



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

January 29, 2016

RE: December 2015 Ambient Air Monitoring Monthly Reports

Attached are the monthly ambient air monitoring reports for the LICA Airshed Zone's Cold Lake South, Maskwa, St. Lina, and Elk Point continuous stations.

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

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

JOB #:2833-2015-12-01- C

DECEMBER 2015

Prepared for:

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

Attention: MIKE BISAGA

DATE: **January 20, 2016**

Prepared by:



Wunmi Adekanmbi, M.Sc.

Project Manager Assistant, Source Testing, Maxxam Analytics

Reviewed by:



Lily Lin, B.Sc.

Senior Project Manager, Air Services, Maxxam Analytics

SUMMARY

In DECEMBER 2015, the Air Services Group of Maxxam Analytics conducted an ambient air monitoring program on the Cold Lake South Site at Lakeland Industry & Community Association, near Bonnyville, 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 AMD1989 and AMD2006.

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

NO₂: The AEMERA-supplied Thermo 42C, S/N: 427408716, analyzer was replaced with the LICA-owned Thermo 42i, S/N: 1505664393, analyzer on December 14 following a shut-down calibration. The analyzer was allowed time to stabilize overnight and the installation calibration was performed on December 15. Seventeen hours of data are invalid due to the analyzer's stabilizing period.

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 Cold Lake South Site						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDENCES		MONTHLY AVERAGE	1-HOUR					24-HOUR		
	1-HR	24-HR	1-HR	24-HR		READING	DAY	HOUR	WIND SPEED (KPH)	WIND DIRECTION (DEGREES)	READING	DAY	
SO2 (PPB)	172	48	0	0	0	3	11	14	8.4	ESE	0.6	18	100.0
TRS (PPB)	-	-	-	-	0	0	ALL	ALL	VAR	VAR	0.0	ALL	100.0
THC (PPM)	-	-	-	-	2.4	4.3	21, 22	VAR	VAR	VAR	3.7	22	100.0
NO2 (PPB)	159	-	0	-	6.4	26.9	3	7	2.6	E	15.8	1	97.7
NO (PPB)	-	-	-	-	3.1	39.8	3	8	2.4	ESE	21.1	22	97.7
NOX (PPB)	-	-	-	-	9.5	65.3	3	8	2.4	ESE	33.1	22	97.7
O3 (PPB)	82	-	0	-	14	34	16	14	10.8	NW	27.8	31	100.0
PM2.5 (UG/M3)	-	30	-	0	7.4	33.0	11	14	8.4	ESE	19.5	1	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	79.7	100	9, 9	9, 10	2.8 0.7	NNW SE	97.0	9	100.0
AMBIENT TEMPERATURE (DEG C)	-	-	-	-	-10.0	4.7	4	14	10	NW	-1.3	9	100.0
VECTOR WS (KPH)	-	-	-	-	4.6	13.7	2	19	-	WSW	8.6	17	100.0
VECTOR WD (DEG)	-	-	-	-	S	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Volatile Organics (VOCs) Data Summary

Sample Collected Date	Maximum reading (PPB)	Volatile Organic Compound
DECEMBER 2, 2015	5.09	N-BUTANE
DECEMBER 8, 2015	1.6	NAPHTHALENE
DECEMBER 14, 2015	6.2	ACETONE
DECEMBER 20, 2015	3.64	N-BUTANE
DECEMBER 26, 2015	1.90	N-BUTANE

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collected Date	Maximum reading (ug)	Semi-Volatile Organic
DECEMBER 2, 2015	0.65	PHENANTHRENE
DECEMBER 8, 2015	1.26	PHENANTHRENE
DECEMBER 14, 2015	0.33	PHENANTHRENE
DECEMBER 20, 2015	1.84	2-METHYLNAPHTHALENE
DECEMBER 26, 2015	0.90	NAPHTHALENE

Note: NA

Partisol Sampler Summary

Sample Collected Date	Concentration (mg)
DECEMBER 2, 2015	0.288
DECEMBER 8, 2015	0.085
DECEMBER 14, 2015	0.037
DECEMBER 20, 2015	0.158
DECEMBER 26, 2015	0.204

Note: NA

Exceedence Summary Report

SO₂ 1- Hour Exceedences

No Exceedences Recorded During the Month

SO₂ 24- Hour Exceedences

No Exceedences Recorded During the Month

NO₂ 1- Hour Exceedences

No Exceedences Recorded During the Month

PM_{2.5} 24- Hour Exceedences

No Exceedences Recorded During the Month

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
1.0 Discussion	4
2.0 Project Personnel	7
3.0 Plant Monthly Required AMD Summary	7
4.0 Calculations and Results	7
5.0 Methods and Procedures	8
Appendix I	Continuous Monitoring Data Results
	Sulphur Dioxide
	Total Reduced Sulphur
	Total Hydrocarbon
	Oxides of Nitrogen
	Nitric Oxides
	Nitrogen Dioxide
	Ozone
	Particulate Matter 2.5
	Wind Speed
	Wind Direction
	Standard Deviation Wind Direction
	Relative Humidity
	Ambient Temperature
Appendix II	Non-Continuous Monitoring Data Results
	VOC Results
	PAH Results
	Partisol Results
Appendix III	Analyzer Calibration Results
	Sulphur Dioxide
	Total Reduced Sulphur
	Total Hydrocarbon
	Nitrogen Dioxide
	Ozone
	Particulate Matter
	Wind System
	PUF Sampler
	Calibrators
	Calibration Gases

Appendix IV

Analytical Results

VOCs Samples

PAHs Samples

Partisol Samples

Appendix V

Chain of Custody

1.0 Discussion

This monthly report consists of data for parameters SO₂, TRS, THC, NO_x, NO, NO₂, O₃, PM_{2.5}, WS, WD, STDWD, RH and Ambient Temperature. It also includes results for non-continuous parameters Passives, VOC, PAH and Partisol.

Sample filters for all continuous air monitors are changed before the calibration is started. The sample manifold is cleaned during the site visit on a monthly basis.

Control checks, consisting of zero and span of the analyzer are conducted on a daily basis on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinder) 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 calibration is done a minimum of once a month for each continuous air monitor. In addition 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.

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.

Hourly/minute data have been reviewed based on daily zero/span results and multi-points calibration results. Data may be considered as 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 (greater than 15%).

Hourly data is corrected using daily zero information.

A new blower for the sample manifold was installed and trailer inspection was completed on December 14. No issues were identified during the inspection.

SULPHUR DIOXIDE (SO₂)

The analyzer was working well throughout the month.
The routine monthly calibration was performed on December 14.

TOTAL REDUCED SULPHUR (TRS)

The analyzer was working well throughout the month.
The routine monthly calibration was performed on December 14.

TOTAL HYDROCARBONS (THC)

The analyzer was working well throughout the month.
The routine monthly calibration was performed on December 14.

NITROGEN DIOXIDE (NO₂)

The analyzer started drifting close to the high acceptance limit towards the end of the month of November. An as found points check was performed on December 5. The result was good. No data was discarded due to this issue. The AEMERA-supplied Thermo 42C, S/N: 427408716, analyzer was replaced with the LICA-owned Thermo 42i, S/N: 1505664393, analyzer on December 14 following a shut-down calibration. The sampling pump was rebuilt and a new perm tube was installed prior to installation. The analyzer was allowed time to stabilize overnight and the installation calibration was performed on December 15. Seventeen hours of data are invalid during the time the analyzer was stabilizing. The AEMERA-supplied analyzer was left in the station as spare.

OZONE (O₃)

The analyzer was working well throughout the month.
The routine monthly calibration was performed on December 15.

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

Two Teom audits were performed this month: one was completed on December 9, and the other audit was performed on December 23. The FDMS filter was replaced during the audits. Data was corrected using Alberta air quality guidelines. If the data was between 0 to -3 ug/m³, the data was corrected to 0 ug/m³. If the data was below -3ug/m³, the data was invalidated. No hourly data was invalidated as all hourly data was above - 3ug/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.
The wind system was working well throughout the month.

RELATIVE HUMIDITY (RH)

The humidity sensor was working well throughout the month.

AMBIENT TEMPERATURE (TPX)

The temperature sensor was working well throughout the month.

PASSIVE SAMPLES

No passive results are included in this monthly report as the sampling program is based on a two-month sample collection period.

VOC SAMPLES

The sampler was programmed to run for 24 hours, and, every 6 days per sample cycle. The values for the VOCs were reported in ppb.

Samples were collected on December 2, 8, 14, 20 and 26. Analytical results are included in this report.

PAH SAMPLES

The sampler was programmed to run for 24 hours, and, every 6 days per sample cycle. The values for the PAHs were reported in μg .

Samples were collected on December 2, 8, 14, 20 and 26. Analytical results are included in this report.

The PUF sampler audit was completed on December 22. The audit report is included in this report.

PARTISOL SAMPLES

The sampler was programmed to run for 24 hours, and, every 6 days per sample cycle. The values for the Partisol were reported in mg.

Samples were collected on December 2, 8, 14, 20 and 26. Analytical results are included in this report.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association, and the Maxxam field sampling team consisted of Alexander Yakupov.

3.0 Plant Monthly Required AMD Summary

All data collected this month were within the objectives outlined in the AMD1989 and AMD2006.

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 method described in the Air Monitoring Directive, 1989, and 2006 Amendments to the Air Monitoring Directive, 1989 (AMD 2006).

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 42C and Thermo 42i Chemiluminescent Analyzers
- 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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE



SULPHUR DIOXIDE (SO2) hourly averages in ppb

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	24:00
HOUR END	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	1:00
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	RDGS.
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
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	24
3	1	1	1	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	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	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	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	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	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	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	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	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	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	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	24
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	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	24
18	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
19	0	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	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	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	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	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	24
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	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	24
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	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	24
31	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
HOURLY MAX	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
HOURLY AVG	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	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	0.1	0.0

STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/Span CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

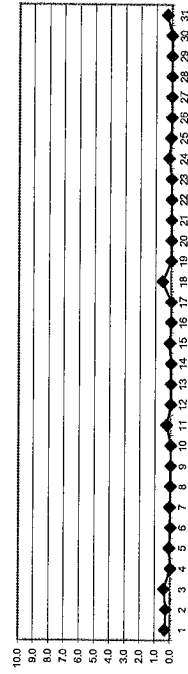
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1.5 HR - 3122 PPB | 24-HR - 48 PPB

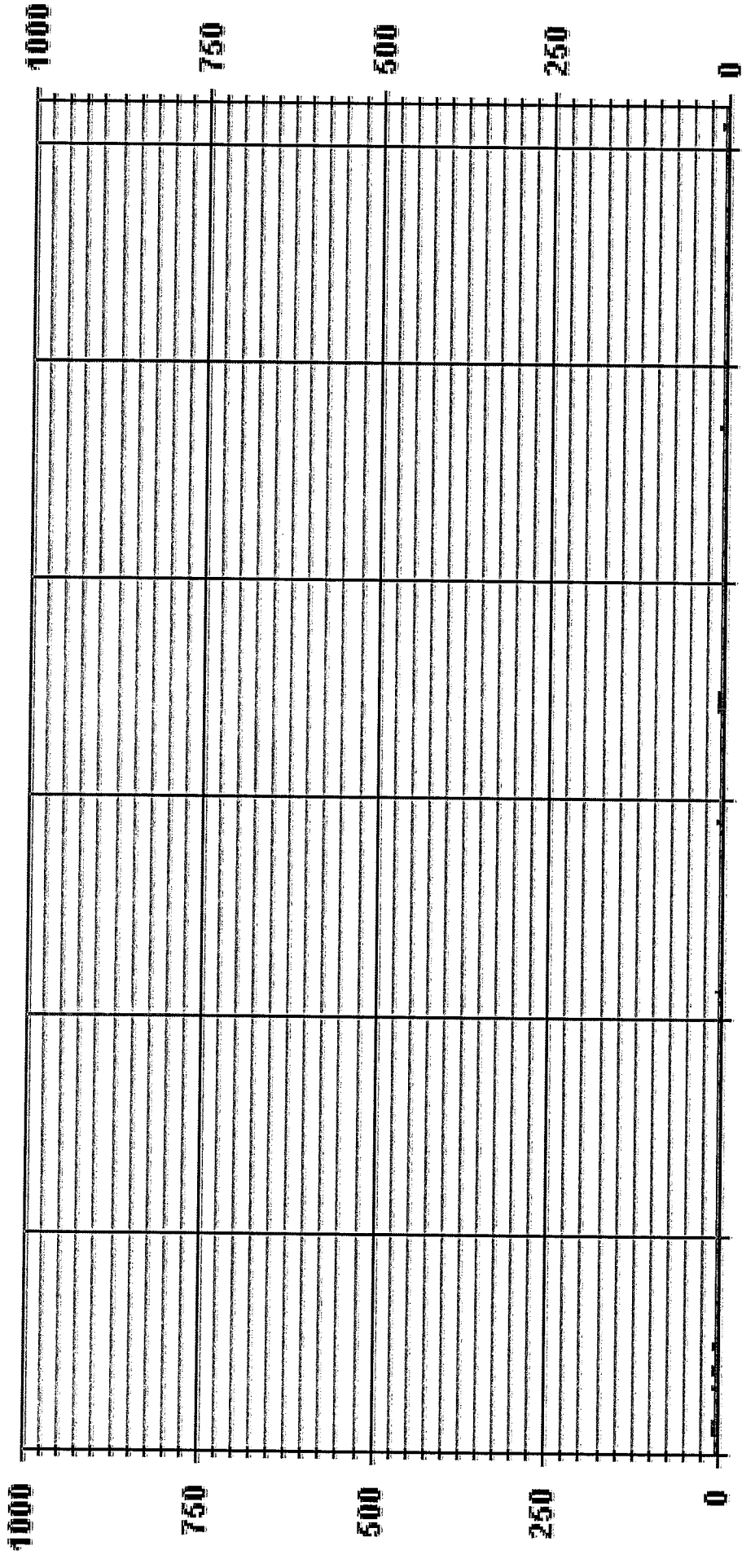
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0
NUMBER OF 24-HR EXCEEDENCES:	0
NUMBER OF NON-ZERO READINGS:	58
MAXIMUM 1-HR AVERAGE:	3 PPB
MAXIMUM 24-HR AVERAGE:	0.6 PPB
1ZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	4 HRS
STANDARD DEVIATION:	0.30
ON DAY(S)	14
ON DAY(S) VAR-VARIOUS	11
OPERATIONAL TIME:	744 HRS
AMID OPERATION UPTIME:	100.0 %
MONTHLY AVERAGE:	0 PPB

24 HOUR AVERAGES FOR DECEMBER 2015



01 Hour Averages



12/01/15 00:00-12/06/15 00:00 12/11/15 00:00-12/16/15 00:00 12/21/15 00:00-12/26/15 00:00 12/31/15 00:00

— LICA S02_ PPB



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - DECEMBER 2015
JOB # 2833-2015-12-01- C

SULPHUR DIOXIDE MAX instantaneous maximum in ppb

MST

DAY	HOURS																								DAILY MAX	24-HOUR AVG	RDGS			
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				24:00		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1.2	24		
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
HOURLY MAX	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2	24	
HOURLY AVG	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	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

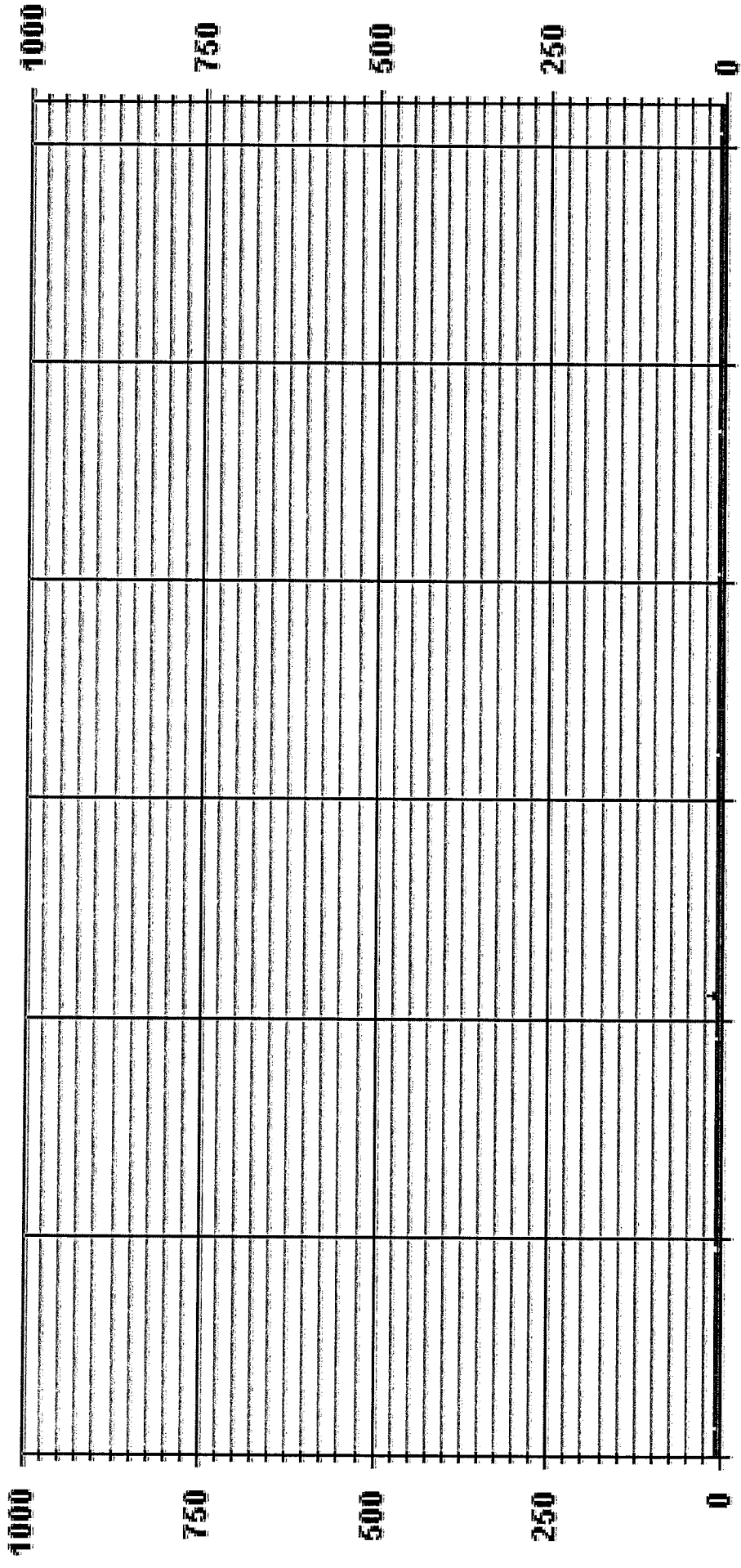
STATUS FLAG CODES

C	- CALIBRATION	Q	- QUALITY ASSURANCE
Y	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MAINTENANCE
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	705
MAXIMUM INSTANTANEOUS VALUE:	10 PPB @ HOUR(S) 14 ON DAY(S) 11
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	4 HRS
OPERATIONAL TIME:	744 HRS
STANDARD DEVIATION:	0.42
VAR-VARIOUS	

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA SO2MAX PPB

LICA
SO2_ / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
Parameter : SO2
Units : PPB

Wind Parameter : WDR
Instrument Height : 10 Meters

Limit	Direction																NNW	NW	NNW Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW			
< 20	2.40	1.83	.98	1.27	11.29	11.29	13.98	4.23	2.68	3.53	4.80	19.06	8.47	3.95	5.50	4.66	100.00		
< 60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
< 110	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
< 170	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
< 340	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
>= 340	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
Totals	2.40	1.83	.98	1.27	11.29	11.29	13.98	4.23	2.68	3.53	4.80	19.06	8.47	3.95	5.50	4.66			

Calm : .00 %

Total # Operational Hours : 708

Distribution By Samples

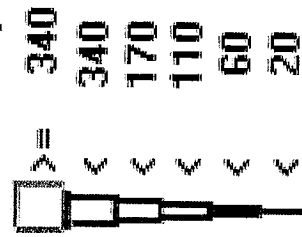
Limit	Direction																NNW Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 20	17	13	7	9	80	80	99	30	19	25	34	135	60	28	39	33	708
< 60																	
< 110																	
< 170																	
< 340																	
>= 340																	
Totals	17	13	7	9	80	80	99	30	19	25	34	135	60	28	39	33	

Calm : .00 %

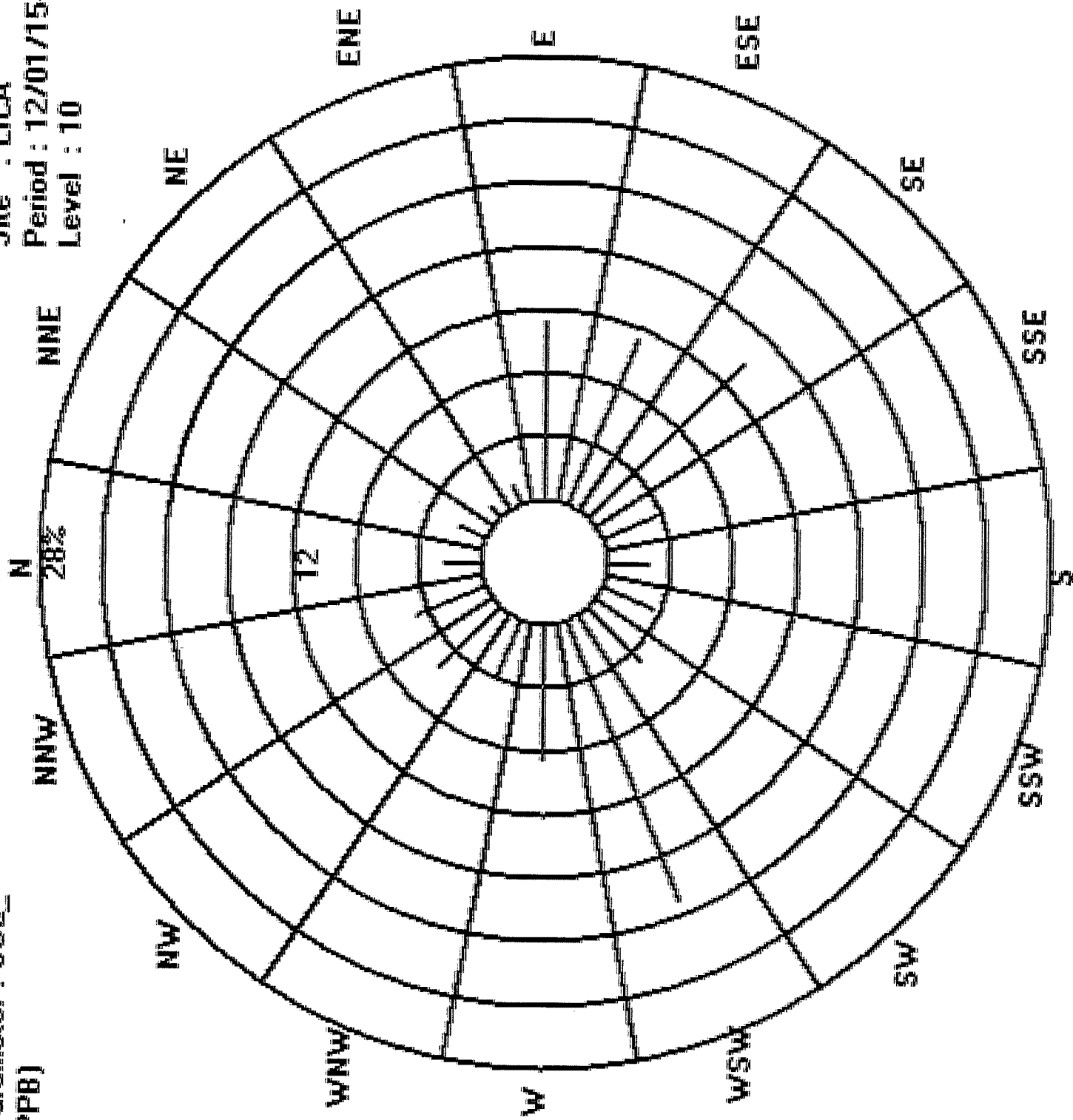
Total # Operational Hours : 708

Logger : 01 Parameter : SO2_

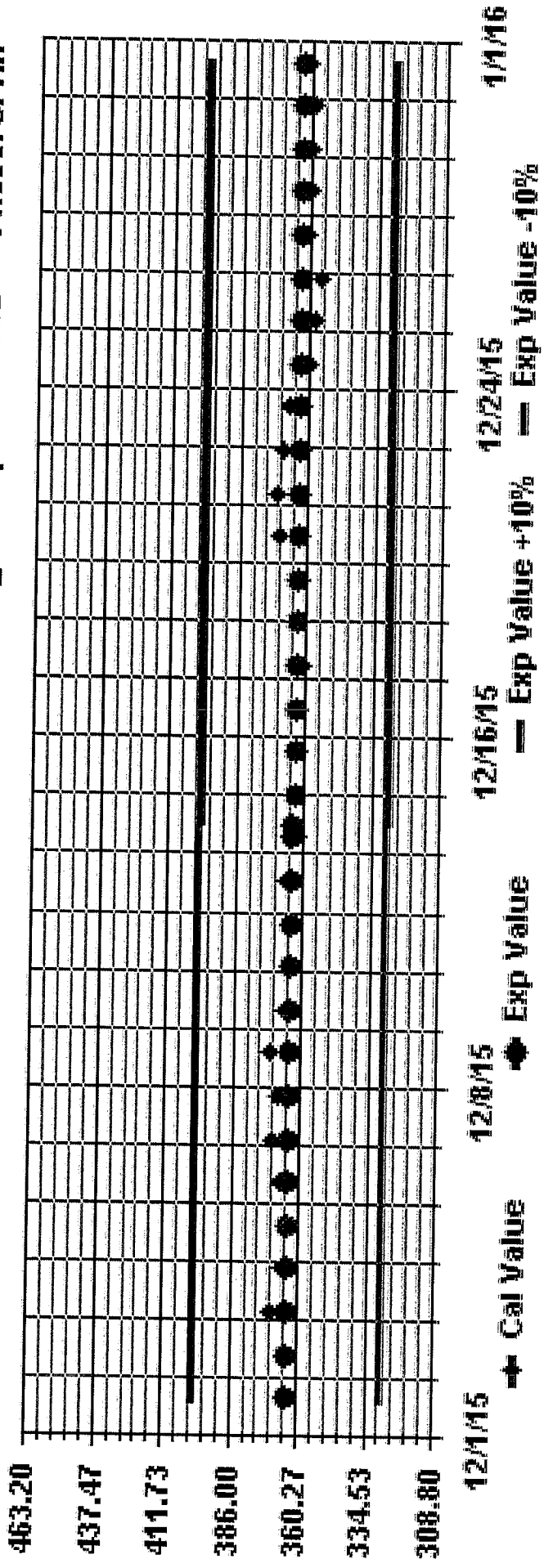
Class Limits (PPB)



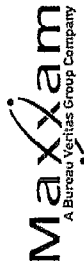
Site : LICA
Period : 12/01/15-12/31/15
Level : 10



Calibration Graph for Site: LICA Parameter: SO2_ Sequence: S02_ Phase: SPAN



TOTAL REDUCED SULPHUR



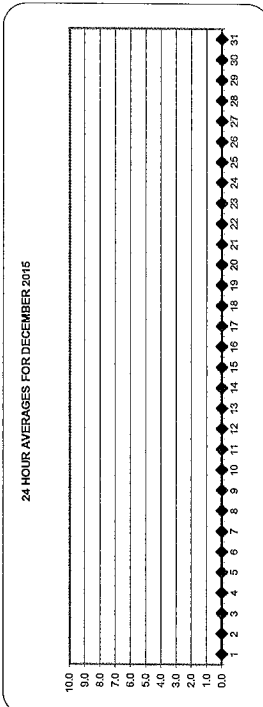
TOTAL REDUCED SULPHUR (TRS) hourly averages in ppb

MST

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
HOURLY MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAILY MAX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DAILY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24-HOUR AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

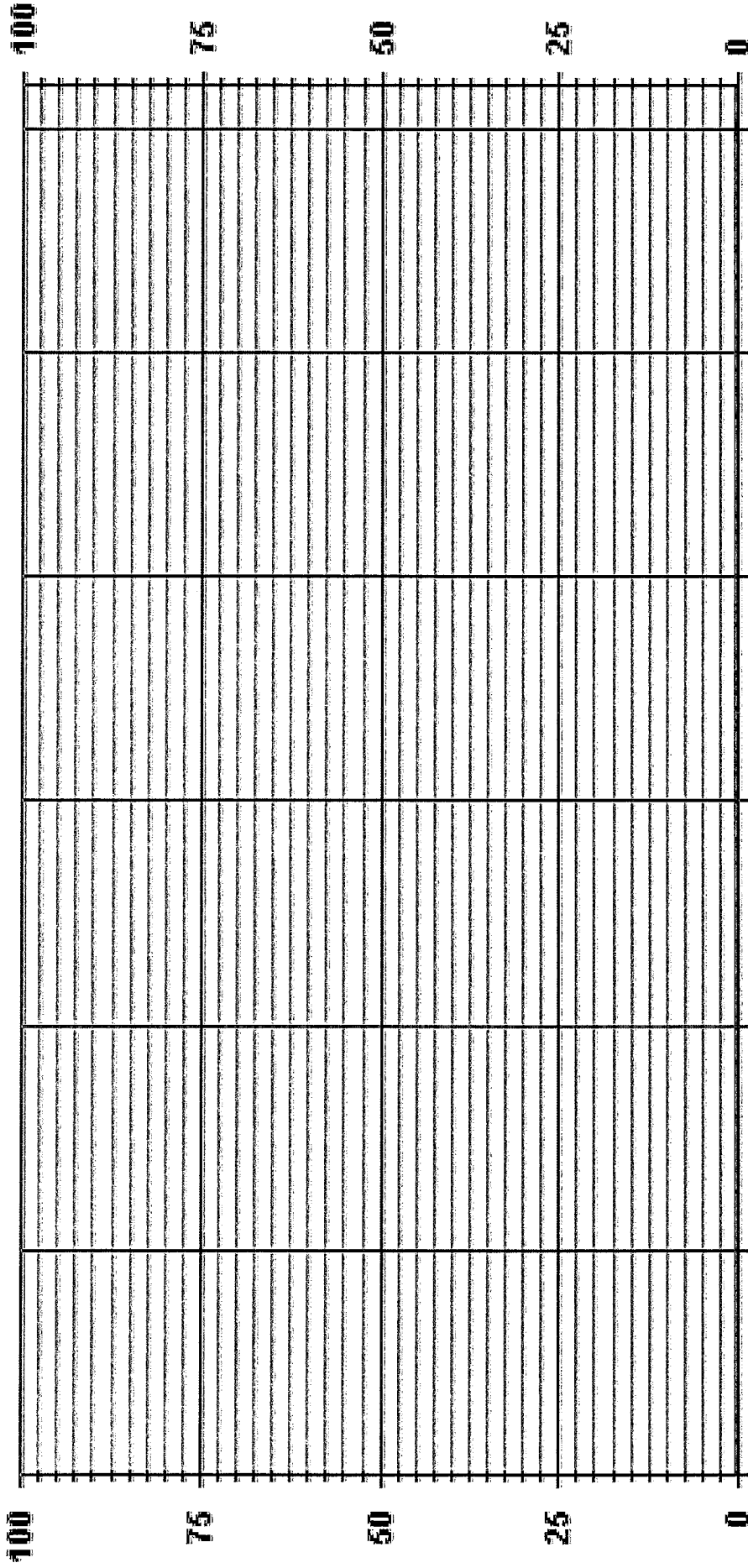
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVER
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR



MONTHLY SUMMARY						
NUMBER OF NON-ZERO READINGS:	0	PPB	@ HOUR(S)	ALL	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	0.0	PPB			ON DAY(S)	ALL
MAXIMUM 24-HR AVERAGE:	0.00				VAR-VARIOUS	
1ZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:			744 HRS
MONTHLY CALIBRATION TIME:	4	HRS	AMD OPERATION LPTIME:			100.0 %
STANDARD DEVIATION:	0.00		MONTHLY AVERAGE:			0 PPB

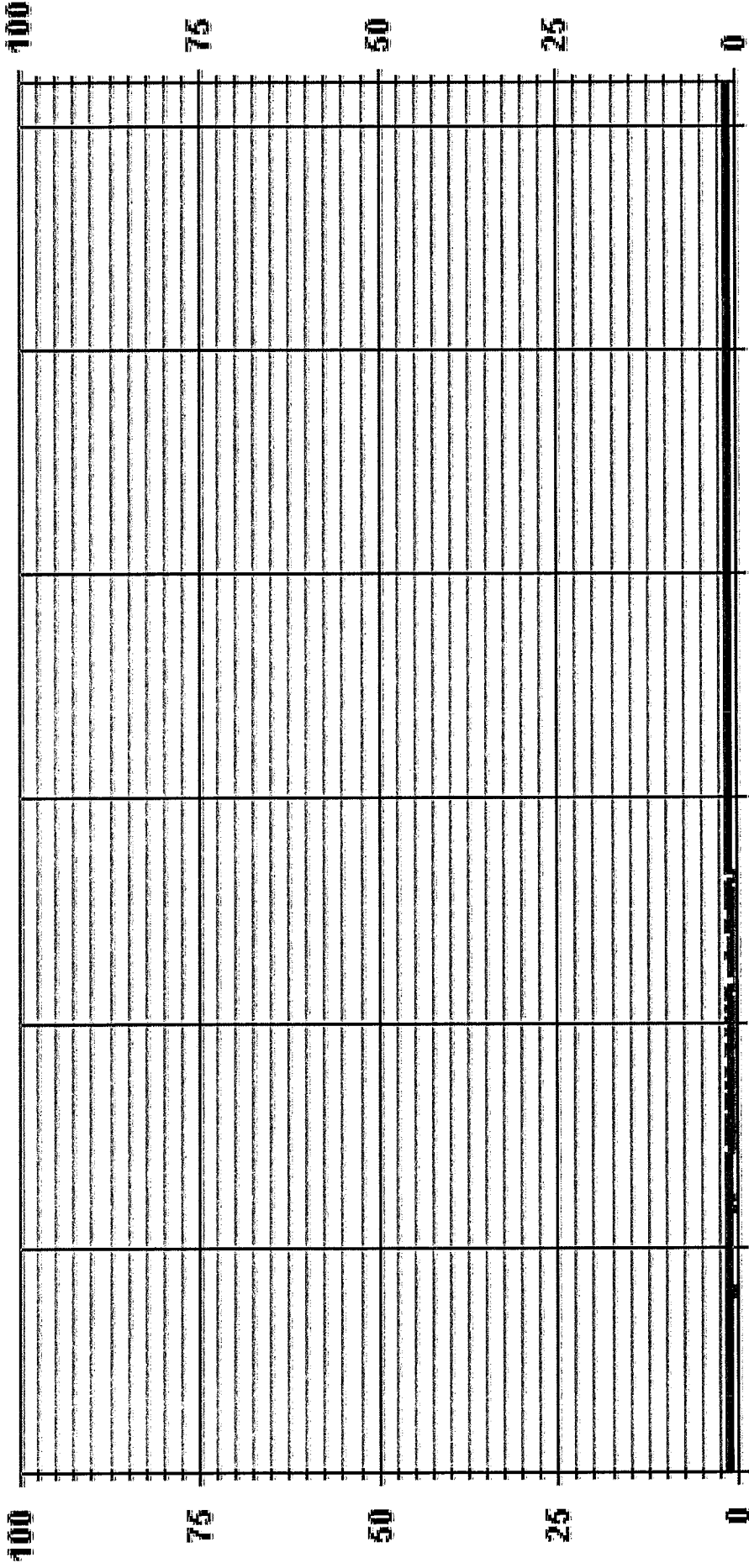
01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA TRS_ PPB

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA TRSMAX PPB

TRS_ / WDR Joint Frequency Distribution (Percent)

IICA

December 2015

Distribution By % Of Samples

Logger Id : 01
 Site Name : IICA
 Parameter : TRS
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
< 3	2.40	1.83	.98	1.27	11.29	11.29	13.98	4.23	2.68	3.53	4.80	19.06	8.47	3.95	5.50	4.66	100.00			
< 10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
< 50	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
>= 50	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
Totals	2.40	1.83	.98	1.27	11.29	11.29	13.98	4.23	2.68	3.53	4.80	19.06	8.47	3.95	5.50	4.66				

Calm : .00 %

Total # Operational Hours : 708

Distribution By Samples

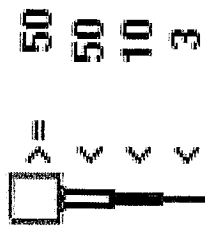
Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
< 3	17	13	7	9	80	80	99	30	19	25	34	135	60	28	39	33	708			
< 10																				
< 50																				
>= 50																				
Totals	17	13	7	9	80	80	99	30	19	25	34	135	60	28	39	33				

Calm : .00 %

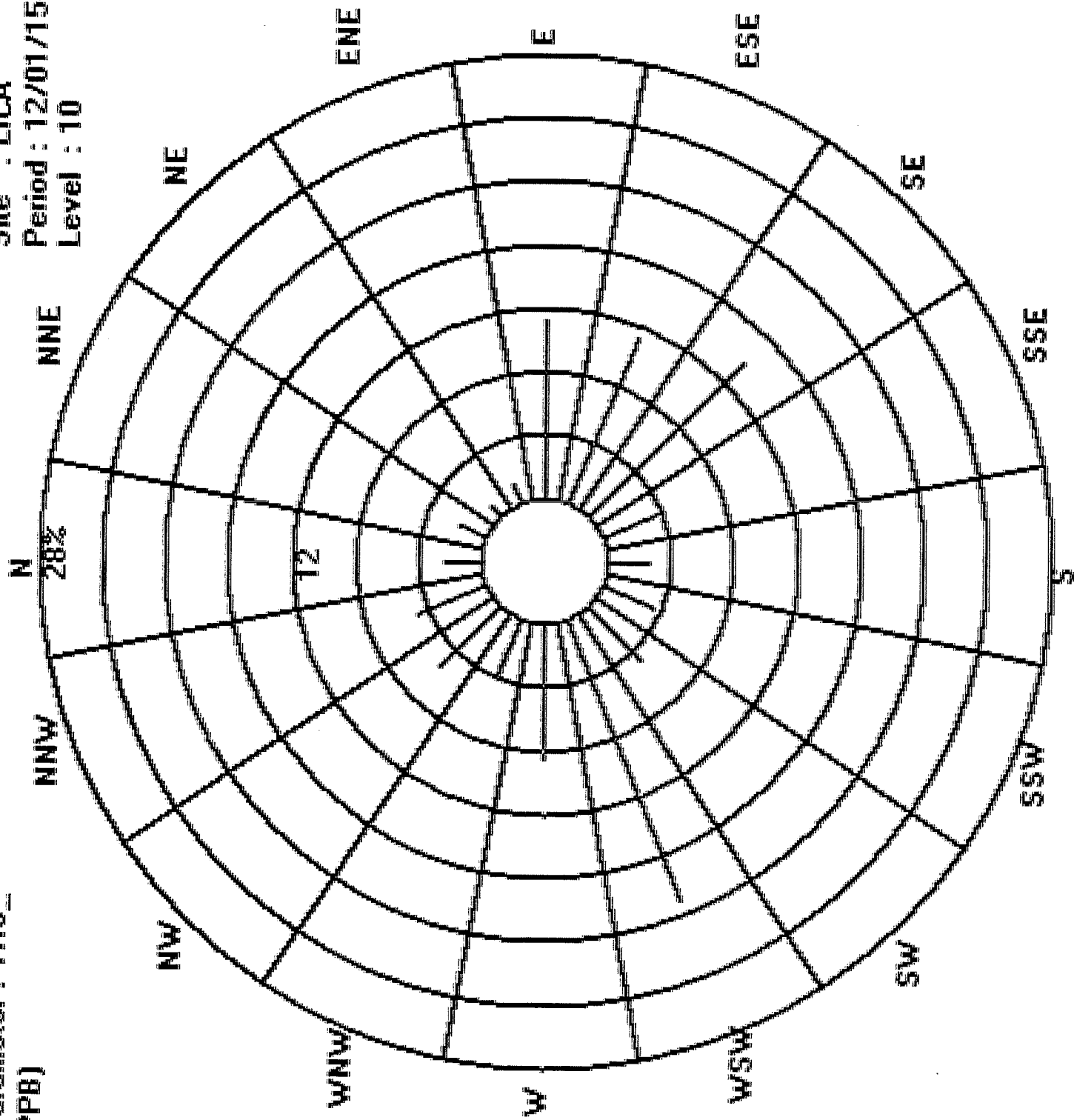
Total # Operational Hours : 708

Logger : 01 Parameter : TRS_

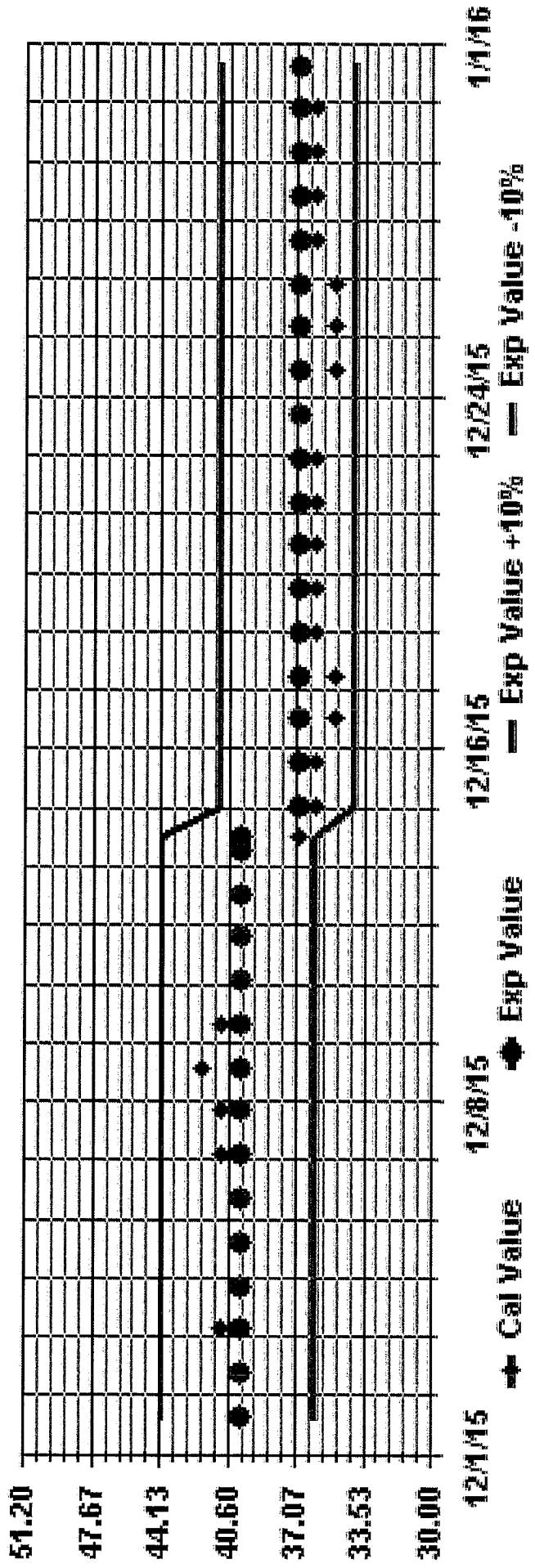
Class Limits (PPB)



Site : LICA
Period : 12/01/15-12/31/15
Level : 10



Calibration Graph for Site: LICA Parameter: TRS_ Sequence: TRS Phase: SPAM



TOTAL HYDROCARBON



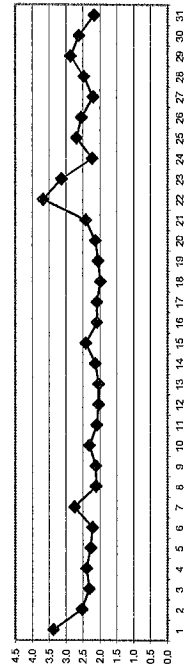
TOTAL HYDROCARBONS (THC) hourly averages in ppm

DAY	DAILY																								RDDS.		
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		24:00	
1	3.2	3.3	3.5	3.8	3.6	3.7	3.6	3.7	3.8	3.8	3.8	3.7	3.6	3.7	3.6	3.7	3.8	3.3	2.6	2.6	2.6	2.7	2.7	2.7	3.8	3.4	24
2	2.7	2.7	2.7	2.7	2.8	2.8	3.0	2.9	2.8	2.7	2.7	2.6	2.6	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	3.0	2.5	24
3	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.6	2.6	2.4	2.3	2.3	2.4	2.4	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.3	24
4	2.4	2.5	2.5	2.4	2.3	2.4	2.5	2.5	2.5	2.6	2.6	2.6	2.9	2.5	2.0	2.0	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.9	2.4	24
5	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.3	24
6	2.3	2.3	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.2	24
7	2.7	2.9	3.0	3.0	2.8	2.5	2.6	2.8	2.9	2.8	2.7	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	3.0	2.7	24
8	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24
9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24
10	2.4	2.4	2.4	2.5	2.5	2.6	2.6	2.6	2.7	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	24
11	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24
12	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	24
13	2.0	2.0	2.0	2.0	2.0	1.9	1.9	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	2.0	2.0	24
14	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24
15	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	24
16	2.2	2.2	2.2	2.1	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	2.0	2.0	2.0	2.0	2.0	24
17	2.1	2.1	2.1	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	2.0	2.0	2.0	2.0	2.0	2.0	24
18	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24
19	1.9	1.9	1.9	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	2.0	2.0	2.0	2.0	2.0	2.0	24
20	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	24
21	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24
22	2.8	2.8	2.9	2.9	3.1	3.1	3.1	3.2	3.3	3.6	4.2	3.9	4.2	4.1	4.1	4.0	4.0	4.0	4.1	4.2	4.2	4.2	4.2	4.2	4.3	3.7	24
23	4.3	4.3	4.3	4.2	3.4	4.0	3.5	2.7	2.9	3.0	2.9	3.0	2.9	3.0	3.0	3.0	3.0	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.1	3.1	24
24	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	24
25	2.2	2.4	2.5	2.6	2.7	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	24
26	2.5	2.3	2.3	2.4	2.6	2.7	2.8	2.8	2.9	3.0	2.9	2.8	2.8	2.6	2.6	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	24
27	2.3	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	24	
28	2.4	2.4	2.4	2.5	2.6	2.5	2.6	2.6	2.6	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	24
29	2.6	2.8	2.9	2.8	2.9	2.7	2.5	2.6	2.7	2.8	2.9	2.8	2.8	3.0	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	24
30	3.1	3.1	3.1	3.2	3.1	2.7	2.5	2.5	2.6	2.7	2.8	2.7	2.7	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	24
31	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	24
HOURLY MAX	4.3	4.3	4.3	4.2	3.6	4.0	3.6	3.7	3.8	3.8	4.2	3.9	4.2	4.1	4.1	4.0	4.0	4.1	4.2	4.2	4.2	4.2	4.2	4.2	4.3	4.3	
HOURLY AVG	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	

STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
X	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/Span CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

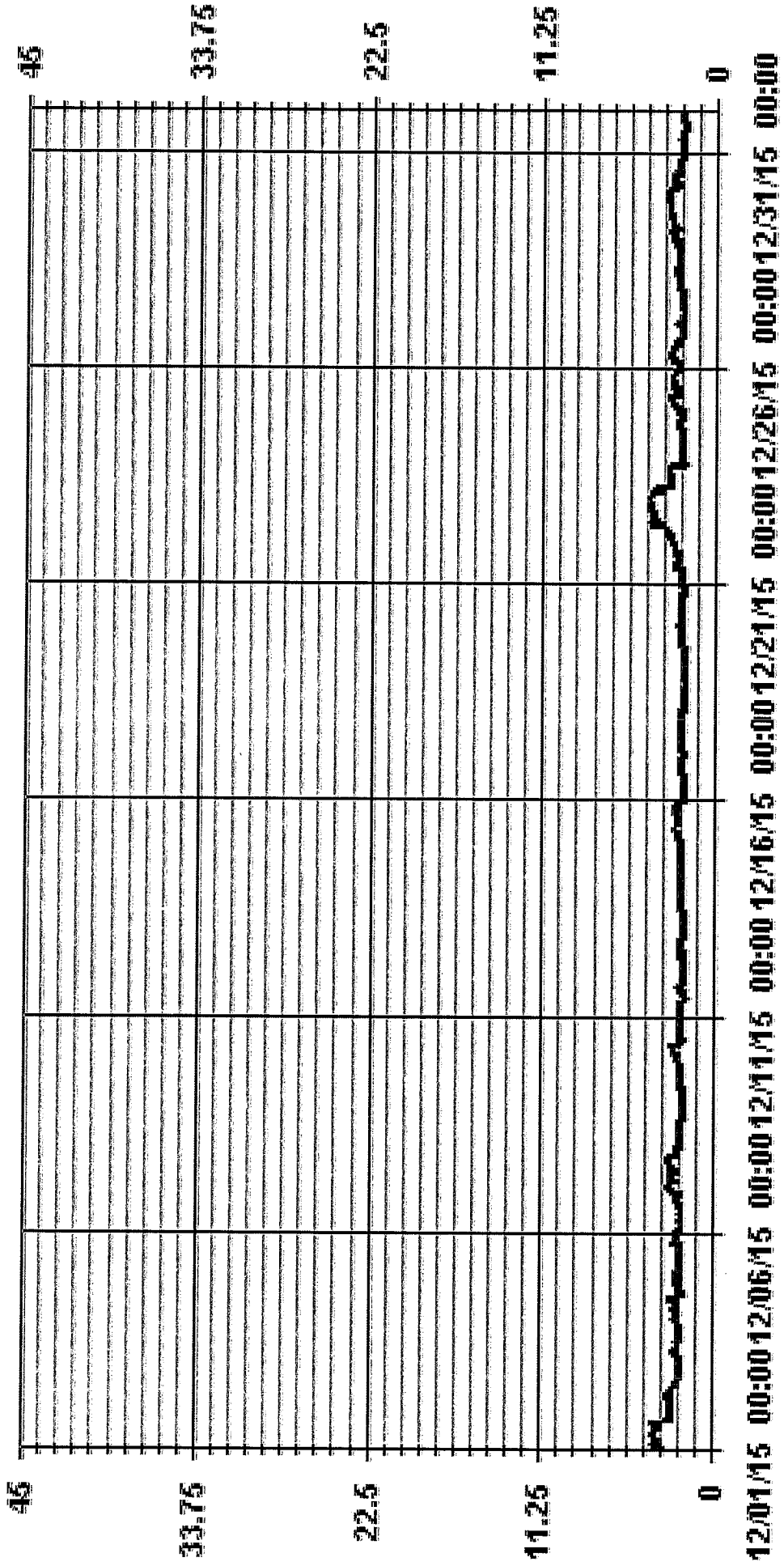
24 HOUR AVERAGES FOR DECEMBER 2015



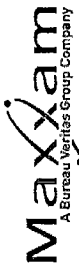
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	708	PPM	4.3	PPM	3.7	VAR	VAR-VARIOUS	ON DAY(S)	21, 22
MAXIMUM 1-HR AVERAGE:	4.3	PPM	3.7	PPM	4.3	VAR	VAR-VARIOUS	ON DAY(S)	22
MAXIMUM 24-HR AVERAGE:	4.3	PPM	3.7	PPM	4.3	VAR	VAR-VARIOUS	ON DAY(S)	22
IZS CALIBRATION TIME:	32	HRS	4	HRS	4	OPERATIONAL TIME:	744	HRS	
MONTHLY CALIBRATION TIME:	4	HRS	4	HRS	4	AMID OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	0.46		0.46		0.46	MONTHLY AVERAGE:	2.4	PPM	

01 Hour Averages



— LICA - - - THC . . . PPM



TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

MST

HOURS 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	24:00	ROG.			
HOURS END	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	1:00	DAILY MAX	24-HOUR AVG.		
DAY																													
1	3.5	4.2	4.3	4.0	4.0	4.0	4.0	4.0	4.3	4.1	4.0	3.9	3.9	3.9	3.9	3.8	4.0	3.9	2.9	2.8	2.7	\$	2.8	2.9	2.8	4.3	3.7	24	
2	2.9	2.8	2.8	2.8	3.0	3.0	3.1	3.1	3.1	3.0	3.1	3.0	3.0	2.8	2.9	2.6	2.6	2.4	2.3	2.3	\$	2.2	2.2	2.2	3.1	2.7	24	24	
3	2.3	2.3	2.4	2.4	2.6	2.6	2.6	2.6	2.8	2.9	2.7	2.4	2.5	2.5	2.6	2.4	2.4	2.4	2.4	2.7	\$	2.3	2.4	2.5	2.5	2.9	2.5	24	
4	2.5	2.7	2.7	2.6	2.8	2.6	3.0	2.7	2.6	2.9	3.0	2.9	3.0	3.0	3.0	2.1	2.1	2.3	\$	2.3	2.4	2.6	2.6	2.5	3.0	2.6	24	24	
5	2.4	2.4	2.5	2.5	2.4	2.3	2.4	2.3	2.4	2.5	2.4	2.5	2.3	2.3	2.2	2.4	2.4	\$	2.3	2.5	2.9	2.7	2.7	2.6	3.5	2.5	24	24	
6	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.4	2.4	\$	2.6	2.4	2.4	2.4	2.4	2.8	2.8	2.4	24	24	
7	2.9	3.0	3.3	3.2	3.2	2.6	2.7	3.0	3.6	3.0	2.8	2.8	2.7	2.7	\$	3.1	3.2	3.4	3.1	3.1	3.0	2.7	2.4	2.4	3.6	3.0	24	24	
8	2.4	2.5	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.8	2.6	2.4	2.3	\$	2.3	2.3	2.9	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.9	2.3	24	24	
9	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	\$	2.3	2.3	2.4	2.4	2.3	2.4	2.3	2.4	2.3	2.5	2.3	2.4	24	24	
10	2.5	2.5	2.6	2.6	2.7	2.7	2.9	3.0	3.1	2.6	2.5	\$	2.2	2.3	2.2	2.2	2.2	2.2	3.6	2.7	2.4	2.6	2.7	2.5	2.4	3.6	2.6	24	24
11	2.4	2.2	2.3	2.5	2.4	2.5	2.4	2.6	2.4	2.3	\$	2.1	2.2	2.5	2.8	3.0	4.3	2.4	2.3	2.3	2.2	2.3	2.1	2.2	4.3	2.5	24	24	
12	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	24	24	
13	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	\$	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	24	24	
14	2.2	2.2	2.2	2.2	2.2	2.3	2.3	\$	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.5	2.5	2.2	2.3	2.4	2.5	2.3	2.2	2.2	2.5	2.3	24	24	
15	2.3	2.4	2.4	2.4	2.4	2.5	\$	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	3.0	2.6	24	24	
16	2.3	2.3	2.3	2.3	2.1	\$	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24	24	
17	2.2	2.2	2.1	2.1	\$	2.2	2.2	2.2	2.3	2.2	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	24	24	
18	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24	24	
19	2.0	2.1	\$	2.1	2.1	2.1	2.1	2.2	2.2	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	24	24	
20	2.3	\$	2.6	2.4	2.3	2.3	2.3	2.3	2.3	2.8	2.8	2.7	2.9	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	24	24	
21	\$	2.2	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	24	24	
22	3.0	3.0	3.1	3.1	3.2	3.2	3.2	3.3	3.3	3.5	4.1	4.5	4.2	4.2	4.2	4.2	4.2	4.1	4.4	4.3	4.4	4.4	4.4	4.4	4.4	4.4	24	24	
23	4.4	4.4	4.4	4.5	4.1	4.2	4.0	2.9	3.2	3.0	3.2	3.1	3.0	3.1	3.1	3.1	3.1	4.0	3.4	3.2	2.9	2.2	\$	2.2	2.3	2.8	24	24	
24	2.3	2.3	2.4	2.3	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.5	2.5	2.8	2.8	2.6	\$	2.3	2.3	2.8	24	24	
25	2.4	2.5	2.7	2.8	2.8	3.0	3.0	2.9	3.1	3.1	2.8	2.6	2.7	2.8	2.8	2.9	2.9	2.9	2.9	3.2	\$	3.1	2.9	2.9	3.2	2.9	24	24	
26	2.7	2.5	2.5	2.5	2.8	2.9	3.0	3.0	3.1	3.1	3.1	2.9	3.0	2.9	2.8	2.8	2.6	2.5	\$	2.4	2.4	2.4	2.4	2.4	2.4	2.4	24	24	
27	2.5	2.7	2.5	2.3	2.4	2.3	2.2	2.2	2.3	2.4	2.7	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	\$	2.4	2.4	2.4	2.4	2.5	2.7	24	24	
28	2.5	2.5	2.6	2.7	2.8	2.6	2.7	2.8	2.7	2.7	2.6	2.6	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	24	24	
29	2.8	3.0	3.1	3.0	3.0	2.9	2.7	2.8	2.8	2.9	3.0	2.9	2.9	2.9	3.2	3.0	\$	3.1	4.2	3.2	3.1	3.2	3.2	3.2	4.2	3.1	24	24	
30	3.2	3.4	3.4	3.3	3.4	3.0	2.6	2.6	2.8	3.1	3.0	3.2	2.8	2.7	\$	2.6	2.6	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	24	24
31	2.3	2.3	2.4	2.4	2.3	2.4	2.3	2.5	2.7	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	24	24	
HOURLY MAX	4.4	4.4	4.4	4.5	4.1	4.2	4.0	4.0	4.3	4.1	4.5	4.2	4.5	4.2	4.5	4.3	4.2	4.2	4.3	4.4	4.3	4.4	4.5	4.4	4.4	4.5	24	24	
HOURLY AVG	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.7	2.7	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.6	2.5	2.5	2.5	2.5	24	24	

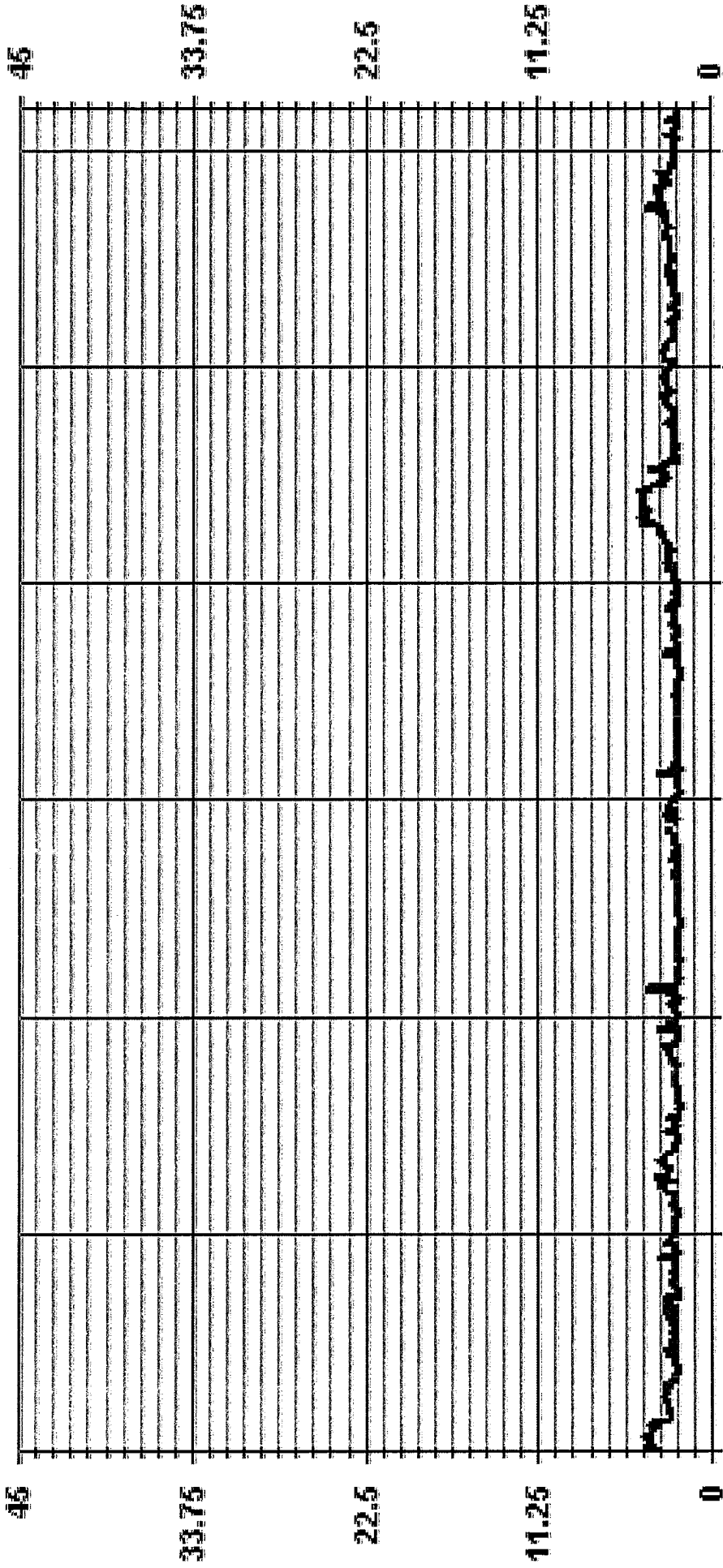
STATUS FLAG CODES

C	CALIBRATION
D	QUALITY ASSURANCE
E	RECOVERY
F	MACHINE/MAINTENANCE
G	DAILY ZERO/SPAN CHECK
H	OPERATOR ERROR
I	POWER FAILURE
J	OUT FOR REPAIR
K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	708	PPM	4.5	@ HOUR(S)	VAR	ON DAY(S)	22, 23
MAXIMUM INSTANTANEOUS VALUE:	32	HRS	4	OPERATIONAL TIME:	VARIOUS		
IZS CALIBRATION TIME:	32	HRS	4				
MONTHLY CALIBRATION TIME:	4	HRS					744 HRS
STANDARD DEVIATION:	0.51						

01 Hour Averages



— LICA THCMAX PPM

LICA
THC / WD Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
Parameter : THC
Units : PPM

Wind Parameter : WD
Instrument Height : 10 Meters

Limit	N	Direction																NNW	Freq
		NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW			
< 3.0	2.54	1.83	.70	1.27	10.73	10.73	13.84	3.81	1.83	2.68	3.38	17.65	6.35	2.96	4.80	4.94	90.11		
< 10.0	.00	.00	.28	.00	.56	.14	.42	.70	.84	.98	1.41	2.11	.98	.70	.14	9.88			
< 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
>= 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
Totals	2.54	1.83	.98	1.27	11.29	11.29	13.98	4.23	2.54	3.53	4.37	19.06	8.47	3.95	5.50	5.08			

Calm : .00 %

Total # Operational Hours : 708





Distribution By Samples

Limit	N	Direction																NNW	Freq
		NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW			
< 3.0	18	13	5	9	76	76	98	27	13	19	24	125	45	21	34	35	638		
< 10.0			2	4	4	4	1	3	5	6	7	10	15	7	5	1	70		
< 50.0																			
>= 50.0																			
Totals	18	13	7	9	80	80	99	30	18	25	31	135	60	28	39	36			

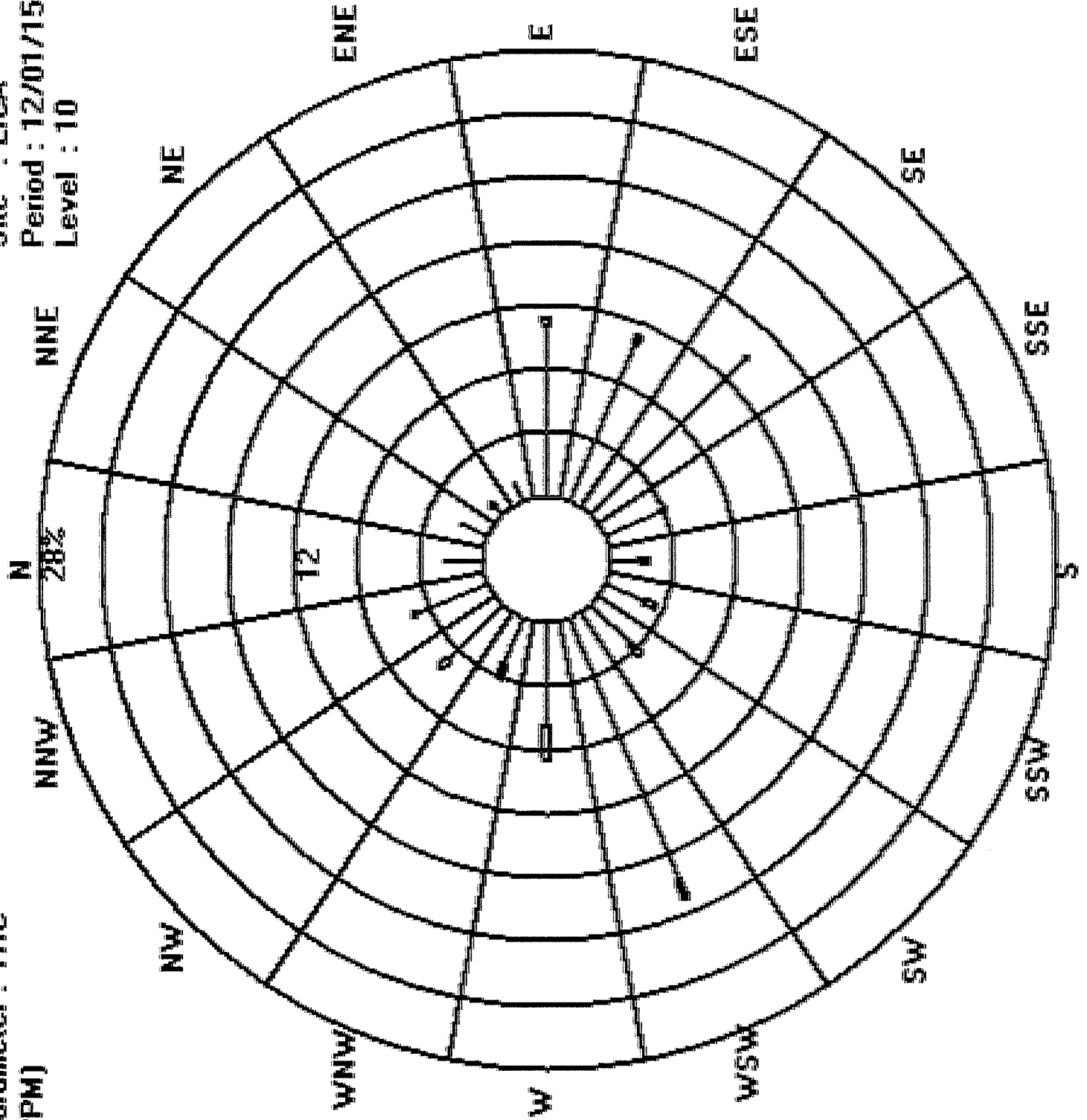
Calm : .00 %

Total # Operational Hours : 708

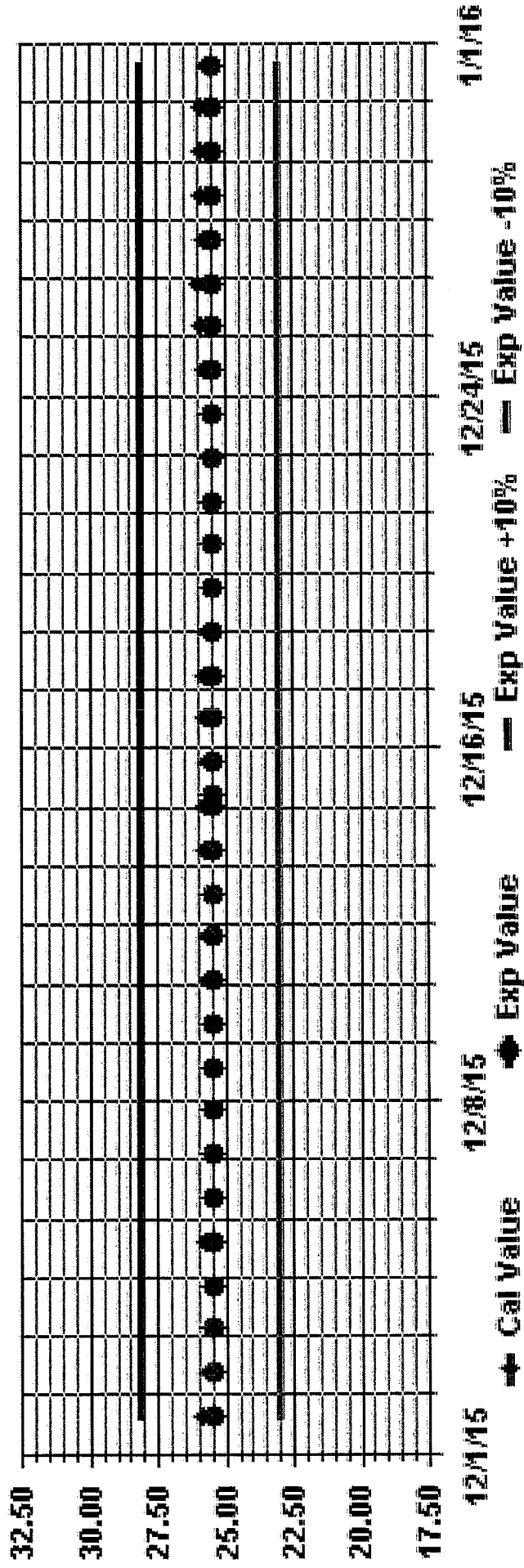
Logger : 01 Parameter : THC
Class Limits (PPM)

-  >= 50.0
-  < 50.0
-  < 10.0
-  < 3.0

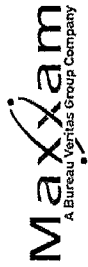
Site : LICA
Period : 12/01/15-12/31/15
Level : 10



Calibration Graph for Site: LICA Parameter: THC Sequence: THC Phase: SPAN



OXIDES OF NITROGEN



OXIDES OF NITROGEN (NOx) hourly averages in ppb

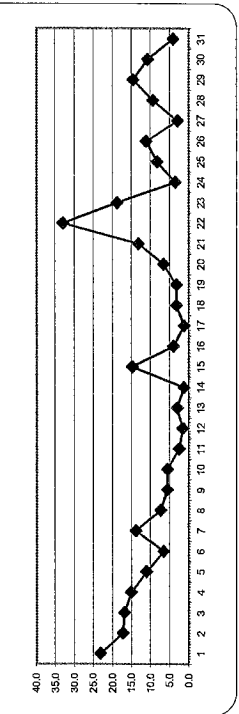
MST

DAY	HOURLY AVERAGES																								DAILY MAX	DAILY AVG	24-HOUR AVG	ROGS
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				
1	10.8	12.4	12.0	13.9	13.3	14.5	28.5	32.4	38.1	37.6	25.7	27.9	30.1	27.9	31.1	30.8	19.2	21.0	21.8	\$	22.0	28.2	20.9	38.1	27.3	24		
2	19.0	14.8	14.8	15.2	20.5	36.5	47.0	\$	\$	39.4	31.9	11.5	20.0	11.5	11.4	17.2	22.5	5.8	4.7	\$	4.0	4.4	5.5	5.3	47.0	13.2	24	
3	6.2	6.3	6.1	7.2	18.5	32.5	30.0	61.7	65.3	13.6	6.2	4.8	5.9	5.0	4.8	8.3	17.3	10.0	\$	4.2	5.5	17.3	22.3	29.8	65.3	16.9	24	
4	20.7	30.9	24.8	21.5	11.4	9.1	27.5	31.7	21.6	30.1	16.3	12.4	17.6	11.3	3.6	3.0	6.5	\$	7.9	9.2	7.8	6.5	10.3	6.1	31.7	15.1	24	
5	5.2	4.4	6.4	3.6	3.1	5.0	6.3	6.9	C	C	5.6	4.1	3.9	3.5	3.7	4.2	\$	11.2	14.1	31.8	40.5	27.7	23.5	19.8	40.5	11.2	24	
6	8.3	6.1	6.1	5.9	4.5	4.4	7.2	8.1	12.4	10.4	10.2	6.2	4.8	5.6	5.3	\$	4.7	5.4	7.2	8.0	7.2	4.6	4.2	5.5	12.4	6.6	24	
7	7.2	8.3	9.1	12.1	8.4	9.9	14.4	21.3	20.2	20.3	10.4	11.3	12.3	10.6	\$	15.5	25.0	23.7	22.1	18.3	13.4	10.7	8.6	8.1	25.0	14.0	24	
8	7.7	6.0	5.3	4.0	3.1	4.1	6.5	6.7	13.6	10.4	8.7	6.8	\$	14.0	15.7	14.2	7.9	7.7	6.9	4.7	5.3	4.1	4.3	15.7	7.4	24		
9	4.1	3.6	4.2	2.7	2.0	2.3	3.0	4.2	4.4	5.6	7.1	4.7	\$	5.7	6.7	7.5	5.5	7.1	6.8	7.9	7.9	13.1	6.9	7.2	13.1	5.7	24	
10	7.7	6.8	8.4	11.2	9.4	7.9	9.8	11.0	11.3	7.7	5.8	\$	2.5	4.0	3.6	3.2	3.2	2.6	3.5	2.4	2.6	2.3	1.7	1.7	11.3	5.7	24	
11	1.3	1.1	1.5	3.8	3.5	4.5	3.0	3.7	2.9	2.1	\$	1.3	2.1	1.9	2.9	4.5	4.4	4.2	3.7	2.1	1.8	1.1	0.8	1.0	4.5	2.6	24	
12	0.8	0.5	0.5	0.5	0.5	1.0	0.6	0.5	0.7	\$	1.3	1.3	1.2	1.7	2.2	3.2	3.1	2.7	3.2	2.9	3.1	2.6	2.2	2.0	3.2	1.7	24	
13	1.9	2.1	1.9	2.2	2.7	2.9	2.5	2.5	\$	4.8	3.5	3.6	3.9	3.2	3.6	4.2	4.3	3.4	2.9	2.8	3.1	2.8	3.0	3.4	4.8	3.1	24	
14	2.6	1.2	1.4	0.9	0.7	1.0	0.9	\$	1.1	2.1	1.9	C	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	2.6	1.4	16	
15	6.6	5.9	5.3	4.7	2.4	\$	3.0	3.6	0.9	0.8	0.3	0.3	0.5	0.1	0.1	2.4	3.1	4.9	9.1	10.7	9.3	7.1	7.7	5.2	10.7	4.1	24	
16	2.5	1.5	1.1	1.6	\$	1.3	1.9	1.8	1.7	0.2	0.1	0.2	0.6	1.1	1.3	0.3	0.5	0.5	0.2	2.4	2.2	2.0	2.2	2.6	2.6	1.3	24	
17	3.0	3.1	1.6	\$	3.7	2.4	3.9	1.6	1.9	2.7	2.3	1.7	1.6	3.0	4.9	8.5	5.9	5.5	4.5	3.5	3.6	3.0	2.1	1.7	8.5	3.3	24	
18	2.1	1.4	\$	3.1	0.9	2.1	2.2	2.7	4.5	3.5	2.5	0.4	0.8	0.5	0.6	1.8	7.9	11.9	10.3	6.0	3.1	2.3	1.7	3.8	11.9	3.3	24	
19	3.7	\$	8.5	5.5	4.0	4.6	2.9	3.2	3.3	7.5	5.5	3.9	3.6	4.0	8.6	13.5	14.0	14.4	14.2	10.4	5.9	3.8	4.7	14.4	6.6	24		
20	5	1.5	0.9	1.1	1.5	1.1	10.4	9.2	14.3	14.4	20.4	13.3	9.4	9.5	11.5	15.8	21.4	21.8	20.1	20.4	26.0	22.3	24.8	\$	26.0	13.2	24	
21	21.6	20.1	27.6	21.1	21.4	26.2	28.5	\$	33.8	29.9	32.6	31.0	35.7	35.9	37.7	38.3	39.2	38.6	40.6	44.3	43.5	41.2	\$	39.2	44.3	33.1	24	
22	37.1	41.0	45.0	47.5	21.7	37.8	35.0	16.0	16.2	17.7	14.5	14.1	10.5	10.2	11.2	8.4	9.8	18.5	22.3	1.4	0.4	\$	0.5	0.2	47.5	18.8	24	
23	0.3	0.4	0.4	0.9	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.2	5.8	9.3	8.3	6.6	\$	11.8	14.1	13.9	14.1	3.6	24
24	12.5	9.7	9.9	11.3	9.1	8.0	7.8	9.1	8.2	9.1	5.6	5.3	6.3	10.5	11.0	9.5	8.1	8.3	9.7	\$	7.5	5.4	5.2	4.9	12.5	8.3	24	
25	4.0	3.0	5.2	6.2	12.0	16.8	19.0	21.6	17.2	21.3	19.9	18.4	15.5	10.4	13.6	12.8	7.9	8.9	\$	5.3	4.3	2.8	4.5	6.7	21.6	11.2	24	
26	3.7	4.4	2.9	3.1	2.2	1.8	0.8	3.3	3.7	3.1	2.2	3.1	2.4	2.7	2.6	3.5	5.4	\$	5.6	3.1	2.1	1.6	2.8	2.4	5.6	3.0	24	
27	2.4	2.1	3.4	7.1	8.8	6.9	7.4	8.7	8.4	6.2	6.0	3.7	3.5	3.2	2.5	5.5	\$	16.5	20.0	20.1	17.6	18.8	18.9	18.8	20.1	9.4	24	
28	22.9	36.5	26.7	21.5	21.1	19.8	11.6	8.9	7.9	8.5	9.4	8.8	10.7	12.6	11.7	\$	15.4	14.9	12.3	9.3	10.3	13.3	12.5	10.0	36.5	14.6	24	
29	10.6	12.7	11.3	11.7	13.5	11.3	13.5	14.9	17.9	23.2	23.1	17.2	15.6	11.8	\$	6.4	7.2	5.8	5.1	3.5	3.6	3.2	2.7	1.9	23.2	10.8	24	
30	1.1	0.9	1.6	2.3	2.2	6.1	5.8	6.2	7.0	5.8	7.0	6.0	4.7	\$	4.2	3.5	4.0	5.0	4.7	4.0	3.7	3.7	3.2	3.2	7.0	4.2	24	
31	37.1	41.0	43.0	47.5	21.7	37.8	47.0	61.7	65.3	39.4	37.6	31.0	35.7	35.9	37.7	38.3	39.2	38.6	40.6	44.3	43.5	41.2	28.2	39.2	44.3	33.1	24	
HOURLY MAX	8.2	8.6	8.7	8.7	7.8	9.7	10.8	10.9	12.1	12.1	10.5	8.0	8.3	7.9	8.0	9.2	11.1	10.8	11.0	10.3	9.5	9.7	8.4	8.4	8.4	8.4	8.4	
HOURLY AVG																												

STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
V	MAINTENANCE	R	RECOVERY
S	DATA ZERO/SIGNAL CHECK	X	MACHINE/ALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

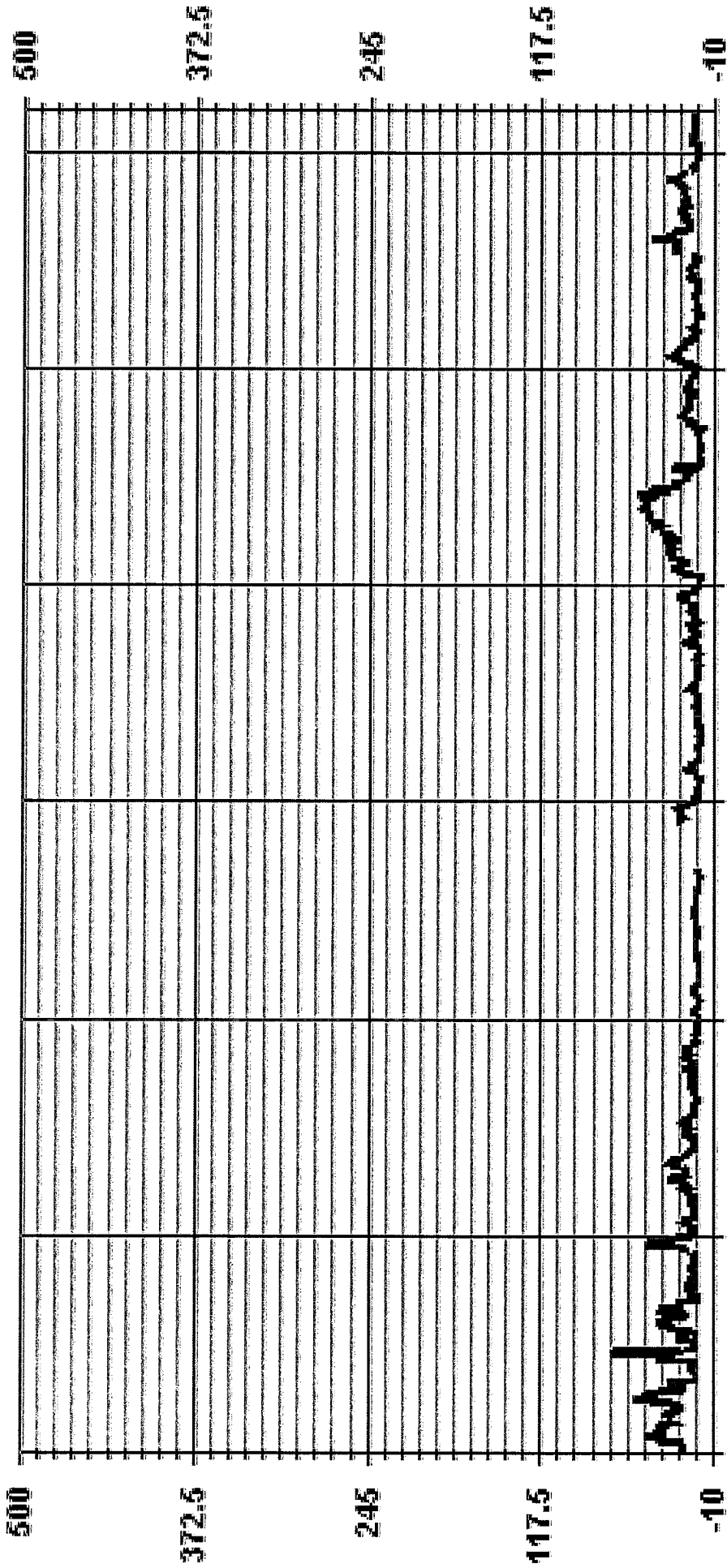
24 HOUR AVERAGES FOR DECEMBER 2015



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	681	ON DAYS(S)	8	ON DAYS(S)	3
MAXIMUM 1-HR AVERAGE:	65.3	PPB	PPB	ON DAYS(S)	22
MAXIMUM 24-HR AVERAGE:	33.1	PPB	PPB	VARIOUS	
ISZ CALIBRATION TIME:	34	HRS	OPERATIONAL TIME:	727	HRS
MONTHLY CALIBRATION TIME:	12	HRS	AMD OPERATION UPTIME:	97.7	%
STANDARD DEVIATION:	9.77		MONTHLY AVERAGE:	9.5	PPB

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA NOX_ PPB



OXIDES OF NITROGEN MAX instantaneous maximum in ppb

MST

DAY	HOUR START																								DAILY MAX	24-HOUR AVG	RDGS	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				
1	12.1	19.5	16.1	23.1	17.1	16.1	19.1	44.0	44.1	64.5	48.1	35.6	32.5	33.5	33.5	46.0	62.6	24.1	28.1	26.5	\$	28.0	48.0	27.0	64.5	32.6	24	
2	32.0	20.0	19.5	19.5	34.0	62.9	60.5	\$	53.5	52.0	19.0	33.0	16.0	14.0	45.4	43.5	9.4	7.4	6.5	6.9	7.0	135.9	31.4	34.0	24			
3	7.9	8.5	8.9	18.5	32.9	91.4	91.4	70.4	84.9	45.4	10.0	6.9	37.4	9.4	11.9	20.9	44.9	22.9	\$	7.5	10.5	27.5	64.5	48.0	91.4	34.0	24	
4	37.0	38.4	36.5	40.5	25.0	16.5	38.0	42.0	44.0	47.9	29.0	15.5	20.9	18.9	4.5	4.0	29.5	\$	10.0	16.0	15.0	12.5	27.5	14.0	47.9	25.4	24	
5	15.0	9.5	14.5	5.5	7.5	12.0	8.0	10.5	C	C	5.5	8.5	8.0	9.5	7.5	\$	23.5	27.5	59.0	61.0	36.5	32.9	31.0	61.0	19.6	24		
6	14.5	9.5	11.0	9.5	7.5	10.0	15.5	20.9	23.5	18.5	16.0	13.0	23.0	9.5	10.0	\$	18.5	13.5	14.0	13.5	10.0	10.5	7.5	10.5	23.5	13.5	24	
7	10.5	11.5	14.5	20.9	15.5	21.5	46.4	32.9	51.4	31.5	14.5	14.0	16.5	22.0	\$	26.5	38.5	43.1	38.5	27.6	22.1	11.6	11.1	11.1	51.4	24.1	24	
8	10.1	9.1	8.1	7.6	5.1	8.6	8.1	11.1	11.1	21.0	18.1	11.0	14.6	\$	23.6	26.5	43.1	14.1	12.6	12.6	7.1	18.6	6.6	7.1	43.1	13.7	24	
9	7.0	8.6	7.0	5.1	3.6	5.1	6.6	7.1	8.6	16.6	8.1	\$	8.1	14.6	12.1	7.6	8.6	8.1	9.6	11.6	11.6	11.6	10.6	18.1	9.1	24		
10	10.6	13.0	16.1	14.1	12.6	16.6	17.1	15.1	18.1	9.6	8.6	\$	6.1	6.1	7.0	7.0	8.5	7.5	10.5	4.0	4.0	6.6	3.0	3.0	18.1	9.8	24	
11	3.0	2.0	3.0	6.6	6.1	8.5	7.0	9.0	5.5	4.0	\$	8.4	9.9	3.9	13.4	10.9	7.9	7.9	6.4	4.9	3.9	3.9	2.9	23.4	23.4	7.1	24	
12	23.4	1.4	1.4	1.4	1.4	6.0	1.4	1.4	1.9	\$	3.5	5.0	2.5	8.0	7.0	25.5	6.5	8.0	6.5	4.5	4.5	5.0	4.0	25.5	5.9	24		
13	3.5	3.5	3.0	3.5	4.6	4.5	4.0	4.5	\$	8.4	6.9	7.0	8.5	16.5	6.0	12.4	8.9	4.9	4.5	23.0	6.0	16.0	32.9	32.9	8.7	24		
14	7.0	2.4	4.9	2.0	1.0	2.0	1.5	\$	2.0	4.5	3.0	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	7.0	3.0	16		
15	9.7	8.9	6.7	6.7	3.4	\$	3.8	6.0	2.6	3.1	1.0	0.9	1.1	0.6	0.2	5.5	5.4	9.1	15.2	15.2	12.6	12.6	8.1	15.2	6.7	24		
16	4.9	3.6	5.0	2.3	\$	2.4	2.6	2.8	13.1	1.3	1.1	1.1	1.7	2.4	3.7	1.3	1.7	1.3	4.8	3.2	3.7	3.7	4.8	13.1	3.2	24		
17	5.3	5.1	2.8	\$	7.3	4.2	61.1	2.6	5.4	6.2	7.2	8.2	5.5	7.3	10.8	15.7	10.1	8.3	10.3	6.3	5.6	5.4	5.0	6.0	61.1	9.2	24	
18	5.9	3.8	\$	6.9	5.2	7.2	5.1	5.4	10.5	6.3	7.4	1.3	5.7	4.3	6.3	4.7	17.1	25.0	18.4	11.8	41.2	6.2	3.0	9.0	41.2	9.5	24	
19	7.9	\$	14.7	10.9	4.3	6.8	7.7	5.7	6.3	9.2	14.2	35.1	8.2	6.2	6.8	16.7	100.5	23.8	21.9	25.0	21.8	10.5	9.8	100.5	16.7	24		
20	\$	2.6	1.8	4.1	5.8	2.3	31.7	13.9	40.1	28.9	26.8	19.5	13.2	15.0	15.0	40.8	51.0	29.6	29.2	36.6	36.6	28.3	37.1	\$	51.0	23.2	24	
21	31.7	30.5	37.4	23.7	25.4	35.3	34.6	\$	\$	38.3	35.5	35.5	37.7	38.6	40.0	53.0	50.9	45.6	46.0	68.2	47.9	48.4	\$	48.0	68.2	40.6	24	
22	40.9	55.1	48.1	58.4	36.7	42.2	45.1	21.7	22.1	22.6	17.8	16.9	41.2	17.1	25.2	13.4	54.5	28.3	40.3	11.5	1.5	\$	5.2	1.3	58.4	29.0	24	
23	3.6	3.7	4.8	5.7	0.6	0.0	0.0	0.0	3.8	1.4	0.0	1.3	0.9	6.7	7.6	4.0	7.7	14.9	16.2	8.5	\$	14.8	16.9	15.8	16.9	6.0	24	
24	16.9	10.6	15.5	14.9	11.4	11.3	9.0	11.3	9.2	11.1	7.9	6.6	9.4	11.6	12.9	12.1	10.2	11.2	11.4	\$	9.3	6.2	6.3	5.3	16.9	10.5	24	
25	4.3	5.1	8.7	10.1	21.1	23.2	21.1	34.4	26.1	33.7	25.3	22.5	19.2	15.6	22.5	24.0	13.8	13.5	\$	7.0	6.0	4.3	11.3	12.9	34.4	16.8	24	
26	5.8	7.9	4.2	4.3	5.2	3.3	4.7	2.4	9.1	9.0	7.7	6.6	5.2	19.0	4.7	6.8	16.3	\$	28.3	16.4	3.0	3.1	7.1	7.1	28.3	8.1	24	
27	6.4	3.4	6.8	10.7	10.2	8.8	11.1	10.6	13.8	8.1	8.5	7.3	8.5	4.4	4.8	8.1	\$	28.6	31.9	27.0	26.6	25.9	20.9	21.8	31.9	13.7	24	
28	41.7	44.6	34.1	30.1	29.2	26.3	15.8	13.8	10.4	10.6	16.3	13.4	12.3	39.2	19.6	\$	36.0	38.3	20.2	13.0	13.7	20.3	17.5	16.2	44.6	23.2	24	
29	16.8	22.2	16.2	18.1	23.2	13.3	17.7	18.7	25.9	29.7	89.7	21.2	21.4	15.4	\$	12.8	18.6	10.4	6.5	4.6	6.3	5.5	4.1	5.7	89.7	18.4	24	
30	2.9	2.9	2.9	4.9	5.0	100.5	8.2	11.5	16.4	7.4	8.9	9.1	10.6	\$	5.6	6.3	7.6	22.0	7.7	6.0	5.6	5.9	4.8	5.9	100.5	11.7	24	
HOURLY MAX	41.7	55.1	48.1	58.4	36.7	100.5	91.4	70.4	84.9	64.5	89.7	35.6	41.2	39.2	40.0	53.0	135.9	45.6	46.0	68.2	61.0	48.4	64.5	48.0	68.2	61.0	14.7	14.5
HOURLY AVG	13.7	12.7	12.9	13.4	12.7	19.6	20.1	15.9	19.6	19.4	17.9	12.7	14.8	13.5	12.6	17.1	29.8	18.6	17.8	16.8	15.8	14.3	14.7	14.5	14.5	14.5	14.5	14.5

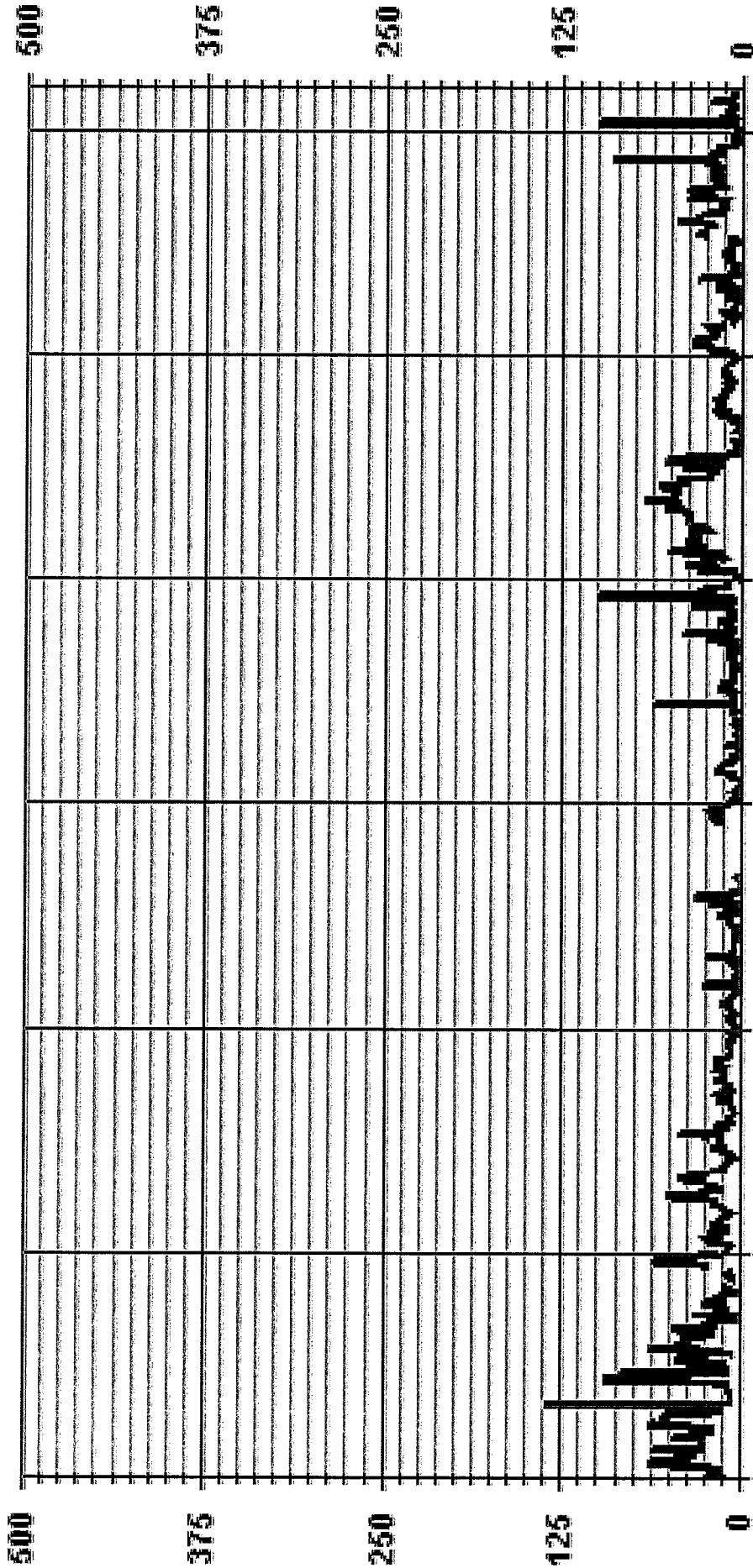
STATUS FLAG CODES

C	CALIBRATION
Q	QUALITY ASSURANCE
R	RECOVERY
M	MAINTENANCE
D	DATA ZERO/SPAN CHECK
X	MACHINE MALFUNCTION
O	OPERATOR ERROR
P	POWER FAILURE
K	COLLECTION ERROR
G	OUTLET REPAIR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	674
MAXIMUM INSTANTANEOUS VALUE:	135.9 PPB @ HOUR(S)
OPERATIONAL TIME:	16 ON DAY(S)
OPERATIONAL TIME:	VAR-VARIOUS
IZS CALIBRATION TIME:	35 HRS
MONTHLY CALIBRATION TIME:	14 HRS
STANDARD DEVIATION:	16.00
OPERATIONAL TIME:	727 HRS

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA NOXMAX PPB

LICA
NOX_ / WD Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
Parameter : NOX_
Units : PPF

Wind Parameter : WD
Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	2.49	1.76	1.02	1.32	11.60	11.60	14.09	4.11	2.34	3.23	3.67	18.94	8.81	4.11	5.72	4.84	99.70
< 110.0	.00	.00	.00	.00	.14	.14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.29
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	2.49	1.76	1.02	1.32	11.74	11.74	14.09	4.11	2.34	3.23	3.67	18.94	8.81	4.11	5.72	4.84	

Calm : .00 %

Total # Operational Hours : 681

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	17	12	7	9	79	79	96	28	16	22	25	129	60	28	39	33	679
< 110.0					1	1											2
< 210.0																	
>= 210.0																	
Totals	17	12	7	9	80	80	96	28	16	22	25	129	60	28	39	33	

Calm : .00 %

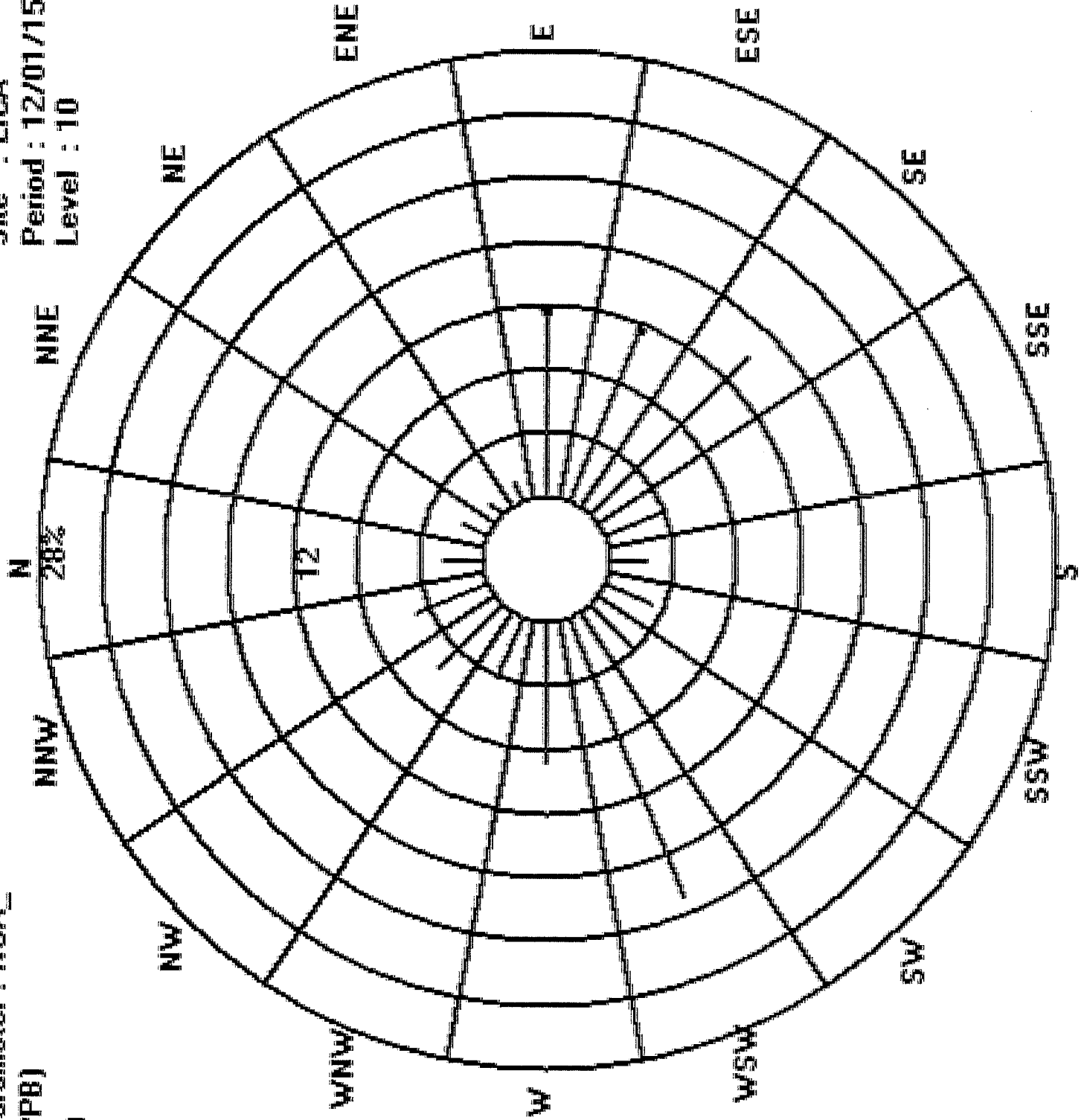
Total # Operational Hours : 681

Logger : 01 Parameter : NOX_

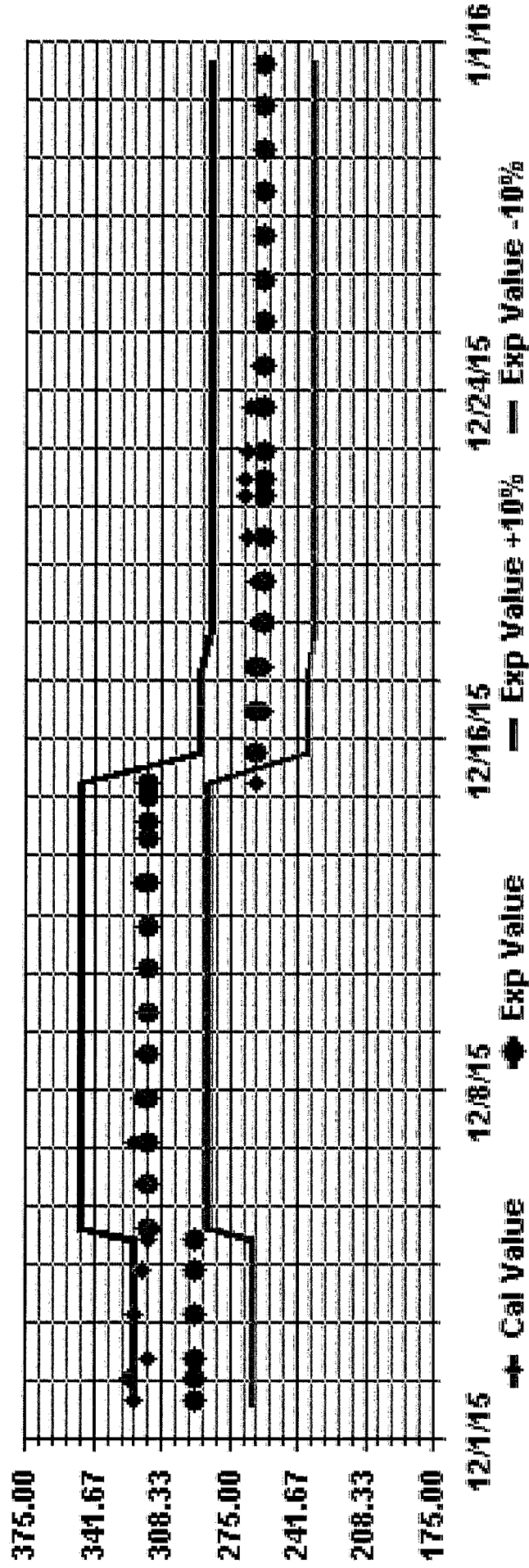
Class Limits (PPB)

-  >= 210.0
-  < 210.0
-  < 110.0
-  < 50.0

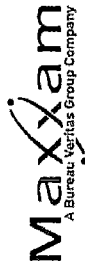
Site : LICA
Period : 12/01/15-12/31/15
Level : 10



Calibration Graph for Site: LICA Parameter: NOX_ Sequence: NO2 Phase: SPAN



NITRIC OXIDES



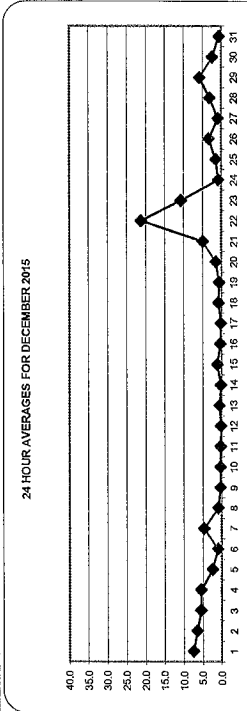
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - DECEMBER 2015
JOB # 2833-2015-12-01-C

NITRIC OXIDE (NO) hourly averages in ppb

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX.	24-HOUR AVE.	RDGS.	
1	0.5	1.4	2.9	3.3	2.4	3.0	15.1	17.5	24.6	21.9	11.8	11.4	11.6	8.1	8.7	7.7	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	34.2	7.5	24
2	4.8	2.3	2.2	3.1	8.4	21.4	32.2	\$	\$	20.1	14.9	2.1	5.7	2.3	1.9	4.8	7.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	26.6	6.4	24
3	0.1	0.2	0.1	0.2	2.1	12.3	10.8	34.8	39.8	3.2	1.0	0.9	1.2	0.6	0.6	0.7	2.0	0.3	\$	0.1	0.1	0.1	1.7	3.4	8.0	39.8	5.4	24
4	4.5	12.4	10.2	7.7	2.3	19.3	18.3	11.8	19.4	6.7	4.2	5.3	2.1	0.0	0.0	0.9	0.5	0.4	0.6	1.4	0.5	1.4	0.5	1.4	1.4	19.4	5.4	24
5	0.3	0.3	0.6	0.0	0.0	0.3	0.3	0.2	C	C	1.1	0.8	0.8	0.5	0.7	0.2	\$	0.9	1.8	11.3	16.5	7.0	4.1	2.6	16.5	2.4	24	
6	0.6	0.5	0.5	0.6	0.5	0.4	0.6	0.9	2.1	2.3	2.5	1.4	1.4	1.3	0.6	\$	0.4	0.6	0.8	0.9	1.0	0.4	0.2	0.5	2.5	0.9	24	
7	0.5	0.8	1.9	4.4	2.0	2.3	6.0	8.7	8.7	9.9	3.7	4.3	5.3	4.2	\$	4.3	10.5	10.8	10.8	6.0	1.0	0.3	0.2	0.3	10.8	4.6	24	
8	0.3	0.1	0.4	0.2	0.2	0.4	0.2	0.4	0.6	2.9	2.2	1.6	1.3	\$	1.9	2.0	2.4	0.7	0.5	0.8	0.1	0.4	0.2	0.4	2.9	0.9	24	
9	0.4	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.6	1.2	0.4	\$	0.4	0.7	0.5	0.1	0.1	0.1	0.0	0.0	0.2	0.9	0.2	0.4	1.2	0.3	24	
10	0.2	0.2	0.3	0.2	0.4	0.4	1.1	0.9	0.8	0.4	0.4	\$	0.1	0.3	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.0	0.0	0.0	1.1	0.3	24	
11	0.0	0.0	0.0	0.2	0.4	0.1	0.1	0.0	\$	0.0	0.3	0.2	0.6	0.5	0.5	0.4	0.6	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.6	0.2	24	
12	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	\$	0.0	0.0	0.0	0.2	0.4	0.5	0.4	0.5	0.4	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.1	24
13	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	\$	1.2	0.8	0.7	0.6	0.4	0.6	0.4	0.6	0.7	0.4	0.3	0.2	0.7	0.3	0.5	0.7	1.2	0.5	24
14	0.2	0.0	0.0	0.0	0.0	0.0	\$	0.0	0.6	0.4	C	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	0.6	0.1	16	
15	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	0.6	0.1	16	
16	0.4	0.4	0.2	0.2	0.0	\$	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.4	0.3	0.6	0.3	0.6	0.3	0.6	0.3	0.8	0.3	0.8	0.3	24
17	0.1	0.2	0.1	0.0	\$	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	24
18	0.1	0.1	0.1	\$	0.1	0.1	1.1	0.3	0.4	0.7	0.8	0.8	1.1	1.4	1.8	1.1	1.5	1.0	0.9	0.8	0.6	0.6	0.6	0.7	1.8	0.7	24	
19	0.6	0.5	\$	0.5	0.1	0.5	0.4	0.4	0.9	0.8	1.0	0.3	0.6	0.4	0.4	0.6	2.0	1.4	0.5	0.9	0.2	0.1	0.3	2.0	0.6	24		
20	0.5	\$	0.8	0.9	0.4	0.6	0.7	0.5	0.7	1.0	3.3	2.8	2.2	1.7	1.6	2.6	3.3	2.1	2.3	1.6	1.3	0.7	0.8	0.9	3.3	1.4	24	
21	\$	0.0	0.0	0.0	0.2	0.0	0.2	0.0	2.7	0.9	4.1	6.2	10.6	6.8	4.8	4.2	4.1	4.5	6.3	7.0	6.4	6.7	12.2	9.5	11.8	\$	5.0	24
22	11.2	10.2	16.6	11.8	12.0	16.7	19.3	\$	21.1	22.1	22.8	20.6	24.6	22.8	23.5	22.1	21.9	22.3	25.3	29.9	30.5	29.4	\$	28.5	30.5	21.1	24	
23	27.3	30.1	30.6	33.7	9.4	25.8	19.8	2.6	3.5	6.2	6.5	7.5	6.1	5.2	4.8	2.0	2.3	7.0	11.7	0.9	0.4	\$	0.5	0.2	33.7	10.6	24	
24	0.3	0.4	0.3	0.5	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.6	2.0	1.5	0.6	0.4	0.8	0.9	0.3	\$	1.9	3.2	2.4	3.2	0.8	24
25	1.9	0.6	0.7	1.5	0.9	0.7	0.6	1.6	1.2	3.8	2.8	2.9	3.2	4.5	3.8	1.8	0.4	0.2	0.1	\$	0.2	0.0	0.0	0.0	4.5	1.4	24	
26	0.0	0.3	0.4	0.4	0.8	1.5	3.0	6.3	4.2	10.4	11.3	10.4	8.1	4.9	5.8	3.9	0.7	1.2	\$	0.2	0.2	0.2	0.7	1.0	11.3	3.3	24	
27	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.3	1.0	1.4	1.9	1.9	1.8	1.8	1.5	1.3	1.5	\$	1.5	0.3	0.1	0.1	0.3	0.3	1.9	0.9	24	
28	0.2	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.6	1.7	2.6	2.1	2.3	2.0	1.3	1.4	\$	4.6	8.7	8.4	7.0	8.3	8.2	9.1	9.1	3.0	24	
29	12.8	23.9	16.1	11.6	10.5	8.7	2.2	0.8	0.6	2.7	4.5	5.1	6.3	6.4	4.4	\$	3.2	2.7	1.2	0.8	0.8	2.5	2.3	1.1	23.9	5.7	24	
30	1.9	2.4	1.2	1.5	1.3	0.6	0.8	0.8	1.8	7.2	11.2	7.5	6.3	4.6	\$	1.1	0.8	0.6	0.2	0.3	0.4	0.4	0.3	0.5	11.2	2.3	24	
31	0.4	0.4	0.1	0.3	0.5	1.4	0.3	0.5	0.7	1.6	1.9	1.8	\$	0.9	0.5	0.5	0.2	0.6	0.2	0.2	0.2	0.2	0.2	0.2	1.9	0.6	24	
HOURLY MAX	27.3	30.1	30.6	33.7	12.0	25.8	32.2	34.8	39.8	24.6	22.8	20.6	24.6	22.8	23.5	22.1	21.9	22.3	25.3	29.9	30.5	29.4	11.8	28.5	30.5	21.1	24	
HOURLY AVE	2.4	3.1	3.0	2.9	2.0	3.5	4.0	3.5	4.5	5.4	4.8	3.6	3.7	3.2	2.7	2.5	2.7	2.5	2.7	2.5	2.8	2.6	2.8	2.4	1.7	2.2	2.2	

STATUS FLAG CODES

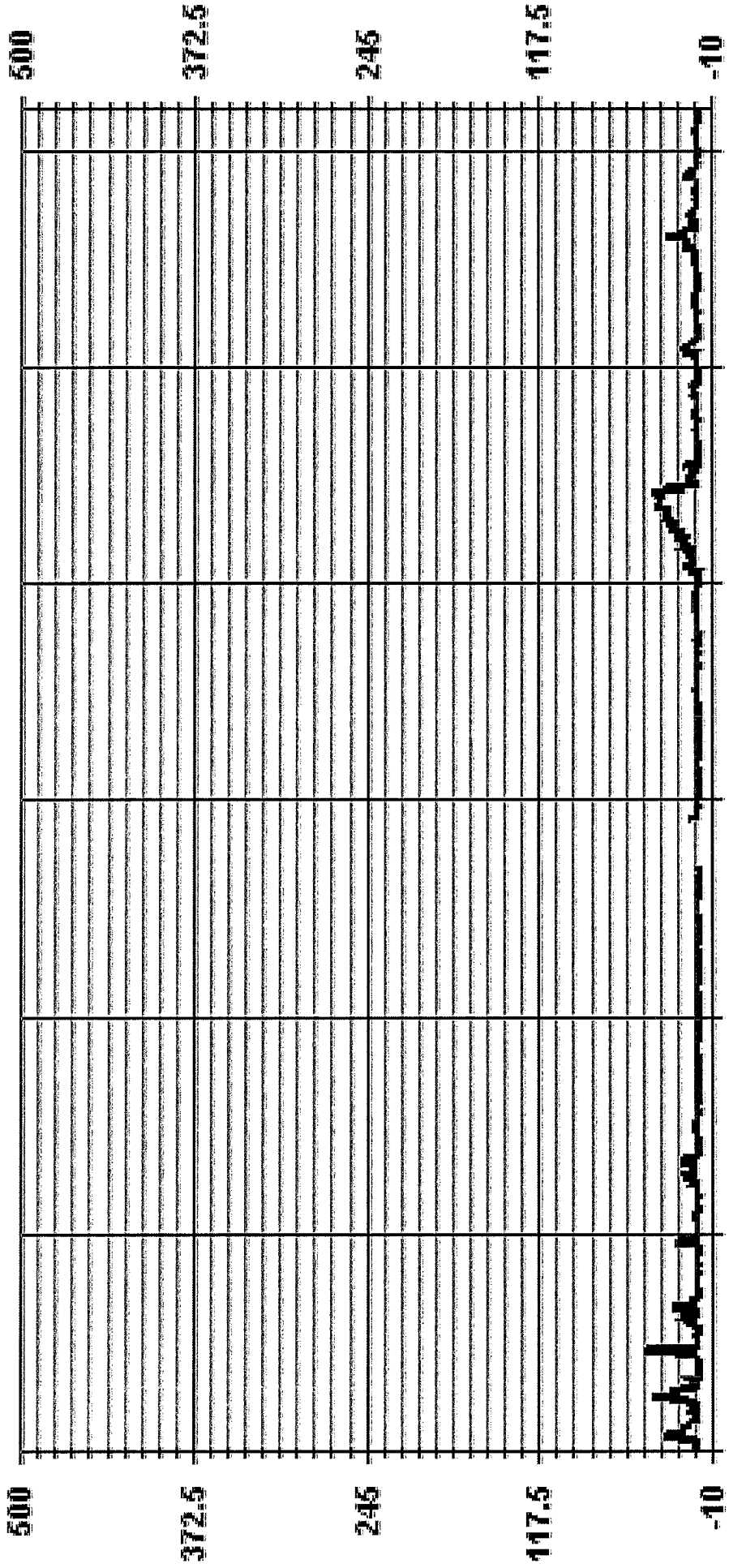
C	-CALIBRATION	O	-QUALITY ASSURANCE
Y	-MAINTENANCE	R	-RECOVERY
S	-DAILY ZERO/SPAN/CHECK	X	-MACHINE MALFUNCTION
P	-POWER FAILURE	O	-OPERATOR ERROR
G	-OUT FOR REPAIR	K	-COLLECTION ERROR



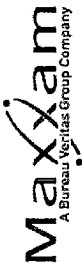
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	625	PPB @ HOUR(S)	8	ON DAY(S)	3	
MAXIMUM 1-HR AVERAGE:	40	PPB	21.1	ON DAY(S)	22	
MAXIMUM 24-HR AVERAGE:	21.1	PPB		VARIOUS		
DAYS CALIBRATION TIME:	34	HRS		OPERATIONAL TIME:	727	HRS
MONTHLY CALIBRATION TIME:	12	HRS		AMD OPERATION UPTIME:	97.7	%
STANDARD DEVIATION:	5.95			MONTHLY AVERAGE:	3.1	PPB

01 Hour Averages



— LICA NO_ PPB



NITRIC OXIDE MAX instantaneous maximum in ppb

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	
HR	00	10	20	30	40	50	60	70	80	90	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	00	
MAX	6.9	3.0	3.5	11.0	7.5	5.5	6.5	27.5	28.0	42.0	29.0	15.5	13.9	14.5	12.0	20.5	28.0	5.5	4.5	4.5	9.0	25.5	9.0	42.0	14.4	
AVG	13.9	6.0	6.9	20.5	13.9	5.5	37.0	45.5	5	31.0	31.5	5.5	12.0	4.0	3.0	31.5	135.4	1.9	1.4	5	2.5	1.5	0.9	1.0	135.4	18.9
ROGS	0.9	1.9	0.9	3.5	11.0	50.5	42.5	55.5	26.5	2.0	1.5	20.4	2.4	10.4	3.4	12.9	2.4	5	1.5	2.0	15.5	24.5	13.9	55.5	15.5	
24-HOUR AVG	20.0	20.0	16.0	21.0	9.5	10.0	22.0	26.5	33.0	51.0	13.9	8.0	6.4	1.0	0.5	19.0	5	2.5	3.5	5.5	4.5	8.5	4.0	51.0	13.6	
24-HOUR MAX	5.5	4.0	5.5	0.5	1.0	4.5	2.0	2.0	C	C	C	1.5	4.5	2.0	6.9	2.0	5	6.0	22.5	31.9	31.0	13.5	9.9	14.0	31.9	
24-HOUR AVG	3.0	2.0	2.5	2.5	2.0	2.0	4.0	5.5	9.0	6.0	5.0	8.0	18.5	4.5	3.5	5	14.5	7.6	6.1	3.1	2.6	3.6	2.6	2.6	18.5	
24-HOUR MAX	3.1	2.1	7.0	11.1	7.6	10.1	37.6	19.1	38.5	18.1	6.1	5.6	9.1	16.1	5	12.5	23.0	29.0	24.0	12.0	5.0	1.5	3.0	38.5	13.2	
24-HOUR AVG	2.0	1.5	4.5	2.5	1.5	3.5	2.0	3.5	6.9	7.9	2.5	6.0	5	10.0	9.0	26.5	2.4	2.0	5.0	1.5	6.0	1.5	2.0	26.5	4.9	
24-HOUR MAX	3.0	3.5	4.0	0.9	1.5	3.5	7.5	2.5	3.5	1.0	1.5	2.5	1.4	4.5	1.4	3.0	1.9	2.4	1.4	0.4	2.9	0.4	0.4	7.5	2.4	
24-HOUR AVG	0.4	0.0	0.4	0.4	0.4	1.9	0.9	0.9	1.4	1.9	0.9	1.4	1.8	9.9	2.9	1.9	1.9	2.4	0.9	3.9	0.9	0.9	18.9	2.5		
24-HOUR MAX	0.9	0.4	0.4	0.4	0.4	1.4	0.4	0.4	0.4	1.4	0.9	0.9	6.4	7.4	8.4	5.9	6.9	1.9	1.4	0.9	1.4	3.4	1.9	8.4	2.4	
24-HOUR AVG	1.4	1.4	1.4	1.4	0.9	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
24-HOUR MAX	4.0	0.4	1.4	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	5.0	
24-HOUR AVG	2.5	2.2	1.3	1.0	0.4	0.4	0.6	0.1	0.2	0.2	0.2	0.7	0.4	0.5	1.8	1.8	3.5	3.7	4.0	6.5	3.2	3.9	1.4	6.5	1.8	
24-HOUR MAX	1.0	1.7	3.0	0.1	0.1	0.3	0.2	0.2	5.4	0.7	0.9	0.5	0.6	0.5	0.6	1.1	0.6	1.1	0.6	1.4	1.2	0.6	5.4	1.0	2.4	
24-HOUR MAX	1.4	1.3	1.3	0.9	0.6	3.2	3.4	6.8	2.4	3.2	4.8	3.2	3.2	3.8	9.1	6.2	12.2	4.3	5.2	2.0	1.6	1.8	3.7	32.3	4.9	
24-HOUR MAX	2.2	1.2	0.8	2.2	2.5	2.1	2.1	4.4	4.3	3.3	1.1	3.4	3.2	5.4	1.3	5.0	12.2	7.8	3.0	30.2	1.3	0.8	1.9	30.2	4.5	
24-HOUR MAX	2.1	0.4	0.4	1.1	2.1	0.9	16.4	3.6	13.7	15.3	13.9	10.3	9.0	6.3	30.6	36.8	13.5	14.2	23.4	20.8	14.8	21.7	5	36.8	12.5	
24-HOUR MAX	18.0	17.8	24.2	14.0	15.2	23.4	23.9	5	29.4	25.2	25.7	26.4	24.8	25.7	41.2	34.1	29.2	29.7	48.8	33.5	37.4	5	33.9	48.8	27.7	
24-HOUR MAX	29.8	41.5	34.9	42.9	24.3	30.1	31.7	6.7	9.7	9.2	8.4	9.1	30.8	12.7	16.0	6.2	78.1	18.9	26.6	9.3	2.6	5	2.5	1.2	78.1	
24-HOUR MAX	2.0	2.4	1.7	3.0	2.1	0.7	0.8	1.1	1.7	2.0	0.9	1.7	1.3	3.7	3.3	1.9	3.7	5.5	7.6	1.2	5	3.9	4.7	3.6	7.6	
24-HOUR MAX	4.1	1.5	3.9	4.1	2.0	2.6	1.7	3.7	2.5	5.6	4.1	3.6	4.3	5.2	5.0	3.3	1.3	0.8	0.4	5	1.2	0.7	1.5	0.2	5.6	
24-HOUR MAX	1.2	1.6	1.5	1.6	1.9	1.3	1.9	1.1	4.8	3.6	3.8	3.2	5.8	3.8	2.9	7.9	5	34.6	6.3	0.8	0.8	2.4	3.3	34.6	4.3	
24-HOUR MAX	3.2	0.3	0.4	1.2	1.0	1.5	2.6	1.5	3.8	2.8	3.7	4.7	5.4	2.6	1.9	2.6	5	13.4	19.4	13.0	14.7	14.2	10.3	11.9	19.4	
24-HOUR MAX	27.2	29.1	21.9	14.6	16.3	15.4	5.1	3.3	1.7	5.0	8.8	8.2	28.5	9.6	5	21.2	19.0	5.8	4.7	3.4	6.6	5.9	5.9	29.1	12.0	
24-HOUR MAX	5.1	9.5	6.7	6.4	7.0	2.8	3.3	2.5	6.0	11.7	84.6	8.7	10.3	6.7	5	5.1	7.1	3.8	0.8	1.5	2.0	2.2	1.7	2.6	84.6	
24-HOUR MAX	2.0	2.1	1.3	1.7	2.5	29.2	1.3	3.8	4.8	1.3	2.9	3.3	2.9	1.6	1.9	2.0	6.0	1.2	1.2	1.2	1.2	2.1	1.0	1.9	29.2	
HOURLY MAX	29.8	41.5	34.9	42.9	24.3	30.1	31.7	6.7	9.7	9.2	8.4	9.1	30.8	12.7	16.0	6.2	78.1	18.9	26.6	9.3	2.6	5	2.5	1.2	78.1	
HOURLY AVG	5.6	5.8	5.6	5.8	5.2	8.8	10.4	6.7	9.8	11.5	10.6	6.1	8.7	6.9	6.8	8.3	20.0	8.0	8.5	7.1	7.6	5.8	5.7	5.6	5.6	

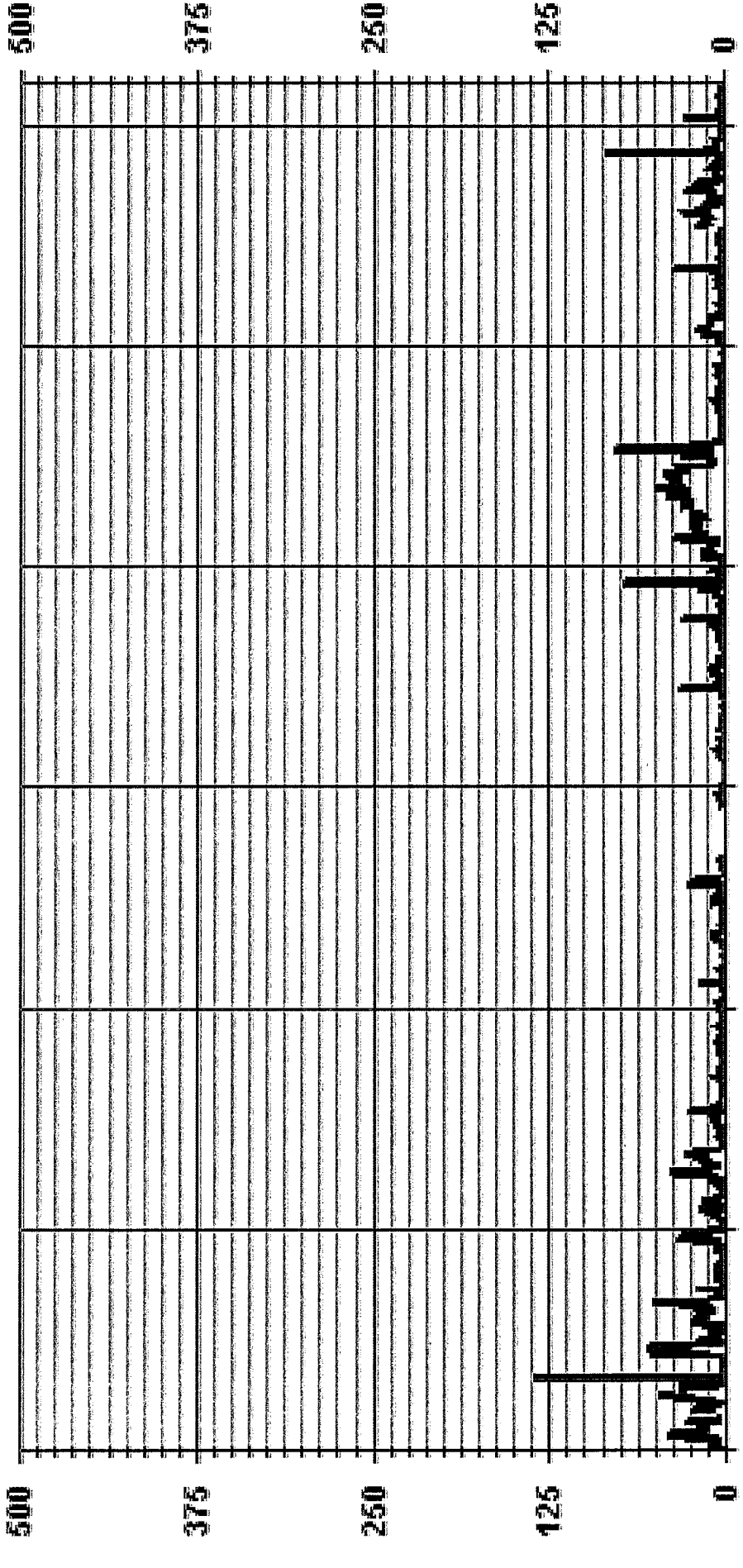
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SIGNAL CHECK	X	MACHINE/MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT OF REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	677
MAXIMUM INSTANTANEOUS VALUE:	135.4 PPB @ HOUR(S) 16 ON DAY(S) 2
1ZS CALIBRATION TIME:	35 HRS
MONTHLY CALIBRATION TIME:	14 HRS
STANDARD DEVIATION:	11.78
OPERATIONAL TIME:	727 HRS
VAR-VARIOUS	

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA - - - - NOMAX PPB

LICA
NO2_ / WD Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
Parameter : NO2
Units : PPB

Wind Parameter : WD
Instrument Height : 10 Meters

Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
< 50.0	2.49	1.76	1.02	1.32	11.74	11.74	14.09	4.11	2.34	3.23	3.67	18.94	8.81	4.11	5.72	4.84	100.00			
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
Totals	2.49	1.76	1.02	1.32	11.74	11.74	14.09	4.11	2.34	3.23	3.67	18.94	8.81	4.11	5.72	4.84				

Calm : .00 %

Total # Operational Hours : 681

Distribution By Samples

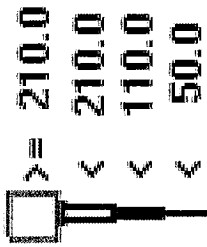
Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
< 50.0	17	12	7	9	80	80	96	28	16	22	25	129	60	28	39	33	681			
< 110.0																				
< 210.0																				
>= 210.0																				
Totals	17	12	7	9	80	80	96	28	16	22	25	129	60	28	39	33				

Calm : .00 %

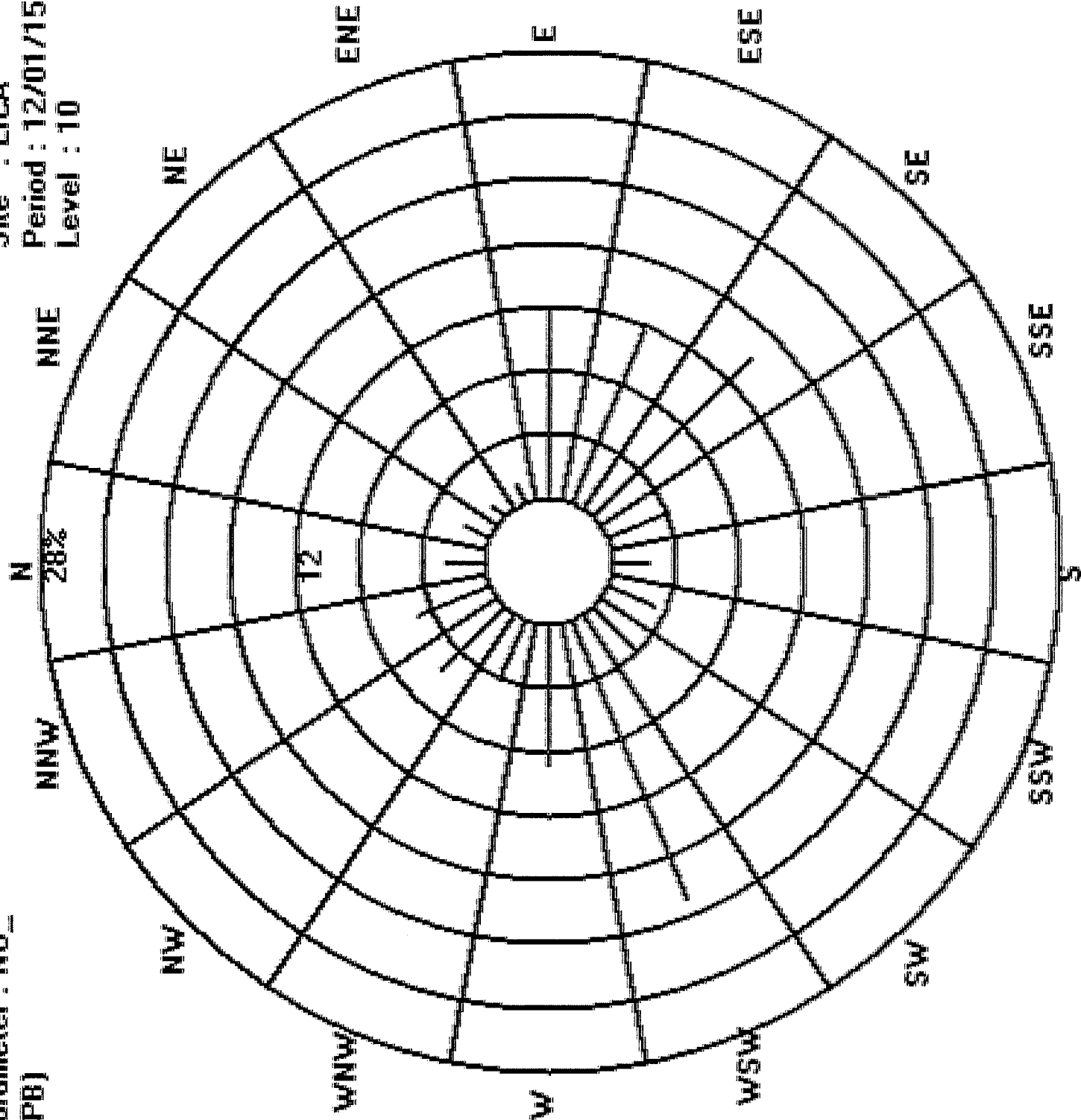
Total # Operational Hours : 681

Logger : 01 Parameter : ND_

Class Limits (PPB)



Site : LICA
Period : 12/01/15-12/31/15
Level : 10



NITROGEN DIOXIDE



NITROGEN DIOXIDE (NO2) hourly averages in ppb

MST

DAY	24-HOUR																								ROGS		
	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00			
1	10.3	11.0	10.6	11.0	10.0	12.1	11.5	13.4	14.9	13.5	15.7	13.9	16.5	18.5	19.8	22.4	23.1	18.2	19.9	20.7	\$	20.5	18.8	16.8	23.1	15.8	24
2	14.2	12.5	12.6	12.1	12.1	15.1	14.8	\$	19.3	17.0	9.4	14.3	9.2	9.5	12.4	15.4	5.6	4.6	\$	3.7	4.2	5.4	5.2	19.3	10.9	24	
3	6.1	6.1	6.0	7.0	16.4	20.2	19.2	26.9	25.5	10.4	5.2	3.9	4.7	4.4	4.2	7.6	15.3	9.7	\$	4.1	5.4	15.6	18.9	21.8	26.9	11.5	24
4	16.2	18.5	14.6	13.8	9.1	7.2	14.0	13.4	9.8	10.7	9.6	8.2	12.3	9.2	3.6	3.0	5.6	\$	7.6	8.7	7.4	5.9	8.9	5.6	18.5	9.7	24
5	4.9	4.1	5.8	3.6	3.1	4.7	6.0	6.7	C	C	4.5	3.3	3.1	3.0	4.0	\$	10.3	12.3	20.5	24.0	20.7	19.4	17.2	24.0	8.8	24	
6	7.7	5.6	5.6	5.3	4.0	4.0	6.6	7.2	10.3	8.1	7.7	4.8	3.4	4.3	4.7	\$	4.3	4.8	6.4	7.1	6.2	4.2	4.0	5.0	10.3	5.7	24
7	6.7	7.5	7.2	7.7	6.4	7.6	8.4	12.6	11.5	10.4	6.7	7.0	7.0	6.4	\$	11.2	14.5	12.9	11.3	12.3	12.4	10.4	8.4	7.8	14.5	9.3	24
8	7.4	5.9	4.9	3.8	2.8	2.7	3.9	6.1	10.7	8.2	7.1	5.5	\$	5.3	6.0	7.0	5.4	7.0	6.8	7.9	7.7	12.2	6.7	6.8	12.2	5.4	24
9	7.5	6.6	8.1	11.0	9.0	7.5	8.7	10.1	10.5	7.3	5.4	\$	2.4	3.7	3.4	3.1	3.0	2.5	3.3	2.4	2.6	2.3	1.7	1.7	11.0	5.4	24
10	1.3	1.1	1.5	3.6	3.3	4.1	2.9	3.6	2.9	2.1	\$	1.3	1.8	1.7	2.3	4.0	3.9	3.8	3.1	1.8	1.7	1.0	1.0	4.1	2.4	24	
11	0.8	0.5	0.5	0.5	0.5	0.9	0.6	0.5	0.7	\$	1.3	1.3	1.2	1.5	1.8	2.7	2.7	2.5	3.0	2.7	2.9	2.4	1.9	1.7	3.0	1.5	24
12	1.7	1.9	1.7	2.0	2.5	2.6	2.3	2.2	\$	3.6	2.7	2.9	3.2	2.6	3.2	3.6	3.6	3.0	2.6	2.6	2.4	2.5	2.7	3.6	2.6	24	
13	2.4	1.2	1.4	0.9	0.7	1.0	0.9	\$	1.1	1.5	1.5	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	2.4	1.3	16	
14	6.2	5.5	5.1	4.5	2.4	\$	3.0	3.6	0.9	0.8	0.2	0.2	0.3	0.0	0.0	2.0	2.8	4.3	8.8	10.1	8.5	6.7	7.1	4.9	10.1	3.8	24
15	2.4	1.3	1.0	1.6	\$	1.2	1.8	1.7	1.5	0.1	0.0	0.4	0.8	1.1	0.2	0.4	0.4	0.4	0.4	2.3	2.1	1.9	2.1	2.5	2.5	1.2	24
16	2.9	3.0	1.5	\$	3.6	2.3	2.8	1.5	1.6	2.3	1.6	0.9	0.8	1.9	3.5	6.7	4.8	4.0	3.5	2.6	2.8	2.4	1.5	1.0	6.7	2.6	24
17	1.5	0.9	\$	2.6	0.8	1.6	1.8	2.3	3.6	2.7	1.5	0.1	0.2	0.1	0.2	1.5	7.3	9.9	8.9	5.5	2.2	2.1	1.6	3.5	9.9	2.7	24
18	3.2	\$	7.7	4.6	2.1	3.4	3.9	2.4	2.5	2.3	4.2	2.7	1.7	1.9	2.4	6.0	10.2	11.9	12.1	12.6	9.1	5.2	3.0	3.8	12.6	5.2	24
19	\$	1.5	0.9	1.1	1.3	1.1	7.7	8.3	10.2	8.2	9.8	6.5	4.6	5.3	7.4	11.3	15.1	14.8	13.7	13.8	12.8	13.0	\$	15.1	8.3	24	
20	10.4	9.9	11.0	9.3	9.4	9.5	9.2	\$	12.7	7.8	9.8	10.4	11.1	13.1	14.2	16.2	17.3	16.3	15.3	14.4	13.0	11.8	\$	10.7	17.3	11.9	24
21	9.8	10.9	12.4	13.8	12.3	12.0	13.2	13.4	12.7	11.5	8.0	6.6	4.4	5.0	6.4	6.4	7.5	11.5	10.6	0.5	0.0	\$	0.3	0.0	13.8	8.2	24
22	0.0	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.5	0.6	5.4	8.5	7.4	6.3	\$	9.9	10.9	11.5	2.8	24
23	10.6	9.1	9.2	9.8	8.2	7.3	7.2	7.5	7.0	5.3	2.8	2.4	3.1	6.0	7.2	7.7	7.7	8.1	9.6	\$	7.4	5.4	5.2	4.9	10.6	6.9	24
24	4.0	2.7	4.8	5.8	11.2	15.3	16.0	15.3	13.0	10.9	8.6	8.0	7.4	5.5	7.8	8.9	7.2	7.7	\$	5.1	4.1	2.6	3.8	5.7	16.0	7.9	24
25	3.4	4.0	2.5	2.2	2.6	1.7	1.3	0.5	2.3	2.3	1.8	1.2	0.6	0.9	1.1	2.2	3.9	\$	4.1	2.8	2.0	1.5	2.1	4.1	2.2	24	
26	2.2	2.1	3.3	7.0	8.6	6.6	7.1	8.4	7.8	4.5	3.4	1.6	1.2	1.2	1.2	4.1	\$	11.9	11.3	11.7	10.6	10.5	10.7	9.7	11.9	6.4	24
27	10.1	12.6	10.6	9.9	10.6	11.1	9.4	8.1	7.3	5.8	4.9	3.7	4.4	6.2	7.3	\$	12.2	12.2	11.1	8.5	9.5	10.8	10.2	8.9	12.6	8.9	24
28	0.7	10.3	10.1	10.2	12.2	10.7	12.7	14.1	16.1	16.0	11.9	9.7	9.3	7.2	\$	5.3	6.4	5.2	4.9	3.2	3.2	2.8	2.4	1.4	16.1	8.4	24
29	0.7	0.5	1.5	2.0	1.7	4.7	5.5	5.9	6.5	5.1	5.4	4.1	2.9	\$	3.3	3.0	3.8	4.4	4.5	3.8	3.5	3.5	3.0	2.9	6.5	3.6	24
30	16.2	18.5	14.6	13.8	16.4	20.2	19.2	26.9	25.5	19.3	17.0	13.9	16.5	18.5	19.8	22.4	23.1	18.2	19.9	20.7	24.0	20.7	19.4	21.8			
31	5.8	5.5	5.7	5.9	5.8	6.2	6.8	7.4	7.5	6.7	5.7	4.5	4.6	4.7	5.3	6.7	8.4	8.4	8.2	7.7	6.7	7.4	6.7	6.2			
HOURLY MAX																											
HOURLY AVG																											

STATUS FLAG CODES

C	CALIBRATION	O	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	-OUT FOR REPAIR	K	COLLECTION ERROR

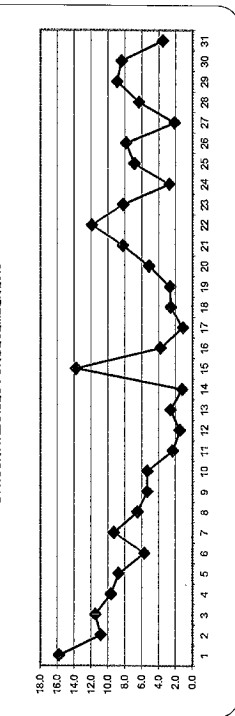
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR: 159 PPB

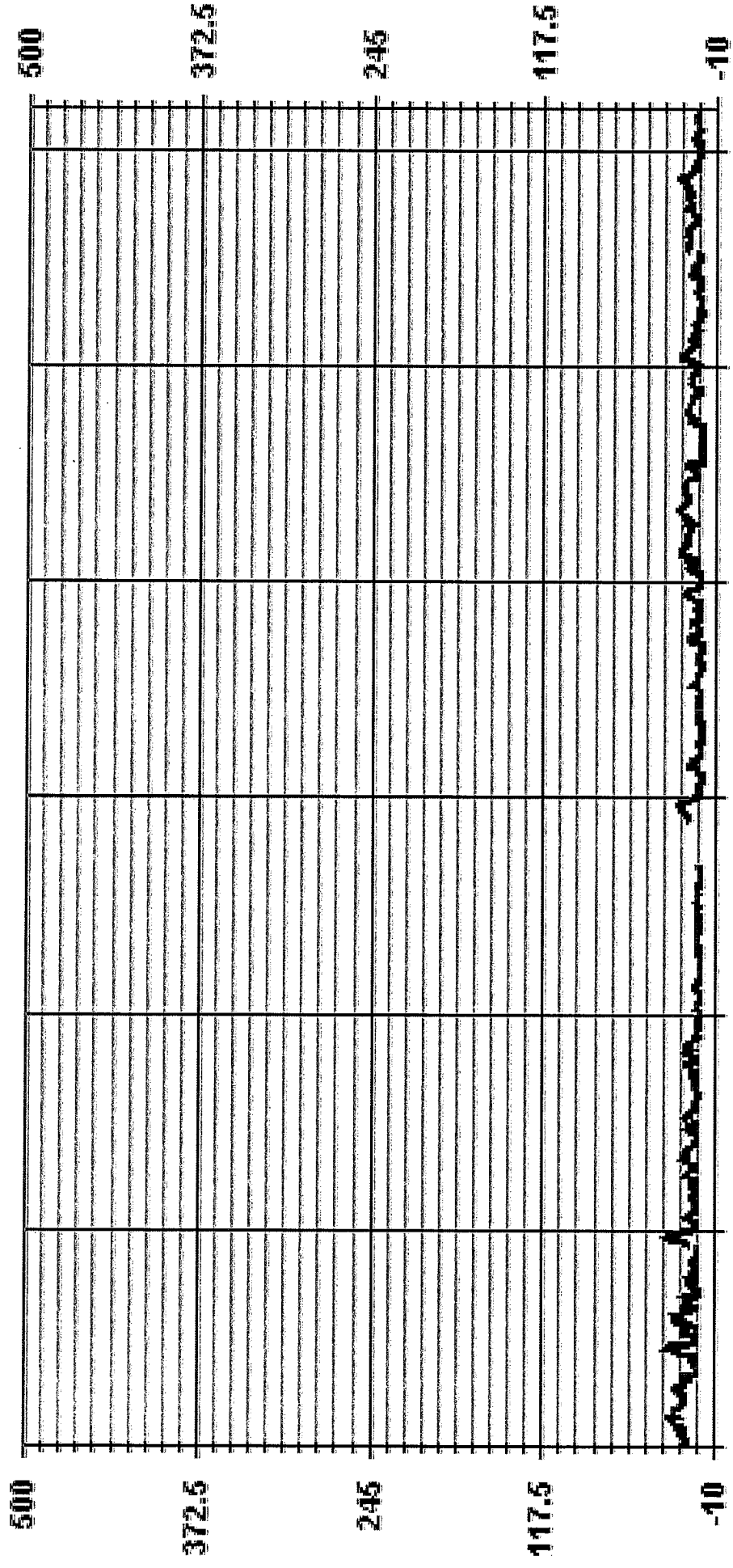
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0
NUMBER OF NON-ZERO READINGS:	664
MAXIMUM 1-HR AVERAGE:	26.9 PPB
MAXIMUM 24-HR AVERAGE:	15.8 PPB
12S CALIBRATION TIME:	34 HRS
MONTHLY CAURATION TIME:	12 HRS
STANDARD DEVIATION:	5.02
OPERATIONAL TIME:	
AMT OPERATION UPTIME:	
MONTHLY AVERAGE:	
ON DAY(S)	7
ON DAY(S)	3
VAR-VARIOUS	1
HRS	727
%	97.7
PPB	6.4

24 HOUR AVERAGES FOR DECEMBER 2015



01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA NO2_ PPB



NITROGEN DIOXIDE MAX instantaneous maximum in ppb

MST

DAY	HOURS																								DAILY MAX	24-HOUR AVG		
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				
1	11.6	16.0	18.5	15.1	12.5	13.5	14.0	17.6	18.1	23.1	19.0	20.0	19.0	20.5	22.6	30.1	39.5	20.0	25.0	23.6	5	23.6	23.1	20.0	39.5	20.0	24	
2	19.0	15.1	14.1	13.1	14.6	26.0	17.6	\$	\$	26.6	23.6	14.5	22.6	12.1	11.6	27.0	61.5	7.5	7.5	\$	5.1	5.6	6.0	6.0	61.5	17.0	24	
3	6.5	7.5	7.6	14.5	23.1	43.6	44.5	31.0	30.1	23.6	8.1	5.0	22.5	7.0	5.0	17.0	32.0	21.0	5	6.4	8.5	23.5	42.5	34.4	44.5	20.2	24	
4	19.9	22.5	20.4	20.4	17.0	11.5	18.9	17.5	12.5	12.9	16.4	10.5	14.4	13.4	4.0	3.5	14.4	5	9.5	13.0	10.6	10.6	19.0	12.5	22.5	14.1	24	
5	10.1	5.6	10.1	5.1	7.0	8.0	7.0	9.1	C	C	4.1	4.1	6.5	6.0	6.1	\$	18.4	16.8	27.3	30.3	25.8	25.3	20.3	30.3	12.7	24		
6	12.8	7.3	8.4	8.4	6.3	7.9	11.4	15.3	15.8	12.3	10.9	6.3	8.4	6.8	6.3	\$	9.4	8.5	12.0	10.5	7.9	6.9	5.5	9.0	15.8	9.3	24	
7	8.5	9.5	9.0	10.0	10.0	12.9	13.4	14.9	13.9	13.9	9.0	8.5	8.5	10.4	\$	15.4	19.4	17.4	14.4	14.4	16.9	17.5	11.0	10.0	9.0	19.4	12.3	24
8	9.0	8.5	7.5	6.9	3.5	6.0	6.9	10.5	9.4	15.4	10.9	9.4	10.0	\$	17.1	20.0	17.6	12.1	11.1	9.1	9.6	12.6	5.6	6.1	20.0	10.0	24	
9	5.6	7.0	5.6	4.6	3.1	4.6	4.6	5.6	5.6	7.5	12.5	6.1	5	7.0	8.1	9.5	7.0	8.1	8.1	9.1	9.1	9.6	15.6	11.1	8.6	15.6	7.6	24
10	8.6	10.0	12.6	12.6	11.6	13.0	12.5	13.0	14.5	9.1	7.5	\$	4.0	5.6	5.5	5.5	6.1	6.1	8.0	4.0	3.5	4.0	3.0	2.5	14.5	7.9	24	
11	2.5	1.5	2.5	5.5	5.5	8.0	5.5	7.0	4.5	3.5	\$	6.5	6.5	2.5	8.5	9.0	6.0	6.5	5.5	3.5	3.0	2.5	22.5	22.5	5.7	24		
12	22.5	1.0	1.0	1.0	1.0	4.5	1.0	1.0	2.0	5	2.0	4.0	2.0	4.5	5.0	17.5	4.5	3.5	5.5	4.5	3.5	3.0	2.5	22.5	4.4	24		
13	3.0	3.0	2.5	2.5	3.5	3.5	3.0	3.5	\$	6.5	3.6	5.1	5.1	8.1	5.1	6.5	9.5	6.0	4.0	4.1	9.5	4.6	5.6	15.0	5.3	24		
14	4.1	2.1	3.5	1.6	1.1	2.1	1.6	\$	2.0	4.0	2.5	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	4.1	2.5	16	
15	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	12.2	14.7	15.6	15.3	14.8	17.5	18.1	15.3	13.2	18.1	15.2	15
16	6.8	6.4	5.0	5.3	1.9	\$	3.9	6.0	2.0	3.0	0.7	0.6	0.2	0.1	4.3	4.7	7.3	14.6	13.1	12.9	11.0	10.5	7.2	14.6	5.6	24		
17	4.4	2.7	2.7	2.2	\$	2.2	2.7	2.7	12.3	0.6	0.8	0.5	1.4	1.8	3.3	1.2	1.3	1.2	0.9	4.2	3.0	2.6	2.7	4.5	12.3	2.7	24	
18	4.0	4.3	2.3	\$	6.6	3.8	28.8	2.5	3.8	3.9	4.8	4.4	3.0	4.6	8.0	11.6	7.0	6.4	6.1	4.9	4.4	4.2	4.2	3.9	28.8	6.0	24	
19	5.0	3.0	\$	5.7	3.3	5.8	3.6	4.4	7.0	5.2	4.5	1.0	2.7	1.5	2.9	3.9	12.2	17.0	14.4	9.9	14.5	4.9	2.9	7.3	17.0	6.2	24	
20	6.8	\$	13.1	8.5	3.4	5.6	6.1	4.6	3.9	3.9	7.9	19.1	4.7	3.4	4.4	8.5	45.3	16.5	16.4	21.2	18.9	9.6	5.0	7.1	45.3	10.6	24	
21	\$	2.2	1.4	3.9	1.8	15.6	11.4	26.7	17.4	13.5	9.3	6.5	8.9	9.2	25.9	21.0	17.1	15.4	16.7	16.9	15.2	15.4	5	26.7	12.5	24		
22	13.8	13.8	13.4	11.2	11.2	12.0	10.7	\$	9.9	11.0	11.4	13.6	13.9	15.3	20.9	19.1	17.5	17.0	23.8	14.4	13.8	\$	14.4	23.8	14.4	24		
23	11.2	14.2	13.6	15.4	13.9	13.7	16.3	15.8	14.9	13.7	10.5	8.4	10.2	7.2	9.5	7.7	14.7	14.8	14.0	7.3	0.1	\$	2.9	0.6	16.3	10.9	24	
24	1.8	1.7	3.6	3.2	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.7	0.0	4.0	4.5	2.5	7.2	11.0	11.1	7.9	\$	11.4	12.9	12.5	12.9	4.3	24	
25	12.9	10.1	11.9	11.6	9.9	8.9	8.6	8.1	8.2	6.8	4.2	3.2	5.2	6.9	8.7	9.3	9.0	10.6	11.5	5	9.5	6.0	6.2	5.5	12.9	8.4	24	
26	4.6	3.8	7.2	7.9	18.3	19.7	18.0	19.0	16.6	18.9	11.3	10.4	9.2	8.3	12.5	13.2	10.2	10.3	5	6.2	6.0	3.8	8.9	8.1	19.7	11.0	24	
27	4.8	6.6	3.9	3.4	3.7	2.6	3.0	1.7	6.3	5.4	4.3	3.7	2.3	14.9	2.6	5.0	9.2	\$	8.1	10.9	2.8	2.5	5.0	4.6	14.9	5.1	24	
28	4.0	3.4	7.1	10.1	10.1	8.4	9.0	10.0	11.1	6.5	5.2	3.5	3.6	2.0	3.1	6.5	\$	16.2	14.5	14.4	13.9	12.1	12.3	11.2	16.2	8.6	24	
29	14.4	15.6	12.5	16.4	13.0	12.1	11.3	10.7	9.1	6.7	8.9	5.0	5.1	25.2	10.1	\$	15.8	26.5	14.9	10.7	12.4	16.4	12.8	12.4	26.5	13.0	24	
30	12.9	13.7	12.8	12.3	16.6	11.9	14.8	17.0	20.3	19.9	22.6	13.8	13.4	9.0	\$	8.2	15.2	9.3	6.4	4.3	4.7	4.4	3.4	3.7	22.6	11.8	24	
31	2.3	2.2	2.8	3.9	4.8	73.3	7.4	9.7	14.2	7.0	6.4	6.1	8.0	\$	4.2	4.4	6.8	16.8	6.7	4.9	4.8	5.0	4.2	4.7	73.3	9.2	24	
HOURLY MAX	22.5	22.5	20.4	20.4	23.1	73.3	44.5	31.0	30.1	26.6	23.6	20.0	22.6	25.2	22.6	30.1	61.5	26.5	25.0	27.3	30.3	25.8	42.5	34.4				
HOURLY AVG	8.7	7.6	8.0	8.4	8.3	12.0	10.7	10.0	11.0	10.3	8.7	7.2	7.7	8.0	7.5	11.2	15.7	12.5	11.2	11.0	9.7	10.0	9.9	10.0				

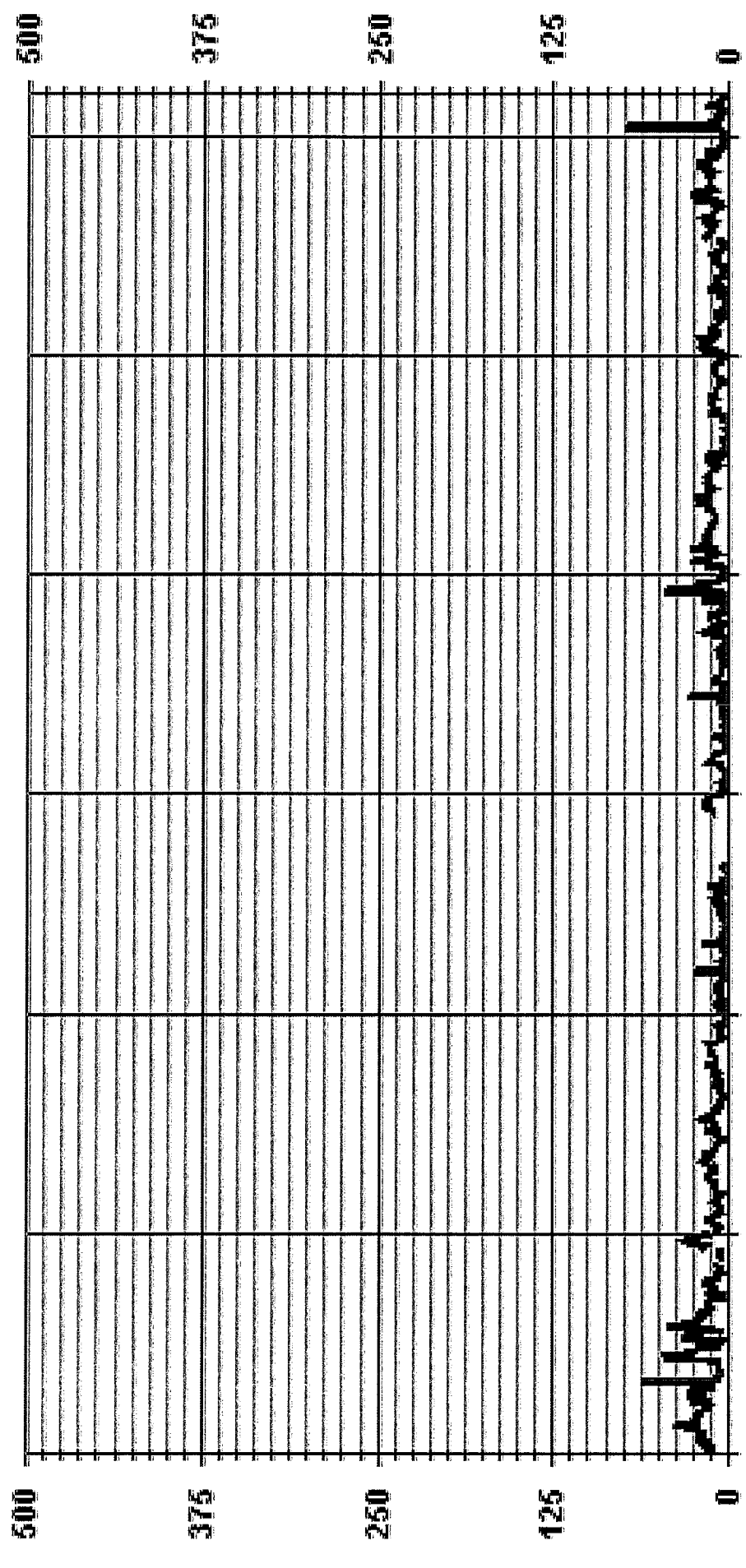
STATUS FLAG CODES

C	QUALITY ASSURANCE
V	RECOVERY
M	MAINTENANCE
S	DAILY ZERO/SPAN CHECK
P	POWER FAILURE
G	OUT OF REPAIR
O	OPERATOR ERROR
K	COLLECTION ERROR
R	RECOVERY
Q	QUALITY ASSURANCE
P	RECOVERY
M	MAINTENANCE
S	DAILY ZERO/SPAN CHECK
P	POWER FAILURE
G	OUT OF REPAIR
O	OPERATOR ERROR
K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	671				
MAXIMUM INSTANTANEOUS VALUE:	73.3				
PPB	@	HOUR(S)	5	ON DAY(S)	31
VAR- VARIOUS					
12S CALIBRATION TIME:	35	HRS	OPERATIONAL TIME:	727	HRS
MONTHLY CALIBRATION TIME:	14	HRS			
STANDARD DEVIATION:	7.61				

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA NO2MAX PPB

LICA
NO_ / WD Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
Parameter : NO
Units : PPB

Wind Parameter : WD
Instrument Height : 10 Meters

Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
< 50.0	2.49	1.76	1.02	1.32	11.74	11.74	14.09	4.11	2.34	3.23	3.67	18.94	8.81	4.11	5.72	4.84	100.00			
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
Totals	2.49	1.76	1.02	1.32	11.74	11.74	14.09	4.11	2.34	3.23	3.67	18.94	8.81	4.11	5.72	4.84				

Calm : .00 %

Total # Operational Hours : 681

Distribution By Samples

Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
< 50.0	17	12	7	9	80	80	96	28	16	22	25	129	60	28	39	33	681			
< 110.0																				
< 210.0																				
>= 210.0																				
Totals	17	12	7	9	80	80	96	28	16	22	25	129	60	28	39	33				

Calm : .00 %

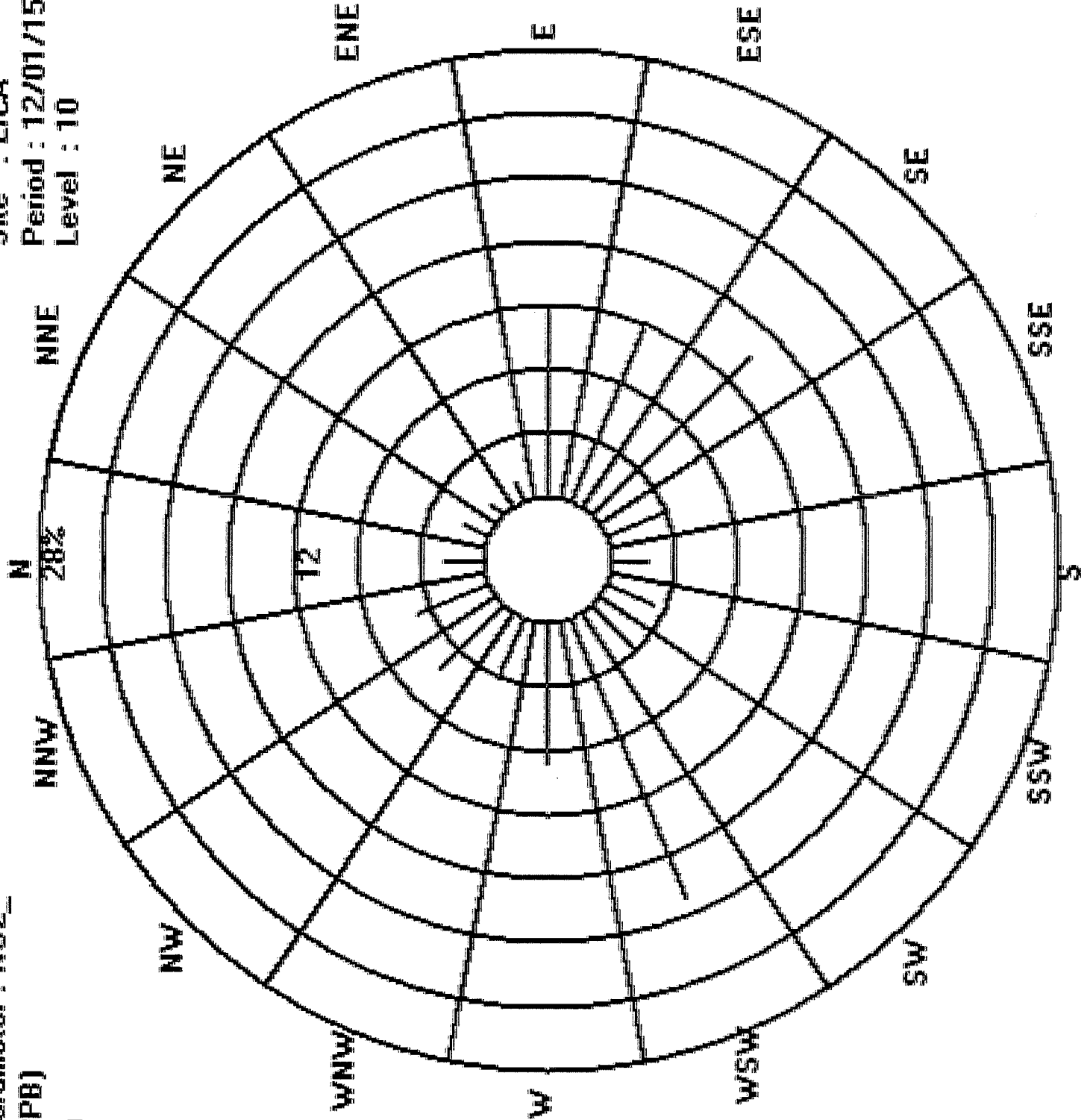
Total # Operational Hours : 681

Logger : 01 Parameter : ND2_

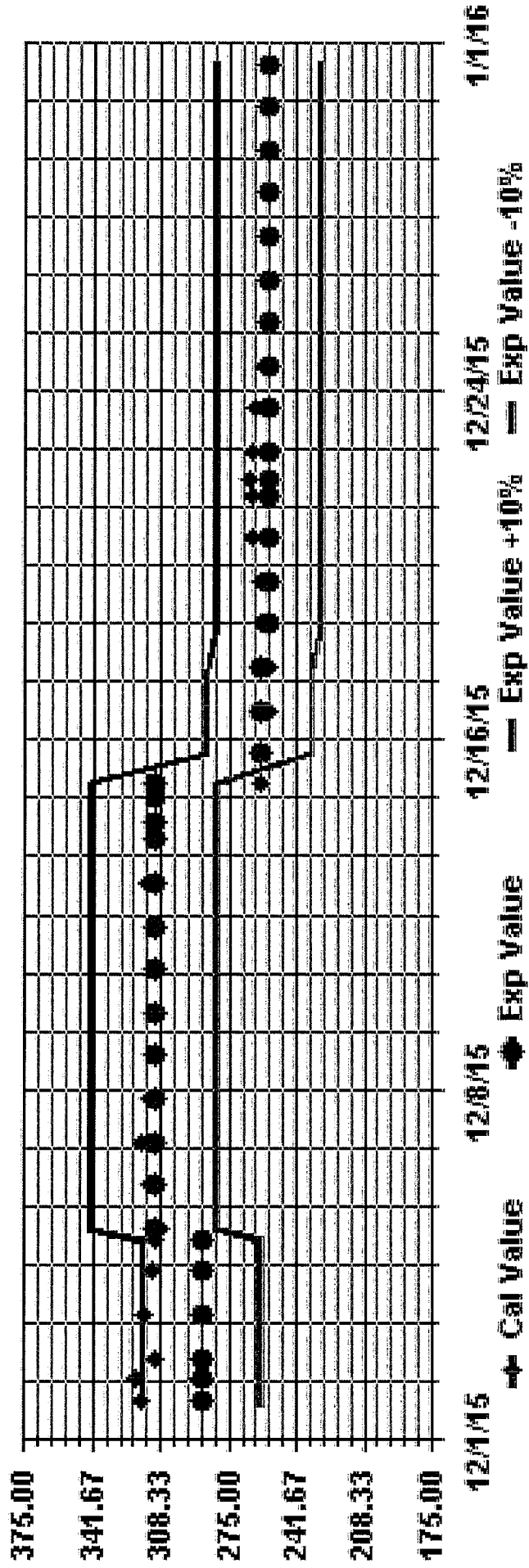
Class Limits (PPB)

-  >= 210.0
-  < 210.0
-  < 110.0
-  < 50.0

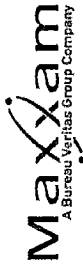
Site : LICA
Period : 12/01/15-12/31/15
Level : 10



Calibration Graph for Site: LICA Parameter: NO2_ Sequence: NO2 Phase: SPAN



OZONE



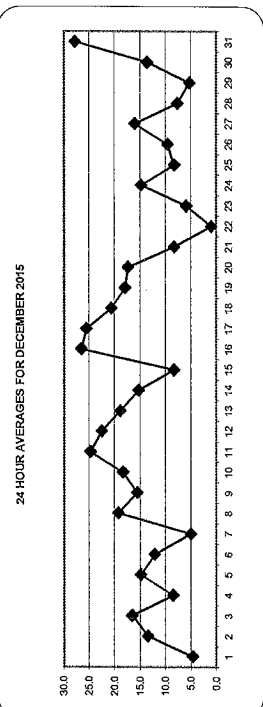
OZONE (O3) hourly averages in ppb

DAY	HOUR START																								DAILY MAX.	24-HOUR AVG.	RDGS	
	0100	1100	2100	3100	4100	5100	6100	7100	8100	9100	10100	11100	12100	13100	14100	15100	16100	17100	18100	19100	20100	21100	22100	23100				24100
1	2	1	1	1	0	0	1	0	1	2	6	11	14	12	12	5	6	11	11	7	7	5	3	1	1	14	4.6	24
2	1	1	1	0	0	1	2	2	6	19	15	25	24	19	16	16	28	30	5	32	30	28	8	1	27	32	13.4	24
3	25	25	21	16	6	4	2	1	2	20	28	27	27	27	23	16	22	5	27	22	8	3	1	28	27	18.6	24	
4	3	1	0	1	6	2	1	0	2	7	12	9	15	24	20	5	14	10	12	15	10	7	24	7	24	8.5	24	
5	6	6	13	10	9	16	19	17	19	21	24	27	28	28	27	5	13	8	3	2	5	6	6	28	28	14.8	24	
6	15	18	17	16	17	17	14	13	8	10	12	15	16	15	15	5	13	10	6	4	4	7	9	7	18	12.1	24	
7	4	3	1	1	3	3	1	1	3	8	9	10	12	5	6	1	1	0	1	8	9	14	15	15	5.0	24		
8	15	10	17	18	25	25	24	21	20	13	19	22	23	5	17	15	17	21	20	21	19	20	20	20	25	19.3	24	
9	21	21	19	20	19	17	15	13	13	12	13	19	5	19	19	17	18	15	14	12	12	6	12	12	21	15.6	24	
10	11	11	9	6	5	4	4	5	8	14	16	5	29	27	27	28	27	28	28	27	26	26	26	28	29	18.3	24	
11	27	26	26	26	25	25	22	22	22	25	29	5	33	26	25	26	22	22	22	23	24	24	25	26	33	24.8	24	
12	25	25	26	26	25	25	26	26	26	5	24	24	26	25	23	21	20	19	18	17	17	17	17	18	19	26	22.5	24
13	18	18	18	17	17	17	18	19	5	17	18	18	21	21	21	21	20	20	20	20	20	20	20	19	21	18.9	24	
14	18	17	19	20	20	19	19	19	5	18	17	17	14	13	11	10	8	7	11	13	14	15	16	20	21	15.3	24	
15	15	14	10	9	8	6	5	5	8	8	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8.3	24
16	19	21	23	24	31	5	32	29	33	32	33	32	33	34	30	28	27	19	16	18	19	20	24	34	26.5	24		
17	28	30	31	29	5	29	27	26	27	27	27	27	25	24	25	25	24	23	21	22	22	21	20	31	25.6	24		
18	20	19	20	5	18	20	21	22	22	21	22	22	21	21	19	19	19	19	19	20	21	21	22	22	23	20.7	24	
19	21	22	5	21	22	21	21	21	21	20	21	20	21	20	18	10	5	5	10	17	18	20	18	22	18.0	24		
20	18	5	15	17	20	19	18	19	20	17	20	21	21	20	16	13	11	11	10	15	19	21	20	21	17.4	24		
21	5	21	20	17	15	14	7	5	3	6	8	12	14	14	13	8	2	1	1	0	0	0	5	21	8.3	24		
22	0	0	0	0	0	0	0	0	0	1	3	5	4	3	2	0	0	0	0	0	0	0	5	5	1.0	24		
23	0	0	0	0	1	0	0	4	2	3	7	8	9	9	7	7	5	1	1	16	19	5	19	18	5.9	24		
24	16	17	16	17	22	22	21	19	19	19	20	21	19	18	18	12	7	6	6	5	2	1	1	22	14.8	24		
25	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8.3	24	
26	21	22	18	15	8	3	1	0	1	4	6	7	8	10	8	7	8	9	5	11	12	14	14	22	9.6	24		
27	17	14	17	16	15	16	17	18	16	16	19	18	18	18	17	16	15	5	15	15	14	15	14	13	19	16.0	24	
28	13	13	12	8	6	7	7	6	6	9	10	14	15	15	13	5	2	1	1	1	1	0	0	1	15	7.6	24	
29	1	1	0	0	1	3	4	5	8	10	11	12	13	13	5	5	7	7	7	9	4	3	2	2	13	5.3	24	
30	3	2	3	2	3	9	8	7	6	6	11	15	16	18	5	21	21	21	21	23	24	24	24	25	25	13.6	24	
31	26	27	26	25	25	24	22	22	21	24	26	29	31	5	33	33	32	29	30	31	31	31	31	31	33	27.8	24	
HOURLY MAX	28	30	31	29	31	29	32	29	33	32	33	34	33	32	33	32	29	30	31	31	31	31	31	31	31	31		
HOURLY AVG	13.7	13.6	13.3	12.6	12.4	12.4	11.6	11.6	13.1	15.3	18.1	18.5	18.6	19.1	17.3	14.5	13.7	12.8	13.1	14.9	13.7	14.6	14.9	14.9	14.9	14.9		

STATUS FLAG CODES

C	QUALITY ASSURANCE
Y	RECOVERY
S	MAINTENANCE
P	DAILY ZERO/SPAN CHECK
G	POWER FAILURE
Q	OUTFOR REPAIR
R	OPERATOR ERROR
X	MACHINER malfunction
A	COLLECTION ERROR

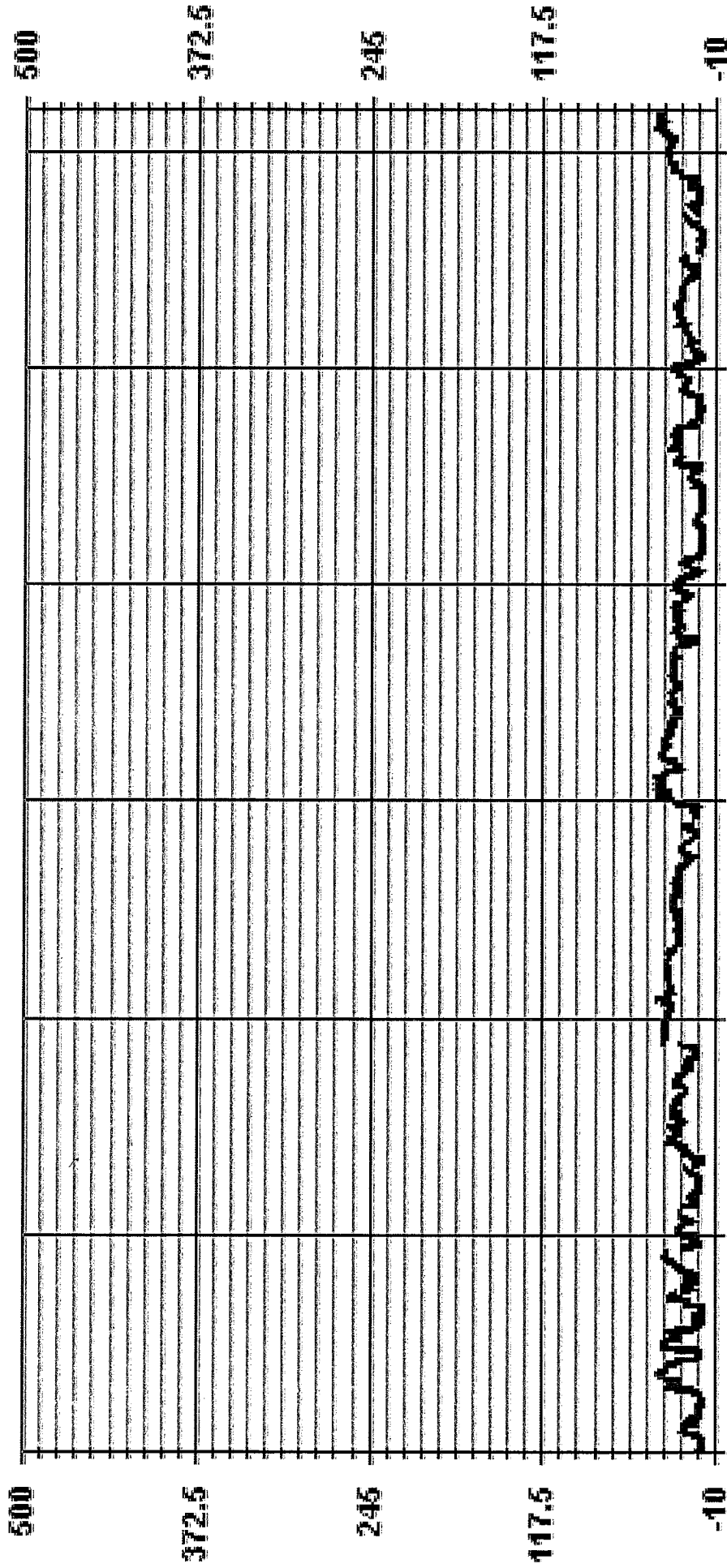
OBJECTIVE LIMIT: ALBERTA ENVIRONMENT: CHR 82 PPB



MONTHLY SUMMARY

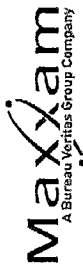
NUMBER OF NON-ZERO READINGS:	667
NUMBER OF 1-HR EXCEEDENCES:	0
NUMBER OF NON-ZERO READINGS:	667
MAXIMUM 1-HR AVERAGE:	34 PPB
MAXIMUM 24-HR AVERAGE:	27.8 PPB
OPERATIONAL TIME:	32 HRS
MONTHLY CALIBRATION TIME:	3 HRS
STANDARD DEVIATION:	9.07
ON DAY(S)	14
VAR-VARIOUS	31
OPERATIONAL TIME:	744 HRS
AMTD OPERATION UPTIME:	100.0 %
MONTHLY AVERAGE:	14 PPB

