution	Barometric Pressure: 0.937 atm Station Temperature °C: 21 Weather Conditions: Mainly sunny Calibration Purpose: post repair Performed By/Reviewer: Alex Yakupov / Tom Bourque Cal Gas Expiry Date: December 2, 2023 Converter Model & s/n (if applicable): n/a																																																								
Analyzer: Serial Number: 467 Range ppb: 1000 Last Calibration Date: n/a As Found C.F.: n/a Previous C.F.: n/a New C.F.: 1.000																																																									
Calibrator: <table border="1" style="float: right; margin-left: auto; margin-right: auto;"> <caption>Standard Calibration Points for Ranges</caption> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> </tr> <tr> <td>Mid</td> <td>380</td> </tr> <tr> <td>Low</td> <td>190</td> </tr> </tbody> </table> Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. # : LL119346 Cal Gas Conc. (ppm): 50.0		Point	Sulphur Dioxide Standard Calibration Points	High	780	Mid	380	Low	190																																																
Point	Sulphur Dioxide Standard Calibration Points																																																								
High	780																																																								
Mid	380																																																								
Low	190																																																								
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Calibrator Flow Rates (cc/min)</th> <th>Calculated Concentration:</th> <th>Indicated Concentration:</th> <th>Correction Factors (C.F.):</th> </tr> <tr> <th>Point</th> <th>Diluent</th> <th>Cal Gas</th> <th>Total</th> <th>(ppb)</th> <th>(ppb)</th> <th></th> </tr> </thead> <tbody> <tr> <td>adjusted zero</td> <td>5000</td> <td>0.00</td> <td>5000</td> <td>0.0</td> <td>0.0</td> <td>N/A</td> </tr> <tr> <td>adjusted high</td> <td>4924</td> <td>78.00</td> <td>5002</td> <td>779.7</td> <td>780.0</td> <td>1.000</td> </tr> <tr> <td>mid</td> <td>4966</td> <td>38.00</td> <td>5004</td> <td>379.7</td> <td>379.0</td> <td>1.002</td> </tr> <tr> <td>low</td> <td>4982</td> <td>19.00</td> <td>5001</td> <td>190.0</td> <td>189.0</td> <td>1.005</td> </tr> <tr> <td>calibrator zero</td> <td>5000</td> <td>0.00</td> <td>5000</td> <td>0.0</td> <td>0.0</td> <td>n/a</td> </tr> <tr> <td colspan="6" style="text-align: right;">Average C.F.=</td> <td>1.002</td> </tr> </tbody> </table>		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	78.00	5002	779.7	780.0	1.000	mid	4966	38.00	5004	379.7	379.0	1.002	low	4982	19.00	5001	190.0	189.0	1.005	calibrator zero	5000	0.00	5000	0.0	0.0	n/a	Average C.F.=						1.002
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	78.00	5002	779.7	780.0	1.000																																																			
mid	4966	38.00	5004	379.7	379.0	1.002																																																			
low	4982	19.00	5001	190.0	189.0	1.005																																																			
calibrator zero	5000	0.00	5000	0.0	0.0	n/a																																																			
Average C.F.=						1.002																																																			
Linear Regression/Calibration Results: <table style="width:100%;"> <tr> <td style="width:50%;">Correlation Coefficient = <u>1.000</u></td> <td style="width:50%;">LIMITS > or = 0.995</td> </tr> <tr> <td>Slope = <u>0.999</u></td> <td>.95-1.05</td> </tr> <tr> <td>b (Intercept as % of full scale)= <u>0.06%</u></td> <td>± 3% F.S.</td> </tr> <tr> <td>% change in C.F. from last cal= <u>n/a</u></td> <td>± 10%</td> </tr> </table>		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>0.06%</u>	± 3% F.S.	% change in C.F. from last cal= <u>n/a</u>	± 10%																																																
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>0.06%</u>	± 3% F.S.																																																								
% change in C.F. from last cal= <u>n/a</u>	± 10%																																																								
API 100E Sulphur Dioxide Analyzer Calibration																																																									
<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: 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> Internal Span: <u>n/a</u> </td> <td style="width:50%; vertical-align: top;"> As left: SLOPE: <u>0.986</u> OFFSET: <u>121.8</u> HVPS: <u>524</u> RCELL TEMP: <u>50.0</u> BOX TEMP: <u>33.5</u> PMT TEMP: <u>8.1</u> IZS TEMP: <u>45.0</u> PRES: <u>25.0</u> SAMP FL: <u>616</u> NORM PMT: <u>147.7</u> UV LAMP: <u>2768.0</u> LAMP RATIO: <u>99.6</u> STR. LGT: <u>60.0</u> DRK PMT: <u>16.0</u> DRK LMP: <u>2.7</u> Internal Span: <u>301</u> </td> </tr> </table>		As found: 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> Internal Span: <u>n/a</u>	As left: SLOPE: <u>0.986</u> OFFSET: <u>121.8</u> HVPS: <u>524</u> RCELL TEMP: <u>50.0</u> BOX TEMP: <u>33.5</u> PMT TEMP: <u>8.1</u> IZS TEMP: <u>45.0</u> PRES: <u>25.0</u> SAMP FL: <u>616</u> NORM PMT: <u>147.7</u> UV LAMP: <u>2768.0</u> LAMP RATIO: <u>99.6</u> STR. LGT: <u>60.0</u> DRK PMT: <u>16.0</u> DRK LMP: <u>2.7</u> Internal Span: <u>301</u>																																																						
As found: 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> Internal Span: <u>n/a</u>	As left: SLOPE: <u>0.986</u> OFFSET: <u>121.8</u> HVPS: <u>524</u> RCELL TEMP: <u>50.0</u> BOX TEMP: <u>33.5</u> PMT TEMP: <u>8.1</u> IZS TEMP: <u>45.0</u> PRES: <u>25.0</u> SAMP FL: <u>616</u> NORM PMT: <u>147.7</u> UV LAMP: <u>2768.0</u> LAMP RATIO: <u>99.6</u> STR. LGT: <u>60.0</u> DRK PMT: <u>16.0</u> DRK LMP: <u>2.7</u> Internal Span: <u>301</u>																																																								
Comments: Post-repair calibration completed after annual maintenance. Valves cleaned, optical filter changed, O-rings changed, reaction cell cleaned. Sample inlet filter changed. Factory calibration and parameters adjustments and calibrations completed. Output voltage calibration completed.																																																									



— SO2[ppb]



API 100E Sulphur Dioxide Analyzer Calibration

Date: August 23, 2016	Barometric Pressure: 0.935 atm
Company/Airshed: LICA	Station Temperature °C: 21
Location/Station Name: Bonnyville - AER	Weather Conditions: A few clouds
Parameter: Sulphur Dioxide	Calibration Purpose: repeat
Start Time 24 hr. (mst): 10:28	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 14:32	Cal Gas Expiry Date: December 2, 2023
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	Range ppb: 1000
Serial Number: 467	As Found C.F.: 0.997
Last Calibration Date: August 3, 2016	New C.F.: 0.998
Previous C.F.: 1.000	

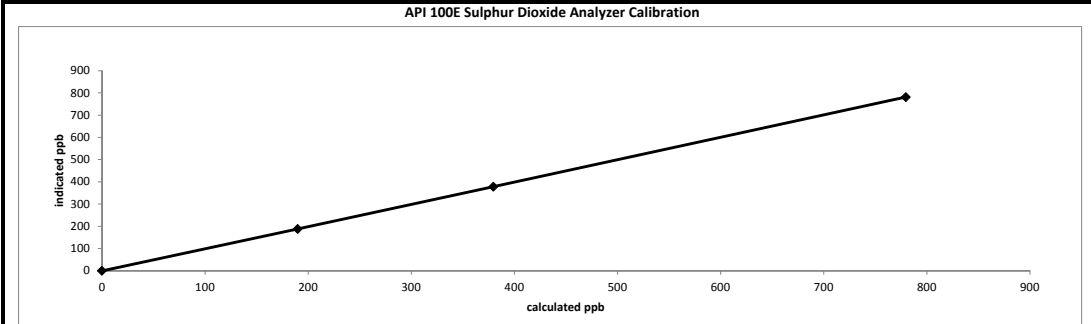
Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> </tr> <tr> <td>Mid</td> <td>380</td> </tr> <tr> <td>Low</td> <td>190</td> </tr> </tbody> </table>	Point	Sulphur Dioxide Standard Calibration Points	High	780	Mid	380	Low	190
Point		Sulphur Dioxide Standard Calibration Points							
High		780							
Mid		380							
Low		190							
Make & Model: API 700									
Serial #: 627									
Cal Gas Cylinder I.D. #: LL119346									
Cal Gas Conc. (ppm): 50.0									

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	4924	78.00	5002	779.7	783.0	0.997
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4924	78.00	5002	779.7	781.0	0.998
mid	4966	38.00	5004	379.7	378.0	1.004
low	4982	19.00	5001	190.0	188.0	1.010
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F.=						1.004

Linear Regression/Calibration Results:

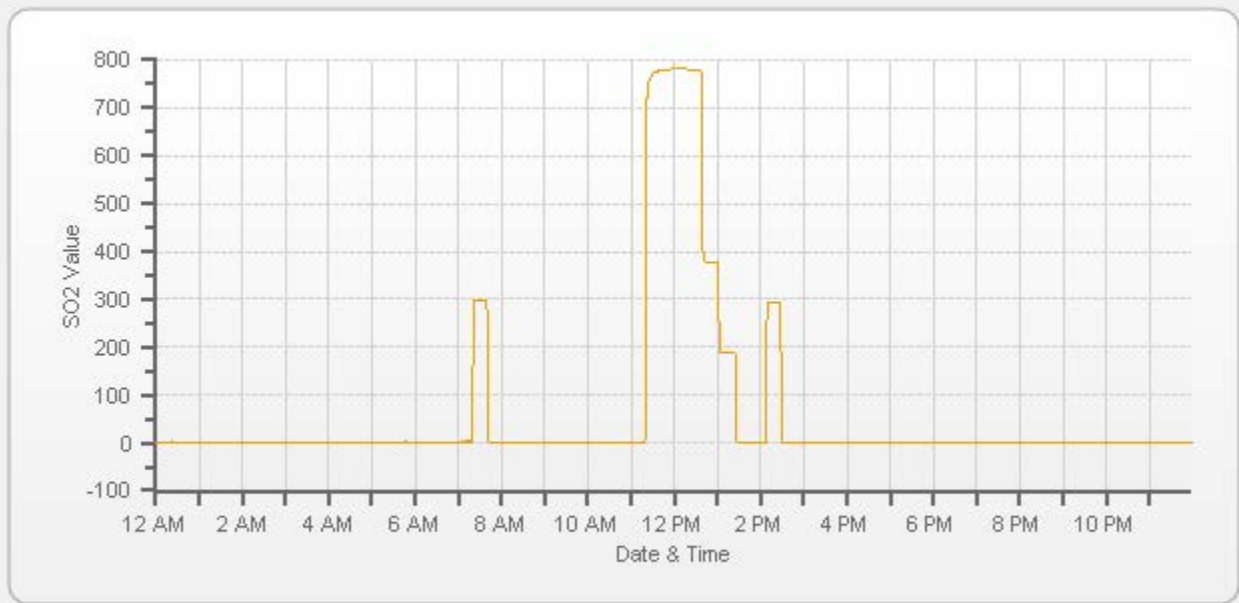
Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.998</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.14%</u>	.95-1.05
% change in C.F. from last cal = <u>0.30%</u>	± 3% F.S.
	± 10%



<p style="text-align: center; font-weight: bold; font-size: small;">As found:</p> <p>SLOPE: <u>0.986</u></p> <p>OFFSET: <u>121.8</u></p> <p>HVPS: <u>524</u></p> <p>RCELL TEMP: <u>50.0</u></p> <p>BOX TEMP: <u>30.4</u></p> <p>PMT TEMP: <u>8.1</u></p> <p>IZS TEMP: <u>45.0</u></p> <p>PRES: <u>24.9</u></p> <p>SAMP FL: <u>624</u></p> <p>NORM PMT: <u>123.3</u></p> <p>UV LAMP: <u>2782.6</u></p> <p>LAMP RATIO: <u>100.1</u></p> <p>STR. LGT: <u>61.0</u></p> <p>DRK PMT: <u>14.4</u></p> <p>DRK LMP: <u>2.6</u></p> <p>Internal Span: <u>301</u></p>	<p style="text-align: center; font-weight: bold; font-size: small;">As left:</p> <p>SLOPE: <u>0.984</u></p> <p>OFFSET: <u>123.5</u></p> <p>HVPS: <u>524</u></p> <p>RCELL TEMP: <u>50.0</u></p> <p>BOX TEMP: <u>30.2</u></p> <p>PMT TEMP: <u>8.1</u></p> <p>IZS TEMP: <u>45.0</u></p> <p>PRES: <u>25.0</u></p> <p>SAMP FL: <u>625</u></p> <p>NORM PMT: <u>122.5</u></p> <p>UV LAMP: <u>2786.2</u></p> <p>LAMP RATIO: <u>100.3</u></p> <p>STR. LGT: <u>60.8</u></p> <p>DRK PMT: <u>14.9</u></p> <p>DRK LMP: <u>2.6</u></p> <p>Internal Span: <u>292</u></p>
--	---


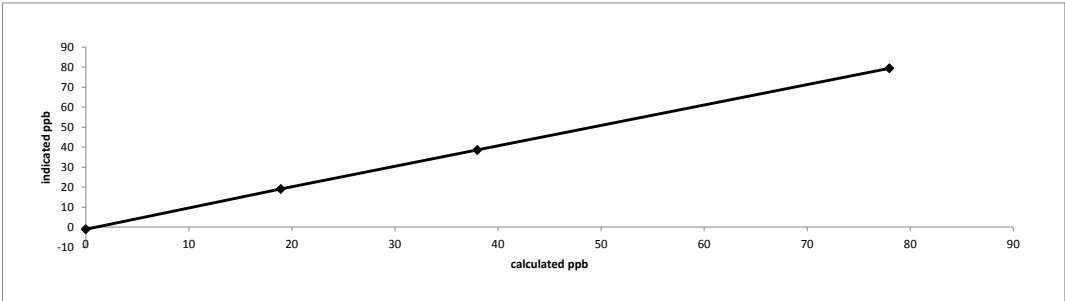
Comments:

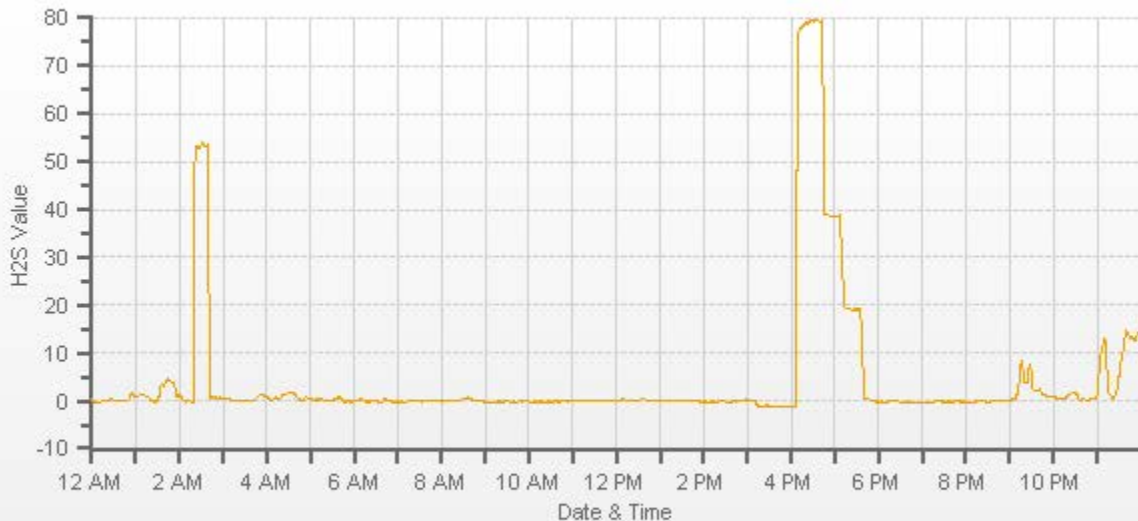
Repeat calibration completed to correct ZERO drift.




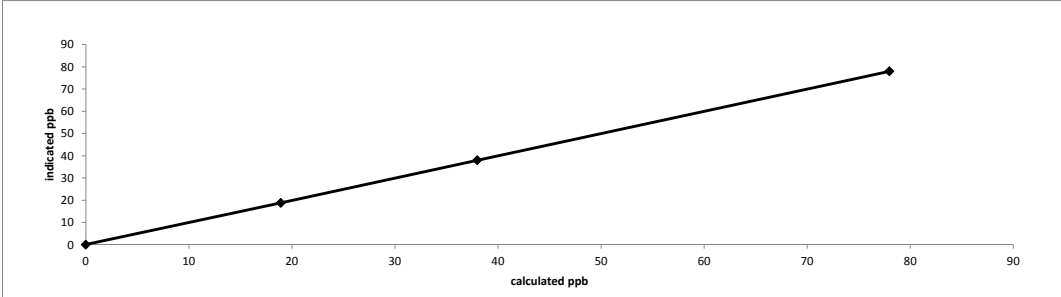
— SO2[ppb]

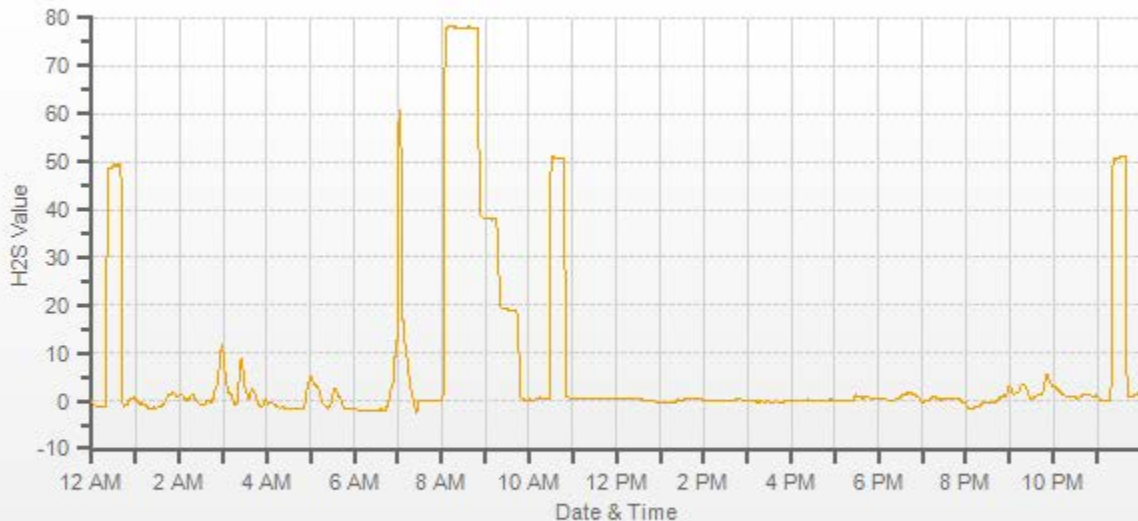
HYDROGEN SULPHIDE

 API 101E Hydrogen Sulphide Analyzer Calibration																																																		
Date: August 2, 2016 Company/Airshed: LICA Location/Station Name: Bonnyville - AER Parameter: Hydrogen Sulphide Start Time 24 hr. (mst): 15:36 End Time 24 hr. (mst): 17:33 Calibration Method: Gas Dilution	Barometric Pressure: 0.937 atm Station Temperature °C: 22 Weather Conditions: Mainly sunny Calibration Purpose: shut down Performed By/Reviewer: Alex Yakupov / Tom Bourque Cal Gas Expiry Date: July 15, 2017 Converter Model & s/n (if applicable): n/a																																																	
Analyzer: Serial Number: 510 Range ppb: 100 Last Calibration Date: July 14, 2016 As Found C.F.: 0.969 Previous C.F.: 0.997 New C.F.: n/a																																																		
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: LL36837 Cal Gas Conc. (ppm): 10.0																																																		
Standard Calibration Points for Ranges																																																		
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Hydrogen Sulphide Standard Calibration Points</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	Hydrogen Sulphide Standard Calibration Points	High	78	Mid	38	Low	19																																									
Point	Hydrogen Sulphide Standard Calibration Points																																																	
High	78																																																	
Mid	38																																																	
Low	19																																																	
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																		
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Calibrator Flow Rates (cc/min)</th> <th>Calculated Concentration:</th> <th>Indicated Concentration:</th> <th>Correction Factors (C.F.):</th> </tr> <tr> <th>Point</th> <th>Diluent</th> <th>Cal Gas</th> <th>Total</th> <th>(ppb)</th> <th>(ppb)</th> <th></th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>7500</td> <td>0.00</td> <td>7500</td> <td>0.0</td> <td>-1.1</td> <td>N/A</td> </tr> <tr> <td>as found high</td> <td>7443</td> <td>58.50</td> <td>7502</td> <td>78.0</td> <td>79.4</td> <td>0.969</td> </tr> <tr> <td>mid</td> <td>7471</td> <td>28.50</td> <td>7500</td> <td>38.0</td> <td>38.5</td> <td>0.960</td> </tr> <tr> <td>low</td> <td>7487</td> <td>14.20</td> <td>7501</td> <td>18.9</td> <td>19.0</td> <td>0.942</td> </tr> <tr> <td colspan="6" style="text-align: right;">Average C.F. =</td> <td>0.957</td> </tr> </tbody> </table>		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	-1.1	N/A	as found high	7443	58.50	7502	78.0	79.4	0.969	mid	7471	28.50	7500	38.0	38.5	0.960	low	7487	14.20	7501	18.9	19.0	0.942	Average C.F. =						0.957
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	-1.1	N/A																																												
as found high	7443	58.50	7502	78.0	79.4	0.969																																												
mid	7471	28.50	7500	38.0	38.5	0.960																																												
low	7487	14.20	7501	18.9	19.0	0.942																																												
Average C.F. =						0.957																																												
Linear Regression/Calibration Results: <table style="width:100%;"> <tr> <td style="width:50%;">Correlation Coefficient = 1.000</td> <td style="width:50%;">LIMITS</td> </tr> <tr> <td>Slope = 0.971</td> <td>> or = 0.995</td> </tr> <tr> <td>b (Intercept as % of full scale) = 0.78%</td> <td>0.90-1.10</td> </tr> <tr> <td>% change in C.F. from last cal = 2.83%</td> <td>± 3% F.S.</td> </tr> <tr> <td></td> <td>± 10%</td> </tr> </table>		Correlation Coefficient = 1.000	LIMITS	Slope = 0.971	> or = 0.995	b (Intercept as % of full scale) = 0.78%	0.90-1.10	% change in C.F. from last cal = 2.83%	± 3% F.S.		± 10%																																							
Correlation Coefficient = 1.000	LIMITS																																																	
Slope = 0.971	> or = 0.995																																																	
b (Intercept as % of full scale) = 0.78%	0.90-1.10																																																	
% change in C.F. from last cal = 2.83%	± 3% F.S.																																																	
	± 10%																																																	
API 101E Hydrogen Sulphide Analyzer Calibration																																																		
																																																		
<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: SLOPE: 1.045 OFFSET: 36.7 HVPS: 526 RCELL TEMP: 50.0 BOX TEMP: 36.2 PMT TEMP: 8.4 IZS TEMP: 45.0 Converter Temp: 314.6 PRES: 21.4 SAMP FL: 555 UV LAMP: 2289.5 LAMP RATIO: 72.1 STR. LGT: 19.2 DRK PMT: 35.1 DRK LMP: -2.1 Internal Span: 51 </td> <td style="width:50%; vertical-align: top;"> As left: SLOPE: n/a OFFSET: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a Converter Temp: n/a PRES: n/a SAMP FL: n/a UV LAMP: n/a LAMP RATIO: n/a STR. LGT: n/a DRK PMT: n/a DRK LMP: n/a Internal Span: n/a </td> </tr> </table>		As found: SLOPE: 1.045 OFFSET: 36.7 HVPS: 526 RCELL TEMP: 50.0 BOX TEMP: 36.2 PMT TEMP: 8.4 IZS TEMP: 45.0 Converter Temp: 314.6 PRES: 21.4 SAMP FL: 555 UV LAMP: 2289.5 LAMP RATIO: 72.1 STR. LGT: 19.2 DRK PMT: 35.1 DRK LMP: -2.1 Internal Span: 51	As left: SLOPE: n/a OFFSET: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a Converter Temp: n/a PRES: n/a SAMP FL: n/a UV LAMP: n/a LAMP RATIO: n/a STR. LGT: n/a DRK PMT: n/a DRK LMP: n/a Internal Span: n/a																																															
As found: SLOPE: 1.045 OFFSET: 36.7 HVPS: 526 RCELL TEMP: 50.0 BOX TEMP: 36.2 PMT TEMP: 8.4 IZS TEMP: 45.0 Converter Temp: 314.6 PRES: 21.4 SAMP FL: 555 UV LAMP: 2289.5 LAMP RATIO: 72.1 STR. LGT: 19.2 DRK PMT: 35.1 DRK LMP: -2.1 Internal Span: 51	As left: SLOPE: n/a OFFSET: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a Converter Temp: n/a PRES: n/a SAMP FL: n/a UV LAMP: n/a LAMP RATIO: n/a STR. LGT: n/a DRK PMT: n/a DRK LMP: n/a Internal Span: n/a																																																	
Comments: Shutdown calibration completed to perform annual maintenance. No ZERO adjustment made. No High Point adjustment made.																																																		



— H2S[ppb]

 API 101E Hydrogen Sulphide Analyzer Calibration																																																								
Date: August 4, 2016 Company/Airshed: LICA Location/Station Name: Bonnyville - AER Parameter: Hydrogen Sulphide Start Time 24 hr. (mst): 7:35 End Time 24 hr. (mst): 12:08 Calibration Method: Gas Dilution	Barometric Pressure: 0.940 atm Station Temperature °C: 22 Weather Conditions: A few clouds and light rain showers Calibration Purpose: post repair Performed By/Reviewer: Alex Yakupov Tom Bourque Cal Gas Expiry Date: July 15, 2017 Converter Model & s/n (if applicable): n/a																																																							
Analyzer: Serial Number: 510 Range ppb: 100 Last Calibration Date: n/a As Found C.F.: n/a Previous C.F.: n/a New C.F.: 1.000																																																								
Calibrator: <table border="1" style="float: right; margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Point</th> <th>Hydrogen Sulphide Standard Calibration Points</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> Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: LL36837 Cal Gas Conc. (ppm): 10.0		Point	Hydrogen Sulphide Standard Calibration Points	High	78	Mid	38	Low	19																																															
Point	Hydrogen Sulphide Standard Calibration Points																																																							
High	78																																																							
Mid	38																																																							
Low	19																																																							
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																								
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Point</th> <th colspan="3">Calibrator Flow Rates (cc/min)</th> <th>Calculated Concentration:</th> <th>Indicated Concentration:</th> <th>Correction Factors (C.F.):</th> </tr> <tr> <th>Diluent</th> <th>Cal Gas</th> <th>Total</th> <th>(ppb)</th> <th>(ppb)</th> <th></th> </tr> </thead> <tbody> <tr> <td>adjusted zero</td> <td>7500</td> <td>0.00</td> <td>7500</td> <td>0.0</td> <td>0.0</td> <td>N/A</td> </tr> <tr> <td>adjusted high</td> <td>7443</td> <td>58.50</td> <td>7502</td> <td>78.0</td> <td>78.0</td> <td>1.000</td> </tr> <tr> <td>mid</td> <td>7472</td> <td>28.50</td> <td>7501</td> <td>38.0</td> <td>38.0</td> <td>1.000</td> </tr> <tr> <td>low</td> <td>7486</td> <td>14.20</td> <td>7500</td> <td>18.9</td> <td>18.8</td> <td>1.007</td> </tr> <tr> <td>calibrator zero</td> <td>7500</td> <td>0.00</td> <td>7500</td> <td>0.0</td> <td>0.0</td> <td>n/a</td> </tr> <tr> <td colspan="6" style="text-align: right;">Average C.F.=</td> <td>1.002</td> </tr> </tbody> </table>		Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):	Diluent	Cal Gas	Total	(ppb)	(ppb)		adjusted zero	7500	0.00	7500	0.0	0.0	N/A	adjusted high	7443	58.50	7502	78.0	78.0	1.000	mid	7472	28.50	7501	38.0	38.0	1.000	low	7486	14.20	7500	18.9	18.8	1.007	calibrator zero	7500	0.00	7500	0.0	0.0	n/a	Average C.F.=						1.002
Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):																																																		
	Diluent	Cal Gas	Total	(ppb)	(ppb)																																																			
adjusted zero	7500	0.00	7500	0.0	0.0	N/A																																																		
adjusted high	7443	58.50	7502	78.0	78.0	1.000																																																		
mid	7472	28.50	7501	38.0	38.0	1.000																																																		
low	7486	14.20	7500	18.9	18.8	1.007																																																		
calibrator zero	7500	0.00	7500	0.0	0.0	n/a																																																		
Average C.F.=						1.002																																																		
Linear Regression/Calibration Results: <table style="width:100%;"> <tr> <td style="width:50%;">Correlation Coefficient = 1.000</td> <td style="width:50%;">LIMITS > or = 0.995</td> </tr> <tr> <td>Slope = 0.999</td> <td>.95-1.05</td> </tr> <tr> <td>b (Intercept as % of full scale) = 0.06%</td> <td>± 3% F.S.</td> </tr> <tr> <td>% change in C.F. from last cal = n/a</td> <td>± 10%</td> </tr> </table>		Correlation Coefficient = 1.000	LIMITS > or = 0.995	Slope = 0.999	.95-1.05	b (Intercept as % of full scale) = 0.06%	± 3% F.S.	% change in C.F. from last cal = n/a	± 10%																																															
Correlation Coefficient = 1.000	LIMITS > or = 0.995																																																							
Slope = 0.999	.95-1.05																																																							
b (Intercept as % of full scale) = 0.06%	± 3% F.S.																																																							
% change in C.F. from last cal = n/a	± 10%																																																							
API 101E Hydrogen Sulphide Analyzer Calibration																																																								
																																																								