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA 03_ PPB



OZONE MAX instantaneous maximum in ppb

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	DAILY MAX	24-HOUR AVG	RDGS.	
1	2	2	2	1	1	1	1	1	1	2	5	9	13	16	16	14	13	14	14	11	8	5	5	4	2	16	6.6	24	
2	2	2	2	1	1	1	1	1	1	5	3	17	21	22	27	26	23	25	30	31	5	33	31	28	28	33	16.0	24	
3	27	25	25	21	11	17	8	1	9	27	29	29	29	28	27	26	23	28	5	29	26	17	10	2	29	20.6	24		
4	5	2	1	9	14	6	2	1	1	7	11	13	12	24	25	25	24	5	15	14	17	19	18	10	25	12.0	24		
5	8	12	16	18	14	20	20	19	21	22	26	28	29	29	29	28	5	17	11	11	8	13	12	12	29	18.4	24		
6	20	19	19	18	18	18	17	16	11	14	15	16	17	17	17	5	14	13	9	5	8	11	10	9	20	14.4	24		
7	5	5	2	3	7	7	3	4	6	9	10	11	14	5	11	5	3	2	3	11	13	15	16	16	16	7.3	24		
8	17	13	20	24	26	26	25	23	23	20	23	25	26	5	24	18	22	23	23	23	23	21	21	21	26	22.2	24		
9	23	22	21	21	20	18	17	15	14	14	20	21	5	21	20	19	19	19	17	15	13	13	11	13	23	17.4	24		
10	13	13	13	7	8	6	9	11	15	16	25	5	32	29	29	31	30	29	29	29	29	27	27	29	30	32	21.2	24	
11	28	27	27	26	26	25	24	24	27	32	5	34	33	30	32	26	26	23	23	23	25	25	25	26	27	34	27.0	24	
12	26	26	27	26	26	27	27	27	26	5	26	26	27	26	24	22	21	20	20	18	17	17	17	19	19	27	23.5	24	
13	19	19	19	18	17	18	19	20	5	18	19	20	22	22	22	22	22	22	22	22	21	21	21	20	20	23	20.0	24	
14	19	19	21	21	21	20	20	5	19	18	18	19	17	16	14	14	13	10	9	13	15	15	15	17	21	16.7	24		
15	16	15	12	10	10	7	5	7	9	11	13	13	C	C	C	C	C	C	6	6	8	8	6	8	20	10.0	24		
16	21	22	24	26	35	5	33	33	34	34	34	34	33	34	35	34	29	29	24	19	22	21	23	27	35	28.7	24		
17	32	32	32	30	5	30	28	27	28	28	28	28	27	26	28	26	25	24	22	23	23	23	22	21	32	26.8	24		
18	20	21	21	5	19	23	23	23	23	22	23	23	23	23	24	24	21	20	20	20	20	22	23	23	24	24	22.0	24	
19	22	22	5	22	23	22	22	22	21	21	21	21	21	21	21	21	20	16	10	11	18	18	19	21	21	20.3	24		
20	20	5	18	20	21	20	19	20	20	21	20	22	21	22	21	19	17	16	13	12	12	21	22	23	22	23	19.6	24	
21	5	22	22	20	17	16	15	10	8	7	9	13	15	15	14	12	4	2	3	1	1	1	1	1	5	22	10.4	24	
22	1	1	1	1	1	1	1	1	1	2	4	6	6	6	5	4	3	1	1	1	1	1	1	1	6	2.0	24		
23	1	1	1	1	1	1	1	1	1	5	6	8	9	10	9	8	7	2	6	19	20	5	4	2	1	19	7.4	24	
24	18	18	17	22	23	23	22	20	20	20	21	22	22	22	20	20	20	17	12	9	7	5	4	2	1	23	16.5	24	
25	2	2	1	1	1	2	2	1	3	9	13	15	16	15	13	13	13	14	13	13	5	16	18	17	20	20	9.6	24	
26	22	24	21	17	13	6	2	1	3	6	7	9	11	10	9	9	10	5	12	14	15	14	17	24	24	11.3	24		
27	18	15	18	18	16	17	18	19	18	20	22	19	19	19	18	18	16	5	17	16	16	15	15	14	22	17.4	24		
28	14	14	13	9	7	9	8	6	8	11	13	15	16	16	16	15	5	6	3	2	3	2	1	1	16	9.0	24		
29	1	1	1	1	1	1	1	1	4	5	7	9	11	12	13	14	15	5	10	11	10	12	8	5	4	5	7.0	24	
30	6	4	5	3	9	10	10	8	7	9	14	16	18	20	5	22	22	22	23	25	25	25	25	26	26	15.4	24		
31	27	28	27	26	26	26	24	23	22	26	28	30	32	32	34	34	33	33	32	31	32	32	32	32	33	34	29.1	24	
HOURLY MAX	15.2	14.9	14.9	14.7	14.5	14.1	14.2	13.3	13.7	15.4	18.1	19.3	20.2	20.4	20.9	19.6	17.8	16.1	15.0	15.1	17.0	15.9	16.4	16.6					
HOURLY AVG																													

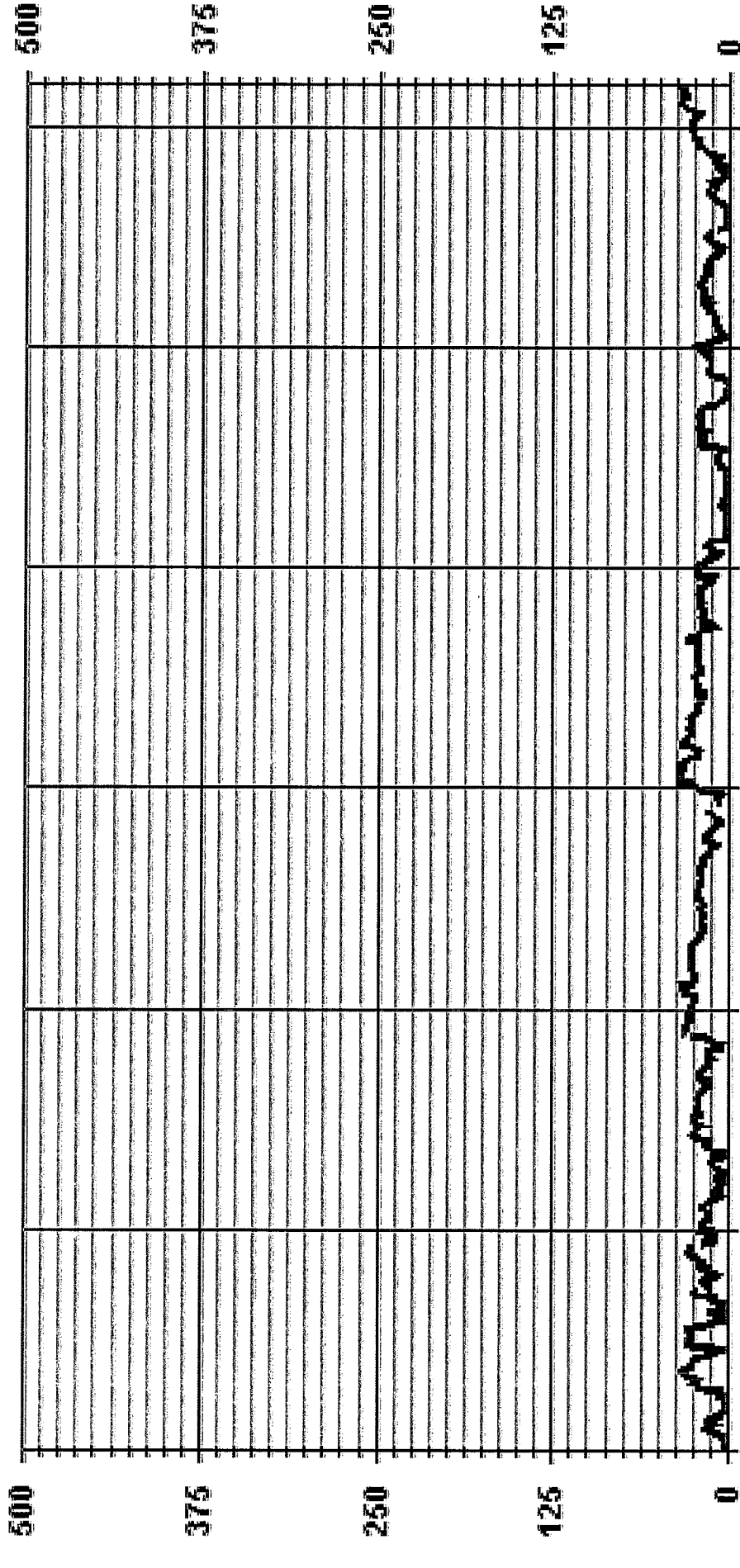
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN/CHECK	X	MACHINE/FAULT/FUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT OF REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	708
MAXIMUM INSTANTANEOUS VALUE:	35 PPB @ HOUR(S) 4 ON DAY(S) 16
12S CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	4 HRS
OPERATIONAL TIME:	744 HRS
STANDARD DEVIATION:	8.98
VAR- VARIOUS	

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA O3MAX PPB

LICA
O3_ / WD Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
Parameter : O3
Units : PPS

Wind Parameter : WD
Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50	2.53	1.83	.98	1.26	11.28	11.28	13.96	4.23	2.67	3.52	4.65	18.75	8.46	3.94	5.50	5.07	100.00
< 110	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 210	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	2.53	1.83	.98	1.26	11.28	11.28	13.96	4.23	2.67	3.52	4.65	18.75	8.46	3.94	5.50	5.07	

Calm : .00 %

Total # Operational Hours : 709

Distribution By Samples

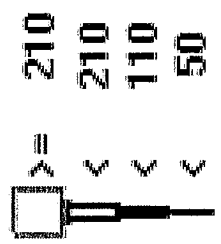
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50	18	13	7	9	80	80	99	30	19	25	33	133	60	28	39	36	709
< 110																	
< 210																	
>= 210																	
Totals	18	13	7	9	80	80	99	30	19	25	33	133	60	28	39	36	

Calm : .00 %

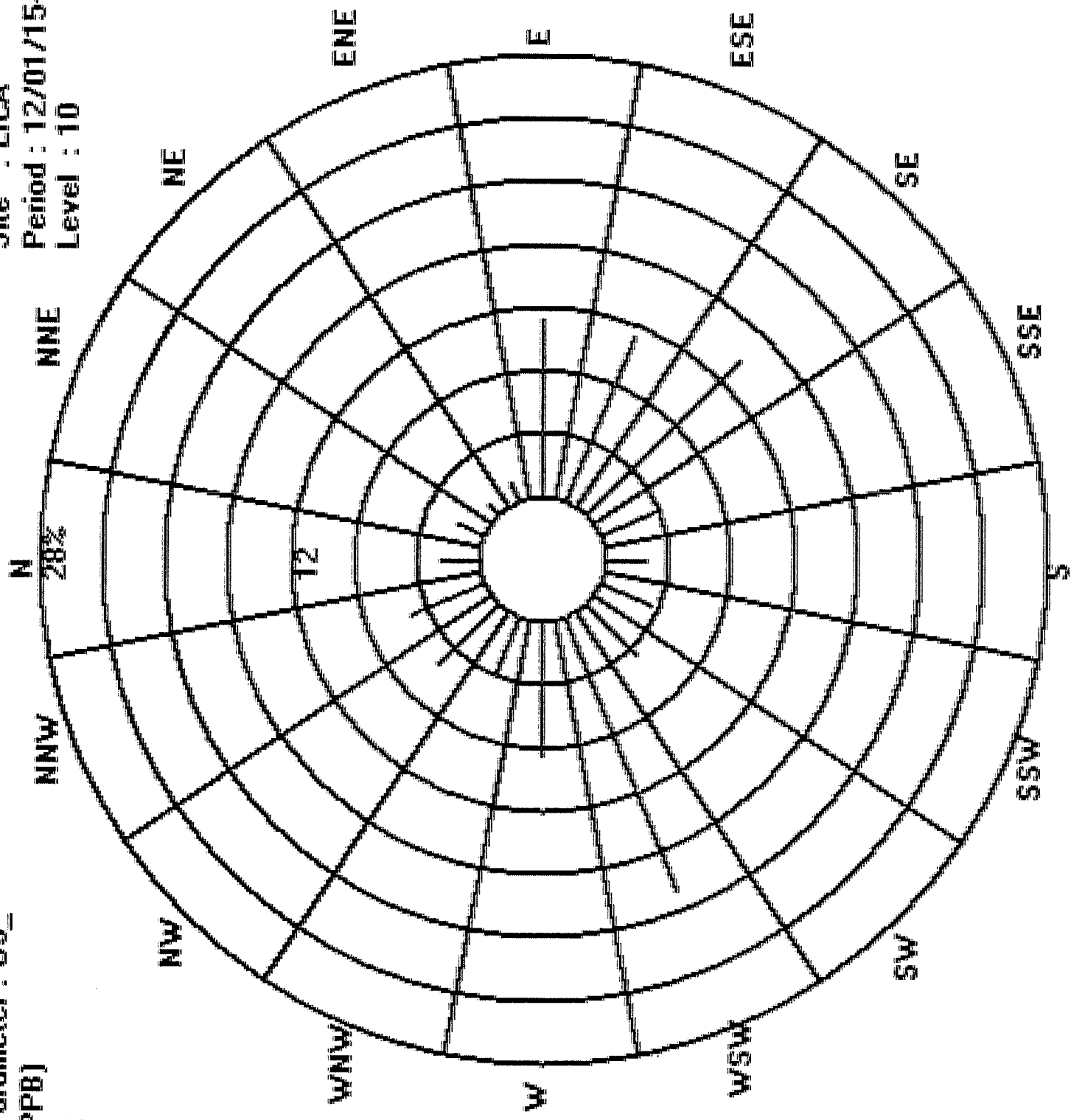
Total # Operational Hours : 709

Logger : 01 Parameter : O3_

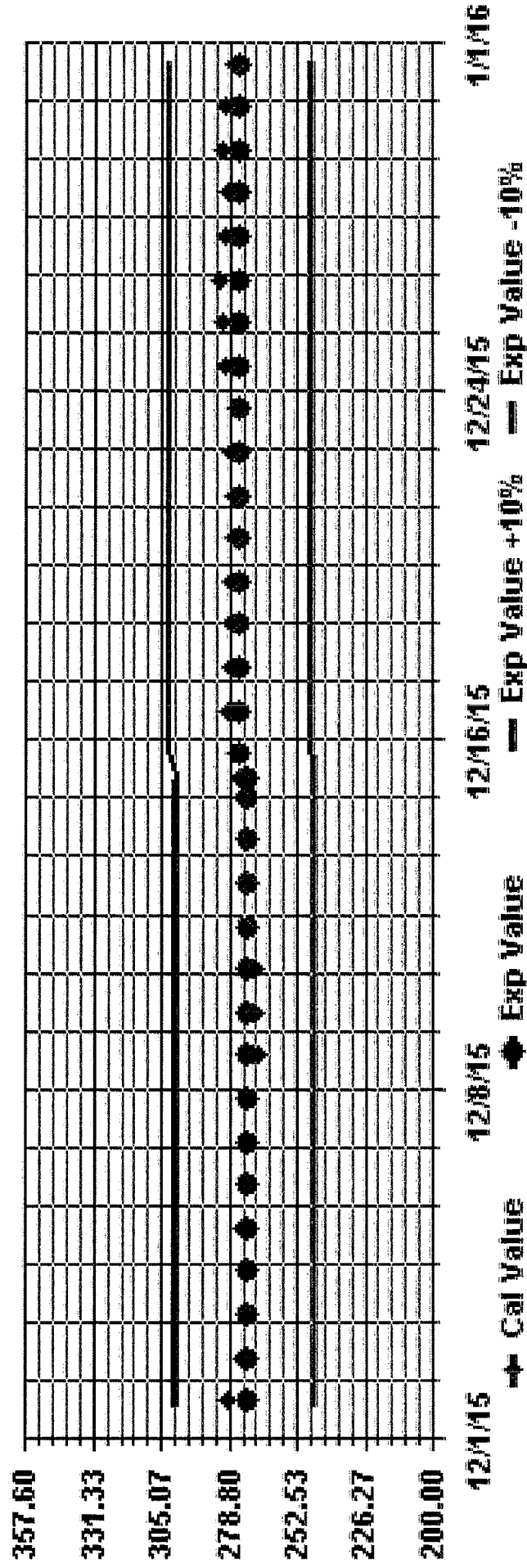
Class Limits (PPB)



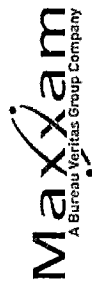
Site : LICA
Period : 12/01/15-12/31/15
Level : 10



Calibration Graph for Site: LICA Parameter: O3_ Sequence: O3 Phase: SPAN



PARTICULATE MATTER 2.5



PARTICULATE MATTER 2.5 (LESS THAN 2.5 MICRONS) (PM2.5) hourly averages in ug/m3

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	24:00			
HOUR END	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	RDGS.			
DAY																												
1	14	16	13	14	13	14	14	14	13	18	18	22	22	21	23	20	19	22	21	24	29	25	26	23	24	29	19.5	24
2	21	21	20	22	19	23	23	23	23	22	25	22	13	13	13	11	8	5	6	6	6	2	7	4	4	25	14.1	24
3	3	4	1	4	7	5	3	6	16	6	4	0	5	10	6	7	8	7	3	2	1	3	3	7	8	16	4.9	24
4	4	8	10	7	5	7	5	4	2	6	8	6	7	7	8	2	3	5	0	5	10	13	18	20	20	7.1	24	
5	19	14	10	4	8	3	2	2	1	3	4	0	0	0	2	2	2	3	6	9	11	7	7	6	19	5.2	24	
6	1	4	3	0	6	3	4	6	7	2	2	4	1	2	4	4	2	2	5	1	1	1	3	5	7	3.0	24	
7	5	4	3	13	14	4	5	9	12	7	9	12	13	10	12	8	8	13	15	10	8	8	9	10	15	9.2	24	
8	9	8	4	4	7	1	1	2	4	5	8	4	6	22	5	8	2	8	2	8	10	7	5	22	22	6.2	24	
9	6	6	8	4	3	7	4	6	8	8	8	10	11	11	11	5	8	5	4	6	6	6	8	8	11	6.7	24	
10	10	8	7	9	8	9	10	9	8	3	0	1	2	2	5	4	2	7	4	4	4	0	3	4	10	5.3	24	
11	3	4	3	3	2	0	1	1	0	1	0	0	0	7	33	7	16	3	3	0	1	1	2	3	33	3.9	24	
12	0	0	0	0	1	5	6	4	2	0	3	7	7	5	5	1	4	6	5	2	3	4	0	2	6	1.9	24	
13	6	0	3	4	4	6	4	2	0	3	3	7	7	5	5	1	4	6	5	2	3	4	0	2	7	3.6	24	
14	3	0	2	3	0	0	1	0	0	2	2	5	1	3	4	0	5	0	0	0	3	8	6	8	8	2.7	24	
15	9	13	18	17	19	17	12	17	16	17	15	14	11	14	14	11	13	12	13	17	13	13	14	12	19	14.2	24	
16	8	8	3	2	0	0	0	0	1	0	2	0	3	2	1	0	0	0	0	0	1	3	2	1	8	1.5	24	
17	4	1	1	0	0	1	0	1	0	1	2	0	0	2	1	1	1	2	2	2	2	2	1	2	4	1.2	24	
18	2	3	5	1	2	1	3	2	4	1	3	5	0	4	2	0	3	0	1	6	4	1	6	4	6	2.6	24	
19	3	5	5	12	8	8	6	3	4	5	13	4	3	4	7	1	6	5	4	4	5	3	5	2	13	5.2	24	
20	9	8	10	8	6	5	4	5	9	6	8	12	7	9	11	6	6	8	12	10	10	6	8	12	8.0	24		
21	9	5	6	7	4	8	5	8	6	9	11	11	12	13	17	21	21	19	19	16	24	18	17	14	24	12.5	24	
22	17	16	13	15	13	14	13	13	12	13	12	23	26	22	23	21	23	24	25	26	23	24	20	17	21	26	19.2	24
23	18	17	20	19	21	20	18	17	17	16	16	16	16	C	4	16	17	15	14	14	3	6	3	6	1	21	13.7	24
24	3	1	1	1	3	0	2	5	1	0	0	1	4	1	4	4	5	6	9	4	4	4	1	5	9	2.9	24	
25	5	3	2	6	7	2	3	7	6	6	8	4	5	5	7	5	4	2	5	4	6	5	3	2	8	4.7	24	
26	3	6	10	9	9	11	9	12	8	9	5	11	7	8	8	13	10	9	7	9	3	3	9	8	13	8.2	24	
27	12	8	5	4	8	4	5	6	8	10	14	8	9	5	7	4	10	8	15	10	6	6	10	10	15	8.0	24	
28	11	8	10	8	9	11	8	8	8	8	11	11	9	8	6	9	12	11	10	12	6	10	9	10	12	9.3	24	
29	12	12	11	10	9	8	7	8	4	6	6	11	14	11	12	8	8	11	12	15	10	13	10	9	15	9.9	24	
30	10	11	8	6	10	14	15	16	17	20	13	14	9	10	6	6	8	5	10	5	10	5	8	8	4	20	9.8	24
31	1	2	4	5	8	8	11	10	11	8	4	0	3	0	2	0	0	1	5	2	2	8	3	2	3	11	4.2	24
HOURLY MAX	21	21	20	22	21	23	23	23	23	22	25	23	26	22	23	33	23	24	25	26	29	25	26	23	24			
HOURLY AVG	7.7	7.3	7.2	7.1	7.5	6.9	6.6	7.3	7.5	7.4	7.8	7.5	6.7	7.6	8.5	6.9	7.5	7.0	8.0	7.4	7.5	6.9	7.5	7.4				

ALBERTA ENVIRONMENT: 24-HR: 30 ug/m3

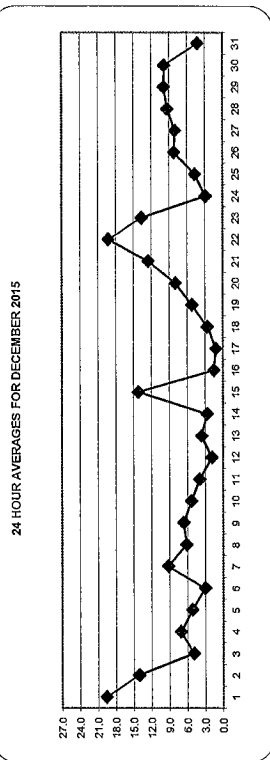
OBJECTIVE LIMIT:

STATUS FLAG CODES

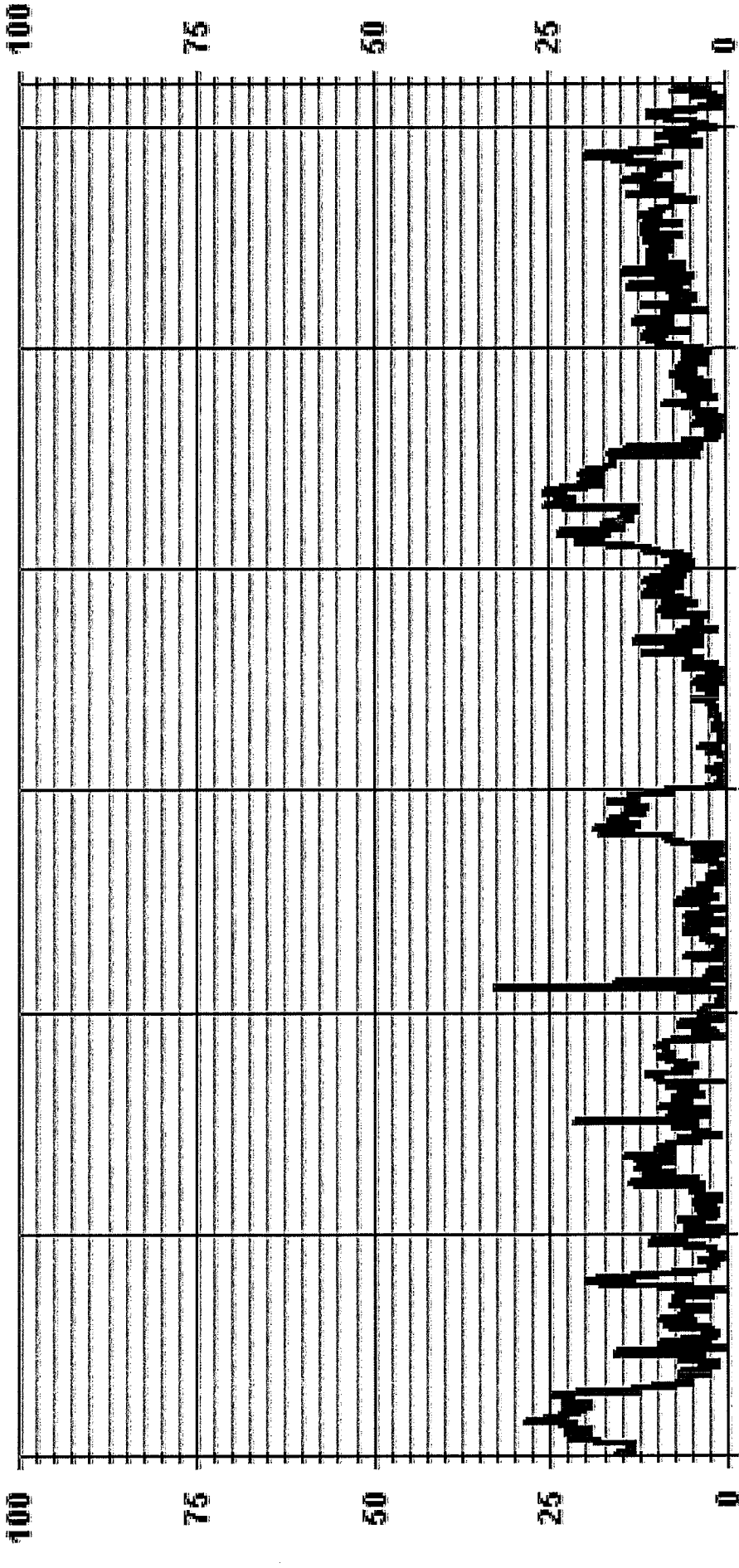
- C - CALIBRATION
- Y - MAINTENANCE
- S - DAILY ZERO/SPEAN CHECK
- P - POWER FAILURE
- G - OUT FOR REPAIR
- Q - QUALITY ASSURANCE
- R - RECOVERY
- X - MACHINE MALFUNCTION
- O - OPERATOR ERROR
- K - COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF 24-HR EXCEEDENCES:	0
NUMBER OF NON-ZERO READINGS:	679
MAXIMUM 1-HR AVERAGE:	33 ug/m3
MAXIMUM 24-HR AVERAGE:	19.5 ug/m3
MONTHLY CALIBRATION TIME:	2 HRS
STANDARD DEVIATION:	6.09
ON DAY(S)	14
ON DAY(S) VAR-VARIOUS	1
OPERATIONAL TIME:	744 HRS
AMD OPERATION UPTIME:	100.0 %
MONTHLY AVERAGE:	7.4 ug/m3



01 Hour Averages



12/04/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA PM2 UG/M3

LICA
 PM2 / WD Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 01
 Site Name : LICA
 Parameter : PM2
 Units : UG/M3

Wind Parameter : WD
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 30	2.42	1.88	.94	1.48	10.91	11.05	13.88	4.31	2.83	3.63	4.71	19.00	8.35	3.77	5.79	4.85	99.86
< 60	.00	.00	.00	.00	.00	.13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.13
< 80	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 120	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 240	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 240	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	2.42	1.88	.94	1.48	10.91	11.18	13.88	4.31	2.83	3.63	4.71	19.00	8.35	3.77	5.79	4.85	

Calm : .00 %

Total # Operational Hours : 742

Distribution By Samples

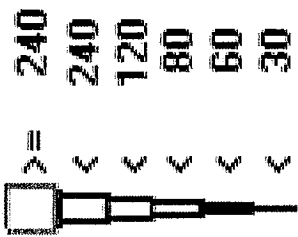
Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 30	18	14	7	11	81	82	103	32	21	27	35	141	62	28	43	36	741
< 60																	1
< 80																	
< 120																	
< 240																	
>= 240																	
Totals	18	14	7	11	81	83	103	32	21	27	35	141	62	28	43	36	

Calm : .00 %

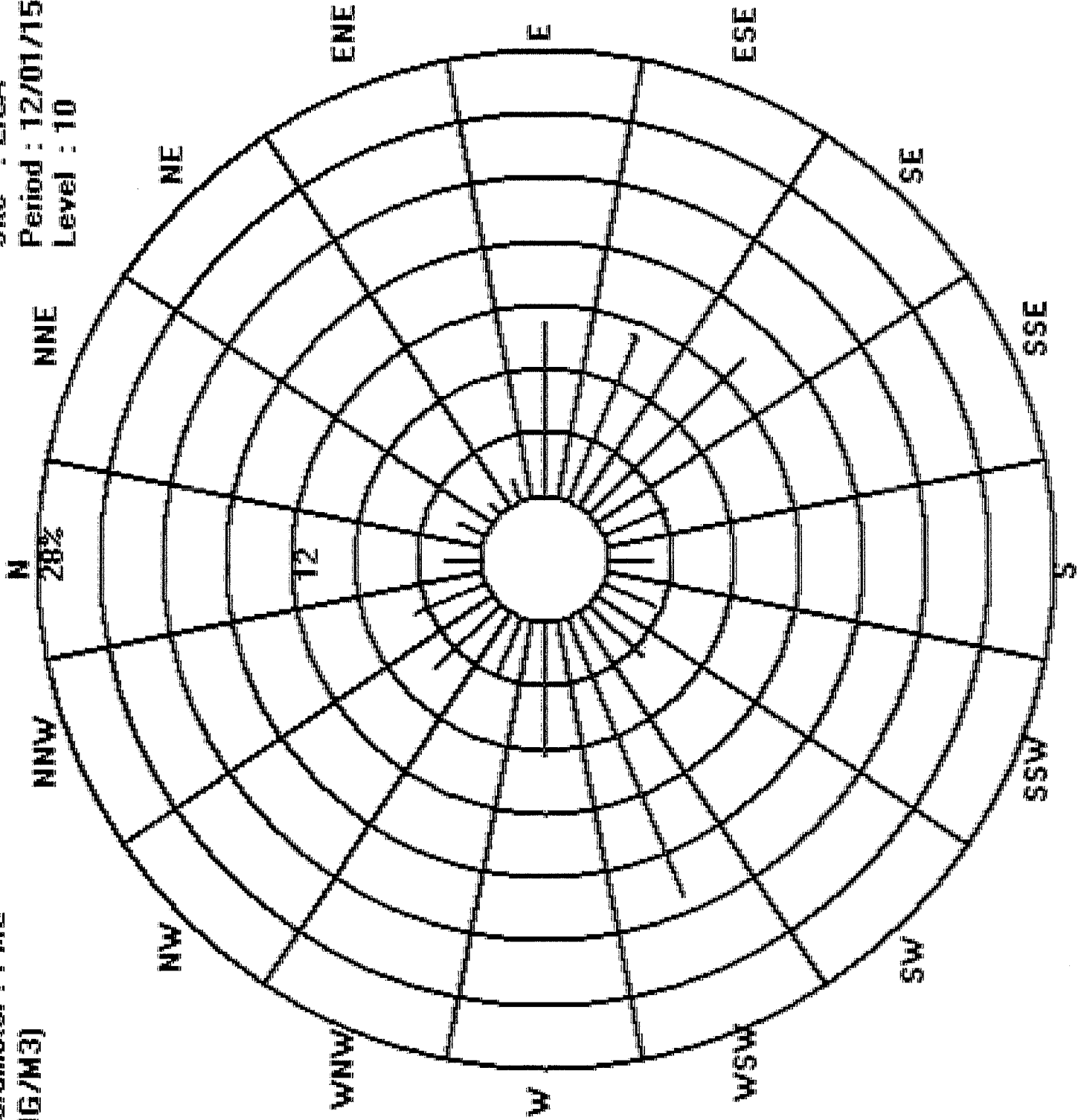
Total # Operational Hours : 742

Logger : 01 Parameter : PM2

Class Limits (UG/M3)



Site : LICA
Period : 12/01/15-12/31/15
Level : 10



WIND SPEED



WIND SPEED (WS) hourly averages in km/hr

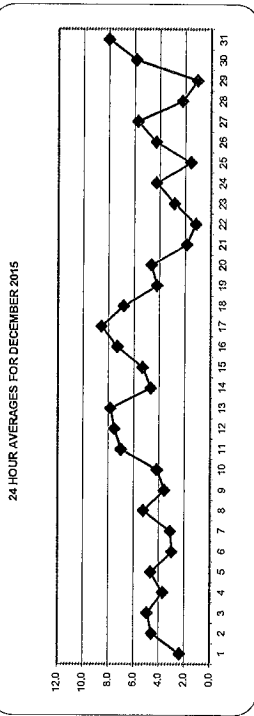
MST

DAY	HOUR START																								24-HOUR AVG.
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	
1	0.4	0.5	0.9	0.5	1.0	1.5	0.9	0.7	1.2	0.7	1.0	2.1	2.3	2.6	3.8	6.1	6.4	6.8	8.3	6.4	1.7	0.3	0.7	8.3	2.4
2	0.7	1.2	0.6	0.5	0.8	1.4	0.9	2.5	0.3	1.6	1.2	1.4	2.3	7.0	7.2	5.1	3.9	7.5	9.7	13.7	11.2	10.3	10.2	8.5	4.6
3	8.4	7.0	2.5	1.1	1.8	1.9	0.9	2.6	2.4	8.8	10.9	11.3	10.0	8.9	8.4	4.9	3.1	7.7	6.8	4.1	0.7	1.6	1.0	11.3	4.9
4	2.1	1.7	0.2	1.7	2.6	1.7	2.6	0.7	1.9	0.9	4.5	8.5	3.8	6.3	10.0	7.9	8.2	5.9	5.0	3.6	3.8	4.0	0.3	10.0	3.7
5	1.4	2.5	3.1	2.5	2.3	6.6	6.6	5.7	7.3	8.3	7.4	9.0	8.9	7.4	8.4	7.1	1.0	1.2	1.9	2.0	2.5	2.9	3.7	2.0	4.7
6	3.2	4.5	6.1	7.1	6.6	7.0	2.2	2.9	2.3	8.5	7.3	8.3	2.8	2.9	3.1	0.8	2.2	1.8	0.9	0.6	0.9	1.4	2.8	2.2	7.1
7	1.8	0.9	1.2	2.3	3.0	2.1	0.7	3.7	0.7	5.3	6.0	4.1	3.1	3.6	2.5	2.3	1.6	0.3	2.5	4.8	5.5	4.9	6.2	6.0	3.1
8	5.1	2.5	6.4	5.7	9.6	8.7	8.6	5.2	4.7	3.2	2.1	2.7	1.5	3.0	2.8	4.0	4.7	4.6	5.4	7.2	6.5	6.5	7.5	8.0	9.6
9	5.6	5.8	2.6	4.6	5.4	4.3	1.5	1.6	4.1	2.8	0.7	3.6	3.1	1.4	2.6	4.2	3.2	4.4	5.4	4.1	3.4	4.0	3.9	3.9	5.8
10	2.9	2.8	2.7	0.9	0.4	0.6	0.8	1.8	3.0	2.8	2.9	2.8	4.2	4.8	5.0	5.8	6.3	6.3	5.9	9.2	7.8	7.0	7.4	6.3	9.2
11	5.5	8.1	6.8	3.5	4.4	4.8	4.8	5.7	6.1	7.6	7.7	9.1	9.7	8.1	8.7	8.4	7.4	6.8	6.2	6.2	7.2	6.4	8.5	9.4	7.5
12	9.9	10.0	9.2	9.8	8.0	7.9	7.5	7.2	6.8	6.6	7.7	8.3	8.8	6.9	7.0	6.1	5.5	5.9	5.3	7.0	6.9	7.2	7.3	8.5	10.0
13	6.9	8.5	8.5	8.8	9.9	9.2	9.8	9.6	7.2	7.6	9.6	9.6	7.5	7.8	5.0	6.7	7.0	8.8	8.5	7.6	7.0	5.0	4.1	9.9	7.9
14	2.1	3.8	5.0	7.7	7.4	5.9	6.8	7.0	6.1	6.2	4.8	5.3	4.5	4.3	4.0	0.7	1.4	1.2	1.9	4.4	4.6	5.0	5.4	6.9	7.7
15	6.9	6.7	5.9	5.6	4.8	4.8	2.7	1.6	2.3	3.5	5.8	5.4	5.4	4.3	4.0	0.7	1.4	1.2	1.9	4.4	4.6	5.0	5.4	6.9	7.7
16	3.9	8.7	9.9	7.1	12.5	8.4	6.9	4.8	5.7	5.0	9.4	12.9	10.9	10.6	10.8	7.0	7.3	6.3	3.8	5.2	5.8	4.8	4.5	4.0	12.9
17	4.3	5.1	7.5	8.0	9.4	7.6	8.8	6.3	7.7	9.9	10.1	10.7	11.4	11.1	13.3	9.5	10.2	7.4	6.5	8.9	9.1	7.0	5.0	13.3	8.6
18	3.8	4.5	5.1	4.0	1.9	2.6	4.2	6.3	7.5	9.0	7.6	8.5	6.6	6.0	6.4	7.0	8.4	8.9	8.6	9.9	8.2	10.9	8.3	10.9	6.8
19	6.9	7.5	7.0	5.4	5.8	4.9	4.0	4.4	4.3	3.5	3.9	7.2	5.2	5.2	4.9	1.8	0.8	0.3	1.2	2.5	4.5	3.5	3.8	3.0	7.5
20	4.1	3.1	3.7	4.2	4.6	4.8	3.9	5.4	5.1	4.7	5.4	6.4	6.4	7.3	6.4	4.4	4.3	2.7	3.7	2.6	4.0	5.4	5.3	3.9	7.3
21	5.2	3.9	1.7	0.7	1.2	1.1	0.9	1.0	1.7	3.5	2.6	3.2	2.8	3.3	3.6	3.2	0.7	0.2	0.7	0.8	0.5	0.6	1.5	0.8	5.2
22	0.6	0.4	0.8	1.0	1.1	0.6	1.3	0.5	0.8	2.0	2.1	0.9	3.4	1.9	2.2	1.2	1.3	1.0	1.0	0.4	0.5	0.1	1.8	0.9	3.4
23	1.5	0.7	0.1	1.7	0.4	1.3	0.5	0.8	2.0	2.1	0.9	3.4	1.9	2.2	1.2	1.3	1.0	1.0	0.4	0.5	0.1	1.8	0.9	3.4	
24	4.8	5.3	3.8	4.1	6.9	9.6	8.2	6.9	5.1	4.2	6.4	5.5	5.8	5.8	7.3	4.9	2.8	0.5	1.1	0.8	0.2	0.6	1.0	0.2	9.6
25	0.4	0.7	1.0	0.1	0.7	0.7	1.4	0.2	0.2	1.1	3.0	1.2	1.6	1.0	2.2	1.0	2.2	1.4	2.1	3.8	3.5	4.2	3.4	3.0	4.2
26	4.6	6.2	6.0	6.1	6.1	5.8	4.1	0.8	5.1	3.3	0.8	1.6	3.1	1.2	1.4	3.6	4.4	4.8	6.0	5.8	7.1	7.0	4.2	3.8	7.1
27	8.5	8.4	8.4	6.8	6.9	6.9	7.9	9.8	5.9	6.3	6.0	6.7	6.6	6.5	6.6	7.3	5.9	4.6	4.7	1.6	1.2	1.9	1.0	1.6	9.8
28	1.4	0.8	2.9	3.7	3.2	3.2	4.0	2.8	3.0	2.0	2.4	5.4	4.0	4.5	4.3	1.2	0.4	0.4	0.3	1.1	0.8	0.3	0.7	0.7	5.4
29	0.6	0.4	1.0	0.6	0.6	1.3	0.4	0.5	1.0	1.7	1.3	0.8	1.3	2.9	2.3	1.0	1.6	0.8	1.4	1.9	0.3	0.8	0.9	0.3	2.9
30	1.2	1.8	1.0	1.1	4.9	6.9	5.9	5.6	6.0	4.2	6.6	6.2	6.2	5.2	6.0	7.3	7.7	7.9	8.8	8.8	8.0	7.9	7.5	8.4	8.8
31	7.9	8.8	6.9	6.2	6.6	7.1	7.2	6.2	6.1	7.9	10.9	12.1	13.2	11.2	10.0	10.1	6.5	5.4	7.3	6.3	6.5	6.8	7.4	8.3	13.2
HOURLY MAX	9.9	10.0	9.9	9.8	12.5	9.6	9.8	9.8	9.7	9.9	10.9	12.9	13.2	11.2	11.1	13.3	9.5	10.2	9.7	13.7	11.2	10.3	10.9	8.5	
HOURLY AVG	4.0	4.3	4.1	4.0	4.5	4.5	4.1	4.0	4.1	4.5	5.0	5.9	5.4	5.5	5.4	4.9	4.2	4.1	4.4	5.1	4.8	4.8	4.6	4.3	

STATUS FLAG CODES

C	- CALIBRATION	O	- QUALITY ASSURANCE
M	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

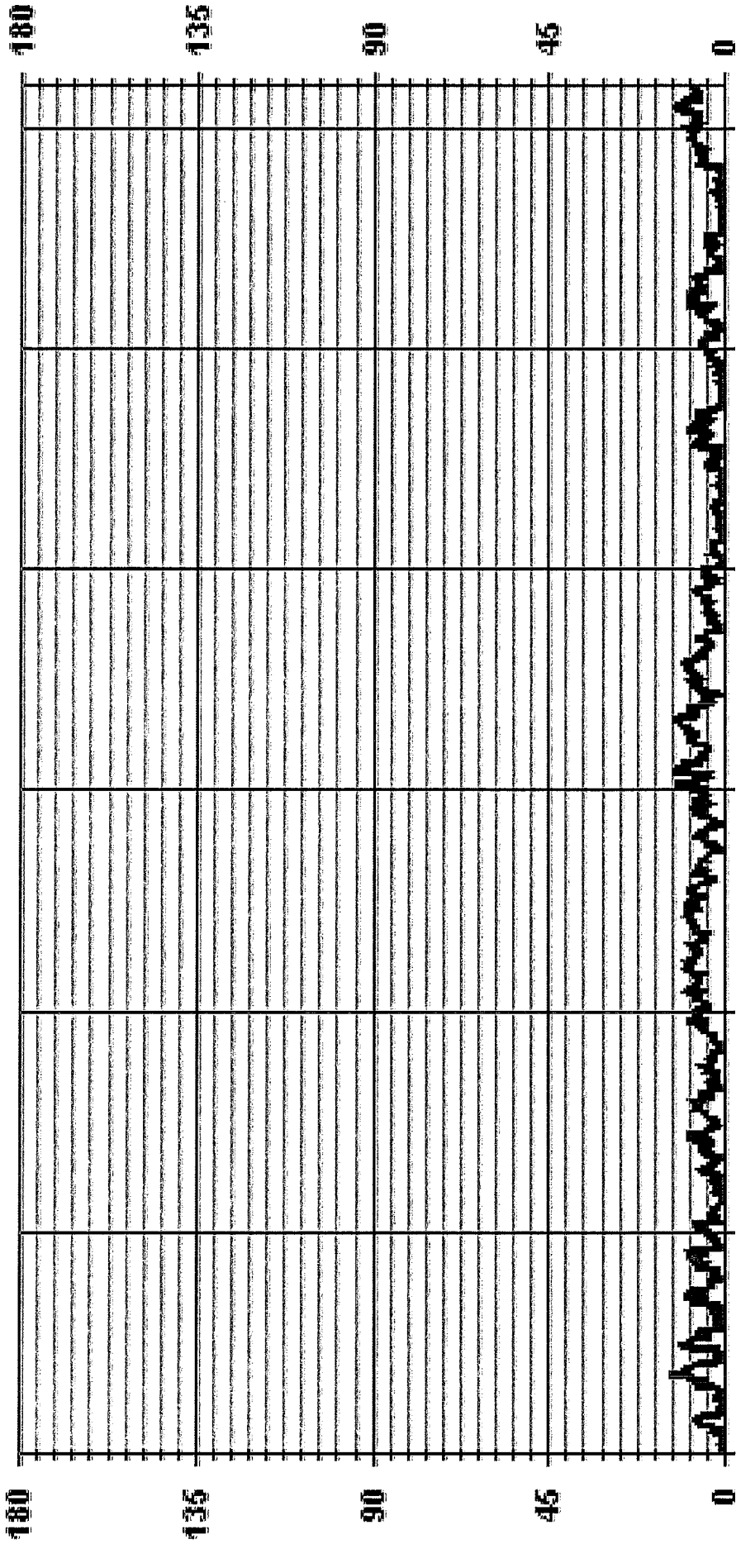
LAST CALIBRATION: April 1, 2015
DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MAXIMUM 1-HR AVERAGE:	13.7 KPH
MAXIMUM 24-HR AVERAGE:	8.6 KPH
MONTHLY CALIBRATION TIME:	0 HRS
STANDARD DEVIATION:	2.99
ON DAY(S)	19
ON DAY(S) VAR- VARIOUS	17
OPERATIONAL TIME:	744 HRS
AMD OPERATION UPTIME:	100.0 %
MONTHLY AVERAGE:	4.6 KPH

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA WSP KPH



VECTOR WIND SPEED MAX instantaneous maximum in km/hr

MST

DAY	HOURS																								24-HOUR AVG.	BDES.		
	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300			2400	
1	1.3	2.3	1.6	3.4	3.9	3.3	3.2	3.9	4.6	4.5	4.3	7.0	8.7	8.2	5.8	8.6	10.2	9.7	9.7	11.3	9.4	5.1	4.6	4.2	11.3	5.8	24	
2	2.4	4.7	2.2	3.0	2.6	2.8	4.2	9.2	4.0	4.9	6.7	6.2	8.0	14.5	10.8	8.7	8.0	10.8	15.6	19.1	16.6	14.3	12.8	14.3	12.8	19.1	8.6	24
3	17.3	9.9	5.6	4.9	4.2	3.3	5.4	4.4	6.0	15.3	18.4	16.0	15.1	14.0	12.3	8.5	5.9	11.7	12.3	8.3	3.7	3.6	4.0	4.4	18.4	8.9	24	
4	4.7	4.3	3.5	5.1	4.7	4.8	5.5	5.7	6.4	6.7	10.0	13.3	11.4	15.0	16.4	11.9	11.3	7.9	7.6	5.0	6.1	7.9	3.3	4.8	16.4	7.6	24	
5	3.3	7.2	7.4	4.7	5.4	9.5	10.1	8.9	12.3	12.6	11.7	13.7	15.0	13.4	14.3	11.7	4.6	3.0	3.9	4.9	4.3	4.9	6.4	4.2	15.0	8.2	24	
6	6.9	8.0	10.5	10.9	12.2	14.3	6.9	5.4	4.9	5.0	7.0	6.7	7.1	5.3	5.0	4.5	4.8	3.6	5.8	3.2	4.1	3.0	7.6	7.5	14.3	6.7	24	
7	5.4	4.4	3.1	5.1	8.3	7.1	5.5	7.6	7.2	9.3	10.3	7.4	5.9	7.0	7.1	5.6	4.3	4.0	4.6	8.2	7.9	9.5	9.9	8.1	10.3	6.8	24	
8	8.5	5.9	9.6	10.7	13.5	12.2	13.3	8.1	8.5	5.9	5.2	6.9	4.5	5.5	4.6	7.2	7.6	8.4	9.3	11.2	13.6	11.5	13.4	12.2	13.6	9.1	24	
9	11.0	10.0	5.0	8.5	9.0	8.5	5.3	5.7	7.2	5.5	5.3	7.7	7.3	6.4	7.8	7.0	5.4	8.0	7.5	7.5	5.8	6.6	6.3	6.3	11.0	7.1	24	
10	5.6	5.1	5.7	4.3	2.3	4.0	2.5	3.7	6.4	6.2	5.3	7.8	8.4	8.7	8.0	10.8	9.7	9.9	9.9	14.9	12.8	12.7	11.7	15.8	15.8	8.0	24	
11	8.8	13.0	11.5	6.3	7.8	11.1	13.0	10.3	15.8	12.4	10.2	15.8	16.4	13.1	15.8	12.9	10.9	8.9	10.7	12.4	9.9	14.0	14.5	13.5	16.4	12.0	24	
12	15.5	15.2	12.9	16.3	12.9	13.2	12.2	13.2	11.8	11.2	14.5	13.9	14.3	11.2	14.7	12.1	8.7	10.5	9.6	13.9	10.5	12.5	13.3	13.6	16.3	12.8	24	
13	11.7	14.1	13.2	12.9	14.2	14.9	16.6	15.5	12.2	12.7	14.5	17.3	11.2	15.5	8.2	14.7	12.9	14.5	14.5	16.6	12.9	11.2	10.7	7.6	17.3	13.3	24	
14	6.5	7.2	10.1	12.7	10.4	10.8	10.4	10.1	9.4	9.3	7.8	8.5	9.8	9.4	7.5	3.0	2.8	3.6	4.2	7.4	8.4	7.6	10.5	11.3	12.7	8.3	24	
15	11.4	10.2	9.2	13.6	10.9	5.8	4.4	5.5	5.9	10.0	11.2	11.7	10.9	11.9	14.8	11.2	9.0	6.9	8.4	12.3	9.2	8.0	9.1	10.5	14.8	9.7	24	
16	6.8	12.2	16.3	13.3	20.6	15.2	12.0	10.3	10.3	10.5	17.1	21.0	19.1	18.4	18.7	11.4	11.8	9.1	6.4	9.0	8.8	7.1	7.0	6.2	21.0	12.4	24	
17	8.3	9.4	14.0	12.1	16.7	13.8	13.3	10.7	12.3	14.8	15.9	19.9	16.9	19.0	19.1	21.5	16.6	15.8	14.3	13.5	14.0	13.3	12.9	8.5	21.5	14.4	24	
18	7.8	8.6	9.7	6.8	4.8	7.0	6.2	10.3	12.7	14.0	11.0	14.0	12.8	9.7	10.5	12.2	14.1	14.2	14.3	15.5	13.7	17.3	17.8	14.1	17.8	11.6	24	
19	11.7	13.5	11.8	9.4	11.3	8.3	7.9	7.5	8.5	8.2	8.6	10.7	7.3	8.3	7.9	8.4	8.1	5.8	6.3	4.7	6.8	9.3	7.5	7.5	12.0	8.2	24	
20	7.2	4.8	6.7	7.7	7.2	8.6	6.8	8.3	9.3	9.1	10.6	12.0	10.1	11.6	11.3	8.4	8.1	5.8	6.3	4.7	6.8	9.3	7.5	7.5	12.0	8.2	24	
21	9.8	6.7	3.7	2.8	5.1	4.1	3.9	4.2	3.6	9.5	3.6	4.3	9.3	6.5	5.9	6.8	6.7	2.7	2.8	6.9	7.0	8.0	4.8	3.9	2.7	9.8	5.4	24
22	3.9	4.5	3.5	3.7	2.7	6.1	3.6	4.0	7.5	3.6	4.3	9.3	6.7	5.0	4.3	4.2	5.1	7.0	6.2	3.3	3.7	4.5	6.1	3.0	9.3	4.8	24	
23	2.7	3.6	2.3	2.7	2.9	2.3	4.5	6.0	4.9	6.7	8.4	7.1	6.5	5.0	1.7	3.1	3.1	4.1	4.1	13.0	11.9	12.7	11.0	10.0	13.0	5.8	24	
24	8.1	10.3	7.7	9.0	11.5	16.0	12.9	12.7	9.6	7.7	10.2	10.3	11.5	11.1	11.7	9.3	6.0	2.2	4.1	2.9	5.0	3.3	2.6	2.8	16.0	8.3	24	
25	2.8	3.0	3.0	1.7	3.0	4.0	3.2	1.9	2.4	2.1	4.3	6.0	4.0	3.3	4.1	3.9	2.7	3.4	5.6	6.2	8.4	8.2	6.7	5.9	8.4	4.2	24	
26	6.7	11.1	9.0	8.6	8.1	7.3	5.8	2.7	9.8	9.2	3.0	6.9	7.3	6.7	5.1	6.9	9.6	9.1	9.7	9.4	11.6	10.0	7.6	8.3	11.6	7.9	24	
27	15.4	13.7	14.2	10.9	11.1	13.3	14.0	16.8	10.4	10.2	10.4	11.8	10.7	10.4	11.3	10.5	10.7	9.2	8.6	7.2	3.9	4.9	3.6	4.5	16.8	10.3	24	
28	5.0	3.4	4.8	6.5	5.5	8.1	7.1	5.3	5.7	4.7	7.3	9.0	8.2	7.1	5.8	4.5	2.4	2.3	3.7	3.4	2.0	2.3	2.5	9.0	5.0	24		
29	2.0	2.7	2.6	2.3	3.1	5.2	4.2	4.0	4.8	6.8	4.5	4.1	5.5	6.2	4.7	4.0	4.8	4.5	3.8	4.8	3.1	3.2	3.6	2.8	6.8	4.1	24	
30	2.8	6.9	6.3	6.4	8.3	11.7	11.0	8.5	8.6	8.8	10.2	9.0	9.7	8.3	9.3	11.5	11.9	11.4	13.9	12.1	12.2	11.4	11.8	11.7	13.9	9.8	24	
31	12.9	13.8	9.9	8.6	8.2	10.0	10.5	10.2	10.1	15.3	16.5	17.1	17.9	16.3	14.1	13.8	9.8	8.5	10.5	10.0	8.7	9.8	10.6	11.4	17.9	11.9	24	
HOURLY MAX	17.3	15.2	16.3	16.3	20.6	16.0	16.6	16.8	15.8	15.3	18.4	21.0	19.1	19.0	19.1	21.5	16.6	15.8	15.6	19.1	16.6	17.3	17.8	15.8				
HOURLY AVG	7.6	8.1	7.6	7.5	8.2	8.6	7.9	7.8	8.2	8.8	9.4	10.8	10.2	10.0	9.7	8.9	7.7	7.6	8.2	9.2	8.6	8.4	8.4	8.4	7.9			

STATUS FLAG CODES

C	QUALITY ASSURANCE	Q	QUALITY ASSURANCE
V	VERIFICATION	R	RECOVERY
M	MAINTENANCE	X	MACHINE MALFUNCTION
S	DAILY ZERO/SPAN CHECK	O	OPERATOR ERROR
P	POWER FAILURE	K	COLLECTION ERROR
G	- OUT FOR REPAIR		

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	21.5	KPH	@ HOUR(S)	15	ON DAY(S)	17
OPERATIONAL TIME:	744	HRS				

LIICA
WSP / WD Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LIICA
Parameter : WSP
Units : KPH

Wind Parameter : WD
Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 6.0	1.74	1.07	.80	1.47	5.10	6.85	3.49	2.68	2.95	3.89	9.67	6.18	2.95	3.22	2.41	61.42	
< 12.0	.53	.67	.00	.00	5.64	4.16	7.12	.40	.00	.67	8.73	2.15	.67	2.15	2.28	35.21	
< 20.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.40	.00	.00	.26	.13	.80	
< 29.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
< 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
>= 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
Totals	2.28	1.74	.80	1.47	10.75	11.02	13.97	3.89	2.68	2.95	4.56	18.81	8.33	3.62	5.64	4.83	

Calm : 2.55 %

Total # Operational Hours : 744

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 6.0	13	8	6	11	38	51	26	20	22	29	72	46	22	24	18	457	
< 12.0	4	5		42	31	53	3		5	65	16	5	16	17	262		
< 20.0											3			2	1	6	
< 29.0																	
< 39.0																	
>= 39.0																	
Totals	17	13	6	11	80	82	104	29	20	22	34	140	62	27	42	36	

Calm : 2.55 %

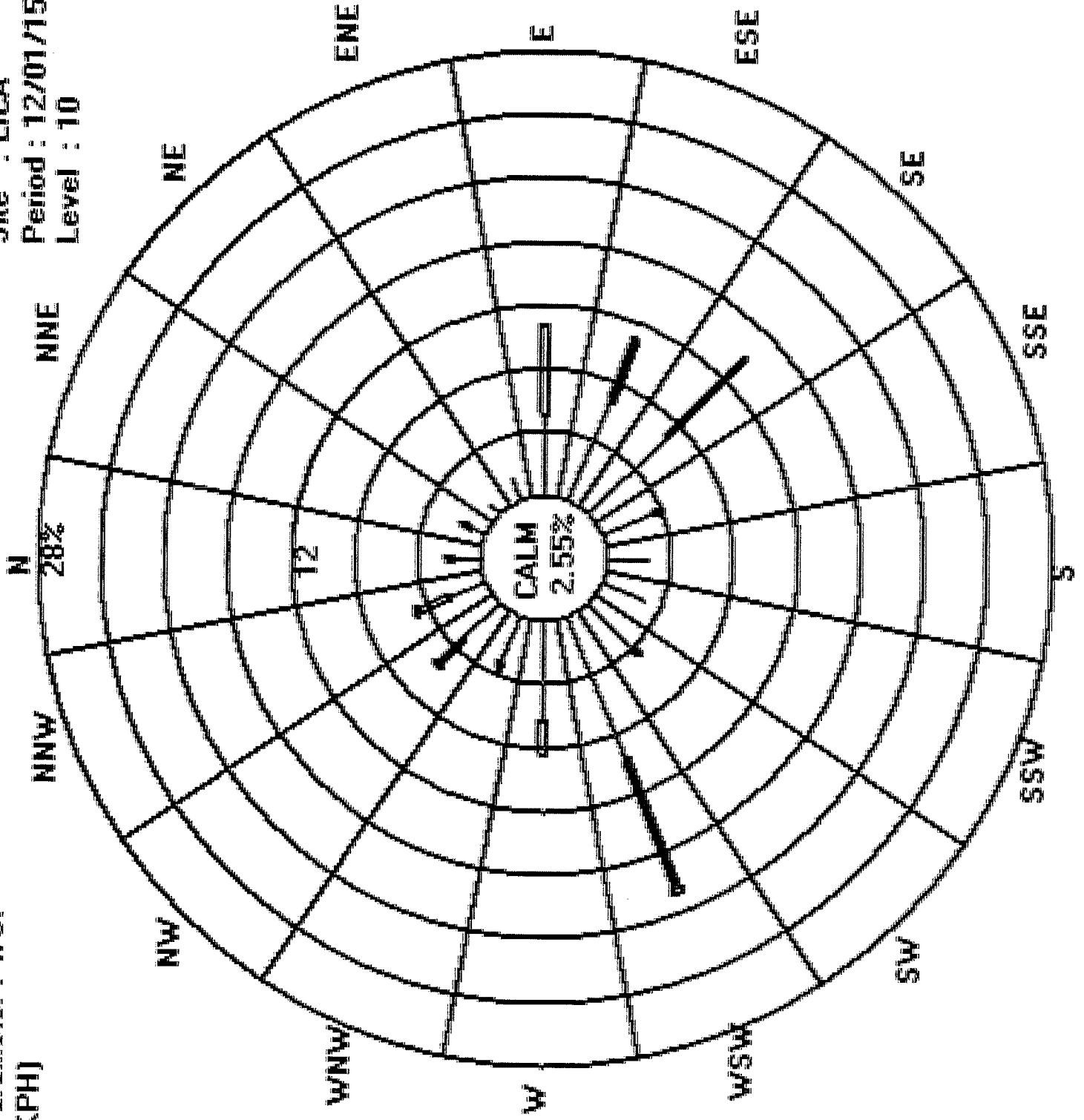
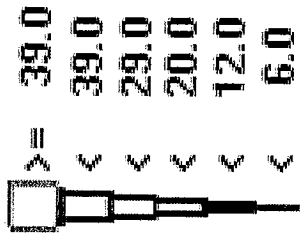
Total # Operational Hours : 744

Logger : 01 Parameter : WSP

Site : LICA

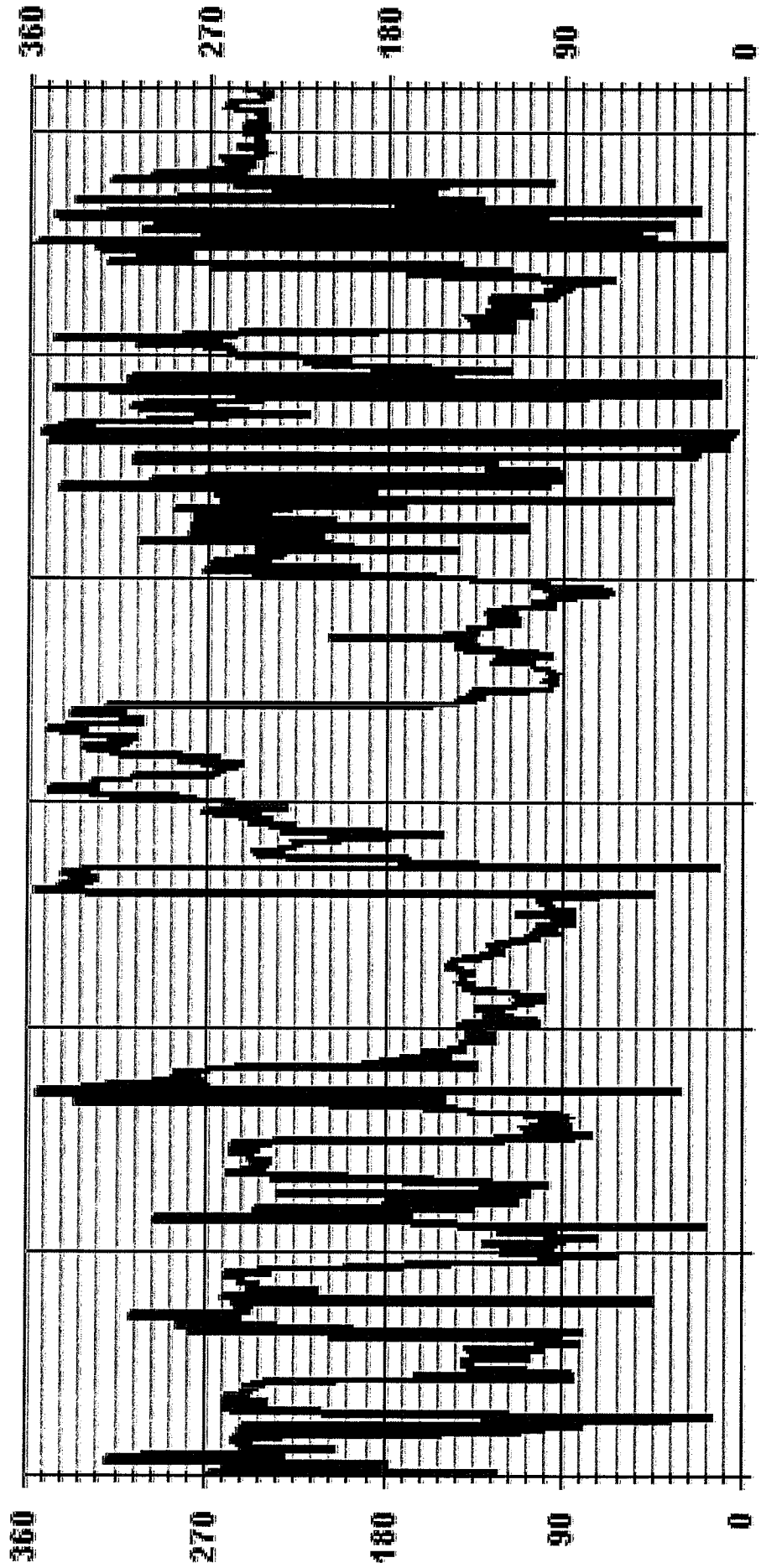
Class Limits (KPH)

Period : 12/01/15-12/31/15
Level : 10



WIND DIRECTION

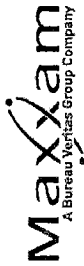
01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA - - - WDR . . . DEG

STANDARD DEVIATION WIND DIRECTION



STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00
1	52	58	42	59	28	29	59	46	43	54	37	52	58	27	33	32	19	15	13	14	14	38	65	52	
2	45	54	48	40	40	22	49	31	38	43	44	58	60	21	19	18	18	18	19	19	18	20	19	18	20
3	18	16	22	52	45	25	51	25	26	13	18	15	14	19	18	21	32	14	18	22	46	84	45	50	
4	34	42	68	59	24	41	24	50	33	50	26	18	30	33	17	17	14	13	12	12	27	21	38	40	
5	35	34	22	25	34	14	14	14	17	19	21	20	20	19	18	16	41	25	24	40	18	20	14	35	
6	38	21	20	17	20	21	51	24	36	28	18	31	34	22	64	24	26	46	33	37	39	32	40	54	
7	46	63	26	26	44	50	42	30	75	19	18	30	33	29	33	41	39	46	40	12	11	13	12	14	
8	22	19	22	16	18	16	15	13	15	19	33	31	44	23	23	18	17	26	23	18	24	22	19	18	
9	21	19	26	60	56	44	65	23	27	32	30	41	26	19	20	17	18	17	23	14	19	18	20	18	
10	16	21	24	22	22	23	20	24	21	22	24	19	22	23	21	21	21	20	22	23	22	22	21	21	
11	16	17	16	17	20	18	16	22	22	21	23	24	18	17	20	22	22	21	21	23	25	22	23	22	
12	22	22	22	21	19	18	19	21	21	20	19	19	21	23	25	21	21	19	20	20	20	19	20	22	
13	24	16	18	16	13	16	14	13	12	15	18	16	24	26	18	36	45	36	24	18	18	19	20	19	
14	16	18	21	24	28	43	56	47	50	42	23	23	24	19	20	18	18	21	18	18	20	15	18	20	
15	19	15	18	18	16	12	13	16	17	17	14	17	20	20	20	18	19	16	15	16	15	12	22	20	
16	17	19	18	14	14	13	14	14	14	13	17	18	17	16	16	20	17	16	18	16	15	16	19	20	
17	20	20	20	19	28	26	19	18	18	14	20	18	20	23	20	19	19	19	20	19	21	18	17	19	
18	21	21	23	21	21	23	24	23	22	27	26	15	18	16	18	38	68	40	44	41	17	19	17	17	
19	16	16	17	20	20	21	22	21	24	25	24	24	23	30	28	36	32	30	22	45	68	54	48	29	
20	21	22	41	70	43	55	48	50	30	33	30	28	36	32	30	22	45	68	54	48	47	60	57	37	
21	45	46	37	71	52	38	43	29	33	53	31	50	32	74	45	46	47	45	63	67	52	36	55		
22	55	50	37	46	47	47	55	25	30	28	19	22	20	32	61	38	26	32	64	20	18	21	22	17	
23	20	20	26	15	17	22	18	19	26	21	23	20	22	20	22	50	61	47	51	63	61	55	81	17	
24	19	21	20	20	21	20	21	24	25	24	24	24	23	24	21	19	21	20	25	36	48	45	58	41	
25	59	53	75	63	56	54	64	61	65	55	27	78	64	44	68	70	30	28	25	16	20	14	23	27	
26	21	19	18	15	17	26	33	69	35	57	78	64	44	68	70	30	28	25	16	20	14	23	27	30	
27	21	22	25	25	24	26	25	23	27	27	25	24	23	24	21	19	21	20	25	36	48	45	58	41	
28	64	37	19	18	22	25	22	27	17	31	30	22	29	20	18	38	59	64	47	62	65	57	60	60	
29	54	61	74	65	72	73	82	61	68	64	62	52	42	28	26	38	42	67	49	51	54	47	58	70	
30	56	39	66	61	29	20	21	19	20	24	19	21	20	20	19	18	14	15	16	16	16	15	15	17	
31	15	17	15	15	14	14	14	14	14	14	18	19	18	19	19	18	15	18	16	17	15	17	15	14	

STATUS FLAG CODES

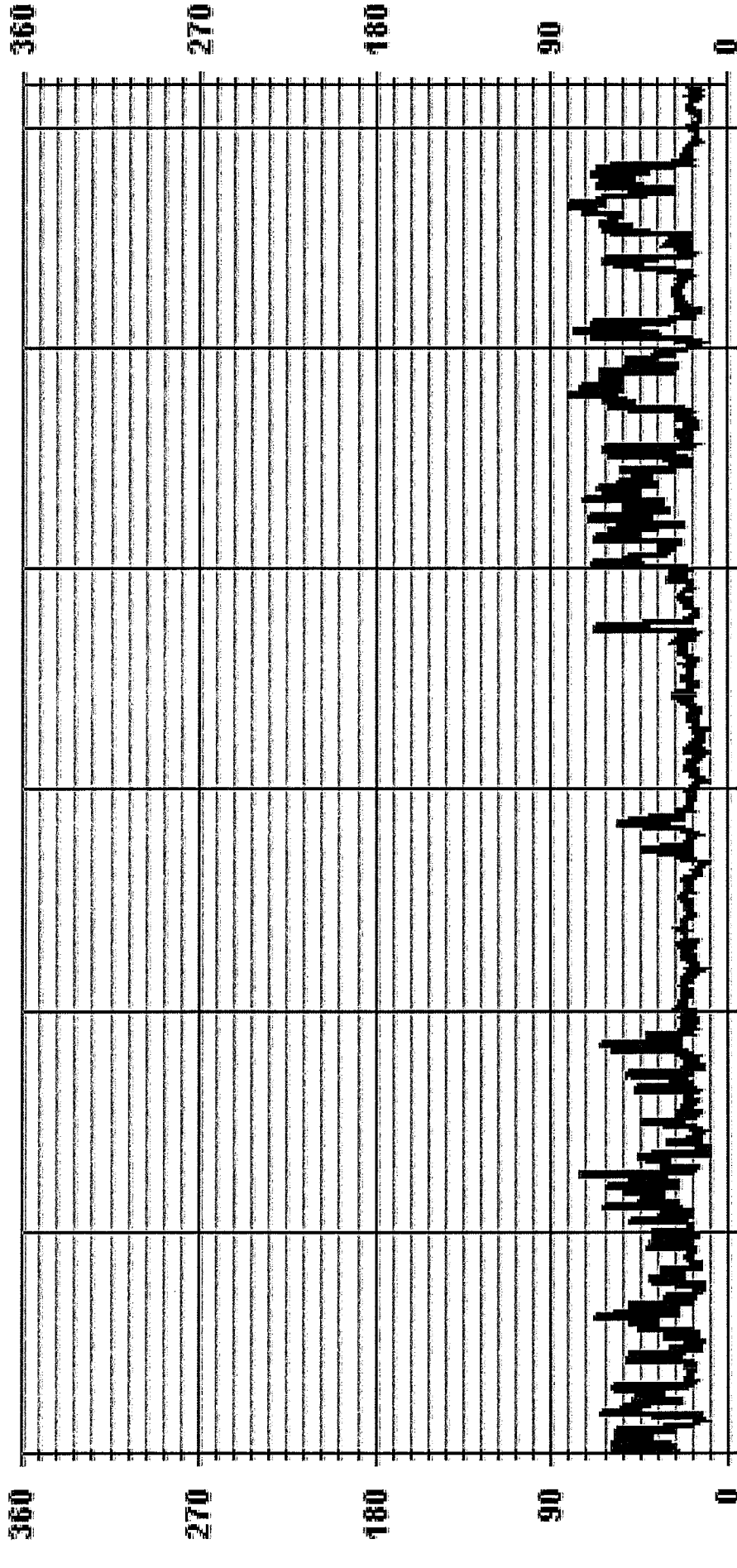
C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SIGNAL CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUTFORREPAIR	K	COLLECTION ERROR

LAST CALIBRATION:

April 1, 2015

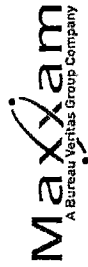
CALIBRATION TIME:	0	HRS	OPERATIONAL TIME:	744	HRS
-------------------	---	-----	-------------------	-----	-----

01 Hour Averages



— LICA STDWDIR DEG

RELATIVE HUMIDITY



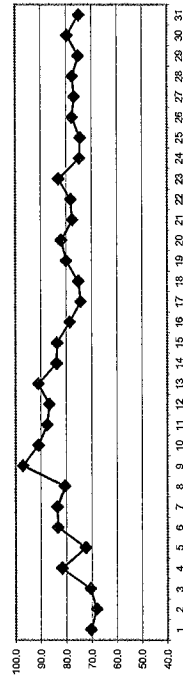
RELATIVE HUMIDITY (RH) hourly averages in %

MST	RELATIVE HUMIDITY (RH) hourly averages in %																								DAILY MAX	24-HOUR AVG.	RDGS.	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				24:00
1	82	80	80	79	80	79	78	78	78	78	74	72	62	53	48	47	54	61	63	67	68	70	74	79	81	82	70.4	24
2	82	82	83	82	82	83	82	79	78	78	78	74	72	60	59	53	52	58	67	63	60	56	57	55	55	83	68.1	24
3	57	58	64	72	76	78	80	81	81	81	67	58	55	55	57	61	65	70	73	74	76	81	84	85	86	86	70.6	24
4	87	87	88	89	92	90	91	91	90	89	86	79	74	66	57	61	68	74	78	83	84	84	86	88	92	81.8	24	
5	89	88	84	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	24
6	80	78	80	81	81	81	83	85	87	87	85	83	80	78	78	80	82	84	87	87	87	88	88	89	89	83.3	24	
7	90	89	90	91	91	90	89	88	88	88	88	83	79	73	66	64	72	79	83	86	87	88	85	84	91	83.5	24	
8	82	87	86	85	79	78	81	82	79	69	72	76	81	82	81	82	86	91	81	82	86	94	94	95	95	100	97.0	24
9	95	95	94	95	96	96	96	96	96	99	100	100	99	98	98	98	99	99	98	96	94	94	94	95	95	100	97.0	24
10	95	93	94	95	96	96	96	96	96	95	93	92	88	85	87	89	88	89	88	87	87	88	89	88	96	91.0	24	
11	87	87	87	88	87	88	87	84	80	81	83	81	80	87	92	94	94	93	92	90	89	90	89	89	89	94	87.5	24
12	90	88	84	85	87	87	87	87	88	88	88	88	88	86	83	85	90	88	86	85	86	85	86	86	86	90	86.6	24
13	86	87	88	90	92	92	92	92	92	92	92	92	92	92	92	91	91	92	92	92	93	93	91	89	87	93	91.0	24
14	86	88	88	86	88	88	88	87	86	86	87	87	86	80	78	77	78	80	81	82	84	84	84	86	88	83.7	24	
15	85	85	85	83	84	88	87	86	84	84	84	78	73	71	71	74	84	85	85	86	87	87	89	90	91	83.5	24	
16	90	89	88	88	80	77	80	81	78	78	78	78	78	68	69	68	71	77	77	79	80	80	80	80	80	90	78.6	24
17	79	79	79	78	77	77	76	76	74	74	74	74	74	73	70	69	67	70	70	70	73	75	75	75	74	79	74.3	24
18	75	76	76	76	76	76	75	74	74	74	74	74	71	69	68	69	71	74	77	79	81	81	81	81	81	81	75.2	24
19	78	79	79	79	81	81	81	80	80	80	80	79	78	78	78	75	75	78	82	80	79	82	83	84	85	84	80.0	24
20	84	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	84	81.9	24
21	83	83	83	82	82	80	80	80	80	80	76	74	72	72	72	70	69	75	81	80	79	78	77	76	75	83	77.5	24
22	76	76	76	75	76	75	74	74	74	74	73	73	82	81	81	81	81	81	82	82	82	81	80	79	77	78	78.2	24
23	76	78	79	82	83	82	82	84	85	84	85	85	84	83	83	83	84	85	84	83	86	84	83	83	82	86	82.9	24
24	81	80	80	79	77	76	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	78.2	24
25	74	74	73	73	73	73	73	73	73	73	73	73	73	72	71	72	71	74	75	77	74	73	73	74	81	74.7	24	
26	78	78	77	77	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	74.4	24
27	78	78	77	77	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77.7	24
28	78	79	79	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	76.8	24
29	73	73	73	73	74	76	77	78	78	78	78	76	71	69	68	64	75	82	81	81	81	80	78	75	75	82	75.2	24
30	74	75	75	74	74	77	79	79	78	78	78	78	78	78	79	74	75	80	83	85	85	86	85	85	84	86	79.6	24
31	84	84	84	83	82	81	80	79	79	79	76	71	66	61	60	62	66	71	75	74	76	77	76	75	74	84	74.8	24
HOURLY MAX	95	96	96	96	97	98	98	98	98	98	98	98	99	98	98	98	99	99	98	96	94	94	94	95	95	95	95	24
HOURLY AVG	81.8	81.9	82.0	82.2	82.4	81.9	81.5	81.2	81.2	80.3	78.2	75.5	73.9	72.7	72.8	76.2	79.4	80.2	80.4	80.8	81.0	81.2	81.5	81.7	81.7	81.7	81.7	24

STATUS FLAG CODES

C	QUALITY ASSURANCE	Q	RECOVERY
Y	MAINTENANCE	R	MACHINE MALFUNCTION
S	DAILY ZERO/Span CHECK	X	OPERATOR ERROR
P	POWER FAILURE	O	COLLECTION ERROR
G	OUT FOR REPAIR	K	

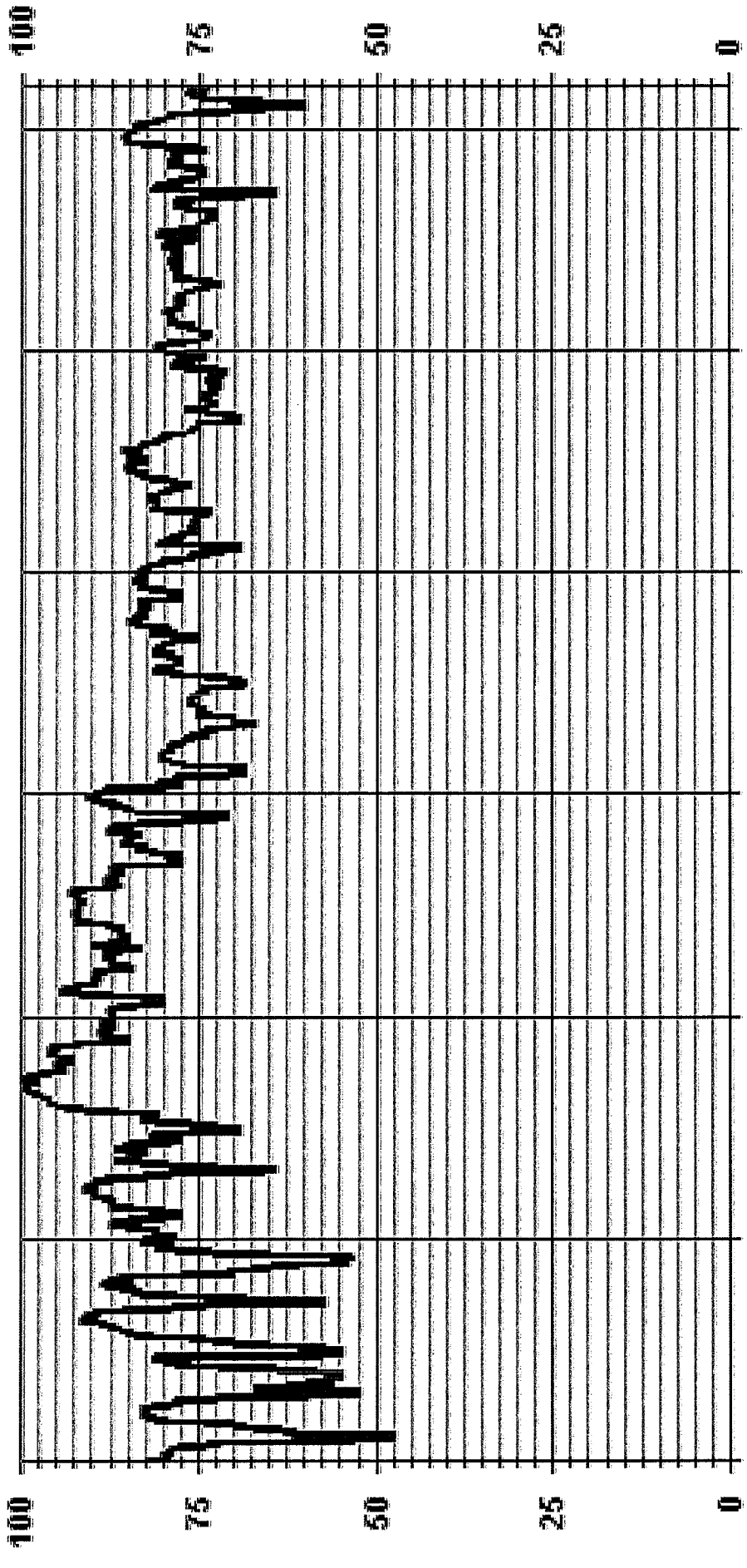
24 HOUR AVERAGES FOR DECEMBER 2015



MONTHLY SUMMARY

MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR(S)	9, 10	ON DAY(S)	9, 9
MAXIMUM 24-HR AVERAGE:	97.0	%			ON DAY(S)	9
					VAR-VARIOUS	
OPERATIONAL TIME:	744	HRS				
AMID OPERATION UPTIME:	100.0	%				
MONTHLY AVERAGE:	8.56					
STANDARD DEVIATION:	8.56					

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA RH %FS

AMBIENT TEMPERATURE



AMBIENT TEMPERATURE (TPX) hourly averages in Degrees Celsius

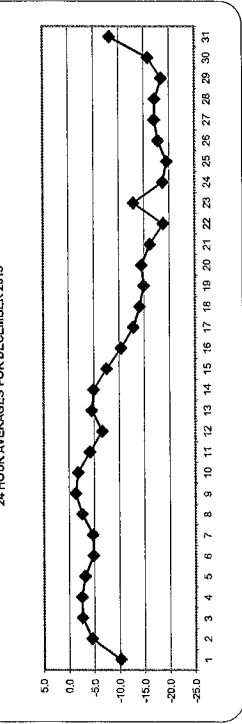
MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	
1	-14.6	-15.1	-15.3	-15.5	-16.1	-16.2	-16.6	-16.7	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	
2	-11.7	-12.1	-11.9	-11.6	-11.3	-11.5	-11.3	-11.0	-10.0	-8.4	-7.5	-5.9	-2.9	-1.5	0.7	1.5	0.6	-1.0	0.6	1.3	2.4	1.9	1.1	1.1	0.6	2.4
3	0.0	-0.5	-2.4	4.6	-6.0	-6.8	-7.7	-8.0	-8.1	-8.5	-0.5	0.4	1.0	1.1	0.6	-0.2	-1.0	-1.2	-0.7	-0.6	-1.8	-3.1	-3.5	-3.9	1.1	
4	-4.2	-4.8	-5.4	-5.6	-4.1	-5.6	-4.1	-5.6	-4.1	-5.6	-4.1	-5.6	-4.1	-5.6	-4.1	-5.6	-4.1	-5.6	-4.1	-5.6	-4.1	-5.6	-4.1	-5.6	-4.1	
5	-7.7	-8.3	-6.0	-6.8	-8.0	-5.4	-3.6	-4.4	-3.6	-4.4	-3.6	-4.4	-3.6	-4.4	-3.6	-4.4	-3.6	-4.4	-3.6	-4.4	-3.6	-4.4	-3.6	-4.4	-3.6	
6	-4.8	-4.1	-4.3	-4.5	-4.3	-4.2	-4.8	-5.3	-6.3	-6.2	-5.3	-4.5	-3.7	-3.1	-3.0	-3.3	-3.8	-4.7	-5.6	-5.5	-5.4	-5.4	-5.5	-5.6	-3.0	
7	-5.4	-5.2	-6.8	-8.0	-7.3	-6.7	-8.0	-7.1	-7.7	-7.1	-7.7	-7.1	-7.7	-7.1	-7.7	-7.1	-7.7	-7.1	-7.7	-7.1	-7.7	-7.1	-7.7	-7.1	-7.7	
8	-3.8	-6.4	-5.0	-5.2	-3.0	-2.8	-3.0	-4.1	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	
9	-1.2	-1.1	-1.2	-1.3	-1.5	-1.6	-1.5	-1.4	-1.4	-1.3	-1.0	-0.8	-1.0	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	
10	-1.2	-1.1	-1.2	-1.4	-1.4	-1.4	-1.4	-1.5	-1.5	-1.4	-1.3	-1.1	-1.2	-1.3	-1.4	-1.6	-1.9	-2.1	-2.2	-2.4	-2.6	-2.9	-3.2	-2.9	-1.1	
11	-2.6	-2.5	-2.5	-2.4	-2.5	-2.3	-2.2	-2.4	-2.8	-3.1	-3.3	-3.2	-3.8	-4.4	-4.9	-5.2	-5.4	-5.5	-5.6	-6.0	-6.3	-6.4	-6.5	-6.7	-2.2	
12	-7.0	-7.3	-7.6	-7.9	-8.0	-7.9	-7.9	-7.7	-7.6	-7.5	-7.2	-7.0	-7.0	-6.4	-6.0	-5.8	-5.6	-5.4	-5.1	-5.1	-5.1	-5.0	-4.9	-5.1	-4.9	
13	-5.2	-5.6	-5.7	-5.7	-5.8	-5.6	-5.4	-5.1	-5.0	-4.8	-4.4	-4.0	-3.6	-3.4	-3.2	-3.1	-3.1	-3.3	-3.7	-4.2	-4.5	-4.5	-4.3	-4.1	-3.1	
14	-3.9	-4.1	-4.1	-4.1	-4.3	-4.7	-4.8	-5.1	-5.6	-6.1	-6.0	-5.6	-4.9	-4.5	-4.5	-4.6	-4.6	-4.7	-4.8	-4.8	-4.9	-5.0	-4.9	-5.1	-3.9	
15	-5.5	-5.9	-5.7	-5.5	-6.5	-8.4	-9.4	-9.7	-10.0	-10.3	-9.5	-8.2	-7.2	-6.4	-6.3	-6.9	-7.1	-7.0	-6.6	-6.5	-6.5	-7.7	-8.4	-8.1	-5.5	
16	-6.9	-7.1	-6.5	-6.4	-6.3	-7.3	-8.2	-8.3	-8.1	-8.2	-8.4	-8.9	-9.0	-8.8	-9.4	-10.4	-12.1	-12.8	-14.3	-15.9	-15.8	-16.5	-16.3	-6.3	-10.3	
17	-14.3	-13.8	-12.9	-12.7	-12.7	-12.9	-13.2	-13.4	-13.4	-13.2	-13.0	-12.7	-12.4	-12.1	-12.1	-12.4	-12.5	-12.5	-12.2	-12.2	-12.6	-12.6	-12.6	-12.6	-12.6	
18	-12.6	-12.8	-12.8	-12.8	-12.7	-12.8	-13.3	-13.6	-13.9	-13.9	-13.7	-13.3	-13.1	-12.9	-13.5	-14.3	-14.9	-15.1	-15.6	-16.0	-15.8	-15.6	-15.7	-15.7	-12.6	
19	-15.6	-15.6	-15.6	-15.5	-15.5	-15.5	-15.5	-15.4	-15.5	-15.4	-14.5	-14.4	-14.0	-13.1	-12.9	-13.3	-15.4	-17.4	-17.5	-17.5	-14.3	-13.8	-12.9	-13.3	-12.9	
20	-14.7	-15.6	-15.7	-15.4	-15.2	-15.2	-15.9	-16.1	-14.9	-14.5	-14.6	-14.4	-13.1	-12.4	-12.1	-12.9	-14.4	-15.1	-15.4	-15.6	-14.4	-13.3	-13.2	-12.1	-14.5	
21	-13.4	-13.5	-13.7	-14.3	-14.8	-16.0	-17.4	-18.9	-19.9	-19.0	-15.7	-13.9	-11.4	-11.5	-12.1	-12.9	-14.7	-16.4	-17.8	-18.6	-19.2	-19.9	-20.3	-21.0	-11.4	
22	-21.1	-21.6	-21.1	-21.9	-22.1	-22.6	-22.7	-23.1	-22.9	-22.5	-20.0	-17.6	-15.7	-14.4	-13.7	-13.6	-14.2	-14.4	-15.0	-16.2	-16.7	-17.9	-18.8	-19.3	-13.6	
23	-19.7	-18.6	-17.1	-15.1	-13.5	-13.5	-12.8	-11.7	-11.7	-11.8	-11.7	-10.9	-10.6	-10.3	-9.7	-10.1	-10.6	-12.6	-14.4	-14.4	-11.9	-12.3	-13.1	-14.3	-9.7	
24	-15.6	-16.8	-16.9	-16.0	-15.6	-16.0	-16.4	-16.7	-17.0	-18.1	-17.4	-16.3	-16.2	-15.8	-16.0	-16.2	-18.0	-20.8	-22.8	-24.2	-25.3	-25.4	-24.7	-23.6	-15.6	
25	-23.2	-24.0	-24.6	-25.4	-26.3	-26.7	-27.0	-25.6	-24.6	-22.8	-20.4	-19.2	-17.5	-16.0	-15.4	-15.5	-15.3	-14.8	-14.8	-14.2	-13.9	-13.5	-13.6	-13.3	-19.5	
26	-13.5	-13.5	-14.6	-16.9	-18.4	-20.4	-21.8	-23.4	-24.8	-22.5	-20.7	-18.8	-18.2	-17.1	-16.6	-16.6	-16.4	-16.1	-16.1	-16.0	-15.8	-15.7	-16.0	-16.5	-17.8	
27	-16.5	-16.9	-16.8	-17.0	-17.3	-17.2	-17.3	-17.6	-18.0	-18.3	-17.5	-17.3	-16.5	-16.6	-16.7	-17.2	-17.3	-17.2	-17.2	-17.0	-16.8	-16.4	-16.0	-15.7	-17.0	
28	-15.5	-15.4	-15.2	-15.2	-15.3	-15.6	-15.4	-14.8	-15.2	-15.5	-15.3	-14.7	-14.2	-13.9	-14.1	-14.7	-16.8	-18.9	-20.4	-21.6	-22.5	-23.1	-23.7	-24.3	-17.1	
29	-24.9	-25.1	-25.4	-25.5	-24.4	-21.6	-19.4	-18.2	-17.7	-17.1	-15.5	-13.6	-12.0	-11.0	-9.7	-12.1	-14.9	-15.3	-16.4	-17.4	-19.6	-20.8	-21.7	-22.9	-9.7	
30	-23.4	-23.7	-23.9	-24.3	-22.5	-18.5	-17.9	-17.7	-17.9	-17.3	-15.8	-13.5	-12.5	-10.5	-9.5	-10.6	-11.5	-11.9	-12.1	-12.1	-12.4	-12.3	-12.7	-13.0	-9.5	
31	-12.5	-12.0	-12.8	-13.6	-13.7	-12.9	-12.4	-12.7	-12.6	-10.7	-8.5	-6.7	-5.0	-3.7	-3.1	-3.5	-4.2	-5.6	-5.2	-5.2	-5.2	-5.1	-5.4	-5.5	-3.1	
HOURLY MAX	0.0	-0.5	-1.2	-1.2	-1.4	-1.4	-1.4	-1.5	-1.4	-1.3	0.6	2.3	3.5	3.3	4.7	3.8	2.0	0.6	1.3	2.4	1.9	1.1	1.1	0.6		
HOURLY AVG	-11.0	-11.3	-11.3	-11.6	-11.5	-11.5	-11.6	-11.7	-11.7	-11.7	-11.1	-9.8	-8.7	-7.9	-7.3	-7.0	-7.7	-8.6	-9.2	-9.7	-9.8	-9.9	-10.2	-10.4	-10.6	

STATUS FLAG CODES

C	CALIBRATION	G	QUALITY ASSURANCE
V	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE/ALERTING
P	POWER FAILURE	O	OPERATOR ERROR
G	SOURCE/REPAIR	K	COLLECTION ERROR

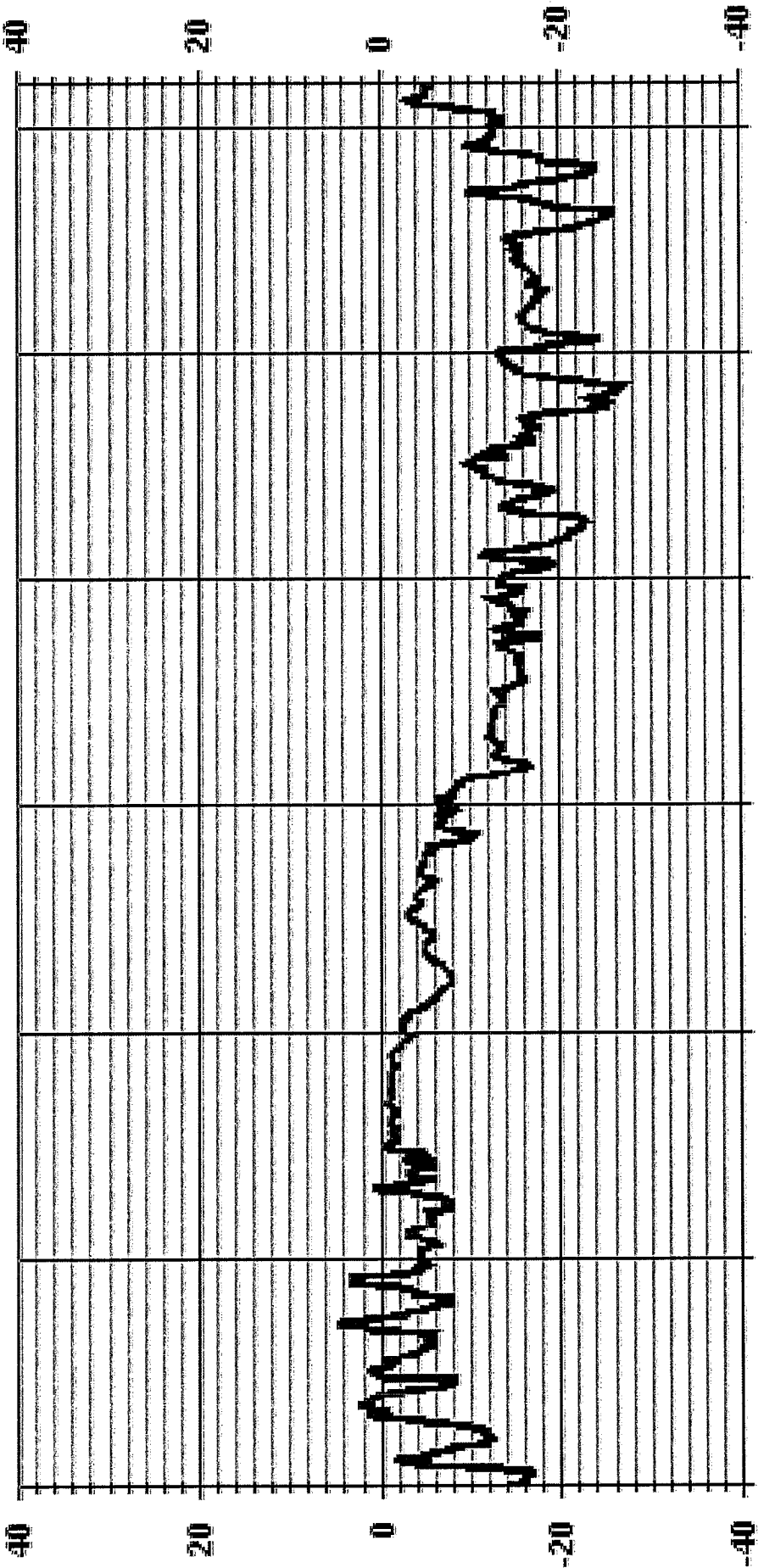
24 HOUR AVERAGES FOR DECEMBER 2015



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-27.0	°C	@ HOURS(S)	6	ON DAY(S)	25
MAXIMUM 1-HR AVERAGE:	4.7	°C	@ HOURS(S)	14	ON DAY(S)	4
MAXIMUM 24-HR AVERAGE:	-1.3	°C			VAR-VARIOUS	9
STANDARD DEVIATION:	6.84					
OPERATIONAL TIME:						744 HRS
AMD OPERATION UPTIME:						100.0 %
MONTHLY AVERAGE:						-10.0 °C

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA TPX DGC

APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

VOC RESULTS

Sample ID: 15120089-001

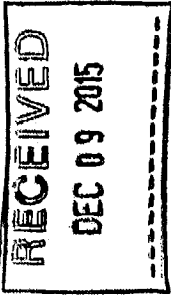
Customer ID: LICA

Cust Samp ID: LICA/VOC/CLS/Dec 2, 2015

AIR FCD-01320/2

Maxxam

VOC Sample Collection Data Sheet



Client: LICA Sampler S/N: 6167
 Location: Cold Lake South Canister ID: 17120
 Station ID: LICA 01 Canister Installation Date/Time: Nov 27, 2015 @ 09:59
 Field Sample ID: LICA/VOC/CLS/Dec 2, 2015 Canister Removal Date/Time: Dec 4, 2015 @ 08:53

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Dec 2, 2015	00:00 Dec 2, 2015	00:00 Dec 3, 2015	24.0

Flow Settings		
Meter Reading (sccm)	Pot Set Pt	Pump Pressure Setting (psig)
10.0	6.52	24

Canister Information	
Initial Canister Vacuum (inHg)	28.0
Final Canister Pressure (psig)	23.1

Canister valve open prior to sampling? YES NO
 Timer set to 0.00 minutes prior to sampling? YES NO
 Canister valve closed prior to disconnection? YES NO

Comments:

Technician Signature: Sample in - by Alex Yawupov
Sample out - by Alex Yawupov
 Date: Dec 4, 2015

Volatile Organics Data Results

Date: DECEMBER 2 , 2015
Canister ID: 17120

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.08
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.22
1-Hexene	0.03
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.13
2,2-Dimethylbutane	0.04
2,3,4-Trimethylpentane	0.04
2,3-Dimethylbutane	0.14
2,3-Dimethylpentane	0.11
2,4-Dimethylpentane	0.09
2-Methylheptane	0.06
2-Methylhexane	0.18
2-Methylpentane	0.51
3-Methylheptane	0.05
3-Methylhexane	0.17
3-Methylpentane	0.29
Acetone	< 0.4
Acrolein	< 0.3
Benzene	0.55
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.01
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.04
Chloromethane	0.63
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.04
cis-2-Pentene	< 0.02
Cyclohexane	0.25
Cyclopentane	0.11
Dibromochloromethane	< 0.01
Ethanol	2.2
Ethyl acetate	< 0.4
Ethylbenzene	0.09
Freon-11	0.37

Volatile Organics Data Results

Date: DECEMBER 2 , 2015
Canister ID: 17120

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.66
Hexachloro-1,3-butadiene	< 0.50
Isobutane	2.66
Isopentane	2.19
Isoprene	0.02
Isopropyl alcohol	0.7
Isopropylbenzene	< 0.01
m,p-Xylene	0.26
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	0.28
Methylcyclopentane	0.27
Methylene chloride	< 0.3
n-Butane	5.09
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.17
n-Hexane	0.46
n-Nonane	0.04
n-Octane	0.09
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	1.3
o-Ethyltoluene	0.03
o-Xylene	0.10
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.59
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	0.03
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 15120124-001

Customer ID: LICA

Cust Samp ID: LICAVOC/ELK/Dec 8,

Priority: Normal

AIR FCD-01320/2

RECEIVED
DEC 11 2015

Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: Ce Lal Lake Sewer
 Station ID: LICA 01
 Field Sample ID: LICA/VOC/CLS/Dec 8, 2015
 Sampler S/N: 6167
 Canister ID: 2653
 Canister Installation Date/Time: Dec 4, 2015 @ 08:57
 Canister Removal Date/Time: Dec 9, 2015 @ 08:55

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Dec 8, 2015	00:00	00:00	24.0
	Dec 8, 2015	Dec 9, 2015	

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
10.0	6.52	24

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
28.0	23.8

Canister valve open prior to sampling?: YES NO
 Timer set to 0.00 minutes prior to sampling? YES NO
 Canister valve closed prior to disconnection?: YES NO

Comments:

Technician Signature: Sample in - by Alex Yancypol
Sample out - by Alex Yancypol
 Date: Dec 9, 2015

Volatile Organics Data Results

Date: DECEMBER 8 , 2015
Canister ID: 2653

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.06
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.13
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.06
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	0.03
2,3-Dimethylbutane	0.07
2,3-Dimethylpentane	0.06
2,4-Dimethylpentane	0.05
2-Methylheptane	0.04
2-Methylhexane	< 0.01
2-Methylpentane	0.21
3-Methylheptane	0.03
3-Methylhexane	0.09
3-Methylpentane	0.12
Acetone	1.2
Acrolein	< 0.3
Benzene	0.27
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.14
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
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	0.13
Cyclopentane	0.05
Dibromochloromethane	< 0.01
Ethanol	1.1
Ethyl acetate	< 0.4
Ethylbenzene	0.05
Freon-11	0.42

Volatile Organics Data Results

Date: DECEMBER 8 , 2015
Canister ID: 2653

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	0.02
Freon-12	0.61
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.78
Isopentane	0.66
Isoprene	0.02
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	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.15
Methylcyclopentane	0.13
Methylene chloride	< 0.3
n-Butane	1.61
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.09
n-Hexane	0.18
n-Nonane	0.02
n-Octane	0.05
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	1.6
o-Ethyltoluene	0.02
o-Xylene	0.06
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.34
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 15120215-004

Customer ID: LICA

Cust Samp ID: LICAVOC/CLS/Dec 14, 2015

AIR FCD-01320/2

Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: Cold Lake South
 Station ID: LICA 01
 Field Sample ID: LICA/VOC/CLS/Dec 14, 2015

Sampler S/N: 6167
 Canister ID: 2664
 Canister Installation Date/Time: Dec 09, 2015 @ 08:58
 Canister Removal Date/Time: Dec 18, 2015 @ 18:30

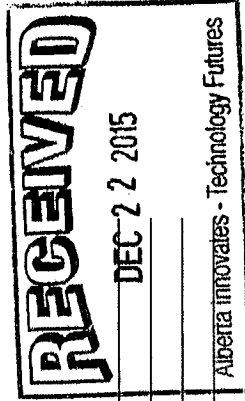
Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Dec 14, 2015	00:00 Dec 14, 2015	00:00 Dec 15, 2015	24.0

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
10.0	6.52	24

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
- 28.0	+ 22.5

Canister valve open prior to sampling?: YES NO
 Timer set to 0.00 minutes prior to sampling? YES NO
 Canister valve closed prior to disconnection?: YES NO

Comments: n/a



Technician Signature: Sample in - by Alex Yanyanov
Sample out - by Alex Yanyanov

Date: December 18, 2015

Volatile Organics Data Results

Date: DECEMBER 14 , 2015
Canister ID: 2664

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.22
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	0.02
2-Methylhexane	0.04
2-Methylpentane	0.13
3-Methylheptane	< 0.02
3-Methylhexane	0.05
3-Methylpentane	0.07
Acetone	6.2
Acrolein	< 0.3
Benzene	0.16
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	3.10
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	0.02
Chloroform	0.02
Chloromethane	0.65
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.03
cis-2-Pentene	< 0.02
Cyclohexane	0.08
Cyclopentane	0.03
Dibromochloromethane	< 0.01
Ethanol	0.8
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.27

Volatile Organics Data Results

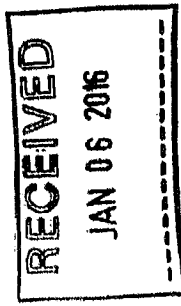
Date: DECEMBER 14 , 2015
Canister ID: 2664

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.60
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.66
Isopentane	0.44
Isoprene	< 0.01
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	0.6
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.10
Methylcyclopentane	0.07
Methylene chloride	< 0.3
n-Butane	1.62
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	< 0.01
n-Hexane	0.19
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	0.11
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.07
trans-2-Pentene	0.03
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 16010003-003
Customer ID: LICA
Cust Samp ID: LICA/VOC/CLS/Dec 20, 2015

Maxxam

VOC Sample Collection Data Sheet



Client: LICA
Location: Cold Lake South
Station ID: LICA 01
Field Sample ID: LICA/VOC/CLS/Dec 20, 2015
Sampler S/N: 6167
Canister ID: 1684
Canister installation Date/Time: December 18, 2015 @ 18:31
Canister Removal Date/Time: December 23, 2015 @ 13:41

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Dec 20, 2015	00:00	00:00	24.0
	Dec 20, 2015	Dec 21, 2015	

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
10.0	6.52	24

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
- 28.0	+ 13.5

Canister valve open prior to sampling? YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection? YES / NO

Comments: n(e)

Technician Signature: Sample in - by Alex Yakupov
Sample out - by Alex Yakupov
Date: December 23, 2015

Volatile Organics Data Results

Date: DECEMBER 20 , 2015
Canister ID: 1684

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.19
1-Hexene	0.04
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.06
2,3,4-Trimethylpentane	0.01
2,3-Dimethylbutane	0.16
2,3-Dimethylpentane	0.08
2,4-Dimethylpentane	< 0.01
2-Methylheptane	0.04
2-Methylhexane	0.06
2-Methylpentane	0.36
3-Methylheptane	0.02
3-Methylhexane	0.10
3-Methylpentane	0.20
Acetone	2.1
Acrolein	< 0.3
Benzene	0.15
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	0.89
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.21
Cyclopentane	0.10
Dibromochloromethane	< 0.01
Ethanol	0.7
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.35

Volatile Organics Data Results

Date: DECEMBER 20 , 2015
Canister ID: 1684

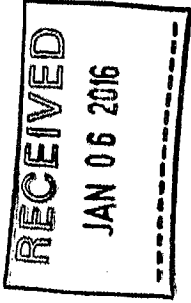
PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.09
Freon-114	0.03
Freon-12	0.77
Hexachloro-1,3-butadiene	< 0.50
Isobutane	1.89
Isopentane	1.21
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.04
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	0.4
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.37
Methylcyclopentane	0.20
Methylene chloride	< 0.3
n-Butane	3.64
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.12
n-Hexane	0.40
n-Nonane	0.02
n-Octane	0.05
n-Pentane	1.3
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.02
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.10
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 16010004-001

Customer ID: LICA

Cust Samp ID: LICA/VOC/CLS/Dec. 26, 2015

AIR FCD-01320/2



Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: Cold Lake South
 Station ID: LICA 01
 Field Sample ID: LICA/VOC/CLS/Dec 26, 2015

Sampler S/N: 6167
 Canister ID: S5587
 Canister Installation Date/Time: Dec 23, 2015 @ 13:42
 Canister Removal Date/Time: Dec 30, 2015 @ 09:16

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Dec 26, 2015	00:00	Dec 27, 2015	24.0

Flow Settings		
Meter Reading (scm)	Pot Set Pt.	Pump Pressure Setting (psig)
10.0	6.52	24

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
-28.0	+237

Canister valve open prior to sampling?: YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection?: YES / NO

Comments:

Technician Signature: Sample in - by Alex Yakupov
Sample out - by Alex Yakupov
 Date: Dec 30, 2015

Volatile Organics Data Results

Date: DECEMBER 26 , 2015
Canister ID: S5587

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.08
1-Hexene	< 0.02
1-Pentene	0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.05
2,3,4-Trimethylpentane	0.01
2,3-Dimethylbutane	0.10
2,3-Dimethylpentane	0.06
2,4-Dimethylpentane	< 0.01
2-Methylheptane	0.03
2-Methylhexane	0.05
2-Methylpentane	0.22
3-Methylheptane	< 0.02
3-Methylhexane	0.07
3-Methylpentane	0.12
Acetone	1.0
Acrolein	< 0.3
Benzene	0.23
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	< 0.01
Carbon tetrachloride	0.10
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.70
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.26
Cyclopentane	0.11
Dibromochloromethane	< 0.01
Ethanol	< 0.3
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.34

Volatile Organics Data Results

Date: DECEMBER 26 , 2015

Canister ID: S5587

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.03
Freon-12	0.75
Hexachloro-1,3-butadiene	< 0.50
Isobutane	1.06
Isopentane	0.90
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.05
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.31
Methylcyclopentane	0.21
Methylene chloride	< 0.3
n-Butane	1.90
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.10
n-Hexane	0.19
n-Nonane	0.02
n-Octane	0.04
n-Pentane	0.8
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	0.16
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

PAH RESULTS

Sample ID: 15120089-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Dec 2, 2015

Priority: Normal

Maxxam

Hi-Vol PUF+ Sample Collection Data Sheet

RECEIVED
DEC 09 2015

Client: LICA Puf+ S/N: 9801
 Location: Catal Lake South Motor S/N: 1138/100-1020
 Station ID: LICA 01 Installation Date/Time: Nov 27, 2015 @ 09:43
 Field Sample ID: LICA/PUF/CLS/Dec 2, 2015 Removal Date/Time: Dec 4, 2015 @ 09:45

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Dec 2, 2015	00:00 Dec 2, 2015	00:00 Dec 3, 2015	24.0

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date
1/9	N/A	1/9	1/9

Set Flow Rate (slpm): 230
 Date of Last Calibration: 05-May-10

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)	Volume (Vstd m ³)
707	229	-3.6°	330.19

Time set correctly prior to sampling? YES NO
 Timer set correctly prior to sampling? YES NO
 Sampling data saved to memory card after sampling? YES NO YES

Comments:

Technician Signature: Sample in. by Alex Yacupov
Sample out - by Alex Yacupov
 Date: Dec 4, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: DECEMBER 2 , 2015
PUF S/N: 9801

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.13
2-Methylnaphthalene	0.20
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	0.01
Acenaphthene	0.21
Acenaphthylene	0.10
Acridine	< 0.01
Anthracene	0.07
Benzo(a)anthracene	0.04
Benzo(a)pyrene	0.04
Benzo(b,j,k)fluoranthene	0.12
Benzo(c)phenanthrene	0.07
Benzo(e)pyrene	0.04
Benzo(ghi)perylene	0.07
Chrysene	0.06
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	0.03
Dibenzo(ah)anthracene	0.01
Fluoranthene	0.27
Fluorene	0.46
Indeno(1,2,3-cd)pyrene	0.05
Naphthalene	0.20
Perylene	0.01
Phenanthrene	0.65
Pyrene	0.22
Retene	0.32

Sample ID: 15120124-001

Customer ID: LICA

Cust Samp ID: LICAVOC/ELK/Dec 8,

Priority: Normal

RECEIVED
DEC 11 2015

TISCH PUF PLUS Sample Collection Data Sheet

Client: LICA PUF# S/N: TE-03
 Location: Cold Lake South Motor S/N: 1139/100-1020
 Station ID: LICA 01 Installation Date/Time: 08:47 Dec 4, 2015
 Field Sample ID: LICA/PUF/ELS/Dec 8, 2015 Removal Date/Time: 09:10 Dec 9, 2015

Sample Data Collection Information

Sample Date: Dec 8, 2015 Average Pressure (mmHg) 701
 Start Time (mst): 00:00 Average Flow (Q_{avg}) 2.29
 End Time (mst): 00:00 Dec 9, 2015 Average Temperature (°C) -1.6°
 Elapsed Time (Hours): 24.0 Volume (V_{std} m³) 330.21

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm? YES NO
 Average temperature appears correct? YES NO
 Average pressure appears correct? YES NO
 Any error messages? (if yes list below) YES NO
 Sample duration 24 hours? YES NO
 Date of last calibration/audit: 05 - May - 10
 Other observations? n/a

Deployed By: Alex Yampov Dec 4, 2015

Collected By: Alex Yampov Dec 9, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: DECEMBER 8 , 2015
PUFS/N: TE03

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.22
2-Methylnaphthalene	0.32
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	0.06
Acenaphthene	0.22
Acenaphthylene	0.51
Acridine	< 0.01
Anthracene	0.22
Benzo(a)anthracene	0.06
Benzo(a)pyrene	0.04
Benzo(b,j,k)fluoranthene	0.18
Benzo(c)phenanthrene	0.02
Benzo(e)pyrene	0.06
Benzo(ghi)perylene	< 0.01
Chrysene	0.06
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	0.03
Fluoranthene	0.40
Fluorene	0.44
Indeno(1,2,3-cd)pyrene	0.06
Naphthalene	0.28
Perylene	0.02
Phenanthrene	1.26
Pyrene	0.30
Retene	0.50

Sample ID: 15120215-005

Customer ID: LICA

Cust Samp ID: LICAPUF/CLS/Dec 14, 2015

TISCH PUF PLUS Sample Collection Data Sheet

Client: LICA PUF+ S/N: 9702
 Location: Cold Lake South Motor S/N: 1138/100-1020
 Station ID: LICA 01 Installation Date/Time: Dec 9, 2015 / 09:11
 Field Sample ID: LICA/PUF/CLS/Dec 14, 2015 Removal Date/Time: Dec 18, 2015 / 12:41

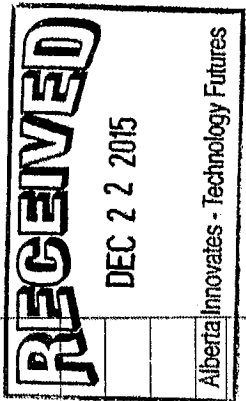
Sample Data Collection Information

Sample Date: Dec 14, 2015 Average Pressure (mmHg) 711
 Start Time (mst): 00:00 Average Flow (Q_{avg}) 22.9
 End Time (mst): 00:00 / Dec 15, 2015 Average Temperature (°C) - 3.7 °
 Elapsed Time (hours): 24:00 Volume (Nstd m³) 330.23

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ? YES NO
 Average temperature appears correct? YES NO
 Average pressure appears correct? YES NO
 Any error messages? (if yes list below) YES NO
 Sample duration 24 hours? YES NO
 Date of last calibration/audit: 05-May-10
 Other observations? n/a



Deployed By: Alex Yampov
 Collected By: Alex Yampov Date: Dec 18, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: DECEMBER 14 , 2015
PUF S/N: 9702

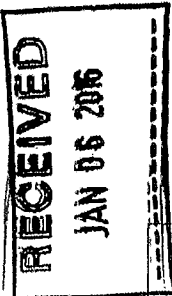
PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.13
2-Methylnaphthalene	0.18
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.06
Acenaphthylene	0.12
Acridine	< 0.01
Anthracene	0.04
Benzo(a)anthracene	0.03
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.11
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.04
Benzo(ghi)perylene	< 0.01
Chrysene	0.03
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.14
Fluorene	0.14
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.19
Perylene	< 0.01
Phenanthrene	0.33
Pyrene	0.11
Retene	0.04

Sample ID: 16010003-004

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Dec 20, 2015

AIR FCD-01321/2



TISCH PUF PLUS Sample Collection Data Sheet

Client: LICA Puf#-S/N: TE-06
 Location: Cold Lake South Motor S/N: 1138/100-1020
 Station ID: LICA 01 Installation Date/Time: Dec 18, 2015/18:42
 Field Sample ID: LICA/PUF/CLS/Dec 20, 2015 Removal Date/Time: Dec 23, 2015/13:33

Sample Data Collection Information

Sample Date: Dec 20, 2015 Average Pressure (mmHg) 706
 Start Time (mst): 00:00 Average Flow (Q_{avg}) 229
 End Time (mst): Dec 21, 2015/00:00 Average Temperature (°C) -13.9°
 Elapsed Time (Hours): 24.0 Volume (V_{std} m³) 330.20

Sample Recovery Checklist

(circle one)

Flow Rate 230 sipm +/- 0.2 sipm? YES NO
 Average temperature appears correct? YES NO
 Average pressure appears correct? YES NO
 Any error messages? (if yes list below) YES NO
 Sample duration 24 hours? YES NO
 Date of last calibration/audit: 05 - May - 10
 Other observations: n/a

Deployed By: Alex Yauykov
 Collected By: Alex Yauykov Date: Dec 23, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: DECEMBER 20 , 2015

PUF S/N: TE06

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	1.24
2-Methylnaphthalene	1.84
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	0.05
Acenaphthene	0.23
Acenaphthylene	0.75
Acridine	< 0.01
Anthracene	0.15
Benzo(a)anthracene	0.07
Benzo(a)pyrene	0.04
Benzo(b,j,k)fluoranthene	0.19
Benzo(c)phenanthrene	0.02
Benzo(e)pyrene	0.06
Benzo(ghi)perylene	< 0.01
Chrysene	0.08
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	0.02
Fluoranthene	0.51
Fluorene	0.42
Indeno(1,2,3-cd)pyrene	0.06
Naphthalene	1.25
Perylene	0.01
Phenanthrene	1.38
Pyrene	0.34
Retene	0.31

Sample ID: 16010004-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Dec. 26, 2015

RECEIVED
JAN 06 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client: LICA Puff S/N: TE-02
 Location: Cold Lake South Motor S/N: 1139/100-1020
 Station ID: LICA 01 Installation Date/Time: Dec 23, 2015/13:34
 Field Sample ID: LICA/PUF/CLS/Dec 26, 2015 Removal Date/Time: Dec 30, 2015/09:07

Sample Data Collection Information

Sample Date: Dec 26, 2015 Average Pressure (mmHg) 725
 Start Time (mst): 00:00 Average Flow (Q_{air}) 22.9
 End Time (mst): 00:00 / Dec 27, 2015 Average Temperature (°C) -16.8
 Elapsed Time (Hours): 24.0 Volume (V_{std} m³) 330.22

Sample Recovery Checklist

(circle one)

Flow Rate 230 s1pm +/- 0.2 s1pm? YES NO
 Average temperature appears correct? YES NO
 Average pressure appears correct? YES NO
 Any error messages? (if yes list below) YES NO
 Sample duration 24 hours? YES NO

Date of last calibration/audit: Dec 22, 2015
 Other observations? N/A

Deployed By: Alex Yakupov
 Collected By: Alex Yakupov Date: Dec 30, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: DECEMBER 26 , 2015

PUF S/N: TE02

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.53
2-Methylnaphthalene	0.69
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	0.05
Acenaphthene	0.09
Acenaphthylene	0.17
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	0.03
Benzo(a)pyrene	0.01
Benzo(b,j,k)fluoranthene	0.13
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.04
Benzo(ghi)perylene	< 0.01
Chrysene	0.04
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.11
Fluorene	0.16
Indeno(1,2,3-cd)pyrene	0.02
Naphthalene	0.90
Perylene	< 0.01
Phenanthrene	0.31
Pyrene	0.10
Retene	0.10

PARTISOL RESULTS

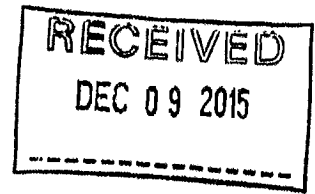
Sample ID: 15120088-001

Customer ID: LICA
Cust Samp ID: LICA P5012879

AIR FCD-01318/2

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Dec 2, 2015
Location: Cold Lake South
Parameter: TSP PM10
Filter #: LICA P5012879

PM2.5

Start Time 00:00 Dec 2, 2015
End Time 00:00 Dec 3, 2015
Status OK
Std Vol 24.652
Valid Time 24:00
Total Time 24.0

Comments: Weather Conditions, etc.

Technician Signature: Alex Yakupov

Date: Dec 4, 2015

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: 15120123-001

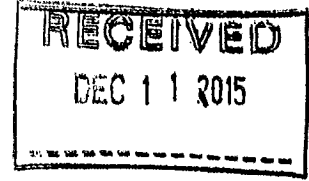
Customer ID: LICA

AIR FCD-01318/2

Cust Samp ID: LICA P5012876

Artisoul Sample Data Sheet

Priority: Normal



Date Sampled: Dec 8, 2015
Location: Cold Lake South
Parameter: TSP PM10
Filter #: LICA P501 2876

PM2.5

Start Time 00:00 Dec 8, 2015
End Time 00:00 Dec 9, 2015
Status OK
Std Vol 24.290
Valid Time 24:00
Total Time 24.0

Comments: Weather Conditions, etc.

Horizontal lines for additional comments.

Technician Signature: Alex Yakupov

Date: Dec 09, 2015 (09:13)

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: 15120213-001

AIR FCD-01318/2

Customer ID: LICA

Cust Samp ID: LICA P5012877

Partisol Sample Data Sheet

Priority: Normal

Date Sampled: Dec 14, 2015

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: LICA P501 2P77

Start Time 00:00 Dec 14, 2015

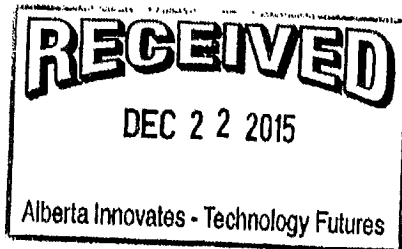
End Time 00:00 Dec 15, 2015

Status OK

Std Vol 24.840

Valid Time 24:00

Total Time 24.0



Comments: Weather Conditions, etc.

n/a

Technician Signature: Alex Yakupov

Date: Dec 18, 2015

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: 16010001-001

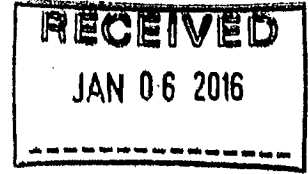
Customer ID: LICA

AIR FCD-01318/2

Cust Samp ID: LICA P5012878

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Dec 20, 2015
Location: Cold Lane South
Parameter: TSP PM10
Filter #: LICA P5012878

PM2.5

Start Time 00:00 Dec 20, 2015
End Time 00:00 Dec 21, 2015
Status OK
Std Vol 25.482
Valid Time 24:00
Total Time 24.0

Comments: Weather Conditions, etc.

n/a

Technician Signature:

Alex Yakupov

Date: Dec 23, 2015

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: 16010002-001

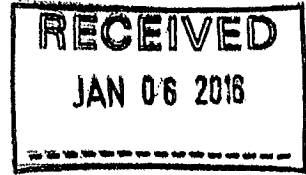
Customer ID: LICA

AIR FCD-01318/2

Cust Samp ID: LICA P5006173

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Dec 26, 2015

Location: cold lake south

Parameter: TSP PM10

PM2.5

Filter #: LICA P500 6173

Start Time 00:00 Dec 26, 2015

End Time 00:00 Dec 27, 2015

Status OK

Std Vol 26.520

Valid Time 24:00

Total Time 24.0

Comments: Weather Conditions, etc.

n/a

Horizontal lines for additional comments.

Technician Signature:

Alex Yakupov

Date: Dec 30, 2015

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


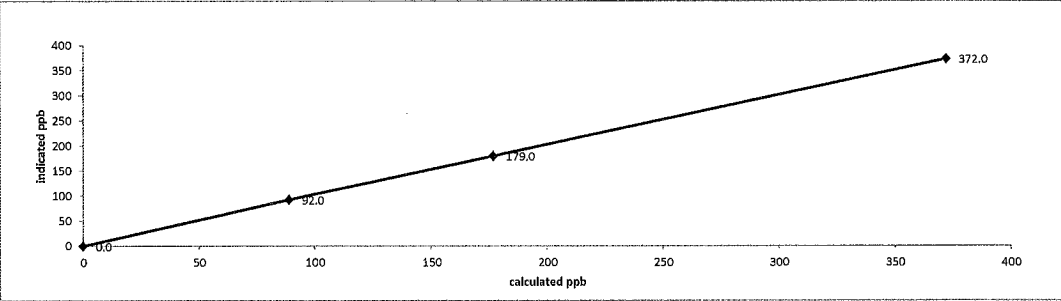


Partisol Sampler Results

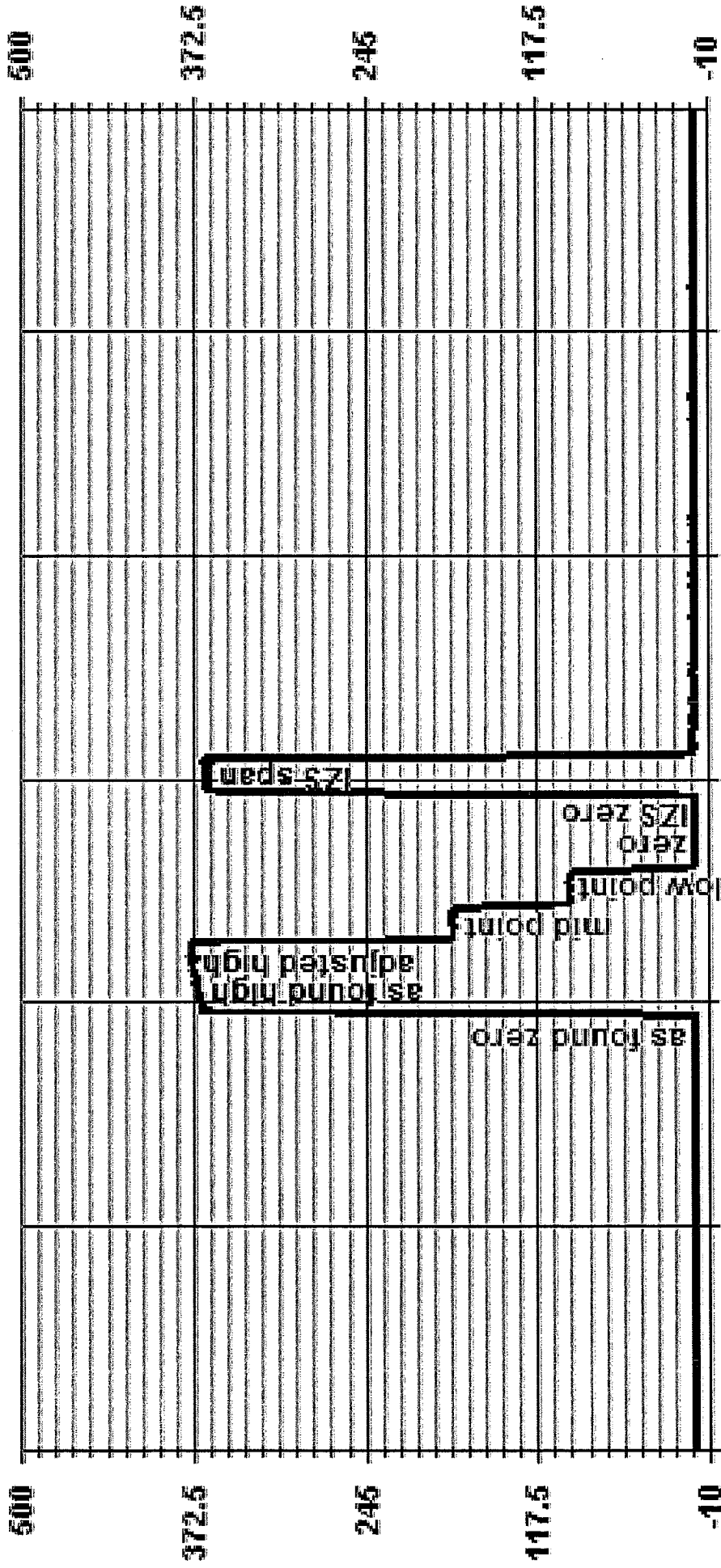
Date	Filter NO.	Concentration (mg)
DECEMBER 2	P5012879	0.288
DECEMBER 8	P5012876	0.085
DECEMBER 14	P5012877	0.037
DECEMBER 20	P5012878	0.158
DECEMBER 26	P5006173	0.204

APPENDIX III
ANALYZER CALIBRATION RESULTS

SULPHUR DIOXIDE

 Thermo 43i Sulphur Dioxide Analyzer Calibration																																																																
Date: December 14, 2015 Company/Alrshed: LICA Location/Station Name: Cold Lake South Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 11:11 End Time 24 hr. (mst): 14:17 Calibration Method: Gas Dilution	Barometric Pressure: 0.928 atm Station Temperature °C: 22 Weather Conditions: A few clouds Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: March 12, 2019 Converter Model & s/n (if applicable): n/a																																																															
Analyzer: Serial Number: 806528242 Range ppb: 500 Last Calibration Date: November 5, 2015 As Found C.F.: 1.006 Previous C.F.: 1.001 New C.F.: 1.001																																																																
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: BLM002073 Cal Gas Conc. (ppm): 49.5																																																																
Standard Calibration Points for Ranges																																																																
<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>380</td> </tr> <tr> <td>Mld</td> <td>180</td> </tr> <tr> <td>Low</td> <td>90</td> </tr> </tbody> </table>		Point	Sulphur Dioxide Standard Calibration Points	High	380	Mld	180	Low	90																																																							
Point	Sulphur Dioxide Standard Calibration Points																																																															
High	380																																																															
Mld	180																																																															
Low	90																																																															
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/mln)</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>5012</td> <td>0.00</td> <td>5012</td> <td>0.0</td> <td>0.0</td> <td>N/A</td> </tr> <tr> <td>as found high</td> <td>4976</td> <td>37.70</td> <td>5014</td> <td>372.2</td> <td>370.0</td> <td>1.006</td> </tr> <tr> <td>adjusted high</td> <td>4976</td> <td>37.70</td> <td>5014</td> <td>372.2</td> <td>372.0</td> <td>1.001</td> </tr> <tr> <td>mld</td> <td>4997</td> <td>17.90</td> <td>5015</td> <td>176.7</td> <td>179.0</td> <td>0.987</td> </tr> <tr> <td>low</td> <td>5004</td> <td>9.00</td> <td>5013</td> <td>88.9</td> <td>92.0</td> <td>0.966</td> </tr> <tr> <td>calibrator zero</td> <td>5012</td> <td>0.00</td> <td>5012</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>0.985</td> </tr> </tbody> </table>		Calibrator Flow Rates (cc/mln)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):	Point	Diluent	Cal Gas	Total	(ppb)	(ppb)		as found zero	5012	0.00	5012	0.0	0.0	N/A	as found high	4976	37.70	5014	372.2	370.0	1.006	adjusted high	4976	37.70	5014	372.2	372.0	1.001	mld	4997	17.90	5015	176.7	179.0	0.987	low	5004	9.00	5013	88.9	92.0	0.966	calibrator zero	5012	0.00	5012	0.0	0.0	n/a	Average C.F.=						0.985
Calibrator Flow Rates (cc/mln)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):																																																										
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)																																																											
as found zero	5012	0.00	5012	0.0	0.0	N/A																																																										
as found high	4976	37.70	5014	372.2	370.0	1.006																																																										
adjusted high	4976	37.70	5014	372.2	372.0	1.001																																																										
mld	4997	17.90	5015	176.7	179.0	0.987																																																										
low	5004	9.00	5013	88.9	92.0	0.966																																																										
calibrator zero	5012	0.00	5012	0.0	0.0	n/a																																																										
Average C.F.=						0.985																																																										
Linear Regression/Calibration Results:																																																																
Correlation Coefficient = 1.000 LIMITS > or = 0.995 Slope = 1.003 .95-1.05 b (Intercept as % of full scale) = -0.35% ± 3% F.S. % change in C.F. from last cal = -0.50% ± 10%																																																																
Thermo 43i Sulphur Dioxide Analyzer Calibration																																																																
																																																																
<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: BKG: 7.0 COEF: 1.083 PMT: -632.0 FLASH: 707 INTERNAL: 28.4 CHAMBER: 45.0 PERM OVEN GAS: 45.0 PERM OVEN HEATER: 44.19 PRESSURE: 677.7 SAMPLE FLOW: 0.474 LAMP INTENSITY: 77 CONVERTER: n/a CONVERTER SET: n/a Internal Span: 364 </td> <td style="width:50%; vertical-align: top;"> As left: BKG: 7.0 COEF: 1.089 PMT: -632.0 FLASH: 708 INTERNAL: 28.2 CHAMBER: 45.0 PERM OVEN GAS: 45.0 PERM OVEN HEATER: 44.19 PRESSURE: 678.0 SAMPLE FLOW: 0.474 LAMP INTENSITY: 77 CONVERTER: n/a CONVERTER SET: n/a Internal Span: 363 </td> </tr> </table>		As found: BKG: 7.0 COEF: 1.083 PMT: -632.0 FLASH: 707 INTERNAL: 28.4 CHAMBER: 45.0 PERM OVEN GAS: 45.0 PERM OVEN HEATER: 44.19 PRESSURE: 677.7 SAMPLE FLOW: 0.474 LAMP INTENSITY: 77 CONVERTER: n/a CONVERTER SET: n/a Internal Span: 364	As left: BKG: 7.0 COEF: 1.089 PMT: -632.0 FLASH: 708 INTERNAL: 28.2 CHAMBER: 45.0 PERM OVEN GAS: 45.0 PERM OVEN HEATER: 44.19 PRESSURE: 678.0 SAMPLE FLOW: 0.474 LAMP INTENSITY: 77 CONVERTER: n/a CONVERTER SET: n/a Internal Span: 363																																																													
As found: BKG: 7.0 COEF: 1.083 PMT: -632.0 FLASH: 707 INTERNAL: 28.4 CHAMBER: 45.0 PERM OVEN GAS: 45.0 PERM OVEN HEATER: 44.19 PRESSURE: 677.7 SAMPLE FLOW: 0.474 LAMP INTENSITY: 77 CONVERTER: n/a CONVERTER SET: n/a Internal Span: 364	As left: BKG: 7.0 COEF: 1.089 PMT: -632.0 FLASH: 708 INTERNAL: 28.2 CHAMBER: 45.0 PERM OVEN GAS: 45.0 PERM OVEN HEATER: 44.19 PRESSURE: 678.0 SAMPLE FLOW: 0.474 LAMP INTENSITY: 77 CONVERTER: n/a CONVERTER SET: n/a Internal Span: 363																																																															
Comments: Sample filter changed. No ZERO adjustment made.																																																																

01 Minute Averages



— LICA - - - S02 ... PPB

TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date:	December 14, 2015	Barometric Pressure:	0.928 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	Cold Lake South	Weather Conditions:	A few clouds
Parameter:	Total Reduced Sulphur	Calibration Purpose:	routine monthly
Start Time 24 hr. (mst):	11:11	Performed By/Reviewer:	Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst):	14:31	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:	November 5, 2015	As Found C.F.:	0.918
Previous C.F.:	1.000	New C.F.:	1.000

Calibrator:	Flow Meter ID's: n/a	Standard Calibration Points for Ranges	
Make & Model:	API 700	Point	Total Reduced Sulphur Standard Calibration Points
Serial #:	830	High	78
Cal Gas Cylinder I.D. #:	LL36837	Mld	38
Cal Gas Conc. (ppm):	10.0	Low	19

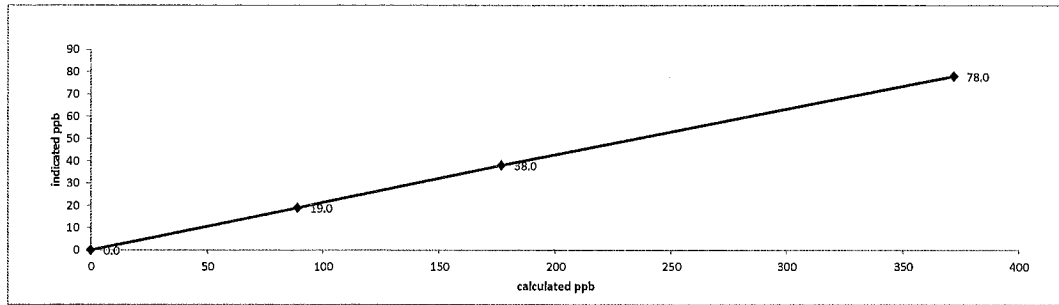
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7496	0.00	7496	0.0	0.0	N/A
as found high	7441	58.50	7500	78.0	85.0	0.918
adjusted zero	7496	0.00	7496	0.0	0.0	n/a
adjusted high	7441	58.50	7500	78.0	78.0	1.000
mld	7472	28.50	7501	38.0	38.0	1.000
low	7486	14.30	7500	19.1	19.0	1.003
calibrator zero	7496	0.00	7496	0.0	0.0	n/a
Average C.F.=						1.001

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		.95-1.05
b (Intercept as % of full scale)=	0.02%		± 3% F.S.
% change in C.F. from last cal=	8.23%		± 10%

Thermo 450i Total Reduced Sulphur Analyzer Calibration

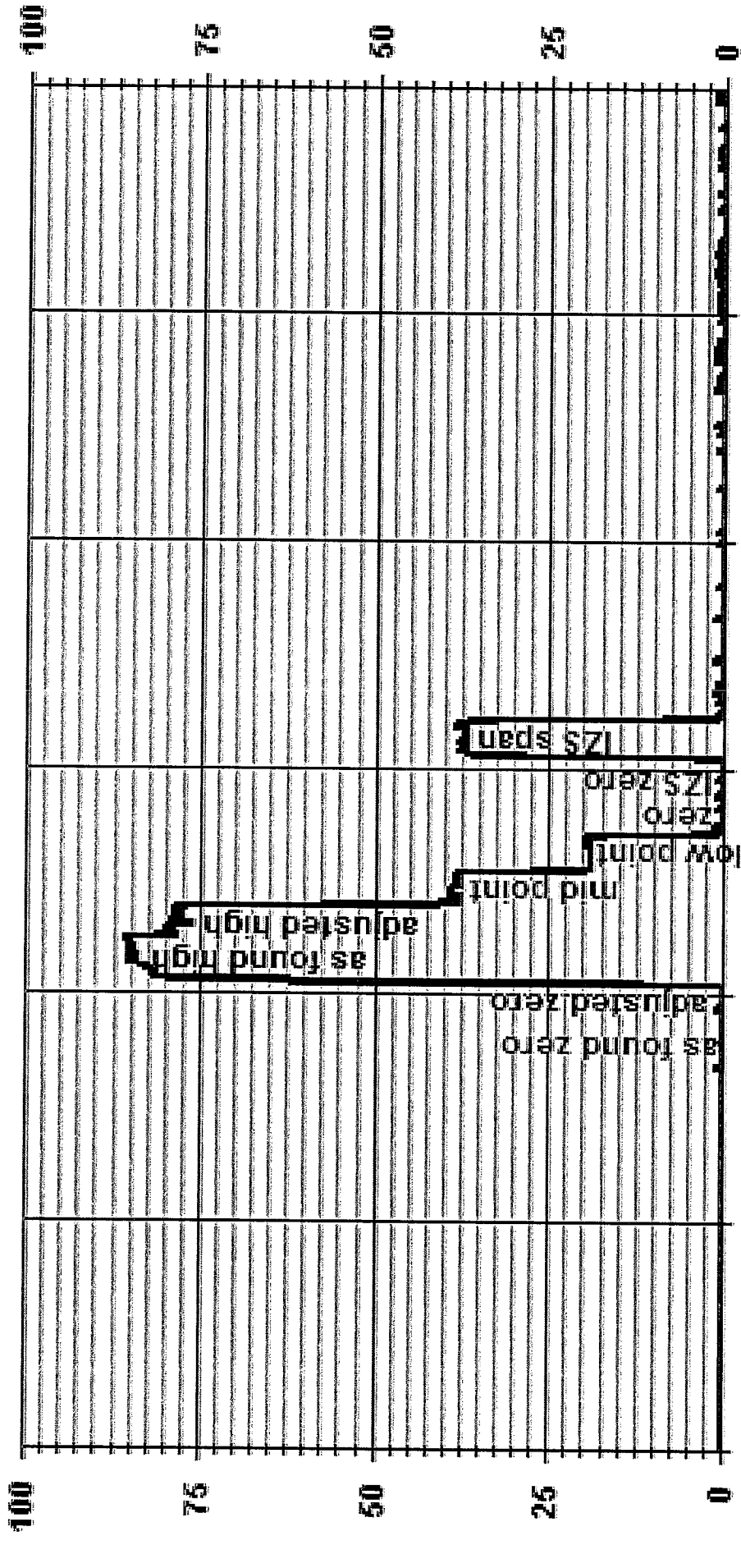


As found:		As left:	
BKG:	14.5	BKG:	13.2
COEF:	1.037	COEF:	0.944
PMT:	-650.5	PMT:	-650.8
FLASH:	742	FLASH:	743
INTERNAL:	32.0	INTERNAL:	32.2
CHAMBER:	45.0	CHAMBER:	45.0
CONVERTER TEMP:	326.0	CONVERTER TEMP:	325.2
CONVERTER SET:	325.0	CONVERTER SET:	325.0
PERM OVEN GAS:	45.0	PERM OVEN GAS:	45.0
PERM OVEN HTR:	44.37	PERM OVEN HTR:	44.38
PRESSURE:	654.4	PRESSURE:	654.7
SAMPLE FLOW:	0.506	SAMPLE FLOW:	0.509
LAMP INTENSITY:	91	LAMP INTENSITY:	92
Internal Span:	40.0	Internal Span:	37.4

Comments:

Sample filter changed.

01 Minute Averages

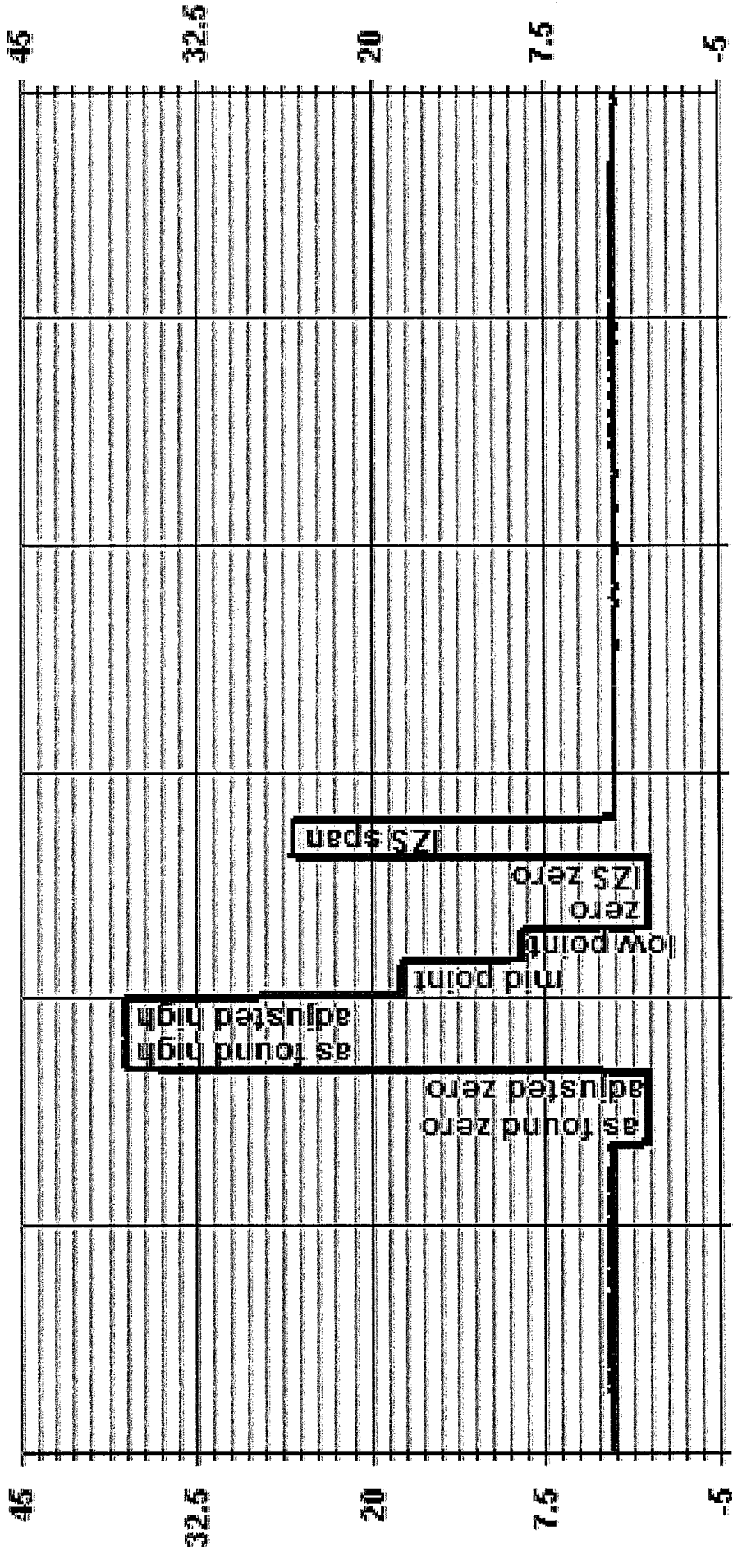


— LICA TRS_ PPB

TOTAL HYDROCARBON


Maxxam <small>ANALYTICAL SERVICES</small>		Thermo 51C Total Hydrocarbon Analyzer Calibration				
Date:	December 15, 2015	Barometric Pressure:	0.925 atm			
Company/Airshed:	LICA	Station Temperature °C:	22			
Location/Station Name:	Cold Lake South	Weather Conditions:	Mainly cloudy with sunny breaks			
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly			
Start/End Time 24 hr. (mst):	9:19 / 12:40	Performed By/Reviewer:	Alex Yakupov / Trina Whitsett			
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	August 12, 2017			
Analyzer:						
Serial Number:	427408718	Range ppm:	50			
Last Calibration Date:	November 5, 2015	As Found C.F.:	1.001			
Previous Cal High Point C.F.:	1.001	New C.F.:	1.000			
Calibrator:						
Flow Meter ID's:	n/a	Standard Calibration Points for a Range of: 50 ppm				
Make & Model:	API 700	Point	Target ppm			
Serial #:	830	High	38			
Cal Gas Cylinder I.D. #:	LL33674	Mid	18			
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm):	601.4 / 202.0	Low	9			
CH ₄ as propane/total CH ₄ equivalents (ppm):	555.5 / 1156.9					
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015						
Calibrator Flow Rates (cc/min)						
Point	Diluent	Cal Gas	Total	Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors
as found zero	1999	0.00	1999	0.0	0.10	n/a
as found high	1932	65.00	1997	37.66	37.70	1.001
adjusted zero	1999	0.00	1999	0.00	0.00	n/a
adjusted high	1932	65.00	1997	37.66	37.65	1.000
mid	1969	31.00	2000	17.93	17.80	1.007
low	1984	16.00	2000	9.26	9.10	1.017
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 =	0.999		.95-1.05			
b (Intercept as % of full scale) =	0.18%		± 3% F.S.			
% change in C.F. from last cal =	-0.05%		± 10%			
Thermo 51C Total Hydrocarbon Analyzer Calibration						
As found: H2 cylinder (psi): 1300 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 1200 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 34 measurement alarms: None service alarms: None cnt: 1395 rng: 1 try: 0 flm: 183.4 det: 125.3 Flame: 183 Filter: 125 Base: 125 Sample psi: 06.53 Internal Air Pressure: 20 Internal Fuel Pressure: 14 Internal Pressure Gauge psi: 27 Internal Span: 25.5	As left: H2 cylinder (psi): 1300 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 1200 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 34 measurement alarms: None service alarms: None cnt: 1369 rng: 1 try: 0 flm: 182.9 det: 125.4 Flame: 182 Filter: 125 Base: 125 Sample psi: 06.53 Internal Air Pressure: 20 Internal Fuel Pressure: 14 Internal Pressure Gauge psi: 27 Internal Span: 25.5					
Comments:						
Sample filter changed. EV has not changed after calibration.						

01 Minute Averages

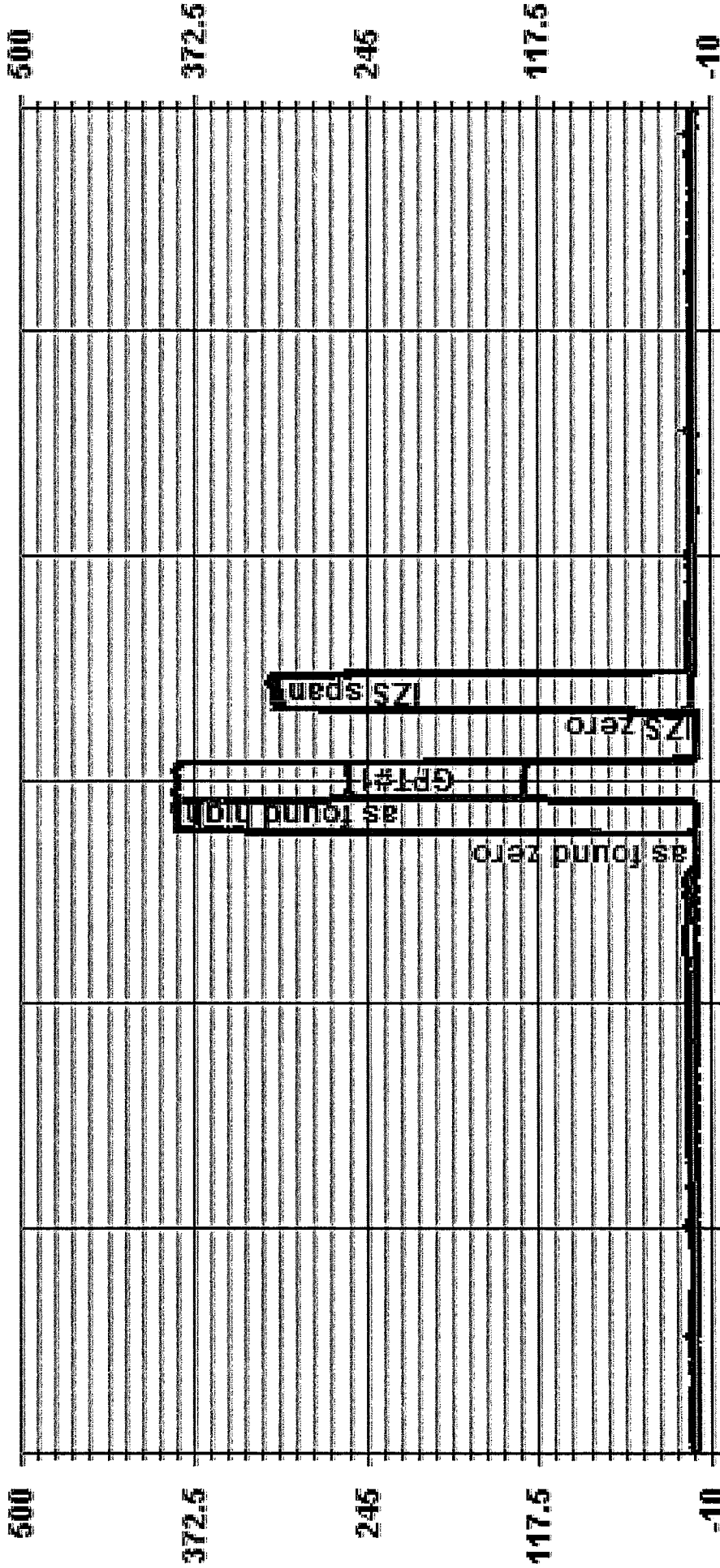


— LICA THC PPM

NITROGEN DIOXIDE


 Thermo 42C NO-NO2-NOx Analyzer Calibration																																																								
Date: December 5, 2015 Company/Alrshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 8:10 / 10:02 G.P.T. to be used for Ozone?: No Calibration Method: Gas Dilution & Varying UV Lamp Power	Barometric Pressure: 0.924 atm Station Temperature °C: 21 Weather Conditions: Mainly sunny Calibration Purpose: as found Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: March 12, 2019																																																							
Analyzer:																																																								
Serial Number: 427408716 Last Calibration Date: November 5, 2015 Range ppb: 500	Correction Factors: <table border="1" style="width:100%; 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>0.988</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>0.999</td> <td>0.988</td> <td>n/a</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	0.988	n/a	NO ₂ =	1.000	1.000	n/a	NOx =	0.999	0.988	n/a																																							
	Previous C.F.:	As Found C.F.:	New C.F.:																																																					
NO =	0.999	0.988	n/a																																																					
NO ₂ =	1.000	1.000	n/a																																																					
NOx =	0.999	0.988	n/a																																																					
Callibrator:																																																								
Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: BLM002073 NO/NOx Gas Conc. (ppm): 50.6 50.6	Standard Calibration Points for a Range of: 500 ppb <table border="1" style="width:100%; 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>280</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>146</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>60</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	280	n/a	Mid	180	146	n/a	Low	90	60	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	280	n/a																																																					
Mid	180	146	n/a																																																					
Low	90	60	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%; text-align: center;"> <tr> <th colspan="4">Callibrator 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> <tr> <td>as found zero</td> <td>5012</td> <td>0.0</td> <td>5012</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>as found high</td> <td>4976</td> <td>37.7</td> <td>5014</td> <td>380.5</td> <td>380.5</td> <td>385.0</td> <td>385.0</td> <td>0.988</td> <td>0.988</td> </tr> <tr> <td colspan="8">Average C.F.=</td> <td>n/a</td> <td>n/a</td> </tr> </table>		Callibrator 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	5012	0.0	5012	0	0	0.0	0.0	n/a	n/a	as found high	4976	37.7	5014	380.5	380.5	385.0	385.0	0.988	0.988	Average C.F.=								n/a	n/a					
Callibrator 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	5012	0.0	5012	0	0	0.0	0.0	n/a	n/a																																															
as found high	4976	37.7	5014	380.5	380.5	385.0	385.0	0.988	0.988																																															
Average C.F.=								n/a	n/a																																															
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																								
<table border="1" style="width:100%; text-align: center;"> <tr> <th colspan="4">Callibrator Flow Rates (cc/min)</th> <th>Callibrator 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> <tr> <td>NOx reference</td> <td>4976</td> <td>37.70</td> <td>5014</td> <td>0.0</td> <td>385.0</td> <td>385.0</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td></td> </tr> <tr> <td>as found high NO₂</td> <td>4976</td> <td>37.70</td> <td>5014</td> <td>260.0</td> <td>127.0</td> <td>385.0</td> <td>258.0</td> <td>258.0</td> <td>258.0</td> <td>1.000</td> </tr> <tr> <td colspan="10">Average NO₂ C.F.=</td> <td>n/a</td> </tr> </table>		Callibrator Flow Rates (cc/min)				Callibrator 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	4976	37.70	5014	0.0	385.0	385.0	0.0	0.0	0.0		as found high NO ₂	4976	37.70	5014	260.0	127.0	385.0	258.0	258.0	258.0	1.000	Average NO ₂ C.F.=										n/a
Callibrator Flow Rates (cc/min)				Callibrator 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	4976	37.70	5014	0.0	385.0	385.0	0.0	0.0	0.0																																															
as found high NO ₂	4976	37.70	5014	260.0	127.0	385.0	258.0	258.0	258.0	1.000																																														
Average NO ₂ C.F.=										n/a																																														
Linear Regression/Calibration Results:																																																								
Correlation Coefficient = Slope = b (Intercept as % of full scale) = % change in C.F. from last cal = NO ₂ converter efficiency	<table border="1" style="width:100%; text-align: center;"> <tr> <th>NO</th> <th>NOx</th> <th>NO₂</th> </tr> <tr> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>1.07%</td> <td>0.00%</td> <td>1.07%</td> </tr> <tr> <td></td> <td></td> <td>1.00</td> </tr> </table>	NO	NOx	NO ₂	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.07%	0.00%	1.07%			1.00																																					
NO	NOx	NO ₂																																																						
n/a	n/a	n/a																																																						
n/a	n/a	n/a																																																						
n/a	n/a	n/a																																																						
1.07%	0.00%	1.07%																																																						
		1.00																																																						
<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: NO Bkg ppb: 5.2 NOx Bkg ppb: 5.4 NO Coef: 1.040 NOx Coef: 1.012 NO₂ Coef: 1.003 PMT: -850 Battery: 3.2 Internal: 27.7 Chamber: 49.9 Cooler: -2.4 Converter: 317 Converter Set: 319 Pressure: 201.8 Sample Flow: 0.490 Ozonator Flow: OK Internal Span NO: 4.4 Internal Span NO₂: 288 Internal Span NOx: 292 </td> <td style="width:50%; vertical-align: top;"> As left: NO Bkg ppb: 5.2 NOx Bkg ppb: 5.4 NO Coef: 1.040 NOx Coef: 1.012 NO₂ Coef: 1.003 PMT: -850 Battery: 3.2 Internal: 27.7 Chamber: 50.0 Cooler: -2.5 Converter: 318 Converter Set: 319 Pressure: 201.9 Sample Flow: 0.490 Ozonator Flow: OK Internal Span NO: 4.4 Internal Span NO₂: 311.4 Internal Span NOx: 315.9 </td> </tr> </table>		As found: NO Bkg ppb: 5.2 NOx Bkg ppb: 5.4 NO Coef: 1.040 NOx Coef: 1.012 NO ₂ Coef: 1.003 PMT: -850 Battery: 3.2 Internal: 27.7 Chamber: 49.9 Cooler: -2.4 Converter: 317 Converter Set: 319 Pressure: 201.8 Sample Flow: 0.490 Ozonator Flow: OK Internal Span NO: 4.4 Internal Span NO ₂ : 288 Internal Span NOx: 292	As left: NO Bkg ppb: 5.2 NOx Bkg ppb: 5.4 NO Coef: 1.040 NOx Coef: 1.012 NO ₂ Coef: 1.003 PMT: -850 Battery: 3.2 Internal: 27.7 Chamber: 50.0 Cooler: -2.5 Converter: 318 Converter Set: 319 Pressure: 201.9 Sample Flow: 0.490 Ozonator Flow: OK Internal Span NO: 4.4 Internal Span NO ₂ : 311.4 Internal Span NOx: 315.9																																																					
As found: NO Bkg ppb: 5.2 NOx Bkg ppb: 5.4 NO Coef: 1.040 NOx Coef: 1.012 NO ₂ Coef: 1.003 PMT: -850 Battery: 3.2 Internal: 27.7 Chamber: 49.9 Cooler: -2.4 Converter: 317 Converter Set: 319 Pressure: 201.8 Sample Flow: 0.490 Ozonator Flow: OK Internal Span NO: 4.4 Internal Span NO ₂ : 288 Internal Span NOx: 292	As left: NO Bkg ppb: 5.2 NOx Bkg ppb: 5.4 NO Coef: 1.040 NOx Coef: 1.012 NO ₂ Coef: 1.003 PMT: -850 Battery: 3.2 Internal: 27.7 Chamber: 50.0 Cooler: -2.5 Converter: 318 Converter Set: 319 Pressure: 201.9 Sample Flow: 0.490 Ozonator Flow: OK Internal Span NO: 4.4 Internal Span NO ₂ : 311.4 Internal Span NOx: 315.9																																																							
Comments: No ZERO adjustment made. No NO ₂ adjustment made. As Found calibration required because SPAN readings drifted over 10%.																																																								

01 Minute Averages



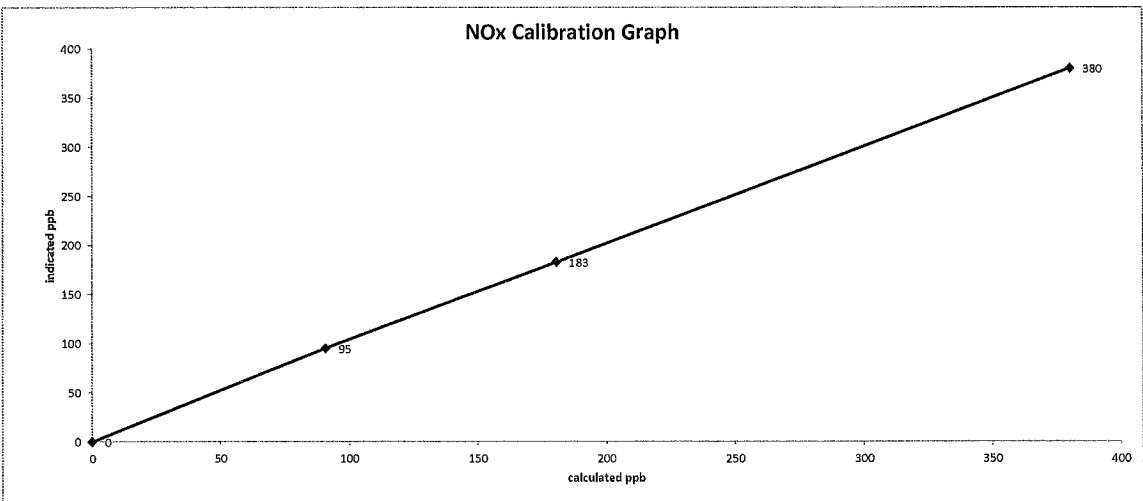
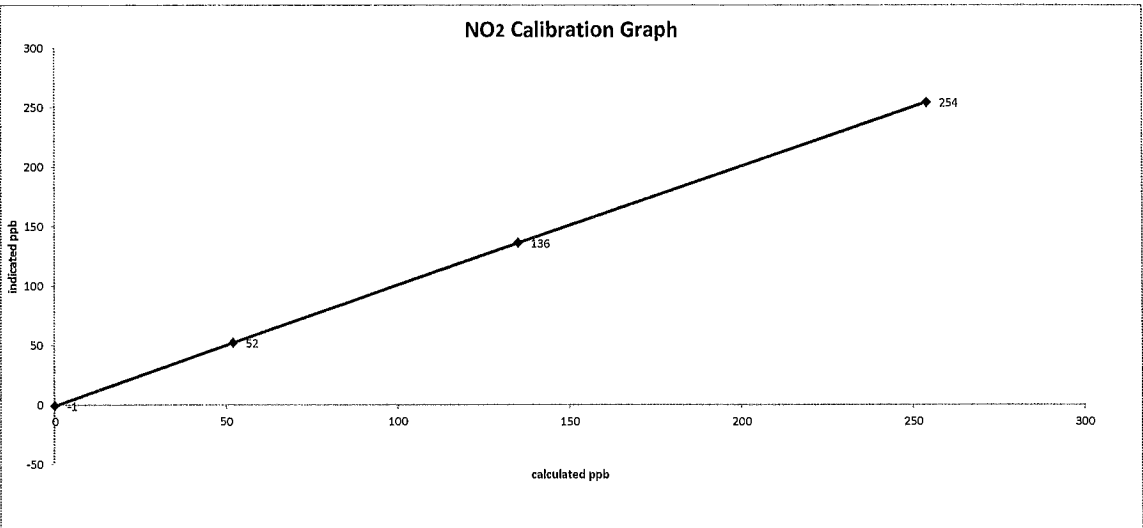
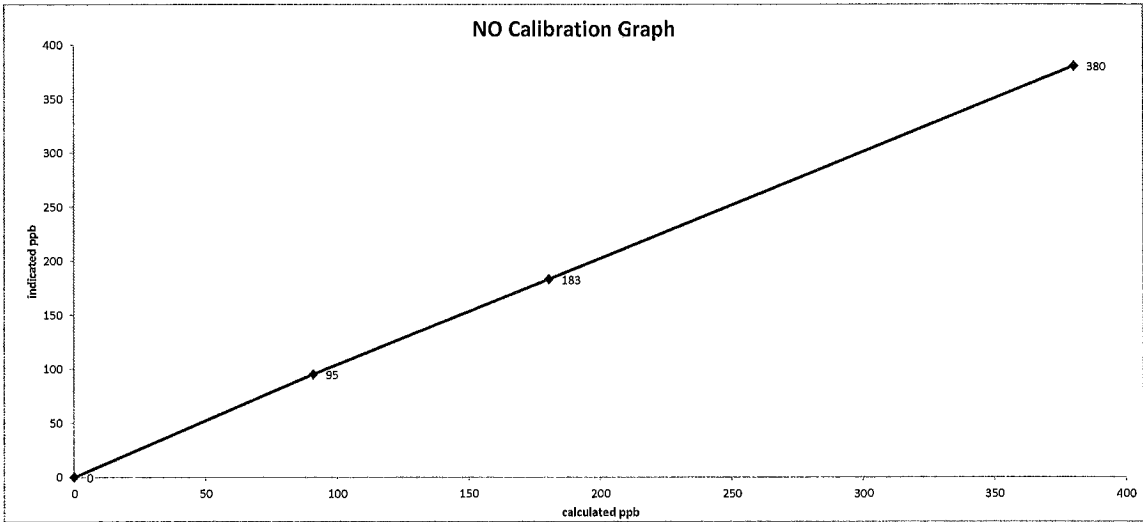
12/05/15 03:00 12/05/15 05:00 12/05/15 07:00 12/05/15 09:00 12/05/15 11:00 12/05/15 13:00

— LICA NOX_ PPB — LICA NO_ PPB — LICA NO2_ PPB

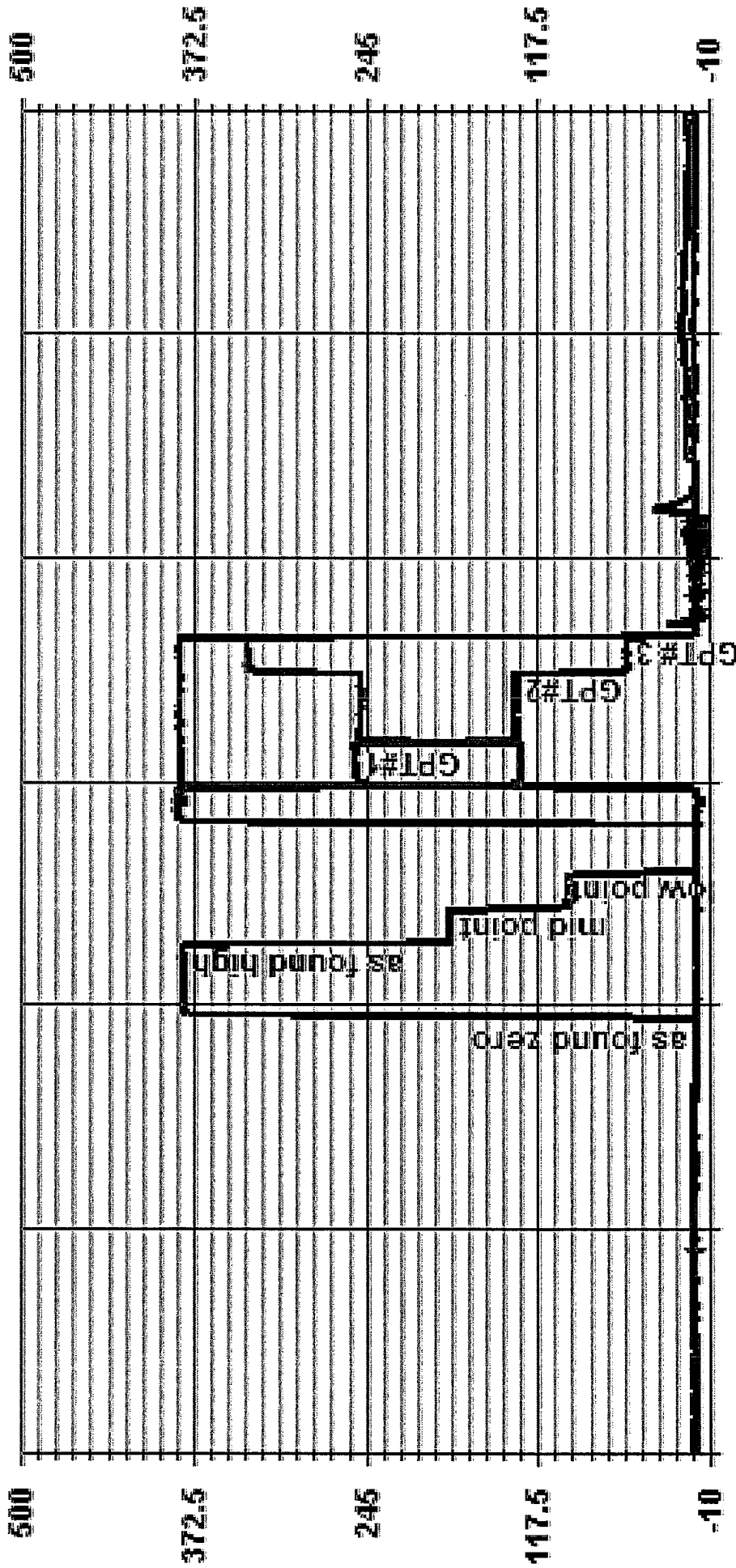
 Thermo 42C NO-NO2-NOx Analyzer Calibration																																																																													
Date: December 14, 2015 Company/Alrshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 11:11/ 15:15 G.P.T. to be used for Ozone?: No Calibration Method: Gas Dilution & Varying UV Lamp Power	Barometric Pressure: 0.928 Station Temperature °C: 22 Weather Conditions: A few clouds Calibration Purpose: shut down Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: March 12, 2019																																																																												
Analyzer: Serial Number: 427408716 Last Calibration Date: November 5, 2015 Range ppb: 500	Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>0.999</td> <td>1.001</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>n/a</td> </tr> <tr> <td>NO_x =</td> <td>0.999</td> <td>1.001</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	1.001	n/a	NO ₂ =	1.000	1.000	n/a	NO _x =	0.999	1.001	n/a																																																												
	Previous C.F.:	As Found C.F.:	New C.F.:																																																																										
NO =	0.999	1.001	n/a																																																																										
NO ₂ =	1.000	1.000	n/a																																																																										
NO _x =	0.999	1.001	n/a																																																																										
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: BLM002073 NO/NOx Gas Conc. (ppm): 50.6 50.6	Standard Calibration Points for a Range of: 500 ppb <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> <td>260</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>145</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>50</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	380	260	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	260	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																																																																													
<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>as found zero</td> <td>5012</td> <td>0.0</td> <td>5012</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>as found high</td> <td>4976</td> <td>37.7</td> <td>5014</td> <td>380.5</td> <td>380.5</td> <td>380.0</td> <td>380.0</td> <td>1.001</td> <td>1.001</td> </tr> <tr> <td>mid</td> <td>4997</td> <td>17.90</td> <td>5015</td> <td>180.6</td> <td>180.6</td> <td>183.0</td> <td>183.0</td> <td>0.987</td> <td>0.987</td> </tr> <tr> <td>low</td> <td>5004</td> <td>9.00</td> <td>5013</td> <td>90.8</td> <td>90.8</td> <td>95.0</td> <td>95.0</td> <td>0.956</td> <td>0.956</td> </tr> <tr> <td colspan="8" style="text-align: right;">Average C.F.=</td> <td>0.981</td> <td>0.981</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)			as found zero	5012	0.0	5012	0	0	0.0	0.0	n/a	n/a	as found high	4976	37.7	5014	380.5	380.5	380.0	380.0	1.001	1.001	mid	4997	17.90	5015	180.6	180.6	183.0	183.0	0.987	0.987	low	5004	9.00	5013	90.8	90.8	95.0	95.0	0.956	0.956	Average C.F.=								0.981	0.981						
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	5012	0.0	5012	0	0	0.0	0.0	n/a	n/a																																																																				
as found high	4976	37.7	5014	380.5	380.5	380.0	380.0	1.001	1.001																																																																				
mid	4997	17.90	5015	180.6	180.6	183.0	183.0	0.987	0.987																																																																				
low	5004	9.00	5013	90.8	90.8	95.0	95.0	0.956	0.956																																																																				
Average C.F.=								0.981	0.981																																																																				
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>4976</td> <td>37.70</td> <td>5014</td> <td>0.0</td> <td>384.0</td> <td>383.0</td> <td>-1.0</td> <td>0.0</td> <td>-1.0</td> <td></td> </tr> <tr> <td>as found high NO2</td> <td>4976</td> <td>37.70</td> <td>5014</td> <td>260.0</td> <td>130.0</td> <td>383.0</td> <td>253.0</td> <td>254.0</td> <td>254.0</td> <td>1.000</td> </tr> <tr> <td>gpt mid</td> <td>4976</td> <td>37.70</td> <td>5014</td> <td>135.0</td> <td>249.0</td> <td>383.0</td> <td>135.0</td> <td>135.0</td> <td>136.0</td> <td>0.993</td> </tr> <tr> <td>gpt low</td> <td>4976</td> <td>37.70</td> <td>5014</td> <td>50.0</td> <td>332.0</td> <td>383.0</td> <td>51.0</td> <td>52.0</td> <td>52.0</td> <td>1.000</td> </tr> <tr> <td colspan="9" style="text-align: right;">Average NO₂ C.F.=</td> <td>0.998</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	4976	37.70	5014	0.0	384.0	383.0	-1.0	0.0	-1.0		as found high NO2	4976	37.70	5014	260.0	130.0	383.0	253.0	254.0	254.0	1.000	gpt mid	4976	37.70	5014	135.0	249.0	383.0	135.0	135.0	136.0	0.993	gpt low	4976	37.70	5014	50.0	332.0	383.0	51.0	52.0	52.0	1.000	Average NO ₂ C.F.=									0.998
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	4976	37.70	5014	0.0	384.0	383.0	-1.0	0.0	-1.0																																																																				
as found high NO2	4976	37.70	5014	260.0	130.0	383.0	253.0	254.0	254.0	1.000																																																																			
gpt mid	4976	37.70	5014	135.0	249.0	383.0	135.0	135.0	136.0	0.993																																																																			
gpt low	4976	37.70	5014	50.0	332.0	383.0	51.0	52.0	52.0	1.000																																																																			
Average NO ₂ C.F.=									0.998																																																																				
Linear Regression/Calibration Results: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>NO</th> <th>NOx</th> <th>NO₂</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>1.004</td> <td>1.004</td> <td>0.996</td> <td>0.90-1.10</td> </tr> <tr> <td>b (Intercept as % of full scale) =</td> <td>0.45%</td> <td>0.45%</td> <td>-0.08%</td> <td>± 3% F.S.</td> </tr> <tr> <td>% change in C.F. from last cal =</td> <td>-0.23%</td> <td>0.00%</td> <td>-0.23%</td> <td>± 10%</td> </tr> <tr> <td>NO2 converter efficiency</td> <td></td> <td></td> <td>0.99</td> <td>0.96 to 1.04</td> </tr> </tbody> </table>			NO	NOx	NO ₂	LIMITS	Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995	Slope =	1.004	1.004	0.996	0.90-1.10	b (Intercept as % of full scale) =	0.45%	0.45%	-0.08%	± 3% F.S.	% change in C.F. from last cal =	-0.23%	0.00%	-0.23%	± 10%	NO2 converter efficiency			0.99	0.96 to 1.04																																														
	NO	NOx	NO ₂	LIMITS																																																																									
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995																																																																									
Slope =	1.004	1.004	0.996	0.90-1.10																																																																									
b (Intercept as % of full scale) =	0.45%	0.45%	-0.08%	± 3% F.S.																																																																									
% change in C.F. from last cal =	-0.23%	0.00%	-0.23%	± 10%																																																																									
NO2 converter efficiency			0.99	0.96 to 1.04																																																																									
<table style="width:100%;"> <tr> <td style="width: 50%; vertical-align: top;"> As found: NO Bkg ppb: 5.2 NOx Bkg ppb: 5.4 NO Coef: 1.040 NOx Coef: 1.012 NO2 Coef: 1.003 PMT: -850 Battery: 3.2 Internal: 27.3 Chamber: 50.0 Cooler: -2.4 Converter: 317 Converter Set: 320 Pressure: 205.6 Sample Flow: 0.492 Ozonator Flow: OK Internal Span NO: 315.9 Internal Span NO2: 4.4 Internal Span NOx: 311.4 </td> <td style="width: 50%; vertical-align: top;"> As left: NO Bkg ppb: n/a NOx Bkg ppb: n/a NO Coef: n/a NOx Coef: n/a NO2 Coef: n/a PMT: n/a Battery: n/a Internal: n/a Chamber: n/a Cooler: n/a Converter: n/a Converter Set: n/a Pressure: n/a Sample Flow: n/a Ozonator Flow: n/a Internal Span NO: n/a Internal Span NO2: n/a Internal Span NOx: n/a </td> </tr> </table>		As found: NO Bkg ppb: 5.2 NOx Bkg ppb: 5.4 NO Coef: 1.040 NOx Coef: 1.012 NO2 Coef: 1.003 PMT: -850 Battery: 3.2 Internal: 27.3 Chamber: 50.0 Cooler: -2.4 Converter: 317 Converter Set: 320 Pressure: 205.6 Sample Flow: 0.492 Ozonator Flow: OK Internal Span NO: 315.9 Internal Span NO2: 4.4 Internal Span NOx: 311.4	As left: NO Bkg ppb: n/a NOx Bkg ppb: n/a NO Coef: n/a NOx Coef: n/a NO2 Coef: n/a PMT: n/a Battery: n/a Internal: n/a Chamber: n/a Cooler: n/a Converter: n/a Converter Set: n/a Pressure: n/a Sample Flow: n/a Ozonator Flow: n/a Internal Span NO: n/a Internal Span NO2: n/a Internal Span NOx: n/a																																																																										
As found: NO Bkg ppb: 5.2 NOx Bkg ppb: 5.4 NO Coef: 1.040 NOx Coef: 1.012 NO2 Coef: 1.003 PMT: -850 Battery: 3.2 Internal: 27.3 Chamber: 50.0 Cooler: -2.4 Converter: 317 Converter Set: 320 Pressure: 205.6 Sample Flow: 0.492 Ozonator Flow: OK Internal Span NO: 315.9 Internal Span NO2: 4.4 Internal Span NOx: 311.4	As left: NO Bkg ppb: n/a NOx Bkg ppb: n/a NO Coef: n/a NOx Coef: n/a NO2 Coef: n/a PMT: n/a Battery: n/a Internal: n/a Chamber: n/a Cooler: n/a Converter: n/a Converter Set: n/a Pressure: n/a Sample Flow: n/a Ozonator Flow: n/a Internal Span NO: n/a Internal Span NO2: n/a Internal Span NOx: n/a																																																																												
Comments: No ZERO adjustment made. No High Point adjustment made. No NO2 adjustment made. Shutdown calibration performed to replace the analyzer with a new analyzer provided by the client.																																																																													

Date: December 14, 2015
Company/Airshed: LICA
Location/Station Name: Cold Lake South


Start/End Time 24 hr. (mst): 11:11/ 15:15
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Varying UV Lamp Power



01 Minute Averages

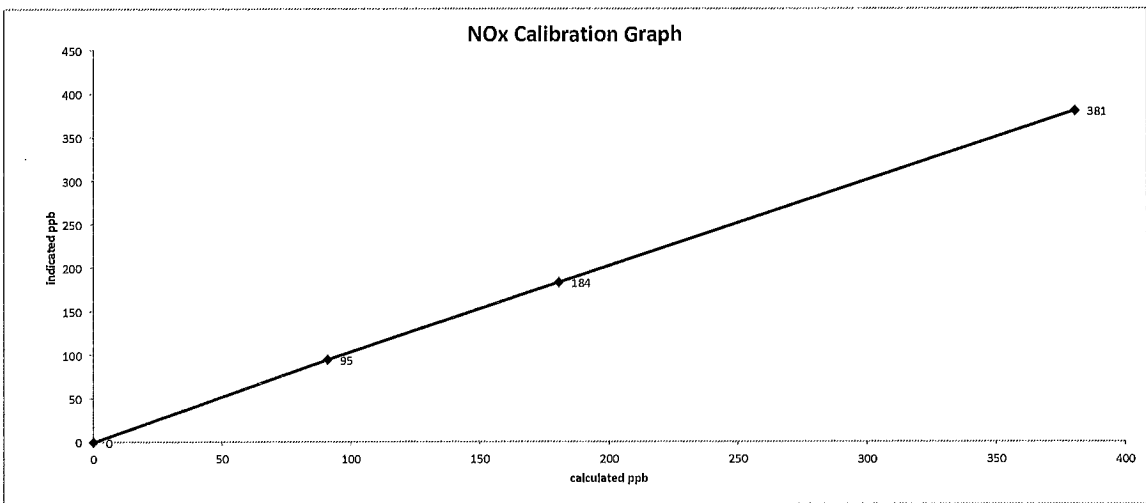
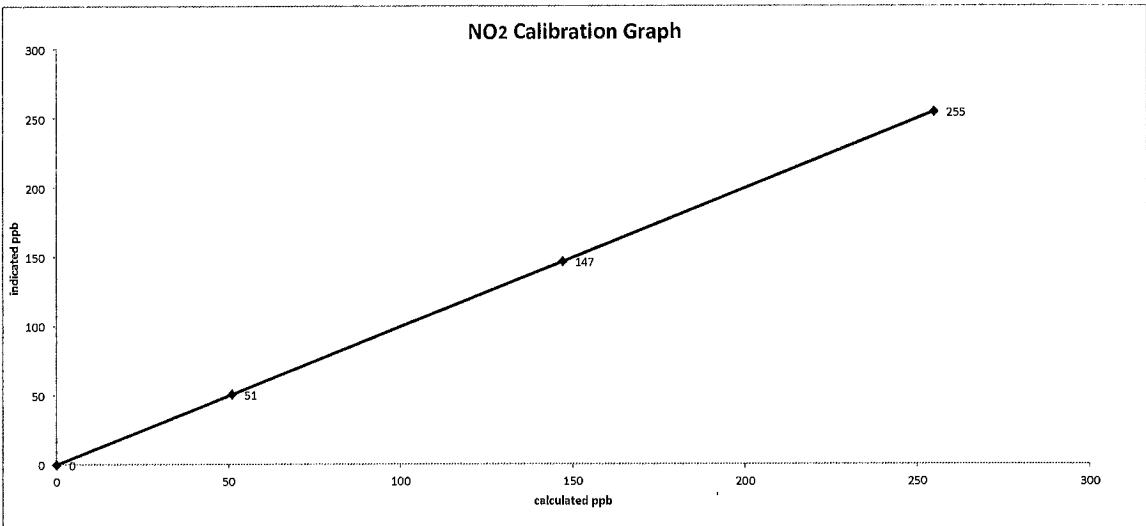
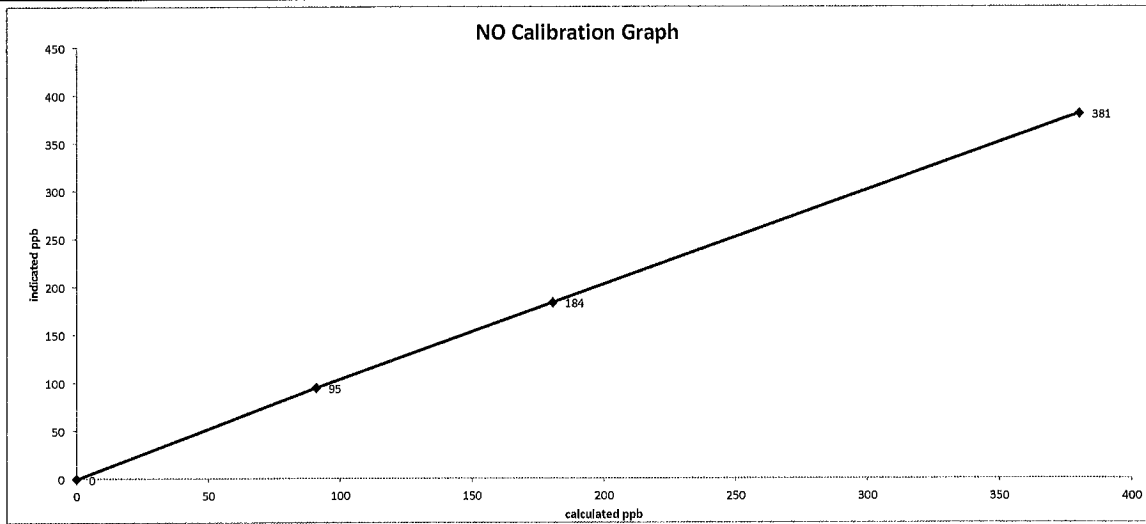


--- LICA NOX_ PPB --- LICA NO_ PPB --- LICA NO2_ PPB

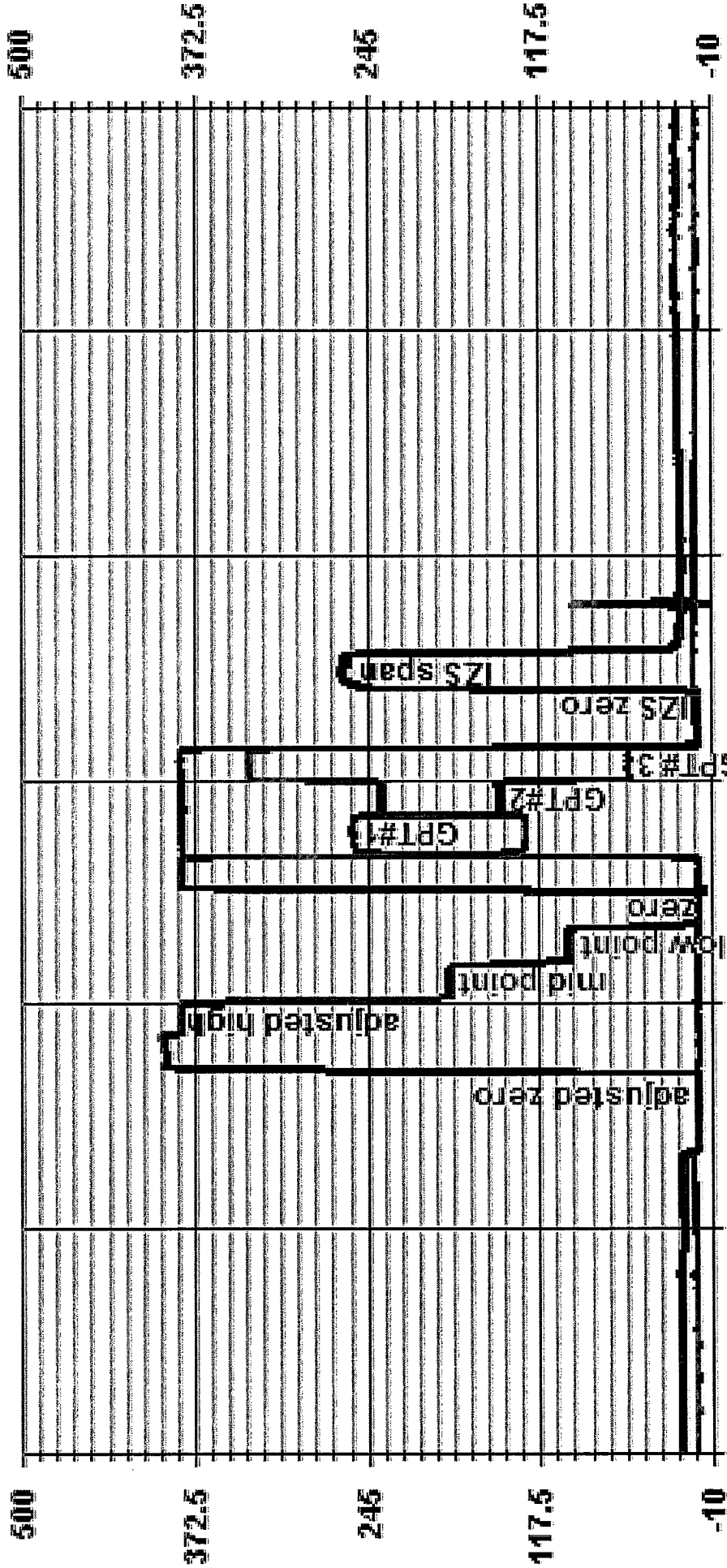
 Thermo 42i NO-NO2-NOx Analyzer Calibration																																																																																	
Date: December 15, 2015 Company/Alrshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 9:19 / 14:13 G.P.T. to be used for Ozone? No Calibration Method: Gas Dilution & Varying UV Lamp Power	Barometric Pressure: 0.925 atm Station Temperature °C: 22 Weather Conditions: Mainly cloudy with sunny breaks Calibration Purpose: Installation Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: March 12, 2019																																																																																
Analyzer:																																																																																	
Serial Number: 1505664393 Last Calibration Date: n/a Range ppb: 500	Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>n/a</td> <td>n/a</td> <td>0.999</td> </tr> <tr> <td>NO₂ =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>n/a</td> <td>n/a</td> <td>0.999</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	n/a	n/a	0.999	NO ₂ =	n/a	n/a	1.000	NOx =	n/a	n/a	0.999																																																																
	Previous C.F.:	As Found C.F.:	New C.F.:																																																																														
NO =	n/a	n/a	0.999																																																																														
NO ₂ =	n/a	n/a	1.000																																																																														
NOx =	n/a	n/a	0.999																																																																														
Calibrator:																																																																																	
Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: BLM002073 NO/NOx Gas Conc. (ppm): 50.6 50.6	Standard Calibration Points for a Range of: 500 ppb <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> <td>250</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>145</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>50</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	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																																																																														
<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 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>5012</td> <td>0.0</td> <td>5012</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>4976</td> <td>37.7</td> <td>5014</td> <td>380.5</td> <td>380.5</td> <td>381.0</td> <td>381.0</td> <td>0.999</td> <td>0.999</td> </tr> <tr> <td>mid</td> <td>4997</td> <td>17.90</td> <td>5015</td> <td>180.6</td> <td>180.6</td> <td>184.0</td> <td>184.0</td> <td>0.982</td> <td>0.982</td> </tr> <tr> <td>low</td> <td>5004</td> <td>9.00</td> <td>5013</td> <td>90.8</td> <td>90.8</td> <td>95.0</td> <td>95.0</td> <td>0.956</td> <td>0.956</td> </tr> <tr> <td>calibrator zero</td> <td>5012</td> <td>0.00</td> <td>5012</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>0.979</td> <td>0.979</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	5012	0.0	5012	0	0	0.0	0.0	n/a	n/a	adjusted high	4976	37.7	5014	380.5	380.5	381.0	381.0	0.999	0.999	mid	4997	17.90	5015	180.6	180.6	184.0	184.0	0.982	0.982	low	5004	9.00	5013	90.8	90.8	95.0	95.0	0.956	0.956	calibrator zero	5012	0.00	5012	0.0	0.0	0.0	0.0	n/a	n/a	Average C.F.=								0.979	0.979
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	5012	0.0	5012	0	0	0.0	0.0	n/a	n/a																																																																								
adjusted high	4976	37.7	5014	380.5	380.5	381.0	381.0	0.999	0.999																																																																								
mid	4997	17.90	5015	180.6	180.6	184.0	184.0	0.982	0.982																																																																								
low	5004	9.00	5013	90.8	90.8	95.0	95.0	0.956	0.956																																																																								
calibrator zero	5012	0.00	5012	0.0	0.0	0.0	0.0	n/a	n/a																																																																								
Average C.F.=								0.979	0.979																																																																								
<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>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>4976</td> <td>37.70</td> <td>5014</td> <td>0.0</td> <td>382.0</td> <td>382.0</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td></td> </tr> <tr> <td>adjusted high NO2</td> <td>4976</td> <td>37.70</td> <td>5014</td> <td>260.0</td> <td>127.0</td> <td>382.0</td> <td>255.0</td> <td>255.0</td> <td>255.0</td> <td>1.000</td> </tr> <tr> <td>gpt mid</td> <td>4976</td> <td>37.70</td> <td>5014</td> <td>145.0</td> <td>235.0</td> <td>382.0</td> <td>147.0</td> <td>147.0</td> <td>147.0</td> <td>1.000</td> </tr> <tr> <td>gpt low</td> <td>4976</td> <td>37.70</td> <td>5014</td> <td>50.0</td> <td>331.0</td> <td>382.0</td> <td>51.0</td> <td>51.0</td> <td>51.0</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	4976	37.70	5014	0.0	382.0	382.0	0.0	0.0	0.0		adjusted high NO2	4976	37.70	5014	260.0	127.0	382.0	255.0	255.0	255.0	1.000	gpt mid	4976	37.70	5014	145.0	235.0	382.0	147.0	147.0	147.0	1.000	gpt low	4976	37.70	5014	50.0	331.0	382.0	51.0	51.0	51.0	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	4976	37.70	5014	0.0	382.0	382.0	0.0	0.0	0.0																																																																								
adjusted high NO2	4976	37.70	5014	260.0	127.0	382.0	255.0	255.0	255.0	1.000																																																																							
gpt mid	4976	37.70	5014	145.0	235.0	382.0	147.0	147.0	147.0	1.000																																																																							
gpt low	4976	37.70	5014	50.0	331.0	382.0	51.0	51.0	51.0	1.000																																																																							
Average NO ₂ C.F.=										1.000																																																																							
Linear Regression/Calibration Results:																																																																																	
Correlation Coefficient = 1.000 Slope = 1.001 b (Intercept as % of full scale) = 0.46% % change in C.F. from last cal = n/a NO2 converter efficiency	<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>1.001</td> <td>1.001</td> <td>1.000</td> </tr> <tr> <td>0.46%</td> <td>0.46%</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	1.001	1.001	1.000	0.46%	0.46%	0.00%	n/a	n/a	n/a			1.00																																																														
NO	NOx	NO ₂																																																																															
1.000	1.000	1.000																																																																															
1.001	1.001	1.000																																																																															
0.46%	0.46%	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%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: NO Bkg: n/a NOx Bkg: n/a NO Coef: n/a NO2 Coef: n/a NOx Coef: n/a PMT: n/a Internal: n/a Chamber: n/a Cooler: n/a NO2 Converter: n/a NO2 Converter Set: n/a Pressure: n/a Flow: n/a Ozonator Flow: n/a Internal Span NO: n/a Internal Span NO2: n/a Internal Span NOx: n/a </td> <td style="width:50%; vertical-align: top;"> As left: NO Bkg: 3.1 NOx Bkg: 3.5 NO Coef: 0.966 NO2 Coef: 1.000 NOx Coef: 0.997 PMT: -854.7 Internal: 25.4 Chamber: 50.6 Cooler: -3.0 NO2 Converter: 325.5 NO2 Converter Set: 325.0 Pressure: 184.4 Flow: 0.803 Ozonator Flow: OK Internal Span NO: 2.5 Internal Span NO2: 259.6 Internal Span NOx: 262.6 </td> </tr> </table>		As found: NO Bkg: n/a NOx Bkg: n/a NO Coef: n/a NO2 Coef: n/a NOx Coef: n/a PMT: n/a Internal: n/a Chamber: n/a Cooler: n/a NO2 Converter: n/a NO2 Converter Set: n/a Pressure: n/a Flow: n/a Ozonator Flow: n/a Internal Span NO: n/a Internal Span NO2: n/a Internal Span NOx: n/a	As left: NO Bkg: 3.1 NOx Bkg: 3.5 NO Coef: 0.966 NO2 Coef: 1.000 NOx Coef: 0.997 PMT: -854.7 Internal: 25.4 Chamber: 50.6 Cooler: -3.0 NO2 Converter: 325.5 NO2 Converter Set: 325.0 Pressure: 184.4 Flow: 0.803 Ozonator Flow: OK Internal Span NO: 2.5 Internal Span NO2: 259.6 Internal Span NOx: 262.6																																																																														
As found: NO Bkg: n/a NOx Bkg: n/a NO Coef: n/a NO2 Coef: n/a NOx Coef: n/a PMT: n/a Internal: n/a Chamber: n/a Cooler: n/a NO2 Converter: n/a NO2 Converter Set: n/a Pressure: n/a Flow: n/a Ozonator Flow: n/a Internal Span NO: n/a Internal Span NO2: n/a Internal Span NOx: n/a	As left: NO Bkg: 3.1 NOx Bkg: 3.5 NO Coef: 0.966 NO2 Coef: 1.000 NOx Coef: 0.997 PMT: -854.7 Internal: 25.4 Chamber: 50.6 Cooler: -3.0 NO2 Converter: 325.5 NO2 Converter Set: 325.0 Pressure: 184.4 Flow: 0.803 Ozonator Flow: OK Internal Span NO: 2.5 Internal Span NO2: 259.6 Internal Span NOx: 262.6																																																																																
Comments: Sample filter changed. A new NOx permeation device Installed. Sampling pump rebuilt. No NO2 adjustment made. The analyzer was installed on December 14, and left for stability overnight. Perm oven temperature was adjusted to 35 C degrees.																																																																																	

Date: December 15, 2015
Company/Alrshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 9:19 / 14:13
Calibration Purpose: Installation
Calibration Method: Gas Dilution & Varying UV Lamp Power




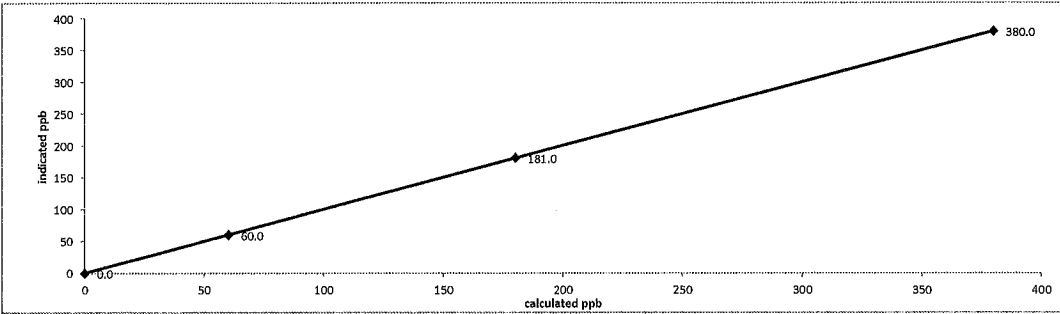
01 Minute Averages



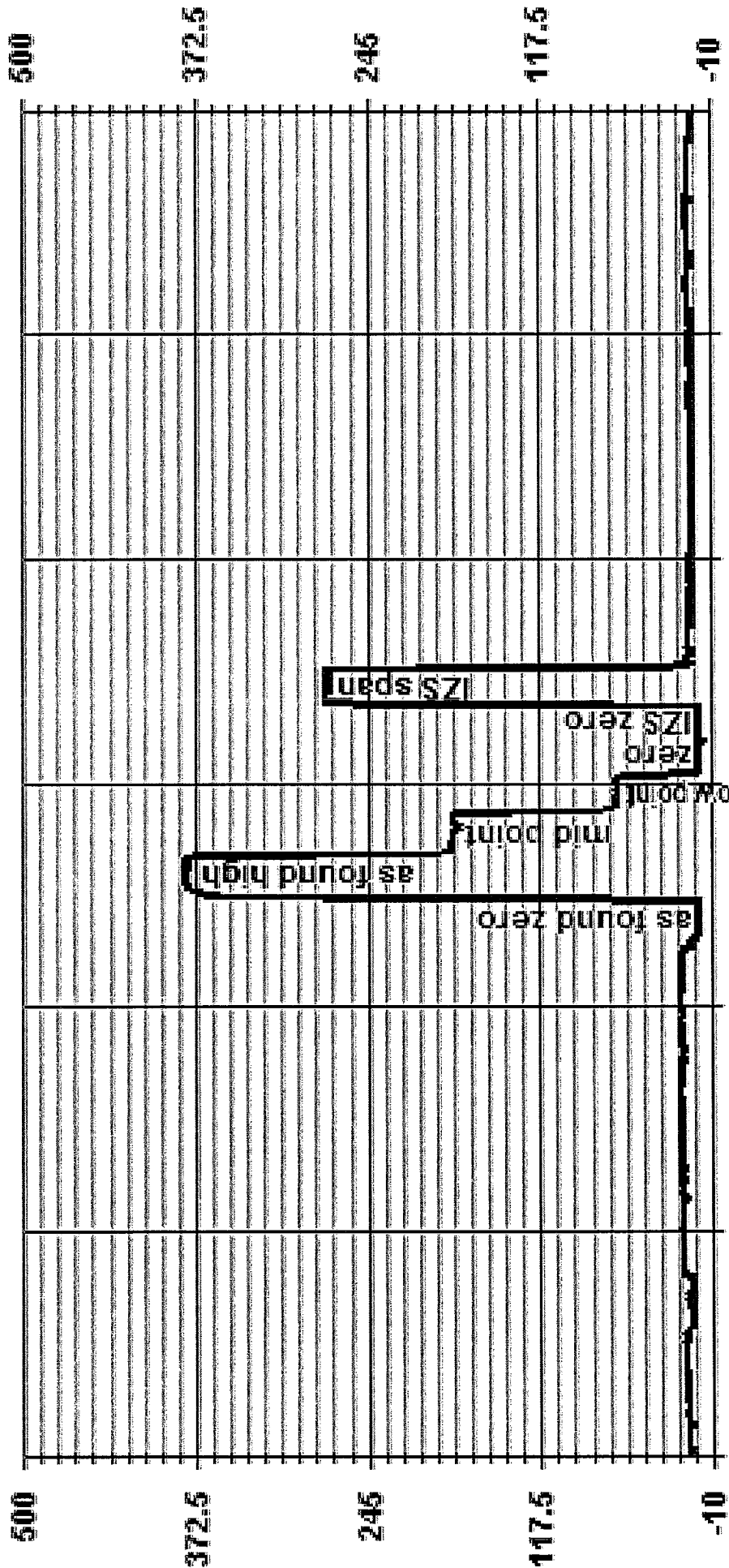
12/15/15 07:00 12/15/15 09:00 12/15/15 11:00 12/15/15 13:00 12/15/15 15:00 12/15/15 17:00

— LICA NOX_ PPB — LICA NO_ — LICA NO2_ PPB

OZONE

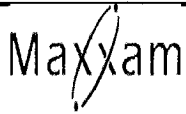
 Thermo 49i Ozone Analyzer Calibration																																																							
Date: December 15, 2015 Company/Airshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 13:22 / 16:06 Ozone Calibration Method: Varying UV Lamp Power G.P.T. Date: n/a-done by Varying UV Lamp Power	Barometric Pressure: 0.925 atm Station Temperature °C: 22 Weather Conditions: Mainly cloudy with sunny breaks Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: n/a																																																						
Analyzer: Serial Number: 700419951 Ozone Range ppb: 500 Last Calibration Date: November 5, 2015 As Found C.F.: 1.000 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																																																							
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="2">Callibrator Flow Rate (cc/min)</th> <th>Calculated Concentration:</th> <th>Corrected Calculated Concentration:</th> <th>Indicated Concentration:</th> <th rowspan="2">Correction Factors:</th> </tr> <tr> <th>Total Flow @ Point Start</th> <th>Total Flow @ Point Finish</th> <th>(ppb)</th> <th>(ppb)</th> <th>(ppb)</th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>5013</td> <td>5013</td> <td>0.0</td> <td>n/a</td> <td>0.0</td> <td>n/a</td> </tr> <tr> <td>as found high</td> <td>5013</td> <td>5013</td> <td>380.0</td> <td>380.0</td> <td>380.0</td> <td>1.000</td> </tr> <tr> <td>mid</td> <td>5013</td> <td>5013</td> <td>180.0</td> <td>180.0</td> <td>181.0</td> <td>0.994</td> </tr> <tr> <td>low</td> <td>5013</td> <td>5013</td> <td>60.0</td> <td>60.0</td> <td>60.0</td> <td>1.000</td> </tr> <tr> <td>calibrator zero</td> <td>5013</td> <td>5013</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>0.998</td> </tr> </tbody> </table>		Point	Callibrator 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	5013	5013	0.0	n/a	0.0	n/a	as found high	5013	5013	380.0	380.0	380.0	1.000	mid	5013	5013	180.0	180.0	181.0	0.994	low	5013	5013	60.0	60.0	60.0	1.000	calibrator zero	5013	5013	0.0	n/a	0.0	n/a	Average C.F. =						0.998
Point	Callibrator 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	5013	5013	0.0	n/a	0.0	n/a																																																	
as found high	5013	5013	380.0	380.0	380.0	1.000																																																	
mid	5013	5013	180.0	180.0	181.0	0.994																																																	
low	5013	5013	60.0	60.0	60.0	1.000																																																	
calibrator zero	5013	5013	0.0	n/a	0.0	n/a																																																	
Average C.F. =						0.998																																																	
Linear Regression/Calibration Results: Correlation Coefficient = 1.000 LIMITS > or = 0.995 Slope = 1.000 .95-1.05 b (Intercept as % of full scale) = -0.04% ± 3% F.S. % change in C.F. from last cal = 0.00% ± 10%																																																							
Thermo 49i Ozone Analyzer Calibration																																																							
																																																							
<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: O3 Bkg: 0.2 O3 Coef: 1.011 Photo Lamp: 8.7 O3 Lamp: 9.0 Bench: 27.3 Bench Lamp: 53.4 O3 Lamp: 67.3 Pressure: 702.3 Cell A lpm: 0.713 Cell B lpm: 0.752 O3 ppb: 0.9 Cell A ppb: 25.5 Cell B ppb: -23.7 Cell A int: 57443 Cell B int: 56111 Internal Span: 272 </td> <td style="width:50%; vertical-align: top;"> As left: O3 Bkg: 0.2 O3 Coef: 1.011 Photo Lamp: 8.7 O3 Lamp: 9.0 Bench: 27.6 Bench Lamp: 53.4 O3 Lamp: 67.3 Pressure: 702.3 Cell A lpm: 0.713 Cell B lpm: 0.752 O3 ppb: -0.6 Cell A ppb: 20.9 Cell B ppb: -22.1 Cell A int: 57433 Cell B int: 56098 Internal Span: 274.7 </td> </tr> </table>		As found: O3 Bkg: 0.2 O3 Coef: 1.011 Photo Lamp: 8.7 O3 Lamp: 9.0 Bench: 27.3 Bench Lamp: 53.4 O3 Lamp: 67.3 Pressure: 702.3 Cell A lpm: 0.713 Cell B lpm: 0.752 O3 ppb: 0.9 Cell A ppb: 25.5 Cell B ppb: -23.7 Cell A int: 57443 Cell B int: 56111 Internal Span: 272	As left: O3 Bkg: 0.2 O3 Coef: 1.011 Photo Lamp: 8.7 O3 Lamp: 9.0 Bench: 27.6 Bench Lamp: 53.4 O3 Lamp: 67.3 Pressure: 702.3 Cell A lpm: 0.713 Cell B lpm: 0.752 O3 ppb: -0.6 Cell A ppb: 20.9 Cell B ppb: -22.1 Cell A int: 57433 Cell B int: 56098 Internal Span: 274.7																																																				
As found: O3 Bkg: 0.2 O3 Coef: 1.011 Photo Lamp: 8.7 O3 Lamp: 9.0 Bench: 27.3 Bench Lamp: 53.4 O3 Lamp: 67.3 Pressure: 702.3 Cell A lpm: 0.713 Cell B lpm: 0.752 O3 ppb: 0.9 Cell A ppb: 25.5 Cell B ppb: -23.7 Cell A int: 57443 Cell B int: 56111 Internal Span: 272	As left: O3 Bkg: 0.2 O3 Coef: 1.011 Photo Lamp: 8.7 O3 Lamp: 9.0 Bench: 27.6 Bench Lamp: 53.4 O3 Lamp: 67.3 Pressure: 702.3 Cell A lpm: 0.713 Cell B lpm: 0.752 O3 ppb: -0.6 Cell A ppb: 20.9 Cell B ppb: -22.1 Cell A int: 57433 Cell B int: 56098 Internal Span: 274.7																																																						
Comments: <p style="text-align: center;">Sample filter changed. No ZERO adjustment made. No High Point adjustment made.</p>																																																							

01 Minute Averages



— LICA O3_ PPB

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: December 9, 2015
 Company: LICA
 Station Name/Location: Cold Lake South
 Previous Audit Date: November 23, 2015
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 9:47
 End Time (mst): 10:36
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Fog

1400A Information and Status:

Serial Number:	<u>1405A201620804</u>	As Found Filter Loading %:	<u>33.08</u>
Ko Factor:	<u>14578</u>	As Left Filter Loading %:	<u>35.12</u>
Ambient Temperature °C:	<u>-0.75</u>	As Found Noise:	<u>0.005</u>
Ambient Pressure atm:	<u>0.909</u>	As Left Noise:	<u>0.000</u>
Main Flow Reading lpm:	<u>3.00</u>	Pump Vacuum:	<u>0.31</u>
Aux Flow Reading lpm:	<u>16.66</u>	Warnings:	<u>None</u>

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>Fisher</u>
Model:	<u>475 Mark III</u>	<u>FB 1291</u>	<u>FB 1291</u>
Serial Number:	<u>n/a</u>	<u>130168457</u>	<u>130168457</u>
Calibration Date:	<u>n/a</u>	<u>18-Mar-15</u>	<u>18-Mar-15</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.15	0.01	0.15
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.08	-0.09	0.05	-0.09
	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	0.15	0.01	0.15
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.08	-0.09	0.05	-0.09
	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>-0.8</u>	1405F pressure atm: <u>0.909</u>
reference temperature °C: <u>-0.8</u>	reference pressure: <u>0.910</u>
difference °C: <u>-0.1</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>-0.8</u>	1405F pressure atm: <u>0.910</u>
reference temperature °C: <u>-0.8</u>	reference pressure: <u>0.910</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>16.66</u>
reference main flow lpm: <u>2.99</u>	reference total/aux flow lpm: <u>16.75</u>
difference lpm: <u>-0.01</u>	difference lpm: <u>0.09</u>

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

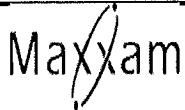
main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.66</u>
reference main flow lpm: <u>2.99</u>	reference total/aux flow lpm: <u>16.75</u>
difference lpm: <u>-0.01</u>	difference lpm: <u>0.09</u>

K_o Audit:

Last K_o audit date: 3-Nov-15
 1405F K_o factor: 14578
 Measured K_o factor: 14764.1000
 % difference: 1.28

Comments:

47 mm FDMS filter changed



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: December 23, 2015
 Company: LICA
 Station Name/Location: Cold Lake South
 Previous Audit Date: December 9, 2015
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whatsitt
 Start Time (mst): 12:43
 End Time (mst): 13:31
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: Mainly cloudy with snow

1400A Information and Status:

Serial Number: 1405A201620804 As Found Filter Loading %: 39.62
 Ko Factor: 14578 As Left Filter Loading %: 40.25
 Ambient Temperature °C: -10.14 As Found Noise: 0.003
 Ambient Pressure atm: 0.919 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.32
 Aux Flow Reading lpm: 16.66 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>Fisher</u>
Model:	<u>475 Mark III</u>	<u>FB 1291</u>	<u>FB 1291</u>
Serial Number:	<u>n/a</u>	<u>130168457</u>	<u>130168457</u>
Calibration Date:	<u>n/a</u>	<u>18-Mar-15</u>	<u>18-Mar-15</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.15	0.01	0.15
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.08	-0.09	0.05	-0.09
	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	0.15	0.01	0.15
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.08	-0.09	0.05	-0.09
	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>-10.1</u>	1405F pressure atm: <u>0.919</u>
reference temperature °C: <u>-10.7</u>	reference pressure: <u>0.923</u>
difference °C: <u>-0.6</u>	difference: <u>-0.004</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>-10.7</u>	1405F pressure atm: <u>0.923</u>
reference temperature °C: <u>-10.7</u>	reference pressure: <u>0.923</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>16.66</u>
reference main flow lpm: <u>3.03</u>	reference total/aux flow lpm: <u>16.86</u>
difference lpm: <u>0.03</u>	difference lpm: <u>0.20</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>16.66</u>
reference main flow lpm: <u>3.03</u>	reference total/aux flow lpm: <u>16.86</u>
difference lpm: <u>0.03</u>	difference lpm: <u>0.20</u>

K_o Audit:

Last K_o audit date: 3-Nov-15
 1405F K_o factor: 14578
 Measured K_o factor: 14764.1000
 % difference: 1.28

Comments:

47 mm FDMS filter changed

WIND SYSTEM



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

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

Sonic Wind Sensor Certificate of Calibration

Sensor Model No: 50.5II 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: AJZ 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 Firmware Version: 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	.666	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

PUF SAMPLER

		TISCH PUF PLUS SAMPLER AUDIT		
Date: December 22, 2015		PUF PLUS Serial #: 100-1020		
Company/Alrshed: LICA		Performed By/Reviewer: Alex Yakupov Trina Whitsitt		
Location/Station Name: Cold Lake South		Weather Conditions: Mainly clear		
Reference Standards:				
Make: Fisher Scientific		Pressure: Fisher Scientific		
Model: FB61291		Temperature: Practical Instrument Electronics		
Serial Number: 130168457		Model: FB61291		
Calibration Date: March 18, 2015		Serial Number: 130168457		
Calibration Date: March 18, 2015		Temperature: January 24, 2015		
TISCH PUF PLUS PRESSURE AND TEMPERATURE AUDIT				
AS FOUND Reference Barometric Pressure (mmHg): 697		AS FOUND Reference Temperature (°C): -22.7		
AS FOUND PUF PLUS Barometric Pressure (mmHg): 705		AS FOUND PUF PLUS Temperature (°C): -22.9		
% Difference (+/- 2% max.): -1.15%		% Difference (+/- 2 °C max.): 0.2		
IF THE PRESSURE DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED		**IF THE TEMPERATURE DEVIATES BY MORE THAN +/- 2 °C A FLOW CALIBRATION IS REQUIRED**		
TISCH PUF PLUS FLOW AUDIT				
Flow Audit Calculations:				
Calibrated Orifice Certification Date: October 12, 2015				
Enter Barometric Pressure from reference (InHg): 27.43				
Barometric Pressure (mmHg): 697.0				
Enter Ambient Temperature from reference °C: -22.7				
Enter "m" variable from calibrated orifice: 6.07570				
Enter "b" variable from calibrated orifice: -0.03578				
Enter Δp In. H ₂ O: 1.76				
Standardized Flow lpm=: 233.98				
Flow Set Point lpm=: 230.00				
% Difference (+/- 2% max.): -1.73%				
IF THE FLOW DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED				
TISCH PUF PLUS PRESSURE CALIBRATION				
Reference Barometric Pressure AFTER CALIBRATION (mmHg): n/a				
PUF Barometric Pressure AFTER CALIBRATION (mmHg): n/a				
% Difference: #VALUE! Max 2.0%				
Calibration Point (mmHg):	Δp (In. H ₂ O) required for target barometric pressure:	As Found barometric pressure (mmHg):	As Left barometric pressure (mmHg):	% Difference vs. Calibration Target:
737	1.57	n/a	n/a	#VALUE!
717	0.79	n/a	n/a	#VALUE!
697	0.00	n/a	n/a	#VALUE!
677	-0.79	n/a	n/a	#VALUE!
657	-1.57	n/a	n/a	#VALUE!
% Difference (+/- 2% max.): #VALUE!				#VALUE!
TISCH PUF PLUS TEMPERATURE CALIBRATION				
Temperature Callibrator Certification Date: n/a				
Reference Temperature AFTER CALIBRATION (°C): n/a				
TISCH PUF PLUS Temperature AFTER CALIBRATION (°C): n/a				
Difference (°C): #VALUE! Max 2.0 °C				
Calibration Point (°C):	As Found (°C)	As Left (°C)	+/- Difference (°C)	
20	n/a	n/a	#VALUE!	
-20	n/a	n/a	#VALUE!	
40	n/a	n/a	#VALUE!	
0	n/a	n/a	#VALUE!	
-30	n/a	n/a	#VALUE!	
% Difference (+/- 2 °C max.): #VALUE!				#VALUE!
TISCH PUF PLUS FLOW CALIBRATION				
Flow Calibration Calculations:				
Calibrated Orifice Certification Date: n/a				
Enter Barometric Pressure from reference (InHg): n/a				
Barometric Pressure (mmHg): n/a				
Enter Ambient Temperature from reference °C: n/a				
Enter "m" variable from calibrated orifice: n/a				
Enter "b" variable from calibrated orifice: n/a				
Enter Δp In. H ₂ O: n/a				
Standardized Flow lpm=: #VALUE!				
Flow Set Point lpm=: 230.00				
% Difference (+/- 2% max.): #VALUE!				
IF THE FLOW DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED				
R, A1 and A0 Factors:				
	As Found/As Left Pressure:	As Found/As Left Temperature:	As Found/As Left Flow:	
A0	14823.1796	-6613.4765	0.4134	
A1	22.8942	0.1641	16.7042	
R	0.0000	0.0000	0.0000	
Notes:				
Calibration was not performed. An issue with the keyboard required fixing.				

CALIBRATORS

Company: Maxxam **Operator:** Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>N/A</u>
Serial Number	<u>11900613</u>	Serial Number	<u>N/A</u>
Oven Temperature	<u>N/A</u>	Temperature (°C)	<u>N/A</u>
Last Verification Date	<u>N/A</u>	Barometric Pressure	<u>N/A</u>

Flow Measurements

Pt. No. 1 5000 **Pt. No. 2** 5000 **Pt. No. 3** 5000

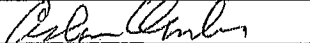
Calibrator Flow (sccm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
5013	0.000	0.001		
5013	0.400	0.407	1%	± 10%
5013	0.200	0.204	1%	± 10%
5014	0.100	0.101	0%	± 10%
Absolute Average Percent Difference			1%	± 10%

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

<u>O₃</u>		<u>LIMITS</u>
Correlation=	1.0000	≥ 0.995
m (Slope)=	1.0163	0.90-1.10
b (Intercept % of FS)=	0.0800	± 3% F.S.

AENV Standards		Ozone Analyzer	
Audit Calibrator		Make/Model	<u>Teco 49i</u>
Make/Model	<u>Teco 49i PS</u>	Serial/AMU Number	<u>AMU 1843</u>
Serial/AMU Number	<u>AMU 1808</u>	Last Calibration Date	<u>May 21, 2015</u>
Ozone Standard	<u>Primary</u>	Full Scale (ppm)	<u>0.5</u>

COMMENTS: _____

Auditor: Al Clark Date: May 21, 2015
 Operator Signature:  Location: McIntyre Center Edmonton



Calibrator Performance Audit

Sulphur Dioxide (by Cylinder Dilution)

File No. 2014-258A

Company: Maxxam

Operator: Limin Li

Calibrator:

Make/Model	<u>API 700</u>
Serial Number	<u>830</u>
Last Verification Date	<u>Oct 2013</u>
SO ₂ Cylinder Conc.	<u>50.3</u>
SO ₂ Cylinder S/N	<u>LL42475</u>

Flow Measurement Device:

Make/Model	<u>N/A</u>
Serial Number	<u>N/A</u>
Temperature (°C)	<u>N/A</u>
Barometric Pressure	<u>N/A</u>

Flow Measurements

Pt. No. 1 79.5 Pt. No. 2 39.8 Pt. No. 3 19.9

Calibrator Flow (sccm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
Zero Air	0.000	0.000		
4918	0.800	0.798	0%	± 10%
4960	0.400	0.398	-1%	± 10%
4977	0.200	0.200	0%	± 10%
Absolute Average Percent Difference			0%	± 10%

LINEAR REGRESSION ANALYSIS

y=mx+b (where x=calculated concentration, y=indicated concentration)

SO₂		LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9971	0.90-1.10
b (Intercept % of FS)=	0.0000	± 3% F.S.

AENV Standards

Audit Calibrator

Make/Model	<u>R&R MFC 201</u>
Serial/AMU Number	<u>AMU 1690</u>

SO₂ Analyzer

Make/Model	<u>Teco 43C</u>
Serial/AMU Number	<u>AMU 1623</u>
Last Calibration Date	<u>Dec 15/14</u>
Full Scale (ppm)	<u>1.0</u>

COMMENTS: H2S gas was slow to move through the calibrator. Check for contamination inside calibrator. SO2 moves through quickly.

Auditor: Al Clark

Date: December 16, 2014

Operator Signature: _____

Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-344CGA

Company: Maxxam Operator's Name: Limin Li
 Cylinder #: BLM002073 Concentration PPM: 49.5 Tolerance(%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: March 31, 2015
 Gas Type: SO2 Conc. 98.57
 Cylinder Number: CAL016720

Flow Measurement Device:

Make/Model: Blos DC2
 Serial Number: AMU 1659
 Temp. °C: 22.5 C
 B.P. 690 mmhg

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 7.9 Span: 1.028 Range: 1.0
 Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.01660	60.242	48.3
4976	82.6	0.801	0.01660	60.242	48.3
4993	41.0	0.396	0.00821	121.780	48.2
4977	20.2	0.193	0.00406	246.386	47.6
Average Cylinder Concentration:					48.0

Previous Stated Concentration PPM: 49.5

Percent variance from Stated: 3.0

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: March 31, 2015
 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 (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	10.0000	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



Praxair Canada, Inc.
 9501-34th Street
 Edmonton, AB T6B 2X6
 Tel: 780-449-0778
 Fax: 780-449-5302

03/27/2014

MAXXAM ANALYTICS INC 'NA'
 9372 49TH ST
 EDMONTON, AB T6B 2L7

Work Order No. 20248656
 Customer Reference No.

Product Lot/Batch No. Z582 4 085 02
 Product Part No. NI ME600P2P-AQ

CERTIFICATE OF ANALYSIS
Primary Standard

Component	Requested Concentration	Certified Concentration	Analytical Principle	Analytical Accuracy
Methane	600.0ppm	601.4ppm	U	±1% rel
Propane	200.0ppm	202ppm	U	±1% rel
Nitrogen	Balance	Balance		

Analytical Instruments: Mettler-Toledo Analytical Balance-ID2ex/USA--
 Hewlett-Packard (Agilent)-6890--GC-FID

Cylinder Style: AQ
 Cylinder Pressure @70F: 2200 psig
 Cylinder Volume: 82.0 ft3
 Valve Outlet Connection: CGA-350
 Cylinder No(s): LL33874

Filling Method: Gravimetric
 Date of Fill: 03/26/2014
 Expiration Date: 03/26/2017

Analyst: Todd Hryniv

The gas contained in this cylinder prepared by Praxair Canada, Inc. is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The cylinder standard is provided as certified against Praxair Canada, Inc. Reference Materials which are either prepared by methods traceable to the National Institute of Standards and Technology (NIST) Measurement Standards or by using NIST Standard Reference Materials where available.

Key to Analytical Techniques			
A	Flow Analysis with Methanizer	W	Gas Chromatography with Electrode Detector
B	Gas Chromatography with Flame Photometric Detector	F	Gas Chromatography with Thermal Conductivity Detector
C	Gas Chromatography with Refractive Gas Analyzer	T	Gas Chromatography with Thermal Conductivity Detector
M	Mass Spectrometry with GC/MS	N	Orifice Flow of Typical Impurities
G	Total Hydrocarbon Analyzer	P	Wet Chemical
U	Orifice Flow	V	Electrochemical
H	Gas Chromatography with Electrode Detector	D	Gas Chromatography with Electrode Detector
I	Gas Chromatography with Electrode Detector	E	Gas Chromatography with Electrode Detector
J	Gas Chromatography with Electrode Detector	K	Gas Chromatography with Electrode Detector
L	Gas Chromatography with Electrode Detector	M	Gas Chromatography with Electrode Detector
N	Gas Chromatography with Electrode Detector	O	Gas Chromatography with Electrode Detector
P	Gas Chromatography with Electrode Detector	R	Gas Chromatography with Electrode Detector
S	Gas Chromatography with Electrode Detector	T	Gas Chromatography with Electrode Detector
U	Gas Chromatography with Electrode Detector	V	Gas Chromatography with Electrode Detector

IMPORTANT:
 The information contained herein has been prepared at your request by personnel within Praxair Canada, Inc. While we believe the information is accurate within the limits of the analytical methods employed, we do not warrant the accuracy of the specific analysis performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is provided with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall liability of Praxair Canada, Inc. arising out of the use of the information contained herein exceed the fee collected for providing such information.



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-345CGA

Company: Maxxam Operators name: Limin Li
 Cylinder #: BLM002073 Conc (PPM) 50.6/50.6 Tolerance (%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>AMU 1659</u>
Last Verification Date	<u>March 31, 2015</u>			Temp. °C	<u>22.5 C</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>690 mmhg</u>
Cylinder Number	<u>CAL018024</u>				

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				
4976	82.6	0.855	0.848	0.01660	60.242	51.5	51.1
4993	41.0	0.427	0.421	0.00821	121.780	52.0	51.3
4977	20.2	0.213	0.209	0.00406	246.386	52.5	51.5
Average Cylinder Concentration:						52.0	51.3

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.6</u>	<u>50.6</u>
Percent variance from Stated: <u>2.8</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 49.5 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



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Dec 2, 2015	17120	Ambient Air	02-Dec-15 00:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15120089	REPORT CREATED:	08-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-001	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-001	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-001	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-001	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	10-Dec-15
15120089-001	1,2,4-Trimethylbenzene	I	0.08 ppbv	0.03	AC-058	10-Dec-15
15120089-001	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-001	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	10-Dec-15
15120089-001	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	10-Dec-15
15120089-001	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-001	1,3,5-Trimethylbenzene	I	0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-001	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-001	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	10-Dec-15
15120089-001	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-001	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-001	1-Butene	I	0.22 ppbv	0.02	AC-058	10-Dec-15
15120089-001	1-Hexene	I	0.03 ppbv	0.02	AC-058	10-Dec-15
15120089-001	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-001	2,2,4-Trimethylpentane	I	0.13 ppbv	0.01	AC-058	10-Dec-15
15120089-001	2,2-Dimethylbutane	I	0.04 ppbv	0.01	AC-058	10-Dec-15
15120089-001	2,3,4-Trimethylpentane	I	0.04 ppbv	0.01	AC-058	10-Dec-15
15120089-001	2,3-Dimethylbutane	I	0.14 ppbv	0.02	AC-058	10-Dec-15
15120089-001	2,3-Dimethylpentane	I	0.11 ppbv	0.02	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead

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

Date: Friday, January 08, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:			
LICA/VOC/CLS/Dec 2, 2015	17120	Ambient Air	02-Dec-15 00:00	Version 01			
DESCRIPTION: Cold Lake South							
REPORT NUMBER: 15120089	REPORT CREATED: 08-Jan-16						
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120089-001	2,4-Dimethylpentane	I	0.09	ppbv	0.01	AC-058	10-Dec-15
15120089-001	2-Methylheptane	I	0.06	ppbv	0.01	AC-058	10-Dec-15
15120089-001	2-Methylhexane	I	0.18	ppbv	0.01	AC-058	10-Dec-15
15120089-001	2-Methylpentane	I	0.51	ppbv	0.01	AC-058	10-Dec-15
15120089-001	3-Methylheptane	I	0.05	ppbv	0.02	AC-058	10-Dec-15
15120089-001	3-Methylhexane	I	0.17	ppbv	0.02	AC-058	10-Dec-15
15120089-001	3-Methylpentane	I	0.29	ppbv	0.01	AC-058	10-Dec-15
15120089-001	Acetone	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Dec-15
15120089-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	10-Dec-15
15120089-001	Benzene		0.55	ppbv	0.01	AC-058	10-Dec-15
15120089-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Dec-15
15120089-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Dec-15
15120089-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Dec-15
15120089-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Dec-15
15120089-001	Carbon disulfide	I	0.01	ppbv	0.01	AC-058	10-Dec-15
15120089-001	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	10-Dec-15
15120089-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Dec-15
15120089-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Dec-15
15120089-001	Chloroform	I	0.04	ppbv	0.02	AC-058	10-Dec-15
15120089-001	Chloromethane		0.63	ppbv	0.02	AC-058	10-Dec-15
15120089-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Dec-15
15120089-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Dec-15
15120089-001	cis-2-Butene	I	0.04	ppbv	0.02	AC-058	10-Dec-15
15120089-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Dec-15
15120089-001	Cyclohexane	I	0.25	ppbv	0.02	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead

Date: Friday, January 08, 2016

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Dec 2, 2015	17120	Ambient Air	02-Dec-15 00:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15120089	REPORT CREATED:	08-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-001	Cyclopentane	I	0.11 ppbv	0.01	AC-058	10-Dec-15
15120089-001	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-001	Ethanol		2.2 ppbv	0.3	AC-058	10-Dec-15
15120089-001	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-001	Ethylbenzene	I	0.09 ppbv	0.01	AC-058	10-Dec-15
15120089-001	Freon-11		0.37 ppbv	0.02	AC-058	10-Dec-15
15120089-001	Freon-113	I	0.08 ppbv	0.01	AC-058	10-Dec-15
15120089-001	Freon-114	I	0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-001	Freon-12		0.66 ppbv	0.02	AC-058	10-Dec-15
15120089-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	10-Dec-15
15120089-001	Isobutane		2.66 ppbv	0.02	AC-058	10-Dec-15
15120089-001	Isopentane		2.19 ppbv	0.03	AC-058	10-Dec-15
15120089-001	Isoprene	I	0.02 ppbv	0.01	AC-058	10-Dec-15
15120089-001	Isopropyl alcohol		0.7 ppbv	0.4	AC-058	10-Dec-15
15120089-001	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-001	m,p-Xylene	I	0.26 ppbv	0.03	AC-058	10-Dec-15
15120089-001	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-001	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	10-Dec-15
15120089-001	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	10-Dec-15
15120089-001	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	10-Dec-15
15120089-001	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-001	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	10-Dec-15
15120089-001	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	10-Dec-15
15120089-001	Methylcyclohexane	I	0.28 ppbv	0.01	AC-058	10-Dec-15
15120089-001	Methylcyclopentane	I	0.27 ppbv	0.02	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead
On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, January 08, 2016
Inquiries: (780) 632 8455
E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Dec 2, 2015	17120	Ambient Air	02-Dec-15 00:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15120089	REPORT CREATED:	08-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-001	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	10-Dec-15
15120089-001	n-Butane		5.09 ppbv	0.03	AC-058	10-Dec-15
15120089-001	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	10-Dec-15
15120089-001	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-001	n-Heptane	I	0.17 ppbv	0.01	AC-058	10-Dec-15
15120089-001	n-Hexane		0.46 ppbv	0.01	AC-058	10-Dec-15
15120089-001	n-Octane	I	0.09 ppbv	0.02	AC-058	10-Dec-15
15120089-001	n-Pentane	K, T, U	< 0.1 ppbv	0.1	AC-058	10-Dec-15
15120089-001	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-001	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-001	Naphthalene		1.3 ppbv	0.5	AC-058	10-Dec-15
15120089-001	n-Nonane	I	0.04 ppbv	0.01	AC-058	10-Dec-15
15120089-001	o-Ethyltoluene	I	0.03 ppbv	0.01	AC-058	10-Dec-15
15120089-001	o-Xylene	I	0.10 ppbv	0.01	AC-058	10-Dec-15
15120089-001	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-001	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	10-Dec-15
15120089-001	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-001	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-001	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-001	Toluene		0.59 ppbv	0.01	AC-058	10-Dec-15
15120089-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-001	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-001	trans-2-Pentene	I	0.03 ppbv	0.02	AC-058	10-Dec-15
15120089-001	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead

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

Date: Friday, January 08, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/VOC/CLS/Dec 2, 2015 **CANISTER ID** 17120 **Matrix** Ambient Air **DATE SAMPLED** 02-Dec-15 00:00
DESCRIPTION: Cold Lake South
REPORT NUMBER: 15120089 **REPORT CREATED:** 08-Jan-16 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120089-001	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Dec-15
15120089-001	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, January 08, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Dec 8, 2015	2653	Ambient Air	08-Dec-15 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	15120124	REPORT CREATED:	15-Jan-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120124-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	14-Dec-15
15120124-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	14-Dec-15
15120124-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	14-Dec-15
15120124-003	1,2,4-Trimethylbenzene	I	0.06	ppbv	0.03	AC-058	14-Dec-15
15120124-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	14-Dec-15
15120124-003	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	14-Dec-15
15120124-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Dec-15
15120124-003	1,3,5-Trimethylbenzene	I	0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	14-Dec-15
15120124-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Dec-15
15120124-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Dec-15
15120124-003	1-Butene	I	0.13	ppbv	0.02	AC-058	14-Dec-15
15120124-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-003	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	14-Dec-15
15120124-003	2,2,4-Trimethylpentane	I	0.06	ppbv	0.01	AC-058	14-Dec-15
15120124-003	2,2-Dimethylbutane	I	0.02	ppbv	0.01	AC-058	14-Dec-15
15120124-003	2,3,4-Trimethylpentane	I	0.03	ppbv	0.01	AC-058	14-Dec-15
15120124-003	2,3-Dimethylbutane	I	0.07	ppbv	0.02	AC-058	14-Dec-15
15120124-003	2,3-Dimethylpentane	I	0.06	ppbv	0.02	AC-058	14-Dec-15

Report certified by: Graham Knox, Team Lead
On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: January-15-16
Inquiries: (780) 632 8455
E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICAN/VOC/CLS/Dec 8, 2015	2653	Ambient Air	08-Dec-15 0:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15120124	REPORT CREATED:	15-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120124-003	2,4-Dimethylpentane	I	0.05 ppbv	0.01	AC-058	14-Dec-15
15120124-003	2-Methylheptane	I	0.04 ppbv	0.01	AC-058	14-Dec-15
15120124-003	2-Methylhexane	K, T, U	< 0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-003	2-Methylpentane	I	0.21 ppbv	0.01	AC-058	14-Dec-15
15120124-003	3-Methylheptane	I	0.03 ppbv	0.02	AC-058	14-Dec-15
15120124-003	3-Methylhexane	I	0.09 ppbv	0.02	AC-058	14-Dec-15
15120124-003	3-Methylpentane	I	0.12 ppbv	0.01	AC-058	14-Dec-15
15120124-003	Acetone		1.2 ppbv	0.4	AC-058	14-Dec-15
15120124-003	Acrolein	K, T, U	< 0.3 ppbv	0.3	AC-058	14-Dec-15
15120124-003	Benzene	I	0.27 ppbv	0.01	AC-058	14-Dec-15
15120124-003	Benzyl chloride	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Dec-15
15120124-003	Bromodichloromethane	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-003	Bromoform	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-003	Bromomethane	K, T, U	< 0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-003	Carbon disulfide	I	0.14 ppbv	0.01	AC-058	14-Dec-15
15120124-003	Carbon tetrachloride	I	0.11 ppbv	0.01	AC-058	14-Dec-15
15120124-003	Chlorobenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-003	Chloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-003	Chloroform	I	0.03 ppbv	0.02	AC-058	14-Dec-15
15120124-003	Chloromethane		0.55 ppbv	0.02	AC-058	14-Dec-15
15120124-003	cis-1,2-Dichloroethene	K, T, U	< 0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-003	cis-1,3-Dichloropropene	K, T, U	< 0.04 ppbv	0.04	AC-058	14-Dec-15
15120124-003	cis-2-Butene	I	0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-003	cis-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-003	Cyclohexane	I	0.13 ppbv	0.02	AC-058	14-Dec-15

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Dec 8, 2015	2653	Ambient Air	08-Dec-15 0:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15120124	REPORT CREATED:	15-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120124-003	Cyclopentane	I	0.05 ppbv	0.01	AC-058	14-Dec-15
15120124-003	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-003	Ethanol		1.1 ppbv	0.3	AC-058	14-Dec-15
15120124-003	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Dec-15
15120124-003	Ethylbenzene	I	0.05 ppbv	0.01	AC-058	14-Dec-15
15120124-003	Freon-11		0.42 ppbv	0.02	AC-058	14-Dec-15
15120124-003	Freon-113	I	0.07 ppbv	0.01	AC-058	14-Dec-15
15120124-003	Freon-114	I	0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-003	Freon-12		0.61 ppbv	0.02	AC-058	14-Dec-15
15120124-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	14-Dec-15
15120124-003	Isobutane		0.78 ppbv	0.02	AC-058	14-Dec-15
15120124-003	Isopentane		0.66 ppbv	0.03	AC-058	14-Dec-15
15120124-003	Isoprene	I	0.02 ppbv	0.01	AC-058	14-Dec-15
15120124-003	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Dec-15
15120124-003	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-003	m,p-Xylene	I	0.16 ppbv	0.03	AC-058	14-Dec-15
15120124-003	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	14-Dec-15
15120124-003	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	14-Dec-15
15120124-003	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	14-Dec-15
15120124-003	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	14-Dec-15
15120124-003	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Dec-15
15120124-003	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	14-Dec-15
15120124-003	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	14-Dec-15
15120124-003	Methylcyclohexane	I	0.15 ppbv	0.01	AC-058	14-Dec-15
15120124-003	Methylcyclopentane	I	0.13 ppbv	0.02	AC-058	14-Dec-15

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Dec 8, 2015	2653	Ambient Air	08-Dec-15 0:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15120124	REPORT CREATED:	15-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120124-003	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	14-Dec-15
15120124-003	n-Butane		1.61 ppbv	0.03	AC-058	14-Dec-15
15120124-003	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	14-Dec-15
15120124-003	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Dec-15
15120124-003	n-Heptane	I	0.09 ppbv	0.01	AC-058	14-Dec-15
15120124-003	n-Hexane	I	0.18 ppbv	0.01	AC-058	14-Dec-15
15120124-003	n-Octane	I	0.05 ppbv	0.02	AC-058	14-Dec-15
15120124-003	n-Pentane	K, T, U	< 0.1 ppbv	0.1	AC-058	14-Dec-15
15120124-003	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	14-Dec-15
15120124-003	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	14-Dec-15
15120124-003	Naphthalene		1.6 ppbv	0.5	AC-058	14-Dec-15
15120124-003	n-Nonane	I	0.02 ppbv	0.01	AC-058	14-Dec-15
15120124-003	o-Ethyltoluene	I	0.02 ppbv	0.01	AC-058	14-Dec-15
15120124-003	o-Xylene	I	0.06 ppbv	0.01	AC-058	14-Dec-15
15120124-003	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	14-Dec-15
15120124-003	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	14-Dec-15
15120124-003	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	14-Dec-15
15120124-003	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	14-Dec-15
15120124-003	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Dec-15
15120124-003	Toluene		0.34 ppbv	0.01	AC-058	14-Dec-15
15120124-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	14-Dec-15
15120124-003	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-003	trans-2-Pentene	I	0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-003	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	14-Dec-15

Report certified by: Graham Knox, Team Lead
Date: January--15-16
On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Inquiries: (780) 632 8455
E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID: LICA/VOC/CLS/Dec 8, 2015
 CANISTER ID: 2653
 DATE SAMPLED: 08-Dec-15 0:00
 Matrix: Ambient Air
 DESCRIPTION: Cold Lake South
 REPORT NUMBER: 15120124
 REPORT CREATED: 15-Jan-16
 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120124-003	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	14-Dec-15
15120124-003	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	14-Dec-15

Report certified by: Graham Knox, Team Lead
 Date: January-15-16
 On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Inquiries: (780) 632 8455
 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Dec 14, 2015	2664	Ambient Air	14-Dec-15 0:00	Version 01		
DESCRIPTION: Cold Lake South						
REPORT NUMBER: 15120215	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120215-004	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-004	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-004	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-004	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-004	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-004	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	30-Dec-15
15120215-004	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	30-Dec-15
15120215-004	1,2,4-Trimethylbenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	30-Dec-15
15120215-004	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-004	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	30-Dec-15
15120215-004	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	30-Dec-15
15120215-004	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-004	1,3,5-Trimethylbenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-004	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-004	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	30-Dec-15
15120215-004	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-004	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-004	1-Butene	I	0.22 ppbv	0.02	AC-058	30-Dec-15
15120215-004	1-Hexene	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-004	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-004	2,2,4-Trimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-004	2,2-Dimethylbutane	I	0.02 ppbv	0.01	AC-058	30-Dec-15
15120215-004	2,3,4-Trimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-004	2,3-Dimethylbutane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-004	2,3-Dimethylpentane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15

Report certified by: Graham Knox, Team Lead

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

Date: January-15-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:			
LICA/VOC/CLS/Dec 14, 2015	2664	Ambient Air	14-Dec-15 0:00	Version 01			
DESCRIPTION:	Cold Lake South						
REPORT NUMBER:	15120215	REPORT CREATED:	15-Jan-16				
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120215-004	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	30-Dec-15
15120215-004	2-Methylheptane	I	0.02	ppbv	0.01	AC-058	30-Dec-15
15120215-004	2-Methylhexane	I	0.04	ppbv	0.01	AC-058	30-Dec-15
15120215-004	2-Methylpentane	I	0.13	ppbv	0.01	AC-058	30-Dec-15
15120215-004	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	30-Dec-15
15120215-004	3-Methylhexane	I	0.05	ppbv	0.02	AC-058	30-Dec-15
15120215-004	3-Methylpentane	I	0.07	ppbv	0.01	AC-058	30-Dec-15
15120215-004	Acetone		6.2	ppbv	0.4	AC-058	30-Dec-15
15120215-004	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	30-Dec-15
15120215-004	Benzene	I	0.16	ppbv	0.01	AC-058	30-Dec-15
15120215-004	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	30-Dec-15
15120215-004	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	30-Dec-15
15120215-004	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	30-Dec-15
15120215-004	Bromomethane	K, T, U	< 0.02	ppbv	0.02	AC-058	30-Dec-15
15120215-004	Carbon disulfide	K, T, U	< 0.01	ppbv	0.01	AC-058	30-Dec-15
15120215-004	Carbon tetrachloride	I	3.10	ppbv	0.01	AC-058	30-Dec-15
15120215-004	Chlorobenzene	K, T, U	0.09	ppbv	0.01	AC-058	30-Dec-15
15120215-004	Chloroethane	I	< 0.02	ppbv	0.02	AC-058	30-Dec-15
15120215-004	Chloroform	I	0.02	ppbv	0.02	AC-058	30-Dec-15
15120215-004	Chloromethane	I	0.65	ppbv	0.02	AC-058	30-Dec-15
15120215-004	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	30-Dec-15
15120215-004	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	30-Dec-15
15120215-004	cis-2-Butene	I	0.03	ppbv	0.02	AC-058	30-Dec-15
15120215-004	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	30-Dec-15
15120215-004	Cyclohexane	I	0.08	ppbv	0.02	AC-058	30-Dec-15

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Dec 14, 2015	2664	Ambient Air	14-Dec-15 0:00	Version 01		
DESCRIPTION:		Cold Lake South				
REPORT NUMBER:	15120215	REPORT CREATED:	15-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120215-004	Cyclopentane	I	0.03 ppbv	0.01	AC-058	30-Dec-15
15120215-004	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-004	Ethanol		0.8 ppbv	0.3	AC-058	30-Dec-15
15120215-004	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-004	Ethylbenzene	I	0.02 ppbv	0.01	AC-058	30-Dec-15
15120215-004	Freon-11	I	0.27 ppbv	0.02	AC-058	30-Dec-15
15120215-004	Freon-113	I	0.08 ppbv	0.01	AC-058	30-Dec-15
15120215-004	Freon-114	I	0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-004	Freon-12	I	0.60 ppbv	0.02	AC-058	30-Dec-15
15120215-004	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	30-Dec-15
15120215-004	Isobutane		0.66 ppbv	0.02	AC-058	30-Dec-15
15120215-004	Isopentane		0.44 ppbv	0.03	AC-058	30-Dec-15
15120215-004	Isoprene	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-004	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-004	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-004	m,p-Xylene	I	0.04 ppbv	0.03	AC-058	30-Dec-15
15120215-004	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-004	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	30-Dec-15
15120215-004	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	30-Dec-15
15120215-004	Methyl ethyl ketone		0.6 ppbv	0.3	AC-058	30-Dec-15
15120215-004	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-004	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	30-Dec-15
15120215-004	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	30-Dec-15
15120215-004	Methylcyclohexane	I	0.10 ppbv	0.01	AC-058	30-Dec-15
15120215-004	Methylcyclopentane	I	0.07 ppbv	0.02	AC-058	30-Dec-15

Report certified by: Graham Knox, Team Lead

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

Date: January-15-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Dec 14, 2015	2664	Ambient Air	14-Dec-15 0:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15120215	REPORT CREATED:	15-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120215-004	Methylene chloride	K, T, U	<0.3 ppbv	0.3	AC-058	30-Dec-15
15120215-004	n-Butane		1.62 ppbv	0.03	AC-058	30-Dec-15
15120215-004	n-Decane	K, T, U	<0.06 ppbv	0.06	AC-058	30-Dec-15
15120215-004	n-Dodecane	K, T, U	<0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-004	n-Heptane	K, T, U	<0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-004	n-Hexane	I	0.19 ppbv	0.01	AC-058	30-Dec-15
15120215-004	n-Octane	K, T, U	<0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-004	n-Pentane	K, T, U	<0.1 ppbv	0.1	AC-058	30-Dec-15
15120215-004	n-Propylbenzene	K, T, U	<0.05 ppbv	0.05	AC-058	30-Dec-15
15120215-004	n-Undecane	K, T, U	<0.5 ppbv	0.5	AC-058	30-Dec-15
15120215-004	Naphthalene	K, T, U	<0.5 ppbv	0.5	AC-058	30-Dec-15
15120215-004	n-Nonane	I	0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-004	o-Ethyltoluene	K, T, U	<0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-004	o-Xylene	I	0.02 ppbv	0.01	AC-058	30-Dec-15
15120215-004	p-Diethylbenzene	K, T, U	<0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-004	p-Ethyltoluene	K, T, U	<0.07 ppbv	0.07	AC-058	30-Dec-15
15120215-004	Styrene	K, T, U	<0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-004	Tetrachloroethylene	K, T, U	<0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-004	Tetrahydrofuran	K, T, U	<0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-004	Toluene	I	0.11 ppbv	0.01	AC-058	30-Dec-15
15120215-004	trans-1,2-Dichloroethylene	K, T, U	<0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-004	trans-1,3-Dichloropropylene	K, T, U	<0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-004	trans-2-Butene	I	0.07 ppbv	0.01	AC-058	30-Dec-15
15120215-004	trans-2-Pentene	I	0.03 ppbv	0.02	AC-058	30-Dec-15
15120215-004	Trichloroethylene	K, T, U	<0.04 ppbv	0.04	AC-058	30-Dec-15

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632-8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/VOC/CLS/Dec 14, 2015	CANISTER ID 2664	Matrix Ambient Air	DATE SAMPLED 14-Dec-15 0:00
DESCRIPTION: Cold Lake South		REPORT CREATED: 15-Jan-16	VERSION: Version 01
REPORT NUMBER: 15120215			
Lab ID	Parameter	Qualifier	Result Units RDL
15120215-004	Vinyl acetate	K, T, U	< 0.4 ppbv 0.4
15120215-004	Vinyl chloride	K, T, U	< 0.02 ppbv 0.02
			Method Analysis Date
			AC-058 30-Dec-15
			AC-058 30-Dec-15

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Dec 20, 2015	1684	Ambient Air	20-Dec-15 0:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	16010003	REPORT CREATED:	15-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010003-003	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	07-Jan-16
16010003-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	07-Jan-16
16010003-003	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	07-Jan-16
16010003-003	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	07-Jan-16
16010003-003	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	07-Jan-16
16010003-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	07-Jan-16
16010003-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	07-Jan-16
16010003-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	07-Jan-16
16010003-003	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	07-Jan-16
16010003-003	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	07-Jan-16
16010003-003	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	07-Jan-16
16010003-003	1,2-Dichloropropane	I	0.01 ppbv	0.01	AC-058	07-Jan-16
16010003-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	07-Jan-16
16010003-003	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	07-Jan-16
16010003-003	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	07-Jan-16
16010003-003	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	07-Jan-16
16010003-003	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	07-Jan-16
16010003-003	1-Butene	I	0.19 ppbv	0.02	AC-058	07-Jan-16
16010003-003	1-Hexene	I	0.04 ppbv	0.02	AC-058	07-Jan-16
16010003-003	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	07-Jan-16
16010003-003	2,2,4-Trimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	07-Jan-16
16010003-003	2,2-Dimethylbutane	I	0.06 ppbv	0.01	AC-058	07-Jan-16
16010003-003	2,3,4-Trimethylpentane	I	0.01 ppbv	0.01	AC-058	07-Jan-16
16010003-003	2,3-Dimethylbutane	I	0.16 ppbv	0.02	AC-058	07-Jan-16
16010003-003	2,3-Dimethylpentane	I	0.08 ppbv	0.02	AC-058	07-Jan-16

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632-8455

E-mail: EAS.Results@albertainnovates.ca



P.O. Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:			
LICA/VOC/CLS/Dec 20, 2015	1684	Ambient Air	20-Dec-15 0:00	Version 01			
DESCRIPTION:	Cold Lake South						
REPORT NUMBER:	16010003	REPORT CREATED:	15-Jan-16				
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16010003-003	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	07-Jan-16
16010003-003	2-Methylheptane	I	0.04	ppbv	0.01	AC-058	07-Jan-16
16010003-003	2-Methylhexane	I	0.06	ppbv	0.01	AC-058	07-Jan-16
16010003-003	2-Methylpentane		0.36	ppbv	0.01	AC-058	07-Jan-16
16010003-003	3-Methylheptane	I	0.02	ppbv	0.02	AC-058	07-Jan-16
16010003-003	3-Methylhexane	I	0.10	ppbv	0.02	AC-058	07-Jan-16
16010003-003	3-Methylpentane	I	0.20	ppbv	0.01	AC-058	07-Jan-16
16010003-003	Acetone		2.1	ppbv	0.4	AC-058	07-Jan-16
16010003-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	07-Jan-16
16010003-003	Benzene	I	0.15	ppbv	0.01	AC-058	07-Jan-16
16010003-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	07-Jan-16
16010003-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	07-Jan-16
16010003-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	07-Jan-16
16010003-003	Bromomethane	I	0.01	ppbv	0.01	AC-058	07-Jan-16
16010003-003	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	07-Jan-16
16010003-003	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	07-Jan-16
16010003-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	07-Jan-16
16010003-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	07-Jan-16
16010003-003	Chloroform	I	0.03	ppbv	0.02	AC-058	07-Jan-16
16010003-003	Chloromethane		0.89	ppbv	0.02	AC-058	07-Jan-16
16010003-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	07-Jan-16
16010003-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	07-Jan-16
16010003-003	cis-2-Butene	I	0.02	ppbv	0.02	AC-058	07-Jan-16
16010003-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	07-Jan-16
16010003-003	Cyclohexane	I	0.21	ppbv	0.02	AC-058	07-Jan-16

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Dec 20, 2015	1684	Ambient Air	20-Dec-15 0:00	Version 01		
DESCRIPTION: Cold Lake South						
REPORT NUMBER: 16010003	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010003-003	Cyclopentane	I	0.10 ppbv	0.01	AC-058	07-Jan-16
16010003-003	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	07-Jan-16
16010003-003	Ethanol		0.7 ppbv	0.3	AC-058	07-Jan-16
16010003-003	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	07-Jan-16
16010003-003	Ethylbenzene	I	0.02 ppbv	0.01	AC-058	07-Jan-16
16010003-003	Freon-11		0.35 ppbv	0.02	AC-058	07-Jan-16
16010003-003	Freon-113	I	0.09 ppbv	0.01	AC-058	07-Jan-16
16010003-003	Freon-114	I	0.03 ppbv	0.02	AC-058	07-Jan-16
16010003-003	Freon-12		0.77 ppbv	0.02	AC-058	07-Jan-16
16010003-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	07-Jan-16
16010003-003	Isobutane		1.89 ppbv	0.02	AC-058	07-Jan-16
16010003-003	Isopentane		1.21 ppbv	0.03	AC-058	07-Jan-16
16010003-003	Isoprene	K, T, U	< 0.01 ppbv	0.01	AC-058	07-Jan-16
16010003-003	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	07-Jan-16
16010003-003	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	07-Jan-16
16010003-003	m,p-Xylene	I	0.04 ppbv	0.03	AC-058	07-Jan-16
16010003-003	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	07-Jan-16
16010003-003	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	07-Jan-16
16010003-003	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	07-Jan-16
16010003-003	Methyl ethyl ketone		0.4 ppbv	0.3	AC-058	07-Jan-16
16010003-003	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	07-Jan-16
16010003-003	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	07-Jan-16
16010003-003	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	07-Jan-16
16010003-003	Methylcyclohexane		0.37 ppbv	0.01	AC-058	07-Jan-16
16010003-003	Methylcyclopentane	I	0.20 ppbv	0.02	AC-058	07-Jan-16

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Dec 20, 2015	1684	Ambient Air	20-Dec-15 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16010003	REPORT CREATED:	15-Jan-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16010003-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	07-Jan-16
16010003-003	n-Butane		3.64	ppbv	0.03	AC-058	07-Jan-16
16010003-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	07-Jan-16
16010003-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	07-Jan-16
16010003-003	n-Heptane	I	0.12	ppbv	0.01	AC-058	07-Jan-16
16010003-003	n-Hexane		0.40	ppbv	0.01	AC-058	07-Jan-16
16010003-003	n-Octane	I	0.05	ppbv	0.02	AC-058	07-Jan-16
16010003-003	n-Pentane		1.3	ppbv	0.1	AC-058	07-Jan-16
16010003-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	07-Jan-16
16010003-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	07-Jan-16
16010003-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	07-Jan-16
16010003-003	n-Nonane	I	0.02	ppbv	0.01	AC-058	07-Jan-16
16010003-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	07-Jan-16
16010003-003	o-Xylene	I	0.02	ppbv	0.01	AC-058	07-Jan-16
16010003-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	07-Jan-16
16010003-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	07-Jan-16
16010003-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	07-Jan-16
16010003-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	07-Jan-16
16010003-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	07-Jan-16
16010003-003	Toluene	I	0.10	ppbv	0.01	AC-058	07-Jan-16
16010003-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	07-Jan-16
16010003-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	07-Jan-16
16010003-003	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	07-Jan-16
16010003-003	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	07-Jan-16
16010003-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	07-Jan-16

Report certified by: Graham Knox, Team Lead
On behalf of: PI Pretorius, Manager, Analysis and Testing Services
Date: January-15-16
Inquiries: (780) 632 8455
E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID: LICA/VOC/CLS/Dec 20, 2015 CANISTER ID: 1684 Matrix: Ambient Air DATE SAMPLED: 20-Dec-15 0:00
 DESCRIPTION: Cold Lake South
 REPORT NUMBER: 16010003 REPORT CREATED: 15-Jan-16 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16010003-003	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	07-Jan-16
16010003-003	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	07-Jan-16

Report certified by: Graham Knox, Team Lead On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Date: January-15-16 Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Dec. 26, 2015	S5587	Ambient Air	26-Dec-15 0:00	Version 01		
DESCRIPTION: Cold Lake South						
REPORT NUMBER: 16010004	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010004-001	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010004-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	06-Jan-16
16010004-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	06-Jan-16
16010004-001	1,2,4-Trimethylbenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	06-Jan-16
16010004-001	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	06-Jan-16
16010004-001	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	06-Jan-16
16010004-001	1,2-Dichloropropane	I	0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	06-Jan-16
16010004-001	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010004-001	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010004-001	1-Butene	I	0.08 ppbv	0.02	AC-058	06-Jan-16
16010004-001	1-Hexene	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	1-Pentene	I	0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-001	2,2,4-Trimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-001	2,2-Dimethylbutane	I	0.05 ppbv	0.01	AC-058	06-Jan-16
16010004-001	2,3,4-Trimethylpentane	I	0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-001	2,3-Dimethylbutane	I	0.10 ppbv	0.02	AC-058	06-Jan-16
16010004-001	2,3-Dimethylpentane	I	0.06 ppbv	0.02	AC-058	06-Jan-16

Report certified by: Graham Knox, Team Lead

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

Date: January-15-16

Inquiries: (780) 632-8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Dec. 26, 2015	S5587	Ambient Air	26-Dec-15 0:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	16010004	REPORT CREATED:	15-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010004-001	2,4-Dimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-001	2-Methylheptane	I	0.03 ppbv	0.01	AC-058	06-Jan-16
16010004-001	2-Methylhexane	I	0.05 ppbv	0.01	AC-058	06-Jan-16
16010004-001	2-Methylpentane	I	0.22 ppbv	0.01	AC-058	06-Jan-16
16010004-001	3-Methylheptane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	3-Methylhexane	I	0.07 ppbv	0.02	AC-058	06-Jan-16
16010004-001	3-Methylpentane	I	0.12 ppbv	0.01	AC-058	06-Jan-16
16010004-001	Acetone		1.0 ppbv	0.4	AC-058	06-Jan-16
16010004-001	Acrolein	K, T, U	< 0.3 ppbv	0.3	AC-058	06-Jan-16
16010004-001	Benzene	I	0.23 ppbv	0.01	AC-058	06-Jan-16
16010004-001	Benzyl chloride	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010004-001	Bromodichloromethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	Bromoform	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	Bromomethane	I	0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-001	Carbon disulfide	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-001	Carbon tetrachloride	I	0.10 ppbv	0.01	AC-058	06-Jan-16
16010004-001	Chlorobenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	Chloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	Chloroform	I	0.03 ppbv	0.02	AC-058	06-Jan-16
16010004-001	Chloromethane		0.70 ppbv	0.02	AC-058	06-Jan-16
16010004-001	cis-1,2-Dichloroethene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-001	cis-1,3-Dichloropropene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010004-001	cis-2-Butene	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	cis-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	Cyclohexane	I	0.26 ppbv	0.02	AC-058	06-Jan-16

Report certified by: Graham Knox, Team Lead

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

Date: January-15-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:			
LICA/VOC/CLS/Dec. 26, 2015	S5587	Ambient Air	26-Dec-15 0:00	Version 01			
DESCRIPTION: Cold Lake South							
REPORT NUMBER: 16010004	REPORT CREATED: 15-Jan-16						
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16010004-001	Cyclopentane	I	0.11	ppbv	0.01	AC-058	06-Jan-16
16010004-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	06-Jan-16
16010004-001	Ethanol	K, T, U	< 0.3	ppbv	0.3	AC-058	06-Jan-16
16010004-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	06-Jan-16
16010004-001	Ethylbenzene	I	0.02	ppbv	0.01	AC-058	06-Jan-16
16010004-001	Freon-11		0.34	ppbv	0.02	AC-058	06-Jan-16
16010004-001	Freon-113	I	0.08	ppbv	0.01	AC-058	06-Jan-16
16010004-001	Freon-114	I	0.03	ppbv	0.02	AC-058	06-Jan-16
16010004-001	Freon-12		0.75	ppbv	0.02	AC-058	06-Jan-16
16010004-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	06-Jan-16
16010004-001	Isobutane		1.06	ppbv	0.02	AC-058	06-Jan-16
16010004-001	Isopentane		0.90	ppbv	0.03	AC-058	06-Jan-16
16010004-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	06-Jan-16
16010004-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	06-Jan-16
16010004-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	06-Jan-16
16010004-001	m,p-Xylene	I	0.05	ppbv	0.03	AC-058	06-Jan-16
16010004-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	06-Jan-16
16010004-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	06-Jan-16
16010004-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	06-Jan-16
16010004-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	06-Jan-16
16010004-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	06-Jan-16
16010004-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	06-Jan-16
16010004-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	06-Jan-16
16010004-001	Methylcyclohexane		0.31	ppbv	0.01	AC-058	06-Jan-16
16010004-001	Methylcyclopentane	I	0.21	ppbv	0.02	AC-058	06-Jan-16

Report certified by: Graham Knox, Team Lead

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

Date: January-15-16

Inquires: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Dec. 26, 2015	S5587	Ambient Air	26-Dec-15 0:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	16010004	REPORT CREATED:	15-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010004-001	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	06-Jan-16
16010004-001	n-Butane		1.90 ppbv	0.03	AC-058	06-Jan-16
16010004-001	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	06-Jan-16
16010004-001	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010004-001	n-Heptane	I	0.10 ppbv	0.01	AC-058	06-Jan-16
16010004-001	n-Hexane	I	0.19 ppbv	0.01	AC-058	06-Jan-16
16010004-001	n-Octane	I	0.04 ppbv	0.02	AC-058	06-Jan-16
16010004-001	n-Pentane		0.8 ppbv	0.1	AC-058	06-Jan-16
16010004-001	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	06-Jan-16
16010004-001	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	06-Jan-16
16010004-001	Naphthalene	K, T, U	< 0.5 ppbv	0.5	AC-058	06-Jan-16
16010004-001	n-Nonane	I	0.02 ppbv	0.01	AC-058	06-Jan-16
16010004-001	o-Ethyltoluene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-001	o-Xylene	I	0.02 ppbv	0.01	AC-058	06-Jan-16
16010004-001	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010004-001	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	06-Jan-16
16010004-001	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010004-001	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010004-001	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010004-001	Toluene	I	0.16 ppbv	0.01	AC-058	06-Jan-16
16010004-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010004-001	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-001	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-001	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Dec. 26, 2015	S5587	Ambient Air	26-Dec-15 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	REPORT CREATED:	VERSION:	Version 01
Lab ID	Parameter	Qualifier	Result Units
16010004-001	Vinyl acetate	K, T, U	< 0.4 ppbv
16010004-001	Vinyl chloride	K, T, U	< 0.02 ppbv
		RDL	Method
		0.4	AC-058
		0.02	AC-058
			Analysis Date
			06-Jan-16
			06-Jan-16

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

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/Dec 2, 2015</p> <p>CANISTER ID 9801</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 02-Dec-15 00:00</p> <p>REPORT CREATED: 08-Jan-16</p> <p>DATE RECEIVED: 09-Dec-15</p> <p>REPORT NUMBER: 15120089</p> <p>VERSION: Version 01</p> <p>Matrix Air Filter</p> <p>Priority Normal</p>
--	--

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-002	1-Methylnaphthalene		0.13 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	2-Methylnaphthalene		0.20 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	7,12-Dimethylbenz(a)anthracene		0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Acenaphthene		0.21 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Acenaphthylene		0.10 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Anthracene		0.07 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Benzo(a)anthracene		0.04 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Benzo(a)pyrene		0.04 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Benzo(b,j,k)fluoranthene		0.12 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Benzo(c)phenanthrene		0.07 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Benzo(e)pyrene		0.04 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Benzo(ghi)perylene		0.07 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Chrysene		0.06 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Dibenzo(a,l)pyrene		0.03 ug/Filter	0.01	NA-017	19-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager

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

Date: Friday, January 08, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/PUF/CLS/Dec 2, 2015	9801	Air Filter	02-Dec-15 00:00	Version 01		
DESCRIPTION: Cold Lake South						
REPORT NUMBER: 15120089	REPORT CREATED: 08-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-002	Dibenzo(ah)anthracene		0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Fluoranthene		0.27 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Fluorene		0.46 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Indeno(1,2,3-cd)pyrene		0.05 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Naphthalene		0.20 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Perylene		0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Phenanthrene		0.65 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Pyrene		0.22 ug/Filter	0.01	NA-017	19-Dec-15
15120089-002	Retene		0.32 ug/Filter	0.01	NA-017	19-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager

Date: Friday, January 08, 2016

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8 INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	CLIENT SAMPLE ID CANISTER ID LICA/PUF/CLS/Dec 8, 2015 TE-03 DESCRIPTION: Cold Lake South DATE SAMPLED: 08-Dec-15 0:00 REPORT CREATED: 15-Jan-16 DATE RECEIVED: 11-Dec-15 REPORT NUMBER: 15120124 VERSION: Version 01 Matrix Air Filter Priority Normal
--	--

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120124-004	1-Methylnaphthalene		0.22 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	2-Methylnaphthalene		0.32 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	7,12-Dimethylbenz(a)anthracene		0.06 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Acenaphthene		0.22 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Acenaphthylene		0.51 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Anthracene		0.22 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Benzo(a)anthracene		0.06 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Benzo(a)pyrene		0.04 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Benzo(b,j,k)fluoranthene		0.18 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Benzo(c)phenanthrene		0.02 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Benzo(e)pyrene		0.06 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Chrysene		0.06 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16

Report certified by: Graham Knox, Team Lead
On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: January-15-16
Inquiries: (780) 632 8455
E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID: LICA/PUF/CLS/Dec 8, 2015 CANISTER ID: TE-03 Matrix: Air Filter DATE SAMPLED: 08-Dec-15 0:00
 DESCRIPTION: Cold Lake South
 REPORT NUMBER: 15120124 REPORT CREATED: 15-Jan-16 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120124-004	Dibenzo(ah)anthracene		0.03	ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Fluoranthene		0.40	ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Fluorene		0.44	ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Indeno(1,2,3-cd)pyrene		0.06	ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Naphthalene		0.28	ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Perylene		0.02	ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Phenanthrene		1.26	ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Pyrene		0.30	ug/Filter	0.01	NA-017	14-Jan-16
15120124-004	Retene		0.50	ug/Filter	0.01	NA-017	14-Jan-16

Report certified by: Graham Knox, Team Lead On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Date: January-15-16 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 CANISTER ID LICA/PUF/CLS/Dec 14, 2015 9702</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 14-Dec-15 0:00</p> <p>REPORT CREATED: 15-Jan-16</p> <p>DATE RECEIVED: 22-Dec-15</p> <p>REPORT NUMBER: 15120215</p> <p>VERSION: Version 01</p> <p>Matrix Air Filter</p> <p>Priority Normal</p>
--	--

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120215-005	1-Methylnaphthalene		0.13	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	2-Methylnaphthalene		0.18	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Acenaphthene		0.06	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Acenaphthylene		0.12	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Anthracene		0.04	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Benzo(a)anthracene		0.03	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Benzo(b,j,k)fluoranthene		0.11	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Benzo(e)pyrene		0.04	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Chrysene		0.03	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/PUF/CLS/Dec 14, 2015 **CANISTER ID** 9702 **Matrix** Air Filter **DATE SAMPLED** 14-Dec-15 0:00
DESCRIPTION: Cold Lake South
REPORT NUMBER: 15120215 **REPORT CREATED:** 15-Jan-16 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120215-005	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Fluoranthene		0.14	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Fluorene		0.14	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Naphthalene		0.19	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Phenanthrene		0.33	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Pyrene		0.11	ug/Filter	0.01	NA-017	14-Jan-16
15120215-005	Retene		0.04	ug/Filter	0.01	NA-017	14-Jan-16

Report certified by: Graham Knox, Team Lead **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: January-15-16 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<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 CANISTER ID LICA/PUF/CLS/Dec 20, 2015 TE-06</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 20-Dec-15 0:00 REPORT CREATED: 15-Jan-16</p> <p>DATE RECEIVED: 04-Jan-16 REPORT NUMBER: 16010003 VERSION: Version 01</p> <p>Matrix Air Filter</p> <p>Priority Normal</p>
--	--

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16010003-004	1-Methylnaphthalene		1.24	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	2-Methylnaphthalene		1.84	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	7,12-Dimethylbenz(a)anthracene		0.05	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Acenaphthene		0.23	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Acenaphthylene		0.75	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Anthracene		0.15	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Benzo(a)anthracene		0.07	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Benzo(a)pyrene		0.04	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Benzo(b,j,k)fluoranthene		0.19	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Benzo(c)phenanthrene		0.02	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Benzo(e)pyrene		0.06	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Chrysene		0.08	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16

Report certified by: Graham Knox, Team Lead
On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: January-15-16
Inquiries: (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/PUF/CLS/Dec 20, 2015	TE-06	Air Filter	20-Dec-15 0:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	16010003	REPORT CREATED:	15-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010003-004	Dibenzo(ah)anthracene		0.02 ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Fluoranthene		0.51 ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Fluorene		0.42 ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Indeno(1,2,3-cd)pyrene		0.06 ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Naphthalene		1.25 ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Perylene		0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Phenanthrene		1.38 ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Pyrene		0.34 ug/Filter	0.01	NA-017	14-Jan-16
16010003-004	Retene		0.31 ug/Filter	0.01	NA-017	14-Jan-16

Report certified by: Graham Knox, Team Lead
Date: January-15-16

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

Inquiries: (780) 632 8455
E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8 INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5		CLIENT SAMPLE ID CANISTER ID LICA/PUF/CLS/Dec. 26, 2015 TE-02 DESCRIPTION: Cold Lake South DATE SAMPLED: 26-Dec-15 0:00 DATE RECEIVED: 04-Jan-16 REPORT CREATED: 15-Jan-16 REPORT NUMBER: 16010004 VERSION: Version 01		Matrix Air Filter Priority Normal		
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010004-002	1-Methylnaphthalene		0.53 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	2-Methylnaphthalene		0.69 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	7,12-Dimethylbenz(a)anthracene		0.05 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Acenaphthene		0.09 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Acenaphthylene		0.17 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Anthracene		0.02 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Benzo(a)anthracene		0.03 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Benzo(a)pyrene		0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Benzo(b,j,k)fluoranthene		0.13 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Benzo(e)pyrene		0.04 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Chrysene		0.04 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID: LICA/PUF/CLS/Dec. 26, 2015 CANISTER ID: TE-02 Matrix: Air Filter DATE SAMPLED: 26-Dec-15 0:00
 DESCRIPTION: Cold Lake South
 REPORT NUMBER: 16010004 REPORT CREATED: 15-Jan-16 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16010004-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Fluoranthene		0.11	ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Fluorene		0.16	ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Indeno(1,2,3-cd)pyrene		0.02	ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Naphthalene		0.90	ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Phenanthrene		0.31	ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Pyrene		0.10	ug/Filter	0.01	NA-017	14-Jan-16
16010004-002	Retene		0.10	ug/Filter	0.01	NA-017	14-Jan-16

Report certified by: Graham Knox, Team Lead On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Date: January-15-16 Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

PARTISOL SAMPLES



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8 INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	CLIENT SAMPLE ID CANISTER ID LICA P5012879 DESCRIPTION: Cold Lake South DATE SAMPLED: 02-Dec-15 0:00 REPORT CREATED: 05-Jan-16 DATE RECEIVED: 09-Dec-15 REPORT NUMBER: 15120088 VERSION: Version 01	Matrix Air Filter Priority Normal
--	---	--

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120088-001	Particulate Weight		0.288	mg	0.004	AC-029	11-Dec-15



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8 INVOICE: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5		CLIENT SAMPLE ID LICA P5012876 DESCRIPTION: Cold Lake South DATE SAMPLED: 08-Dec-15 0:00 REPORT CREATED: 12-Jan-16 DATE RECEIVED: 11-Dec-15 REPORT NUMBER: 15120123 VERSION: Version 01		MATRIX Air Filter PRIORITY Normal	
Lab ID 15120123-001		Parameter Particulate Weight		Qualifier 	
Result Units 0.085 mg		RDL 0.004		Method AC-029	
Analysis Date 16-Dec-15					

Report certified by: Graham Knox, Team Lead
Date: January 12, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Inquiries: (780) 632 8455
E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<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 P5012877</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 14-Dec-15 0:00</p> <p>REPORT CREATED: 06-Jan-16</p> <p>CANISTER ID</p> <p>MATRIX Air Filter</p> <p>DATE RECEIVED: 22-Dec-15</p> <p>REPORT NUMBER: 15120213</p> <p>VERSION: Version 01</p> <p>PRIORITY Normal</p>
--	---

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120213-001	Particulate Weight		0.037	mg	0.004	AC-029	29-Dec-15

Report certified by: Graham Knox, Team Lead

Date: January 6, 2016

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8 INVOICE: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5		CLIENT SAMPLE ID LICA P5012878 DESCRIPTION: Cold Lake South DATE SAMPLED: 20-Dec-15 DATE RECEIVED: 04-Jan-16 REPORT CREATED: 12-Jan-16 REPORT NUMBER: 16010001 VERSION: Version 01 CANISTER ID MATRIX Air Filter PRIORITY Normal				
Lab ID 16010001-001	Parameter Particulate Weight	Qualifier 0.158 mg	Result Units 0.004	RDL AC-029	Method 05-Jan-16	Analysis Date
Report certified by: Graham Knox, Team Lead		On behalf of: PJ Pretorius, Manager, Analysis and Testing Services		Inquiries: (780) 632 8455		E-mail: EAS.Results@albertainnovates.ca
Date: January 12, 2016						



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<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 CANISTER ID LICA P5006I73</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 26-Dec-15 0:00 DATE RECEIVED: 04-Jan-16</p> <p>REPORT CREATED: 12-Jan-16 REPORT NUMBER: 16010002</p> <p>REPORT REVISED: 13-Jan-16 VERSION: Version 02</p>	<p>Matrix Air Filter</p> <p>Priority Normal</p>
--	--	---

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010002-001	Particulate Weight		0.204 mg	0.004	AC-029	05-Jan-16

Report certified by: Graham Knox, Team Lead
Date: January-13-16
On behalf of: PI Pretorius, Manager, Analysis and Testing Services
Inquiries: (780) 632 8455
E-mail: EAS.Results@albertainnovates.ca

APPENDIX V
CHAIN OF CUSTODY



Maxxam Analytics - Air Services Group
Project Chain of Custody

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2015-12-01- C</u>
Site: <u>Cold Lake South Site</u>	Contact: <u>Mike Bisaga</u>

QA Check Complete *W. Schmidt* Date 19-Jan-2016

QA Check Review *W. Schmidt* Date 19-Jan-2016

Report Complete *W. Schmidt* Date 21-Jan-2016

Report Reviewed *[Signature]* Date 21-Jan-16

Report Shipped _____ Date _____

Notes



maxxam.ca

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

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

AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
ELK POINT AIRPORT SITE

JOB #:2833-2015-12-35- C

DECEMBER 2015

Prepared for:

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

Attention: MIKE BISAGA

DATE: January 19, 2016

Prepared by:



Wunmi Adekanmbi, M.Sc.

Project Manager Assistant, Source Testing, Maxxam Analytics

Reviewed by:



Lily Lin, B.Sc.

Senior Project Manager, Air Services, Maxxam Analytics

SUMMARY

In DECEMBER 2015, the Air Services Group of Maxxam Analytics conducted an ambient air monitoring program on the Elk Point Airport Site at Lakeland Industry & Community Association, near Bonnyville, 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 AMD1989 and AMD2006.

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

PM 2.5: Three hours of data were invalidated as the data were below -3 ug/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, Elk Point Airport 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 Elk Point Airport Site						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDENCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-HR	24-HR	1-HR	24-HR				HOUR	WIND SPEED (KPH)	WIND DIRECTION (DEGREES)	READING	DAY	
SO2 (PPB)	172	48	0	0	0	1	VAR	VAR	VAR	VAR	0.3	1	100.0
H2S (PPB)	10	3	0	0	0	1	VAR	VAR	VAR	VAR	0.4	1	100.0
THC (PPM)	-	-	-	-	3.0	9.4	1	17	9.2	WNW	6.4	22	100.0
CH4 (PPM)	-	-	-	-	3.0	9.0	1	17	9.2	WNW	6.3	22	100.0
NMHC (PPM)	-	-	-	-	0.01	0.40	1	17	9.2	WNW	0.14	1	100.0
NO2 (PPB)	159	-	0	-	10.7	27.1	1	18	11.3	W	19.3	1	100.0
NO (PPB)	-	-	-	-	8.5	89.3	22	12	0.8	SE	57.0	22	100.0
NOX (PPB)	-	-	-	-	19.2	108.8	22	12	0.8	SE	74.1	22	100.0
O3 (PPB)	82	-	0	-	10	30	31	22	23.7	WNW	22.7	17	100.0
PM2.5 (UG/M3)	-	30	-	0	8.1	29.0	21	12	6.8	W	20.0	22	99.6
VECTOR WS (KPH)	-	-	-	-	8.7	29.7	31	15	-	W	16.3	31	100.0
VECTOR WD (DEG)	-	-	-	-	SE	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedence Summary Report

SO₂ 1- Hour Exceedences

No Exceedences Recorded During the Month

SO₂ 24- Hour Exceedences

No Exceedences Recorded During the Month

H₂S 1- Hour Exceedences

No Exceedences Recorded During the Month

H₂S 24- Hour Exceedences

No Exceedences Recorded During the Month

NO₂ 1- Hour Exceedences

No Exceedences Recorded During the Month

PM_{2.5} 24- Hour Exceedences

No Exceedences Recorded During the Month

Volatile Organics (VOCs) Data Summary

Sample Collected Date	Maximum reading (PPB)	Volatile Organic Compound
DECEMBER 2, 2015	4.31	N-BUTANE
DECEMBER 8, 2015	3.5	ACETONE
DECEMBER 14, 2015	1.82	N-BUTANE
DECEMBER 20, 2015	2.44	N-BUTANE
DECEMBER 26, 2015	3.03	N-BUTANE

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collected Date	Maximum reading (ug)	Semi-Volatile Organic
DECEMBER 2, 2015	0.53	PHENANTHRENE
DECEMBER 8, 2015	0.22	PHENANTHRENE
DECEMBER 14, 2015	0.31	NAPHTHALENE
DECEMBER 20, 2015	0.57	2-METHYLNAPHTHALENE
DECEMBER 26, 2015	0.31	2-METHYLNAPHTHALENE

Note: NA

Volatile Organics (VOCs) Data Summary - NMHC Canister System

Sample Collected Date	Maximum reading (PPB)	Volatile Organic Compound
DECEMBER 1, 2015	9.99	ISOBUTANE
DECEMBER 12, 2015	6.18	N-BUTANE

Note: NA

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
1.0 Discussion	4
2.0 Project Personnel	7
3.0 Plant Monthly Required AMD Summary	7
4.0 Calculations and Results	7
5.0 Methods and Procedures	8
Appendix I	Continuous Monitoring Data Results
	Sulphur Dioxide
	Hydrogen Sulphide
	Total Hydrocarbon
	Methane
	Non-Methane Hydrocarbon
	Oxides of Nitrogen
	Nitric Oxides
	Nitrogen Dioxide
	Ozone
	Particulate Matter 2.5
	Wind Speed
	Wind Direction
	Standard Deviation Wind Direction
Appendix II	Non-Continuous Monitoring Data Results
	VOC Results
	PAH Results
	NMHC Canister Results
Appendix III	Analyzer Calibration Results
	Sulphur Dioxide
	Hydrogen Sulphide
	Total Hydrocarbon
	Nitrogen Dioxide
	Ozone
	Particulate Matter
	Wind System
	Calibrators
	Calibration Gases

Appendix IV

Analytical Results

VOCs Samples

PAHs Samples

NMHC Canister Samples

Appendix V

Chain of Custody

1.0 Discussion

This monthly report consists of data for parameters SO₂, H₂S, THC, CH₄, NMHC, NO_x, NO, NO₂, O₃, PM_{2.5}, WS, WD and STDWD. It also includes results for non-continuous parameters VOC, PAH and NMHC canister.

Sample filters for all continuous air monitors are changed before the calibration is started. The sample manifold is cleaned during the site visit on a monthly basis.

Control checks, consisting of zero and span of the analyzer are conducted on a daily basis on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinder) 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 calibration is done a minimum of once a month for each continuous air monitor. In addition 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.

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.

Hourly/minute data have been reviewed based on daily zero/span results and multi-points calibration results. Data may be considered as 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 (greater than 15%).

Hourly data is corrected using daily zero information.

SULPHUR DIOXIDE (SO₂)

The analyzer was working well throughout the month. A shut-down calibration was completed prior to performing a digital output calibration on December 7. A one-point check was performed afterwards followed by a zero/span check. The results for both checks were good. A full post-repair calibration was completed on December 8. The analyzer met the calibration requirements.

HYDROGEN SULPHIDE (H₂S)

The daily zero drifted close to the acceptable high limit on November 30. An as found points check was performed on December 4 to check the analyzer's functionality. The result was good. The routine monthly calibration was completed on December 7.

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

The analyzer was working well throughout the month. The Nitrogen and span gas cylinders were replaced on December 1. The routine monthly calibration was performed on December 8.

NITROGEN DIOXIDE (NO₂)

The analyzer was working well throughout the month. A shut-down calibration was completed prior to performing a digital output calibration on December 7. A one-point check was performed afterwards followed by a zero/span check. The results for both checks were good. A full post-repair calibration was completed on December 8. The analyzer met the calibration requirements.

OZONE (O₃)

The analyzer was working well throughout the month. The routine monthly calibration was performed on December 8.

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

Two Teom audits were performed on this month: one was completed on December 9, and the other audit was performed on December 24. The FDMS filter were replaced during the audits. The flow calibration was not done during the audit on December 24 due to extreme cold weather conditions. Data was corrected using Alberta air quality guideline. If the data was between 0 to -3 ug/m³, the data was corrected to 0 ug/m³. If the data was below -3ug/m³, the data was invalidated. Three hours of data were invalidated as the data were below -3 ug/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.

The wind system was working well throughout the month.

VOC SAMPLES

The sampler was programmed to run for 24 hours, and, every 6 days per sample cycle. The values for the VOCs were reported in ppb.

Samples were collected on December 2, 8, 14, 20 and 26. Analytical results are included in this report.

PAH SAMPLES

The sampler was programmed to run for 24 hours, and, every 6 days per sample cycle. The values for the PAHs were reported in µg.

Samples were collected on December 2, 8, 14, 20 and 26. Analytical results are included in this report.

NMHC CANISTER SAMPLES

The sampler was programmed to be triggered when the 5-minute average concentration of NMHC is above 0.30 ppm. Two canister events were recorded this month: concentrations of 0.3 ppm on December 1 at 17:00 and 0.5 ppm on December 12 at 10:10. Analytical results are included in this report.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association, and the Maxxam field sampling team consisted of Alexander Yakupov and Raja Ashraf.

3.0 Plant Monthly Required AMD Summary

All data collected this month were within the objectives outlined in the AMD1989 and AMD2006.

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 method described in the Air Monitoring Directive, 1989, and 2006 Amendments to the Air Monitoring Directive, 1989 (AMD 2006).

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
- 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 - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101A 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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE



SULPHUR DIOXIDE (SO2) hourly averages in ppb

MST

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
HR 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	24:00	24:00	24:00	24:00	24:00	24:00	24:00
HR END	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
RDSS	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAILY MAX	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
24-HOUR AVG	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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

OBJECTIVE LIMIT:

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES: 0

NUMBER OF 24-HR EXCEEDENCES: 0

NUMBER OF NON-ZERO READINGS: 21

MAXIMUM 1-HR AVERAGE: 1 PPB @ HOUR(S) 1

MAXIMUM 24-HR AVERAGE: 0.3 PPB

ON DAY(S) VAR: 1

OPERATIONAL TIME: 33 HRS

MONTHLY CALIBRATION TIME: 11 HRS

AWD OPERATION UPTIME: 744 HRS

STANDARD DEVIATION: 0.17

MONTHLY AVERAGE: 0 PPB

STATUS FLAG CODES

C - CALIBRATION

Q - QUALITY ASSURANCE

Y - MAINTENANCE

R - RECOVERY

S - DAILY ZERO/SPAN CHECK

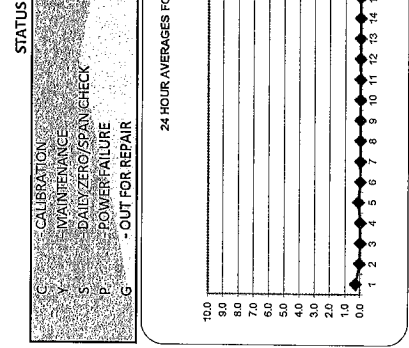
X - MACHINE MALFUNCTION

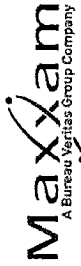
P - POWER FAILURE

O - OPERATOR ERROR

G - OUT FOR REPAIR

K - COLLECTION ERROR





SULPHUR DIOXIDE MAX instantaneous maximum in ppb

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	DAILY MAX	24-HOUR AVG	RDGS	
																												0:00
1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2.0	24	
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.0	24
3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.0	24
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2	24	
5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0.8	24
6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.0	24
7	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.0	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	1.9	24	
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	24	
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	24	
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	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	0.9	24	
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	24	
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	24	
22	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.1	24
23	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.1	24	
24	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.6	24	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	24	
26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.3	24	
27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
28	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.9	24	
29	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.2	24	
30	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.9	24	
31	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.7	24	
HOURLY MAX	2	3	3	2	3	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
HOURLY AVG	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.2	1.3	1.3	1.2	1.3	1.4	1.3	1.3	1.3	1.3	1.1		

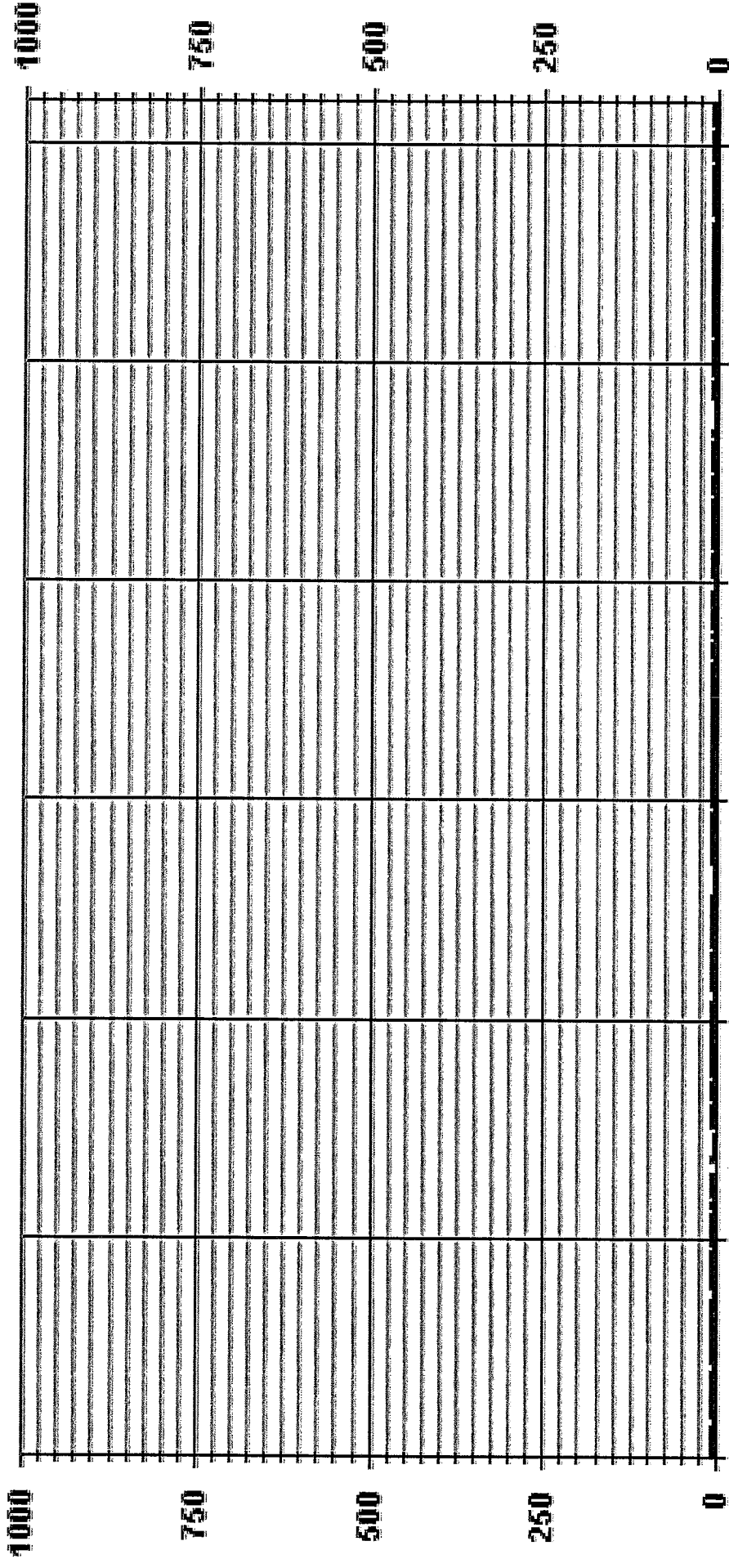
STATUS FLAG CODES

C	CALIBRATION	A	QUALITY ASSURANCE
V	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT-OF-REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	685
MAXIMUM INSTANTANEOUS VALUE:	3 PPB @ HOUR(S) VAR ON DAY(S) VAR
1ZS CALIBRATION TIME:	33 HRS
MONTHLY CALIBRATION TIME:	13 HRS
STANDARD DEVIATION:	0.64
OPERATIONAL TIME:	744 HRS

01 Hour Averages



— LICA35 SO2MAX PPB

LICA-ELK
 SO2_ / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : SO2
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
< 20	1.85	1.00	1.00	2.28	15.57	22.57	8.14	2.85	1.42	1.57	2.42	9.57	10.85	8.57	7.28	3.00	100.00			
< 60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
< 110	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
< 170	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
< 340	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
>= 340	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
Totals	1.85	1.00	1.00	2.28	15.57	22.57	8.14	2.85	1.42	1.57	2.42	9.57	10.85	8.57	7.28	3.00				

Calm : .00 %

Total # Operational Hours : 700

Distribution By Samples

Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
< 20	13	7	7	16	109	158	57	20	10	11	17	67	76	60	51	21	700			
< 60																				
< 110																				
< 170																				
< 340																				
>= 340																				
Totals	13	7	7	16	109	158	57	20	10	11	17	67	76	60	51	21				

Calm : .00 %

Total # Operational Hours : 700

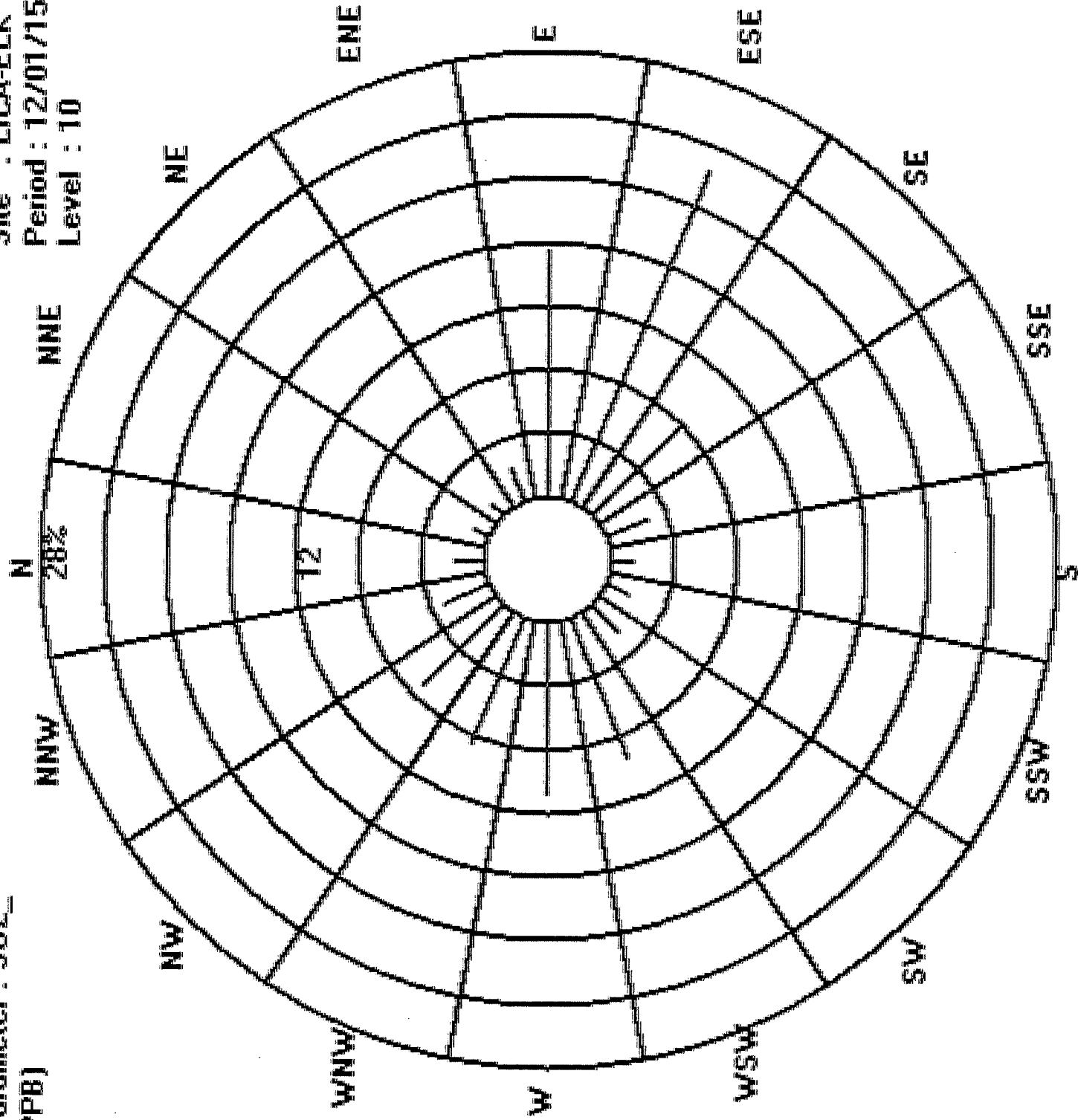
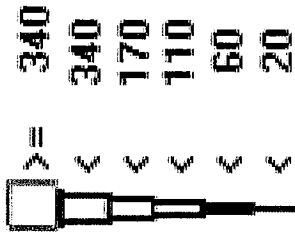
Logger : 35 Parameter : SO2_

Site : LICA-ELK

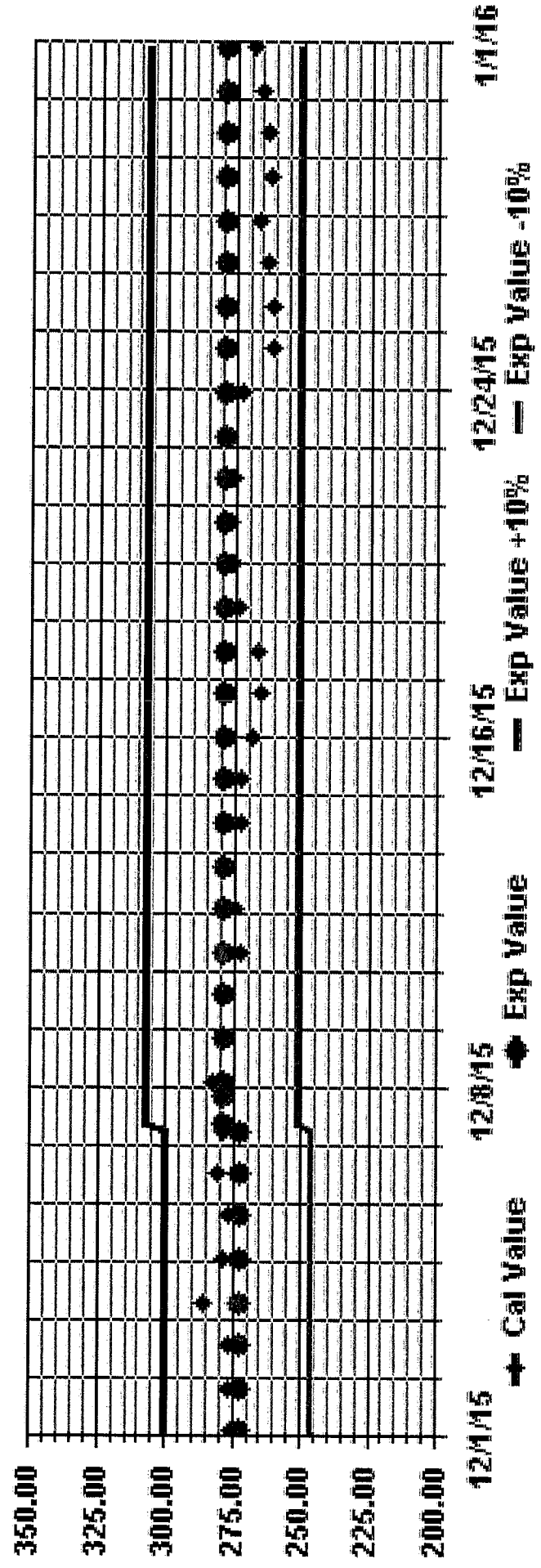
Class Limits (PPB)

Period : 12/01/15-12/31/15

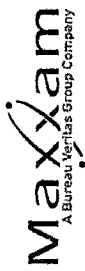
Level : 10



Calibration Graph for Site: LICA35 Parameter: SO2_ Sequence: SO2 Phase: SPAN



HYDROGEN SULPHIDE



HYDROGEN SULPHIDE (H2S) hourly averages in ppb

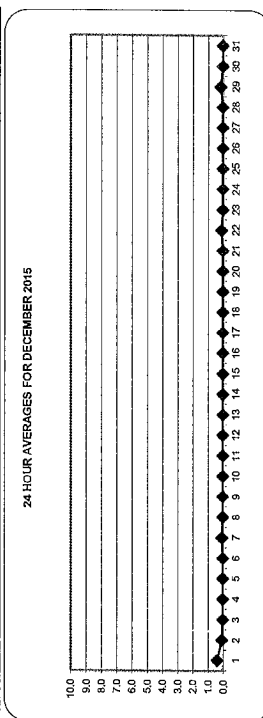
DAY	MST																								DAILY MAX	24-HOUR AVG	ROGS		
	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				24:00	
1	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	24	
2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	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	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	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	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	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	0.1	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	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	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	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	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	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	24	
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	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	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	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	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	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	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	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	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	0.1	24	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	24	24
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	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	24	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	24	24
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	24
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	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	0.1	24	24
31	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	24
HOURLY MAX	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	24
HOURLY AVG	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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

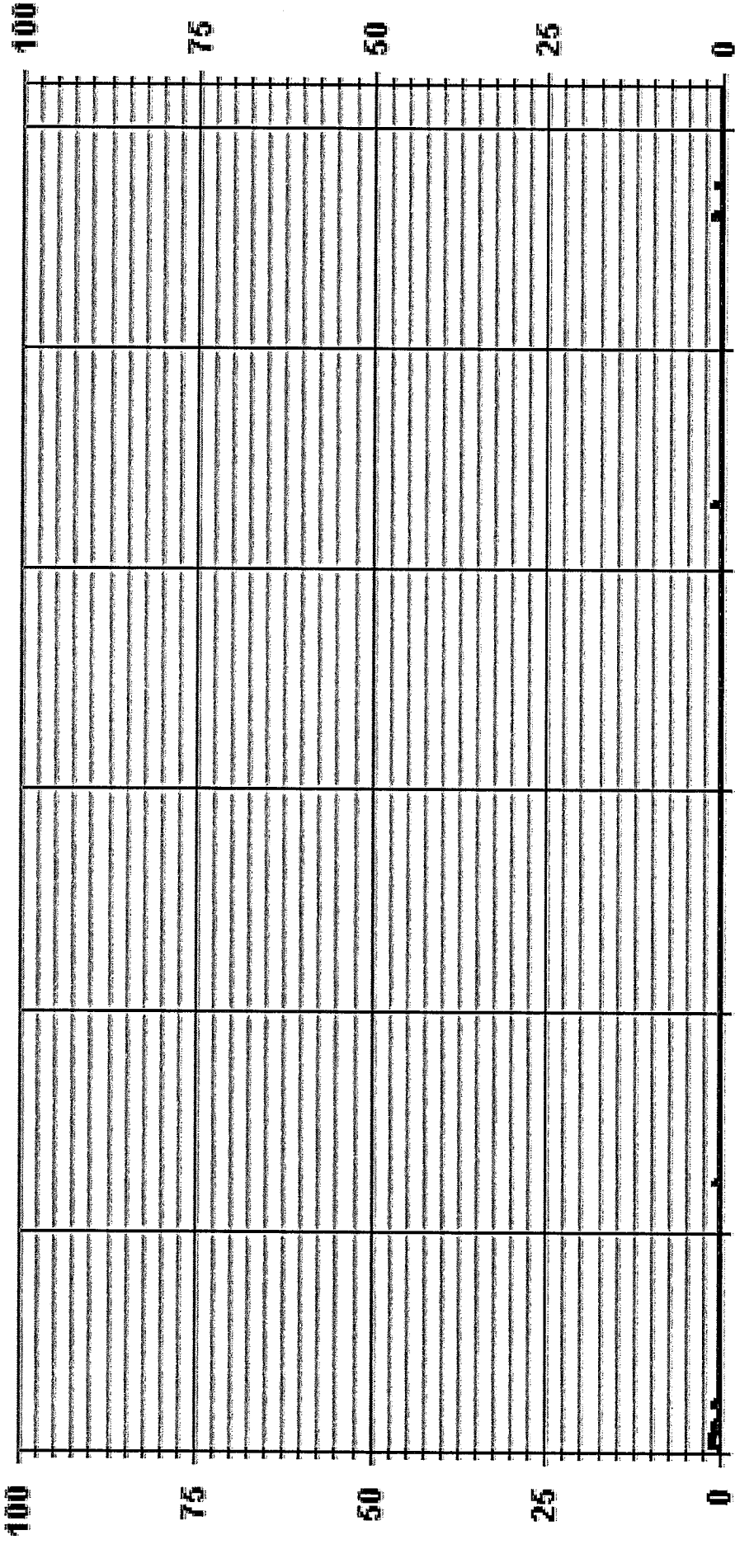
STATUS FLAG CODES:
 C - CALIBRATION O - QUALITY ASSURANCE
 Y - MAINTENANCE K - RECOVERY
 S - DAILY ZERO/SPAN CHECK X - MACHINE MALFUNCTION
 P - POWER FAILURE O - OPERATOR ERROR
 G - OUT FOR REPAIR K - COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0	15
NUMBER OF 24-HR EXCEEDENCES:	0	1
NUMBER OF NON-ZERO READINGS:	0.4	PPB @ HOUR(S) VAR
MAXIMUM 1-HR AVERAGE:	35 HRS	ON DAY(S) VAR
MAXIMUM 24-HR AVERAGE:	6 HRS	ON DAY(S) VAR- VARIOUS
12S CALIBRATION TIME:	0.14	OPERATIONAL TIME: 744 HRS
MONTHLY CALIBRATION TIME:		AMTD OPERATION UPTIME: 100.0 %
STANDARD DEVIATION:		MONTHLY AVERAGE: 0 PPB

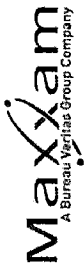


01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA35 H2S_ PPB



HYDROGEN SULPHIDE MAX instantaneous maximum in ppb

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	DAILY	24-HOUR		
HOUR END	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	MAX.	AVG.	RDGS	
DAY	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.7	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	1	0.1	24
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	1	0.1	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	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	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	1	0.1	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	1	0.4	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	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	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	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	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	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	24
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	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	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	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	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	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	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	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	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	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	24
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	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	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	24
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
HOURLY MAX	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HOURLY AVG	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	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	0.0	0.1

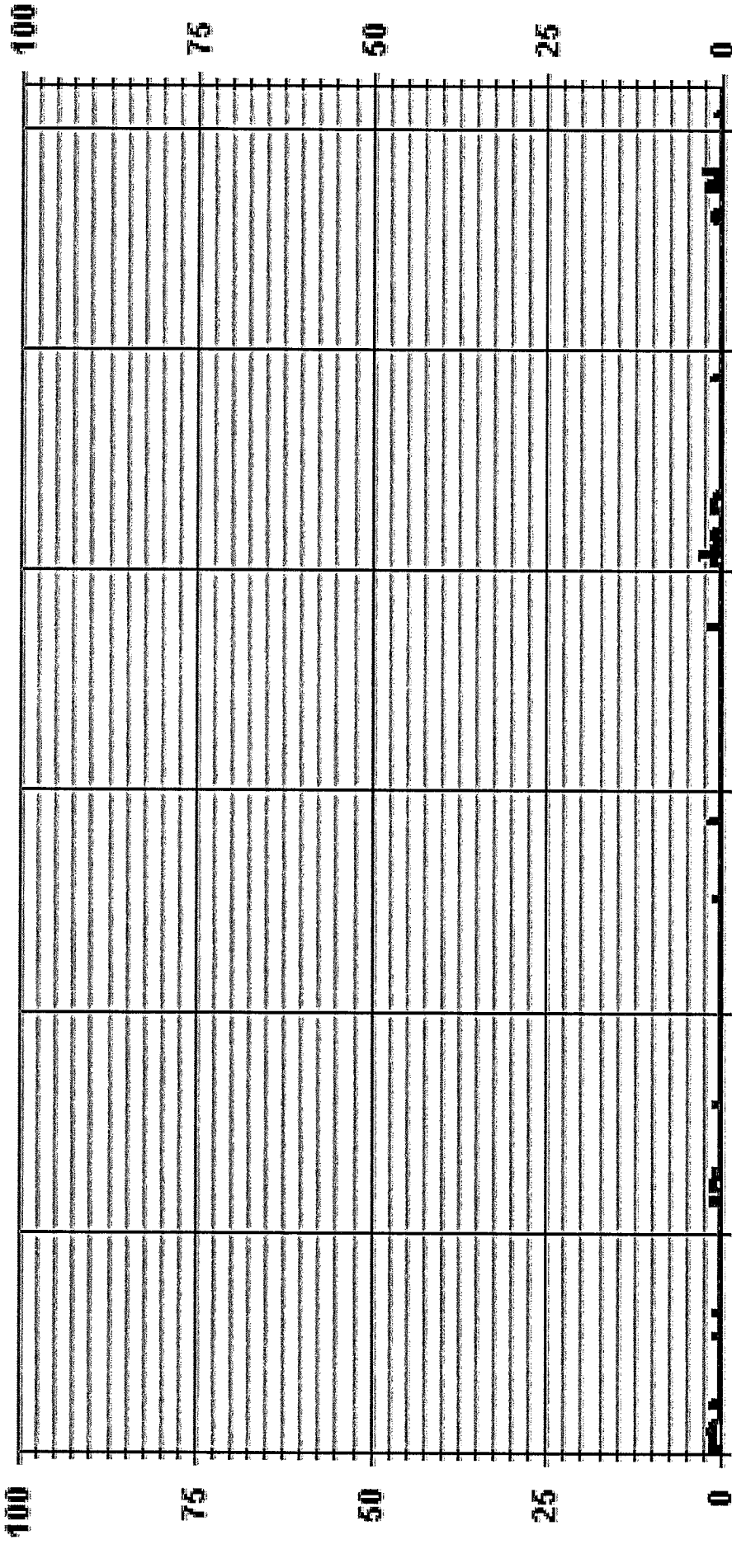
STATUS FLAG CODES

C	CALIBRATION	O	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	-OUT FOR REPAIR	K	-COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	65
MAXIMUM INSTANTANEOUS VALUE:	3 PPB @ HOUR(S) 9, 2 ON DAY(S) 21, 30
OPERATIONAL TIME:	744 HRS
VAR- VARIOUS	
ISZ CALIBRATION TIME:	3S HRS
MONTHLY CALIBRATION TIME:	6 HRS
STANDARD DEVIATION:	0.36

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA35 H2SMAX PPB

LICA-ELK
H2S_ / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 35
Site Name : LICA-ELK
Parameter : H2S
Units : PPB

Wind Parameter : WDR
Instrument Height : 10 Meters

Limit	Direction																NNW	NW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NW			
< 3	1.84	.99	.99	2.27	15.78	22.33	8.10	2.84	1.42	1.70	2.41	9.53	10.81	8.67	7.25	2.98	100.00		
< 10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
< 50	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
>= 50	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
Totals	1.84	.99	.99	2.27	15.78	22.33	8.10	2.84	1.42	1.70	2.41	9.53	10.81	8.67	7.25	2.98			

Calm : .00 %

Total # Operational Hours : 703

Distribution By Samples

Limit	Direction																NNW	NW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NW			
< 3	13	7	7	16	111	157	57	20	10	12	17	67	76	61	51	21	703		
< 10																			
< 50																			
>= 50																			
Totals	13	7	7	16	111	157	57	20	10	12	17	67	76	61	51	21			

Calm : .00 %

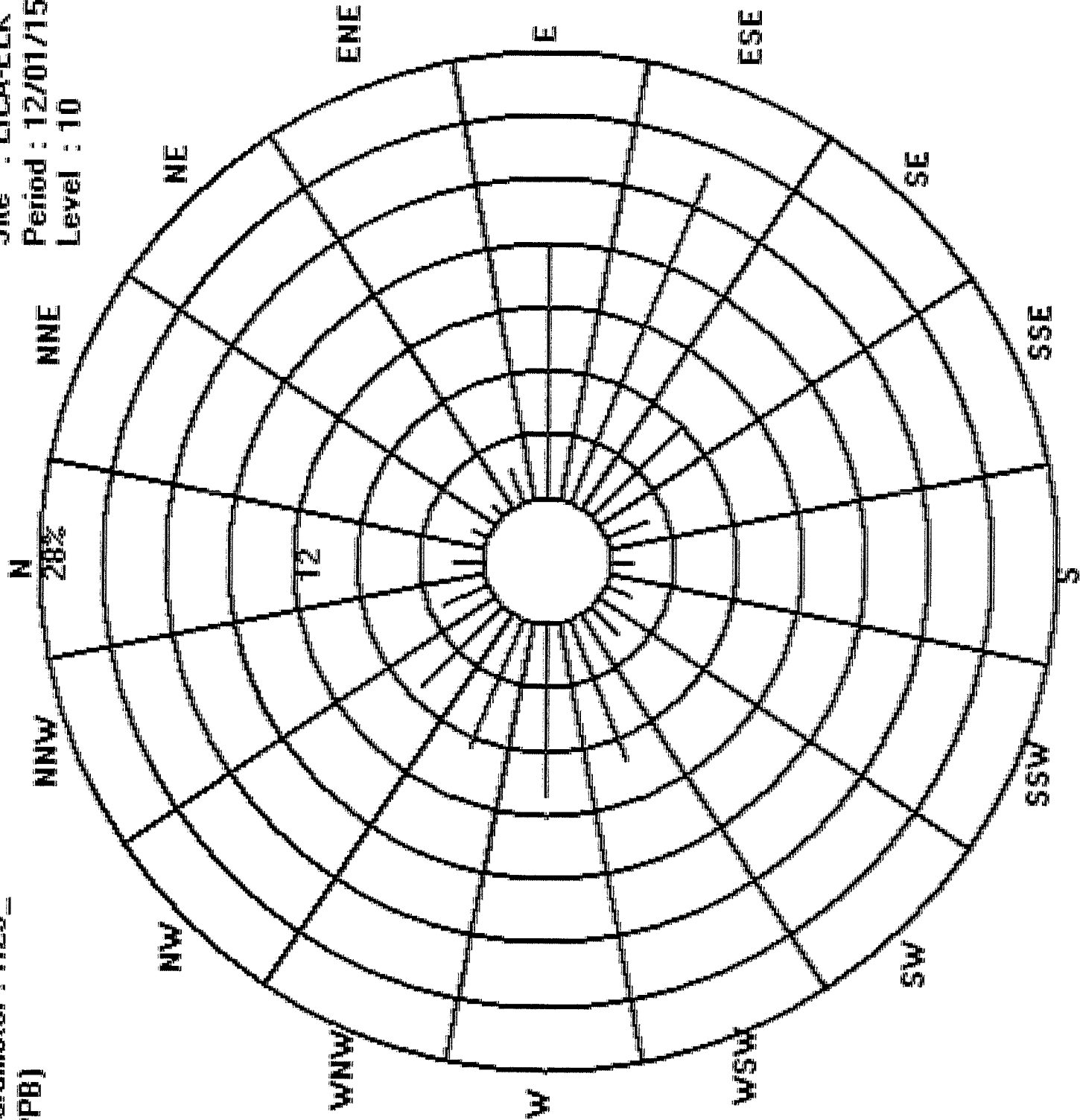
Total # Operational Hours : 703

Logger : 35 Parameter : H2S_

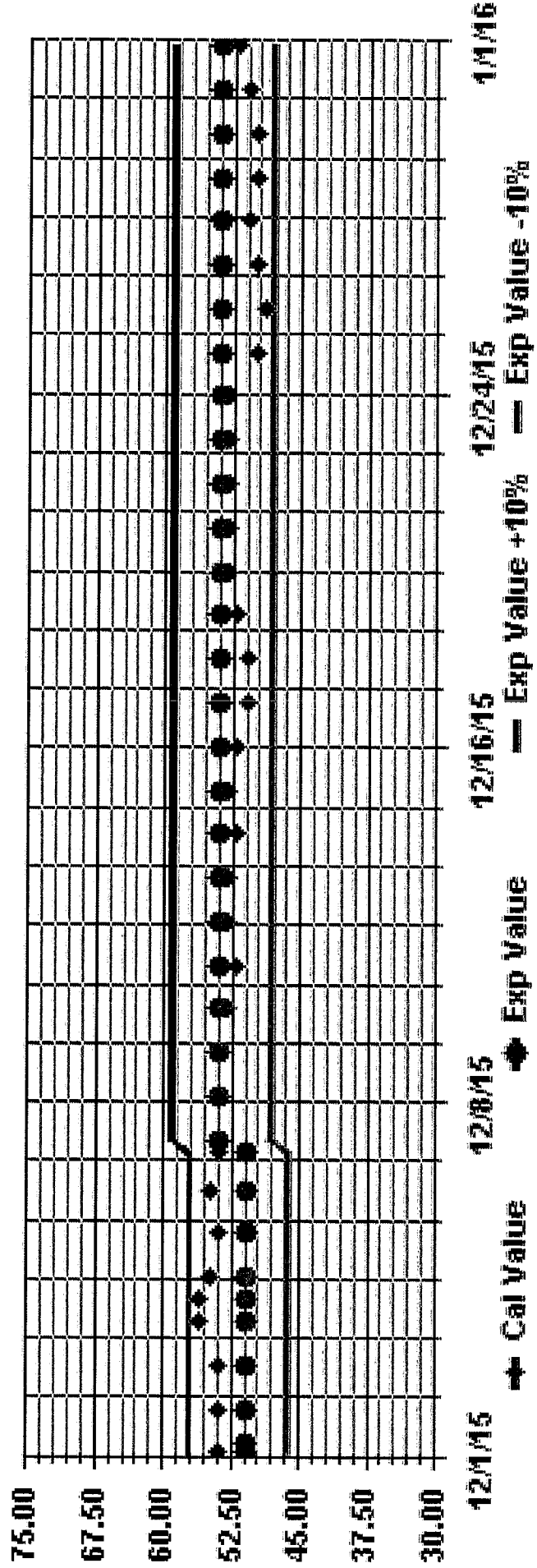
Class Limits (PPB)



Site : LICA-ELK
Period : 12/01/15-12/31/15
Level : 10



Calibration Graph for Site: LICA35 Parameter: H2S_ Sequence: H2S_ Phase: SPAN



TOTAL HYDROCARBON

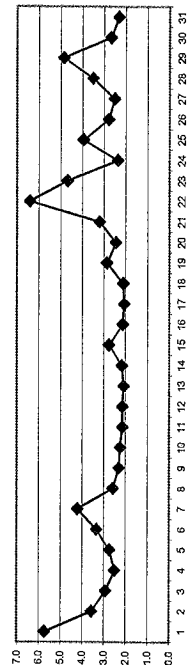
TOTAL HYDROCARBONS (THC) hourly averages in ppm

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX	24-HOUR AVG	ROGS
1	5.0	5.5	\$	6.1	6.9	7.5	7.3	8.3	8.1	7.1	6.8	6.8	6.0	\$	4.9	6.1	9.4	3.3	2.6	2.9	3.0	3.1	3.3	3.6	5.7	24	
2	3.6	\$	4.6	5.3	5.8	5.9	4.5	4.0	4.1	4.2	4.3	4.2	4.3	4.2	3.5	2.8	2.3	2.3	2.2	2.2	2.6	2.3	2.3	2.6	5.9	3.6	24
3	\$	2.9	2.9	3.2	3.6	3.9	3.8	3.5	3.5	3.3	3.0	2.8	2.7	2.4	2.3	2.4	2.4	2.6	2.7	2.4	2.5	2.6	2.7	\$	3.9	2.9	24
4	2.7	2.9	2.9	2.8	2.7	2.6	2.6	2.7	2.7	2.7	2.6	2.1	2.2	2.0	2.0	2.1	2.2	2.5	2.6	2.6	2.3	2.5	\$	2.9	2.5	24	
5	3.1	3.2	3.1	3.0	2.3	3.0	2.6	2.5	2.3	2.3	2.2	2.2	2.2	2.1	2.2	2.2	2.6	3.5	3.7	3.1	2.9	\$	3.4	3.4	2.7	24	
6	3.3	3.2	3.3	3.1	3.0	2.9	2.9	2.9	3.1	3.0	3.1	3.1	3.1	3.1	3.2	3.3	3.4	4.1	4.5	\$	4.2	4.0	3.7	4.5	3.3	24	
7	4.3	5.4	6.6	5.7	5.8	5.7	4.5	4.2	4.4	4.2	4.1	4.1	4.0	3.9	3.7	3.5	3.9	2.8	3.6	2.9	3.1	\$	2.5	6.6	4.2	24	
8	2.5	2.3	2.2	2.2	2.6	2.3	2.4	2.3	2.3	2.6	3.0	C	C	C	3.0	3.0	2.8	2.9	3.0	2.7	2.5	\$	2.4	2.5	3.0	2.6	24
9	2.5	2.5	2.5	3.0	3.0	2.7	2.7	2.5	2.3	2.4	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.1	\$	2.1	2.1	2.0	3.0	2.3	24
10	2.1	2.5	2.3	2.5	2.2	2.4	2.2	2.3	2.3	2.5	2.4	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	\$	2.1	2.1	2.2	2.1	2.5	2.2	24
11	2.1	2.2	2.2	2.3	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	\$	2.1	2.1	2.1	2.1	2.4	2.1	24
12	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	\$	2.1	2.1	2.1	2.1	2.4	2.1	24
13	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	\$	2.1	2.1	2.1	2.1	2.4	2.1	24
14	2.1	2.0	2.0	2.1	2.1	2.1	2.3	2.3	2.1	2.3	2.3	2.5	2.3	2.2	2.1	2.0	\$	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	24
15	2.6	2.3	2.5	2.9	2.9	3.1	4.4	3.7	3.1	3.0	2.9	2.8	2.8	2.5	\$	2.5	2.5	2.5	2.8	2.6	2.3	2.3	2.2	2.2	4.4	2.8	24
16	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	1.9	1.9	\$	2.0	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.7	2.1	24
17	2.7	2.7	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	\$	1.9	2.0	2.0	2.1	2.1	2.0	1.9	2.0	2.0	2.1	2.0	2.1	2.1	24
18	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	\$	2.1	2.1	2.1	2.1	2.1	2.1	24
19	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.5	\$	2.4	2.4	3.0	2.7	4.1	4.7	5.6	4.4	3.1	3.0	2.5	2.4	2.8	5.6	2.9	24
20	2.9	2.9	3.2	3.4	3.1	2.7	2.6	2.4	2.6	\$	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	24
21	2.3	2.2	2.3	2.4	2.7	3.4	3.8	3.4	\$	3.0	2.9	2.5	2.3	2.5	2.6	2.8	3.1	3.5	4.0	3.9	3.3	2.7	2.3	2.1	2.1	2.1	24
22	5.5	5.0	5.3	5.6	5.2	5.0	5.6	\$	6.1	6.2	5.8	6.7	8.4	7.9	7.3	6.9	6.0	5.9	6.5	6.2	6.6	8.9	7.8	6.6	8.9	6.4	24
23	6.3	6.1	6.4	6.8	6.6	6.7	\$	6.1	5.8	5.1	4.9	4.1	2.7	2.5	2.6	2.3	2.4	2.3	2.6	4.2	4.9	4.8	5.3	6.0	6.8	4.7	24
24	4.3	3.3	2.9	2.1	2.0	\$	2.0	2.0	2.0	2.0	2.1	2.1	2.1	1.9	2.1	1.9	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	24
25	2.7	3.0	3.5	3.5	\$	4.3	4.4	5.5	5.7	5.7	5.1	4.0	4.5	4.9	4.8	4.4	4.1	4.1	3.9	3.3	2.7	2.3	2.1	2.1	5.7	3.9	24
26	2.2	2.2	2.2	\$	2.4	2.3	2.3	2.5	2.7	2.5	3.3	3.5	3.4	3.4	3.9	3.4	3.9	3.4	2.9	2.7	2.7	2.8	2.7	2.7	2.7	2.8	24
27	2.8	2.8	\$	2.7	2.6	2.6	2.6	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.5	2.6	2.7	3.0	3.0	2.5	24
28	3.3	\$	3.0	3.1	3.5	3.0	2.7	2.7	2.7	2.8	2.8	2.7	2.7	3.0	3.0	3.1	3.1	3.1	3.0	3.4	4.9	6.7	6.4	5.8	6.7	3.5	24
29	\$	6.1	6.6	5.8	5.2	5.3	5.0	4.8	5.1	4.9	4.5	4.2	4.1	4.2	4.1	4.1	4.3	4.6	4.8	5.2	5.0	4.6	4.1	\$	6.6	4.8	24
30	4.1	4.2	4.1	4.3	4.3	2.6	2.2	2.4	2.4	2.3	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.3	2.3	2.2	2.2	2.1	2.1	\$	2.2	4.3	24
31	2.1	2.1	2.2	2.1	2.2	2.1	2.2	2.1	2.4	2.5	2.4	2.3	2.1	2.3	2.2	2.2	2.4	2.1	2.0	2.1	2.4	3.8	2.6	\$	2.1	2.5	24
HOURLY MAX	6.3	6.1	6.6	6.8	6.9	7.5	7.3	8.3	8.1	7.1	6.8	6.8	8.4	7.9	7.3	6.9	6.1	9.4	6.5	6.2	6.6	8.9	7.8	6.6	8.9	6.6	3.0
HOURLY AVG	3.0	3.1	3.2	3.3	3.3	3.3	3.1	3.1	3.2	3.1	3.0	3.0	2.9	2.8	2.7	2.9	3.1	2.9	2.9	3.1	2.9	2.9	3.1	3.0	3.0	3.0	3.0

STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	DAILY ZERO / SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

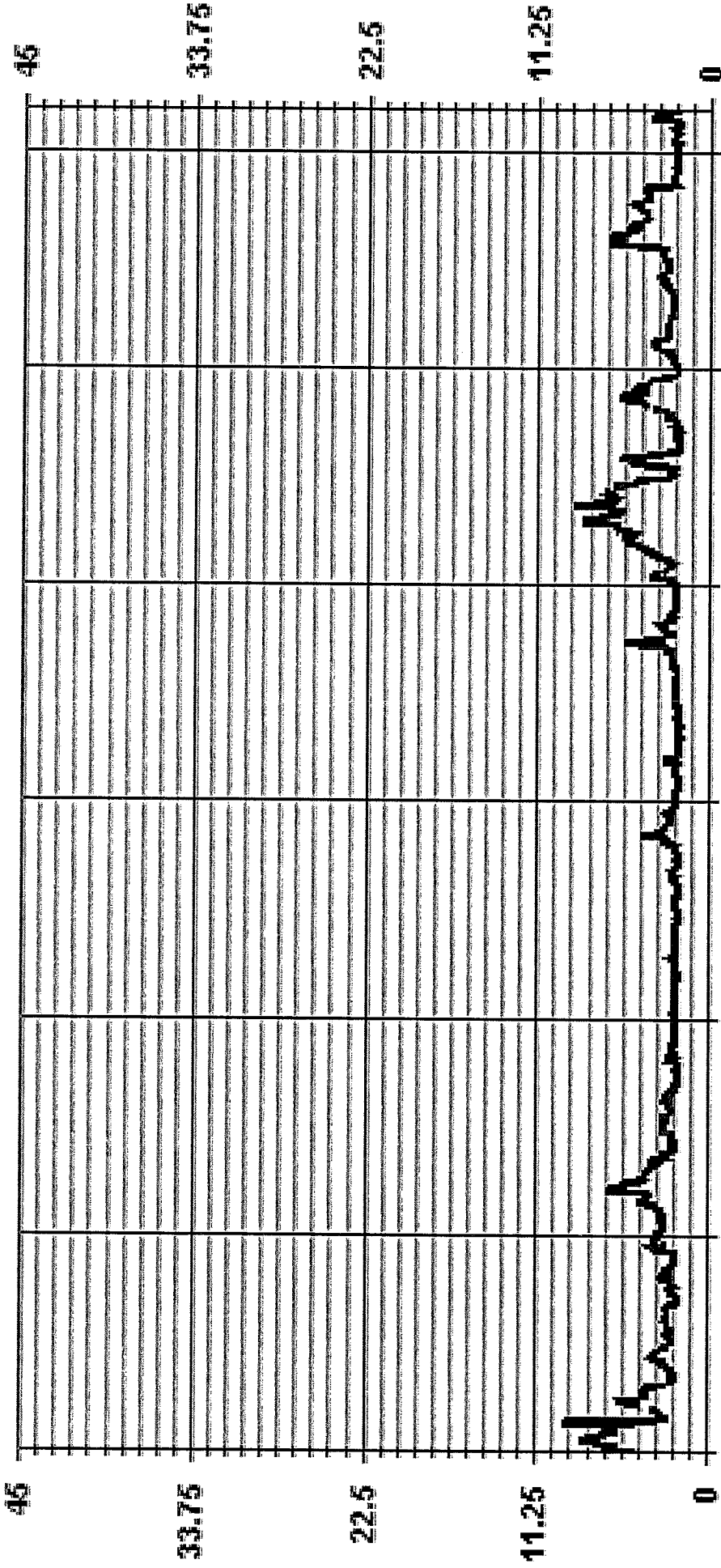
24 HOUR AVERAGES FOR DECEMBER 2015



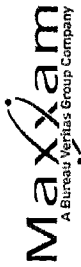
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	706	PPM @ HOUR(S)	17	ON DAY(S)	1
MAXIMUM 1-HR AVERAGE:	9.4	MAXIMUM 24-HR AVERAGE:	6.4	VAR- VARIOUS	22
IS CALIBRATION TIME:	35	OPERATIONAL TIME:	744	HRS	
MONTHLY CALIBRATION TIME:	3	AMTD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	1.31	MONTHLY AVERAGE:	3.0	PPM	

01 Hour Averages



— LICA35 - - - - - THC55 PPM



TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	RDSS		
1	5.3	5.8	S	6.4	7.2	8.5	8.1	8.9	8.6	7.9	7.0	7.1	6.6	S	5.1	9.4	11.2	5.6	2.7	3.2	3.2	3.2	3.3	3.5	11.2	6.4	24	
2	3.8	S	5.2	5.7	6.1	6.4	5.3	4.3	4.3	4.3	4.4	4.5	4.4	4.3	3.0	2.7	2.5	2.6	2.3	2.4	2.7	2.6	2.6	2.8	S	4.1	3.9	24
3	S	3.0	3.1	3.8	3.8	4.1	4.0	3.6	3.7	3.5	3.3	2.9	2.8	2.8	2.1	2.1	2.2	2.5	2.7	2.7	2.6	2.6	2.8	S	4.1	3.1	24	
4	2.8	3.1	3.0	2.9	2.8	2.7	2.7	2.8	2.8	2.9	3.0	2.1	2.1	2.1	2.1	2.2	2.4	2.8	2.8	2.8	2.7	2.4	2.6	S	2.9	3.1	24	
5	3.2	3.5	3.2	3.2	3.1	3.3	2.8	2.6	2.7	2.5	2.4	2.3	2.3	2.2	2.4	3.0	4.0	4.1	3.4	3.1	S	3.6	3.5	4.1	3.0	2.4	24	
6	3.5	3.3	3.4	3.2	3.2	2.9	3.1	3.1	3.2	3.1	3.2	3.2	3.2	3.2	3.2	3.3	3.4	3.7	4.4	5.0	S	5.0	4.3	3.8	5.0	3.5	24	
7	4.8	5.8	7.4	6.4	6.0	6.1	5.3	4.3	4.5	4.4	4.3	4.2	4.2	4.0	4.0	4.0	4.8	4.7	3.3	4.5	3.2	3.3	S	3.1	7.4	4.6	24	
8	2.8	2.7	2.3	2.2	3.0	2.8	2.6	2.5	2.4	2.9	C	C	C	C	3.1	3.3	3.0	3.0	3.1	3.1	2.5	S	2.5	2.6	3.3	2.8	24	
9	2.7	2.6	2.8	3.2	3.2	2.9	2.9	2.7	2.4	2.8	2.5	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.2	2.2	2.2	2.2	2.2	2.2	2.4	24	
10	2.4	2.8	2.7	2.9	2.5	2.5	2.5	2.5	3.0	3.2	3.5	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.4	24	
11	2.2	2.3	2.2	2.4	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.5	2.4	24	
12	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.4	24	
13	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	S	2.1	2.2	2.2	2.2	2.2	2.1	2.0	2.3	24	
14	2.1	2.0	2.1	2.1	2.2	2.6	2.6	2.1	2.7	2.4	2.8	2.4	2.3	2.1	2.1	S	2.2	2.3	2.3	2.1	2.1	2.1	2.3	2.4	2.6	2.8	24	
15	2.8	2.3	3.6	3.5	3.1	3.5	5.2	4.1	3.5	3.1	3.0	2.9	3.0	2.7	S	2.6	2.6	2.7	3.0	2.8	2.7	2.4	2.4	2.4	5.2	3.0	24	
16	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.1	2.1	2.1	2.0	S	2.0	2.4	2.3	2.3	2.3	2.3	2.2	2.7	2.7	2.3	3.1	3.1	24	
17	3.0	2.8	2.6	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	S	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	24	
18	2.2	2.1	2.0	2.0	2.0	2.1	2.1	2.3	2.2	2.2	2.1	S	2.1	2.1	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	24	
19	2.1	2.2	2.2	2.3	2.4	2.4	2.3	2.3	2.4	2.6	S	2.4	2.4	3.5	3.0	6.0	7.0	6.1	5.7	3.4	3.2	2.8	2.8	2.9	7.0	3.2	24	
20	3.0	3.1	3.3	3.4	3.4	2.9	2.8	2.5	2.7	S	2.5	2.2	2.2	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	3.4	2.6	24	
21	2.3	2.3	2.3	3.1	3.6	3.5	4.5	3.8	S	3.2	3.2	2.6	2.5	2.6	2.9	3.1	3.3	3.8	4.2	4.0	4.4	4.5	5.3	5.3	3.4	2.4	24	
22	6.3	6.2	5.8	5.9	5.7	5.2	5.9	S	6.6	6.7	6.1	7.6	8.8	8.8	8.0	7.1	7.1	6.8	6.8	6.6	7.6	9.3	8.5	7.2	9.3	7.0	24	
23	6.6	6.6	7.1	7.1	6.8	7.0	S	6.5	6.0	5.6	5.2	5.2	3.0	2.6	2.8	2.5	2.6	2.4	3.1	5.0	5.2	5.2	5.6	6.4	7.1	5.0	24	
24	6.4	3.4	3.5	2.3	2.1	S	2.0	2.0	2.0	2.0	2.1	2.3	2.4	2.0	2.3	2.3	2.2	2.5	2.3	2.3	2.5	2.5	2.8	2.6	6.4	2.6	24	
25	2.9	3.1	3.9	3.7	S	5.2	5.0	6.6	7.0	6.0	5.8	4.4	4.7	5.1	5.1	4.7	4.3	4.1	4.0	3.6	3.2	2.5	2.2	2.2	7.0	4.3	24	
26	2.2	2.3	2.3	S	2.5	2.4	2.4	2.6	2.9	2.7	2.8	3.4	3.6	3.6	3.7	4.0	3.8	3.1	2.9	2.7	2.9	2.9	2.8	2.8	4.0	2.9	24	
27	2.8	2.8	S	2.7	2.6	2.7	2.6	2.6	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.5	2.5	2.5	2.6	2.7	2.8	3.0	3.0	2.6	2.4	24	
28	3.5	S	3.2	3.3	3.8	3.6	2.8	2.9	2.8	2.8	2.9	2.9	2.8	3.3	3.1	3.2	3.2	3.3	3.1	3.6	5.9	7.2	6.7	6.1	7.2	3.7	24	
29	S	6.5	6.8	6.7	5.3	5.5	5.1	5.0	5.3	5.2	4.8	4.3	4.3	4.3	4.3	4.2	4.2	4.4	4.8	5.2	5.3	5.2	5.0	4.2	S	6.8	5.1	24
30	4.3	4.5	4.2	4.9	4.8	3.2	2.3	2.6	2.6	2.6	2.4	2.4	2.5	2.1	2.1	2.2	2.5	2.3	2.3	2.3	2.3	2.1	2.3	S	2.3	4.9	2.9	24
31	2.2	2.2	2.2	2.2	2.3	2.3	2.5	2.5	2.5	2.6	2.2	2.8	2.4	2.4	2.7	2.4	2.1	2.3	4.5	5.7	3.9	S	2.3	3.3	5.7	2.7	24	
HOURLY MAX	6.6	6.6	7.4	7.1	7.2	8.5	8.1	8.9	8.6	7.9	7.0	7.6	8.8	8.8	8.0	7.1	9.4	11.2	6.8	6.6	7.6	9.3	8.5	7.2				
HOURLY AVG	3.3	3.3	3.4	3.5	3.5	3.6	3.3	3.3	3.4	3.3	3.3	3.1	3.1	3.0	2.9	3.1	3.3	3.4	3.3	3.2	3.2	3.2	3.3	3.2	3.2			

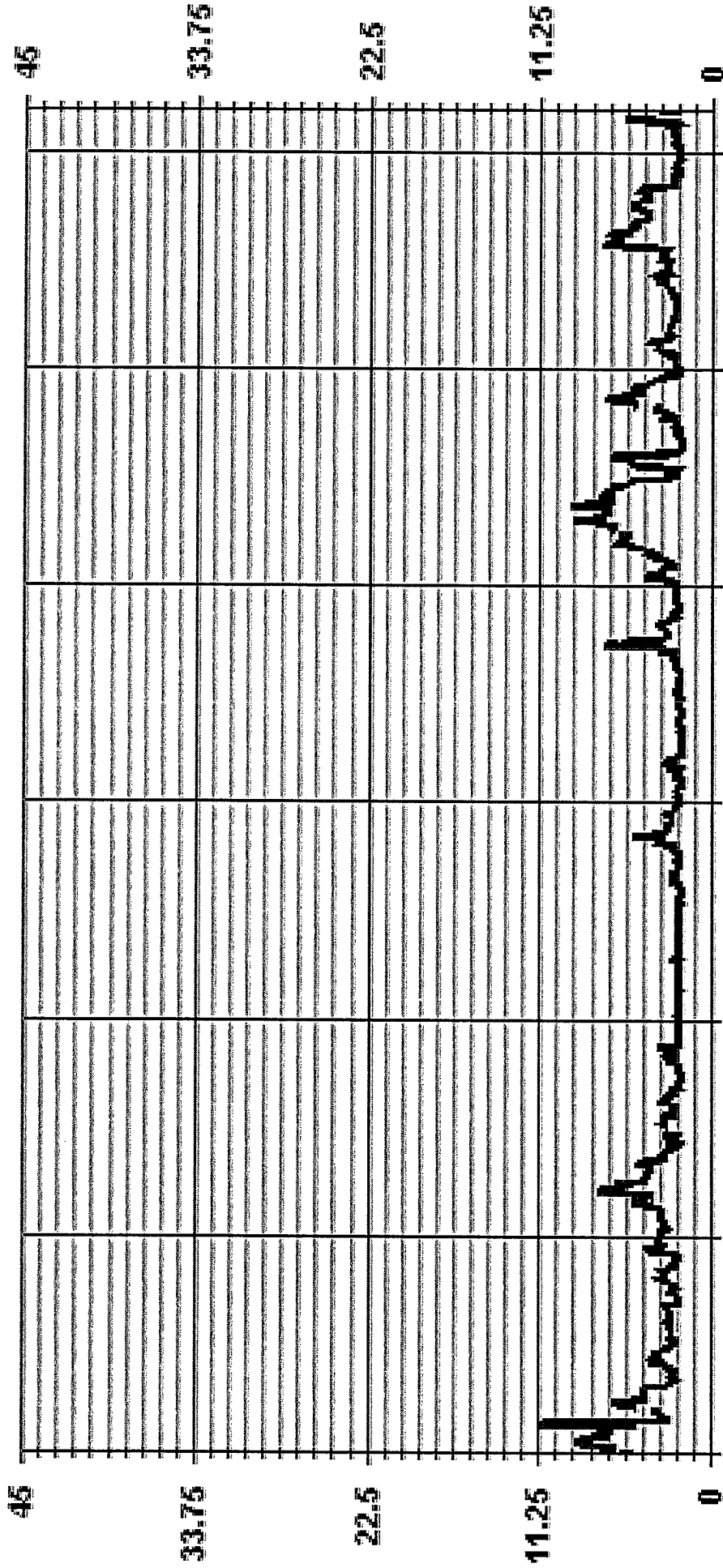
STATUS FLAG CODES

C	-CALIBRATION
Y	-MAINTENANCE
S	-DAILY ZERO/SPAN CHECK
P	-POWER FAILURE
G	-OUT FOR REPAIR
Q	-QUALITY ASSURANCE
R	-RECOVERY
X	-MACHINE/MAFUNCTION
O	-OPERATOR ERROR
K	-COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	705
MAXIMUM INSTANTANEOUS VALUE:	11.2 PPM @ HOUR(S) 17 ON DAY(S) 1
12S CALIBRATION TIME:	35 HRS
MONTHLY CALIBRATION TIME:	4 HRS
STANDARD DEVIATION:	1.49
OPERATIONAL TIME:	744 HRS
VAR- VARIOUS	

01 Hour Averages



— LICA35 THC55MAX PPM

LICA35
 THC55 / WDR Joint Frequency Distribution (Percent)
 December 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA35
 Parameter : THC55
 Units : PPM

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3.0	1.13	.70	.42	1.13	5.94	14.87	6.09	1.41	.56	.99	1.84	7.22	9.91	6.09	6.37	2.12	66.85
< 10.0	.84	.28	.42	1.41	9.63	7.36	1.98	1.41	.84	.56	.56	2.26	1.13	2.69	.84	.84	33.14
< 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.98	.99	.84	2.54	15.58	22.23	8.07	2.83	1.41	1.55	2.40	9.49	11.04	8.78	7.22	2.97	

Calm : .00 %

Total # Operational Hours : 706

Distribution By Samples





Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3.0	8	5	3	8	42	105	43	10	4	7	13	51	70	43	45	15	472
< 10.0	6	2	3	10	68	52	14	10	6	4	4	16	8	19	6	6	234
< 50.0																	
>= 50.0																	
Totals	14	7	6	18	110	157	57	20	10	11	17	67	78	62	51	21	

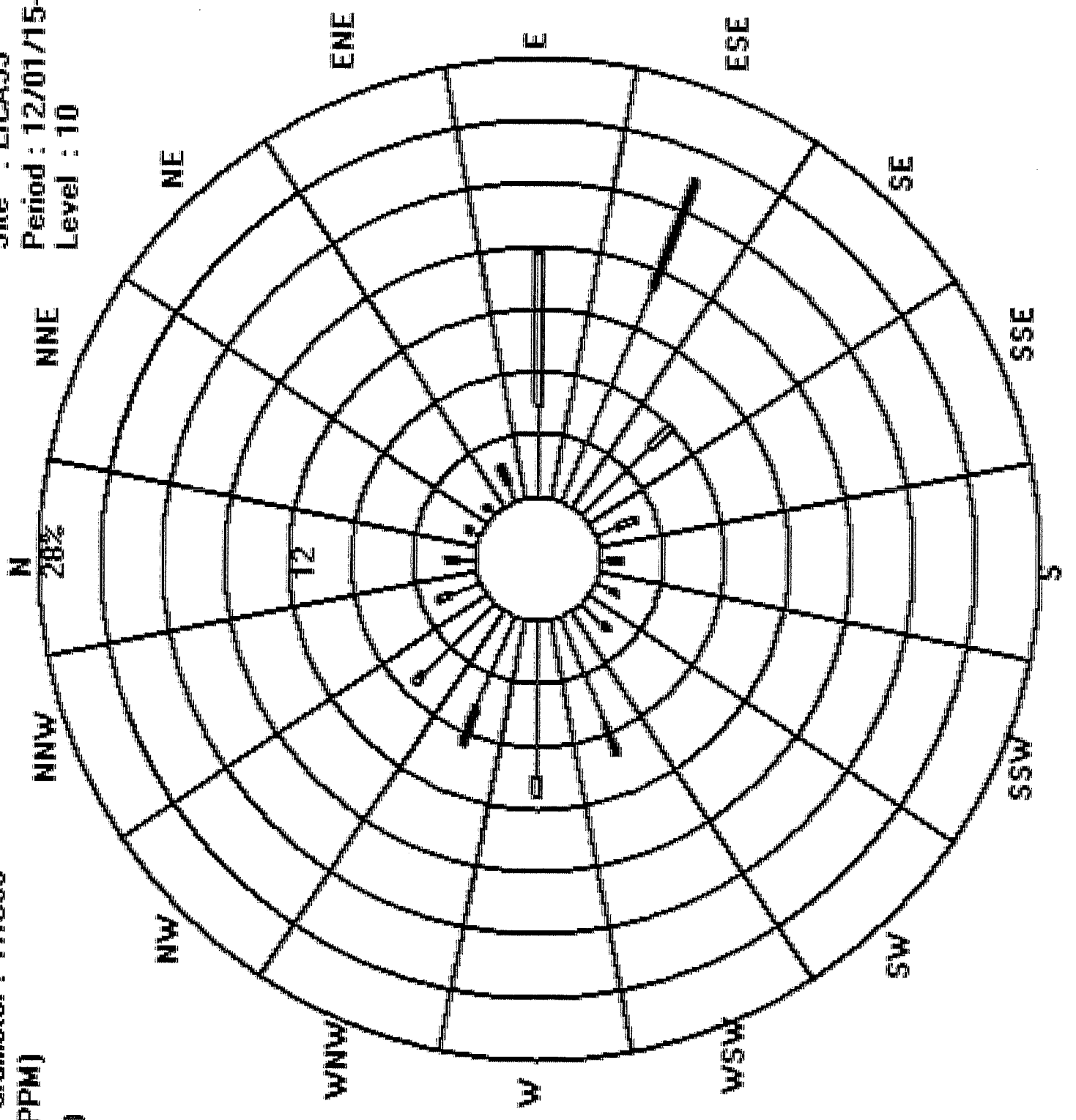
Calm : .00 %

Total # Operational Hours : 706

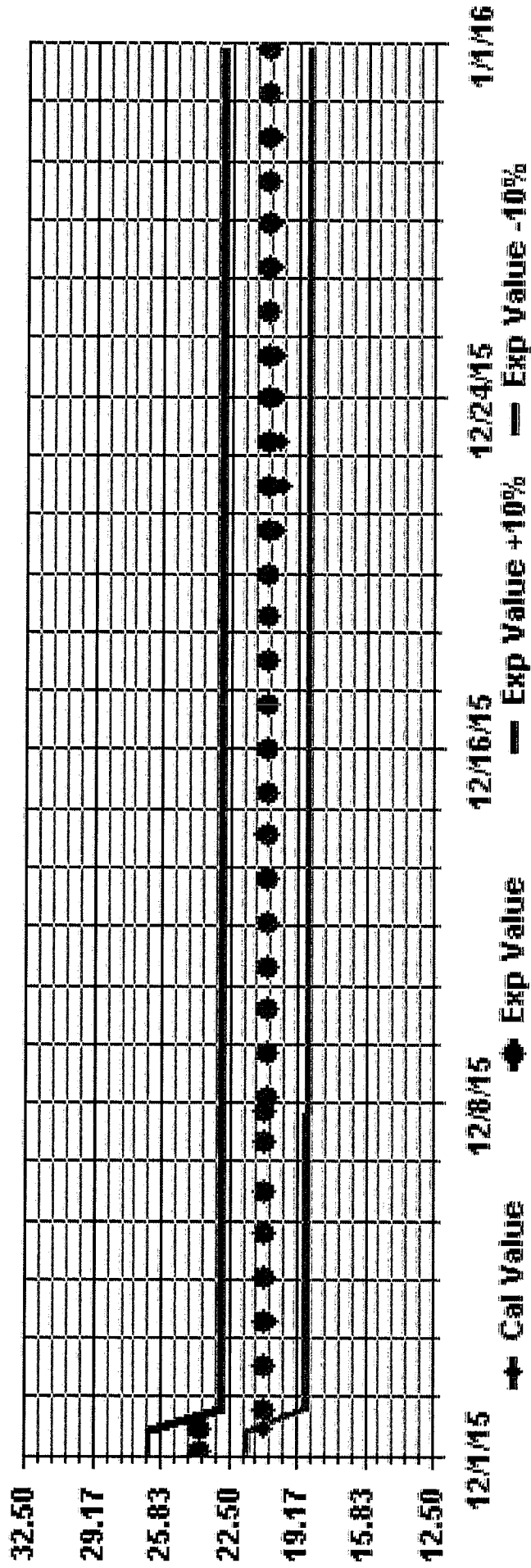
Site : LICA35
 Period : 12/01/15-12/31/15
 Level : 10

Logger : 35 Parameter : THC55
 Class Limits (PPM)

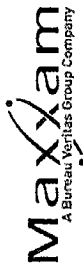
-  >= 50.0
-  < 50.0
-  < 10.0
-  < 3.0



Calibration Graph for Site: LICA35 Parameter: THC55 Sequence: THC55 Phase: SPAN



METHANE



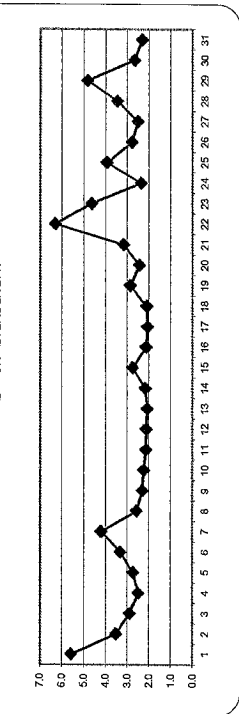
METHANE (CH4) hourly averages in ppm

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	24:00			
HOUR END	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	1:00			
DAY																									DAILY MAX	24-HOUR AVG		
1	4.9	5.3	\$	5.9	6.7	7.4	7.2	8.2	7.9	7.0	6.6	5.9	\$	5	4.9	6.0	9.0	3.2	2.5	2.7	2.9	3.0	3.3	9.0	5.6	24		
2	3.5	\$	4.4	5.1	5.6	4.5	4.0	4.1	4.1	4.1	4.1	4.3	4.2	3.5	2.8	2.4	2.3	2.3	2.2	2.2	2.6	2.3	2.3	2.6	5.7	3.5	24	
3	\$	2.9	2.9	2.9	3.2	3.5	3.9	3.7	3.5	3.3	3.0	2.8	2.7	2.4	2.3	2.4	2.4	2.6	2.7	2.4	2.5	2.6	2.7	\$	3.9	2.9	24	
4	2.7	2.9	2.9	2.8	2.7	2.6	2.7	2.7	2.7	2.7	2.6	2.1	2.0	2.0	2.1	2.2	2.2	2.6	2.6	2.6	2.3	2.5	\$	2.6	2.9	2.5	24	
5	3.1	3.2	3.1	3.0	2.3	3.0	2.6	2.5	2.3	2.3	2.2	2.2	2.2	2.1	2.2	2.2	2.6	3.5	3.7	3.1	2.9	\$	3.4	3.7	2.7	24		
6	3.3	3.2	3.3	3.1	3.0	2.9	2.9	3.1	3.0	3.1	3.0	3.1	3.1	3.1	3.1	3.2	3.3	3.4	4.1	4.4	\$	4.2	4.0	3.7	4.4	3.3	24	
7	4.3	5.4	6.6	5.7	5.8	5.7	4.5	4.4	4.2	4.1	4.0	3.9	3.7	3.5	3.9	2.8	2.9	3.0	2.7	2.5	\$	2.5	6.6	4.2	24	24		
8	2.5	2.3	2.2	2.2	2.2	2.6	2.3	2.4	2.3	2.3	2.6	3.0	C	C	3.0	3.0	2.8	2.9	3.0	2.7	2.5	\$	2.4	2.5	3.0	2.6	24	
9	2.5	2.5	2.5	3.0	3.0	2.7	2.7	2.5	2.3	2.4	2.2	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.1	\$	2.1	2.1	2.0	3.0	2.6	24	
10	2.1	2.5	2.3	2.5	2.2	2.4	2.2	2.2	2.3	2.3	2.5	2.4	2.2	2.1	2.1	2.2	2.2	2.2	2.2	\$	2.1	2.1	2.1	2.1	2.2	2.2	24	
11	2.1	2.2	2.2	2.3	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	\$	2.1	2.1	2.1	2.1	2.1	2.1	24	
12	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	\$	2.2	2.2	2.2	2.1	2.1	2.1	24	
13	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	\$	2.1	2.1	2.1	2.1	2.1	2.1	24
14	2.1	2.0	2.0	2.1	2.1	2.3	2.3	2.3	2.3	2.3	2.5	2.3	2.2	2.1	2.0	\$	2.1	2.2	2.2	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	24
15	2.6	2.3	2.5	2.8	2.9	3.1	4.2	3.7	3.1	3.0	2.9	2.8	2.8	2.5	\$	2.5	2.5	2.5	2.8	2.6	2.3	2.3	2.3	2.2	4.2	2.7	24	
16	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.9	\$	1.9	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.7	2.7	2.1	24	
17	2.7	2.7	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	\$	1.9	2.0	2.0	2.1	2.0	2.0	1.9	2.0	2.1	2.0	2.1	2.0	2.1	24	
18	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	\$	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	24	
19	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.5	\$	2.4	3.0	2.7	4.1	4.7	5.6	4.4	3.1	3.0	2.5	2.4	2.8	5.6	2.9	24	
20	2.9	2.9	3.2	3.4	3.1	2.7	2.6	2.4	2.5	\$	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	24
21	2.3	2.2	2.3	2.4	2.7	3.4	3.8	3.4	\$	3.0	2.9	2.5	2.3	2.5	2.6	2.8	3.1	3.5	3.9	3.9	4.1	4.2	4.6	4.7	4.7	3.2	24	
22	5.4	5.0	5.2	5.6	5.2	4.9	5.6	\$	6.0	6.1	5.7	6.6	8.2	7.8	7.2	6.8	6.0	5.8	6.4	6.1	6.5	8.7	7.7	6.5	8.7	6.3	24	
23	6.2	6.1	6.4	6.7	6.5	6.6	\$	6.1	5.8	5.1	4.9	4.1	2.7	2.5	2.6	2.3	2.4	2.3	2.6	4.2	4.8	4.7	5.2	5.8	6.7	4.6	24	
24	4.2	3.3	2.9	2.1	2.0	\$	2.0	2.0	2.0	2.0	2.1	2.1	1.9	2.1	2.1	2.2	2.1	2.4	2.2	2.2	2.4	3.0	2.5	2.5	4.2	2.4	24	
25	2.7	3.0	3.5	3.5	\$	4.3	4.4	5.5	5.7	5.7	5.1	4.5	4.9	4.8	4.3	4.1	4.1	3.9	3.3	2.7	2.3	2.1	2.1	3.9	2.4	24		
26	2.2	2.2	2.2	\$	2.4	2.3	2.3	2.5	2.7	2.5	3.3	3.5	3.4	3.4	3.9	3.4	3.9	3.4	2.9	2.7	2.8	2.8	2.7	2.7	3.9	2.8	24	
27	2.8	2.8	\$	2.7	2.6	2.6	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.6	2.7	2.7	3.0	2.5	24		
28	3.3	\$	3.0	3.1	3.5	3.0	2.7	2.7	2.8	2.8	2.7	2.7	2.7	3.0	3.0	3.1	3.1	3.0	3.0	3.4	4.8	6.5	6.2	5.7	3.5	24		
29	\$	5.9	6.5	5.7	5.2	5.3	5.0	4.8	5.1	4.9	4.5	4.2	4.1	4.2	4.1	4.1	4.3	4.6	4.8	5.1	5.0	4.6	4.1	\$	6.5	4.8	24	
30	4.1	4.2	4.1	4.3	4.2	2.6	2.2	2.3	2.4	2.4	2.3	2.3	2.1	2.1	2.1	2.1	2.3	2.3	2.2	2.2	2.2	2.1	2.1	\$	2.2	4.3	24	
31	2.1	2.1	2.2	2.1	2.2	2.1	2.4	2.5	2.4	2.3	2.1	2.3	2.2	2.2	2.4	2.1	2.0	2.1	2.0	2.1	2.0	2.1	2.1	\$	2.2	4.3	24	
HOURLY MAX	6.2	6.1	6.6	6.7	7.4	7.2	8.2	7.9	7.0	6.6	6.6	8.2	7.8	7.2	6.8	6.0	9.0	6.4	6.1	6.5	8.7	7.7	6.5	8.7	6.5	24		
HOURLY AVG	3.0	3.1	3.1	3.3	3.2	3.3	3.1	3.1	3.2	3.1	3.0	2.9	2.9	2.8	2.7	2.9	2.9	3.1	2.9	2.9	2.9	2.9	3.0	3.0	3.0	2.9	24	

STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
Y	MAINTENANCE	P	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT OF REPAIR	K	COLLECTION ERROR