<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: SLOPE: n/a OFFSET: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a Converter Temp: n/a PRES: n/a SAMP FL: n/a UV LAMP: n/a LAMP RATIO: n/a STR. LGT: n/a DRK PMT: n/a DRK LMP: n/a Internal Span: n/a </td> <td style="width:50%; vertical-align: top;"> As left: SLOPE: 0.970 OFFSET: 34.0 HVPS: 530 RCELL TEMP: 50.0 BOX TEMP: 34.0 PMT TEMP: 8.4 IZS TEMP: 45.0 Converter Temp: 314.4 PRES: 21.1 SAMP FL: 551 UV LAMP: 3805.6 LAMP RATIO: 100.2 STR. LGT: 16.5 DRK PMT: 37.1 DRK LMP: -1.5 Internal Span: 50.9 </td> </tr> </table>		As found: SLOPE: n/a OFFSET: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a Converter Temp: n/a PRES: n/a SAMP FL: n/a UV LAMP: n/a LAMP RATIO: n/a STR. LGT: n/a DRK PMT: n/a DRK LMP: n/a Internal Span: n/a	As left: SLOPE: 0.970 OFFSET: 34.0 HVPS: 530 RCELL TEMP: 50.0 BOX TEMP: 34.0 PMT TEMP: 8.4 IZS TEMP: 45.0 Converter Temp: 314.4 PRES: 21.1 SAMP FL: 551 UV LAMP: 3805.6 LAMP RATIO: 100.2 STR. LGT: 16.5 DRK PMT: 37.1 DRK LMP: -1.5 Internal Span: 50.9																																																					
As found: SLOPE: n/a OFFSET: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a Converter Temp: n/a PRES: n/a SAMP FL: n/a UV LAMP: n/a LAMP RATIO: n/a STR. LGT: n/a DRK PMT: n/a DRK LMP: n/a Internal Span: n/a	As left: SLOPE: 0.970 OFFSET: 34.0 HVPS: 530 RCELL TEMP: 50.0 BOX TEMP: 34.0 PMT TEMP: 8.4 IZS TEMP: 45.0 Converter Temp: 314.4 PRES: 21.1 SAMP FL: 551 UV LAMP: 3805.6 LAMP RATIO: 100.2 STR. LGT: 16.5 DRK PMT: 37.1 DRK LMP: -1.5 Internal Span: 50.9																																																							
Comments: Post-repair calibration completed after annual maintenance. Sample inlet filter changed. Reaction cell cleaned, lamp adjusted, optical filter changed, O-rings changed, valves cleaned, manifold cleaned. Factory calibration and output voltage calibration completed.																																																								



— H2S[ppb]



API 101E Hydrogen Sulphide Analyzer Calibration

Date: August 29, 2016	Barometric Pressure: 0.944 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Bonnyville - AER	Weather Conditions: Mainly sunny
Parameter: Hydrogen Sulphide	Calibration Purpose: repeat
Start Time 24 hr. (mst): 13:49	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 17:46	Cal Gas Expiry Date: July 15, 2017
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer: Serial Number: 510	Range ppb: 100
Last Calibration Date: August 4, 2016	As Found C.F.: 1.009
Previous C.F.: 1.000	New C.F.: 0.997

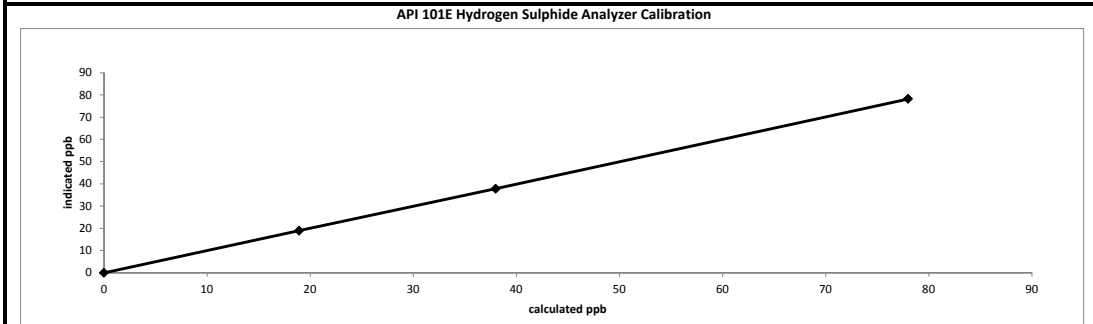
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: LL36837 Cal Gas Conc. (ppm): 10.0	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Hydrogen Sulphide Standard Calibration Points</th> </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	Hydrogen Sulphide Standard Calibration Points	High	78	Mid	38	Low	19
Point	Hydrogen Sulphide Standard Calibration Points								
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	-1.7	N/A
as found high	7443	58.50	7502	78.0	75.6	1.009
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7443	58.50	7502	78.0	78.2	0.997
mid	7473	28.50	7502	38.0	37.8	1.005
low	7486	14.20	7500	18.9	18.9	1.002
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						1.001

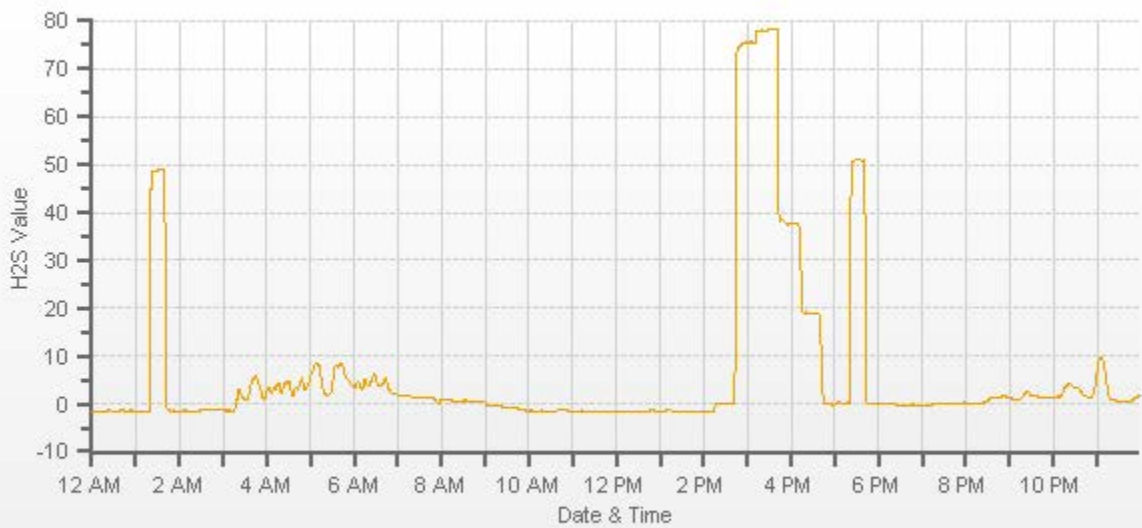
Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.997</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.10%</u>	.95-1.05
% change in C.F. from last cal = <u>-0.89%</u>	± 3% F.S.
	± 10%



As found: SLOPE: 0.970 OFFSET: 34.0 HVPS: 530 RCELL TEMP: 50.0 BOX TEMP: 32.6 PMT TEMP: 8.4 IZS TEMP: 45.0 Converter Temp: 315.1 PRES: 21.6 SAMP FL: 559 UV LAMP: 3814.6 LAMP RATIO: 100.5 STR. LGT: 16.5 DRK PMT: 33.7 DRK LMP: -1.6 Internal Span: 50.9	As left: SLOPE: 0.987 OFFSET: 30.6 HVPS: 530 RCELL TEMP: 50.0 BOX TEMP: 35.1 PMT TEMP: 8.4 IZS TEMP: 45.0 Converter Temp: 315.0 PRES: 21.6 SAMP FL: 559 UV LAMP: 3807.7 LAMP RATIO: 100.5 STR. LGT: 15.1 DRK PMT: 34.8 DRK LMP: -1.5 Internal Span: 50.9
--	---

Comments:
 Repeat calibration completed to correct negative ZERO drift. EV after calibration has not changed and matched the current EV.

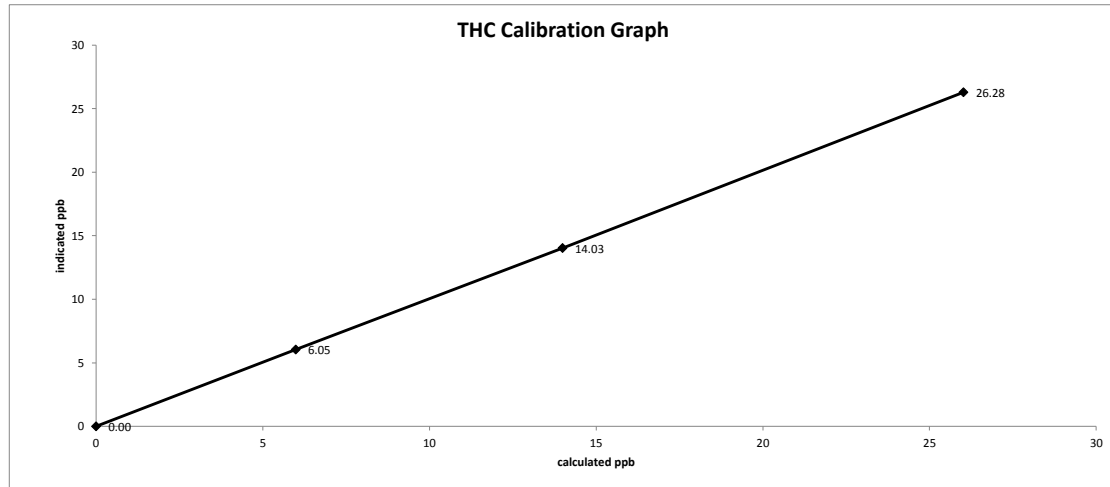
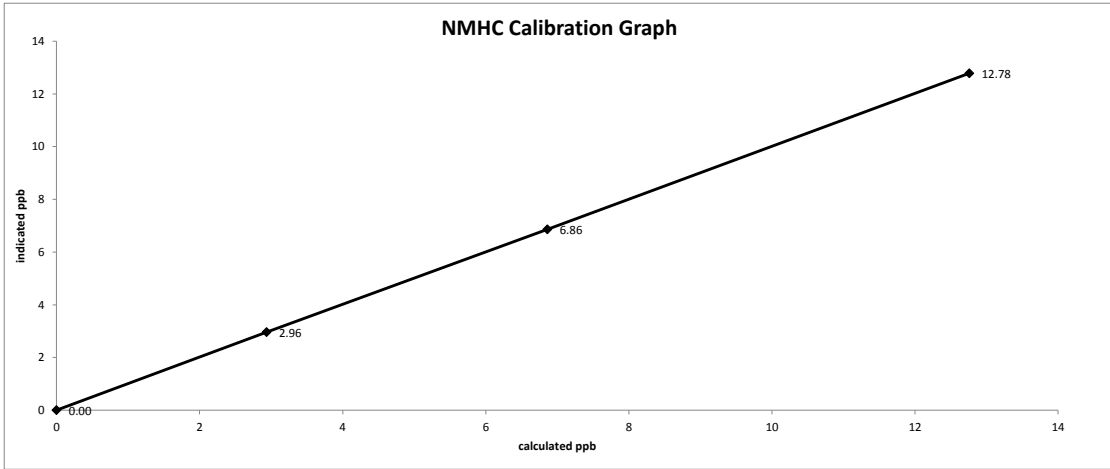
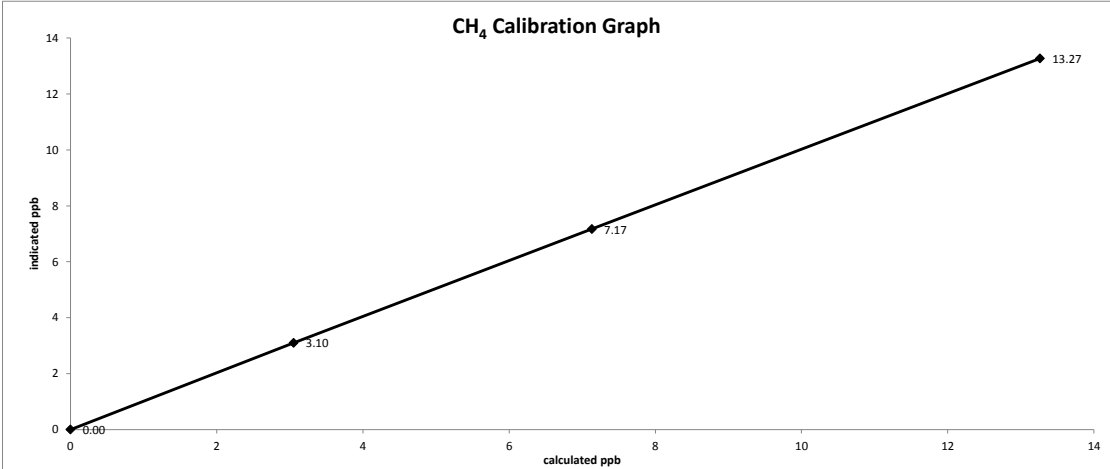


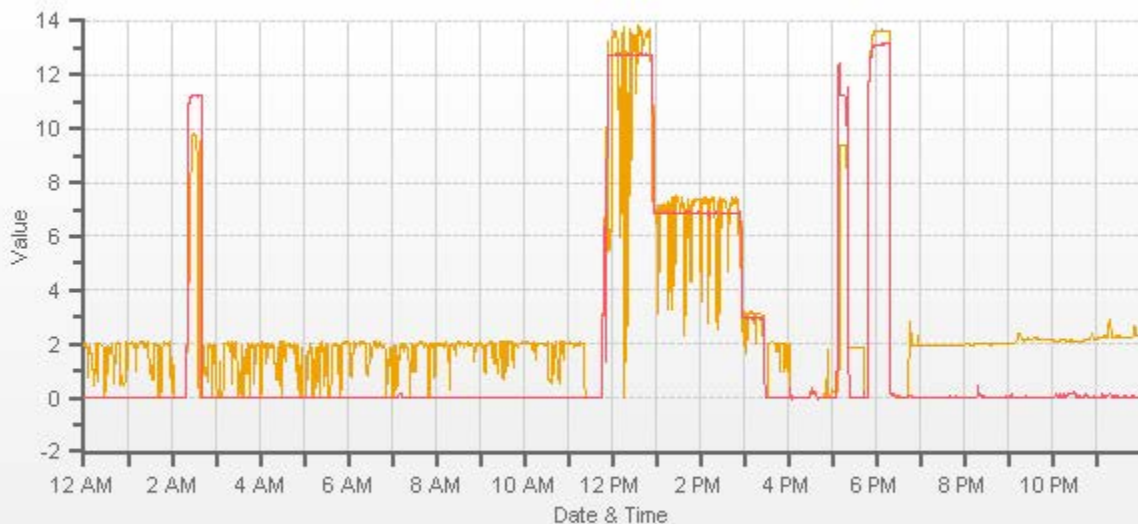
— H2S[ppb]

TOTAL HYDROCARBON

Thermo 55i Methane/Non-Methane Analyzer Calibration																																																																																																			
Date: August 2, 2016 Company/Airshed: LICA Location/Station Name: Bonnyville - AER Parameter: CH ₄ / NMHC / THC Start/End Time 24 hr. (mst): 11:17 / 15:26 Calibration Method: Gas Dilution	Barometric Pressure: 0.937 atm Station Temperature °C: 22 Weather Conditions: Mainly sunny Calibration Purpose: shut down Performed By/Reviewer: Alex Yakupov Tom Bourque Cal Gas Expiry Date: November 25, 2023																																																																																																		
Analyzer:																																																																																																			
Serial Number: 1236656107 Last Calibration Date: July 12, 2016 Range ppm: 20 CH ₄ /20 NMHC/40 THC	Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>CH₄ =</td> <td>1.004</td> <td>0.999</td> <td>n/a</td> </tr> <tr> <td>NMHC =</td> <td>0.999</td> <td>0.998</td> <td>n/a</td> </tr> <tr> <td>THC =</td> <td>1.001</td> <td>0.990</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	CH ₄ =	1.004	0.999	n/a	NMHC =	0.999	0.998	n/a	THC =	1.001	0.990	n/a																																																																																		
	Previous C.F.:	As Found C.F.:	New C.F.:																																																																																																
CH ₄ =	1.004	0.999	n/a																																																																																																
NMHC =	0.999	0.998	n/a																																																																																																
THC =	1.001	0.990	n/a																																																																																																
Calibrator:																																																																																																			
Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. # : LL165372 CH₄ Cylinder Conc. = 606.0 212.0 =C ₃ H ₈ Cylinder Conc. CH₄ as C₃H₈ = 583.0 1189.0 =total CH ₄ equivalent	Standard Calibration Points for Analyzer Range of 20/20/40 ppm <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>CH₄</th> <th>NMHC</th> <th>THC</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>13.00</td> <td>13.00</td> <td>26.00</td> </tr> <tr> <td>Mid</td> <td>7.00</td> <td>7.00</td> <td>14.00</td> </tr> <tr> <td>Low</td> <td>3.00</td> <td>3.00</td> <td>6.00</td> </tr> </tbody> </table>	Point	CH ₄	NMHC	THC	High	13.00	13.00	26.00	Mid	7.00	7.00	14.00	Low	3.00	3.00	6.00																																																																																		
Point	CH ₄	NMHC	THC																																																																																																
High	13.00	13.00	26.00																																																																																																
Mid	7.00	7.00	14.00																																																																																																
Low	3.00	3.00	6.00																																																																																																
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																																																																			
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Calibrator Flow Rates (cc/min)</th> <th rowspan="2">Calculated CH₄ (ppm)</th> <th rowspan="2">Calculated NMHC (ppm)</th> <th rowspan="2">Calculated THC (ppm)</th> <th rowspan="2">Indicated CH₄ (ppm)</th> <th rowspan="2">Indicated NMHC (ppm)</th> <th rowspan="2">Indicated THC (ppm)</th> <th colspan="3">Correction Factors:</th> </tr> <tr> <th>Point</th> <th>Diluent</th> <th>Cal Gas</th> <th>Total Flow</th> <th>CH₄</th> <th>NMHC</th> <th>THC</th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>3000</td> <td>0.00</td> <td>3000</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>as found high</td> <td>2932</td> <td>65.60</td> <td>2998</td> <td>13.26</td> <td>12.76</td> <td>26.02</td> <td>13.27</td> <td>12.78</td> <td>26.28</td> <td>0.999</td> <td>0.998</td> <td>0.990</td> </tr> <tr> <td>mid</td> <td>2964</td> <td>35.30</td> <td>2999</td> <td>7.13</td> <td>6.86</td> <td>13.99</td> <td>7.17</td> <td>6.86</td> <td>14.03</td> <td>0.995</td> <td>1.000</td> <td>0.997</td> </tr> <tr> <td>low</td> <td>2983</td> <td>15.10</td> <td>2998</td> <td>3.05</td> <td>2.94</td> <td>5.99</td> <td>3.10</td> <td>2.96</td> <td>6.05</td> <td>0.985</td> <td>0.992</td> <td>0.990</td> </tr> <tr> <td colspan="10"></td> <td colspan="3" style="text-align: center;">Average C.F.=</td> </tr> <tr> <td colspan="10"></td> <td colspan="3" style="text-align: center;">0.993 0.997 0.992</td> </tr> </tbody> </table>		Calibrator Flow Rates (cc/min)				Calculated CH ₄ (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	Correction Factors:			Point	Diluent	Cal Gas	Total Flow	CH ₄	NMHC	THC	as found zero	3000	0.00	3000	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	as found high	2932	65.60	2998	13.26	12.76	26.02	13.27	12.78	26.28	0.999	0.998	0.990	mid	2964	35.30	2999	7.13	6.86	13.99	7.17	6.86	14.03	0.995	1.000	0.997	low	2983	15.10	2998	3.05	2.94	5.99	3.10	2.96	6.05	0.985	0.992	0.990											Average C.F.=													0.993 0.997 0.992		
Calibrator Flow Rates (cc/min)				Calculated CH ₄ (ppm)	Calculated NMHC (ppm)							Calculated THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	Correction Factors:																																																																																			
Point	Diluent	Cal Gas	Total Flow			CH ₄	NMHC	THC																																																																																											
as found zero	3000	0.00	3000	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a																																																																																							
as found high	2932	65.60	2998	13.26	12.76	26.02	13.27	12.78	26.28	0.999	0.998	0.990																																																																																							
mid	2964	35.30	2999	7.13	6.86	13.99	7.17	6.86	14.03	0.995	1.000	0.997																																																																																							
low	2983	15.10	2998	3.05	2.94	5.99	3.10	2.96	6.05	0.985	0.992	0.990																																																																																							
										Average C.F.=																																																																																									
										0.993 0.997 0.992																																																																																									
Linear Regression/Calibration Results:																																																																																																			
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>CH₄</th> <th>NMHC</th> <th>THC</th> <th>LIMITS</th> </tr> </thead> <tbody> <tr> <td>Correlation Coefficient =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> <td>> or = 0.995</td> </tr> <tr> <td>Slope =</td> <td>1.000</td> <td>1.001</td> <td>1.009</td> <td>0.90-1.10</td> </tr> <tr> <td>b (Intercept as % of full scale)=</td> <td>0.12%</td> <td>0.03%</td> <td>-0.04%</td> <td>± 3% F.S.</td> </tr> <tr> <td>% change in C.F. from last cal=</td> <td>0.46%</td> <td>0.07%</td> <td>1.09%</td> <td>± 10%</td> </tr> </tbody> </table>			CH ₄	NMHC	THC	LIMITS	Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995	Slope =	1.000	1.001	1.009	0.90-1.10	b (Intercept as % of full scale)=	0.12%	0.03%	-0.04%	± 3% F.S.	% change in C.F. from last cal=	0.46%	0.07%	1.09%	± 10%																																																																									
	CH ₄	NMHC	THC	LIMITS																																																																																															
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995																																																																																															
Slope =	1.000	1.001	1.009	0.90-1.10																																																																																															
b (Intercept as % of full scale)=	0.12%	0.03%	-0.04%	± 3% F.S.																																																																																															
% change in C.F. from last cal=	0.46%	0.07%	1.09%	± 10%																																																																																															
As found:																																																																																																			
Interface Board Voltages: Bias Supply: -292.8 Temperatures: Detector Oven: 175.0 Filter: 175.0 Column Oven: 74.9 Internal: 31.2 Cylinder Pressures/reg.: Carrier: 1000 50 Fuel: 110 50 Span Gas: 600 22 Zero Air Generator: 55 Internal Pressures: Carrier: 31.1 Fuel: 40.3 Air: 32.4 FID Status: Status: LIT Counts: 26435 Flame: 375.8 Det Base: 175.0 Flame and Power Stats: Last Power On: June 17, 2016 Flameouts: 1 Det Oven at Start: 149.7 Col Oven at Start: 70.1 Calibration History: Time: July 12, 2016 /09:48 Type: SPAN Status: GOOD Check/Adjust: ADJUST CH ₄ Span Conc: 13.62 CH ₄ SP Ratio: 0.000754 CH ₄ RT: 13.4 CH ₄ PK IDX: 27 CH ₄ PK HT: 18059 NM Span Conc: 13.11 NM SP Ratio: 0.000151	As left: Calibration History cnt'd: NM Peak Area: 86873 Crucial Settings: Methane Start: n/a Methane End: n/a Backflush: n/a NMHV Start: n/a NMHC End: n/a Run History>1: Date: August 02, 2016 Time: 11:21 CH ₄ PK HT: 0 CH ₄ RT: 8.0 CH ₄ Baseline: 2453 CH ₄ LOD: 57 CH ₄ SD: 19 CH ₄ CONC: 0.0 NM PK HT: 0 NM Peak Area: 0 NM CONC: 0.0 NM Base Start: 2265 NM Base End: 2263 NM LOD: 9 NM Start IDX: 29 NM End IDX: 91 NM Max Slope: 5.1e-01 NM Min Slope: -6.3e-01 NM PT Count: 0 Daily Zero/Span Values: Previous CH ₄ : 9.4 Previous NMHC: 11.22 Previous THC: 20.66 New CH ₄ : n/a New NMHC: n/a New THC: n/a																																																																																																		
Comments:																																																																																																			
Shutdown calibration completed to perform annual maintenance and replace actuator. No ZERO adjustment made. No High Point adjustment made.																																																																																																			

Date:	August 2, 2016	Start/End Time 24 hr. (mst):	11:17 / 15:26
Company/Airshed:	LICA	Calibration Purpose:	shut down
Location/Station Name:	Bonnyville - AER	Calibration Method:	Gas Dilution

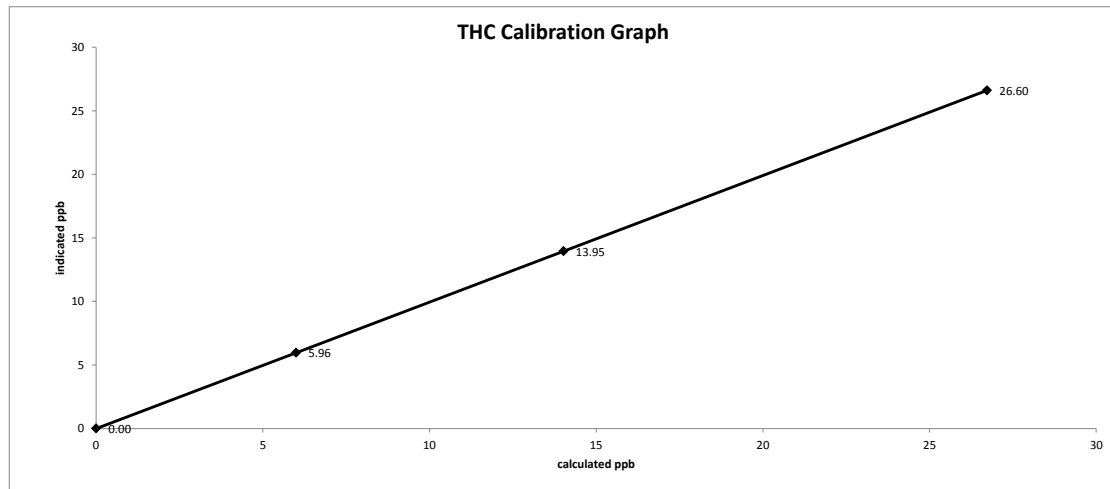
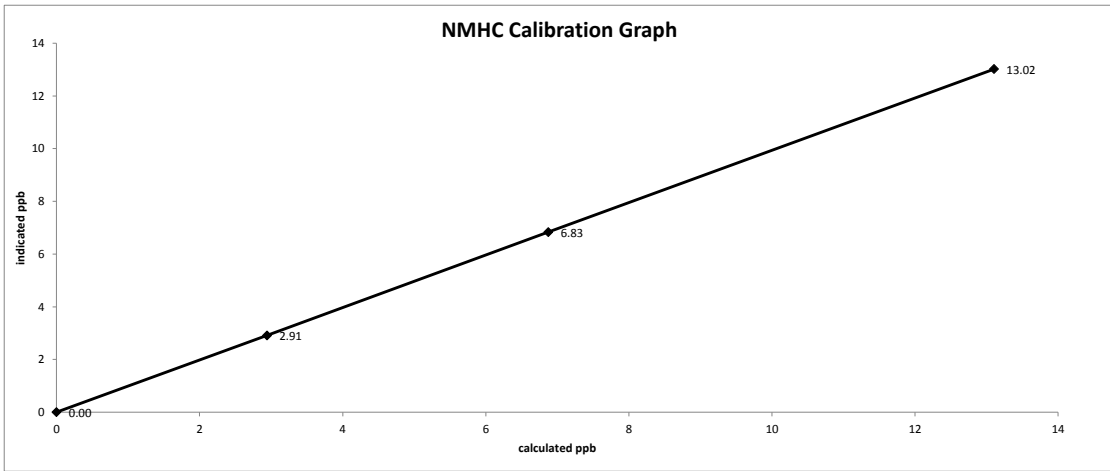
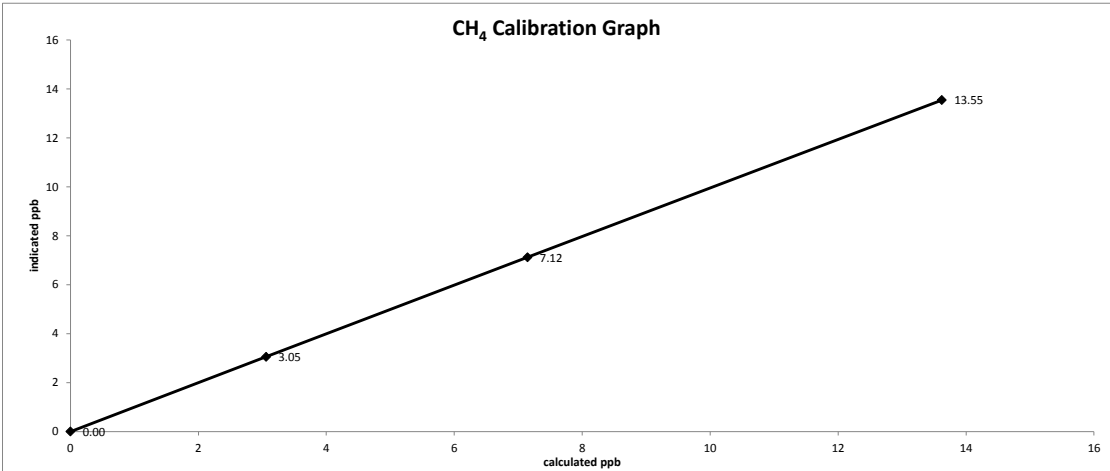