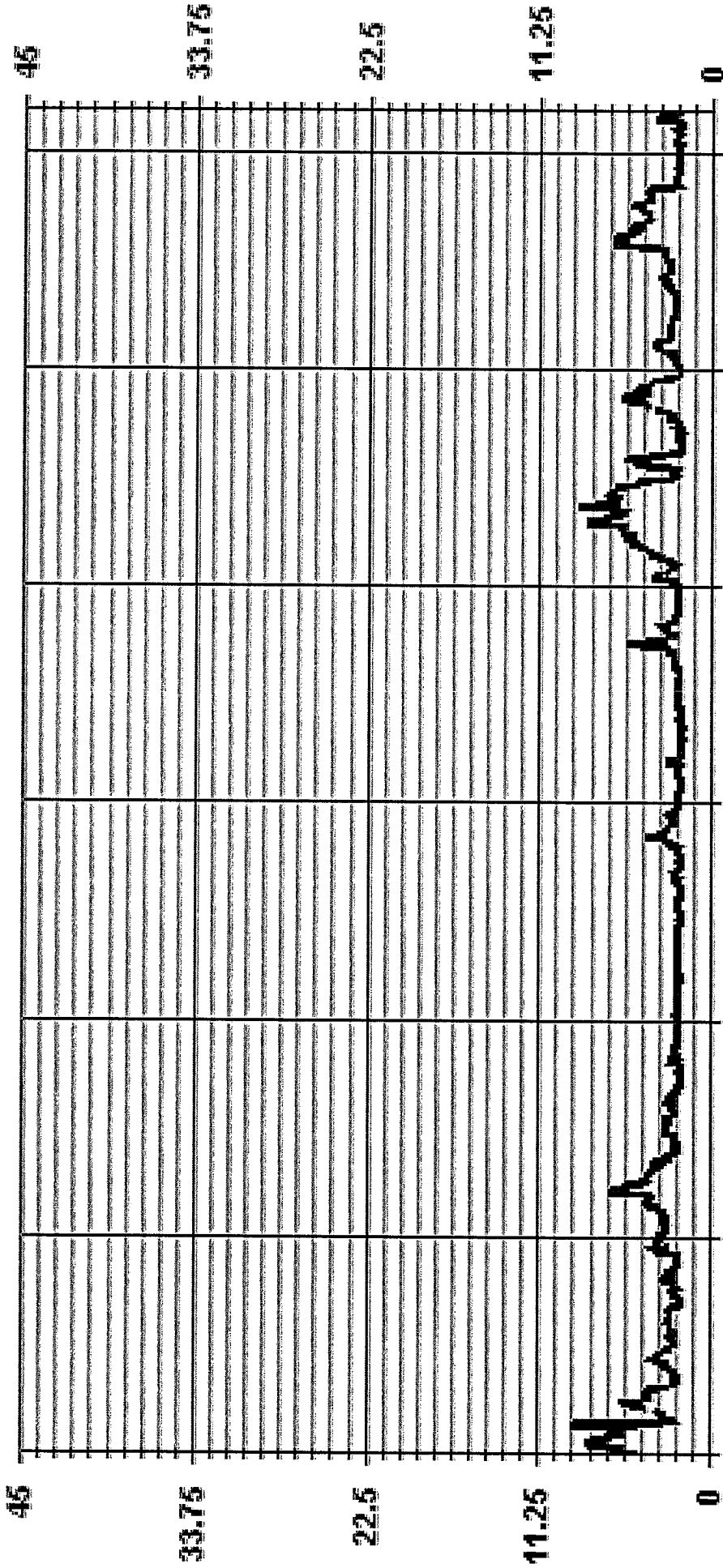
24 HOUR AVERAGES FOR DECEMBER 2015



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	706					
MAXIMUM 1-HR AVERAGE:	9.0	PPM	@ HOUR(S)	17	ON DAY(S)	
MAXIMUM 24-HR AVERAGE:	6.3	PPM			VAR-VARIOUS	
ISZ CALIBRATION TIME:	35	HRS	OPERATIONAL TIME:		744	HRS
MONTHLY CALIBRATION TIME:	3	HRS	AMTD OPERATION UPTIME:		100.0	%
STANDARD DEVIATION:	1.28		MONTHLY AVERAGE:		3.0	PPM

01 Hour Averages



— LICA35 METHANE PPM



METHANE MAX instantaneous maximum in ppm

MST

DAY	HOUR START																								DAILY MAX	24-HOUR AVG	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00			0:00
1	5.2	5.7	\$	6.2	7.1	8.3	7.9	8.7	8.3	7.6	6.8	7.0	6.5	\$	4.9	9.0	10.8	5.5	2.6	3.0	3.0	3.0	3.2	3.4	10.8	6.2	24
2	3.7	\$	5.0	5.5	6.0	6.3	5.2	4.3	4.2	4.2	4.2	4.4	4.3	4.1	3.0	2.7	2.5	2.6	2.3	2.4	2.7	2.6	2.5	2.7	6.3	3.8	24
3	\$	3.0	3.1	3.5	3.7	4.1	4.0	3.6	3.7	3.5	3.3	2.9	2.8	2.6	2.4	2.5	2.7	2.7	2.6	2.6	2.6	2.6	2.8	\$	4.1	3.1	24
4	2.8	3.1	3.0	2.9	2.8	2.7	2.7	2.8	2.8	2.9	3.0	2.1	2.1	2.1	2.1	2.2	2.4	2.8	2.8	2.7	2.4	2.6	\$	2.9	3.1	2.6	24
5	3.2	3.5	3.2	3.2	3.1	3.3	2.8	2.6	2.7	2.5	2.4	2.3	2.2	2.4	3.0	4.0	4.1	3.4	3.1	\$	3.6	3.5	4.1	3.0	2.4	2.4	24
6	3.5	3.3	3.4	3.2	2.9	3.1	3.1	3.2	3.1	3.2	3.1	3.2	3.2	3.2	3.3	3.4	3.7	4.3	4.9	\$	5.0	4.3	3.8	5.0	3.5	2.4	24
7	4.8	5.7	7.4	6.3	5.9	6.0	5.3	4.3	4.5	4.4	4.2	4.2	4.2	3.9	4.0	3.9	4.7	4.7	3.3	4.4	3.2	\$	3.1	7.4	4.6	24	
8	2.8	2.7	2.3	2.2	3.0	2.8	2.7	2.5	2.4	2.9	C	C	C	C	3.1	3.3	3.0	3.0	3.1	3.1	2.5	\$	2.5	2.6	3.3	2.8	24
9	2.6	2.6	2.8	3.2	3.3	2.9	2.9	2.7	2.4	2.8	2.5	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.2	\$	2.2	2.2	3.3	2.4	24
10	2.4	2.8	2.7	2.9	2.4	2.5	2.5	2.5	3.0	3.2	3.5	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	\$	2.2	2.1	2.2	2.2	3.5	2.5	24
11	2.2	2.3	2.3	2.4	2.4	2.3	2.2	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	\$	2.2	2.1	2.1	2.2	3.5	2.5	24
12	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	\$	2.2	2.2	2.2	2.2	3.5	2.2	24
13	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	\$	2.1	2.1	2.1	2.1	2.2	2.1	24
14	2.2	2.0	2.1	2.1	2.2	2.6	2.6	2.6	2.1	2.7	2.4	2.8	2.4	2.3	2.1	2.1	2.1	2.1	2.1	\$	2.2	2.3	2.3	2.2	2.2	2.1	24
15	2.8	2.4	3.6	3.4	3.0	3.4	5.0	4.0	3.5	3.1	3.0	2.9	3.0	2.7	\$	2.5	2.6	2.7	2.9	2.8	2.6	2.4	2.4	2.4	5.0	3.0	24
16	2.2	2.2	2.2	2.2	2.2	2.4	2.3	2.4	2.4	2.4	2.1	2.1	2.0	2.0	\$	2.0	2.4	2.3	2.3	2.2	2.2	2.7	2.7	2.3	3.1	2.3	24
17	3.0	2.8	2.6	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	2.1	2.1	2.0	2.0	2.1	2.2	2.2	3.0	2.1	24
18	2.2	2.1	2.0	2.0	2.0	2.1	2.1	2.3	2.2	2.2	2.1	\$	2.1	2.1	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.3	2.2	24
19	2.2	2.2	2.2	2.3	2.4	2.4	2.3	2.4	2.4	2.6	\$	2.4	2.4	3.5	3.0	6.0	7.0	6.1	5.8	3.4	3.2	2.8	2.8	2.9	7.0	3.2	24
20	3.0	3.2	3.3	3.4	3.4	2.9	2.8	2.4	2.5	\$	2.3	2.2	2.2	2.1	2.1	2.1	2.3	2.3	2.3	\$	2.3	2.3	2.3	2.3	3.4	2.5	24
21	2.3	2.3	2.3	2.5	3.1	3.6	4.4	3.8	\$	3.2	3.1	2.6	2.4	2.6	2.7	3.0	3.3	3.8	4.0	4.0	4.4	4.4	5.1	5.1	3.4	2.4	24
22	6.1	5.9	5.7	5.7	5.6	5.1	5.8	\$	6.5	6.5	6.0	7.4	8.7	8.6	7.9	6.9	6.9	6.6	6.4	7.5	9.1	8.3	7.1	9.1	6.8	2.4	24
23	6.5	6.4	7.0	7.0	6.7	6.9	\$	6.3	6.0	5.5	5.2	5.2	3.1	2.5	2.8	2.5	2.4	3.1	4.9	5.0	5.0	5.0	5.3	6.3	7.0	5.0	24
24	6.2	3.4	3.5	2.3	2.1	\$	2.0	2.0	2.0	2.0	2.2	2.3	2.4	2.0	2.2	2.3	2.2	2.5	2.3	2.3	2.5	3.4	2.8	2.6	6.2	2.6	24
25	2.9	3.1	3.9	3.7	\$	5.2	5.0	6.6	7.0	6.0	5.8	4.4	4.7	5.1	5.1	4.7	4.3	4.1	4.0	3.6	3.2	2.5	2.2	2.2	7.0	4.3	24
26	2.2	2.3	2.3	\$	2.5	2.4	2.4	2.6	2.9	2.7	2.8	3.4	3.6	3.5	3.7	4.0	3.8	3.1	2.9	2.7	2.9	2.9	2.8	2.8	4.0	2.9	24
27	2.8	2.8	\$	2.7	2.6	2.7	2.6	2.6	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.5	2.6	2.7	2.8	3.0	3.0	2.6	24
28	3.5	\$	3.2	3.3	3.8	3.6	2.8	2.9	2.8	2.8	2.9	2.9	2.8	3.3	3.1	3.2	3.2	3.1	3.1	3.6	5.8	7.0	6.5	5.9	7.0	3.7	24
29	\$	6.3	6.6	6.6	5.3	5.4	5.1	5.0	5.2	5.1	4.7	4.3	4.2	4.2	4.2	4.2	4.4	4.8	5.1	5.3	5.1	4.9	4.2	\$	6.6	5.0	24
30	4.2	4.3	4.1	4.8	4.7	3.2	2.3	2.6	2.6	2.5	2.3	2.4	2.5	2.1	2.1	2.2	2.5	2.3	2.3	2.3	2.1	2.3	2.1	2.3	4.8	2.8	24
31	2.2	2.2	2.2	2.2	2.3	2.3	2.5	2.5	2.5	2.6	2.2	2.8	2.4	2.4	2.7	2.4	2.1	2.3	4.5	5.6	3.8	\$	2.3	3.3	5.6	2.7	24
HOURLY MAX	6.5	6.4	7.4	7.0	7.1	8.3	7.9	8.7	8.3	7.6	6.8	7.4	8.7	8.6	7.9	6.9	9.0	10.8	6.6	6.4	7.5	9.1	8.3	7.1	9.1	6.8	24
HOURLY AVG	3.2	3.3	3.4	3.5	3.4	3.6	3.3	3.3	3.4	3.3	3.2	3.1	3.1	2.9	2.9	3.0	3.3	3.3	3.2	3.2	3.1	3.2	3.1	3.2	3.2	3.1	24

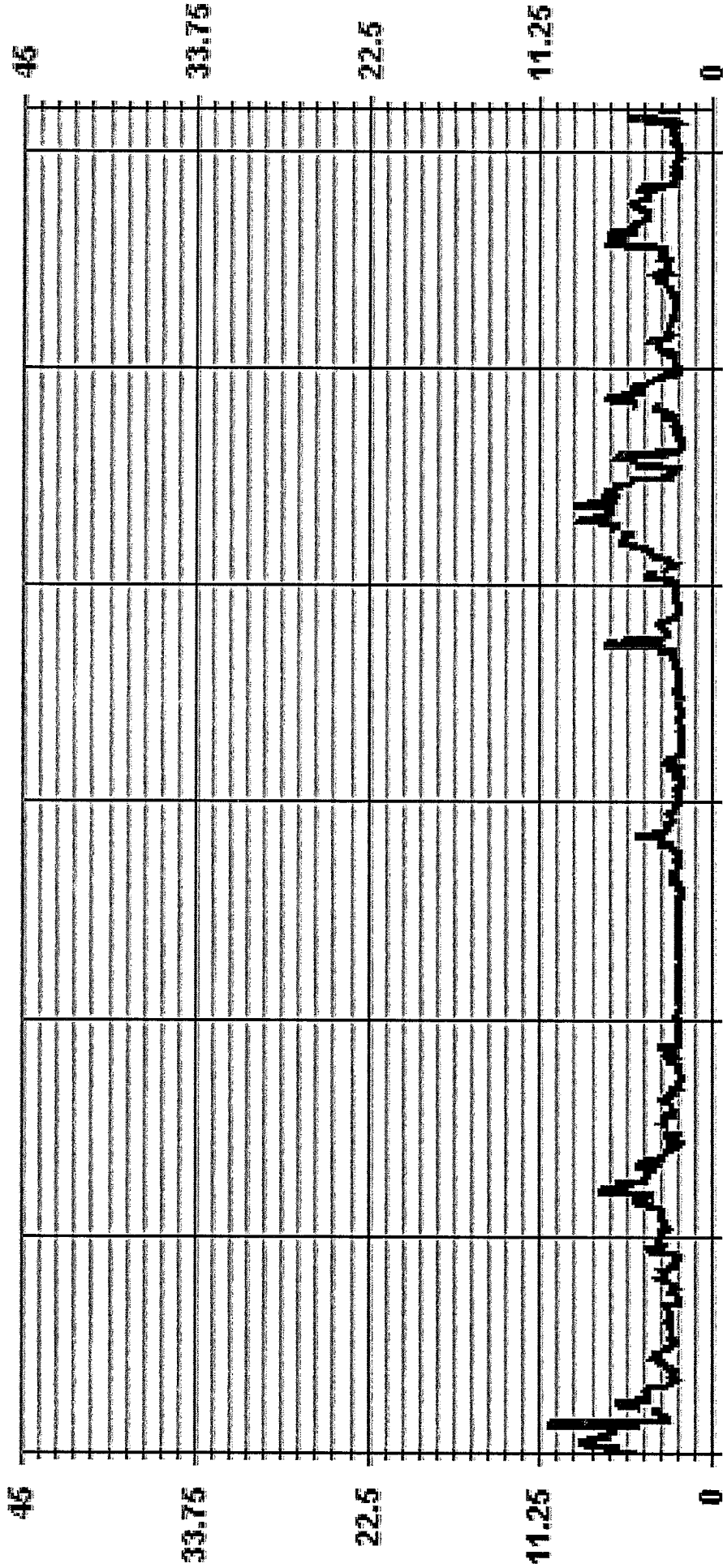
STATUS FLAG CODES

C	CALIBRATION
Q	QUALITY ASSURANCE
V	MAINTENANCE
R	RECOVERY
S	DAILY ZERO/SPAN CHECK
P	POWER FAILURE
O	OPERATOR ERROR
K	COLLECTION ERROR
G	OUT OF REPAIR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	705
MAXIMUM INSTANTANEOUS VALUE:	10.8
PPM @ HOUR(S)	17
ON DAY(S)	1
VAR-VARIOUS	
OPERATIONAL TIME:	744 HRS
125 CALIBRATION TIME:	35 HRS
MONTHLY CALIBRATION TIME:	4 HRS
STANDARD DEVIATION:	1.45

01 Hour Averages



— LICA35 MATHMAX PPM

LICA35
 METHANE / WDR Joint Frequency Distribution (Percent)
 December 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA35
 Parameter : METHANE
 Units : PPM

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3.0	1.13	.70	.42	1.13	5.94	14.87	6.09	1.41	.56	.99	1.84	7.36	9.91	6.09	6.37	2.12	66.99
< 10.0	.84	.28	.42	1.41	9.63	7.36	1.98	1.41	.84	.56	.56	2.12	1.13	2.69	.84	.84	33.00
< 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.98	.99	.84	2.54	15.58	22.23	8.07	2.83	1.41	1.55	2.40	9.49	11.04	8.78	7.22	2.97	

Calm : .00 %

Total # Operational Hours : 706

Distribution By Samples

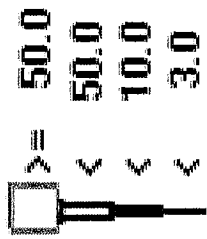
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3.0	8	5	3	8	42	105	43	10	4	7	13	52	70	43	45	15	473
< 10.0	6	2	3	10	68	52	14	10	6	4	4	15	8	19	6	6	233
< 50.0																	
>= 50.0																	
Totals	14	7	6	18	110	157	57	20	10	11	17	67	78	62	51	21	

Calm : .00 %

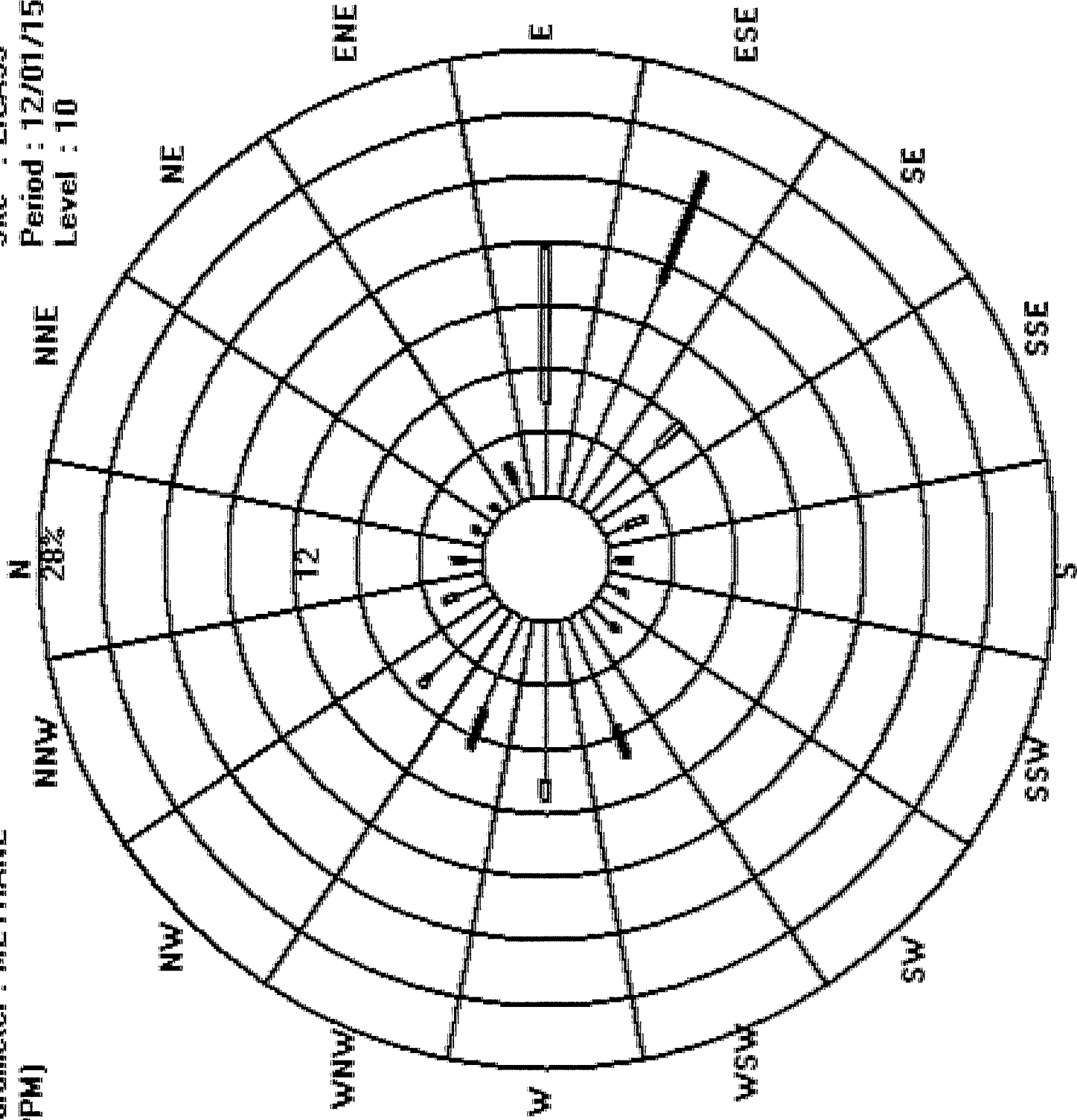
Total # Operational Hours : 706

Logger : 35 Parameter : METHANE

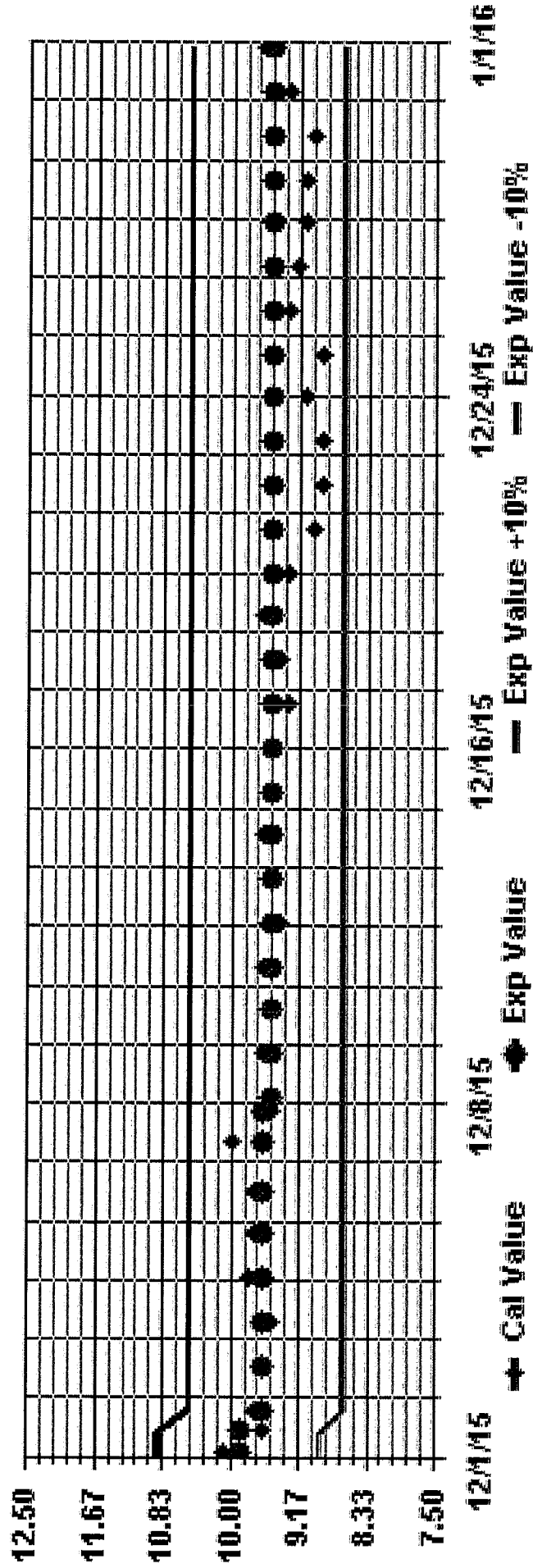
Class Limits (PPM)



Site : LICA35
Period : 12/01/15-12/31/15
Level : 10



Calibration Graph for Site: LICA35 Parameter: METHANE Sequence: THC55 Phase: SPAN

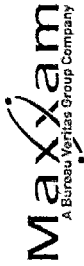


NON-METHANE HYDROCARBON

01 Hour Averages

Start Time	End Time	Start Time	End Time	Start Time	End Time	Start Time	End Time	Start Time	End Time	Start Time	End Time
12/01/15 00:00	12/06/15 00:00	12/01/15 00:00	12/11/15 00:00	12/01/15 00:00	12/16/15 00:00	12/01/15 00:00	12/21/15 00:00	12/01/15 00:00	12/26/15 00:00	12/01/15 00:00	12/31/15 00:00
45	45	45	45	45	45	45	45	45	45	45	45
33.75	33.75	33.75	33.75	33.75	33.75	33.75	33.75	33.75	33.75	33.75	33.75
22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
11.25	11.25	11.25	11.25	11.25	11.25	11.25	11.25	11.25	11.25	11.25	11.25
0	0	0	0	0	0	0	0	0	0	0	0

— LICA35 NMHC PPM



NON-METHANE HYDROCARBONS MAX instantaneous maximum in ppm

DAY	HOUR	MST																								DAILY MAX	24-HOUR AVG
		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		
1		0.24	0.26		0.28	0.33	0.28	0.25	0.24	0.22		0.21	0.34	0.52	0.22	0.19	0.21	0.19	0.20	0.18	0.52	0.27	24				
2		0.21	\$	0.23	0.28	0.15	0.14	0.15	0.18	0.17	0.18	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	24				
3		\$	0.00	0.00	0.26	0.09	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	\$	0.26	0.03	24				
4		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24				
5		0.00	0.00	0.00	0.09	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24				
6		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24				
7		0.00	0.20	0.21	0.17	0.26	0.19	0.02	0.00	0.00	0.00	0.13	0.10	0.14	0.04	0.13	0.00	0.10	\$	0.09	0.00	0.01	24				
8		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	24				
9		0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	24				
10		0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24				
11		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24				
12		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24				
13		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.02	24				
14		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24				
15		0.00	0.00	0.11	0.15	0.14	0.15	0.24	0.14	0.12	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24				
16		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24				
17		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24				
18		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24				
19		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24				
20		0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24				
21		0.05	0.00	0.00	0.05	0.10	0.14	0.14	0.13	\$	0.08	0.11	0.00	0.08	0.10	0.14	0.11	0.15	0.18	0.14	0.17	0.19	0.25	24			
22		0.25	0.24	0.21	0.18	0.16	0.19	0.19	\$	0.22	0.26	0.20	0.27	0.30	0.30	0.23	0.26	0.22	0.26	0.26	0.26	0.33	0.31	0.25	24		
23		0.24	0.26	0.20	0.22	0.20	0.26	\$	0.23	0.16	0.13	0.06	0.18	0.00	0.11	0.00	0.07	0.11	0.14	0.22	0.25	0.29	0.25	0.17	24		
24		0.23	0.09	0.00	0.00	0.00	\$	0.00	0.08	0.09	0.08	0.08	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	24		
25		0.00	0.00	0.14	0.00	\$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	24		
26		0.00	0.00	0.00	\$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	24		
27		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	24		
28		0.00	\$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	24		
29		\$	0.24	0.19	0.17	0.10	0.14	0.08	0.10	0.14	0.13	0.06	0.06	0.14	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	24		
30		0.17	0.19	0.13	0.16	0.15	0.00	0.06	0.09	0.10	0.12	0.10	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	24		
31		0.25	0.26	0.23	0.28	0.33	0.32	0.28	0.31	0.33	0.28	0.55	0.27	0.30	0.30	0.23	0.26	0.34	0.52	0.26	0.26	0.33	0.31	0.25	24		
HOURLY MAX		0.25	0.26	0.23	0.28	0.33	0.32	0.28	0.31	0.33	0.28	0.55	0.27	0.30	0.30	0.23	0.26	0.34	0.52	0.26	0.26	0.33	0.31	0.25	24		
HOURLY AVG		0.05	0.05	0.05	0.07	0.07	0.06	0.05	0.05	0.05	0.05	0.07	0.04	0.04	0.04	0.03	0.04	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.04		

STATUS FLAG CODES

C	CALIBRATION	QUALITY ASSURANCE	
O	OPERATION	RECOVERY	
M	MAINTENANCE	R	MACHINE/VALVE/INJECTION
D	DAILY ZERO/SPAN CHECK	Y	OPERATOR ERROR
P	POWER/FLOURE	O	COLLECTION ERROR
G	-OUT FOR REPAIR	K	

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	237
MAXIMUM INSTANTANEOUS VALUE:	0.55 PPM @ HOUR(S) 10 ON DAY(S) 12
12S CALIBRATION TIME:	35 HRS
MONTHLY CALIBRATION TIME:	4 HRS
STANDARD DEVIATION:	0.09
OPERATIONAL TIME:	VAR-VARIOUS
	744 HRS

01 Hour Averages

45						45
33.75						33.75
22.5						22.5
11.25						11.25
0						0

12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA35 NMHC MAX PPM

LICA35
 NMHC / WDR Joint Frequency Distribution (Percent)
 December 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA35
 Parameter : NMHC
 Units : PPM

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																NNW Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< .2	1.98	.99	.84	2.54	15.58	22.23	7.93	2.83	1.41	1.55	2.40	9.49	11.04	8.64	7.22	2.97	99.71
< .5	.00	.00	.00	.00	.00	.00	.14	.00	.00	.00	.00	.00	.00	.14	.00	.00	.28
< 1.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 2.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 4.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 4.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.98	.99	.84	2.54	15.58	22.23	8.07	2.83	1.41	1.55	2.40	9.49	11.04	8.78	7.22	2.97	

Calm : .00 %

Total # Operational Hours : 706

Distribution By Samples

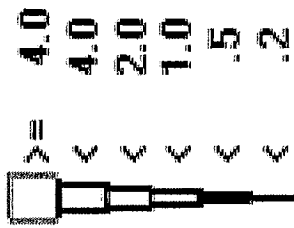
Limit	Direction																NNW Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< .2	14	7	6	18	110	157	56	20	10	11	17	67	78	61	51	21	704
< .5														1			2
< 1.0																	
< 2.0																	
< 4.0																	
>= 4.0																	
Totals	14	7	6	18	110	157	57	20	10	11	17	67	78	62	51	21	

Calm : .00 %

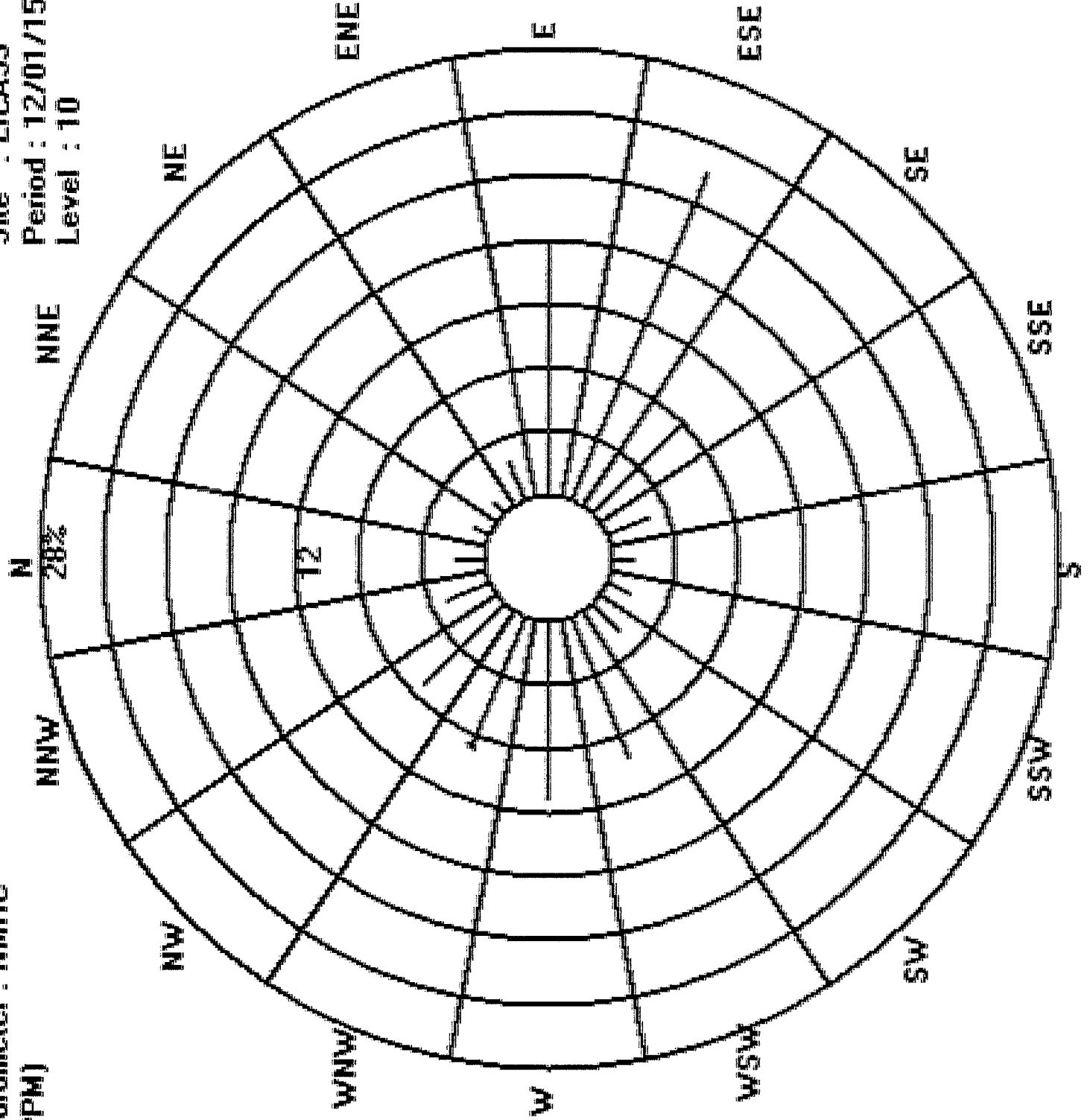
Total # Operational Hours : 706

Logger : 35 Parameter : NMHC

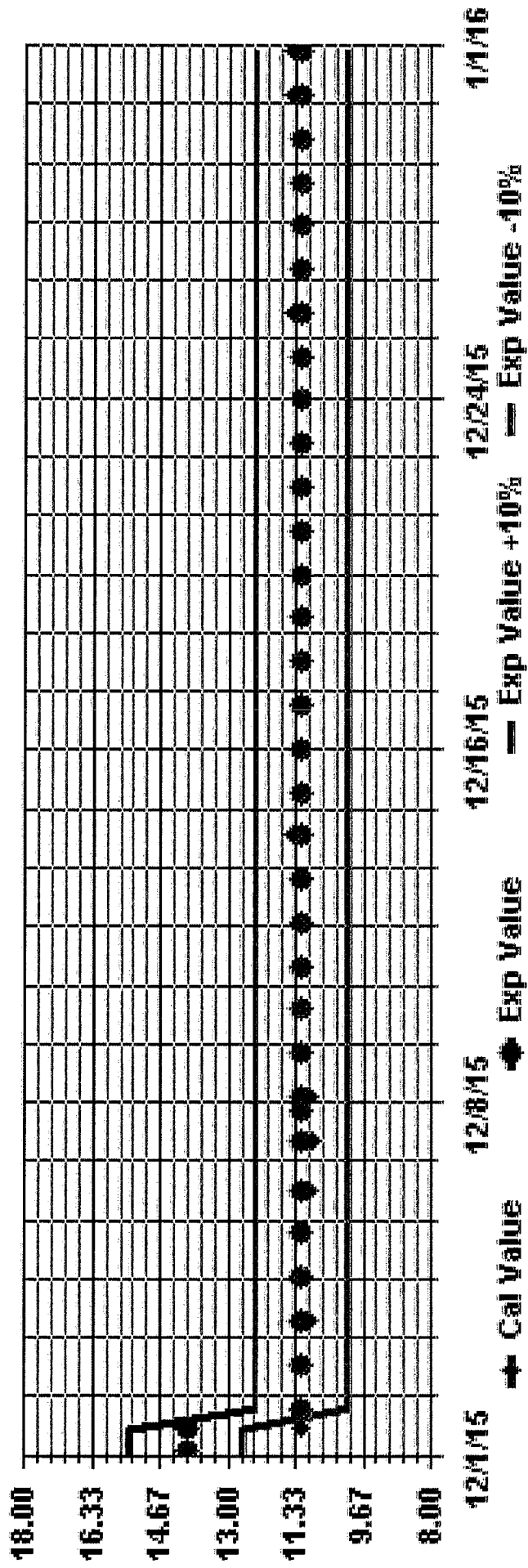
Class Limits (PPM)



Site : LICA35
Period : 12/01/15-12/31/15
Level : 10



Calibration Graph for Site: LICA35 Parameter: MMHC Sequence: THC55 Phase: SPAN



OXIDES OF NITROGEN

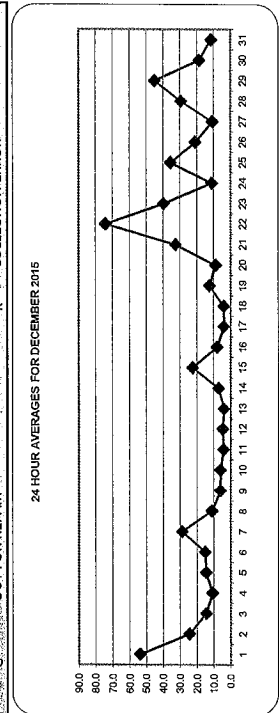


OXIDES OF NITROGEN (NOx) hourly averages in ppb

DAY	24-HOUR AVG.																								ROSS					
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		24:00				
1	40.3	45.5	\$	51.3	63.9	64.5	75.1	93.3	89.9	70.7	65.4	59.1	49.7	59.2	46.6	40.1	62.6	81.3	38.2	26.7	27.2	29.2	27.2	30.8	93.3	53.8	24			
2	30.8	\$	38.9	52.6	54.6	46.4	31.8	25.8	27.2	26.2	22.6	22.8	23.6	22.4	22.5	14.8	10.5	12.7	11.1	11.7	15.9	12.6	12.5	12.8	54.6	24.5	24			
3	\$	17.5	15.9	16.2	20.5	24.5	30.2	28.1	20.2	20.4	11.3	9.0	9.7	8.1	5.8	6.2	11.8	22.9	15.6	7.2	6.4	6.6	6.6	\$	30.2	14.6	24			
4	9.0	12.2	9.6	9.9	8.2	14.3	20.5	20.3	\$	17.0	4.6	2.4	1.9	2.1	5.2	16.3	20.5	10.1	10.1	7.6	13.9	\$	13.2	20.5	10.9	24				
5	20.5	22.9	19.2	18.1	9.5	19.1	12.4	11.0	10.1	9.2	8.2	7.5	7.8	6.8	6.8	8.2	25.9	22.1	25.7	23.6	11.9	\$	14.3	14.6	25.9	14.6	24			
6	11.9	9.6	9.3	7.1	7.0	6.6	7.3	8.9	7.8	10.1	13.4	12.7	11.9	12.7	13.8	17.2	23.6	25.3	33.2	40.3	\$	21.3	21.2	17.6	40.3	15.2	24			
7	31.3	40.4	42.4	40.0	45.3	48.5	28.2	23.1	21.9	20.2	16.9	16.5	C	C	C	C	C	C	C	C	C	C	C	23.9	24.7	\$	14.2	45.3	28.8	24
8	12.0	10.2	7.6	5.0	11.5	10.6	11.6	15.7	11.2	17.1	18.6	C	C	C	C	C	13.2	13.2	17.1	10.9	5.8	\$	5.4	5.5	18.6	11.2	24			
9	8.8	7.2	7.9	15.4	14.8	8.7	11.1	8.5	9.2	9.1	7.8	3.7	3.7	2.7	2.7	2.7	2.3	2.0	2.1	2.9	\$	3.3	3.6	2.7	15.4	6.2	24			
10	4.7	6.8	5.8	9.8	9.0	15.5	7.5	8.5	7.9	7.7	5.4	4.1	4.5	4.9	5.4	4.9	5.0	4.9	5.2	\$	3.9	3.1	4.1	3.5	15.5	6.2	24			
11	4.5	3.8	3.3	4.1	4.9	4.3	4.7	3.5	5.0	4.9	5.3	4.9	3.5	5.3	5.2	4.6	4.1	4.6	\$	4.2	3.7	4.1	3.4	5.3	4.3	4.3	24			
12	3.1	3.3	3.7	3.6	4.7	4.5	5.2	4.8	4.3	3.5	7.4	7.0	5.1	5.4	5.3	5.0	5.1	\$	5.6	6.0	4.6	4.2	5.5	4.8	7.4	4.9	24			
13	5.2	4.6	4.8	4.3	5.0	4.5	4.6	3.7	4.4	4.3	4.4	3.8	3.5	3.6	\$	5.0	3.7	3.7	3.9	3.6	2.9	2.9	5.2	4.1	24					
14	3.4	2.6	3.2	3.2	3.4	9.0	9.3	4.1	9.4	8.2	14.0	10.9	7.4	3.9	3.9	\$	6.8	7.8	12.3	6.3	6.7	8.4	8.4	14.3	14.3	7.3	24			
15	17.1	12.4	12.2	12.6	13.4	23.3	39.0	39.9	31.7	29.1	26.3	23.0	23.3	19.8	\$	25.3	28.9	23.0	28.8	32.4	19.3	14.1	13.8	10.5	39.9	22.6	24			
16	9.6	8.9	7.1	7.7	7.6	6.3	9.4	8.2	5.5	3.5	3.3	2.3	2.3	\$	3.1	5.3	8.7	10.8	13.0	9.4	11.5	8.6	13.8	22.0	8.2	24				
17	15.9	14.0	6.0	2.4	2.6	2.7	2.1	2.5	3.3	2.7	2.0	1.9	\$	2.2	2.2	2.0	4.0	4.4	2.5	2.0	3.6	4.8	3.4	4.7	15.9	4.1	24			
18	4.1	2.4	2.7	2.7	2.8	3.1	3.6	5.9	5.1	5.1	4.7	\$	4.0	4.4	4.5	5.4	6.5	5.4	5.1	3.6	3.3	3.8	3.4	6.5	4.1	24				
19	3.5	3.9	4.3	4.8	6.0	6.1	6.1	6.5	7.9	12.0	\$	8.7	9.9	17.6	14.9	17.2	25.2	31.4	30.8	18.8	15.6	9.4	8.1	20.9	31.4	12.6	24			
20	17.0	15.2	16.7	16.8	14.3	9.7	10.3	6.9	8.2	\$	6.1	6.8	6.3	5.7	5.6	7.5	8.9	8.2	6.6	7.7	5.3	5.4	5.5	7.6	17.0	9.1	24			
21	7.1	6.5	6.9	7.3	18.0	44.4	40.5	36.9	\$	25.3	20.2	15.0	15.7	18.3	22.8	28.7	45.0	57.8	60.2	72.8	53.2	49.7	51.2	48.5	72.8	32.7	24			
22	60.9	56.0	51.3	60.1	56.2	54.6	63.6	\$	73.4	84.7	85.5	82.9	108.8	101.3	79.5	80.8	74.3	68.7	85.8	82.7	74.3	76.8	75.5	66.7	108.8	74.1	24			
23	61.7	60.1	59.0	60.0	55.0	50.6	\$	43.4	39.9	36.1	28.2	22.2	13.5	12.6	14.1	11.4	14.3	15.3	21.9	41.7	54.1	55.0	76.9	66.1	76.9	39.7	24			
24	37.0	21.7	20.6	7.5	7.5	\$	6.0	5.1	4.8	4.2	3.9	4.0	4.0	4.3	3.5	7.6	8.8	8.5	14.8	9.2	7.9	10.3	18.5	21.9	21.1	11.2	24			
25	27.6	32.4	32.1	31.5	\$	12.3	15.4	16.9	22.9	25.1	19.6	20.1	31.3	36.3	33.7	33.7	48.5	32.2	23.2	21.1	16.7	14.0	11.3	11.2	10.8	20.8	24			
26	8.2	7.3	7.1	\$	9.6	9.2	10.9	12.1	10.8	8.8	7.4	7.2	6.2	7.1	7.9	9.9	8.1	7.9	9.9	9.5	10.7	24.2	17.5	17.5	16.5	24.2	10.9	24		
27	10.3	10.5	\$	24.2	28.1	28.6	20.6	14.1	13.4	13.8	15.5	17.2	15.5	15.6	21.4	21.1	30.7	38.5	34.6	35.9	38.5	44.0	63.8	57.3	64.7	29.4	24			
28	19.4	\$	88.9	86.1	55.7	51.2	47.4	43.2	40.4	50.5	48.0	35.7	32.1	30.6	30.2	28.5	30.1	38.6	32.3	41.7	59.5	51.8	38.6	30.0	\$	88.9	45.1	24		
29	\$	31.0	30.7	27.9	33.3	48.8	21.7	15.7	18.9	21.9	21.0	18.6	18.1	13.2	8.1	6.0	6.7	16.7	15.8	14.2	13.9	7.8	8.1	\$	9.8	48.8	18.6	24		
30	7.7	8.0	10.8	10.4	11.2	10.0	18.4	20.9	17.0	15.3	10.5	12.3	14.6	11.9	11.7	6.4	4.6	5.8	7.0	27.2	9.5	\$	4.0	10.8	27.2	11.6	24			
31	61.7	88.9	86.1	60.1	63.9	64.5	75.1	93.3	89.9	84.7	85.5	82.9	108.8	101.3	79.5	80.8	74.3	68.7	85.8	82.7	74.3	76.8	75.5	66.7	108.8	74.1	24			
HOURLY MAX	18.1	19.5	18.8	19.7	20.2	21.3	20.4	20.2	21.0	21.1	18.9	16.9	17.5	17.3	15.3	16.6	19.9	21.1	20.6	21.3	18.6	19.0	18.4	18.3						
HOURLY AVG																														

STATUS FLAG CODES

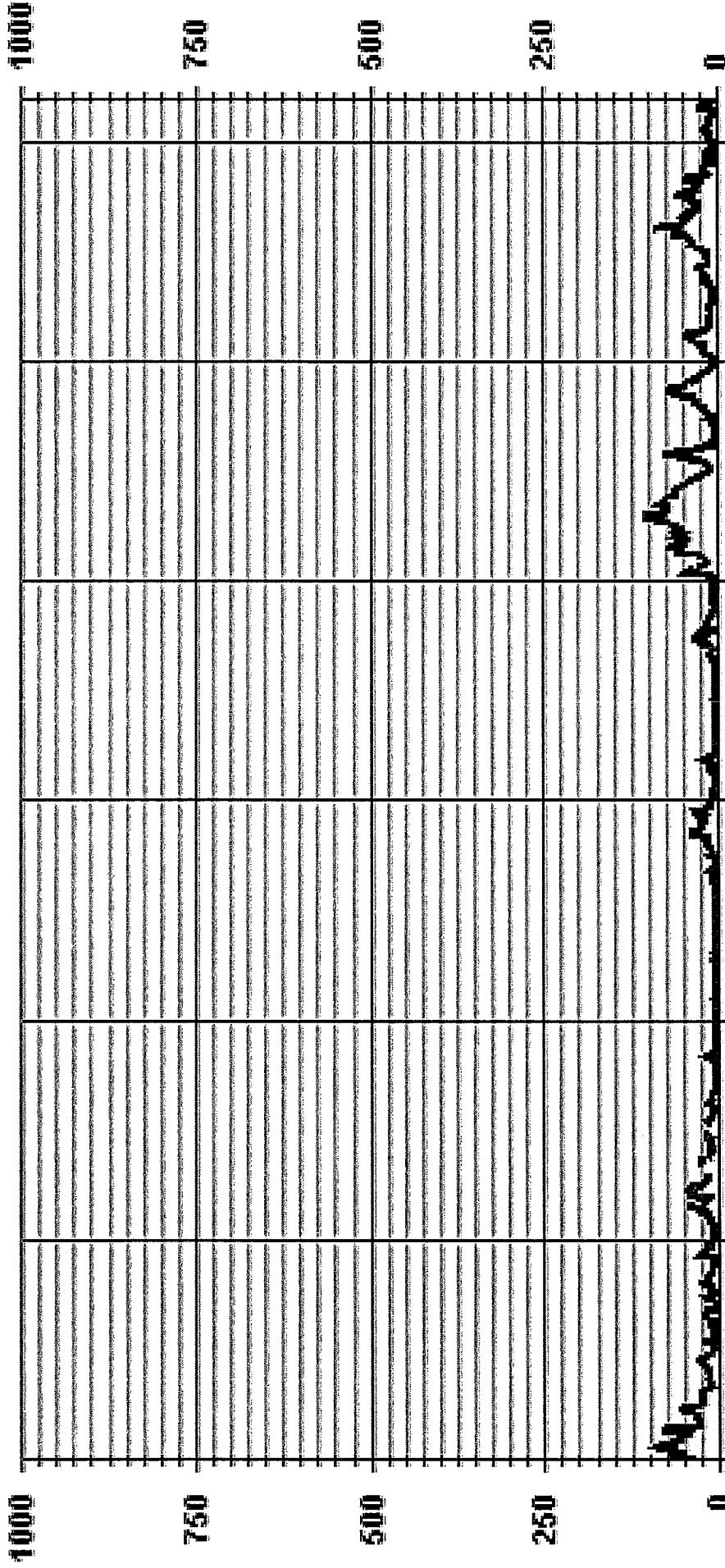
C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPIRAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	696
MAXIMUM 1-HR AVERAGE:	108.8
MAXIMUM 24-HR AVERAGE:	74.1
1/2 CALIBRATION TIME:	35 HRS
MONTHLY CALIBRATION TIME:	13 HRS
STANDARD DEVIATION:	19.35
OPERATIONAL TIME:	744 HRS
AMD OPERATION UPTIME:	100.0 %
MONTHLY AVERAGE:	15.2
PPB	15.2
ON DAY(S)	22
ON DAY(S) VAR-VARIOUS	22

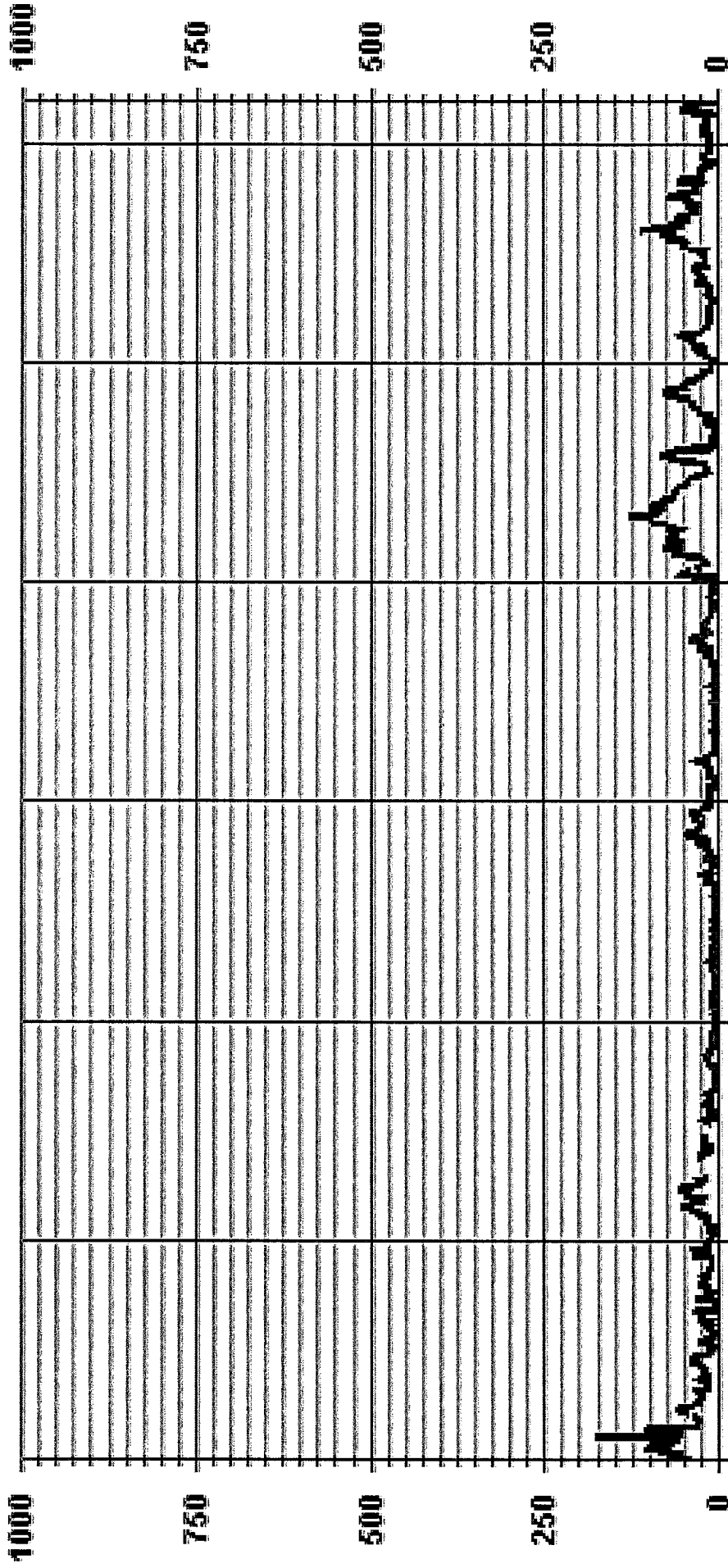
01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA35 NOX_ PPB

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA35 NOXMAX PPB

LICA-ELK
 NOX_ / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : NOX_
 Units : PPF

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	W	WNW				
< 50.0	1.72	.86	.57	2.15	12.64	20.25	7.04	2.29	1.14	1.29	2.44	9.62	10.34	8.18	.43	.43	2.72	90.22		
< 110.0	.14	.00	.43	.14	3.01	2.29	1.14	.57	.28	.28	.00	.00	.28	.43	.43	.28	.28	9.77		
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
Totals	1.86	.86	1.00	2.29	15.66	22.55	8.18	2.87	1.43	1.58	2.44	9.62	10.63	8.62	7.32	3.01				

Calm : .00 %

Total # Operational Hours : 696

Distribution By Samples

Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	W	WNW				
< 50.0	12	6	4	15	88	141	49	16	8	9	17	67	72	57	48	19	628			
< 110.0	1	3	3	1	21	16	8	4	2	2			2	3	3	2	68			
< 210.0																				
>= 210.0																				
Totals	13	6	7	16	109	157	57	20	10	11	17	67	74	60	51	21				

Calm : .00 %

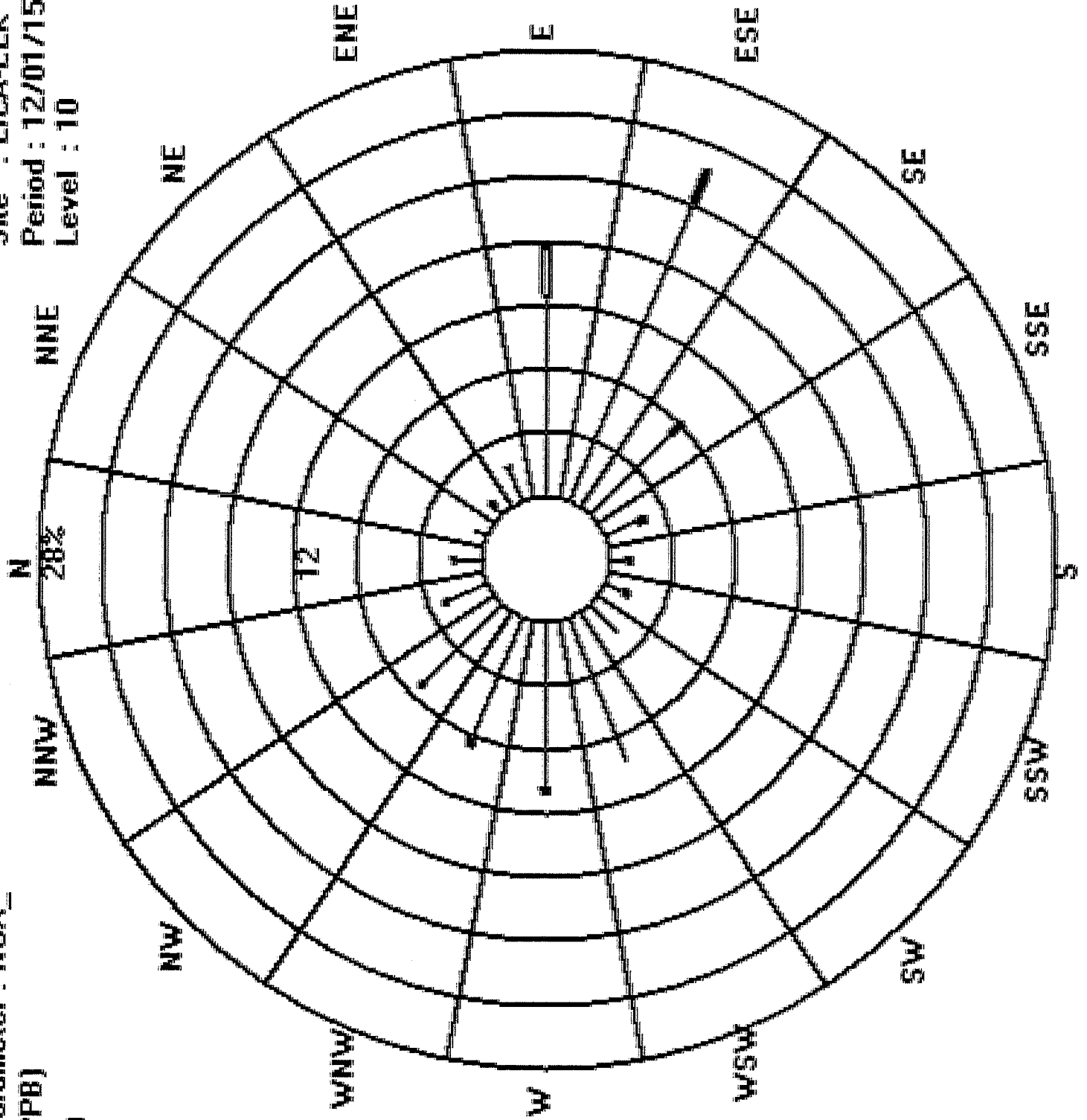
Total # Operational Hours : 696

Logger : 35 Parameter : NOX_

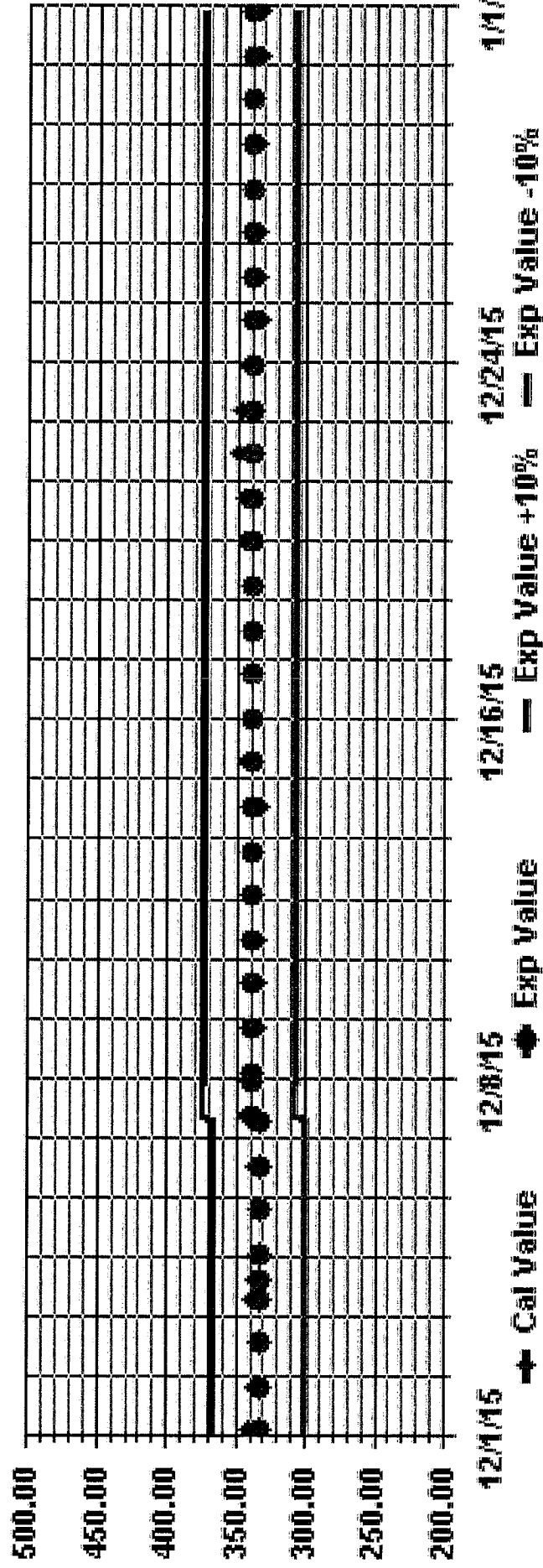
Class Limits (PPB)

-  >= 210.0
-  < 210.0
-  < 110.0
-  < 50.0

Site : LICA-ELK
Period : 12/01/15-12/31/15
Level : 10



Calibration Graph for Site: LICA35 Parameter: NOX_ Sequence: NO2 Phase: SPAN



NITRIC OXIDES

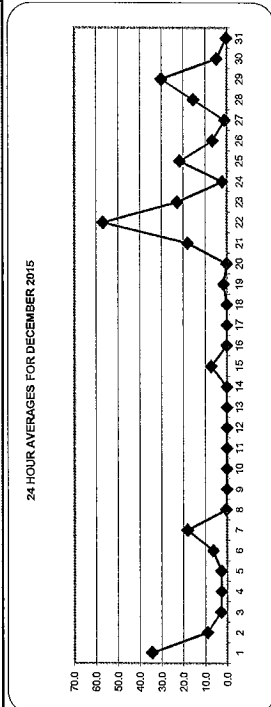


NITRIC OXIDE (NO) hourly averages in ppb

DAY	MST																								DAILY MAX.	24-HOUR AVG.	ROGS.	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				
1	24.0	29.9	\$	37.1	50.7	52.9	60.7	76.8	74.1	54.4	47.0	40.5	30.6	38.7	25.3	19.1	41.7	59.0	111.1	3.4	3.5	4.5	3.5	6.2	76.8	34.6	24	
2	9.9	\$	22.8	36.8	40.0	28.8	12.2	4.6	5.8	7.0	5.3	6.3	6.3	5.1	4.5	2.0	1.3	1.4	1.5	1.4	1.7	1.4	1.4	1.4	1.2	40.0	9.1	24
3	\$	2.1	1.7	1.6	3.1	4.7	9.5	8.2	3.2	4.7	2.1	1.8	1.7	1.5	1.3	1.1	1.6	3.9	2.3	1.2	1.1	1.1	1.3	\$	9.5	2.8	24	
4	1.7	1.6	1.2	1.4	1.2	4.4	6.6	5.7	\$	5.1	3.9	0.9	0.9	0.9	0.9	0.9	1.3	3.3	5.5	1.7	1.3	2.5	\$	1.9	6.6	2.5	24	
5	3.2	3.7	2.8	2.6	1.3	2.4	1.4	1.2	1.4	1.4	1.5	1.7	1.8	1.3	1.4	1.4	7.8	3.7	6.3	6.5	1.4	\$	2.1	2.1	7.8	2.6	24	
6	1.6	1.5	1.5	1.1	1.2	1.1	1.1	1.5	1.4	2.6	3.6	3.4	3.2	3.4	3.5	6.0	12.1	15.5	22.7	29.3	\$	9.7	10.4	8.3	29.3	6.3	24	
7	22.2	33.1	34.8	31.9	37.3	34.5	18.5	12.8	12.0	10.7	8.3	8.3	C	C	C	C	C	C	C	C	C	3.1	3.0	\$	0.5	37.3	18.1	24
8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
15	1.4	0.0	0.0	0.3	1.2	9.3	24.3	24.9	16.2	13.6	11.3	8.8	8.1	4.5	\$	8.2	10.2	3.4	10.3	10.4	1.2	0.0	0.0	0.0	0.0	24.9	7.3	24
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	0.1	0.0	0.2	1.0	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	0.0	0.0	24
21	0.0	0.0	0.0	0.0	0.0	4.6	25.3	23.1	18.2	\$	8.6	5.5	2.7	3.1	4.2	6.3	10.5	25.1	39.1	41.8	55.4	36.2	33.5	36.5	33.6	55.4	18.0	24
22	44.2	39.4	35.4	44.5	41.0	40.9	48.9	\$	57.8	68.6	68.2	64.3	89.3	81.2	59.8	53.7	50.4	67.7	65.1	58.1	58.1	61.2	59.5	50.3	89.3	57.0	24	
23	44.5	43.4	42.2	42.7	37.8	32.9	\$	24.9	21.4	17.4	10.6	5.9	0.8	0.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
24	19.8	4.5	5.9	0.0	0.0	\$	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
25	12.1	16.7	18.4	19.2	\$	24.0	37.3	50.0	48.3	55.9	45.6	27.1	34.8	32.6	24.8	15.2	12.0	11.1	7.6	2.2	1.1	0.1	0.0	0.0	0.0	0.0	24	
26	0.0	0.0	0.0	\$	0.7	0.9	1.6	5.1	8.0	4.9	5.3	15.7	20.4	17.5	17.0	29.8	14.2	5.8	3.9	1.5	0.6	0.0	0.1	0.1	29.8	6.7	24	
27	0.0	0.1	\$	0.4	0.2	0.5	0.8	0.2	0.3	0.1	0.3	0.3	0.5	0.6	1.1	0.4	0.0	0.1	0.0	0.1	8.6	2.7	3.0	2.5	8.6	1.0	24	
28	4.6	\$	8.1	11.2	12.2	5.6	0.6	0.6	1.3	2.9	4.9	3.9	3.6	7.5	6.5	14.9	23.5	19.5	22.0	24.4	28.8	50.4	45.7	52.3	15.4	24		
29	\$	76.9	72.0	42.4	36.0	32.4	28.7	26.4	36.1	33.2	21.8	18.7	16.9	16.3	14.1	14.7	22.1	15.9	25.1	42.0	34.1	22.6	15.2	\$	76.9	30.2	24	
30	17.2	15.7	11.8	18.2	29.5	3.6	0.9	1.3	2.4	3.0	2.4	2.4	1.4	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	\$	0.0	29.5	4.8	24	
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	0.3	0.0	0.3	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	\$	0.0	0.0	0.0	24	
HOURLY MAX	44.5	76.9	72.0	44.5	50.7	52.9	60.7	76.8	74.1	68.6	68.2	64.3	89.3	81.2	59.8	53.7	50.4	67.7	65.1	58.1	61.2	59.5	50.3	89.3	57.0	24		
HOURLY AVG	7.1	9.3	9.0	9.8	9.9	10.1	9.2	8.8	10.0	8.4	7.4	8.0	7.9	6.0	6.7	8.1	8.5	8.1	8.5	8.1	9.3	7.4	8.3	8.6	7.4	7.4	7.4	

STATUS FLAG CODES

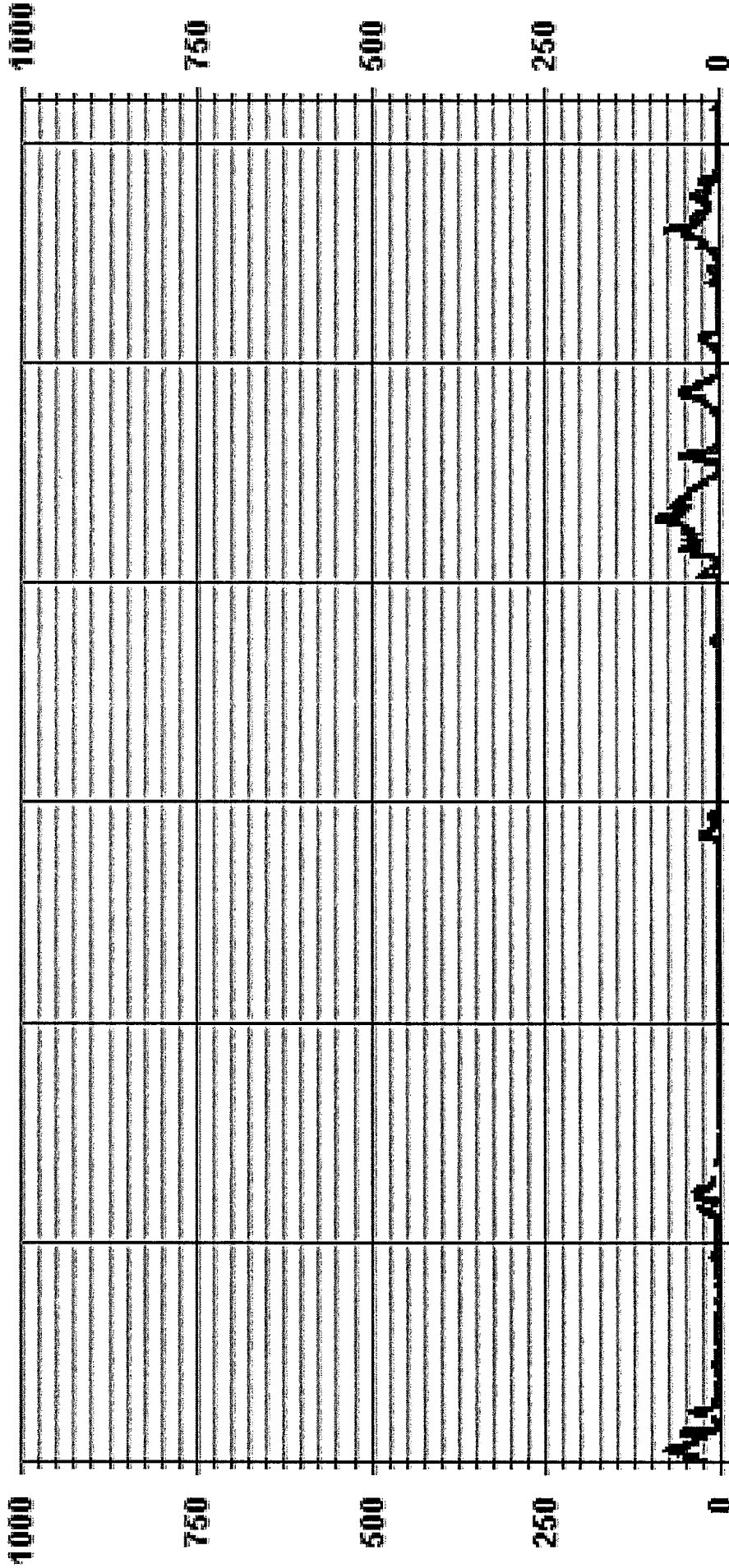
C	-	CALIBRATION	Q	-	QUALITY ASSURANCE
Y	-	MAINTENANCE	R	-	RECOVERY
S	-	DAILY ZERO/SPAN CHECK	X	-	MACHINE MALFUNCTION
P	-	POWER FAILURE	O	-	OPERATOR ERROR
G	-	OUT-OF-REPAIR	K	-	COLLECTION ERROR



MONTHLY SUMMARY

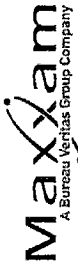
NUMBER OF NON-ZERO READINGS:	401
MAXIMUM 1-HR AVERAGE:	89.3
MAXIMUM 24-HR AVERAGE:	57.0
IS CALIBRATION TIME:	35 HRS
MONTHLY CALIBRATION TIME:	13 HRS
STANDARD DEVIATION:	15.99
OPERATIONAL TIME:	744 HRS
AMD OPERATION UPTIME:	100.0 %
MONTHLY AVERAGE:	8.5 PPB
ON DAY(S)	22
ON DAY(S) VAR-VARIOUS	22

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA35 NO_x PPB



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Elk Point Airport Site - DECEMBER 2015
JOB # 2833-2015-12-35 - C

NITRIC OXIDE MAX instantaneous maximum in ppb

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	RDGS.		
1	27.3	34.4	\$	41.5	54.4	58.1	70.2	84.8	83.1	65.7	50.4	45.8	37.4	155.9	32.5	20.5	49.0	87.7	28.3	5.7	5.1	5.5	5.2	8.2	155.9	45.9	24	
2	13.2	\$	13.2	40.4	42.8	37.8	21.8	6.3	8.1	8.4	6.8	6.6	7.8	7.1	2.9	2.9	2.1	2.4	2.3	2.6	4.7	2.1	2.0	1.9	42.8	11.7	24	
3	\$	3.4	2.4	2.5	4.1	8.3	16.9	16.5	12.7	13.5	3.2	2.6	2.8	2.2	2.4	1.8	3.6	6.5	3.8	2.1	1.7	2.0	2.0	\$	16.9	5.3	24	
4	2.8	3.6	2.0	3.0	2.0	9.4	7.8	\$	\$	14.7	2.0	1.5	1.5	1.4	2.2	10.9	10.7	2.6	2.1	2.1	4.5	\$	2.8	14.7	4.7	24		
5	5.6	5.6	4.1	3.8	2.8	3.4	2.1	1.8	1.9	2.0	2.2	2.4	2.4	1.9	2.0	2.1	14.4	5.9	15.1	16.1	2.1	\$	3.1	16.1	4.6	24		
6	2.3	2.3	2.3	1.7	1.8	1.9	2.2	2.1	2.2	5.0	5.4	4.7	4.4	4.4	5.4	13.5	18.4	26.5	28.0	35.7	\$	19.5	12.7	11.8	35.7	9.3	24	
7	28.2	36.8	36.8	37.6	42.0	41.5	29.4	15.9	14.0	17.0	9.6	9.4	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	30.0	42.0	24	
8	1.6	1.1	0.5	0.0	1.1	0.7	1.9	1.5	0.7	4.9	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	0.5	0.0	24	
9	0.1	0.0	0.5	1.5	2.1	0.7	1.3	0.8	0.6	5.3	0.8	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$	0.6	0.0	0.1	5.3	0.6	24	
10	0.2	0.1	0.5	0.4	0.5	0.7	0.2	0.3	0.7	0.9	0.1	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	\$	0.6	0.1	0.1	5.3	0.6	24	
11	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	1.2	0.9	0.0	0.4	0.1	0.1	0.0	0.0	0.0	0.0	\$	0.6	0.1	0.1	0.1	0.9	0.3	24
12	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.0	0.2	0.0	1.3	0.7	0.5	0.5	0.2	0.1	0.2	\$	0.9	0.4	0.0	0.0	0.4	0.2	1.3	0.3	24	
13	0.2	0.2	0.0	0.3	0.3	0.0	0.3	0.3	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	\$	0.8	0.2	0.1	0.0	0.0	0.0	0.0	0.8	0.1	24	
14	0.2	0.0	0.0	0.1	0.5	0.4	0.1	0.5	0.4	0.1	0.7	0.6	7.0	2.8	1.3	0.1	0.0	\$	1.1	0.5	1.4	0.4	0.4	1.3	7.0	0.9	24	
15	4.4	0.8	0.6	1.2	3.2	17.3	28.2	31.2	24.4	16.3	12.7	10.4	10.7	7.4	\$	13.3	12.3	8.8	13.7	15.6	5.8	0.7	0.8	31.2	10.4	24		
16	0.7	0.3	0.1	0.6	0.6	0.9	0.3	0.4	0.2	0.0	0.4	0.2	0.4	\$	1.2	0.8	0.4	0.5	0.7	0.5	0.7	0.7	1.1	2.5	0.6	24		
17	1.0	0.5	0.5	0.3	0.6	0.3	0.3	0.3	0.3	0.6	0.2	0.2	\$	1.1	0.5	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	1.1	0.4	24	
18	0.3	0.3	0.2	0.2	0.0	0.0	0.2	0.2	0.5	0.4	0.5	\$	1.0	0.6	0.7	0.7	2.2	0.3	0.4	0.1	0.2	0.4	0.1	0.0	2.2	0.4	24	
19	0.0	0.0	0.1	0.4	0.4	0.3	0.0	0.1	2.1	\$	1.4	2.1	7.6	2.8	4.7	7.5	14.8	12.6	2.7	1.4	0.7	0.9	3.5	14.8	2.9	24		
20	1.0	0.9	1.1	3.2	1.6	0.7	0.7	0.5	0.8	\$	1.5	0.8	0.7	0.3	0.2	0.4	0.4	0.4	0.5	0.3	0.4	0.0	0.1	0.1	3.2	0.7	24	
21	0.0	0.2	0.8	0.2	16.6	31.2	30.4	25.0	\$	11.1	8.8	3.5	3.9	6.1	7.9	25.0	31.5	45.0	47.6	61.6	54.5	40.9	41.7	40.3	61.6	23.2	24	
22	50.1	56.1	40.7	48.3	45.2	44.1	55.0	\$	60.9	76.5	78.6	75.9	101.8	103.1	69.4	65.7	65.3	60.2	77.3	77.9	60.8	63.8	63.4	53.7	103.1	64.9	24	
23	47.1	45.5	45.1	45.5	41.8	37.2	\$	28.1	23.7	21.5	12.0	11.0	2.2	1.5	1.8	0.7	0.7	1.1	7.3	32.2	37.3	50.8	64.4	55.5	64.4	26.7	24	
24	47.2	7.6	11.7	0.5	0.3	\$	1.1	0.3	0.7	0.4	0.5	0.6	0.7	0.6	1.7	1.2	0.7	3.9	1.5	0.7	0.9	8.6	7.6	11.4	47.2	4.8	24	
25	18.3	18.6	21.8	22.1	\$	29.7	43.1	53.6	53.3	60.5	54.0	34.6	36.4	34.8	31.2	20.2	13.8	13.3	10.0	5.1	2.1	0.7	0.4	0.5	60.5	25.1	24	
26	0.4	0.5	0.5	\$	1.5	2.2	3.6	9.3	12.8	7.0	8.5	18.1	22.2	20.4	27.8	32.2	24.6	10.3	7.5	5.5	1.5	0.7	0.9	32.2	9.5	24		
27	0.7	1.2	\$	1.1	1.0	1.3	1.8	0.8	1.0	0.9	1.3	0.9	1.1	1.6	2.8	1.5	0.7	1.2	0.6	1.4	15.6	11.0	6.5	3.9	15.6	2.6	24	
28	7.4	\$	13.2	17.1	18.5	17.6	2.0	2.1	3.0	4.7	6.6	6.4	6.4	10.7	7.7	24.6	34.8	35.5	33.1	34.2	53.9	54.3	49.0	63.2	63.2	22.0	24	
29	\$	95.3	85.4	62.0	38.8	34.8	31.3	30.1	44.9	36.2	28.4	19.9	18.3	16.9	16.0	25.0	27.1	19.9	31.6	54.2	44.3	27.9	16.7	\$	95.3	36.6	24	
30	19.3	19.0	12.8	26.6	36.1	12.6	1.7	2.8	4.6	5.7	3.5	3.5	2.8	0.7	0.3	1.0	1.4	1.5	1.2	0.4	0.4	\$	0.7	36.1	7.0	24		
31	0.5	0.2	0.2	0.4	0.7	0.4	0.8	2.0	1.1	1.5	0.8	1.7	1.5	1.3	0.8	0.6	0.0	0.0	0.0	6.9	17.5	4.4	\$	0.9	2.6	24		
HOURLY MAX	50.1	95.3	85.4	62.0	54.4	58.1	70.2	84.8	83.1	76.5	78.6	75.9	101.8	155.9	69.4	65.7	65.3	60.2	87.7	77.3	77.9	60.8	63.8	63.4	63.2			
HOURLY AVG	9.7	11.5	10.9	12.1	12.0	13.1	11.9	10.8	12.4	12.7	11.1	9.2	9.7	13.9	8.0	9.3	11.5	12.4	11.7	13.0	10.8	10.8	10.8	10.0	10.0	9.4		

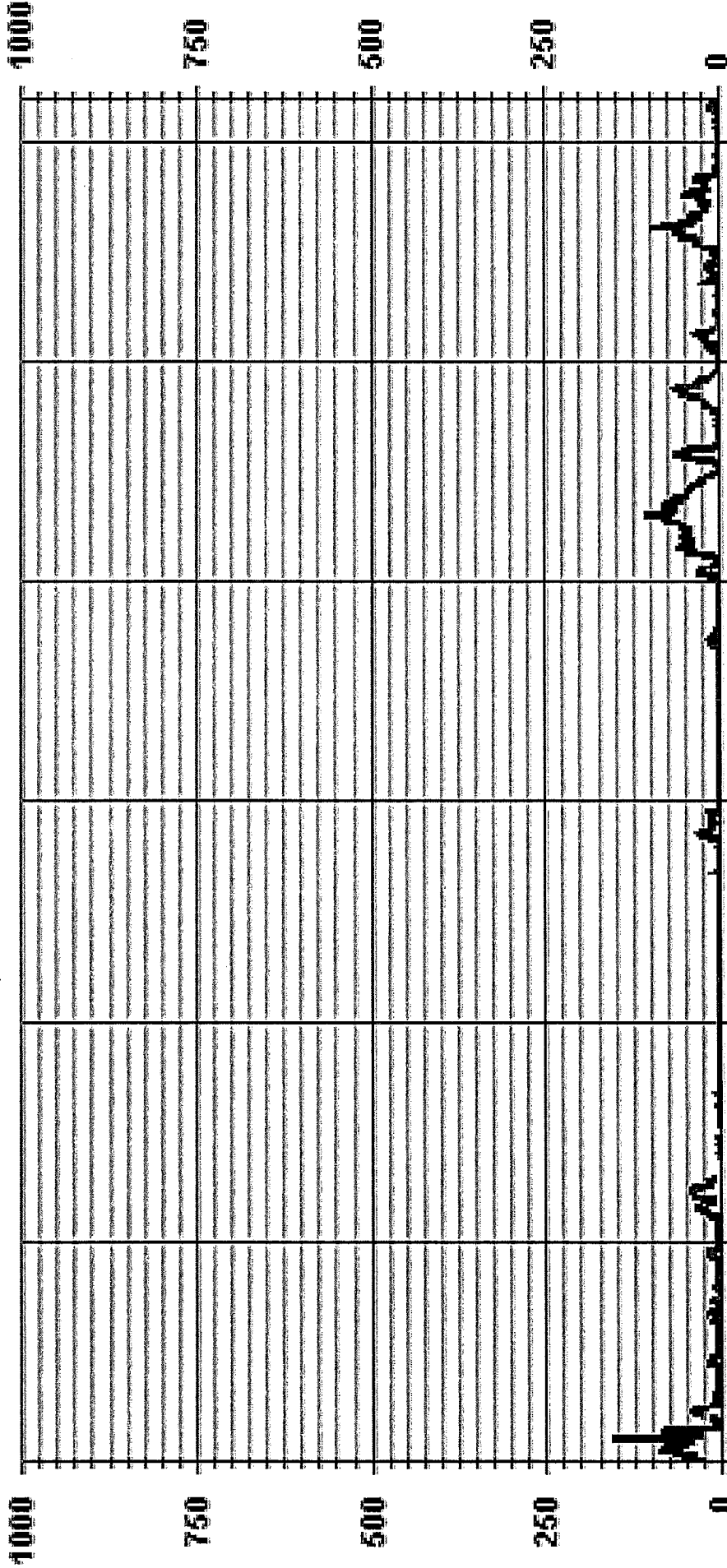
STATUS FLAG CODES

C	-	CALIBRATION	Q	-	QUALITY ASSURANCE
M	-	MAINTENANCE	R	-	RECOVERY
S	-	DAILY ZERO/Span CHECK	X	-	MACHINE MALFUNCTION
P	-	POWER FAILURE	O	-	OPERATOR ERROR
U	-	OUT OF REPAIR	K	-	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	626
MAXIMUM INSTANTANEOUS VALUE:	155.9 PPB @ HOUR(S) 13 ON DAY(S) 1
12S CALIBRATION TIME:	35 HRS
MONTHLY CALIBRATION TIME:	16 HRS
STANDARD DEVIATION:	19.37
OPERATIONAL TIME:	744 HRS
VAR-VARIOUS	

01 Hour Averages



— LICA35 NOMAX PPB

LICA-ELK
NO_ / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 35
Site Name : LICA-ELK
Parameter : NO
Units : PPF

Wind Parameter : WDR
Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	1.86	.86	.86	2.15	14.22	21.69	7.47	2.58	1.29	1.43	2.44	9.62	10.63	8.33	7.04	3.01	95.54
< 110.0	.00	.00	.14	.14	1.43	.86	.71	.28	.14	.14	.00	.00	.00	.28	.28	.00	4.45
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.86	.86	1.00	2.29	15.66	22.55	8.18	2.87	1.43	1.58	2.44	9.62	10.63	8.62	7.32	3.01	

Calm : .00 %

Total # Operational Hours : 696

Distribution By Samples

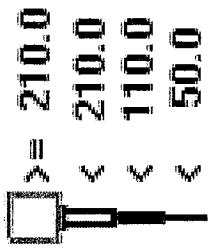
Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	13	6	6	15	99	151	52	18	9	10	17	67	74	58	49	21	665
< 110.0			1	1	10	6	5	2	1	1				2	2		31
< 210.0																	
>= 210.0																	
Totals	13	6	7	16	109	157	57	20	10	11	17	67	74	60	51	21	

Calm : .00 %

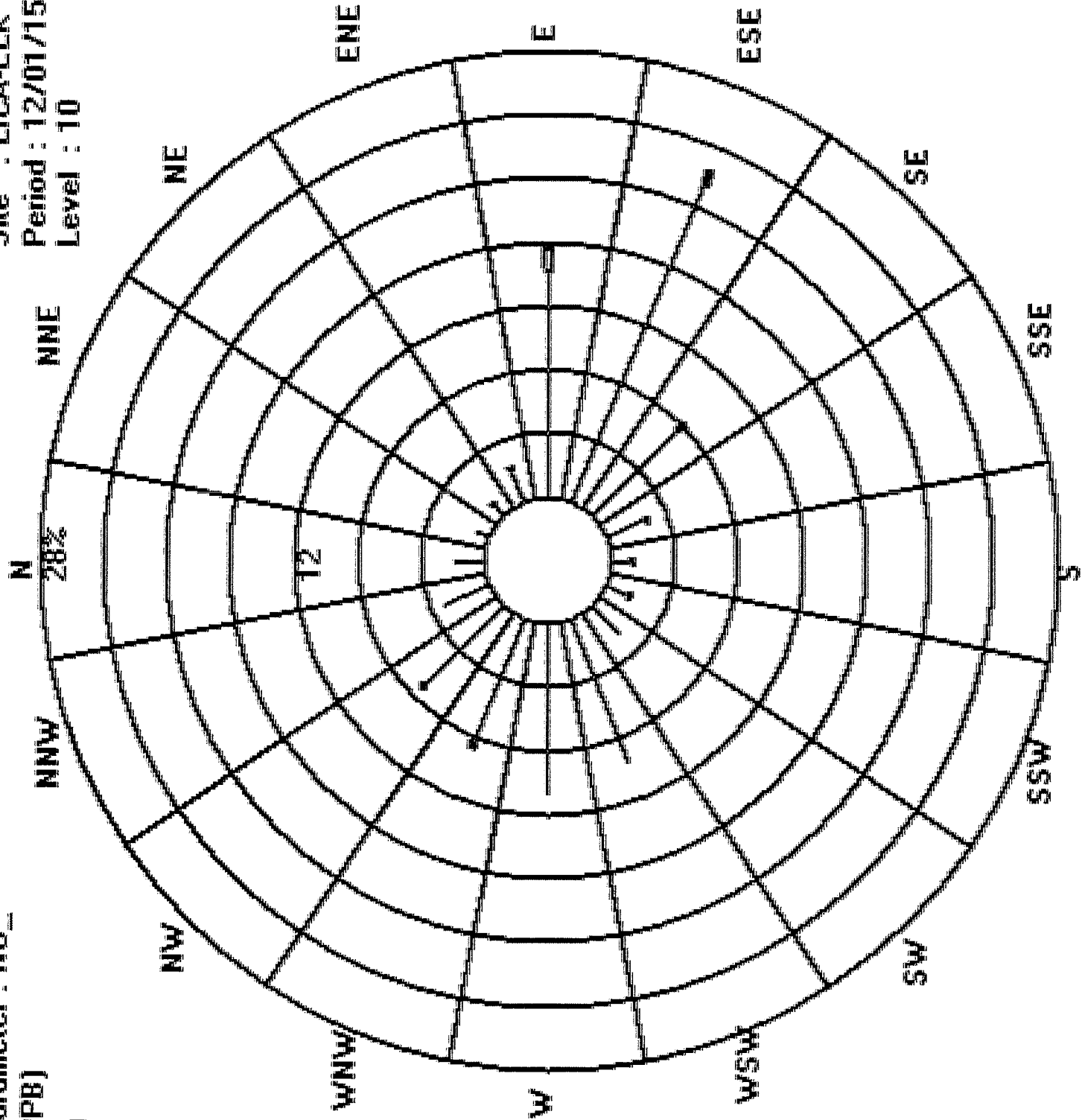
Total # Operational Hours : 696

Logger : 35 Parameter : NO_

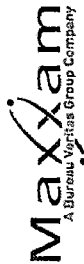
Class Limits (PPB)



Site : LICA-ELK
Period : 12/01/15-12/31/15
Level : 10



NITROGEN DIOXIDE



NITROGEN DIOXIDE (NO2) hourly averages in ppb

DAY	HOUR																								DAILY MAX.	24-HOUR AVG.	RDSS.						
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				24:00					
1	16.3	15.6	\$	14.2	13.2	11.6	14.4	16.5	15.8	16.3	18.4	18.6	19.1	20.5	21.3	21.0	20.9	22.3	27.1	23.3	24.7	23.7	24.6	27.1	19.3	24							
2	20.9	\$	15.8	14.6	17.6	19.6	21.2	21.4	19.2	19.2	17.3	17.0	17.3	17.3	18.0	12.8	9.2	11.3	9.6	10.3	14.2	11.2	11.1	11.6	21.4	24							
3	\$	15.4	14.2	14.6	17.4	19.8	20.7	19.9	17.0	15.7	9.2	8.0	6.6	4.5	5.1	10.2	19.0	13.3	6.0	5.3	5.5	5.3	\$	20.7	11.8	24							
4	7.3	10.6	8.4	8.5	7.0	9.9	13.9	14.6	\$	11.9	3.3	1.5	1.0	1.4	3.9	12.4	15.0	8.4	8.8	6.3	11.4	\$	11.3	15.0	8.4	24							
5	17.3	19.2	16.4	15.5	8.2	16.7	11.0	9.8	8.7	7.8	6.7	5.8	6.0	5.5	5.4	6.8	18.1	18.4	19.4	17.1	10.5	\$	12.2	12.5	19.4	24							
6	10.3	8.0	7.8	6.0	5.8	5.5	6.2	7.4	6.4	7.5	9.7	10.3	9.9	9.5	8.6	8.2	8.7	9.3	10.3	11.5	9.8	10.5	11.0	\$	11.6	10.8	24						
7	9.1	7.3	7.6	8.1	8.0	8.9	9.7	10.3	9.9	9.5	8.6	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	\$	13.7	21.7	10.8	24					
8	11.9	10.2	7.6	5.0	11.5	10.6	11.6	15.7	11.2	16.2	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	\$	5.4	5.5	16.5	10.9	24				
9	8.8	7.2	7.9	15.4	14.8	8.7	11.1	8.5	9.2	9.1	7.8	3.7	3.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	\$	3.3	3.6	2.7	15.4	6.2	24			
10	4.7	6.8	5.8	9.8	9.0	15.5	7.5	8.5	7.9	7.7	5.4	4.1	4.5	4.9	5.4	4.9	5.0	4.9	5.2	\$	3.9	3.1	4.1	3.5	15.5	6.2	24	24	24	24			
11	4.5	3.8	3.3	4.1	4.9	4.3	4.7	3.5	5.0	4.9	5.3	4.9	3.5	5.3	5.2	4.6	4.1	4.6	\$	4.2	3.7	4.1	3.4	4.0	5.3	4.3	24	24	24	24			
12	3.1	3.3	3.7	3.6	4.7	4.5	5.2	4.8	4.3	3.5	7.4	7.0	5.1	5.4	5.3	5.0	5.1	\$	5.6	6.0	4.6	4.2	5.5	4.8	7.4	4.9	24	24	24	24			
13	5.2	4.6	4.8	4.3	5.0	4.5	4.6	3.7	4.4	4.3	4.4	3.9	4.4	3.8	3.5	3.6	\$	5.0	3.7	3.9	3.6	2.9	5.2	4.1	24	24	24	24	24	24			
14	3.4	2.6	3.2	3.2	3.4	9.0	9.3	4.1	9.4	8.2	14.0	10.9	7.4	3.9	3.9	\$	6.8	7.8	12.0	6.3	6.7	8.4	8.4	14.0	14.0	7.2	24	24	24	24	24		
15	15.7	12.4	12.2	12.3	12.2	14.0	14.7	15.0	15.5	15.5	15.0	14.2	15.2	15.3	\$	17.1	18.7	19.6	18.5	22.0	18.1	14.1	13.8	10.5	22.0	15.3	24	24	24	24	24		
16	9.6	8.9	7.1	7.7	7.6	6.3	9.4	8.2	5.5	3.5	3.3	2.3	2.3	\$	3.1	5.3	8.7	10.8	13.0	9.4	11.5	8.6	13.6	21.0	8.1	24	24	24	24	24	24		
17	15.8	14.0	6.0	2.4	2.6	2.7	2.1	2.5	3.3	2.7	2.0	1.9	\$	1.9	2.2	2.0	4.0	4.4	2.5	2.0	3.6	4.8	3.4	4.7	15.8	4.1	24	24	24	24	24	24	
18	4.1	2.4	2.7	2.7	2.8	3.1	3.6	5.9	5.1	5.1	4.7	\$	3.9	4.4	4.5	5.4	6.5	5.4	5.1	3.6	3.3	3.8	3.4	3.4	6.5	4.1	24	24	24	24	24	24	
19	3.5	3.9	4.3	4.8	6.0	6.1	6.1	6.5	7.9	11.4	\$	8.2	9.1	14.4	13.4	15.3	20.0	21.2	22.4	18.0	15.3	9.4	8.1	19.2	22.4	11.1	24	24	24	24	24	24	
20	16.9	15.2	16.5	15.8	14.0	9.7	10.3	6.9	8.2	\$	5.8	6.6	6.3	5.7	5.6	7.5	8.9	8.2	6.6	7.7	5.3	5.4	5.5	7.6	16.9	9.0	24	24	24	24	24	24	
21	7.1	6.5	6.9	7.3	13.4	19.1	17.4	18.7	\$	16.7	14.7	12.3	12.6	14.1	16.5	18.2	19.9	18.7	18.4	17.4	17.0	16.2	14.7	14.9	19.9	14.7	24	24	24	24	24	24	
22	16.7	16.6	14.9	15.5	15.2	13.7	14.7	\$	15.6	16.1	17.3	18.6	19.5	20.1	19.7	21.0	20.6	18.3	18.1	17.6	16.2	15.6	16.0	16.4	21.0	17.1	24	24	24	24	24	24	
23	17.2	16.7	16.8	17.3	17.2	17.7	\$	18.5	18.5	18.7	17.6	16.3	12.7	11.9	13.3	11.4	14.3	15.1	19.8	20.5	20.4	20.1	20.0	18.9	20.5	17.0	24	24	24	24	24	24	
24	17.2	17.1	14.7	7.5	7.5	\$	5.8	5.1	4.8	4.2	3.9	4.0	4.3	3.5	7.2	8.7	8.5	13.7	9.2	7.9	10.1	14.7	16.0	15.1	17.2	9.2	24	24	24	24	24	24	
25	15.5	15.7	13.7	12.3	\$	12.5	13.7	13.4	13.9	15.2	15.1	14.9	15.6	15.6	15.8	15.2	15.9	16.3	16.4	17.7	14.8	11.6	6.1	6.5	17.7	14.1	24	24	24	24	24	24	
26	8.2	7.3	7.1	\$	11.6	14.5	15.3	17.8	17.1	14.7	14.8	15.6	15.9	16.2	16.7	18.7	18.0	17.4	17.2	15.2	13.4	11.3	11.1	10.7	18.7	14.2	24	24	24	24	24	24	
27	10.3	10.4	\$	9.2	9.0	10.4	11.3	10.6	8.5	7.3	6.9	5.9	6.6	7.3	8.8	7.7	7.9	9.8	9.5	10.6	15.6	14.8	14.5	14.0	15.6	9.9	24	24	24	24	24	24	
28	14.8	\$	16.1	16.9	16.4	15.0	13.5	12.8	12.5	12.6	13.3	11.6	12.0	13.9	14.6	15.8	15.0	15.1	13.9	14.1	15.2	13.4	11.6	12.4	16.9	14.0	24	24	24	24	24	24	
29	\$	12.0	14.1	13.3	15.2	15.0	14.5	14.0	14.4	14.8	13.9	13.4	13.7	13.9	14.4	15.4	16.5	16.4	16.6	17.5	17.7	16.0	14.8	\$	17.7	14.9	24	24	24	24	24	24	
30	13.8	15.0	16.1	15.1	19.3	18.1	14.8	17.6	19.5	18.0	16.2	15.7	11.8	8.1	6.0	6.7	16.4	15.7	14.2	13.9	7.8	8.1	\$	9.8	19.5	13.8	24	24	24	24	24	24	
31	7.7	8.0	10.8	10.4	11.2	10.0	18.4	20.3	16.9	15.0	12.0	14.2	11.6	11.6	6.4	4.6	5.8	7.0	22.8	9.5	\$	4.0	10.8	22.8	11.3	24	24	24	24	24	24	24	
HOURLY MAX	20.9	19.2	16.8	17.3	19.3	19.8	20.7	21.2	21.4	19.2	18.4	18.6	19.5	20.5	21.3	21.0	20.9	22.3	27.1	23.3	23.7	24.7	23.7	24.6	20.9	10.9							
HOURLY AVG	10.9	10.2	9.9	10.0	10.3	11.2	11.2	11.4	11.0	11.1	10.6	9.6	9.5	9.4	9.3	10.0	11.8	12.6	12.5	12.0	11.2	10.7	9.8	10.9									

STATUS FLAG CODES

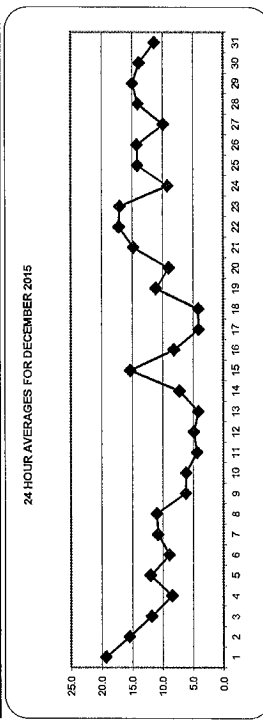
C	CALIBRATION
O	QUALITY ASSURANCE
Y	RECOVERY
S	MAINTENANCE
X	DAILY ZERO / SPAN CHECK
P	POWER FAILURE
G	SOIL FLOOR REPAIR
R	RECOVERY
M	MACHINERY / FUNCTION
E	OPERATOR ERROR
N	COLLECTION ERROR

OBJECTIVE LIMIT:

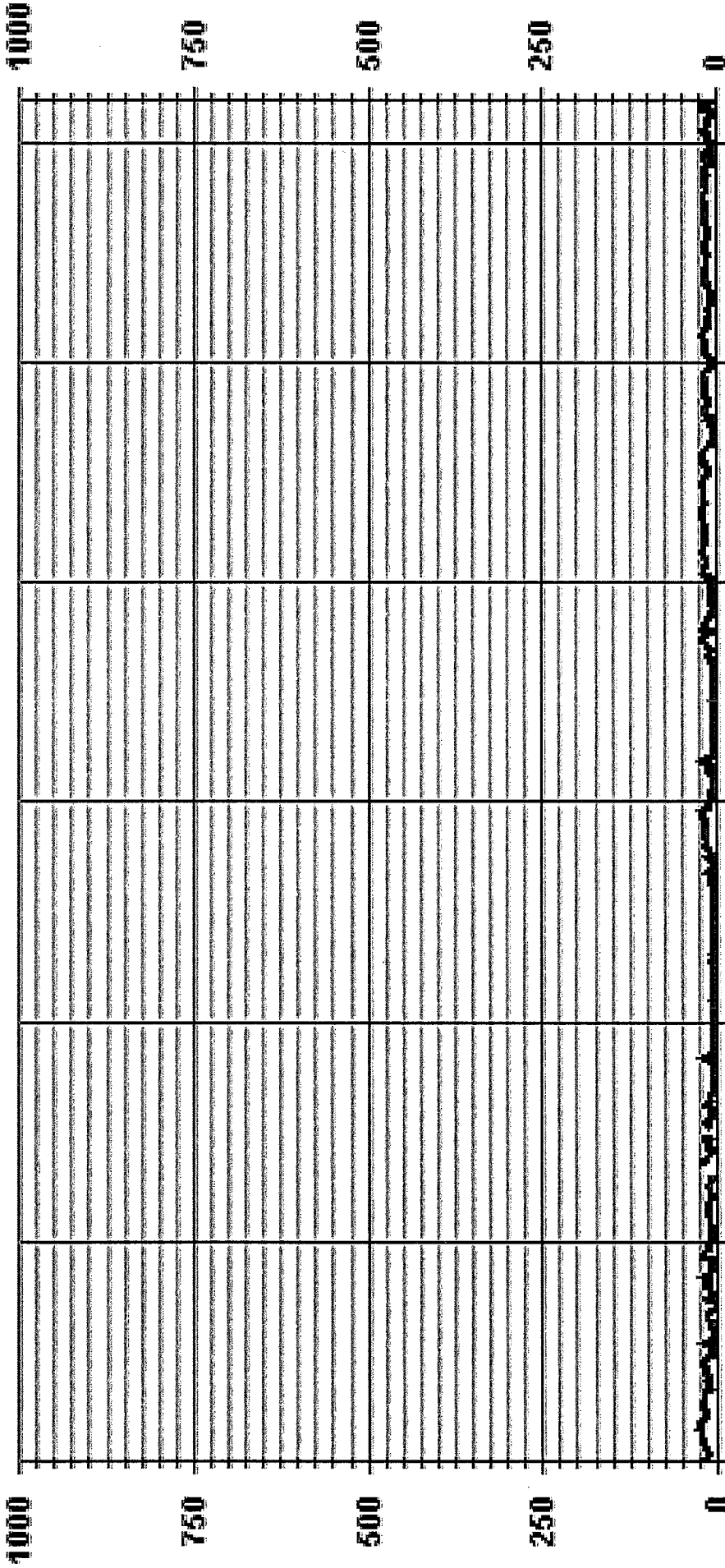
ALBERTA ENVIRONMENT: 1-FIR: 159 PPB

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES	0
NUMBER OF NON-ZERO READINGS	696
MAXIMUM 1-HR AVERAGE	27.1 PPB @ HOUR(S) 18 ON DAY(S) 1
MAXIMUM 24-HR AVERAGE	19.3 PPB VAR-VARIOUS ON DAY(S) 1
1/2 CALIBRATION TIME	35 HRS OPERATIONAL TIME: 744 HRS
MONTHLY CALIBRATION TIME	13 HRS AMD OPERATION UPTIME: 100.0 %
STANDARD DEVIATION	5.54 MONTHLY AVERAGE: 10.7 PPB

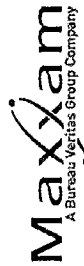


01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA35 NO2_ PPB



NITROGEN DIOXIDE MAX instantaneous maximum in ppb

MST

DAY	HOUR START	HOUR END	NITROGEN DIOXIDE MAX instantaneous maximum in ppb																								24-HOUR AVG.	RDGS.
			0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		
1	18.7	17.1	\$	16.4	15.2	14.5	17.3	18.9	17.8	18.4	20.7	20.7	21.1	30.0	28.0	30.1	28.4	26.6	29.4	27.7	25.6	26.2	26.1	26.7	30.1	22.2	24	
2	25.9	\$	19.0	19.1	16.7	19.8	22.3	22.9	23.4	21.3	19.6	18.9	20.4	19.1	22.8	15.6	14.1	13.8	12.9	11.7	10.7	6.7	17.7	15.9	13.6	25.9	18.6	24
3	\$	19.5	17.3	18.5	20.2	21.8	22.6	22.8	22.1	22.8	12.3	8.8	10.3	8.9	8.0	8.3	15.0	23.7	19.9	11.1	6.4	6.7	7.3	\$	23.7	15.1	24	
4	11.9	14.5	10.0	12.3	10.6	14.3	15.7	17.5	\$	17.4	5.1	3.9	2.8	2.8	7.2	7.4	9.3	28.6	21.6	21.2	12.5	\$	15.8	18.6	11.7	24		
5	19.5	20.9	18.6	17.4	15.4	19.7	15.6	13.0	13.6	10.6	10.4	7.7	7.8	7.2	7.4	9.3	28.6	21.6	21.2	12.5	\$	14.3	15.0	23.6	15.0	24		
6	12.5	11.5	10.4	7.7	7.6	6.9	9.0	10.0	8.0	10.7	12.6	11.6	10.6	10.5	12.3	14.6	14.4	12.7	12.9	14.1	\$	13.6	12.3	12.4	14.6	11.3	24	
7	11.4	9.2	9.4	10.2	10.2	10.3	12.1	11.9	11.8	11.1	10.0	9.5	C	C	C	C	C	C	C	C	C	C	C	23.4	22.1	23.4	12.3	24
8	16.4	15.7	11.5	6.6	17.4	15.8	20.4	19.8	13.4	18.9	C	C	C	C	C	C	15.0	20.7	19.3	7.7	\$	6.8	7.2	20.7	14.5	24		
9	10.7	10.6	10.6	19.3	18.4	13.2	13.2	10.7	11.7	12.7	12.8	5.9	5.4	4.7	4.5	4.3	3.9	4.0	3.7	4.9	\$	5.5	6.8	6.4	19.3	8.9	24	
10	7.6	10.2	11.4	14.7	13.8	18.0	12.9	12.3	11.2	12.3	10.7	6.4	6.7	6.0	7.3	6.8	7.6	6.3	7.6	\$	4.9	5.1	6.8	5.1	18.0	9.2	24	
11	5.9	5.6	5.1	5.6	6.5	6.0	6.4	5.5	7.7	7.6	8.3	7.7	5.1	7.0	6.3	6.9	6.0	6.2	\$	5.6	5.3	5.6	5.4	5.6	8.3	6.2	24	
12	5.4	5.3	5.4	5.9	7.1	6.0	7.2	6.1	7.2	5.0	13.2	10.4	6.1	6.6	6.4	6.2	6.3	\$	7.4	7.8	6.0	5.7	7.2	7.0	13.2	6.8	24	
13	7.1	5.7	6.3	5.7	6.1	6.0	6.4	5.5	5.9	5.4	5.9	5.6	5.6	5.2	4.9	5.3	\$	6.0	5.1	5.2	5.6	5.8	4.8	4.3	7.1	5.6	24	
14	4.9	4.3	4.5	4.6	6.7	14.4	14.2	6.2	15.4	12.1	14.6	12.5	8.8	5.7	5.6	\$	8.3	11.5	16.7	8.2	7.9	10.6	12.4	16.9	16.9	9.9	24	
15	18.2	14.0	13.9	13.8	14.4	15.5	15.9	17.4	16.7	16.5	16.3	15.3	16.2	16.6	\$	18.8	19.7	21.3	19.5	24.2	23.8	15.7	16.5	12.6	24.2	17.1	24	
16	10.8	10.8	10.1	11.3	12.7	15.0	12.9	13.8	14.3	5.6	5.5	3.8	4.5	\$	4.0	10.9	11.2	12.8	14.9	13.0	14.7	13.8	18.4	27.2	27.2	11.8	24	
17	23.1	17.3	14.8	4.1	4.1	4.2	4.4	4.1	4.9	4.1	3.4	3.3	\$	2.8	3.7	3.5	6.0	6.6	4.3	3.5	5.8	6.5	6.2	7.1	23.1	6.4	24	
18	6.6	4.3	4.3	4.3	4.3	4.9	5.8	8.7	7.9	7.0	6.1	\$	4.9	6.1	5.9	6.5	10.2	6.8	7.6	5.3	4.7	5.7	5.2	4.8	10.2	6.0	24	
19	4.9	5.4	5.6	6.8	7.7	8.1	7.6	8.5	9.7	14.9	\$	9.4	11.8	18.8	16.6	19.7	21.8	22.3	23.6	22.0	17.4	13.6	14.3	21.9	23.6	13.6	24	
20	18.1	17.6	18.9	17.4	16.2	12.7	11.5	9.2	10.8	\$	7.0	7.7	7.4	7.3	6.7	9.4	11.9	10.4	8.8	9.9	6.5	7.1	7.0	10.6	18.9	10.9	24	
21	8.7	8.5	8.7	8.7	20.3	20.8	18.9	19.6	\$	17.9	17.1	14.0	13.9	16.7	17.7	20.9	22.0	19.7	19.9	19.1	18.8	17.4	16.9	16.7	22.0	16.6	24	
22	18.8	18.2	16.6	18.0	17.2	15.5	16.5	\$	17.1	18.2	20.0	20.7	22.4	23.2	20.8	22.4	22.2	20.4	19.7	19.9	18.5	17.1	17.3	17.9	23.2	19.1	24	
23	18.4	17.9	18.0	18.4	18.6	18.9	\$	19.6	19.7	19.8	18.6	17.8	15.7	13.1	15.4	14.8	17.0	17.6	21.2	21.1	21.5	21.5	21.6	20.0	21.6	18.5	24	
24	19.1	18.6	17.3	11.8	8.8	\$	6.6	6.2	6.0	5.6	5.1	4.9	5.4	4.7	12.5	12.6	10.5	18.2	12.4	10.6	12.1	18.2	18.1	16.5	19.1	11.4	24	
25	17.0	17.7	15.3	14.1	\$	15.1	15.9	15.9	16.0	18.4	16.9	17.0	16.9	17.3	17.1	16.3	17.1	17.4	17.6	19.0	18.6	13.2	10.9	8.9	19.0	16.1	24	
26	9.8	9.2	8.4	\$	13.8	16.8	18.2	19.1	19.9	16.7	16.5	16.9	17.1	17.7	18.6	19.7	19.4	18.9	19.1	18.2	15.1	13.2	12.9	12.1	19.9	16.0	24	
27	11.5	11.8	\$	10.2	10.0	12.8	13.2	12.5	10.7	8.7	8.9	6.8	8.0	8.6	12.0	10.9	10.2	11.5	11.6	13.1	18.4	17.6	16.8	16.2	18.4	11.8	24	
28	16.5	\$	17.7	18.8	17.8	17.2	15.0	15.5	15.3	13.7	13.4	13.5	15.0	15.5	15.7	17.8	16.3	16.5	15.2	16.5	18.8	16.7	13.8	14.9	18.8	16.0	24	
29	\$	15.1	15.9	15.3	16.9	17.3	16.3	15.8	16.2	16.4	15.6	15.1	15.0	15.6	15.6	17.0	18.0	18.1	18.1	19.1	19.6	17.8	16.3	\$	19.6	16.6	24	
30	15.9	17.5	17.7	17.1	21.3	20.9	16.4	20.9	21.8	17.8	18.6	14.6	9.7	7.7	13.9	20.1	18.1	19.9	18.0	10.7	11.7	\$	11.9	21.8	16.7	24		
31	9.6	11.8	12.7	12.2	13.4	11.7	21.0	21.8	20.5	20.1	11.6	17.7	16.1	13.7	15.9	15.3	6.2	9.0	29.3	35.2	27.8	\$	5.8	24.8	35.2	16.7	24	
HOURLY MAX	25.9	20.9	19.0	19.3	21.3	21.8	22.6	22.9	23.4	22.8	20.7	20.7	22.4	30.0	23.0	30.1	23.6	26.6	29.4	35.2	27.8	26.2	26.1	27.2				
HOURLY AVG	13.3	12.6	12.3	12.2	13.0	13.8	13.7	13.7	13.7	13.6	12.7	11.5	11.3	11.5	11.3	13.0	14.3	14.9	15.6	15.1	15.7	13.1	12.3	13.9				

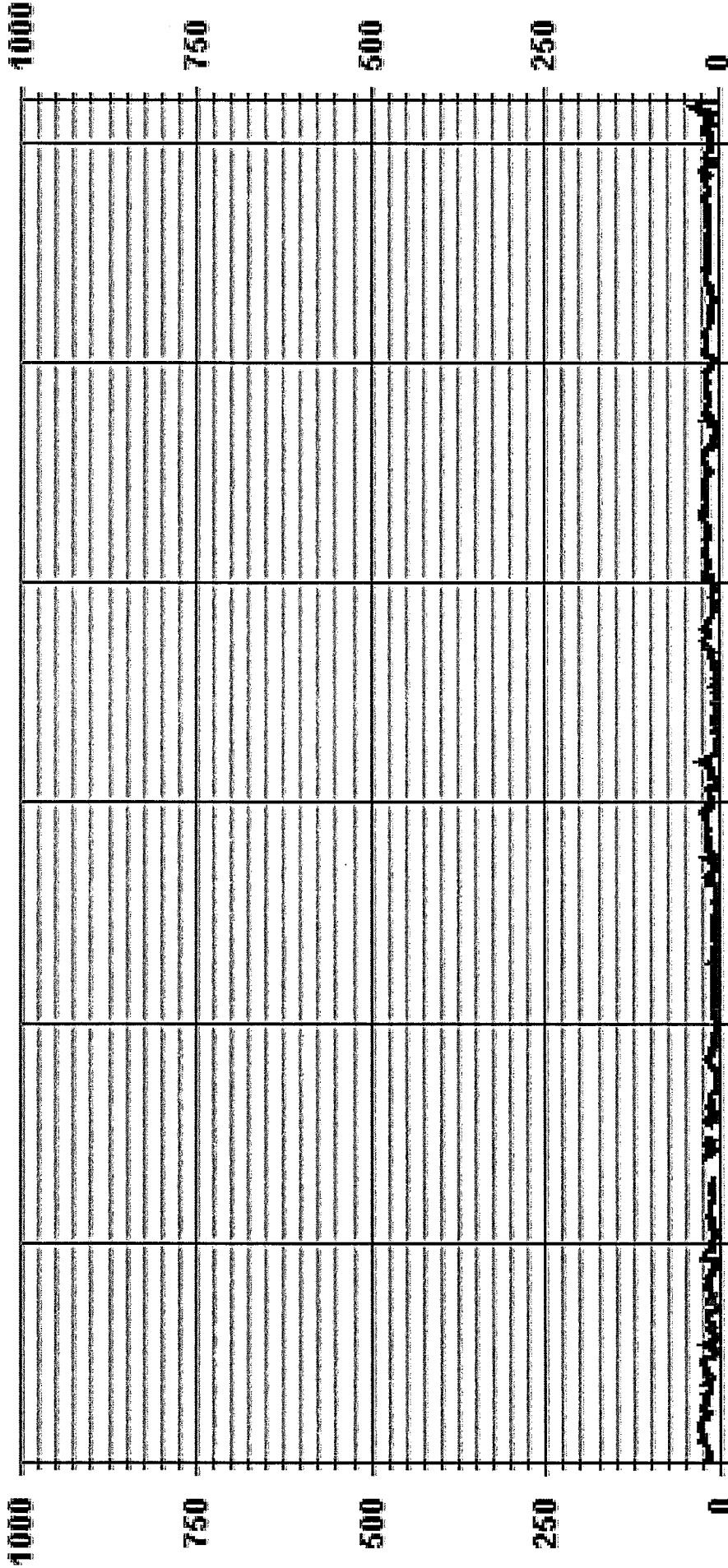
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/Span CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT OF ORDER/REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	693
MAXIMUM INSTANTANEOUS VALUE:	35.2 PPB @ HOUR(S) 19 ON DAY(S) 31
IS CALIBRATION TIME:	35 HRS
MONTHLY CALIBRATION TIME:	16 HRS
STANDARD DEVIATION:	5.92
OPERATIONAL TIME:	744 HRS
VAR-VARIOUS	VAR-VARIOUS

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA35 NO2MAX PPB

LICA-ELK
 NO2_ / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : NO2
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	1.86	.86	1.00	2.29	15.66	22.55	8.18	2.87	1.43	1.58	2.44	9.62	10.63	8.62	7.32	3.01	100.00
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.86	.86	1.00	2.29	15.66	22.55	8.18	2.87	1.43	1.58	2.44	9.62	10.63	8.62	7.32	3.01	3.01

Calm : .00 %

Total # Operational Hours : 696

Distribution By Samples


Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	13	6	7	16	109	157	57	20	10	11	17	67	74	60	51	21	696
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	13	6	7	16	109	157	57	20	10	11	17	67	74	60	51	21	696

Calm : .00 %

Total # Operational Hours : 696

Logger : 35 Parameter : NO2_

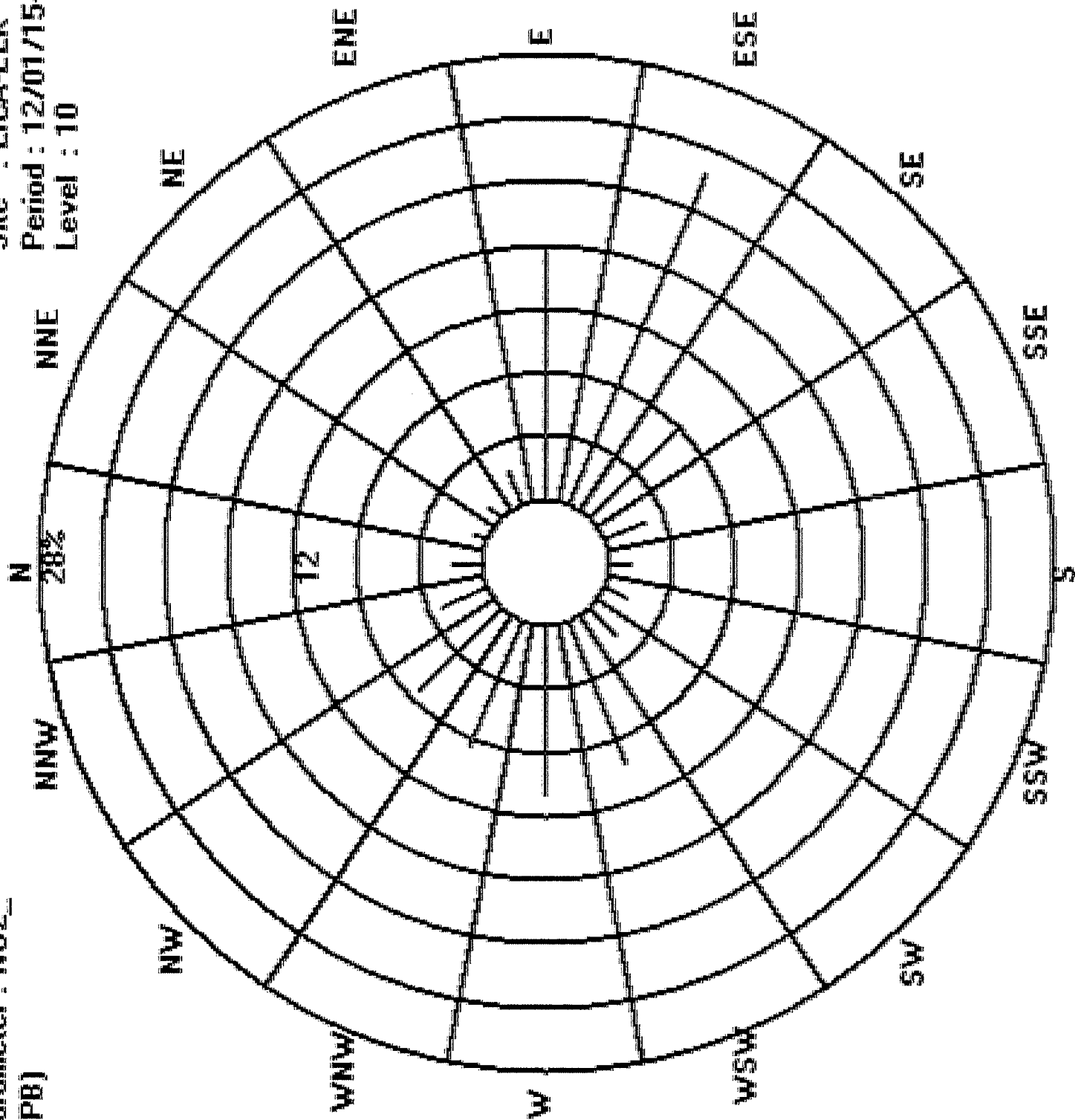
Class Limits (PPB)

-  >= 210.0
-  < 210.0
-  < 110.0
-  < 50.0

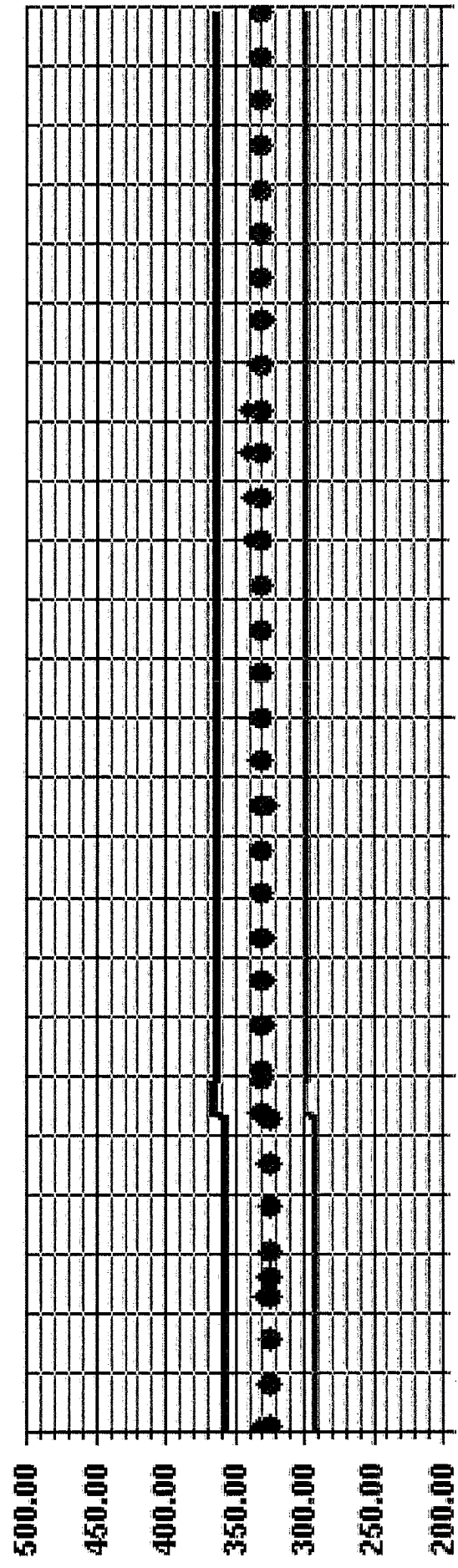
Site : LICA-ELK

Period : 12/01/15-12/31/15

Level : 10



Calibration Graph for Site: LICA35 Parameter: NO2_ Sequence: NO2 Phase: SPAN



12/1/15 12/8/15 12/16/15 12/24/15 1/1/16
+ Cal Value ● Exp Value — Exp Value +10% — Exp Value -10%

OZONE



OZONE (O3) hourly averages in ppb

DAY	MST																								24-HOUR AVG.	ROSS				
	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00							
1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	4	1.5	24			
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24	
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.5	24
HOURLY MAX	21	20	25	28	27	27	27	26	25	27	28	28	27	25	26	30	30	28	27	22	25	22	30	24	24	30	19.8	24	24	
HOURLY AVG	8.7	9.2	9.3	8.7	8.8	7.9	8.2	8.5	9.1	9.3	10.4	11.1	11.5	11.8	12.2	11.6	9.9	8.9	9.0	10.4	9.9	11.0	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1

STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
V	MAINTENANCE	R	RECOVERY
S	DAILY ZERO SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUTLET FOR REPAIR	K	COLLECTION ERROR

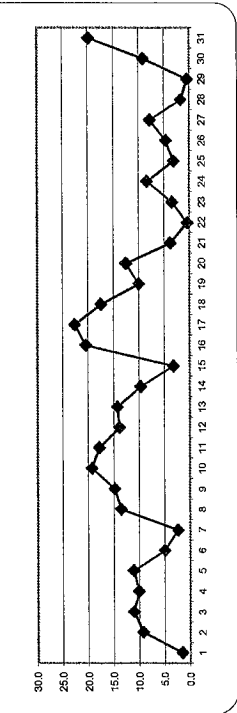
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR: 82 PPB

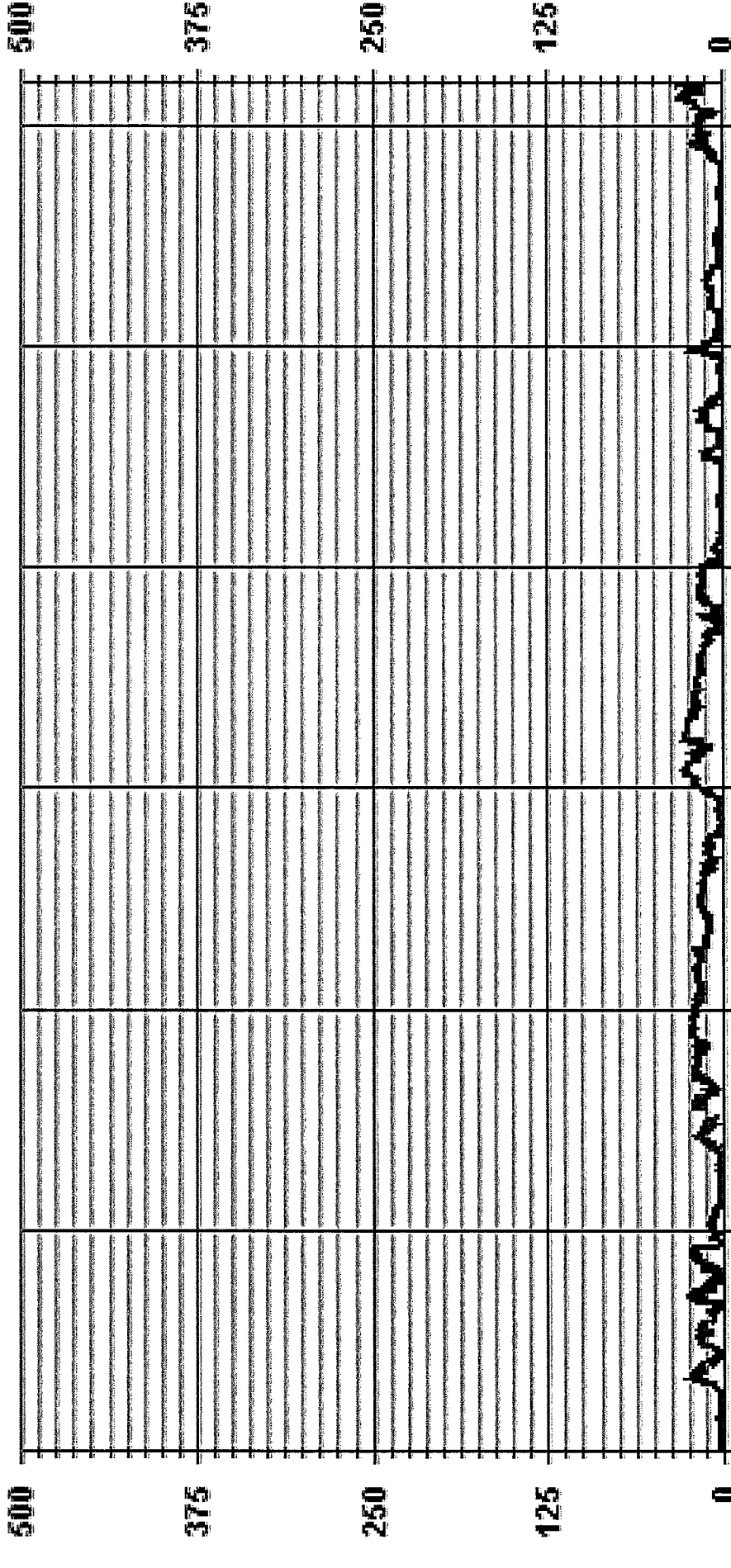
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES	0
NUMBER OF NON-ZERO READINGS	642
MAXIMUM 1-HR AVERAGE	30
MAXIMUM 24-HR AVERAGE	22.7
ISZ CALIBRATION TIME	34 HRS
MONTHLY CALIBRATION TIME	4 HRS
STANDARD DEVIATION	7.83
PPB @ HOUR(S)	22
ON DAY(S)	31
ON DAY(S) VAR- VARIOUS	17
OPERATIONAL TIME	744 HRS
AMD OPERATION UPTIME	100.0 %
MONTHLY AVERAGE	10 PPB

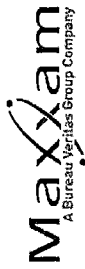
24 HOUR AVERAGES FOR DECEMBER 2015



01 Hour Averages



— LICA36 03_ PPB



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Elk Point Airport Site - DECEMBER 2015
JOB # 2833-2015-12-35- C

OZONE MAX instantaneous maximum in ppb

DAY	OZONE MAX instantaneous maximum in ppb																								DAILY MAX.	24-HOUR AVG.	RDGS.	
	0:00-1:00	1:00-2:00	2:00-3:00	3:00-4:00	4:00-5:00	5:00-6:00	6:00-7:00	7:00-8:00	8:00-9:00	9:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:00	16:00-17:00	17:00-18:00	18:00-19:00	19:00-20:00	20:00-21:00	21:00-22:00	22:00-23:00	23:00-0:00				
1	1	1	1	1	1	1	1	1	1	1	1	2	2	13	2	5	5	2	3	3	5	3	4	4	13	2.6	24	
2	1	5	1	1	1	1	1	1	1	1	1	2	7	12	16	21	26	22	24	21	17	23	24	4	26	11.3	24	
3	5	11	10	7	4	3	4	7	13	17	18	18	19	21	21	20	13	16	19	18	17	15	5	21	21	13.5	24	
4	9	9	10	10	10	10	2	3	6	6	20	21	25	26	25	21	15	15	17	13	14	7	5	13	26	13.3	24	
5	5	4	2	14	18	12	20	18	20	20	23	24	25	25	23	15	7	4	8	10	5	8	7	25	14.6	24		
6	8	9	10	10	11	10	10	8	8	7	8	8	7	6	4	2	1	1	1	1	1	1	1	11	6.1	24		
7	1	1	1	1	1	1	1	1	3	4	4	5	5	4	5	4	3	3	4	6	3	5	13	13	3.3	24		
8	12	17	20	20	18	20	20	17	19	15	16	13	17	17	7	C	C	C	C	18	23	5	22	21	23	17.5	24	
9	17	18	15	13	12	12	9	9	12	22	22	23	24	24	24	24	24	24	23	23	23	23	23	25	22.0	24		
10	22	21	22	19	18	12	22	22	21	19	19	18	17	19	18	19	18	19	5	20	20	20	19	22	19.9	24		
11	22	21	22	21	18	17	17	19	20	20	19	14	12	11	12	11	5	11	11	11	11	11	11	20	15.0	24		
12	20	20	18	18	18	17	17	19	20	20	19	14	12	11	12	11	5	17	16	15	15	17	16	15	19	15.5	24	
13	11	11	12	13	13	14	16	16	15	17	17	18	17	18	19	18	5	11	10	10	13	11	10	7	15	11.8	24	
14	15	15	14	14	14	14	10	12	12	9	8	12	14	15	14	5	11	10	10	10	10	10	10	7	15	11.8	24	
15	5	6	5	4	3	1	1	1	1	1	2	3	3	4	5	3	4	1	4	1	10	10	12	14	4.2	24		
16	15	17	21	21	24	25	21	23	28	28	29	29	29	29	26	26	22	20	19	23	21	24	20	12	29	22.7	24	
17	19	20	28	28	28	28	28	27	25	26	26	26	26	26	24	23	22	22	23	23	22	20	21	28	24.1	24		
18	20	21	20	21	20	21	20	18	20	19	20	19	20	19	20	19	15	16	16	16	17	17	17	16	21	18.6	24	
19	16	16	16	16	16	17	14	14	16	13	12	5	14	14	9	13	13	3	1	4	8	10	18	19	8	19	12.3	24
20	7	6	9	12	13	16	15	15	5	18	17	17	17	17	17	17	14	16	17	16	17	17	16	16	18	14.1	24	
21	14	14	12	11	8	1	1	1	1	5	3	6	8	7	6	5	3	1	1	1	1	1	1	1	14	4.7	24	
22	1	1	1	1	2	1	2	5	2	2	2	2	2	2	1	1	2	1	3	1	1	1	1	3	1.3	24		
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1.3	24	
24	6	3	4	11	10	5	12	15	16	16	15	15	15	15	13	12	9	11	10	9	6	2	2	16	10.4	24		
25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5.1	24	
26	19	15	14	5	9	5	2	3	4	4	2	2	2	2	1	1	3	3	5	7	10	10	9	19	5.9	24		
27	9	9	5	9	9	8	8	10	11	12	12	13	12	11	12	12	11	9	8	6	5	4	2	13	9.2	24		
28	1	5	2	1	1	1	3	3	7	7	3	6	6	4	4	2	1	1	1	1	1	1	1	7	2.7	24		
29	5	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	2	1.3	24		
30	1	1	1	1	1	1	1	6	7	6	10	9	13	22	19	21	15	14	15	16	19	19	5	19	11.3	24		
31	21	22	17	17	17	20	15	7	16	20	21	22	23	27	28	32	32	31	31	24	30	5	32	31	22.3	24		
HOURLY MAX	22	22	28	28	28	28	28	27	28	29	29	29	29	29	28	32	32	31	31	24	30	24	32	31	32	23.3	24	
HOURLY AVG	10.3	10.8	10.7	10.4	10.7	9.7	10.2	10.1	10.9	11.1	12.5	12.9	13.5	13.7	14.0	14.1	12.0	10.9	10.7	10.9	12.4	11.7	12.7	12.1				

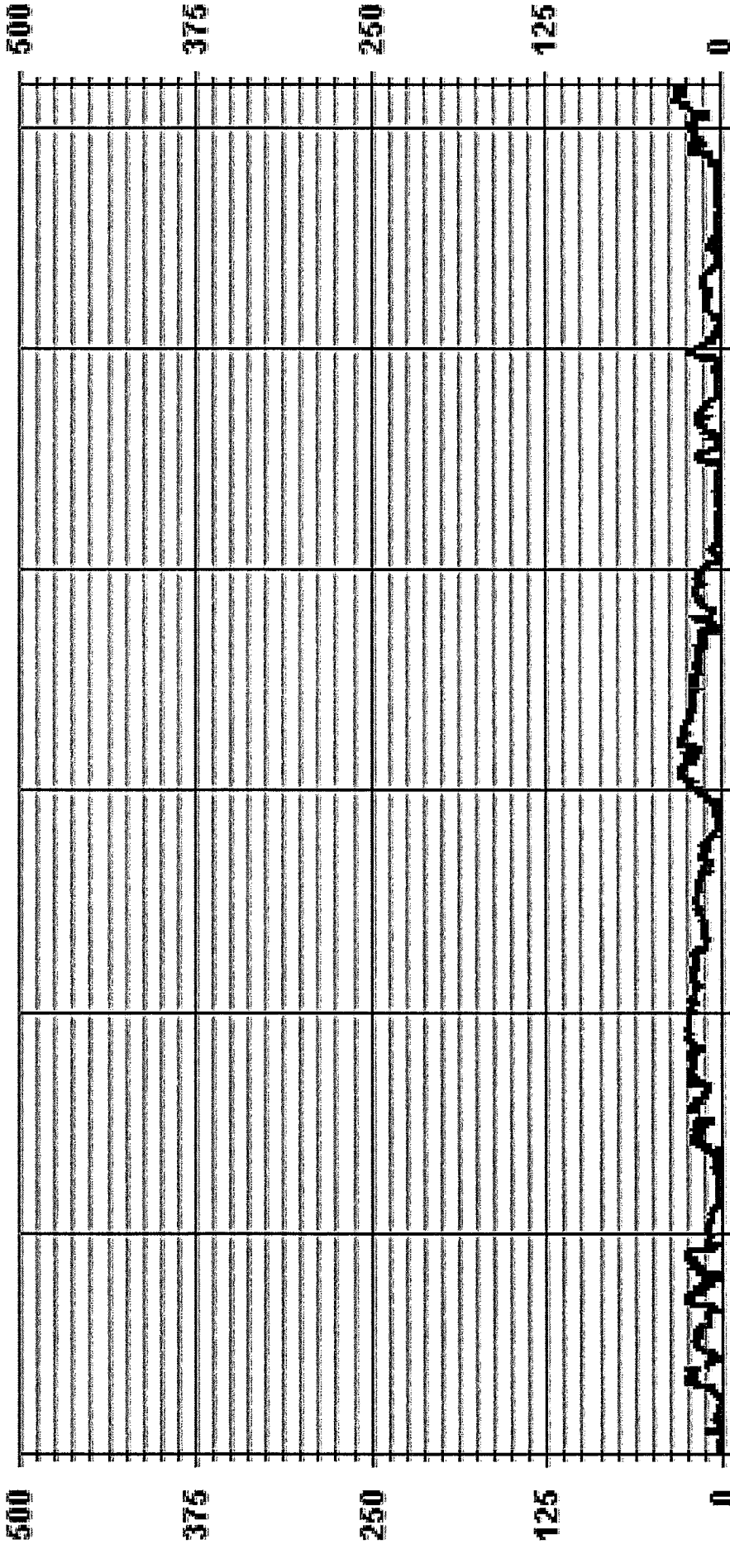
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
V	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	Y	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	705	PPB	@ HOUR(S)	22	ON DAY(S)	31
MAXIMUM INSTANTANEOUS VALUE:	32	PPB				VAR-VARIOUS
IZS CALIBRATION TIME:	35	HRS	OPERATIONAL TIME:			744
MONTHLY CALIBRATION TIME:	4	HRS				HRS
STANDARD DEVIATION:	8.28					

01 Hour Averages



— LICA35 O3MAX PPB

IICA-ELK
 O3_ / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : IICA-ELK
 Parameter : O3
 Units : PPS

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50	1.98	.99	.99	2.54	15.58	21.95	8.07	2.83	1.41	1.69	2.40	9.63	11.04	8.64	7.22	2.97	100.00
< 110	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 210	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.98	.99	.99	2.54	15.58	21.95	8.07	2.83	1.41	1.69	2.40	9.63	11.04	8.64	7.22	2.97	

Calm : .00 %

Total # Operational Hours : 706

Distribution By Samples

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50	14	7	7	18	110	155	57	20	10	12	17	68	78	61	51	21	706
< 110																	
< 210																	
>= 210																	
Totals	14	7	7	18	110	155	57	20	10	12	17	68	78	61	51	21	

Calm : .00 %





Total # Operational Hours : 706

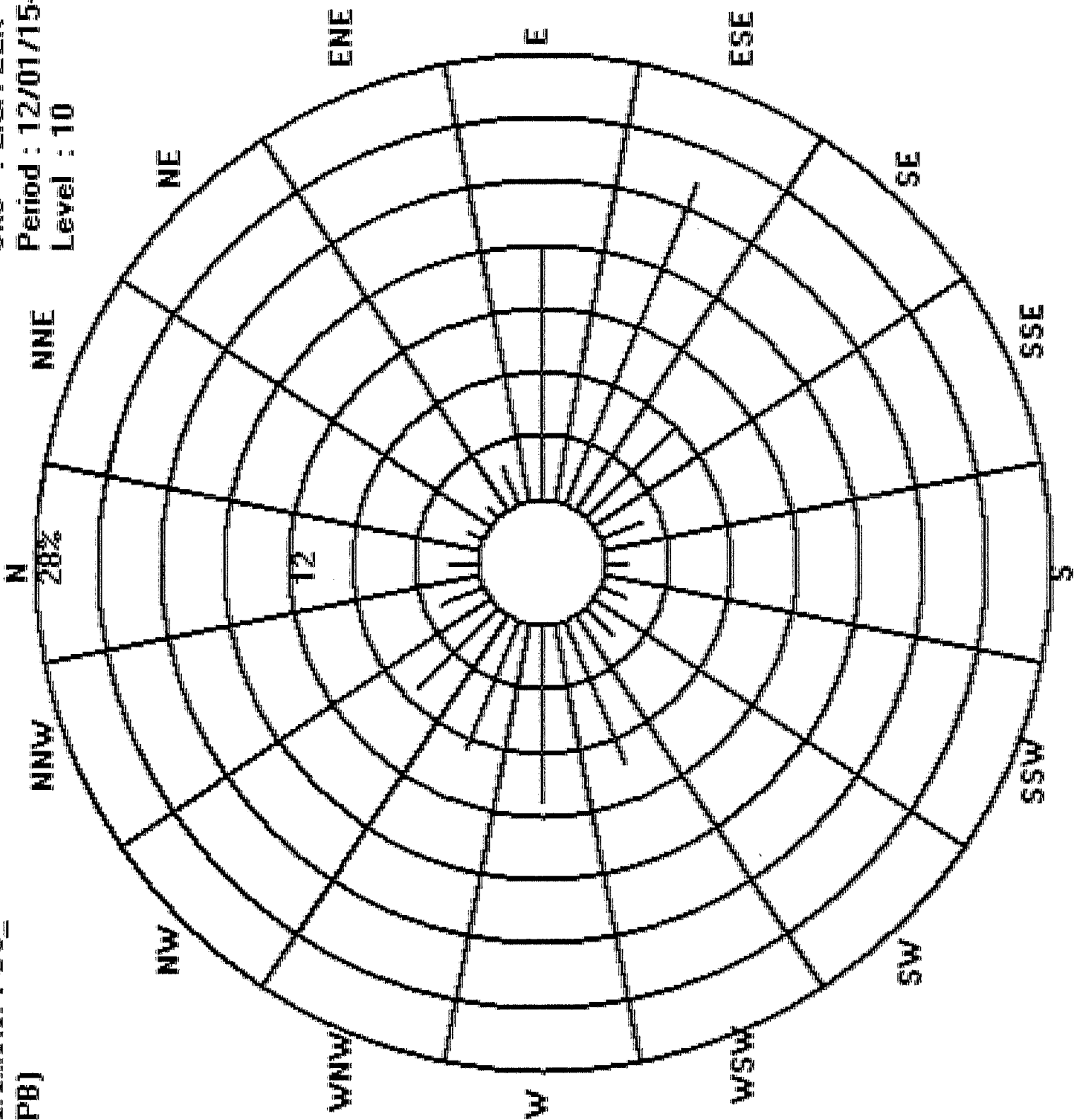
Logger : 35 Parameter : 03_

Site : LICA-ELK

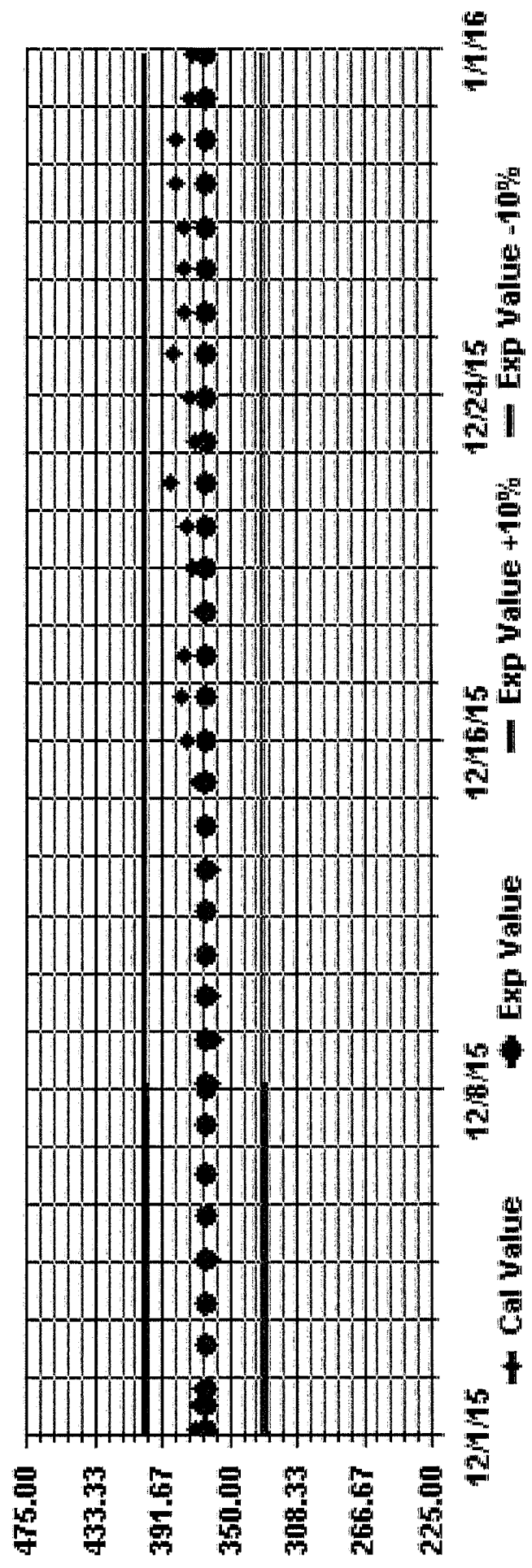
Class Limits (PPB)

Period : 12/01/15-12/31/15
Level : 10

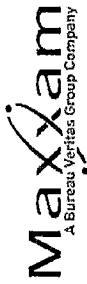
-  >= 210
-  < 210
-  < 110
-  < 50



Calibration Graph for Site: LICA35 Parameter: O3_ Sequence: O3_NEW Phase: SPAM



PARTICULATE MATTER 2.5



PARTICULATE MATTER 2.5 (LESS THAN 2.5 MICRONS) (PM2.5) hourly averages in ug/m3

MST

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	DAILY MAX	24-HOUR AVG.	RDGS.
1	16	15	17	17	19	16	16	17	21	23	21	23	25	28	25	23	21	24	21	21	21	18	16	16	16	18	26	8	25	14	28	19.8	24	
2	26	21	17	20	18	15	21	20	21	23	21	23	21	17	11	5	6	2	9	10	6	8	8	5	5	26	14.6	5	26	14.6	24			
3	6	5	10	3	0	14	7	10	10	7	10	X	10	3	5	18	13	10	1	3	1	3	1	3	7	18	7.1	18	7.1	22	24			
4	3	2	5	4	3	9	3	2	4	4	1	3	4	2	4	0	0	7	3	12	3	12	3	12	13	4.3	13	4.3	24	24				
5	7	3	1	5	1	2	5	4	5	1	1	0	0	0	0	0	5	3	1	0	3	1	0	3	1	7	2.2	7	2.2	24				
6	5	7	0	4	0	0	2	5	2	1	1	2	0	4	6	0	6	5	7	5	5	5	4	7	7	3.5	7	3.5	24	24				
7	4	0	10	10	0	7	9	8	9	12	7	14	13	5	9	6	12	8	5	9	8	5	8	6	14	7.7	14	7.7	24	24				
8	5	9	4	1	4	5	1	8	4	3	6	6	2	6	7	4	6	8	4	8	5	0	5	0	9	4.6	9	4.6	24	24				
9	10	5	2	8	9	12	13	11	17	17	8	11	C	0	6	8	7	7	7	8	6	5	6	17	8.7	17	8.7	24	24					
10	5	4	10	6	6	7	8	5	7	8	7	6	8	9	6	5	1	5	2	7	8	6	5	10	6.1	10	6.1	24	24					
11	5	4	3	5	6	9	7	4	0	5	2	3	1	2	5	8	4	7	6	1	5	4	4	9	4.3	9	4.3	24	24					
12	4	3	4	5	7	3	5	3	2	3	4	4	7	5	9	8	7	6	5	6	6	6	7	9	5.1	9	5.1	24	24					
13	8	6	7	6	6	6	5	3	5	1	7	7	6	6	4	3	3	5	1	1	1	1	4	4	8	4.4	8	4.4	24	24				
14	2	0	2	2	0	5	4	4	6	3	4	X	3	5	5	6	0	0	6	13	11	8	11	13	4.3	11	4.3	23	23					
15	13	13	14	13	10	11	19	17	11	11	14	13	8	12	14	13	11	11	15	15	13	13	14	9	19	12.8	14	12.8	24	24				
16	8	8	4	5	0	1	2	3	0	3	4	1	1	3	1	2	0	2	4	1	0	1	3	0	8	2.9	8	2.9	24	24				
17	6	3	4	0	3	0	2	0	1	1	1	0	0	4	0	2	1	0	1	3	0	2	4	1	6	1.6	6	1.6	24	24				
18	2	2	4	4	5	1	1	2	1	2	0	1	4	0	0	1	6	0	2	0	1	4	1	6	1.8	6	1.8	24	24					
19	2	6	2	3	5	4	4	9	5	6	5	6	4	4	10	4	4	8	5	7	5	1	5	2	10	4.8	10	4.8	24	24				
20	2	7	4	11	9	6	9	7	9	6	8	7	7	6	6	7	6	6	6	6	7	6	7	3	11	6.7	11	6.7	24	24				
21	5	7	7	9	8	12	11	12	11	11	8	13	29	25	25	26	20	24	22	25	22	25	22	25	26	26	17.0	24	17.0	24	24			
22	24	20	19	19	19	22	20	19	20	19	15	20	21	24	24	21	20	17	22	21	20	21	19	24	24	20.0	24	20.0	24	24				
23	19	23	22	23	19	22	27	24	26	24	18	10	8	13	10	9	13	19	23	21	24	21	17	27	19.1	24	19.1	24	24	24				
24	10	9	6	3	5	3	5	0	1	8	0	C	0	3	7	1	2	2	2	3	6	6	1	3	10	3.9	10	3.9	24	24				
25	5	8	5	1	7	5	1	6	5	4	4	8	7	5	6	4	5	4	5	1	3	0	8	4.6	8	4.6	24	24	24	24				
26	3	2	5	6	5	11	12	12	14	11	13	7	5	11	9	10	13	9	17	8	10	12	13	13	17	9.6	13	9.6	24	24				
27	15	9	10	12	9	13	10	10	10	8	11	5	11	12	11	9	13	11	9	8	9	11	11	11	15	10.4	11	10.4	24	24				
28	10	15	9	15	10	12	13	13	13	15	9	13	12	11	15	14	8	15	10	11	13	14	16	19	12.7	14	12.7	24	24					
29	17	20	10	8	13	16	12	12	13	13	11	12	12	12	14	14	14	16	13	13	13	10	11	20	12.9	24	12.9	24	24	24				
30	12	6	7	10	13	14	12	12	13	12	7	6	8	6	7	8	6	4	6	5	2	2	14	8.2	14	8.2	24	24	24	24				
31	2	6	9	6	9	7	7	7	5	4	3	3	0	0	3	2	0	1	4	1	0	3	1	0	9	3.5	9	3.5	24	24				
HOURLY MAX	26	23	22	23	19	22	27	24	26	24	24	23	29	28	25	26	21	24	22	25	26	26	25	26	26	26	26	26	26	26	26			
HOURLY AVG	8.4	8.2	7.6	7.8	7.3	8.7	8.9	8.7	9.0	8.5	8.1	7.9	7.7	8.5	8.0	7.6	7.9	7.8	7.9	7.6	8.2	7.2	8.5	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3			

STATUS FLAG CODES

C	-CALIBRATION	Q	-QUALITY ASSURANCE
Y	-MAINTENANCE	R	-RECOVERY
S	-DAILY ZERO/SPAN CHECK	X	-MACHINE MALFUNCTION
P	-POWER FAILURE	O	-OPERATOR ERROR
G	-OUTPOST REPAIR	K	-COLLECTION ERROR

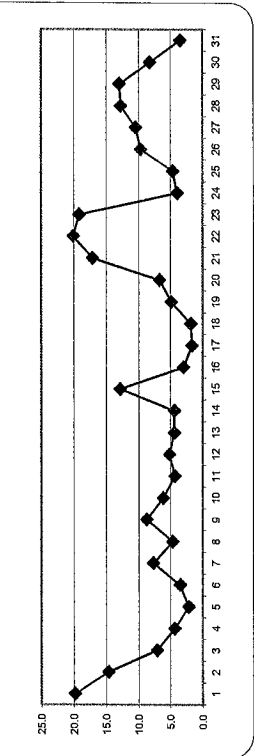
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 24-HR: 30 ug/m3

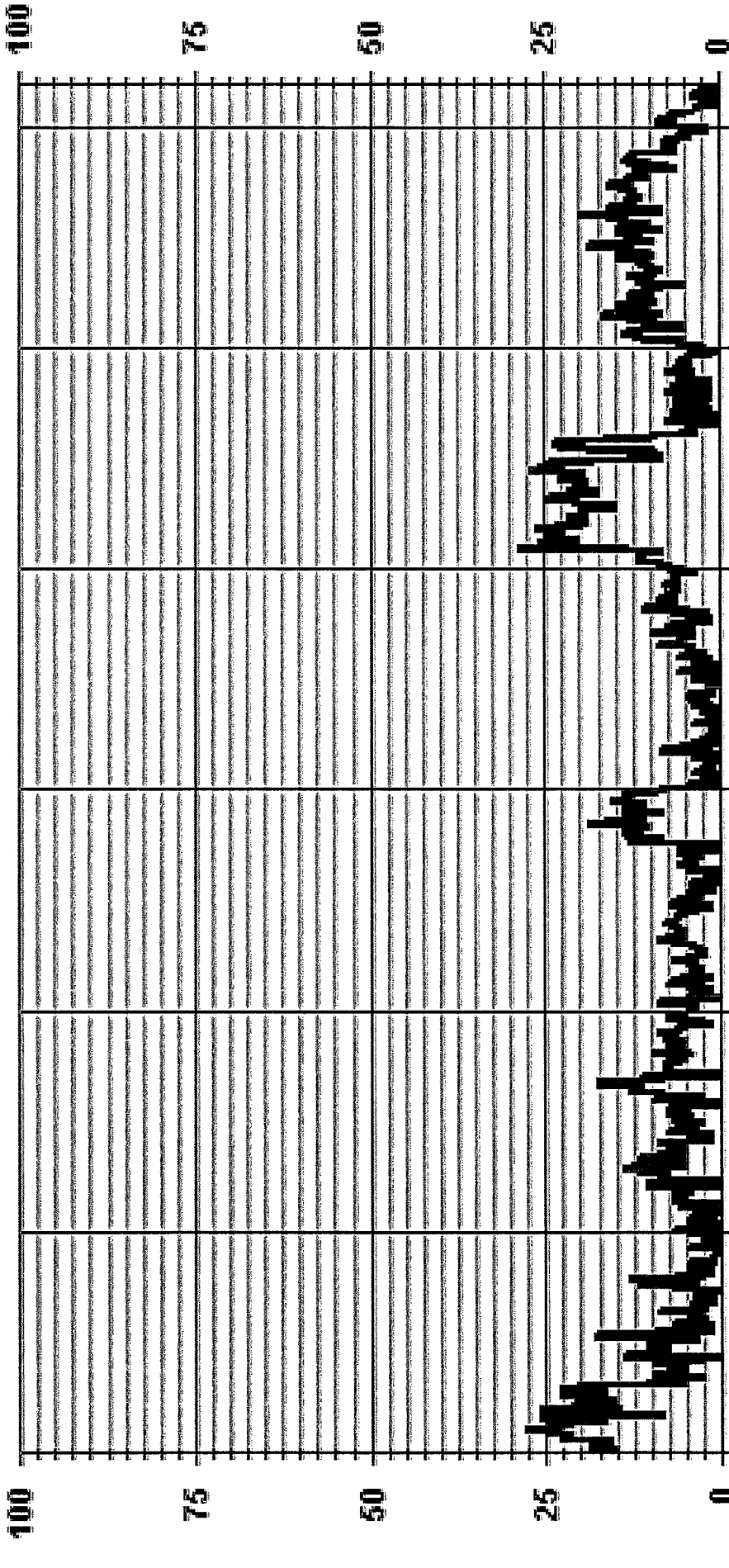
MONTHLY SUMMARY

NUMBER OF 24-HR EXCEEDENCES:	0
NUMBER OF NON-ZERO READINGS:	686
MAXIMUM 1-HR AVERAGE:	29 ug/m3 @ HOUR(S) 12
MAXIMUM 24-HR AVERAGE:	20.0 ug/m3
MONTHLY CALIBRATION TIME:	2 HRS
MONTHLY OPERATIONAL TIME:	741 HRS
MONTHLY STANDARD DEVIATION:	6.44
MONTHLY AMOUNT OF OPERATION:	99.6 %
MONTHLY AVERAGE:	8.1 ug/m3

24 HOUR AVERAGES FOR DECEMBER 2015



01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA35 PM2.5 UG/M3

LICA-ELK
 PM2 / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : PM2
 Units : UG/M3

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 30	2.02	.94	1.07	2.56	15.51	22.26	7.96	2.69	1.48	1.75	2.29	9.98	10.66	8.50	7.28	2.96	100.00
< 60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 80	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 120	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 240	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 240	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	2.02	.94	1.07	2.56	15.51	22.26	7.96	2.69	1.48	1.75	2.29	9.98	10.66	8.50	7.28	2.96	

Calm : .00 %

Total # Operational Hours : 741

Distribution By Samples

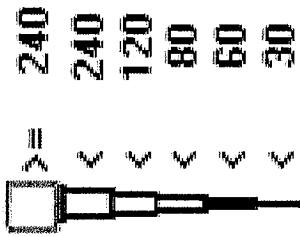
Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 30	15	7	8	19	115	165	59	20	11	13	17	74	79	63	54	22	741
< 60																	
< 80																	
< 120																	
< 240																	
>= 240																	
Totals	15	7	8	19	115	165	59	20	11	13	17	74	79	63	54	22	

Calm : .00 %

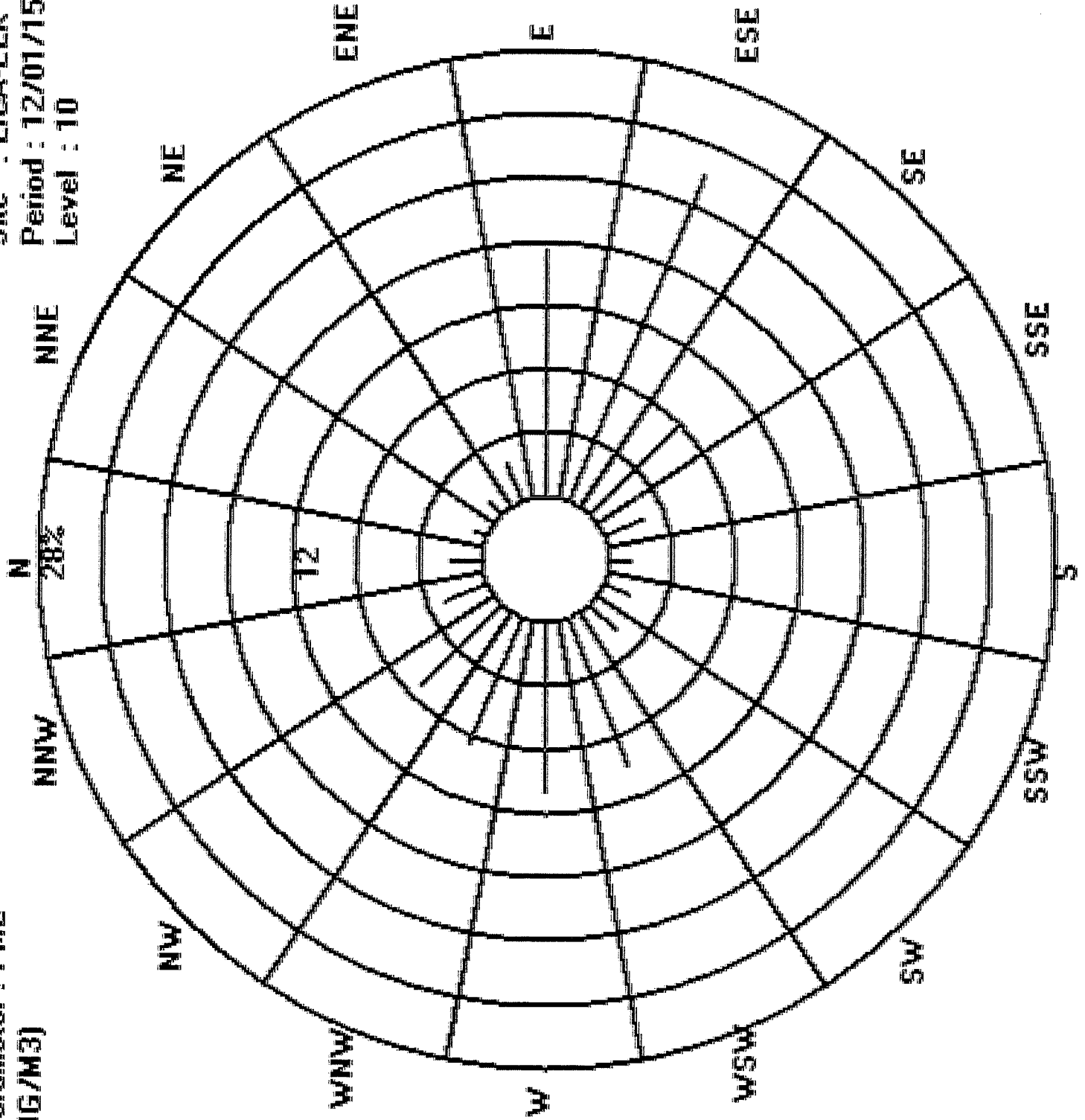
Total # Operational Hours : 741

Logger : 35 Parameter : PM2

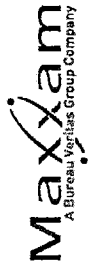
Class Limits (UG/M3)



Site : LICA-ELK
Period : 12/01/15-12/31/15
Level : 10



WIND SPEED



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Elk Point Airport Site - DECEMBER 2015
JOB # 2833-2015-12-35-C

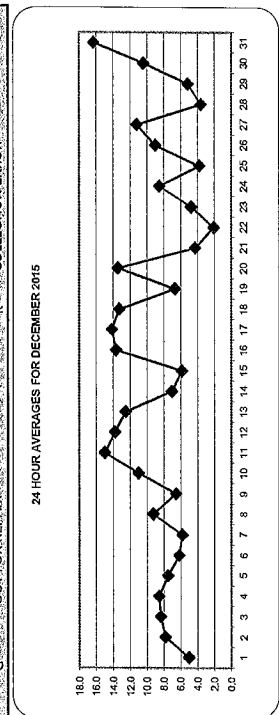
WIND SPEED (WS) hourly averages in km/hr

DAY	WIND SPEED (WS) hourly averages in km/hr																								24-HOUR AVG.		
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00			
1	1.2	1.5	0.2	2.0	1.2	2.5	2.9	1.9	0.4	2.2	2.8	5.2	4.4	1.8	5.4	0.2	7.0	9.2	11.3	9.6	10.5	12.3	12.6	11.7	12.6	5.0	24
2	1.0	1.2	4.1	3.1	6.4	9.3	10.9	10.2	7.7	8.0	4.1	3.0	0.3	4.5	6.6	7.9	16.4	17.4	15.0	5.6	7.8	18.4	8.7	10.2	18.4	7.8	24
3	2.3	1.3	4.2	1.3	5.1	5.2	6.5	6.4	7.9	12.1	13.8	11.5	10.2	13.0	8.6	12.2	12.6	12.4	15.7	12.6	7.1	6.8	7.4	4.7	15.7	8.4	24
4	4.4	6.1	6.7	7.1	7.3	3.7	4.4	2.7	2.6	5.0	15.6	18.3	24.4	24.4	19.9	7.9	7.3	8.8	12.6	5.8	1.7	0.4	3.0	5.1	24.4	8.6	24
5	2.9	3.3	2.1	3.7	11.0	5.7	5.8	7.5	8.3	6.6	8.4	12.0	11.2	11.8	9.1	6.0	5.5	5.4	8.5	8.9	9.9	8.8	8.7	9.1	12.0	7.5	24
6	9.8	10.4	10.7	10.1	9.7	10.9	11.5	8.3	9.6	6.3	9.5	6.5	2.8	1.6	2.8	1.1	1.5	2.7	4.3	4.6	6.5	3.8	5.8	3.4	11.5	6.2	24
7	2.7	3.0	4.2	3.4	5.5	5.8	9.1	5.6	5.2	7.0	6.6	7.1	5.5	1.5	1.2	2.7	4.6	4.5	6.0	8.0	5.6	8.2	14.2	12.0	14.2	5.8	24
8	6.7	12.7	9.3	7.3	8.4	13.0	11.3	10.9	8.8	5.6	7.6	2.8	3.2	6.6	9.5	11.7	9.2	10.5	9.7	12.9	14.6	11.2	11.8	7.0	14.6	9.3	24
9	2.5	2.1	1.9	5.5	10.7	10.2	11.5	14.0	11.3	5.3	6.1	5.8	5.3	8.9	3.7	3.3	2.0	2.9	5.2	7.3	6.4	8.8	7.8	8.7	14.0	6.6	24
10	6.7	4.0	6.5	4.8	4.7	2.1	3.6	5.2	5.8	10.6	11.4	11.0	11.4	14.1	14.0	12.4	14.3	15.2	16.7	17.4	17.0	18.7	17.5	18.7	18.7	11.0	24
11	12.0	9.3	9.4	10.1	14.6	16.5	17.6	17.5	16.0	16.4	17.3	20.9	19.1	16.3	15.3	13.7	13.8	14.7	15.1	14.6	14.1	15.0	15.8	13.8	20.9	15.0	24
12	16.4	15.3	13.6	11.7	12.8	11.1	11.1	11.2	13.4	10.7	12.3	13.1	13.9	11.8	12.6	14.0	12.1	12.3	14.2	13.9	16.7	18.0	18.7	19.8	19.8	13.8	24
13	19.1	18.5	18.5	16.1	16.5	17.7	21.9	17.0	17.1	19.7	18.5	19.2	15.9	11.4	7.3	6.3	3.0	4.2	3.4	5.7	7.0	5.5	4.2	21.9	12.5	24	
14	6.3	6.5	6.6	6.6	6.0	6.7	7.0	5.1	5.7	4.2	5.8	5.7	5.9	8.5	7.0	9.5	8.7	5.4	8.5	9.6	10.8	6.4	6.7	10.8	7.0	24	
15	7.6	9.3	10.7	3.0	4.3	2.6	3.6	6.6	6.5	6.5	3.6	2.0	4.1	5.6	2.6	0.9	1.3	5.8	6.1	10.0	11.2	11.4	10.7	8.6	11.4	5.9	24
16	11.4	9.3	10.7	8.6	9.5	15.7	18.8	12.4	11.7	17.1	18.5	21.9	18.6	19.8	18.3	13.2	13.2	16.0	14.7	12.9	14.1	12.5	6.7	5.6	21.9	13.6	24
17	9.7	11.1	15.9	17.5	22.5	21.7	18.9	15.1	15.2	17.2	18.9	21.2	19.8	17.7	16.4	10.7	10.5	12.5	11.6	9.7	7.6	6.4	6.1	5.1	22.5	14.1	24
18	5.1	3.8	3.5	2.7	3.9	3.7	3.2	5.4	10.5	14.0	15.8	18.2	20.2	21.0	20.0	19.1	20.5	19.3	20.2	18.2	16.3	19.7	18.2	21.0	19.3	24	
19	15.9	13.5	11.6	9.5	6.1	4.7	7.7	5.5	7.7	6.3	4.5	3.2	4.4	1.5	3.4	3.9	5.5	5.0	4.2	4.4	7.2	7.7	9.4	7.7	15.9	6.7	24
20	7.9	7.7	7.1	8.3	9.2	10.3	10.3	16.3	17.8	19.9	21.7	18.7	19.6	19.2	16.6	14.0	15.1	9.7	12.8	14.1	12.5	12.1	5.4	21.7	13.4	24	
21	6.1	1.8	2.9	2.0	4.3	6.8	5.2	6.6	7.3	3.8	6.8	6.8	4.0	3.4	3.4	2.8	4.5	4.1	3.4	3.4	3.4	0.7	1.1	2.4	7.3	4.3	24
22	1.5	2.6	3.0	0.6	0.2	2.0	4.3	1.5	1.1	0.3	1.7	1.1	0.8	2.5	3.7	1.1	2.3	2.5	4.5	2.2	2.9	3.5	2.7	1.3	4.5	2.1	24
23	0.1	2.9	6.2	3.2	5.2	7.0	2.3	2.4	4.2	1.6	2.4	4.2	5.9	4.0	3.8	4.5	4.9	4.4	5.5	9.7	7.6	7.2	6.8	8.0	9.7	4.8	24
24	8.2	8.5	7.1	8.5	6.5	9.4	8.4	10.2	12.6	9.7	10.8	9.6	7.5	10.1	7.3	9.4	6.8	4.4	9.9	10.5	10.1	8.7	5.8	4.7	12.6	8.5	24
25	4.1	1.0	0.7	1.8	0.3	1.9	2.4	0.9	0.7	2.6	2.0	2.0	4.1	5.4	4.9	4.5	4.9	5.1	3.8	2.5	6.5	9.7	10.0	9.5	10.0	3.8	24
26	12.4	14.2	9.0	12.6	13.0	11.0	7.5	9.6	7.5	8.4	1.9	1.8	1.4	3.9	5.4	4.0	8.7	10.9	10.7	11.9	11.3	11.5	13.5	14.1	14.2	9.0	24
27	13.1	14.1	14.2	14.4	14.9	11.4	12.0	12.3	14.4	13.4	14.1	14.5	15.0	13.2	12.6	16.7	16.3	12.1	1.4	4.9	4.6	5.0	2.9	1.2	16.7	11.2	24
28	1.3	0.2	0.8	2.4	5.7	8.1	6.6	5.3	7.4	7.7	7.3	5.4	1.9	3.7	4.7	2.4	1.7	1.4	0.5	4.1	3.7	2.6	0.6	0.8	8.1	3.6	24
29	0.2	3.8	4.4	4.8	7.8	4.6	4.3	4.5	5.8	5.6	6.5	6.3	3.8	5.4	6.5	8.4	7.0	7.5	5.8	5.6	5.6	3.6	1.9	3.7	8.4	5.1	24
30	2.9	2.7	0.4	2.7	6.1	7.6	10.7	10.8	11.5	13.0	11.2	11.8	18.3	17.7	18.6	12.0	11.8	12.1	12.5	10.9	13.0	12.2	11.6	8.5	18.6	10.4	24
31	11.8	11.0	5.3	2.8	8.2	7.7	5.1	3.6	6.9	10.4	12.9	14.0	19.5	23.5	27.9	29.7	27.4	26.9	25.6	24.8	23.1	22.0	23.7	16.5	29.7	16.3	24
HOURLY MAX	19.1	18.5	18.5	17.5	22.5	21.7	21.9	17.5	17.1	19.7	19.9	21.9	24.4	24.4	27.9	29.7	27.4	26.9	25.6	24.8	23.1	22.0	23.7	19.8			
HOURLY AVG	6.9	6.9	6.7	6.4	8.0	8.3	8.5	8.1	8.6	9.0	9.3	9.8	9.8	10.1	9.8	8.8	9.0	9.4	9.6	9.5	9.6	9.7	9.7	9.3	8.3		

STATUS FLAG CODES

C	QUALITY ASSURANCE
Q	RECOVERY
R	MACHINE/MAINTENANCE
M	OPERATOR ERROR
O	COLLECTION ERROR
K	
G	

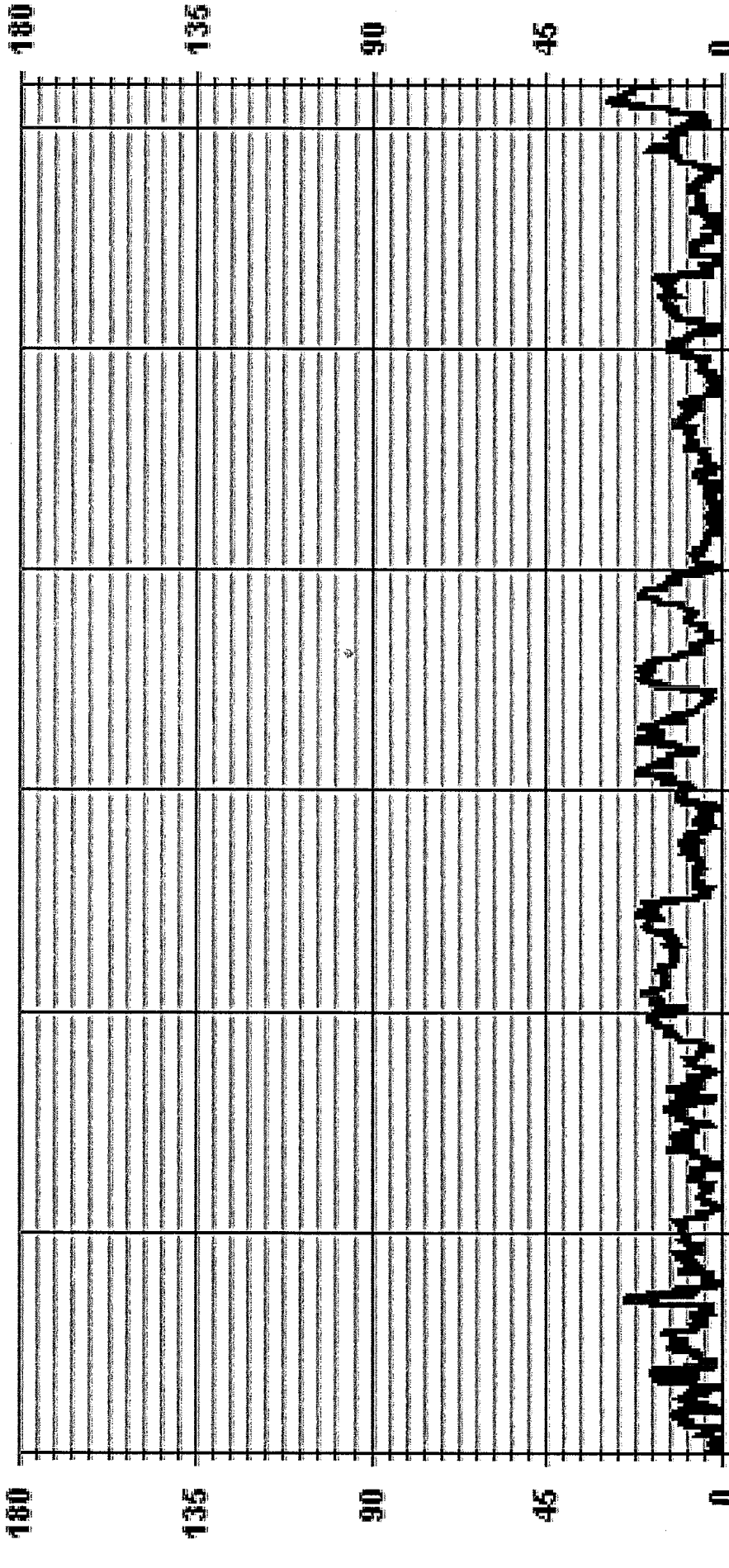
LAST CALIBRATION: November 25, 2015
DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MAXIMUM 1-HR AVERAGE:	29.7 KPH
MAXIMUM 24-HR AVERAGE:	16.3 KPH
MONTHLY CALIBRATION TIME:	0 HRS
STANDARD DEVIATION:	5.62
OPERATIONAL TIME:	
AMTD OPERATION UPTIME:	
MONTHLY AVERAGE:	
ON DAY(S)	15
ON DAY(S) VAR- VARIOUS	31
HRS	744
%	100.0
KPH	8.7