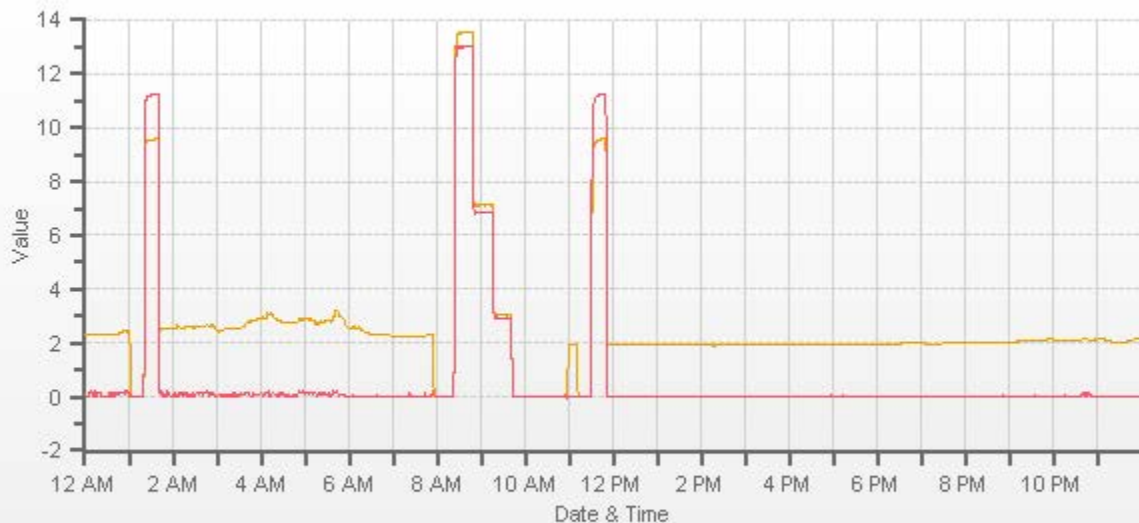


CH4[ppm] NMHC[ppm]

Thermo 55i Methane/Non-Methane Analyzer Calibration																																																																																																									
Date: August 3, 2016 Company/Airshed: LICA Location/Station Name: Bonnyville - AER Parameter: CH ₄ / NMHC / THC Start/End Time 24 hr. (mst): 7:10 / 11:58 Calibration Method: Gas Dilution	Barometric Pressure: 0.937 atm Station Temperature °C: 21 Weather Conditions: Mainly sunny Calibration Purpose: post repair Performed By/Reviewer: Alex Yakupov not yet reviewed Cal Gas Expiry Date: November 25, 2023																																																																																																								
Analyzer:																																																																																																									
Serial Number: 1236656107 Last Calibration Date: n/a Range ppm: 20 CH ₄ /20 NMHC/40 THC	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="3" style="text-align: center;">Correction Factors:</th> </tr> <tr> <th style="width:33%;"></th> <th style="width:33%;">Previous C.F.:</th> <th style="width:33%;">As Found C.F.:</th> </tr> <tr> <td>CH₄ =</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>NMHC =</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>THC =</td> <td>n/a</td> <td>n/a</td> </tr> </table>	Correction Factors:				Previous C.F.:	As Found C.F.:	CH ₄ =	n/a	n/a	NMHC =	n/a	n/a	THC =	n/a	n/a																																																																																									
Correction Factors:																																																																																																									
	Previous C.F.:	As Found C.F.:																																																																																																							
CH ₄ =	n/a	n/a																																																																																																							
NMHC =	n/a	n/a																																																																																																							
THC =	n/a	n/a																																																																																																							
Calibrator:																																																																																																									
Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. # : LL165372 CH₄ Cylinder Conc.: 606.0 212.0 =C ₃ H ₈ Cylinder Conc. CH₄ as C₃H₈: 583.0 1189.0 =total CH ₄ equivalent	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4" style="text-align: center;">Standard Calibration Points for Analyzer Range of 20/20/40 ppm</th> </tr> <tr> <th style="width:20%;">Point</th> <th style="width:20%;">CH₄</th> <th style="width:20%;">NMHC</th> <th style="width:20%;">THC</th> </tr> <tr> <td>High</td> <td>13.00</td> <td>13.00</td> <td>26.00</td> </tr> <tr> <td>Mid</td> <td>7.00</td> <td>7.00</td> <td>14.00</td> </tr> <tr> <td>Low</td> <td>3.00</td> <td>3.00</td> <td>6.00</td> </tr> </table>	Standard Calibration Points for Analyzer Range of 20/20/40 ppm				Point	CH ₄	NMHC	THC	High	13.00	13.00	26.00	Mid	7.00	7.00	14.00	Low	3.00	3.00	6.00																																																																																				
Standard Calibration Points for Analyzer Range of 20/20/40 ppm																																																																																																									
Point	CH ₄	NMHC	THC																																																																																																						
High	13.00	13.00	26.00																																																																																																						
Mid	7.00	7.00	14.00																																																																																																						
Low	3.00	3.00	6.00																																																																																																						
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">Calibrator Flow Rates (cc/min)</th> <th colspan="3" style="text-align: center;">Calculated</th> <th colspan="3" style="text-align: center;">Indicated</th> <th colspan="3" style="text-align: center;">Correction Factors:</th> </tr> <tr> <th style="width:15%;">Point</th> <th style="width:10%;">Diluent</th> <th style="width:10%;">Cal Gas</th> <th style="width:10%;">Total Flow</th> <th style="width:10%;">CH₄ (ppm)</th> <th style="width:10%;">NMHC (ppm)</th> <th style="width:10%;">THC (ppm)</th> <th style="width:10%;">CH₄ (ppm)</th> <th style="width:10%;">NMHC (ppm)</th> <th style="width:10%;">THC (ppm)</th> <th style="width:10%;">CH₄</th> <th style="width:10%;">NMHC</th> <th style="width:10%;">THC</th> </tr> </thead> <tbody> <tr> <td>adjusted zero</td> <td>2001</td> <td>0.00</td> <td>2001</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>adjusted high</td> <td>1957</td> <td>45.00</td> <td>2002</td> <td>13.62</td> <td>13.10</td> <td>26.73</td> <td>13.55</td> <td>13.02</td> <td>26.60</td> <td>1.005</td> <td>1.006</td> <td>1.005</td> </tr> <tr> <td>mid</td> <td>1978</td> <td>23.60</td> <td>2002</td> <td>7.15</td> <td>6.87</td> <td>14.02</td> <td>7.12</td> <td>6.83</td> <td>13.95</td> <td>1.004</td> <td>1.006</td> <td>1.005</td> </tr> <tr> <td>low</td> <td>1991</td> <td>10.10</td> <td>2001</td> <td>3.06</td> <td>2.94</td> <td>6.00</td> <td>3.05</td> <td>2.91</td> <td>5.96</td> <td>1.003</td> <td>1.011</td> <td>1.007</td> </tr> <tr> <td>calibrator zero</td> <td>2001</td> <td>0.00</td> <td>2001</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td colspan="10" style="text-align: right;">Average C.F.=</td> <td>1.004</td> <td>1.008</td> <td>1.006</td> </tr> </tbody> </table>		Calibrator Flow Rates (cc/min)				Calculated			Indicated			Correction Factors:			Point	Diluent	Cal Gas	Total Flow	CH ₄ (ppm)	NMHC (ppm)	THC (ppm)	CH ₄ (ppm)	NMHC (ppm)	THC (ppm)	CH ₄	NMHC	THC	adjusted zero	2001	0.00	2001	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	adjusted high	1957	45.00	2002	13.62	13.10	26.73	13.55	13.02	26.60	1.005	1.006	1.005	mid	1978	23.60	2002	7.15	6.87	14.02	7.12	6.83	13.95	1.004	1.006	1.005	low	1991	10.10	2001	3.06	2.94	6.00	3.05	2.91	5.96	1.003	1.011	1.007	calibrator zero	2001	0.00	2001	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	Average C.F.=										1.004	1.008	1.006
Calibrator Flow Rates (cc/min)				Calculated			Indicated			Correction Factors:																																																																																															
Point	Diluent	Cal Gas	Total Flow	CH ₄ (ppm)	NMHC (ppm)	THC (ppm)	CH ₄ (ppm)	NMHC (ppm)	THC (ppm)	CH ₄	NMHC	THC																																																																																													
adjusted zero	2001	0.00	2001	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a																																																																																													
adjusted high	1957	45.00	2002	13.62	13.10	26.73	13.55	13.02	26.60	1.005	1.006	1.005																																																																																													
mid	1978	23.60	2002	7.15	6.87	14.02	7.12	6.83	13.95	1.004	1.006	1.005																																																																																													
low	1991	10.10	2001	3.06	2.94	6.00	3.05	2.91	5.96	1.003	1.011	1.007																																																																																													
calibrator zero	2001	0.00	2001	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a																																																																																													
Average C.F.=										1.004	1.008	1.006																																																																																													
Linear Regression/Calibration Results:																																																																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;"></th> <th style="width:10%;">CH₄</th> <th style="width:10%;">NMHC</th> <th style="width:10%;">THC</th> <th style="width:10%;">LIMITS</th> </tr> </thead> <tbody> <tr> <td>Correlation Coefficient =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> <td>> or = 0.995</td> </tr> <tr> <td>Slope =</td> <td>0.995</td> <td>0.994</td> <td>0.995</td> <td>.95-1.05</td> </tr> <tr> <td>b (Intercept as % of full scale)=</td> <td>0.03%</td> <td>-0.03%</td> <td>-0.01%</td> <td>± 3% F.S.</td> </tr> <tr> <td>% change in C.F. from last cal=</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> <td>± 10%</td> </tr> </tbody> </table>			CH ₄	NMHC	THC	LIMITS	Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995	Slope =	0.995	0.994	0.995	.95-1.05	b (Intercept as % of full scale)=	0.03%	-0.03%	-0.01%	± 3% F.S.	% change in C.F. from last cal=	n/a	n/a	n/a	± 10%																																																																															
	CH ₄	NMHC	THC	LIMITS																																																																																																					
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995																																																																																																					
Slope =	0.995	0.994	0.995	.95-1.05																																																																																																					
b (Intercept as % of full scale)=	0.03%	-0.03%	-0.01%	± 3% F.S.																																																																																																					
% change in C.F. from last cal=	n/a	n/a	n/a	± 10%																																																																																																					
<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> Interface Board Voltages: Bias Supply: n/a Temperatures: Detector Oven: n/a Filter: n/a Column Oven: n/a Internal: n/a Cylinder Pressures/reg.: Carrier: 1000 60 Fuel: 110 50 Span Gas: 600 22 Zero Air Generator: 46 Internal Pressures: Carrier: n/a Fuel: n/a Air: n/a FID Status: Status: n/a Counts: n/a Flame: n/a Det Base: n/a Flame and Power Stats: Last Power On: n/a Flameouts: n/a Det Oven at Start: n/a Col Oven at Start: n/a Calibration History: Time: n/a Type: n/a Status: n/a Check/Adjust: n/a CH₄ Span Conc: n/a CH₄ SP Ratio: n/a CH₄ RT: n/a CH₄ PK IDX: n/a CH₄ PK HT: n/a NM Span Conc: n/a NM SP Ratio: n/a </td> <td style="width:50%; vertical-align: top;"> As found: Calibration History cnt'd: NM Peak Area: n/a Crucial Settings: Methane Start: n/a Methane End: n/a Backflush: n/a NMHV Start: n/a NMHC End: n/a Run History>1: Date: Aug 3, 2016 Time: 13:33 CH₄ PK HT: 2765 CH₄ RT: 12.4 CH₄ Baseline: 2284 CH₄ LOD: 75 CH₄ SD: 19 CH₄ CONC: 1.95 NM PK HT: 0 NM Peak Area: 0 NM CONC: 0.00 NM Base Start: 2256 NM Base End: 2286 NM LOD: 11 NM Start IDX: 6 NM End IDX: 65 NM Max Slope: 1.7e+00 NM Min Slope: -6.0e-01 NM PT Count: 0 Daily Zero/Span Values: Previous CH₄: n/a Previous NMHC: n/a Previous THC: n/a New CH₄: 9.6 New NMHC: 11.26 New THC: 20.87 </td> </tr> </table>		Interface Board Voltages: Bias Supply: n/a Temperatures: Detector Oven: n/a Filter: n/a Column Oven: n/a Internal: n/a Cylinder Pressures/reg.: Carrier: 1000 60 Fuel: 110 50 Span Gas: 600 22 Zero Air Generator: 46 Internal Pressures: Carrier: n/a Fuel: n/a Air: n/a FID Status: Status: n/a Counts: n/a Flame: n/a Det Base: n/a Flame and Power Stats: Last Power On: n/a Flameouts: n/a Det Oven at Start: n/a Col Oven at Start: n/a Calibration History: Time: n/a Type: n/a Status: n/a Check/Adjust: n/a CH ₄ Span Conc: n/a CH ₄ SP Ratio: n/a CH ₄ RT: n/a CH ₄ PK IDX: n/a CH ₄ PK HT: n/a NM Span Conc: n/a NM SP Ratio: n/a	As found: Calibration History cnt'd: NM Peak Area: n/a Crucial Settings: Methane Start: n/a Methane End: n/a Backflush: n/a NMHV Start: n/a NMHC End: n/a Run History>1: Date: Aug 3, 2016 Time: 13:33 CH ₄ PK HT: 2765 CH ₄ RT: 12.4 CH ₄ Baseline: 2284 CH ₄ LOD: 75 CH ₄ SD: 19 CH ₄ CONC: 1.95 NM PK HT: 0 NM Peak Area: 0 NM CONC: 0.00 NM Base Start: 2256 NM Base End: 2286 NM LOD: 11 NM Start IDX: 6 NM End IDX: 65 NM Max Slope: 1.7e+00 NM Min Slope: -6.0e-01 NM PT Count: 0 Daily Zero/Span Values: Previous CH ₄ : n/a Previous NMHC: n/a Previous THC: n/a New CH ₄ : 9.6 New NMHC: 11.26 New THC: 20.87																																																																																																						
Interface Board Voltages: Bias Supply: n/a Temperatures: Detector Oven: n/a Filter: n/a Column Oven: n/a Internal: n/a Cylinder Pressures/reg.: Carrier: 1000 60 Fuel: 110 50 Span Gas: 600 22 Zero Air Generator: 46 Internal Pressures: Carrier: n/a Fuel: n/a Air: n/a FID Status: Status: n/a Counts: n/a Flame: n/a Det Base: n/a Flame and Power Stats: Last Power On: n/a Flameouts: n/a Det Oven at Start: n/a Col Oven at Start: n/a Calibration History: Time: n/a Type: n/a Status: n/a Check/Adjust: n/a CH ₄ Span Conc: n/a CH ₄ SP Ratio: n/a CH ₄ RT: n/a CH ₄ PK IDX: n/a CH ₄ PK HT: n/a NM Span Conc: n/a NM SP Ratio: n/a	As found: Calibration History cnt'd: NM Peak Area: n/a Crucial Settings: Methane Start: n/a Methane End: n/a Backflush: n/a NMHV Start: n/a NMHC End: n/a Run History>1: Date: Aug 3, 2016 Time: 13:33 CH ₄ PK HT: 2765 CH ₄ RT: 12.4 CH ₄ Baseline: 2284 CH ₄ LOD: 75 CH ₄ SD: 19 CH ₄ CONC: 1.95 NM PK HT: 0 NM Peak Area: 0 NM CONC: 0.00 NM Base Start: 2256 NM Base End: 2286 NM LOD: 11 NM Start IDX: 6 NM End IDX: 65 NM Max Slope: 1.7e+00 NM Min Slope: -6.0e-01 NM PT Count: 0 Daily Zero/Span Values: Previous CH ₄ : n/a Previous NMHC: n/a Previous THC: n/a New CH ₄ : 9.6 New NMHC: 11.26 New THC: 20.87																																																																																																								
Comments: <p style="text-align: center;">Post-repair calibration completed after annual maintenance. No ZERO adjustment made. Valve Actuator replaced. Sample inlet filter changed.</p>																																																																																																									


Date:	August 3, 2016	Start/End Time 24 hr. (mst):	7:10 / 11:58
Company/Airshed:	LICA	Calibration Purpose:	post repair
Location/Station Name:	Bonnyville - AER	Calibration Method:	Gas Dilution





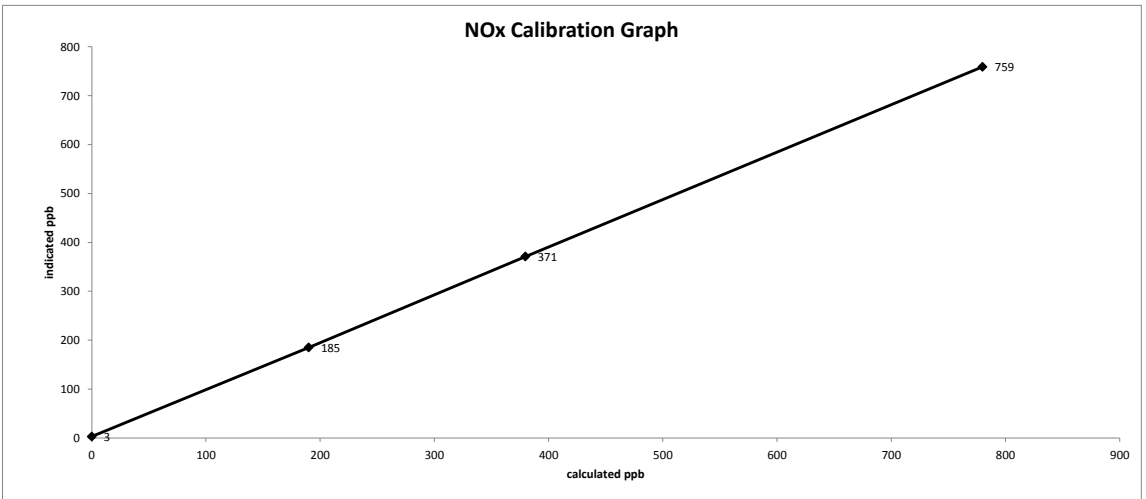
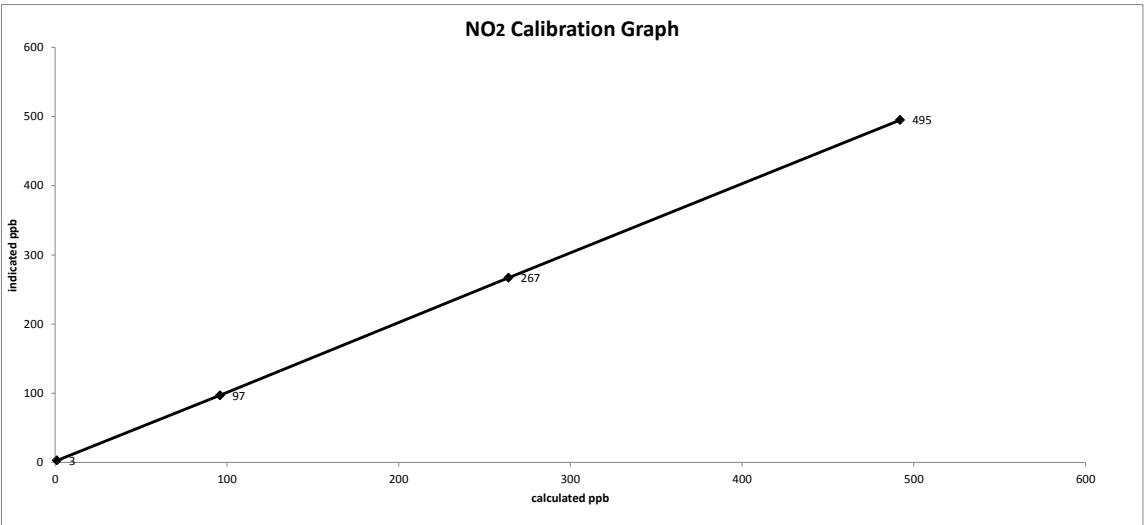
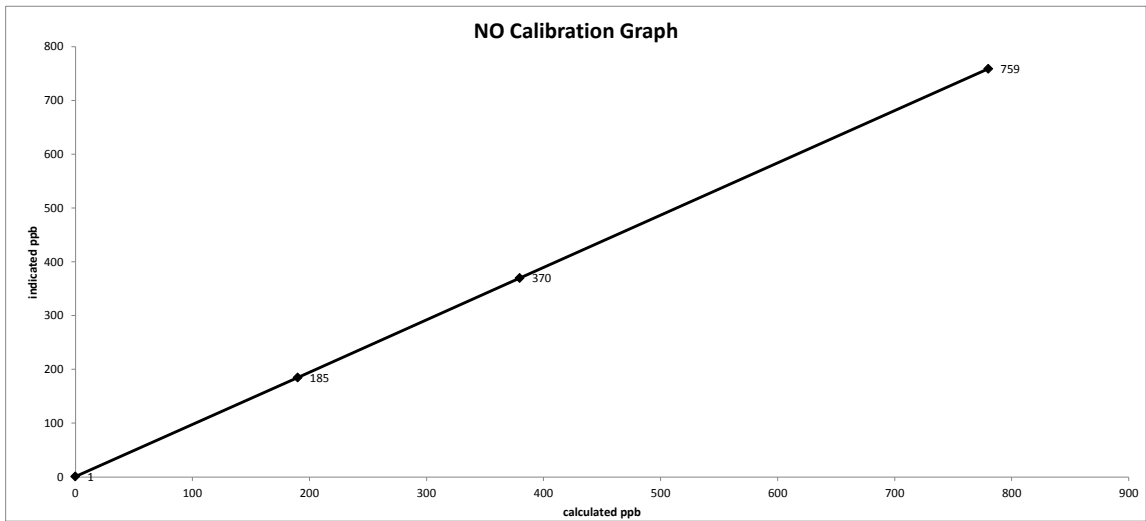
CH4[ppm] NMHC[ppm]

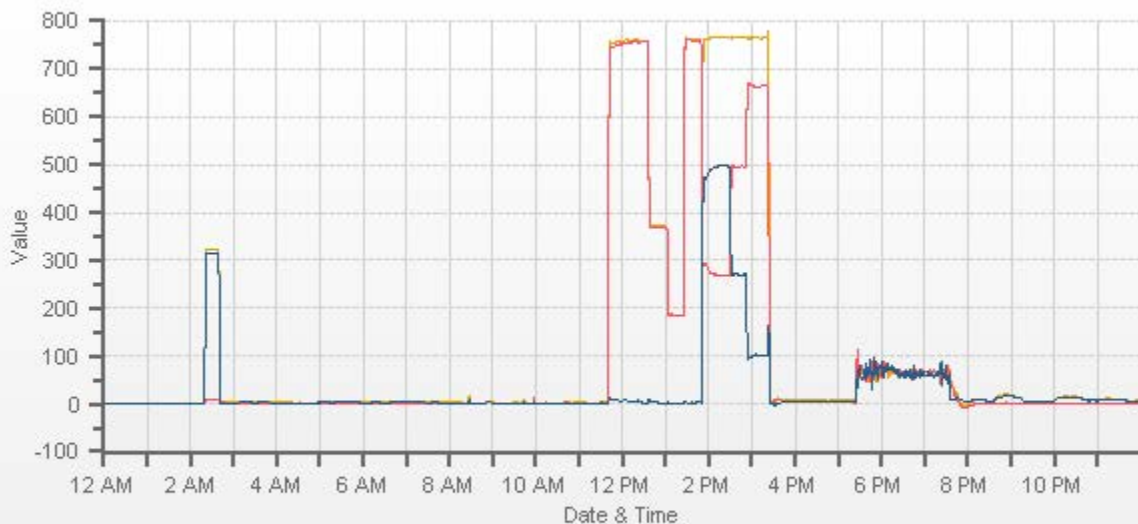
NITROGEN DIOXIDE

		<h2 style="margin: 0;">API 200E NO-NO2-NOx Analyzer Calibration</h2>																									
Date: August 2, 2016 Company/Airshed: LICA Location/Station Name: Bonnyville - AER Start/End Time 24 hr. (mst): 11:17 / 15:22 G.P.T. to be used for Ozone? No Calibration Method: Gas Dilution & Gas Phase Titration		Barometric Pressure: 0.937 atm Station Temperature °C: 22 Weather Conditions: Mainly sunny Calibration Purpose: shut down Performed By/Reviewer: Alex Yakupov Tom Bourque Cal Gas Expiry Date: December 2, 2023																									
Analyzer: Serial Number: 593 Last Calibration Date: July 13, 2016 Range ppb: 1000		Correction Factors: <table border="1" style="margin: 0 auto;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>0.997</td> <td>1.029</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>0.994</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>0.997</td> <td>1.032</td> <td>n/a</td> </tr> </tbody> </table>			Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.997	1.029	n/a	NO ₂ =	1.000	0.994	n/a	NOx =	0.997	1.032	n/a								
	Previous C.F.:	As Found C.F.:	New C.F.:																								
NO =	0.997	1.029	n/a																								
NO ₂ =	1.000	0.994	n/a																								
NOx =	0.997	1.032	n/a																								
Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL119346 NO/NOx Gas Conc. (ppm): 50.0 50.0		Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="margin: 0 auto;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>		Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																								
High	780	500	n/a																								
Mid	380	275	n/a																								
Low	190	100	n/a																								
Extra Point #1	n/a	n/a	n/a																								
Extra Point #2	n/a	n/a	n/a																								
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																											
Calibrator Flow Rates (cc/min)																											
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	1.0	3.0	n/a	n/a																		
as found high	4922	78.0	5000	780.0	780.0	759.0	759.0	1.029	1.032																		
mid	4966	38.00	5004	379.7	379.7	370.0	371.0	1.029	1.032																		
low	4982	19.00	5001	190.0	190.0	185.0	185.0	1.032	1.044																		
Average C.F.=								1.030	1.036																		
Calibrator Flow Rates (cc/min)				ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																							
Point	Diluent	Cal Gas	Total Flow	Calibrator Setting (volts or ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	Indicated NO ₂ (ppb)	NO drop (ppb)	NO ₂ gain (ppb)	NO ₂ C.F.																	
NOx reference	4922	78.00	5000	0.0	760.0	763.0	3.0	1.0	3.0																		
as found high NO2	4800	78.00	4878	515.0	268.0	766.0	498.0	492.0	495.0	0.994																	
gpt mid	4800	78.00	4878	280.0	496.0	766.0	270.0	264.0	267.0	0.989																	
gpt low	4800	78.00	4878	110.0	664.0	765.0	100.0	96.0	97.0	0.990																	
Average NO ₂ C.F.=									0.991																		
Linear Regression/Calibration Results:																											
				NO	NOx	NO ₂	LIMITS																				
Correlation Coefficient =				1.000	1.000	1.000	> or = 0.995																				
Slope =				1.029	1.031	0.997	0.90-1.10																				
b (Intercept as % of full scale)=				0.08%	0.22%	0.16%	± 3% F.S.																				
% change in C.F. from last cal=				-3.21%	0.61%	-3.49%	± 10%																				
NO2 converter efficiency						0.99	0.96 to 1.04																				
As found:						As left:																					
NOx SLOPE:	1.116			NOx SLOPE:	n/a																						
NOx OFFS:	0.8			NOx OFFS:	n/a																						
NO SLOPE:	1.116			NO SLOPE:	n/a																						
NO OFFS:	-0.6			NO OFFS:	n/a																						
SAMP FLW:	485			SAMP FLW:	n/a																						
OZONE FL:	77			OZONE FL:	n/a																						
PMT:	8.8			PMT:	n/a																						
NORM PMT:	3.8			NORM PMT:	n/a																						
AZERO:	6.9			AZERO:	n/a																						
HVPS:	662			HVPS:	n/a																						
RCELL TEMP:	50.0			RCELL TEMP:	n/a																						
BOX TEMP:	29.5			BOX TEMP:	n/a																						
PMT TEMP:	6.7			PMT TEMP:	n/a																						
IZS TEMP:	45.2			IZS TEMP:	n/a																						
MOLY TEMP:	315.0			MOLY TEMP:	n/a																						
RCEL:	7.0			RCEL:	n/a																						
SAMP:	27.6			SAMP:	n/a																						
Internal Span NO:	8.8			Internal Span NO:	n/a																						
Internal Span NO2:	318			Internal Span NO2:	n/a																						
Internal Span NOx:	327			Internal Span NOx:	n/a																						
Comments: Shutdown calibration completed to perform annual maintenance. No ZERO adjustment made. No High Point adjustment made. No NO2 adjustment made.																											


Date: August 2, 2016
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 11:17 / 15:22
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration



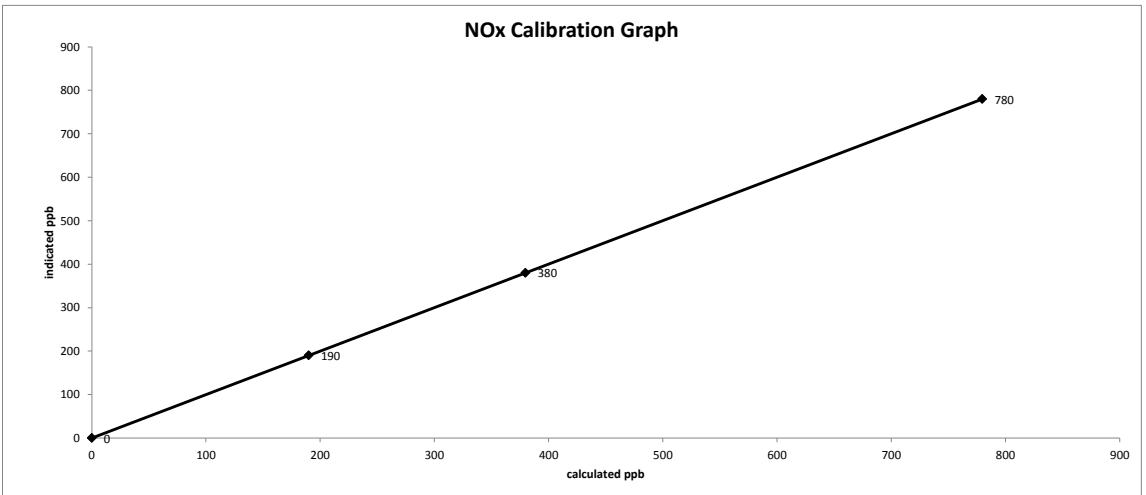
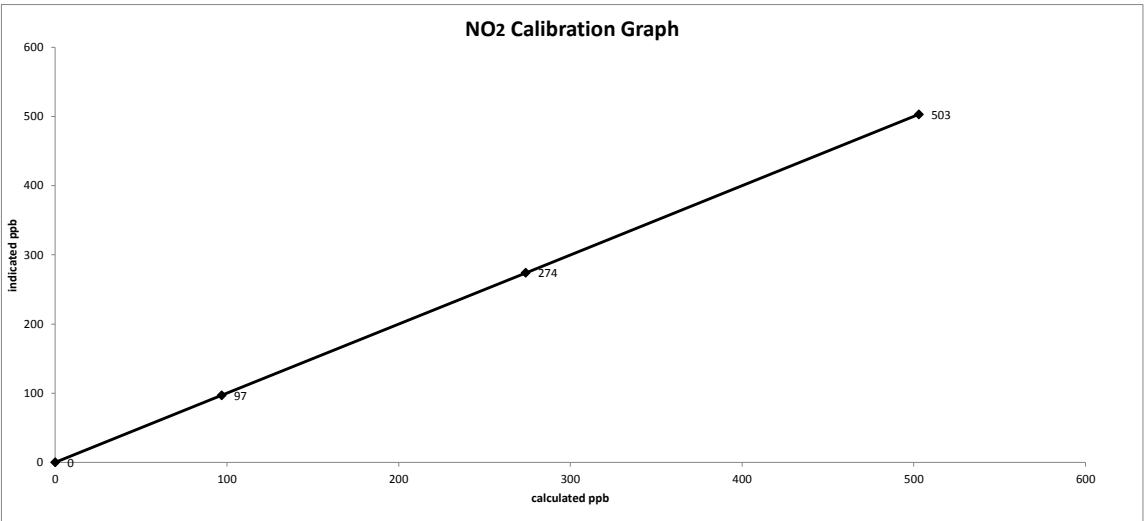
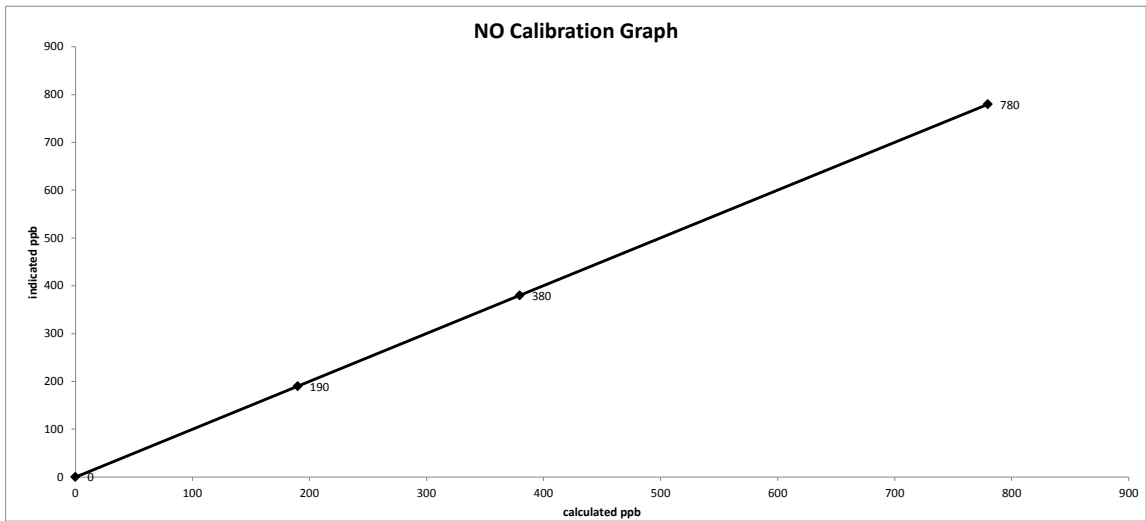


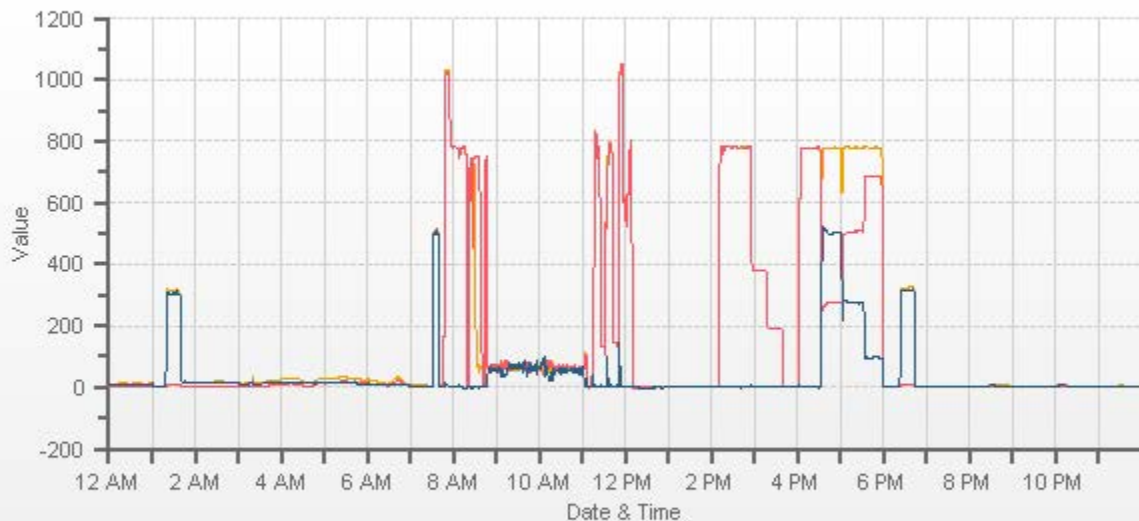
— NOX[ppb] — NO[ppb] — NO2[ppb]

 API 200E NO-NO2-NOx Analyzer Calibration																																																																																	
Date: August 3, 2016 Company/Airshed: LICA Location/Station Name: Bonnyville - AER Start/End Time 24 hr. (mst): 13:07 / 18:52 G.P.T. to be used for Ozone? No Calibration Method: Gas Dilution & Gas Phase Titration	Barometric Pressure: 0.937 atm Station Temperature °C: 21 Weather Conditions: Mainly sunny Calibration Purpose: post repair Performed By/Reviewer: Alex Yakupov Tom Bourque Cal Gas Expiry Date: December 2, 2023																																																																																
Analyzer:																																																																																	
Serial Number: 593 Last Calibration Date: n/a Range ppb: 1000	Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	n/a	n/a	1.000	NO ₂ =	n/a	n/a	1.000	NOx =	n/a	n/a	1.000																																																																
	Previous C.F.:	As Found C.F.:	New C.F.:																																																																														
NO =	n/a	n/a	1.000																																																																														
NO ₂ =	n/a	n/a	1.000																																																																														
NOx =	n/a	n/a	1.000																																																																														
Calibrator:																																																																																	
Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL119346 NO/NOx Gas Conc. (ppm): 50.0 50.0	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a																																																								
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																																																																														
High	780	500	n/a																																																																														
Mid	380	275	n/a																																																																														
Low	190	100	n/a																																																																														
Extra Point #1	n/a	n/a	n/a																																																																														
Extra Point #2	n/a	n/a	n/a																																																																														
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																																																	
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Calibrator Flow Rates (cc/min)</th> <th>Calculated NO</th> <th>Calculated NOx</th> <th>Indicated NO</th> <th>Indicated NOx</th> <th>NO C.F.</th> <th>NOx C.F.</th> </tr> <tr> <th>Point</th> <th>Diluent</th> <th>Cal Gas</th> <th>Total Flow</th> <th>(ppb)</th> <th>(ppb)</th> <th>(ppb)</th> <th>(ppb)</th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>adjusted zero</td> <td>5000</td> <td>0.0</td> <td>5000</td> <td>0</td> <td>0</td> <td>0.0</td> <td>0.0</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>adjusted high</td> <td>4924</td> <td>78.0</td> <td>5002</td> <td>779.7</td> <td>779.7</td> <td>780.0</td> <td>780.0</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>mid</td> <td>4966</td> <td>38.00</td> <td>5004</td> <td>379.7</td> <td>379.7</td> <td>380.0</td> <td>380.0</td> <td>0.999</td> <td>0.999</td> </tr> <tr> <td>low</td> <td>4982</td> <td>19.00</td> <td>5001</td> <td>190.0</td> <td>190.0</td> <td>190.0</td> <td>190.0</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>calibrator zero</td> <td>5000</td> <td>0.00</td> <td>5000</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td colspan="8" style="text-align: right;">Average C.F.=</td> <td>1.000</td> <td>1.000</td> </tr> </tbody> </table>		Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.	Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)			adjusted zero	5000	0.0	5000	0	0	0.0	0.0	n/a	n/a	adjusted high	4924	78.0	5002	779.7	779.7	780.0	780.0	1.000	1.000	mid	4966	38.00	5004	379.7	379.7	380.0	380.0	0.999	0.999	low	4982	19.00	5001	190.0	190.0	190.0	190.0	1.000	1.000	calibrator zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a	Average C.F.=								1.000	1.000
Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.																																																																								
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)																																																																										
adjusted zero	5000	0.0	5000	0	0	0.0	0.0	n/a	n/a																																																																								
adjusted high	4924	78.0	5002	779.7	779.7	780.0	780.0	1.000	1.000																																																																								
mid	4966	38.00	5004	379.7	379.7	380.0	380.0	0.999	0.999																																																																								
low	4982	19.00	5001	190.0	190.0	190.0	190.0	1.000	1.000																																																																								
calibrator zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a																																																																								
Average C.F.=								1.000	1.000																																																																								
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																																																	
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Calibrator Flow Rates (cc/min)</th> <th>Calibrator Setting</th> <th>Indicated NO</th> <th>Indicated NOx</th> <th>Indicated NO₂</th> <th>NO drop</th> <th>NO₂ gain</th> <th>NO₂ C.F.</th> </tr> <tr> <th>Point</th> <th>Diluent</th> <th>Cal Gas</th> <th>Total Flow</th> <th>volts or ppb</th> <th>(ppb)</th> <th>(ppb)</th> <th>(ppb)</th> <th>(ppb)</th> <th>(ppb)</th> <th>(ppb)</th> </tr> </thead> <tbody> <tr> <td>NOx reference</td> <td>4922</td> <td>78.00</td> <td>5000</td> <td>0.0</td> <td>780.0</td> <td>780.0</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td></td> </tr> <tr> <td>adjusted high NO2</td> <td>4800</td> <td>78.00</td> <td>4878</td> <td>490.0</td> <td>277.0</td> <td>780.0</td> <td>503.0</td> <td>503.0</td> <td>503.0</td> <td>1.000</td> </tr> <tr> <td>gpt mid</td> <td>4800</td> <td>78.00</td> <td>4878</td> <td>265.0</td> <td>506.0</td> <td>780.0</td> <td>274.0</td> <td>274.0</td> <td>274.0</td> <td>1.000</td> </tr> <tr> <td>gpt low</td> <td>4800</td> <td>78.00</td> <td>4878</td> <td>95.0</td> <td>683.0</td> <td>780.0</td> <td>97.0</td> <td>97.0</td> <td>97.0</td> <td>1.000</td> </tr> <tr> <td colspan="10" style="text-align: right;">Average NO₂ C.F.=</td> <td>1.000</td> </tr> </tbody> </table>		Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.	Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	NOx reference	4922	78.00	5000	0.0	780.0	780.0	0.0	0.0	0.0		adjusted high NO2	4800	78.00	4878	490.0	277.0	780.0	503.0	503.0	503.0	1.000	gpt mid	4800	78.00	4878	265.0	506.0	780.0	274.0	274.0	274.0	1.000	gpt low	4800	78.00	4878	95.0	683.0	780.0	97.0	97.0	97.0	1.000	Average NO ₂ C.F.=										1.000			
Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.																																																																							
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)																																																																							
NOx reference	4922	78.00	5000	0.0	780.0	780.0	0.0	0.0	0.0																																																																								
adjusted high NO2	4800	78.00	4878	490.0	277.0	780.0	503.0	503.0	503.0	1.000																																																																							
gpt mid	4800	78.00	4878	265.0	506.0	780.0	274.0	274.0	274.0	1.000																																																																							
gpt low	4800	78.00	4878	95.0	683.0	780.0	97.0	97.0	97.0	1.000																																																																							
Average NO ₂ 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 = n/a NO2 converter efficiency = n/a	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>NO</th> <th>NOx</th> <th>NO₂</th> </tr> </thead> <tbody> <tr> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>0.00%</td> <td>0.00%</td> <td>0.00%</td> </tr> <tr> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td></td> <td></td> <td>1.00</td> </tr> </tbody> </table>	NO	NOx	NO ₂	1.000	1.000	1.000	1.000	1.000	1.000	0.00%	0.00%	0.00%	n/a	n/a	n/a			1.00																																																														
NO	NOx	NO ₂																																																																															
1.000	1.000	1.000																																																																															
1.000	1.000	1.000																																																																															
0.00%	0.00%	0.00%																																																																															
n/a	n/a	n/a																																																																															
		1.00																																																																															
LIMITS > or = 0.995 .95-1.05 ± 3% F.S. ± 10% 0.96 to 1.04																																																																																	
<table style="width:100%;"> <thead> <tr> <th style="text-align: center;">As found:</th> <th style="text-align: center;">As left:</th> </tr> </thead> <tbody> <tr> <td>NOx SLOPE: n/a</td> <td>NOx SLOPE: 0.983</td> </tr> <tr> <td>NOx OFFS: n/a</td> <td>NOx OFFS: 0.6</td> </tr> <tr> <td>NO SLOPE: n/a</td> <td>NO SLOPE: 0.982</td> </tr> <tr> <td>NO OFFS: n/a</td> <td>NO OFFS: -0.9</td> </tr> <tr> <td>SAMP FLW: n/a</td> <td>SAMP FLW: 478</td> </tr> <tr> <td>OZONE FL: n/a</td> <td>OZONE FL: 63</td> </tr> <tr> <td>PMT: n/a</td> <td>PMT: 15.1</td> </tr> <tr> <td>NORM PMT: n/a</td> <td>NORM PMT: 0.6</td> </tr> <tr> <td>AZERO: n/a</td> <td>AZERO: 11.6</td> </tr> <tr> <td>HVPS: n/a</td> <td>HVPS: 658</td> </tr> <tr> <td>RCELL TEMP: n/a</td> <td>RCELL TEMP: 50.0</td> </tr> <tr> <td>BOX TEMP: n/a</td> <td>BOX TEMP: 33.4</td> </tr> <tr> <td>PMT TEMP: n/a</td> <td>PMT TEMP: 6.7</td> </tr> <tr> <td>IZS TEMP: n/a</td> <td>IZS TEMP: 45.3</td> </tr> <tr> <td>MOLY TEMP: n/a</td> <td>MOLY TEMP: 314.6</td> </tr> <tr> <td>RCEL: n/a</td> <td>RCEL: 5.5</td> </tr> <tr> <td>SAMP: n/a</td> <td>SAMP: 27.2</td> </tr> <tr> <td>Internal Span NO: n/a</td> <td>Internal Span NO: 8.2</td> </tr> <tr> <td>Internal Span NO2: n/a</td> <td>Internal Span NO2: 318</td> </tr> <tr> <td>Internal Span NOx: n/a</td> <td>Internal Span NOx: 326</td> </tr> </tbody> </table>		As found:	As left:	NOx SLOPE: n/a	NOx SLOPE: 0.983	NOx OFFS: n/a	NOx OFFS: 0.6	NO SLOPE: n/a	NO SLOPE: 0.982	NO OFFS: n/a	NO OFFS: -0.9	SAMP FLW: n/a	SAMP FLW: 478	OZONE FL: n/a	OZONE FL: 63	PMT: n/a	PMT: 15.1	NORM PMT: n/a	NORM PMT: 0.6	AZERO: n/a	AZERO: 11.6	HVPS: n/a	HVPS: 658	RCELL TEMP: n/a	RCELL TEMP: 50.0	BOX TEMP: n/a	BOX TEMP: 33.4	PMT TEMP: n/a	PMT TEMP: 6.7	IZS TEMP: n/a	IZS TEMP: 45.3	MOLY TEMP: n/a	MOLY TEMP: 314.6	RCEL: n/a	RCEL: 5.5	SAMP: n/a	SAMP: 27.2	Internal Span NO: n/a	Internal Span NO: 8.2	Internal Span NO2: n/a	Internal Span NO2: 318	Internal Span NOx: n/a	Internal Span NOx: 326																																						
As found:	As left:																																																																																
NOx SLOPE: n/a	NOx SLOPE: 0.983																																																																																
NOx OFFS: n/a	NOx OFFS: 0.6																																																																																
NO SLOPE: n/a	NO SLOPE: 0.982																																																																																
NO OFFS: n/a	NO OFFS: -0.9																																																																																
SAMP FLW: n/a	SAMP FLW: 478																																																																																
OZONE FL: n/a	OZONE FL: 63																																																																																
PMT: n/a	PMT: 15.1																																																																																
NORM PMT: n/a	NORM PMT: 0.6																																																																																
AZERO: n/a	AZERO: 11.6																																																																																
HVPS: n/a	HVPS: 658																																																																																
RCELL TEMP: n/a	RCELL TEMP: 50.0																																																																																
BOX TEMP: n/a	BOX TEMP: 33.4																																																																																
PMT TEMP: n/a	PMT TEMP: 6.7																																																																																
IZS TEMP: n/a	IZS TEMP: 45.3																																																																																
MOLY TEMP: n/a	MOLY TEMP: 314.6																																																																																
RCEL: n/a	RCEL: 5.5																																																																																
SAMP: n/a	SAMP: 27.2																																																																																
Internal Span NO: n/a	Internal Span NO: 8.2																																																																																
Internal Span NO2: n/a	Internal Span NO2: 318																																																																																
Internal Span NOx: n/a	Internal Span NOx: 326																																																																																
Comments:																																																																																	
Post-repair calibration completed after annual maintenance. No NO2 adjustment made. Sample inlet filter changed. O-rings and sintered filters replaced, valves and manifold cleaned, reaction cell cleaned, output voltage calibration, pump rebuilt, exhaust tubing replaced.																																																																																	

Date: August 3, 2016
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 13:07 / 18:52
Calibration Purpose: post repair
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]



API 200E NO-NO2-NOx Analyzer Calibration

Date: August 6, 2016	Barometric Pressure: 28.17 inHg
Company/Airshed: LICA	Station Temperature °C: 21
Location/Station Name: Bonnyville - AER	Weather Conditions: Mainly sunny
Start/End Time 24 hr. (mst): 08:20 / 11:15	Calibration Purpose: as found
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Limin Li Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 25, 2018

Analyzer:	Correction Factors:																
Serial Number: 593	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;"></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>NO =</td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">1.010</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>NO₂ =</td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">0.994</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>NOx =</td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">1.006</td> <td style="text-align: center;">n/a</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.010	n/a	NO₂ =	1.000	0.994	n/a	NOx =	1.000	1.006	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.010	n/a														
NO₂ =	1.000	0.994	n/a														
NOx =	1.000	1.006	n/a														
Last Calibration Date: August 2, 2016																	
Range ppb: 1000																	

Calibrator:	Standard Calibration Points for a Range of: 1000 ppb																								
Flow Meter ID's: n/a																									
Make & Model: API 700																									
Serial #: 829																									
Cal Gas Cylinder I.D. #: BLM002756T																									
NO/NOx Gas Conc. (ppm): 50.7 50.7																									
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td 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 ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	4998	0.0	4998	0	0	0.0	0.0	n/a	n/a
as found high	4923	76.9	5000	779.8	779.8	772.0	775.0	1.010	1.006
Average C.F.=								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 ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4923	76.90	5000	0.0	772.0	775.0	3.0	0.0	3.0	n/a
as found high NO ₂	4923	76.90	5000	500.0	263.0	778.0	515.0	509.0	512.0	0.994
Average NO₂ C.F.=										n/a

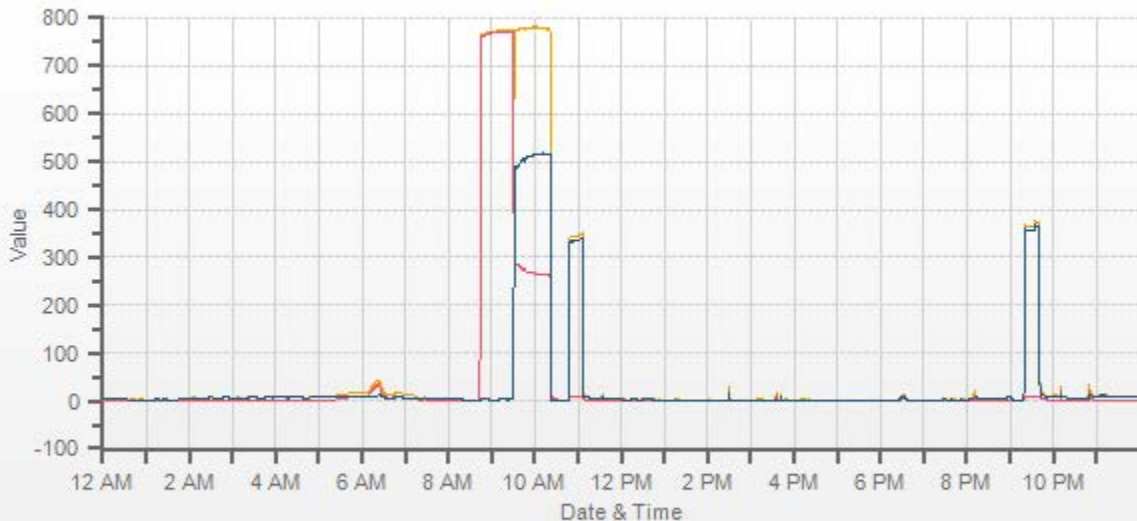
Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
% change in C.F. from last cal=	-1.01%	0.59%	-0.62%	± 10%
NO ₂ converter efficiency	n/a	n/a	0.99	0.96 to 1.04

As found: NOx SLOPE: 0.983 NOx OFFS: 0.6 NO SLOPE: 0.982 NO OFFS: -0.9 SAMP FLW: 480 OZONE FL: 62 PMT: 6.3 NORM PMT: -1.4 AZERO: 7.9 HVPS: 658 RCELL TEMP: 50.0 BOX TEMP: 29.5 PMT TEMP: 6.7 IZS TEMP: 45.1 MOLY TEMP: 313.5 RCEL: 5.5 SAMP: 27.1 Internal Span NO: 8.6 Internal Span NO ₂ : 349.5 Internal Span NOx: 358.5	As left: NOx SLOPE: 0.983 NOx OFFS: 0.6 NO SLOPE: 0.982 NO OFFS: -0.9 SAMP FLW: 478 OZONE FL: 63 PMT: 15.1 NORM PMT: 0.6 AZERO: 11.6 HVPS: 658 RCELL TEMP: 50.0 BOX TEMP: 33.4 PMT TEMP: 6.7 IZS TEMP: 45.3 MOLY TEMP: 314.6 RCEL: 5.5 SAMP: 27.2 Internal Span NO: 8.6 Internal Span NO ₂ : 349.5 Internal Span NOx: 358.5
---	---

Comments:

NO and NOx daily span result at 9.9% - as found performed for diligence - analyzer okay.