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA35 WSP KPH



VECTOR WIND SPEED MAX instantaneous maximum in km/hr

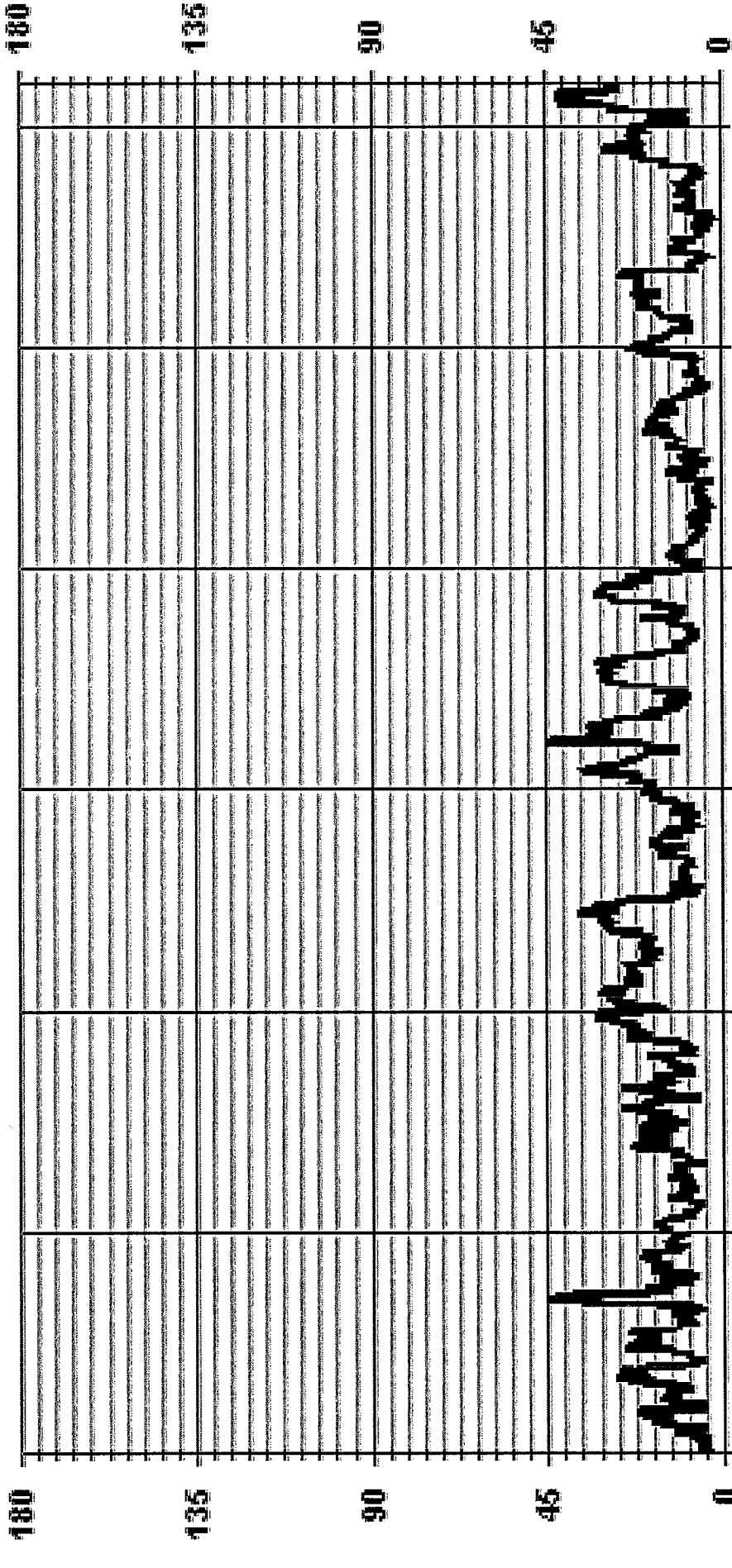
DAY	MST																								DAILY MAX	24-HOUR AVG.	ROGS
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00			
1	3.7	5.1	5.9	6.7	3.1	5.4	6.3	5.4	3.4	5.0	8.8	11.6	12.4	7.3	10.5	3.8	12.0	15.9	18.5	15.6	14.9	19.8	14.1	22.4	10.1	24	
2	5.4	3.8	6.8	4.9	10.7	13.9	15.9	14.8	11.1	15.0	11.4	9.3	9.3	14.1	13.8	20.7	24.2	26.1	27.3	20.5	21.0	26.7	19.0	27.3	15.4	24	
3	10.2	6.2	7.3	4.9	9.0	7.5	9.8	12.4	13.0	19.8	24.8	21.2	19.4	22.7	15.5	17.4	18.0	15.9	24.3	19.6	12.6	11.2	11.0	7.8	24.8	24	
4	8.2	8.6	11.9	10.9	13.5	7.7	7.0	6.2	7.6	16.7	31.2	36.5	45.3	43.6	39.3	19.5	12.4	19.0	19.3	15.3	12.5	7.7	12.9	16.4	45.3	24	
5	5.8	9.7	7.9	17.2	18.5	12.9	16.7	13.9	17.5	17.3	19.8	21.1	19.6	19.9	15.5	11.4	10.6	12.2	12.7	13.8	12.3	12.5	11.0	12.1	21.1	24	
6	13.1	13.7	16.2	14.4	15.6	17.4	16.1	12.2	12.8	10.7	6.5	10.6	7.5	7.3	6.3	6.6	4.5	8.4	8.3	14.3	12.6	11.1	9.9	9.3	17.4	24	
7	6.2	8.6	10.8	6.8	8.5	8.6	13.8	12.2	11.3	11.4	10.9	11.8	12.0	5.3	5.5	8.6	8.4	9.5	12.6	12.8	9.6	13.3	21.9	24.0	11.0	24	
8	15.0	21.7	18.7	14.0	14.8	21.6	20.3	21.6	18.8	11.0	21.5	16.1	9.1	11.0	15.2	19.2	13.1	17.5	17.8	22.1	25.8	17.3	20.8	16.0	25.8	24	
9	10.2	5.3	9.6	11.7	17.6	19.3	21.5	26.2	20.2	14.7	13.0	13.8	13.3	17.9	13.0	7.1	8.9	8.5	9.2	12.6	12.2	14.4	13.9	15.6	26.2	24	
10	19.5	9.0	9.6	8.1	7.7	9.3	8.3	10.3	17.4	20.5	24.4	18.2	19.3	21.1	24.5	21.3	22.6	22.9	25.9	28.7	29.4	32.6	28.8	32.4	32.6	24	
11	20.7	15.4	16.1	17.4	22.5	27.3	27.8	27.0	29.9	25.9	27.7	30.7	30.4	25.5	24.3	20.2	22.2	22.0	25.0	21.9	21.4	22.0	24.1	21.8	30.7	24	
12	23.4	24.1	21.9	18.0	18.9	17.6	18.1	18.9	20.6	14.8	18.8	20.2	21.4	18.6	18.3	20.9	18.7	19.5	25.6	19.9	29.0	27.4	29.6	30.4	30.4	24	
13	28.8	29.8	28.5	30.8	28.6	29.8	37.3	25.8	29.8	33.1	30.2	28.3	25.0	19.6	12.8	11.0	13.8	7.0	7.0	6.6	10.8	13.0	11.2	7.7	37.3	24	
14	10.1	10.3	9.5	10.1	9.6	10.2	10.2	7.8	8.3	7.2	9.2	9.3	11.1	16.0	14.0	15.7	13.2	9.1	17.0	18.6	15.1	18.1	16.6	11.5	18.6	24	
15	11.8	14.9	14.6	6.6	8.9	6.5	7.0	10.1	8.4	10.1	7.5	5.5	12.6	12.6	8.0	6.9	9.4	10.7	11.4	16.3	18.6	17.0	14.8	17.9	18.6	24	
16	20.9	17.9	19.5	17.7	17.0	22.7	22.1	23.0	20.5	31.2	34.9	35.5	32.9	32.2	26.7	24.3	21.4	24.3	21.8	20.7	18.8	19.9	11.2	12.2	35.5	24	
17	17.8	19.9	24.1	44.5	42.6	35.3	34.4	28.7	30.9	27.6	30.4	34.6	32.2	31.1	26.3	26.4	15.3	20.4	20.1	19.0	14.5	11.3	10.8	9.9	44.5	24	
18	9.7	14.9	11.6	7.9	11.5	10.1	8.8	17.2	17.6	24.1	25.9	29.1	28.9	30.2	30.3	29.2	30.4	32.0	28.1	29.0	26.7	27.3	32.5	28.8	32.5	24	
19	25.0	22.6	17.5	15.2	12.7	9.0	11.3	10.3	12.4	10.5	8.3	6.0	7.1	5.4	8.4	8.5	9.1	8.6	13.1	11.0	14.1	15.0	20.5	10.1	25.0	24	
20	11.3	10.3	9.2	11.0	16.9	16.6	16.4	27.5	27.8	28.5	31.9	32.8	29.6	30.8	30.7	23.2	21.1	25.4	17.2	24.7	23.0	19.5	19.8	10.1	32.8	24	
21	10.8	5.2	6.4	5.0	7.0	10.7	10.4	12.8	13.6	13.2	8.8	11.3	12.2	9.4	8.0	8.1	5.4	7.1	7.0	5.6	5.8	4.9	3.7	6.3	13.6	24	
22	7.0	8.2	6.6	7.1	2.6	7.1	8.4	4.4	4.2	2.2	5.9	3.1	3.7	5.8	6.1	4.2	4.8	6.3	6.7	6.9	5.1	5.7	4.8	4.4	8.4	24	
23	1.9	6.2	10.7	8.7	8.4	14.0	6.3	5.9	7.5	4.5	4.2	9.6	10.1	8.6	7.5	6.8	9.2	8.3	12.3	13.7	12.4	11.4	10.8	11.3	14.0	8.8	24
24	13.8	13.1	13.1	13.1	19.7	13.4	14.5	12.8	19.5	18.6	17.0	18.4	16.4	13.3	14.1	10.8	17.1	13.9	11.3	16.0	13.1	12.4	11.1	10.2	8.5	19.7	24
25	8.8	5.8	3.9	3.4	2.3	7.1	6.0	3.7	5.5	6.1	9.9	5.2	6.9	7.2	7.5	7.8	6.8	7.3	5.9	6.2	12.9	19.9	20.7	18.9	20.7	8.2	24
26	22.9	22.4	16.6	17.6	17.9	15.3	14.9	13.4	11.9	13.6	7.1	9.6	7.0	8.2	10.2	7.3	13.5	14.9	15.4	15.5	16.4	15.6	20.7	21.7	22.9	14.6	24
27	18.4	20.1	20.4	21.3	21.8	15.1	19.7	19.9	21.8	21.6	20.2	22.0	20.8	19.6	21.2	26.5	25.5	21.0	7.0	7.2	7.5	8.0	7.5	4.4	26.5	17.4	24
28	6.0	3.7	4.5	6.4	9.1	13.3	9.6	8.3	11.2	10.4	10.9	6.9	6.8	5.8	6.1	4.5	4.4	3.9	3.5	7.2	5.0	5.5	2.3	2.7	13.3	6.6	24
29	2.7	5.5	6.5	8.5	11.7	10.5	7.6	6.3	8.2	8.3	8.9	12.0	6.6	7.8	8.7	10.8	9.8	10.5	7.6	7.9	9.1	5.3	4.6	5.4	12.0	8.0	24
30	4.5	7.9	5.7	15.4	14.7	14.4	19.6	19.6	23.2	20.2	20.2	30.2	26.4	27.6	21.0	21.5	21.3	22.3	20.8	22.6	23.9	20.0	20.4	30.2	19.3	24	
31	23.0	20.2	14.3	7.3	15.2	18.7	9.9	9.5	17.5	23.3	28.5	27.1	29.6	41.4	39.2	42.4	38.0	94.5	42.6	29.2	29.3	25.1	29.5	28.5	42.6	26.0	24
HOURLY MAX	28.8	29.8	28.5	44.5	42.6	35.3	37.3	28.7	30.9	33.1	34.9	36.5	45.3	43.6	39.3	42.4	38.0	34.5	42.6	29.2	29.4	32.6	32.5	32.4			
HOURLY AVG	12.8	12.6	12.4	12.9	13.9	14.5	14.7	14.7	15.6	16.0	17.4	17.6	17.6	17.6	16.5	15.4	14.9	15.5	16.4	16.0	15.9	15.9	16.1	15.2			

STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
V	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT-OF-REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY		OPERATIONAL TIME:	
MAXIMUM INSTANTANEOUS VALUE:	45.3 KPH	@ HOUR(S)	12
ON DAY(S)	12	VAR-VARIOUS	744 HRS

01 Hour Averages



— LICA35 WSMAX KPH

LICA-ELK
WSP / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 35
Site Name : LICA-ELK
Parameter : WSP
Units : KPH

Wind Parameter : WDR
Instrument Height : 10 Meters

Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
< 6.0	1.74	.94	1.07	1.88	8.60	4.97	2.41	2.41	1.07	1.20	1.07	2.28	3.36	2.95	1.47	.80	38.30			
< 12.0	.26	.00	.00	.67	5.91	5.91	1.34	.26	.40	.53	.67	5.64	5.10	2.95	3.22	1.88	34.81			
< 20.0	.00	.00	.00	.00	.94	10.75	3.89	.00	.00	.00	.53	2.01	2.15	1.34	1.74	.26	23.65			
< 29.0	.00	.00	.00	.00	.13	.67	.26	.00	.00	.00	.00	.00	.00	1.20	.80	.00	3.09			
< 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.13	.00	.00	.13			
>= 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
Totals	2.01	.94	1.07	2.55	15.59	22.31	7.93	2.68	1.47	1.74	2.28	9.94	10.61	8.60	7.25	2.95				

Calm : .00 %

Total # Operational Hours : 744

Distribution By Samples

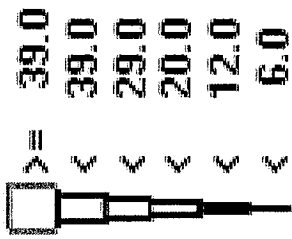
Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
< 6.0	13	7	8	14	64	37	18	18	8	9	8	17	25	22	11	6	285			
< 12.0	2			5	44	44	10	2	3	4	5	42	38	22	24	14	259			
< 20.0					7	80	29				4	15	16	10	13	2	176			
< 29.0					1	5	2							9	6		23			
< 39.0																				
>= 39.0														1			1			
Totals	15	7	8	19	116	166	59	20	11	13	17	74	79	64	54	22				

Calm : .00 %

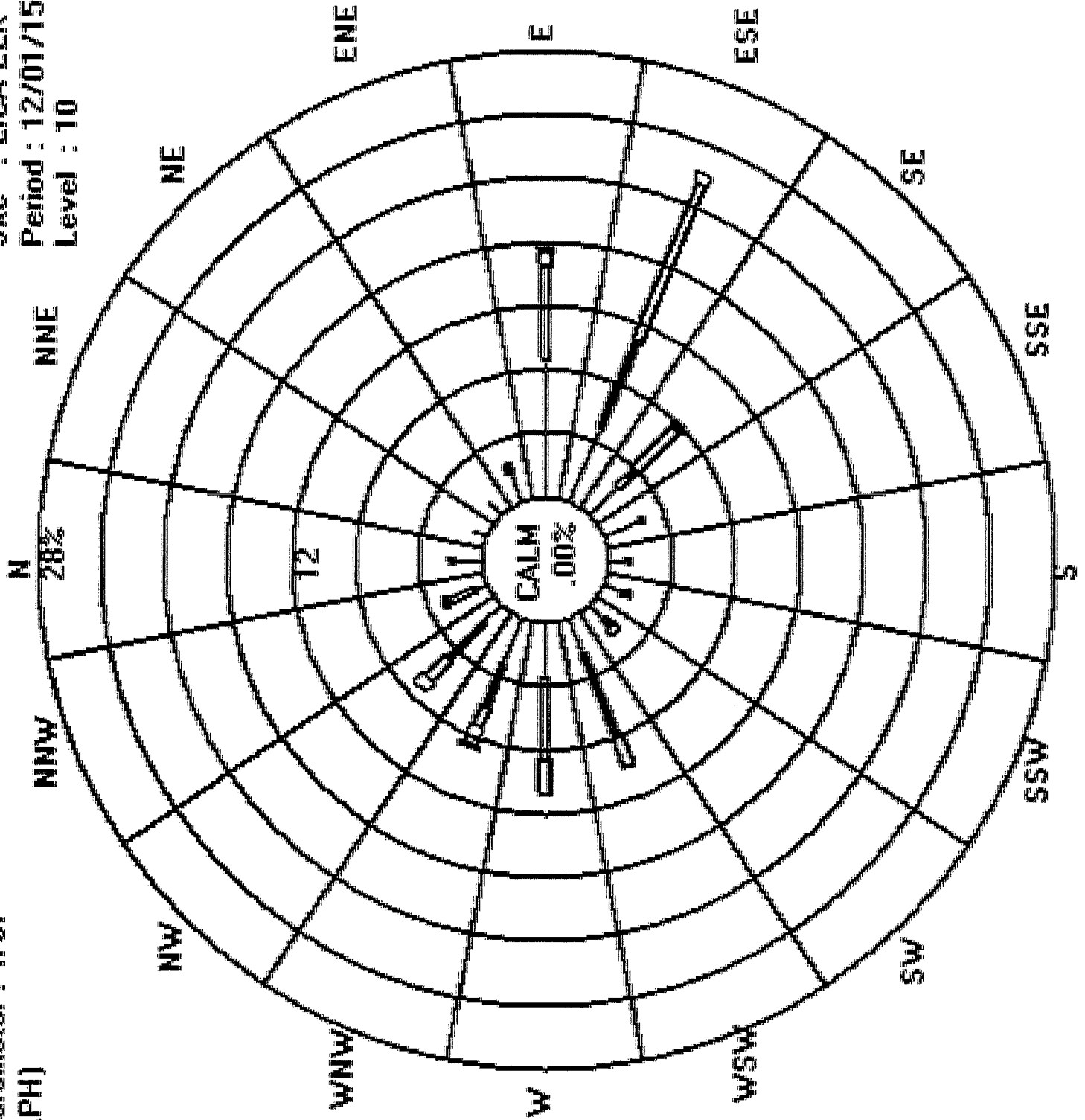
Total # Operational Hours : 744

Logger : 35 Parameter : WSP

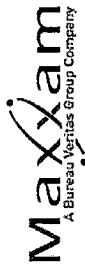
Class Limits (KPH)



Site : LICA-ELK
Period : 12/01/15-12/31/15
Level : 10



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Elk Point Airport Site - DECEMBER 2015
 JOB # 2833-2015-12-35-C

WIND DIRECTION (WD) hourly averages

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	
HR	ENE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
DIR	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
24-HOUR AVG																										
QUADRANT																										
RDCS.																										
1	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
2	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
3	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
4	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
5	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
6	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
7	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
8	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
9	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
10	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
11	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
12	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
13	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
14	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
15	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
16	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
17	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
18	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
19	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
20	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
21	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
22	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
23	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
24	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
25	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
26	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
27	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
28	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
29	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
30	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
31	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE

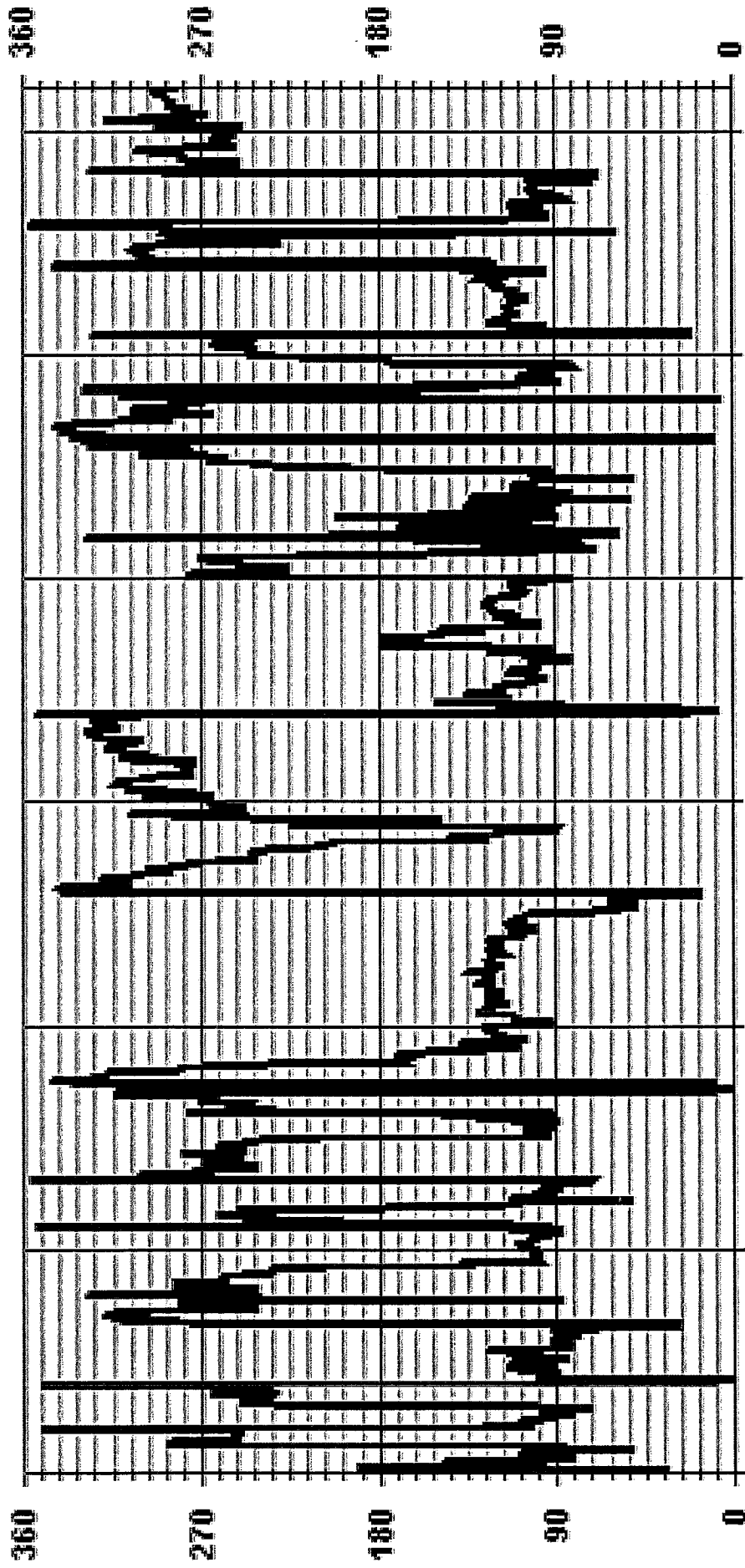
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
V	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	EO	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

LAST CALIBRATION: November 23, 2015
 DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	HRS	OPERATIONAL TIME:	744	HRS
STANDARD DEVIATION:	90.84		AMD OPERATION UPTIME:	100.0	%
MONTHLY AVERAGE:			MONTHLY AVERAGE:	SE	

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA35 WDR DEG

STANDARD DEVIATION WIND DIRECTION



STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	
1	8	17	30	20	12	25	5	13	9	8	24	14	26	50	11	45	24	31	10	9	35	16	7	7	42	
2	23	21	7	5	5	6	7	5	9	14	16	22	41	39	13	15	7	7	7	5	6	16	7	7	32	
3	39	44	21	10	14	16	6	16	10	8	9	17	17	14	12	4	6	5	5	6	7	8	10	11	10	
4	15	8	8	9	7	14	11	17	22	25	11	11	11	11	8	9	10	12	6	23	30	28	29	45		
5	16	29	34	23	21	20	21	16	17	19	16	13	11	11	9	26	8	11	6	6	5	4	6	5	5	
6	7	4	5	5	9	7	5	6	5	9	18	9	23	37	20	32	23	23	11	32	28	48	12	31	31	
7	19	22	47	17	9	12	8	13	13	9	13	13	14	30	20	40	10	16	10	7	10	7	7	14	14	
8	18	11	12	12	13	8	12	15	15	13	16	49	39	20	8	6	5	6	8	8	8	8	7	11	11	
9	44	30	46	11	8	16	11	10	14	20	22	24	24	15	37	18	24	16	8	8	12	10	10	8	8	
10	9	16	5	10	8	25	17	13	14	13	13	12	10	8	10	11	9	7	8	8	9	9	9	8	8	
11	10	8	8	8	7	7	7	8	7	8	8	8	8	9	9	8	8	7	7	8	8	8	8	8	9	9
12	7	7	7	7	7	11	11	9	7	7	8	7	8	8	6	6	6	6	7	8	7	7	7	7	7	7
13	7	7	8	8	8	8	8	8	8	8	8	8	8	9	9	11	8	11	12	9	9	11	11	11	11	11
14	8	6	7	5	8	6	6	6	3	5	6	8	10	9	7	7	7	11	9	10	9	10	9	10	11	9
15	8	8	10	15	10	17	16	5	5	7	17	10	38	25	29	24	32	9	10	10	9	9	7	13	9	
16	11	18	11	9	10	4	8	8	8	7	9	9	8	7	6	6	6	10	6	8	6	6	7	10	13	
17	7	5	4	7	8	8	10	8	9	8	7	10	10	10	10	11	9	7	9	9	9	9	9	10	16	
18	10	23	20	20	24	19	22	14	9	8	7	6	10	17	15	9	7	7	7	7	7	7	7	7	7	7
19	7	8	6	7	8	7	4	7	7	8	7	7	8	7	7	7	7	8	20	14	12	12	8	4	4	
20	8	5	4	3	8	7	7	7	7	7	7	7	8	7	7	5	5	6	9	8	7	6	6	6	11	
21	8	15	27	8	11	11	21	9	23	13	15	14	13	17	22	8	14	9	5	11	12	39	40	37	37	
22	13	36	8	48	38	6	13	23	38	6	46	18	43	10	9	18	17	19	9	18	4	5	9	6	6	
23	14	6	3	12	9	12	18	18	8	25	7	13	12	17	17	12	9	10	11	5	7	6	7	8	8	
24	9	10	15	11	12	8	8	8	8	9	10	7	8	6	9	12	13	17	6	3	3	4	6	7	7	
25	10	30	27	35	3	46	10	27	38	14	56	14	7	7	7	7	7	10	18	12	10	12	11	11	11	
26	10	8	12	4	5	7	6	6	11	9	36	44	35	20	11	30	5	4	4	5	6	5	5	5	5	
27	6	6	6	6	5	5	5	7	6	5	6	7	6	7	6	6	6	9	61	7	10	9	10	20	20	
28	27	8	34	21	8	8	5	8	5	4	5	3	28	8	8	7	6	37	19	17	4	9	4	1	1	
29	31	7	9	9	6	14	11	6	4	8	8	7	9	10	6	4	6	4	6	4	6	6	9	12	18	6
30	11	25	27	19	15	12	11	12	10	11	12	10	11	9	7	7	9	10	11	11	12	10	11	10	14	
31	13	12	18	14	13	15	15	18	17	18	15	12	7	7	5	5	5	4	4	4	4	3	3	2	5	

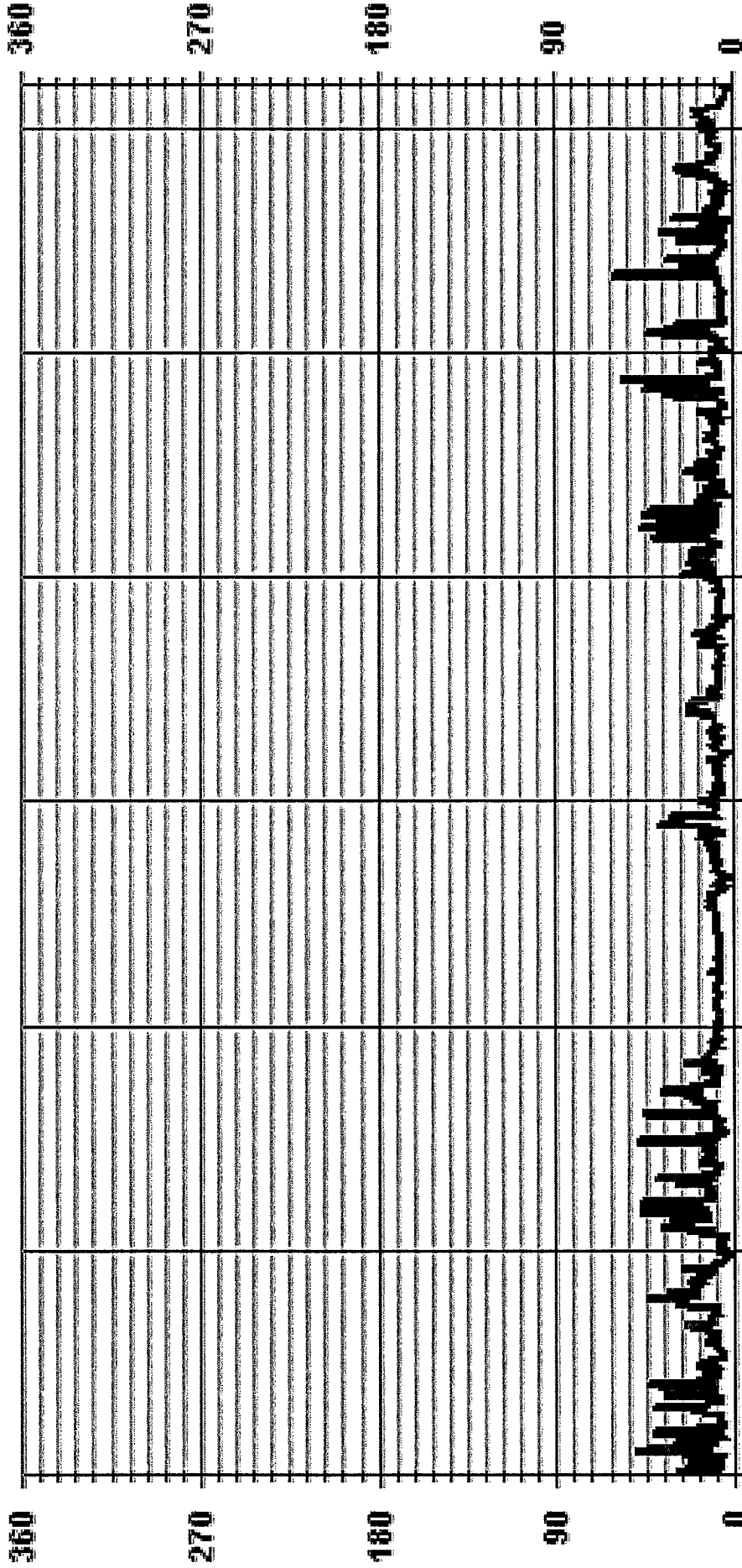
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
V	MAINTENANCE	R	RECOVERY
S	DAILY ZERO / SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUTFORREPAIR	K	COLLECTION ERROR

LAST CALIBRATION: November 23, 2015

CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 744 HRS

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA35 STOWDIR DEG

APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

VOC RESULTS

Sample ID: 15120089-003

Customer ID: LICA

Cust Samp ID: LICA/VOC/ELK/Dec 2,

Priority: Normal

Maxxam

VOC Sample Collection Data Sheet

Client: LICA

Location: Elk Point Airport

Station ID: LICA 35

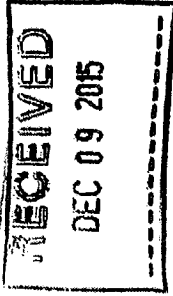
Field Sample ID: LICA/VOC/ELK/Dec 2, 2015

Sampler S/N: 6200

Canister ID: 1532

Canister Installation Date/Time: Nov 27, 2015 @ 12:11

Canister Removal Date/Time: Dec 7, 2015 @ 11:16



Date and Time Information		
Sample Date	Start Time (MST)	End Time (MST)
Dec 2, 2015	00:00 Dec 2, 2015	00:00 Dec 3, 2015
		Elapsed Time (Hours) 24.0

Flow Settings		
Meter Reading (scfm)	Pot Set Pt.	Pump Pressure Setting (psig)
10.0	4.94	26

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
29.0	29.8

Canister valve open prior to sampling? YES NO
 Timer set to 0.00 minutes prior to sampling? YES NO
 Canister valve closed prior to disconnection? YES NO

Comments:

Technician Signature: Sample in - by Alex Yaxupov

Sample out - by Alex Yaxupov

Date: Dec 7, 2015

Volatile Organics Data Results

Date: DECEMBER 2 , 2015
Canister ID: 1532

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.17
1-Hexene	0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.11
2,3,4-Trimethylpentane	0.04
2,3-Dimethylbutane	0.32
2,3-Dimethylpentane	0.17
2,4-Dimethylpentane	0.13
2-Methylheptane	0.10
2-Methylhexane	0.22
2-Methylpentane	0.61
3-Methylheptane	0.06
3-Methylhexane	0.24
3-Methylpentane	0.35
Acetone	< 0.4
Acrolein	< 0.3
Benzene	0.35
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	0.44
Carbon tetrachloride	0.10
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.60
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.05
cis-2-Pentene	< 0.02
Cyclohexane	0.43
Cyclopentane	0.15
Dibromochloromethane	< 0.01
Ethanol	1.3
Ethyl acetate	< 0.4
Ethylbenzene	0.07
Freon-11	0.32

Volatile Organics Data Results

Date: DECEMBER 2 , 2015
Canister ID: 1532

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	< 0.02
Freon-12	0.60
Hexachloro-1,3-butadiene	< 0.50
Isobutane	2.54
Isopentane	2.09
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.18
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	0.7
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.66
Methylcyclopentane	0.37
Methylene chloride	< 0.3
n-Butane	4.31
n-Decane	< 0.06
n-Dodecane	0.5
n-Heptane	0.27
n-Hexane	0.66
n-Nonane	0.04
n-Octane	0.13
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	1.5
o-Ethyltoluene	0.02
o-Xylene	0.07
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.41
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

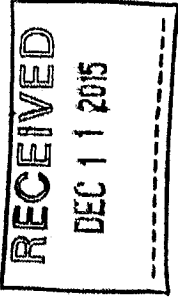
Sample ID: 15120124-001

Customer ID: LICA

Cust Samp ID: LICAVOC/ELK/Dec 8,

Priority: Normal

AIR FCD-01320/2



Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: ELK Point Airport
 Station ID: LICA 35
 Field Sample ID: LICA/VOC/ELK/Dec 8, 2015

Sampler S/N: 6200
 Canister ID: S 5593
 Canister Installation Date/Time: Dec 7, 2015 @ 11:17
 Canister Removal Date/Time: Dec 9, 2015 @ 18:57

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Dec 8, 2015	00:00	00:00	24.0
	Dec 8, 2015	Dec 9, 2015	

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
10.0	4.94	26

Canister Information	
Initial Canister Vacuum (inHg)	19.0
Final Canister Pressure (psig)	

Canister valve open prior to sampling? YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection? YES / NO

Comments:

Technician Signature: Sample in - by Alex Yauyoo
Sample out - by Alex Yauyoo
 Date: Dec 9, 2015

Volatile Organics Data Results

Date: DECEMBER 8 , 2015
Canister ID: S5593

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.08
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.04
2,3,4-Trimethylpentane	0.03
2,3-Dimethylbutane	0.13
2,3-Dimethylpentane	0.07
2,4-Dimethylpentane	0.05
2-Methylheptane	0.04
2-Methylhexane	0.09
2-Methylpentane	0.23
3-Methylheptane	0.03
3-Methylhexane	0.11
3-Methylpentane	0.13
Acetone	3.5
Acrolein	< 0.3
Benzene	0.20
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.05
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.56
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.20
Cyclopentane	0.05
Dibromochloromethane	< 0.01
Ethanol	1.8
Ethyl acetate	< 0.4
Ethylbenzene	0.04
Freon-11	0.41

Volatile Organics Data Results

Date: DECEMBER 8 , 2015
Canister ID: S5593

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	< 0.02
Freon-12	0.56
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.93
Isopentane	0.80
Isoprene	0.23
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.08
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	0.29
Methylcyclopentane	0.15
Methylene chloride	< 0.3
n-Butane	1.60
n-Decane	< 0.06
n-Dodecane	0.8
n-Heptane	0.12
n-Hexane	0.26
n-Nonane	0.02
n-Octane	0.06
n-Pentane	0.7
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	3.0
o-Ethyltoluene	0.01
o-Xylene	0.03
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	0.05
Tetrahydrofuran	< 0.4
Toluene	0.23
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 15120215-002

Customer ID: LICA

Cust Samp ID: LICAVOC/ELK/Dec 14, 2015

Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: ELK Point Airport
 Station ID: LICA 35
 Field Sample ID: LICA/VOC/ELK/Dec 14, 2015

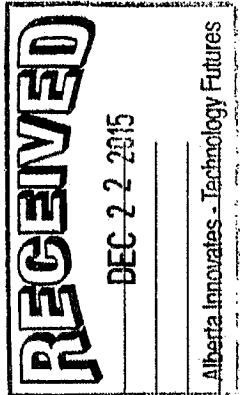
Sampler SN: 6200
 Canister ID: 2535
 Canister Installation Date/Time: Dec 9, 2015 @ 12:58
 Canister Removal Date/Time: Dec 18, 2015 @ 18:01

Date and Time Information		
Sample Date	Start Time (MST)	End Time (MST)
Dec 14, 2015	00:00 Dec 14, 2015	00:00 Dec 15, 2015
		Elapsed Time (Hours) 24.0

Flow Settings		
Meter Reading (scm)	Pot Set Pt.	Pump Pressure Setting (psig)
10.0	4.94	26

Canister Information	
Initial Canister Vacuum (inHg)	20.0
Final Canister Pressure (psig)	20.0

Canister valve open prior to sampling?: YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection?: YES / NO



Comments:

Technician Signature: Sample in - by Alex Yankov
Sample out - by Alex Yankov

Date: Dec 18, 2015

Volatile Organics Data Results

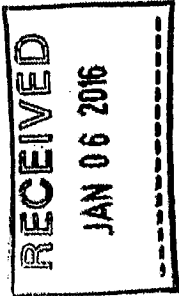
Date: DECEMBER 14 , 2015
Canister ID: 2535

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.08
1-Hexene	0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.04
2,3,4-Trimethylpentane	0.02
2,3-Dimethylbutane	0.07
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	0.03
2-Methylhexane	0.04
2-Methylpentane	0.16
3-Methylheptane	0.02
3-Methylhexane	0.05
3-Methylpentane	0.10
Acetone	1.0
Acrolein	< 0.3
Benzene	0.15
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	0.03
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.84
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.11
Cyclopentane	0.05
Dibromochloromethane	< 0.01
Ethanol	0.3
Ethyl acetate	< 0.4
Ethylbenzene	0.03
Freon-11	0.28

Volatile Organics Data Results

Date: DECEMBER 14 , 2015
Canister ID: 2535

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.03
Freon-12	0.62
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.84
Isopentane	0.51
Isoprene	0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	0.01
m,p-Xylene	0.05
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.14
Methylcyclopentane	0.10
Methylene chloride	< 0.3
n-Butane	1.82
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	< 0.01
n-Hexane	0.18
n-Nonane	0.03
n-Octane	0.05
n-Pentane	0.6
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	0.01
o-Xylene	0.03
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.10
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02



Sample ID: 16010003-001

Customer ID: LICA

Cust Samp ID: LICAVOC/ELK/Dec 20, 2015

Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: Elk Point Airport
 Station ID: LICA 35
 Field Sample ID: LICA/VOC/ELK/Dec 20, 2015

Sampler S/N: 6200
 Canister ID: 2530
 Canister Installation Date/Time: Dec 18, 2015 @ 16:02
 Canister Removal Date/Time: Dec 24, 2015 @ 10:42

Date and Time Information		
Sample Date	Start Time (MST)	End Time (MST)
Dec 20, 2015	00:00 Dec 20, 2015	00:00 Dec 21, 2015
		Elapsed Time (Hours) 24.0

Flow Settings		
Meter Reading (scm)	Pot Set Pt.	Pump Pressure Setting (psig)
10.0	4.94	26

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
- 28.0	+ 18.5

Canister valve open prior to sampling? YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection? YES / NO

Comments:

Technician Signature: Sample in - by Alex Yakupov
Sample out - by Alex Yakupov
 Date: Dec 24, 2015

Volatile Organics Data Results

Date: DECEMBER 20 , 2015
Canister ID: 2530

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.10
1-Hexene	< 0.02
1-Pentene	0.02
2,2,4-Trimethylpentane	0.07
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	0.02
2,3-Dimethylbutane	0.07
2,3-Dimethylpentane	0.07
2,4-Dimethylpentane	< 0.01
2-Methylheptane	0.02
2-Methylhexane	0.05
2-Methylpentane	0.19
3-Methylheptane	< 0.02
3-Methylhexane	0.07
3-Methylpentane	0.11
Acetone	0.9
Acrolein	< 0.3
Benzene	0.24
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	< 0.01
Carbon tetrachloride	0.10
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.75
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	0.04
Dibromochloromethane	< 0.01
Ethanol	1.4
Ethyl acetate	< 0.4
Ethylbenzene	0.03
Freon-11	0.31

Volatile Organics Data Results

Date: DECEMBER 20 , 2015
Canister ID: 2530

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.03
Freon-12	0.73
Hexachloro-1,3-butadiene	< 0.50
Isobutane	1.48
Isopentane	0.79
Isoprene	0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.10
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	0.10
Methylcyclopentane	0.09
Methylene chloride	< 0.3
n-Butane	2.44
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.06
n-Hexane	0.15
n-Nonane	0.02
n-Octane	0.02
n-Pentane	0.5
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.04
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	0.05
Tetrahydrofuran	< 0.4
Toluene	0.20
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	0.03
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 16010004-003

Customer ID: LICA
Cust Samp ID: LICA/VOC/ELK/Dec. 26, 2015

AIR FCD-01320/2

Maxxam

VOC Sample Collection Data Sheet

RECEIVED
JAN 06 2016

Client: LICA
Location: ELK POINT AIRPORT
Station ID: LICA 35
Field Sample ID: LICA/VOC/ELK/Dec 26, 2015

Sampler S/N: 6200
Canister ID: 2580 A.Y. 2659
Canister Installation Date/Time: Dec 24, 2015 @ 10:43
Canister Removal Date/Time: Dec 30, 2015 @ 11:17

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Dec 26, 2015	00:00	00:00	24.0
	Dec 26, 2015	Dec 27, 2015	

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
10.0	4.94	26

Canister Information	
Initial Canister Vacuum (inHg)	+ 20.9
Final Canister Pressure (psig)	

Canister valve open prior to sampling? YES / NO
Timer set to 0.00 minutes prior to sampling? YES / NO
Canister valve closed prior to disconnection? YES / NO

Comments: n/a

Technician Signature: Sample in - by Alex Yakupov
Sample out - by Alex Yakupov
Date: Dec 30, 2015

Volatile Organics Data Results

Date: DECEMBER 26 , 2015
Canister ID: 2659

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.21
1-Hexene	< 0.02
1-Pentene	0.02
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.08
2,3,4-Trimethylpentane	0.02
2,3-Dimethylbutane	0.21
2,3-Dimethylpentane	0.11
2,4-Dimethylpentane	< 0.01
2-Methylheptane	0.05
2-Methylhexane	0.08
2-Methylpentane	0.32
3-Methylheptane	0.03
3-Methylhexane	0.11
3-Methylpentane	0.17
Acetone	2.8
Acrolein	< 0.3
Benzene	0.29
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	0.20
Carbon tetrachloride	0.10
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.83
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.03
cis-2-Pentene	< 0.02
Cyclohexane	0.23
Cyclopentane	0.08
Dibromochloromethane	< 0.01
Ethanol	< 0.3
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.35

Volatile Organics Data Results

Date: DECEMBER 26 , 2015
Canister ID: 2659

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.78
Hexachloro-1,3-butadiene	< 0.50
Isobutane	1.87
Isopentane	1.36
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.06
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.38
Methylcyclopentane	0.21
Methylene chloride	< 0.3
n-Butane	3.03
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.15
n-Hexane	0.31
n-Nonane	0.02
n-Octane	0.08
n-Pentane	1.5
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	0.21
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: 15120089-004

Customer ID: LICA

Cust Samp ID: LICA/PUF/ELK/Dec 2, 2015

Priority: Normal

Maxxam

Hi-Vol PUF+ Sample Collection Data Sheet

Client: LICA

Puf+ S/N: TE-05

Location: ELK Point Airport

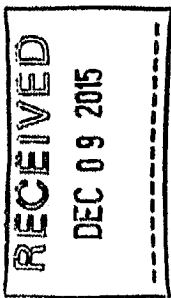
Motor S/N: 1139 / 100-1015

Station ID: LICA 35

Installation Date/Time: NOV 27, 2015 @ 11:58

Field Sample ID: LICA/PUF/ELK/Dec 2, 2015

Removal Date/Time: Dec 7, 2015 @ 4:11 PM



Date and Time Information		
Sample Date	Start Time (MST)	End Time (MST)
Dec 2, 2015	00:00	Dec 3, 2015
		Elapsed Time (Hours)
		24.0

PUF and QFF Information		
Date Received	Date Shipped	Puf Expiration Date
n/a	1/4	n/a
		QFF Prep Date
		n/a

Set Flow Rate (slpm): 230

Date of Last Calibration: Nov 25, 2015

Sampling Data		
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)
695	229	-5.2°
		Volume (Vstd m³)
		330.19

Time set correctly prior to sampling? YES / NO

Timer set correctly prior to sampling? YES / NO

Sampling data saved to memory card after sampling? YES / NO

Comments:

Technician Signature: Sample in - by Alex Yampoor

Sample out - by Alex Yampoor

Date: Dec 7, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: DECEMBER 2 , 2015
PUF S/N: TE05

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.25
2-Methylnaphthalene	0.38
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.13
Acenaphthylene	0.03
Acridine	< 0.01
Anthracene	0.03
Benzo(a)anthracene	0.01
Benzo(a)pyrene	0.02
Benzo(b,j,k)fluoranthene	0.08
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.02
Benzo(ghi)perylene	0.04
Chrysene	0.04
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	0.02
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.16
Fluorene	0.48
Indeno(1,2,3-cd)pyrene	0.03
Naphthalene	0.30
Perylene	< 0.01
Phenanthrene	0.53
Pyrene	0.09
Retene	0.22

Sample ID: 15120124-001

Customer ID: LICA

Cust Samp ID: LICAVOC/ELK/Dec 8,

Priority: Normal

RECEIVED
DEC 11 2015

TISCH PUF PLUS Sample Collection Data Sheet

Client: LICA PUF+ S/N: A13-02
 Location: Elk Point Airport Motor S/N: 1139/100-1015
 Station ID: LICA 35 Installation Date/Time: Dec 7, 2015/11:12
 Field Sample ID: LICA/PUF/ELK/Dec 8, 2015 Removal Date/Time: Dec 9, 2015/12:51

Sample Data Collection Information

Sample Date: Dec 8, 2015 Average Pressure (mmHg) 6.88
 Start Time (mst): 00:00 Average Flow (Q_{avg}) 2.29
 End Time (mst): 00:00 / Dec 9, 2015 Average Temperature (°C) -1.4°
 Elapsed Time (Hours): 24.0 Volume (Vstd m³) 330.15

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm? YES NO
 Average temperature appears correct? YES NO
 Average pressure appears correct? YES NO
 Any error messages? (if yes list below) YES NO
 Sample duration 24 hours? YES NO
 Date of last calibration/audit: Nov 25, 2015
 Other observations? N/A

Deployed By: Alex Yakupov
 Collected By: Alex Yakupov Date: Dec 9, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: DECEMBER 8 , 2015
PUF S/N: A1302

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.13
2-Methylnaphthalene	0.19
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	0.05
Acenaphthene	0.07
Acenaphthylene	0.04
Acridine	< 0.01
Anthracene	0.01
Benzo(a)anthracene	0.03
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.12
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.04
Benzo(ghi)perylene	< 0.01
Chrysene	0.03
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	0.02
Fluoranthene	0.09
Fluorene	0.21
Indeno(1,2,3-cd)pyrene	0.02
Naphthalene	0.13
Perylene	< 0.01
Phenanthrene	0.22
Pyrene	0.07
Retene	0.08

Sample ID: 15120215-003

Customer ID: LICA

Cust Samp ID: LICA/PUF/ELK/Dec 14,

2015

TISCH PUF PLUS Sample Collection Data Sheet

Client: LICA Puff+ S/N: TE-08
 Location: ELK Point Airport Motor S/N: 1139 / 100-1015
 Station ID: LICA 35 Installation Date/Time: Dec 9, 2015 / 12:52
 Field Sample ID: LICA/PUF/ELK/Dec 14, 2015 Removal Date/Time: Dec 18, 2015 / 15:50

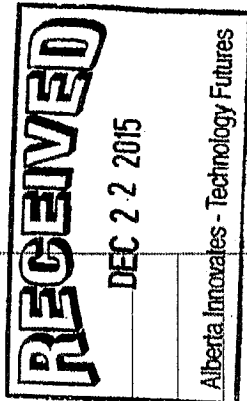
Sample Data Collection Information

Sample Date: Dec 14, 2015 Average Pressure (mmHg) 698
 Start Time (mst): 00:00 Average Flow (Q_{avg}) 229
 End Time (mst): 00:00 / Dec 15, 2015 Average Temperature (°C) - 5.3°
 Elapsed Time (Hours): 24.0 Volume (Vstd m³) 330.12

Sample Recovery Checklist

(circle one)

Flow Rate 230 sipm +/- 0.2 sipm ? YES NO
 Average temperature appears correct? YES NO
 Average pressure appears correct? YES NO
 Any error messages? (if yes list below) YES NO
 Sample duration 24 hours? YES NO
 Date of last calibration/audit: Nov 25, 2015
 Other observations: n/a



Deployed By: Alex Yakusov
 Collected By: Alex Yakusov Date: Dec 18, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: DECEMBER 14 , 2015

PUF S/N: TE08

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.18
2-Methylnaphthalene	0.26
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.06
Acenaphthylene	0.05
Acridine	< 0.01
Anthracene	0.01
Benzo(a)anthracene	0.03
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.10
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.03
Benzo(ghi)perylene	< 0.01
Chrysene	0.02
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	0.14
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.31
Perylene	< 0.01
Phenanthrene	0.21
Pyrene	0.07
Retene	0.03

Sample ID: 16010003-002

Customer ID: LICA
Cust Samp ID: LICA/PUF/ELK/Dec 20, 2015

AIR FCD-01321/2

RECEIVED
JAN 06 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client: LICA Puff S/N: 9801
 Location: ELK POINT AIRPORT Motor S/N: 1139/100-1015
 Station ID: LICA 35 Installation Date/Time: Dec 18, 2015/15:51
 Field Sample ID: LICA/PUF/ELK/Dec 20, 2015 Removal Date/Time: Dec 24, 2015/10:52

Sample Data Collection Information

Sample Date: Dec 20, 2015 Average Pressure (mmHg) 697
 Start Time (mst): 00:00 Average Flow (Q_{std}) 229
 End Time (mst): 00:00/Dec 21, 2015 Average Temperature (°C) -14.9°
 Elapsed Time (Hours): 24.0 Volume (V_{std} m³) 330.17

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm? YES NO
 Average temperature appears correct? YES NO
 Average pressure appears correct? YES NO
 Any error messages? (if yes list below) YES NO
 Sample duration 24 hours? YES NO

Date of last calibration/audit: Nov 25, 2015

Other observations? N/A

Deployed By: Alex Yakupov
 Collected By: Alex Yakupov Date: Dec 24, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: DECEMBER 20 , 2015

PUF S/N: 9801

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.40
2-Methylnaphthalene	0.57
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.08
Acenaphthylene	0.04
Acridine	< 0.01
Anthracene	0.01
Benzo(a)anthracene	0.03
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.11
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.03
Benzo(ghi)perylene	< 0.01
Chrysene	0.02
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.08
Fluorene	0.14
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.35
Perylene	< 0.01
Phenanthrene	0.20
Pyrene	0.08
Retene	0.03

Sample ID: 16010004-004

Customer ID: LICA

Cust Samp ID: LICA/PUF/ELK/Dec. 26, 2015

RECEIVED

JAN 06 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client: LICA Puff S/N: P13-01
 Location: ELK POINT AIRPORT Motor S/N: 1133 / 100 - 1015
 Station ID: LICA 35 Installation Date/Time: Dec 24, 2015 / 10:53
 Field Sample ID: LICA/PUF/ELK/Dec 26, 2015 Removal Date/Time: Dec 30, 2015 / 12:27

Sample Data Collection Information

Sample Date: Dec 26, 2015 Average Pressure (mmHg) 711
 Start Time (mst): 00:00 Average Flow (Q_{cal}) 229
 End Time (mst): 00:00 / Dec 27, 2015 Average Temperature (°C) -18.2
 Elapsed Time (Hours): 24.0 Volume (Vstd m³) 330.18

Sample Recovery Checklist

(circle one)

Flow Rate 230 sipm +/- 0.2 sipm ? YES NO
 Average temperature appears correct? YES NO
 Average pressure appears correct? YES NO
 Any error messages? (if yes list below) YES NO
 Sample duration 24 hours? YES NO
 Date of last calibration/audit: Nov 25, 2015
 Other observations? n/a

Deployed By: Alex Yakusov
 Collected By: Alex Yakusov Date: Dec 30, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: DECEMBER 26 , 2015
PUF S/N: P1301

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.94
2-Methylnaphthalene	1.31
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	0.05
Acenaphthene	0.10
Acenaphthylene	0.10
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	0.03
Benzo(a)pyrene	0.01
Benzo(b,j,k)fluoranthene	0.12
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.04
Benzo(ghi)perylene	< 0.01
Chrysene	0.04
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.09
Fluorene	0.19
Indeno(1,2,3-cd)pyrene	0.02
Naphthalene	1.01
Perylene	< 0.01
Phenanthrene	0.28
Pyrene	0.09
Retene	0.10

NMHC CANISTER RESULTS

Sample ID: 15120089-005

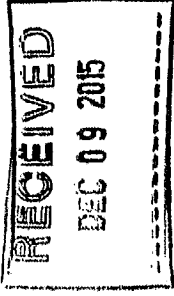
Customer ID: LICA

Cust Samp ID: LICA/VOC/ELK/Dec 1,

Priority: Normal

Maxxam

VOC Sample Collection Data Sheet



AIR FCD-01320/2

Client: LICA
 Location: Elk Point Airport
 Station ID: LICA 35
 Field Sample ID: LICA/VOC/ELK/Dec 1, 2015

Sampler S/N: n/a
 Canister ID: 2660
 Canister Installation Date/Time: December 1, 2015 @ 12:58
 Canister Removal Date/Time: December 7, 2015 @ 10:16

Date and Time Information		
Sample Date	Start Time (MST)	End Time (MST)
Dec 1, 2015	17:00	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 Pressure (psig)
-28.0	- 4.0

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: (N/AHC) - canister

Technician Signature: Sample in - by Alex Yauyoo
Sample out - by Alex Yauyoo
 Date: December 7, 2015

Volatile Organics Data Results (NMHC Canister System)

Date: DECEMBER 1 , 2015
Canister ID: 2660

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.05
1,2,3-Trimethylbenzene	< 0.06
1,2,4-Trichlorobenzene	< 1.0
1,2,4-Trimethylbenzene	0.12
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.03
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.06
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	1.18
1-Hexene	0.05
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.56
2,3,4-Trimethylpentane	0.21
2,3-Dimethylbutane	1.67
2,3-Dimethylpentane	0.69
2,4-Dimethylpentane	0.55
2-Methylheptane	0.31
2-Methylhexane	0.61
2-Methylpentane	2.12
3-Methylheptane	0.20
3-Methylhexane	0.72
3-Methylpentane	1.21
Acetone	< 0.5
Acrolein	< 0.4
Benzene	0.91
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.06
Carbon tetrachloride	0.13
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.74
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.07
cis-2-Pentene	< 0.02
Cyclohexane	1.60
Cyclopentane	0.51
Dibromochloromethane	< 0.01
Ethanol	3.0
Ethyl acetate	< 0.5
Ethylbenzene	0.16
Freon-11	0.54

Volatile Organics Data Results (NMHC Canister System)

Date: DECEMBER 1 , 2015
Canister ID: 2660

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.10
Freon-114	< 0.02
Freon-12	0.55
Hexachloro-1,3-butadiene	< 0.60
Isobutane	9.99
Isopentane	6.56
Isoprene	0.02
Isopropyl alcohol	< 0.5
Isopropylbenzene	0.03
m,p-Xylene	0.41
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.10
Methyl butyl ketone	< 0.60
Methyl ethyl ketone	0.9
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.08
Methyl tert butyl ether	< 0.04
Methylcyclohexane	2.63
Methylcyclopentane	1.41
Methylene chloride	< 0.4
n-Butane	13.1
n-Decane	0.09
n-Dodecane	1.1
n-Heptane	0.85
n-Hexane	2.13
n-Nonane	0.13
n-Octane	0.37
n-Pentane	< 0.1
n-Propylbenzene	< 0.06
n-Undecane	< 0.6
Naphthalene	2.3
o-Ethyltoluene	0.04
o-Xylene	0.15
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.08
Styrene	< 0.05
Tetrachloroethylene	< 0.05
Tetrahydrofuran	< 0.5
Toluene	1.06
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	< 0.01
trans-2-Pentene	0.04
Trichloroethylene	< 0.05
Vinyl acetate	0.5
Vinyl chloride	< 0.02

Sample ID: 15120215-001

Customer ID: LICA

Cust Samp ID: LICANOC/ELK/Dec 12, 2015

AIR FCD-01320/2

Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: Elk Point Airport
 Station ID: LICA 35
 Field Sample ID: LICA/VOC/ELK/Dec 12, 2015

Sampler S/N: n/a
 Canister ID: H 3302
 Canister Installation Date/Time: December 7, 2015 @ 10:47
 Canister Removal Date/Time: December 18, 2015 @ 15:27

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Dec 12, 2015	10:10	n/a	n/a

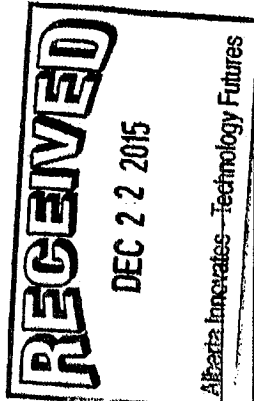
Flow Settings		
Meter Reading (sccm)	Pot Set Pt	Pump Pressure Setting (psig)
n/a	n/a	n/a

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
-28.0	-0.1

in Hg (A.X)

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: _____
Sample in - by Alex Yampouor
Sample out - by Alex Yampouor

Date: December 18, 2015

Volatile Organics Data Results (NMHC Canister System)

Date: DECEMBER 12 , 2015
Canister ID: H3302

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.9
1,2,4-Trimethylbenzene	0.19
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	0.01
1,3,5-Trimethylbenzene	0.06
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	1.51
1-Hexene	0.03
1-Pentene	< 0.01
2,2,4-Trimethylpentane	1.09
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	0.33
2,3-Dimethylbutane	0.41
2,3-Dimethylpentane	0.89
2,4-Dimethylpentane	< 0.01
2-Methylheptane	0.24
2-Methylhexane	0.34
2-Methylpentane	1.21
3-Methylheptane	0.15
3-Methylhexane	0.39
3-Methylpentane	0.68
Acetone	10.7
Acrolein	< 0.3
Benzene	1.72
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.04
Carbon tetrachloride	0.10
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	1.08
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.12
cis-2-Pentene	0.03
Cyclohexane	0.24
Cyclopentane	0.20
Dibromochloromethane	< 0.01
Ethanol	1.5
Ethyl acetate	< 0.4
Ethylbenzene	0.11
Freon-11	0.32



Volatile Organics Data Results (NMHC Canister System)

Date: DECEMBER 12 , 2015
Canister ID: H3302

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.09
Freon-114	0.03
Freon-12	0.63
Hexachloro-1,3-butadiene	< 0.54
Isobutane	2.23
Isopentane	3.20
Isoprene	1.28
Isopropyl alcohol	< 0.4
Isopropylbenzene	0.01
m,p-Xylene	0.44
m-Diethylbenzene	< 0.04
m-Ethyltoluene	0.10
Methyl butyl ketone	< 0.54
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.08
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.63
Methylcyclopentane	0.73
Methylene chloride	< 0.3
n-Butane	6.18
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.40
n-Hexane	0.80
n-Nonane	0.18
n-Octane	0.30
n-Pentane	1.8
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	2.0
o-Ethyltoluene	0.04
o-Xylene	0.17
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.08
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.77
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.21
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

APPENDIX III
ANALYZER CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date:	December 7, 2015	Barometric Pressure:	0.915 atm
Company/Alrshed:	LICA	Station Temperature °C:	21
Location/Station Name:	Elk Point	Weather Conditions:	Mainly sunny
Parameter:	Sulphur Dioxide	Calibration Purpose:	shut down
Start Time 24 hr. (mst):	12:07	Performed By/Reviewer:	Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst):	14:17	Cal Gas Expiry Date:	March 12, 2019
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a

Analyzer:		Range ppb:	1000
Serial Number:	467	As Found C.F.:	0.993
Last Calibration Date:	November 10, 2015	New C.F.:	n/a
Previous C.F.:	1.000		

Calibrator:	Standard Calibration Points for Ranges
Flow Meter ID's:	n/a
Make & Model:	SABIO 2010 D
Serial #:	11900613
Cal Gas Cylinder I.D. #:	BLM002073
Cal Gas Conc. (ppm):	49.5

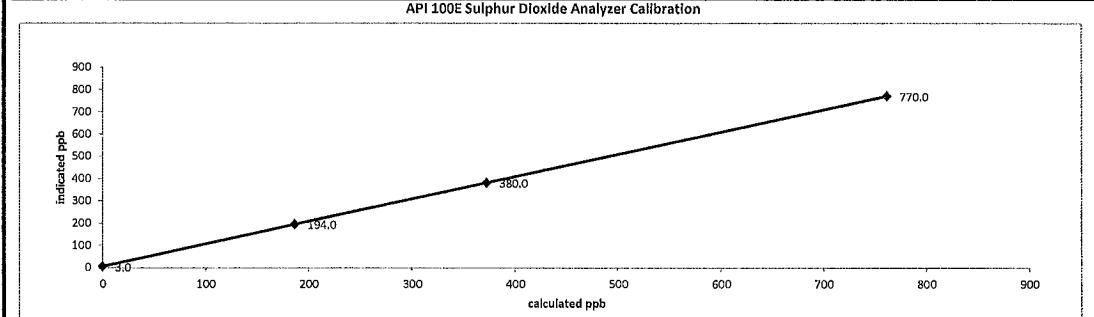
Point	Sulphur Dioxide Standard Calibration Points
High	780
Mld	380
Low	190

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	5013	0.00	5013	0.0	3.0	N/A
as found high	4938	77.20	5015	762.0	770.0	0.993
mld	4976	37.70	5014	372.2	380.0	0.987
low	4994	18.90	5013	186.6	194.0	0.977
Average C.F. =						0.986


Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.995		0.90-1.10
b (Intercept as % of full scale) =	-0.47%		± 3% F.S.
% change in C.F. from last cal =	0.66%		± 10%

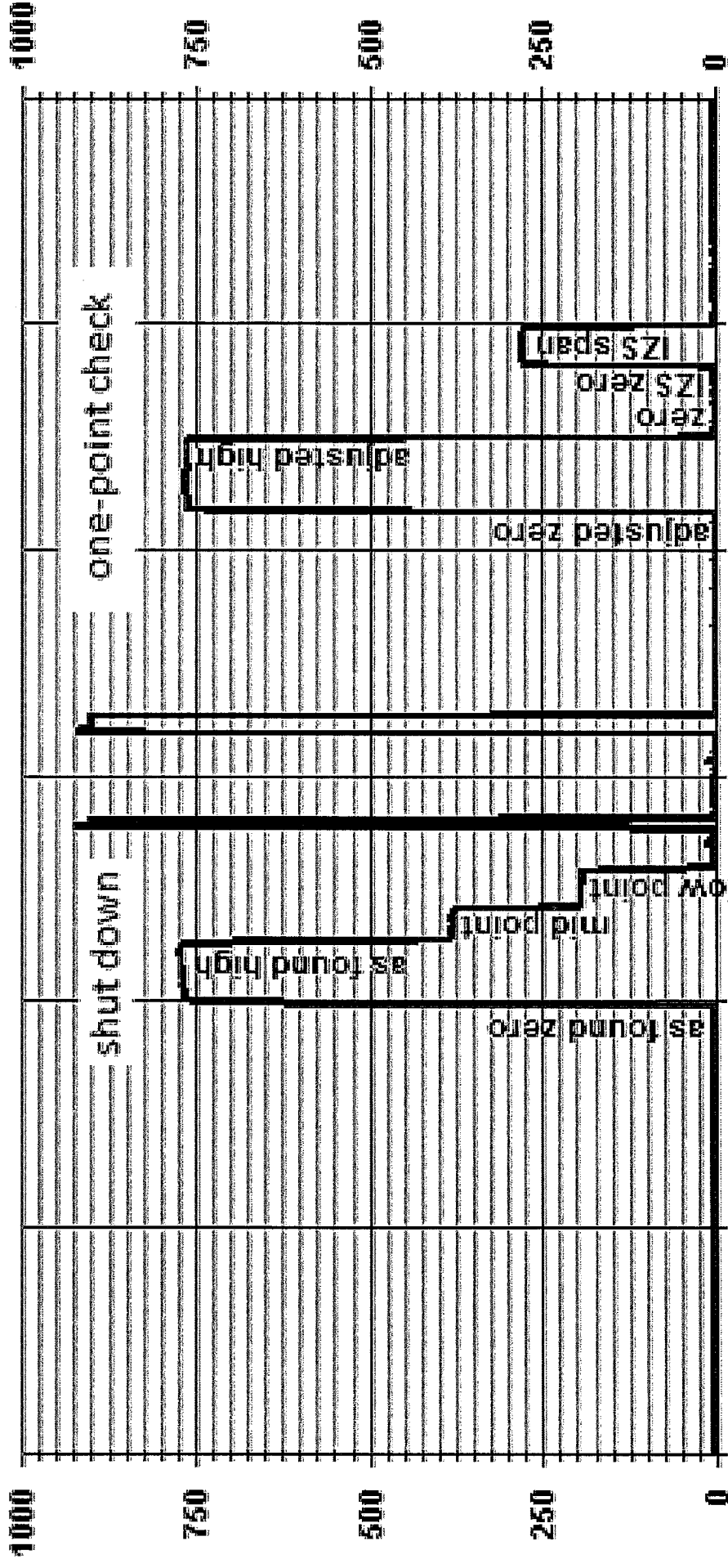


As found:	As left:
SLOPE: 1.059	SLOPE: n/a
OFFSET: 119.0	OFFSET: n/a
HVPS: 512	HVPS: n/a
RCELL TEMP: 50.0	RCELL TEMP: n/a
BOX TEMP: 34.4	BOX TEMP: n/a
PMT TEMP: 8.2	PMT TEMP: n/a
IZS TEMP: 45.0	IZS TEMP: n/a
PRES: 24.5	PRES: n/a
SAMP FL: 606	SAMP FL: n/a
NORM PMT: 114.2	NORM PMT: n/a
UV LAMP: 3079.0	UV LAMP: n/a
LAMP RATIO: 102.5	LAMP RATIO: n/a
STR. LGT: 63.0	STR. LGT: n/a
DRK PMT: 15.6	DRK PMT: n/a
DRK LMP: 2.8	DRK LMP: n/a
Internal Span: 273	Internal Span: n/a

Comments:
 Shutdown calibration performed to calibrate output voltage. No ZERO adjustment made. No high point adjustment made. DAC calibration performed.

		API 100E Sulphur Dioxide Analyzer Calibration																																											
Date: December 7, 2015 Company/Alrshed: LICA Location/Station Name: Elk Point Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 17:09 End Time 24 hr. (mst): 19:03 Calibration Method: Gas Dilution	Barometric Pressure: 0.915 atm Station Temperature °C: 21 Weather Conditions: Mainly sunny Calibration Purpose: post repair Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: March 12, 2019 Converter Model & s/n (if applicable): n/a																																												
Analyzer: Serial Number: 467 Last Calibration Date: November 10, 2015 Previous C.F.: n/a		Range ppb: 1000 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. #: BLM002073 Cal Gas Conc. (ppm): 49.5		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>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></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>5013</td> <td>0.00</td> <td>5013</td> <td>0.0</td> <td>0.0</td> <td>n/a</td> </tr> <tr> <td>adjusted high</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>762.0</td> <td>762.0</td> <td>1.000</td> </tr> <tr> <td>calibrator zero</td> <td>5013</td> <td>0.00</td> <td>5013</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>n/a</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	5013	0.00	5013	0.0	0.0	n/a	adjusted high	4938	77.20	5015	762.0	762.0	1.000	calibrator zero	5013	0.00	5013	0.0	0.0	n/a	Average C.F. =						n/a
Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):																																							
	Diluent	Cal Gas	Total	(ppb)	(ppb)																																								
adjusted zero	5013	0.00	5013	0.0	0.0	n/a																																							
adjusted high	4938	77.20	5015	762.0	762.0	1.000																																							
calibrator zero	5013	0.00	5013	0.0	0.0	n/a																																							
Average C.F. =						n/a																																							
Linear Regression/Calibration Results:																																													
		LIMITS																																											
Correlation Coefficient =	n/a	> or =	0.995																																										
Slope =	n/a	.95-	1.05																																										
b (Intercept as % of full scale) =	n/a	±	3% F.S.																																										
% change in C.F. from last cal =	n/a	±	10%																																										
As found:		As left:																																											
SLOPE:	n/a	SLOPE:	1.051																																										
OFFSET:	n/a	OFFSET:	117.8																																										
HVPS:	n/a	HVPS:	512																																										
RCELL TEMP:	n/a	RCELL TEMP:	50.0																																										
BOX TEMP:	n/a	BOX TEMP:	32.7																																										
PMT TEMP:	n/a	PMT TEMP:	8.1																																										
IZS TEMP:	n/a	IZS TEMP:	45.0																																										
PRES:	n/a	PRES:	24.0																																										
SAMP FL:	n/a	SAMP FL:	608																																										
NORM PMT:	n/a	NORM PMT:	118.4																																										
UV LAMP:	n/a	UV LAMP:	3082.1																																										
LAMP RATIO:	n/a	LAMP RATIO:	102.6																																										
STR. LGT	n/a	STR. LGT	61.9																																										
DRK PMT:	n/a	DRK PMT:	15.5																																										
DRK LMP:	n/a	DRK LMP:	2.8																																										
Internal Span:	n/a	Internal Span:	278.7																																										
Comments:																																													
Sample filter changed. One-Point calibration performed to leave the analyzer in the sampling mode. This calibration is considered a one-point check.																																													

01 Minute Averages



12/07/15 09:00 12/07/15 11:00 12/07/15 13:00 12/07/15 15:00 12/07/15 17:00 12/07/15 19:00

— LICA35 S02_ PPB



API 100E Sulphur Dioxide Analyzer Calibration

Date:	December 8, 2015	Barometric Pressure:	0.921 atm
Company/Airshed:	LICA	Station Temperature °C:	20
Location/Station Name:	Elk Point	Weather Conditions:	Clear
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly
Start Time 24 hr. (mst):	10:47	Performed By/Reviewer:	Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst):	14:23	Cal Gas Expiry Date:	March 12, 2019
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a

Analyzer:	Serial Number:	467	Range ppb:	1000
	Last Calibration Date:	December 7, 2015	As Found C.F.:	1.003
	Previous C.F.:	1.000	New C.F.:	1.000

Callibrator:	Flow Meter ID's:	n/a	Standard Calibration Points for Ranges	
	Make & Model:	SABIO 2010 D	Point	Sulphur Dioxide Standard Calibration Points
	Serial #:	11900613	High	780
	Cal Gas Cylinder I.D. #:	BLM002073	Mid	380
	Cal Gas Conc. (ppm):	49.5	Low	190

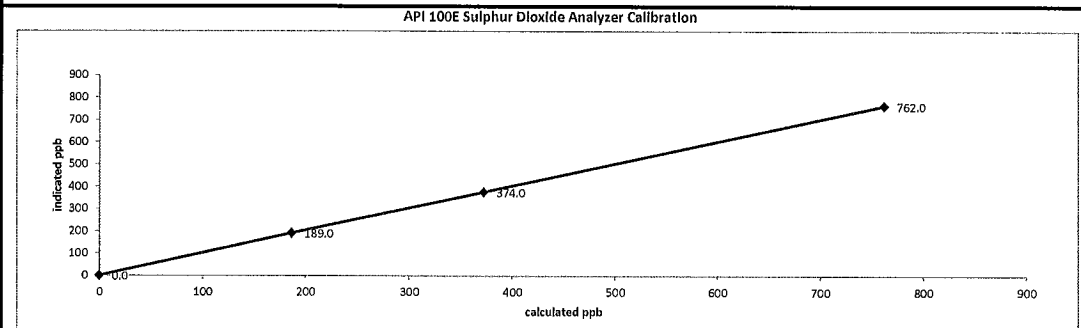
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Diluent	Cal Gas	Total	Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):
as found zero	5013	0.00	5013	0.0	0.0	N/A
as found high	4938	77.20	5015	762.0	760.0	1.003
adjusted zero	5013	0.00	5013	0.0	0.0	n/a
adjusted high	4938	77.20	5015	762.0	762.0	1.000
mid	4976	37.70	5014	372.2	374.0	0.995
low	4994	18.90	5013	186.6	189.0	0.987
calibrator zero	5013	0.00	5013	0.0	0.0	n/a

Average C.F. = 0.994

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.001		.95-1.05
b (Intercept as % of full scale) =	-0.13%		± 3% F.S.
% change in C.F. from last cal =	-0.26%		± 10%

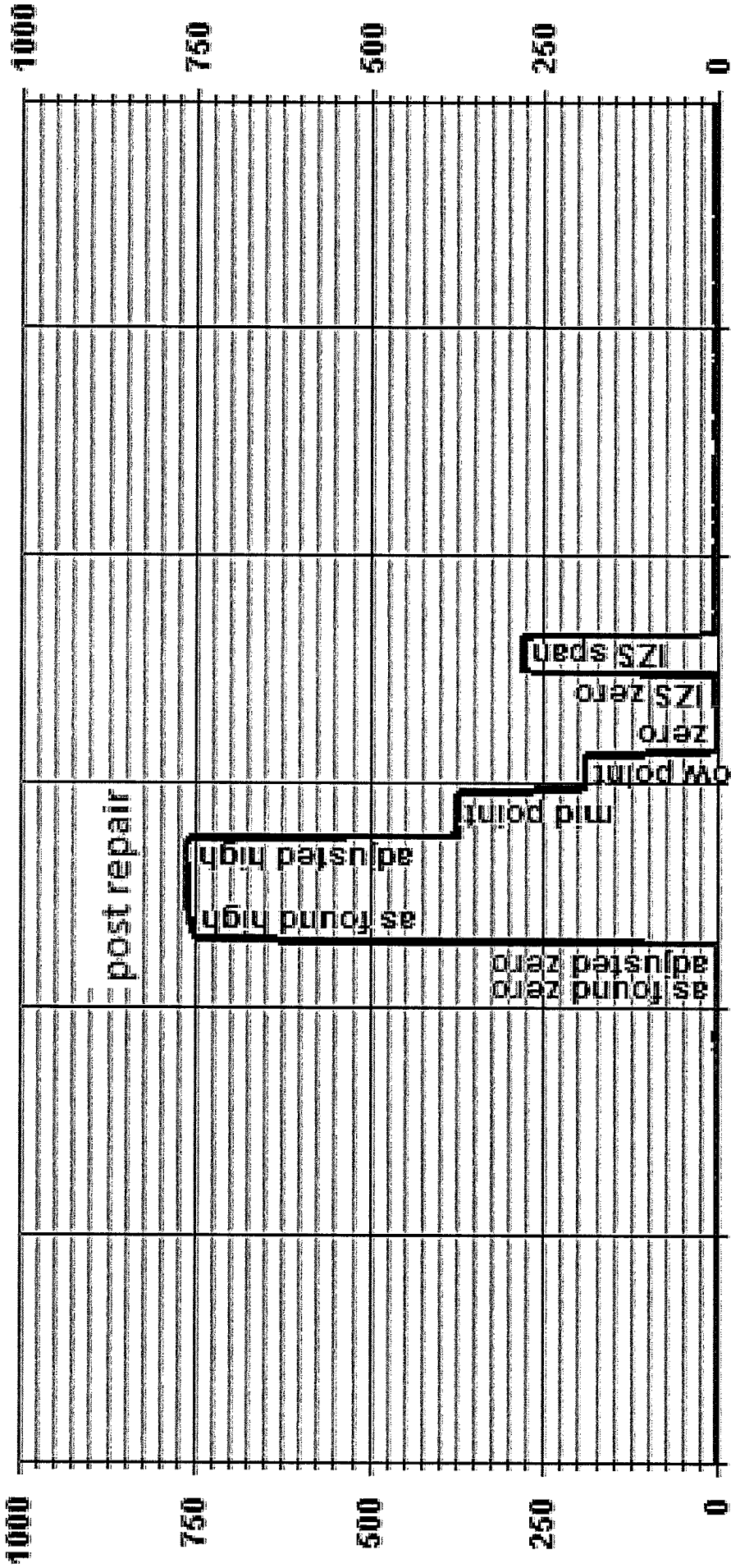


As found:	As left:
SLOPE: 1.051	SLOPE: 1.053
OFFSET: 117.8	OFFSET: 117.8
HVPS: 512	HVPS: 512
RCCELL TEMP: 50.0	RCCELL TEMP: 50.0
BOX TEMP: 31.9	BOX TEMP: 33.2
PMT TEMP: 8.1	PMT TEMP: 8.1
IZS TEMP: 45.0	IZS TEMP: 45.0
PRES: 24.2	PRES: 24.1
SAMP FL: 612	SAMP FL: 610
NORM PMT: 117.3	NORM PMT: 117.5
UV LAMP: 3083.8	UV LAMP: 3081.2
LAMP RATIO: 102.5	LAMP RATIO: 102.5
STR. LGT: 61.9	STR. LGT: 62.0
DRK PMT: 14.5	DRK PMT: 15.1
DRK LMP: 2.9	DRK LMP: 2.8
Internal Span: 278.7	Internal Span: 279

Comments:

Sample filter changed on December 7, 2015. This calibration is considered a post-repair.


01 Minute Averages



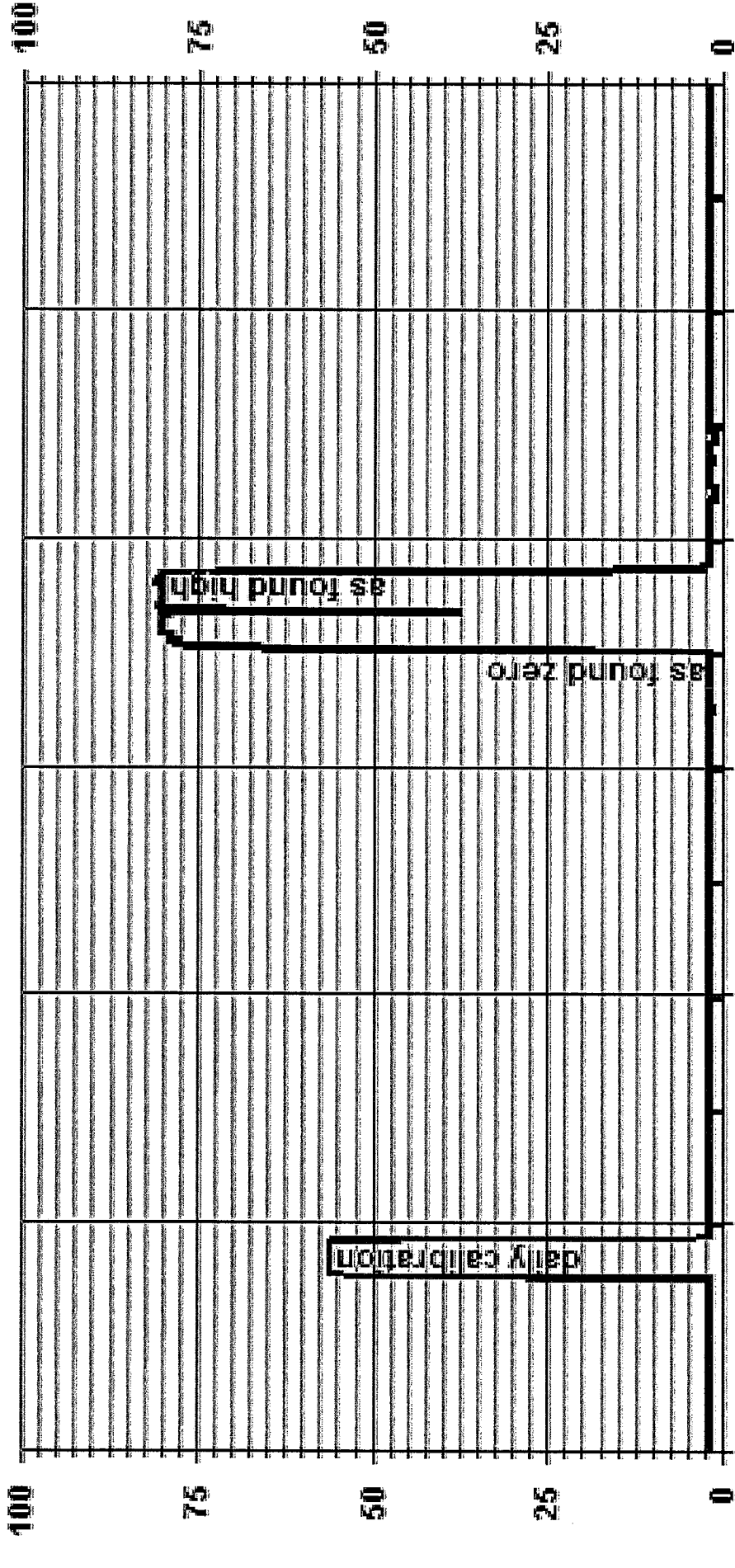
12/08/15 07:00 12/08/15 09:00 12/08/15 11:00 12/08/15 13:00 12/08/15 15:00 12/08/15 17:00

— LICA35 S02_ PPB

HYDROGEN SULPHIDE

 API 101A Hydrogen Sulphide Analyzer Calibration																																					
Date: December 4, 2015 Company/Airshed: LICA Location/Station Name: Elk Point Parameter: Hydrogen Sulphide Start Time 24 hr. (mst): 15:38 End Time 24 hr. (mst): 16:42 Calibration Method: Gas Dilution	Barometric Pressure: 102.1 kPa Station Temperature °C: 22 Weather Conditions: Mainly sunny Calibration Purpose: as found Performed By/Reviewer: Raja Abid / Trina Whitsitt Cal Gas Expiry Date: July 8, 2016 Converter Model & s/n (if applicable): n/a																																				
Analyzer: Serial Number: 510 Range ppb: 100 Last Calibration Date: November 10, 2015 As Found C.F.: 0.994 Previous C.F.: 1.000 New C.F.: n/a																																					
Calibrator: Flow Meter ID's: n/a Make & Model: Envirotronics 6100 Serial #: 4760 Cal Gas Cylinder I.D. #: BLM 001434 Cal Gas Conc. (ppm): 10.3																																					
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																																					
<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>7479</td> <td>0.00</td> <td>7479</td> <td>0.0</td> <td>1.7</td> <td>N/A</td> </tr> <tr> <td>as found high</td> <td>7429</td> <td>56.40</td> <td>7485</td> <td>77.8</td> <td>79.9</td> <td>0.994</td> </tr> <tr> <td colspan="6" style="text-align: right;">Average C.F.=</td> <td>n/a</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	7479	0.00	7479	0.0	1.7	N/A	as found high	7429	56.40	7485	77.8	79.9	0.994	Average C.F.=						n/a	
Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):																															
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)																																
as found zero	7479	0.00	7479	0.0	1.7	N/A																															
as found high	7429	56.40	7485	77.8	79.9	0.994																															
Average C.F.=						n/a																															
Linear Regression/Calibration Results: Correlation Coefficient = n/a LIMITS > or = 0.995 Slope = n/a .95-1.05 b (Intercept as % of full scale) = n/a ± 3% F.S. % change in C.F. from last cal = 0.57% ± 10%																																					
<table style="width:100%;"> <thead> <tr> <th style="width:50%;">As found:</th> <th style="width:50%;">As left:</th> </tr> </thead> <tbody> <tr><td>SLOPE: 1.130</td><td>SLOPE: n/a</td></tr> <tr><td>OFFSET: 26.2</td><td>OFFSET: n/a</td></tr> <tr><td>HVPS: 526</td><td>HVPS: n/a</td></tr> <tr><td>DCPS: 50</td><td>DCPS: n/a</td></tr> <tr><td>RCELL TEMP: 35.9</td><td>RCELL TEMP: n/a</td></tr> <tr><td>BOX TEMP: 35.9</td><td>BOX TEMP: n/a</td></tr> <tr><td>PMT TEMP: 8.3</td><td>PMT TEMP: n/a</td></tr> <tr><td>IZS TEMP: 45</td><td>IZS TEMP: n/a</td></tr> <tr><td>Converter Temp: 314.4</td><td>Converter Temp: n/a</td></tr> <tr><td>PRES: 21.4</td><td>PRES: n/a</td></tr> <tr><td>SAMP FL: 556</td><td>SAMP FL: n/a</td></tr> <tr><td>UV LAMP: 2819.6</td><td>UV LAMP: n/a</td></tr> <tr><td>LAMP RATIO: 88.8</td><td>LAMP RATIO: n/a</td></tr> <tr><td>STR. LGT: 14.8</td><td>STR. LGT: n/a</td></tr> <tr><td>DRK PMT: 36.3</td><td>DRK PMT: n/a</td></tr> <tr><td>DRK LMP: -2.1</td><td>DRK LMP: n/a</td></tr> <tr><td>Internal Span: n/a</td><td>Internal Span: n/a</td></tr> </tbody> </table>		As found:	As left:	SLOPE: 1.130	SLOPE: n/a	OFFSET: 26.2	OFFSET: n/a	HVPS: 526	HVPS: n/a	DCPS: 50	DCPS: n/a	RCELL TEMP: 35.9	RCELL TEMP: n/a	BOX TEMP: 35.9	BOX TEMP: n/a	PMT TEMP: 8.3	PMT TEMP: n/a	IZS TEMP: 45	IZS TEMP: n/a	Converter Temp: 314.4	Converter Temp: n/a	PRES: 21.4	PRES: n/a	SAMP FL: 556	SAMP FL: n/a	UV LAMP: 2819.6	UV LAMP: n/a	LAMP RATIO: 88.8	LAMP RATIO: n/a	STR. LGT: 14.8	STR. LGT: n/a	DRK PMT: 36.3	DRK PMT: n/a	DRK LMP: -2.1	DRK LMP: n/a	Internal Span: n/a	Internal Span: n/a
As found:	As left:																																				
SLOPE: 1.130	SLOPE: n/a																																				
OFFSET: 26.2	OFFSET: n/a																																				
HVPS: 526	HVPS: n/a																																				
DCPS: 50	DCPS: n/a																																				
RCELL TEMP: 35.9	RCELL TEMP: n/a																																				
BOX TEMP: 35.9	BOX TEMP: n/a																																				
PMT TEMP: 8.3	PMT TEMP: n/a																																				
IZS TEMP: 45	IZS TEMP: n/a																																				
Converter Temp: 314.4	Converter Temp: n/a																																				
PRES: 21.4	PRES: n/a																																				
SAMP FL: 556	SAMP FL: n/a																																				
UV LAMP: 2819.6	UV LAMP: n/a																																				
LAMP RATIO: 88.8	LAMP RATIO: n/a																																				
STR. LGT: 14.8	STR. LGT: n/a																																				
DRK PMT: 36.3	DRK PMT: n/a																																				
DRK LMP: -2.1	DRK LMP: n/a																																				
Internal Span: n/a	Internal Span: n/a																																				
Comments:																																					

01 Minute Averages



— LICA35 H2S_ PPB



API 101E Hydrogen Sulphide Analyzer Calibration

Date:	December 7, 2015	Barometric Pressure:	0.915 atm
Company/Airshed:	LICA	Station Temperature °C:	21
Location/Station Name:	Elk Point	Weather Conditions:	Mainly sunny
Parameter:	Hydrogen Sulphide	Calibration Purpose:	routine monthly
Start Time 24 hr. (mst):	12:07	Performed By/Reviewer:	Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst):	15:54	Cal Gas Expiry Date:	July 15, 2017
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a

Analyzer:	
Serial Number:	510
Last Calibration Date:	November 10, 2015
Previous C.F.:	1.000
Range ppb:	100
As Found C.F.:	0.999
New C.F.:	1.000

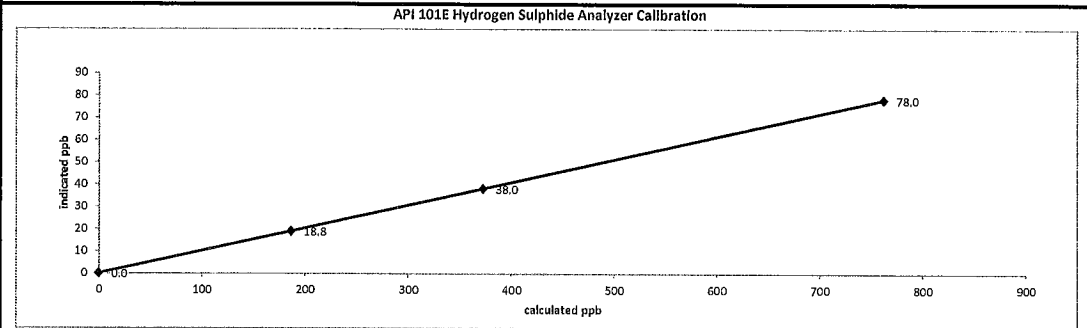
Calibrator:		Standard Calibration Points for Ranges	
Flow Meter ID's:	n/a	Point	Hydrogen Sulphide Standard Calibration Points
Make & Model:	API 700	High	78
Serial #:	830	Mid	38
Cal Gas Cylinder I.D. #:	LL36837	Low	19
Cal Gas Conc. (ppm):	10.0		

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

Calibrator Flow Rates (cc/mln)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7496	0.00	7496	0.0	1.9	N/A
as found high	7441	58.50	7500	78.0	80.0	0.999
adjusted zero	7496	0.00	7496	0.0	0.0	n/a
adjusted high	7441	58.50	7500	78.0	78.0	1.000
mid	7472	28.50	7501	38.0	38.0	1.000
low	7486	14.30	7500	19.1	18.8	1.014
calibrator zero	7496	0.00	7496	0.0	0.0	n/a
Average C.F.=						1.005

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		.95-1.05
b (Intercept as % of full scale)=	0.10%		± 3% F.S.
% change in C.F. from last cal=	0.12%		± 10%

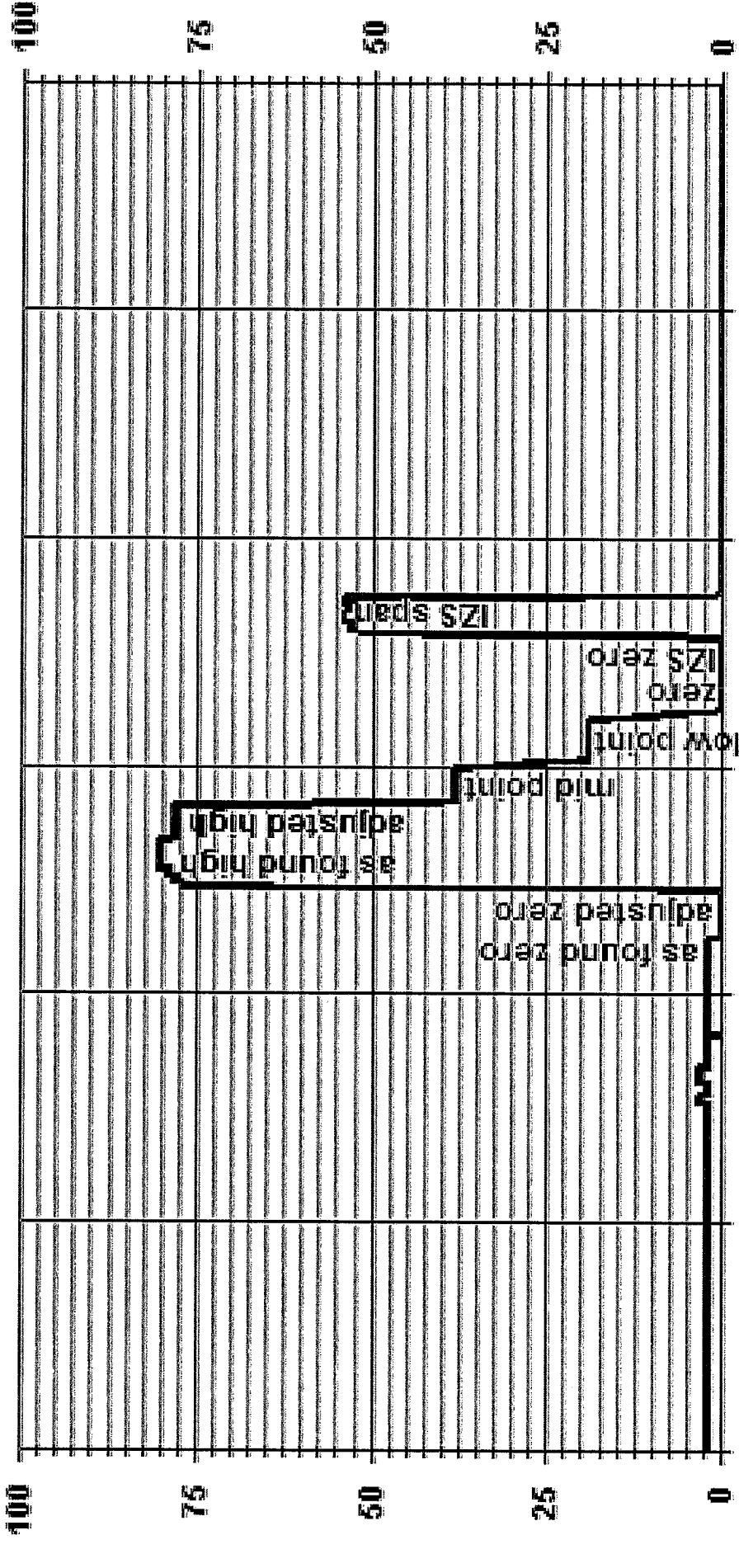


As found:		As left:	
SLOPE:	1.163	SLOPE:	1.131
OFFSET:	30.2	OFFSET:	30.2
HVPS:	526	HVPS:	526
RCCELL TEMP:	50.0	RCCELL TEMP:	50.0
BOX TEMP:	36.0	BOX TEMP:	35.6
PMT TEMP:	8.3	PMT TEMP:	8.3
IZS TEMP:	45.0	IZS TEMP:	45.0
Converter Temp:	315.1	Converter Temp:	314.9
PRES:	21.2	PRES:	21.2
SAMP FL:	552	SAMP FL:	553
UV LAMP:	2815.1	UV LAMP:	2815.0
LAMP RATIO:	88.7	LAMP RATIO:	88.7
STR. LGT	17.6	STR. LGT	17.7
DRK PMT:	35.9	DRK PMT:	36.1
DRK LMP:	-2.1	DRK LMP:	-2.1
Internal Span:	51.49	Internal Span:	53.6

Comments:

Sample filter changed.

01 Minute Averages

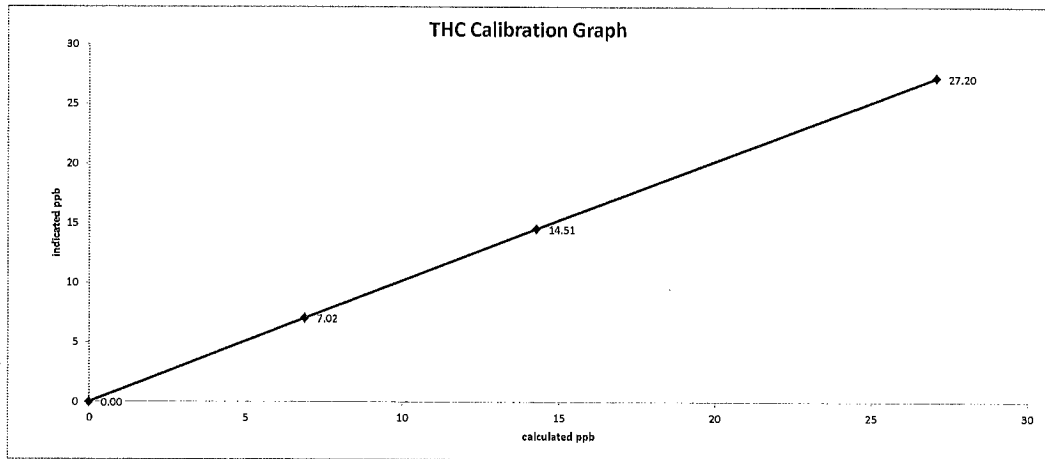
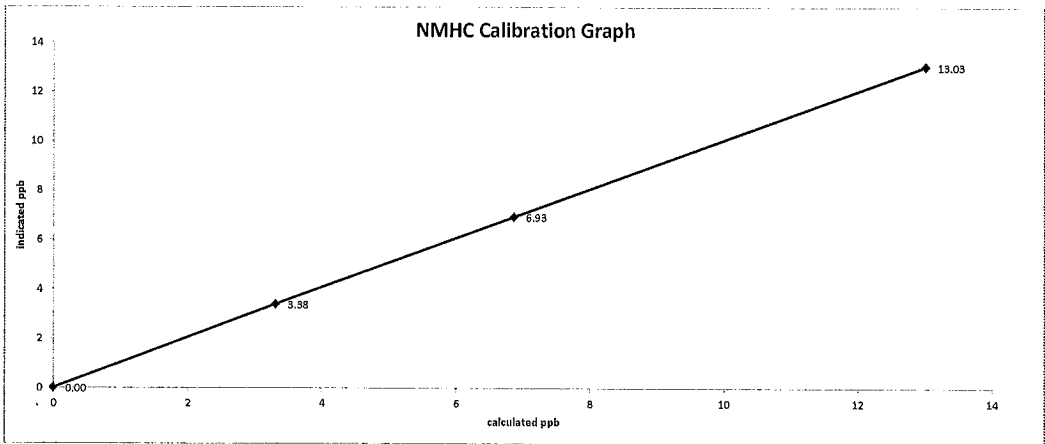
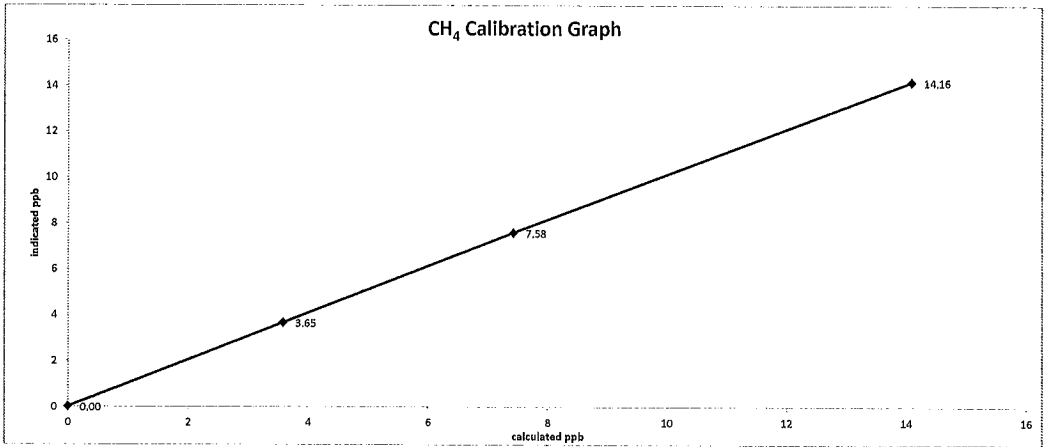


— LICA35 H2S_ PPB

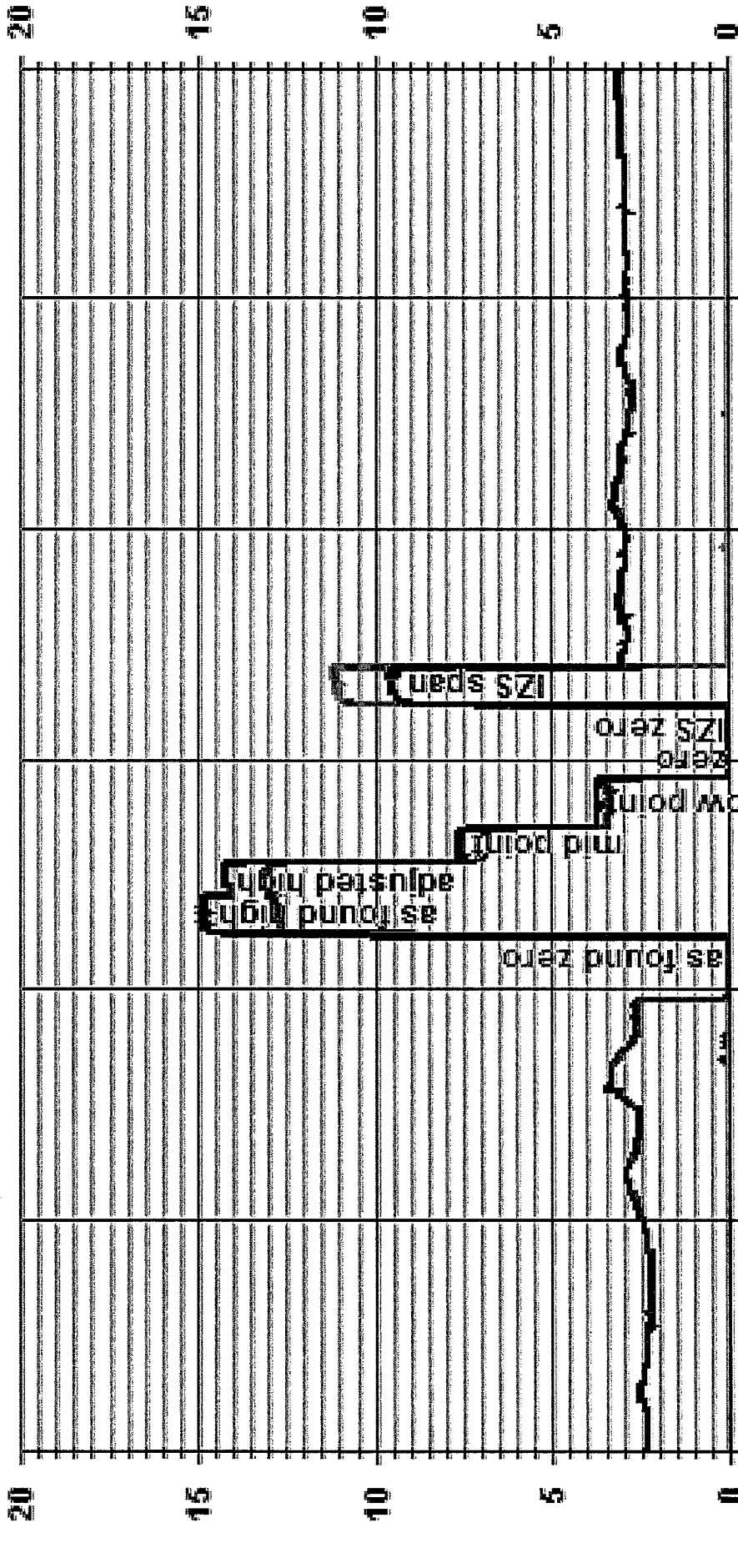
TOTAL HYDROCARBON

Thermo 55i Methane/Non-Methane Analyzer Calibration																	
Date: <u>December 8, 2015</u> Company/Alshed: <u>LICA</u> Location/Station Name: <u>Elk Point</u> Parameter: <u>CH₄ / NMHC / THC</u> Start/End Time 24 hr. (mst): <u>10:47 / 13:58</u> Calibration Method: <u>Gas Dilution</u>	Barometric Pressure: <u>0.921 atm</u> Station Temperature °C: <u>20</u> Weather Conditions: <u>Clear</u> Calibration Purpose: <u>routine monthly</u> Performed By/Reviewer: <u>Alex Yakupov Trina Whitsitt</u> Cal Gas Expiry Date: <u>March 26, 2017</u>																
Analyzer: Serial Number: <u>1236656107</u> Last Calibration Date: <u>November 10, 2015</u> Range ppm: <u>20 CH₄/20 NMHC/40 THC</u>	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>0.997</td> <td>0.956</td> <td>0.995</td> </tr> <tr> <td>NMHC =</td> <td>0.999</td> <td>1.028</td> <td>0.999</td> </tr> <tr> <td>THC =</td> <td>0.997</td> <td>0.989</td> <td>0.997</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	CH ₄ =	0.997	0.956	0.995	NMHC =	0.999	1.028	0.999	THC =	0.997	0.989	0.997
	Previous C.F.:	As Found C.F.:	New C.F.:														
CH ₄ =	0.997	0.956	0.995														
NMHC =	0.999	1.028	0.999														
THC =	0.997	0.989	0.997														
Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>API 700</u> Serial #: <u>830</u> Cal Gas Cylinder I.D. #: <u>LL33674</u> CH ₄ Cylinder Conc. = <u>601.4</u> <u>202.0</u> = C ₃ H ₈ Cylinder Conc. CH ₄ as C ₃ H ₈ = <u>555.5</u> <u>1156.9</u> = 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																	
Calibrator Flow Rates (cc/min)																	
											Correction Factors:						
Point	Diluent	Cal Gas	Total Flow	Calculated CH ₄ (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	CH ₄	NMHC	THC					
as found zero	2000	0.00	2000	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a					
as found high	2000	48.00	2048	14.10	13.02	27.11	14.75	12.67	27.43	0.956	1.028	0.989					
adjusted high	2000	48.00	2048	14.10	13.02	27.11	14.16	13.03	27.20	0.995	0.999	0.997					
mid	2000	25.00	2025	7.42	6.86	14.28	7.58	6.93	14.51	0.980	0.990	0.984					
low	2000	12.00	2012	3.59	3.31	6.90	3.65	3.38	7.02	0.983	0.980	0.983					
calibrator zero	2000	0.00	2000	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a					
											Average C.F. =	0.986	0.990	0.988			
Linear Regression/Calibration Results:																	
				CH ₄	NMHC	THC							LIMITS				
Correlation Coefficient =				1.000	1.000	1.000							> or = 0.995				
Slope =				1.005	1.000	1.003							.95-1.05				
b (Intercept as % of full scale) =				0.21%	0.19%	0.18%							± 3% F.S.				
% change in C.F. from last cal =				4.15%	-2.86%	0.85%							± 10%				
As found:													As left:				
Interface Board Voltages: Bias Supply: <u>-293.0</u> Temperatures: Detector Oven: <u>175.0</u> Filter: <u>175.0</u> Column Oven: <u>75.0</u> Internal: <u>33.0</u> Cylinder Pressures/reg.: Carrier: <u>2500</u> <u>50</u> Fuel: <u>800</u> <u>50</u> Span Gas: <u>2000</u> <u>22</u> Zero Air Generator: <u>46/34</u> Internal Pressures: Carrier: <u>31.1</u> Fuel: <u>40.3</u> Air: <u>32.4</u> FID Status: Status: <u>LIT</u> Counts: <u>25490</u> Flame: <u>278.1</u> Det Base: <u>175.0</u> Flame and Power Stats: Last Power On: <u>May 5, 2015</u> Flameouts: <u>40</u> Det Oven at Start: <u>170.1</u> Col Oven at Start: <u>74.5</u> Calibration History: Time: <u>November 10, 2015</u> Type: <u>SPAN</u> Status: <u>GOOD</u> Check/Adjust: <u>ADJUST</u> CH ₄ Span Conc: <u>14.10</u> CH ₄ SP Ratio: <u>0.000792</u> CH ₄ RT: <u>12.2</u> CH ₄ PK IDX: <u>21</u> CH ₄ PK HT: <u>17804</u> NM Span Conc: <u>13.02</u> NM SP Ratio: <u>0.000155</u>	Calibration History cont'd: NM Peak Area: <u>84028</u> Crucial Settings: Methane Start: <u>n/a</u> Methane End: <u>n/a</u> Backflush: <u>n/a</u> NMHV Start: <u>n/a</u> NMHC End: <u>n/a</u> Run History>1: Date: <u>December 08, 2015</u> Time: <u>11:13</u> CH ₄ PK HT: <u>0</u> CH ₄ RT: <u>8.0</u> CH ₄ Baseline: <u>2243</u> CH ₄ LOD: <u>64</u> CH ₄ SD: <u>21</u> CH ₄ CONC: <u>0.00</u> NM PK HT: <u>0</u> NM Peak Area: <u>0</u> NM CONC: <u>0.00</u> NM Base Start: <u>2132</u> NM Base End: <u>2145</u> NM LOD: <u>10</u> NM Start IDX: <u>24</u> NM End IDX: <u>56</u> NM Max Slope: <u>6.4e-0.1</u> NM Min Slope: <u>-3.3e-0.1</u> NM PT Count: <u>0</u> Daily Zero/Span Values: Previous CH ₄ : <u>9.58</u> Previous NMHC: <u>11.16</u> Previous THC: <u>20.76</u> New CH ₄ : <u>9.54</u> New NMHC: <u>11.15</u> New THC: <u>20.71</u>																
Comments: <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> Sample filter changed. No ZERO adjustment made. A new N2 gas cylinder connected. A new CH₄/C3H8 gas cylinder connected. </div>																	

Date:	December 8, 2015	Start/End Time 24 hr. (mst):	10:47 / 13:58
Company/Airshed:	LICA	Calibration Purpose:	routine monthly
Location/Station Name:	Elk Point	Calibration Method:	Gas Dilution



01 Minute Averages



12/08/15 07:00 12/08/15 09:00 12/08/15 11:00 12/08/15 13:00 12/08/15 15:00 12/08/15 17:00

— LICA35 METHANE PPM — LICA35 MMHC PPM

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: December 7, 2015 Company/Airshed: LICA Location/Station Name: Elk Point Start/End Time 24 hr. (mst): 12:07 / 15:48 G.P.T. to be used for Ozone? No Calibration Method: Gas Dilution & Varying UV Lamp Power	Barometric Pressure: 0.915 atm Station Temperature °C: 21 Weather Conditions: Mainly sunny Calibration Purpose: shut down Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: March 12, 2019
--	---

Analyzer: Serial Number: 592 Last Calibration Date: November 10, 2015 Range ppb: 1000	Correction Factors: <table border="1" style="width:100%"> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> <tr> <td>NO =</td> <td>0.999</td> <td>1.016</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>0.996</td> <td>1.000</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>0.999</td> <td>1.019</td> <td>n/a</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	1.016	n/a	NO ₂ =	0.996	1.000	n/a	NOx =	0.999	1.019	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	0.999	1.016	n/a														
NO ₂ =	0.996	1.000	n/a														
NOx =	0.999	1.019	n/a														

Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: BLM002073 NO/NOx Gas Conc. (ppm): 50.6 50.6	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width:100%"> <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	5013	0.0	5013	0	0	1.0	4.0	n/a	n/a
as found high	4938	77.2	5015	778.9	778.9	768.0	768.0	1.016	1.019
mid	4976	37.70	5014	380.5	380.5	380.0	380.0	1.004	1.012
low	4994	18.80	5013	189.8	189.8	194.0	194.0	0.983	0.999
Average C.F.=								1.001	1.010

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	4938	77.20	5015	0.0	766.0	768.0	4.0	1.0	4.0	
as found high NO2	4938	77.20	5015	520.0	288.0	769.0	482.0	478.0	478.0	1.000
gpt mid	4938	77.20	5015	275.0	504.0	768.0	265.0	262.0	261.0	1.004
gpt low	4938	77.20	5015	100.0	670.0	768.0	100.0	96.0	96.0	1.000
Average NO₂ C.F.=								1.001		

Linear Regression/Calibration Results:

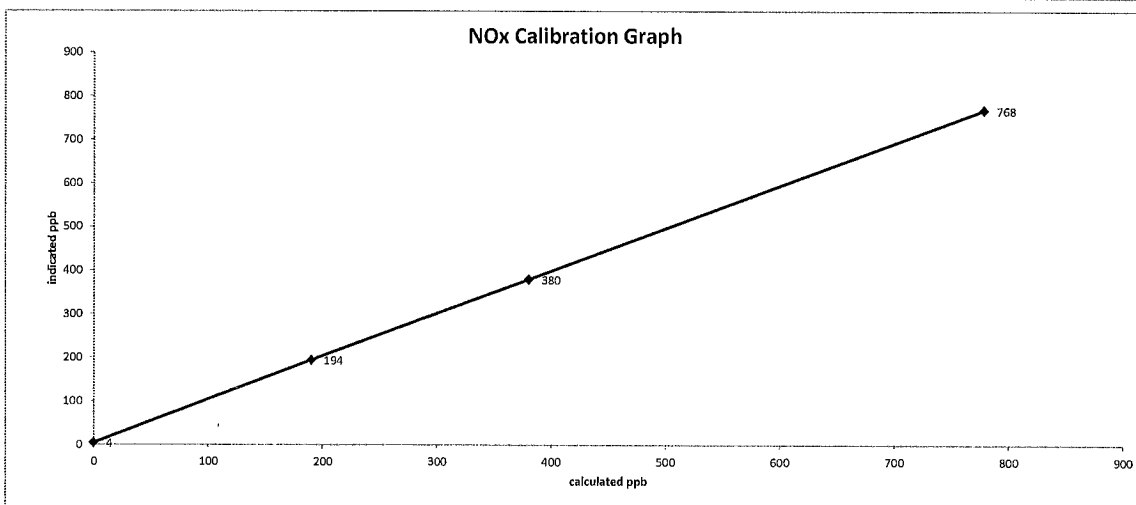
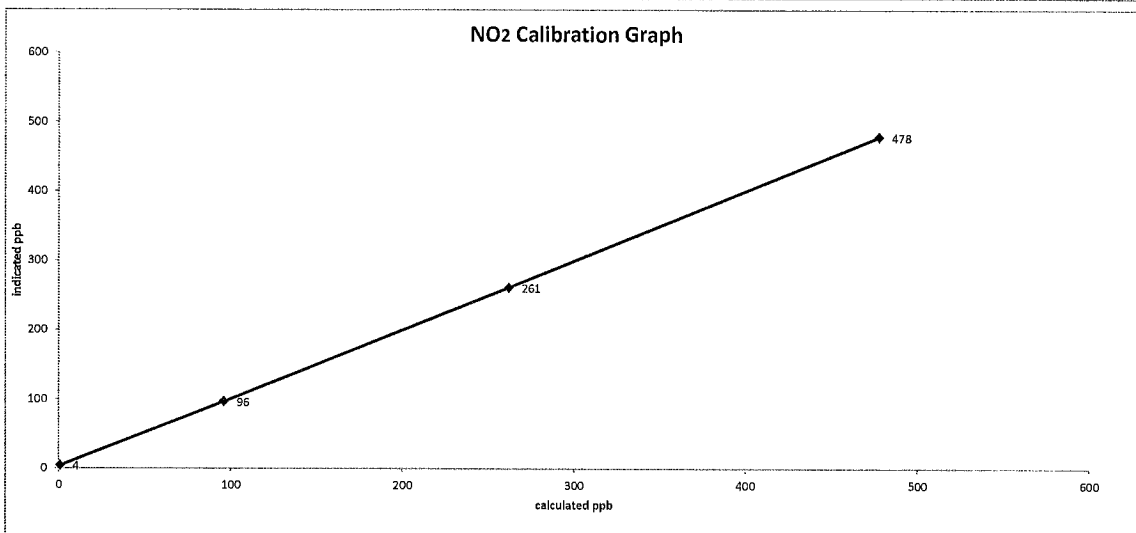
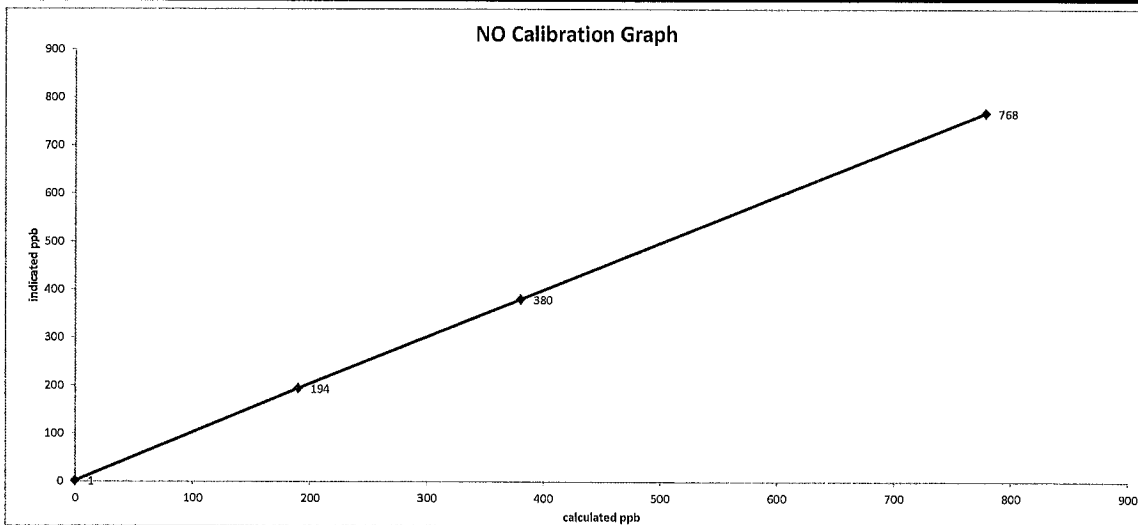
	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.018	1.021	1.005	0.90-1.10
b (Intercept as % of full scale)=	0.43%	0.61%	0.16%	± 3% F.S.
% change in C.F. from last cal=	-1.65%	-0.40%	-2.05%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04


As found: NOx SLOPE: 1.396 NOx OFFS: 3.4 NO SLOPE: 1.391 NO OFFS: -0.2 SAMP FLW: 475 OZONE FL: 73 PMT: 16.4 NORM PMT: 1.8 AZERO: 16.7 HVPS: 637 RCELL TEMP: 50.0 BOX TEMP: 33.9 PMT TEMP: 6.9 IZS TEMP: 40.3 MOLY TEMP: 313.7 RCEL: 5.3 SAMP: 27.3 Internal Span NO: 10 Internal Span NO ₂ : 324 Internal Span NOx: 333	As left: NOx SLOPE: n/a NOx OFFS: n/a NO SLOPE: n/a NO OFFS: n/a SAMP FLW: n/a OZONE FL: n/a PMT: n/a NORM PMT: n/a AZERO: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a MOLY TEMP: n/a RCEL: n/a SAMP: n/a Internal Span NO: n/a Internal Span NO ₂ : n/a Internal Span NOx: n/a
---	---

Comments:
 Shutdown calibration performed to calibrate output voltage. No NO₂ adjustment made. No ZERO adjustment made. No High point adjustment made. DAC calibration performed after shutdown calibration.

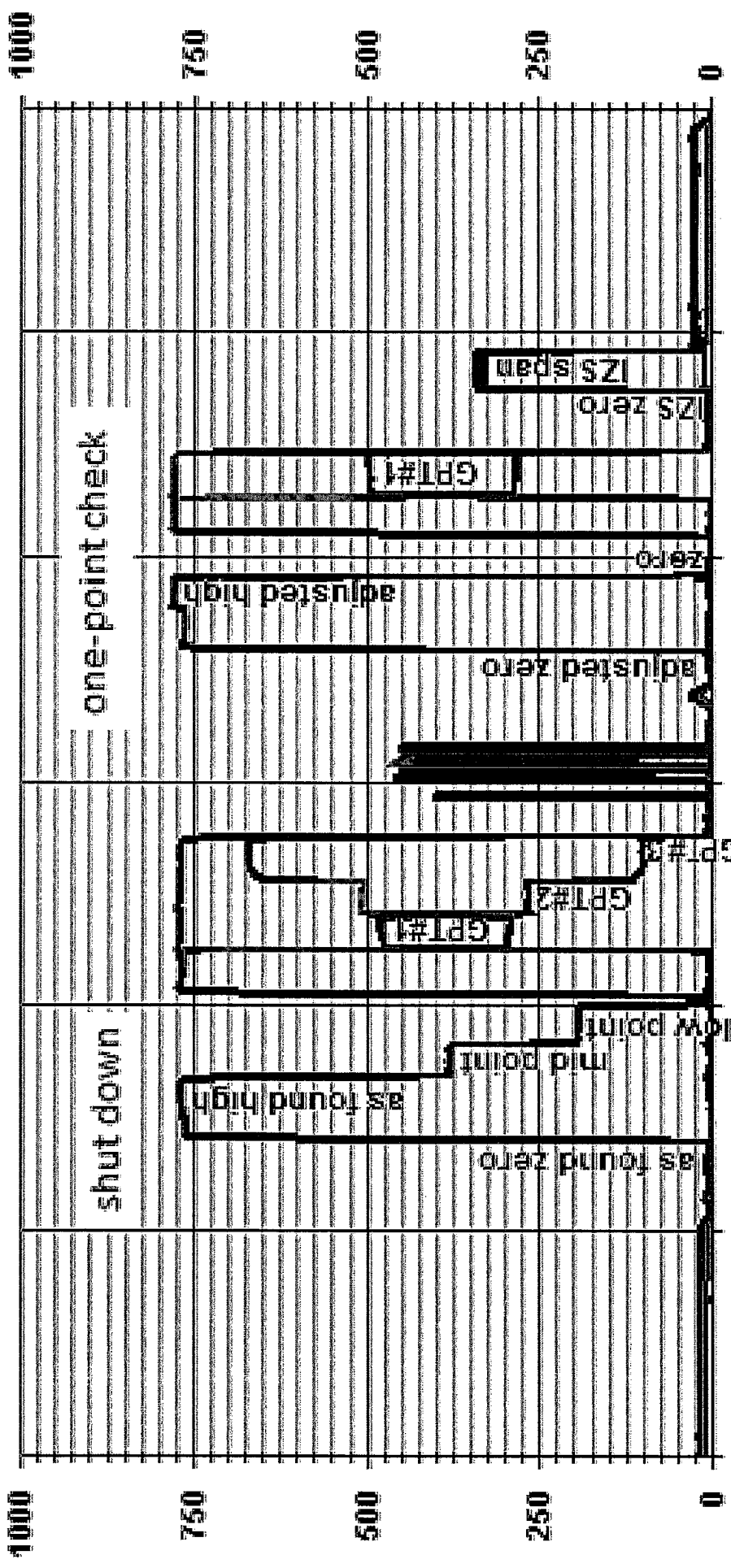
Date: December 7, 2015
Company/Airshed: LICA
Location/Station Name: Elk Point

Start/End Time 24 hr. (mst): 12:07 / 15:48
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Varying UV Lamp Power




 API 200E NO-NO2-NOx Analyzer Calibration																																																													
Date: December 7, 2015 Company/Atshed: LICA Location/Station Name: Elk Point Start/End Time 24 hr. (mst): 17:09 / 20:05 G.P.T. to be used for Ozone? No Calibration Method: Gas Dilution & Varying UV Lamp Power	Barometric Pressure: 0.915 atm Station Temperature °C: 21 Weather Conditions: Mainly sunny Calibration Purpose: post repair Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: March 12, 2019																																																												
Analyzer: Serial Number: 592 Last Calibration Date: November 10, 2015 Range ppb: 1000	Correction Factors: <table border="1" style="width:100%; 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>n/a</td> <td>n/a</td> <td>1.001</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>1.002</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	n/a	n/a	1.001	NO ₂ =	n/a	n/a	1.000	NOx =	n/a	n/a	1.002																																												
	Previous C.F.:	As Found C.F.:	New C.F.:																																																										
NO =	n/a	n/a	1.001																																																										
NO ₂ =	n/a	n/a	1.000																																																										
NOx =	n/a	n/a	1.002																																																										
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: BLM002073 NO/NOx Gas Conc. (ppm): 50.6 50.6	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width:100%; 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>780</td> <td>600</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	600	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	600	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%; text-align: center;"> <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> <tr> <td>adjusted zero</td> <td>5013</td> <td>0.0</td> <td>5013</td> <td>0</td> <td>0</td> <td>0.0</td> <td>1.0</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>adjusted high</td> <td>4938</td> <td>77.2</td> <td>5015</td> <td>778.9</td> <td>778.9</td> <td>778.0</td> <td>1.001</td> <td>1.002</td> <td></td> </tr> <tr> <td>calibrator zero</td> <td>5013</td> <td>0.00</td> <td>5013</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>1.0</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td colspan="8"></td> <td>Average C.F.=</td> <td>n/a n/a</td> </tr> </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	5013	0.0	5013	0	0	0.0	1.0	n/a	n/a	adjusted high	4938	77.2	5015	778.9	778.9	778.0	1.001	1.002		calibrator zero	5013	0.00	5013	0.0	0.0	0.0	1.0	n/a	n/a									Average C.F.=	n/a n/a
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	5013	0.0	5013	0	0	0.0	1.0	n/a	n/a																																																				
adjusted high	4938	77.2	5015	778.9	778.9	778.0	1.001	1.002																																																					
calibrator zero	5013	0.00	5013	0.0	0.0	0.0	1.0	n/a	n/a																																																				
								Average C.F.=	n/a n/a																																																				
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																													
<table border="1" style="width:100%; text-align: center;"> <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> <tr> <td>NOx reference</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>0.0</td> <td>777.0</td> <td>776.0</td> <td>1.0</td> <td>0.0</td> <td>1.0</td> <td></td> </tr> <tr> <td>adjusted high NO2</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>530.0</td> <td>284.0</td> <td>778.0</td> <td>494.0</td> <td>493.0</td> <td>493.0</td> <td>1.000</td> </tr> <tr> <td colspan="10"></td> <td>Average NO₂ C.F.=</td> <td>1.000</td> </tr> </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	4938	77.20	5015	0.0	777.0	776.0	1.0	0.0	1.0		adjusted high NO2	4938	77.20	5015	530.0	284.0	778.0	494.0	493.0	493.0	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	4938	77.20	5015	0.0	777.0	776.0	1.0	0.0	1.0																																																				
adjusted high NO2	4938	77.20	5015	530.0	284.0	778.0	494.0	493.0	493.0	1.000																																																			
										Average NO ₂ C.F.=	1.000																																																		
Linear Regression/Calibration Results: <table border="1" style="width:100%; text-align: center;"> <tr> <td></td> <td>NO</td> <td>NOx</td> <td>NO₂</td> <td>LIMITS</td> </tr> <tr> <td>Correlation Coefficient =</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> <td>> or = 0.995</td> </tr> <tr> <td>Slope =</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> <td>.95-1.05</td> </tr> <tr> <td>b (Intercept as % of full scale) =</td> <td>n/a</td> <td>n/a</td> <td>n/a</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> <tr> <td>NO2 converter efficiency</td> <td></td> <td></td> <td>1.00</td> <td>0.96 to 1.04</td> </tr> </table>			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 =	n/a	n/a	n/a	± 10%	NO2 converter efficiency			1.00	0.96 to 1.04																														
	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 =	n/a	n/a	n/a	± 10%																																																									
NO2 converter efficiency			1.00	0.96 to 1.04																																																									
<table style="width:100%;"> <tr> <td style="width: 50%; vertical-align: top;"> As found: NOx SLOPE: n/a NOx OFFS: n/a NO SLOPE: n/a NO OFFS: n/a SAMP FLW: n/a OZONE FL: n/a PMT: n/a NORM PMT: n/a AZERO: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a MOLY TEMP: n/a RCEL: n/a SAMP: n/a Internal Span NO: n/a Internal Span NO2: n/a Internal Span NOx: n/a </td> <td style="width: 50%; vertical-align: top;"> As left: NOx SLOPE: 1.424 NOx OFFS: 1.8 NO SLOPE: 1.419 NO OFFS: 1.1 SAMP FLW: 466 OZONE FL: 73 PMT: 22.2 NORM PMT: 3.6 AZERO: 17.3 HVPS: 637 RCELL TEMP: 50.0 BOX TEMP: 31.2 PMT TEMP: 6.9 IZS TEMP: 40.2 MOLY TEMP: 315.1 RCEL: 5.3 SAMP: 26.2 Internal Span NO: 9 Internal Span NO2: 331.4 Internal Span NOx: 340 </td> </tr> </table>		As found: NOx SLOPE: n/a NOx OFFS: n/a NO SLOPE: n/a NO OFFS: n/a SAMP FLW: n/a OZONE FL: n/a PMT: n/a NORM PMT: n/a AZERO: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a MOLY TEMP: n/a RCEL: n/a SAMP: n/a Internal Span NO: n/a Internal Span NO2: n/a Internal Span NOx: n/a	As left: NOx SLOPE: 1.424 NOx OFFS: 1.8 NO SLOPE: 1.419 NO OFFS: 1.1 SAMP FLW: 466 OZONE FL: 73 PMT: 22.2 NORM PMT: 3.6 AZERO: 17.3 HVPS: 637 RCELL TEMP: 50.0 BOX TEMP: 31.2 PMT TEMP: 6.9 IZS TEMP: 40.2 MOLY TEMP: 315.1 RCEL: 5.3 SAMP: 26.2 Internal Span NO: 9 Internal Span NO2: 331.4 Internal Span NOx: 340																																																										
As found: NOx SLOPE: n/a NOx OFFS: n/a NO SLOPE: n/a NO OFFS: n/a SAMP FLW: n/a OZONE FL: n/a PMT: n/a NORM PMT: n/a AZERO: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a MOLY TEMP: n/a RCEL: n/a SAMP: n/a Internal Span NO: n/a Internal Span NO2: n/a Internal Span NOx: n/a	As left: NOx SLOPE: 1.424 NOx OFFS: 1.8 NO SLOPE: 1.419 NO OFFS: 1.1 SAMP FLW: 466 OZONE FL: 73 PMT: 22.2 NORM PMT: 3.6 AZERO: 17.3 HVPS: 637 RCELL TEMP: 50.0 BOX TEMP: 31.2 PMT TEMP: 6.9 IZS TEMP: 40.2 MOLY TEMP: 315.1 RCEL: 5.3 SAMP: 26.2 Internal Span NO: 9 Internal Span NO2: 331.4 Internal Span NOx: 340																																																												
Comments: <p style="text-align: center;">Sample filter changed. No NO2 adjustment made. One-point calibration performed to leave the analyzer in the sampling mode. This calibration is considered a one-point check.</p>																																																													

01 Minute Averages



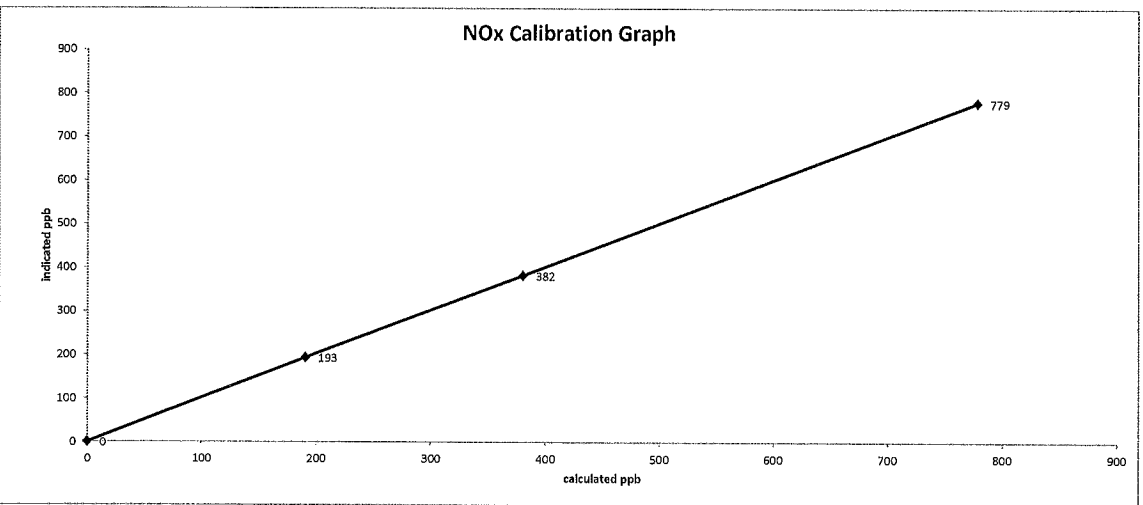
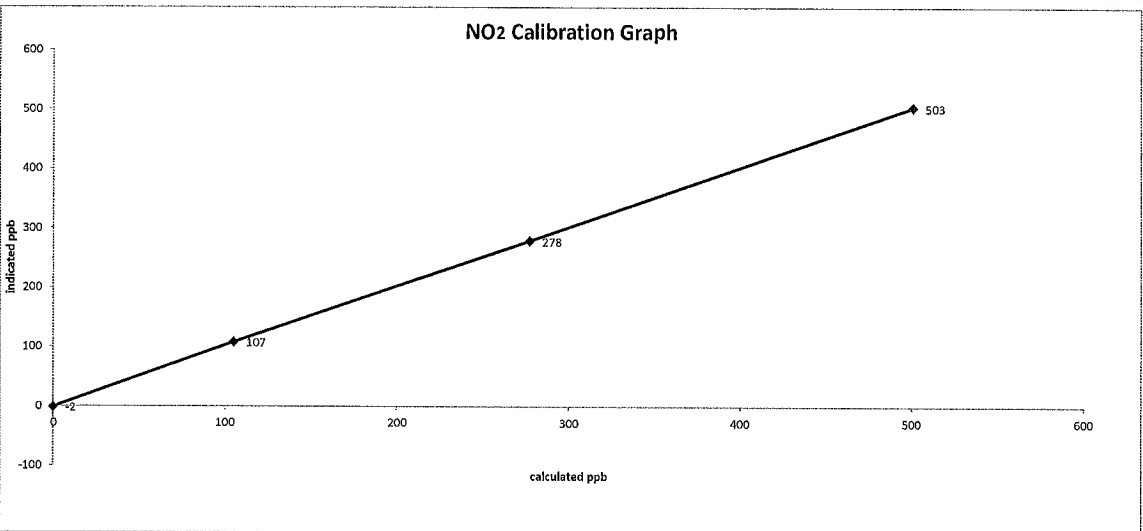
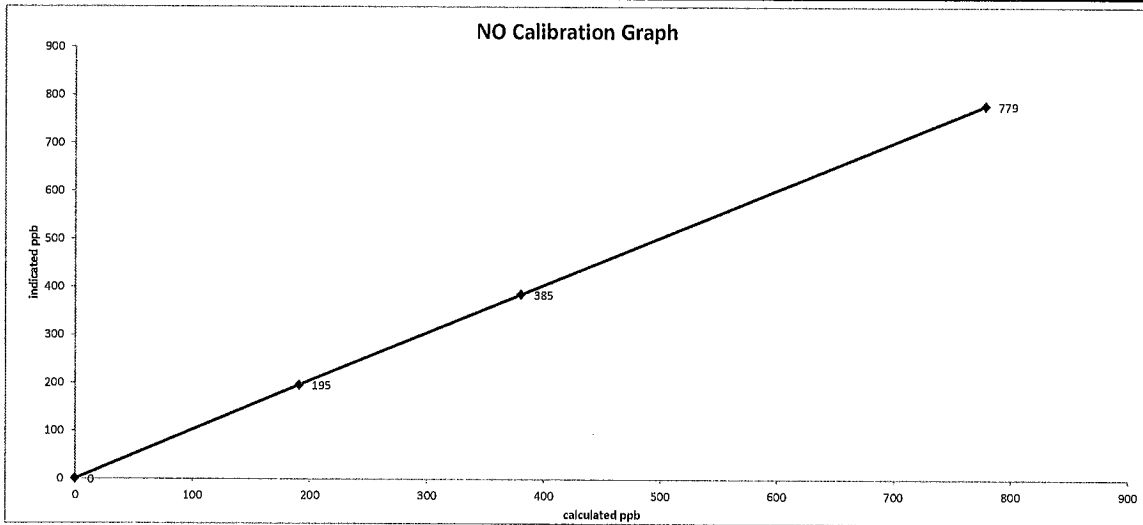
12/07/15 10:10 12/07/15 12:10 12/07/15 14:10 12/07/15 16:10 12/07/15 18:10 12/07/15 20:10

— LICA35 NOX_ PPB — LICA35 NO_ PPB — LICA35 NO2_ PPB

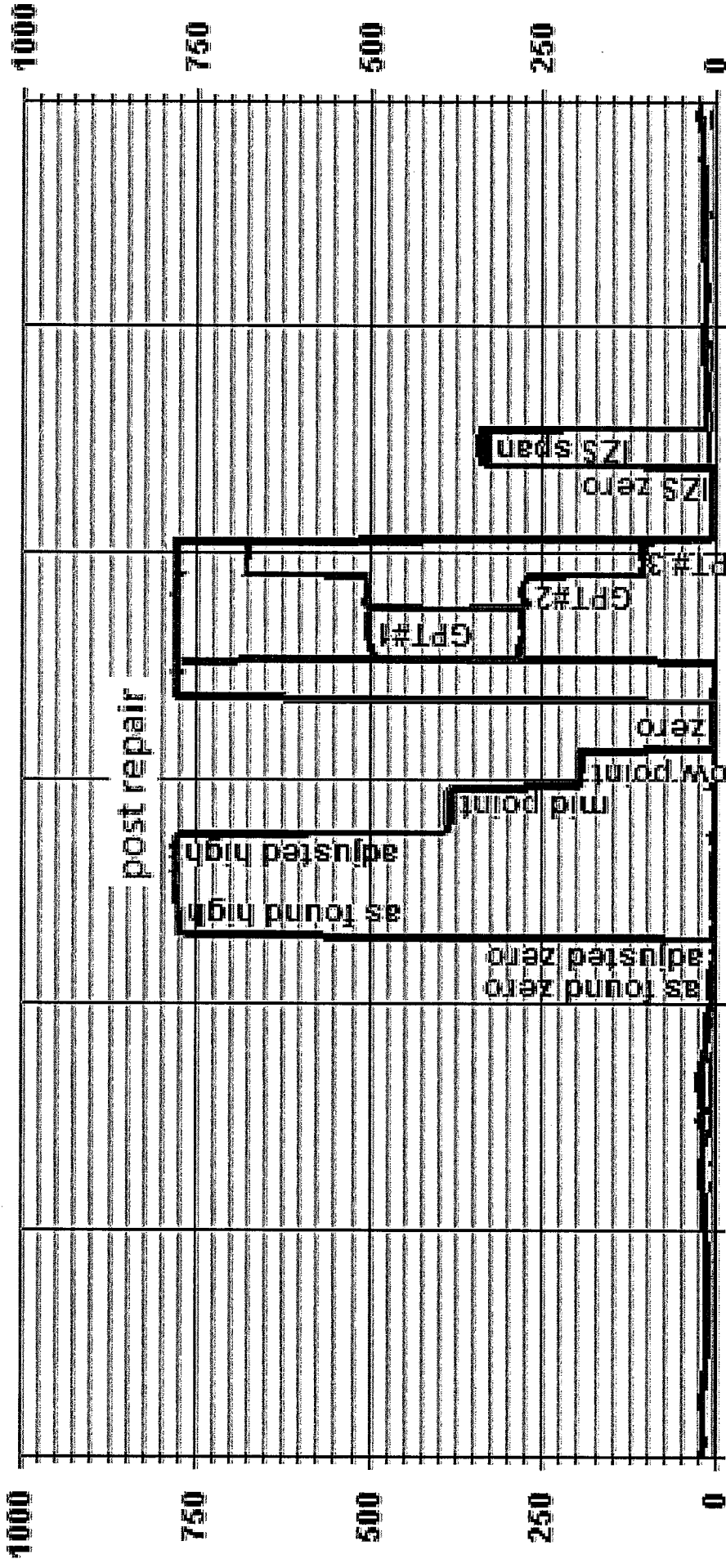
 API 200E NO-NO2-NOx Analyzer Calibration																																																																																																					
Date: December 8, 2015 Company/Airshed: LICA Location/Station Name: Elk Point Start/End Time 24 hr. (mst): 10:47 / 16:11 G.P.T. to be used for Ozone? No Calibration Method: Gas Dilution & Varying UV Lamp Power	Barometric Pressure: 0.921 atm Station Temperature °C: 20 Weather Conditions: Clear Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov / Trina Whitsitt Cal Gas Expiry Date: March 12, 2019																																																																																																				
Analyzer: Serial Number: 592 Last Calibration Date: December 7, 2015 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>1.001</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>0.996</td> <td>0.996</td> </tr> <tr> <td>NOx =</td> <td>1.002</td> <td>1.009</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.001	1.001	1.000	NO ₂ =	1.000	0.996	0.996	NOx =	1.002	1.009	1.000																																																																																				
	Previous C.F.:	As Found C.F.:	New C.F.:																																																																																																		
NO =	1.001	1.001	1.000																																																																																																		
NO ₂ =	1.000	0.996	0.996																																																																																																		
NOx =	1.002	1.009	1.000																																																																																																		
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: BLM002073 NO/NOx Gas Conc. (ppm): 50.6 50.6	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>600</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	600	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	600	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>as found zero</td> <td>5013</td> <td>0.0</td> <td>5013</td> <td>0</td> <td>0</td> <td>-1.0</td> <td>5.0</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>as found high</td> <td>4938</td> <td>77.2</td> <td>5015</td> <td>778.9</td> <td>778.9</td> <td>777.0</td> <td>777.0</td> <td>1.001</td> <td>1.009</td> </tr> <tr> <td>adjusted zero</td> <td>5013</td> <td>0.00</td> <td>5013</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>adjusted high</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>778.9</td> <td>778.9</td> <td>779.0</td> <td>779.0</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>mld</td> <td>4976</td> <td>37.70</td> <td>5014</td> <td>380.5</td> <td>380.5</td> <td>385.0</td> <td>382.0</td> <td>0.988</td> <td>0.996</td> </tr> <tr> <td>low</td> <td>4994</td> <td>18.90</td> <td>5013</td> <td>190.8</td> <td>190.8</td> <td>195.0</td> <td>193.0</td> <td>0.978</td> <td>0.988</td> </tr> <tr> <td>calibrator zero</td> <td>5013</td> <td>0.00</td> <td>5013</td> <td>0</td> <td>0</td> <td>0.0</td> <td>1.0</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td colspan="8" style="text-align: right;">Average C.F.=</td> <td>0.989</td> <td>0.995</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)			as found zero	5013	0.0	5013	0	0	-1.0	5.0	n/a	n/a	as found high	4938	77.2	5015	778.9	778.9	777.0	777.0	1.001	1.009	adjusted zero	5013	0.00	5013	0.0	0.0	0.0	0.0	n/a	n/a	adjusted high	4938	77.20	5015	778.9	778.9	779.0	779.0	1.000	1.000	mld	4976	37.70	5014	380.5	380.5	385.0	382.0	0.988	0.996	low	4994	18.90	5013	190.8	190.8	195.0	193.0	0.978	0.988	calibrator zero	5013	0.00	5013	0	0	0.0	1.0	n/a	n/a	Average C.F.=								0.989	0.995
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	5013	0.0	5013	0	0	-1.0	5.0	n/a	n/a																																																																																												
as found high	4938	77.2	5015	778.9	778.9	777.0	777.0	1.001	1.009																																																																																												
adjusted zero	5013	0.00	5013	0.0	0.0	0.0	0.0	n/a	n/a																																																																																												
adjusted high	4938	77.20	5015	778.9	778.9	779.0	779.0	1.000	1.000																																																																																												
mld	4976	37.70	5014	380.5	380.5	385.0	382.0	0.988	0.996																																																																																												
low	4994	18.90	5013	190.8	190.8	195.0	193.0	0.978	0.988																																																																																												
calibrator zero	5013	0.00	5013	0	0	0.0	1.0	n/a	n/a																																																																																												
Average C.F.=								0.989	0.995																																																																																												
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>4938</td> <td>77.20</td> <td>5015</td> <td>0.0</td> <td>779.0</td> <td>776.0</td> <td>-2.0</td> <td>0.0</td> <td>-2.0</td> <td></td> </tr> <tr> <td>as found high NO2</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>535.0</td> <td>278.0</td> <td>779.0</td> <td>501.0</td> <td>501.0</td> <td>503.0</td> <td>0.996</td> </tr> <tr> <td>gpt mld</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>290.0</td> <td>502.0</td> <td>777.0</td> <td>276.0</td> <td>277.0</td> <td>278.0</td> <td>0.996</td> </tr> <tr> <td>gpt low</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>100.0</td> <td>674.0</td> <td>778.0</td> <td>105.0</td> <td>105.0</td> <td>107.0</td> <td>0.981</td> </tr> <tr> <td colspan="9" style="text-align: right;">Average NO₂ C.F.=</td> <td>0.991</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	4938	77.20	5015	0.0	779.0	776.0	-2.0	0.0	-2.0		as found high NO2	4938	77.20	5015	535.0	278.0	779.0	501.0	501.0	503.0	0.996	gpt mld	4938	77.20	5015	290.0	502.0	777.0	276.0	277.0	278.0	0.996	gpt low	4938	77.20	5015	100.0	674.0	778.0	105.0	105.0	107.0	0.981	Average NO ₂ C.F.=									0.991																								
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	4938	77.20	5015	0.0	779.0	776.0	-2.0	0.0	-2.0																																																																																												
as found high NO2	4938	77.20	5015	535.0	278.0	779.0	501.0	501.0	503.0	0.996																																																																																											
gpt mld	4938	77.20	5015	290.0	502.0	777.0	276.0	277.0	278.0	0.996																																																																																											
gpt low	4938	77.20	5015	100.0	674.0	778.0	105.0	105.0	107.0	0.981																																																																																											
Average NO ₂ C.F.=									0.991																																																																																												
Linear Regression/Calibration Results: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>NO</th> <th>NOx</th> <th>NO₂</th> </tr> </thead> <tbody> <tr> <td>Correlation Coefficient =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>Slope =</td> <td>1.001</td> <td>1.001</td> <td>0.994</td> </tr> <tr> <td>b (Intercept as % of full scale) =</td> <td>0.26%</td> <td>0.12%</td> <td>-0.05%</td> </tr> <tr> <td>% change in C.F. from last cal =</td> <td>-0.02%</td> <td>-0.69%</td> <td>0.40%</td> </tr> <tr> <td>NO₂ converter efficiency</td> <td></td> <td></td> <td>0.99</td> </tr> </tbody> </table>			NO	NOx	NO ₂	Correlation Coefficient =	1.000	1.000	1.000	Slope =	1.001	1.001	0.994	b (Intercept as % of full scale) =	0.26%	0.12%	-0.05%	% change in C.F. from last cal =	-0.02%	-0.69%	0.40%	NO ₂ converter efficiency			0.99																																																																												
	NO	NOx	NO ₂																																																																																																		
Correlation Coefficient =	1.000	1.000	1.000																																																																																																		
Slope =	1.001	1.001	0.994																																																																																																		
b (Intercept as % of full scale) =	0.26%	0.12%	-0.05%																																																																																																		
% change in C.F. from last cal =	-0.02%	-0.69%	0.40%																																																																																																		
NO ₂ converter efficiency			0.99																																																																																																		
LIMITS > or = 0.995 .95-1.05 ± 3% F.S. ± 10% 0.96 to 1.04																																																																																																					
As found: NOx SLOPE: 1.424 NOx OFFS: 1.8 NO SLOPE: 1.419 NO OFFS: 1.1 SAMP FLW: 479 OZONE FL: 74 PMT: 27.7 NORM PMT: 9.5 AZERO: 16.8 HVPS: 637 RCELL TEMP: 50.0 BOX TEMP: 30.2 PMT TEMP: 6.9 IZS TEMP: 40.0 MOLY TEMP: 314.6 RCEL: 5.3 SAMP: 27.0 Internal Span NO: 9 Internal Span NO2: 331.4 Internal Span NOx: 340	As left: NOx SLOPE: 1.421 NOx OFFS: 2.0 NO SLOPE: 1.423 NO OFFS: 1.2 SAMP FLW: 477 OZONE FL: 73 PMT: 15.3 NORM PMT: 1.9 AZERO: 17.2 HVPS: 637 RCELL TEMP: 50.0 BOX TEMP: 31.1 PMT TEMP: 6.9 IZS TEMP: 40.2 MOLY TEMP: 315.2 RCEL: 5.3 SAMP: 27.4 Internal Span NO: 8.9 Internal Span NO2: 330.2 Internal Span NOx: 338.9																																																																																																				
Comments: <p style="text-align: center;">Sample filter changed on December 7, 2015. No NO2 adjustment made. This calibration is considered a post-repair.</p>																																																																																																					

Date: December 8, 2015
Company/Airshed: LICA
Location/Station Name: Elk Point

Start/End Time 24 hr. (mst): 10:47 / 16:11
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Varying UV Lamp Power




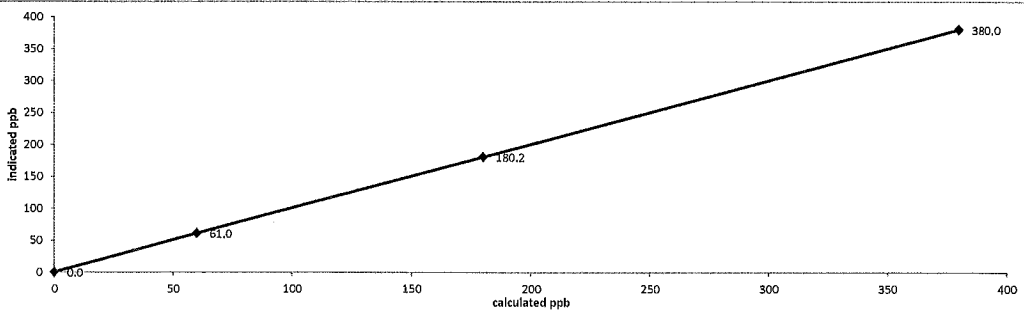
01 Minute Averages



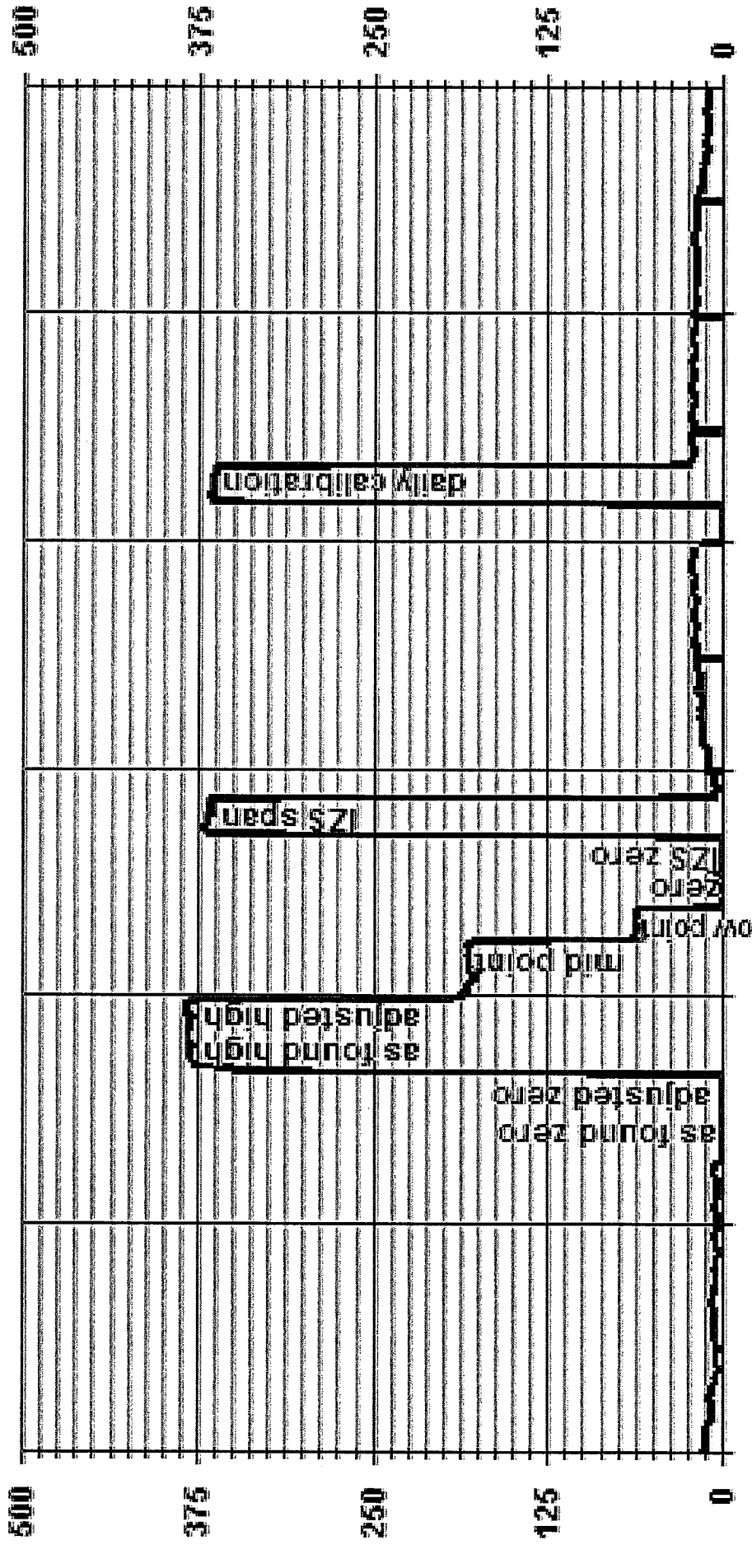
12/08/15 07:00 12/08/15 09:00 12/08/15 11:00 12/08/15 13:00 12/08/15 15:00 12/08/15 17:00

— LICA35 NOX_ PPB — LICA35 NO_ PPB — LICA35 NO2_ PPB

OZONE

 Thermo 49i Ozone Analyzer Calibration																																																																					
Date: December 8, 2015 Company/Alrshed: LICA Location/Station Name: Elk Point Start/End Time 24 hr. (mst): 15:27 / 18:50 Ozone Calibration Method: Varying UV Lamp Power G.P.T. Date: n/a-done by Varying UV Lamp Power	Barometric Pressure: 0.921 atm Station Temperature °C: 20 Weather Conditions: Clear Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov / Trina Whitsitt Cal Gas Expiry Date: n/a																																																																				
Analyzer: Serial Number: 1002240372 Ozone Range ppb: 500 Last Calibration Date: November 10, 2015 As Found C.F.: 0.998 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																																																																					
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="2">Callibrator Flow Rate (cc/min)</th> <th>Calculated Concentration:</th> <th>Corrected Calculated Concentration:</th> <th>Indicated Concentration:</th> <th rowspan="2">Correction Factors:</th> </tr> <tr> <th>Total Flow @ Point Start</th> <th>Total Flow @ Point Finish</th> <th>(ppb)</th> <th>(ppb)</th> <th>(ppb)</th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>5013</td> <td>5013</td> <td>0.0</td> <td>n/a</td> <td>0.1</td> <td>n/a</td> </tr> <tr> <td>as found high</td> <td>5013</td> <td>5013</td> <td>380.0</td> <td>380.0</td> <td>381.0</td> <td>0.998</td> </tr> <tr> <td>adjusted zero</td> <td>5013</td> <td>5013</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>n/a</td> </tr> <tr> <td>adjusted high</td> <td>5013</td> <td>5013</td> <td>380.0</td> <td>380.0</td> <td>380.0</td> <td>1.000</td> </tr> <tr> <td>mid</td> <td>5013</td> <td>5013</td> <td>180.0</td> <td>180.0</td> <td>180.2</td> <td>0.999</td> </tr> <tr> <td>low</td> <td>5013</td> <td>5013</td> <td>60.0</td> <td>60.0</td> <td>61.0</td> <td>0.984</td> </tr> <tr> <td>calibrator zero</td> <td>5013</td> <td>5013</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>0.994</td> </tr> </tbody> </table>		Point	Callibrator 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	5013	5013	0.0	n/a	0.1	n/a	as found high	5013	5013	380.0	380.0	381.0	0.998	adjusted zero	5013	5013	0.0	0.0	0.0	n/a	adjusted high	5013	5013	380.0	380.0	380.0	1.000	mid	5013	5013	180.0	180.0	180.2	0.999	low	5013	5013	60.0	60.0	61.0	0.984	calibrator zero	5013	5013	0.0	n/a	0.0	n/a	Average C.F. =						0.994
Point	Callibrator 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	5013	5013	0.0	n/a	0.1	n/a																																																															
as found high	5013	5013	380.0	380.0	381.0	0.998																																																															
adjusted zero	5013	5013	0.0	0.0	0.0	n/a																																																															
adjusted high	5013	5013	380.0	380.0	380.0	1.000																																																															
mid	5013	5013	180.0	180.0	180.2	0.999																																																															
low	5013	5013	60.0	60.0	61.0	0.984																																																															
calibrator zero	5013	5013	0.0	n/a	0.0	n/a																																																															
Average C.F. =						0.994																																																															
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 = 1.001</td> <td>.95-1.05</td> </tr> <tr> <td>b (Intercept as % of full scale) = -0.09%</td> <td>± 3% F.S.</td> </tr> <tr> <td>% change in C.F. from last cal = 0.24%</td> <td>± 10%</td> </tr> </table>		Correlation Coefficient = 1.000	LIMITS > or = 0.995	Slope = 1.001	.95-1.05	b (Intercept as % of full scale) = -0.09%	± 3% F.S.	% change in C.F. from last cal = 0.24%	± 10%																																																												
Correlation Coefficient = 1.000	LIMITS > or = 0.995																																																																				
Slope = 1.001	.95-1.05																																																																				
b (Intercept as % of full scale) = -0.09%	± 3% F.S.																																																																				
% change in C.F. from last cal = 0.24%	± 10%																																																																				
Thermo 49i Ozone Analyzer Calibration 																																																																					
<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: O3 Bkg: -0.4 O3 Coef: 0.999 Photo Lamp: 14.2 O3 Lamp: 5.8 Bench: 31.6 Bench Lamp: 54.1 O3 Lamp: 68.2 Pressure: 685.2 Cell A lpm: 0.736 Cell B lpm: 0.741 O3 ppb: -0.8 Cell A ppb: -7.6 Cell B ppb: 6.1 Cell A Int: 101020 Cell B Int: 100373 Internal Span: 364.4 </td> <td style="width:50%; vertical-align: top;"> As left: O3 Bkg: -0.2 O3 Coef: 0.994 Photo Lamp: 14.2 O3 Lamp: 5.8 Bench: 31.5 Bench Lamp: 54.1 O3 Lamp: 68.2 Pressure: 684.3 Cell A lpm: 0.735 Cell B lpm: 0.740 O3 ppb: 0.2 Cell A ppb: 0.9 Cell B ppb: -0.5 Cell A Int: 101032 Cell B Int: 100388 Internal Span: 365.2 </td> </tr> </table>		As found: O3 Bkg: -0.4 O3 Coef: 0.999 Photo Lamp: 14.2 O3 Lamp: 5.8 Bench: 31.6 Bench Lamp: 54.1 O3 Lamp: 68.2 Pressure: 685.2 Cell A lpm: 0.736 Cell B lpm: 0.741 O3 ppb: -0.8 Cell A ppb: -7.6 Cell B ppb: 6.1 Cell A Int: 101020 Cell B Int: 100373 Internal Span: 364.4	As left: O3 Bkg: -0.2 O3 Coef: 0.994 Photo Lamp: 14.2 O3 Lamp: 5.8 Bench: 31.5 Bench Lamp: 54.1 O3 Lamp: 68.2 Pressure: 684.3 Cell A lpm: 0.735 Cell B lpm: 0.740 O3 ppb: 0.2 Cell A ppb: 0.9 Cell B ppb: -0.5 Cell A Int: 101032 Cell B Int: 100388 Internal Span: 365.2																																																																		
As found: O3 Bkg: -0.4 O3 Coef: 0.999 Photo Lamp: 14.2 O3 Lamp: 5.8 Bench: 31.6 Bench Lamp: 54.1 O3 Lamp: 68.2 Pressure: 685.2 Cell A lpm: 0.736 Cell B lpm: 0.741 O3 ppb: -0.8 Cell A ppb: -7.6 Cell B ppb: 6.1 Cell A Int: 101020 Cell B Int: 100373 Internal Span: 364.4	As left: O3 Bkg: -0.2 O3 Coef: 0.994 Photo Lamp: 14.2 O3 Lamp: 5.8 Bench: 31.5 Bench Lamp: 54.1 O3 Lamp: 68.2 Pressure: 684.3 Cell A lpm: 0.735 Cell B lpm: 0.740 O3 ppb: 0.2 Cell A ppb: 0.9 Cell B ppb: -0.5 Cell A Int: 101032 Cell B Int: 100388 Internal Span: 365.2																																																																				
Comments: <div style="text-align: center;">Sample filter changed.</div>																																																																					

01 Minute Averages



— LICA35 03_ PPB

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: December 9, 2015
 Company: LICA
 Station Name/Location: Elk Point
 Previous Audit Date: November 23, 2015
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 13:32
 End Time (mst): 14:17
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Fog

1400A Information and Status:

Serial Number: 1405A207691003 As Found Filter Loading %: 30.02
 Ko Factor: 15635 As Left Filter Loading %: 30.42
 Ambient Temperature °C: -0.4 As Found Noise: 0.004
 Ambient Pressure atm: 0.911 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.31
 Aux Flow Reading lpm: 13.68 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>Fisher</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>FB 1291</u>
Serial Number:	<u>n/a</u>	<u>130168457</u>	<u>130168457</u>
Calibration Date:	<u>n/a</u>	<u>18-Mar-15</u>	<u>18-Mar-15</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.53	0.01	0.53
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.72	0.00	-0.72
	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	0.53	0.01	0.53
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.72	0.00	-0.72
	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>-0.4</u>	1405F pressure atm: <u>0.911</u>
reference temperature °C: <u>-0.2</u>	reference pressure: <u>0.911</u>
difference °C: <u>0.2</u>	difference: <u>0.000</u>

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>-0.2</u>	1405F pressure atm: <u>0.911</u>
reference temperature °C: <u>-0.2</u>	reference pressure: <u>0.911</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>16.68</u>
reference main flow lpm: <u>2.91</u>	reference total/aux flow lpm: <u>16.10</u>
difference lpm: <u>-0.09</u>	difference lpm: <u>-0.58</u>

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

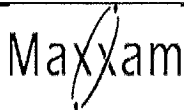
main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.68</u>
reference main flow lpm: <u>3.04</u>	reference total/aux flow lpm: <u>16.40</u>
difference lpm: <u>0.04</u>	difference lpm: <u>-0.28</u>

K_o Audit:

Last K_o audit date: 16-Jul-15
 1405F K_o factor: 15635
 Measured K_o factor: 15757.7000
 % difference: 0.79

Comments:

47 mm FDMS filter changed.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: December 24, 2015
 Company: LICA
 Station Name/Location: Elk Point
 Previous Audit Date: December 9, 2015
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whatsitt
 Start Time (mst): 11:23
 End Time (mst): 12:03
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: Mainly cloudy with snow

1400A Information and Status:

Serial Number:	<u>1405A207691003</u>	As Found Filter Loading %:	<u>35.33</u>
Ko Factor:	<u>15635</u>	As Left Filter Loading %:	<u>35.90</u>
Ambient Temperature °C:	<u>-18.62</u>	As Found Noise:	<u>0.004</u>
Ambient Pressure atm:	<u>0.916</u>	As Left Noise:	<u>0.000</u>
Main Flow Reading lpm:	<u>3.00</u>	Pump Vacuum:	<u>0.31</u>
Aux Flow Reading lpm:	<u>13.68</u>	Warnings:	<u>None</u>

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>Fisher</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>FB 1291</u>
Serial Number:	<u>n/a</u>	<u>130168457</u>	<u>130168457</u>
Calibration Date:	<u>n/a</u>	<u>18-Mar-15</u>	<u>18-Mar-15</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.54	0.01	0.54
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.72	0.00	-0.72
	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	0.54	0.01	0.54
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.72	0.00	-0.72
	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>-18.6</u>	1405F pressure atm:	<u>0.916</u>
reference temperature °C:	<u>-20.1</u>	reference pressure:	<u>0.917</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>-20.1</u>	1405F pressure atm:	<u>0.917</u>
reference temperature °C:	<u>-20.1</u>	reference pressure:	<u>0.917</u>
difference °C:	<u>0.0</u>	difference :	<u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm		total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%	
1405F main flow lpm:	<u>3.00</u>	1400A total/aux flow lpm:	<u>16.68</u>
reference main flow lpm:	<u>2.96</u>	reference total/aux flow lpm:	<u>15.89</u>
difference lpm:	<u>-0.04</u>	difference lpm:	<u>-0.79</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>16.68</u>
reference main flow lpm:	<u>2.96</u>	reference total/aux flow lpm:	<u>15.89</u>
difference lpm:	<u>-0.04</u>	difference lpm:	<u>-0.79</u>

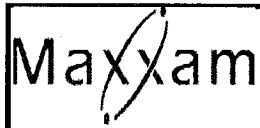
K_o Audit:

Last K_o audit date: 16-Jul-15
 1405F K_o factor: 15635
 Measured K_o factor: 15757.7000
 % difference: 0.79

Comments:

47 mm FDMS filter changed.

WIND SYSTEM



Meteorological Sensor Audit

Station Information

Company:	<u>Maxxam/LICA</u>	Performed By:	<u>Angie Noonan</u>
Location:	<u>Edmonton/Elk Point</u>	Reason:	<u>Pre-Installation</u>
Audit Date:	<u>23-Nov-15</u>	Start Time (mst):	<u>14:45</u>
Previous Audit Date:	<u>n/a</u>	End Time (mst):	<u>15:30</u>

Wind Speed

Sensor make:	<u>R. M. Young</u>	Sensor height:	<u>n/a</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>110980</u>
Callibrator:	<u>Young 18802</u>	Variable speed motor:	<u>CA 03309</u>
Voltage range:	<u>0-1</u>	Output signal range:	<u>200</u>

Wind Speed Audit Data

RPM	Wind Speed Actual	Indicated WS - CW	Indicated WS-CCW	Correction Factor
0	0.0	0.04747	0.04747	-
1000	17.6	17.67	17.65	1.00
2000	35.28	35.3	35.3	1.00
3000	52.92	52.93	52.91	1.00
4000	70.56	70.53	70.54	1.00
5000	88.2	88.18	88.18	1.00
6000	105.84	105.8	105.8	1.00
7000	123.48	123.4	123.4	1.00
8000	141.12	141.1	141.1	1.00
9000	158.76	158.7	158.7	1.00
10000	176.4	176.3	176.3	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>110980</u>
Calibrator:	<u>Young 18802</u>	Variable speed motor:	<u>CA 03309</u>
Voltage range:	<u>0-1</u>	Output signal range:	<u>200</u>

Wind Direction Audit Data

Wind Direction	Indicated	Correction Factor
0	0.2	NA
45	44.9	1.00
90	89.4	1.01
135	134.3	1.01
180	179.5	1.00
225	224.3	1.00
270	269.6	1.00
315	315.1	1.00
360	354.8	1.01
Average Correction Factor:		1.00

Remarks: Pre-Installation calibration.

Audit Performed by: Angie Noonan

CALIBRATORS

Company: Maxxam **Operator:** Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>N/A</u>
Serial Number	<u>11900613</u>	Serial Number	<u>N/A</u>
Oven Temperature	<u>N/A</u>	Temperature (°C)	<u>N/A</u>
Last Verification Date	<u>N/A</u>	Barometric Pressure	<u>N/A</u>

Flow Measurements

Pt. No. 1 5000 Pt. No. 2 5000 Pt. No. 3 5000

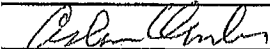
Calibrator Flow (sccm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
5013	0.000	0.001		
5013	0.400	0.407	1%	± 10%
5013	0.200	0.204	1%	± 10%
5014	0.100	0.101	0%	± 10%
Absolute Average Percent Difference			1%	± 10%

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

<u>O₃</u>		<u>LIMITS</u>
Correlation=	1.0000	≥ 0.995
m (Slope)=	1.0163	0.90-1.10
b (Intercept % of FS)=	0.0800	± 3% F.S.

AENV Standards		Ozone Analyzer	
Audit Calibrator		Make/Model	<u>Teco 49i</u>
Make/Model	<u>Teco 49i PS</u>	Serial/AMU Number	<u>AMU 1843</u>
Serial/AMU Number	<u>AMU 1808</u>	Last Calibration Date	<u>May 21, 2015</u>
Ozone Standard	<u>Primary</u>	Full Scale (ppm)	<u>0.5</u>

COMMENTS: _____

Auditor: Al Clark Date: May 21, 2015
 Operator Signature:  Location: McIntyre Center Edmonton

Company Maxxam Operator: Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>EnviroNics 6100</u>	Make/Model	<u>N/A</u>
Serial Number	<u>4760</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>December 2013</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>LL42475</u>	Barometric Pressure	<u>N/A</u>
NO/NOX Concentration	<u>48.5/48.5</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
Pt. #3	<u>5000</u>		
Gas Flow (sccm)			
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>
Pt. #3	<u>20</u>	Gas flows not available from display.	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4980	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4993	0.0	0.799	0.799	0.840	-0.001	0.839	5%	5%
4994	0.0	0.399	0.399	0.420	-0.001	0.419	5%	5%
4991	0.0	0.200	0.200	0.211	0.000	0.211	5%	5%
Absolute Average Percent Difference							5%	5%

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)=	1.0511	0.90-1.10		m (Slope)=	1.0496
b (Intercept % of FS)=	0.0400	± 3% F.S.		b (Intercept % of FS)=	0.0400

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4993	0.000	0.000	0.823	-0.001	0.822	NO ₂	% Diff. Limit
4993	0.480	0.530	0.293	0.530	0.823	0	± 10%
4993	0.240	0.269	0.554	0.269	0.823	0	± 10%
4993	0.090	0.096	0.727	0.097	0.824	0	± 10%
Absolute Average Percent Difference						0	± 10%

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

NO ₂		LIMITS	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	1.0006	0.90-1.10	
b (Intercept % of FS)=	-0.0132	± 3% F.S.	

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
		Last Calibration Date	<u>December 15, 2014</u>
		Full Scale (ppm)	<u>1.0</u>

COMMENTS:

Auditor: Al Clark
Operator Signature: [Signature]

Date: December 17, 2014
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-344CGA

Company: Maxxam Operator's Name: Limin Li
Cylinder #: BLM002073 Concentration PPM: 49.5 Tolerance(%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
Serial Number: AMU 1690
Last Verification Date: March 31, 2015
Gas Type: SO2 Conc. 98.57
Cylinder Number: CAL016720

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 43C Serial/AMU Number: 1623
Instrument Settings: Zero: 7.9 Span: 1.028 Range: 1.0
Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.01660	60.242	48.3
4976	82.6	0.801	0.01660	60.242	48.3
4993	41.0	0.396	0.00821	121.780	48.2
4977	20.2	0.193	0.00406	246.386	47.6
Average Cylinder Concentration:					48.0

Previous Stated Concentration PPM: 49.5

Percent variance from Stated: 3.0

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: March 31, 2015
Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2013-314CGA

Company: Maxxam Operator's Name: Limin Li
Cylinder #: BLM001434 Concentration PPM: 10.32 Tolerance(%): 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
Serial Number: AMU 1690
Last Verification Date: December 4, 2013
Gas Type: H2S Conc. 20.43
Cylinder Number: CAL016106

Flow Measurement Device:

Make/Model: Blae DC2
Serial Number: AMU 1659
Temp. °C: 22.5 C
B.P. 711 mmhg

Reference Analyzer:

Make/Model: Teco 46C Serial/AMU Number: 1624
Instrument Settings: Zero: 7.8 Span: 1.041 Range: 0.1
Last Calibration: Date: Dec 4/13 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000			
5083	38.4	0.0803	0.00765	132.370	10.63
5076	17.9	0.0369	0.00353	283.575	10.18
5050	9.2	0.0177	0.00182	548.913	9.72
Average Cylinder Concentration:					10.18

Previous Stated Concentration PPM: 10.32

Percent variance from Stated: 1.4

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 4, 2013
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 (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	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

NO Cylinder Gas

File No. 2015-346CGA

Company: Maxxam Operators name: Limin Li
Cylinder #: BLM002073 Conc (PPM) 50.6/50.6 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				
4976	82.6	0.855	0.848	0.01660	60.242	51.5	51.1
4993	41.0	0.427	0.421	0.00821	121.780	52.0	51.3
4977	20.2	0.213	0.209	0.00406	246.386	52.5	51.5
Average Cylinder Concentration:						52.0	51.3

NO **NOx**

Previous Stated Concentration PPM: 50.6 50.6

Percent variance from Stated: 2.8 1.4

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 49.5 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



Praxair Canada, Inc.
 9501 34th Street
 Edmonton, AB T6B 2X5
 Tel: 780-449-0770
 Fax: 780-449-5302

03/27/2014

MAXAM ANALYTICS INC 'NA'
 9372 49TH ST
 EDMONTON, AB T6B 2L7

Work Order No. 20248656
 Customer Reference No.

Product Lot/Batch No. Z582 4 085 02
 Product Part No. NI ME600P2P-AQ

CERTIFICATE OF ANALYSIS
 Primary Standard

Component	Requested Concentration	Certified Concentration	Analytical Principle	Analytical Accuracy
Methane	500.0ppm	501.4ppm	U	±1% rel
Propane	200.0ppm	202ppm	U	±1% rel
Nitrogen	Balance	Balance		

Analytical Instruments: Mettler-Toledo Analytical Balance-ID2sx/USA--
 Hewlett-Packard (Agilent)-6890--GC-FID

Cylinder Style: AQ
 Cylinder Pressure @70F: 2200 psig
 Cylinder Volume: 82.0 ft3
 Valve Outlet Connection: CGA-350
 Cylinder No(s): LL33574

Filling Method: Gravimetric
 Date of Fill: 03/26/2014
 Expiration Date: 03/26/2017

Analyst: Todd Hryniv

The gas calibration cylinder standard prepared by Praxair Canada, Inc. is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Praxair Canada, Inc. Reference Materials which are either prepared by weight measure to the National Institute of Standards and Technology (NIST), Montreal, Canada or by other NIST Standard Reference Materials whose analysis is by other NIST Standard Reference Materials whose analysis is by other NIST Standard Reference Materials.

Ref. to Analytical Techniques	Method	Detector	Calibration
A	Gas Chromatography with Flame Ionization Detector	Flame Ionization	External
B	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
C	Gas Chromatography with Nitrogen Gas Analyzer	Nitrogen	External
D	Mass Spectrometry - MS/MS (GC/MS)	Mass Spectrometry	External
E	Gas Chromatography with Electrode Conductivity Detector	Electrode Conductivity	External
F	Gas Chromatography with Refractive Index Detector	Refractive Index	External
G	Gas Chromatography with Mass Spectrometry	Mass Spectrometry	External
H	Gas Chromatography with Photoacoustic Detector	Photoacoustic	External
I	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
J	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
K	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
L	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
M	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
N	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
O	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
P	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
Q	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
R	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
S	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
T	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
U	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
V	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
W	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
X	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
Y	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External
Z	Gas Chromatography with Thermal Conductivity Detector	Thermal Conductivity	External

IMPORTANT!
 The information contained herein has been prepared at your request by personnel within Praxair Canada, Inc. When we believe the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is intended for use as a reference only and any use of the information is at the user's discretion and risk of the user. In no event shall Praxair Canada, Inc. be liable for the use of the information furnished herein except the fee assessed for providing such information.