— NOX[ppb] — NO[ppb] — NO2[ppb]



API 200E NO-NO2-NOx Analyzer Calibration

Date: August 9, 2016	Barometric Pressure: 0.928 atm
Company/Airshed: LICA	Station Temperature °C: 21
Location/Station Name: Bonnyville - AER	Weather Conditions: Moderate rain
Start/End Time 24 hr. (mst): 11:21 / 17:18	Calibration Purpose: repeat
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 2, 2023

Analyzer: Serial Number: 593 Last Calibration Date: August 3, 2016 Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.000</td> <td>1.056</td> <td>1.001</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.052</td> <td>1.001</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.056	1.001	NO ₂ =	1.000	1.000	1.000	NOx =	1.000	1.052	1.001
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.056	1.001														
NO ₂ =	1.000	1.000	1.000														
NOx =	1.000	1.052	1.001														

Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL119346 NO/NOx Gas Conc. (ppm): 50.0 50.0	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	1.0	n/a	n/a
as found high	4924	78.0	5002	779.7	779.7	738.0	742.0	1.056	1.052
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4924	78.00	5002	779.7	779.7	779.0	779.0	1.001	1.001
mid	4965	38.00	5003	379.8	379.8	379.0	379.0	1.002	1.002
low	4982	19.00	5001	190.0	190.0	190.0	189.0	1.000	1.005
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.001	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 ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	78.00	5002	0.0	782.0	783.0	1.0	0.0	1.0	
as found high NO2	4799	78.00	4877	490.0	284.0	783.0	499.0	498.0	498.0	1.000
adjusted high NO2	4799	78.00	4877	490.0	284.0	783.0	499.0	498.0	498.0	1.000
gpt mid	4799	78.00	4877	270.0	509.0	784.0	275.0	273.0	274.0	0.996
gpt low	4799	78.00	4877	100.0	686.0	783.0	97.0	96.0	96.0	1.000
Average NO₂ C.F.=										0.999

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.001	1.001	1.001	.95-1.05
b (Intercept as % of full scale) =	0.00%	-0.04%	0.07%	± 3% F.S.
% change in C.F. from last cal =	-5.65%	-5.22%	0.00%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

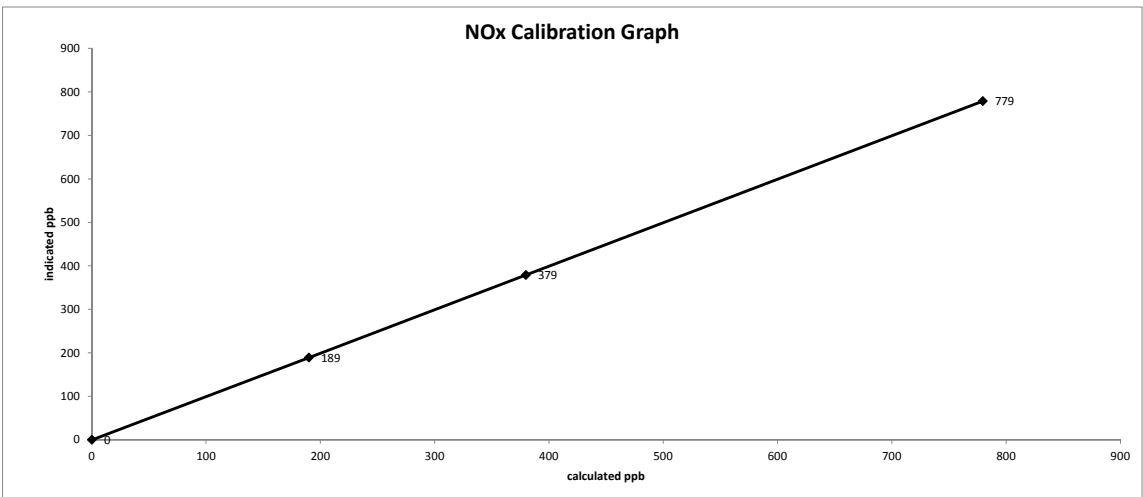
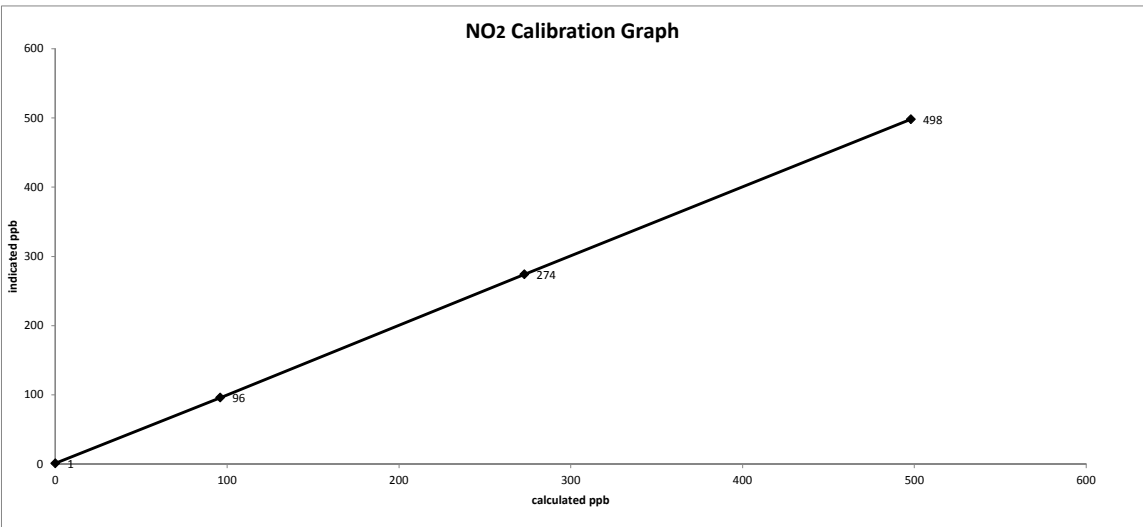
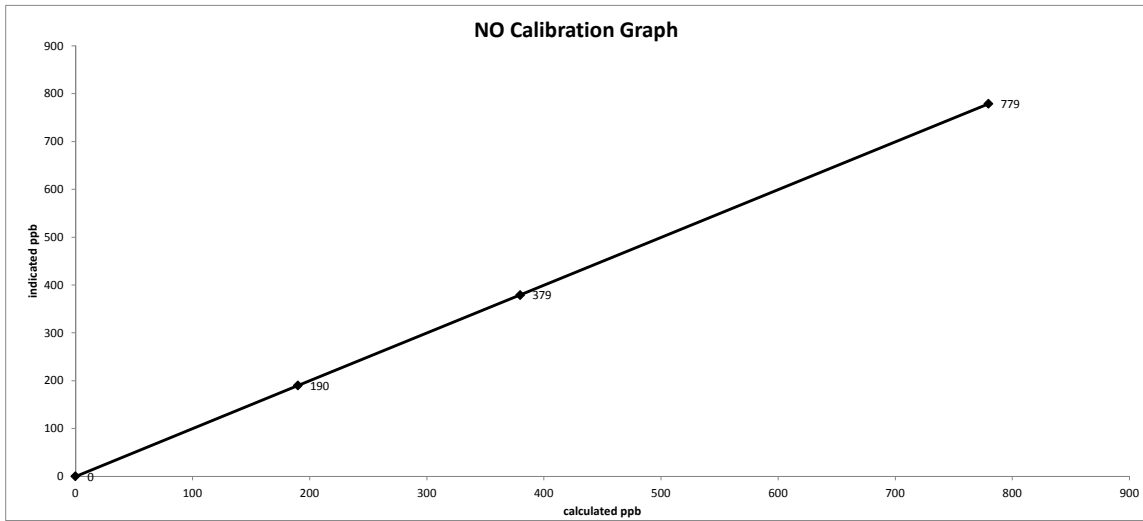
As found:	As left:
NOx SLOPE: 0.983	NOx SLOPE: 1.034
NOx OFFS: 0.6	NOx OFFS: 1.9
NO SLOPE: 0.982	NO SLOPE: 1.035
NO OFFS: -0.9	NO OFFS: -0.4
SAMP FLW: 477	SAMP FLW: 477
OZONE FL: 62	OZONE FL: 62
PMT: 10.9	PMT: 12.7
NORM PMT: -0.8	NORM PMT: 5.2
AZERO: 7.2	AZERO: 7.7
HVPS: 658	HVPS: 658
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 28.9	BOX TEMP: 31.7
PMT TEMP: 6.7	PMT TEMP: 6.7
IZS TEMP: 45.1	IZS TEMP: 40.0
MOLY TEMP: 315.0	MOLY TEMP: 314.4
RCEL: 5.4	RCEL: 5.4
SAMP: 27.0	SAMP: 26.9
Internal Span NO: 8.6	Internal Span NO: 6.8
Internal Span NO ₂ : 349.5	Internal Span NO ₂ : 260
Internal Span NOx: 358.5	Internal Span NOx: 267

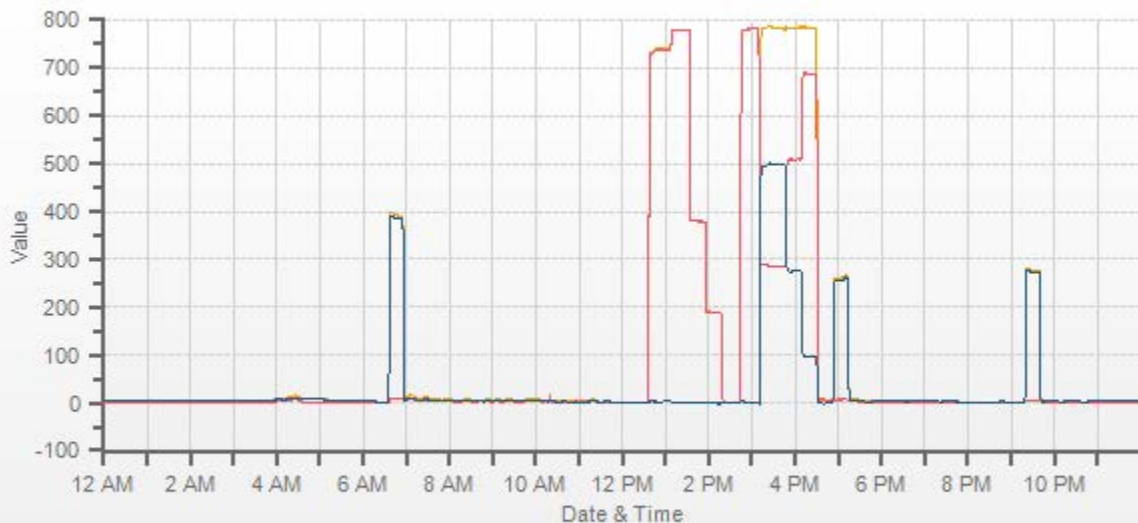
Comments:

Repeat calibration completed because NOX/NO2 span check was 9.45%/10.01%. Repeat calibration required. No NO2 adjustment made. IZS temperature adjusted from 45.0 degrees to 40.0 degrees.

Date: August 9, 2016
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 11:21 / 17:18
Calibration Purpose: repeat
Calibration Method: Gas Dilution & Gas Phase Titration

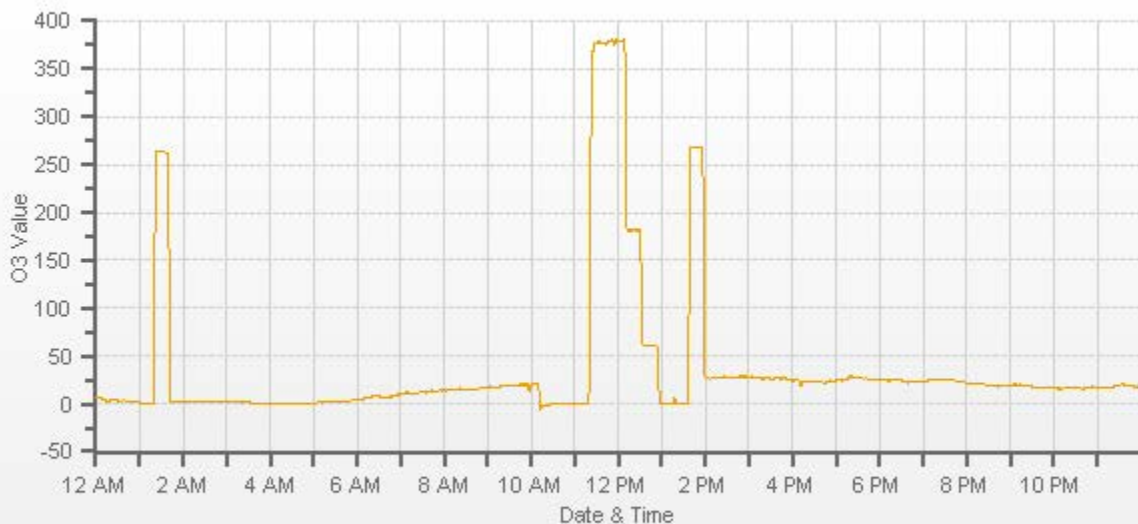




— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE

Thermo 49i Ozone Analyzer Calibration <small>A Bureau Veritas Group Company</small>																																																																							
Date: August 3, 2016 Company/Airshed: LICA Location/Station Name: Bonnyville - AER Start/End Time 24 hr. (mst): 10:05 / 14:06 Ozone Calibration Method: Varying UV Lamp Power G.P.T. Date: n/a-done by Varying UV Lamp Power	Barometric Pressure: 0.937 atm Station Temperature °C: 21 Weather Conditions: Mainly sunny Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Tom Bourque Cal Gas Expiry Date: n/a																																																																						
Analyzer: Serial Number: 1002240372 Ozone Range ppb: 500 Last Calibration Date: July 14, 2016 As Found C.F.: 1.005 Previous Cal High Point C.F.: 1.000 New C.F.: 1.000																																																																							
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: n/a																																																																							
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-75 ppb</td> </tr> </table>		Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-75 ppb																																																														
Point	AMD Required Range of Ozone Calibration Points																																																																						
High	300-400 ppb																																																																						
Mid	150-200 ppb																																																																						
Low	50-75 ppb																																																																						
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																																							
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="2">Calibrator Flow Rate (cc/min)</th> <th>Calculated Concentration:</th> <th>Corrected Calculated Concentration:</th> <th>Indicated Concentration:</th> <th>Correction Factors:</th> </tr> <tr> <th>Point</th> <th>Total Flow @ Point Start</th> <th>Total Flow @ Point Finish</th> <th>(ppb)</th> <th>(ppb)</th> <th>(ppb)</th> <th></th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>5000</td> <td>5000</td> <td>0.0</td> <td>n/a</td> <td>-0.2</td> <td>n/a</td> </tr> <tr> <td>as found high</td> <td>5000</td> <td>5000</td> <td>380.0</td> <td>380.0</td> <td>378.0</td> <td>1.005</td> </tr> <tr> <td>adjusted zero</td> <td>5000</td> <td>5000</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>n/a</td> </tr> <tr> <td>adjusted high</td> <td>5000</td> <td>5000</td> <td>380.0</td> <td>380.0</td> <td>380.0</td> <td>1.000</td> </tr> <tr> <td>mid</td> <td>5000</td> <td>5000</td> <td>180.0</td> <td>180.0</td> <td>181.0</td> <td>0.994</td> </tr> <tr> <td>low</td> <td>5000</td> <td>5000</td> <td>60.0</td> <td>60.0</td> <td>61.0</td> <td>0.984</td> </tr> <tr> <td>calibrator zero</td> <td>5000</td> <td>5000</td> <td>0.0</td> <td>n/a</td> <td>0.0</td> <td>n/a</td> </tr> <tr> <td colspan="6" style="text-align: right;">Average C.F. =</td> <td>0.993</td> </tr> </tbody> </table>			Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:	Point	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)		as found zero	5000	5000	0.0	n/a	-0.2	n/a	as found high	5000	5000	380.0	380.0	378.0	1.005	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	181.0	0.994	low	5000	5000	60.0	60.0	61.0	0.984	calibrator zero	5000	5000	0.0	n/a	0.0	n/a	Average C.F. =						0.993
	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:																																																																	
Point	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)																																																																		
as found zero	5000	5000	0.0	n/a	-0.2	n/a																																																																	
as found high	5000	5000	380.0	380.0	378.0	1.005																																																																	
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	181.0	0.994																																																																	
low	5000	5000	60.0	60.0	61.0	0.984																																																																	
calibrator zero	5000	5000	0.0	n/a	0.0	n/a																																																																	
Average C.F. =						0.993																																																																	
Linear Regression/Calibration Results: <table style="width:100%;"> <tr> <td style="width:50%;">Correlation Coefficient = 1.000</td> <td style="width:50%;">LIMITS</td> </tr> <tr> <td>Slope = 1.001</td> <td>> or = 0.995</td> </tr> <tr> <td>b (Intercept as % of full scale) = -0.13%</td> <td>.95-1.05</td> </tr> <tr> <td>% change in C.F. from last cal = -0.48%</td> <td>± 3% F.S.</td> </tr> <tr> <td></td> <td>± 10%</td> </tr> </table>		Correlation Coefficient = 1.000	LIMITS	Slope = 1.001	> or = 0.995	b (Intercept as % of full scale) = -0.13%	.95-1.05	% change in C.F. from last cal = -0.48%	± 3% F.S.		± 10%																																																												
Correlation Coefficient = 1.000	LIMITS																																																																						
Slope = 1.001	> or = 0.995																																																																						
b (Intercept as % of full scale) = -0.13%	.95-1.05																																																																						
% change in C.F. from last cal = -0.48%	± 3% F.S.																																																																						
	± 10%																																																																						
Thermo 49i Ozone Analyzer Calibration 																																																																							
<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: O3 Bkg: -0.1 O3 Coef: 0.985 Photo Lamp: 14.2 O3 Lamp: 5.8 Bench: 29.5 Bench Lamp: 54.1 O3 Lamp: 68.1 Pressure: 702.4 Cell A lpm: 0.752 Cell B lpm: 0.763 O3 ppb: -1.3 Cell A ppb: 1.3 Cell B ppb: 3.9 Cell A int: 87117 Cell B int: 84690 Internal Span: 275 </td> <td style="width:50%; vertical-align: top;"> As left: O3 Bkg: -0.3 O3 Coef: 0.990 Photo Lamp: 14.2 O3 Lamp: 5.8 Bench: 31.6 Bench Lamp: 54.1 O3 Lamp: 68.2 Pressure: 702.1 Cell A lpm: 0.751 Cell B lpm: 0.762 O3 ppb: 0.5 Cell A ppb: 1.5 Cell B ppb: -0.5 Cell A int: 87011 Cell B int: 84559 Internal Span: 268 </td> </tr> </table>		As found: O3 Bkg: -0.1 O3 Coef: 0.985 Photo Lamp: 14.2 O3 Lamp: 5.8 Bench: 29.5 Bench Lamp: 54.1 O3 Lamp: 68.1 Pressure: 702.4 Cell A lpm: 0.752 Cell B lpm: 0.763 O3 ppb: -1.3 Cell A ppb: 1.3 Cell B ppb: 3.9 Cell A int: 87117 Cell B int: 84690 Internal Span: 275	As left: O3 Bkg: -0.3 O3 Coef: 0.990 Photo Lamp: 14.2 O3 Lamp: 5.8 Bench: 31.6 Bench Lamp: 54.1 O3 Lamp: 68.2 Pressure: 702.1 Cell A lpm: 0.751 Cell B lpm: 0.762 O3 ppb: 0.5 Cell A ppb: 1.5 Cell B ppb: -0.5 Cell A int: 87011 Cell B int: 84559 Internal Span: 268																																																																				
As found: O3 Bkg: -0.1 O3 Coef: 0.985 Photo Lamp: 14.2 O3 Lamp: 5.8 Bench: 29.5 Bench Lamp: 54.1 O3 Lamp: 68.1 Pressure: 702.4 Cell A lpm: 0.752 Cell B lpm: 0.763 O3 ppb: -1.3 Cell A ppb: 1.3 Cell B ppb: 3.9 Cell A int: 87117 Cell B int: 84690 Internal Span: 275	As left: O3 Bkg: -0.3 O3 Coef: 0.990 Photo Lamp: 14.2 O3 Lamp: 5.8 Bench: 31.6 Bench Lamp: 54.1 O3 Lamp: 68.2 Pressure: 702.1 Cell A lpm: 0.751 Cell B lpm: 0.762 O3 ppb: 0.5 Cell A ppb: 1.5 Cell B ppb: -0.5 Cell A int: 87011 Cell B int: 84559 Internal Span: 268																																																																						
Comments: <p style="text-align: center;">Sample inlet filter changed.</p>																																																																							



— O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: August 4, 2016
 Company: LICA
 Station Name/Location: Bonnyville
 Previous Audit Date: July 27, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
 Start Time (mst): 8:05
 End Time (mst): 12:16
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Light rain/scattered showers

1400A Information and Status:

Serial Number: 1405A207691003 As Found Filter Loading %: 21.24
 Ko Factor: 15635 As Left Filter Loading %: 17.56
 Ambient Temperature °C: 15.41 As Found Noise: 0.005
 Ambient Pressure atm: 0.940 As Left Noise: 0.003
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.33
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	Dwyer	Fisher	FLUKE
Model:	475 Mark III	FB1291	1551A Ex STIK
Serial Number:	#2	130168457	ID# 4295
Calibration Date:	January 15, 2016	February 7, 2016	November 2, 2015

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.07	0.00	0.07
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.55	0.00	-0.55
	limit	0.60	0.60	0.60	0.60

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.07	0.00	0.07
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.55	0.00	-0.55
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: 15.4	1405F pressure atm: 0.940
reference temperature °C: 16.1	reference pressure: 0.938
difference °C: 0.7	difference: 0.002

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: 22.5	1405F pressure atm: 0.939
reference temperature °C: 22.5	reference pressure: 0.939
difference °C: 0.0	difference: 0.000

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: 3.00	1400A total/aux flow lpm: 16.67
reference main flow lpm: 3.05	reference total/aux flow lpm: 16.82
difference lpm: 0.05	difference lpm: 0.15

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: 3.00	1400A total/aux flow lpm: 13.67
reference main flow lpm: 3.00	reference total/aux flow lpm: 13.67
difference lpm: 0.00	difference lpm: 0.00

K_o Audit:

Last K_o audit date: 4-Aug-16
 1405F K_o factor: 15635
 Measured K_o factor: 15819.0000
 % difference: 1.18

Comments:

TEOM sample filter changed. 47 mm FDMS filter changed. Sample inlet head PM 2.5/10 cleaned. Ko factor audited. Cooler cleaned. A new dryer installed. Flows calibrated.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: August 23, 2016
 Company: LICA
 Station Name/Location: Bonnyville
 Previous Audit Date: August 4, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
 Start Time (mst): 12:38
 End Time (mst): 13:34
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: A few clouds

1400A Information and Status:

Serial Number: 1405A207691003 As Found Filter Loading %: 30.02
 Ko Factor: 15635 As Left Filter Loading %: 28.79
 Ambient Temperature °C: 17.62 As Found Noise: 0.007
 Ambient Pressure atm: 0.935 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>#2</u>	<u>130168457</u>	<u>ID# 4295</u>
Calibration Date:	<u>January 15, 2016</u>	<u>February 7, 2016</u>	<u>November 2, 2015</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.10	0.00	0.10
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.01	-0.44	0.00	-0.43
	limit	0.60	0.60	0.60	0.60

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.10	0.00	0.10
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.01	-0.44	0.00	-0.43
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>17.6</u>	1405F pressure atm: <u>0.935</u>
reference temperature °C: <u>16.2</u>	reference pressure: <u>0.936</u>
difference °C: <u>-1.5</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>16.2</u>	1405F pressure atm: <u>0.936</u>
reference temperature °C: <u>16.2</u>	reference pressure: <u>0.936</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>3.02</u>	reference total/aux flow lpm: <u>16.85</u>
difference lpm: <u>0.02</u>	difference lpm: <u>0.18</u>

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

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.02</u>	reference total/aux flow lpm: <u>16.85</u>
difference lpm: <u>0.02</u>	difference lpm: <u>0.18</u>

K_o Audit:

Last K_o audit date: August 4, 2016
 1405F K_o factor: 15635
 Measured K_o factor: 15819.0000
 % difference: 1.18

Comments:

47 mm FDMS filter changed. Sample inlet head PM 2.5/10 cleaned.

WIND SYSTEM



Meteorological Sensor Audit

Station Information

Company:	<u>LICA</u>	Performed By:	<u>Limin Li</u>
Location:	<u>Bonnyville (in Calgary shop)</u>	Reason:	<u>Annual maintenance</u>
Audit Date:	<u>26-Jan-16</u>	Start Time (mst):	<u>11:00</u>
Previous Audit Date:	<u>NA</u>	End Time (mst):	<u>15:00</u>

Wind Speed

Sensor make:	<u>R. M. Young</u>	Sensor height:	<u>n/a</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>56589</u>
Calibrator:	<u>Young 18802</u>	Variable speed motor:	<u>CA 03309</u>
Voltage range:	<u>0-1</u>	Output signal range:	<u>200KPH</u>

Wind Speed Audit Data

RPM	Wind Speed Actual	Indicated WS - CW	Indicated WS-CCW	Correction Factor
0	0.0	0.032	0.032	-
1000	17.6	17.66	17.64	1.00
2000	35.28	35.3	35.29	1.00
3000	52.92	52.99	52.99	1.00
4000	70.56	70.66	70.65	1.00
5000	88.2	88.35	88.33	1.00
6000	105.84	106	106	1.00
7000	123.48	123.7	123.7	1.00
8000	141.12	141.4	141.3	1.00
9000	158.76	159.1	159.1	1.00
10000	176.4	176.7	176.7	1.00
Average Correction Factor:				1.00

Wind Direction

Sensor make:	<u>R. M. Young</u>	Sensor height:	<u>n/a</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>56589</u>
Calibrator:	<u>Young 18802</u>	Variable speed motor:	<u>CA 03309</u>
Voltage range:	<u>0-1</u>	Output signal range:	<u>0-360DEG</u>

Wind Direction Audit Data

Wind Direction	Indicated	Correction Factor
0	0.5	NA
45	44.9	1.00
90	92.0	0.98
135	136.5	0.99
180	180.6	1.00
225	224.4	1.00
270	270.3	1.00
315	312.2	1.01
359	355.0	1.01
Average Correction Factor:		1.00

Remarks: Annual maintenance. Changed 05163PG, 05124VG bearings. 05131D, 05133B & 05135D

Audit Performed by: Limin Li

CALIBRATORS



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-119

Company Maxxam Operator: Chris Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>627</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 1 2015</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</u>		

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5007	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5003	77.5	0.779	0.779	0.787	-0.001	0.786	1%	1%
5004	37.8	0.380	0.380	0.383	0.000	0.383	1%	1%
5001	18.9	0.190	0.190	0.191	0.000	0.191	1%	1%
Absolute Average Percent Difference							1%	1%

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

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0106	0.90-1.10	m (Slope)= 1.0092
b (Intercept % of FS)= -0.0566	± 3% F.S.	b (Intercept % of FS)= -0.0368

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5003	0	0.000	0.787	0.001	0.788	NO ₂	% Diff. Limit
5003	0.5	0.493	0.294	0.498	0.792	1%	± 10%
5003	0.25	0.256	0.531	0.262	0.792	2%	± 10%
5003	0.1	0.108	0.679	0.110	0.789	1%	± 10%
Absolute Average Percent Difference						1.2%	± 10%

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

NO _x	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 1.0089	0.90-1.10
b (Intercept % of FS)= 0.1591	± 3% F.S.

AENV Standards Audit Calibrator	NO _x Analyzer
Make/Model <u>Thermo 146i</u>	Make/Model <u>Thermo 42i</u>
Serial/AMU Number <u>1809</u>	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>February 1, 2016</u>
	Full Scale (ppm) <u>1</u>

COMMENTS: Flows not manually measured - calibration system audited as it is currently being operated.

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: February 3, 2016
Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-165

Company Maxxam Operator: Chris Wesson

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

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

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

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
<u>NO</u>		<u>LIMITS</u>		<u>NOx</u>			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	0.9950	0.90-1.10		m (Slope)=	0.9946		
b (Intercept % of FS)=	-0.0773	± 3% F.S.		b (Intercept % of FS)=	-0.0167		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5001	0	0.000	0.772	0.000	0.772	NO ₂	% Diff. Limit
5001	0.51	0.507	0.265	0.506	0.772	0%	± 10%
5001	0.25	0.252	0.520	0.254	0.773	1%	± 10%
5001	0.1	0.110	0.662	0.109	0.772	-1%	± 10%
Absolute Average Percent Difference						0.1%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
<u>NO₂</u>		<u>LIMITS</u>					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9992	0.90-1.10					
b (Intercept % of FS)=	0.0171	± 3% F.S.					

AENV Standards		NO _x Analyzer	
Audit Calibrator			
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
		Last Calibration Date	<u>March 28, 2016</u>
		Full Scale (ppm)	<u>1</u>

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

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: March 31, 2016
 Location: McIntyre Center Edmonton

Company Maxxam Operator: Chris Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>829</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 1, 2015</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
		Pt. #3	<u>5000</u>
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>37.7</u>
		Pt. #3	<u>18.8</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4995	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5000	77.5	0.780	0.780	0.795	0.000	0.795	2%	2%
5001	37.7	0.379	0.379	0.388	0.001	0.389	2%	3%
4997	18.8	0.189	0.189	0.193	0.000	0.193	2%	2%
Absolute Average Percent Difference							2%	2%

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

NO	LIMITS	NO _x
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0193	0.90-1.10	m (Slope)= 1.0194
b (Intercept % of FS)= 0.0501	± 3% F.S.	b (Intercept % of FS)= 0.0709

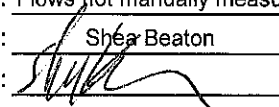
Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NO _x	% Diff. Vs Audit gas	
5000	0	0.000	0.793	0.001	0.794	NO ₂	% Diff. Limit
5000	0.5	0.533	0.260	0.537	0.797	1%	± 10%
5000	0.25	0.277	0.516	0.280	0.796	1%	± 10%
5000	0.095	0.115	0.678	0.114	0.792	-2%	± 10%
Absolute Average Percent Difference						0%	± 10%

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

NO ₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 1.0077	0.90-1.10
b (Intercept % of FS)= -0.0025	± 3% F.S.

AENV Standards Audit Calibrator	NO _x Analyzer
Make/Model <u>Thermo 146i</u>	Make/Model <u>Thermo 42i</u>
Serial/AMU Number <u>1809</u>	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>February 1, 2016</u>
	Full Scale (ppm) <u>1</u>

 COMMENTS: Flows not manually measured - calibration system audited as it is currently being operated.