APPENDIX IV
ANALYTICAL RESULTS

VOCS SAMPLES



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/VOC/ELK/Dec 2, 2015 **CANISTER ID** 1532 **Matrix** Ambient Air **DATE SAMPLED** 02-Dec-15 00:00
DESCRIPTION: Elk Point Airport
REPORT NUMBER: 15120089 **REPORT CREATED:** 08-Jan-16 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-003	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	10-Dec-15
15120089-003	1,2,4-Trimethylbenzene	I	0.05 ppbv	0.03	AC-058	10-Dec-15
15120089-003	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	10-Dec-15
15120089-003	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	10-Dec-15
15120089-003	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-003	1,3,5-Trimethylbenzene	I	0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	10-Dec-15
15120089-003	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-003	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-003	1-Butene	I	0.17 ppbv	0.02	AC-058	10-Dec-15
15120089-003	1-Hexene	I	0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-003	2,2,4-Trimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-003	2,2-Dimethylbutane	I	0.11 ppbv	0.01	AC-058	10-Dec-15
15120089-003	2,3,4-Trimethylpentane	I	0.04 ppbv	0.01	AC-058	10-Dec-15
15120089-003	2,3-Dimethylbutane	I	0.32 ppbv	0.02	AC-058	10-Dec-15
15120089-003	2,3-Dimethylpentane	I	0.17 ppbv	0.02	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, January 08, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 2, 2015	1532	Ambient Air	02-Dec-15 00:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15120089	REPORT CREATED: 08-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-003	2,4-Dimethylpentane	I	0.13 ppbv	0.01	AC-058	10-Dec-15
15120089-003	2-Methylheptane	I	0.10 ppbv	0.01	AC-058	10-Dec-15
15120089-003	2-Methylhexane	I	0.22 ppbv	0.01	AC-058	10-Dec-15
15120089-003	2-Methylpentane	I	0.61 ppbv	0.01	AC-058	10-Dec-15
15120089-003	3-Methylheptane	I	0.06 ppbv	0.02	AC-058	10-Dec-15
15120089-003	3-Methylhexane	I	0.24 ppbv	0.02	AC-058	10-Dec-15
15120089-003	3-Methylpentane	I	0.35 ppbv	0.01	AC-058	10-Dec-15
15120089-003	Acetone	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-003	Acrolein	K, T, U	< 0.3 ppbv	0.3	AC-058	10-Dec-15
15120089-003	Benzene	I	0.35 ppbv	0.01	AC-058	10-Dec-15
15120089-003	Benzyl chloride	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-003	Bromodichloromethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	Bromoform	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	Bromomethane	I	0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-003	Carbon disulfide	I	0.44 ppbv	0.01	AC-058	10-Dec-15
15120089-003	Carbon tetrachloride	I	0.10 ppbv	0.01	AC-058	10-Dec-15
15120089-003	Chlorobenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	Chloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	Chloroform	I	0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	Chloromethane	I	0.60 ppbv	0.02	AC-058	10-Dec-15
15120089-003	cis-1,2-Dichloroethene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-003	cis-1,3-Dichloropropene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-003	cis-2-Butene	I	0.05 ppbv	0.02	AC-058	10-Dec-15
15120089-003	cis-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	Cyclohexane	I	0.43 ppbv	0.02	AC-058	10-Dec-15



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 2, 2015	1532	Ambient Air	02-Dec-15 00:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15120089	REPORT CREATED: 08-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-003	Cyclopentane	I	0.15 ppbv	0.01	AC-058	10-Dec-15
15120089-003	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-003	Ethanol		1.3 ppbv	0.3	AC-058	10-Dec-15
15120089-003	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-003	Ethylbenzene	I	0.07 ppbv	0.01	AC-058	10-Dec-15
15120089-003	Freon-11		0.32 ppbv	0.02	AC-058	10-Dec-15
15120089-003	Freon-113	I	0.07 ppbv	0.01	AC-058	10-Dec-15
15120089-003	Freon-114	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	Freon-12		0.60 ppbv	0.02	AC-058	10-Dec-15
15120089-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	10-Dec-15
15120089-003	Isobutane		2.54 ppbv	0.02	AC-058	10-Dec-15
15120089-003	Isopentane		2.09 ppbv	0.03	AC-058	10-Dec-15
15120089-003	Isoprene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-003	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-003	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-003	m,p-Xylene	I	0.18 ppbv	0.03	AC-058	10-Dec-15
15120089-003	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-003	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	10-Dec-15
15120089-003	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	10-Dec-15
15120089-003	Methyl ethyl ketone		0.7 ppbv	0.3	AC-058	10-Dec-15
15120089-003	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-003	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	10-Dec-15
15120089-003	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	10-Dec-15
15120089-003	Methylcyclohexane		0.66 ppbv	0.01	AC-058	10-Dec-15
15120089-003	Methylcyclopentane		0.37 ppbv	0.02	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead

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

Date: Friday, January 08, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 2, 2015	1532	Ambient Air	02-Dec-15 00:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15120089	REPORT CREATED: 08-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-003	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	10-Dec-15
15120089-003	n-Butane		4.31 ppbv	0.03	AC-058	10-Dec-15
15120089-003	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	10-Dec-15
15120089-003	n-Dodecane		0.5 ppbv	0.4	AC-058	10-Dec-15
15120089-003	n-Heptane	I	0.27 ppbv	0.01	AC-058	10-Dec-15
15120089-003	n-Hexane		0.66 ppbv	0.01	AC-058	10-Dec-15
15120089-003	n-Octane	I	0.13 ppbv	0.02	AC-058	10-Dec-15
15120089-003	n-Pentane	K, T, U	< 0.1 ppbv	0.1	AC-058	10-Dec-15
15120089-003	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-003	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-003	Naphthalene		1.5 ppbv	0.5	AC-058	10-Dec-15
15120089-003	n-Nonane	I	0.04 ppbv	0.01	AC-058	10-Dec-15
15120089-003	o-Ethyltoluene	I	0.02 ppbv	0.01	AC-058	10-Dec-15
15120089-003	o-Xylene	I	0.07 ppbv	0.01	AC-058	10-Dec-15
15120089-003	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-003	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	10-Dec-15
15120089-003	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-003	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-003	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-003	Toluene		0.41 ppbv	0.01	AC-058	10-Dec-15
15120089-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-003	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-003	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-003	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead

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

Date: Friday, January 08, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID: LICA/VOC/ELK/Dec 2, 2015 CANISTER ID: 1532 Matrix: Ambient Air DATE SAMPLED: 02-Dec-15 00:00
 DESCRIPTION: Elk Point Airport
 REPORT NUMBER: 15120089 REPORT CREATED: 08-Jan-16 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120089-003	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Dec-15
15120089-003	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Date: Friday, January 08, 2016 Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 8, 2015	S5593	Ambient Air	08-Dec-15 0:00	Version 01		
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	15120124					
REPORT CREATED:	15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120124-001	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-001	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-001	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-001	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	14-Dec-15
15120124-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	14-Dec-15
15120124-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	14-Dec-15
15120124-001	1,2,4-Trimethylbenzene	I	0.03 ppbv	0.03	AC-058	14-Dec-15
15120124-001	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-001	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	14-Dec-15
15120124-001	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	14-Dec-15
15120124-001	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-001	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-001	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	14-Dec-15
15120124-001	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Dec-15
15120124-001	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Dec-15
15120124-001	1-Butene	I	0.08 ppbv	0.02	AC-058	14-Dec-15
15120124-001	1-Hexene	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-001	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-001	2,2,4-Trimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-001	2,2-Dimethylbutane	I	0.04 ppbv	0.01	AC-058	14-Dec-15
15120124-001	2,3,4-Trimethylpentane	I	0.03 ppbv	0.01	AC-058	14-Dec-15
15120124-001	2,3-Dimethylbutane	I	0.13 ppbv	0.02	AC-058	14-Dec-15
15120124-001	2,3-Dimethylpentane	I	0.07 ppbv	0.02	AC-058	14-Dec-15

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID: LICA/VOC/ELK/Dec 8, 2015
 CANISTER ID: S5593
 Matrix: Ambient Air
 DATE SAMPLED: 08-Dec-15 0:00
 DESCRIPTION: Elk Point Airport
 REPORT NUMBER: 15120124
 REPORT CREATED: 15-Jan-16
 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120124-001	2,4-Dimethylpentane	I	0.05	ppbv	0.01	AC-058	14-Dec-15
15120124-001	2-Methylheptane	I	0.04	ppbv	0.01	AC-058	14-Dec-15
15120124-001	2-Methylhexane	I	0.09	ppbv	0.01	AC-058	14-Dec-15
15120124-001	2-Methylpentane	I	0.23	ppbv	0.01	AC-058	14-Dec-15
15120124-001	3-Methylheptane	I	0.03	ppbv	0.02	AC-058	14-Dec-15
15120124-001	3-Methylhexane	I	0.11	ppbv	0.02	AC-058	14-Dec-15
15120124-001	3-Methylpentane	I	0.13	ppbv	0.01	AC-058	14-Dec-15
15120124-001	Acetone		3.5	ppbv	0.4	AC-058	14-Dec-15
15120124-001	Acrolein	K, T, U	<0.3	ppbv	0.3	AC-058	14-Dec-15
15120124-001	Benzene	I	0.20	ppbv	0.01	AC-058	14-Dec-15
15120124-001	Benzyl chloride	K, T, U	<0.4	ppbv	0.4	AC-058	14-Dec-15
15120124-001	Bromodichloromethane	K, T, U	<0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-001	Bromoform	K, T, U	<0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-001	Bromomethane	K, T, U	<0.01	ppbv	0.01	AC-058	14-Dec-15
15120124-001	Carbon disulfide	I	0.05	ppbv	0.01	AC-058	14-Dec-15
15120124-001	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	14-Dec-15
15120124-001	Chlorobenzene	K, T, U	<0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-001	Chloroethane	K, T, U	<0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-001	Chloroform	I	0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-001	Chloromethane		0.56	ppbv	0.02	AC-058	14-Dec-15
15120124-001	cis-1,2-Dichloroethene	K, T, U	<0.01	ppbv	0.01	AC-058	14-Dec-15
15120124-001	cis-1,3-Dichloropropene	K, T, U	<0.04	ppbv	0.04	AC-058	14-Dec-15
15120124-001	cis-2-Butene	K, T, U	<0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-001	cis-2-Pentene	K, T, U	<0.02	ppbv	0.02	AC-058	14-Dec-15
15120124-001	Cyclohexane	I	0.20	ppbv	0.02	AC-058	14-Dec-15

Report certified by: Graham Knox, Team Lead
 On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Date: January-15-16
 Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 8, 2015	S5593	Ambient Air	08-Dec-15 0:00	Version 01		
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	15120124	REPORT CREATED:	15-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120124-001	Cyclopentane	I	0.05 ppbv	0.01	AC-058	14-Dec-15
15120124-001	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-001	Ethanol		1.8 ppbv	0.3	AC-058	14-Dec-15
15120124-001	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Dec-15
15120124-001	Ethylbenzene	I	0.04 ppbv	0.01	AC-058	14-Dec-15
15120124-001	Freon-11		0.41 ppbv	0.02	AC-058	14-Dec-15
15120124-001	Freon-113	I	0.07 ppbv	0.01	AC-058	14-Dec-15
15120124-001	Freon-114	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-001	Freon-12		0.56 ppbv	0.02	AC-058	14-Dec-15
15120124-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	14-Dec-15
15120124-001	Isobutane		0.93 ppbv	0.02	AC-058	14-Dec-15
15120124-001	Isopentane		0.80 ppbv	0.03	AC-058	14-Dec-15
15120124-001	Isoprene	I	0.23 ppbv	0.01	AC-058	14-Dec-15
15120124-001	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Dec-15
15120124-001	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-001	m,p-Xylene	I	0.08 ppbv	0.03	AC-058	14-Dec-15
15120124-001	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	14-Dec-15
15120124-001	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	14-Dec-15
15120124-001	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	14-Dec-15
15120124-001	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	14-Dec-15
15120124-001	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Dec-15
15120124-001	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	14-Dec-15
15120124-001	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	14-Dec-15
15120124-001	Methylcyclohexane	I	0.29 ppbv	0.01	AC-058	14-Dec-15
15120124-001	Methylcyclopentane	I	0.15 ppbv	0.02	AC-058	14-Dec-15

Report certified by: Graham Knox, Team Lead
 On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Date: January-15-16
 Inquiries: (780) 632 8455
 E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 8, 2015	S5593	Ambient Air	08-Dec-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15120124	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120124-001	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	14-Dec-15
15120124-001	n-Butane		1.60 ppbv	0.03	AC-058	14-Dec-15
15120124-001	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	14-Dec-15
15120124-001	n-Dodecane		0.8 ppbv	0.4	AC-058	14-Dec-15
15120124-001	n-Heptane	I	0.12 ppbv	0.01	AC-058	14-Dec-15
15120124-001	n-Hexane	I	0.26 ppbv	0.01	AC-058	14-Dec-15
15120124-001	n-Octane	I	0.06 ppbv	0.02	AC-058	14-Dec-15
15120124-001	n-Pentane		0.7 ppbv	0.1	AC-058	14-Dec-15
15120124-001	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	14-Dec-15
15120124-001	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	14-Dec-15
15120124-001	Naphthalene		3.0 ppbv	0.5	AC-058	14-Dec-15
15120124-001	n-Nonane	I	0.02 ppbv	0.01	AC-058	14-Dec-15
15120124-001	o-Ethyltoluene	I	0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-001	o-Xylene	I	0.03 ppbv	0.01	AC-058	14-Dec-15
15120124-001	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	14-Dec-15
15120124-001	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	14-Dec-15
15120124-001	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	14-Dec-15
15120124-001	Tetrachloroethylene	I	0.05 ppbv	0.04	AC-058	14-Dec-15
15120124-001	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Dec-15
15120124-001	Toluene	I	0.23 ppbv	0.01	AC-058	14-Dec-15
15120124-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	14-Dec-15
15120124-001	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	14-Dec-15
15120124-001	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15
15120124-001	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	14-Dec-15

Report certified by: Graham Knox, Team Lead

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

Date: January-15-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/VOC/ELK/Dec 8, 2015	CANISTER ID S5593	Matrix Ambient Air	DATE SAMPLED 08-Dec-15 0:00			
DESCRIPTION: Elk Point Airport		REPORT CREATED: 15-Jan-16	VERSION: Version 01			
REPORT NUMBER: 15120124						
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120124-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	14-Dec-15
15120124-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	14-Dec-15

Report certified by: Graham Knox, Team Lead

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

Date: January-15-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 14, 2015	2535	Ambient Air	14-Dec-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15120215	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120215-002	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-002	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	30-Dec-15
15120215-002	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	30-Dec-15
15120215-002	1,2,4-Trimethylbenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	30-Dec-15
15120215-002	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	30-Dec-15
15120215-002	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	30-Dec-15
15120215-002	1,2-Dichloropropane	I	0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-002	1,3,5-Trimethylbenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	30-Dec-15
15120215-002	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-002	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-002	1-Butene	I	0.08 ppbv	0.02	AC-058	30-Dec-15
15120215-002	1-Hexene	I	0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-002	2,2,4-Trimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-002	2,2-Dimethylbutane	I	0.04 ppbv	0.01	AC-058	30-Dec-15
15120215-002	2,3,4-Trimethylpentane	I	0.02 ppbv	0.01	AC-058	30-Dec-15
15120215-002	2,3-Dimethylbutane	I	0.07 ppbv	0.02	AC-058	30-Dec-15
15120215-002	2,3-Dimethylpentane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15

Report certified by: Graham Knox, Team Lead
 On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Date: January-15-16
 Inquiries: (780) 632 8455
 E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 14, 2015	2535	Ambient Air	14-Dec-15 0:00	Version 01		
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	15120215	REPORT CREATED:	15-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120215-002	2,4-Dimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-002	2-Methylheptane	I	0.03 ppbv	0.01	AC-058	30-Dec-15
15120215-002	2-Methylhexane	I	0.04 ppbv	0.01	AC-058	30-Dec-15
15120215-002	2-Methylpentane	I	0.16 ppbv	0.01	AC-058	30-Dec-15
15120215-002	3-Methylheptane	I	0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	3-Methylhexane	I	0.05 ppbv	0.02	AC-058	30-Dec-15
15120215-002	3-Methylpentane	I	0.10 ppbv	0.01	AC-058	30-Dec-15
15120215-002	Acetone	I	1.0 ppbv	0.4	AC-058	30-Dec-15
15120215-002	Acrolein	K, T, U	< 0.3 ppbv	0.3	AC-058	30-Dec-15
15120215-002	Benzene	I	0.15 ppbv	0.01	AC-058	30-Dec-15
15120215-002	Benzyl chloride	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-002	Bromodichloromethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	Bromoform	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	Bromomethane	I	0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-002	Carbon disulfide	I	0.03 ppbv	0.01	AC-058	30-Dec-15
15120215-002	Carbon tetrachloride	I	0.09 ppbv	0.01	AC-058	30-Dec-15
15120215-002	Chlorobenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	Chloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	Chloroform	I	0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	Chloromethane	I	0.84 ppbv	0.02	AC-058	30-Dec-15
15120215-002	cis-1,2-Dichloroethene	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-002	cis-1,3-Dichloropropene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-002	cis-2-Butene	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	cis-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	Cyclohexane	I	0.11 ppbv	0.02	AC-058	30-Dec-15

Report certified by: Graham Knox, Team Lead
On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: January-15-16
Inquiries: (780) 632 8455
E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 14, 2015	2535	Ambient Air	14-Dec-15 0:00	Version 01		
DESCRIPTION: Eik Point Airport						
REPORT NUMBER: 15120215	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120215-002	Cyclopentane	I	0.05 ppbv	0.01	AC-058	30-Dec-15
15120215-002	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-002	Ethanol		0.3 ppbv	0.3	AC-058	30-Dec-15
15120215-002	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-002	Ethylbenzene	I	0.03 ppbv	0.01	AC-058	30-Dec-15
15120215-002	Freon-11	I	0.28 ppbv	0.02	AC-058	30-Dec-15
15120215-002	Freon-113	I	0.08 ppbv	0.01	AC-058	30-Dec-15
15120215-002	Freon-114	I	0.03 ppbv	0.02	AC-058	30-Dec-15
15120215-002	Freon-12	I	0.62 ppbv	0.02	AC-058	30-Dec-15
15120215-002	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	30-Dec-15
15120215-002	Isobutane		0.84 ppbv	0.02	AC-058	30-Dec-15
15120215-002	Isopentane		0.51 ppbv	0.03	AC-058	30-Dec-15
15120215-002	Isoprene	I	0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-002	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-002	Isopropylbenzene	I	0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-002	m,p-Xylene	I	0.05 ppbv	0.03	AC-058	30-Dec-15
15120215-002	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-002	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	30-Dec-15
15120215-002	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	30-Dec-15
15120215-002	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	30-Dec-15
15120215-002	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-002	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	30-Dec-15
15120215-002	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	30-Dec-15
15120215-002	Methylcyclohexane	I	0.14 ppbv	0.01	AC-058	30-Dec-15
15120215-002	Methylcyclopentane	I	0.10 ppbv	0.02	AC-058	30-Dec-15

Report certified by: Graham Knox, Team Lead

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

Date: January-15-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 14, 2015	2535	Ambient Air	14-Dec-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15120215	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120215-002	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	30-Dec-15
15120215-002	n-Butane		1.82 ppbv	0.03	AC-058	30-Dec-15
15120215-002	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	30-Dec-15
15120215-002	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-002	n-Heptane	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-002	n-Hexane	I	0.18 ppbv	0.01	AC-058	30-Dec-15
15120215-002	n-Octane	I	0.05 ppbv	0.02	AC-058	30-Dec-15
15120215-002	n-Pentane		0.6 ppbv	0.1	AC-058	30-Dec-15
15120215-002	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	30-Dec-15
15120215-002	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	30-Dec-15
15120215-002	Naphthalene	K, T, U	< 0.5 ppbv	0.5	AC-058	30-Dec-15
15120215-002	n-Nonane	I	0.03 ppbv	0.01	AC-058	30-Dec-15
15120215-002	o-Ethyltoluene	I	0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-002	o-Xylene	I	0.03 ppbv	0.01	AC-058	30-Dec-15
15120215-002	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-002	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	30-Dec-15
15120215-002	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-002	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-002	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-002	Toluene	I	0.10 ppbv	0.01	AC-058	30-Dec-15
15120215-002	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-002	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-002	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-002	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-002	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632-8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:			
LICA/VOC/ELK/Dec 14, 2015	2535	Ambient Air	14-Dec-15 0:00	Version 01			
DESCRIPTION:	Elk Point Airport						
REPORT NUMBER:	15120215						
REPORT CREATED:	15-Jan-16						
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120215-002	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	30-Dec-15
15120215-002	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	30-Dec-15
Report certified by:	Graham Knox, Team Lead						
Date:	January-15-16						
On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services						
Inquiries:	(780) 632 8455						
E-mail:	EAS.Results@albertainnovates.ca						



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/ELK/Dec 20, 2015	2530	Ambient Air	20-Dec-15 0:00
DESCRIPTION:	Elk Point Airport		
REPORT NUMBER:	16010003	REPORT CREATED:	15-Jan-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16010003-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	06-Jan-16
16010003-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	06-Jan-16
16010003-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	06-Jan-16
16010003-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	06-Jan-16
16010003-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	06-Jan-16
16010003-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	06-Jan-16
16010003-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	06-Jan-16
16010003-001	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	06-Jan-16
16010003-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	06-Jan-16
16010003-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	06-Jan-16
16010003-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	06-Jan-16
16010003-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	06-Jan-16
16010003-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	06-Jan-16
16010003-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	06-Jan-16
16010003-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	06-Jan-16
16010003-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	06-Jan-16
16010003-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	06-Jan-16
16010003-001	1-Butene	I	0.10	ppbv	0.02	AC-058	06-Jan-16
16010003-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	06-Jan-16
16010003-001	1-Pentene	I	0.02	ppbv	0.01	AC-058	06-Jan-16
16010003-001	2,2,4-Trimethylpentane	I	0.07	ppbv	0.01	AC-058	06-Jan-16
16010003-001	2,2-Dimethylbutane	I	0.02	ppbv	0.01	AC-058	06-Jan-16
16010003-001	2,3,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	06-Jan-16
16010003-001	2,3-Dimethylbutane	I	0.07	ppbv	0.02	AC-058	06-Jan-16
16010003-001	2,3-Dimethylpentane	I	0.07	ppbv	0.02	AC-058	06-Jan-16

Report certified by:	Graham Knox, Team Lead	On behalf of:	PI Pretorius, Manager, Analysis and Testing Services
Date:	January-15-16	Inquiries:	(780) 632 8455 E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICAN/OC/ELK/Dec 20, 2015	2530	Ambient Air	20-Dec-15 0:00	Version 01		
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	16010003	REPORT CREATED:	15-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010003-001	2,4-Dimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010003-001	2-Methylheptane	I	0.02 ppbv	0.01	AC-058	06-Jan-16
16010003-001	2-Methylhexane	I	0.05 ppbv	0.01	AC-058	06-Jan-16
16010003-001	2-Methylpentane	I	0.19 ppbv	0.01	AC-058	06-Jan-16
16010003-001	3-Methylheptane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010003-001	3-Methylhexane	I	0.07 ppbv	0.02	AC-058	06-Jan-16
16010003-001	3-Methylpentane	I	0.11 ppbv	0.01	AC-058	06-Jan-16
16010003-001	Acetone	I	0.9 ppbv	0.4	AC-058	06-Jan-16
16010003-001	Acrolein	K, T, U	< 0.3 ppbv	0.3	AC-058	06-Jan-16
16010003-001	Benzene	I	0.24 ppbv	0.01	AC-058	06-Jan-16
16010003-001	Benzyl chloride	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010003-001	Bromodichloromethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010003-001	Bromoform	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010003-001	Bromomethane	I	0.01 ppbv	0.01	AC-058	06-Jan-16
16010003-001	Carbon disulfide	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010003-001	Carbon tetrachloride	I	0.10 ppbv	0.01	AC-058	06-Jan-16
16010003-001	Chlorobenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010003-001	Chloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010003-001	Chloroform	I	0.03 ppbv	0.02	AC-058	06-Jan-16
16010003-001	Chloromethane	I	0.75 ppbv	0.02	AC-058	06-Jan-16
16010003-001	cis-1,2-Dichloroethene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010003-001	cis-1,3-Dichloropropene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010003-001	cis-2-Butene	I	0.02 ppbv	0.02	AC-058	06-Jan-16
16010003-001	cis-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010003-001	Cyclohexane	I	0.06 ppbv	0.02	AC-058	06-Jan-16

Report certified by: Graham Knox, Team Lead
On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: January-15-16
Inquiries: (780) 632 8455
E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 20, 2015	2530	Ambient Air	20-Dec-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 16010003	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010003-001	Cyclopentane	I	0.04 ppbv	0.01	AC-058	06-Jan-16
16010003-001	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010003-001	Ethanol		1.4 ppbv	0.3	AC-058	06-Jan-16
16010003-001	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010003-001	Ethylbenzene	I	0.03 ppbv	0.01	AC-058	06-Jan-16
16010003-001	Freon-11		0.31 ppbv	0.02	AC-058	06-Jan-16
16010003-001	Freon-113	I	0.08 ppbv	0.01	AC-058	06-Jan-16
16010003-001	Freon-114	I	0.03 ppbv	0.02	AC-058	06-Jan-16
16010003-001	Freon-12		0.73 ppbv	0.02	AC-058	06-Jan-16
16010003-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	06-Jan-16
16010003-001	Isobutane		1.48 ppbv	0.02	AC-058	06-Jan-16
16010003-001	Isopentane		0.79 ppbv	0.03	AC-058	06-Jan-16
16010003-001	Isoprene	I	0.01 ppbv	0.01	AC-058	06-Jan-16
16010003-001	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010003-001	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010003-001	m,p-Xylene	I	0.10 ppbv	0.03	AC-058	06-Jan-16
16010003-001	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010003-001	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	06-Jan-16
16010003-001	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	06-Jan-16
16010003-001	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	06-Jan-16
16010003-001	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010003-001	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	06-Jan-16
16010003-001	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	06-Jan-16
16010003-001	Methylcyclohexane	I	0.10 ppbv	0.01	AC-058	06-Jan-16
16010003-001	Methylcyclopentane	I	0.09 ppbv	0.02	AC-058	06-Jan-16

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 20, 2015	2530	Ambient Air	20-Dec-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 16010003	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010003-001	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	06-Jan-16
16010003-001	n-Butane		2.44 ppbv	0.03	AC-058	06-Jan-16
16010003-001	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	06-Jan-16
16010003-001	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010003-001	n-Heptane	I	0.06 ppbv	0.01	AC-058	06-Jan-16
16010003-001	n-Hexane	I	0.15 ppbv	0.01	AC-058	06-Jan-16
16010003-001	n-Octane	I	0.02 ppbv	0.02	AC-058	06-Jan-16
16010003-001	n-Pentane		0.5 ppbv	0.1	AC-058	06-Jan-16
16010003-001	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	06-Jan-16
16010003-001	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	06-Jan-16
16010003-001	Naphthalene	K, T, U	< 0.5 ppbv	0.5	AC-058	06-Jan-16
16010003-001	n-Nonane	I	0.02 ppbv	0.01	AC-058	06-Jan-16
16010003-001	o-Ethyltoluene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010003-001	o-Xylene	I	0.04 ppbv	0.01	AC-058	06-Jan-16
16010003-001	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010003-001	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	06-Jan-16
16010003-001	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010003-001	Tetrachloroethylene	I	0.05 ppbv	0.04	AC-058	06-Jan-16
16010003-001	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010003-001	Toluene	I	0.20 ppbv	0.01	AC-058	06-Jan-16
16010003-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010003-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010003-001	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010003-001	trans-2-Pentene	I	0.03 ppbv	0.02	AC-058	06-Jan-16
16010003-001	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16

Report certified by: Graham Knox, Team Lead

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

Date: January-15-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED			
LICA/VOC/ELK/Dec 20, 2015	2530	Ambient Air	20-Dec-15 0:00			
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 16010003	REPORT CREATED: 15-Jan-16					
VERSION: Version 01						
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010003-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010003-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
Report certified by: Graham Knox, Team Lead						
Date: January-15-16						
On behalf of: PJ Pretorius, Manager, Analysis and Testing Services						
Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca						



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec. 26, 2015	2659	Ambient Air	26-Dec-15 0:00	Version 01		
DESCRIPTION:	Elk Point Airport		REPORT CREATED:			
REPORT NUMBER:	16010004	15-Jan-16				
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010004-003	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-003	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-003	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-003	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010004-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	06-Jan-16
16010004-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	06-Jan-16
16010004-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	06-Jan-16
16010004-003	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-003	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	06-Jan-16
16010004-003	1,2-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-003	1,2-Dichloropropane	I	0.02 ppbv	0.01	AC-058	06-Jan-16
16010004-003	1,3,5-Trimethylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-003	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-003	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	06-Jan-16
16010004-003	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010004-003	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010004-003	1-Butene	I	0.21 ppbv	0.02	AC-058	06-Jan-16
16010004-003	1-Hexene	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-003	1-Pentene	I	0.02 ppbv	0.01	AC-058	06-Jan-16
16010004-003	2,2,4-Trimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-003	2,2-Dimethylbutane	I	0.08 ppbv	0.01	AC-058	06-Jan-16
16010004-003	2,3,4-Trimethylpentane	I	0.02 ppbv	0.01	AC-058	06-Jan-16
16010004-003	2,3-Dimethylbutane	I	0.21 ppbv	0.02	AC-058	06-Jan-16
16010004-003	2,3-Dimethylpentane	I	0.11 ppbv	0.02	AC-058	06-Jan-16

Report certified by: Graham Knox, Team Lead
 On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Date: January-15-16
 Inquiries: (780) 632 8455
 E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:			
LICA/VOC/ELK/Dec. 26, 2015	2659	Ambient Air	26-Dec-15 0:00	Version 01			
DESCRIPTION: Elk Point Airport							
REPORT NUMBER: 16010004	REPORT CREATED: 15-Jan-16						
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16010004-003	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	06-Jan-16
16010004-003	2-Methylheptane	I	0.05	ppbv	0.01	AC-058	06-Jan-16
16010004-003	2-Methylhexane	I	0.08	ppbv	0.01	AC-058	06-Jan-16
16010004-003	2-Methylpentane	I	0.32	ppbv	0.01	AC-058	06-Jan-16
16010004-003	3-Methylheptane	I	0.03	ppbv	0.02	AC-058	06-Jan-16
16010004-003	3-Methylhexane	I	0.11	ppbv	0.02	AC-058	06-Jan-16
16010004-003	3-Methylpentane	I	0.17	ppbv	0.01	AC-058	06-Jan-16
16010004-003	Acetone		2.8	ppbv	0.4	AC-058	06-Jan-16
16010004-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	06-Jan-16
16010004-003	Benzene	I	0.29	ppbv	0.01	AC-058	06-Jan-16
16010004-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	06-Jan-16
16010004-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	06-Jan-16
16010004-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	06-Jan-16
16010004-003	Bromomethane	I	0.01	ppbv	0.01	AC-058	06-Jan-16
16010004-003	Carbon disulfide	I	0.20	ppbv	0.01	AC-058	06-Jan-16
16010004-003	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	06-Jan-16
16010004-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	06-Jan-16
16010004-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	06-Jan-16
16010004-003	Chloroform	I	0.02	ppbv	0.02	AC-058	06-Jan-16
16010004-003	Chloromethane	I	0.83	ppbv	0.02	AC-058	06-Jan-16
16010004-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	06-Jan-16
16010004-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	06-Jan-16
16010004-003	cis-2-Butene	I	0.03	ppbv	0.02	AC-058	06-Jan-16
16010004-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	06-Jan-16
16010004-003	Cyclohexane	I	0.23	ppbv	0.02	AC-058	06-Jan-16

Report certified by: Graham Knox, Team Lead
 On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Date: January-15-16
 Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec. 26, 2015	2659	Ambient Air	26-Dec-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 16010004	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010004-003	Cyclopentane	I	0.08 ppbv	0.01	AC-058	06-Jan-16
16010004-003	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-003	Ethanol	K, T, U	< 0.3 ppbv	0.3	AC-058	06-Jan-16
16010004-003	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010004-003	Ethylbenzene	I	0.02 ppbv	0.01	AC-058	06-Jan-16
16010004-003	Freon-11	I	0.35 ppbv	0.02	AC-058	06-Jan-16
16010004-003	Freon-113	I	0.08 ppbv	0.01	AC-058	06-Jan-16
16010004-003	Freon-114	I	0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-003	Freon-12	I	0.78 ppbv	0.02	AC-058	06-Jan-16
16010004-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	06-Jan-16
16010004-003	Isobutane	I	1.87 ppbv	0.02	AC-058	06-Jan-16
16010004-003	Isopentane	I	1.36 ppbv	0.03	AC-058	06-Jan-16
16010004-003	Isoprene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-003	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010004-003	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-003	m,p-Xylene	I	0.06 ppbv	0.03	AC-058	06-Jan-16
16010004-003	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010004-003	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	06-Jan-16
16010004-003	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	06-Jan-16
16010004-003	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	06-Jan-16
16010004-003	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010004-003	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	06-Jan-16
16010004-003	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	06-Jan-16
16010004-003	Methylcyclohexane	I	0.38 ppbv	0.01	AC-058	06-Jan-16
16010004-003	Methylcyclopentane	I	0.21 ppbv	0.02	AC-058	06-Jan-16

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec. 26, 2015	2659	Ambient Air	26-Dec-15 0:00	Version 01		
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	16010004					
REPORT CREATED:	15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010004-003	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	06-Jan-16
16010004-003	n-Butane		3.03 ppbv	0.03	AC-058	06-Jan-16
16010004-003	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	06-Jan-16
16010004-003	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010004-003	n-Heptane	I	0.15 ppbv	0.01	AC-058	06-Jan-16
16010004-003	n-Hexane		0.31 ppbv	0.01	AC-058	06-Jan-16
16010004-003	n-Octane	I	0.08 ppbv	0.02	AC-058	06-Jan-16
16010004-003	n-Pentane		1.5 ppbv	0.1	AC-058	06-Jan-16
16010004-003	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	06-Jan-16
16010004-003	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	06-Jan-16
16010004-003	Naphthalene	K, T, U	< 0.5 ppbv	0.5	AC-058	06-Jan-16
16010004-003	n-Nonane	I	0.02 ppbv	0.01	AC-058	06-Jan-16
16010004-003	o-Ethyltoluene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-003	o-Xylene	I	0.02 ppbv	0.01	AC-058	06-Jan-16
16010004-003	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010004-003	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	06-Jan-16
16010004-003	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010004-003	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010004-003	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	06-Jan-16
16010004-003	Toluene	I	0.21 ppbv	0.01	AC-058	06-Jan-16
16010004-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16
16010004-003	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	06-Jan-16
16010004-003	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	06-Jan-16
16010004-003	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	06-Jan-16

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID: LICA/VOC/ELK/Dec. 26, 2015
 CANISTER ID: 2659
 DATE SAMPLED: 26-Dec-15 0:00
 Matrix: Ambient Air
 DESCRIPTION: Elk Point Airport
 REPORT NUMBER: 16010004
 REPORT CREATED: 15-Jan-16
 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16010004-003	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	06-Jan-16
16010004-003	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	06-Jan-16

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

PAHS SAMPLES



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/PUF/ELK/Dec 2, 2015	TE-05	Air Filter	02-Dec-15 00:00	Version 01		
DESCRIPTION:	Eik Point Airport					
REPORT NUMBER:	15120089	REPORT CREATED:	08-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-004	1-Methylnaphthalene		0.25 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	2-Methylnaphthalene		0.38 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Acenaphthene		0.13 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Acenaphthylene		0.03 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Anthracene		0.03 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Benzo(a)anthracene		0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Benzo(a)pyrene		0.02 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Benzo(b,j,k)fluoranthene		0.08 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Benzo(e)pyrene		0.02 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Benzo(ghi)perylene		0.04 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Chrysene		0.04 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Dibenzo(a,l)pyrene		0.02 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Fluoranthene		0.16 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Fluorene		0.48 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Indeno(1,2,3-cd)pyrene		0.03 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Naphthalene		0.30 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15120089-004	Phenanthrene		0.53 ug/Filter	0.01	NA-017	19-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager

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

Date: Friday, January 08, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	MATRIX	DATE SAMPLED	VERSION:
LICA/PUF/ELK/Dec 2, 2015	TE-05	Air Filter	02-Dec-15 00:00	Version 01
DESCRIPTION:				
Elk Point Airport				
REPORT NUMBER:	REPORT CREATED:			
15120089	08-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL
15120089-004	Pyrene		0.09 ug/Filter	0.01
15120089-004	Retene		0.22 ug/Filter	0.01
				Method
				NA-017
				Analysis Date
				19-Dec-15
				19-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager

Date: Friday, January 08, 2016

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/PUF/ELK/Dec 8, 2015	A13-02	Air Filter	08-Dec-15 0:00	Version 01		
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	15120124	REPORT CREATED:	15-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120124-002	1-Methylnaphthalene		0.13 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	2-Methylnaphthalene		0.19 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	7,12-Dimethylbenz(a)anthracene		0.05 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Acenaphthene		0.07 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Acenaphthylene		0.04 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Anthracene		0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Benzo(a)anthracene		0.03 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Benzo(a)pyrene		< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Benzo(b,j,k)fluoranthene	K, T, U	0.12 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Benzo(c)phenanthrene		< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Benzo(e)pyrene		0.04 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Chrysene		0.03 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Dibenzo(ah)anthracene		0.02 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Fluoranthene		0.09 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Fluorene		0.21 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Indeno(1,2,3-cd)pyrene		0.02 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Naphthalene		0.13 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Phenanthrene		0.22 ug/Filter	0.01	NA-017	14-Jan-16

Report certified by: Graham Knox, Team Lead
 On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Date: January-15-16
 Inquiries: (780) 632 8455
 E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID: LICA/PUF/ELK/Dec 8, 2015
 CANISTER ID: A13-02
 Matrix: Air Filter
 DATE SAMPLED: 08-Dec-15 0:00
 DESCRIPTION: Elk Point Airport
 REPORT NUMBER: 15120124
 REPORT CREATED: 15-Jan-16
 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120124-002	Pyrene		0.07	ug/Filter	0.01	NA-017	14-Jan-16
15120124-002	Retene		0.08	ug/Filter	0.01	NA-017	14-Jan-16

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/PUF/ELK/Dec 14, 2015	TE-08	Air Filter	14-Dec-15 0:00	Version 01		
DESCRIPTION: Eik Point Airport						
REPORT NUMBER: 15120215	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120215-003	1-Methylnaphthalene		0.18 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	2-Methylnaphthalene		0.26 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Acenaphthene		0.06 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Acenaphthylene		0.05 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Anthracene		0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Benzo(a)anthracene		0.03 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Benzo(a)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Benzo(b,j,k)fluoranthene	K, T, U	0.10 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Benzo(e)pyrene		0.03 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Chrysene	K, T, U	0.02 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Fluoranthene		0.07 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Fluorene		0.14 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Naphthalene		0.31 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Phenanthrene		0.21 ug/Filter	0.01	NA-017	14-Jan-16

Report certified by: Graham Knox, Team Lead
 On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Date: January-15-16
 Inquiries: (780) 632 8455
 E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/PUF/ELK/Dec 14, 2015	CANISTER ID TE-08	Matrix Air Filter	DATE SAMPLED 14-Dec-15 0:00			
DESCRIPTION: Elk Point Airport		VERSION: Version 01				
REPORT NUMBER: 15120215	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120215-003	Pyrene		0.07 ug/Filter	0.01	NA-017	14-Jan-16
15120215-003	Retene		0.03 ug/Filter	0.01	NA-017	14-Jan-16

Report certified by: Graham Knox, Team Lead

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

Date: January-15-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/PUF/ELK/Dec 20, 2015	9801	Air Filter	20-Dec-15 0:00	Version 01		
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	16010003	REPORT CREATED:	15-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010003-002	1-Methylnaphthalene		0.40 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	2-Methylnaphthalene		0.57 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Acenaphthene		0.08 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Acenaphthylene		0.04 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Anthracene		0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Benzo(a)anthracene		0.03 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Benzo(a)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Benzo(b,j,k)fluoranthene	K, T, U	0.11 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Benzo(e)pyrene		0.03 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Chrysene		0.02 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Fluoranthene		0.08 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Fluorene		0.14 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Naphthalene		0.35 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010003-002	Phenanthrene		0.20 ug/Filter	0.01	NA-017	14-Jan-16

Report certified by: Graham Knox, Team Lead

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

Date: January-15-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/PUF/ELK/Dec 20, 2015	CANISTER ID 9801	MATRIX Air Filter	DATE SAMPLED 20-Dec-15 0:00
DESCRIPTION: Elk Point Airport		VERSION: Version 01	
REPORT NUMBER: 16010003	REPORT CREATED: 15-Jan-16		
Lab ID	Parameter	Qualifier	Result Units RDL
16010003-002	Pyrene		0.08 ug/Filter 0.01
16010003-002	Retene		0.03 ug/Filter 0.01
			Method Analysis Date
			NA-017 14-Jan-16
			NA-017 14-Jan-16

Report certified by: Graham Knox, Team Lead

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

Date: January-15-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/PUF/ELK/Dec. 26, 2015	P13-01	Air Filter	26-Dec-15 0:00	Version 01		
REPORT NUMBER: 16010004	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16010004-004	1-Methylnaphthalene		0.94 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	2-Methylnaphthalene		1.31 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	7,12-Dimethylbenz(a)anthracene		0.05 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Acenaphthene		0.10 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Acenaphthylene		0.10 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Anthracene		0.02 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Benzo(a)anthracene		0.03 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Benzo(a)pyrene		0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Benzo(b,j,k)fluoranthene		0.12 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Benzo(e)pyrene		0.04 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Chrysene		0.04 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Fluoranthene		0.09 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Fluorene		0.19 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Indeno(1,2,3-cd)pyrene		0.02 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Naphthalene		1.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	14-Jan-16
16010004-004	Phenanthrene		0.28 ug/Filter	0.01	NA-017	14-Jan-16

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/PUF/ELK/Dec. 26, 2015	CANISTER ID P13-01	MATRIX Air Filter	DATE SAMPLED 26-Dec-15 0:00
DESCRIPTION: Elk Point Airport	REPORT CREATED: 15-Jan-16		
REPORT NUMBER: 16010004	VERSION: Version 01		
Lab ID	Parameter	Qualifier	Result Units RDL Method Analysis Date
16010004-004	Pyrene		0.09 ug/Filter 0.01 NA-017 14-Jan-16
16010004-004	Retene		0.10 ug/Filter 0.01 NA-017 14-Jan-16

Report certified by: Graham Knox, Team Lead

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

Date: January-15-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

NMHC CANISTER SAMPLES



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 1, 2015	2660	Ambient Air	01-Dec-15 17:00	Version 01		
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	15120089	REPORT CREATED:	08-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-005	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-005	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-005	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-005	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-005	1,1-Dichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-005	1,2,3-Trimethylbenzene	K, T, U	< 0.06 ppbv	0.06	AC-058	10-Dec-15
15120089-005	1,2,4-Trichlorobenzene	K, T, U	< 1.0 ppbv	1.0	AC-058	10-Dec-15
15120089-005	1,2,4-Trimethylbenzene	I	0.12 ppbv	0.04	AC-058	10-Dec-15
15120089-005	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-005	1,2-Dichlorobenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-005	1,2-Dichloroethane	I	0.03 ppbv	0.01	AC-058	10-Dec-15
15120089-005	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-005	1,3,5-Trimethylbenzene	I	0.06 ppbv	0.02	AC-058	10-Dec-15
15120089-005	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-005	1,3-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-005	1,4-Dichlorobenzene	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-005	1,4-Dioxane	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-005	1-Butene	I	1.18 ppbv	0.02	AC-058	10-Dec-15
15120089-005	1-Hexene	I	0.05 ppbv	0.02	AC-058	10-Dec-15
15120089-005	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-005	2,2,4-Trimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-005	2,2-Dimethylbutane	I	0.56 ppbv	0.01	AC-058	10-Dec-15
15120089-005	2,3,4-Trimethylpentane	I	0.21 ppbv	0.01	AC-058	10-Dec-15
15120089-005	2,3-Dimethylbutane	I	1.67 ppbv	0.02	AC-058	10-Dec-15
15120089-005	2,3-Dimethylpentane	I	0.69 ppbv	0.02	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead

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

Date: Friday, January 08, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 1, 2015	2660	Ambient Air	01-Dec-15 17:00	Version 01		
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	15120089	REPORT CREATED:	08-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-005	2,4-Dimethylpentane		0.55 ppbv	0.01	AC-058	10-Dec-15
15120089-005	2-Methylheptane	I	0.31 ppbv	0.01	AC-058	10-Dec-15
15120089-005	2-Methylhexane		0.61 ppbv	0.01	AC-058	10-Dec-15
15120089-005	2-Methylpentane		2.12 ppbv	0.01	AC-058	10-Dec-15
15120089-005	3-Methylheptane	I	0.20 ppbv	0.02	AC-058	10-Dec-15
15120089-005	3-Methylhexane		0.72 ppbv	0.02	AC-058	10-Dec-15
15120089-005	3-Methylpentane		1.21 ppbv	0.01	AC-058	10-Dec-15
15120089-005	Acetone	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-005	Acrolein	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-005	Benzene		0.91 ppbv	0.01	AC-058	10-Dec-15
15120089-005	Benzyl chloride	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-005	Bromodichloromethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-005	Bromoform	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-005	Bromomethane	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-005	Carbon disulfide		0.06 ppbv	0.01	AC-058	10-Dec-15
15120089-005	Carbon tetrachloride	I	0.13 ppbv	0.01	AC-058	10-Dec-15
15120089-005	Chlorobenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-005	Chloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-005	Chloroform	I	0.03 ppbv	0.02	AC-058	10-Dec-15
15120089-005	Chloromethane		0.74 ppbv	0.02	AC-058	10-Dec-15
15120089-005	cis-1,2-Dichloroethene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-005	cis-1,3-Dichloropropene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-005	cis-2-Butene	I	0.07 ppbv	0.02	AC-058	10-Dec-15
15120089-005	cis-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-005	Cyclohexane		1.60 ppbv	0.02	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead

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

Date: Friday, January 08, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 1, 2015	2660	Ambient Air	01-Dec-15 17:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15120089	REPORT CREATED: 08-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-005	Cyclopentane		0.51 ppbv	0.01	AC-058	10-Dec-15
15120089-005	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-005	Ethanol		3.0 ppbv	0.4	AC-058	10-Dec-15
15120089-005	Ethyl acetate	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-005	Ethylbenzene	I	0.16 ppbv	0.01	AC-058	10-Dec-15
15120089-005	Freon-11		0.54 ppbv	0.02	AC-058	10-Dec-15
15120089-005	Freon-113	I	0.10 ppbv	0.01	AC-058	10-Dec-15
15120089-005	Freon-114	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-005	Freon-12		0.55 ppbv	0.02	AC-058	10-Dec-15
15120089-005	Hexachloro-1,3-butadiene	K, T, U	< 0.60 ppbv	0.60	AC-058	10-Dec-15
15120089-005	Isobutane		9.99 ppbv	0.02	AC-058	10-Dec-15
15120089-005	Isopentane		6.56 ppbv	0.04	AC-058	10-Dec-15
15120089-005	Isoprene	I	0.02 ppbv	0.01	AC-058	10-Dec-15
15120089-005	Isopropyl alcohol	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-005	Isopropylbenzene	I	0.03 ppbv	0.01	AC-058	10-Dec-15
15120089-005	m,p-Xylene		0.41 ppbv	0.04	AC-058	10-Dec-15
15120089-005	m-Diethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-005	m-Ethyltoluene	K, T, U	< 0.10 ppbv	0.10	AC-058	10-Dec-15
15120089-005	Methyl butyl ketone	K, T, U	< 0.60 ppbv	0.60	AC-058	10-Dec-15
15120089-005	Methyl ethyl ketone		0.9 ppbv	0.4	AC-058	10-Dec-15
15120089-005	Methyl isobutyl ketone	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-005	Methyl methacrylate	K, T, U	< 0.08 ppbv	0.08	AC-058	10-Dec-15
15120089-005	Methyl tert butyl ether	K, T, U	< 0.04 ppbv	0.04	AC-058	10-Dec-15
15120089-005	Methylcyclohexane		2.63 ppbv	0.01	AC-058	10-Dec-15
15120089-005	Methylcyclopentane		1.41 ppbv	0.02	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead

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

Date: Friday, January 08, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 1, 2015	2660	Ambient Air	01-Dec-15 17:00	Version 01		
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	15120089	REPORT CREATED:	08-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-005	Methylene chloride	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Dec-15
15120089-005	n-Butane		13.1 ppbv	0.04	AC-058	10-Dec-15
15120089-005	n-Decane	I	0.09 ppbv	0.07	AC-058	10-Dec-15
15120089-005	n-Dodecane		1.1 ppbv	0.5	AC-058	10-Dec-15
15120089-005	n-Heptane		0.85 ppbv	0.01	AC-058	10-Dec-15
15120089-005	n-Hexane		2.13 ppbv	0.01	AC-058	10-Dec-15
15120089-005	n-Octane		0.37 ppbv	0.02	AC-058	10-Dec-15
15120089-005	n-Pentane	K, T, U	< 0.1 ppbv	0.1	AC-058	10-Dec-15
15120089-005	n-Propylbenzene	K, T, U	< 0.06 ppbv	0.06	AC-058	10-Dec-15
15120089-005	n-Undecane	K, T, U	< 0.6 ppbv	0.6	AC-058	10-Dec-15
15120089-005	Naphthalene		2.3 ppbv	0.6	AC-058	10-Dec-15
15120089-005	n-Nonane	I	0.13 ppbv	0.01	AC-058	10-Dec-15
15120089-005	o-Ethyltoluene	I	0.04 ppbv	0.01	AC-058	10-Dec-15
15120089-005	o-Xylene	I	0.15 ppbv	0.01	AC-058	10-Dec-15
15120089-005	p-Diethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-005	p-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	10-Dec-15
15120089-005	Styrene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-005	Tetrachloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-005	Tetrahydrofuran	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-005	Toluene		1.06 ppbv	0.01	AC-058	10-Dec-15
15120089-005	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-005	trans-1,3-Dichloropropylene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-005	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-005	trans-2-Pentene	I	0.04 ppbv	0.02	AC-058	10-Dec-15
15120089-005	Trichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead

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

Date: Friday, January 08, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/ELK/Dec 1, 2015	2660	Ambient Air	01-Dec-15 17:00
DESCRIPTION: Elk Point Airport			
REPORT NUMBER: 15120089	REPORT CREATED: 08-Jan-16		
VERSION: Version 01			

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15120089-005	Vinyl acetate		0.5	ppbv	0.5	AC-058	10-Dec-15
15120089-005	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, January 08, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 12, 2015	H3302	Ambient Air	12-Dec-15 10:10	Version 01		
DESCRIPTION: Elk Point Airport - NMHC						
REPORT NUMBER: 15120215	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120215-001	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-001	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-001	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-001	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	30-Dec-15
15120215-001	1,2,4-Trichlorobenzene	K, T, U	< 0.9 ppbv	0.9	AC-058	30-Dec-15
15120215-001	1,2,4-Trimethylbenzene	I	0.19 ppbv	0.03	AC-058	30-Dec-15
15120215-001	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-001	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	30-Dec-15
15120215-001	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	30-Dec-15
15120215-001	1,2-Dichloropropane	I	0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-001	1,3,5-Trimethylbenzene	I	0.06 ppbv	0.02	AC-058	30-Dec-15
15120215-001	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-001	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	30-Dec-15
15120215-001	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-001	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-001	1-Butene	I	1.51 ppbv	0.02	AC-058	30-Dec-15
15120215-001	1-Hexene	I	0.03 ppbv	0.02	AC-058	30-Dec-15
15120215-001	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-001	2,2,4-Trimethylpentane	K, T, U	1.09 ppbv	0.01	AC-058	30-Dec-15
15120215-001	2,2-Dimethylbutane	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-001	2,3,4-Trimethylpentane		0.33 ppbv	0.01	AC-058	30-Dec-15
15120215-001	2,3-Dimethylbutane		0.41 ppbv	0.02	AC-058	30-Dec-15
15120215-001	2,3-Dimethylpentane		0.89 ppbv	0.02	AC-058	30-Dec-15

Report certified by: Graham Knox, Team Lead

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

Date: January-15-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LiCA/VOC/ELK/Dec 12, 2015	H3302	Ambient Air	12-Dec-15 10:10	Version 01		
DESCRIPTION: Elk Point Airport - NMHC						
REPORT NUMBER: 15120215	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120215-001	2,4-Dimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-001	2-Methylheptane	I	0.24 ppbv	0.01	AC-058	30-Dec-15
15120215-001	2-Methylhexane		0.34 ppbv	0.01	AC-058	30-Dec-15
15120215-001	2-Methylpentane		1.21 ppbv	0.01	AC-058	30-Dec-15
15120215-001	3-Methylheptane	I	0.15 ppbv	0.02	AC-058	30-Dec-15
15120215-001	3-Methylhexane		0.39 ppbv	0.02	AC-058	30-Dec-15
15120215-001	3-Methylpentane		0.68 ppbv	0.01	AC-058	30-Dec-15
15120215-001	Acetone		10.7 ppbv	0.4	AC-058	30-Dec-15
15120215-001	Acrolein	K, T, U	< 0.3 ppbv	0.3	AC-058	30-Dec-15
15120215-001	Benzene		1.72 ppbv	0.01	AC-058	30-Dec-15
15120215-001	Benzyl chloride	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-001	Bromodichloromethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-001	Bromoform	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-001	Bromomethane	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-001	Carbon disulfide	I	0.04 ppbv	0.01	AC-058	30-Dec-15
15120215-001	Carbon tetrachloride	I	0.10 ppbv	0.01	AC-058	30-Dec-15
15120215-001	Chlorobenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-001	Chloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-001	Chloroform	I	0.03 ppbv	0.02	AC-058	30-Dec-15
15120215-001	Chloromethane		1.08 ppbv	0.02	AC-058	30-Dec-15
15120215-001	cis-1,2-Dichloroethene	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-001	cis-1,3-Dichloropropene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-001	cis-2-Butene	I	0.12 ppbv	0.02	AC-058	30-Dec-15
15120215-001	cis-2-Pentene	I	0.03 ppbv	0.02	AC-058	30-Dec-15
15120215-001	Cyclohexane	I	0.24 ppbv	0.02	AC-058	30-Dec-15

Report certified by: Graham Knox, Team Lead
 On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Date: January-15-16
 Inquiries: (780) 632 8455
 E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 12, 2015	H3302	Ambient Air	12-Dec-15 10:10	Version 01		
DESCRIPTION: Elk Point Airport - NMHC						
REPORT NUMBER: 15120215	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120215-001	Cyclopentane	I	0.20 ppbv	0.01	AC-058	30-Dec-15
15120215-001	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-001	Ethanol		1.5 ppbv	0.3	AC-058	30-Dec-15
15120215-001	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-001	Ethylbenzene	I	0.11 ppbv	0.01	AC-058	30-Dec-15
15120215-001	Freon-11	I	0.32 ppbv	0.02	AC-058	30-Dec-15
15120215-001	Freon-113	I	0.09 ppbv	0.01	AC-058	30-Dec-15
15120215-001	Freon-114	I	0.03 ppbv	0.02	AC-058	30-Dec-15
15120215-001	Freon-12		0.63 ppbv	0.02	AC-058	30-Dec-15
15120215-001	Hexachloro-1,3-butadiene	K, T, U	< 0.54 ppbv	0.54	AC-058	30-Dec-15
15120215-001	Isobutane		2.23 ppbv	0.02	AC-058	30-Dec-15
15120215-001	Isopentane		3.20 ppbv	0.03	AC-058	30-Dec-15
15120215-001	Isoprene		1.28 ppbv	0.01	AC-058	30-Dec-15
15120215-001	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-001	Isopropylbenzene	I	0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-001	m,p-Xylene		0.44 ppbv	0.03	AC-058	30-Dec-15
15120215-001	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-001	m-Ethyltoluene	I	0.10 ppbv	0.09	AC-058	30-Dec-15
15120215-001	Methyl butyl ketone	K, T, U	< 0.54 ppbv	0.54	AC-058	30-Dec-15
15120215-001	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	30-Dec-15
15120215-001	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-001	Methyl methacrylate	K, T, U	< 0.08 ppbv	0.08	AC-058	30-Dec-15
15120215-001	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	30-Dec-15
15120215-001	Methylcyclohexane		0.63 ppbv	0.01	AC-058	30-Dec-15
15120215-001	Methylcyclopentane		0.73 ppbv	0.02	AC-058	30-Dec-15

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Dec 12, 2015	H3302	Ambient Air	12-Dec-15 10:10	Version 01		
DESCRIPTION: Elk Point Airport - NMHC						
REPORT NUMBER: 15120215	REPORT CREATED: 15-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120215-001	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	30-Dec-15
15120215-001	n-Butane		6.18 ppbv	0.03	AC-058	30-Dec-15
15120215-001	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	30-Dec-15
15120215-001	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-001	n-Heptane		0.40 ppbv	0.01	AC-058	30-Dec-15
15120215-001	n-Hexane		0.80 ppbv	0.01	AC-058	30-Dec-15
15120215-001	n-Octane	I	0.30 ppbv	0.02	AC-058	30-Dec-15
15120215-001	n-Pentane		1.8 ppbv	0.1	AC-058	30-Dec-15
15120215-001	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	30-Dec-15
15120215-001	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	30-Dec-15
15120215-001	Naphthalene		2.0 ppbv	0.5	AC-058	30-Dec-15
15120215-001	n-Nonane	I	0.18 ppbv	0.01	AC-058	30-Dec-15
15120215-001	o-Ethyltoluene	I	0.04 ppbv	0.01	AC-058	30-Dec-15
15120215-001	o-Xylene	I	0.17 ppbv	0.01	AC-058	30-Dec-15
15120215-001	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-001	p-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	30-Dec-15
15120215-001	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-001	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-001	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-001	Toluene		0.77 ppbv	0.01	AC-058	30-Dec-15
15120215-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	30-Dec-15
15120215-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15
15120215-001	trans-2-Butene	I	0.21 ppbv	0.01	AC-058	30-Dec-15
15120215-001	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15
15120215-001	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	30-Dec-15

Report certified by: Graham Knox, Team Lead
 On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Date: January-15-16
 Inquiries: (780) 632-8455 E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED			
LICA/VOC/ELK/Dec 12, 2015	H3302	Ambient Air	12-Dec-15 10:10			
DESCRIPTION: Elk Point Airport - NMHC						
REPORT NUMBER: 15120215	REPORT CREATED: 15-Jan-16					
VERSION:	Version 01					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120215-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	30-Dec-15
15120215-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	30-Dec-15

Report certified by: Graham Knox, Team Lead

Date: January-15-16

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

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

APPENDIX V
CHAIN OF CUSTODY



Maxxam Analytics - Air Services Group

Project Chain of Custody

Client: Lakeland Industry & Community Association
Site: Elk Point Airport Site

Project #: 2833-2015-12-35- C
Contact: Mike Bisaga

QA Check Complete	<u><i>msalamba</i></u>	Date	<u>18-Jan-2016</u>
QA Check Review	<u><i>msalamba</i></u>	Date	<u>18-Jan-2016</u>
Report Complete	<u><i>msalamba</i></u>	Date	<u>18-Jan-2016</u>
Report Reviewed	<u><i>[Signature]</i></u>	Date	<u>19-Jan-16</u>
Report Shipped	<u></u>	Date	<u></u>

Notes

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

JOB #:2833-2015-12-30- C

DECEMBER 2015

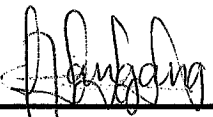
Prepared for:

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

Attention: MIKE BISAGA

DATE: **January 20, 2016**

Prepared by:



Ernestine Tangang, Ph.D.
Team Leader, Source Testing, Maxxam Analytics

Reviewed by:



Lily Lin, B.Sc.
Senior Project Manager, Air Services, Maxxam Analytics

SUMMARY

In DECEMBER 2015, the Air Services Group of Maxxam Analytics conducted an ambient air monitoring program on the Maskwa Site at Lakeland Industry & Community Association, near Bonnyville, 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 AMD1989 and AMD2006.

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

SO₂: The Maxxam-supplied API 100A, S/N: 1124 analyzer was replaced by the LICA-owned API 100E, S/N: 508 which had been repaired on December 2.

H₂S: Thirty six hours of data were invalidated due to sample pump failure.

THC: Thirty five hours of data were invalidated due to zero air generator failure 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, Maskwa Site.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3689 or toll-free at 1-800-386-7247.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Maskwa Site						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDENCES		MONTHLY AVERAGE	1-HOUR				24-HOUR			
	1-HR	24-HR	1-HR	24-HR		READING	DAY	HOUR	WIND SPEED (KPH)	WIND DIRECTION (DEGREES)	READING	DAY	
SO2 (PPB)	172	48	0	0	0	14	30	10	4.7	NW	2.6	31	100.0
H2S (PPB)	10	3	0	0	0	1	VAR	VAR	VAR	VAR	0.6	3, 7	95.2
THC (PPM)	-	-	-	-	2.3	4.2	1	17	4.4	SW	3.3	1	95.2
NO2 (PPB)	159	-	0	-	5.4	31.1	1	19	5.1	SW	21.9	1	100.0
NO (PPB)	-	-	-	-	2.0	36.0	22	12	0.9	WNW	20.5	22	100.0
NOX (PPB)	-	-	-	-	7.4	53	1	18	4.7	SW	33.1	22	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	77.2	90	9	VAR	VAR	VAR	89.1	9	100.0
BAROMETRIC PRESSURE (MILIBAR)	-	-	-	-	934	955	26	9	0.8	SSW	952	26	100.0
AMBIENT TEMPERATURE (DEG C)	-	-	-	-	-10.1	4.5	4	13	8.6	NW	-1.6	9	100.0
PRECIPITATION (MM)	-	-	-	-	0.0	0.8	8	23	6	E	0.1	9, 23	100.0
VECTOR WS (KPH)	-	-	-	-	4.0	9.3	5	12	-	WNW	6.5	31	100.0
VECTOR WD (DEG)	-	-	-	-	SSE	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedence Summary Report

SO₂ 1- Hour Exceedences

No Exceedences Recorded During the Month

SO₂ 24- Hour Exceedences

No Exceedences Recorded During the Month

H₂S 1- Hour Exceedences

No Exceedences Recorded During the Month

H₂S 24- Hour Exceedences

No Exceedences Recorded During the Month

NO₂ 1- Hour Exceedences

No Exceedences Recorded During the Month

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
1.0 Discussion	3
2.0 Project Personnel	6
3.0 Plant Monthly Required AMD Summary	6
4.0 Calculations and Results	6
5.0 Methods and Procedures	7
Appendix I	Continuous Monitoring Data Results
	Sulphur Dioxide
	Hydrogen Sulphide
	Total Hydrocarbon
	Oxides of Nitrogen
	Nitric Oxides
	Nitrogen Dioxide
	Wind Speed
	Wind Direction
	Standard Deviation Wind Direction
	Relative Humidity
	Barometric Pressure
	Ambient Temperature
	Precipitation
Appendix II	Analyzer Calibration Results
	Sulphur Dioxide
	Hydrogen Sulphide
	Total Hydrocarbon
	Nitrogen Dioxide
	Wind System
	Calibrators
	Calibration Gases
Appendix III	Chain of Custody

1.0 Discussion

This monthly report consists of data for parameters SO₂, H₂S, THC, NO_x, NO, NO₂, WS, WD, RH, BP, STDWD, Precipitation and Ambient Temperature.

Sample filters for all continuous air monitors are changed before the calibration is started. The sample manifold is cleaned during the site visit on a monthly basis.

Control checks, consisting of zero and span of the analyzer are conducted on a daily basis on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinder) 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 calibration is done a minimum of once a month for each continuous air monitor. In addition 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.

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.

Hourly/minute data have been reviewed based on daily zero/span results and multi-points calibration results. Data may be considered as 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 (greater than 15%).

Hourly data is corrected using daily zero information.

SULPHUR DIOXIDE (SO₂)

The analyzer was working well throughout the month.

A shutdown calibration was performed on the Maxxam supplied API 100A, S/N: 1124, on December 2. Following the shutdown calibration, the Maxxam-supplied API 100A analyzer was replaced by the LICA-owned API 100E, S/N: 508 analyzer which had been repaired at the Maxxam shop. The installation calibration was performed on the API 100E analyzer on the same day.

HYDROGEN SULPHIDE (H₂S)

A monthly calibration was performed on December 3. The analyzer spanned high on December 17. Upon arrival at the station on December 17, it was found that the sample pump had failed. The sample pump was rebuilt following a post-repair calibration on December 18. Data was invalidated back to the last good calibration, which was December 16. Thirty six hours of data were discarded due to this event.

TOTAL HYDROCARBONS (THC)

The analyzer, Thermo 51i, S/N: 436609738, failed due to zero air generator failure on December 2 during hour 1. As the Thermo 51i, S/N: 436609738 analyzer required maintenance on the internal pump, it was removed on December 2 following a removal calibration. The Thermo 51C S/N: 436609739 analyzer was installed on December 2. Twenty four hours of data were discarded. The Thermo 51i analyzer was brought back to the Maxxam shop for repair. An as found points check was performed on December 10 in order to confirm the analyzer's functionality. The check result passed the calibration requirements. The zero air generator failed again on December 13 during hour 1. A temporary fix was performed on the zero air generator while the new parts were ordered. A post repair calibration was performed on December 13. Eleven hours of data were invalidated due to this event.

NITROGEN DIOXIDE (NO₂)

The analyzer was working well throughout the month.

The routine monthly calibration was performed on December 3.

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.

The wind system was working well throughout the month.

RELATIVE HUMIDITY (RH)

The humidity sensor was working well throughout the month.

BAROMETRIC PRESSURE (BP)

The pressure sensor was working well throughout the month.

PRECIPITATION

Both the rain gauge system and heating system were working well throughout the month.

AMBIENT TEMPERATURE (TPX)

The temperature sensor was working well throughout the month.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association, and the Maxxam field sampling team consisted of Alexander Yakupov and Raja Ashraf.

3.0 Plant Monthly Required AMD Summary

All data collected this month were within the objectives outlined in the AMD1989 and AMD2006.

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 method described in the Air Monitoring Directive, 1989, and 2006 Amendments to the Air Monitoring Directive, 1989 (AMD 2006).

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

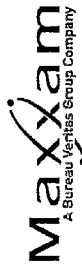
There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100A and API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C and Thermo 51i FID Analyzer
- Oxides of Nitrogen - API 200E 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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE



SULPHUR DIOXIDE (SO2) hourly averages in ppb

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	24:00	DAILY MAX.	24-HOUR AVG.	RODS.	
DAY	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1.3	24
1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	24
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.0	24
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.0	24
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	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	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	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	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	0.1	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	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	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	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	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	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	24
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	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	24
17	5	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	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	0.2	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	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	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	24
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	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	24
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	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	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	24
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	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	24
30	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	1.9	24
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9	2.6	24
HOURLY MAX	5	1	1	6	3	2	2	2	1	2	4	14	5	5	7	4	4	5	9	6	6	6	5	4	8	10	10	0.5	
HOURLY AVG	0.3	0.1	0.1	0.4	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.3	1.0	0.7	0.7	0.8	0.6	0.4	0.4	0.5	0.3	0.4	0.3	0.2	0.4	0.4	0.4		

STATUS FLAG CODES

C	CALIBRATION	O	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT-OF-REPAIR	K	COLLECTION ERROR

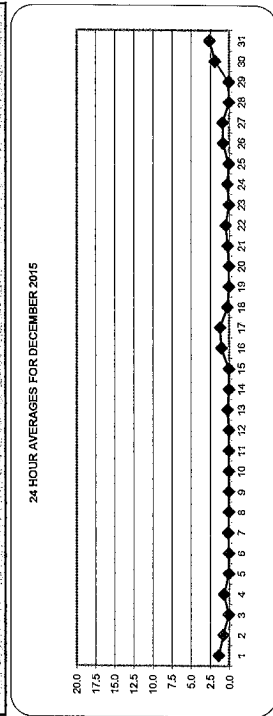
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1.0 PPB

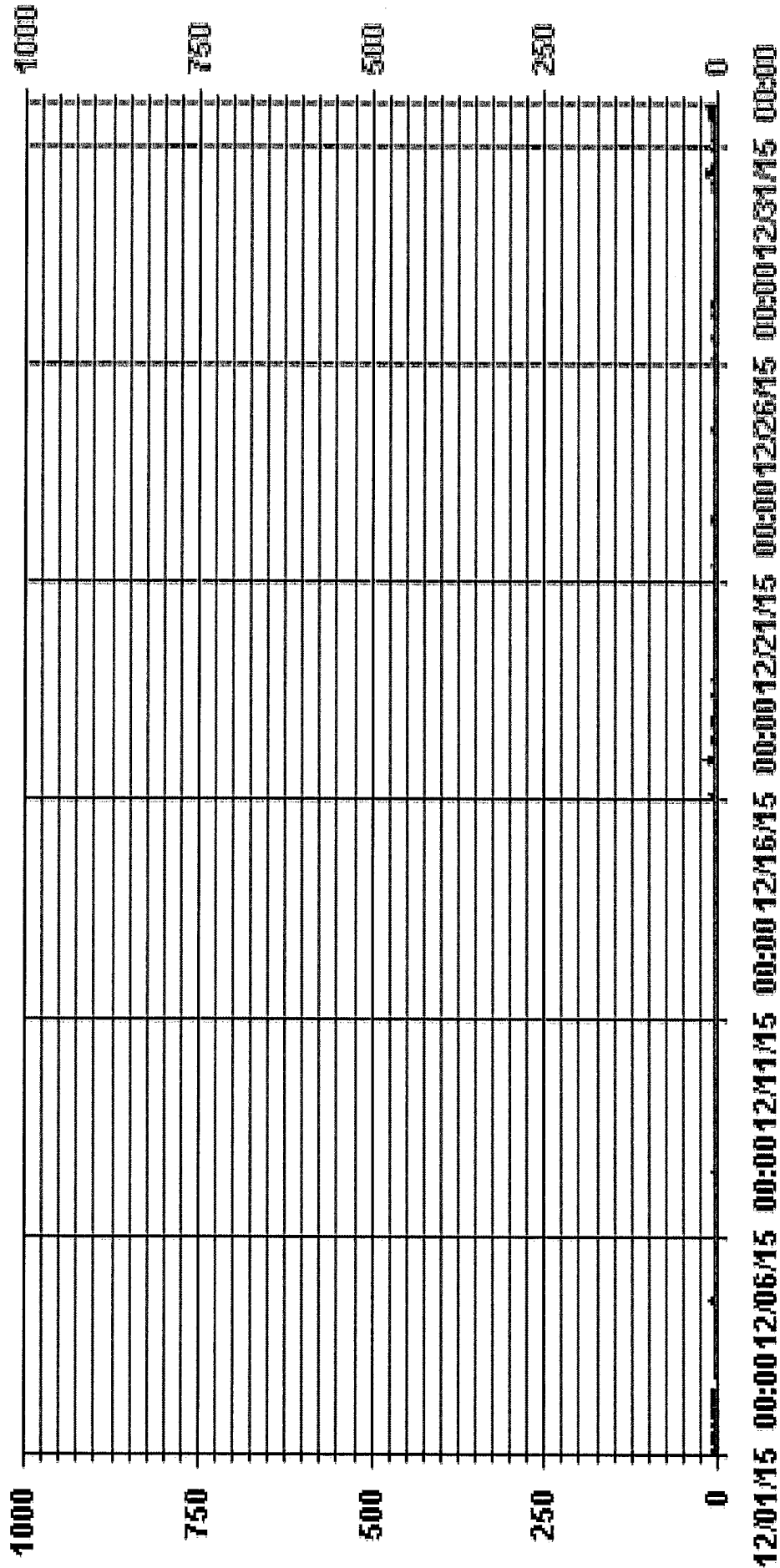
24-HR: 2.6 PPB

MONTHLY SUMMARY

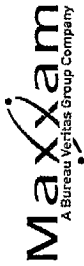
NUMBER OF 1-HR EXCEEDENCES:	0
NUMBER OF 24-HR EXCEEDENCES:	0
NUMBER OF NON-ZERO READINGS:	130
MAXIMUM 1-HR AVERAGE:	14 PPB @ HOUR(S) 10
MAXIMUM 24-HR AVERAGE:	2.6 PPB
12S CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	8 HRS
OPERATIONAL TIME:	744 HRS
AMT OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	1.20
MONTHLY AVERAGE:	0 PPB



01 Hour Averages



— LICA30 SO2_ PPB



SULPHUR DIOXIDE MAX instantaneous maximum in ppb

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	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
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
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
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
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
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
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
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
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
13	1	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
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
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	9	13	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	10	12	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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
20	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
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	0	0	1	2	1	1	1	0	2	2	3	7	6	5	5	5	5	5	5	5	5	5	5	5	5
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
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
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	3	5	4	5	5	2	0	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
27	1	1	2	6	6	4	5	2	5	4	3	4	5	2	3	4	3	4	3	1	1	1	1	1	1
28	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
29	1	1	0	1	1	1	1	5	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	1	2	1	2	2	2	2	2	2	2	11	26	12	11	11	15	4	1	1	1	1	1	1	1	1
31	2	1	1	2	5	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
HOURLY MAX	10	12	9	13	6	5	5	4	7	11	26	14	12	15	17	7	9	20	12	11	11	11	9	10	10
HOURLY AVG	0.8	0.8	0.7	1.3	0.8	0.7	0.8	0.6	0.8	1.1	2.6	1.9	2.2	2.2	2.4	1.3	1.0	1.2	0.9	1.0	1.0	1.0	1.0	1.0	1.6
DAILY MAX	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
DAILY AVG	1.9	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1

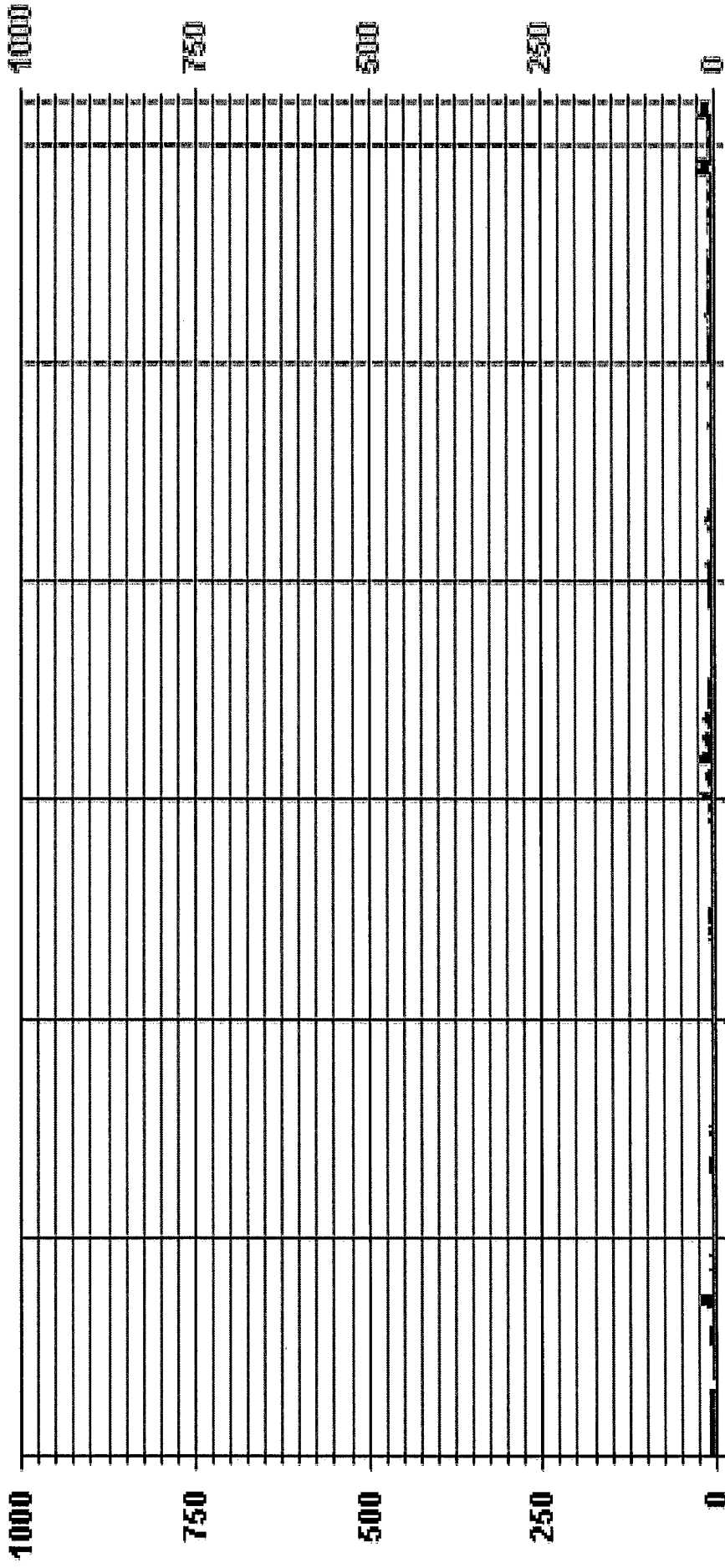
STATUS FLAG CODES

C	CALIBRATION
Y	QUALITY ASSURANCE
M	RECOVERY
S	MAINTENANCE
P	DAILY ZERO/SPAN CHECK
G	POWER FAILURE
	OUT FOR REPAIR
	OPERATOR ERROR
	MACHINE MALFUNCTION
	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	328
MAXIMUM INSTANTANEOUS VALUE:	26 PPB @ HOUR(S) 10 ON DAY(S) 30
IS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	9 HRS
STANDARD DEVIATION:	2.67
OPERATIONAL TIME:	744 HRS
VAR-VARIOUS	10

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA30 SO2MAX PPB

SO2_ / WDR Joint Frequency Distribution (Percent)

LICA30

December 2015

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 Parameter : SO2
 Units : PPS

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 20	3.40	4.82	6.81	8.80	4.11	7.67	12.21	3.69	3.12	12.50	14.48	4.68	2.41	4.26	3.83	3.12	100.00
< 60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 110	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 170	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 340	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 340	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	3.40	4.82	6.81	8.80	4.11	7.67	12.21	3.69	3.12	12.50	14.48	4.68	2.41	4.26	3.83	3.12	

Calm : .00 %

Total # Operational Hours : 704

Distribution By Samples

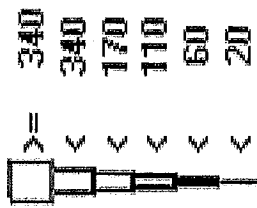
Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 20	24	34	48	62	29	54	86	26	22	88	102	33	17	30	27	22	704
< 60																	
< 110																	
< 170																	
< 340																	
>= 340																	
Totals	24	34	48	62	29	54	86	26	22	88	102	33	17	30	27	22	

Calm : .00 %

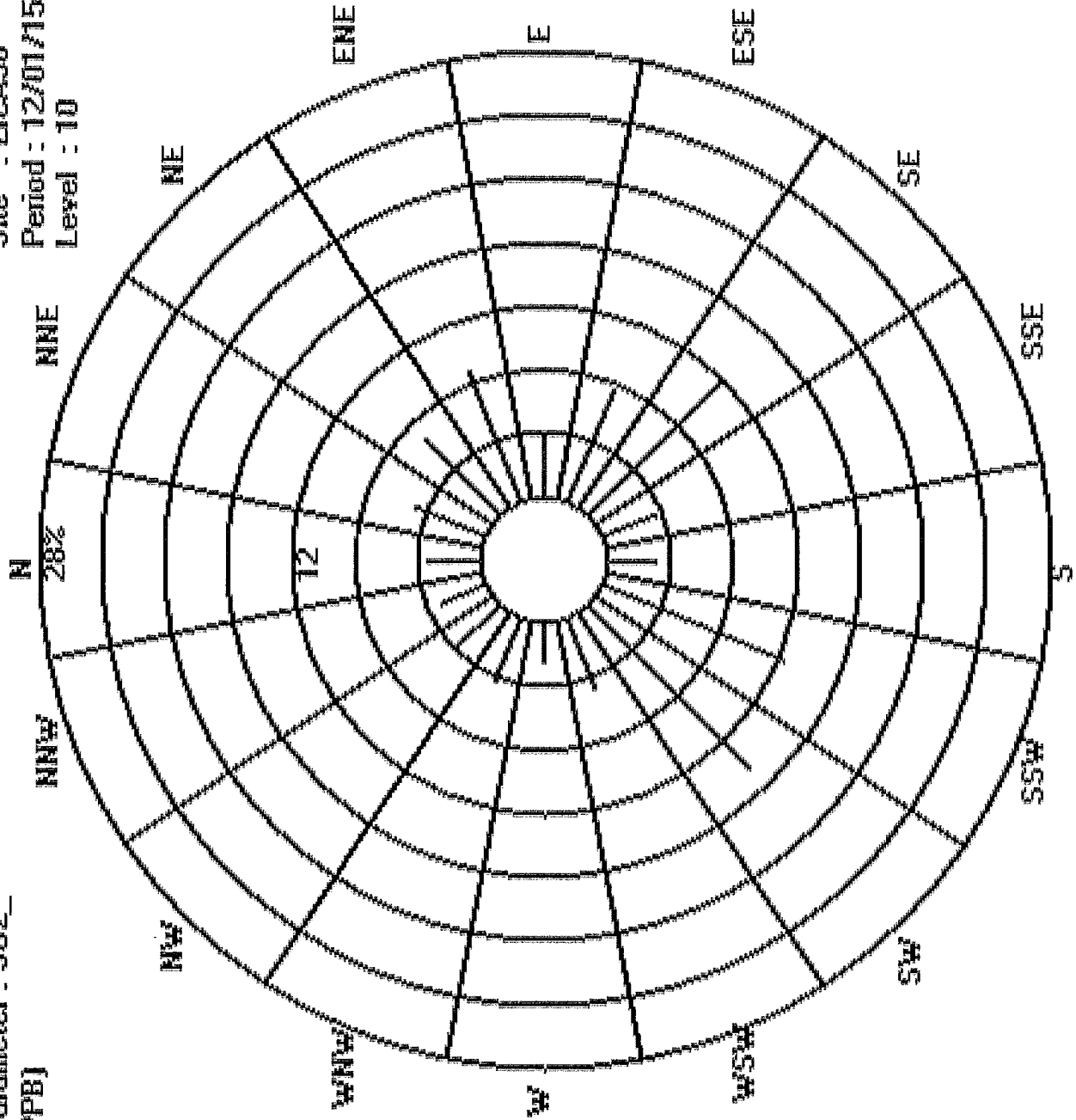
Total # Operational Hours : 704

Logger : 30 Parameter : S02_

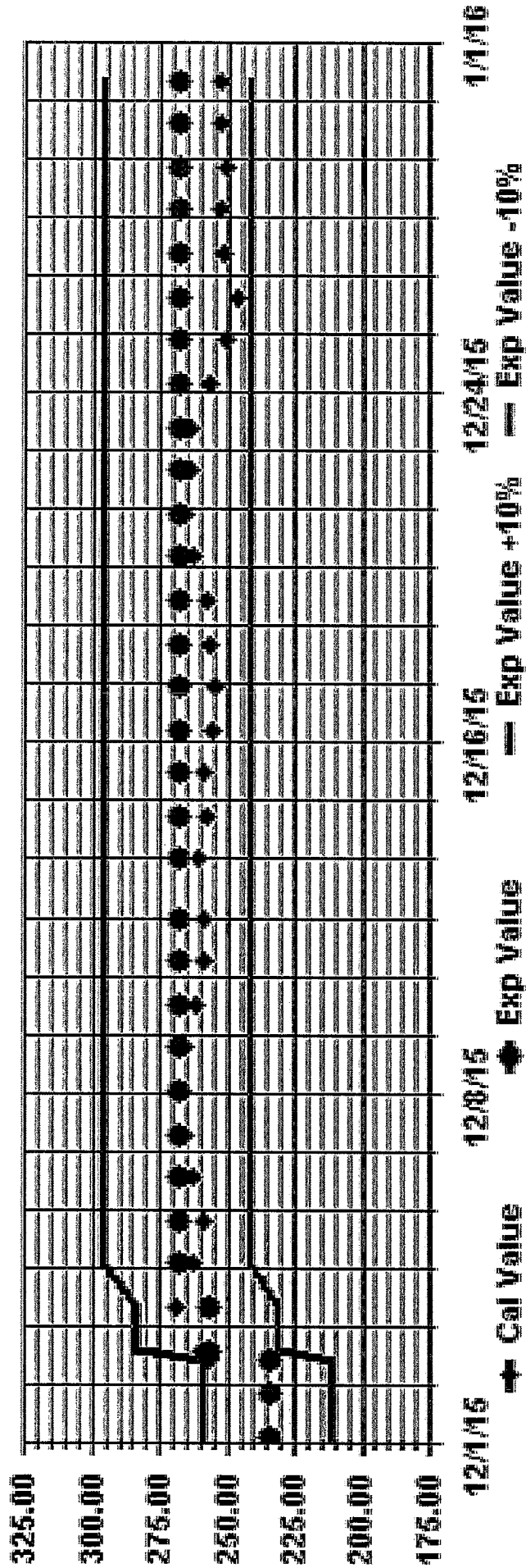
Class Limits (PPB)



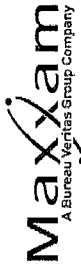
Site : LICA30
Period : 12/01/15-12/31/15
Level : 10



Calibration Graph for Site: LICA30 Parameter: S02 Sequence: S02 Phase: SPAN



HYDROGEN SULPHIDE



HYDROGEN SULPHIDE (H2S) hourly averages in ppb

MST

DAY	HOUR																								DAILY MAX	24-HOUR AVG	RDGS	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				
1	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	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	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	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	24	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0	20	
18	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	0.0	2	
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	14	
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.1	24	
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.1	24	
HOURLY MAX	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.1	24
HOURLY AVG	0.1	0.0	0.0	0.0	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

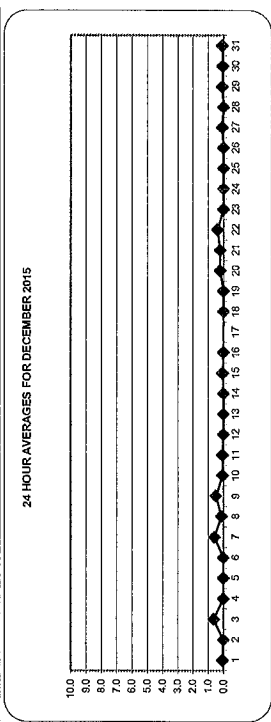
STATUS FLAG CODES

C	- CALIBRATION	Q	- QUALITY ASSURANCE
M	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

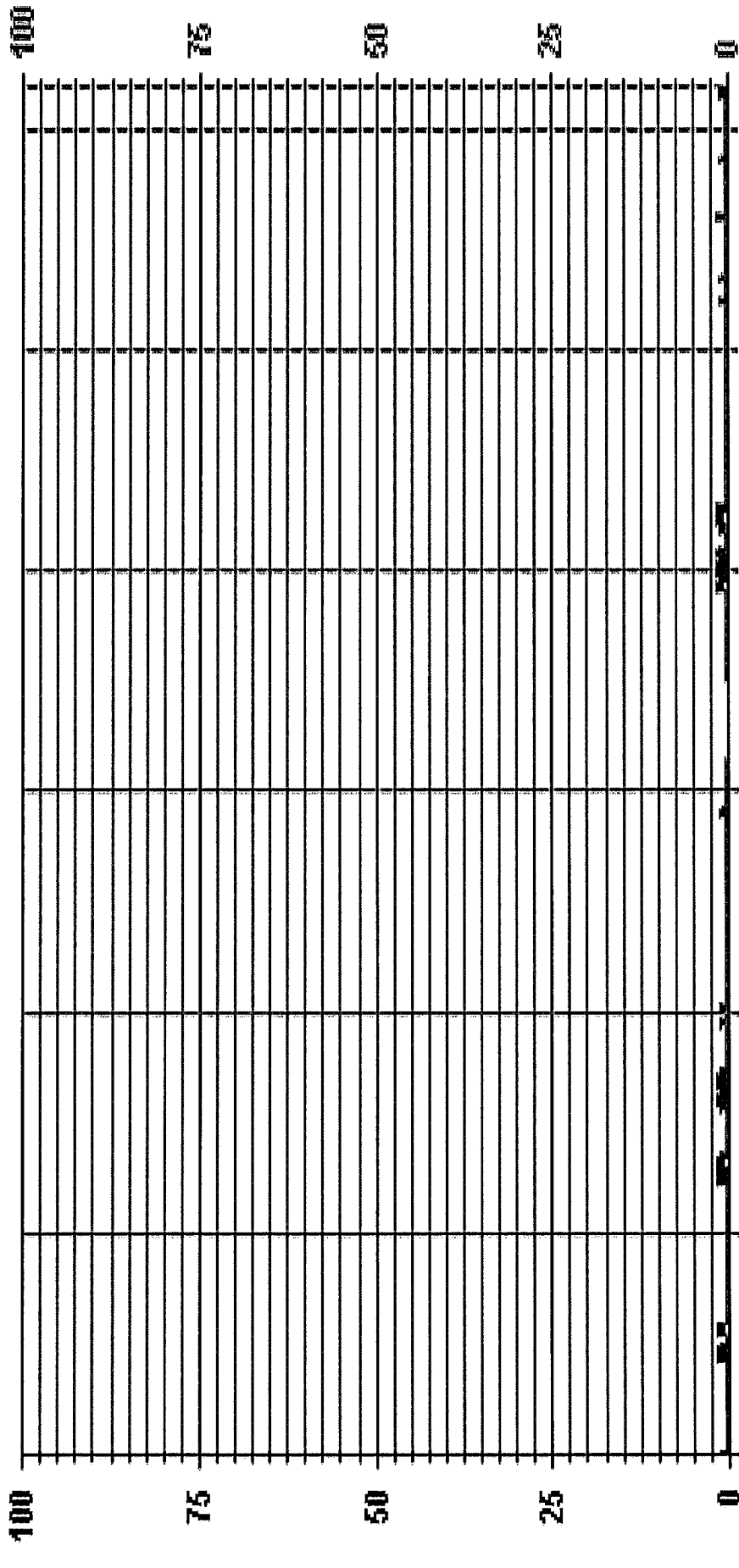
OBJECTIVE LIMIT: ALBERTA ENVIRONMENT: 1-HR: 10 PPB, 24-HR: 3 PPB

MONTHLY SUMMARY

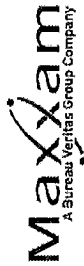
NUMBER OF 1-HR EXCEEDENCES:	0
NUMBER OF 24-HR EXCEEDENCES:	0
NUMBER OF NON-ZERO READINGS:	69
MAXIMUM 1-HR AVERAGE:	1 PPB
MAXIMUM 24-HR AVERAGE:	0.5 PPB
1ZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	10 HRS
STANDARD DEVIATION:	0.30
OPERATIONAL TIME:	708 HRS
AMD OPERATION UPTIME:	95.2 %
MONTHLY AVERAGE:	0 PPB
VAR	3.7
ON DAY(S)	VAR/VARIOUS



01 Hour Averages



— LICA30 H2S_ PPB



HYDROGEN SULPHIDE MAX instantaneous maximum in ppb

MST

DAY	HOUR START																								24-HOUR AVG.	ROSCS			
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00			DAILY MAX	DAILY AVG.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	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	0.3	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	1.2	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	0.1	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	0.7	24
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	24
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	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	0.2	24
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	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	0.3	24
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	24	
12	0	1	3	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	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	24	
14	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	24	
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	24	
16	1	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	0.3	20	
17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	2	
18	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	2	
19	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.2	14	
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	24	
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
22	1	0	1	2	1	1	1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	1	1	1.0	24	
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	24	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	24	
27	0	0	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	24	
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	24	
29	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	24	
30	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.4	24	
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	24	
HOURLY MAX	2	1	3	2	2	2	2	2	3	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
HOURLY AVG	0.4	0.4	0.6	0.5	0.6	0.6	0.6	0.6	0.7	0.5	0.5	0.5	0.5	0.5	0.6	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	

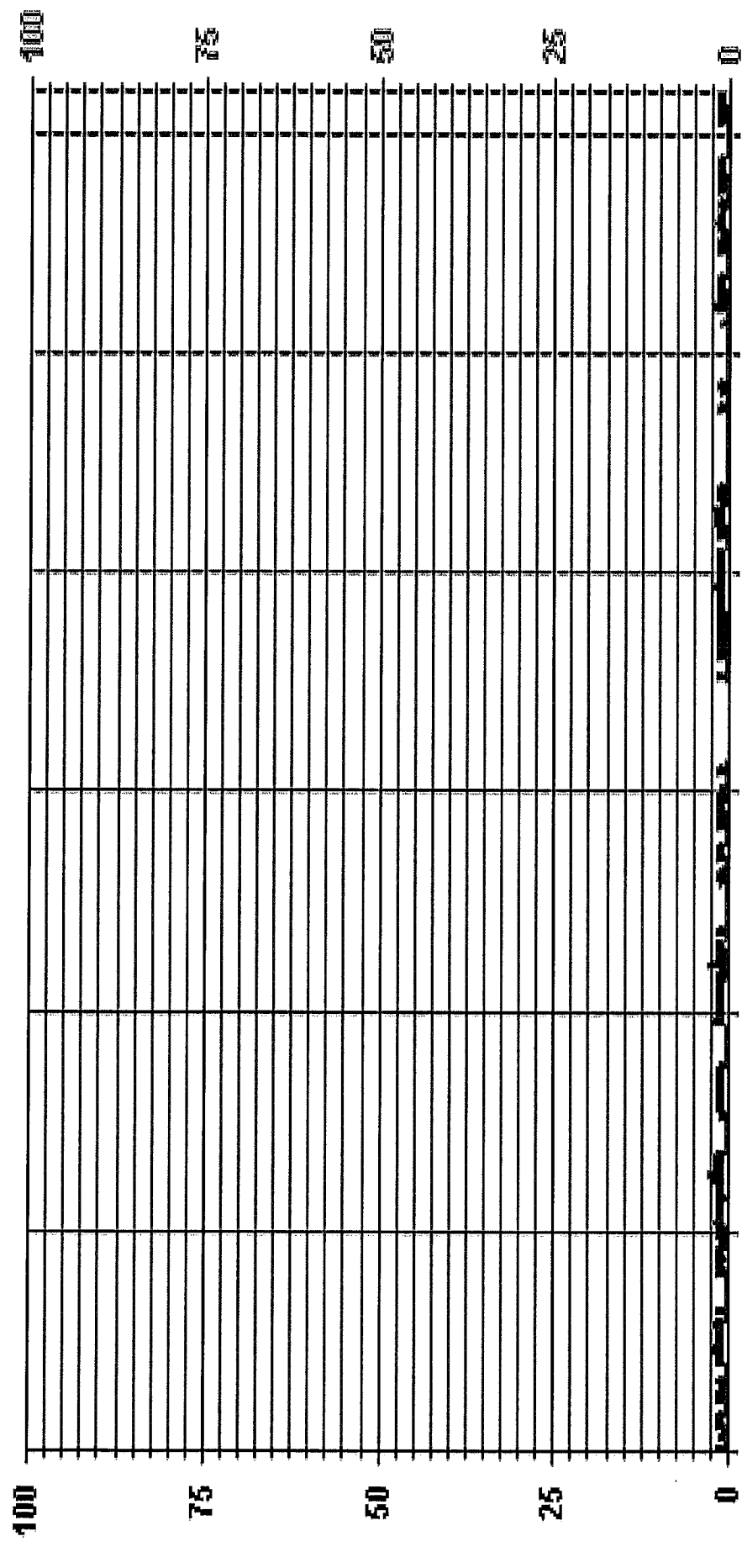
STATUS FLAG CODES

C	- CALIBRATION	Q	- QUALITY ASSURANCE
Y	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	325
MAXIMUM INSTANTANEOUS VALUE:	3 PPB @ HOUR(S) 2, 8 ON DAY(S) 12, 7
12S CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	10 HRS
STANDARD DEVIATION:	0.57
OPERATIONAL TIME:	708 HRS
VAR-VARIOUS	VAR-VARIOUS

01 Hour Averages



12:01:15 00:00:12:06:15 00:00:12:11:15 00:00:12:16:15 00:00:12:21:15 00:00:12:26:15 00:00:12:31:15 00:00:00:00:00

-- LIC830 H2S MAX PPB

HZS_ / WDR Joint Frequency Distribution (Percent)
 LICA30
 December 2015

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 Parameter : HZS
 Units : PPH

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< 3	2.99	4.79	6.89	9.29	3.89	7.94	12.14	3.59	3.29	13.64	15.89	5.09	2.39	4.04	1.94	2.09	100.00	
< 10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
< 50	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
>= 50	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
Totals	2.99	4.79	6.89	9.29	3.89	7.94	12.14	3.59	3.29	13.64	15.89	5.09	2.39	4.04	1.94	2.09	2.09	

Calm : .00 %

Total # Operational Hours : 667

Distribution By Samples

Limit	Direction																NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< 3	20	32	46	62	26	53	81	24	22	91	106	34	16	27	13	14	667	
< 10																		
< 50																		
>= 50																		
Totals	20	32	46	62	26	53	81	24	22	91	106	34	16	27	13	14	667	

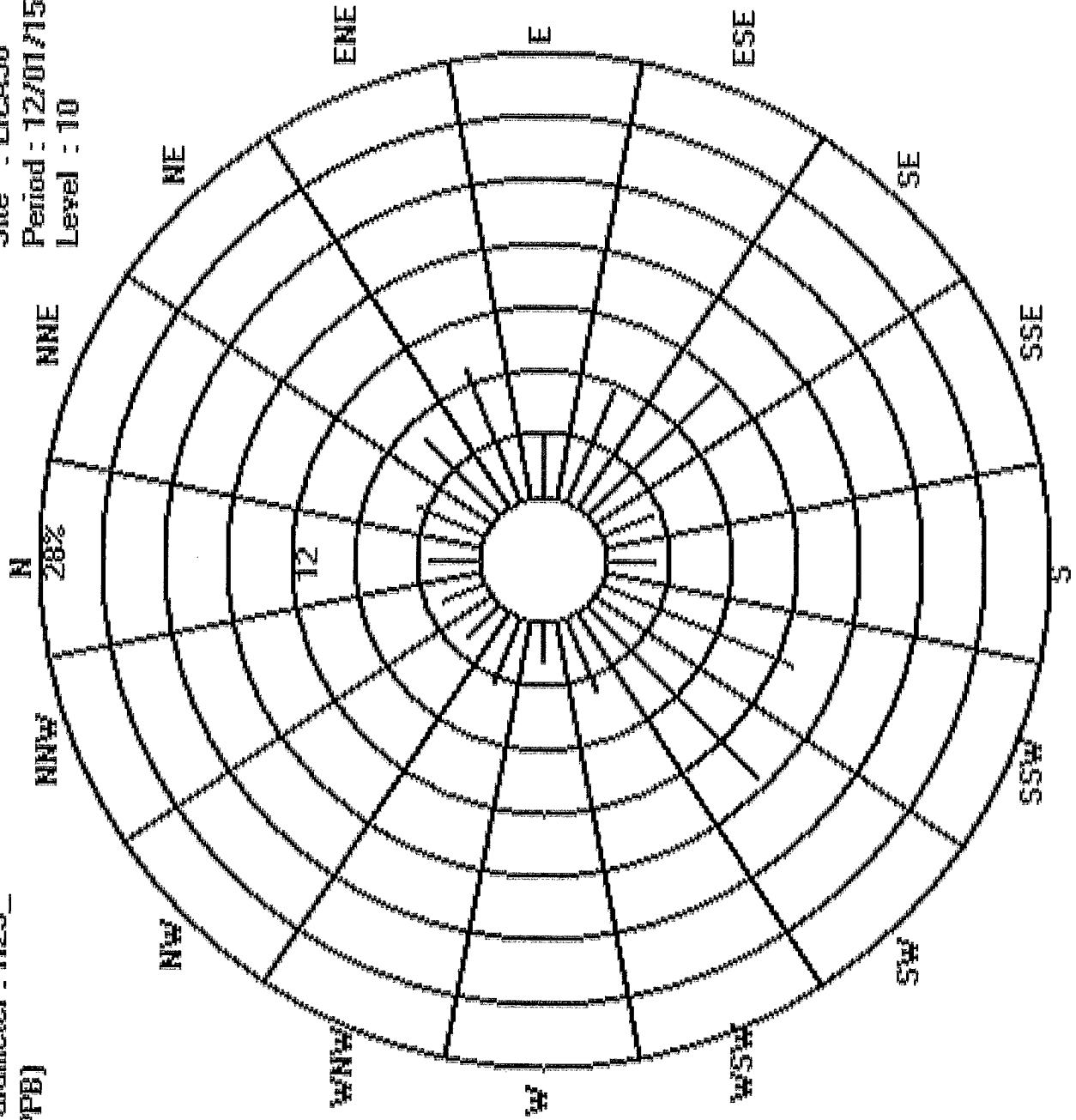
Calm : .00 %

Total # Operational Hours : 667

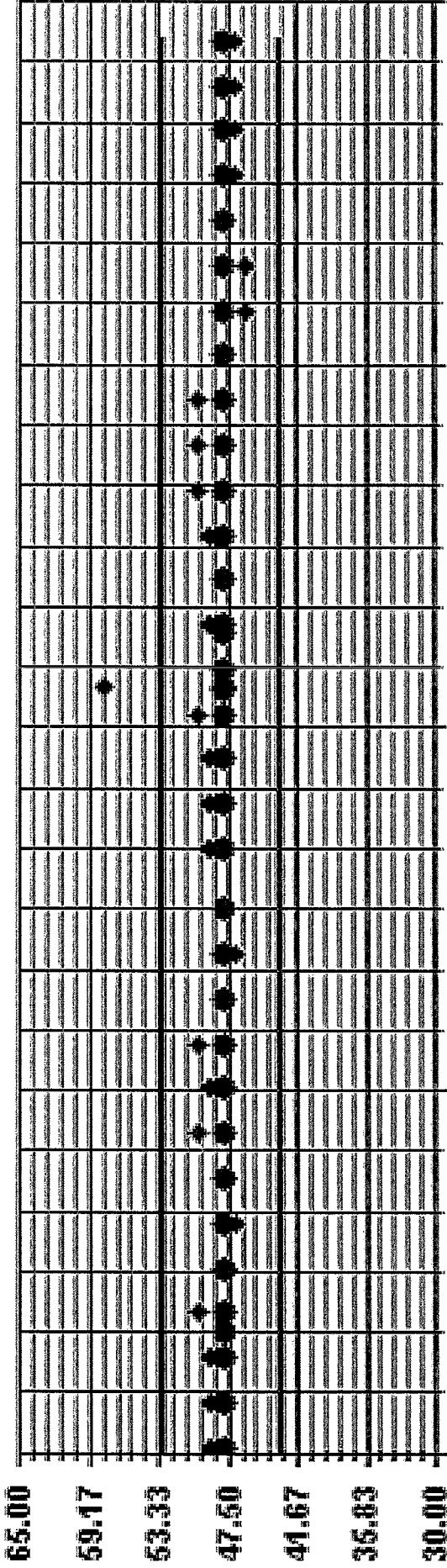
Logger : 30 Parameter : H25
Class Limits (PPB)



Site : LICA30
Period : 12/01/15-12/31/15
Level : 10



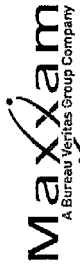
Calibration Graph for Site: LICA30 Parameter: H2S_ Sequence: H2S Phase: SPAN



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

Cal Value
 Exp Value
 Exp Value +10%
 Exp Value -10%

TOTAL HYDROCARBON



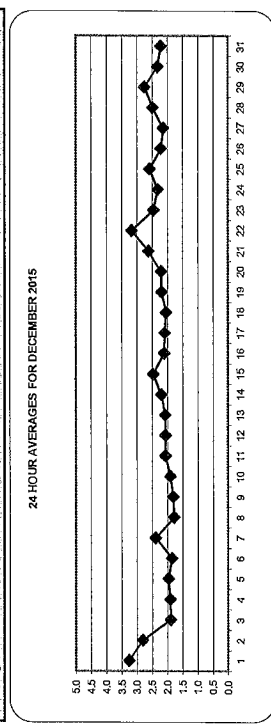
TOTAL HYDROCARBONS (THC) hourly averages in ppm

MST

DAY	24-HOUR AVG.																								RODS.	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		
1	3.3	3.2	3.2	3.1	3.1	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
2	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
3	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
4	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
5	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
6	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
7	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
8	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
9	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
10	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
11	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
12	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
13	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
14	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
15	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
16	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
17	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
18	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
19	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
20	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
21	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
22	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
23	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
24	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
25	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
26	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
27	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
28	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
29	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
30	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
31	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.2	2.9	2.7	2.7	2.9	3.3	3.8	4.2	4.1	3.8	3.4	3.4	3.4	3.3	4.2	3.3	24
HOURLY MAX	3.5	3.5	3.4	3.2	3.2	3.3	3.3	3.3	3.3	3.2	3.1	3.2	2.2	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
HOURLY AVG	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9

STATUS FLAG CODES

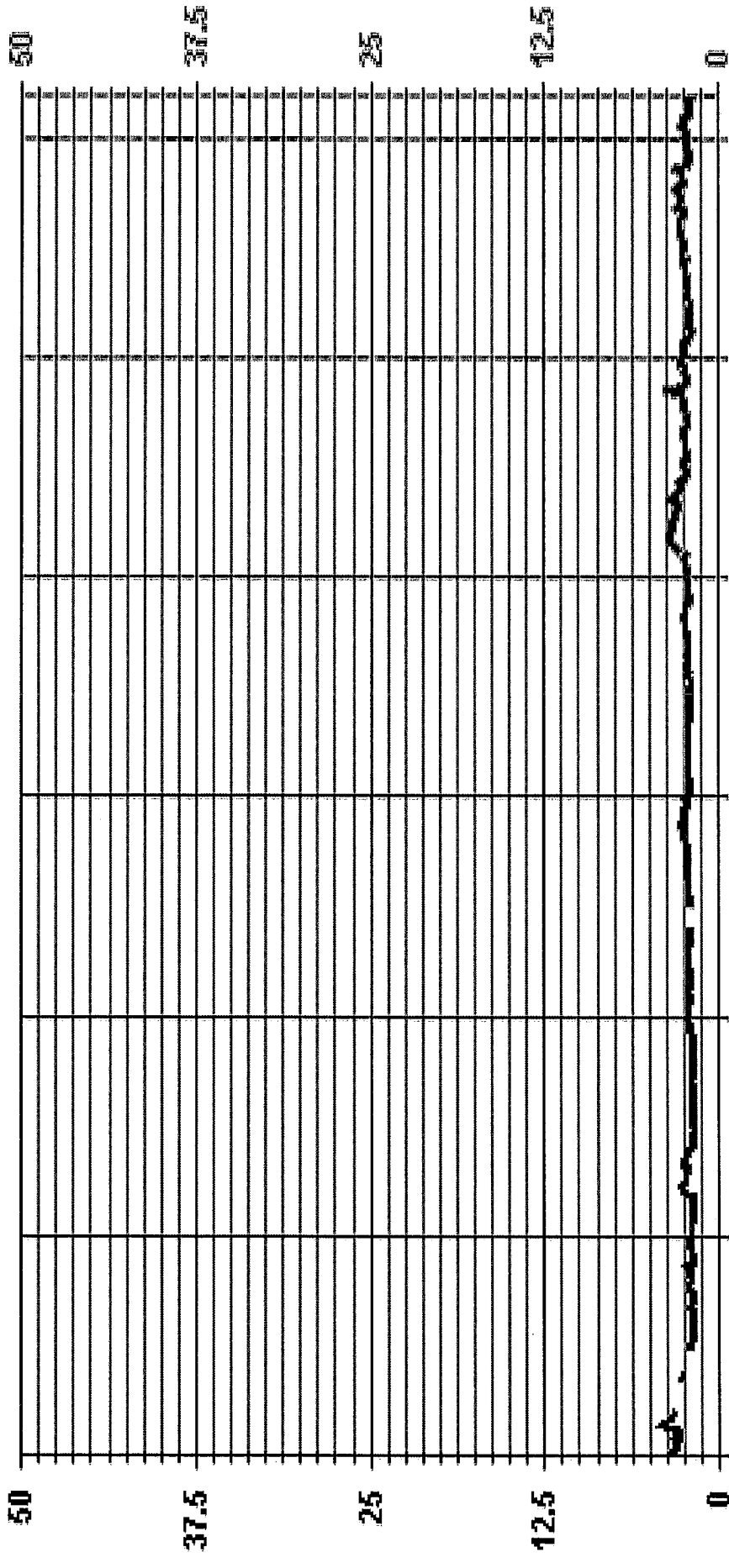
C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVER
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT-OF-REPAIR	K	COLLECTION ERROR



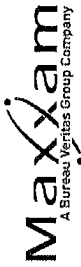
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	666	ON DAY(S)	1
MAXIMUM 1-HR AVERAGE:	4.2 PPM	@ HOUR(S)	17
MAXIMUM 24-HR AVERAGE:	3.3 PPM	VAR-VARIOUS	1
12S CALIBRATION TIME:	30 HRS	OPERATIONAL TIME:	708 HRS
MONTHLY CALIBRATION TIME:	12 HRS	AMID OPERATION UPTIME:	95.2 %
STANDARD DEVIATION:	0.41	MONTHLY AVERAGE:	2.3 PPM

01 Hour Averages



— LICA30 - - - - - THC PPM



TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

MST

DAY	HOURS																								24-HOUR AVG.	RODS
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		
1	3.5	3.4	3.2	3.2	3.2	3.4	3.4	3.1	3.3	3.3	3.1	2.8	2.7	2.8	3.2	3.5	4.1	4.2	4.2	4.0	3.6	3.5	3.6	3.3	4.2	3.4
2	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.1	3.3	3.3	3.1	2.8	2.7	2.8	3.2	3.5	4.1	4.2	4.2	4.0	3.6	3.5	3.6	3.3	4.2	3.4
3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.1	3.3	3.3	3.1	2.8	2.7	2.8	3.2	3.5	4.1	4.2	4.2	4.0	3.6	3.5	3.6	3.3	4.2	3.4
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.4	2.2	2.0	1.8	1.8	2.0	1.9	1.9	1.9	1.9	2.0	2.2	2.2	2.2	2.1	S	2.2	2.0
6	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	S	2.0	2.4	
7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	S	2.0	2.4	
8	2.3	2.1	1.9	1.8	1.8	1.9	2.0	2.1	1.9	1.8	1.9	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	S	2.5	2.5	
9	1.7	1.8	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	S	1.7	1.7	
10	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	S	1.8	1.8	
11	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	S	2.0	2.1	
12	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	S	2.1	2.1	
13	2.0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	S	2.1	2.1	
14	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	S	2.1	2.2	
15	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	S	2.6	2.6	
16	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	S	2.3	2.3	
17	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	S	2.1	2.2	
18	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	S	2.1	2.1	
19	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	S	2.1	2.1	
20	2.3	2.4	2.5	2.5	2.5	2.4	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	S	2.6	2.6	
21	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	S	2.1	2.1	
22	3.6	3.6	3.5	3.4	3.3	3.5	3.4	3.4	3.4	3.4	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	S	3.4	3.4	
23	2.9	2.9	2.8	2.7	2.5	3.0	2.9	2.7	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	S	3.0	3.0	
24	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	S	2.5	2.5	
25	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	S	2.8	2.8	
26	2.7	2.6	2.6	2.6	2.6	2.5	2.5	2.4	2.5	2.4	2.5	2.4	2.5	2.4	2.5	2.4	2.5	2.4	2.5	2.4	2.5	2.4	S	2.3	2.3	
27	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	S	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	S	2.1	2.1	
28	2.4	2.4	2.4	2.5	2.5	2.5	2.4	S	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	S	2.7	2.7	
29	2.8	2.8	2.8	2.8	2.7	2.8	S	2.5	2.5	3.1	3.1	3.0	2.8	2.9	2.9	2.8	2.7	2.7	2.8	3.0	3.1	3.0	S	3.1	3.1	
30	2.6	2.5	2.6	2.6	2.6	S	2.9	3.2	3.2	2.8	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	S	2.3	2.3	
31	2.5	2.5	2.4	2.3	S	2.5	2.6	2.8	2.7	2.6	2.5	2.6	2.5	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	S	2.2	2.2	
HOURLY MAX	3.6	3.6	3.5	3.4	3.3	3.5	3.8	4.0	3.5	3.3	3.3	3.3	3.3	3.3	3.2	3.5	4.1	4.2	4.2	4.0	3.6	3.5	3.6	3.6	3.6	
HOURLY AVG	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	

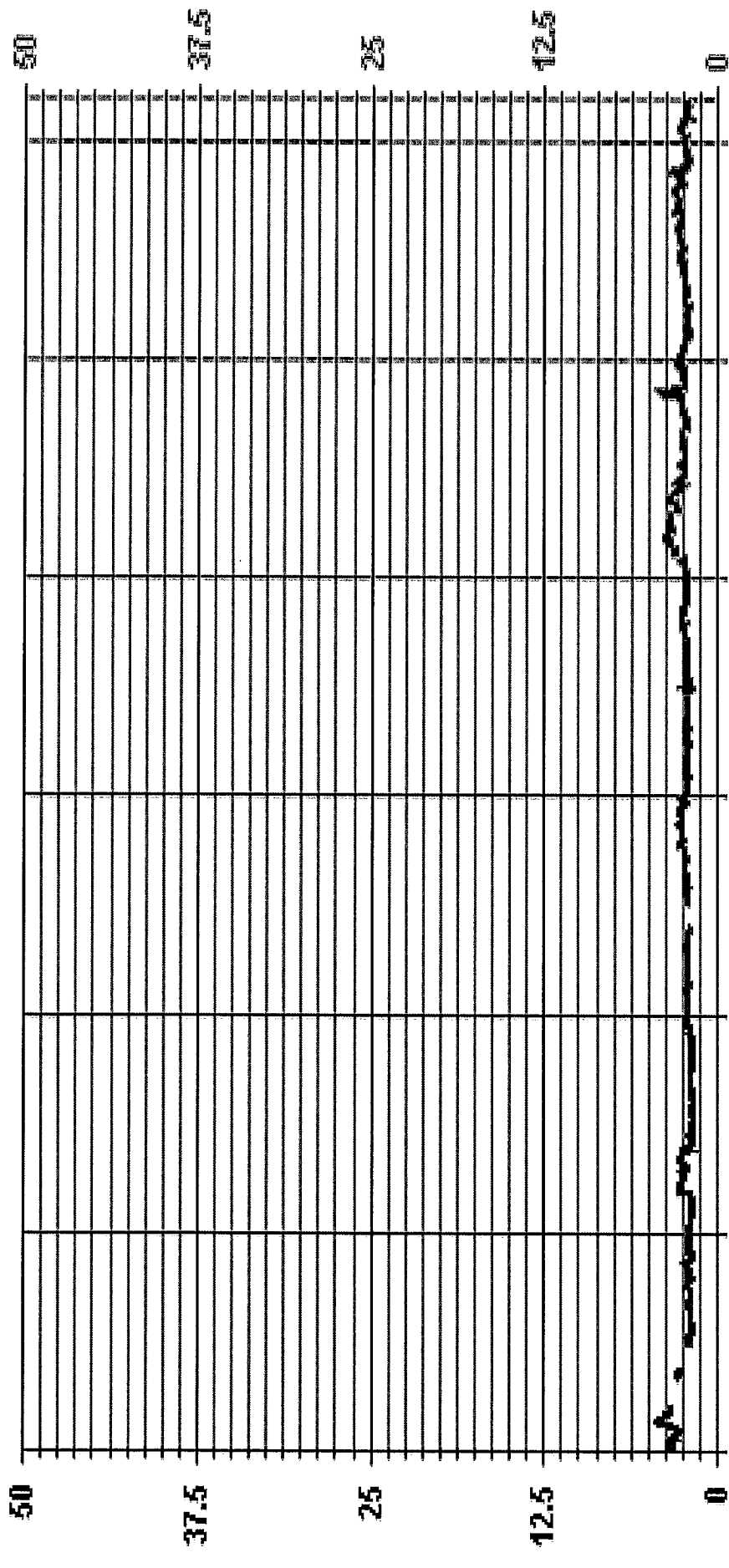
STATUS FLAG CODES

C	-CALIBRATION	Q	-QUALITY ASSURANCE
Y	-MAINTENANCE	R	-RECOVERY
S	-DAILY ZERO/SPAN CHECK	X	-MACHINE MALFUNCTION
P	-POWER FAILURE	O	-OPERATOR ERROR
G	-OUT FOR REPAIR	K	-COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	665	PPM @ HOUR(S)	17, 18	ON DAY(S)	1, 1
MAXIMUM INSTANTANEOUS VALUE:	4.2	PPM	VAR-VARIOUS		
12S CALIBRATION TIME:	30	HRS	OPERATIONAL TIME:	707	HRS
MONTHLY CALIBRATION TIME:	12	HRS			
STANDARD DEVIATION:	0.43				

01 Hour Averages



— LICA30 THCMAX PPM

LICA30
 THC / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 Parameter : THC
 Units : PPM

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3.0	3.30	4.95	7.20	7.80	2.55	6.60	12.01	3.75	2.40	11.11	12.16	4.05	2.55	4.35	4.05	3.30	92.19
< 10.0	.15	.15	.00	.30	.45	.60	.30	.00	.60	1.95	2.40	.75	.00	.15	.00	.00	7.80
< 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	3.45	5.10	7.20	8.10	3.00	7.20	12.31	3.75	3.00	13.06	14.56	4.80	2.55	4.50	4.05	3.30	

Calm : .00 %

Total # Operational Hours : 666

Distribution By Samples

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3.0	22	33	48	52	17	44	80	25	16	74	81	27	17	29	27	22	614
< 10.0	1	1		2	3	4	2		4	13	16	5		1			52
< 50.0																	
>= 50.0																	
Totals	23	34	48	54	20	48	82	25	20	87	97	32	17	30	27	22	

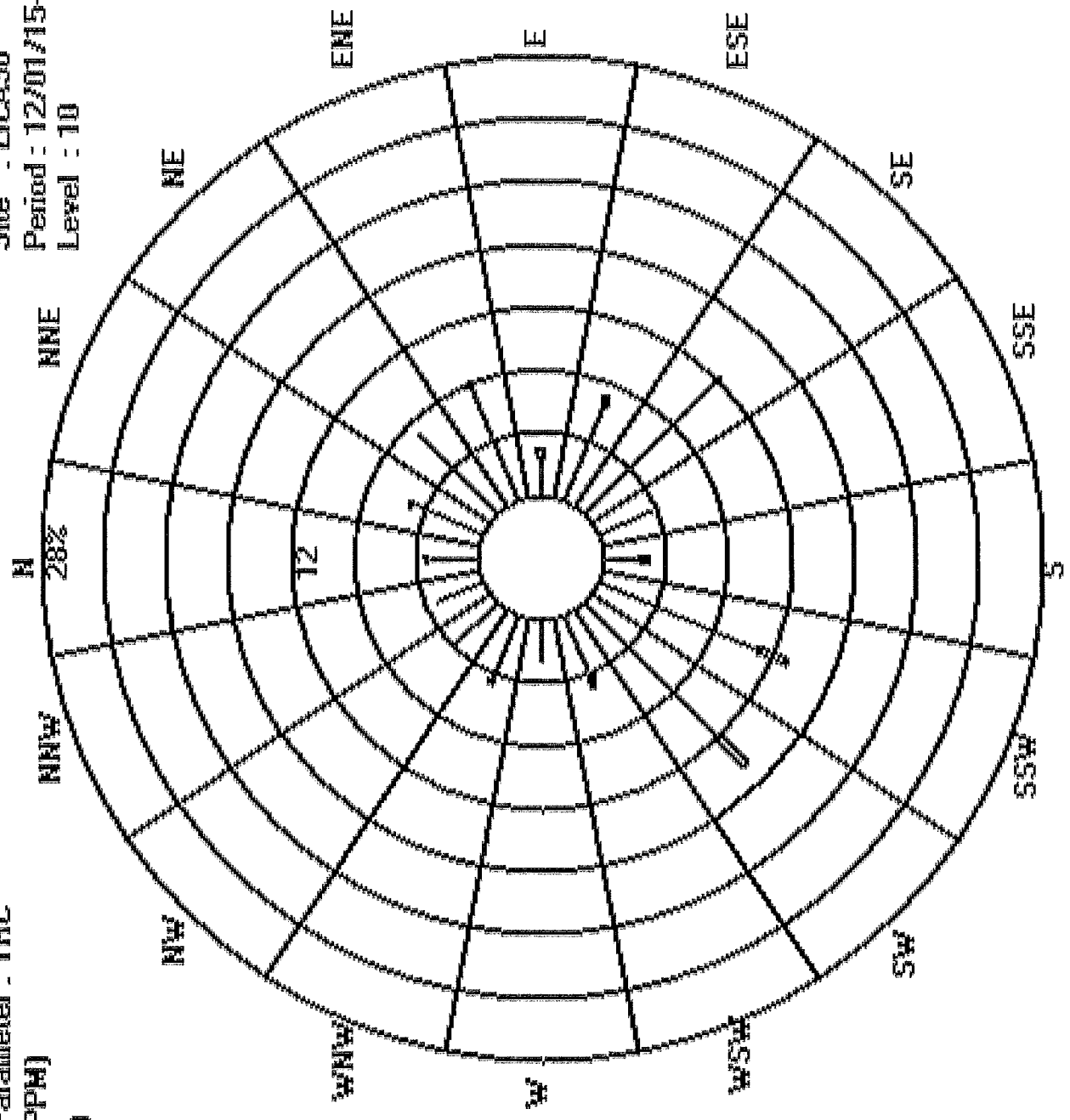
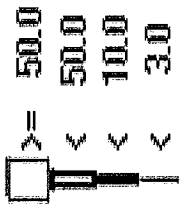
Calm : .00 %

Total # Operational Hours : 666

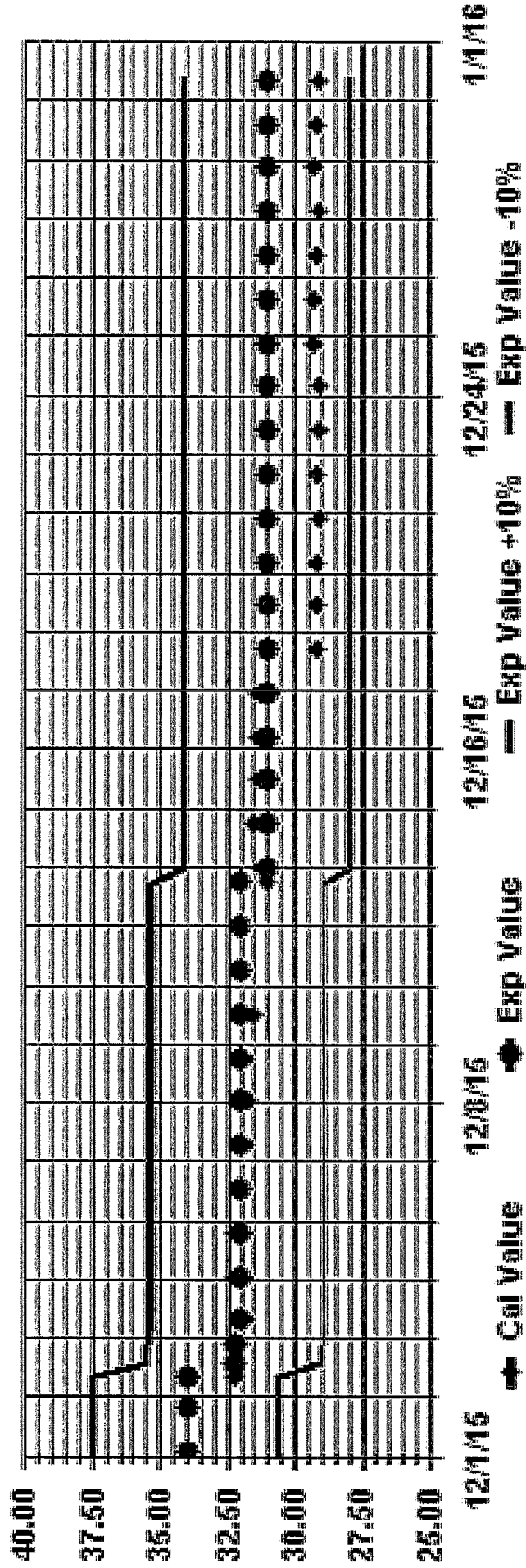
Logger : 30 Parameter : THC

Site : LICA30
Period : 12/01/15-12/31/15
Level : 10

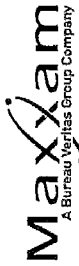
Class Limits (PPM)



Calibration Graph for Site: LICA30 Parameter: THC Sequence: THC Phase: SPAN



OXIDES OF NITROGEN

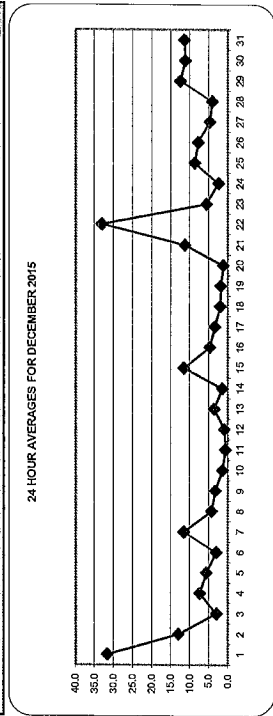


OXIDES OF NITROGEN (NOx) hourly averages in ppb

DAY	HOUR																								DAILY MAX	24-HOUR AVG	RDGS	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				0:00
1	21.4	19.2	26.5	5	20.8	20.6	23.1	26.5	25.5	30.2	33	30.9	28	27.6	29	35.8	43.4	52.5	53	47.3	40.5	39	31.2	29.6	53	31.7	24	
2	25	18.2	5	18.9	18.7	14.6	13.7	18.8	29.4	15	14.7	7.1	9.3	8	11.4	15.9	20.4	12.4	5.5	4.7	4.4	4.1	6.6	1.5	29.4	13.0	24	
3	3.9	5	4.8	3.7	2.5	2.8	3.6	3.7	4	3.5	3.4	2.7	C	C	C	C	C	3.2	1.9	2.3	3.4	2.2	1.5	1.1	4.8	3.0	24	
4	5	2.1	1.8	1.4	1.1	1	1.1	5.9	12	12.4	12.9	18.3	16.9	10.7	13.4	14.1	3.5	4.7	7.1	6.8	7.5	6.7	5	18.3	7.4	24		
5	6.7	7.4	7.6	6.9	6.9	9.1	8	13.7	15.7	8.4	1.8	0.6	0.3	1.4	1.4	5.3	8.7	4	3.2	2.3	2.6	2.3	5	4.7	15.7	5.6	24	
6	4.4	3.5	2.6	2	1.6	1.4	2.8	9.4	8.1	4.2	3	1.5	3.1	2.1	1.8	1.3	1.4	1.4	2.1	0.9	0.7	5	2.1	8.9	9.4	3.1	24	
7	16.8	14	13.6	11.5	9.7	7.9	6.5	6.7	26.4	8.7	8.6	16.4	10.2	9	10.5	10.9	12.3	12.3	15.3	13.2	5	10	3.7	12.8	26.4	11.6	24	
8	0.6	0.6	0.4	0.3	0.3	0.6	2	1.9	6.3	3.5	3.3	8.4	6.7	6.4	11.1	9.3	2.5	3	1.9	5	2	1.3	0.9	0.7	15.4	4.3	24	
9	1	2.9	1.4	1.6	1.1	1.4	1.3	3.1	3.5	2.1	1.2	0.7	0.7	1.1	1.6	1.6	1.4	5	1.7	0.8	1	1	0.7	0.3	3.5	1.4	24	
10	0.2	0.3	0.5	0.6	0.5	0.4	0.2	0.4	0.5	0.5	0.1	0	0.2	0.9	4.8	1.5	5	1.1	0.7	0.4	0.4	0.3	0.2	0.1	4.8	0.6	24	
11	0.1	0.1	0.2	0.3	0.2	0.3	0.2	0.4	0.6	0.7	0.8	0.8	0.8	0.8	1.1	5	1.3	0.8	0.6	0.8	0.5	2.1	0.9	1.8	5.2	0.9	24	
12	1.6	5.4	7.1	5	5.7	6.1	5.7	7.7	0.5	6	8.5	0.6	6.8	5.7	7.1	2.3	0.2	0.1	0.1	0	0	0	5	0.6	8.5	3.6	24	
13	0.2	0.1	0	0.2	0.5	0	0.1	0.2	0.5	1.9	1.5	1.3	2.4	1.5	1	0.9	0.9	0.7	1.1	1.8	1.9	5	8.2	7	8.2	1.5	24	
14	3.6	4	8.3	10.2	11.9	14.4	11.1	11.6	15.9	15.6	13.3	12.6	12.1	14.4	14.2	14.7	17.6	15.3	16.7	13.4	5	5.4	2.7	6.9	17.6	11.6	24	
15	3	1.6	7.6	12.3	0	0	0	5	2.7	0	4	8.7	2.5	5.4	9.4	2.9	1.1	5	0.8	1.4	10.1	25.3	25.3	4.7	24	24	24	
16	15.2	3.7	0	0.3	0.5	0	0	5.5	6.1	4.1	9	12.2	1	0	0.3	0.2	0.3	0.3	5	4.8	3.5	7.1	2.1	2.2	15.2	3.4	24	
17	1.4	0.9	0.2	0.3	0.3	0.3	0.3	0.9	1.4	1.6	1.7	1.8	2.1	2.5	1.6	0.9	1.2	0.7	5	6	8.9	8.3	3	0	8.9	2.0	24	
18	0	0	0.8	1.1	0	0	0	1.2	1.4	0.9	0.6	1.9	2	1.7	2.6	5	5.7	7.1	4.1	3.3	2.4	2.5	2.8	7.1	1.8	24	24	
19	3	1.7	1.7	1.9	1.9	1.2	1.2	1.6	1.7	2.3	1.9	1.5	1.5	1.8	1.7	5	0.5	0	0	0	0.1	0	0	0	3	1.2	24	
20	0	0	0	0.4	0.6	0.4	3.8	3.7	8.8	8.9	20.5	9.3	4.3	5.4	5	14.1	15.1	15.9	16.3	17.6	18.4	35.6	34.3	25.8	35.6	11.3	24	
21	22.6	25.5	23.9	49.4	40.9	36.1	28.2	42.8	38.6	42.8	5	44.4	51.3	5	29	27.1	35.6	28.4	27.7	27.3	25.9	26.8	28	26.2	51.3	33.1	24	
22	23.7	20.3	16.1	12.6	9.4	16.7	12.3	5.9	0.2	0.9	0.4	0.1	5	1.9	3.2	2.6	1.1	0	0	0	0	0	0	0	23.7	5.5	24	
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
24	1.9	1.4	1.2	1.2	1.1	1.1	25.5	34.9	18.6	8.4	5	11.2	6.9	6.5	7.8	7.6	7.7	9.4	6	5.4	6.7	9.7	11	9.5	34.9	7.8	24	
25	7.5	6.6	12.4	13.1	10.7	9.4	11.6	5.7	6.2	5	5.5	4.1	4	6.7	8.2	14	12.3	12.3	8.4	6	4.5	3.9	4.3	2.3	14	7.8	24	
26	1.8	1.9	3	12.6	13.7	7.9	7	1.5	5	7.3	4.1	12	7.7	2.4	3.2	8.1	2.2	0.2	3.8	1.1	1	1.6	2	2.4	13.7	4.7	24	
27	3.2	2.5	2.4	3.1	3.3	3.8	2.9	5	6.6	6.7	5	2.5	3.8	3.2	1.5	0.8	2.9	7.8	10	5.6	4.6	3.7	2.9	4.1	10	4.0	24	
28	26.9	43.4	22	4.5	4.3	6.1	5	5.2	4.2	6.7	14.3	12.4	10	11.3	13.2	11.2	11.2	10.3	11.8	12.8	13.2	12.4	11.7	43.4	12.5	24		
29	10.8	10.5	11.3	12.7	14.9	5	21.7	28.8	27.1	22.9	30.2	11.9	12.3	7.1	8	4.6	2.3	0.2	0	3.4	2.3	1.8	5.1	8.1	30.2	11.2	24	
30	8.9	10	4.1	6.4	5	10.6	11.1	12.6	12.4	14.1	16.5	16.6	5.7	0	4.1	12.9	12.9	19	22.7	13.3	10.8	6.7	28	3	28	11.4	24	
31	26.9	43.4	26.5	49.4	40.9	36.1	28.2	42.8	38.6	42.8	33	44.4	51.3	27.6	29	35.8	43.4	52.5	53.0	47.3	40.5	35.6	34.3	29.6	6.8			
HOURLY MAX	7.6	7.1	6.1	6.5	6.1	6.0	7.0	9.0	9.8	8.4	7.7	8.0	7.7	5.8	6.9	8.4	8.7	7.8	7.9	7.7	6.3	6.6	7.3	29.6				
HOURLY AVG																												

STATUS FLAG CODES

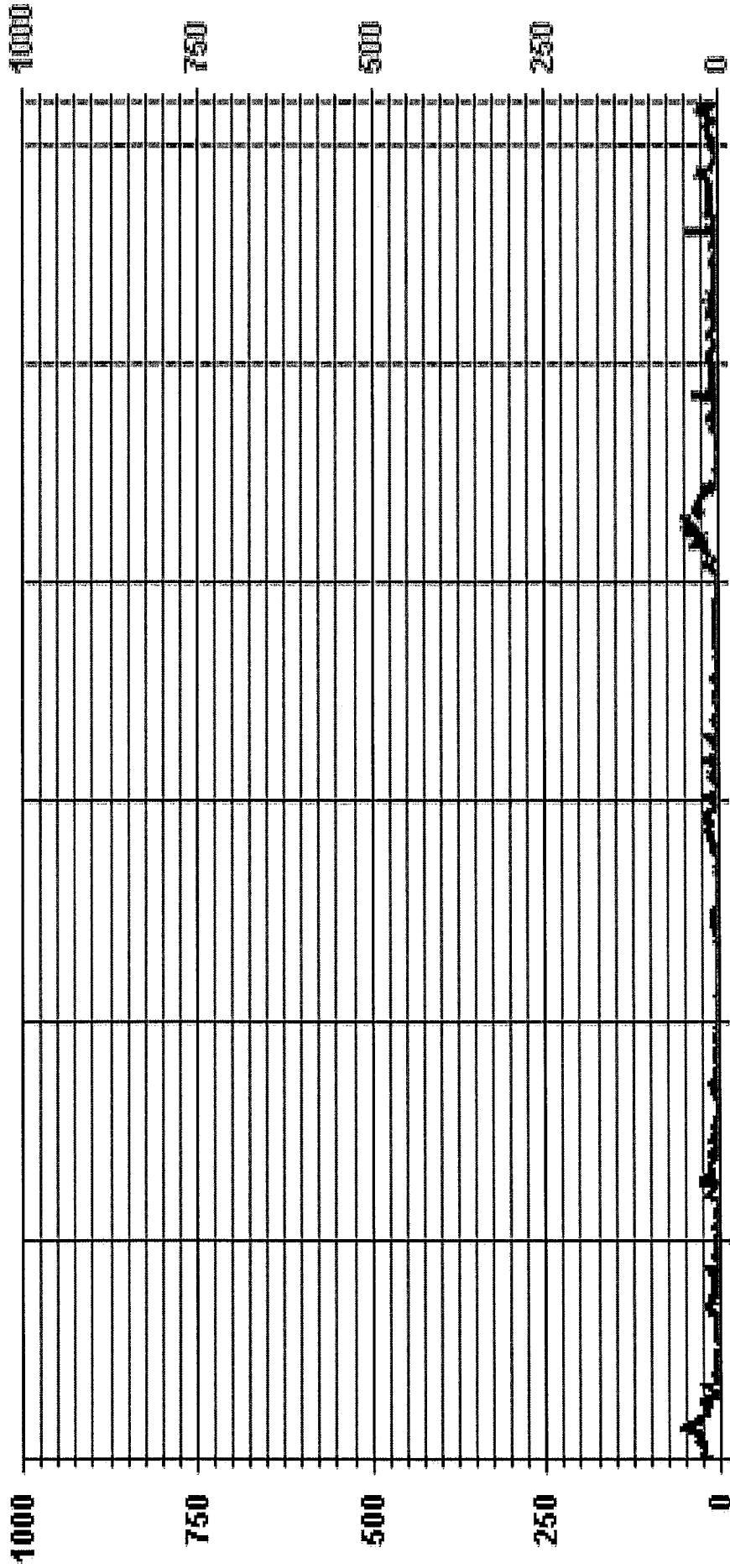
C	QUALITY ASSURANCE	G	RECOVERY
S	MAINTENANCE	R	RECOVERY
P	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
G	OUT-OF-REPAIR	O	OPERATOR ERROR
		K	COLLECTION ERROR



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	652	ON DAY(S)	1
MAXIMUM 1-HR AVERAGE:	53.0 PPB	@ HOUR(S)	18
MAXIMUM 24-HR AVERAGE:	33.1 PPB	ON DAY(S)	22
IS CALIBRATION TIME:	35 HRS	OPERATIONAL TIME:	744 HRS
MONTHLY CALIBRATION TIME:	5 HRS	AMTD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	9.27	MONTHLY AVERAGE:	7.4 PPB

01 Hour Averages



12:01/15 00:00 12:06/15 00:00 12:11/15 00:00 12:16/15 00:00 12:21/15 00:00 12:26/15 00:00 12:31/15 00:00

— LICA30 NOX_ PPB



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Site - DECEMBER 2015
JOB # 2833-2015-12-30-C

OXIDES OF NITROGEN MAX instantaneous maximum in ppb

MST

DAY	HOURS																								24-HOUR AVG.		
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		RODS.	
1	24.7	21.7	30.6	S	25.6	26	74.2	50.9	41.4	36.9	38.1	36.7	29.6	30.6	32.4	63.6	82.1	58.5	54.6	50.3	70.1	36	32.7	31.8	82.1	42.6	24
2	29.2	22.3	S	4.1	21.4	17.6	33	74.1	18.7	27.4	34.6	11.1	9.5	16.6	22.5	24.4	17.5	7.1	7.1	7.3	6.3	2.8	10.5	2.9	74.1	20.0	24
3	8.4	S	9.1	4.7	7.1	5.4	6.3	4.4	5.1	4.1	C	C	C	C	C	C	C	C	2.5	5.2	4.5	6.8	2.5	1.8	9.1	4.8	24
4	S	3.2	2.3	2.1	1.6	1.4	1.7	2	22.7	19.1	16.3	16.1	29.9	32.8	28.9	73.2	44.2	5.6	6.5	8.8	8.6	7.8	S	73.2	15.6	24	
5	8	8.8	9.5	7.5	7.5	13.1	33.7	33.7	18.5	12.9	4.8	1.4	0.9	6.8	6.9	11.8	18.1	6.1	4.2	2.8	3.4	3.9	S	5.6	33.7	10.0	24
6	5.5	4.5	3.4	2.7	2.2	1.9	6.1	14.2	12.1	9.9	7.5	5.1	6.1	3.4	4.3	2.3	2.6	2.5	3	1.7	1.3	S	2.9	18.4	18.4	5.4	24
7	18.5	14.8	14.6	12.5	11.6	8.8	8.3	8.8	22.8	11.6	11.8	34	14.4	11.3	16.1	13.4	16.3	14.8	16.7	15	S	14.1	6	15.3	22.8	23.4	24
8	14.3	7	1.9	1.4	2.1	8.2	9.7	24.7	27.1	6.4	12.3	5.6	11	10.3	7.4	9	4.7	4	3.1	S	3	2	1.6	1.1	27.1	7.7	24
9	1.2	1.1	1.2	0.7	0.8	2	2.9	3	13.6	7	6.1	10.8	10	8.4	15.7	13.1	4.3	4.4	S	3.2	4.2	2.8	1.5	3.8	15.7	5.3	24
10	1.6	6.7	4.3	4.7	1.9	7.9	4	9.1	5.2	3.8	2	1.5	1.8	1.9	2.4	2.1	2.1	S	3.8	1.5	1.5	1.4	1.3	0.8	9.1	3.2	24
11	0.7	0.9	1	1.1	1.3	1	0.7	1	1.1	1	0.7	0.5	1	4.8	16.6	6.3	S	2.3	1.1	1.1	0.7	0.7	0.7	0.7	16.6	2.0	24
12	0.7	0.9	0.9	0.7	0.7	0.8	0.7	1.1	1.6	1.4	1.3	1.5	1.4	1.6	S	2.5	1.7	1	1.2	1.0	5.3	1.7	4.8	10	1.9	24	
13	3	11.8	13.8	12.9	10.4	9.6	10.6	17.4	1.6	19.3	12.8	2.7	13.8	10.6	11.2	5.4	0.7	0.6	0.6	0.4	0.4	0.5	S	1.7	19.3	7.5	24
14	0.7	0.7	0.4	1.1	1.2	0.5	1.1	0.7	2.3	5.3	5.5	2.3	3.8	2.4	1.7	1.5	1.5	1.2	1.8	2.6	2.6	S	10.1	10.7	2.7	24	
15	5.4	6.8	9.3	12.1	13.4	18	13.1	14.8	104.3	49	21.5	14.5	13.7	19.1	18.3	22.9	27	16.1	18	17.4	S	18.1	7.5	9.8	104.3	20.4	24
16	4.2	3.2	20.6	23.4	1.6	0	S	S	20.6	0.7	11.1	17.1	14.3	14.5	21.3	9	3.6	S	2.8	6.5	18.2	41.5	41.5	11.7	24	24	
17	21.2	20.7	0.6	2.4	3.4	0.6	0.5	11.5	16.1	7	15	30.8	5.9	1.8	2.6	1.8	1.5	1.1	S	7.5	8.3	14.2	8.2	11.3	30.8	8.4	24
18	3.2	1.5	0.7	0.9	0.8	0.8	2.9	2.8	2.2	2.9	2.7	2.8	8.1	2.5	1.6	3.4	1.9	S	10.4	15.4	13.9	7.5	0.5	0.2	15.4	3.9	24
19	0.2	0.2	5	4.8	0.3	0.4	0.3	0.6	4.3	4.6	1.8	1.8	3.8	2.6	2.9	4.7	S	9.1	10.4	5.8	4.2	3	3.3	4	10.4	3.4	24
20	3.8	2.3	2.1	2.4	2.6	1.8	2.1	2.2	2.3	3.1	2.5	2.3	2.1	2.5	2.4	S	1.5	0.5	0	0	0	0	0	0	3.8	1.7	24
21	0	0	0.2	1.3	1.3	0.9	40.6	7.4	44.2	15.8	27.9	12.2	5.6	11.4	S	15.5	16.9	18.5	18.8	21	21.5	50.1	44.9	29.1	50.1	17.6	24
22	24.9	30.9	29.7	113.4	50.4	39.8	35.6	57	44.4	52.1	S	58.4	55.6	S	57.5	43.1	98.5	36.4	34.5	28.8	27.6	31.5	29.6	27.3	113.4	45.8	24
23	25.4	23.5	17.9	14.9	12.3	19.1	14.8	11.3	0.8	1.8	1	0.9	S	3.7	9.7	9.7	1.7	0.7	0	0	0	0	0	0	25.4	7.4	24
24	0	0	0	0	0	0	0	0	0	0	S	6.3	10.1	5.7	10.6	3.9	1.5	1.8	55.6	18	5.4	4.6	2.6	55.6	5.5	24	
25	2.7	1.9	1.6	1.8	1.7	6	35.4	39.7	26.8	11.4	S	15.9	8.1	7.2	10.2	8.3	9.8	11.7	6.6	6	8.7	11.2	11.6	10.5	39.7	11.1	24
26	9.3	9.3	18.7	18.6	15	16.7	17.2	8.5	7.5	S	7.7	4.9	7.8	10.7	10.3	16	16.8	19.4	11.7	7.4	5.5	4.6	5.5	3.5	19.4	11.0	24
27	2.2	2.7	6.5	23.4	22	14.8	18.5	4.9	S	17.1	13.1	15.5	15.6	8.5	11.2	14.9	12.3	1.8	6.8	2.6	1.8	2.5	2.5	6.1	23.4	9.9	24
28	6.2	3.1	3	3.7	3.9	5	3.9	S	8.1	13	11.4	3.6	10.8	5.6	3	1.4	10.1	10.6	12.5	8.9	5.7	4.9	3.6	23.6	23.6	7.2	24
29	62.6	68.3	42.5	10	5	8.9	S	6.7	5	15	15.5	14.9	12.9	13.1	15.5	12.9	10.6	11.5	11.6	13	13.5	13.7	13.7	12.6	68.3	17.8	24
30	11.8	12.8	12.2	14.3	17.4	S	25.8	60.9	39.5	31.8	47.9	23.2	21.3	20.7	24.9	11.2	9.1	2.3	4	4.1	3.7	2.5	11.2	11.5	60.9	18.4	24
31	9.9	11.3	8.4	10.1	S	13.2	14	14.2	14.7	17.9	17.8	18.2	21.1	1.9	13	21.7	21.1	37.7	42.1	25.6	23.9	26.6	30.7	27.3	42.1	19.2	24
HOURLY MAX	62.6	68.3	42.5	113.4	50.4	39.8	74.2	60.9	228.8	52.1	47.9	58.4	55.6	32.8	57.5	73.2	98.5	58.5	54.6	55.6	70.1	50.1	44.9	41.5			
HOURLY AVG	10.3	10.1	9.1	11.0	8.1	8.3	13.4	15.4	26.8	13.8	12.4	12.6	11.9	9.4	12.6	15.6	16.7	11.0	10.3	11.0	9.5	9.9	9.5	10.7			

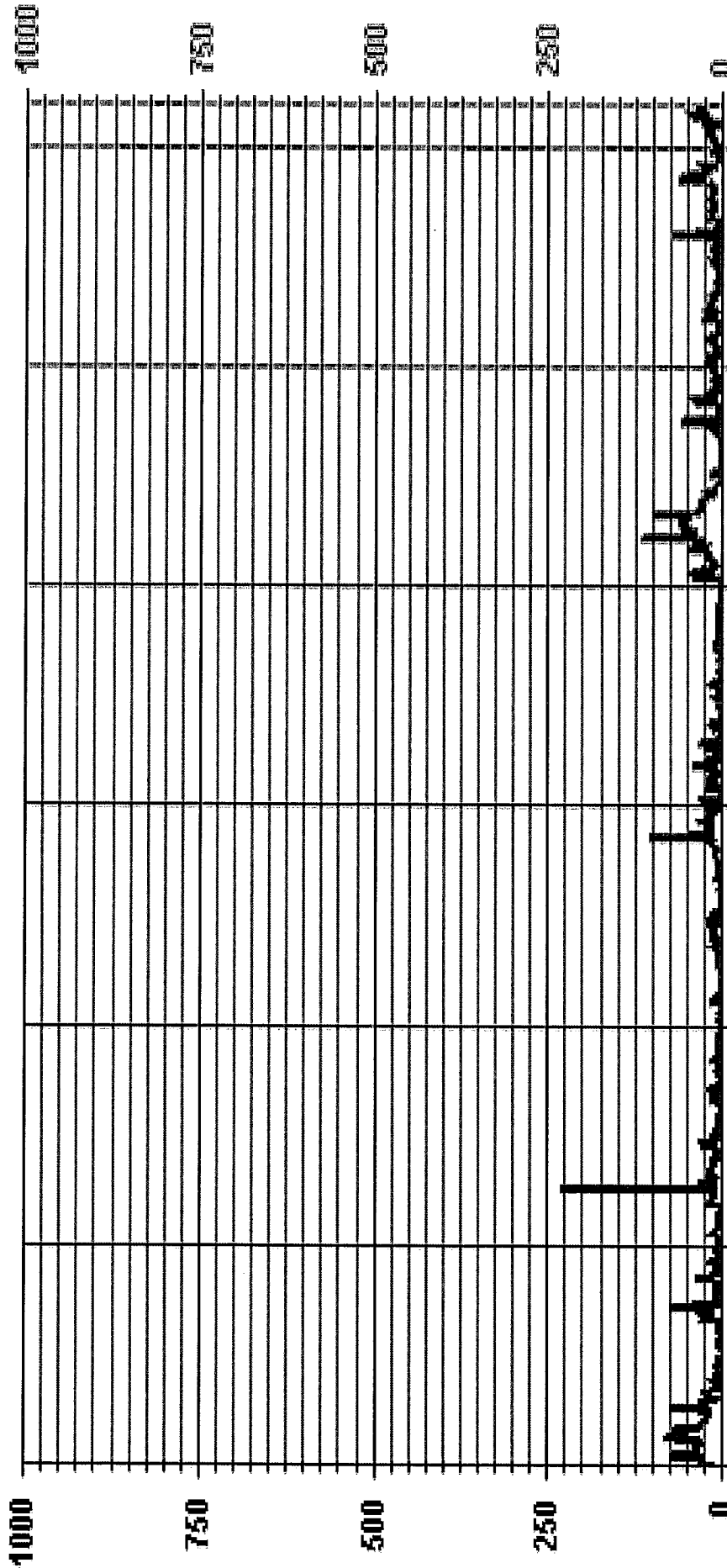
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
Z	ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	675
MAXIMUM INSTANTANEOUS VALUE:	228.8 PPB @ HOUR(S)
ON DAY(S)	8
VARIABLES	VAR-VARIOUS
OPERATIONAL TIME:	744 HRS
OPERATIONAL TIME:	36 HRS
MONTHLY CALIBRATION TIME:	6 HRS
STANDARD DEVIATION:	16.71

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA30 NOXMAX PPB

LICA30
NOX_ / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 30
Site Name : LICA30
Parameter : NOX
Units : PPS

Wind Parameter : WDR
Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	3.12	4.82	6.81	8.80	4.11	7.52	11.64	3.55	3.12	12.92	14.77	4.82	2.41	4.11	3.83	3.12	99.57
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.28	.00	.00	.00	.14	.00	.00	.42
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	3.12	4.82	6.81	8.80	4.11	7.52	11.64	3.55	3.12	12.92	15.05	4.82	2.41	4.26	3.83	3.12	

Calm : .00 %

Total # Operational Hours : 704





Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	22	34	48	62	29	53	82	25	22	91	104	34	17	29	27	22	701
< 110.0										2				1			3
< 210.0																	
>= 210.0																	
Totals	22	34	48	62	29	53	82	25	22	91	106	34	17	30	27	22	

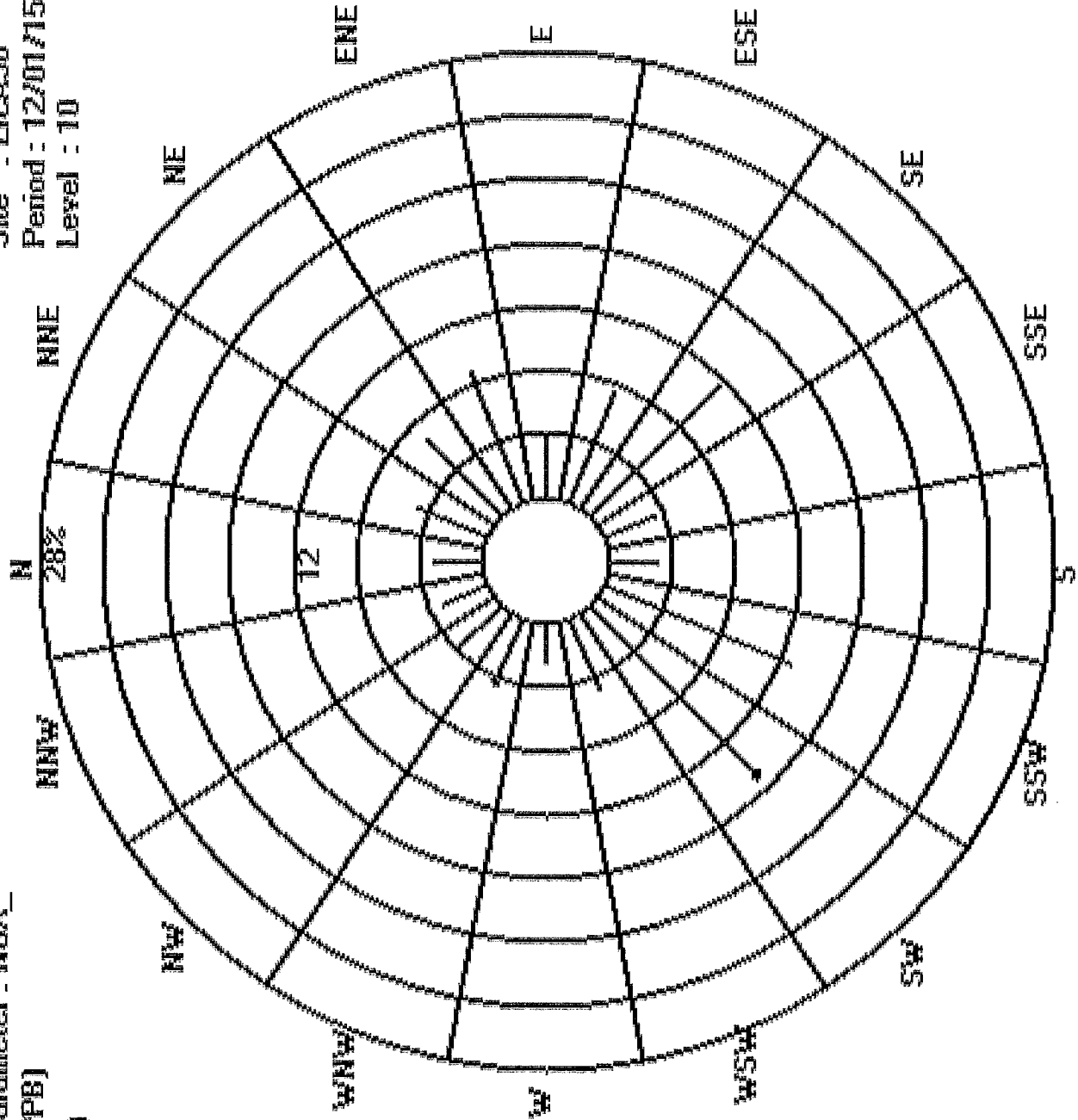
Calm : .00 %

Total # Operational Hours : 704

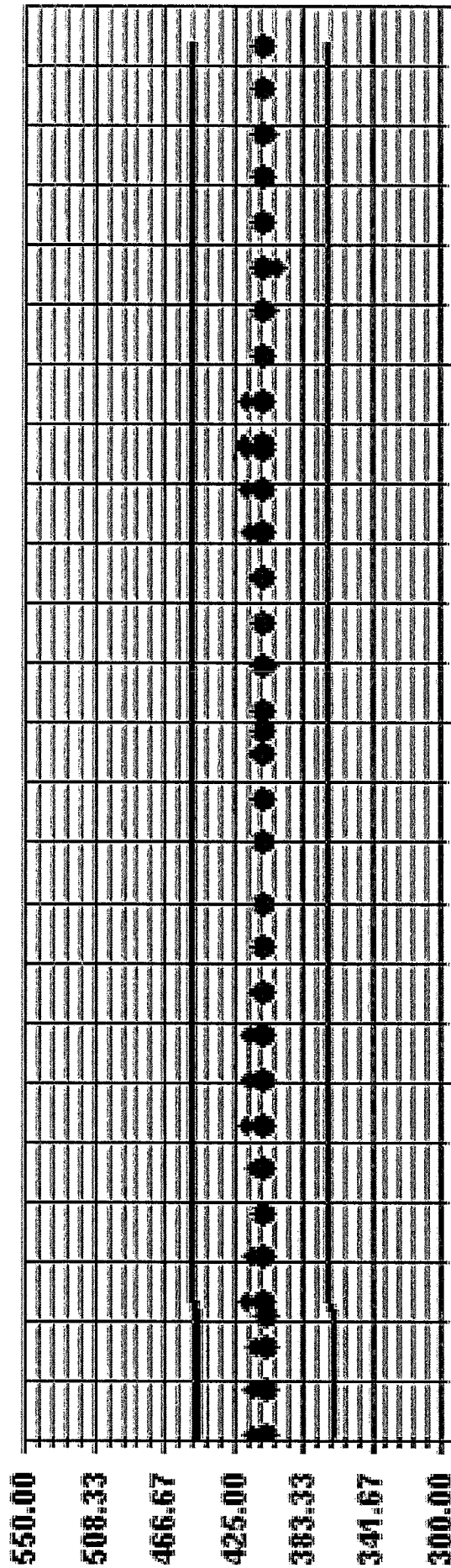
Logger : 30 Parameter : NOX_
Class Limits (PPB)

-  >= 210.0
-  < 210.0
-  < 110.0
-  < 50.0

Site : LIC43D
Period : 12/01/15-12/31/15
Level : 10



Calibration Graph for Site: LICA30 Parameter: NOX_ Sequence: NO2 Phase: SPAN



12/1/15 12/8/15 12/16/15 12/24/15 1/1/16
 → Cal Value ● Exp Value — Exp Value +10% — Exp Value -10%

NITRIC OXIDES



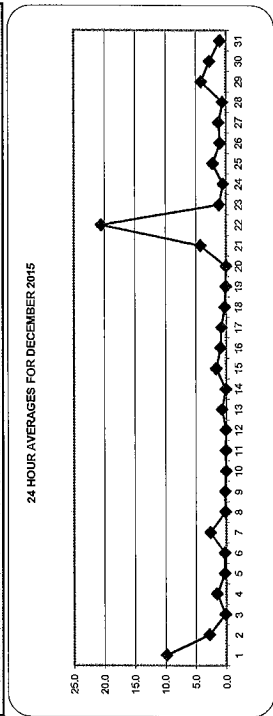
NITRIC OXIDE (NO) hourly averages in ppb

MST

DAY	HOURLY MAX	HOURLY AVG	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX	DAILY AVG	24-HOUR AVG	RODS	
1	3	2.5	3.1	5	1.2	2.1	5.9	10.8	10	17.8	15	12.8	10.7	10	8.8	9.9	13.5	21.8	22	16.2	11.2	6.6	6.1	4.4	22	9.8	24	24		
2	0	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	15.7	2.8	24	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	1.1	0.1	24	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	6.1	1.5	24	24	
5	0	0.2	0	0	0	0	0.1	0.9	0.9	1	0.2	0	0	0	0.3	0.4	0.2	0.9	0	0	0	0	0	0	0	1	0.2	24	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	1.8	0.2	24	24	
7	3.5	2.5	1.8	1.3	0.8	0.5	0.4	0.5	18.9	3.3	3.9	9.8	4.3	2.5	1.2	1.1	0.2	0.7	0.1	0	0	0	0	0	0	18.9	2.6	24	24	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1	0.2	0	0	0	0	0	0	0	0	1	0.1	24	24	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0.4	0.7	0.1	0	0	0	0	0	0	0	1.1	0.2	24	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	24	24
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	0.1	0	0	0	0	0	0	0	0.9	0.0	24	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	0.5	0.0	24	24	
13	0	0.9	1.7	1.1	1.3	1.2	1.1	1.5	0	1.1	1.8	0	1.5	1.1	1	0	0	0	0	0	0	0	0	0	0	1.8	0.7	24	24	
14	0	0	0	0	0	0	0	0	0	0	0.5	0.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0.1	24	24	
15	0	0	0	0	0	0	0	0.4	0.2	0.5	3.6	4.7	5.1	5.2	4.7	3.8	3.1	2.3	2.2	0.3	0.3	0	0	0	0	5.2	1.5	24	24	
16	0	0	1.1	3.1	0	0	0	0	0	0	0	0	1.1	2.9	0.8	1.1	1.5	0	0	0	0	0	0	0	0	6.4	0.9	24	24	
17	2.4	0.8	0	0	0	0	0	1.3	1.1	0.8	2.5	4.5	0.3	0	0	0	0	0	0	0	0	0	0	0	0	4.5	0.7	24	24	
18	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.4	0.3	0	0	0	0	0	0	0	0	0	0	1.8	0.2	24	24	
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0.2	0	0	0	0	0	0	0	0	0.5	0.0	24	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	0.1	0.0	24	24	
21	10.4	13.8	13.5	35.9	29.5	26.1	19	31	27.9	31.4	5	24	2.6	3.6	2.6	3.8	1.6	1.8	2	3.2	3.9	20.2	18.6	12.6	20.2	4.2	24	24	24	
22	8.7	5.7	2.8	1.1	0.2	4.8	0.8	0	0	0	0	0.1	0.7	0.8	0.3	0	0	0	0	0	0	0	0	0	0	8.7	1.1	24	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	6.1	0.5	24	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	1.9	2.2	24	24	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.9	1.0	24	24	
26	0	0	0.6	2	1.3	1.4	2.9	0.1	0.3	1.8	1.5	1.6	2.3	2	2.5	0.7	0.9	0.1	0	0	0	0	0	0	0	5.9	1.2	24	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	0.5	24	24	24
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.6	0.5	24	24	24
29	15.8	31.2	13.2	0.9	0	0.7	5	0	0	2.3	6.9	6.3	4.8	5	4.9	1.8	0	0	0	0	0	0	0	0	0	31.2	4.1	24	24	24
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.3	0	0	0	0	0	0	0	15.4	2.7	24	24	24
31	15.8	31.2	13.5	35.9	29.5	26.1	19	31	27.9	31.4	5	24	2.6	3.6	2.6	3.8	1.6	1.8	2	3.2	3.9	20.2	18.6	12.6	20.2	4.2	24	24	24	
HOURLY MAX	15.8	31.2	13.5	35.9	29.5	26.1	19	31	27.9	31.4	5	24	31.5	36	10	15.5	12.8	18.2	14.3	14	13.8	13.2	14.7	15.7	13	36	20.5	24	24	
HOURLY AVG	1.5	1.9	1.3	1.8	1.5	1.3	1.7	2.7	3.4	3.2	3.0	3.6	3.3	1.8	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.3	

STATUS FLAG CODES

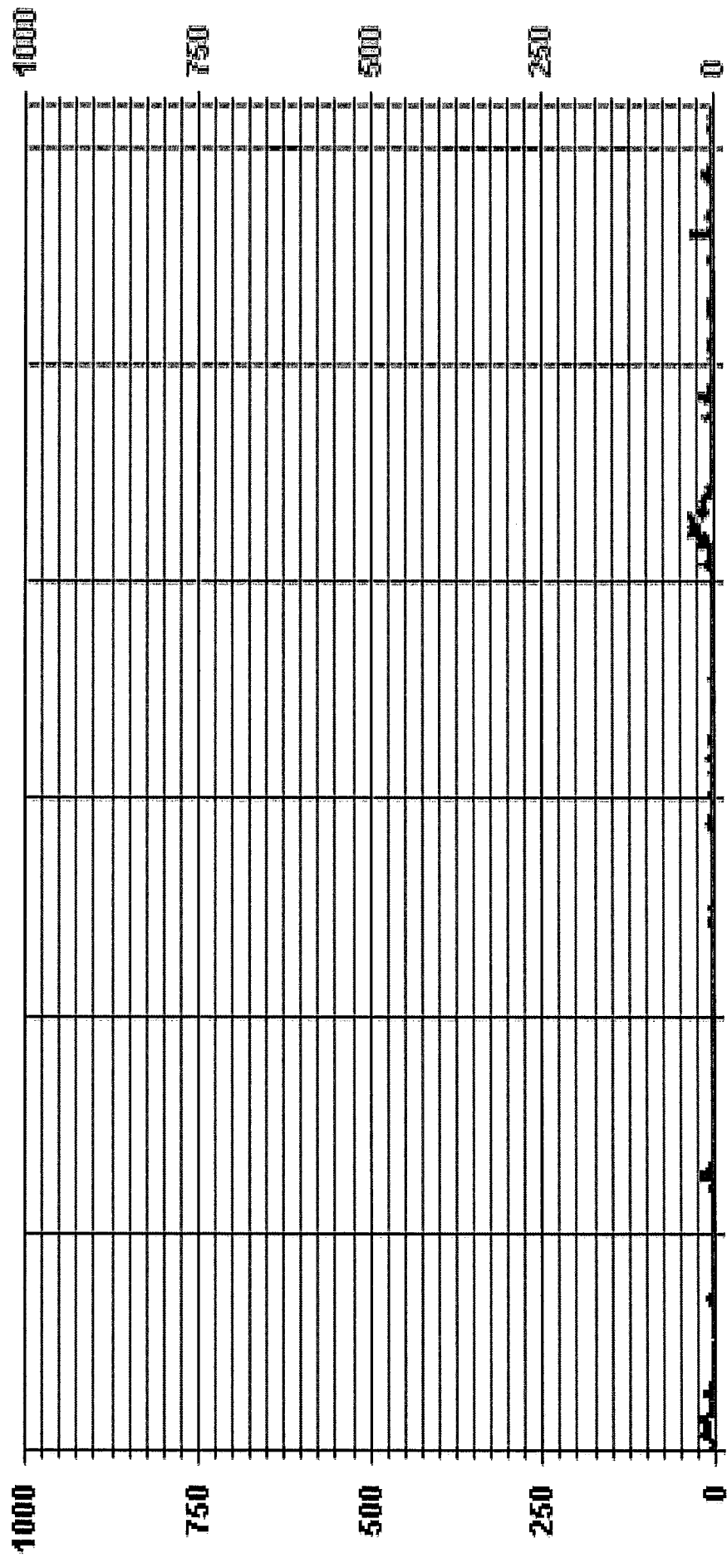
C	QUALITY ASSURANCE
O	RECOVERY
R	MACHINE MALFUNCTION
X	OPERATOR ERROR
S	POWER FAILURE
P	OUT FOR REPAIR
G	COLLECTION ERROR
M	MAINTENANCE
D	DAILY ZERO/SPAN CHECK



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	306
MAXIMUM 1-HR AVERAGE:	36.0 PPB
MAXIMUM 24-HR AVERAGE:	20.5 PPB
ISZ CALIBRATION TIME:	35 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	4.89
ON DAY(S)	12
ON DAY(S) VAR-VARIOUS	22
OPERATIONAL TIME:	744 HRS
AMID OPERATION UPTIME:	100.0 %
MONTHLY AVERAGE:	2.0 PPB

01 Hour Averages



12:01:15 00:00:12:06:15 00:00:12:11:15 00:00:12:16:15 00:00:12:21:15 00:00:12:26:15 00:00:12:31:15 00:00

— LICA30 NO_ PPB



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Site - DECEMBER 2015
JOB # 2833-2015-12-30-C

NITRIC OXIDE MAX instantaneous maximum in ppb

MST

HOURS START	HOURS END	DAILY MAX																								24-HOUR AVG.	RDGS.		
		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				
1	5:2	3.6	1.1	\$	7.6	4.1	4.1	39.1	26.6	25	17.1	16.5	12.2	11.8	11.9	33.9	48.9	27.5	24	19.3	40.9	7.6	9.2	6.2	49.1	19.4	24		
2	3.6	1.1	\$	7.6	7.5	4.1	3.1	17.8	56.1	10.9	17.8	23.3	3.5	3	7.3	3.7	3.5	0.6	0.4	1.3	1.3	0.3	0.5	0.3	56.1	7.8	24		
3	1	\$	2.4	0.4	0.2	0.1	0.8	0.1	0.9	1.5	1.9	1.1	C	C	C	C	C	C	0.3	0.2	0	0.1	0.1	0	2.4	0.7	24		
4	\$	0.6	0.3	0.1	0	0	0	13.2	10.1	7.8	5.3	13.3	14.4	10.3	46.6	11.4	0.6	0.1	0.3	0.2	0.3	0.3	\$	46.6	6.1	24			
5	1.2	0.6	0.6	0.5	0.4	0.7	17.7	1.8	1.8	1	0.5	0.4	2.4	3.9	1.8	4.8	0.8	0.4	0.4	0.4	0.4	0.3	\$	17.7	2.6	24			
6	0.3	0.1	0.2	0.1	0.1	0.5	7.2	2	3.4	2	2.3	2.8	0.7	1.1	0.1	0.1	0.1	0	0	0.1	0	\$	1	4.1	7.2	24			
7	4.2	3.1	2.5	2.1	1.5	1.2	1.5	212.5	4.9	6.5	24.6	8.4	4.4	6	2.9	3.9	0.9	1.6	0.8	\$	0.8	0.2	0.3	212.5	12.9	24			
8	0.2	0.1	0	0	0	0.2	1.8	2.2	1.2	0.7	0.6	2.3	2.1	0.8	0.3	0.1	0.1	0.1	\$	0.6	0.3	0	0	2.7	0.7	24			
9	0	0.1	0.1	0.2	0.3	0.3	0.4	0.3	5.6	0.7	2.2	1.5	1	1.6	1	0.2	0.3	\$	0.5	0.3	0.3	0.2	0.4	5.6	0.8	24			
10	0.4	0.4	0.6	0.4	0.4	2.2	1.1	2.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.2	0.4	\$	0.5	0.4	0.5	0.6	0.3	2.2	0.6	24		
11	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.3	0.3	0.5	0.5	0.3	0.4	0.9	4.6	1.2	\$	0.7	0.5	0.2	0.5	0.4	0.2	0.1	4.6	0.6	24	
12	0.4	0.4	0.3	0.5	0.2	0.4	0.4	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	\$	0.4	0.3	0.4	0.3	1.8	0.6	0.2	0.8	1.8	24	
13	0.6	3.5	4.7	4.2	3.1	2.5	3.1	5.1	0.1	5.8	3.1	0.6	3.7	2.6	2.6	0.8	0.3	0.1	0	0	0.1	0.3	\$	0.3	5.8	2.1	24		
14	0.3	0.2	0.2	0.2	0.2	0.3	0.1	0	0.3	0.3	0.9	2.6	0.9	1.2	0.5	0.3	0.2	0.3	0.5	0.5	0.5	0.3	\$	0.6	0.5	0.5	2.6	0.5	24
15	0.2	0.2	0.4	0.4	0.6	0.6	2.8	2	3.2	83.9	30	9.7	6.6	5.8	5.9	5.6	7.1	9.7	1	1.7	1.6	\$	2.7	0.3	0.3	83.9	7.9	24	
16	0.4	0.3	5.9	7.7	0.6	0.3	0.2	3	4.3	2	5.4	13.3	2.3	1.2	0.9	1.1	0.4	0.5	\$	1.7	0.4	1.1	15.3	15.3	3.3	2.4	24		
17	6.1	6.6	0.3	0.6	2	0.4	0.4	3	0.8	0.3	0.4	0.7	1.2	0.8	0.7	0.6	0.3	\$	2.3	4.6	3.4	1.5	0.1	4.6	0.9	2.4	24		
18	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.8	0.2	0.2	0.2	0.2	0.4	0.7	1.7	1	0.7	0.7	\$	0.5	0.9	0.2	0.2	0.2	0.1	1.7	0.4	24	
19	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0	0.6	0.5	0.7	0.5	0.7	0.4	0.4	0.4	\$	0.4	0.4	0.6	0.5	0.5	0.7	0.4	0.4	2.4	24	
20	0.2	0.1	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0	0.6	0.5	0.7	0.5	0.7	0.4	0.4	\$	0.4	0.4	0.6	0.5	0.5	0.7	0.4	0.4	2.4	24	
21	0.4	0.4	0.4	0.4	0.6	0.6	0.5	23.6	1.2	27.1	8.1	16.2	6.6	3.3	5.2	\$	5.8	2.6	3.7	3.3	5	5.5	33.3	28.5	16.3	33.3	8.6	24	
22	12	18.3	18.2	94.8	37.3	29.1	25.6	42.2	35.2	38.6	\$	43	39.3	\$	38.1	26.5	69.1	21.6	20.2	14.6	14.2	19.3	17.5	14.5	94.8	31.2	24		
23	10.8	8.9	4.2	2.5	1.8	6.8	3.6	0.2	0	0.1	0.7	0.7	\$	1.5	2.5	2.7	0.3	0.2	0.1	0.1	0.1	0.1	0.1	10.8	2.1	24			
24	0.1	0.2	0.1	0	0	0.1	0	0.1	0.2	0.2	0.3	\$	2.6	3.6	1.9	6	0.5	0	0.1	36.3	3.5	0.3	0	36.3	2.4	24			
25	0.1	0	0.1	0.1	0.1	0.6	20.1	23.4	11.1	2.4	\$	7.2	3.3	2.8	2.5	1.4	0.5	0.5	0.3	0.3	0.3	0.5	0.6	0.4	23.4	3.4	24		
26	0.3	0.3	0.3	4.1	6.1	4.4	5.2	6.3	1.2	1	\$	2.7	2	3.7	3.7	3.5	3.1	2.2	4.1	0.9	0.4	0.4	0.3	0.2	6.3	2.5	24		
27	0.4	0.4	1.1	8.1	7.3	3.9	6.4	0.8	\$	6.2	\$	8	8.3	4.5	4.1	4.8	3	0.4	0.9	0.3	0.3	0.3	0.2	1.7	8.3	3.3	24		
28	1.8	0.2	0.2	0.2	0.3	0.3	0.8	\$	0.5	6.9	5.8	2.4	6.6	3.6	1.9	0.7	0.5	1.2	1.3	0.2	0	0.2	0.1	11.8	11.8	2.1	24		
29	48.3	53.3	30.1	4.4	0.4	2.5	\$	0.6	0.7	7.1	7.9	7.2	6.3	7.6	3.9	0.7	0.8	0.5	0.3	0.1	0.3	0.3	0.2	53.3	8.3	24			
30	0.1	0.8	0.1	0.3	0.7	\$	6.4	38	18.5	13.8	28.5	11.3	10.9	10.4	11.2	1.7	3.2	0.8	0.1	0.1	0.2	0.2	0.4	0.5	38	6.9	24		
31	0.3	0.5	0.1	0.2	0.2	\$	0.6	0.8	1.1	4.3	4.7	6.7	12.9	0.6	2	2.3	2.9	9.6	8.5	2.9	1.4	2.8	2	0.9	12.9	3.0	24		
HOURLY MAX		48.3	53.3	30.1	94.8	37.3	29.1	49.1	42.2	212.5	38.6	28.5	43	39.3	14.4	38.1	46.6	69.1	27.5	24	36.3	40.9	33.3	28.5	16.3				
HOURLY AVG		3.3	3.5	2.8	4.8	2.4	2.3	5.8	7.2	17.4	6.5	5.5	6.6	5.6	3.5	4.8	5.9	6.3	2.8	2.4	3.2	2.7	2.7	2.3	2.7				

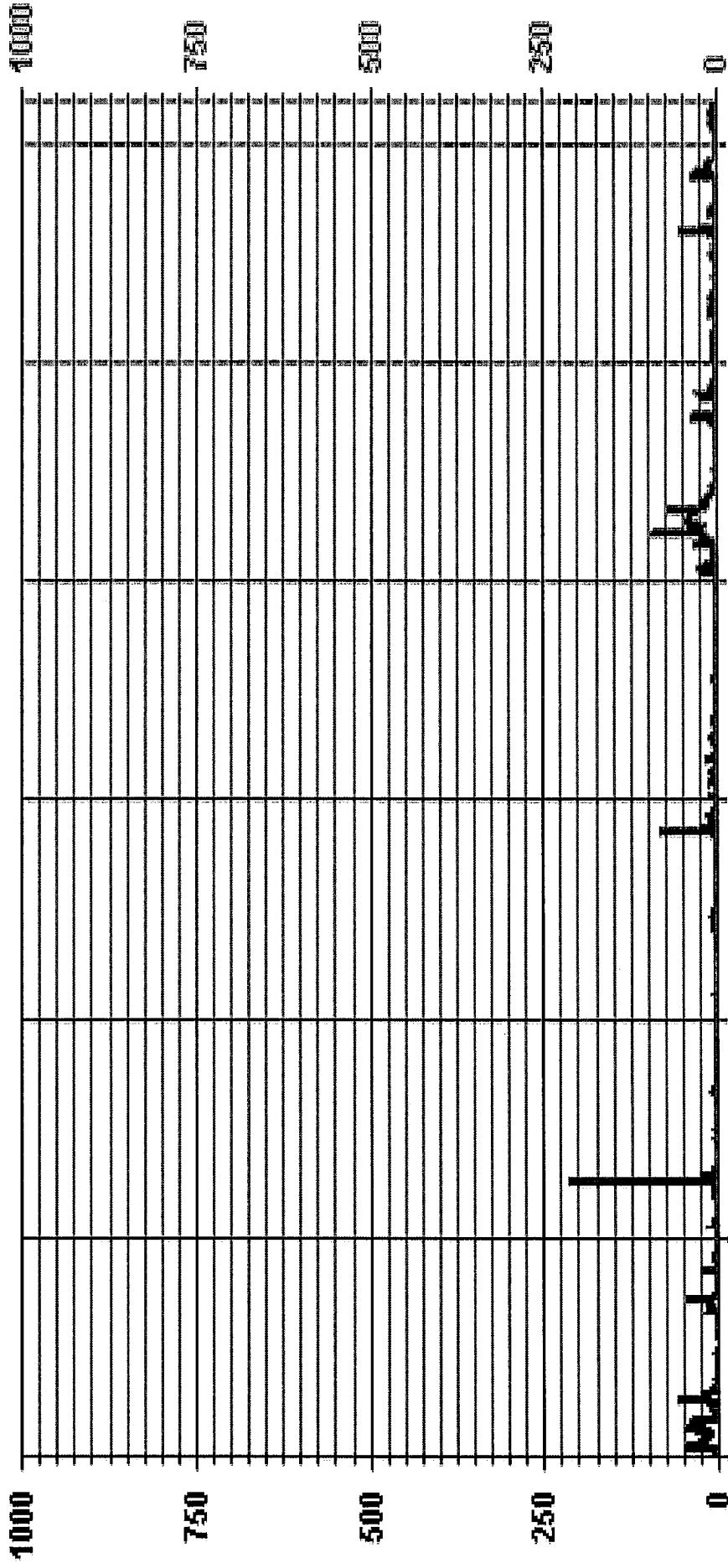
STATUS FLAG CODES

C	CALIBRATION	O	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPECIAL CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUTFORREPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	672
MAXIMUM INSTANTANEOUS VALUE:	212.5 PPB @ HOUR(S) 8 ON DAY(S) 7
IZS CALIBRATION TIME:	36 HRS
MONTHLY CALIBRATION TIME:	6 HRS
STANDARD DEVIATION:	12.51
OPERATIONAL TIME:	744 HRS
VAR-VARIOUS	VAR-VARIOUS