 Auditor: Shea Beaton
 Operator Signature: 

 Date: February 3, 2016
 Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-116CGA

Company: Maxxam Operator's Name: Chris Wesson
 Cylinder #: LL119346 Concentration PPM: 50.0 Tolerance(%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: Thermo146i
 Serial Number: 1809
 Last Verification Date: February 2, 2016
 Gas Type: SO2 Conc. 98.07
 Cylinder Number: CAL016625

Flow Measurement Device:

Make/Model: Bios DC-2
 Serial Number: Bios D
 Temp. °C: 24.5
 B.P. 702mmHg

Reference Analyzer:

Make/Model: Thermo 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 8.7 Span: 1.027 Range: 1.0
 Last Calibration: Date: 1-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4952	0.0	0.000	0.01608	62.183	49.3
4946	79.54	0.793	0.01608	62.183	49.3
4941	39.35	0.396	0.00796	125.565	49.7
4940	19.57	0.195	0.00396	252.427	49.2
Average Cylinder Concentration:					49.4

Previous Stated Concentration PPM: 50.0

Percent variance from Stated: 1.2

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: SO2/NO blend 50.0ppm NO
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 2, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam Operator's Name: Limin Li
 Cylinder #: LL36837 Concentration PPM: 10.0 Tolerance(%): 2 Certified By: Air Liquide

Reference Calibrator and Gas:
 Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: December 15, 2014
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:
 Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P.: 702 mmhg

Reference Analyzer:
 Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
 Last Calibration: Date: Dec15/14 C.F.: 1.000 Done By: Al Clark

Calibrator Flows (scem)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	1000.000	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

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: December 16, 2014
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

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

Reference Calibrator and Gas:

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

Flow Measurement Device:

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

Reference Analyzer:

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

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

CH4	C3H8
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. 2015-115CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL119346 **Conc (PPM)** 50.0/50.0 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Thermo 146i</u>			Make/Model	<u>Bios DC-2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>Bios D</u>
Last Verification Date	<u>February 2, 2016</u>			Temp. °C	<u>24.5</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>702mmHg</u>
Cylinder Number	<u>CAL018024</u>				

Reference Analyzer:
Make/Model Thermo 42i **Serial/AMU Number:** 1868
Instrument Settings **Zero:** 4.2 **Span:** 1.014 **Range:** 1.0
Last Calibration: **Date:** 02-Feb-16 **C.F.** 1.000 **Done By:** SB

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
4952	0.0	0.000	0.000				
4946	79.54	0.809	0.809	0.01608	62.183	50.3	50.3
4941	39.35	0.403	0.402	0.00796	125.565	50.6	50.5
4940	19.57	0.200	0.200	0.00396	252.427	50.5	50.5
Average Cylinder Concentration:						50.5	50.4

	<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM:	<u>50.0</u>	<u>50.0</u>
Percent variance from Stated:	<u>0.9</u>	<u>0.8</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO Blend 50.0PPM SO2
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton **Date:** February 2, 2016
Operator Signature: [Signature] **Location:** McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-343CGA

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

Reference Calibrator and Gas:

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

Flow Measurement Device:

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

Reference Analyzer:

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

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

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

Cylinder gas tolerances based on NO only

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

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

APPENDIX IV
ANALYTICAL RESULTS

VOCS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Aug 4, 2016	2414	Ambient Air	04-Aug-16	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080099-003	1,1,1-Trichloroethane		3.35	ppbv	0.02	AC-058	19-Aug-16
16080099-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Aug-16
16080099-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Aug-16
16080099-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Aug-16
16080099-003	1,1-Dichloroethylene	I	0.12	ppbv	0.04	AC-058	19-Aug-16
16080099-003	1,2,3-Trimethylbenzene		0.49	ppbv	0.05	AC-058	19-Aug-16
16080099-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	19-Aug-16
16080099-003	1,2,4-Trimethylbenzene		1.42	ppbv	0.03	AC-058	19-Aug-16
16080099-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Aug-16
16080099-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-003	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-003	1,3,5-Trimethylbenzene	I	0.27	ppbv	0.02	AC-058	19-Aug-16
16080099-003	1,3-Butadiene	I	0.21	ppbv	0.02	AC-058	19-Aug-16
16080099-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	19-Aug-16
16080099-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Aug-16
16080099-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Aug-16
16080099-003	1-Butene		0.85	ppbv	0.02	AC-058	19-Aug-16
16080099-003	1-Hexene	I	0.11	ppbv	0.02	AC-058	19-Aug-16
16080099-003	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-003	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-003	2,2-Dimethylbutane	I	0.02	ppbv	0.01	AC-058	19-Aug-16
16080099-003	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-003	2,3-Dimethylbutane	I	0.04	ppbv	0.02	AC-058	19-Aug-16
16080099-003	2,3-Dimethylpentane	I	0.19	ppbv	0.02	AC-058	19-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September-16-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Aug 4, 2016	2414	Ambient Air	04-Aug-16	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080099-003	2,4-Dimethylpentane	I	0.04	ppbv	0.01	AC-058	19-Aug-16
16080099-003	2-Methylheptane	I	0.13	ppbv	0.01	AC-058	19-Aug-16
16080099-003	2-Methylhexane		0.54	ppbv	0.01	AC-058	19-Aug-16
16080099-003	2-Methylpentane		0.40	ppbv	0.01	AC-058	19-Aug-16
16080099-003	3-Methylheptane	I	0.09	ppbv	0.02	AC-058	19-Aug-16
16080099-003	3-Methylhexane		0.75	ppbv	0.02	AC-058	19-Aug-16
16080099-003	3-Methylpentane	I	0.26	ppbv	0.01	AC-058	19-Aug-16
16080099-003	Acetone		173	ppbv	4.8	AC-058	19-Aug-16
16080099-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	19-Aug-16
16080099-003	Benzene	I	0.30	ppbv	0.01	AC-058	19-Aug-16
16080099-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Aug-16
16080099-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Aug-16
16080099-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Aug-16
16080099-003	Bromomethane	I	0.02	ppbv	0.01	AC-058	19-Aug-16
16080099-003	Carbon disulfide		10.2	ppbv	0.01	AC-058	19-Aug-16
16080099-003	Carbon tetrachloride	I	0.07	ppbv	0.01	AC-058	19-Aug-16
16080099-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Aug-16
16080099-003	Chloroethane	I	0.05	ppbv	0.02	AC-058	19-Aug-16
16080099-003	Chloroform	I	0.02	ppbv	0.02	AC-058	19-Aug-16
16080099-003	Chloromethane		0.50	ppbv	0.02	AC-058	19-Aug-16
16080099-003	cis-1,2-Dichloroethene	I	0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Aug-16
16080099-003	cis-2-Butene	I	0.22	ppbv	0.02	AC-058	19-Aug-16
16080099-003	cis-2-Pentene	I	0.21	ppbv	0.02	AC-058	19-Aug-16
16080099-003	Cyclohexane		0.47	ppbv	0.02	AC-058	19-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September-16-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Aug 4, 2016	2414	Ambient Air	04-Aug-16	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080099-003	Cyclopentane	I	0.05	ppbv	0.01	AC-058	19-Aug-16
16080099-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-003	Ethanol		77.0	ppbv	3.6	AC-058	19-Aug-16
16080099-003	Ethyl acetate		7.5	ppbv	0.4	AC-058	19-Aug-16
16080099-003	Ethylbenzene		4.65	ppbv	0.01	AC-058	19-Aug-16
16080099-003	Freon-11		0.36	ppbv	0.02	AC-058	19-Aug-16
16080099-003	Freon-113	I	0.08	ppbv	0.01	AC-058	19-Aug-16
16080099-003	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Aug-16
16080099-003	Freon-12		0.51	ppbv	0.02	AC-058	19-Aug-16
16080099-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	19-Aug-16
16080099-003	Isobutane		3.05	ppbv	0.02	AC-058	19-Aug-16
16080099-003	Isopentane		2.56	ppbv	0.03	AC-058	19-Aug-16
16080099-003	Isoprene		0.53	ppbv	0.01	AC-058	19-Aug-16
16080099-003	Isopropyl alcohol		13.4	ppbv	0.4	AC-058	19-Aug-16
16080099-003	Isopropylbenzene	I	0.09	ppbv	0.01	AC-058	19-Aug-16
16080099-003	m,p-Xylene		12.6	ppbv	0.03	AC-058	19-Aug-16
16080099-003	m-Diethylbenzene	I	0.05	ppbv	0.04	AC-058	19-Aug-16
16080099-003	m-Ethyltoluene		0.61	ppbv	0.08	AC-058	19-Aug-16
16080099-003	Methyl butyl ketone		1.37	ppbv	0.50	AC-058	19-Aug-16
16080099-003	Methyl ethyl ketone		18.2	ppbv	0.3	AC-058	19-Aug-16
16080099-003	Methyl isobutyl ketone		6.6	ppbv	0.4	AC-058	19-Aug-16
16080099-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	19-Aug-16
16080099-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-003	Methylcyclohexane	I	0.29	ppbv	0.01	AC-058	19-Aug-16
16080099-003	Methylcyclopentane		0.40	ppbv	0.02	AC-058	19-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September-16-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Aug 4, 2016	2414	Ambient Air	04-Aug-16	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080099-003	Methylene chloride		0.9	ppbv	0.3	AC-058	19-Aug-16
16080099-003	n-Butane		1.23	ppbv	0.03	AC-058	19-Aug-16
16080099-003	n-Decane	I	0.07	ppbv	0.06	AC-058	19-Aug-16
16080099-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Aug-16
16080099-003	n-Heptane		1.02	ppbv	0.01	AC-058	19-Aug-16
16080099-003	n-Hexane		0.75	ppbv	0.01	AC-058	19-Aug-16
16080099-003	n-Octane	I	0.28	ppbv	0.02	AC-058	19-Aug-16
16080099-003	n-Pentane		0.4	ppbv	0.1	AC-058	19-Aug-16
16080099-003	n-Propylbenzene	I	0.21	ppbv	0.05	AC-058	19-Aug-16
16080099-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Aug-16
16080099-003	Naphthalene		9.0	ppbv	0.5	AC-058	19-Aug-16
16080099-003	n-Nonane	I	0.17	ppbv	0.01	AC-058	19-Aug-16
16080099-003	o-Ethyltoluene		0.33	ppbv	0.01	AC-058	19-Aug-16
16080099-003	o-Xylene		3.61	ppbv	0.01	AC-058	19-Aug-16
16080099-003	p-Diethylbenzene	I	0.14	ppbv	0.04	AC-058	19-Aug-16
16080099-003	p-Ethyltoluene	I	0.30	ppbv	0.07	AC-058	19-Aug-16
16080099-003	Styrene	I	0.11	ppbv	0.04	AC-058	19-Aug-16
16080099-003	Tetrachloroethylene		7.54	ppbv	0.04	AC-058	19-Aug-16
16080099-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Aug-16
16080099-003	Toluene		86.4	ppbv	0.12	AC-058	19-Aug-16
16080099-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Aug-16
16080099-003	trans-2-Butene		0.36	ppbv	0.01	AC-058	19-Aug-16
16080099-003	trans-2-Pentene	I	0.29	ppbv	0.02	AC-058	19-Aug-16
16080099-003	Trichloroethylene		6.28	ppbv	0.04	AC-058	19-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September-16-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Aug 4, 2016	2414	Ambient Air	04-Aug-16	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080099-003	Vinyl acetate		6.8	ppbv	0.4	AC-058	19-Aug-16
16080099-003	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Aug-16

Report certified by:	Graham Knox, Team Lead	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services	
Date:	September-16-16	Inquiries:	(780) 632 8455	E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Aug 10, 2016	1519	Ambient Air	10-Aug-16 0:00
DESCRIPTION:	Bonnyville-AER		
REPORT NUMBER:	16080119	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080119-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	24-Aug-16
16080119-001	1,2,3-Trimethylbenzene	I	0.05	ppbv	0.05	AC-058	24-Aug-16
16080119-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	24-Aug-16
16080119-001	1,2,4-Trimethylbenzene	I	0.09	ppbv	0.03	AC-058	24-Aug-16
16080119-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	24-Aug-16
16080119-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	24-Aug-16
16080119-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Aug-16
16080119-001	1,3,5-Trimethylbenzene	I	0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	1,3-Butadiene	I	0.06	ppbv	0.02	AC-058	24-Aug-16
16080119-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	24-Aug-16
16080119-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	24-Aug-16
16080119-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	24-Aug-16
16080119-001	1-Butene	I	0.15	ppbv	0.02	AC-058	24-Aug-16
16080119-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Aug-16
16080119-001	2,2,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	24-Aug-16
16080119-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Aug-16
16080119-001	2,3,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	24-Aug-16
16080119-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	2,3-Dimethylpentane	I	0.04	ppbv	0.02	AC-058	24-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/Aug 10, 2016	1519	Ambient Air	10-Aug-16	0:00
DESCRIPTION:	Bonnyville-AER			
REPORT NUMBER:	16080119	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080119-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Aug-16
16080119-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Aug-16
16080119-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Aug-16
16080119-001	2-Methylpentane	I	0.06	ppbv	0.01	AC-058	24-Aug-16
16080119-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	3-Methylhexane	I	0.03	ppbv	0.02	AC-058	24-Aug-16
16080119-001	3-Methylpentane	I	0.05	ppbv	0.01	AC-058	24-Aug-16
16080119-001	Acetone		10.2	ppbv	0.4	AC-058	24-Aug-16
16080119-001	Acrolein		0.4	ppbv	0.3	AC-058	24-Aug-16
16080119-001	Benzene		5.19	ppbv	0.01	AC-058	24-Aug-16
16080119-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	24-Aug-16
16080119-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	Bromomethane	I	0.02	ppbv	0.01	AC-058	24-Aug-16
16080119-001	Carbon disulfide		2.65	ppbv	0.01	AC-058	24-Aug-16
16080119-001	Carbon tetrachloride	I	0.08	ppbv	0.01	AC-058	24-Aug-16
16080119-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	Chloroform	I	0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	Chloromethane		0.74	ppbv	0.02	AC-058	24-Aug-16
16080119-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Aug-16
16080119-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	24-Aug-16
16080119-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	Cyclohexane	I	0.06	ppbv	0.02	AC-058	24-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/Aug 10, 2016	1519	Ambient Air	10-Aug-16	0:00
DESCRIPTION:	Bonnyville-AER			
REPORT NUMBER:	16080119	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080119-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Aug-16
16080119-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Aug-16
16080119-001	Ethanol		3.8	ppbv	0.3	AC-058	24-Aug-16
16080119-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	24-Aug-16
16080119-001	Ethylbenzene	I	0.08	ppbv	0.01	AC-058	24-Aug-16
16080119-001	Freon-11	I	0.24	ppbv	0.02	AC-058	24-Aug-16
16080119-001	Freon-113	I	0.07	ppbv	0.01	AC-058	24-Aug-16
16080119-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	Freon-12		0.52	ppbv	0.02	AC-058	24-Aug-16
16080119-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	24-Aug-16
16080119-001	Isobutane		0.78	ppbv	0.02	AC-058	24-Aug-16
16080119-001	Isopentane		0.51	ppbv	0.03	AC-058	24-Aug-16
16080119-001	Isoprene	I	0.17	ppbv	0.01	AC-058	24-Aug-16
16080119-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	24-Aug-16
16080119-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Aug-16
16080119-001	m,p-Xylene	I	0.16	ppbv	0.03	AC-058	24-Aug-16
16080119-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	24-Aug-16
16080119-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	24-Aug-16
16080119-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	24-Aug-16
16080119-001	Methyl ethyl ketone		0.8	ppbv	0.3	AC-058	24-Aug-16
16080119-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	24-Aug-16
16080119-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	24-Aug-16
16080119-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	24-Aug-16
16080119-001	Methylcyclohexane	I	0.13	ppbv	0.01	AC-058	24-Aug-16
16080119-001	Methylcyclopentane	I	0.07	ppbv	0.02	AC-058	24-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/Aug 10, 2016	1519	Ambient Air	10-Aug-16	0:00
DESCRIPTION:	Bonnyville-AER			
REPORT NUMBER:	16080119	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080119-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	24-Aug-16
16080119-001	n-Butane		0.56	ppbv	0.03	AC-058	24-Aug-16
16080119-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	24-Aug-16
16080119-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	24-Aug-16
16080119-001	n-Heptane	I	0.03	ppbv	0.01	AC-058	24-Aug-16
16080119-001	n-Hexane	I	0.06	ppbv	0.01	AC-058	24-Aug-16
16080119-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	n-Pentane	I	0.2	ppbv	0.1	AC-058	24-Aug-16
16080119-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	24-Aug-16
16080119-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	24-Aug-16
16080119-001	Naphthalene		98.3	ppbv	3.0	AC-058	24-Aug-16
16080119-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Aug-16
16080119-001	o-Ethyltoluene	I	0.03	ppbv	0.01	AC-058	24-Aug-16
16080119-001	o-Xylene	I	0.08	ppbv	0.01	AC-058	24-Aug-16
16080119-001	p-Diethylbenzene	I	0.05	ppbv	0.04	AC-058	24-Aug-16
16080119-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	24-Aug-16
16080119-001	Styrene		0.56	ppbv	0.04	AC-058	24-Aug-16
16080119-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	24-Aug-16
16080119-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	24-Aug-16
16080119-001	Toluene		0.36	ppbv	0.01	AC-058	24-Aug-16
16080119-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Aug-16
16080119-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	24-Aug-16
16080119-001	trans-2-Butene	I	0.06	ppbv	0.01	AC-058	24-Aug-16
16080119-001	trans-2-Pentene	I	0.02	ppbv	0.02	AC-058	24-Aug-16
16080119-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	24-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Aug 10, 2016	1519	Ambient Air	10-Aug-16 0:00
DESCRIPTION:	Bonnyville-AER		
REPORT NUMBER:	16080119	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16080119-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	24-Aug-16
16080119-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	24-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Aug 16, 2016	S5673	Ambient Air	16-Aug-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Aug-16
16080238-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	25-Aug-16
16080238-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-003	1,2-Dichloroethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Aug-16
16080238-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-003	1-Butene	I	0.06	ppbv	0.02	AC-058	25-Aug-16
16080238-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	2,2,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	25-Aug-16
16080238-003	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Aug 16, 2016	S5673	Ambient Air	16-Aug-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-003	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	2-Methylpentane	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080238-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	3-Methylpentane	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080238-003	Acetone		5.4	ppbv	0.4	AC-058	25-Aug-16
16080238-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Aug-16
16080238-003	Benzene	I	0.04	ppbv	0.01	AC-058	25-Aug-16
16080238-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	Bromomethane	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080238-003	Carbon disulfide		0.33	ppbv	0.01	AC-058	25-Aug-16
16080238-003	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	25-Aug-16
16080238-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	Chloroform	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	Chloromethane		0.66	ppbv	0.02	AC-058	25-Aug-16
16080238-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-003	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Aug 16, 2016	S5673	Ambient Air	16-Aug-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-003	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	Ethanol		2.1	ppbv	0.3	AC-058	25-Aug-16
16080238-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-003	Ethylbenzene	I	0.02	ppbv	0.01	AC-058	25-Aug-16
16080238-003	Freon-11	I	0.25	ppbv	0.02	AC-058	25-Aug-16
16080238-003	Freon-113	I	0.08	ppbv	0.01	AC-058	25-Aug-16
16080238-003	Freon-114	I	0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	Freon-12		0.58	ppbv	0.02	AC-058	25-Aug-16
16080238-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Aug-16
16080238-003	Isobutane	I	0.24	ppbv	0.02	AC-058	25-Aug-16
16080238-003	Isopentane	I	0.24	ppbv	0.03	AC-058	25-Aug-16
16080238-003	Isoprene		0.81	ppbv	0.01	AC-058	25-Aug-16
16080238-003	Isopropyl alcohol		0.5	ppbv	0.4	AC-058	25-Aug-16
16080238-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	m,p-Xylene	I	0.04	ppbv	0.03	AC-058	25-Aug-16
16080238-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	25-Aug-16
16080238-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Aug-16
16080238-003	Methyl ethyl ketone		0.4	ppbv	0.3	AC-058	25-Aug-16
16080238-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Aug-16
16080238-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-003	Methylcyclohexane	I	0.02	ppbv	0.01	AC-058	25-Aug-16
16080238-003	Methylcyclopentane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Aug 16, 2016	S5673	Ambient Air	16-Aug-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Aug-16
16080238-003	n-Butane	I	0.27	ppbv	0.03	AC-058	25-Aug-16
16080238-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	25-Aug-16
16080238-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-003	n-Heptane	I	0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	n-Hexane	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080238-003	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	n-Pentane	I	0.1	ppbv	0.1	AC-058	25-Aug-16
16080238-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Aug-16
16080238-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080238-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080238-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	o-Xylene	I	0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Aug-16
16080238-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-003	Toluene	I	0.08	ppbv	0.01	AC-058	25-Aug-16
16080238-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-003	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-003	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Aug-16
16080238-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Aug 16, 2016	S5673	Ambient Air	16-Aug-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16080238-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	25-Aug-16
16080238-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/Aug 22, 2016	1531	Ambient Air	22-Aug-16	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080288	REPORT CREATED:	22-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080288-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16
16080288-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Sep-16
16080288-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	03-Sep-16
16080288-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Sep-16
16080288-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Sep-16
16080288-003	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Sep-16
16080288-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-003	1-Butene	I	0.03	ppbv	0.02	AC-058	03-Sep-16
16080288-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	2,2,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	03-Sep-16
16080288-003	2,2-Dimethylbutane	I	0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	2,3-Dimethylpentane	I	0.03	ppbv	0.02	AC-058	03-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Thursday, September 22, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Aug 22, 2016	1531	Ambient Air	22-Aug-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16080288	REPORT CREATED:	22-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080288-003	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	2-Methylhexane	I	0.05	ppbv	0.01	AC-058	03-Sep-16
16080288-003	2-Methylpentane	I	0.05	ppbv	0.01	AC-058	03-Sep-16
16080288-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	3-Methylhexane	I	0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	3-Methylpentane	I	0.03	ppbv	0.01	AC-058	03-Sep-16
16080288-003	Acetone		3.0	ppbv	0.4	AC-058	03-Sep-16
16080288-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Sep-16
16080288-003	Benzene	I	0.03	ppbv	0.01	AC-058	03-Sep-16
16080288-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	Bromomethane	I	0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	Carbon disulfide	I	0.16	ppbv	0.01	AC-058	03-Sep-16
16080288-003	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	03-Sep-16
16080288-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	Chloroform	I	0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	Chloromethane		0.55	ppbv	0.02	AC-058	03-Sep-16
16080288-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16
16080288-003	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	Cyclohexane	I	0.03	ppbv	0.02	AC-058	03-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Thursday, September 22, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Aug 22, 2016	1531	Ambient Air	22-Aug-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16080288	REPORT CREATED:	22-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080288-003	Cyclopentane	I	0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	Ethanol		1.3	ppbv	0.3	AC-058	03-Sep-16
16080288-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-003	Ethylbenzene	I	0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	Freon-11		0.30	ppbv	0.02	AC-058	03-Sep-16
16080288-003	Freon-113	I	0.08	ppbv	0.01	AC-058	03-Sep-16
16080288-003	Freon-114	I	0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	Freon-12		0.68	ppbv	0.02	AC-058	03-Sep-16
16080288-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Sep-16
16080288-003	Isobutane		0.30	ppbv	0.02	AC-058	03-Sep-16
16080288-003	Isopentane	I	0.28	ppbv	0.03	AC-058	03-Sep-16
16080288-003	Isoprene	I	0.28	ppbv	0.01	AC-058	03-Sep-16
16080288-003	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Sep-16
16080288-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16
16080288-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	03-Sep-16
16080288-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Sep-16
16080288-003	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Sep-16
16080288-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Sep-16
16080288-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Sep-16
16080288-003	Methylcyclohexane	I	0.03	ppbv	0.01	AC-058	03-Sep-16
16080288-003	Methylcyclopentane	I	0.04	ppbv	0.02	AC-058	03-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Thursday, September 22, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/Aug 22, 2016	1531	Ambient Air	22-Aug-16	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080288	REPORT CREATED:	22-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080288-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Sep-16
16080288-003	n-Butane		0.37	ppbv	0.03	AC-058	03-Sep-16
16080288-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Sep-16
16080288-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-003	n-Heptane	I	0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	n-Hexane	I	0.04	ppbv	0.01	AC-058	03-Sep-16
16080288-003	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	n-Pentane	I	0.1	ppbv	0.1	AC-058	03-Sep-16
16080288-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Sep-16
16080288-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Sep-16
16080288-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Sep-16
16080288-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	o-Xylene	I	0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16
16080288-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Sep-16
16080288-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16
16080288-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16
16080288-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-003	Toluene	I	0.06	ppbv	0.01	AC-058	03-Sep-16
16080288-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16
16080288-003	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Sep-16
16080288-003	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16
16080288-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Thursday, September 22, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/Aug 22, 2016	1531	Ambient Air	22-Aug-16	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080288	REPORT CREATED:	22-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080288-003	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Sep-16
16080288-003	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Thursday, September 22, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Aug 28, 2016	S5683	Ambient Air	28-Aug-16 0:00
DESCRIPTION:	Bonnyville		
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-002	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16
16090012-002	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	04-Sep-16
16090012-002	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	04-Sep-16
16090012-002	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-002	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-002	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Sep-16
16090012-002	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-002	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-002	1-Butene	I	0.03	ppbv	0.02	AC-058	04-Sep-16
16090012-002	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	1-Pentene	I	0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	2,2,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	04-Sep-16
16090012-002	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	2,3-Dimethylpentane	I	0.03	ppbv	0.02	AC-058	04-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Aug 28, 2016	S5683	Ambient Air	28-Aug-16 0:00
DESCRIPTION:	Bonnyville		
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-002	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	2-Methylhexane	I	0.05	ppbv	0.01	AC-058	04-Sep-16
16090012-002	2-Methylpentane	I	0.05	ppbv	0.01	AC-058	04-Sep-16
16090012-002	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	3-Methylhexane	I	0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	3-Methylpentane	I	0.03	ppbv	0.01	AC-058	04-Sep-16
16090012-002	Acetone		2.1	ppbv	0.4	AC-058	04-Sep-16
16090012-002	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Sep-16
16090012-002	Benzene	I	0.03	ppbv	0.01	AC-058	04-Sep-16
16090012-002	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-002	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	Bromomethane	I	0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	Carbon disulfide	I	0.08	ppbv	0.01	AC-058	04-Sep-16
16090012-002	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	04-Sep-16
16090012-002	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	Chloroform	I	0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	Chloromethane		0.50	ppbv	0.02	AC-058	04-Sep-16
16090012-002	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16
16090012-002	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Aug 28, 2016	S5683	Ambient Air	28-Aug-16 0:00
DESCRIPTION:	Bonnyville		
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-002	Cyclopentane	I	0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	Ethanol		0.9	ppbv	0.3	AC-058	04-Sep-16
16090012-002	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-002	Ethylbenzene	I	0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	Freon-11		0.31	ppbv	0.02	AC-058	04-Sep-16
16090012-002	Freon-113	I	0.08	ppbv	0.01	AC-058	04-Sep-16
16090012-002	Freon-114	I	0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	Freon-12		0.71	ppbv	0.02	AC-058	04-Sep-16
16090012-002	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	04-Sep-16
16090012-002	Isobutane	I	0.14	ppbv	0.02	AC-058	04-Sep-16
16090012-002	Isopentane	I	0.28	ppbv	0.03	AC-058	04-Sep-16
16090012-002	Isoprene	I	0.10	ppbv	0.01	AC-058	04-Sep-16
16090012-002	Isopropyl alcohol		0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-002	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	m,p-Xylene	I	0.04	ppbv	0.03	AC-058	04-Sep-16
16090012-002	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16
16090012-002	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	04-Sep-16
16090012-002	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	04-Sep-16
16090012-002	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Sep-16
16090012-002	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-002	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Sep-16
16090012-002	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-002	Methylcyclohexane	I	0.02	ppbv	0.01	AC-058	04-Sep-16
16090012-002	Methylcyclopentane	I	0.03	ppbv	0.02	AC-058	04-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Aug 28, 2016	S5683	Ambient Air	28-Aug-16 0:00
DESCRIPTION:	Bonnyville		
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-002	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Sep-16
16090012-002	n-Butane		0.39	ppbv	0.03	AC-058	04-Sep-16
16090012-002	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	04-Sep-16
16090012-002	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-002	n-Heptane	I	0.02	ppbv	0.01	AC-058	04-Sep-16
16090012-002	n-Hexane	I	0.03	ppbv	0.01	AC-058	04-Sep-16
16090012-002	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	n-Pentane	I	0.1	ppbv	0.1	AC-058	04-Sep-16
16090012-002	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	04-Sep-16
16090012-002	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	04-Sep-16
16090012-002	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	04-Sep-16
16090012-002	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	o-Xylene	I	0.02	ppbv	0.01	AC-058	04-Sep-16
16090012-002	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16
16090012-002	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Sep-16
16090012-002	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16
16090012-002	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16
16090012-002	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-002	Toluene	I	0.06	ppbv	0.01	AC-058	04-Sep-16
16090012-002	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16
16090012-002	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Sep-16
16090012-002	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-002	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/Aug 28, 2016	S5683	Ambient Air	28-Aug-16	0:00
DESCRIPTION:	Bonnyville			
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-002	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Sep-16
16090012-002	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