01 Hour Averages



12:01:15 00:00:12:06:15 00:00:12:11:15 00:00:12:16:15 00:00:12:21:15 00:00:12:26:15 00:00:12:31:15 00:00

— LICA30 NOMAX PPB

LICA30
 NO_ / WDR Joint Frequency Distribution (Percent)
 December 2015

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 Parameter : NO
 Units : PPS

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< 50.0	3.12	4.82	6.81	8.80	4.11	7.52	11.64	3.55	3.12	12.92	15.05	4.82	2.41	4.26	3.83	3.12	100.00	
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
Totals	3.12	4.82	6.81	8.80	4.11	7.52	11.64	3.55	3.12	12.92	15.05	4.82	2.41	4.26	3.83	3.12		

Calm : .00 %

Total # Operational Hours : 704

Distribution By Samples

Limit	Direction																NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< 50.0	22	34	48	62	29	53	82	25	22	91	106	34	17	30	27	22	704	
< 110.0																		
< 210.0																		
>= 210.0																		
Totals	22	34	48	62	29	53	82	25	22	91	106	34	17	30	27	22		

Calm : .00 %

Total # Operational Hours : 704

Logger : 30 Parameter : ND_

Site : LICA30

Period : 12/01/15-12/31/15

Level : 10

N 28%

NNE

NE

ENE

E

ESE

SE

SSE

S

SSW

SW

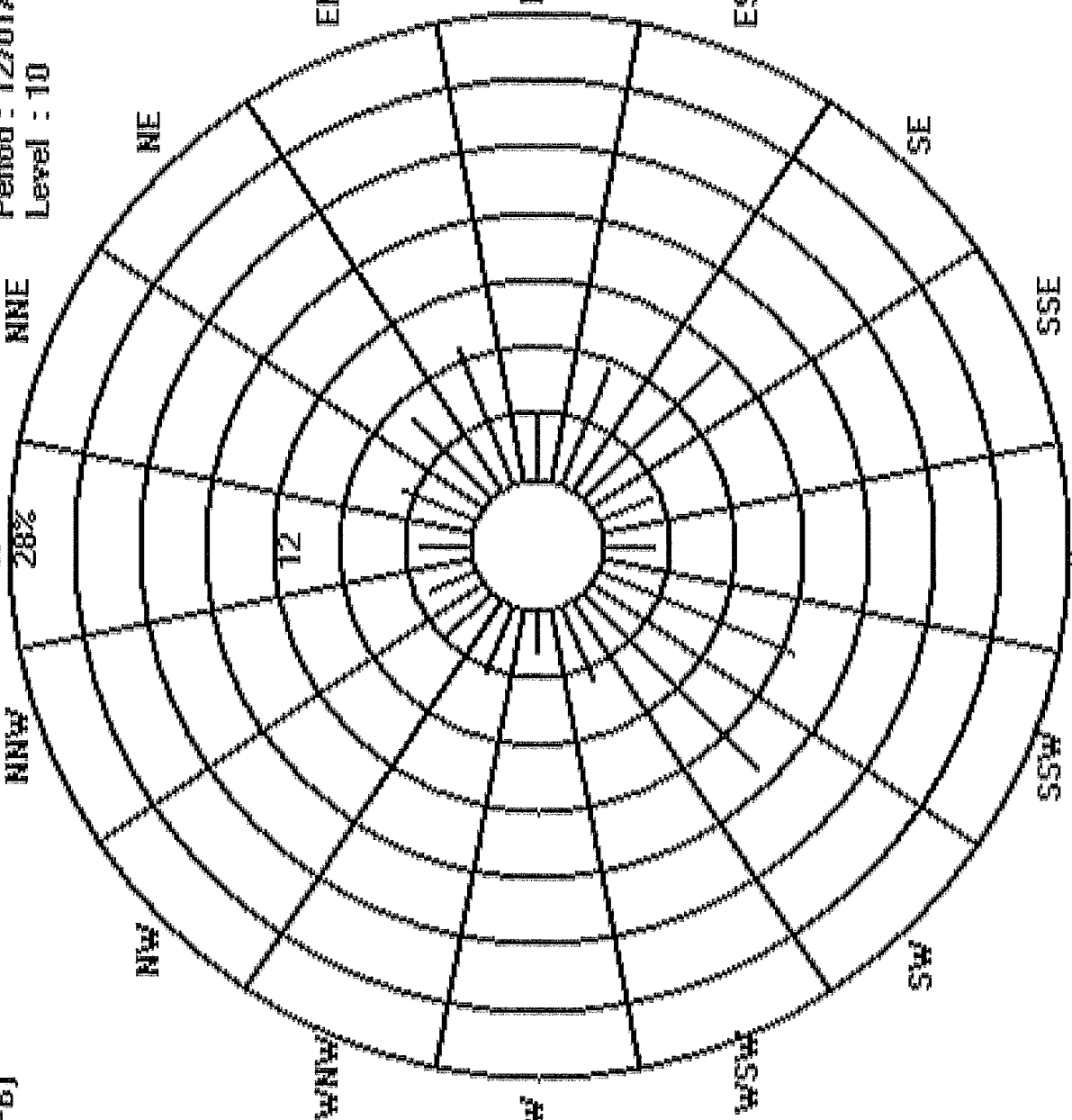
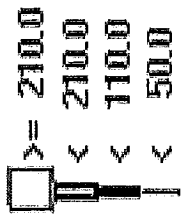
WSW

W

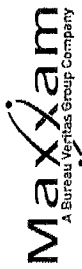
WNW

NW

NNW



NITROGEN DIOXIDE



NITROGEN DIOXIDE (NO2) hourly averages in ppb

DAY	NITROGEN DIOXIDE (NO2) hourly averages in ppb																								DAILY MAX.	24-HOUR AVG.	RDGS.		
	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300				0000	
1	18.4	16.7	23.4	\$	19.6	18.5	17.2	15.7	15.5	12.4	18.0	18.1	17.3	17.6	20.2	25.9	29.9	30.7	31.0	31.1	29.3	26.4	25.1	25.2	31.1	21.9	24		
2	23.0	17.7	\$	13.9	12.8	13.1	11.9	13.8	13.7	8.2	7.4	5.2	7.3	5.9	8.5	13.9	19.5	12.4	5.5	4.7	4.4	4.1	6.6	1.5	23.0	10.2	24		
3	3.9	\$	4.6	3.7	2.8	3.6	3.7	4.0	2.9	2.3	2.2	C	C	C	C	C	C	1.9	2.3	3.4	2.2	1.5	1.1	4.6	2.9	24			
4	\$	2.1	1.8	1.4	1.1	1.0	1.1	1.0	1.1	4.2	7.3	8.1	9.4	12.2	10.8	10.8	13.0	3.5	4.7	7.1	6.8	7.5	6.7	\$	13.0	5.9	24		
5	6.5	7.4	7.6	6.9	6.9	9.0	7.9	12.8	14.8	7.4	1.6	0.6	0.3	1.1	1.4	5.1	7.8	4.0	3.2	2.3	2.6	2.3	\$	4.7	14.8	5.4	24		
6	4.4	3.5	2.6	2.0	1.6	1.4	2.8	7.6	7.7	3.8	2.8	1.5	2.5	2.1	1.8	1.3	1.4	1.4	2.1	0.9	0.7	\$	1.9	7.7	2.8	24			
7	13.3	11.5	11.8	10.2	8.9	7.4	6.1	6.2	7.5	5.4	4.7	6.6	5.9	6.5	7.9	9.7	11.2	12.1	14.6	13.1	\$	10.0	3.7	12.8	14.6	9.0	24		
8	11.1	3.8	1.0	0.3	1.1	4.6	5.0	14.6	9.3	1.8	4.9	2.2	4.2	5.9	5.6	5.7	4.1	3.0	1.9	\$	2.0	1.3	0.9	0.7	14.6	4.1	24		
9	0.6	0.6	0.4	0.3	0.6	2.0	1.9	5.2	3.5	3.3	7.4	6.1	6.0	10.4	9.2	2.5	3.0	\$	2.2	2.7	1.5	0.6	1.1	10.4	3.1	24			
10	1.0	2.9	1.4	1.6	1.1	1.4	1.3	3.1	3.5	2.1	1.2	0.7	0.7	1.1	1.6	1.6	1.4	\$	1.7	0.8	1.0	1.0	0.7	0.3	3.5	1.4	24		
11	0.2	0.3	0.5	0.6	0.5	0.4	0.2	0.4	0.5	0.5	0.1	0.0	0.2	0.9	3.9	1.4	\$	1.1	0.7	0.4	0.4	0.3	0.2	0.1	3.9	0.6	24		
12	0.1	0.1	0.2	0.3	0.2	0.3	0.2	0.4	0.6	0.7	0.8	0.8	0.8	0.8	1.1	\$	1.3	0.8	0.6	0.8	4.7	2.1	0.9	1.8	4.7	0.9	24		
13	1.6	4.5	5.4	3.9	4.4	4.9	4.6	6.2	0.5	4.9	6.7	0.6	5.3	4.6	6.1	2.3	0.2	0.1	0.1	0.0	0.0	\$	0.6	6.7	2.9	2.9	24		
14	0.2	0.1	0.0	0.2	0.5	0.0	0.1	0.2	0.5	1.9	1.0	1.0	1.8	1.5	1.0	0.9	0.9	0.7	1.1	1.8	1.9	\$	8.2	7.0	8.2	1.4	24		
15	3.6	4.0	8.3	10.2	11.9	14.0	10.9	11.1	12.3	10.9	8.2	7.4	10.6	11.1	12.4	15.4	15.4	15.0	16.4	13.4	\$	5.1	2.7	6.9	16.4	10.0	24		
16	3.0	2.6	6.5	9.2	0.0	0.0	0.0	0.0	0.0	\$	1.8	0.0	2.9	5.8	1.7	4.3	7.9	2.9	1.1	\$	0.8	1.4	9.9	18.9	3.8	24			
17	12.8	2.9	0.0	0.3	0.5	0.0	0.0	4.2	5.0	3.3	6.5	7.7	0.7	0.0	0.3	0.2	0.3	0.3	\$	4.1	2.9	5.4	1.9	2.1	12.8	2.7	24		
18	1.4	0.9	0.2	0.3	0.3	0.3	0.9	1.4	1.6	1.7	1.8	2.0	2.1	1.3	0.9	1.2	0.7	\$	5.1	7.1	6.8	2.9	0.0	0.0	7.1	1.8	24		
19	0.0	0.0	0.8	1.1	0.0	0.0	0.0	0.0	1.2	1.4	0.9	0.6	1.6	1.5	1.5	2.6	\$	5.7	7.1	4.1	3.3	2.4	2.5	2.8	7.1	1.8	24		
20	3.0	1.7	1.7	1.9	1.9	1.2	1.2	1.6	1.7	2.3	1.9	1.5	1.8	1.7	\$	10.3	13.5	14.1	14.3	14.4	14.5	15.4	15.7	13.2	15.7	7.1	24		
21	0.0	0.0	0.0	0.4	0.6	0.4	2.4	3.5	5.9	5.5	9.6	4.3	1.9	2.8	\$	13.5	14.3	17.4	14.1	13.7	13.5	12.7	12.1	12.3	13.2	17.4	12.6	24	
22	12.2	11.7	10.4	13.5	11.4	10.0	9.2	11.8	10.7	11.4	\$	12.9	15.3	\$	13.5	14.3	17.4	14.1	13.7	13.5	12.7	12.1	12.3	13.2	17.4	12.6	24		
23	15.0	14.6	13.3	11.5	9.2	11.9	11.5	9.9	0.2	0.9	0.4	0.0	\$	1.2	2.4	2.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	1.2	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$	2.1	4.3	2.1	3.0	1.8	0.9	0.9	10.7	8.6	4.5	3.3	2.2	10.7	1.9	24		
25	1.9	1.4	1.2	1.2	1.1	1.1	1.3	15.9	13.6	7.0	\$	6.3	4.2	4.5	6.1	6.9	7.7	9.4	6.0	5.4	6.7	9.7	11.0	9.5	15.9	6.6	24		
26	7.5	6.6	11.8	11.1	9.4	8.0	8.7	5.6	5.9	\$	3.7	2.6	2.4	4.4	6.2	11.5	11.6	11.4	8.3	6.0	4.5	3.9	4.3	2.3	11.8	6.9	24		
27	1.8	1.9	3.0	9.4	10.3	6.5	5.5	1.5	\$	5.3	2.6	6.1	3.7	1.3	2.2	5.9	2.1	0.2	3.8	1.1	1.0	1.6	2.0	2.4	10.3	3.5	24		
28	3.2	2.5	2.4	3.1	3.3	3.8	2.9	\$	6.6	4.7	2.5	0.6	1.2	1.2	0.7	0.8	9.8	10.0	10.3	11.8	12.8	13.2	12.4	11.7	13.2	8.4	24		
29	11.1	12.2	8.8	3.6	4.3	5.4	\$	5.2	4.2	4.4	7.4	6.1	5.2	6.3	8.3	9.4	9.8	10.0	10.3	11.8	12.8	13.2	12.4	11.7	13.2	8.4	24		
30	10.8	10.5	11.3	12.7	14.9	\$	18.4	19.8	18.5	15.1	14.8	6.7	6.6	4.0	5.0	4.1	2.0	0.2	0.0	3.4	2.3	1.8	5.1	8.1	19.8	8.5	24		
31	8.9	10.0	4.1	6.4	\$	10.6	11.1	12.6	12.3	12.2	12.4	10.9	3.7	0.0	4.1	11.9	12.5	20.1	16.5	20.1	12.5	10.4	6.7	26.8	3.0	26.8	10.4	24	
HOURLY MAX	23.0	17.7	23.4	13.9	19.6	18.5	18.4	19.8	18.5	15.1	18.0	18.1	17.3	17.6	20.2	25.9	29.9	30.7	31.0	31.1	29.3	26.4	25.1	25.2	31.1	21.9	24		
HOURLY AVG	6.0	5.1	4.8	4.7	4.7	4.6	5.3	6.3	6.4	5.1	4.7	4.4	4.4	4.0	5.0	6.7	7.2	6.4	6.4	6.2	5.2	5.1	5.9	5.5	6.0	5.1	5.5		

STATUS FLAG CODES

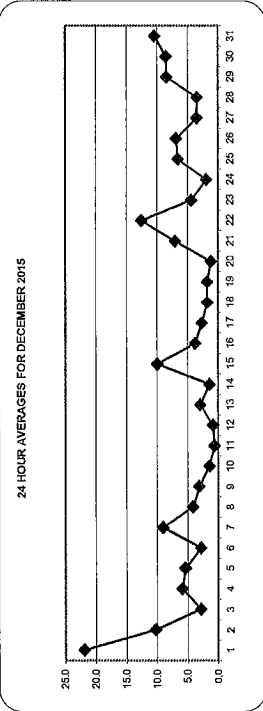
C	CALIBRATION
Q	QUALITY ASSURANCE
Y	RECOVERY
M	MAINTENANCE
S	DAILY ZERO/SPAN CHECK
P	POWER FAILURE
G	OUT FOR REPAIR
R	RECOVERY
X	MACHINE MALFUNCTION
O	OPERATOR ERROR
K	COLLECTION ERROR

OBJECTIVE LIMIT:

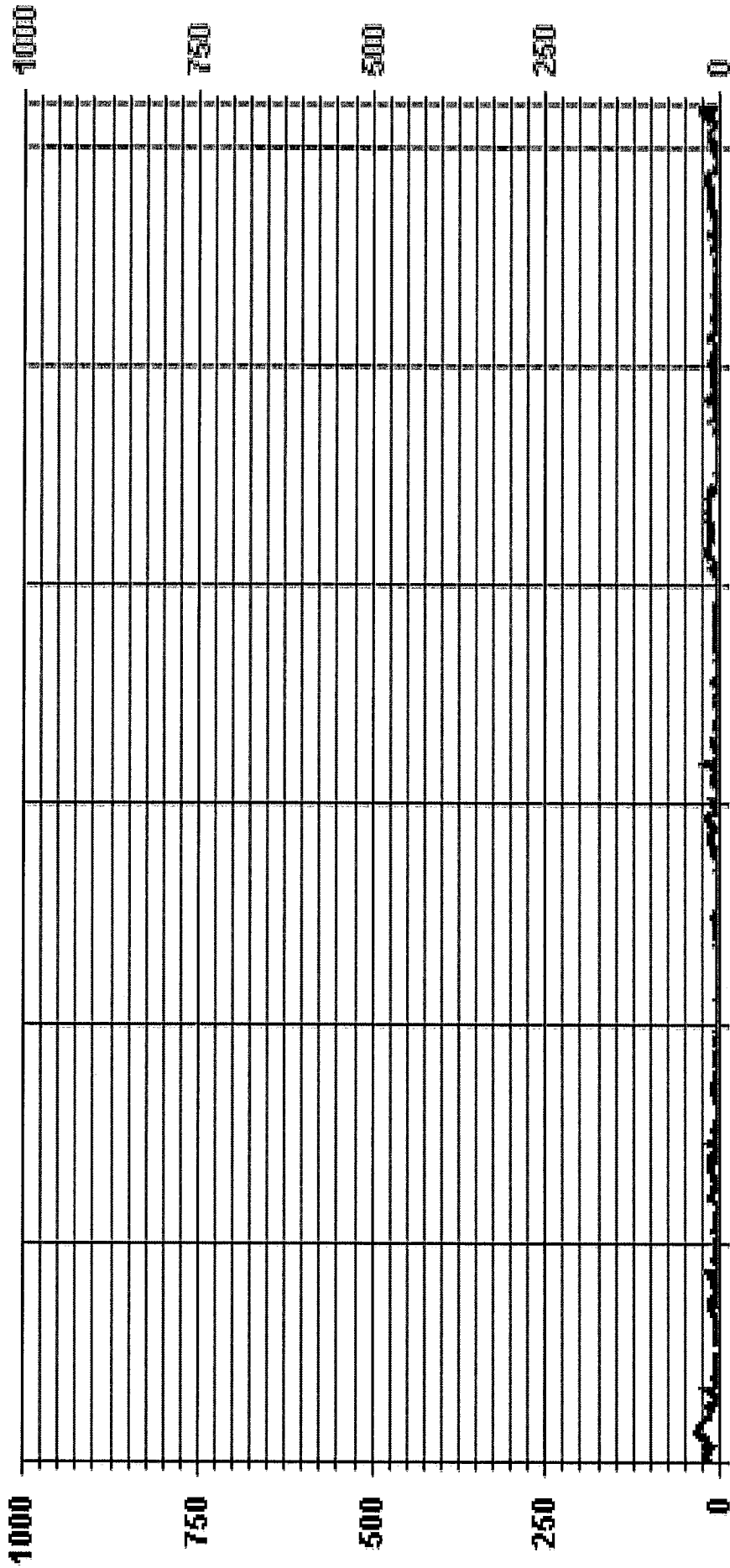
ALBERTA ENVIRONMENT: 1-HR: 159 PPB

MONTHLY SUMMARY

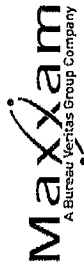
NUMBER OF 1-HR EXCEEDENCES:	0
NUMBER OF NON-ZERO READINGS:	650
MAXIMUM 1-HR AVERAGE:	31.1 PPB
MAXIMUM 24-HR AVERAGE:	21.9 PPB
1/2S CALIBRATION TIME:	35 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	5.67
OPERATIONAL TIME:	744 HRS
AMTD OPERATION UPTIME:	100.0 %
MONTHLY AVERAGE:	5.4 PPB
ON DAY(S):	19
ON DAY(S) VAR-VARIOUS:	1



01 Hour Averages



— LICA30 NO2_ PPB



NITROGEN DIOXIDE MAX instantaneous maximum in ppb

MST

DAY	HOURLY MAX	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX	24-HOUR AVG	RDGS.
1	22.6	19.6	26.6	S	23.6	22.9	27.7	17.4	16.9	13.3	20.2	19.6	17.1	17.9	21.9	35.8	38.7	30.5	30.7	31.1	29.7	27.7	26.1	26.2	38.7	24.5	24
2	25.4	20.6	S	15.3	13.4	14.7	14	15.1	26.2	9.9	9.4	12.8	7.5	6.6	9.6	18.6	20.7	16.9	7.3	5.8	6	5.9	10	16.6	26.2	12.8	24
3	8	S	6.2	4.3	3.1	4.4	6.1	4.9	5	3.6	2.7	2.6	C	C	C	C	C	C	C	5.1	3.9	3.2	2.8	8	4.4	24	
4	5	2.4	2	1.6	1.3	1.1	1.4	2	9.2	8.6	9	11	16.3	17.7	17.9	30.5	31.9	4.8	6.2	8.5	8.4	8.2	7.3	S	31.9	9.4	24
5	7	8	8.9	7	7	12.5	15.6	17.3	17.3	11.6	3.9	0.9	0.4	3.8	3.4	10	13.1	5.4	4	2.6	3	3.7	S	5.1	17.3	7.5	24
6	5.2	4.5	3.4	2.6	2.1	1.9	5.9	9.9	10.2	6	5.3	2.6	3.6	2.6	3.1	2.1	2.3	2.6	2.9	1.5	1.3	S	2.3	14	4.3	24	
7	14.2	12	12.8	11.3	10.8	7.7	6.9	7.2	23.1	6.7	5.3	10.2	6.3	7	10.1	11.5	12	13.7	14.9	14	S	12.9	5.6	14.5	23.1	10.9	24
8	13.7	6.9	1.7	1.2	1.9	8	9.2	22.4	24.6	5.1	9.3	4.6	8.2	7.6	6	8.2	4.5	3.9	2.9	S	2.5	1.7	1.4	0.9	24.6	6.8	24
9	0.9	0.9	1	0.7	0.6	1.7	2.3	2.6	7.6	5.9	5.1	8.8	8.2	7.1	13.9	12.1	4.1	4.2	S	2.5	3.9	2.5	1	3.4	13.9	4.4	24
10	1.6	6.1	3.8	4.3	1.4	5.6	2.6	6.8	4.8	3.6	1.8	1.3	1.3	1.4	1.9	1.9	1.8	S	3.3	1.2	1.3	1.3	1	0.6	6.8	2.6	24
11	0.6	0.7	0.8	1.1	1.1	0.8	0.6	0.9	1.1	0.8	0.5	0.2	0.8	3.8	12	5.2	S	1.3	0.7	0.6	0.3	0.3	0.3	12	1.5	24	
12	0.1	0.5	0.5	0.3	0.3	0.3	0.3	0.4	0.7	0.9	0.8	1.1	0.8	1.1	S	1.8	1.2	0.7	0.8	8.1	4.5	1.1	3.7	8.1	1.3	24	
13	2.5	8.2	9	8.2	7.3	6.7	6.9	11.9	1.1	13.1	9.5	1.9	9.8	7.8	8.2	4.4	0.3	0.3	0.3	0.2	0.1	0.2	S	1.2	13.1	5.2	24
14	0.6	0.5	0.2	0.9	1	0.5	1.1	0.7	1.9	4.4	2.9	1.2	2.3	1.8	1.2	1.3	1.1	1.6	2.1	2.4	S	9.5	10.1	10.1	2.2	24	
15	4.9	6.2	8.8	11.6	12.8	15	11.2	11.5	29.1	18.8	11.4	7.8	7.6	12.9	12.4	15.6	17	15.1	16.7	16.4	S	15.5	7	9.2	29.1	12.8	24
16	4.2	2.7	14.4	15.1	0.8	0	0	S	S	S	13.1	0.5	8.6	11.8	10.6	10.6	16.9	9	3.8	S	2.3	5.7	17.1	25.7	8.6	24	
17	14.8	13.8	0.1	1.5	1.6	0.1	0.1	8.4	12	5	9.8	17.4	3.1	0.5	1.6	0.6	0.7	0.8	S	5.7	6.2	9.4	6.5	8.6	17.4	5.6	24
18	3.1	1.5	0.5	0.6	0.5	0.6	1.9	1.9	2	2.8	2.3	7.4	2	1.2	2.8	1.4	S	7.7	10.5	10.1	5.7	0.9	0.1	10.5	3.0	24	
19	0	0	4.5	4.3	0.2	0.2	0.1	0.7	4	4	1.2	1.1	2.3	1.5	1.9	4.3	S	8.2	9.3	5.4	3.8	2.6	2.9	3.9	9.3	2.0	24
20	3.6	2	2	2.3	2.3	1.7	1.6	1.9	2.3	2.7	2.1	1.6	1.3	1.6	2	S	1.1	0.4	0	0	0	0	0	0	3.6	1.4	24
21	0	0	0.1	1.1	1.4	0.9	18.2	6.7	19.3	8.1	11.5	5.6	2.4	6.2	S	12.1	14.7	14.7	15.1	15.5	15.8	16.8	17	13.4	19.3	9.4	24
22	13.5	12.3	11.2	32.2	12.6	10.8	9.7	15	12.4	13.6	S	15	16	S	24.4	15.9	36.4	15.2	14.6	13.9	13.3	12.3	12.3	14.2	36.4	15.8	24
23	15	14.8	13.6	12.4	10.3	12.2	12.7	11	0.9	1.5	0.8	0.1	S	2.2	7	6.7	1.6	0.4	0	0	0	0	0	0	15	5.4	24
24	0	0	0	0	0	0	0	0	0	0	S	3.5	6.5	3.5	4.5	3	1.5	2	19.9	15.4	5.2	4.5	2.7	19.9	3.1	24	
25	2.9	2.1	1.8	2	1.9	5.2	15.2	16.2	15.8	9.6	S	8.6	4.8	4.8	7.6	7.2	9.4	11.3	6.4	5.6	8.5	10.6	11.2	10.1	16.2	7.8	24
26	8.9	8.7	14.2	12.6	10.3	11.4	10.9	7.2	6.8	S	4.7	2.9	3.8	6.6	7.6	13.5	14.4	14.9	10.6	6.5	4.7	4.1	4.9	2.9	14.9	8.4	24
27	1.9	2.1	5.1	14.7	14.3	10.2	11.9	3.5	S	10.8	8	7.6	7.2	3.8	6.8	10.6	9.1	1.6	6	2.7	1.8	2.4	2.6	4.4	14.7	6.5	24
28	5.2	3	3	3.8	3.9	4.8	3.4	S	7.6	5.4	5.2	0.7	3.6	1.8	0.7	0.8	9	9.3	11	8.4	5.4	4.6	3.4	10.8	11	5.0	24
29	14.1	15.5	12.1	5.4	4.4	6.4	S	6.3	4.9	7.8	8	6.8	5.8	6.8	8.9	9.5	10.1	10.7	11.3	12.6	13.2	13.5	13.4	12.4	15.5	9.6	24
30	11.7	12.1	12.1	13.7	16.8	S	20.2	22.2	20.6	17.7	19	11.6	10.5	10.1	13.9	9	5.4	1.2	3.5	3.8	3.3	2.2	10.4	10.8	22.2	11.4	24
31	9.5	10.4	7.9	9.8	S	12.6	12.9	13.6	13.6	13.6	13.3	11.3	9	1.1	10.4	19.4	19.2	31.4	33.1	23.2	22	23.3	28.4	25.7	33.1	16.3	24
HOURLY MAX	25.4	20.6	26.6	32.2	23.6	22.9	27.7	22.4	29.1	18.8	20.2	19.6	17.1	17.9	24.4	35.8	38.7	31.4	33.1	31.1	29.7	27.7	26.1	26.2	38.7	24.5	24
HOURLY AVG	7.2	6.6	6.3	6.7	5.6	6.0	7.7	8.5	10.4	7.4	6.8	6.0	6.2	5.7	8.0	10.2	10.8	8.3	7.9	7.8	6.8	7.1	7.3	8.0	7.3	8.0	24

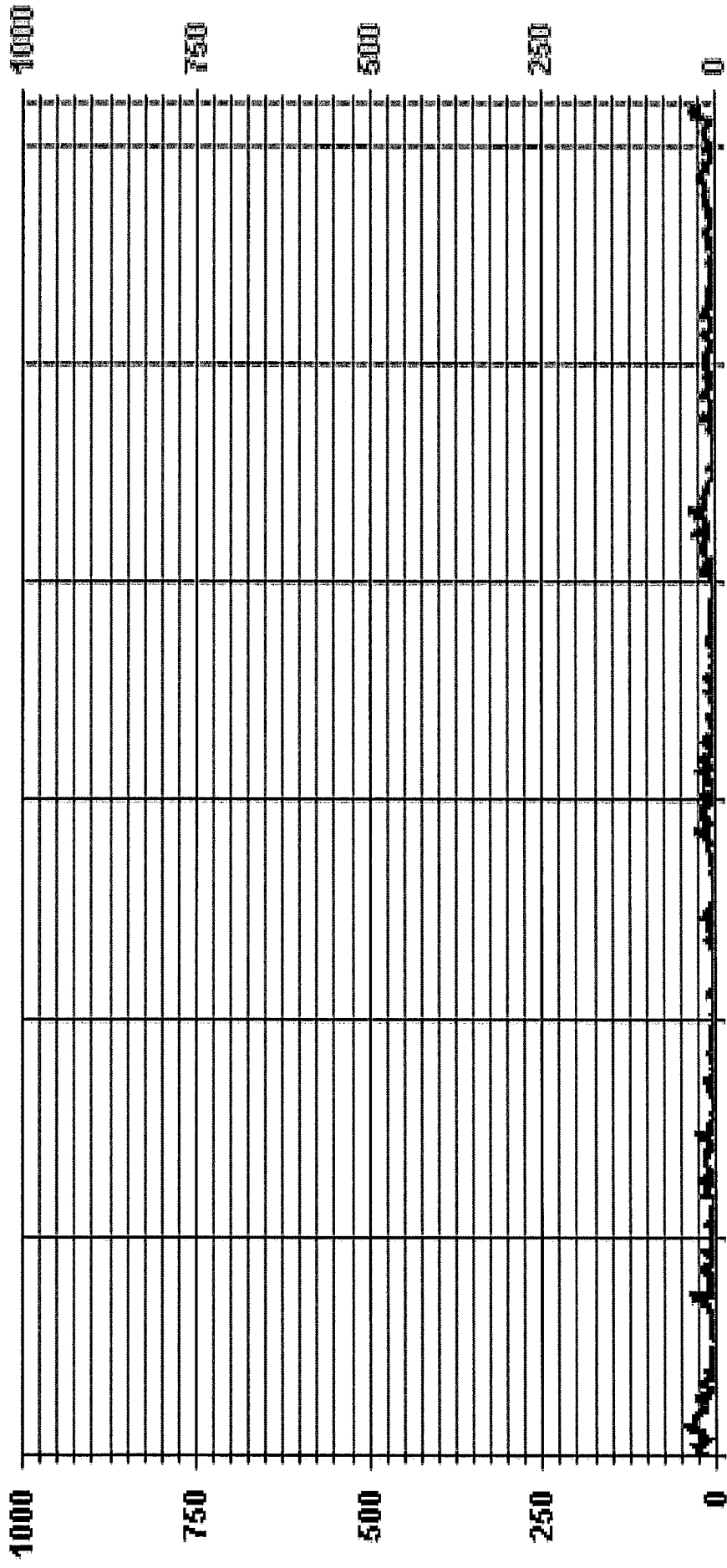
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE/ALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	-OUT FOR REPAIR	K	-COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	673
MAXIMUM INSTANTANEOUS VALUE:	38.7
PPB @ HOUR(S)	16
ON DAY(S)	1
OPERATIONAL TIME:	VAR-VARIOUS
HRS	744
OPERATIONAL TIME:	7.04
MONTHLY CALIBRATION TIME:	6
HRS	6
STANDARD DEVIATION:	7.04
IS CALIBRATION TIME:	36
HRS	36

01 Hour Averages



— LICA30 NO2MAX PPB

LICA30
 NO2_ / WDR Joint Frequency Distribution (Percent)
 December 2015

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 Parameter : NO2
 Units : PPF

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< 50.0	3.12	4.82	6.81	8.80	4.11	7.52	11.64	3.55	3.12	12.92	15.05	4.82	2.41	4.26	3.83	3.12	100.00	
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
Totals	3.12	4.82	6.81	8.80	4.11	7.52	11.64	3.55	3.12	12.92	15.05	4.82	2.41	4.26	3.83	3.12		

Calm : .00 %

Total # Operational Hours : 704

Distribution By Samples

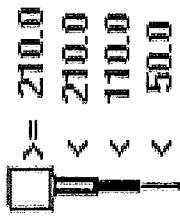
Limit	Direction																NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< 50.0	22	34	48	62	29	53	82	25	22	91	106	34	17	30	27	22	704	
< 110.0																		
< 210.0																		
>= 210.0																		
Totals	22	34	48	62	29	53	82	25	22	91	106	34	17	30	27	22		

Calm : .00 %

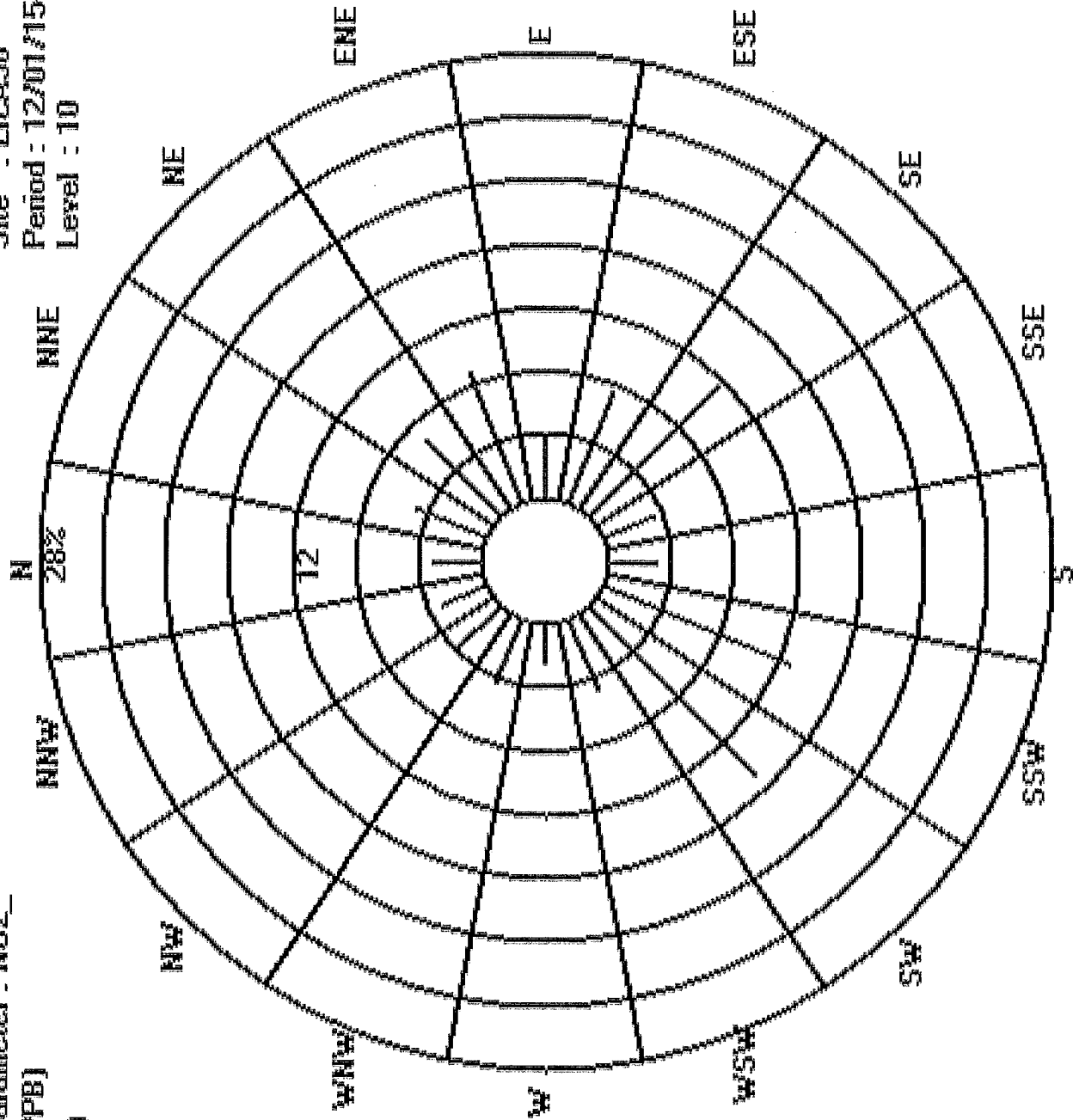
Total # Operational Hours : 704

Logger : 30 Parameter : ND2_

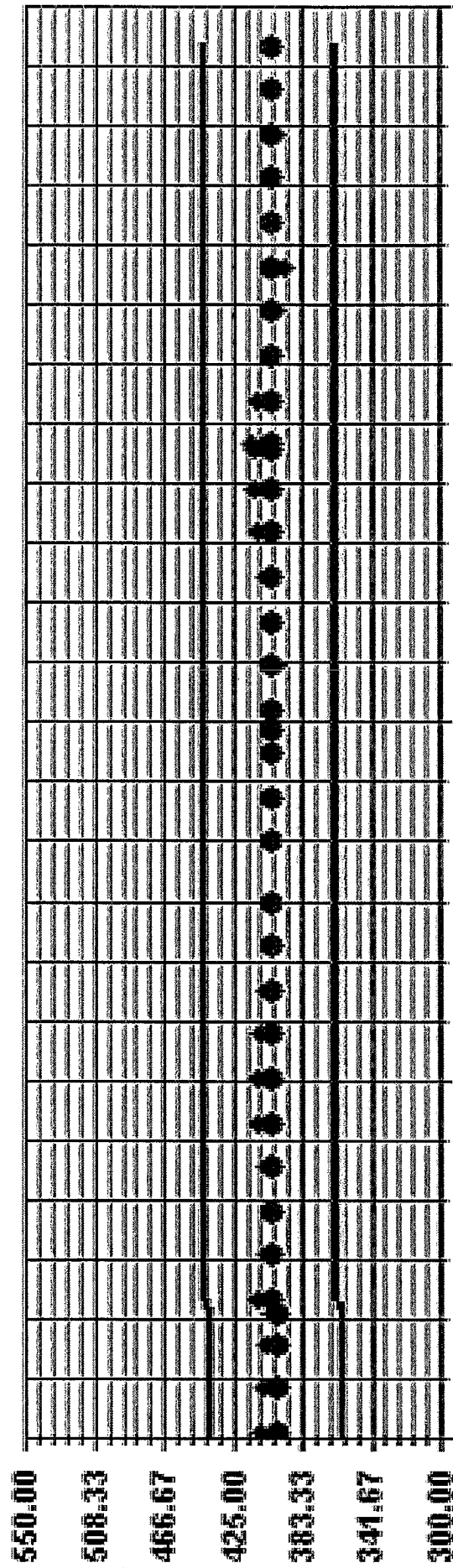
Class Limits (PPB)



Site : LIC&3D
Period : 12/01/15-12/31/15
Level : 10



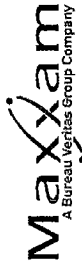
Calibration Graph for Site: LICA30 Parameter: NO2_ Sequence: NO2 Phase: SPAN



12/1/15 12/8/15 12/16/15 12/24/15 1/1/16

● Cal Value ● Exp Value — Exp Value -10%

WIND SPEED



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Site - DECEMBER 2015
JOB # 2833-2015-12-30-C

WIND SPEED (WS) hourly averages in km/hr

DAY	HOURS																								DAILY MAX	24-HOUR AVG.	ROGS.	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				
1	1.6	1.2	3.5	2.9	1.7	0.8	0.9	1.1	0.6	1.7	4.0	3.5	1.2	3.8	4.9	5.4	3.5	4.4	4.7	5.1	4.2	7.8	3.5	2.1	5.4	2.9	24	
2	1.7	1.2	1.6	1.7	1.7	1.9	0.5	1.2	1.1	0.3	1.5	5.7	4.3	4.3	7.3	6.6	5.7	6.8	8.3	6.0	6.2	7.0	7.5	8.2	8.3	4.0	24	
3	7.4	4.9	3.5	1.7	2.6	1.8	0.3	2.2	1.4	1.0	4.3	5.9	6.7	7.3	6.7	5.4	4.4	6.1	3.9	1.4	1.2	1.1	2.1	2.6	7.4	3.6	24	
4	2.3	2.5	1.9	3.2	2.4	1.5	2.6	0.2	1.7	1.2	3.2	4.1	7.7	8.6	6.2	5.8	3.1	3.6	4.6	5.3	7.9	7.5	8.6	4.3	24			
5	7.0	7.6	7.4	6.4	5.2	3.2	4.5	6.2	7.9	6.4	4.1	7.8	9.3	5.1	4.3	4.7	3.3	3.3	1.2	1.8	3.0	3.1	3.7	9.3	5.0	24		
6	3.6	3.1	4.6	3.6	3.5	2.3	3.9	2.9	2.6	2.4	3.0	2.4	2.9	3.6	3.0	2.5	0.6	0.0	0.8	1.0	0.5	0.7	1.8	2.8	4.6	2.4	24	
7	0.3	1.7	0.8	1.6	1.2	2.0	2.5	3.2	0.7	2.7	2.3	1.2	1.9	3.3	4.3	4.6	3.1	3.4	3.8	3.8	4.3	3.8	6.4	6.4	6.4	2.4	24	
8	5.0	3.5	4.2	4.6	5.1	4.2	4.7	4.0	2.9	1.9	2.1	1.8	3.1	4.1	3.1	4.1	3.4	3.2	5.3	5.6	5.4	4.9	6.0	6.0	3.9	24		
9	5.3	4.8	5.7	2.6	1.9	1.2	2.7	3.5	2.6	2.3	2.3	1.6	1.6	1.9	0.9	2.7	4.4	2.1	0.4	1.2	2.0	1.3	2.8	2.4	5.7	2.5	24	
10	2.6	1.8	0.9	0.7	0.6	0.5	0.5	1.6	2.5	2.7	4.0	4.3	3.3	4.4	4.1	4.8	4.5	6.0	4.5	6.0	6.5	5.3	6.9	7.1	7.1	3.6	24	
11	6.2	4.9	5.5	5.7	2.9	3.6	5.0	5.6	6.4	6.1	7.5	6.6	5.7	6.6	7.1	6.7	6.2	6.0	6.2	6.1	7.8	6.8	7.1	6.4	7.8	6.0	24	
12	7.2	5.3	6.1	6.0	5.7	5.7	6.2	6.0	4.9	5.8	6.1	6.1	6.7	5.7	3.7	4.2	5.9	6.5	5.8	6.7	6.8	7.2	7.1	6.7	7.2	6.0	24	
13	6.9	6.7	6.4	6.4	6.6	6.7	7.7	8.2	6.8	5.1	6.2	5.7	5.9	5.8	4.5	4.2	5.1	6.5	5.9	7.3	5.5	6.6	5.4	5.3	8.2	6.1	24	
14	5.8	5.4	5.0	5.2	4.4	4.0	5.2	4.4	4.0	2.4	0.4	2.7	0.6	3.3	3.6	2.1	1.6	2.7	1.9	2.0	1.1	2.4	3.7	3.3	4.3	5.8	3.1	24
15	6.3	6.9	5.8	6.5	6.2	6.9	6.8	6.8	7.0	6.6	6.3	6.2	5.7	7.9	5.0	4.3	1.8	3.2	3.9	4.4	4.5	8.9	7.3	7.2	8.9	5.4	24	
16	4.0	3.7	6.9	8.6	7.5	5.0	4.5	3.5	3.8	4.4	6.3	6.2	5.7	7.9	5.0	4.3	1.8	3.2	3.9	4.4	4.5	8.9	7.3	7.2	8.9	5.4	24	
17	6.8	7.7	6.3	5.6	5.5	5.1	3.9	4.5	4.8	6.5	6.4	5.8	6.0	6.1	5.8	6.6	6.1	3.0	4.4	4.2	5.1	4.7	4.4	3.4	7.7	5.4	24	
18	1.8	2.7	2.2	0.7	2.2	1.6	1.7	2.2	3.0	3.7	3.6	4.2	5.9	5.8	4.3	4.4	5.5	6.8	8.0	7.6	6.7	6.6	7.7	6.3	8.0	4.4	24	
19	4.4	4.1	2.6	3.1	3.7	3.7	2.4	2.3	1.8	2.2	3.5	3.2	2.5	3.5	3.9	3.4	1.8	2.4	1.2	4.5	3.0	4.4	4.4	4.3	4.5	3.2	24	
20	4.3	4.1	4.4	4.7	5.5	4.2	5.3	5.6	5.8	4.6	5.2	6.1	6.5	6.3	6.7	6.2	5.7	4.8	5.6	5.5	4.6	5.6	6.0	4.0	6.7	5.3	24	
21	3.4	2.4	0.3	1.8	1.3	0.4	0.6	1.0	0.9	2.4	2.0	2.0	2.6	2.3	4.1	3.1	0.6	2.7	0.9	1.6	1.1	1.5	1.2	1.8	4.1	1.8	24	
22	0.4	2.5	1.6	1.4	1.0	0.1	2.0	2.1	1.3	0.7	0.2	0.6	0.9	1.1	1.6	0.9	1.3	1.7	1.4	1.1	0.6	2.2	1.8	2.5	2.5	1.3	24	
23	3.3	2.7	1.9	3.6	1.1	0.1	2.8	4.0	3.6	4.7	7.3	6.5	5.8	5.4	3.1	2.1	3.6	5.9	7.6	8.2	7.0	5.6	4.7	5.5	8.2	4.4	24	
24	2.5	2.2	5.6	5.4	7.3	5.3	6.3	6.4	5.8	3.8	5.2	3.5	3.6	3.7	3.5	2.3	2.6	1.4	0.9	1.5	0.8	2.0	1.4	1.1	7.3	3.5	24	
25	1.2	0.4	1.5	1.0	1.9	1.3	3.9	3.5	5.4	4.3	2.6	3.4	3.0	4.9	3.8	4.7	4.0	5.5	5.6	5.8	6.3	6.4	5.7	6.4	3.8	24		
26	4.7	2.8	2.5	2.8	1.9	2.7	3.3	1.0	1.6	0.8	1.0	0.7	0.8	3.2	2.6	1.5	2.0	3.4	1.5	3.4	4.6	4.6	3.8	5.6	5.6	2.4	24	
27	7.0	6.5	8.0	8.0	7.5	7.4	6.3	6.9	5.6	5.8	4.5	5.0	4.9	4.6	6.0	4.8	2.8	2.5	1.2	0.2	1.4	3.0	0.5	2.0	8.0	4.7	24	
28	2.3	1.1	1.1	1.4	2.5	3.2	2.2	1.4	1.1	0.9	0.6	2.6	2.3	4.9	3.7	2.4	3.2	2.6	0.5	0.9	0.6	0.3	0.6	1.2	4.9	1.8	24	
29	0.0	0.6	1.1	1.1	0.6	0.6	1.5	1.3	0.7	1.6	4.8	6.2	6.8	5.9	5.9	6.5	9.0	8.5	7.5	6.3	4.1	4.4	5.2	7.1	9.0	4.1	24	
30	8.1	5.2	5.0	5.2	5.5	6.0	4.6	4.2	2.8	2.5	4.7	6.4	3.8	4.4	3.9	3.1	3.8	4.2	4.4	5.9	4.7	5.6	8.0	8.2	8.2	5.0	24	
31	8.2	4.9	3.4	5.4	5.1	5.9	6.9	6.0	5.7	6.9	7.1	6.6	8.7	6.6	6.3	5.7	5.5	7.0	8.5	7.4	7.3	7.7	5.1	8.7	6.5	24		
HOURLY MAX	8.2	7.7	8.0	8.6	7.5	7.4	7.7	8.2	7.9	6.9	7.5	7.8	9.3	8.7	7.3	6.7	9.0	8.5	8.3	8.5	7.9	8.9	8.0	8.2	8.7	8.7	24	
HOURLY AVG	4.2	3.7	3.8	3.8	3.6	3.2	3.6	3.6	3.3	3.4	4.0	4.4	4.5	4.7	4.5	4.2	3.9	4.1	4.0	4.2	4.1	4.5	4.5	4.7	4.7	4.7	24	

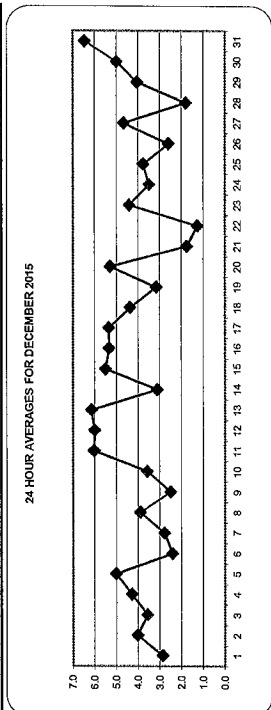
LAST CALIBRATION: March 4, 2014
 DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST

STATUS FLAG CODES

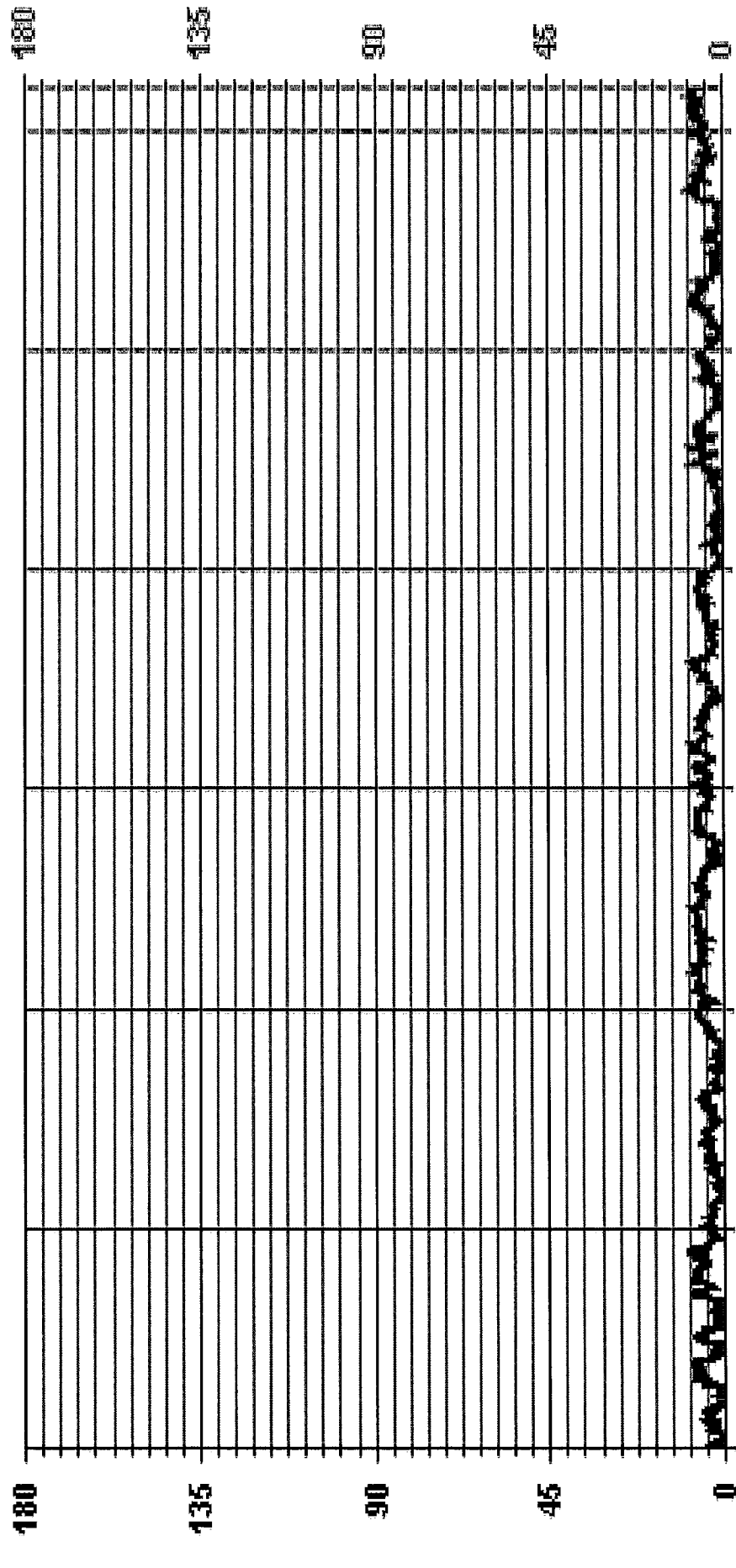
C	- CALIBRATION	Q	- QUALITY ASSURANCE
Y	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SIGNAL CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	742	ON DAY(S)	5
MAXIMUM 1-HR AVERAGE:	9.3 KPH	@ HOUR(S)	12
MAXIMUM 24-HR AVERAGE:	6.5 KPH	VARIOUS	31
MONTHLY CALIBRATION TIME:	0 HRS	OPERATIONAL TIME:	744 HRS
STANDARD DEVIATION:	2.17	AMD OPERATION UPTIME:	100.0 %
		MONTHLY AVERAGE:	4.0 KPH



01 Hour Averages



— LICA30 WSP KPH



VECTOR WIND SPEED MAX instantaneous maximum in km/hr

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00		
1	15.1	17.7	7.2	17.3	15.5	16.4	21.9	17.7	18.0	28.5	15.1	12.7	12.6	19.2	16.4	13.7	11.0	10.7	11.8	10.5	10.0	10.2	8.5	28.5	14.4	24	
2	8.8	13.3	18.6	13.1	9.8	14.6	12.4	46.5	12.7	14.4	16.6	17.9	16.8	19.7	16.7	14.6	17.0	24.1	15.9	19.9	18.4	21.2	46.5	17.7	24	24	
3	19.9	17.1	11.6	7.1	9.4	9.1	5.4	12.4	12.0	14.2	15.5	20.5	21.4	25.8	21.6	15.9	12.4	18.4	13.5	10.5	4.4	9.6	10.7	12.2	25.8	24	
4	12.0	12.0	11.6	12.9	12.2	11.4	12.0	11.6	9.8	11.6	12.9	14.4	31.1	29.5	26.0	17.8	17.5	11.1	12.9	11.6	16.2	17.2	17.9	18.4	31.1	24	
5	15.1	18.4	16.9	15.7	14.6	13.3	14.2	13.5	18.6	20.3	17.3	35.3	32.0	19.9	17.5	15.1	8.7	8.3	10.2	10.9	11.1	11.4	12.7	11.3	35.3	24	
6	12.4	12.9	12.7	12.2	11.6	10.2	15.4	12.0	12.9	12.2	12.4	11.8	10.9	11.1	11.2	11.8	10.5	10.7	10.0	11.6	4.3	10.7	11.4	12.2	15.4	24	
7	8.7	12.0	10.2	13.1	10.9	17.7	11.6	12.2	13.5	12.0	11.3	12.2	10.9	10.5	11.4	11.6	9.8	10.9	12.4	12.0	14.6	14.8	14.4	14.3	17.7	24	
8	13.6	13.1	16.4	21.4	19.4	15.3	12.7	16.2	10.2	11.2	12.9	12.6	9.8	12.2	10.5	12.2	12.0	12.9	12.1	13.3	17.0	16.4	13.9	17.5	21.4	24	
9	13.5	13.3	15.5	12.7	10.8	8.9	11.3	10.2	11.8	13.5	10.0	10.7	11.8	11.1	11.6	10.5	13.5	9.1	10.4	12.2	10.9	11.3	12.4	11.3	15.5	24	
10	8.3	13.4	11.8	11.3	9.6	3.4	11.6	8.0	9.6	9.3	11.3	13.6	12.2	15.5	12.0	13.5	15.3	16.2	19.2	21.0	18.6	15.8	20.5	22.3	13.5	24	
11	18.8	14.0	20.3	20.3	11.3	11.8	14.7	21.2	19.9	18.6	23.2	21.4	20.6	21.8	19.9	18.4	21.2	17.5	17.7	22.1	21.4	19.2	23.2	18.2	19.0	24	
12	24.1	19.0	22.9	20.1	15.5	17.5	17.9	22.3	16.4	18.1	22.5	22.1	18.2	17.6	11.8	12.9	17.3	21.4	20.8	20.6	23.9	24.5	21.9	24.1	24.5	24	
13	24.3	21.4	23.0	27.8	23.5	28.5	29.8	26.7	23.4	22.1	27.5	18.4	28.2	18.9	19.4	14.2	17.3	16.8	16.4	16.8	14.6	15.6	15.1	12.9	29.8	24	
14	15.7	13.3	10.7	12.6	12.0	11.0	13.0	10.9	9.4	10.7	10.0	12.0	10.2	10.8	11.2	11.8	10.9	11.6	10.9	11.3	10.7	14.5	11.1	12.9	15.7	24	
15	11.1	15.1	13.7	14.6	17.5	18.4	15.7	15.7	17.3	22.7	16.9	19.5	21.9	17.0	19.5	13.3	13.5	15.3	12.9	20.1	14.4	15.5	14.6	13.5	22.7	24	
16	11.1	20.8	23.2	37.7	31.3	21.9	21.4	12.2	12.9	17.0	23.8	25.6	27.8	28.4	21.5	33.1	42.1	16.4	19.7	18.4	22.3	26.5	28.5	25.8	42.1	24	
17	30.3	30.7	23.0	21.0	23.8	21.4	13.4	21.9	18.2	23.2	24.1	23.3	23.0	24.3	20.1	26.5	20.4	13.3	26.0	28.8	26.3	22.5	27.8	27.6	21.4	31.3	24
18	14.6	26.5	31.3	20.4	22.5	28.2	13.5	26.7	15.5	16.8	14.2	15.3	16.0	18.7	14.0	17.0	20.3	26.0	28.8	26.3	22.5	27.8	27.6	21.4	31.3	24	
19	18.2	15.3	59.9	14.2	11.4	15.9	22.3	16.4	31.5	11.0	10.9	10.7	10.7	8.0	9.6	11.1	10.7	12.2	15.3	13.3	12.4	13.3	13.7	15.5	59.9	24	
20	12.1	13.7	13.7	13.5	12.9	14.0	18.2	15.3	14.9	13.7	16.9	18.8	27.1	17.9	19.0	21.2	17.3	15.3	19.9	17.3	14.9	20.0	17.7	13.3	27.1	16.6	24
21	13.1	10.9	27.2	41.3	15.1	56.3	37.5	21.1	57.2	25.4	33.3	26.3	43.2	19.3	11.6	10.2	20.6	10.5	30.3	61.0	17.5	71.1	21.9	34.2	71.1	29.8	24
22	17.1	64.5	21.9	26.6	19.0	68.2	68.3	28.7	20.8	71.3	17.3	34.2	13.3	34.2	20.6	17.0	16.6	15.4	13.5	16.4	25.0	43.2	70.7	16.4	14.6	30.9	24
23	13.1	17.3	16.7	14.0	26.5	9.8	12.9	12.9	14.3	14.2	17.9	19.7	16.2	14.6	29.6	13.4	11.6	12.2	17.5	16.8	18.6	19.9	15.1	29.6	16.4	24	
24	32.4	40.1	18.6	82.3	21.2	20.1	15.7	13.1	15.5	13.3	12.9	28.9	17.7	11.8	12.7	16.2	9.2	13.3	14.0	14.5	14.2	16.4	14.6	12.2	82.3	20.0	24
25	31.5	40.1	18.6	82.3	21.2	20.1	15.7	13.1	15.5	13.3	12.9	28.9	17.7	11.8	12.7	16.2	9.2	13.3	14.0	14.5	14.2	16.4	14.6	12.2	82.3	20.0	24
26	11.0	16.8	33.5	39.0	30.2	44.4	79.6	69.5	83.1	77.9	99.9	44.7	20.1	10.3	12.4	42.1	85.1	29.1	27.4	13.5	13.3	14.0	17.1	19.9	85.1	36.4	24
27	23.2	21.7	26.8	25.7	28.5	25.0	22.5	24.4	21.9	18.2	15.3	17.5	17.9	15.1	10.2	18.6	25.0	52.4	19.3	27.1	32.0	13.1	23.2	14.4	52.4	23.3	24
28	11.6	15.8	10.2	31.5	30.0	14.4	30.7	19.5	19.1	31.1	26.7	14.4	11.6	8.7	12.4	53.9	83.4	57.7	32.7	28.0	60.5	69.5	16.4	19.9	83.4	29.6	24
29	78.6	41.7	20.6	64.1	44.1	73.7	58.3	74.2	66.5	34.6	58.5	15.3	17.5	18.6	12.7	15.5	20.6	21.1	18.8	15.5	11.8	12.4	14.2	25.6	78.6	34.8	24
30	23.0	14.9	14.9	19.7	12.2	14.9	16.0	11.1	22.6	25.4	17.3	20.6	17.0	17.0	16.4	13.5	17.9	19.9	17.1	13.7	14.6	13.3	17.5	16.8	25.4	17.0	24
31	16.8	13.5	15.7	14.0	14.1	13.7	16.4	18.4	16.4	19.5	25.2	19.7	31.3	33.7	26.7	29.7	18.8	23.0	24.8	25.4	25.6	23.8	26.2	21.0	33.7	21.4	24
HOURLY MAX	78.6	64.5	59.9	82.3	44.1	73.7	79.6	74.2	83.1	77.9	98.5	44.7	43.2	33.7	30.2	59.9	85.1	57.7	32.7	61.0	60.5	85.8	28.5	43.4			
HOURLY AVG	18.8	19.5	19.2	22.9	18.2	21.5	22.1	21.4	21.8	21.8	19.8	19.6	19.5	17.5	16.7	19.2	20.7	18.6	18.0	19.5	19.1	23.9	17.3	18.0			

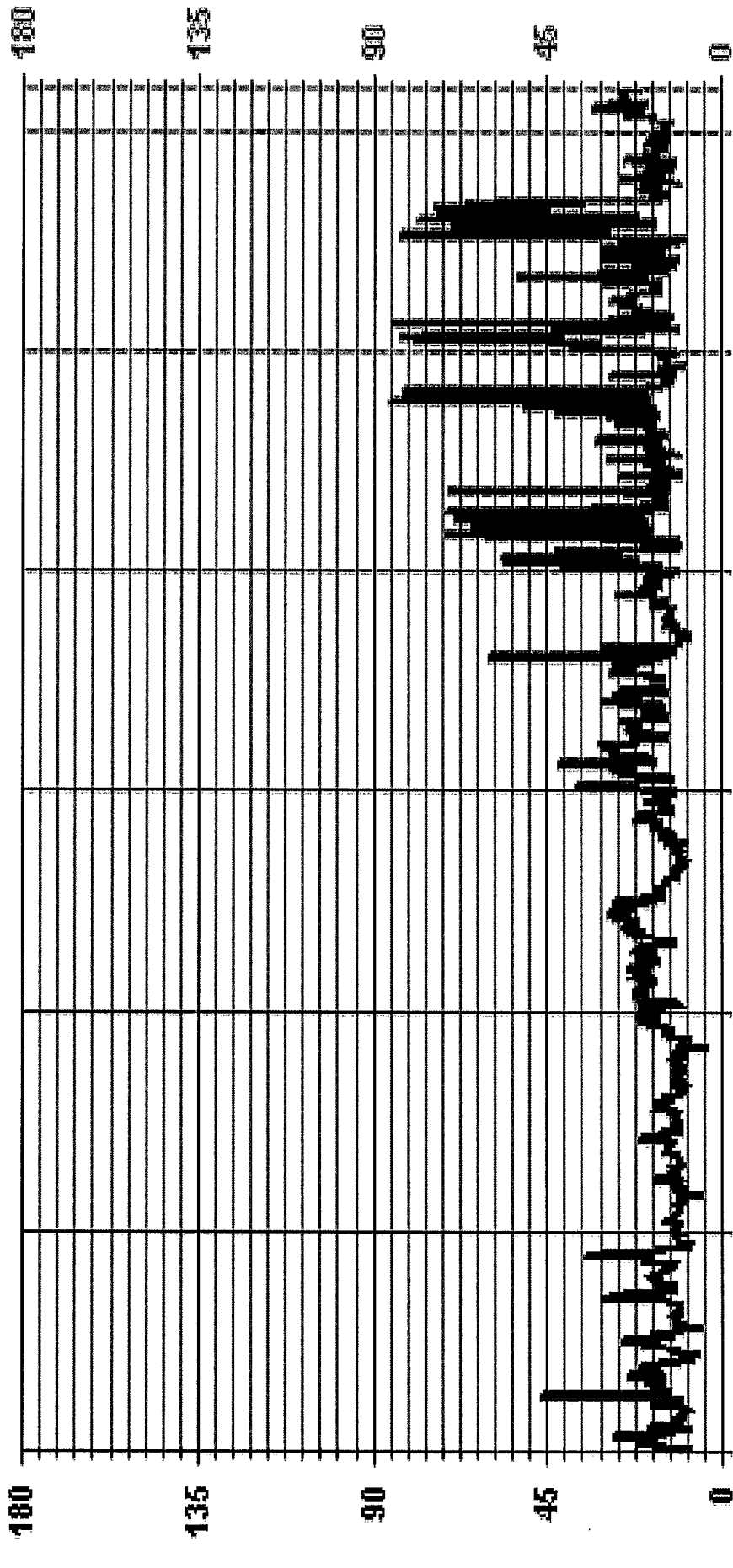
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
V	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/Span CHECK	X	MACHINE MAINTENANCE
P	POWER FAILURE	O	OPERATOR ERROR
G	SOFTWARE REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	85.8	KPH	@ HOUR(S)	21	ON DAY(S)	24
OPERATIONAL TIME:	VAR/VARIOUS					744
						HRS

01 Hour Averages



— LICA30 WSMAX KPH

LIICA30
WSP / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 30
Site Name : LIICA30
Parameter : WSP
Units : KPH

Wind Parameter : WDR
Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 6.0	2.82	4.16	5.91	8.46	3.22	4.56	6.85	2.95	3.09	8.73	11.82	4.70	2.01	2.55	2.41	2.55	76.88
< 12.0	.53	.40	.94	.26	.80	2.82	5.24	.40	.00	4.16	3.09	.00	.53	1.61	1.47	.53	22.84
< 20.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 29.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	3.36	4.56	6.85	8.73	4.03	7.39	12.09	3.36	3.09	12.90	14.91	4.70	2.55	4.16	3.89	3.09	

Calm : .26 %

Total # Operational Hours : 744

Distribution By Samples

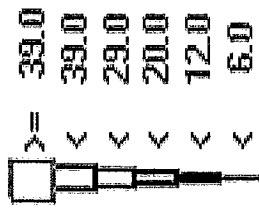
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 6.0	21	31	44	63	24	34	51	22	23	65	88	35	15	19	18	19	572
< 12.0	4	3	7	2	6	21	39	3		31	23		4	12	11	4	170
< 20.0																	
< 29.0																	
< 39.0																	
>= 39.0																	
Totals	25	34	51	65	30	55	90	25	23	96	111	35	19	31	29	23	

Calm : .26 %

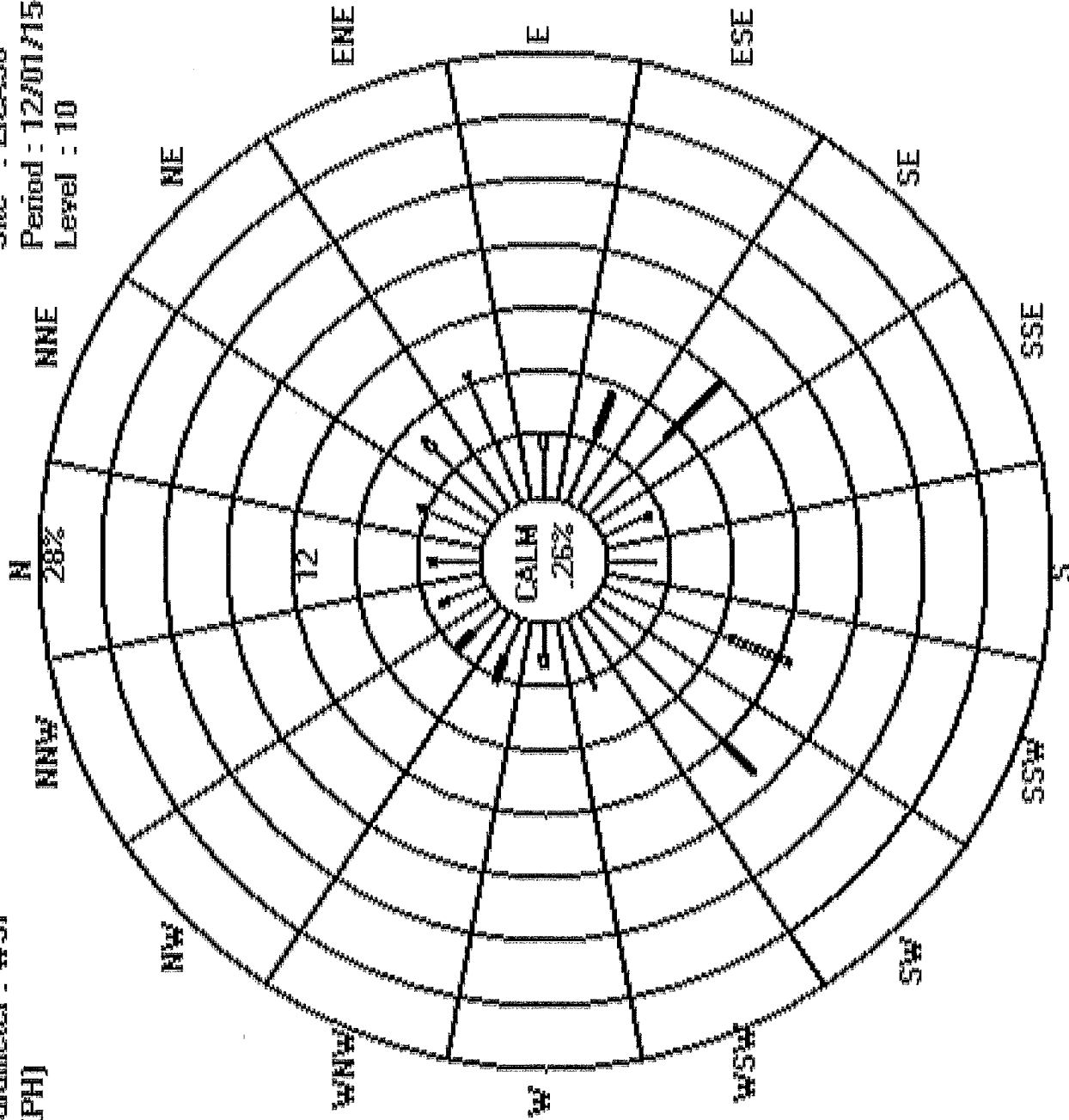
Total # Operational Hours : 744

Logger : 30 Parameter : WSP

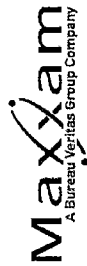
Class Limits (KPH)



Site : LIC&30
Period : 12/01/15-12/31/15
Level : 10



WIND DIRECTION



WIND DIRECTION (WD) hourly averages

MST

DAY	24-HOUR AVG QUADRANT																								RDGS.	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		24:00
1	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
2	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
3	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
4	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
5	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
6	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	24
7	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
8	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
9	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	24
10	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	24
11	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	24
12	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
13	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
14	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
15	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
16	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
17	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	24
18	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
19	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
20	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
21	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
22	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
23	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
24	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
25	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
26	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
27	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
28	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
29	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
30	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
31	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24

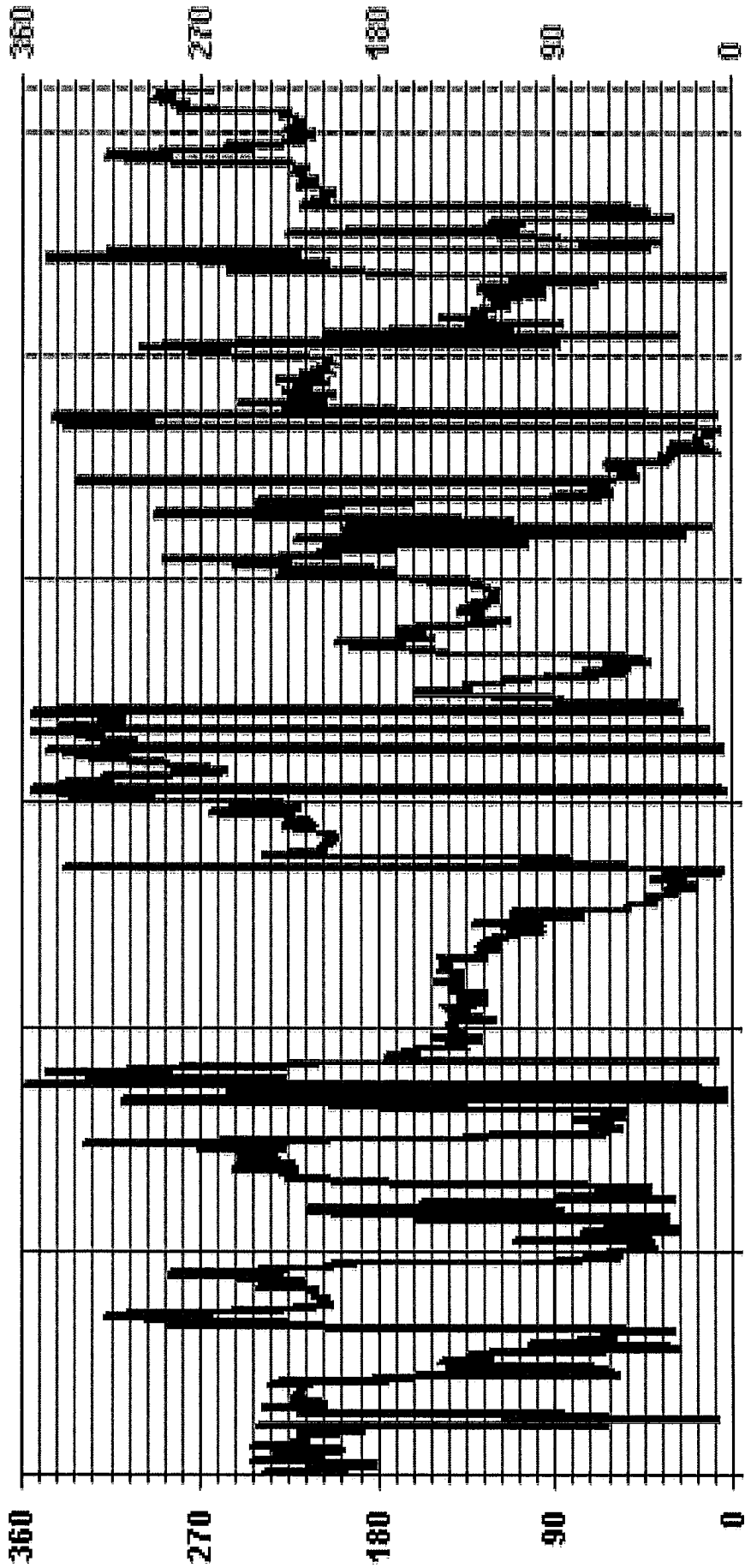
STATUS FLAG CODES

C	CALIBRATION	G	QUALITY ASSURANCE
V	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

LAST CALIBRATION: March 4, 2014
 DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0 HRS	OPERATIONAL TIME:	744 HRS
STANDARD DEVIATION:	89.30	AMID OPERATION UPTIME:	100.0 %
		MONTHLY AVERAGE:	SSE

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— WDR - - - DEG

STANDARD DEVIATION WIND DIRECTION

STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees

MST

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
1	28	31	40	42	49	65	21	34	28	48	64	50	31	24	30	22	28	22	60	60	22	28	30	32	18	15	14	15	15	26	28	28	33
2	40	42	40	31	26	30	23	49	58	44	54	61	58	58	28	33	27	18	16	16	17	19	32	17	19	21	17	17	16	17	17	17	
3	20	31	26	30	23	49	58	44	64	25	32	24	25	22	19	31	44	47	47	47	48	26	26	26	26	26	26	26	26	26	26	26	
4	28	38	38	26	33	29	36	47	43	41	26	31	30	36	32	25	29	19	17	14	12	15	15	17	14	12	15	15	15	15	15		
5	16	14	13	14	21	32	25	16	16	23	35	33	29	34	35	25	12	15	17	32	28	16	18	16	16	16	16	16	16	16	16		
6	17	20	16	22	24	29	30	26	22	26	29	25	16	21	27	21	38	39	38	41	44	54	34	39	39	39	39	39	39	39	39		
7	49	35	49	40	49	30	23	32	56	35	37	50	38	29	21	20	26	29	19	18	21	30	25	16	16	16	16	16	16	16	16		
8	20	25	26	35	33	27	19	31	30	35	48	42	26	31	30	22	19	41	25	17	21	23	22	24	24	24	24	24	24	24	24		
9	19	19	39	32	42	29	21	36	37	48	65	59	34	59	35	19	70	47	28	44	35	36	36	36	36	36	36	36	36	36	36		
10	33	54	58	54	50	54	59	47	28	25	25	26	31	25	27	24	26	24	27	24	25	31	28	23	23	23	23	23	23	23	23		
11	26	25	26	25	25	26	25	23	24	23	24	23	24	24	24	28	27	25	27	26	27	29	29	24	24	23	27	27	27	27	27		
12	28	28	25	29	26	28	25	23	27	27	26	28	31	27	26	28	25	32	31	27	27	28	29	29	29	29	29	29	29	29	29		
13	29	30	32	27	30	31	29	26	28	31	27	26	30	28	33	30	22	22	24	18	19	18	20	19	18	20	19	18	20	19	21		
14	14	17	16	17	18	18	17	18	17	18	29	61	18	28	63	32	27	41	47	26	22	29	23	58	28	31	27	21	21	21	21		
15	16	17	18	17	18	17	18	17	18	17	18	17	18	17	18	24	24	24	27	33	23	23	32	31	30	38	28	18	30	30	30		
16	17	28	27	31	37	38	33	30	35	28	35	35	39	37	37	37	32	54	32	26	28	26	22	24	29	29	29	29	29	29	29		
17	36	39	36	36	35	33	34	27	40	37	40	37	29	35	40	37	36	36	36	36	33	25	33	38	35	37	35	39	39	39	39		
18	49	26	45	32	21	34	53	36	27	30	31	33	27	27	27	26	30	30	30	30	30	25	26	27	24	20	23	23	23	23			
19	29	21	35	37	19	20	20	21	27	34	27	32	23	23	23	22	17	29	13	46	22	32	27	28	28	28	28	28	28	28	28		
20	22	14	16	19	18	24	23	24	21	30	31	31	29	29	26	25	25	27	29	26	25	25	27	27	30	31	31	31	31	31	31		
21	34	30	76	45	48	44	60	53	46	27	42	43	30	38	13	19	64	27	69	55	57	39	41	28	28	28	28	28	28	28	28		
22	50	32	31	43	52	56	25	37	33	41	43	58	51	47	53	50	41	46	62	68	74	30	36	20	20	20	20	20	20	20	20		
23	24	28	28	24	51	39	25	19	21	20	21	24	26	22	24	28	14	12	13	14	15	15	15	15	15	15	15	15	15	15	15		
24	39	33	19	19	18	22	22	21	21	28	24	41	39	39	37	40	38	33	41	19	47	32	44	49	49	49	49	49	49	49	49		
25	45	64	34	61	31	51	19	20	20	32	21	33	25	25	18	24	13	21	17	17	17	14	16	16	16	16	16	16	16	16	16		
26	17	35	41	38	46	39	39	55	38	37	45	58	59	34	31	56	45	28	53	25	24	27	33	24	24	24	24	24	24	24	24		
27	28	28	26	26	27	28	31	26	27	28	27	31	33	32	27	34	29	23	72	66	53	35	48	33	33	33	33	33	33	33	33		
28	68	39	42	30	32	32	32	45	34	59	42	30	38	11	24	26	19	24	54	35	56	46	41	34	34	34	34	34	34	34	34		
29	68	64	43	49	66	56	33	43	66	31	17	19	20	17	17	17	16	15	17	19	25	22	21	18	18	18	18	18	18	18	18		
30	25	24	22	27	18	18	19	16	39	50	36	34	36	37	36	31	25	30	22	13	18	14	12	14	14	14	14	14	14	14	14		
31	14	19	26	17	17	17	17	22	17	22	17	22	24	24	21	28	28	29	29	29	29	29	29	29	29	29	29	29	29	29	29		

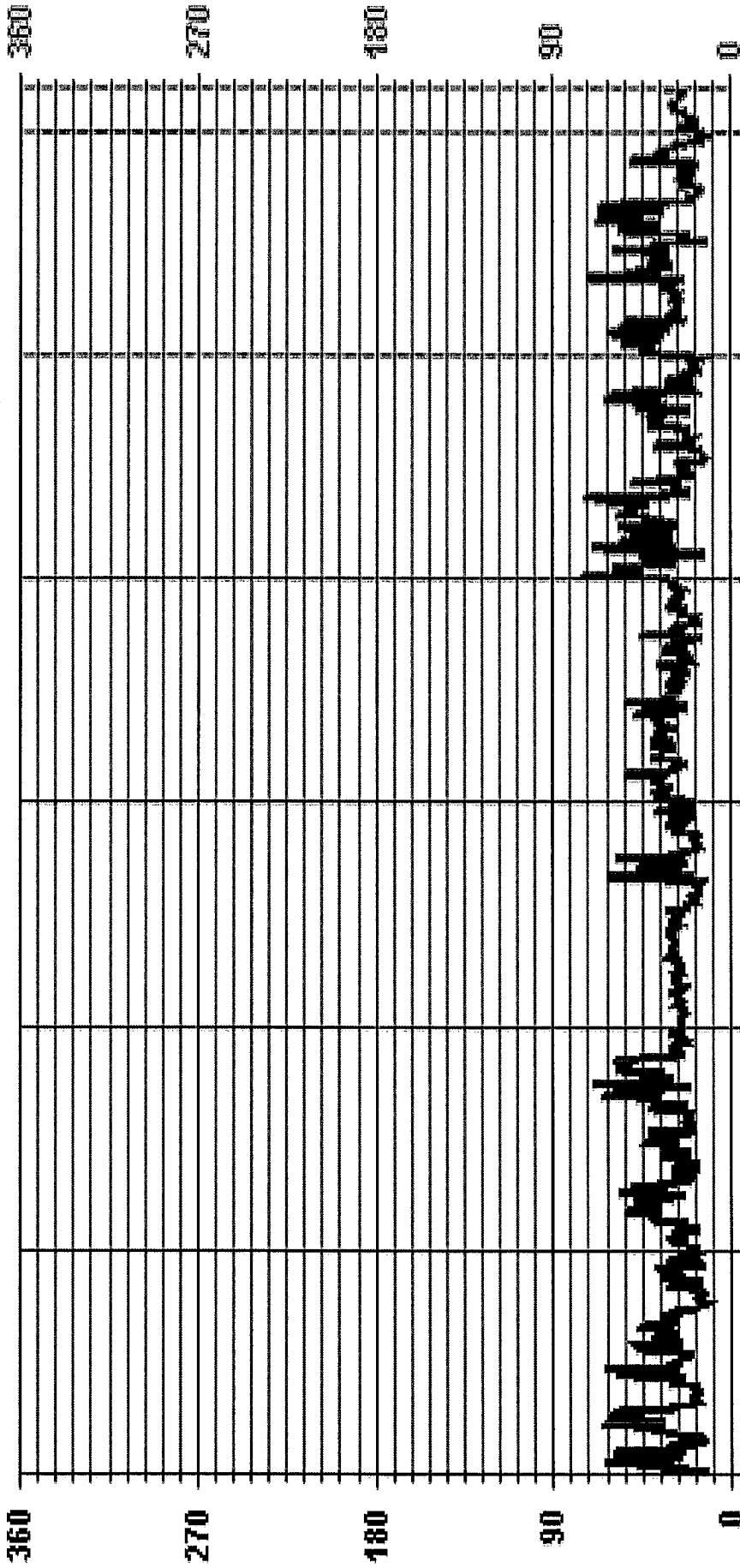
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

LAST CALIBRATION: March 4, 2014

CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 744 HRS

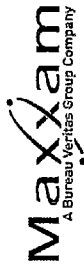
01 Hour Averages



12:01:15 00:00:12:06:15 00:00:12:11:15 00:00:12:16:15 00:00:12:21:15 00:00:12:26:15 00:00:12:31:15 00:00

— LIC830 STDWDIR DEG

RELATIVE HUMIDITY

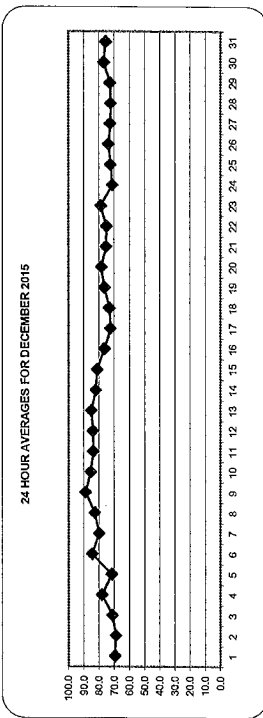


RELATIVE HUMIDITY (RH) hourly averages in %

DAY	HOURS																								DAILY MAX	24-HOUR AVG	RDBS
	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00			
1	80	79	80	80	79	79	78	78	78	79	76	56	47	44	45	54	60	64	66	68	70	75	77	79	80	69.6	24
2	80	80	80	79	79	79	80	81	80	81	76	52	53	51	53	60	65	68	67	68	66	62	61	63	81	69.0	24
3	63	62	63	69	76	80	81	82	83	81	66	50	53	55	58	70	75	78	80	82	82	82	84	84	84	71.3	24
4	86	86	87	87	87	87	87	86	85	84	73	66	58	60	63	67	73	76	79	78	77	77	77	87	87	78.1	24
5	77	77	78	78	76	77	67	66	64	63	60	61	60	60	63	67	72	76	78	81	82	84	86	86	86	71.7	24
6	87	86	85	86	85	86	85	85	84	84	84	84	82	81	82	83	86	86	85	85	85	86	86	87	87	84.7	24
7	85	85	85	84	84	84	83	84	83	84	83	82	81	81	82	83	86	86	85	80	80	82	83	82	85	80.1	24
8	84	85	83	83	84	84	83	85	84	84	84	82	82	81	82	85	87	86	85	85	86	87	88	88	88	83.0	24
9	89	89	89	89	89	89	90	90	90	90	89	89	89	89	89	89	89	89	89	89	89	89	89	90	90	89.1	24
10	88	87	86	87	88	88	88	87	87	86	85	82	81	82	84	85	86	86	85	85	86	86	86	88	88	85.7	24
11	85	85	85	85	84	84	84	84	84	84	84	84	84	84	84	84	85	85	86	86	86	86	85	85	85	84.0	24
12	85	85	85	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	85	85	85	84	84	84	85	84.2	24
13	84	84	85	86	86	86	86	86	85	84	85	84	84	84	84	85	86	86	87	87	86	86	85	87	87	85.3	24
14	86	86	85	84	83	83	83	84	85	84	82	79	78	77	77	80	81	82	81	82	83	83	83	86	86	82.3	24
15	84	83	83	83	83	83	83	83	84	85	84	82	79	78	77	80	82	82	84	84	84	85	84	85	85	81.3	24
16	85	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	85	85	76.5	24
17	75	74	74	74	74	73	73	74	74	74	74	73	72	70	69	67	71	71	73	73	74	74	74	74	75	72.5	24
18	74	73	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	77	73.3	24
19	76	76	77	77	77	77	76	76	76	76	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	76.4	24
20	80	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	80	80	78.4	24
21	79	79	78	78	77	76	75	74	74	75	77	73	69	67	71	77	79	78	77	76	75	76	75	74	79	75.4	24
22	74	74	74	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	75.1	24
23	79	79	78	79	80	79	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	78.4	24
24	76	76	74	73	72	72	72	72	71	70	71	69	67	65	64	67	71	74	75	74	73	71	71	73	76	71.3	24
25	72	72	71	70	69	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72.5	24
26	78	78	78	77	76	75	74	73	72	71	72	72	71	71	70	71	72	73	74	74	75	75	75	78	73.8	24	
27	74	75	75	74	75	75	75	74	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	72.7	24
28	74	74	75	74	73	74	74	76	76	75	74	65	63	65	66	73	76	74	74	73	72	71	70	76	72.4	24	
29	70	69	69	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	72.9	24
30	77	77	76	76	75	75	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	76.8	24
31	80	80	81	80	79	79	78	78	78	78	77	75	72	68	65	65	72	75	78	79	77	77	78	81	82	75.7	24
HOURLY MAX	89	89	89	89	89	89	90	90	90	90	89	89	89	89	89	89	89	89	89	89	89	89	89	88	88		
HOURLY AVG	79.5	79.3	79.2	79.0	78.6	78.8	78.5	78.6	78.5	78.3	76.6	73.0	71.2	70.0	71.1	74.5	76.8	78.3	78.5	78.8	78.8	79.0	79.0	79.1	79.1		

STATUS FLAG CODES

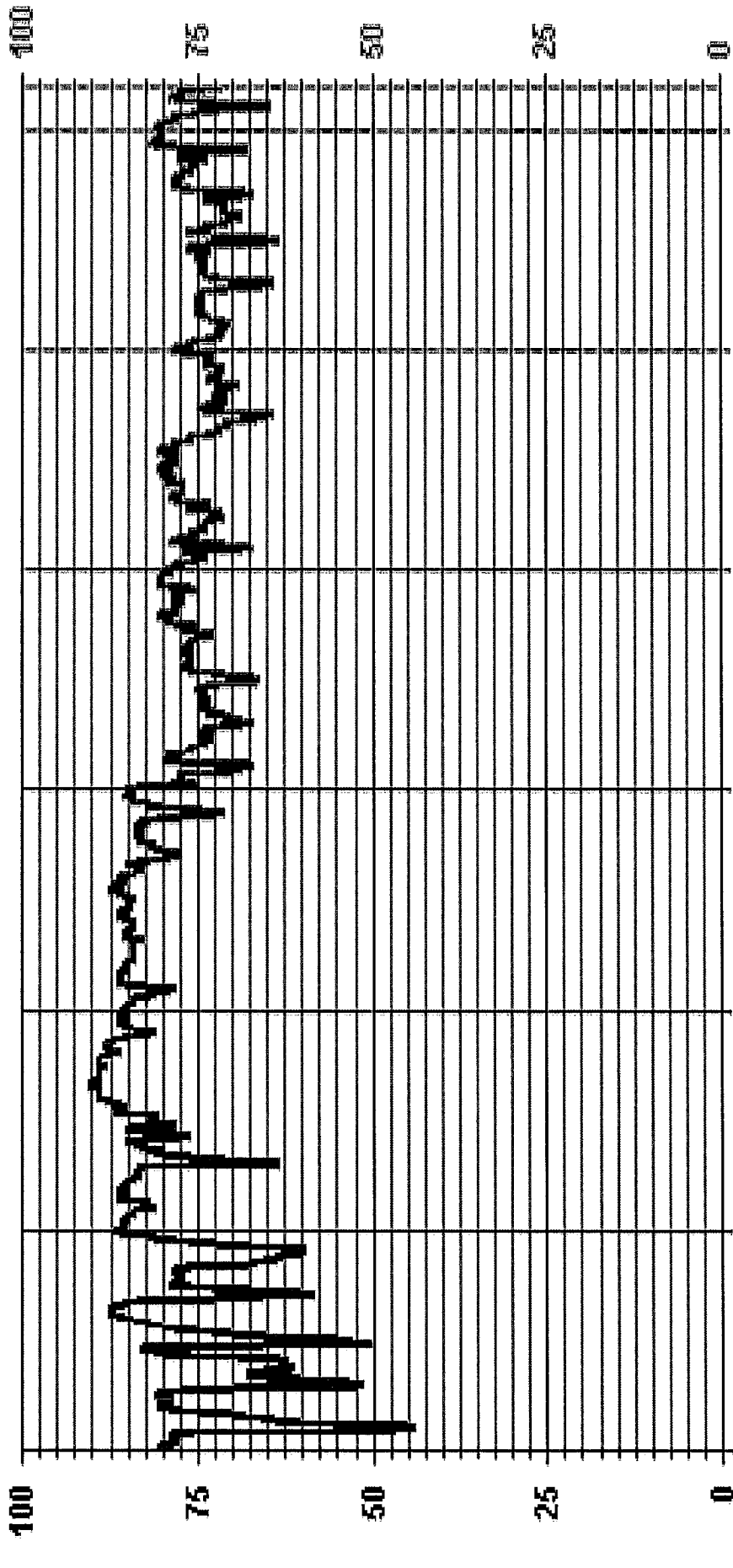
G	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE/FAULT FUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT-OF-REPAIR	K	COLLECTION ERROR



MONTHLY SUMMARY

MAXIMUM 1-HR AVERAGE:	90	%	@ HOUR(S)	VAR	ON DAY(S)	9
MAXIMUM 24-HR AVERAGE:	89.1	%			ON DAY(S)	9
STANDARD DEVIATION:	7.24				VAR-VARIOUS	
OPERATIONAL TIME:	744	HRS				
AMD OPERATION UPTIME:	100.0	%				
MONTHLY AVERAGE:	77	%				

01 Hour Averages



— LICA30 RH %

BAROMETRIC PRESSURE



BAROMETRIC PRESSURE (BP) hourly averages in millibar

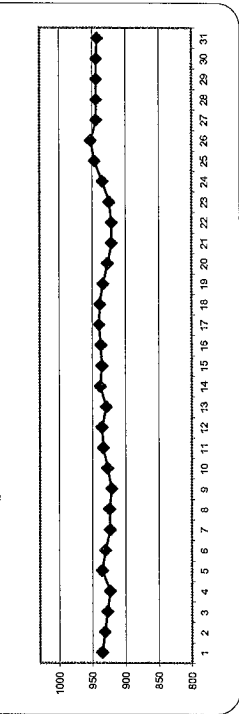
MST

DAY	HOUR																								DAILY MAX	DAILY AVG	24-HOUR AVG	RGS.
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				
1	935	935	935	935	936	936	936	936	935	935	936	937	937	936	936	936	936	936	936	936	936	936	935	935	937	936	24	
2	935	934	934	933	933	933	932	932	930	930	929	929	929	930	930	931	931	931	931	931	931	931	931	931	931	931	931	24
3	934	935	935	934	934	934	933	932	931	930	929	928	928	927	926	925	924	923	923	922	921	920	920	919	919	919	919	24
4	919	919	919	919	918	918	918	919	919	920	921	923	924	925	926	927	928	928	929	930	930	930	930	930	930	930	930	24
5	931	931	931	932	932	932	932	933	934	935	936	937	938	938	938	939	939	939	939	938	938	937	937	936	936	936	24	
6	935	934	934	933	933	933	932	931	931	931	930	930	929	929	929	929	929	929	929	929	929	929	929	929	929	929	24	
7	929	928	927	927	927	927	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	24	
8	924	924	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	24	
9	920	921	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	24	
10	926	927	927	928	928	928	927	927	928	928	928	928	928	927	927	927	927	927	927	927	927	927	927	927	927	927	24	
11	929	930	930	930	930	930	931	931	932	932	933	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	24	
12	937	937	937	938	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	24	
13	930	930	929	929	928	928	928	928	928	928	928	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	24	
14	933	934	934	935	935	935	936	936	937	937	937	938	938	938	938	938	938	938	938	938	938	938	938	938	938	938	24	
15	939	939	938	938	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	24	
16	935	935	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	24	
17	938	938	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	24	
18	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	24	
19	935	935	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	24	
20	932	932	932	932	932	932	932	932	932	932	932	932	932	932	932	932	932	932	932	932	932	932	932	932	932	932	24	
21	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	24	
22	919	920	920	920	920	920	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	24	
23	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	24	
24	928	928	929	929	929	929	929	929	929	929	929	929	929	929	929	929	929	929	929	929	929	929	929	929	929	929	24	
25	942	943	943	944	944	944	945	945	945	945	946	947	947	947	947	947	947	947	947	947	947	947	947	947	947	947	24	
26	950	950	951	951	951	951	952	952	952	952	952	952	952	952	952	952	952	952	952	952	952	952	952	952	952	952	24	
27	950	949	948	948	948	948	947	946	945	945	944	944	943	943	943	943	943	943	943	943	943	943	943	943	943	943	24	
28	942	941	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	24	
29	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	24	
30	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	24	
31	946	946	946	946	944	944	944	943	942	942	941	941	941	940	940	940	940	940	940	940	940	940	940	940	940	940	24	
HOURLY MAX	950	950	951	951	952	952	953	953	954	954	954	954	954	954	954	954	954	954	954	954	954	954	954	954	954	954	954	
HOURLY AVG	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	

STATUS FLAG CODES

C	QUALITY ASSURANCE	Q	RECOVERY
V	MAINTENANCE	R	MACHINE W/ALBUCTION
S	DAILY ZERO/SPIRING CHECK	X	OPERATOR ERROR
P	POWER FAILURE	O	COLLECTION ERROR
G	OUT-OF-REPAIR	K	

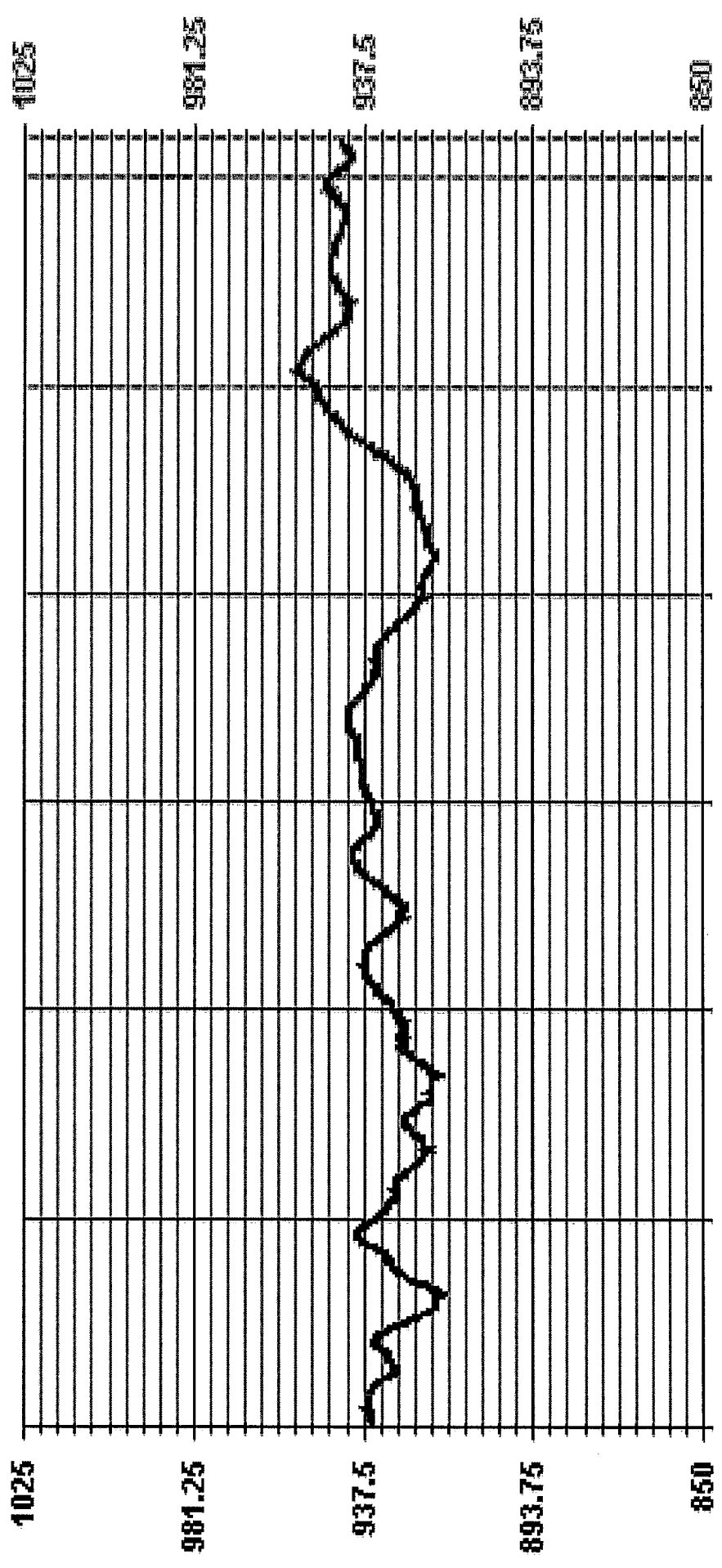
24 HOUR AVERAGES FOR DECEMBER 2015



MONTHLY SUMMARY

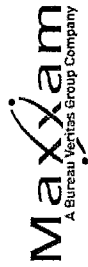
MAXIMUM 1-HR AVERAGE:	955	MB	@ HOUR(S)	9	ON DAY(S)	26
MAXIMUM 24-HR AVERAGE:	952	MB			ON DAY(S)	26
					VAR-VARIOUS	
STANDARD DEVIATION:	8.65					
					OPERATIONAL TIME:	744
					AMD OPERATION UPTIME:	100.0
					MONTHLY AVERAGE:	934
						934
						24

01 Hour Averages



— LIC430 BP MB

AMBIENT TEMPERATURE



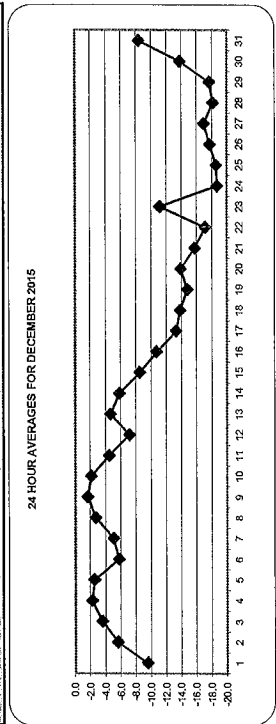
AMBIENT TEMPERATURE (TPX) hourly averages in Degrees Celsius

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX	DAILY MIN	24-HOUR AVG	RDS
1	-13.7	-14.4	-14.0	-13.4	-14.5	-15.2	-15.3	-15.5	-15.8	-13.2	-7.5	-3.2	-1.1	-0.2	-0.6	-3.8	-5.7	-6.6	-7.0	-7.5	-8.4	-10.1	-10.4	-11.3	-0.2	-9.5	24	
2	-11.9	-12.2	-12.2	-11.5	-11.4	-12.1	-11.9	-11.0	-9.3	-5.9	-1.9	-1.1	1.1	0.8	-1.1	-2.2	-1.7	-0.8	-1.3	-1.3	-0.9	-1.1	-1.5	-1.1	-1.5	1.1	-5.6	24
3	-1.7	-1.8	-2.5	-4.2	-6.5	-7.6	-8.8	-10.0	-10.3	-9.2	-2.8	2.4	1.6	1.3	0.8	-0.7	-1.9	-1.9	-2.9	-2.9	-3.7	-4.2	-4.2	-4.7	2.4	-3.6	24	
4	-5.0	-5.4	-5.8	-5.9	-6.5	-6.8	-6.2	-6.0	-5.9	-4.9	-0.7	2.1	3.3	4.5	4.0	3.3	1.3	-0.8	-1.6	-2.0	-1.6	-2.1	-2.6	4.5	-2.2	24		
5	-3.0	-3.2	-3.2	-3.4	-4.2	-4.9	-3.4	-3.4	-3.1	-1.6	0.6	2.9	3.1	3.1	3.2	0.5	-1.4	-2.8	-3.9	-4.9	-6.4	-7.1	-6.7	-6.4	3.2	-2.5	24	
6	-6.7	-7.3	-7.7	-7.2	-6.0	-6.8	-5.5	-6.4	-7.1	-7.1	-6.2	-4.4	-3.7	-3.3	-3.7	-4.4	-5.6	-5.8	-5.5	-5.6	-6.4	-5.9	-3.3	-5.7	2.4	-5.7	24	
7	-5.4	-6.3	-8.2	-9.2	-9.2	-9.5	-10.1	-9.6	-9.6	-8.7	-5.5	-3.2	0.3	1.6	0.7	-1.6	-3.1	-4.0	-3.9	-3.6	-3.6	-3.5	-2.8	-1.6	-5.0	24		
8	-3.4	-3.6	-3.1	-2.4	-2.4	-3.1	-3.7	-5.1	-5.4	-4.5	-1.9	-1.4	-1.1	-1.0	-1.2	-1.4	-1.5	-1.6	-1.8	-1.8	-1.9	-1.8	-1.9	-1.7	-1.0	-1.6	24	
9	-1.5	-1.9	-2.0	-2.0	-1.7	-1.6	-1.8	-1.7	-1.4	-1.1	-1.0	-1.1	-1.1	-1.1	-1.4	-1.6	-2.1	-2.3	-2.5	-2.6	-2.8	-3.0	-3.1	-3.5	-3.8	-1.1	-2.1	24
10	-1.5	-1.6	-1.6	-1.6	-1.9	-2.0	-2.0	-2.0	-2.1	-2.0	-1.6	-1.4	-1.1	-1.4	-1.4	-1.6	-2.1	-2.3	-2.5	-2.6	-2.8	-3.0	-3.1	-3.5	-3.8	-1.1	-2.1	24
11	-3.7	-3.4	-3.3	-3.3	-3.2	-3.1	-3.0	-3.0	-3.2	-3.4	-3.6	-3.5	-3.5	-3.5	-3.7	-4.3	-5.0	-5.4	-5.7	-6.0	-6.1	-6.5	-6.8	-7.1	-3.0	-4.4	24	
12	-7.3	-7.4	-7.6	-8.1	-8.4	-8.6	-8.6	-8.6	-8.4	-8.3	-8.0	-7.6	-7.3	-7.1	-6.8	-6.8	-6.5	-6.1	-5.9	-5.7	-5.6	-5.6	-5.5	-5.4	-5.4	-7.1	-7.1	24
13	-5.5	-5.5	-5.6	-5.6	-5.4	-5.3	-5.2	-5.3	-5.5	-5.2	-4.6	-4.2	-3.7	-3.6	-3.5	-3.5	-3.6	-3.9	-4.0	-4.2	-4.4	-4.6	-4.7	-4.9	-3.5	-4.6	24	
14	-5.0	-5.2	-5.3	-5.5	-5.8	-5.9	-6.2	-7.0	-7.9	-6.9	-5.8	-5.4	-5.6	-5.1	-4.9	-5.4	-5.6	-5.9	-5.9	-5.9	-5.8	-5.9	-5.8	-5.9	-4.9	-5.8	24	
15	-6.3	-6.6	-6.7	-6.8	-7.6	-8.8	-9.7	-10.2	-11.0	-10.1	-8.7	-8.0	-8.6	-8.6	-8.6	-8.6	-8.5	-8.2	-8.5	-7.8	-7.9	-8.5	-8.6	-8.6	-6.3	-8.5	24	
16	-8.1	-7.7	-6.1	-6.5	-7.8	-9.0	-8.4	-8.5	-8.8	-9.1	-9.5	-9.6	-9.2	-9.8	-10.1	-11.6	-13.9	-15.3	-14.9	-15.5	-15.8	-14.5	-14.1	-13.5	-6.1	-10.7	24	
17	-13.1	-13.1	-13.3	-13.3	-13.6	-13.9	-14.2	-14.0	-13.9	-13.7	-13.2	-12.8	-12.4	-12.4	-12.7	-12.9	-13.1	-12.9	-13.2	-13.2	-13.4	-13.4	-13.5	-13.6	-12.4	-13.3	24	
18	-13.4	-13.5	-13.6	-13.5	-13.6	-13.5	-13.6	-13.7	-13.8	-13.6	-13.2	-12.5	-12.9	-13.3	-13.8	-14.0	-14.2	-14.3	-14.2	-14.2	-14.3	-14.2	-14.5	-15.7	-16.0	-13.8	24	
19	-16.2	-16.0	-15.1	-14.5	-15.5	-15.4	-15.2	-15.0	-14.6	-13.9	-13.2	-12.9	-12.0	-11.4	-10.4	-10.4	-10.9	-11.4	-11.4	-11.4	-11.4	-11.4	-11.4	-11.4	-11.4	-14.8	24	
20	-12.8	-15.1	-16.3	-16.2	-16.0	-15.9	-16.0	-16.4	-16.3	-15.1	-13.5	-12.4	-11.6	-10.8	-11.4	-12.7	-13.5	-13.6	-13.6	-13.3	-13.2	-12.8	-12.4	-12.7	-10.8	-13.9	24	
21	-13.0	-13.6	-14.4	-15.2	-16.2	-18.0	-19.3	-20.1	-20.2	-19.3	-15.2	-10.8	-6.9	-8.5	-12.2	-15.1	-16.4	-17.4	-18.1	-19.1	-19.8	-20.0	-20.3	-6.9	-15.7	24		
22	-20.9	-20.8	-21.4	-21.4	-22.1	-22.5	-23.1	-22.3	-21.8	-20.0	-17.5	-14.7	-11.2	-10.9	-11.3	-12.1	-14.1	-15.2	-15.2	-16.0	-15.8	-14.7	-13.3	-12.3	-10.9	-17.1	24	
23	-11.9	-11.7	-11.8	-11.5	-10.9	-11.0	-10.6	-10.7	-10.6	-10.6	-10.3	-9.5	-9.5	-9.5	-9.3	-9.4	-10.0	-10.5	-10.9	-11.4	-12.1	-12.7	-14.2	-16.3	-9.3	-11.1	24	
24	-17.9	-16.8	-15.6	-16.0	-16.7	-17.2	-17.5	-17.9	-18.4	-18.4	-17.6	-16.8	-16.2	-15.2	-15.8	-16.8	-18.2	-18.2	-23.8	-24.5	-22.4	-21.1	-15.2	-18.7	24			
25	-21.9	-22.1	-23.1	-24.2	-26.1	-26.7	-23.1	-22.0	-20.9	-19.8	-19.2	-17.8	-16.3	-15.3	-14.9	-15.2	-15.6	-15.5	-14.8	-14.4	-14.3	-14.2	-14.2	-14.1	-14.1	-18.6	24	
26	-14.3	-14.7	-16.9	-18.0	-19.5	-20.1	-20.0	-21.3	-22.9	-22.9	-19.4	-17.4	-16.8	-16.8	-16.6	-16.4	-16.6	-16.8	-16.6	-16.3	-16.1	-16.0	-16.0	-16.4	-14.3	-17.7	24	
27	-16.6	-17.2	-17.4	-17.3	-17.5	-17.3	-17.5	-18.1	-18.0	-18.1	-18.1	-18.1	-18.1	-18.1	-18.1	-18.1	-18.1	-18.1	-18.1	-18.1	-18.1	-18.1	-18.1	-18.1	-18.1	-18.1	24	
28	-16.3	-16.2	-16.7	-16.5	-15.8	-15.6	-15.8	-17.3	-18.9	-19.3	-18.1	-13.8	-12.7	-13.2	-13.2	-16.1	-18.6	-19.8	-21.7	-22.7	-23.5	-24.2	-24.5	-25.0	-12.7	-18.1	24	
29	-25.4	-26.0	-26.5	-25.1	-22.3	-20.6	-19.5	-19.5	-19.4	-18.8	-16.0	-13.3	-12.2	-11.3	-11.5	-13.1	-13.3	-13.8	-14.5	-15.4	-16.4	-16.8	-16.7	-17.2	-11.3	-17.7	24	
30	-16.7	-17.5	-18.1	-18.1	-17.9	-18.1	-18.2	-19.0	-19.6	-16.0	-11.4	-10.1	-9.0	-6.6	-6.1	-8.5	-9.9	-11.1	-11.8	-13.3	-13.4	-13.6	-13.5	-6.1	-13.8	24		
31	-15.3	-13.9	-13.7	-12.9	-13.3	-13.3	-13.3	-13.3	-13.3	-12.3	-10.4	-8.7	-4.6	-2.3	-1.9	-3.7	-4.4	-4.8	-4.7	-4.1	-4.4	-4.9	-4.2	-4.5	-1.9	-8.4	24	
HOURLY MAX	-1.5	-1.6	-1.6	-1.6	-1.7	-1.6	-1.6	-1.8	-1.7	-1.4	0.6	2.9	3.3	4.5	4.0	3.5	1.3	-0.8	-0.8	-1.3	-1.3	-0.9	-1.1	-1.3				
HOURLY AVG	-10.8	-11.0	-11.3	-11.3	-11.6	-11.9	-11.8	-12.1	-12.3	-11.6	-9.7	-8.0	-7.1	-6.6	-6.8	-8.0	-9.0	-9.6	-9.9	-10.0	-10.1	-10.2	-10.2	-10.2	-10.3			

STATUS FLAG CODES

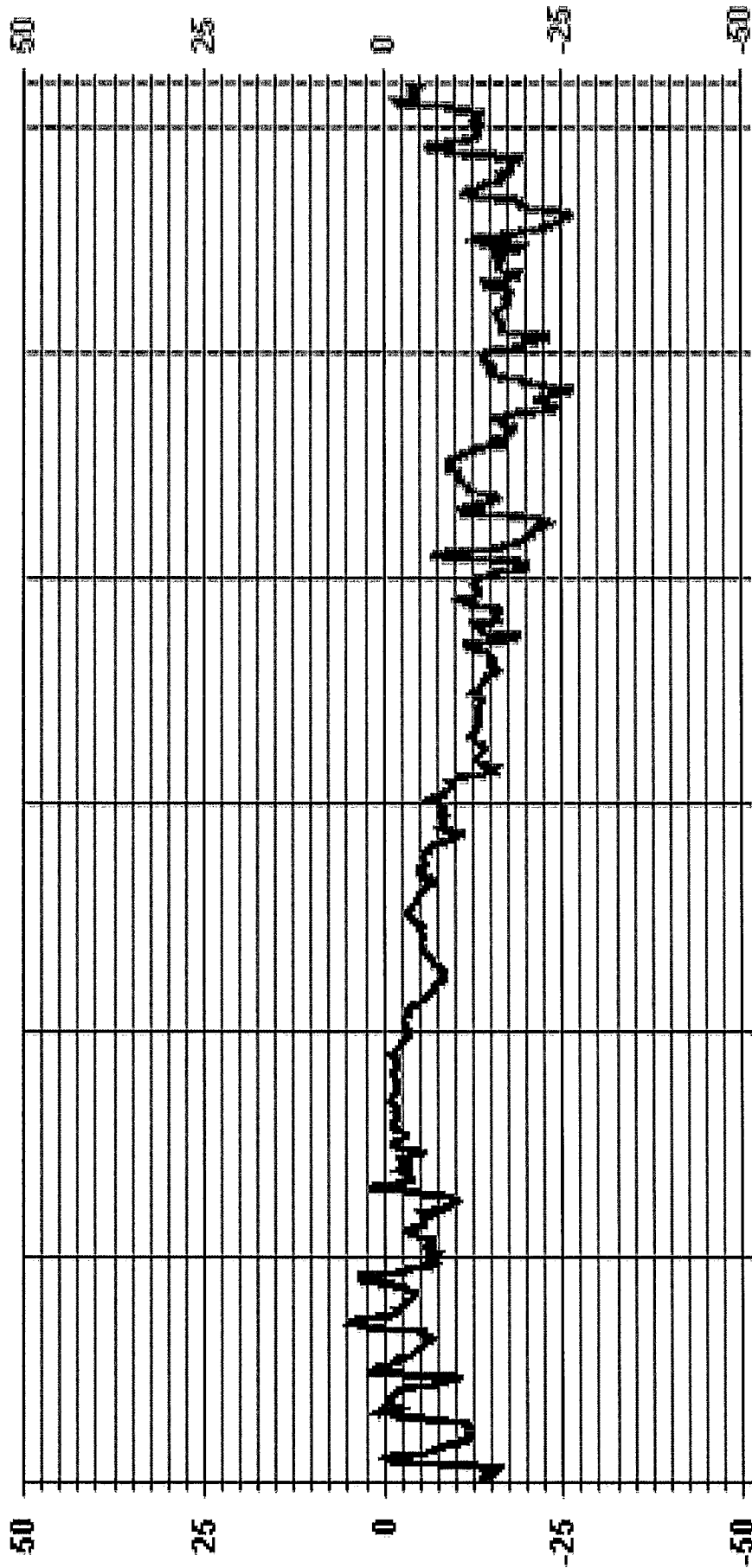
C	CALIBRATION	O	QUALITY ASSURANCE
V	MAINTENANCE	R	RECOVERY
S	DATA ZERO SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUTFLOW REPAIR	K	COLLECTION ERROR



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-26.7	°C	@ HOUR(S)	5	ON DAY(S)	25
MAXIMUM 1-HR AVERAGE:	4.5	°C	@ HOUR(S)	13	ON DAY(S)	4
MAXIMUM 24-HR AVERAGE:	-1.6	°C			VAR-VARIOUS	9
STANDARD DEVIATION:	6.49					
OPERATIONAL TIME:						744 HRS
AMTD OPERATION UPTIME:						100.0 %
MONTHLY AVERAGE:						-10.1 °C

01 Hour Averages

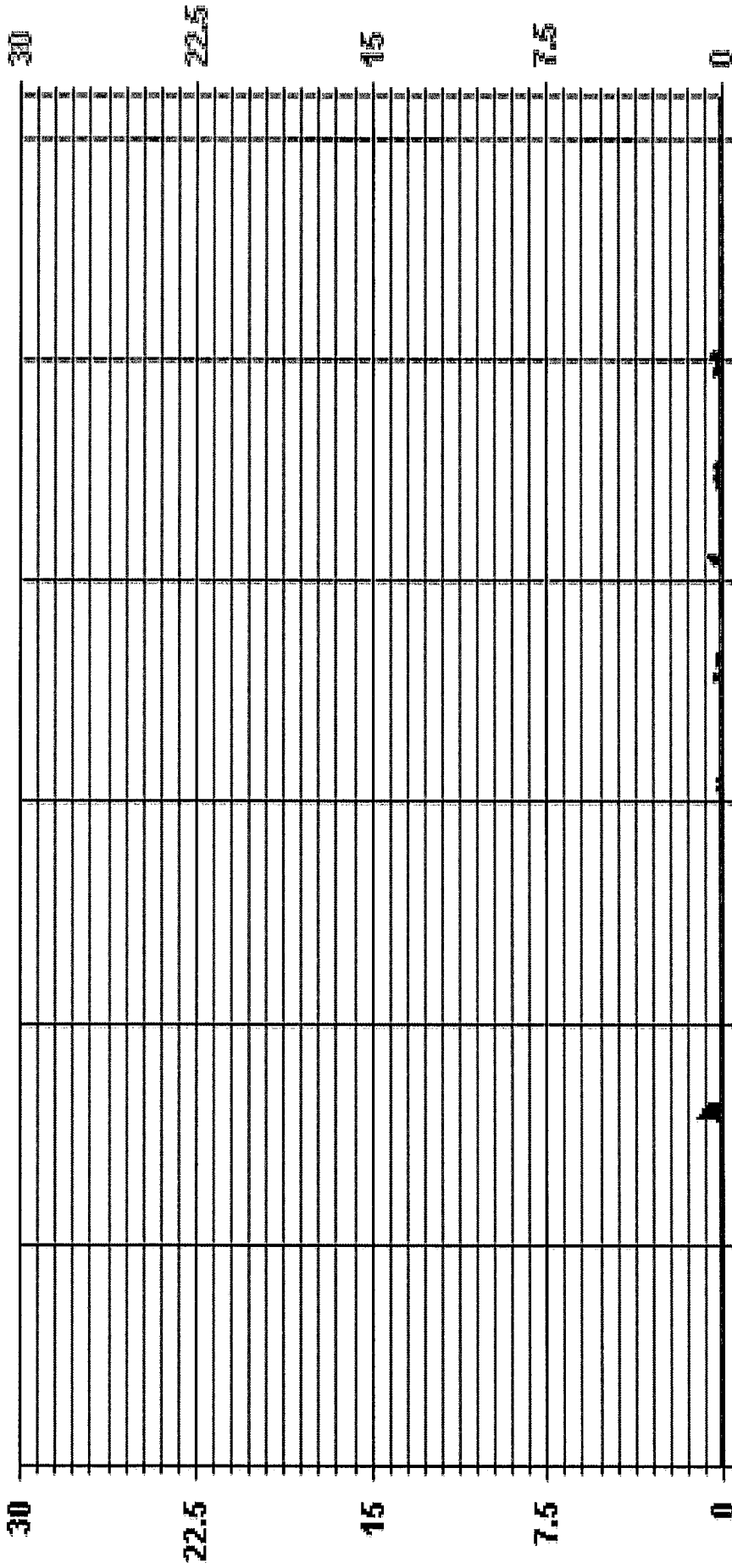


12:01:15 00:00:12:06:15 00:00:12:11:15 00:00:12:16:15 00:00:12:21:15 00:00:12:26:15 00:00:12:31:15 00:00

— LICA30 TPX DGC

PRECIPITATION

01 Hour Averages




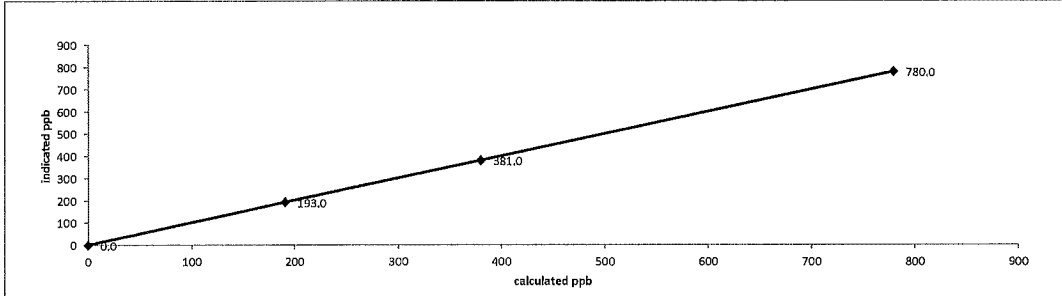
12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA30 PRECIP MM

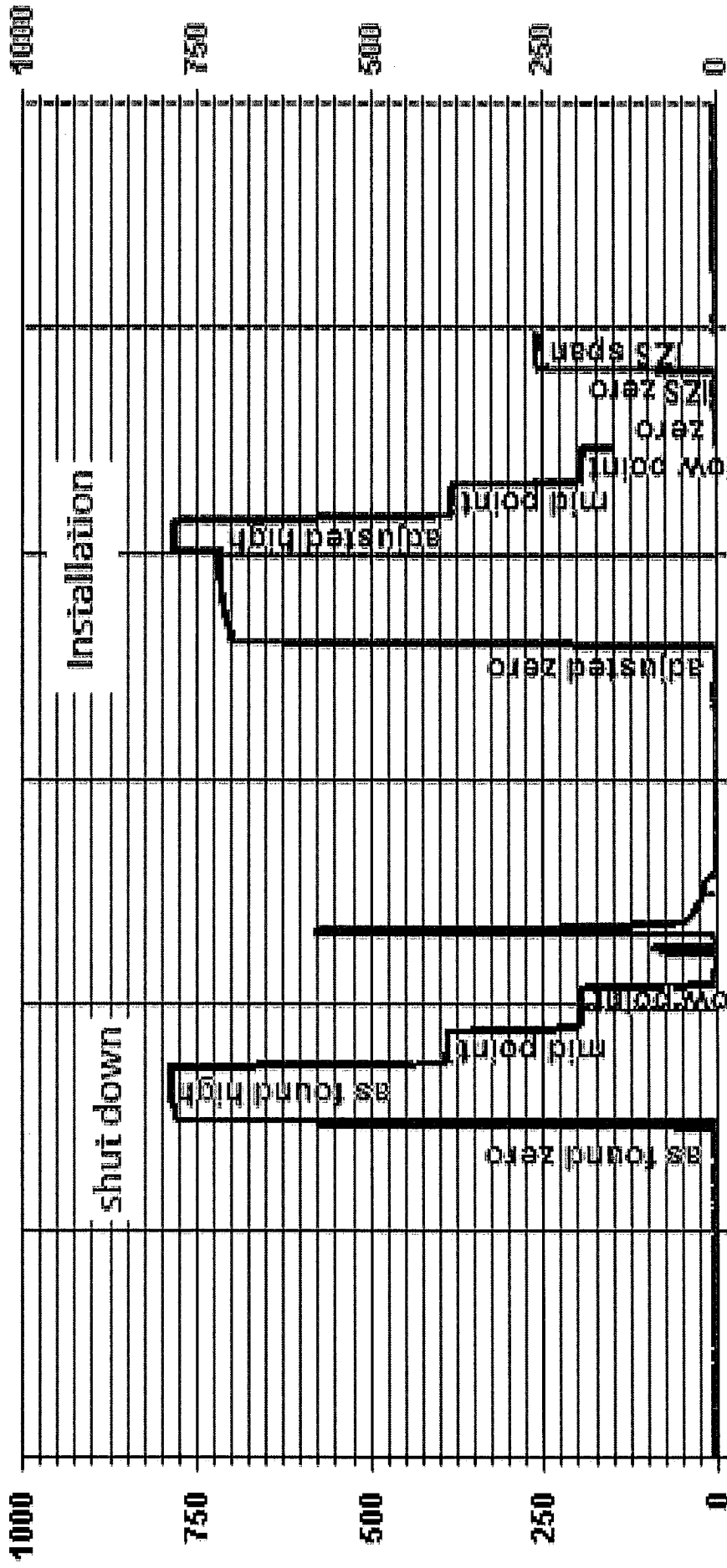
APPENDIX II
ANALYZER CALIBRATION RESULTS

SULPHUR DIOXIDE

API 100A Sulphur Dioxide Analyzer Calibration																																											
<p>Date: December 2, 2015</p> <p>Company/Airshed: LICA</p> <p>Location/Station Name: Maskwa</p> <p>Parameter: Sulphur Dioxide</p> <p>Start Time 24 hr. (mst): 12:23</p> <p>End Time 24 hr. (mst): 14:17</p> <p>Calibration Method: Gas Dilution</p>	<p>Barometric Pressure: 0.916 atm</p> <p>Station Temperature °C: 20</p> <p>Weather Conditions: A few clouds</p> <p>Calibration Purpose: shut down</p> <p>Performed By/Reviewer: Alex Yakupov Trina Whitsitt</p> <p>Cal Gas Expiry Date: March 12, 2019</p> <p>Converter Model & s/n (if applicable): n/a</p>																																										
<p>Analyzer:</p> <p>Serial Number: 1124 Range ppb: 1000</p> <p>Last Calibration Date: November 12, 2015 As Found C.F.: 0.994</p> <p>Previous C.F.: 1.000 New C.F.: n/a</p>																																											
<p>Calibrator:</p> <p>Flow Meter ID's: n/a</p> <p>Make & Model: SABIO 2010 D</p> <p>Serial #: 11900613</p> <p>Cal Gas Cylinder I.D. #: BLM002073</p> <p>Cal Gas Conc. (ppm): 49.5</p>																																											
<p>Standard Calibration Points for Ranges</p> <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																																										
<p><i>ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015</i></p>																																											
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Callibrator Flow Rates (cc/min)</th> <th>Cal Gas</th> <th>Total</th> <th>Calculated Concentration: (ppb)</th> <th>Indicated Concentration: (ppb)</th> <th>Correction Factors (C.F.):</th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>5013</td> <td>0.00</td> <td>5013</td> <td>0.0</td> <td>0.7</td> <td>N/A</td> </tr> <tr> <td>as found high</td> <td>4936</td> <td>79.00</td> <td>5015</td> <td>779.8</td> <td>785.0</td> <td>0.994</td> </tr> <tr> <td>mid</td> <td>4976</td> <td>38.50</td> <td>5015</td> <td>380.0</td> <td>388.0</td> <td>0.981</td> </tr> <tr> <td>low</td> <td>4994</td> <td>19.30</td> <td>5013</td> <td>190.6</td> <td>196.0</td> <td>0.976</td> </tr> <tr> <td colspan="6" style="text-align: right;">Average C.F. =</td> <td>0.984</td> </tr> </tbody> </table>		Point	Callibrator Flow Rates (cc/min)	Cal Gas	Total	Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):	as found zero	5013	0.00	5013	0.0	0.7	N/A	as found high	4936	79.00	5015	779.8	785.0	0.994	mid	4976	38.50	5015	380.0	388.0	0.981	low	4994	19.30	5013	190.6	196.0	0.976	Average C.F. =						0.984
Point	Callibrator Flow Rates (cc/min)	Cal Gas	Total	Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):																																					
as found zero	5013	0.00	5013	0.0	0.7	N/A																																					
as found high	4936	79.00	5015	779.8	785.0	0.994																																					
mid	4976	38.50	5015	380.0	388.0	0.981																																					
low	4994	19.30	5013	190.6	196.0	0.976																																					
Average C.F. =						0.984																																					
<p>Linear Regression/Calibration Results:</p> <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 = 0.995</td> <td>0.90-1.10</td> </tr> <tr> <td>b (Intercept as % of full scale) = -0.32%</td> <td>± 3% F.S.</td> </tr> <tr> <td>% change in C.F. from last cal = 0.58%</td> <td>± 10%</td> </tr> </table>		Correlation Coefficient = 1.000	LIMITS > or = 0.995	Slope = 0.995	0.90-1.10	b (Intercept as % of full scale) = -0.32%	± 3% F.S.	% change in C.F. from last cal = 0.58%	± 10%																																		
Correlation Coefficient = 1.000	LIMITS > or = 0.995																																										
Slope = 0.995	0.90-1.10																																										
b (Intercept as % of full scale) = -0.32%	± 3% F.S.																																										
% change in C.F. from last cal = 0.58%	± 10%																																										
<p>API 100A Sulphur Dioxide Analyzer Calibration</p>																																											
<table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>As found:</p> <p>SLOPE: 0.957</p> <p>OFFSET: 23.5</p> <p>HVPS: 782</p> <p>DCPS: 2566</p> <p>RCELL TEMP: 50.0</p> <p>BOX TEMP: 30.4</p> <p>PMT TEMP: 7.1</p> <p>IZS TEMP: 45.0</p> <p>Converter Temp: n/a</p> <p>PRES: 24.8</p> <p>SAMP FL: 658</p> <p>PMT: 57.1</p> <p>UV LAMP: 2486.3</p> <p>LAMP RATIO: 124.8</p> <p>STR. LGT: 11.2</p> <p>DRK PMT: 34.7</p> <p>DRK LMP: -11.9</p> <p>Internal Span: 234.2</p> </td> <td style="width: 50%; vertical-align: top;"> <p>As left:</p> <p>SLOPE: n/a</p> <p>OFFSET: n/a</p> <p>HVPS: n/a</p> <p>DCPS: n/a</p> <p>RCELL TEMP: n/a</p> <p>BOX TEMP: n/a</p> <p>PMT TEMP: n/a</p> <p>IZS TEMP: n/a</p> <p>Converter Temp: n/a</p> <p>PRES: n/a</p> <p>SAMP FL: n/a</p> <p>PMT: n/a</p> <p>UV LAMP: n/a</p> <p>LAMP RATIO: n/a</p> <p>STR. LGT: n/a</p> <p>DRK PMT: n/a</p> <p>DRK LMP: n/a</p> <p>Internal Span: n/a</p> </td> </tr> </table>		<p>As found:</p> <p>SLOPE: 0.957</p> <p>OFFSET: 23.5</p> <p>HVPS: 782</p> <p>DCPS: 2566</p> <p>RCELL TEMP: 50.0</p> <p>BOX TEMP: 30.4</p> <p>PMT TEMP: 7.1</p> <p>IZS TEMP: 45.0</p> <p>Converter Temp: n/a</p> <p>PRES: 24.8</p> <p>SAMP FL: 658</p> <p>PMT: 57.1</p> <p>UV LAMP: 2486.3</p> <p>LAMP RATIO: 124.8</p> <p>STR. LGT: 11.2</p> <p>DRK PMT: 34.7</p> <p>DRK LMP: -11.9</p> <p>Internal Span: 234.2</p>	<p>As left:</p> <p>SLOPE: n/a</p> <p>OFFSET: n/a</p> <p>HVPS: n/a</p> <p>DCPS: n/a</p> <p>RCELL TEMP: n/a</p> <p>BOX TEMP: n/a</p> <p>PMT TEMP: n/a</p> <p>IZS TEMP: n/a</p> <p>Converter Temp: n/a</p> <p>PRES: n/a</p> <p>SAMP FL: n/a</p> <p>PMT: n/a</p> <p>UV LAMP: n/a</p> <p>LAMP RATIO: n/a</p> <p>STR. LGT: n/a</p> <p>DRK PMT: n/a</p> <p>DRK LMP: n/a</p> <p>Internal Span: n/a</p>																																								
<p>As found:</p> <p>SLOPE: 0.957</p> <p>OFFSET: 23.5</p> <p>HVPS: 782</p> <p>DCPS: 2566</p> <p>RCELL TEMP: 50.0</p> <p>BOX TEMP: 30.4</p> <p>PMT TEMP: 7.1</p> <p>IZS TEMP: 45.0</p> <p>Converter Temp: n/a</p> <p>PRES: 24.8</p> <p>SAMP FL: 658</p> <p>PMT: 57.1</p> <p>UV LAMP: 2486.3</p> <p>LAMP RATIO: 124.8</p> <p>STR. LGT: 11.2</p> <p>DRK PMT: 34.7</p> <p>DRK LMP: -11.9</p> <p>Internal Span: 234.2</p>	<p>As left:</p> <p>SLOPE: n/a</p> <p>OFFSET: n/a</p> <p>HVPS: n/a</p> <p>DCPS: n/a</p> <p>RCELL TEMP: n/a</p> <p>BOX TEMP: n/a</p> <p>PMT TEMP: n/a</p> <p>IZS TEMP: n/a</p> <p>Converter Temp: n/a</p> <p>PRES: n/a</p> <p>SAMP FL: n/a</p> <p>PMT: n/a</p> <p>UV LAMP: n/a</p> <p>LAMP RATIO: n/a</p> <p>STR. LGT: n/a</p> <p>DRK PMT: n/a</p> <p>DRK LMP: n/a</p> <p>Internal Span: n/a</p>																																										
<p>Comments:</p> <p style="text-align: center;">Shutdown calibration performed to replace a Maxxam analyzer with a LICA analyzer, which has been repaired.</p>																																											


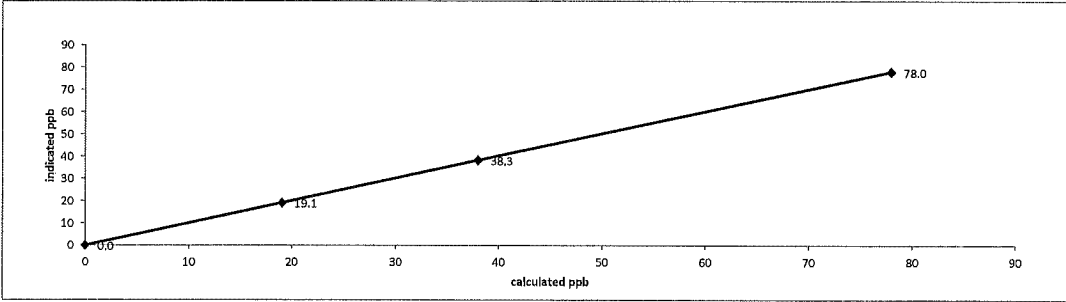
 API 100E Sulphur Dioxide Analyzer Calibration																																																									
Date: December 2, 2015 Company/Airshed: LICA Location/Station Name: Maskwa Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 16:34 End Time 24 hr. (mst): 20:12 Calibration Method: Gas Dilution	Barometric Pressure: 0.916 atm Station Temperature °C: 20 Weather Conditions: A few clouds Calibration Purpose: Installation Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: March 12, 2019 Converter Model & s/n (if applicable): n/a																																																								
Analyzer: Serial Number: 508 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: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: BLM002073 Cal Gas Conc. (ppm): 49.5																																																									
Standard Calibration Points for Ranges																																																									
<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																																																								
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>5013</td> <td>0.00</td> <td>5013</td> <td>0.0</td> <td>0.0</td> <td>N/A</td> </tr> <tr> <td>adjusted high</td> <td>4936</td> <td>79.00</td> <td>5015</td> <td>779.8</td> <td>780.0</td> <td>1.000</td> </tr> <tr> <td>mid</td> <td>4976</td> <td>38.50</td> <td>5015</td> <td>380.0</td> <td>381.0</td> <td>0.998</td> </tr> <tr> <td>low</td> <td>4994</td> <td>19.30</td> <td>5013</td> <td>190.6</td> <td>193.0</td> <td>0.987</td> </tr> <tr> <td>calibrator zero</td> <td>5013</td> <td>0.00</td> <td>5013</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>0.995</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	5013	0.00	5013	0.0	0.0	N/A	adjusted high	4936	79.00	5015	779.8	780.0	1.000	mid	4976	38.50	5015	380.0	381.0	0.998	low	4994	19.30	5013	190.6	193.0	0.987	calibrator zero	5013	0.00	5013	0.0	0.0	n/a	Average C.F. =						0.995
Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):																																																			
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)																																																				
adjusted zero	5013	0.00	5013	0.0	0.0	N/A																																																			
adjusted high	4936	79.00	5015	779.8	780.0	1.000																																																			
mid	4976	38.50	5015	380.0	381.0	0.998																																																			
low	4994	19.30	5013	190.6	193.0	0.987																																																			
calibrator zero	5013	0.00	5013	0.0	0.0	n/a																																																			
Average C.F. =						0.995																																																			
Linear Regression/Calibration Results:																																																									
Correlation Coefficient = 1.000 LIMITS > or = 0.995 Slope = 1.001 .95-1.05 b (Intercept as % of full scale) = -0.11% ± 3% F.S. % change in C.F. from last cal = n/a ± 10%																																																									
API 100E Sulphur Dioxide 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 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> <td style="width:50%; vertical-align: top;"> As left: SLOPE: 1.115 OFFSET: 83.4 HVPS: 479 RCELL TEMP: 50.0 BOX TEMP: 30.6 PMT TEMP: 7.7 IZS TEMP: 45.0 PRES: 24.4 SAMP FL: 589 NORM PMT: 83.4 UV LAMP: 4191.0 LAMP RATIO: 119.6 STR. LGT: 46.5 DRK PMT: 38.9 DRK LMP: -0.8 Internal Span: 268 </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 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 left: SLOPE: 1.115 OFFSET: 83.4 HVPS: 479 RCELL TEMP: 50.0 BOX TEMP: 30.6 PMT TEMP: 7.7 IZS TEMP: 45.0 PRES: 24.4 SAMP FL: 589 NORM PMT: 83.4 UV LAMP: 4191.0 LAMP RATIO: 119.6 STR. LGT: 46.5 DRK PMT: 38.9 DRK LMP: -0.8 Internal Span: 268																																																						
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 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 left: SLOPE: 1.115 OFFSET: 83.4 HVPS: 479 RCELL TEMP: 50.0 BOX TEMP: 30.6 PMT TEMP: 7.7 IZS TEMP: 45.0 PRES: 24.4 SAMP FL: 589 NORM PMT: 83.4 UV LAMP: 4191.0 LAMP RATIO: 119.6 STR. LGT: 46.5 DRK PMT: 38.9 DRK LMP: -0.8 Internal Span: 268																																																								
Comments: Sample filter changed. Installation calibration performed to replace a Maxxam analyzer with a LICA analyzer, which has been repaired.																																																									

01 Minute Averages

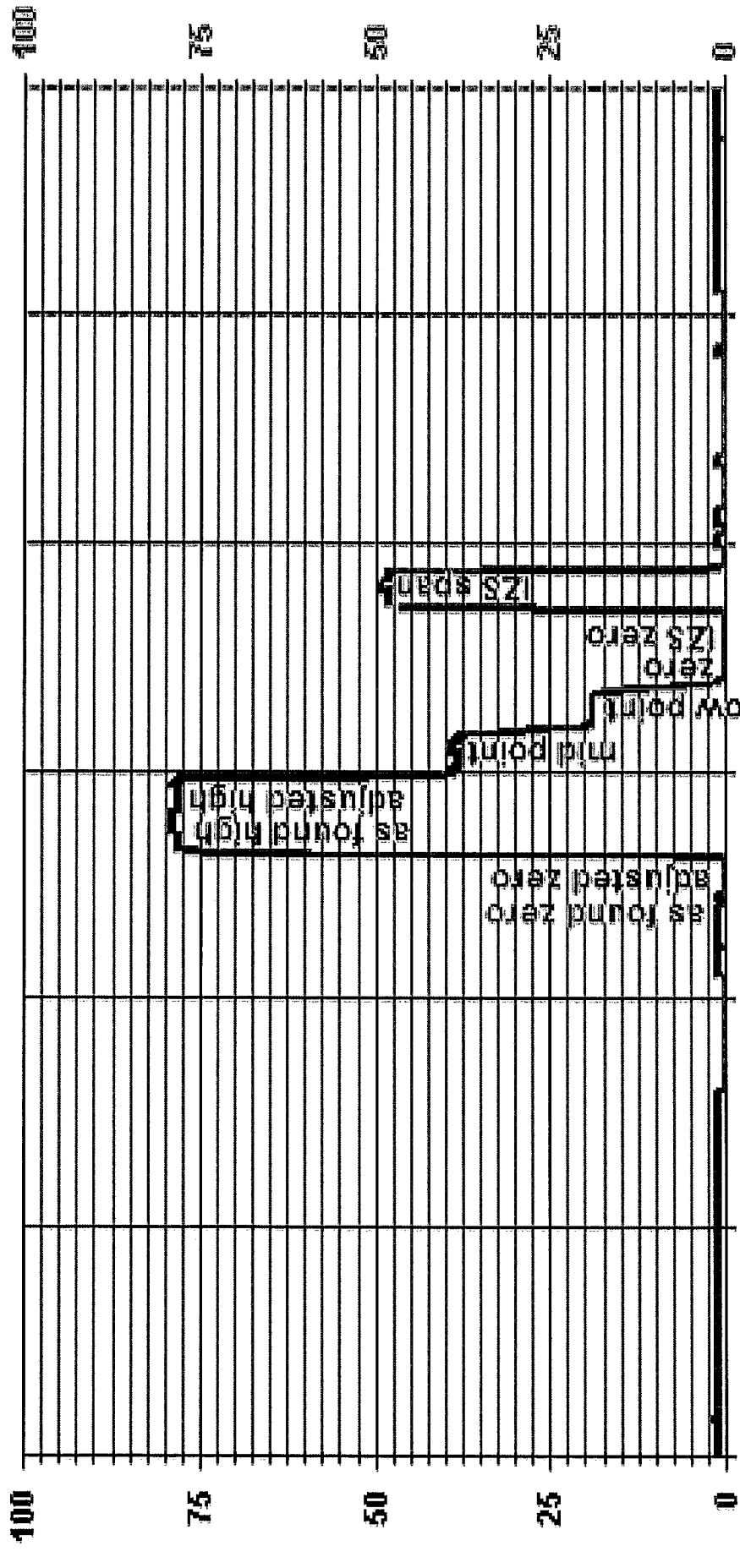


— LIC430 SO2_ PPB

HYDROGEN SULPHIDE

 API 101E Hydrogen Sulphide Analyzer Calibration																																																																			
Date: December 3, 2015 Company/Alrshed: LICA Location/Station Name: Maskwa Parameter: Hydrogen Sulphide Start Time 24 hr. (mst): 12:01 End Time 24 hr. (mst): 15:20 Calibration Method: Gas Dilution	Barometric Pressure: 0.916 atm Station Temperature °C: 20 Weather Conditions: Mainly sunny Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov / Trina Whitsitt Cal Gas Expiry Date: July 15, 2017 Converter Model & s/n (if applicable): n/a																																																																		
Analyzer: Serial Number: 511 Range ppb: 100 Last Calibration Date: November 12, 2015 As Found C.F.: 1.009 Previous C.F.: 1.000 New C.F.: 1.000																																																																			
Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 830 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 rowspan="2">Point</th> <th colspan="3">Calibrator Flow Rates (cc/min)</th> <th rowspan="2">Calculated Concentration: (ppb)</th> <th rowspan="2">Indicated Concentration: (ppb)</th> <th rowspan="2">Correction Factors (C.F.):</th> </tr> <tr> <th>Diluent</th> <th>Cal Gas</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>7497</td> <td>0.00</td> <td>7497</td> <td>0.0</td> <td>0.6</td> <td>N/A</td> </tr> <tr> <td>as found high</td> <td>7442</td> <td>58.50</td> <td>7501</td> <td>78.0</td> <td>77.9</td> <td>1.009</td> </tr> <tr> <td>adjusted zero</td> <td>7497</td> <td>0.00</td> <td>7497</td> <td>0.0</td> <td>0.0</td> <td>n/a</td> </tr> <tr> <td>adjusted high</td> <td>7442</td> <td>58.50</td> <td>7501</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>38.3</td> <td>0.992</td> </tr> <tr> <td>low</td> <td>7486</td> <td>14.30</td> <td>7500</td> <td>19.1</td> <td>19.1</td> <td>0.998</td> </tr> <tr> <td>calibrator zero</td> <td>7497</td> <td>0.00</td> <td>7497</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>0.997</td> </tr> </tbody> </table>		Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):	Diluent	Cal Gas	Total	as found zero	7497	0.00	7497	0.0	0.6	N/A	as found high	7442	58.50	7501	78.0	77.9	1.009	adjusted zero	7497	0.00	7497	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	38.3	0.992	low	7486	14.30	7500	19.1	19.1	0.998	calibrator zero	7497	0.00	7497	0.0	0.0	n/a	Average C.F.=						0.997
Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)				Correction Factors (C.F.):																																																										
	Diluent	Cal Gas	Total																																																																
as found zero	7497	0.00	7497	0.0	0.6	N/A																																																													
as found high	7442	58.50	7501	78.0	77.9	1.009																																																													
adjusted zero	7497	0.00	7497	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	38.3	0.992																																																													
low	7486	14.30	7500	19.1	19.1	0.998																																																													
calibrator zero	7497	0.00	7497	0.0	0.0	n/a																																																													
Average C.F.=						0.997																																																													
Linear Regression/Calibration Results:																																																																			
<table style="width:100%;"> <tr> <td style="width:50%;"> Correlation Coefficient = 1.000 Slope = 1.000 b (Intercept as % of full scale) = -0.07% % change in C.F. from last cal = -0.90% </td> <td style="width:50%; vertical-align: top;"> LIMITS > or = 0.995 .95-1.05 ± 3% F.S. ± 10% </td> </tr> </table>		Correlation Coefficient = 1.000 Slope = 1.000 b (Intercept as % of full scale) = -0.07% % change in C.F. from last cal = -0.90%	LIMITS > or = 0.995 .95-1.05 ± 3% F.S. ± 10%																																																																
Correlation Coefficient = 1.000 Slope = 1.000 b (Intercept as % of full scale) = -0.07% % change in C.F. from last cal = -0.90%	LIMITS > or = 0.995 .95-1.05 ± 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: 0.837 OFFSET: 51.6 HVPS: 616 RCELL TEMP: 50.0 BOX TEMP: 32.2 PMT TEMP: 7.9 IZS TEMP: 45.0 Converter Temp: 314.4 PRES: 28.4 SAMP FL: 637 UV LAMP: 2540.8 LAMP RATIO: 81.9 STR. LGT: 22.1 DRK PMT: 33.3 DRK LMP: 5.5 Internal Span: 47.85 </td> <td style="width:50%; vertical-align: top;"> As left: SLOPE: 0.826 OFFSET: 52.4 HVPS: 616 RCELL TEMP: 50.0 BOX TEMP: 32.3 PMT TEMP: 7.9 IZS TEMP: 45.0 Converter Temp: 315.1 PRES: 28.3 SAMP FL: 636 UV LAMP: 2539.1 LAMP RATIO: 81.9 STR. LGT: 21.6 DRK PMT: 33.8 DRK LMP: 5.5 Internal Span: 48.2 </td> </tr> </table>		As found: SLOPE: 0.837 OFFSET: 51.6 HVPS: 616 RCELL TEMP: 50.0 BOX TEMP: 32.2 PMT TEMP: 7.9 IZS TEMP: 45.0 Converter Temp: 314.4 PRES: 28.4 SAMP FL: 637 UV LAMP: 2540.8 LAMP RATIO: 81.9 STR. LGT: 22.1 DRK PMT: 33.3 DRK LMP: 5.5 Internal Span: 47.85	As left: SLOPE: 0.826 OFFSET: 52.4 HVPS: 616 RCELL TEMP: 50.0 BOX TEMP: 32.3 PMT TEMP: 7.9 IZS TEMP: 45.0 Converter Temp: 315.1 PRES: 28.3 SAMP FL: 636 UV LAMP: 2539.1 LAMP RATIO: 81.9 STR. LGT: 21.6 DRK PMT: 33.8 DRK LMP: 5.5 Internal Span: 48.2																																																																
As found: SLOPE: 0.837 OFFSET: 51.6 HVPS: 616 RCELL TEMP: 50.0 BOX TEMP: 32.2 PMT TEMP: 7.9 IZS TEMP: 45.0 Converter Temp: 314.4 PRES: 28.4 SAMP FL: 637 UV LAMP: 2540.8 LAMP RATIO: 81.9 STR. LGT: 22.1 DRK PMT: 33.3 DRK LMP: 5.5 Internal Span: 47.85	As left: SLOPE: 0.826 OFFSET: 52.4 HVPS: 616 RCELL TEMP: 50.0 BOX TEMP: 32.3 PMT TEMP: 7.9 IZS TEMP: 45.0 Converter Temp: 315.1 PRES: 28.3 SAMP FL: 636 UV LAMP: 2539.1 LAMP RATIO: 81.9 STR. LGT: 21.6 DRK PMT: 33.8 DRK LMP: 5.5 Internal Span: 48.2																																																																		
Comments: <div style="text-align: center;">Sample filter changed.</div>																																																																			

01 Minute Averages

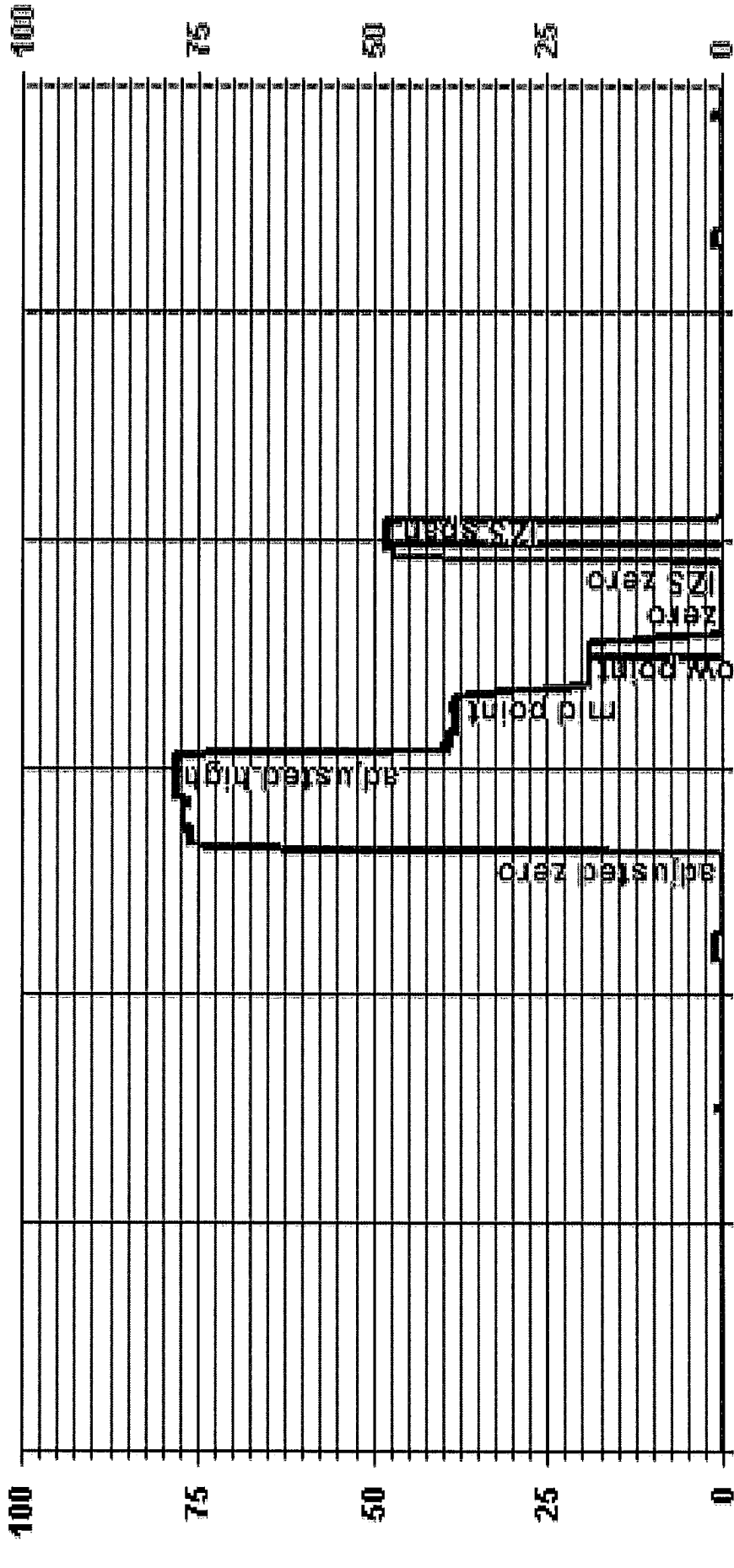


12/03/15 07:30 12/03/15 09:30 12/03/15 11:30 12/03/15 13:30 12/03/15 15:30 12/03/15 17:30

— LICA30 H2S_ PPB

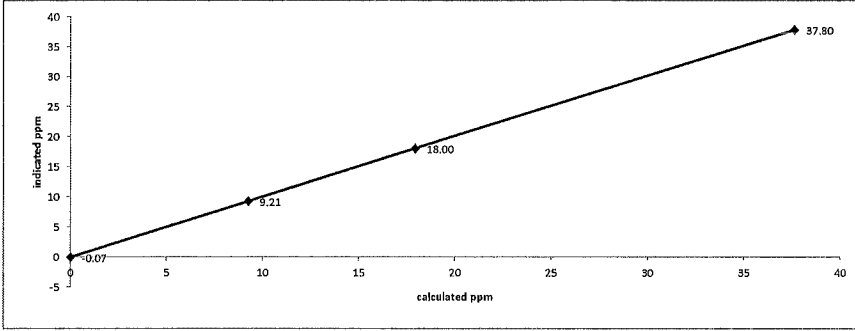
API 101E Hydrogen Sulphide Analyzer Calibration																																																									
Date: December 18, 2015 Company/Airshed: LICA Location/Station Name: Maskwa Parameter: Hydrogen Sulphide Start Time 24 hr. (mst): 9:46 End Time 24 hr. (mst): 13:15 Calibration Method: Gas Dilution	Barometric Pressure: 0.920 atm Station Temperature °C: 20 Weather Conditions: Mainly cloudy with snow Calibration Purpose: post repair Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: July 15, 2017 Converter Model & s/n (if applicable): n/a																																																								
Analyzer: Serial Number: 511 Range ppb: 100 Last Calibration Date: n/a As Found C.F.: n/a Previous C.F.: n/a New C.F.: 0.999																																																									
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>adjusted zero</td> <td>7515</td> <td>0.00</td> <td>7515</td> <td>0.0</td> <td>0.0</td> <td>N/A</td> </tr> <tr> <td>adjusted high</td> <td>7459</td> <td>58.60</td> <td>7518</td> <td>78.0</td> <td>78.0</td> <td>0.999</td> </tr> <tr> <td>mid</td> <td>7490</td> <td>28.60</td> <td>7519</td> <td>38.0</td> <td>38.2</td> <td>0.996</td> </tr> <tr> <td>low</td> <td>7504</td> <td>14.40</td> <td>7518</td> <td>19.2</td> <td>19.0</td> <td>1.008</td> </tr> <tr> <td>calibrator zero</td> <td>7515</td> <td>0.00</td> <td>7515</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>1.001</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	7515	0.00	7515	0.0	0.0	N/A	adjusted high	7459	58.60	7518	78.0	78.0	0.999	mid	7490	28.60	7519	38.0	38.2	0.996	low	7504	14.40	7518	19.2	19.0	1.008	calibrator zero	7515	0.00	7515	0.0	0.0	n/a	Average C.F. =						1.001
Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):																																																			
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)																																																				
adjusted zero	7515	0.00	7515	0.0	0.0	N/A																																																			
adjusted high	7459	58.60	7518	78.0	78.0	0.999																																																			
mid	7490	28.60	7519	38.0	38.2	0.996																																																			
low	7504	14.40	7518	19.2	19.0	1.008																																																			
calibrator zero	7515	0.00	7515	0.0	0.0	n/a																																																			
Average C.F. =						1.001																																																			
Linear Regression/Calibration Results:																																																									
Correlation Coefficient = 1.000 LIMITS > or = 0.995 Slope = 0.998 .95-1.05 b (intercept as % of full scale) = 0.04% ± 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 RCCELL 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: 0.839 OFFSET: 52.8 HVPS: 61.6 RCCELL TEMP: 50.0 BOX TEMP: 32.0 PMT TEMP: 7.9 IZS TEMP: 45.0 Converter Temp: 315.0 PRES: 28.8 SAMP FL: 644 UV LAMP: 2528.1 LAMP RATIO: 81.3 STR. LGT: 22.2 DRK PMT: 34.2 DRK LMP: 5.5 Internal Span: 48.2 </td> </tr> </table>		As found: SLOPE: n/a OFFSET: n/a HVPS: n/a RCCELL 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: 0.839 OFFSET: 52.8 HVPS: 61.6 RCCELL TEMP: 50.0 BOX TEMP: 32.0 PMT TEMP: 7.9 IZS TEMP: 45.0 Converter Temp: 315.0 PRES: 28.8 SAMP FL: 644 UV LAMP: 2528.1 LAMP RATIO: 81.3 STR. LGT: 22.2 DRK PMT: 34.2 DRK LMP: 5.5 Internal Span: 48.2																																																						
As found: SLOPE: n/a OFFSET: n/a HVPS: n/a RCCELL 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: 0.839 OFFSET: 52.8 HVPS: 61.6 RCCELL TEMP: 50.0 BOX TEMP: 32.0 PMT TEMP: 7.9 IZS TEMP: 45.0 Converter Temp: 315.0 PRES: 28.8 SAMP FL: 644 UV LAMP: 2528.1 LAMP RATIO: 81.3 STR. LGT: 22.2 DRK PMT: 34.2 DRK LMP: 5.5 Internal Span: 48.2																																																								
Comments: Sampling pump Model 107CAB18 was rebuilt. Sampling filter was changed on December 3, 2015. After the calibration EV has not changed.																																																									

01 Minute Averages



— LICA30 H2S_ PPB

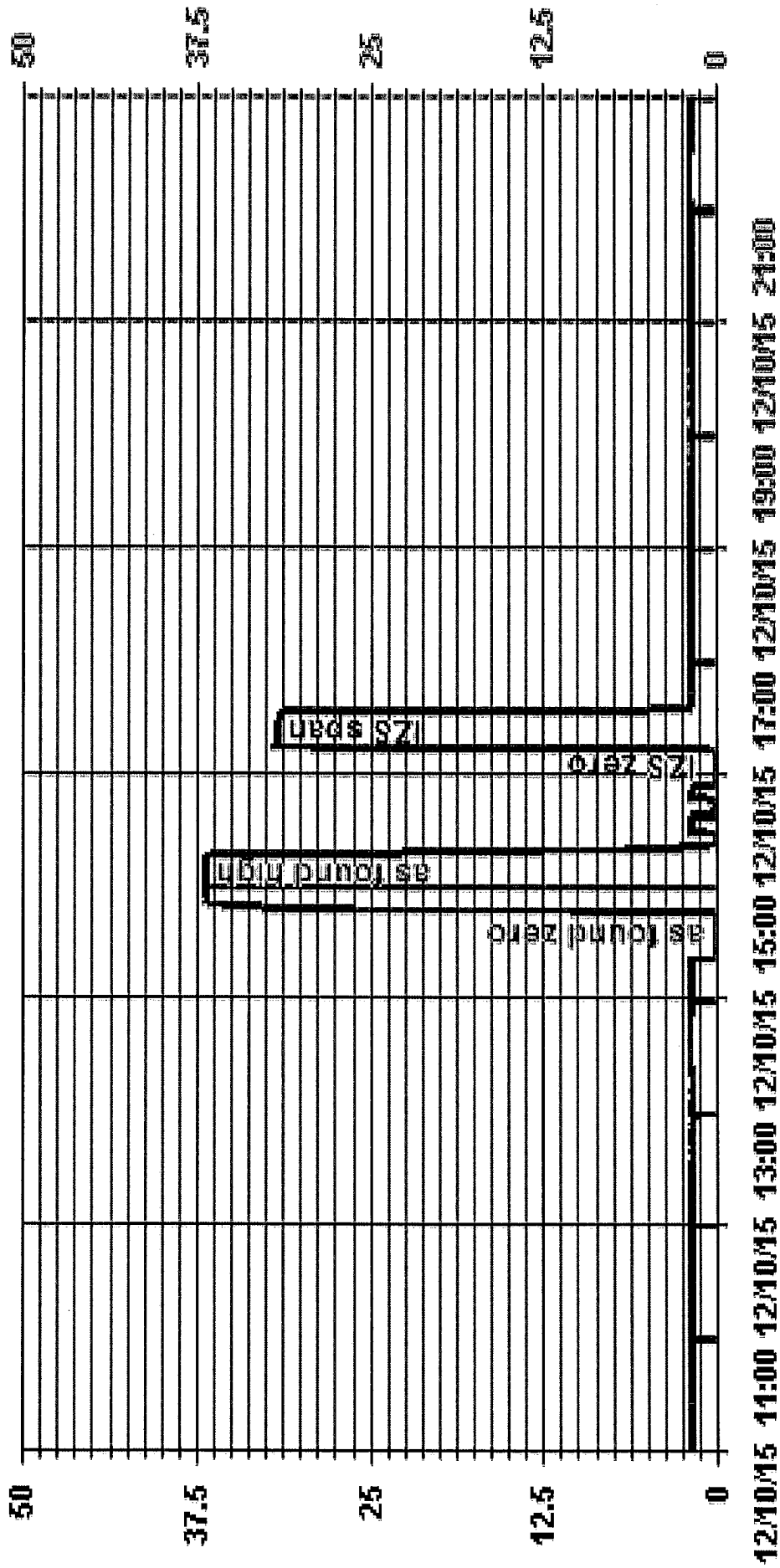
TOTAL HYDROCARBON

Maxxam		Thermo 51C Total Hydrocarbon Analyzer Calibration																																																
Date: December 2, 2015		Barometric Pressure: 0.916 atm																																																
Company/Airshed: LICA		Station Temperature °C: 20																																																
Location/Station Name: Maskwa		Weather Conditions: A few clouds																																																
Parameter: Total Hydrocarbon		Calibration Purpose: shut down																																																
Start/End Time 24 hr. (mst): 12:23 / 14:01		Performed By/Reviewer: Alex Yakupov Trina Whitsett																																																
Calibration Method: Gas Dilution		Cal Gas Expiry Date: March 26, 2017																																																
Analyzer:																																																		
Serial Number: 436609738		Range ppm: 50																																																
Last Calibration Date: November 12, 2015		As Found C.F.: 0.994																																																
Previous Cal High Point C.F.: 0.999		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 #: 830																																																		
Cal Gas Cylinder I.D. #: LL33674																																																		
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm): 601.4 202.0																																																		
CH ₄ as propane/total CH ₄ equivalents (ppm): 555.5 1156.9		<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target ppm</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mid</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </tbody> </table>		Point	Target ppm	High	38	Mid	18	Low	9																																							
Point	Target ppm																																																	
High	38																																																	
Mid	18																																																	
Low	9																																																	
<i>ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015</i>																																																		
Calibrator Flow Rates (cc/min)																																																		
<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 rowspan="2">Correction Factors:</th> </tr> <tr> <th>Diluent</th> <th>Cal Gas</th> <th>Total</th> <th>(ppm)</th> <th>(ppm)</th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>1999</td> <td>0.00</td> <td>1999</td> <td>0.0</td> <td>-0.07</td> <td>n/a</td> </tr> <tr> <td>as found high</td> <td>1932</td> <td>65.00</td> <td>1997</td> <td>37.66</td> <td>37.80</td> <td>0.994</td> </tr> <tr> <td>mid</td> <td>1969</td> <td>31.00</td> <td>2000</td> <td>17.93</td> <td>18.00</td> <td>0.992</td> </tr> <tr> <td>low</td> <td>1984</td> <td>16.00</td> <td>2000</td> <td>9.26</td> <td>9.21</td> <td>0.997</td> </tr> <tr> <td colspan="6" style="text-align: right;">Average C.F. =</td> <td>0.995</td> </tr> </tbody> </table>				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	-0.07	n/a	as found high	1932	65.00	1997	37.66	37.80	0.994	mid	1969	31.00	2000	17.93	18.00	0.992	low	1984	16.00	2000	9.26	9.21	0.997	Average C.F. =						0.995
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	-0.07	n/a																																												
as found high	1932	65.00	1997	37.66	37.80	0.994																																												
mid	1969	31.00	2000	17.93	18.00	0.992																																												
low	1984	16.00	2000	9.26	9.21	0.997																																												
Average C.F. =						0.995																																												
Linear Regression/Calibration Results:																																																		
Correlation Coefficient = 1.000		LIMITS > or = 0.995																																																
Slope = 0.994		.9S-1.0S																																																
b (Intercept as % of full scale) = 0.15%		± 3% F.S.																																																
% change in C.F. from last cal = 0.47%		± 10%																																																
Thermo 51C Total Hydrocarbon Analyzer Calibration																																																		
																																																		
As found:		As left:																																																
H2 cylinder (psi): 750		H2 cylinder (psi): n/a																																																
H2 cylinder reg set (psi): 25		H2 cylinder reg set (psi): n/a																																																
Span Cylinder (psi): 500		Span Cylinder (psi): n/a																																																
Span Cylinder Reg Set (psi): 22		Span Cylinder Reg Set (psi): n/a																																																
Zero Air Gen Pressure: 35		Zero Air Gen Pressure: n/a																																																
measurement alarms: None		measurement alarms: n/a																																																
service alarms: Flow Regulator Fail		service alarms: n/a																																																
cnt: 819		cnt: n/a																																																
rng: 1		rng: n/a																																																
try: 0		try: n/a																																																
flm: 178.9		flm: n/a																																																
det: 125.7		det: n/a																																																
Flame: 178		Flame: n/a																																																
Filter: 125		Filter: n/a																																																
Base: 125		Base: n/a																																																
Sample psi: 07.52		Sample psi: n/a																																																
Internal Air Pressure: 21		Internal Air Pressure: n/a																																																
Internal Fuel Pressure: 10		Internal Fuel Pressure: n/a																																																
Internal Pressure Gauge psi: 27		Internal Pressure Gauge psi: n/a																																																
Internal Span: 34		Internal Span: n/a																																																
Comments:																																																		
Shutdown calibration performed to complete service maintenance on the analyzer. Reason: internal pump/flow regulator needs to be rebuilt/changed.																																																		

Maxxam <small>Maxxam Analytical Systems Company</small>		Thermo 51C Total Hydrocarbon Analyzer Calibration											
Date: December 2, 2015		Barometric Pressure: 0.916 atm											
Company/Alrshed: LICA		Station Temperature °C: 20											
Location/Station Name: Maskwa		Weather Conditions: A few clouds											
Parameter: Total Hydrocarbon		Calibration Purpose: Installation											
Start/End Time 24 hr. (mst): 15:06 / 18:44		Performed By/Reviewer: Alex Yakupov / Trina Whitlitt											
Calibration Method: Gas Dilution		Cal Gas Expiry Date: March 26, 2017											
Analyzer:													
Serial Number: 436609739		Range ppm: 50											
Last Calibration Date: n/a		As Found C.F.: n/a											
Previous Cal High Point C.F.: n/a		New C.F.: 1.000											
Calibrator:													
Flow Meter ID's: n/a		<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Standard Calibration Points for a Range of: 50 ppm</th> </tr> <tr> <th>Point</th> <th>Target ppm</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mid</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </tbody> </table>		Standard Calibration Points for a Range of: 50 ppm		Point	Target ppm	High	38	Mid	18	Low	9
Standard Calibration Points for a Range of: 50 ppm													
Point	Target ppm												
High	38												
Mid	18												
Low	9												
Make & Model: API 700													
Serial #: 830													
Cal Gas Cylinder I.D., #: LL33674													
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm): 601.4 202.0													
CH ₄ as propane/total CH ₄ equivalents (ppm): 555.5 1156.9													
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015													
Calibrator Flow Rates (cc/min)													
Point	Diluent	Cal Gas	Total	Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors							
adjusted zero	1999	0.00	1999	0.0	0.00	n/a							
adjusted high	1932	65.00	1997	37.66	37.67	1.000							
mid	1969	31.00	2000	17.93	17.93	1.000							
low	1984	16.00	2000	9.26	9.23	1.003							
calibrator zero	1999	0.00	1999	0.00	0.00	n/a							
Average C.F. =						1.001							
Linear Regression/Calibration Results:													
Correlation Coefficient = 1.000				LIMITS > or = 0.995									
Slope = 0.999				.95-1.05									
b (Intercept as % of full scale) = 0.03%				± 3% F.S.									
% change in C.F. from last cal = 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													
Internal Pressure Gauge psi: n/a													
Internal Span: n/a													
As left:													
H2 cylinder (psi): 750													
H2 cylinder reg set (psi): 25													
Span Cylinder (psi): 500													
Span Cylinder Reg Set (psi): 22													
Zero Air Gen Pressure: 35													
measurement alarms: None													
service alarms: None													
cnt: 2302													
rng: 1													
try: 3													
flm: 208.8													
det: 125.4													
Flame: 208													
Filter: 125													
Base: 125													
Sample psi: 06.80													
Internal Air Pressure: 22													
Internal Fuel Pressure: 11													
Internal Pressure Gauge psi: 28													
Internal Span: 32.07													
Comments:													
Sample filter changed. Installation calibration performed to replace a previous analyzer for repair/maintenance service. Reason: "Flow Regulator" service alarm.													