PAHS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/Bonnyville/Aug 4, 2016	9801	Air Filter	04-Aug-16	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080099-004	1-Methylnaphthalene		0.05	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	2-Methylnaphthalene		0.10	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Acenaphthene		0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Acenaphthylene		0.05	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Anthracene		0.02	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Benzo(c)phenanthrene		0.23	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Fluoranthene		0.06	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Fluorene		0.04	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Naphthalene		0.05	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Phenanthrene		0.27	ug/puf	0.01	NA-017	02-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: September-16-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/Bonnyville/Aug 4, 2016	9801	Air Filter	04-Aug-16	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16080099-004	Pyrene		0.06 ug/puf	0.01	NA-017	02-Sep-16
16080099-004	Retene		0.02 ug/puf	0.01	NA-017	02-Sep-16

Report certified by:	Graham Knox, Team Lead	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services		
Date:	September-16-16	Inquiries:	(780) 632 8455	E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/PUF/Bonnyville/Aug 10, 2016	TE03	Air Filter	10-Aug-16 0:00
DESCRIPTION:	Bonnyville-AER		
REPORT NUMBER:	16080119	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080119-002	1-Methylnaphthalene		0.04	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	2-Methylnaphthalene		0.10	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Acenaphthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Acenaphthylene		0.02	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Anthracene		0.03	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Fluoranthene		0.12	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Fluorene		0.04	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Naphthalene		0.06	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Phenanthrene		0.52	ug/puf	0.01	NA-017	02-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/PUF/Bonnyville/Aug 10, 2016	TE03	Air Filter	10-Aug-16 0:00
DESCRIPTION:	Bonnyville-AER		
REPORT NUMBER:	16080119	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16080119-002	Pyrene		0.07 ug/puf	0.01	NA-017	02-Sep-16
16080119-002	Retene	K, T, U	< 0.01 ug/puf	0.01	NA-017	02-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/PUF/Bonnyville/Aug 16, 2016	TE-11	Air Filter	16-Aug-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-004	1-Methylnaphthalene		0.02	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	2-Methylnaphthalene		0.05	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Acenaphthene		0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Acenaphthylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Anthracene		0.03	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Fluoranthene		0.07	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Fluorene		0.04	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Naphthalene		0.02	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Phenanthrene		0.36	ug/puf	0.01	NA-017	02-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/PUF/Bonnyville/Aug 16, 2016	TE-11	Air Filter	16-Aug-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16080238-004	Pyrene		0.05 ug/puf	0.01	NA-017	02-Sep-16
16080238-004	Retene		0.62 ug/puf	0.01	NA-017	02-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID CA/PUF/Bonnyville/Aug 22, 201	CANISTER ID TE-01	Matrix Air Filter	Priority Normal
	DESCRIPTION: Bonnyville - AER			
INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 22-Aug-16 0:00	DATE RECEIVED: 25-Aug-16		
	REPORT CREATED: 22-Sep-16	REPORT NUMBER: 16080288		
		VERSION: Version 01		

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080288-004	1-Methylnaphthalene		0.02	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	2-Methylnaphthalene		0.05	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Acenaphthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Acenaphthylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Anthracene		0.03	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Thursday, September 22, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/PUF/Bonnyville/Aug 22, 2016	TE-01	Air Filter	22-Aug-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16080288	REPORT CREATED:	22-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080288-004	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Fluoranthene		0.05	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Fluorene		0.02	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Naphthalene		0.02	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Phenanthrene		0.21	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Pyrene		0.03	ug/puf	0.01	NA-017	13-Sep-16
16080288-004	Retene		0.02	ug/puf	0.01	NA-017	13-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Thursday, September 22, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/PUF/Bonnyville/Aug 28, 2016	P13-01	Air Filter	28-Aug-16 0:00
DESCRIPTION:	Bonnyville		
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-003	1-Methylnaphthalene		0.02	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	2-Methylnaphthalene		0.05	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Acenaphthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Acenaphthylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Anthracene		0.02	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Fluoranthene		0.03	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Fluorene		0.04	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Naphthalene		0.04	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Phenanthrene		0.12	ug/puf	0.01	NA-017	13-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/PUF/Bonnyville/Aug 28, 2016	P13-01	Air Filter	28-Aug-16	0:00
DESCRIPTION:	Bonnyville			
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-003	Pyrene		0.02	ug/puf	0.01	NA-017	13-Sep-16
16090012-003	Retene		0.01	ug/puf	0.01	NA-017	13-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

NMHC CANISTER SAMPLES

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID VMHC-VOC/ Bonnyville/Aug. 4,	CANISTER ID 1522	Matrix Ambient Air	Priority Normal
	DESCRIPTION:			
INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 04-Aug-16 6:25	DATE RECEIVED: 05-Aug-16		
	REPORT CREATED: 07-Sep-16	REPORT NUMBER: 16080050		
		VERSION: Version 01		

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080050-001	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	17-Aug-16
16080050-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	17-Aug-16
16080050-001	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	17-Aug-16
16080050-001	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	17-Aug-16
16080050-001	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	17-Aug-16
16080050-001	1,2,3-Trimethylbenzene		0.96	ppbv	0.07	AC-058	17-Aug-16
16080050-001	1,2,4-Trichlorobenzene	K, T, U	< 1.1	ppbv	1.1	AC-058	17-Aug-16
16080050-001	1,2,4-Trimethylbenzene		1.98	ppbv	0.04	AC-058	17-Aug-16
16080050-001	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	17-Aug-16
16080050-001	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	17-Aug-16
16080050-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	17-Aug-16
16080050-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080050-001	1,3,5-Trimethylbenzene		0.48	ppbv	0.03	AC-058	17-Aug-16
16080050-001	1,3-Butadiene	I	0.07	ppbv	0.03	AC-058	17-Aug-16
16080050-001	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Aug-16
16080050-001	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	17-Aug-16
16080050-001	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	17-Aug-16
16080050-001	1-Butene		1.75	ppbv	0.03	AC-058	17-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September 7, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/ Bonnyville/Aug. 4, 2	1522	Ambient Air	04-Aug-16 6:25
DESCRIPTION:			
REPORT NUMBER: 16080050	REPORT CREATED: 07-Sep-16	VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080050-001	1-Hexene	I	0.22	ppbv	0.03	AC-058	17-Aug-16
16080050-001	1-Pentene		0.65	ppbv	0.01	AC-058	17-Aug-16
16080050-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080050-001	2,2-Dimethylbutane	I	0.05	ppbv	0.01	AC-058	17-Aug-16
16080050-001	2,3,4-Trimethylpentane	I	0.25	ppbv	0.01	AC-058	17-Aug-16
16080050-001	2,3-Dimethylbutane		0.40	ppbv	0.03	AC-058	17-Aug-16
16080050-001	2,3-Dimethylpentane		0.68	ppbv	0.03	AC-058	17-Aug-16
16080050-001	2,4-Dimethylpentane	I	0.12	ppbv	0.01	AC-058	17-Aug-16
16080050-001	2-Methylheptane		2.09	ppbv	0.01	AC-058	17-Aug-16
16080050-001	2-Methylhexane		0.94	ppbv	0.01	AC-058	17-Aug-16
16080050-001	2-Methylpentane		0.84	ppbv	0.01	AC-058	17-Aug-16
16080050-001	3-Methylheptane		0.74	ppbv	0.03	AC-058	17-Aug-16
16080050-001	3-Methylhexane		2.42	ppbv	0.03	AC-058	17-Aug-16
16080050-001	3-Methylpentane		0.66	ppbv	0.01	AC-058	17-Aug-16
16080050-001	Acetone		94.6	ppbv	3.2	AC-058	18-Aug-16
16080050-001	Acrolein		1.0	ppbv	0.4	AC-058	17-Aug-16
16080050-001	Benzene		2.27	ppbv	0.01	AC-058	17-Aug-16
16080050-001	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	17-Aug-16
16080050-001	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	17-Aug-16
16080050-001	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	17-Aug-16
16080050-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080050-001	Carbon disulfide		33.8	ppbv	0.04	AC-058	17-Aug-16
16080050-001	Carbon tetrachloride	I	0.08	ppbv	0.01	AC-058	17-Aug-16
16080050-001	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	17-Aug-16
16080050-001	Chloroethane	I	0.11	ppbv	0.03	AC-058	17-Aug-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: September 7, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/ Bonnyville/Aug. 4, 2	1522	Ambient Air	04-Aug-16 6:25
DESCRIPTION:			
REPORT NUMBER: 16080050	REPORT CREATED: 07-Sep-16	VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080050-001	Chloroform	K, T, U	< 0.03	ppbv	0.03	AC-058	17-Aug-16
16080050-001	Chloromethane		0.65	ppbv	0.03	AC-058	17-Aug-16
16080050-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080050-001	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	17-Aug-16
16080050-001	cis-2-Butene		0.55	ppbv	0.03	AC-058	17-Aug-16
16080050-001	cis-2-Pentene		0.40	ppbv	0.03	AC-058	17-Aug-16
16080050-001	Cyclohexane		1.73	ppbv	0.03	AC-058	17-Aug-16
16080050-001	Cyclopentane	I	0.30	ppbv	0.01	AC-058	17-Aug-16
16080050-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080050-001	Ethanol		18.3	ppbv	0.4	AC-058	17-Aug-16
16080050-001	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	17-Aug-16
16080050-001	Ethylbenzene		7.37	ppbv	0.01	AC-058	17-Aug-16
16080050-001	Freon-11	I	0.20	ppbv	0.03	AC-058	17-Aug-16
16080050-001	Freon-113	I	0.05	ppbv	0.01	AC-058	17-Aug-16
16080050-001	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	17-Aug-16
16080050-001	Freon-12		0.43	ppbv	0.03	AC-058	17-Aug-16
16080050-001	Hexachloro-1,3-butadiene	K, T, U	< 0.66	ppbv	0.66	AC-058	17-Aug-16
16080050-001	Isobutane		2.65	ppbv	0.03	AC-058	17-Aug-16
16080050-001	Isopentane		4.15	ppbv	0.04	AC-058	17-Aug-16
16080050-001	Isoprene	I	0.39	ppbv	0.01	AC-058	17-Aug-16
16080050-001	Isopropyl alcohol		3.0	ppbv	0.5	AC-058	17-Aug-16
16080050-001	Isopropylbenzene	I	0.35	ppbv	0.01	AC-058	17-Aug-16
16080050-001	m,p-Xylene		17.6	ppbv	0.04	AC-058	17-Aug-16
16080050-001	m-Diethylbenzene	I	0.06	ppbv	0.05	AC-058	17-Aug-16
16080050-001	m-Ethyltoluene		1.93	ppbv	0.11	AC-058	17-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September 7, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/ Bonnyville/Aug. 4, 2	1522	Ambient Air	04-Aug-16 6:25
DESCRIPTION:			
REPORT NUMBER: 16080050	REPORT CREATED: 07-Sep-16	VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080050-001	Methyl butyl ketone		7.86	ppbv	0.66	AC-058	17-Aug-16
16080050-001	Methyl ethyl ketone		85.6	ppbv	2.4	AC-058	18-Aug-16
16080050-001	Methyl isobutyl ketone		1.1	ppbv	0.5	AC-058	17-Aug-16
16080050-001	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	17-Aug-16
16080050-001	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	17-Aug-16
16080050-001	Methylcyclohexane		3.83	ppbv	0.01	AC-058	17-Aug-16
16080050-001	Methylcyclopentane		1.67	ppbv	0.03	AC-058	17-Aug-16
16080050-001	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Aug-16
16080050-001	n-Butane		4.04	ppbv	0.04	AC-058	17-Aug-16
16080050-001	n-Decane	I	0.19	ppbv	0.08	AC-058	17-Aug-16
16080050-001	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	17-Aug-16
16080050-001	n-Heptane		7.35	ppbv	0.01	AC-058	17-Aug-16
16080050-001	n-Hexane		1.44	ppbv	0.01	AC-058	17-Aug-16
16080050-001	n-Octane		3.98	ppbv	0.03	AC-058	17-Aug-16
16080050-001	n-Pentane		2.0	ppbv	0.1	AC-058	17-Aug-16
16080050-001	n-Propylbenzene		0.91	ppbv	0.07	AC-058	17-Aug-16
16080050-001	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	17-Aug-16
16080050-001	Naphthalene		5.8	ppbv	0.7	AC-058	17-Aug-16
16080050-001	n-Nonane		1.22	ppbv	0.01	AC-058	17-Aug-16
16080050-001	o-Ethyltoluene		0.89	ppbv	0.01	AC-058	17-Aug-16
16080050-001	o-Xylene		7.08	ppbv	0.01	AC-058	17-Aug-16
16080050-001	p-Diethylbenzene	I	0.22	ppbv	0.05	AC-058	17-Aug-16
16080050-001	p-Ethyltoluene		1.14	ppbv	0.09	AC-058	17-Aug-16
16080050-001	Styrene	I	0.07	ppbv	0.05	AC-058	17-Aug-16
16080050-001	Tetrachloroethylene	I	0.06	ppbv	0.05	AC-058	17-Aug-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: September 7, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/ Bonnyville/Aug. 4, 2	1522	Ambient Air	04-Aug-16 6:25
DESCRIPTION:			
REPORT NUMBER: 16080050	REPORT CREATED: 07-Sep-16	VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080050-001	Tetrahydrofuran	K, T, U	< 0.5	ppbv	0.5	AC-058	17-Aug-16
16080050-001	Toluene		41.2	ppbv	0.04	AC-058	17-Aug-16
16080050-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Aug-16
16080050-001	trans-1,3-Dichloropropylene	K, T, U	< 0.05	ppbv	0.05	AC-058	17-Aug-16
16080050-001	trans-2-Butene		0.80	ppbv	0.01	AC-058	17-Aug-16
16080050-001	trans-2-Pentene		0.66	ppbv	0.03	AC-058	17-Aug-16
16080050-001	Trichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	17-Aug-16
16080050-001	Vinyl acetate		9.4	ppbv	0.5	AC-058	17-Aug-16
16080050-001	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	17-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September 7, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

RESULTS:	Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE		CLIENT SAMPLE ID	CANISTER ID	Matrix	Priority
	Calgary AB	T2E 6P8	'NMHC-VOC/Bonnyville/Aug 6,	S5650	Ambient Air	Normal
INVOICE:	Charmaine Code	780 812-2182	DESCRIPTION: Bonnyville - AER		DATE SAMPLED: 06-Aug-16 21:55	DATE RECEIVED: 12-Aug-16
	PO Box 8237 5107W-50 St Bonnyville AB	T9N 2J5	REPORT CREATED: 07-Sep-16	REPORT REVISION: 16-Sep-16	REPORT NUMBER: 16080099	VERSION: Version 02

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16080099-001	1,1,1-Trichloroethane	K, T, U	< 0.03 ppbv	0.03	AC-058	19-Aug-16
16080099-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03 ppbv	0.03	AC-058	19-Aug-16
16080099-001	1,1,2-Trichloroethane	K, T, U	< 0.03 ppbv	0.03	AC-058	19-Aug-16
16080099-001	1,1-Dichloroethane	K, T, U	< 0.03 ppbv	0.03	AC-058	19-Aug-16
16080099-001	1,1-Dichloroethylene	K, T, U	< 0.06 ppbv	0.06	AC-058	19-Aug-16
16080099-001	1,2,3-Trimethylbenzene	K, T, U	< 0.07 ppbv	0.07	AC-058	19-Aug-16
16080099-001	1,2,4-Trichlorobenzene	K, T, U	< 1.2 ppbv	1.2	AC-058	19-Aug-16
16080099-001	1,2,4-Trimethylbenzene	I	0.06 ppbv	0.04	AC-058	19-Aug-16
16080099-001	1,2-Dibromoethane	K, T, U	< 0.03 ppbv	0.03	AC-058	19-Aug-16
16080099-001	1,2-Dichlorobenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	19-Aug-16
16080099-001	1,2-Dichloroethane	K, T, U	< 0.01 ppbv	0.01	AC-058	19-Aug-16
16080099-001	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	19-Aug-16
16080099-001	1,3,5-Trimethylbenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	19-Aug-16
16080099-001	1,3-Butadiene	I	0.25 ppbv	0.03	AC-058	19-Aug-16
16080099-001	1,3-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	19-Aug-16
16080099-001	1,4-Dichlorobenzene	K, T, U	< 0.6 ppbv	0.6	AC-058	19-Aug-16
16080099-001	1,4-Dioxane	K, T, U	< 0.6 ppbv	0.6	AC-058	19-Aug-16
16080099-001	1-Butene	I	0.37 ppbv	0.03	AC-058	19-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September-16-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
A/NMHC-VOC/Bonnyville/Aug 6, 2	S5650	Ambient Air	06-Aug-16	21:55
DESCRIPTION: Bonnyville - AER				
REPORT NUMBER: 16080099	REPORT CREATED: 07-Sep-16	REPORT REVISED: 16-Sep-16	VERSION: Version 02	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080099-001	1-Hexene	I	0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-001	1-Pentene	I	0.06	ppbv	0.01	AC-058	19-Aug-16
16080099-001	2,2,4-Trimethylpentane	I	0.08	ppbv	0.01	AC-058	19-Aug-16
16080099-001	2,2-Dimethylbutane	I	0.02	ppbv	0.01	AC-058	19-Aug-16
16080099-001	2,3,4-Trimethylpentane	I	0.03	ppbv	0.01	AC-058	19-Aug-16
16080099-001	2,3-Dimethylbutane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-001	2,3-Dimethylpentane	I	0.06	ppbv	0.03	AC-058	19-Aug-16
16080099-001	2,4-Dimethylpentane	I	0.03	ppbv	0.01	AC-058	19-Aug-16
16080099-001	2-Methylheptane	I	0.02	ppbv	0.01	AC-058	19-Aug-16
16080099-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-001	2-Methylpentane	I	0.19	ppbv	0.01	AC-058	19-Aug-16
16080099-001	3-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-001	3-Methylhexane	I	0.05	ppbv	0.03	AC-058	19-Aug-16
16080099-001	3-Methylpentane	I	0.10	ppbv	0.01	AC-058	19-Aug-16
16080099-001	Acetone		4.4	ppbv	0.6	AC-058	19-Aug-16
16080099-001	Acrolein		0.8	ppbv	0.4	AC-058	19-Aug-16
16080099-001	Benzene		1.14	ppbv	0.01	AC-058	19-Aug-16
16080099-001	Benzyl chloride	K, T, U	< 0.6	ppbv	0.6	AC-058	19-Aug-16
16080099-001	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-001	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-001	Carbon disulfide	I	0.07	ppbv	0.01	AC-058	19-Aug-16
16080099-001	Carbon tetrachloride	I	0.08	ppbv	0.01	AC-058	19-Aug-16
16080099-001	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-001	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September-16-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
A/NMHC-VOC/Bonnyville/Aug 6, 2	S5650	Ambient Air	06-Aug-16	21:55
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080099-001	Chloroform	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-001	Chloromethane		0.47	ppbv	0.03	AC-058	19-Aug-16
16080099-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-001	cis-1,3-Dichloropropene	K, T, U	< 0.06	ppbv	0.06	AC-058	19-Aug-16
16080099-001	cis-2-Butene	I	0.06	ppbv	0.03	AC-058	19-Aug-16
16080099-001	cis-2-Pentene	I	0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-001	Cyclohexane	I	0.05	ppbv	0.03	AC-058	19-Aug-16
16080099-001	Cyclopentane	I	0.04	ppbv	0.01	AC-058	19-Aug-16
16080099-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-001	Ethanol		4.3	ppbv	0.4	AC-058	19-Aug-16
16080099-001	Ethyl acetate	K, T, U	< 0.6	ppbv	0.6	AC-058	19-Aug-16
16080099-001	Ethylbenzene	I	0.08	ppbv	0.01	AC-058	19-Aug-16
16080099-001	Freon-11	I	0.22	ppbv	0.03	AC-058	19-Aug-16
16080099-001	Freon-113	I	0.05	ppbv	0.01	AC-058	19-Aug-16
16080099-001	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-001	Freon-12	I	0.44	ppbv	0.03	AC-058	19-Aug-16
16080099-001	Hexachloro-1,3-butadiene	K, T, U	< 0.74	ppbv	0.74	AC-058	19-Aug-16
16080099-001	Isobutane		0.50	ppbv	0.03	AC-058	19-Aug-16
16080099-001	Isopentane		0.49	ppbv	0.04	AC-058	19-Aug-16
16080099-001	Isoprene		1.90	ppbv	0.01	AC-058	19-Aug-16
16080099-001	Isopropyl alcohol	K, T, U	< 0.6	ppbv	0.6	AC-058	19-Aug-16
16080099-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-001	m,p-Xylene	I	0.19	ppbv	0.04	AC-058	19-Aug-16
16080099-001	m-Diethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	19-Aug-16
16080099-001	m-Ethyltoluene	K, T, U	< 0.12	ppbv	0.12	AC-058	19-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September-16-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
A/NMHC-VOC/Bonnyville/Aug 6, 2	S5650	Ambient Air	06-Aug-16	21:55
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080099-001	Methyl butyl ketone	K, T, U	< 0.74	ppbv	0.74	AC-058	19-Aug-16
16080099-001	Methyl ethyl ketone		0.7	ppbv	0.4	AC-058	19-Aug-16
16080099-001	Methyl isobutyl ketone	K, T, U	< 0.6	ppbv	0.6	AC-058	19-Aug-16
16080099-001	Methyl methacrylate	K, T, U	< 0.10	ppbv	0.10	AC-058	19-Aug-16
16080099-001	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Aug-16
16080099-001	Methylcyclohexane	I	0.08	ppbv	0.01	AC-058	19-Aug-16
16080099-001	Methylcyclopentane	I	0.11	ppbv	0.03	AC-058	19-Aug-16
16080099-001	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Aug-16
16080099-001	n-Butane		0.68	ppbv	0.04	AC-058	19-Aug-16
16080099-001	n-Decane	K, T, U	< 0.09	ppbv	0.09	AC-058	19-Aug-16
16080099-001	n-Dodecane	K, T, U	< 0.6	ppbv	0.6	AC-058	19-Aug-16
16080099-001	n-Heptane	I	0.06	ppbv	0.01	AC-058	19-Aug-16
16080099-001	n-Hexane	I	0.13	ppbv	0.01	AC-058	19-Aug-16
16080099-001	n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-001	n-Pentane	I	0.4	ppbv	0.1	AC-058	19-Aug-16
16080099-001	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	19-Aug-16
16080099-001	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	19-Aug-16
16080099-001	Naphthalene		1.9	ppbv	0.7	AC-058	19-Aug-16
16080099-001	n-Nonane	I	0.02	ppbv	0.01	AC-058	19-Aug-16
16080099-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-001	o-Xylene	I	0.07	ppbv	0.01	AC-058	19-Aug-16
16080099-001	p-Diethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	19-Aug-16
16080099-001	p-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	19-Aug-16
16080099-001	Styrene	K, T, U	< 0.06	ppbv	0.06	AC-058	19-Aug-16
16080099-001	Tetrachloroethylene	K, T, U	< 0.06	ppbv	0.06	AC-058	19-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September-16-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
A/NMHC-VOC/Bonnyville/Aug 6, 2	S5650	Ambient Air	06-Aug-16	21:55
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080099-001	Tetrahydrofuran	K, T, U	< 0.6	ppbv	0.6	AC-058	19-Aug-16
16080099-001	Toluene	I	0.44	ppbv	0.01	AC-058	19-Aug-16
16080099-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-001	trans-1,3-Dichloropropylene	K, T, U	< 0.06	ppbv	0.06	AC-058	19-Aug-16
16080099-001	trans-2-Butene	I	0.04	ppbv	0.01	AC-058	19-Aug-16
16080099-001	trans-2-Pentene	I	0.06	ppbv	0.03	AC-058	19-Aug-16
16080099-001	Trichloroethylene	K, T, U	< 0.06	ppbv	0.06	AC-058	19-Aug-16
16080099-001	Vinyl acetate	K, T, U	< 0.6	ppbv	0.6	AC-058	19-Aug-16
16080099-001	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September-16-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
A/NMHC-VOC/Bonnyville/Aug 8, 2	15005	Ambient Air	08-Aug-16	20:55
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080099-002	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Aug-16
16080099-002	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	19-Aug-16
16080099-002	1,2,4-Trichlorobenzene	K, T, U	< 1.0	ppbv	1.0	AC-058	19-Aug-16
16080099-002	1,2,4-Trimethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Aug-16
16080099-002	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Aug-16
16080099-002	1,2-Dichloroethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-002	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-002	1,3,5-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	1,3-Butadiene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Aug-16
16080099-002	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Aug-16
16080099-002	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Aug-16
16080099-002	1-Butene	I	0.31	ppbv	0.03	AC-058	19-Aug-16
16080099-002	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	1-Pentene	I	0.16	ppbv	0.01	AC-058	19-Aug-16
16080099-002	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-002	2,2-Dimethylbutane	I	0.37	ppbv	0.01	AC-058	19-Aug-16
16080099-002	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-002	2,3-Dimethylbutane	I	0.27	ppbv	0.03	AC-058	19-Aug-16
16080099-002	2,3-Dimethylpentane	I	0.07	ppbv	0.03	AC-058	19-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September-16-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
A/NMHC-VOC/Bonnyville/Aug 8, 2	15005	Ambient Air	08-Aug-16	20:55
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080099-002	2,4-Dimethylpentane	I	0.04	ppbv	0.01	AC-058	19-Aug-16
16080099-002	2-Methylheptane	I	0.02	ppbv	0.01	AC-058	19-Aug-16
16080099-002	2-Methylhexane	I	0.23	ppbv	0.01	AC-058	19-Aug-16
16080099-002	2-Methylpentane		1.20	ppbv	0.01	AC-058	19-Aug-16
16080099-002	3-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	3-Methylhexane	I	0.13	ppbv	0.03	AC-058	19-Aug-16
16080099-002	3-Methylpentane		0.61	ppbv	0.01	AC-058	19-Aug-16
16080099-002	Acetone		6.4	ppbv	0.5	AC-058	19-Aug-16
16080099-002	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Aug-16
16080099-002	Benzene	I	0.19	ppbv	0.01	AC-058	19-Aug-16
16080099-002	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Aug-16
16080099-002	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-002	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	19-Aug-16
16080099-002	Carbon tetrachloride	I	0.08	ppbv	0.01	AC-058	19-Aug-16
16080099-002	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	Chloroform	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	Chloromethane		0.44	ppbv	0.03	AC-058	19-Aug-16
16080099-002	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-002	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Aug-16
16080099-002	cis-2-Butene	I	0.33	ppbv	0.03	AC-058	19-Aug-16
16080099-002	cis-2-Pentene	I	0.24	ppbv	0.03	AC-058	19-Aug-16
16080099-002	Cyclohexane	I	0.09	ppbv	0.03	AC-058	19-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September-16-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
A/NMHC-VOC/Bonnyville/Aug 8, 2	15005	Ambient Air	08-Aug-16	20:55
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080099-002	Cyclopentane	I	0.12	ppbv	0.01	AC-058	19-Aug-16
16080099-002	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-002	Ethanol		6.9	ppbv	0.4	AC-058	19-Aug-16
16080099-002	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Aug-16
16080099-002	Ethylbenzene	I	0.04	ppbv	0.01	AC-058	19-Aug-16
16080099-002	Freon-11	I	0.22	ppbv	0.03	AC-058	19-Aug-16
16080099-002	Freon-113	I	0.06	ppbv	0.01	AC-058	19-Aug-16
16080099-002	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	Freon-12		0.42	ppbv	0.03	AC-058	19-Aug-16
16080099-002	Hexachloro-1,3-butadiene	K, T, U	< 0.66	ppbv	0.66	AC-058	19-Aug-16
16080099-002	Isobutane		7.24	ppbv	0.03	AC-058	19-Aug-16
16080099-002	Isopentane		13.3	ppbv	0.04	AC-058	19-Aug-16
16080099-002	Isoprene		0.90	ppbv	0.01	AC-058	19-Aug-16
16080099-002	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Aug-16
16080099-002	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-002	m,p-Xylene	I	0.08	ppbv	0.04	AC-058	19-Aug-16
16080099-002	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Aug-16
16080099-002	m-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	19-Aug-16
16080099-002	Methyl butyl ketone	K, T, U	< 0.66	ppbv	0.66	AC-058	19-Aug-16
16080099-002	Methyl ethyl ketone		0.5	ppbv	0.4	AC-058	19-Aug-16
16080099-002	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Aug-16
16080099-002	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	19-Aug-16
16080099-002	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Aug-16
16080099-002	Methylcyclohexane	I	0.09	ppbv	0.01	AC-058	19-Aug-16
16080099-002	Methylcyclopentane		0.41	ppbv	0.03	AC-058	19-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September-16-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
A/NMHC-VOC/Bonnyville/Aug 8, 2	15005	Ambient Air	08-Aug-16	20:55
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080099-002	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Aug-16
16080099-002	n-Butane		3.75	ppbv	0.04	AC-058	19-Aug-16
16080099-002	n-Decane	K, T, U	< 0.08	ppbv	0.08	AC-058	19-Aug-16
16080099-002	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Aug-16
16080099-002	n-Heptane	I	0.06	ppbv	0.01	AC-058	19-Aug-16
16080099-002	n-Hexane	I	0.23	ppbv	0.01	AC-058	19-Aug-16
16080099-002	n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Aug-16
16080099-002	n-Pentane		1.7	ppbv	0.1	AC-058	19-Aug-16
16080099-002	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	19-Aug-16
16080099-002	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	19-Aug-16
16080099-002	Naphthalene	K, T, U	< 0.7	ppbv	0.7	AC-058	19-Aug-16
16080099-002	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-002	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-002	o-Xylene	I	0.03	ppbv	0.01	AC-058	19-Aug-16
16080099-002	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Aug-16
16080099-002	p-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	19-Aug-16
16080099-002	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Aug-16
16080099-002	Tetrachloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Aug-16
16080099-002	Tetrahydrofuran	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Aug-16
16080099-002	Toluene	I	0.27	ppbv	0.01	AC-058	19-Aug-16
16080099-002	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Aug-16
16080099-002	trans-1,3-Dichloropropylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Aug-16
16080099-002	trans-2-Butene		0.45	ppbv	0.01	AC-058	19-Aug-16
16080099-002	trans-2-Pentene		0.46	ppbv	0.03	AC-058	19-Aug-16
16080099-002	Trichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: September-16-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
A/NMHC-VOC/Bonnyville/Aug 8, 2	15005	Ambient Air	08-Aug-16	20:55
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16080099	REPORT CREATED:	07-Sep-16	REPORT REVISED: 16-Sep-16
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16080099-002	Vinyl acetate		0.9 ppbv	0.5	AC-058	19-Aug-16
16080099-002	Vinyl chloride	K, T, U	< 0.03 ppbv	0.03	AC-058	19-Aug-16

Report certified by:	Graham Knox, Team Lead	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services		
Date:	September-16-16	Inquiries:	(780) 632 8455	E-mail:	EAS.Results@albertainnovates.ca

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID VMHC-VOC/Bonnyville/Aug 18,	CANISTER ID 2644	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville - AER			
INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 18-Aug-16 5:10	DATE RECEIVED: 23-Aug-16		
	REPORT CREATED: 16-Sep-16	REPORT NUMBER: 16080238		
		VERSION: Version 01		

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-005	1,1,1-Trichloroethane	I	0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-005	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-005	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-005	1,1-Dichloroethane	I	0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-005	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Aug-16
16080238-005	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Aug-16
16080238-005	1,2,4-Trichlorobenzene	K, T, U	< 1.1	ppbv	1.1	AC-058	25-Aug-16
16080238-005	1,2,4-Trimethylbenzene	I	0.05	ppbv	0.04	AC-058	25-Aug-16
16080238-005	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-005	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-005	1,2-Dichloroethane	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080238-005	1,2-Dichloropropane	I	0.04	ppbv	0.01	AC-058	25-Aug-16
16080238-005	1,3,5-Trimethylbenzene	I	0.04	ppbv	0.03	AC-058	25-Aug-16
16080238-005	1,3-Butadiene	I	0.06	ppbv	0.03	AC-058	25-Aug-16
16080238-005	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-005	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080238-005	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080238-005	1-Butene	I	0.15	ppbv	0.03	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/Bonnyville/Aug 18, 2	2644	Ambient Air	18-Aug-16 5:10
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-005	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-005	1-Pentene	I	0.06	ppbv	0.01	AC-058	25-Aug-16
16080238-005	2,2,4-Trimethylpentane	I	0.04	ppbv	0.01	AC-058	25-Aug-16
16080238-005	2,2-Dimethylbutane	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080238-005	2,3,4-Trimethylpentane	I	0.05	ppbv	0.01	AC-058	25-Aug-16
16080238-005	2,3-Dimethylbutane	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-005	2,3-Dimethylpentane	I	0.05	ppbv	0.03	AC-058	25-Aug-16
16080238-005	2,4-Dimethylpentane	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080238-005	2-Methylheptane	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080238-005	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-005	2-Methylpentane	I	0.12	ppbv	0.01	AC-058	25-Aug-16
16080238-005	3-Methylheptane	I	0.05	ppbv	0.03	AC-058	25-Aug-16
16080238-005	3-Methylhexane	I	0.06	ppbv	0.03	AC-058	25-Aug-16
16080238-005	3-Methylpentane	I	0.07	ppbv	0.01	AC-058	25-Aug-16
16080238-005	Acetone		2.5	ppbv	0.5	AC-058	25-Aug-16
16080238-005	Acrolein		6.1	ppbv	0.4	AC-058	25-Aug-16
16080238-005	Benzene	I	0.10	ppbv	0.01	AC-058	25-Aug-16
16080238-005	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080238-005	Bromodichloromethane		0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-005	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-005	Bromomethane	I	0.05	ppbv	0.01	AC-058	25-Aug-16
16080238-005	Carbon disulfide	I	0.22	ppbv	0.01	AC-058	25-Aug-16
16080238-005	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	25-Aug-16
16080238-005	Chlorobenzene	I	0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-005	Chloroethane	I	0.04	ppbv	0.03	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/Bonnyville/Aug 18, 2	2644	Ambient Air	18-Aug-16 5:10
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-005	Chloroform	I	0.05	ppbv	0.03	AC-058	25-Aug-16
16080238-005	Chloromethane		0.60	ppbv	0.03	AC-058	25-Aug-16
16080238-005	cis-1,2-Dichloroethene	I	0.02	ppbv	0.01	AC-058	25-Aug-16
16080238-005	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Aug-16
16080238-005	cis-2-Butene	I	0.03	ppbv	0.03	AC-058	25-Aug-16
16080238-005	cis-2-Pentene	I	0.04	ppbv	0.03	AC-058	25-Aug-16
16080238-005	Cyclohexane	I	0.05	ppbv	0.03	AC-058	25-Aug-16
16080238-005	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Aug-16
16080238-005	Dibromochloromethane	I	0.02	ppbv	0.01	AC-058	25-Aug-16
16080238-005	Ethanol		1.5	ppbv	0.4	AC-058	25-Aug-16
16080238-005	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080238-005	Ethylbenzene	I	0.06	ppbv	0.01	AC-058	25-Aug-16
16080238-005	Freon-11	I	0.26	ppbv	0.03	AC-058	25-Aug-16
16080238-005	Freon-113	I	0.09	ppbv	0.01	AC-058	25-Aug-16
16080238-005	Freon-114	I	0.04	ppbv	0.03	AC-058	25-Aug-16
16080238-005	Freon-12		0.53	ppbv	0.03	AC-058	25-Aug-16
16080238-005	Hexachloro-1,3-butadiene	K, T, U	< 0.66	ppbv	0.66	AC-058	25-Aug-16
16080238-005	Isobutane		0.47	ppbv	0.03	AC-058	25-Aug-16
16080238-005	Isopentane		0.83	ppbv	0.04	AC-058	25-Aug-16
16080238-005	Isoprene		0.47	ppbv	0.01	AC-058	25-Aug-16
16080238-005	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080238-005	Isopropylbenzene	I	0.02	ppbv	0.01	AC-058	25-Aug-16
16080238-005	m,p-Xylene	I	0.11	ppbv	0.04	AC-058	25-Aug-16
16080238-005	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Aug-16
16080238-005	m-Ethyltoluene	K, T, U	< 0.11	ppbv	0.11	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/Bonnyville/Aug 18, 2	2644	Ambient Air	18-Aug-16 5:10
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-005	Methyl butyl ketone	K, T, U	< 0.66	ppbv	0.66	AC-058	25-Aug-16
16080238-005	Methyl ethyl ketone		0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-005	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080238-005	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	25-Aug-16
16080238-005	Methyl tert butyl ether	I	0.04	ppbv	0.04	AC-058	25-Aug-16
16080238-005	Methylcyclohexane	I	0.04	ppbv	0.01	AC-058	25-Aug-16
16080238-005	Methylcyclopentane	I	0.06	ppbv	0.03	AC-058	25-Aug-16
16080238-005	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Aug-16
16080238-005	n-Butane		0.92	ppbv	0.04	AC-058	25-Aug-16
16080238-005	n-Decane	K, T, U	< 0.08	ppbv	0.08	AC-058	25-Aug-16
16080238-005	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080238-005	n-Heptane	I	0.05	ppbv	0.01	AC-058	25-Aug-16
16080238-005	n-Hexane	I	0.09	ppbv	0.01	AC-058	25-Aug-16
16080238-005	n-Octane	I	0.04	ppbv	0.03	AC-058	25-Aug-16
16080238-005	n-Pentane	I	0.2	ppbv	0.1	AC-058	25-Aug-16
16080238-005	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Aug-16
16080238-005	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	25-Aug-16
16080238-005	Naphthalene		0.7	ppbv	0.7	AC-058	25-Aug-16
16080238-005	n-Nonane	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080238-005	o-Ethyltoluene	I	0.02	ppbv	0.01	AC-058	25-Aug-16
16080238-005	o-Xylene	I	0.06	ppbv	0.01	AC-058	25-Aug-16
16080238-005	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Aug-16
16080238-005	p-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	25-Aug-16
16080238-005	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Aug-16
16080238-005	Tetrachloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/Bonnyville/Aug 18, 2	2644	Ambient Air	18-Aug-16 5:10
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16080238	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16080238-005	Tetrahydrofuran	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080238-005	Toluene	I	0.13	ppbv	0.01	AC-058	25-Aug-16
16080238-005	trans-1,2-Dichloroethylene	I	0.03	ppbv	0.01	AC-058	25-Aug-16
16080238-005	trans-1,3-Dichloropropylene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Aug-16
16080238-005	trans-2-Butene	I	0.05	ppbv	0.01	AC-058	25-Aug-16
16080238-005	trans-2-Pentene	I	0.06	ppbv	0.03	AC-058	25-Aug-16
16080238-005	Trichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Aug-16
16080238-005	Vinyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Aug-16
16080238-005	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Aug-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID VMHC-VOC/Bonnyville/Aug 30,	CANISTER ID 1521	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville			
INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 30-Aug-16 7:25	DATE RECEIVED: 01-Sep-16		
	REPORT CREATED: 16-Sep-16	REPORT NUMBER: 16090012		
		VERSION: Version 01		

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-001	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-001	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-001	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-001	1,1-Dichloroethylene	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Sep-16
16090012-001	1,2,3-Trimethylbenzene	K, T, U	< 0.08	ppbv	0.08	AC-058	04-Sep-16
16090012-001	1,2,4-Trichlorobenzene	K, T, U	< 1.3	ppbv	1.3	AC-058	04-Sep-16
16090012-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	04-Sep-16
16090012-001	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-001	1,2-Dichlorobenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	04-Sep-16
16090012-001	1,2-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-001	1,2-Dichloropropane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-001	1,3,5-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-001	1,3-Butadiene	I	0.05	ppbv	0.03	AC-058	04-Sep-16
16090012-001	1,3-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	04-Sep-16
16090012-001	1,4-Dichlorobenzene	K, T, U	< 0.7	ppbv	0.7	AC-058	04-Sep-16
16090012-001	1,4-Dioxane	K, T, U	< 0.7	ppbv	0.7	AC-058	04-Sep-16
16090012-001	1-Butene	I	0.16	ppbv	0.03	AC-058	04-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/Bonnyville/Aug 30, 2	1521	Ambient Air	30-Aug-16 7:25
DESCRIPTION:	Bonnyville		
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-001	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-001	1-Pentene	I	0.19	ppbv	0.02	AC-058	04-Sep-16
16090012-001	2,2,4-Trimethylpentane	I	0.07	ppbv	0.02	AC-058	04-Sep-16
16090012-001	2,2-Dimethylbutane	I	0.05	ppbv	0.02	AC-058	04-Sep-16
16090012-001	2,3,4-Trimethylpentane	I	0.04	ppbv	0.02	AC-058	04-Sep-16
16090012-001	2,3-Dimethylbutane	I	0.14	ppbv	0.03	AC-058	04-Sep-16
16090012-001	2,3-Dimethylpentane	I	0.09	ppbv	0.03	AC-058	04-Sep-16
16090012-001	2,4-Dimethylpentane	I	0.04	ppbv	0.02	AC-058	04-Sep-16
16090012-001	2-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-001	2-Methylhexane	I	0.10	ppbv	0.02	AC-058	04-Sep-16
16090012-001	2-Methylpentane		0.54	ppbv	0.02	AC-058	04-Sep-16
16090012-001	3-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-001	3-Methylhexane	I	0.07	ppbv	0.03	AC-058	04-Sep-16
16090012-001	3-Methylpentane	I	0.30	ppbv	0.02	AC-058	04-Sep-16
16090012-001	Acetone		2.5	ppbv	0.7	AC-058	04-Sep-16
16090012-001	Acrolein	K, T, U	< 0.5	ppbv	0.5	AC-058	04-Sep-16
16090012-001	Benzene	I	0.12	ppbv	0.02	AC-058	04-Sep-16
16090012-001	Benzyl chloride	K, T, U	< 0.7	ppbv	0.7	AC-058	04-Sep-16
16090012-001	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-001	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-001	Bromomethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-001	Carbon disulfide	I	0.11	ppbv	0.02	AC-058	04-Sep-16
16090012-001	Carbon tetrachloride	I	0.10	ppbv	0.02	AC-058	04-Sep-16
16090012-001	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-001	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/Bonnyville/Aug 30, 2	1521	Ambient Air	30-Aug-16 7:25
DESCRIPTION:	Bonnyville		
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-001	Chloroform	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-001	Chloromethane	I	0.48	ppbv	0.03	AC-058	04-Sep-16
16090012-001	cis-1,2-Dichloroethene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-001	cis-1,3-Dichloropropene	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Sep-16
16090012-001	cis-2-Butene	I	0.09	ppbv	0.03	AC-058	04-Sep-16
16090012-001	cis-2-Pentene	I	0.19	ppbv	0.03	AC-058	04-Sep-16
16090012-001	Cyclohexane	I	0.09	ppbv	0.03	AC-058	04-Sep-16
16090012-001	Cyclopentane	I	0.13	ppbv	0.02	AC-058	04-Sep-16
16090012-001	Dibromochloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-001	Ethanol		4.3	ppbv	0.5	AC-058	04-Sep-16
16090012-001	Ethyl acetate	K, T, U	< 0.7	ppbv	0.7	AC-058	04-Sep-16
16090012-001	Ethylbenzene	I	0.03	ppbv	0.02	AC-058	04-Sep-16
16090012-001	Freon-11	I	0.30	ppbv	0.03	AC-058	04-Sep-16
16090012-001	Freon-113	I	0.07	ppbv	0.02	AC-058	04-Sep-16
16090012-001	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-001	Freon-12		0.69	ppbv	0.03	AC-058	04-Sep-16
16090012-001	Hexachloro-1,3-butadiene	K, T, U	< 0.84	ppbv	0.84	AC-058	04-Sep-16
16090012-001	Isobutane		1.52	ppbv	0.03	AC-058	04-Sep-16
16090012-001	Isopentane		3.76	ppbv	0.05	AC-058	04-Sep-16
16090012-001	Isoprene	I	0.24	ppbv	0.02	AC-058	04-Sep-16
16090012-001	Isopropyl alcohol	K, T, U	< 0.7	ppbv	0.7	AC-058	04-Sep-16
16090012-001	Isopropylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-001	m,p-Xylene	I	0.08	ppbv	0.05	AC-058	04-Sep-16
16090012-001	m-Diethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Sep-16
16090012-001	m-Ethyltoluene	K, T, U	< 0.13	ppbv	0.13	AC-058	04-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/Bonnyville/Aug 30, 2	1521	Ambient Air	30-Aug-16 7:25
DESCRIPTION:	Bonnyville		
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-001	Methyl butyl ketone	K, T, U	< 0.84	ppbv	0.84	AC-058	04-Sep-16
16090012-001	Methyl ethyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	04-Sep-16
16090012-001	Methyl isobutyl ketone	K, T, U	< 0.7	ppbv	0.7	AC-058	04-Sep-16
16090012-001	Methyl methacrylate	K, T, U	< 0.12	ppbv	0.12	AC-058	04-Sep-16
16090012-001	Methyl tert butyl ether	K, T, U	< 0.05	ppbv	0.05	AC-058	04-Sep-16
16090012-001	Methylcyclohexane	I	0.06	ppbv	0.02	AC-058	04-Sep-16
16090012-001	Methylcyclopentane	I	0.25	ppbv	0.03	AC-058	04-Sep-16
16090012-001	Methylene chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	04-Sep-16
16090012-001	n-Butane		7.49	ppbv	0.05	AC-058	04-Sep-16
16090012-001	n-Decane	K, T, U	< 0.10	ppbv	0.10	AC-058	04-Sep-16
16090012-001	n-Dodecane	K, T, U	< 0.7	ppbv	0.7	AC-058	04-Sep-16
16090012-001	n-Heptane	I	0.06	ppbv	0.02	AC-058	04-Sep-16
16090012-001	n-Hexane	I	0.32	ppbv	0.02	AC-058	04-Sep-16
16090012-001	n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16
16090012-001	n-Pentane		1.6	ppbv	0.2	AC-058	04-Sep-16
16090012-001	n-Propylbenzene	K, T, U	< 0.08	ppbv	0.08	AC-058	04-Sep-16
16090012-001	n-Undecane	K, T, U	< 0.8	ppbv	0.8	AC-058	04-Sep-16
16090012-001	Naphthalene	K, T, U	< 0.8	ppbv	0.8	AC-058	04-Sep-16
16090012-001	n-Nonane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-001	o-Ethyltoluene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-001	o-Xylene	I	0.04	ppbv	0.02	AC-058	04-Sep-16
16090012-001	p-Diethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Sep-16
16090012-001	p-Ethyltoluene	K, T, U	< 0.12	ppbv	0.12	AC-058	04-Sep-16
16090012-001	Styrene	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Sep-16
16090012-001	Tetrachloroethylene	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/Bonnyville/Aug 30, 2	1521	Ambient Air	30-Aug-16 7:25
DESCRIPTION:	Bonnyville		
REPORT NUMBER:	16090012	REPORT CREATED:	16-Sep-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090012-001	Tetrahydrofuran	K, T, U	< 0.7	ppbv	0.7	AC-058	04-Sep-16
16090012-001	Toluene	I	0.17	ppbv	0.02	AC-058	04-Sep-16
16090012-001	trans-1,2-Dichloroethylene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Sep-16
16090012-001	trans-1,3-Dichloropropylene	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Sep-16
16090012-001	trans-2-Butene	I	0.04	ppbv	0.02	AC-058	04-Sep-16
16090012-001	trans-2-Pentene	I	0.33	ppbv	0.03	AC-058	04-Sep-16
16090012-001	Trichloroethylene	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Sep-16
16090012-001	Vinyl acetate	K, T, U	< 0.7	ppbv	0.7	AC-058	04-Sep-16
16090012-001	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID VMHC-VOC/Bonnyville/Aug 31,	CANISTER ID S5623	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville- AER			
INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 31-Aug-16 13:15	DATE RECEIVED: 06-Sep-16		
	REPORT CREATED: 16-Sep-16	REPORT NUMBER: 16090046		
		VERSION: Version 01		

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090046-001	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090046-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090046-001	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090046-001	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090046-001	1,1-Dichloroethylene	K, T, U	< 0.06	ppbv	0.06	AC-058	11-Sep-16
16090046-001	1,2,3-Trimethylbenzene	K, T, U	< 0.08	ppbv	0.08	AC-058	11-Sep-16
16090046-001	1,2,4-Trichlorobenzene	K, T, U	< 1.3	ppbv	1.3	AC-058	11-Sep-16
16090046-001	1,2,4-Trimethylbenzene	I	0.06	ppbv	0.05	AC-058	11-Sep-16
16090046-001	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090046-001	1,2-Dichlorobenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	11-Sep-16
16090046-001	1,2-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090046-001	1,2-Dichloropropane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090046-001	1,3,5-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090046-001	1,3-Butadiene	I	0.05	ppbv	0.03	AC-058	11-Sep-16
16090046-001	1,3-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	11-Sep-16
16090046-001	1,4-Dichlorobenzene	K, T, U	< 0.6	ppbv	0.6	AC-058	11-Sep-16
16090046-001	1,4-Dioxane	K, T, U	< 0.6	ppbv	0.6	AC-058	11-Sep-16
16090046-001	1-Butene	I	0.17	ppbv	0.03	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Aug 31, 2	S5623	Ambient Air	31-Aug-16	13:15
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16090046	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090046-001	1-Hexene	I	0.04	ppbv	0.03	AC-058	11-Sep-16
16090046-001	1-Pentene	I	0.28	ppbv	0.02	AC-058	11-Sep-16
16090046-001	2,2,4-Trimethylpentane	I	0.11	ppbv	0.02	AC-058	11-Sep-16
16090046-001	2,2-Dimethylbutane	I	0.07	ppbv	0.02	AC-058	11-Sep-16
16090046-001	2,3,4-Trimethylpentane	I	0.02	ppbv	0.02	AC-058	11-Sep-16
16090046-001	2,3-Dimethylbutane	I	0.33	ppbv	0.03	AC-058	11-Sep-16
16090046-001	2,3-Dimethylpentane	I	0.13	ppbv	0.03	AC-058	11-Sep-16
16090046-001	2,4-Dimethylpentane	I	0.08	ppbv	0.02	AC-058	11-Sep-16
16090046-001	2-Methylheptane	I	0.03	ppbv	0.02	AC-058	11-Sep-16
16090046-001	2-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090046-001	2-Methylpentane		0.92	ppbv	0.02	AC-058	11-Sep-16
16090046-001	3-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090046-001	3-Methylhexane	I	0.13	ppbv	0.03	AC-058	11-Sep-16
16090046-001	3-Methylpentane		0.51	ppbv	0.02	AC-058	11-Sep-16
16090046-001	Acetone		13.9	ppbv	0.6	AC-058	11-Sep-16
16090046-001	Acrolein	K, T, U	< 0.5	ppbv	0.5	AC-058	11-Sep-16
16090046-001	Benzene		0.61	ppbv	0.02	AC-058	11-Sep-16
16090046-001	Benzyl chloride	K, T, U	< 0.6	ppbv	0.6	AC-058	11-Sep-16
16090046-001	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090046-001	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090046-001	Bromomethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090046-001	Carbon disulfide		1.79	ppbv	0.02	AC-058	11-Sep-16
16090046-001	Carbon tetrachloride	I	0.09	ppbv	0.02	AC-058	11-Sep-16
16090046-001	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090046-001	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, September 16, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Aug 31, 2	S5623	Ambient Air	31-Aug-16	13:15
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16090046	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090046-001	Chloroform	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090046-001	Chloromethane	I	0.48	ppbv	0.03	AC-058	11-Sep-16
16090046-001	cis-1,2-Dichloroethene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090046-001	cis-1,3-Dichloropropene	K, T, U	< 0.06	ppbv	0.06	AC-058	11-Sep-16
16090046-001	cis-2-Butene	I	0.12	ppbv	0.03	AC-058	11-Sep-16
16090046-001	cis-2-Pentene	I	0.28	ppbv	0.03	AC-058	11-Sep-16
16090046-001	Cyclohexane	I	0.11	ppbv	0.03	AC-058	11-Sep-16
16090046-001	Cyclopentane	I	0.23	ppbv	0.02	AC-058	11-Sep-16
16090046-001	Dibromochloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090046-001	Ethanol		7.2	ppbv	0.5	AC-058	11-Sep-16
16090046-001	Ethyl acetate	K, T, U	< 0.6	ppbv	0.6	AC-058	11-Sep-16
16090046-001	Ethylbenzene	I	0.06	ppbv	0.02	AC-058	11-Sep-16
16090046-001	Freon-11	I	0.27	ppbv	0.03	AC-058	11-Sep-16
16090046-001	Freon-113	I	0.07	ppbv	0.02	AC-058	11-Sep-16
16090046-001	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090046-001	Freon-12		0.54	ppbv	0.03	AC-058	11-Sep-16
16090046-001	Hexachloro-1,3-butadiene	K, T, U	< 0.81	ppbv	0.81	AC-058	11-Sep-16
16090046-001	Isobutane		2.29	ppbv	0.03	AC-058	11-Sep-16
16090046-001	Isopentane		6.52	ppbv	0.05	AC-058	11-Sep-16
16090046-001	Isoprene		0.53	ppbv	0.02	AC-058	11-Sep-16
16090046-001	Isopropyl alcohol		1.5	ppbv	0.6	AC-058	11-Sep-16
16090046-001	Isopropylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090046-001	m,p-Xylene	I	0.17	ppbv	0.05	AC-058	11-Sep-16
16090046-001	m-Diethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	11-Sep-16
16090046-001	m-Ethyltoluene	K, T, U	< 0.13	ppbv	0.13	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Aug 31, 2	S5623	Ambient Air	31-Aug-16	13:15
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16090046	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090046-001	Methyl butyl ketone	K, T, U	< 0.81	ppbv	0.81	AC-058	11-Sep-16
16090046-001	Methyl ethyl ketone		1.5	ppbv	0.5	AC-058	11-Sep-16
16090046-001	Methyl isobutyl ketone	K, T, U	< 0.6	ppbv	0.6	AC-058	11-Sep-16
16090046-001	Methyl methacrylate	K, T, U	< 0.11	ppbv	0.11	AC-058	11-Sep-16
16090046-001	Methyl tert butyl ether	K, T, U	< 0.05	ppbv	0.05	AC-058	11-Sep-16
16090046-001	Methylcyclohexane	I	0.10	ppbv	0.02	AC-058	11-Sep-16
16090046-001	Methylcyclopentane	I	0.41	ppbv	0.03	AC-058	11-Sep-16
16090046-001	Methylene chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	11-Sep-16
16090046-001	n-Butane		13.8	ppbv	0.05	AC-058	11-Sep-16
16090046-001	n-Decane	K, T, U	< 0.10	ppbv	0.10	AC-058	11-Sep-16
16090046-001	n-Dodecane	K, T, U	< 0.6	ppbv	0.6	AC-058	11-Sep-16
16090046-001	n-Heptane	I	0.10	ppbv	0.02	AC-058	11-Sep-16
16090046-001	n-Hexane		0.57	ppbv	0.02	AC-058	11-Sep-16
16090046-001	n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090046-001	n-Pentane		3.1	ppbv	0.2	AC-058	11-Sep-16
16090046-001	n-Propylbenzene	K, T, U	< 0.08	ppbv	0.08	AC-058	11-Sep-16
16090046-001	n-Undecane	K, T, U	< 0.8	ppbv	0.8	AC-058	11-Sep-16
16090046-001	Naphthalene	K, T, U	< 0.8	ppbv	0.8	AC-058	11-Sep-16
16090046-001	n-Nonane	I	0.03	ppbv	0.02	AC-058	11-Sep-16
16090046-001	o-Ethyltoluene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090046-001	o-Xylene	I	0.07	ppbv	0.02	AC-058	11-Sep-16
16090046-001	p-Diethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	11-Sep-16
16090046-001	p-Ethyltoluene	K, T, U	< 0.11	ppbv	0.11	AC-058	11-Sep-16
16090046-001	Styrene	K, T, U	< 0.06	ppbv	0.06	AC-058	11-Sep-16
16090046-001	Tetrachloroethylene	K, T, U	< 0.06	ppbv	0.06	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Aug 31, 2	S5623	Ambient Air	31-Aug-16	13:15
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16090046	REPORT CREATED:	16-Sep-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090046-001	Tetrahydrofuran	K, T, U	< 0.6	ppbv	0.6	AC-058	11-Sep-16
16090046-001	Toluene		0.54	ppbv	0.02	AC-058	11-Sep-16
16090046-001	trans-1,2-Dichloroethylene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090046-001	trans-1,3-Dichloropropylene	K, T, U	< 0.06	ppbv	0.06	AC-058	11-Sep-16
16090046-001	trans-2-Butene	I	0.07	ppbv	0.02	AC-058	11-Sep-16
16090046-001	trans-2-Pentene		0.51	ppbv	0.03	AC-058	11-Sep-16
16090046-001	Trichloroethylene	K, T, U	< 0.06	ppbv	0.06	AC-058	11-Sep-16
16090046-001	Vinyl acetate	K, T, U	< 0.6	ppbv	0.6	AC-058	11-Sep-16
16090046-001	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: Friday, September 16, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

APPENDIX VI
REPORT CERTIFICATION FORM

Report Certification Form

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

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



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

05-10-2016





Report Issued Date (dd-mm-yyyy)

APPENDIX VII
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2016-08-37- C</u>
Site: <u>Bonnyville</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u></u>	Date <u>10-Sep-16</u>
Level 1 Primary Validation	<u></u>	Date <u>23-Sep-16</u>
Level 2 Final Validation	<u></u>	Date <u>05-Oct-16</u>
Level 3 Independent Data Review	<u></u>	Date <u>05-Oct-2016</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

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