Thermo 51C Total Hydrocarbon Analyzer Calibration																																				
Date: <u>December 10, 2015</u> Company/Alrshed: <u>LICA</u> Location/Station Name: <u>Maskwa</u> Parameter: <u>Total Hydrocarbon</u> Start/End Time 24 hr. (mst): <u>15:21-16:13</u> Calibration Method: <u>Gas Dilution</u>	Barometric Pressure: <u>100.4 kPa</u> Station Temperature °C: <u>20</u> Weather Conditions: <u>A few clouds</u> Calibration Purpose: <u>as found</u> Performed By/Reviewer: <u>Raja Abid</u> / <u>Trina Whitsitt</u> Cal Gas Expiry Date: <u>March 26, 2017</u>																																			
Analyzer: Serial Number: <u>436609739</u> Range ppm: <u>50</u> Last Calibration Date: <u>December 2, 2015</u> As Found C.F.: <u>1.017</u> Previous Cal High Point C.F.: <u>1.000</u> New C.F.: <u>n/a</u>																																				
Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>EnviroNics 6100</u> Serial #: <u>4760</u> Cal Gas Cylinder I.D. #: <u>LL33674</u> CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm): <u>601.4</u> <u>202.0</u> CH ₄ as propane/total CH ₄ equivalents (ppm): <u>555.5</u> <u>1156.9</u>																																				
Standard Calibration Points for a Range of 50 ppm																																				
<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Point</th> <th>Target ppm</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mid</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </tbody> </table>		Point	Target ppm	High	38	Mid	18	Low	9																											
Point	Target ppm																																			
High	38																																			
Mid	18																																			
Low	9																																			
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																				
<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:</th> </tr> <tr> <th>Point</th> <th>Diluent</th> <th>Cal Gas</th> <th>Total</th> <th>(ppm)</th> <th>(ppm)</th> <th></th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>1996</td> <td>0.00</td> <td>1996</td> <td>0.0</td> <td>-0.28</td> <td>n/a</td> </tr> <tr> <td>as found high</td> <td>1932</td> <td>65.00</td> <td>1997</td> <td>37.66</td> <td>36.76</td> <td>1.017</td> </tr> <tr> <td colspan="6" style="text-align: right;">Average C.F.=</td> <td>n/a</td> </tr> </tbody> </table>		Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:	Point	Diluent	Cal Gas	Total	(ppm)	(ppm)		as found zero	1996	0.00	1996	0.0	-0.28	n/a	as found high	1932	65.00	1997	37.66	36.76	1.017	Average C.F.=						n/a
Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:																														
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)																															
as found zero	1996	0.00	1996	0.0	-0.28	n/a																														
as found high	1932	65.00	1997	37.66	36.76	1.017																														
Average C.F.=						n/a																														
Linear Regression/Calibration Results: Correlation Coefficient = <u>n/a</u> LIMITS <u>> or = 0.995</u> Slope = <u>n/a</u> <u>.95-1.05</u> b (Intercept as % of full scale) = <u>n/a</u> <u>± 3% F.S.</u> % change in C.F. from last cal = <u>-1.66%</u> <u>± 10%</u>																																				
As found: H2 cylinder (psi): <u>750</u> H2 cylinder reg set (psi): <u>25</u> Span Cylinder (psi): <u>500</u> Span Cylinder Reg Set (psi): <u>22</u> Zero Air Gen Pressure: <u>35</u> measurement alarms: <u>None</u> service alarms: <u>None</u> cnt: <u>3552</u> rng: <u>1</u> try: <u>0</u> flm: <u>207.9</u> det: <u>125.5</u> Flame: <u>208</u> Filter: <u>125</u> Base: <u>125</u> Sample psi: <u>6.81</u> Internal Air Pressure: <u>22</u> Internal Fuel Pressure: <u>11</u> Internal Pressure Gauge psi: <u>28</u> Internal Span: <u>n/a</u>	As left: H2 cylinder (psi): <u>n/a</u> H2 cylinder reg set (psi): <u>n/a</u> Span Cylinder (psi): <u>n/a</u> Span Cylinder Reg Set (psi): <u>n/a</u> Zero Air Gen Pressure: <u>n/a</u> measurement alarms: <u>n/a</u> service alarms: <u>n/a</u> cnt: <u>n/a</u> rng: <u>n/a</u> try: <u>n/a</u> flm: <u>n/a</u> det: <u>n/a</u> Flame: <u>n/a</u> Filter: <u>n/a</u> Base: <u>n/a</u> Sample psi: <u>n/a</u> Internal Air Pressure: <u>n/a</u> Internal Fuel Pressure: <u>n/a</u> Internal Pressure Gauge psi: <u>n/a</u> Internal Span: <u>n/a</u>																																			
Comments: 																																				

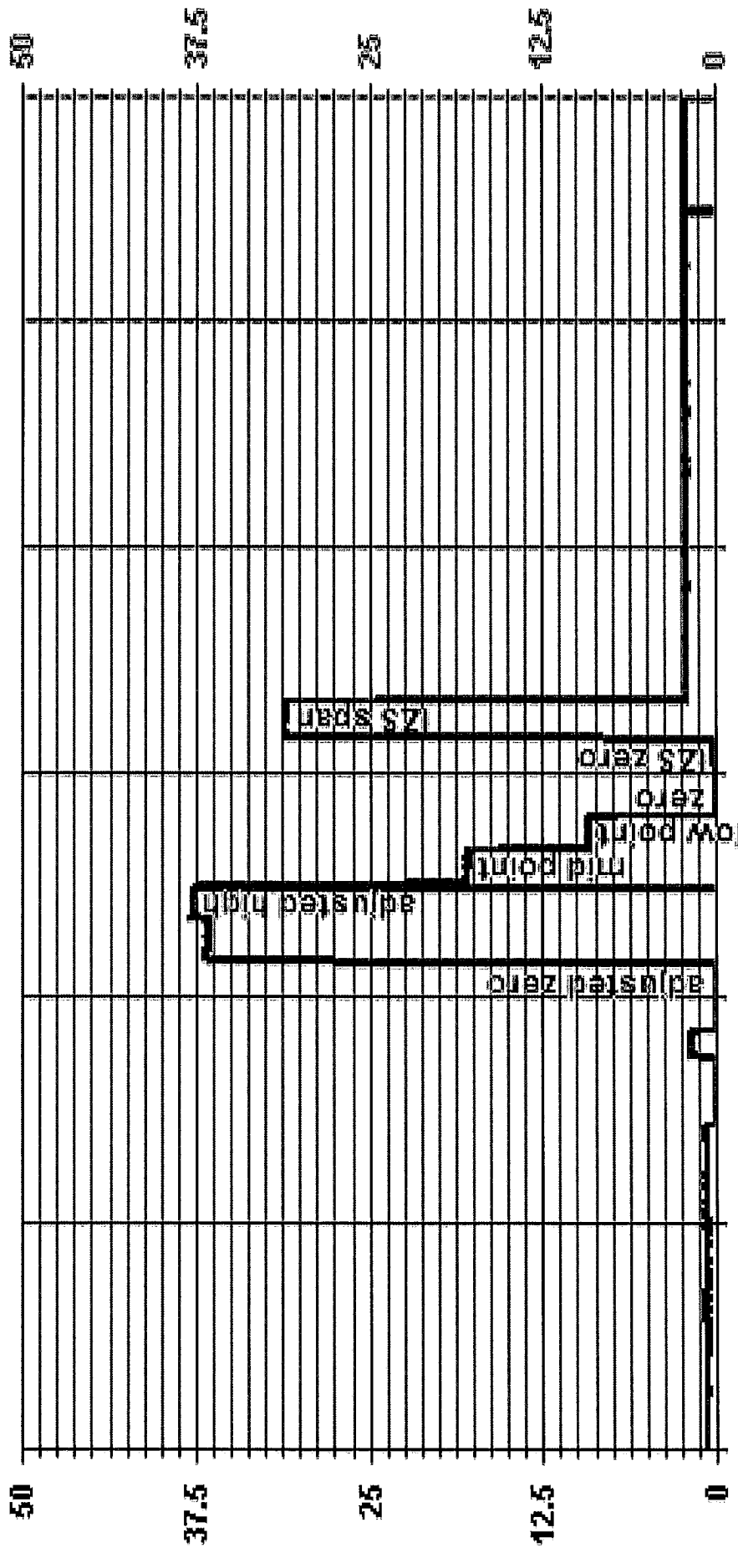
01 Minute Averages



— LICA30 - - - THC . . . PPM

Thermo 51C Total Hydrocarbon Analyzer Calibration																																																		
Date: December 13, 2015 Company/Airshed: LICA Location/Station Name: Maskwa Parameter: Total Hydrocarbon Start/End Time 24 hr. (mst): 11:44 / 14:45 Calibration Method: Gas Dilution	Barometric Pressure: 0.917 atm Station Temperature °C: 20 Weather Conditions: Mainly cloudy with freezing rain Calibration Purpose: post repair Performed By/Reviewer: Alex Yakupov Trina Whitsett Cal Gas Expiry Date: March 26, 2017																																																	
Analyzer: Serial Number: 436609739 Range ppm: 50 Last Calibration Date: n/a As Found C.F.: n/a Previous Cal High Point C.F.: n/a New C.F.: 1.000																																																		
Callibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 830 Cal Gas Cylinder I.D. #: LL33674 <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">CH₄/C₂H₆ Cylinder Conc. (ppm):</td> <td style="width: 25%;">601.4</td> <td style="width: 25%;">202.0</td> </tr> <tr> <td>CH₄ as propane/total CH₄ equivalents (ppm):</td> <td>555.5</td> <td>1156.9</td> </tr> </table>		CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm):	601.4	202.0	CH ₄ as propane/total CH ₄ equivalents (ppm):	555.5	1156.9																																											
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm):	601.4	202.0																																																
CH ₄ as propane/total CH ₄ equivalents (ppm):	555.5	1156.9																																																
Standard Calibration Points for a Range of: 60 ppm																																																		
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Point</th> <th>Target ppm</th> </tr> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mid</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </table>		Point	Target ppm	High	38	Mid	18	Low	9																																									
Point	Target ppm																																																	
High	38																																																	
Mid	18																																																	
Low	9																																																	
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Callibrator Flow Rates (cc/min)</th> <th>Calculated Concentration:</th> <th>Indicated Concentration:</th> <th>Correction Factors:</th> </tr> <tr> <th>Point</th> <th>Diluent</th> <th>Cal Gas</th> <th>Total</th> <th>(ppm)</th> <th>(ppm)</th> <th></th> </tr> </thead> <tbody> <tr> <td>adjusted zero</td> <td>1999</td> <td>0.00</td> <td>1999</td> <td>0.0</td> <td>0.00</td> <td>n/a</td> </tr> <tr> <td>adjusted high</td> <td>1932</td> <td>65.00</td> <td>1997</td> <td>37.66</td> <td>37.66</td> <td>1.000</td> </tr> <tr> <td>mid</td> <td>1969</td> <td>31.00</td> <td>2000</td> <td>17.93</td> <td>17.93</td> <td>1.000</td> </tr> <tr> <td>low</td> <td>1984</td> <td>16.00</td> <td>2000</td> <td>9.26</td> <td>9.26</td> <td>0.999</td> </tr> <tr> <td>callibrator zero</td> <td>1999</td> <td>0.00</td> <td>1999</td> <td>0.00</td> <td>0.00</td> <td>n/a</td> </tr> </tbody> </table>		Callibrator 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	1932	65.00	1997	37.66	37.66	1.000	mid	1969	31.00	2000	17.93	17.93	1.000	low	1984	16.00	2000	9.26	9.26	0.999	callibrator zero	1999	0.00	1999	0.00	0.00	n/a
Callibrator 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	1932	65.00	1997	37.66	37.66	1.000																																												
mid	1969	31.00	2000	17.93	17.93	1.000																																												
low	1984	16.00	2000	9.26	9.26	0.999																																												
callibrator zero	1999	0.00	1999	0.00	0.00	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 = 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 Internal Pressure Gauge psi: n/a Internal Span: n/a	As left: H2 cylinder (psi): 700 H2 cylinder reg set (psi): 25 Span Cylinder (psi): 2100 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 35 measurement alarms: None service alarms: None cnt: 2179 rng: 1 try: 1 flm: 207.8 det: 125.8 Flame: 207 Filter: 125 Base: 125 Sample psi: 06.82 Internal Air Pressure: 22 Internal Fuel Pressure: 11 Internal Pressure Gauge psi: 27 Internal Span: 31																																																	
Comments: THC failed because of ZERO air generator failure. Troubleshooting required as soon as possible. ZERO Air generator was fixed and post-repair calibration performed. A new CH4-C3H8 SPAN gas cylinder connected. Sampling filter was changed during monthly calibration on December 3, 2015.																																																		

01 Minute Averages



— LICA30 THC PPM

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date:	December 3, 2015	Barometric Pressure:	0.916 atm
Company/Airshed:	LICA	Station Temperature °C:	20
Location/Station Name:	Maskwa	Weather Conditions:	Mainly sunny
Start/End Time 24 hr. (mst):	12:01 / 17:05	Calibration Purpose:	routine monthly
G.P.T. to be used for Ozone?	No	Performed By/Reviewer:	Alex Yakupov / Trina Whitsitt
Calibration Method:	Gas Dilution & Varying UV Lamp Power	Cal Gas Expiry Date:	March 12, 2019

Analyzer:		Correction Factors:			
Serial Number:	593	Previous C.F.:	As Found C.F.:	New C.F.:	
Last Calibration Date:	November 12, 2015	NO =	1.000	1.005	1.000
Range ppb:	1000	NO ₂ =	0.996	0.994	0.994
		NOx =	1.000	1.006	1.000

Callibrator:		Standard Calibration Points for a Range of: 1000 ppb			
Flow Meter ID's:	n/a	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?
Make & Model:	SABIO 2010 D	High	780	500	n/a
Serial #:	11900613	Mid	380	275	n/a
Cal Gas Cylinder I.D. #:	BLM002073	Low	190	100	n/a
NO/NOx Gas Conc. (ppm):	50.6 50.6	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	5013	0.0	5013	0	0	0.0	1.0	n/a	n/a
as found high	4938	77.2	5015	778.9	778.9	775.0	775.0	1.005	1.006
adjusted zero	5013	0.00	5013	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4938	77.20	5015	778.9	778.9	779.0	779.0	1.000	1.000
mid	4976	37.70	5014	380.5	380.5	384.0	384.0	0.991	0.991
low	4994	18.90	5013	190.8	190.8	194.0	194.0	0.983	0.983
calibrator zero	5013	0.00	5013	0	0	0.0	0.0	n/a	n/a
								Average C.F.=	0.991 0.991

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	4938	77.20	5015	0.0	780.0	781.0	1.0	0.0	1.0	
as found high NO2	4938	77.20	5015	525.0	283.0	784.0	501.0	497.0	500.0	0.994
gpt mid	4938	77.20	5015	280.0	513.0	784.0	270.0	267.0	269.0	0.993
gpt low	4938	77.20	5015	100.0	677.0	783.0	105.0	103.0	104.0	0.990
									Average NO ₂ C.F.=	0.992

Linear Regression/Calibration Results:

Correlation Coefficient =	NO	NOx	NO ₂	LIMITS > or = 0.995 .95-1.05 ± 3% F.S. ± 10% 0.96 to 1.04
Slope =	1.000	1.000	1.000	
b (Intercept as % of full scale) =	1.001	1.001	0.996	
% change in C.F. from last cal =	0.20%	0.20%	0.08%	
NO2 converter efficiency	-0.50%	-0.63%	0.20%	

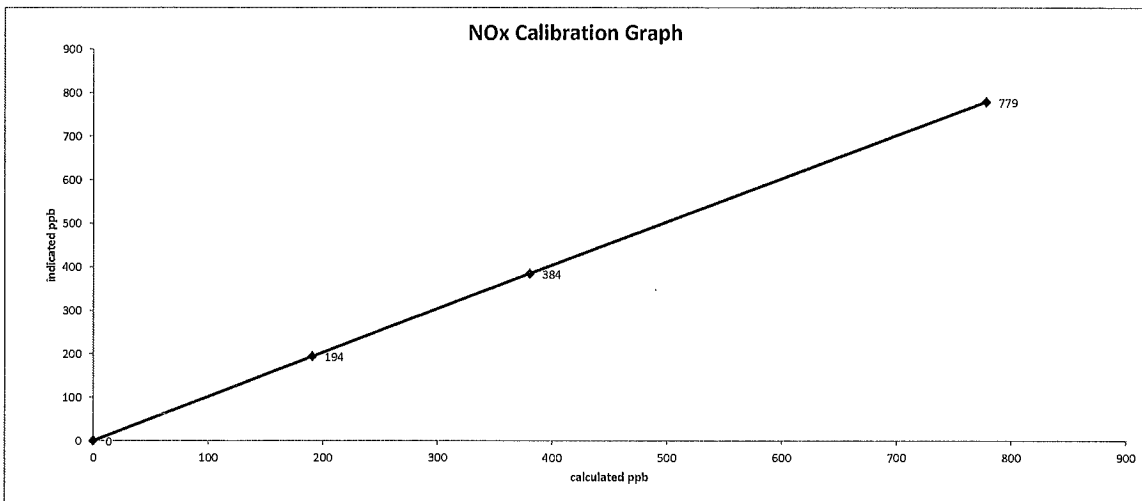
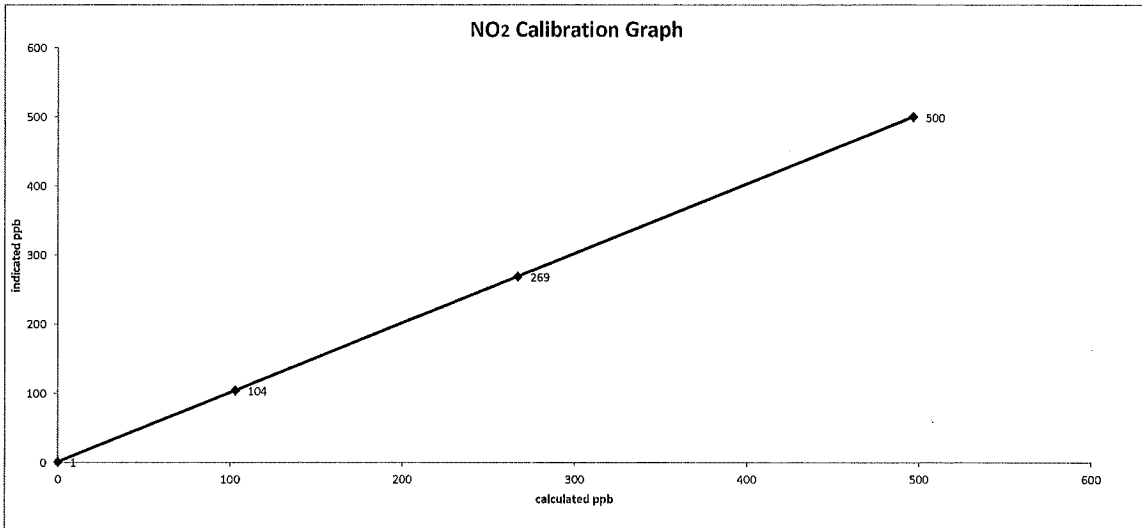
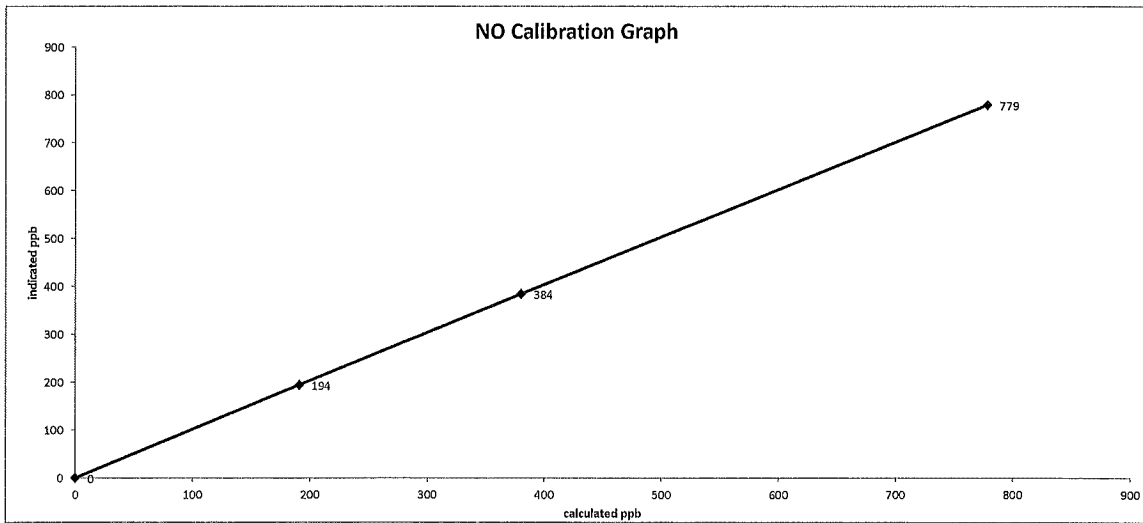
As found:		As left:	
NOx SLOPE:	0.980	NOx SLOPE:	0.982
NOx OFFS:	0.0	NOx OFFS:	0.4
NO SLOPE:	0.987	NO SLOPE:	0.986
NO OFFS:	-0.3	NO OFFS:	-0.2
SAMP FLW:	473	SAMP FLW:	473
OZONE FL:	77	OZONE FL:	77
PMT:	7.9	PMT:	10.5
NORM PMT:	0.2	NORM PMT:	1.4
AZERO:	8.1	AZERO:	7.9
HVPS:	662	HVPS:	662
RCELL TEMP:	50.0	RCELL TEMP:	50.0
BOX TEMP:	30.5	BOX TEMP:	30.9
PMT TEMP:	6.7	PMT TEMP:	6.7
ISZ TEMP:	38.6	ISZ TEMP:	38.5
MOLY TEMP:	315.3	MOLY TEMP:	315.1
RCEL:	4.2	RCEL:	4.2
SAMP:	27.0	SAMP:	27.0
Internal Span NO:	6.6	Internal Span NO:	6.4
Internal Span NO2:	398.6	Internal Span NO2:	401.9
Internal Span NOx:	404.9	Internal Span NOx:	408

Comments:

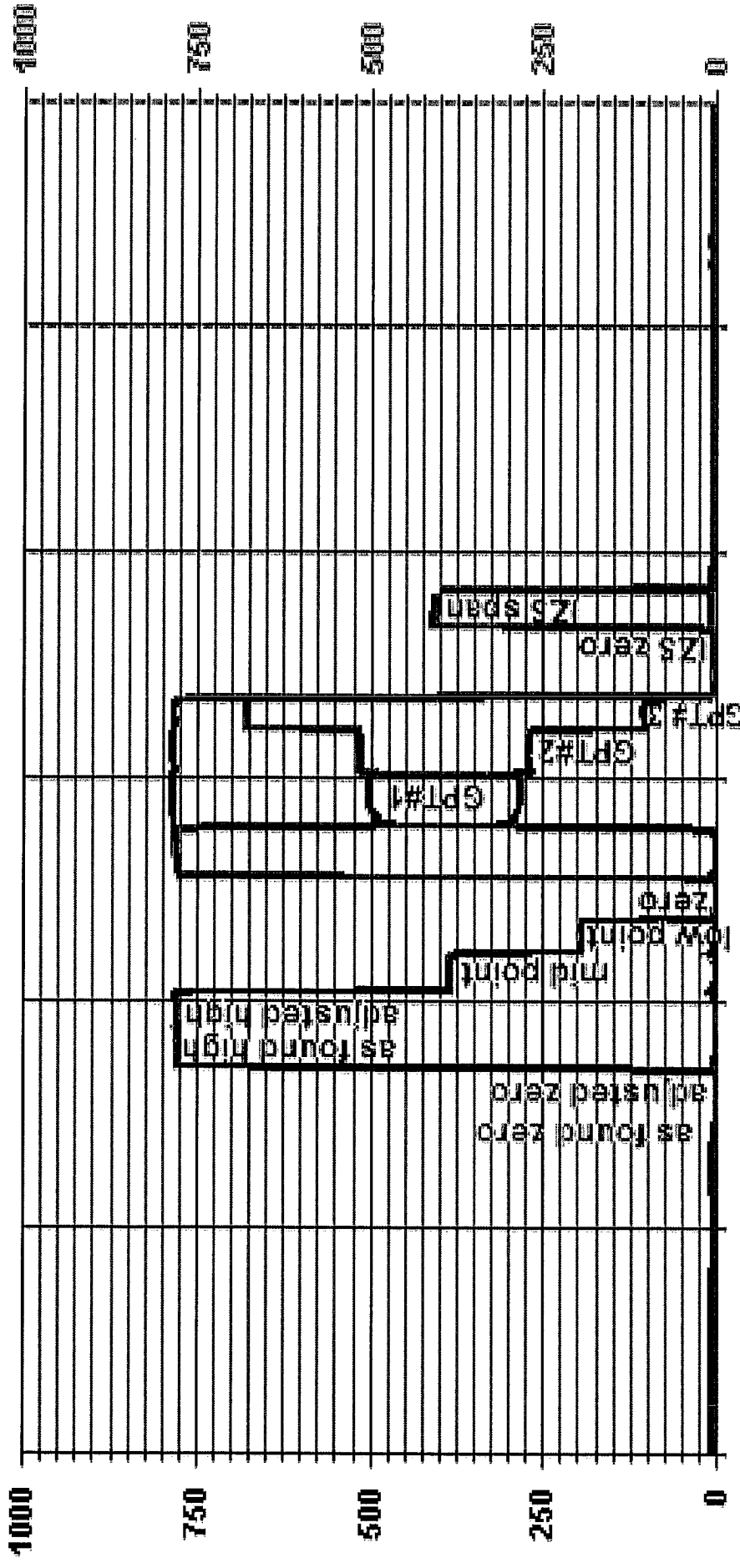
Sample filter changed. No NO2 adjustment made.

Date: December 3, 2015
Company/Alrshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 12:01 / 17:05
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Varying UV Lamp Power



01 Minute Averages



12/03/15 09:20 12/03/15 11:20 12/03/15 13:20 12/03/15 15:20 12/03/15 17:20 12/03/15 19:20

-- LICA30 NOX_ PPB -- LICA30 NO_ PPB -- LICA30 NO2_ PPB

WIND SYSTEM

**Met One Instruments Inc.
Certificate of Calibration**

Instrument: Sonic Wind Sensor

Model No.: 50.5H

Manufacturer: Met One Instruments Inc.

Serial No.: H10703

Sales Order No.: 101530

Customer: Maxam Analytics

Tested per P.O. No.: 35-54786

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

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

Date (As Found): n/a

Date (As Left Test): 3/4/2014

Calibrated by: Dan Reed

Date: 3/4/14

Test Equipment Used for Calibration of Instruments

Description	Manufacturer	Model No.	Serial No.	Cal Date	Cal Due	Accuracy
Digital Multimeter	Kelley	197A	490833	3/8/2013	3/8/2014	+/- 0.2% of input
Counter	Hewlett Packard	5245L	71616181	3/8/2013	3/8/2014	+/- 0.0001%
Standard Cup Assembly	Met One Instruments	17041	3309	4/24/2012	4/24/2017	< 15mph or 1% ws

Environmental: Rain, Temperature 65 to 80 DegF, Humidity 20 to 70%, Vibration none, Radiation none

All calibration and/or calibration data acquired as equal to or greater than the minimum specified. The standards are on record and are traceable to NIST to the extent possible by manufacturer's calibration. Unless otherwise stated, all instruments are calibrated to meet the manufacturer's published specifications. This calibration system conforms with MIL-STD-45662A (6/1/88) instrument calibration and the requirements of Regulatory Guide 1.23 (2/72). Compliance will also be to the requirements.

Calibration by: Dan Reed

Date: 3/10/14

CALIBRATORS



Calibrator Performance Audit

OZONE

File No. 2015-030A

Company: Maxxam **Operator:** Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>N/A</u>
Serial Number	<u>11900613</u>	Serial Number	<u>N/A</u>
Oven Temperature	<u>N/A</u>	Temperature (°C)	<u>N/A</u>
Last Verification Date	<u>N/A</u>	Barometric Pressure	<u>N/A</u>

Flow Measurements

Pt. No. 1 5000 Pt. No. 2 5000 Pt. No. 3 5000

Calibrator Flow (sccm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
5013	0.000	0.001		
5013	0.400	0.407	1%	± 10%
5013	0.200	0.204	1%	± 10%
5014	0.100	0.101	0%	± 10%
Absolute Average Percent Difference			1%	± 10%

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

<u>O₃</u>		<u>LIMITS</u>
Correlation=	1.0000	≥ 0.995
m (Slope)=	1.0163	0.90-1.10
b (Intercept % of FS)=	0.0800	± 3% F.S.

AENV Standards		Ozone Analyzer	
Audit Calibrator		Make/Model	<u>Teco 49i</u>
Make/Model	<u>Teco 49i PS</u>	Serial/AMU Number	<u>AMU 1843</u>
Serial/AMU Number	<u>AMU 1808</u>	Last Calibration Date	<u>May 21, 2015</u>
Ozone Standard	<u>Primary</u>	Full Scale (ppm)	<u>0.5</u>

COMMENTS: _____

Auditor: Al Clark Date: May 21, 2015
 Operator Signature: Location: McIntyre Center Edmonton

Company <u>Maxxam</u>		Operator: <u>Limin Li</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Enviroics 6100</u>	Make/Model	<u>N/A</u>
Serial Number	<u>4760</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>December 2013</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>LL42475</u>	Barometric Pressure	<u>N/A</u>
NO/NOx Concentration	<u>48.5/48.5</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
Pt. #3	<u>5000</u>		
Gas Flow (sccm)			
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>
Pt. #3	<u>20</u>	Gas flows not available from display.	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4980	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4993	0.0	0.799	0.799	0.840	-0.001	0.839	5%	5%
4994	0.0	0.399	0.399	0.420	-0.001	0.419	5%	5%
4991	0.0	0.200	0.200	0.211	0.000	0.211	5%	5%
Absolute Average Percent Difference							5%	5%

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)= 1.0511	0.90-1.10	m (Slope)= 1.0496
b (Intercept % of FS)= 0.0400	± 3% F.S.	b (Intercept % of FS)= 0.0400

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
4993	0.000	0.000	0.823	-0.001	0.822	NO ₂	% Diff. Limit
4993	0.480	0.530	0.293	0.530	0.823	0	± 10%
4993	0.240	0.269	0.554	0.269	0.823	0	± 10%
4993	0.090	0.096	0.727	0.097	0.824	0	± 10%
Absolute Average Percent Difference						0	± 10%

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

NO₂	LIMITS	
Correlation= 1.0000	≥ 0.995	
m (Slope)= 1.0006	0.90-1.10	
b (Intercept % of FS)= -0.0132	± 3% F.S.	

AENV Standards	NO_x Analyzer
Audit Calibrator	Make/Model <u>Teco 42i</u>
Make/Model <u>Teco 146i</u>	Serial/AMU Number <u>AMU 1868</u>
Serial/AMU Number <u>AMU 1809</u>	Last Calibration Date <u>December 15, 2014</u>
	Full Scale (ppm) <u>1.0</u>

COMMENTS: _____

Auditor: Al Clark Date: December 17, 2014

Operator Signature: *[Signature]* Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-344CGA

Company: Maxxam **Operator's Name:** Limin Li
Cylinder #: BLM002073 **Concentration PPM:** 49.5 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: March 31, 2015
 Gas Type: SO2 Conc. 98.57
 Cylinder Number: CAL016720

Flow Measurement Device:

Make/Model: Blos DC2
 Serial Number: AMU 1659
 Temp. °C: 22.5 C
 B.P. 690 mmhg

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 7.9 Span: 1.028 Range: 1.0
 Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.000	0.000	0.000
4976	82.6	0.801	0.01660	60.242	48.3
4993	41.0	0.396	0.00821	121.780	48.2
4977	20.2	0.193	0.00406	246.386	47.6
Average Cylinder Concentration:					48.0

Previous Stated Concentration PPM: 49.5

Percent variance from Stated: 3.0

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: March 31, 2015
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam **Operator's Name:** Limh Li
Cylinder #: LL36837 **Concentration PPM:** 10.0 **Tolerance(%)** 2 **Certified By:** Alr 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:** Dec/15/14 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	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

NO Cylinder Gas

File No. 2016-345CGA

Company: Maxxam Operators name: Limin Li
 Cylinder #: BLM002073 Conc (PPM) 50.6/50.6 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	51.5	51.1
4976	82.6	0.855	0.848	0.01660	60.242	51.5	51.1
4993	41.0	0.427	0.421	0.00821	121.780	52.0	51.3
4977	20.2	0.213	0.209	0.00406	246.386	52.5	51.5
Average Cylinder Concentration:						52.0	51.3

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.6</u>	<u>50.6</u>
Percent variance from Stated: <u>2.8</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 49.5 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



Praxair Canada, Inc.
 9501-34th Street
 Edmonton AB T6B 2K5
 Tel: 780-449-0776
 Fax: 780-449-5302

03/27/2014

MAXXAM ANALYTICS INC "NA"
 9373 49TH ST
 EDMONTON, AB T6B 2L7

Work Order No. 20248656
 Customer Reference No.

Product Lot/Batch No. Z582 4 085 02
 Product Part No. NI ME600P2P-AQ

CERTIFICATE OF ANALYSIS
Primary Standard

Component	Requested Concentration	Certified Concentration	Analytical Principle	Analytical Accuracy
Methane	600.0ppm	601.4ppm	U	±1% rel
Propane	200.0ppm	202ppm	U	±1% rel
Nitrogen	Balance	Balance		

Analytical Instruments: Mettler-Toledo Analytical Balance-ID2sx/USA--
 Hewlett-Packard (Agilent)-5890--GC-FID

Cylinder Style: AQ
 Cylinder Pressure @70F: 2200 psig
 Cylinder Volume: 82.8 ft3
 Valve Outlet Connection: CGA-350
 Cylinder No(s): LL33674

Filling Method: Gravimetric
 Date of Fill: 03/26/2014
 Expiration Date: 03/26/2017

Analyst: Todd Hryniv

This calibration cylinder, unless prepared by Praxair Canada, Inc. is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard is used as a reference against Praxair Canada, Inc. Reference Standards which are either prepared by weight (traceable to the National Institute of Standards and Technology (NIST) Measurement Canada) or by volume (NIST) Standard Reference Material (SRM) standards.

NOTE: All specifications for concentration (e.g., % or ppm) are for gas volume, for volume (e.g., ppmv) unless otherwise noted.

- | | | | |
|---|---|--|---|
| 1. Gas Chromatography with Methanol | 2. Gas Chromatography with Thermal Conductivity Detector | 3. Gas Chromatography with Electrode Conductivity Detector | 4. Gas Chromatography with Flame Ionization Detector |
| 5. Gas Chromatography with Photoacoustic Detector | 6. Gas Chromatography with Mass Spectrometry | 7. Gas Chromatography with Thermal Conductivity Detector | 8. Gas Chromatography with Thermal Conductivity Detector |
| 9. Gas Chromatography with Infrared Spectroscopy | 10. Gas Chromatography with Thermal Conductivity Detector | 11. Gas Chromatography with Thermal Conductivity Detector | 12. Gas Chromatography with Thermal Conductivity Detector |
| 13. Gas Chromatography with Thermal Conductivity Detector | 14. Gas Chromatography with Thermal Conductivity Detector | 15. Gas Chromatography with Thermal Conductivity Detector | 16. Gas Chromatography with Thermal Conductivity Detector |
| 17. Gas Chromatography with Thermal Conductivity Detector | 18. Gas Chromatography with Thermal Conductivity Detector | 19. Gas Chromatography with Thermal Conductivity Detector | 20. Gas Chromatography with Thermal Conductivity Detector |

This information is provided for your reference and is not intended to be used as a substitute for a certificate of analysis. While we believe the information is accurate within the limits of the analytical methods employed and is provided in the form of the best analysis possible, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is provided with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall Praxair Canada, Inc. be liable for any damages, including consequential damages, arising out of the use of the information, even if such damages were foreseeable.

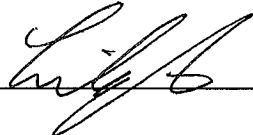
APPENDIX III
CHAIN OF CUSTODY



Maxxam Analytics - Air Services Group


Project Chain of Custody

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2015-12-30- C</u>
Site: <u>Maskwa Site</u>	Contact: <u>Mike Bisaga</u>

QA Check Complete  Date 19-Jan-16

QA Check Review _____ Date _____

Report Complete E. Tangang Date 20-Jan-16

Report Reviewed  Date 19-Jan-16

Report Shipped _____ Date _____

Notes

**AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
ST. LINA SITE**

JOB #:2833-2015-12-31- C

DECEMBER 2015

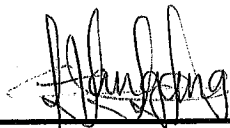
Prepared for:

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

Attention: MIKE BISAGA

DATE: **January 21, 2016**

Prepared by:



Ernestine Tangang, Ph.D.
Team Leader, Source Testing, Maxxam Analytics

Reviewed by:



Lily Lin, B.Sc.
Senior Project Manager, Air Services, Maxxam Analytics

SUMMARY

In DECEMBER 2015, the Air Services Group of Maxxam Analytics conducted an ambient air monitoring program on the St. Lina Site at Lakeland Industry & Community Association, near Bonnyville, 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 AMD1989 and AMD2006.

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

H2S: The Maxxam-supplied API 100A, S/N 375 analyzer was replaced by the LICA-owned API 101E, S/N: 509, analyzer which had been repaired at the Maxxam shop on December 11.

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 403-219-3689 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		EXCEEDENCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-HR	24-HR	1-HR	24-HR				HOUR	WIND SPEED (KPH)	WIND DIRECTION (DEGREES)	READING	DAY	
SO2 (PPB)	172	48	0	0	0	3	1	0	10.8	WSW	1.0	2	100.0
H2S (PPB)	10	3	0	0	0	1	VAR	VAR	VAR	VAR	0.7	9, 23	100.0
THC (PPM)	-	-	-	-	2.2	4.5	23	VAR	VAR	VAR	3.7	23	100.0
NO2 (PPB)	159	-	0	-	5.3	39	1	0	10.8	WSW	21.9	1	100.0
NO (PPB)	-	-	-	-	1.1	28.5	23	11	0.7	NNE	14.4	23	100.0
NOX (PPB)	-	-	-	-	6.4	50.5	1	0	10.8	WSW	29.3	23	100.0
O3 (PPB)	82	-	0	-	19	40	31	VAR	VAR	VAR	33.2	16	100.0
PM2.5 (UG/M3)	-	30	-	0	8.6	33.0	22	10	4.5	SW	24.7	22	99.9
RELATIVE HUMIDITY (%)	-	-	-	-	75.2	88	9, 10	VAR	VAR	VAR	87.2	9	100.0
BAROMETRIC PRESSURE (MILIBAR)	-	-	-	-	920	939	26	11	3.6	S	937	26	100.0
AMBIENT TEMPERATURE (DEG C)	-	-	-	-	-9.1	4.6	4	14	8.9	WNW	0.8	4	100.0
PRECIPITATION (MM)	-	-	-	-	0.0	0.8	18	20	16.9	ENE	0.1	18	99.9
VECTOR WS (KPH)	-	-	-	-	8.9	24.4	31	13	-	WSW	16.4	31	100.0
VECTOR WD (DEG)	-	-	-	-	S	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedence Summary Report

SO₂ 1- Hour Exceedences

No Exceedences Recorded During the Month

SO₂ 24- Hour Exceedences

No Exceedences Recorded During the Month

H₂S 1- Hour Exceedences

No Exceedences Recorded During the Month

H₂S 24- Hour Exceedences

No Exceedences Recorded During the Month

NO₂ 1- Hour Exceedences

No Exceedences Recorded During the Month

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
1.0 Discussion	3
2.0 Project Personnel	6
3.0 Plant Monthly Required AMD Summary	6
4.0 Calculations and Results	6
5.0 Methods and Procedures	7
<u>Appendix I</u>	<u>Continuous Monitoring Data Results</u>
	Sulphur Dioxide
	Hydrogen Sulphide
	Total Hydrocarbon
	Oxides of Nitrogen
	Nitric Oxides
	Nitrogen Dioxide
	Ozone
	Particulate Matter 2.5
	Wind Speed
	Wind Direction
	Standard Deviation Wind Direction
	Relative Humidity
	Barometric Pressure
	Ambient Temperature
	Precipitation
<u>Appendix II</u>	<u>Analyzer Calibration Results</u>
	Sulphur Dioxide
	Hydrogen Sulphide
	Total Hydrocarbon
	Nitrogen Dioxide
	Ozone
	Particulate Matter
	Wind System
	Meteorological System Check
	Calibrators
	Calibration Gases
<u>Appendix IV</u>	<u>Analytical Results</u>

1.0 Discussion

This monthly report consists of data for parameters SO₂, H₂S, THC, NO_x, NO, NO₂, O₃, PM_{2.5}, WS, WD, STDWD, RH, BP, Precipitation and Ambient Temperature.

Sample filters for all continuous air monitors are changed before the calibration is started. The sample manifold is cleaned during the site visit on a monthly basis.

Control checks, consisting of zero and span of the analyzer are conducted on a daily basis on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinder) 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 calibration is done a minimum of once a month for each continuous air monitor. In addition 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.

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.

Hourly/minute data have been reviewed based on daily zero/span results and multi-points calibration results. Data may be considered as 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 (greater than 15%).

Hourly data is corrected using daily zero information.

SULPHUR DIOXIDE (SO₂)

The analyzer was working well throughout the month.

A shutdown calibration was performed prior to calibrating the UV lamp of the analyzer and completing a factory calibration on December 10. One point check was performed on December 10 after the UV lamp and factory calibrations were performed. The full post-repair calibration was performed on December 11.

HYDROGEN SULPHIDE (H₂S)

A shutdown calibration was performed on Maxxam supplied API 100A, S/N: 375, on December 10. Following the shutdown calibration, the Maxxam-supplied API 100A, analyzer was replaced by the LICA-owned API 101E, S/N: 509, analyzer which had been repaired at the Maxxam shop. The installation calibration was performed on the API 100E analyzer on the same day. The analyzer spanned low on December 24. An as found points check was performed on December 30 to ensure the analyzer's functionality, and the result was good. No data was discarded due to this issue.

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

The analyzer was working well throughout the month.

The routine monthly calibration was performed on December 11.

NITROGEN DIOXIDE (NO₂)

The analyzer was working well throughout the month.

The routine monthly calibration was performed on December 10. The calibration was repeated on December 11, in order to correct the zero drift.

OZONE (O₃)

The analyzer was working well throughout the month.

The routine monthly calibration was performed on December 17.

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

Two routine audits were performed this month: one was completed on December 11, and the other audit was performed on December 24. The flows were calibrated on December 24. The FDMS filter was replaced during the audits. One hour of data was invalidated as the data were below -3 ug/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.

The wind system was working well throughout the month.

RELATIVE HUMIDITY (RH)

The humidity sensor was working well throughout the month.

BAROMETRIC PRESSURE (BP)

The pressure sensor was working well throughout the month.

PRECIPITATION

Both the rain gauge system and heating system were working well throughout the month.

Both the rain gauge system and heating system were checked on December 11. The check result is included in this report.

AMBIENT TEMPERATURE (TPX)

The temperature sensor was working well throughout the month.

2.0 Project Personnel

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

3.0 Plant Monthly Required AMD Summary

All data collected this month were within the objectives outlined in the AMD1989 and AMD2006.

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 method described in the Air Monitoring Directive, 1989, and 2006 Amendments to the Air Monitoring Directive, 1989 (AMD 2006).

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-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

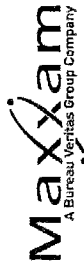
There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 100A and API 101E UV Fluorescent Analyzers
- 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 - 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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE



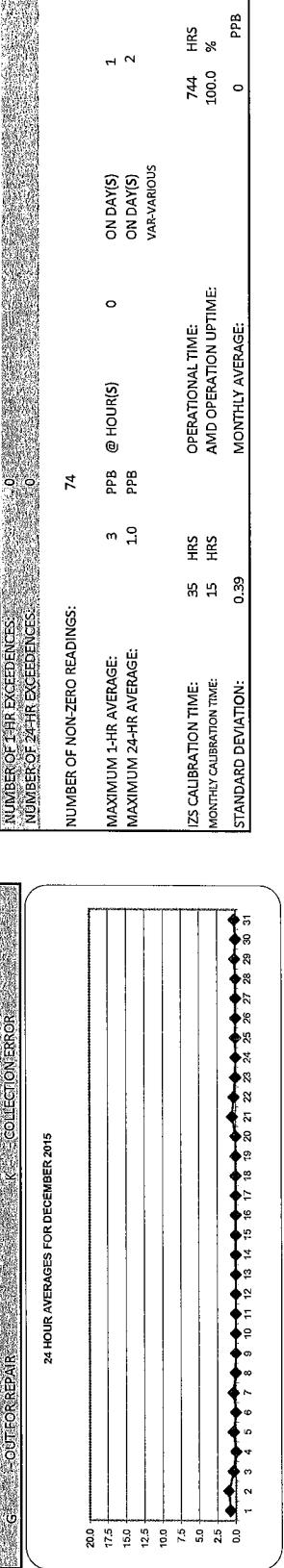
SULPHUR DIOXIDE (SO2) hourly averages in ppb

MST

DAY	HOUR START																								DAILY MAX	24-HOUR AVG	PPB		
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				0:00	
1	3	1	1	2	2	1	1	2	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	3	0.7	24
2	0	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	2	1.0	24
3	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.3	24
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	24
5	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	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	24
7	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	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	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	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	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	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	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	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	24
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	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	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	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	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	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	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	24
22	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	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	24
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	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	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	24
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	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	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	24
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
HOURLY MAX	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
HOURLY AVG	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	0.1	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	

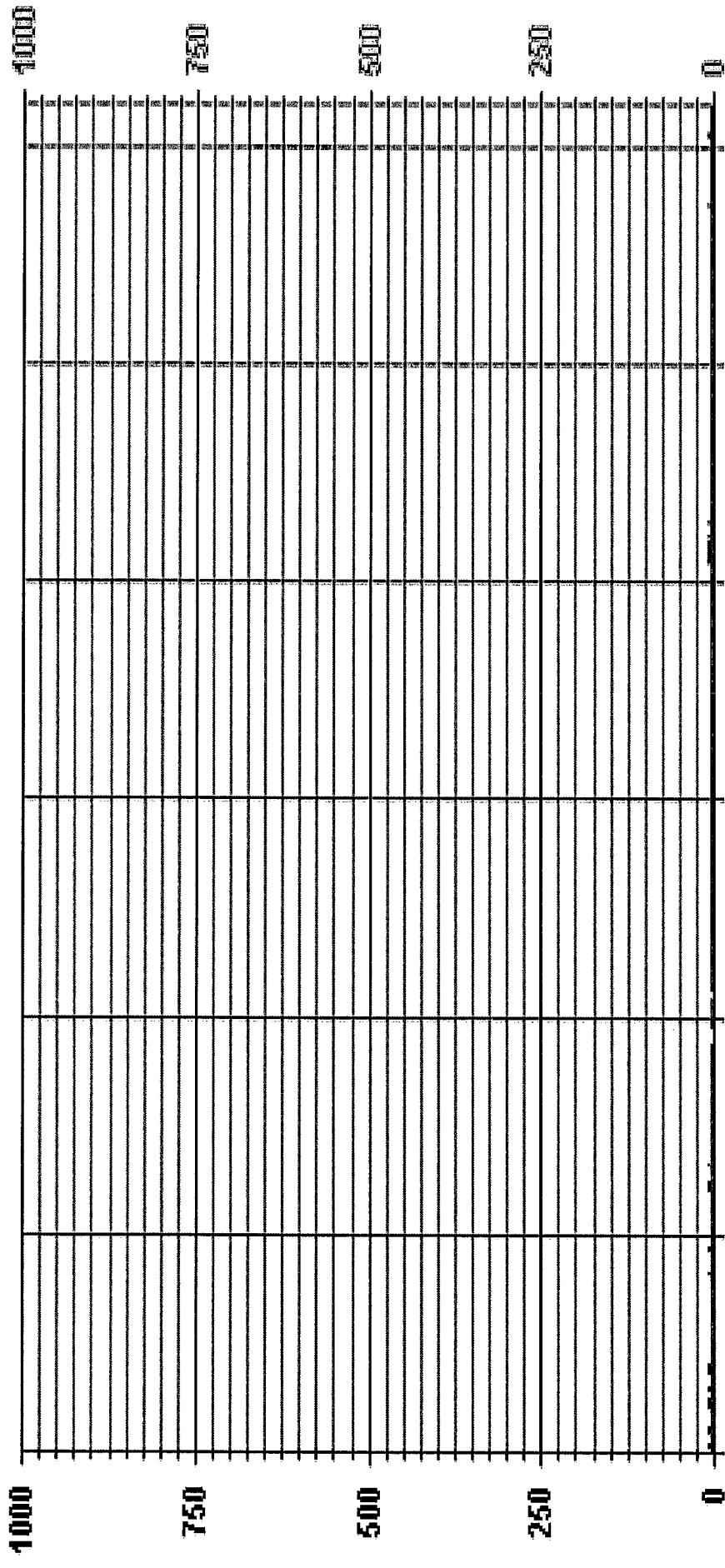
OBJECTIVE LIMIT: ALBERTA ENVIRONMENT: 35 HR @ 1.0 PPB 74 PPB @ 1.0 PPB 744 HRS 100.0 % 0 PPB

MONTHLY SUMMARY
 NUMBER OF 1-HR EXCEEDENCES: 0
 NUMBER OF 24-HR EXCEEDENCES: 0



STATUS FLAG CODES:
 C - CALIBRATION
 V - MAINTENANCE
 S - DAILY ZERO SPAN CHECK
 P - POWER FAILURE
 G - OUT FOR REPAIR
 O - QUALITY ASSURANCE
 R - RECOVERY
 X - MACHINE MALFUNCTION
 Y - OPERATOR ERROR
 K - COLLECTION ERROR

01 Hour Averages



— LIC831 SO2_ PPF



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 St. Lina Site - DECEMBER 2015
 JOB # 2833-2015-12-31-C

SULPHUR DIOXIDE MAX instantaneous maximum in ppb

MST

HR	0000	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000	23000	24000	25000	26000	27000	28000	29000	30000	31000	DAILY MAX	24-HOUR AVG.	RDCS.	
1	6	3	3	3	3	3	3	7	1	1	1	1	1	3	2	2	1	1	1	5	1	1	1	1	2	1	1	1	1	1	1	7	2.4	24		
2	1	3	3	3	3	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3	2.1	24		
3	3	3	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1.3	24		
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.3	24	
5	1	1	2	2	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.4	24	
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.4	24	
7	0	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	24	
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	24	
9	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	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	0	0	0	0	0	0	0.5	24	
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.3	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	0.6	24	
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.0	24	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
15	0	1	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	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	0.7	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	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	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	24	
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	24	
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	24	
22	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.0	24	
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	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	24	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.3	24	
27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.4	24	
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
30	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	24	
31	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0.7	24	
HOURLY MAX	6	3	3	3	3	3	3	5	7	3	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0.8	0.7		
HOURLY AVG	0.9	1.0	1.1	1.0	0.9	0.9	1.0	1.1	0.9	0.8	0.7	0.8	0.8	0.9	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	

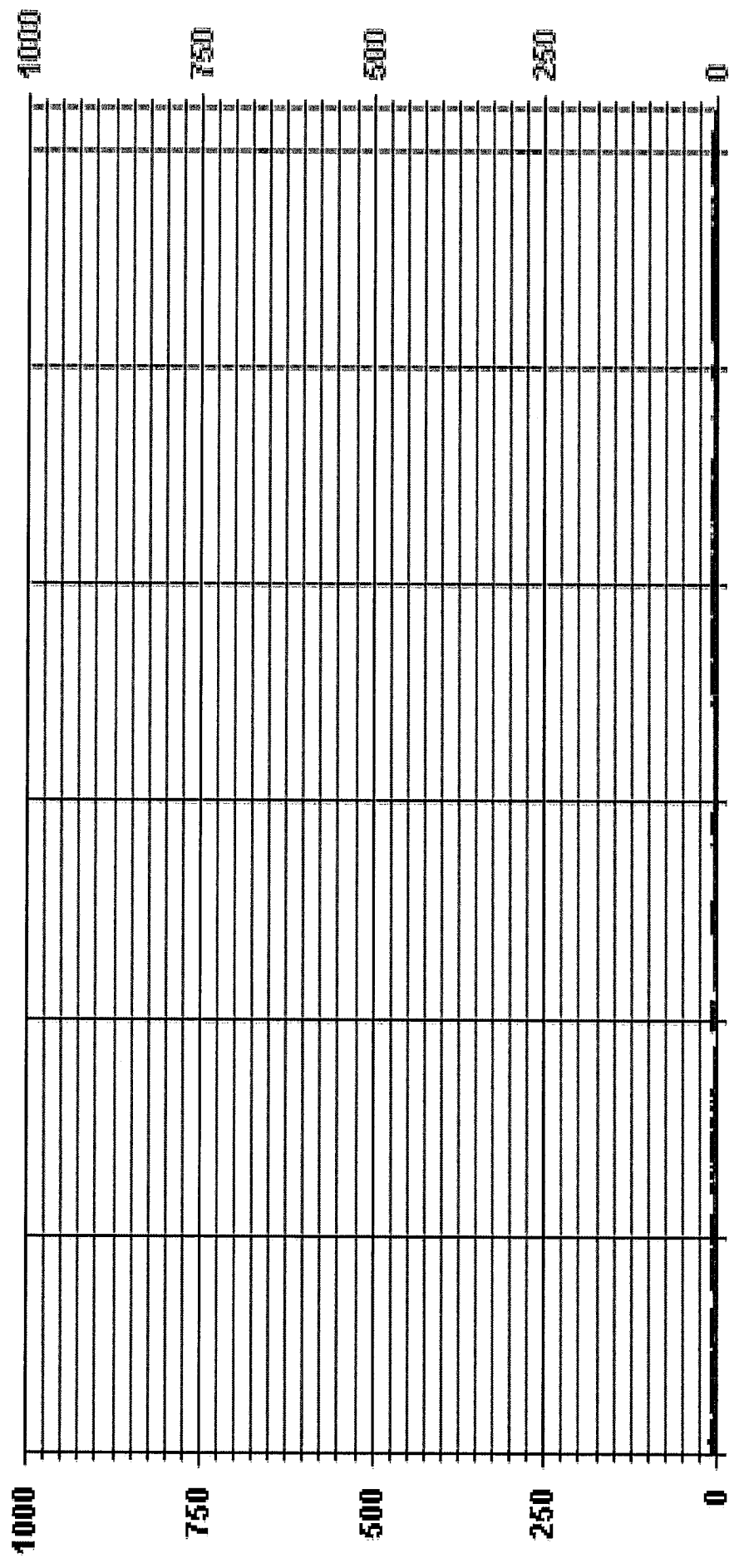
STATUS FLAG CODES

C	-	QUALITY ASSURANCE
M	-	MAINTENANCE
R	-	RECOVERY
S	-	DAILY ZERO/SPAN CHECK
P	-	POWER FAILURE
G	-	OUT FOR REPAIR
Q	-	QUALITY ASSURANCE
R	-	RECOVERY
X	-	MACHINE MALFUNCTION
O	-	OPERATOR ERROR
K	-	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	472
MAXIMUM INSTANTANEOUS VALUE:	7 PPB @ HOUR(S) 7 ON DAY(S) 1
OPERATIONAL TIME:	743 HRS
MONTHLY CALIBRATION TIME:	16 HRS
STANDARD DEVIATION:	0.79
OPERATIONAL TIME:	36 HRS
MONTHLY CALIBRATION TIME:	16 HRS
STANDARD DEVIATION:	0.79

01 Hour Averages



--- LICA31 SO2MAX PPB

LICA31
 SO2_ / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 31
 Site Name : LICA31
 Parameter : SO2
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 20	2.01	.86	3.02	4.17	6.62	9.65	5.76	6.19	8.50	11.38	13.40	7.49	6.91	6.34	5.90	1.72	100.00
< 60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 110	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 170	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 340	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 340	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	2.01	.86	3.02	4.17	6.62	9.65	5.76	6.19	8.50	11.38	13.40	7.49	6.91	6.34	5.90	1.72	

Calm : .00 %

Total # Operational Hours : 694

Distribution By Samples

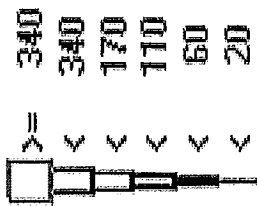
Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 20	14	6	21	29	46	67	40	43	59	79	93	52	48	44	41	12	694
< 60																	
< 110																	
< 170																	
< 340																	
>= 340																	
Totals	14	6	21	29	46	67	40	43	59	79	93	52	48	44	41	12	

Calm : .00 %

Total # Operational Hours : 694

Logger : 31 Parameter : S02_

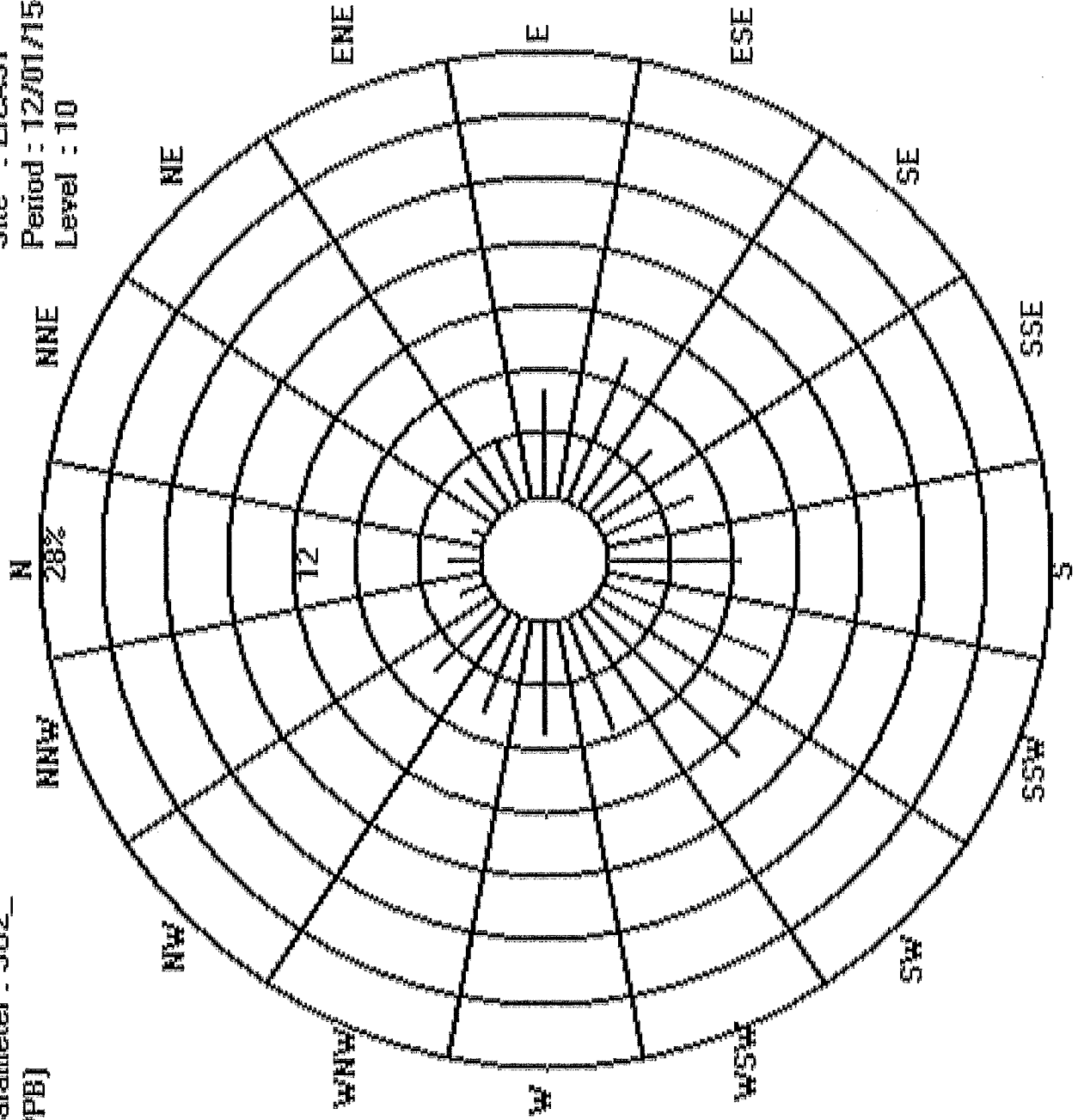
Class Limits (PPB)



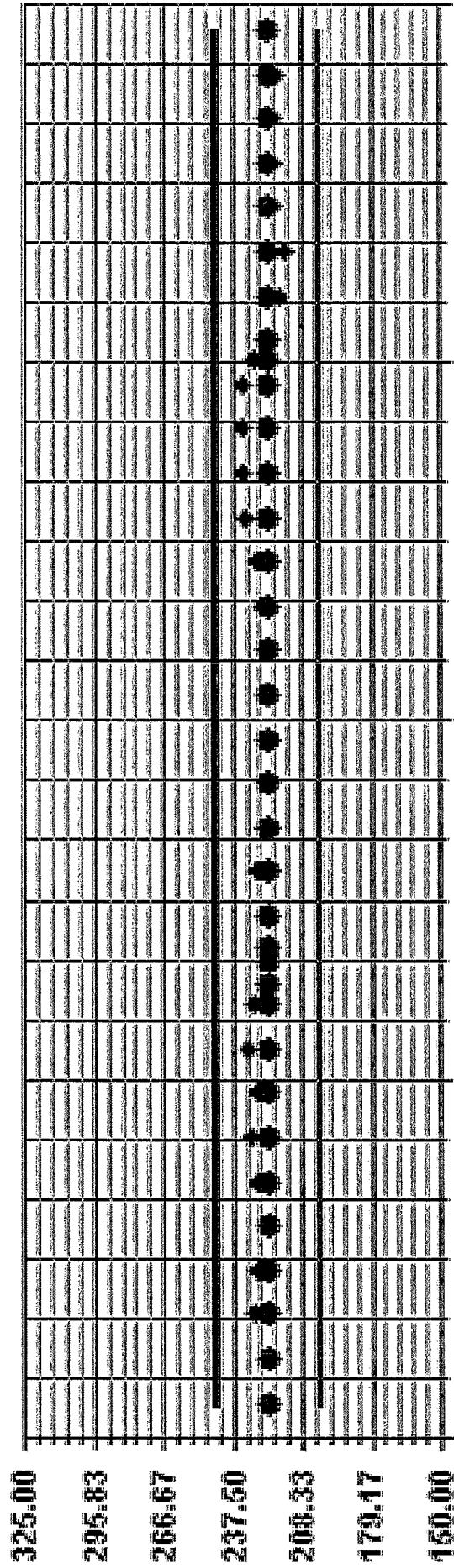
Site : LIC&31

Period : 12/01/15-12/31/15

Level : 10



Calibration Graph for Site: LICA31 Parameter: S02_ Sequence: S02 Phase: SPAN

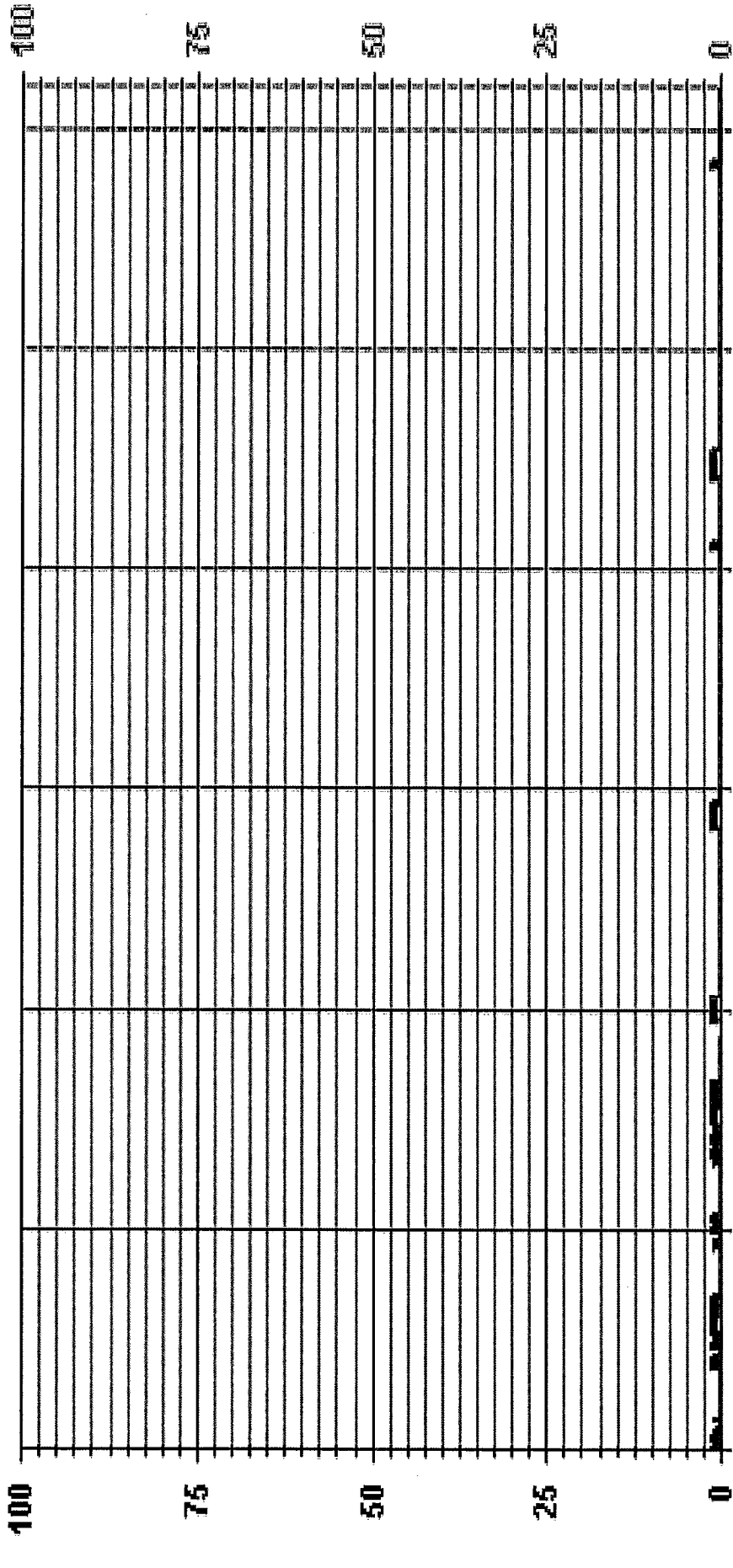


12/1/16 12/8/16 12/16/16 12/24/16 1/1/16

→ Cal Value ● Exp Value — Exp Value +10% — Exp Value -10%

HYDROGEN SULPHIDE

01 Hour Averages



— LICA31 H2S_ PPB



HYDROGEN SULPHIDE MAX instantaneous maximum in ppb

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00																								
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																								
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	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																								
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																								
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																								
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																								
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																								
8	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																								
9	1	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																								
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																								
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																								
12	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																								
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																								
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																								
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																								
16	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																								
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																								
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																								
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																								
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																								
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																								
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																								
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																								
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																								
25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																								
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																								
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																								
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																								
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																								
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																								
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																								
HOURLY MAX	1	2	1	2	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1																								
HOURLY AVG	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4																								
DAILY MAX																									3																								
DAILY AVG																									0.8																								
24-HOUR AVG																									0.3																								
ROGS.																									24																								

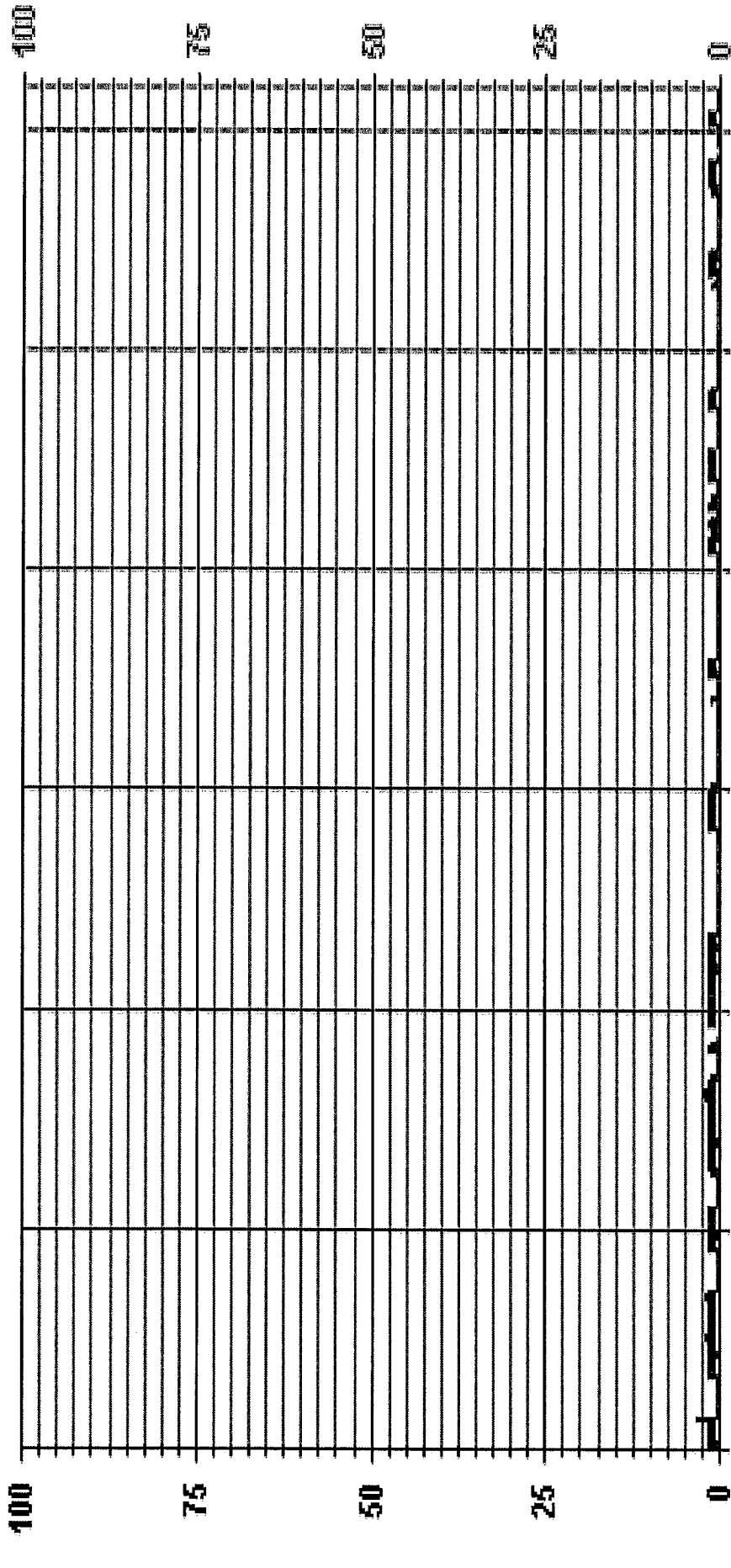
STATUS FLAG CODES

C	- CALIBRATION
Q	- QUALITY ASSURANCE
Y	- MAINTENANCE
R	- RECOVERY
X	- MACHINE MALFUNCTION
O	- OPERATOR ERROR
P	- POWER FAILURE
G	- OUT FOR REPAIR
K	- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	275
MAXIMUM INSTANTANEOUS VALUE:	3 PPB @ HOUR(S) 17 ON DAY(S) 1
ISZS CALIBRATION TIME:	38 HRS
MONTHLY CALIBRATION TIME:	10 HRS
OPERATIONAL TIME:	743 HRS
STANDARD DEVIATION:	0.52
VAR- VARIOUS	

01 Hour Averages



— LICA31 H2S MAX PPB

LICA31
H2S_ / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 31
Site Name : LICA31
Parameter : H2S
Units : PPM

Wind Parameter : WDR
Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3	2.14	.85	3.00	4.14	6.72	10.58	5.72	6.15	8.15	11.15	13.30	7.43	6.58	6.29	6.00	1.71	100.00
< 10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 50	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 50	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	2.14	.85	3.00	4.14	6.72	10.58	5.72	6.15	8.15	11.15	13.30	7.43	6.58	6.29	6.00	1.71	

Calm : .00 %

Total # Operational Hours : 699

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3	15	6	21	29	47	74	40	43	57	78	93	52	46	44	42	12	699
< 10																	
< 50																	
>= 50																	
Totals	15	6	21	29	47	74	40	43	57	78	93	52	46	44	42	12	

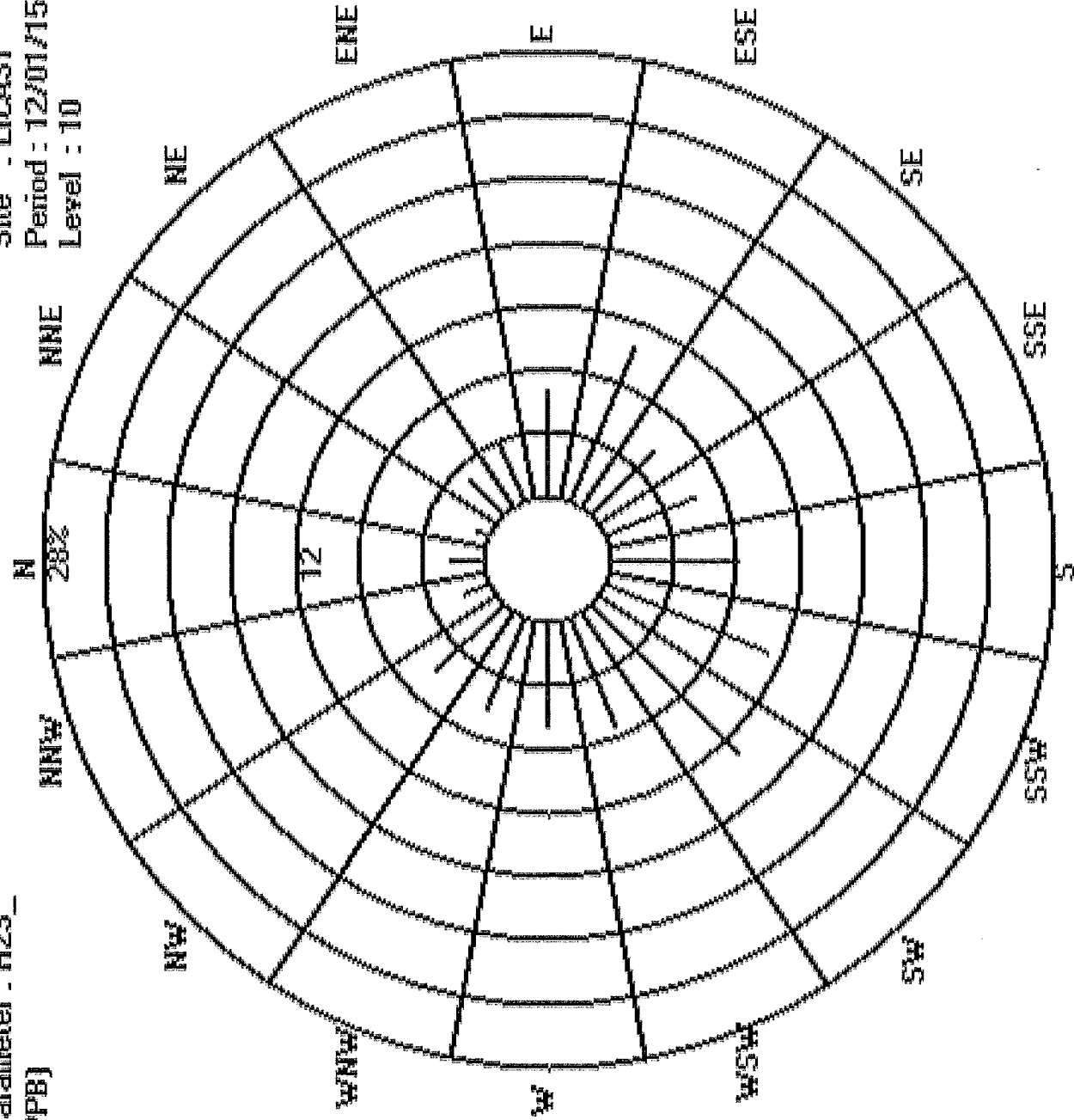
Calm : .00 %

Total # Operational Hours : 699

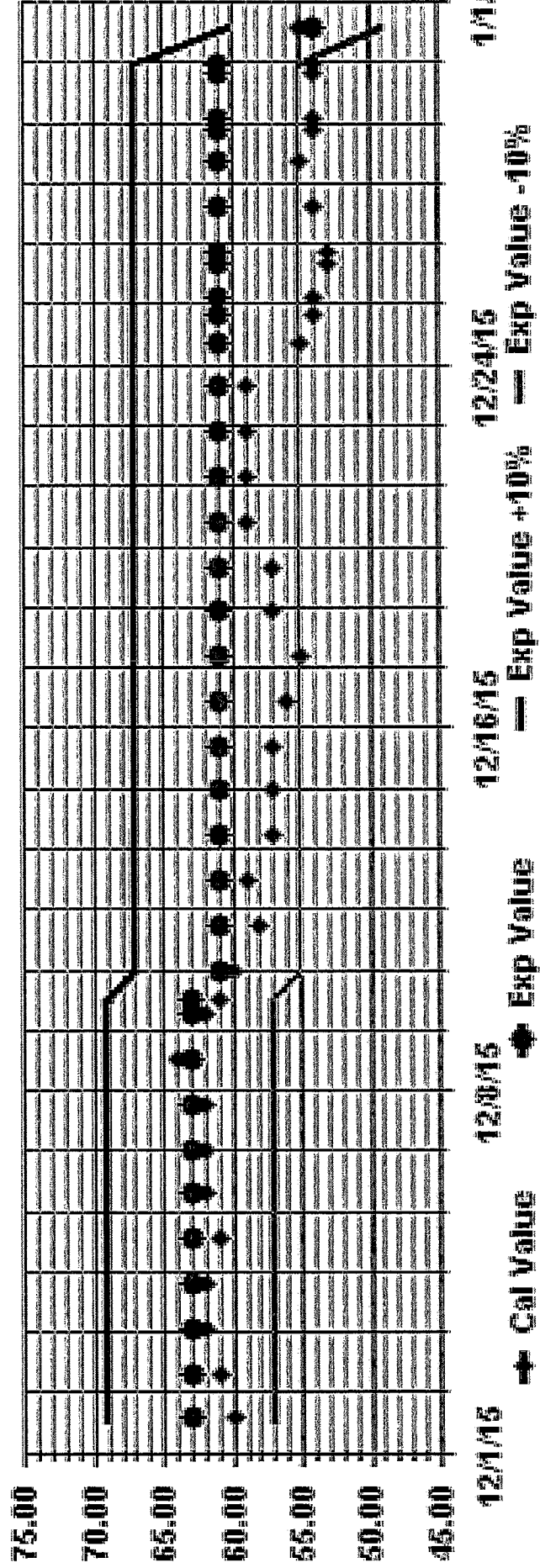
Logger : 31 Parameter : H2S_
Class Limits (PPB)



Site : LICA31
Period : 12/01/15-12/31/15
Level : 10

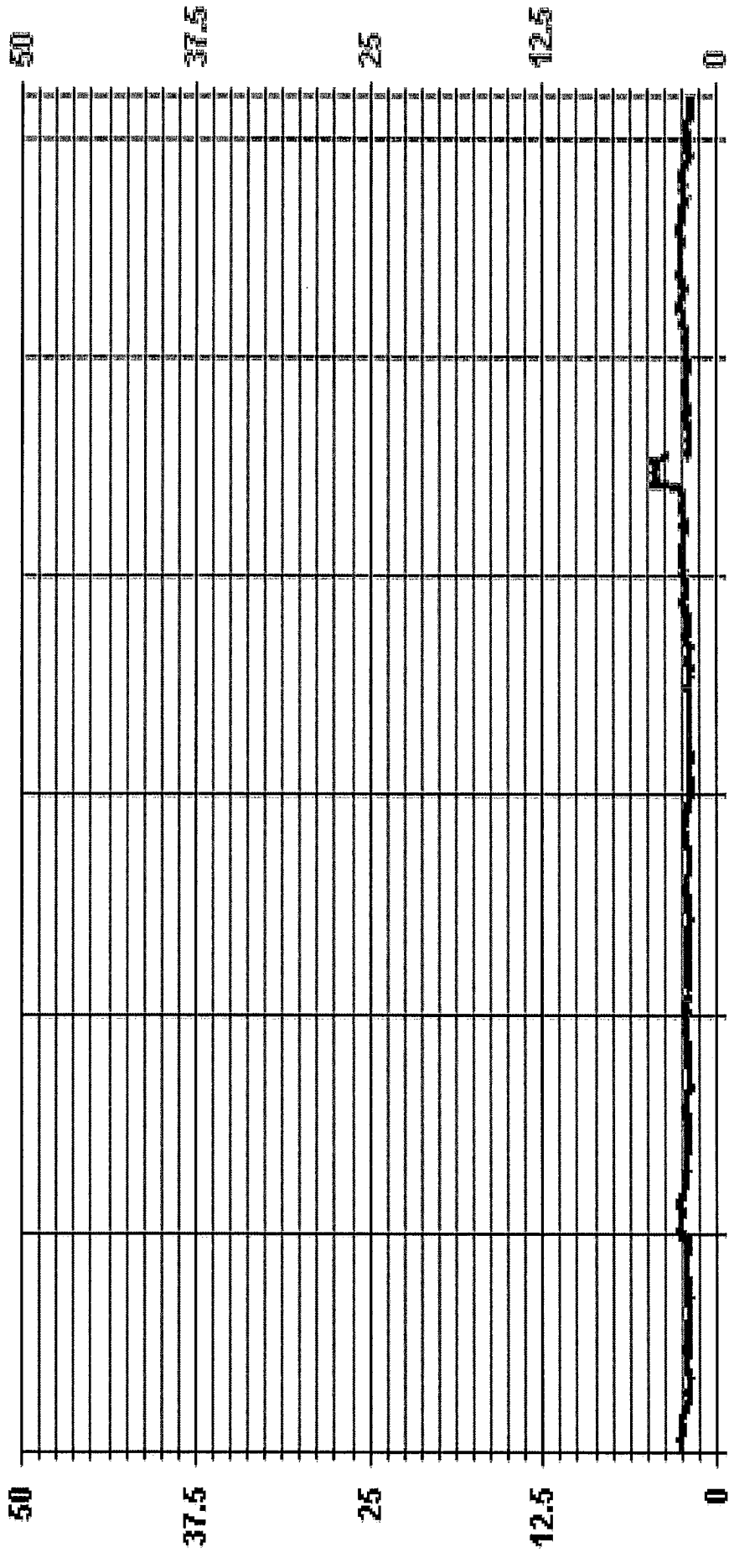


Calibration Graph for Site: LICA31 Parameter: H2S_ Sequence: H2S Phase: SPAM



TOTAL HYDROCARBON

01 Hour Averages



— LICA31 THC PPM



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 St. Lina Site - DECEMBER 2015
 JOB # 2833-2015-12-31- C

TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX	24-HOUR AVG	RDGS		
1	2.5	2.6	2.6	2.6	2.6	2.5	2.7	2.8	2.6	2.6	2.5	2.5	2.5	2.5	2.4	2.5	2.6	2.6	2.6	2.7	2.6	2.5	2.4	2.3	2.8	2.8	2.6	24	
2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.3	2.1	2.1	24
3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24
4	2.0	2.0	2.0	1.9	1.9	1.9	1.9	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	2.1	2.1	2.0	24	
5	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24
6	2.7	2.7	2.9	2.9	2.9	2.8	3.1	2.8	3.0	3.0	2.9	2.5	2.5	2.5	3.0	2.6	2.7	2.7	2.7	2.6	2.7	2.6	2.5	2.4	3.1	2.7	2.4	24	
7	2.3	2.5	2.5	2.3	2.3	2.2	2.3	2.2	2.3	2.4	2.4	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.5	2.2	2.2	24	
8	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24
9	2.6	3.3	2.2	2.1	2.2	2.1	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	3.3	2.1	2.1	24	
10	2.0	2.0	2.0	2.1	2.1	2.2	2.0	2.0	2.1	2.1	2.2	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.1	2.1	24	
11	2.2	2.2	2.2	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.2	2.2	24	
12	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	24	
13	2.0	2.0	2.0	2.1	2.0	1.8	2.0	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	24	
14	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	24
15	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	24
16	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	24
17	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	24
18	1.9	2.0	2.4	2.1	2.2	2.1	2.2	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24
19	2.0	2.0	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	24
20	2.0	2.0	2.0	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	24
21	2.4	2.4	2.4	2.4	2.3	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	24
22	2.4	2.4	2.4	2.3	2.3	2.6	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	24
23	3.0	2.7	4.5	4.7	4.5	4.5	4.3	4.2	4.4	4.5	4.5	4.6	4.6	4.7	4.6	4.6	4.6	4.6	4.4	4.1	2.9	2.0	2.2	2.1	4.7	3.9	2.4	24	
24	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	24
25	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	24
26	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24
27	2.3	2.3	2.7	2.8	2.8	2.8	2.7	2.6	2.7	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	24
28	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	24
29	2.6	2.6	2.6	2.5	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	24
30	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	24
31	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24
HOURLY MAX	3.0	3.3	4.5	4.7	4.5	4.5	4.3	4.2	4.4	4.5	4.5	4.6	4.6	4.7	4.6	4.6	4.6	4.6	4.4	4.1	2.9	2.0	2.2	2.1	4.7	3.9	2.4	24	
HOURLY AVG	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	24

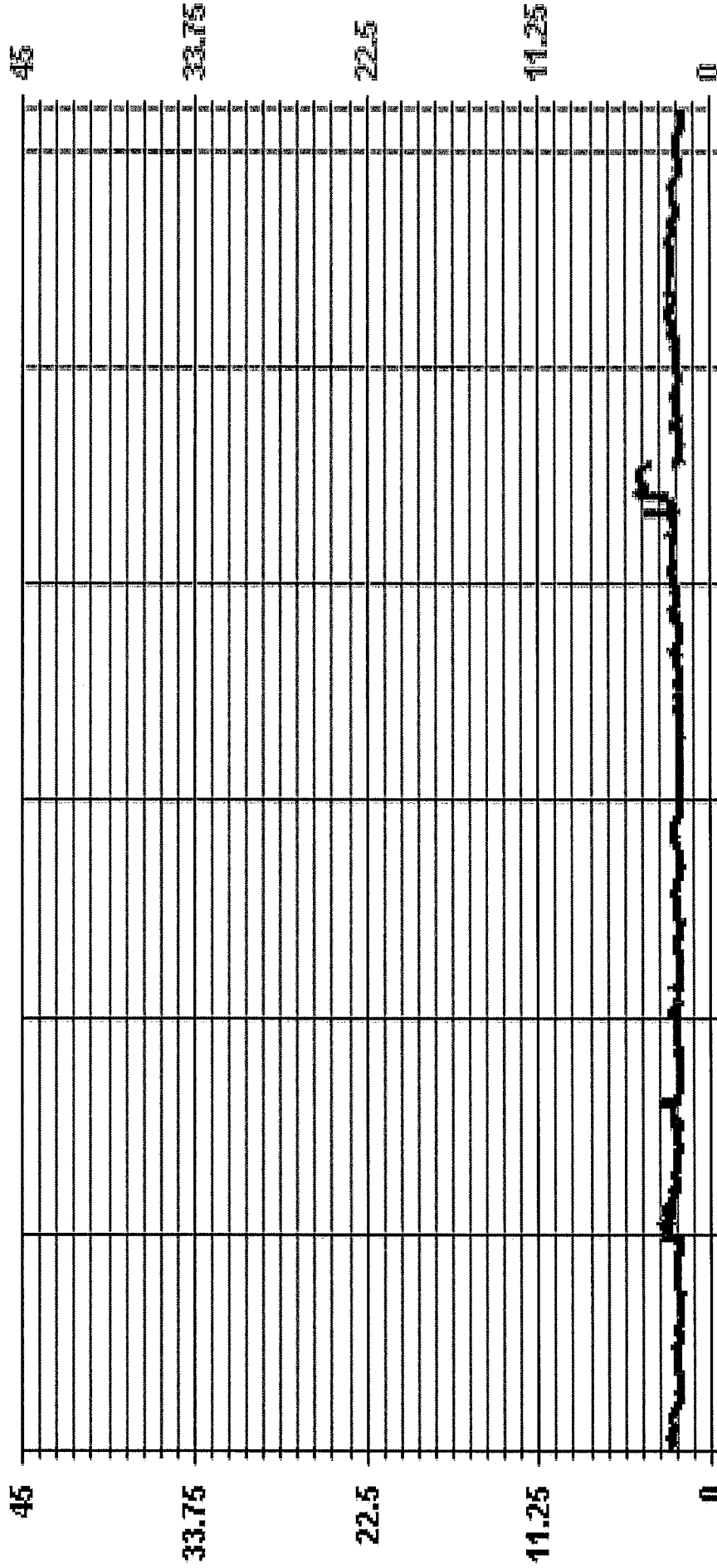
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	DAILY ZERO SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	706	ON DAY(S)	23, 23
MAXIMUM INSTANTANEOUS VALUE:	4.7 PPM @ HOUR(S)	3, 12	VAR-VARIOUS
IZS CALIBRATION TIME:	33 HRS	OPERATIONAL TIME:	743 HRS
MONTHLY CALIBRATION TIME:	4 HRS		
STANDARD DEVIATION:	0.44		

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

-- LICA31 THCMAX PPM

LICA31
 THC / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 31
 Site Name : LICA31
 Parameter : THC
 Units : PPM

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3.0	2.12	.56	2.12	3.81	6.78	10.46	5.94	6.08	8.34	11.17	13.15	7.21	6.64	6.08	5.51	1.55	97.59
< 10.0	.00	.28	.84	.28	.00	.00	.00	.00	.00	.00	.00	.14	.14	.14	.42	.14	2.40
< 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	2.12	.84	2.97	4.10	6.78	10.46	5.94	6.08	8.34	11.17	13.15	7.35	6.78	6.22	5.94	1.69	

Calm : .00 %

Total # Operational Hours : 707

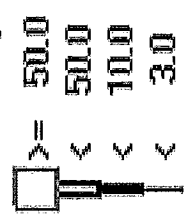
Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3.0	15	4	15	27	48	74	42	43	59	79	93	51	47	43	39	11	690
< 10.0	2	6	6	2	2	2	2	2	2	2	2	1	1	1	3	1	17
< 50.0																	
>= 50.0																	
Totals	15	6	21	29	48	74	42	43	59	79	93	52	48	44	42	12	

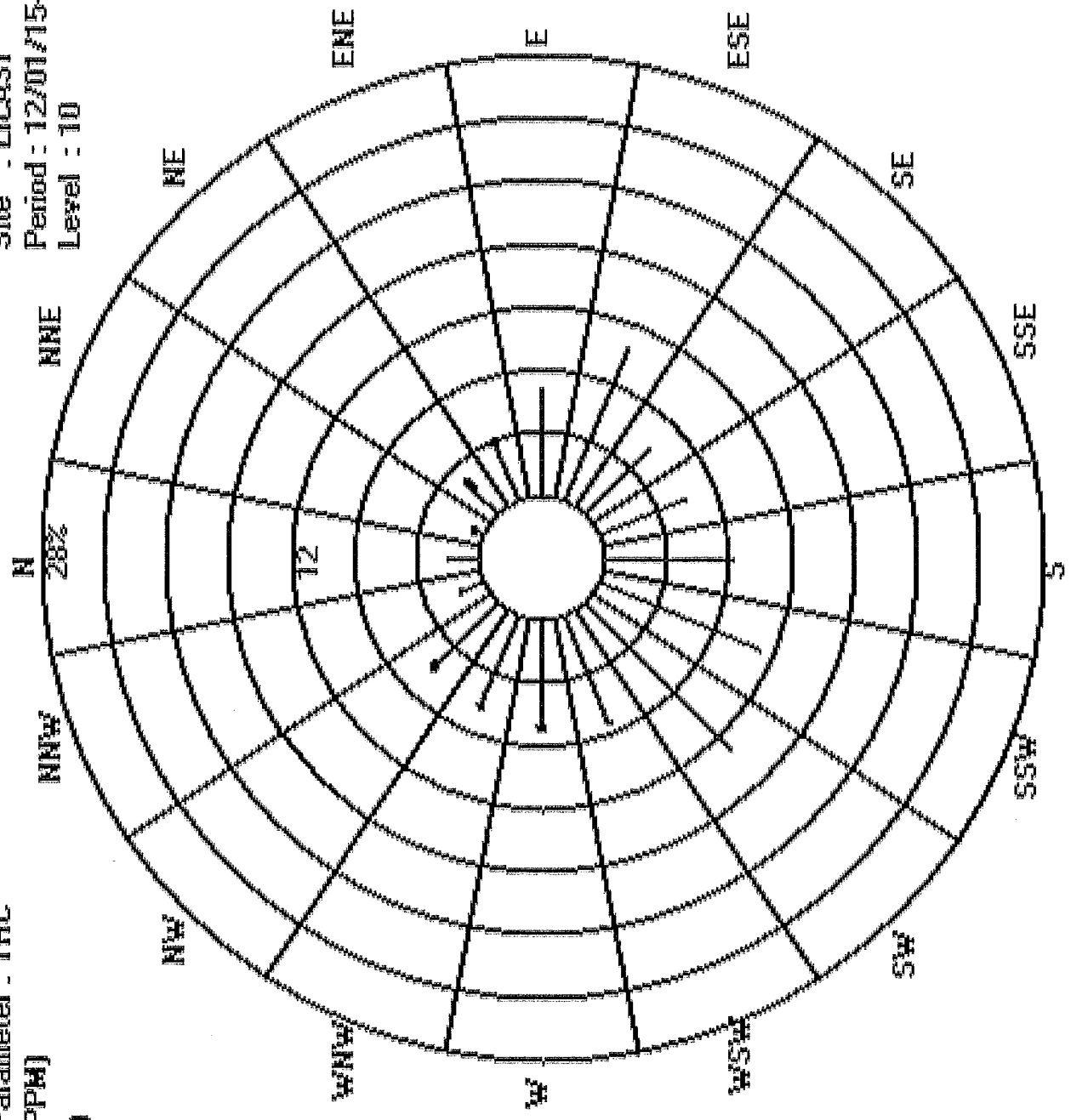
Calm : .00 %

Total # Operational Hours : 707

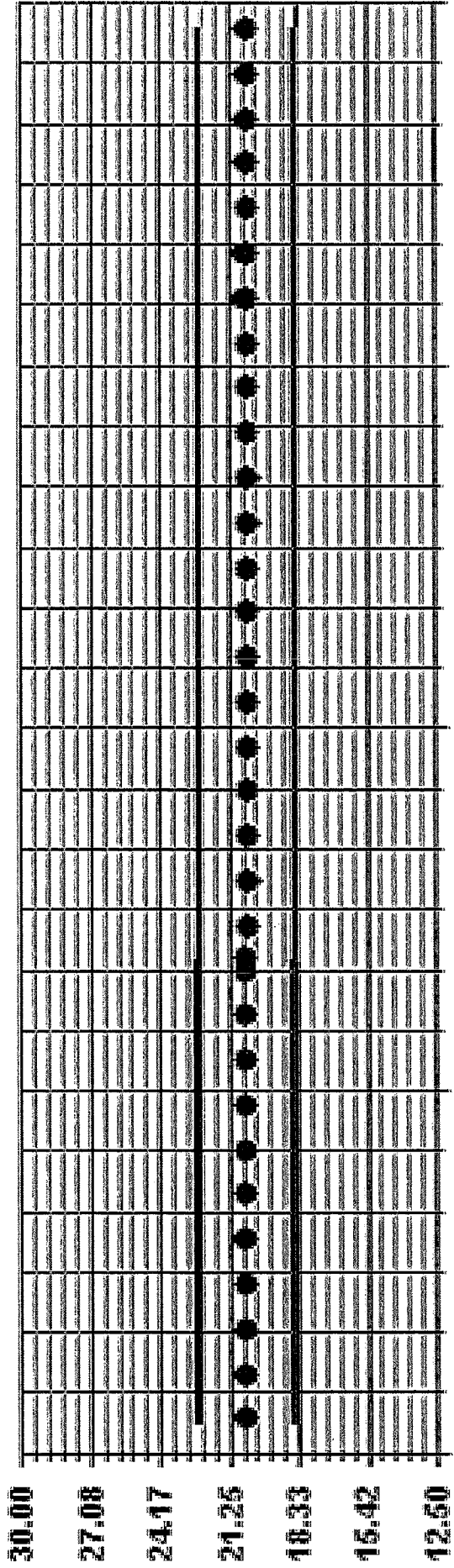
Logger : 31 Parameter : THC
Class Limits (PPM)



Site : LIC#31
Period : 12/01/15-12/31/15
Level : 10



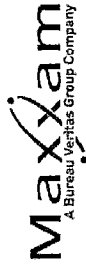
Calibration Graph for Site: LICA31 Parameter: THC Sequence: THC Phase: SPAN



12/1/16 12/8/16 12/16/16 12/24/16 12/31/16

+ Cal Value • Exp Value — Exp Value +10% — Exp Value -10%

OXIDES OF NITROGEN



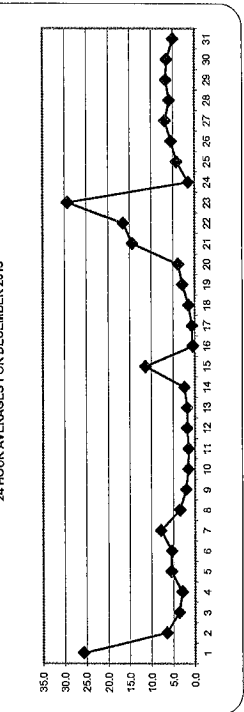
OXIDES OF NITROGEN (NOx) hourly averages in ppb

DAY	24-HOUR AVG.																								RDGS			
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300					
1	108	147	122	108	6.4	4	4.1	3.9	4.5	6.2	5.7	5.6	5.9	5.5	5.2	3.9	3.1	S	1.6	2.6	7.2	7.9	7.9	14.7	6.5	24		
2	7.5	6.4	5.4	4.3	4	2.8	2.9	2.6	3.4	6.6	5	4.1	3.1	2.9	2.8	2.7	S	2.7	3.5	3	2.7	2.2	2.2	2.3	7.5	24		
3	2.5	2.9	2.3	1.8	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	7.9	24		
4	6.8	7.3	7.8	6.2	5.8	7	7.4	5.5	4.1	3.4	3.8	6.1	S	9.6	8.3	4	2.9	2.9	2.9	5.1	6.8	6.4	9.6	5.5	24	24		
5	5.6	6.7	6.4	5.4	4.9	5	4.6	3.8	3.8	4.2	5	4.9	4.9	5	5.2	5.7	5.8	6	6.8	6.5	6.2	5.8	5.4	5.5	6.8	24		
6	6.3	13.6	16	12.9	10.3	7.6	7.6	7.7	8.1	8.5	7.7	5.9	S	5.5	5.1	6.8	6.3	9	8.2	6.6	6.3	5.9	2.8	2.4	16	7.9	24	
7	0.9	0.8	0.9	1.2	1.6	1.1	0.8	0.5	1.3	1.7	2.6	S	4.1	6.8	7.6	6.2	6.3	7.1	6.2	5.2	6	4.8	4	3.3	7.6	3.5	24	
8	2.9	2.7	2.6	2.6	2.7	2.8	3.7	3.1	2	1.5	S	2.9	2.7	1.7	1.4	1.6	1.5	1.3	1.5	1.2	2.2	1.2	1.1	1.1	3.7	2.1	24	
9	1.5	1.4	1.3	1.2	1.4	1.1	1.1	0.9	0.8	S	1.9	C	C	C	C	C	C	C	C	2.3	2.3	2.1	1.7	2.2	2.3	1.5	24	
10	1.7	1.8	1.3	1.2	1.4	1.1	1.3	S	1.7	1.3	C	C	C	C	C	C	C	C	C	1.9	1.6	1.8	1.4	1.4	1.9	1.5	24	
11	1.6	1.6	1.6	1.1	0.9	0.8	0.8	1	S	1	1	1	1	1	1	1	1	1	1	2.8	2.7	2.6	3	3	3	1.8	2.4	24
12	2.6	2.6	2.1	1.6	1.5	1.1	S	1.4	1.2	1.3	1.2	1.1	1.1	1.1	1.1	1.3	1.3	1.3	1.2	2.1	2.4	3.3	4	3	1.4	4	1.8	24
13	1.3	1.1	0.9	1.4	1.9	S	1.8	2	1	1.1	1.4	2	1	1.1	0.7	0.5	1.1	1.6	1.4	1.7	2.7	7	9.2	12.2	2.4	2.4	24	
14	15.5	23.4	19.7	13.3	S	11.2	12.7	13.7	13.5	13.6	14.6	13.4	14.4	14.5	13.9	14.2	12.9	7	5.1	3.8	3.5	2.9	2.5	1.9	23.4	11.4	24	
15	1.7	0.9	0.3	S	0.3	0.4	0.2	0.4	0.2	0.3	0.7	0.4	0.5	0.3	0.3	0.2	0.2	0.4	0.5	0.5	1	0.8	0.9	0.6	1.7	0.5	24	
16	0.8	S	3.9	0.4	1.7	0.5	0.7	0.6	0.9	1.3	2.1	2.8	1.8	1.5	1.7	1.5	1.7	1.5	1.8	1.8	1.6	1.5	1.1	1.1	1.2	0.7	24	
17	S	2	1.9	1.6	1.7	1.7	1.6	1.6	2.7	2.7	2.9	3.4	4.1	4.6	5	5	5.7	3.2	2.3	2.4	2.9	2.3	2	S	5.7	2.9	24	
18	1.3	1.2	1.4	1.7	2.4	3.8	3.3	3.5	3.3	3.4	4.1	4.4	4.7	4.6	S	4.8	4.7	5.3	5.4	5.4	5.5	5.7	S	3.9	5.7	3.9	24	
19	4.2	4.3	5.2	4.6	4.6	4.9	5.6	4.9	5.6	4.8	5.5	11.6	18.7	24.2	28.5	28.7	25.1	23.3	22.7	22.8	19.9	19.4	S	20.1	16.8	28.7	14.4	24
20	16.6	16.5	15.5	18	15.5	14.5	14.9	15	16.6	18.5	17.9	18.9	18.8	17.9	18.7	17.7	19.4	17.9	16	13.8	S	14	13.2	14.6	19.4	16.5	24	
21	13.7	15.4	23.9	37.1	35.9	33.2	34.7	36.2	39.2	41.2	43.1	41.6	41.6	41.6	41.6	40.9	40.8	35	30.1	S	5.5	3.2	3.3	2	43.1	29.3	24	
22	4.2	4.8	4.8	4.5	4.1	4.2	3.8	4.5	5.4	5.3	5.1	4.9	4.7	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.6	1.5	24
23	4.3	5.3	6.3	6.2	6	5.2	4	3	2.7	2.8	3.7	4.3	5	4.2	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.6	1.5	24
24	5.8	5.4	6.3	9.6	8.9	9	7.9	6.7	6.3	6.5	6.7	6.6	6.2	5.5	5.1	S	5.7	6.5	7.7	7	7.1	7.3	7.2	9.6	6.8	5.8	24	
25	7.3	7.2	7	6.8	6.4	5.8	5.7	5.8	5.2	4.9	5.2	5.2	5.2	5.2	5.2	S	4.6	5	6.8	5.9	6.3	5.4	5.6	6	7.3	5.9	24	
26	5.8	6.6	6	5.6	5.3	5.4	6.1	5.3	5.9	6.2	6.7	6.6	6.3	S	6.3	5.3	5.8	6.3	7.1	7.7	8.4	9	9.5	9.7	9.7	6.6	24	
27	9.8	9.9	10.4	10.8	12.7	14.8	16.6	15.1	8.8	6.8	4.5	3.7	S	3.1	2.3	2.2	2.2	2.1	1.6	1.8	2.4	2.1	2.3	2.1	16.6	6.4	24	
28	2.3	2.3	4.1	6.1	11.4	13.2	13.1	12	12.9	12.6	10.1	S	3.3	1.5	1.3	1.5	1.5	1	0.9	0.6	0.8	0.8	0.5	0.8	13.2	5.0	24	
29	50.5	32.2	29.5	37.1	38.6	33.9	33.2	39.8	36.2	39.2	41.2	43.1	41.6	41.6	41.6	40.9	40.8	35	30.1	29.6	24.3	16.3	20.1	16.8	5.0	24		
30	6.7	6.8	6.9	7.1	6.8	6.4	6.7	6.9	6.1	6.4	6.6	7.0	7.0	7.1	7.1	7.2	7.3	6.8	5.7	5.5	5.3	4.9	5.0	5.0	5.0	24		
31	HOURLY MAX	50.5	32.2	29.5	37.1	38.6	33.9	33.2	39.8	36.2	39.2	41.2	43.1	41.6	41.6	41.6	40.9	40.8	35	30.1	29.6	24.3	16.3	20.1	16.8	5.0	24	
	HOURLY AVG	6.7	6.8	6.9	7.1	6.8	6.4	6.7	6.9	6.1	6.4	6.6	7.0	7.0	7.1	7.1	7.2	7.3	6.8	5.7	5.5	5.3	4.9	5.0	5.0	5.0	24	

STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

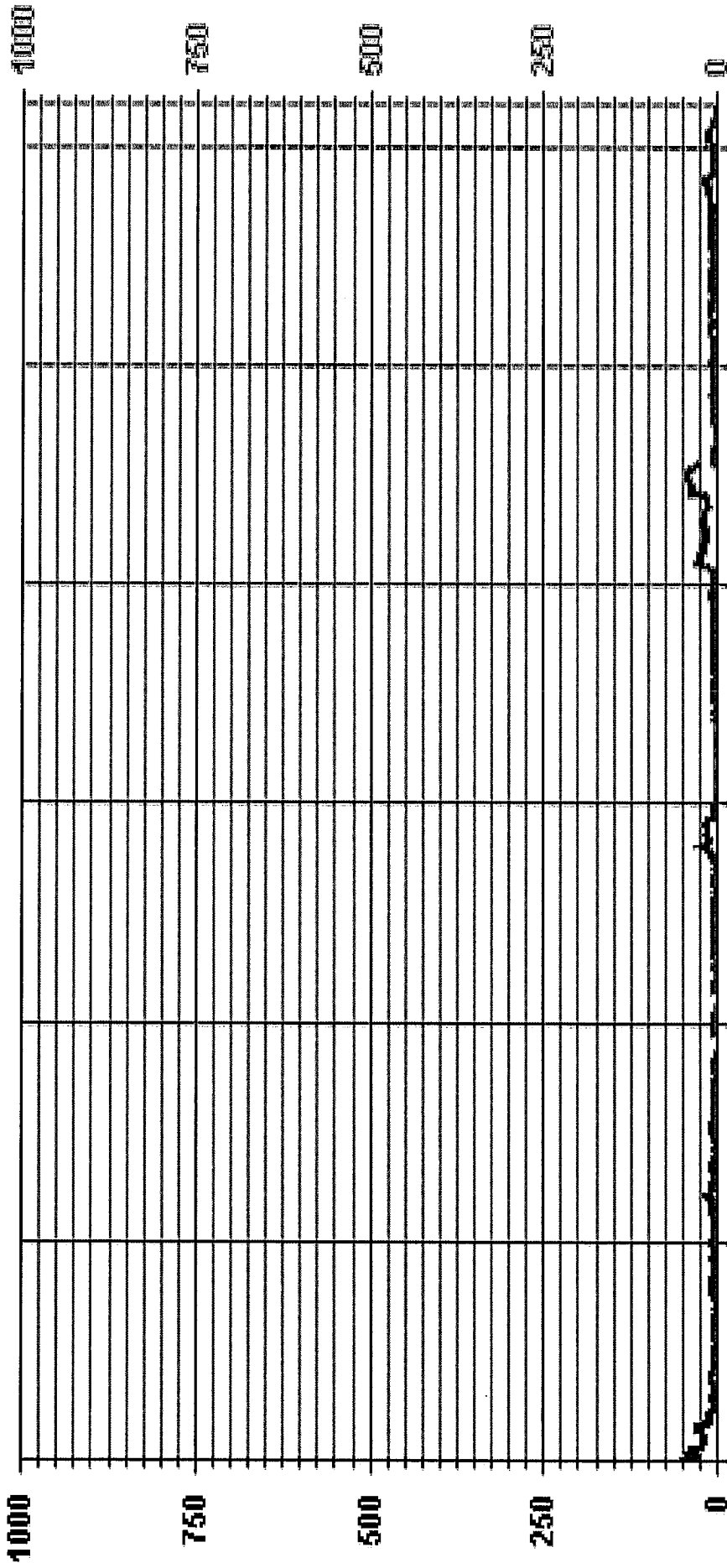
24 HOUR AVERAGES FOR DECEMBER 2015



MONTHLY SUMMARY

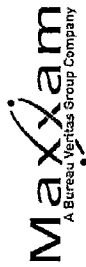
NUMBER OF NON-ZERO READINGS:	690	ON DAY(S)	1
MAXIMUM 1-HR AVERAGE:	50.5 PPB	@ HOUR(S)	0
MAXIMUM 24-HR AVERAGE:	29.3 PPB	ON DAY(S)	23
1/2 CALIBRATION TIME:	33 HRS	OPERATIONAL TIME:	744 HRS
MONTHLY CALIBRATION TIME:	15 HRS	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	7.86	MONTHLY AVERAGE:	6.4 PPB

01 Hour Averages



12:01:15 00:00-12:06:15 00:00-12:11:15 00:00-12:16:15 00:00-12:21:15 00:00-12:26:15 00:00-12:31:15 00:00

— LICA31 NOX_ PPB



OXIDES OF NITROGEN MAX instantaneous maximum in ppb

MST

DAY	HOURS																								DAILY MAX	24-HOUR AVG	RDGS.	
	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300				2400
1	52.9	41.7	35.7	42.6	43.3	39.6	52.6	58	34.6	25.3	21.2	21.1	21	21.4	23	23	34.3	24.6	5	30.9	29.7	20	17.5	15.5	58	31.7	24	
2	13.7	16.4	13.7	12.9	8.9	5.5	4.7	4.4	5.5	7.2	12.4	7.3	6.5	6.1	6.5	5.3	5.7	5	3	4.1	9.4	8.8	8.7	8.8	16.4	8.1	24	
3	8.6	7.5	6.6	4.9	4.9	3.5	3.9	3.5	3.1	7.8	5.8	5.1	4.1	3.9	3.7	3.8	5	3.4	4.4	3.8	3.2	3.3	2.8	3.1	8.6	4.7	24	
4	3.1	3.4	3.1	2.5	2.3	2.3	2.3	3	2.6	4	4.5	3.2	2.1	1.2	1.2	1.2	5	5.2	3.3	5	6.8	19.2	8.2	7.3	6.8	19.2	4.5	24
5	7.9	8.2	9.5	7	6.3	8.4	8.5	7.6	5.9	4.5	3.7	4.4	5.1	32.3	5	14.7	10.1	5.5	3.5	3.7	3.5	6.9	7.7	7.7	32.3	7.9	24	
6	6.6	7.8	7.4	6.3	5.5	5.8	5.8	4.6	4.5	5.2	5.6	5.7	9	5	6.1	8.8	29	6.9	8.8	8.2	17.2	6.9	6.9	7.8	29	8.1	24	
7	8.6	17.6	17.9	15.7	11.7	8.4	8.4	8.7	8.9	9.2	8.7	7.2	5	18.3	6.3	48.9	32.4	12	10.1	8	8.2	6.8	4	4.2	48.9	12.6	24	
8	2.1	1.5	1.5	2.6	2.3	2	1.3	17.9	31.3	2.5	3.5	5	5	8.5	9.6	7.2	7.5	8	7.4	6.6	6.8	5.9	4.6	4.2	31.3	6.5	24	
9	3.5	3.4	3.3	3.3	3.4	3.4	39.8	6.3	15.8	3.3	5	5.2	4.1	2.5	2	3.3	2	1.9	2.4	2	28.1	2	2.9	1.8	39.8	6.3	24	
10	2.6	2.6	2.1	2	1.9	1.9	2.2	5	5	2.2	2.2	2	2	1.8	1.6	2	2	2.1	1.8	2.9	3	4.3	4.9	4.9	2.1	4.9	2.6	24
11	2.3	2.3	1.5	1.7	1.5	1.7	1.6	5	1.6	1.7	1.7	1.5	1.8	2.3	2.3	2.8	3.2	4	4	3.5	3.4	3.8	3.7	4	2.5	2.4	24	
12	3.4	3.2	2.9	2.6	2.3	1.8	5	2.3	1.8	1.8	1.8	2	2	2.1	1.8	2.9	3	4.3	4.9	4.9	2.1	4.9	2.1	4.9	2.6	2.4	24	
13	1.9	2	1.6	2.2	2.7	5	6.4	4.1	1.9	3.5	3.3	28.5	3.1	3.9	1.6	1	2.8	5.3	3.1	3.8	29.6	67.2	10.7	14.6	67.2	8.9	24	
14	17.5	24.7	24.7	16	5	12.4	13.9	15.6	15.1	31	45.9	14.1	59.9	45.1	15	17.5	39.5	10.4	26.2	4.5	4.3	3.6	4.1	4.5	59.9	20.2	24	
15	4.7	3	2.9	5	0.9	1.1	0.8	1.8	0.7	1.2	3.4	4.5	19.6	2.8	2.6	1.2	0.8	1.2	1	1.2	20.6	1.5	2	1.3	47	5.4	24	
16	2	1	5	86.2	1.2	2.6	2.2	1.5	1.3	1.6	2.1	2.9	4.1	2.7	2.2	2.1	2.1	2.6	2.5	2.1	2	2	1.7	1.8	1.5	86.2	5.8	24
17	1.3	5	2.8	2.7	2.2	2.3	2.5	2.2	2.6	3.3	3.4	3.4	4.2	4.9	5.3	5.8	5.6	7.4	5.1	3.1	4.2	4.2	3.1	2.7	5	7.4	3.8	24
18	2.2	1.9	2	2.4	3.6	4.5	4.1	4.1	3.9	4.1	4.7	4.8	5.2	5.2	5.6	5.5	5.3	6.1	6.1	6.3	6.3	6.3	5	5	6.3	4.6	24	
19	4.8	5	5.8	5.8	6	6.4	36.9	6.1	5.6	7.1	18.2	22.5	29.3	50.4	94.1	26.5	27.1	26.4	24.8	23.6	51.5	5	84.7	19.3	94.1	25.6	24	
20	20.1	17.9	21	19.7	17	15.5	15.9	16.4	18.9	21.3	19.4	59.7	22.8	21.3	70.4	22	33.9	24.5	18.5	15	5	15.3	14.8	15.5	70.4	23.3	24	
21	15.2	18.2	36.3	39.7	37.9	35.6	35.3	35.7	38.9	40.2	43.3	44.1	45.1	69.5	43.6	43.9	44.2	41.8	34.3	5	8.9	4.8	6.9	5.6	69.5	33.4	24	
22	2.7	2.8	2.1	2	5.2	3.9	0.8	0	0.4	1	1.2	0.6	0.5	1.4	1	2.9	1.2	3.3	5	5.3	5.3	4.7	4	5.5	5.5	2.5	24	
23	5.7	5.6	5.9	5.7	5.1	5	4.5	5.9	5.9	5.8	5.6	5.6	5.6	5	5	4	5	5.5	3.6	3.9	3.7	4.7	4.7	5.9	5.1	24		
24	5	6.4	6.9	6.8	6.8	5.8	5.4	4.5	3.5	3.8	4.5	5.3	5.9	5.3	4.8	5.1	5	7	8.5	10.8	10.2	7.8	6.4	10.8	6.4	24		
25	6.4	6.1	9.6	10.2	9.8	9.7	9.1	7.7	7	7.5	7.4	7.5	7.1	6.3	6.1	5	5.7	6.5	8	8.4	7.6	7.6	7.9	10.2	7.7	24		
26	8.2	7.9	7.8	7.6	7.4	6.5	6.2	7.3	5.9	5.4	5.8	6.4	7.7	6.5	5	5.5	7.1	10.9	7.8	7.7	6.3	6.3	6.6	6.9	10.9	7.0	24	
27	6.7	7.2	7	6.1	6.2	6	7	6.5	7.8	7.3	9.2	7.8	8.1	5	9.7	6.2	7.8	8.1	7.9	8.6	9.3	9.8	10.3	11	11	7.9	24	
28	10.5	10.7	11.1	11.9	13.9	16.3	17.4	16.9	10.5	8.6	5.7	4.9	5	26	19.3	3.2	3.8	3.2	2.1	3	3.2	3.2	3	2.9	2.6	9.2	24	
29	3	3.5	5.1	10.5	12.7	14.3	14.6	13.2	13.9	13.4	11.8	5	4.5	2.7	1.9	2.6	2.9	1.8	1.6	1.2	1.6	1.3	1.1	1.6	14.6	6.1	24	
30	52.9	41.7	86.2	42.6	43.3	39.6	52.6	58	38.9	40.2	45.9	59.7	59.9	69.5	94.1	48.9	44.2	41.8	34.3	30.9	51.5	67.2	84.7	19.3	6.4	24		
31	9.3	8.2	11.5	8.6	7.9	7.8	10.5	9.4	8.9	8.5	9.1	11.1	10.9	13.3	13.1	11.0	12.3	8.8	7.8	6.7	10.6	7.9	8.5	6.4	19.3	6.4	24	
HOURLY MAX	52.9	41.7	86.2	42.6	43.3	39.6	52.6	58	38.9	40.2	45.9	59.7	59.9	69.5	94.1	48.9	44.2	41.8	34.3	30.9	51.5	67.2	84.7	19.3	6.4	24		
HOURLY AVG	9.3	8.2	11.5	8.6	7.9	7.8	10.5	9.4	8.9	8.5	9.1	11.1	10.9	13.3	13.1	11.0	12.3	8.8	7.8	6.7	10.6	7.9	8.5	6.4	19.3	6.4	24	

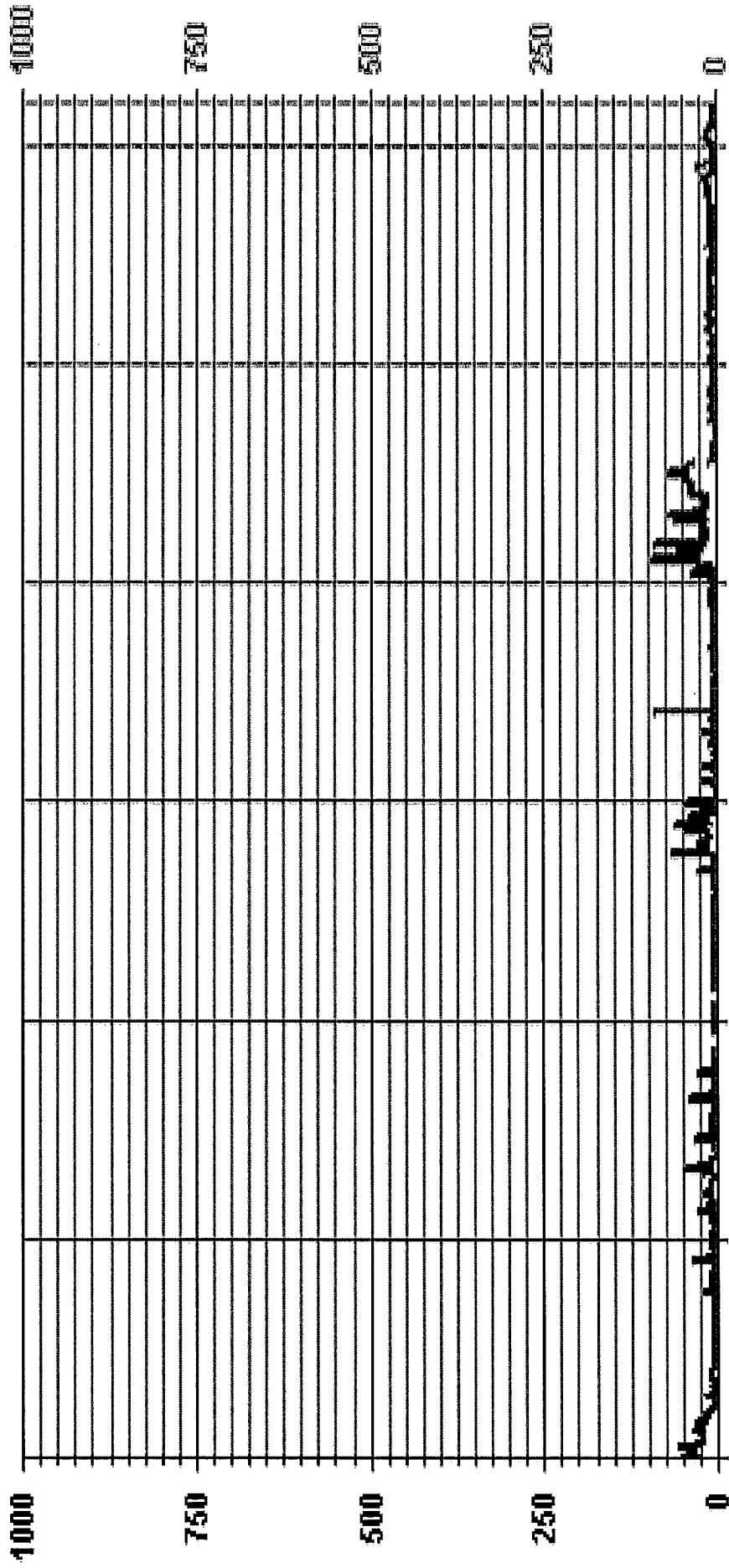
STATUS FLAG CODES

C	CALIBRATION
Q	QUALITY ASSURANCE
R	RECOVERY
M	MAINTENANCE
S	DAILY ZERO/SPAN CHECK
P	POWER FAILURE
G	OUT-OF-REPAIR
X	MACHINE MALFUNCTION
O	OPERATOR ERROR
K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	694
MAXIMUM INSTANTANEOUS VALUE:	94.1 PPB
@ HOUR(S)	14
ON DAY(S)	21
VAR-VARIOUS	
OPERATIONAL TIME:	743 HRS
33 HRS	
MONTHLY CALIBRATION TIME:	15 HRS
STANDARD DEVIATION:	12.20

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA31 NOXMAX PPB

LICA31
NOX_ / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 31
Site Name : LICA31
Parameter : NOX_
Units : PFB

Wind Parameter : WDR
Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	2.15	.86	3.01	4.16	6.60	9.62	5.74	6.17	8.47	11.35	13.36	7.32	6.89	6.32	6.03	1.72	99.85
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.14	.00	.00	.00	.00	.00	.14
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	2.15	.86	3.01	4.16	6.60	9.62	5.74	6.17	8.47	11.35	13.36	7.47	6.89	6.32	6.03	1.72	

Calm : .00 %

Total # Operational Hours : 696

Distribution By Samples

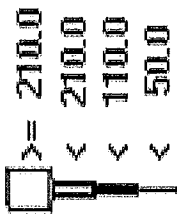
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	15	6	21	29	46	67	40	43	59	79	93	51	48	44	42	12	695
< 110.0											1						1
< 210.0																	
>= 210.0																	
Totals	15	6	21	29	46	67	40	43	59	79	93	52	48	44	42	12	

Calm : .00 %

Total # Operational Hours : 696

Logger : 31 Parameter : NOX

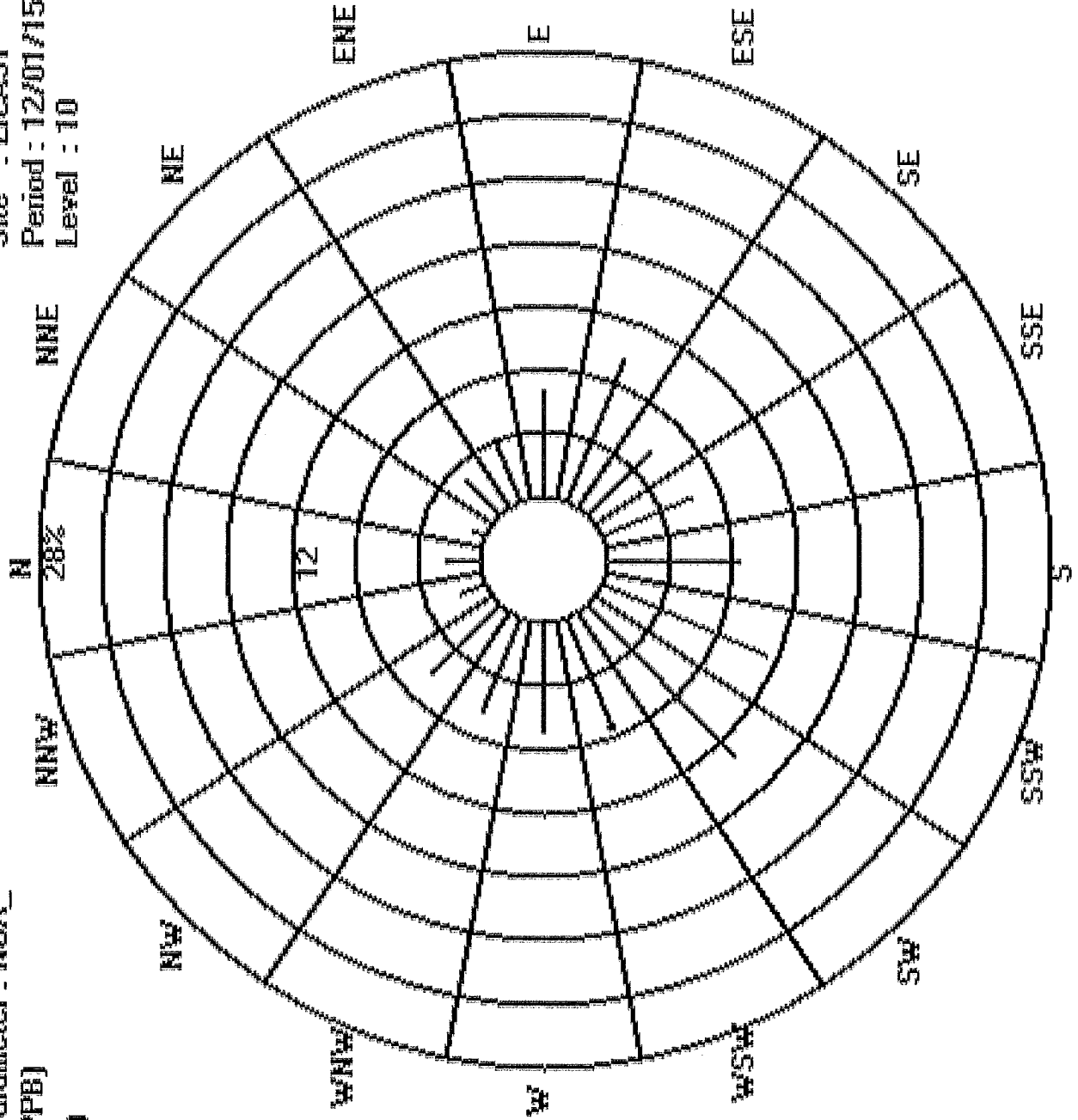
Class Limits (PPB)



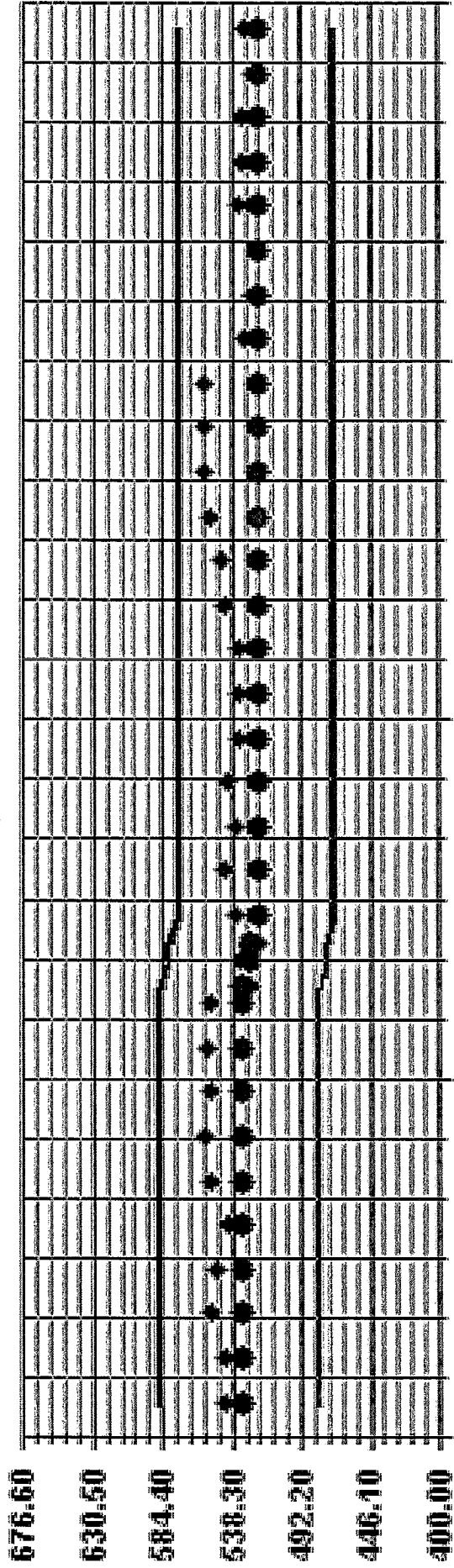
Site : LIC431

Period : 12/01/15-12/31/15

Level : 10



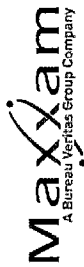
Calibration Graph for Site: LICA31 Parameter: NOX_ Sequence: NO2 Phase: SPAN



12/1/16 12/2/16 12/3/16 12/4/16 12/5/16 12/6/16 12/7/16 12/8/16 12/9/16 12/10/16

+ Cal Value ♦ Exp Value — Exp Value +10% — Exp Value -10%

NITRIC OXIDES



NITRIC OXIDE (NO) hourly averages in ppb

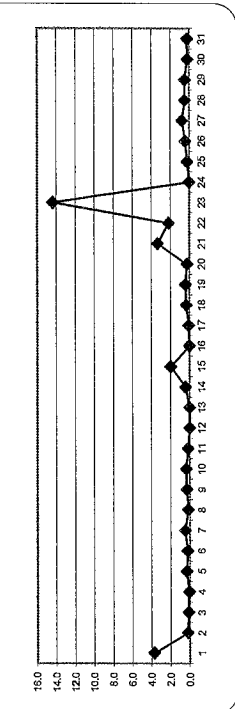
MST

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	DAILY MAX	DAILY AVG	ROGS	
1	11.5	2.2	1.2	3.7	5.5	1.2	2.8	6.2	2.3	6	7.9	8.1	7.7	7.6	5.5	3.5	1.1	0.3	\$	1.2	0.2	0	0	0	0	11.5	3.7	24
2	0	0	0	0	0	0	0	0	0	0	0.5	0.9	1.3	1	0.6	0	0	0	\$	0.1	0	0	0	0	0	1.3	0.2	24
3	0	0	0	0	0	0	0	0	0	0.7	0.9	0.7	0.2	0.3	0.2	0	\$	0	0	0	0	0	0	0	0	0.9	0.1	24
4	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	\$	0.4	0.3	0.2	0	0.2	0	0.1	0	0	0.4	0.1	24
5	0.1	0.1	0	0.1	0.1	0	0	0	0.4	0.3	0.7	1.1	1.3	1.8	\$	1	0	0	0	0	0	0	0	0	0	1.8	0.3	24
6	0	0	0	0	0	0	0	0	0	0.1	0.8	1.1	1.1	\$	1	0.6	0.3	0	0	0	0	0	0	0	0	1.1	0.2	24
7	0	0	0	0	0	0	0	0	0.1	0.3	1.1	1.9	1.6	\$	2	1	1.4	0.9	0.3	0	0	0	0	0	0	2	0.5	24
8	0	0	0	0	0	0	0	0	0.2	0	\$	0.8	0.9	0.7	0.2	0.1	0	0	0	0	0.2	0.2	0	0	0	0.9	0.2	24
9	0	0	0	0	0	0	0.4	0.2	0.1	0	\$	0.9	0.8	0.5	0.4	0.5	0.4	0.3	0.4	0.4	0.9	0.3	0.3	0.4	0.9	0.3	0.3	24
10	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.3	\$	0.2	C	C	C	C	C	C	C	C	C	0.7	0.4	0.4	0.4	0.7	0.4	0.4	24
11	0.2	0.4	0.3	0.4	0.4	0.3	0	\$	\$	0.1	0.3	C	C	C	C	C	C	C	C	0	0	0	0	0	0.4	0.2	24	
12	0	0	0	0	0	0	0	\$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
13	0	0	0	0	0	0	0	\$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
14	0	0	0	0	0	0	0	\$	0.6	0.5	0.3	0.4	0.6	1.1	0.4	0.5	0.3	0.2	0.3	0.5	0.2	0.6	2.5	0.4	0.4	2.5	0.4	24
15	0.5	5.4	3.2	0.2	\$	0.1	0.1	0.2	0.6	3.9	6.7	6.2	5.8	4.8	4.2	2.4	0.6	0	0.1	0	0	0	0	0	0	6.7	2.0	24
16	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	0.4	0.0	24
17	0	0	\$	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0	0	0	0.6	0.1	24
18	0	\$	2.2	0.1	0.1	0	0.2	0.1	0.3	0.3	0.4	0.7	0.7	0.5	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0	2.2	0.3	24	
19	\$	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0	0.2	0.7	1.1	1.2	1.4	1.5	0.8	0.3	0.2	0.1	0.1	0.1	0.1	0.1	\$	1.5	0.4	24	
20	0	0	0	0	0	0	0	0	0	0.3	0.9	1.1	1.4	1.2	0.9	0.1	0	0	0	0	0	0	0	\$	1.4	0.3	24	
21	0	0	0	0	0	0	0	0	0.2	0	0.9	5.1	10.4	14.2	15.8	14.2	8.3	3.7	1.5	0.9	0.1	0.5	\$	1.1	0	15.8	3.3	24
22	0.3	0.1	0.5	0	0	0	0.1	0	0.3	4.2	6.8	8.3	7.2	7.2	7	4	3	0.6	0.1	0	\$	0.5	0.2	0.2	8.3	2.2	24	
23	0.2	0.4	4.7	17.3	16.6	14.3	13.7	16	17.9	23.1	26.7	28.5	27.4	26.3	25.6	22.8	21.1	15.9	11.8	\$	0	0	0	0	28.5	14.4	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	0.2	0.0	24
25	0	0	0	0	0	0	0	0	0	0	0.5	1.2	1.1	1.2	0.6	0.4	0	\$	0.2	0	0	0	0	0	0	1.2	0.2	24
26	0	0	0	0	0	0	0	0	0.1	0.1	0.7	1.2	1.4	0.9	0.8	0.4	\$	0.7	0.6	0.6	0.7	0.5	0.5	0.3	1.4	0.4	24	
27	0.3	0.5	0.3	0.4	0.3	0.3	0.5	0.5	0.5	1.4	2.1	2.8	2.9	2.4	1.8	\$	0.2	0	0	0.1	0.1	0.1	0.1	0	2.9	0.8	24	
28	0.1	0.2	0.2	0.1	0	0	0	0.2	0	0.7	1.7	2.3	2.6	2.1	\$	0.9	0.3	0	0	0	0	0	0	0	2.6	0.5	24	
29	0	0	0	0	0	0	0	0	0	1	2.4	2.7	2.5	\$	1.9	0.4	0.1	0	0	0	0	0	0	0	2.7	0.5	24	
30	0	0	0	0	0	0	0	0	0	0	0.6	0.7	0.5	\$	1.1	0.6	0.3	0.1	0.2	0	0.1	0	0	0	1.1	0.2	24	
31	0	0	0	0	0.1	0	0.1	0	0.4	1.7	2.4	\$	0.6	0	0	0	0	0	0	0	0	0	0	0	2.4	0.2	24	
HOURLY MAX	11.5	5.4	4.7	17.3	16.6	14.3	13.7	16	17.9	23.1	26.7	28.5	27.4	26.3	25.6	22.8	21.1	15.9	11.8	1.2	0.9	2.5	1.1	0.4	28.5	14.4	24	
HOURLY AVG	0.5	0.3	0.4	0.8	0.8	0.6	0.6	0.8	0.8	1.6	2.4	3.1	3.1	2.9	2.6	1.8	1.2	0.8	0.5	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1

STATUS FLAG CODES

C	-CALIBRATION	Q	-QUALITY ASSURANCE
M	-MAINTENANCE	R	-RECOVERY
S	-DAILY ZERO/SPAN CHECK	X	-MACHINE/FAULT FUNCTION
P	-POWER FAILURE	O	-OPERATOR ERROR
G	-OUT FOR REPAIR	K	-COLLECTION ERROR

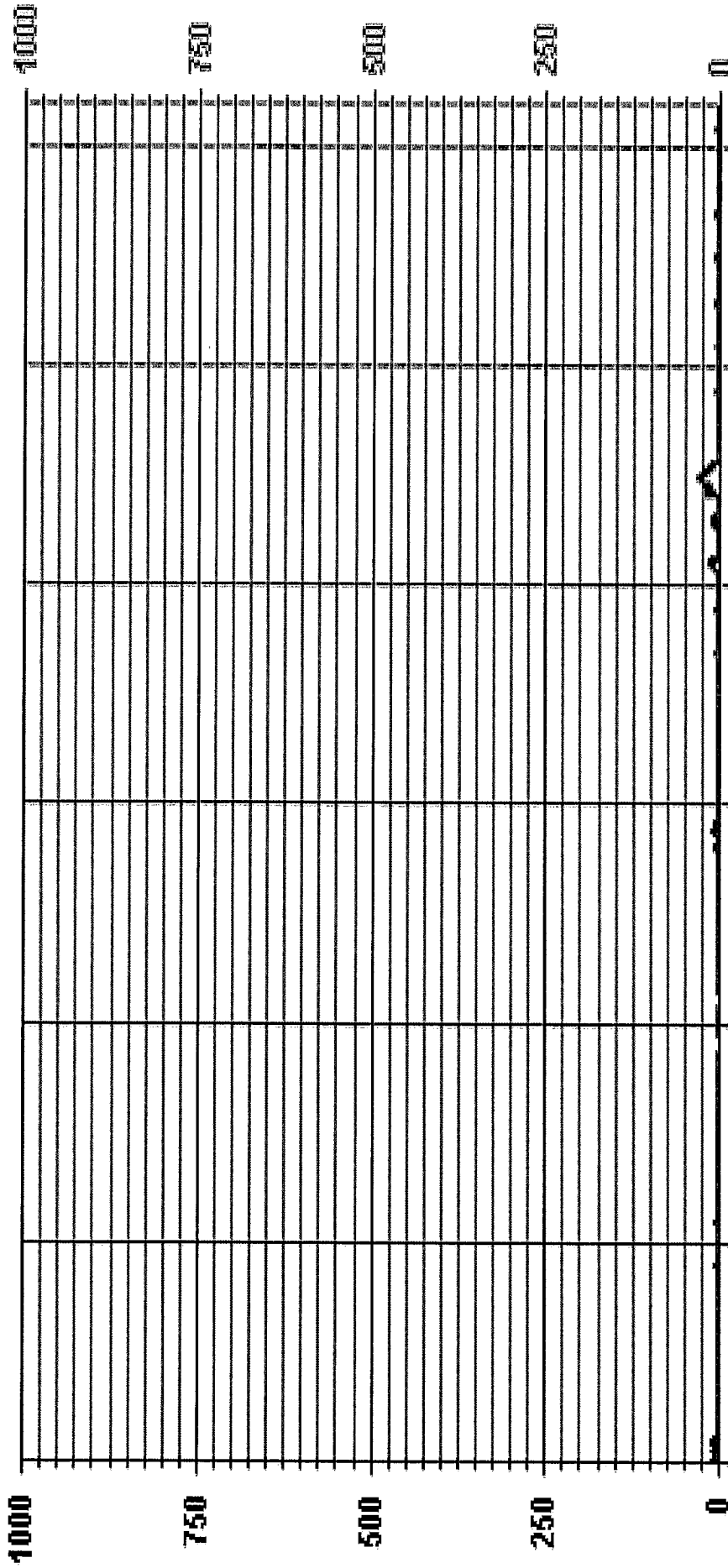
24 HOUR AVERAGES FOR DECEMBER 2015



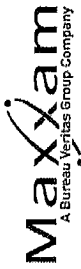
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	340	ON DAY(S)	23
MAXIMUM 1-HR AVERAGE:	29 PPB	ON DAY(S)	23
MAXIMUM 24-HR AVERAGE:	14.4 PPB	VAR-VARIOUS	
12S CALIBRATION TIME:	33 HRS	OPERATIONAL TIME:	744 HRS
MONTHLY CALIBRATION TIME:	15 HRS	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3.48	MONTHLY AVERAGE:	1.1 PPB

01 Hour Averages



— LICA31 NO_ PPB



NITRIC OXIDE MAX instantaneous maximum in ppb

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	RDGS.				
1	13.6	6	3.7	7.1	8.6	5.8	14.2	17.8	5.1	7.5	8.7	9.4	9.5	8.4	7.3	5.8	11.6	0.9	\$	2.3	1.3	0.5	2.2	17.8	6.9	24				
2	0.2	0.6	0.5	0.4	0.2	0.2	0.2	0.2	0.2	0.8	2.1	2	2	1.6	1.9	1.1	1.1	\$	1	0.6	0.6	0.7	0.6	2.1	0.8	24				
3	0.6	0.4	0.4	0.3	0.4	0.1	0.4	0.1	0.7	1.5	1.7	1.7	1.7	1.1	0.8	0.4	\$	0.3	0.5	0.2	0.2	0.2	0.2	1.7	0.6	24				
4	0.2	0.2	0.2	0.3	0.2	0	0.2	0.6	0.7	1	0.8	0.4	0.3	0.2	0.3	\$	2.2	0.9	0.9	0.7	9.4	0.5	0.7	1.3	9.4	1.0	24			
5	0.7	0.6	0.6	0.6	0.7	0.6	1.2	0.6	1.6	1.2	1.3	2	2.2	19.3	\$	3.8	0.6	0.4	0.2	0.2	0.2	0.2	0.2	19.3	1.7	24				
6	0.4	0.2	0.2	0.2	0.2	0.4	0.2	0.1	0.5	0.8	1.4	1.5	4.1	\$	1.7	2.7	18.4	0.4	1.2	1.4	9.4	0.4	1.5	18.4	2.1	24				
7	0.4	0.4	0.7	0.7	0.7	0.5	0.5	0.2	0.4	0.8	2.3	2.9	2.4	\$	16.3	2.1	39.9	16.9	2	1.4	0.3	1.5	0.3	0.4	39.9	4.1	24			
8	0.2	0.4	0.3	0.8	0.5	0.2	0.4	8.2	24.1	0.6	0.9	\$	1.5	1.5	1.2	0.9	0.7	0.7	0.6	0.4	0.7	0.7	0.4	0.6	24.1	2.0	24			
9	0.6	0.7	0.5	0.4	0.5	0.6	27.6	2.7	10.9	0.6	\$	2.2	1.7	1.1	0.9	1.3	1.2	1.2	1	1	1.7	1	1.7	1	27.6	3.4	24			
10	1	0.7	1.2	1	1	1	1	1	1	0.8	\$	0.8	C	C	C	C	C	C	C	C	1.2	1	1.2	0.9	1.2	1.0	24			
11	0.9	0.9	0.9	1	1	1	1	1	1	\$	0.8	1	C	C	C	C	C	C	C	C	0	0	0	0	0	0.6	24			
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.1	0.2	0.4	0.2	24		
13	0.2	0.2	0.3	0.1	0.1	0.3	\$	0.5	0.3	0.5	0.5	0.3	0.4	0.3	0.8	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.8	0.4	24			
14	0.4	0.5	0.6	0.6	0.6	\$	4.4	2	0.9	2	2.3	17.9	1.7	2.7	0.9	0.7	1	2.9	1	1.6	19.3	58.5	1.2	1.1	58.5	5.4	24			
15	1.5	7.1	7.2	0.8	\$	0.7	0.7	1.2	1.8	20.9	33.3	6.9	39.1	30	5.3	4.6	20.2	1.8	1.8	1.8	0.2	0.2	0.2	11.9	0.5	0.6	0.2	32.4	3.0	24
16	32.4	1.2	0.8	\$	0.2	0.4	0.4	0.4	0.4	0.4	1.2	1.7	11.9	1.4	1.2	0.4	0.2	0.4	0.2	0.4	0.2	0.2	11.9	0.5	0.6	0.2	32.4	3.0	24	
17	0.2	0.2	\$	72.2	0.9	0.7	0.4	0.9	0.7	1	0.7	1	1.3	1.4	1.2	1	0.8	0.7	0.9	0.8	0.9	0.7	0.8	0.8	72.2	4.0	24			
18	0.6	\$	0.9	0.9	0.9	0.9	0.8	0.8	0.6	0.9	1.4	1.7	1.9	2.2	2.2	1.5	1	0.7	0.6	0.6	0.6	0.5	0.5	2.2	1.1	24				
19	0.4	0.4	0.3	0.5	0.5	0.5	0.4	0.5	0.5	1.2	1.7	1.7	2	1.9	1.6	0.8	0.6	0.7	0.5	0.6	0.5	0.5	0.5	2	0.8	24				
20	0.3	0.4	0.4	0.4	0.4	0.1	26.5	0.5	0.4	2.4	9.9	15.4	17.8	31.9	68.1	11.4	6.3	4.6	2	2.3	25.1	\$	35.7	0.9	68.1	11.4	24			
21	2.5	0.8	5.9	0.8	0.6	0.8	0.8	0.6	2.6	6	8.4	4.5	9.8	9.9	58.7	7.6	16	6.4	1.5	0.5	\$	1.7	1	0.8	58.7	8.2	24			
22	0.9	1.1	16.2	19.6	18.7	16.3	15.9	16.9	21.4	25.2	28.3	29.4	30.3	51.3	27.6	24.3	23.7	21.8	15.5	\$	0.5	0.1	0.4	0.4	51.3	17.6	24			
23	0.5	0.3	0.2	0	1.2	0.2	0.1	0.1	0	0.4	0.9	0.7	0.6	1.1	0.7	1.7	0.6	1.2	\$	1	0.4	0.7	0.3	0.5	1.7	0.6	24			
24	1	0.3	0.5	0.3	0.3	0.5	0.2	0.4	0.5	1.6	1.8	1.8	2.5	1.2	0.9	0.9	0.3	\$	1.6	0.8	1.1	0.6	0.3	0.5	2.5	0.9	24			
25	0.6	0.3	0.6	0.5	0.6	0.5	0.5	0.8	0.8	0.7	1.6	2	2.2	1.7	1.2	0.9	\$	1.5	1.2	1.2	1.2	1.2	1	1.2	0.8	2.2	1.0	24		
26	0.9	1.3	1	1.1	0.9	1	1.2	1.1	1.1	2.7	2.7	3.5	3.7	2.9	2.7	\$	0.8	0.6	0.6	0.7	0.6	0.7	0.8	0.5	3.7	1.4	24			
27	0.5	1	0.7	0.7	0.7	0.5	0.7	1.2	0.5	1.5	2.6	3.2	5	3.5	\$	1.6	1.9	0.3	0.5	0.3	0.3	0.3	0.3	0.5	5	1.2	24			
28	0.3	0.7	0.4	0.3	0.4	0.3	0.4	0.2	1.2	2.2	4	3.7	3.7	\$	4.2	1.3	1.6	0.7	0.6	0.3	0.3	0.4	0.3	0.7	4.2	1.2	24			
29	0.2	0	0.3	0.2	0.4	0.6	0.6	0.8	0.5	2.1	1.3	1.2	\$	17.4	11.4	1	1.2	1	0.6	0.8	0.8	1.5	1	0.6	17.4	2.0	24			
30	0.7	0.5	0.5	0.7	0.7	0.6	0.7	0.7	1.5	2.8	3.3	\$	1.2	1	0.3	0.2	0.3	0	0	0	0	0.2	0	0.1	3.3	0.7	24			
31	32.4	7.1	72.2	19.6	18.7	16.3	27.6	17.8	24.1	25.2	33.3	45	39.1	51.3	68.1	39.9	23.7	21.8	18	2.3	25.1	58.5	35.7	3.7	3.7	0.8	24			
HOURLY MAX	32.4	7.1	72.2	19.6	18.7	16.3	27.6	17.8	24.1	25.2	33.3	45	39.1	51.3	68.1	39.9	23.7	21.8	18	2.3	25.1	58.5	35.7	3.7	3.7	0.8	24			
HOURLY AVG	2.1	0.9	3.9	1.4	1.4	1.2	3.4	2.3	2.7	3.2	4.3	6.1	5.9	7.9	7.7	4.9	4.9	2.0	2.0	2.0	0.8	3.6	2.5	1.9	0.8	0.8	24			

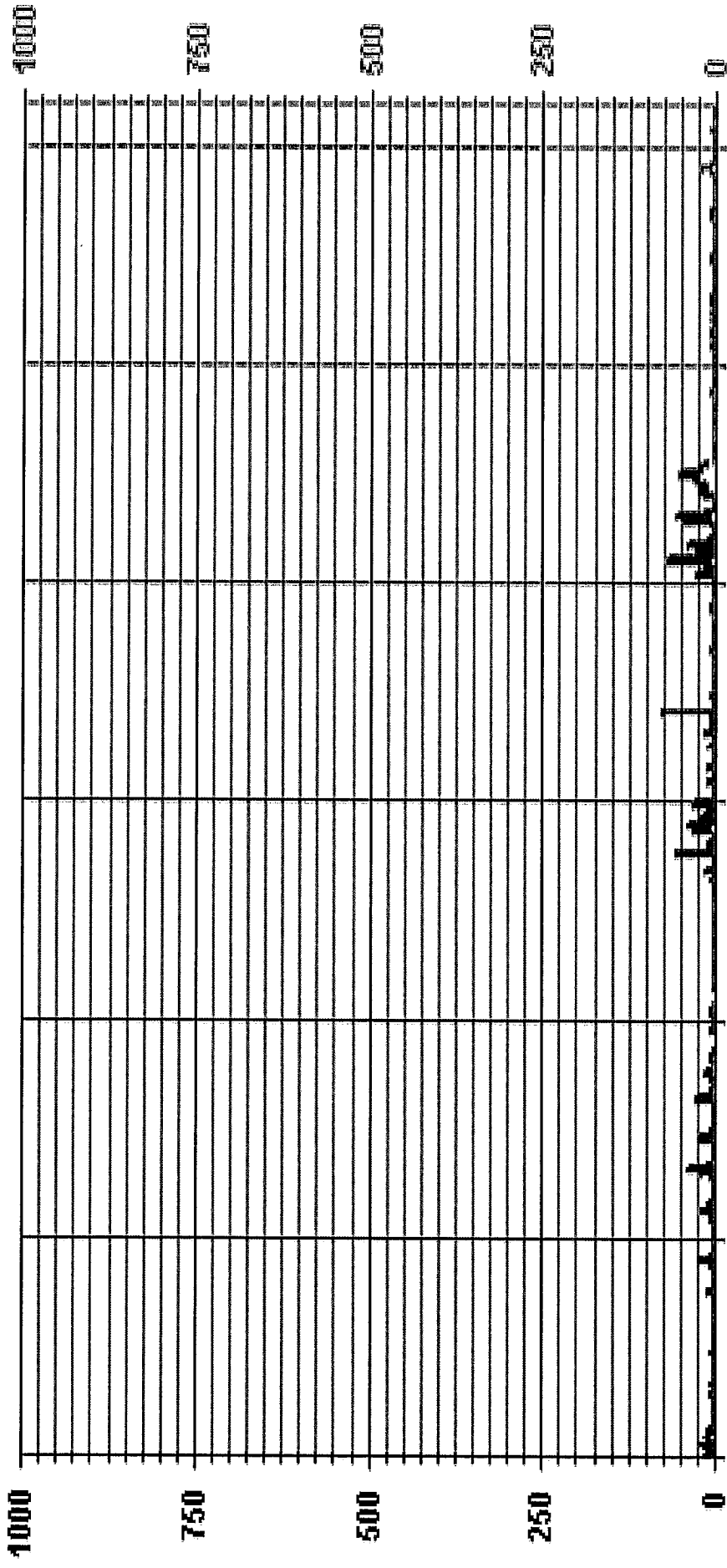
STATUS FLAG CODES

C	- CALIBRATION	O	- QUALITY ASSURANCE
M	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	D	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	673
MAXIMUM INSTANTANEOUS VALUE:	72.2 PPB @ HOUR(S) 2 ON DAY(S) 18
IZS CALIBRATION TIME:	33 HRS
MONTHLY CALIBRATION TIME:	15 HRS
STANDARD DEVIATION:	7.82
OPERATIONAL TIME:	743 HRS
VAR- VARIOUS	

01 Hour Averages



LICA31
 NO_ / WDR Joint Frequency Distribution (Percent)
 December 2015

Distribution By % Of Samples

Logger Id : 31
 Site Name : LICA31
 Parameter : NO
 Units : PPS

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	2.15	.86	3.01	4.16	6.60	9.62	5.74	6.17	8.47	11.35	13.36	7.47	6.89	6.32	6.03	1.72	100.00
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	2.15	.86	3.01	4.16	6.60	9.62	5.74	6.17	8.47	11.35	13.36	7.47	6.89	6.32	6.03	1.72	

Calm : .00 %

Total # Operational Hours : 696

Distribution By Samples

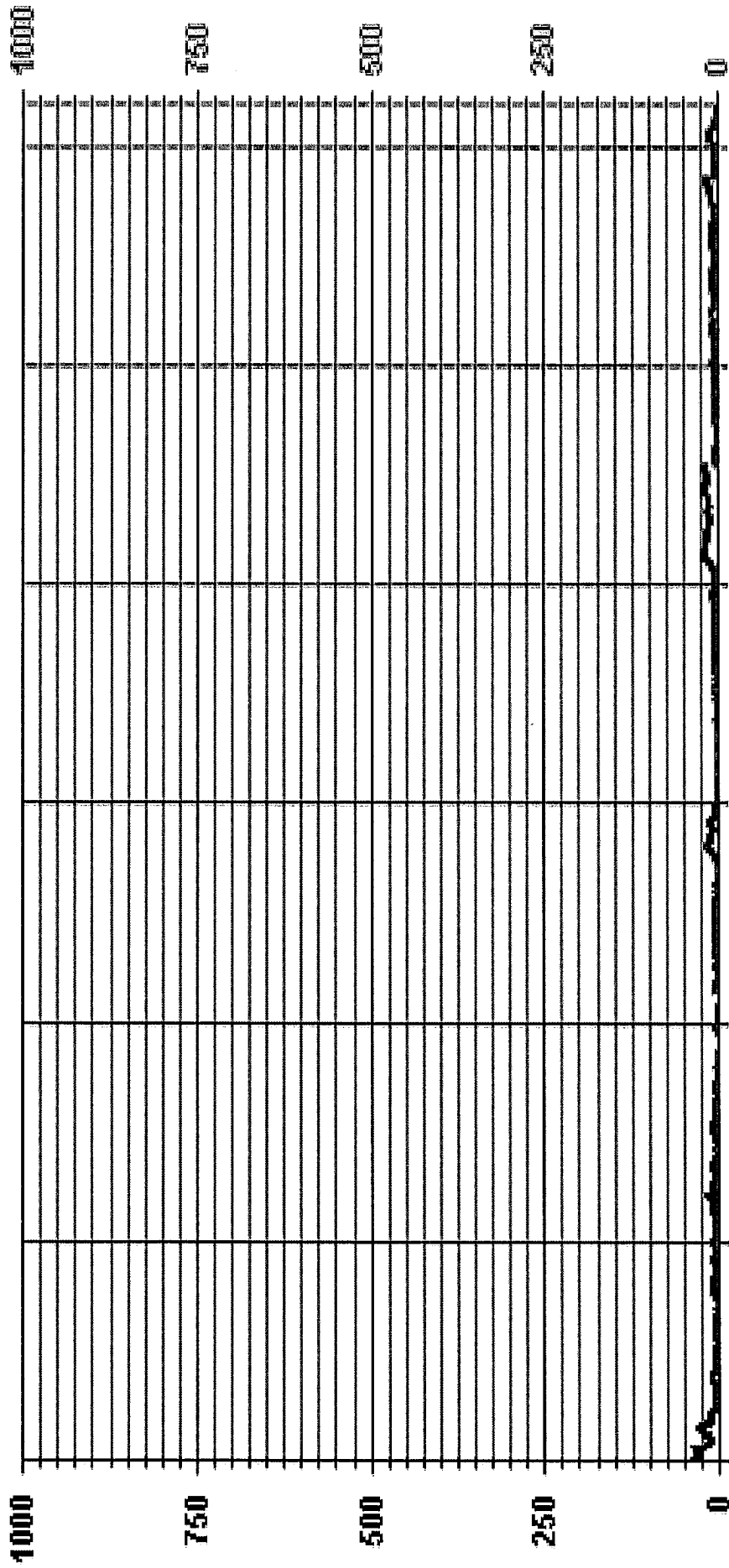
Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	15	6	21	29	46	67	40	43	59	79	93	52	48	44	42	12	696
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	15	6	21	29	46	67	40	43	59	79	93	52	48	44	42	12	

Calm : .00 %

Total # Operational Hours : 696

NITROGEN DIOXIDE

01 Hour Averages



— LIC31 NO2_ PPB



NITROGEN DIOXIDE MAX instantaneous maximum in ppb

MST

DAY	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX.	24-HOUR AVE.	RDGS.											
1	40.1	35.6	32.1	35.6	33.7	38.5	40.6	29.6	18.3	13.5	12.4	12.3	13.7	17.2	19.6	25.5	23.8	5	29.1	28.5	19.7	17.4	15.1	40.6	25.5	24		
2	14	16.6	13.9	12.7	9.1	5.6	4.8	6.1	7.4	11.1	5.6	5	5.2	5.4	4.7	5.2	5	2.1	4.1	4.1	9.2	9.1	9	9.1	16.6	7.8	24	
3	8.5	7.6	6.7	4.9	4.9	3.5	4.2	3.5	5.6	7.1	5	3.8	3.6	3.3	3.2	3.8	3	3.7	4.2	3.9	3.3	3.1	2.6	3.3	8.5	4.5	24	
4	3.3	3.6	3.2	2.6	2.2	2.5	2.6	2.4	3.6	4.2	3.2	1.2	1.2	1.2	1.2	1.2	3	2.8	4.5	6.6	12.9	8.2	7.1	6.5	12.9	4.0	24	
5	7.7	8.2	9.5	6.6	6.4	8.2	7.9	7.3	4.6	3.6	2.8	2.6	3.2	13.4	5	11	10	6	3.8	3.9	3.7	7.1	8	8.2	13.4	6.7	24	
6	8.5	17.5	17.7	15.5	11.6	8.5	8.4	8.5	8.9	8.7	6.8	5.1	5.1	7.4	13.6	7	8	7.2	8	7.2	9.8	7	6.1	6.9	13.6	6.7	24	
7	1.9	1.6	1.7	2.1	2.4	2.3	1.4	9.5	10.3	2.2	2.9	5	4.4	7.5	9.1	6.8	7.3	8	7.3	6.7	6.6	5.4	4.4	4	10.3	5.1	24	
8	3.5	3.3	3.3	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	2	1.3	1.3	1.3	1.4	1.5	1.2	13.9	3.5	24	
9	1.5	2	1.4	1.5	1.5	1.5	1.4	1.3	1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	24	
10	2.7	2.7	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	24	
11	3	3	2.7	2.5	2.4	2.5	2.7	5	1.8	1.8	1.9	1.7	2.3	2.3	2.3	3.1	3.7	4	4	3.6	3.6	4	3.9	3.8	4	2.9	24	
12	3.7	3.4	2.9	2.7	2.6	2.1	5	1.9	1.6	1.4	1.6	1.6	1.4	1.3	1.6	1.7	2.1	2.1	2.7	2.7	4	4.6	4.6	1.9	4.6	2.4	24	
13	1.6	1.7	1.5	2	2.5	5	2.4	2.2	1.3	1.8	1.4	1.1	1.8	1.4	1.6	0.9	0.8	2.4	2.5	2.1	2.4	10.1	18.7	10.1	13.7	4.2	24	
14	16.1	18.5	17.8	15.3	5	12.1	13.5	14.5	13.7	14.1	15.3	7.9	21	16.7	10.4	14.2	20.7	10.6	11.6	4.5	4	3.6	9.3	2.7	21	12.3	24	
15	14.8	1.9	2.1	5	1	1.1	0.8	1.3	0.8	1	2.1	2.7	7.7	1.6	1.5	1	1.1	1.1	1.1	1.7	10.4	1.4	1.8	1.5	14.8	2.7	24	
16	1.9	1.1	5	0.8	1	1.1	0.8	2.6	0.8	9.7	0.8	P	1	1.6	1.3	7.2	2.5	2.1	3.2	3.5	2.5	2.9	3.7	3.8	9.7	2.5	23	
17	1.5	23.8	0.9	2.8	2.4	1.1	1.2	1.3	2	2.6	3.1	1.9	1.7	2	2	2.4	2.3	2.2	2	1.9	1.4	1.5	1.3	23.8	2.8	2.4	24	
18	5	2.1	2.1	1.9	1.8	1.8	1.8	2.5	2.9	2.6	2.4	2.7	3.4	3.6	4.4	5.1	6.8	4.6	2.9	4.1	4.1	2.7	2.3	5	6.8	3.1	24	
19	2	1.8	2	2.2	3.5	4.3	4.1	3.9	3.4	3.7	3.7	3.9	3.9	4.8	5.3	5.2	6.1	5.9	6.1	6.1	6.2	5	4.5	6.2	4.2	24		
20	5	5.4	6.3	6	6	6.8	12.4	5.9	6.1	5.9	8.7	9.5	11.9	19.1	17.2	15.3	16.4	12.9	11.6	15.7	15.1	18.3	18.6	17.9	15.2	24		
21	17.7	17.4	17.3	19.6	17.1	15.4	15.7	16.3	17.3	17.3	13.1	16.4	12.9	11.6	15.7	15.1	18.3	18.6	17.9	15.2	5	14.8	14.3	15	19.6	16.1	24	
22	14.6	17.6	20.6	20.6	20	20.3	20.2	19.1	19.1	17.2	15.3	15.5	15.3	22.8	17.4	20	20.8	20.4	19.3	5	8.4	5.1	6.9	5.8	22.8	16.6	24	
23	2.5	2.7	2.3	2.3	4.1	4	0.9	0.5	0.7	1.1	1.2	0	0.3	0.6	1.5	1.4	2.5	5	4	3.2	3.1	3.6	4.7	4.4	6	4.5	24	
24	4.8	5.7	6	5.8	5.3	4.7	4.5	5.6	5.7	5.4	4.1	4.1	3.7	3.7	4	4.1	3.8	5	4	3.2	3.1	3.6	4.7	4.4	6	4.5	24	
25	4.7	6.6	7	6.6	6.8	5.8	4.9	3.9	3.1	3.5	3.5	3.7	4.2	4.2	4	4.7	5	6.1	7.7	10.2	10.2	9.4	7.2	6.1	10.2	5.8	24	
26	5.9	5.6	9	9.5	9.1	9.2	8.7	7.1	6.3	5.8	5.1	4	3.7	3.4	3.8	5	5.3	6.1	7.7	8	7.5	7.6	7.7	7.8	9.5	6.7	24	
27	8	7.9	7.3	7.3	7.5	6.3	6.4	6.4	5.9	5	4.1	3.6	3.5	3.6	5	4.3	5.3	10.7	7.6	7.8	6.4	6.5	6.5	6.6	10.7	6.3	24	
28	6.5	7.3	6.9	6.2	6	6.1	6.6	6.5	7.1	6	5.6	4.3	4.7	5	6.4	5.6	6.9	7.4	8.1	8.7	9.1	9.6	10	10.4	7.0	24		
29	10.7	10.7	11.1	11.7	13.9	16.4	17.1	16.6	10.6	7.6	5.1	3.8	5	8.8	8.1	3	2.9	2.6	2.1	2.8	3.2	2.6	3.1	2.8	17.1	7.7	24	
30	2.7	3.3	5.2	10.3	12.6	14.5	14.5	12.9	13.4	12.1	9.6	5	3.6	2.1	1.9	2.2	2.3	1.8	1.4	1.4	1.4	1.4	1.4	1.4	1.4	14.5	5.8	24
31	40	36	32	36	34	39	41	30	18	15	16	21	23	29	20	26	24	23	29	29	20	53	19	6.1				
HOURLY MAX	7.5	7.7	8.4	7.6	7.0	7.1	7.7	7.5	6.7	6.2	5.4	5.4	6.2	6.2	7.1	8.1	7.3	6.4	6.4	7.7	6.2	7.2	6.1					

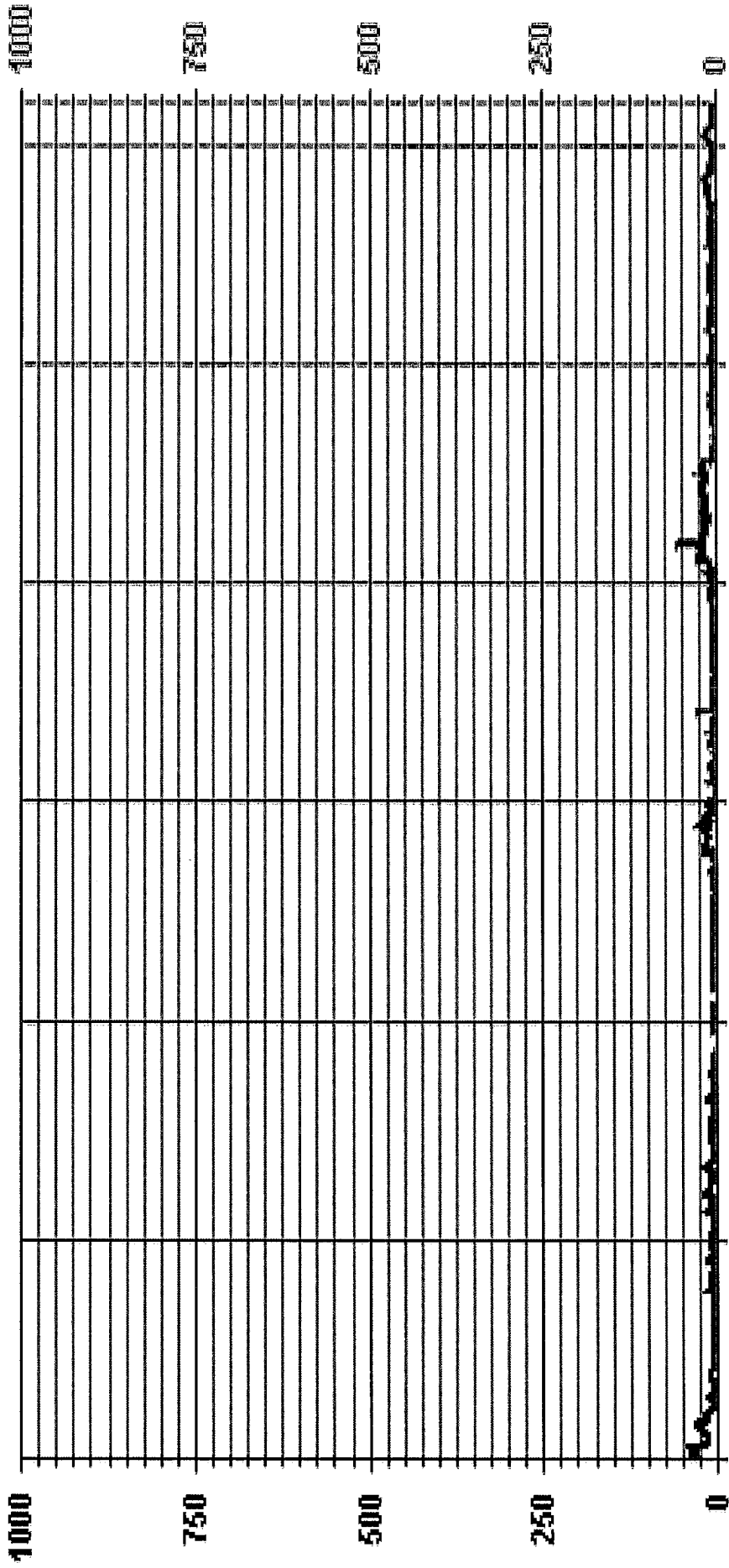
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	SPAN/ZERO/SPAN/CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	693
MAXIMUM INSTANTANEOUS VALUE:	52.9
PPB	22
@ HOUR(S)	22
ON DAY(S)	1
VAR-VARIOUS	
OPERATIONAL TIME:	743
HRS	
IZS CALIBRATION TIME:	33
HRS	
MONTHLY CALIBRATION TIME:	15
HRS	
STANDARD DEVIATION:	6.59

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA31 NO2MAX FPB

LICA31
 NO2_ / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 31
 Site Name : LICA31
 Parameter : NO2
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	2.15	.86	3.01	4.16	6.60	9.62	5.74	6.17	8.47	11.35	13.36	7.47	6.89	6.32	6.03	1.72	100.00
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	2.15	.86	3.01	4.16	6.60	9.62	5.74	6.17	8.47	11.35	13.36	7.47	6.89	6.32	6.03	1.72	

Calm : .00 %

Total # Operational Hours : 696

Distribution By Samples

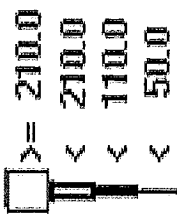
Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	15	6	21	29	46	67	40	43	59	79	93	52	48	44	42	12	696
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	15	6	21	29	46	67	40	43	59	79	93	52	48	44	42	12	

Calm : .00 %

Total # Operational Hours : 696

Logger : 31 Parameter : ND2_

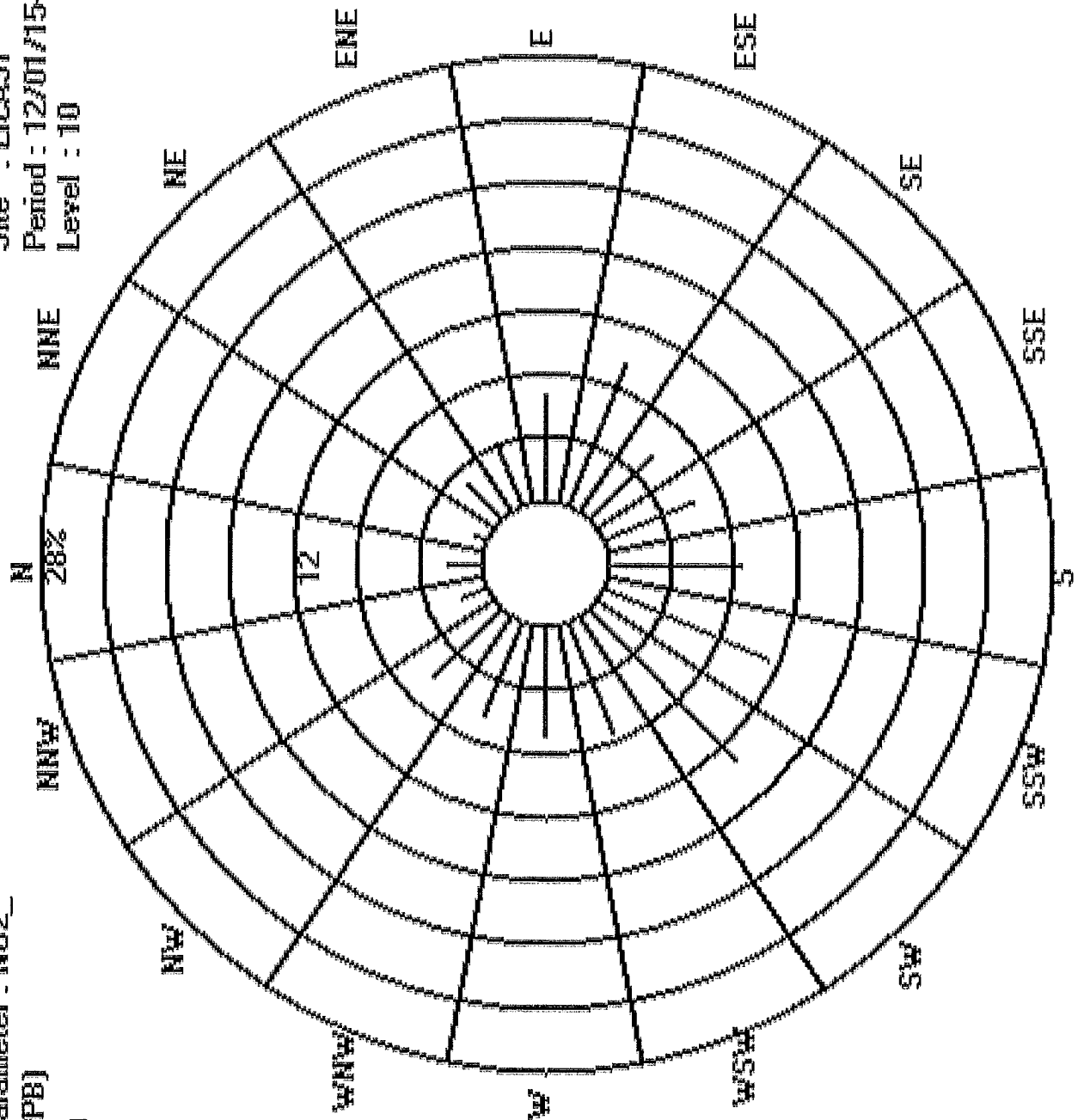
Class Limits (FPB)



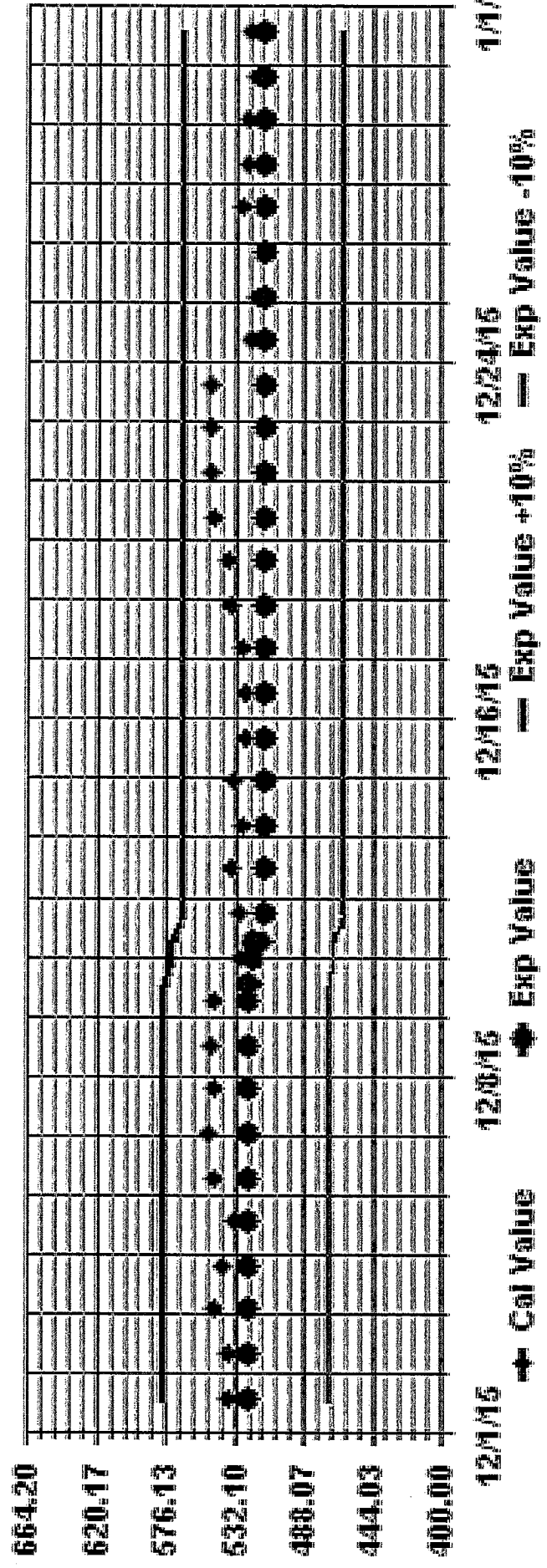
Site : LICA31

Period : 12/01/15-12/31/15

Level : 10

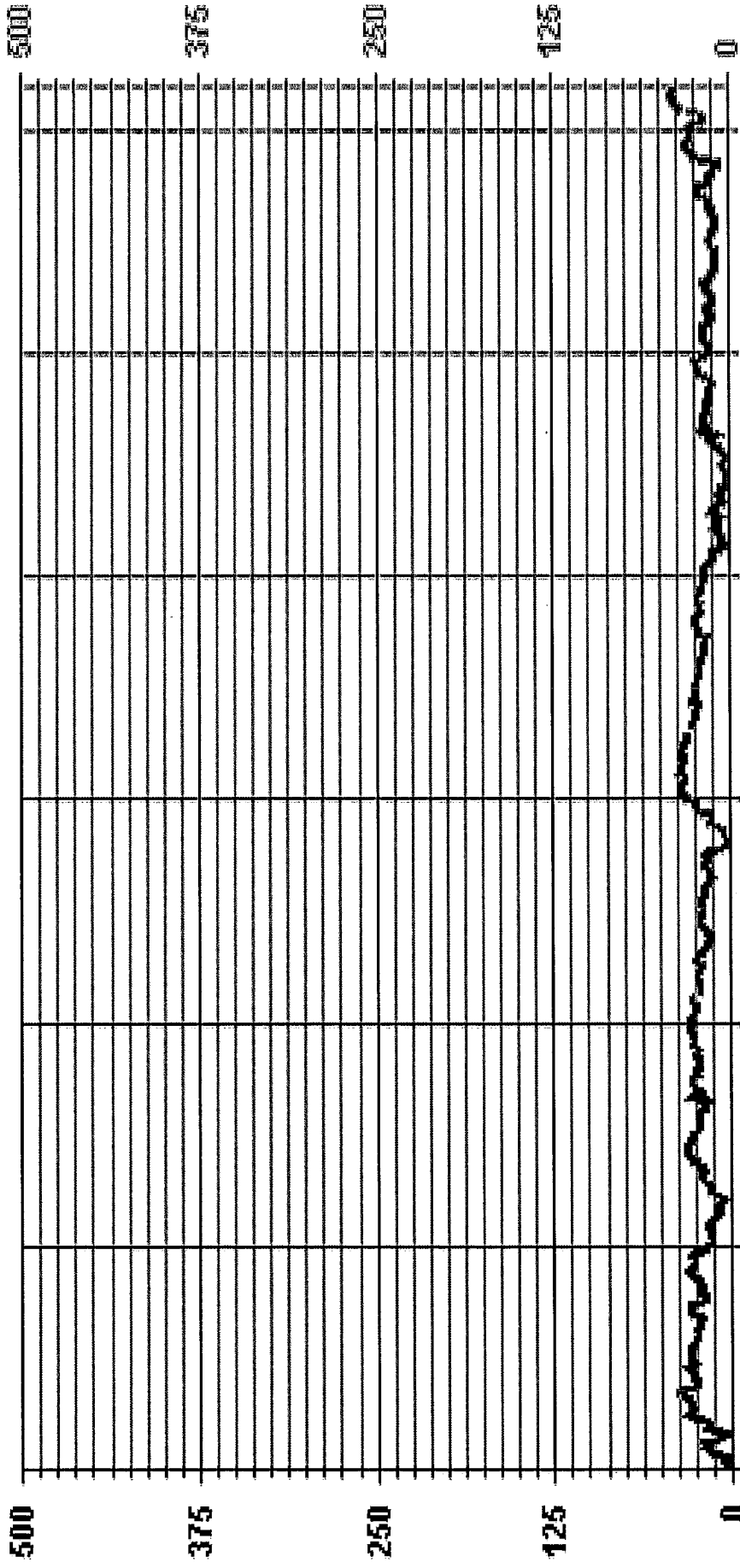


Calibration Graph for Site: LICA31 Parameter: NO2_ Sequence: NO2 Phase: SPAN



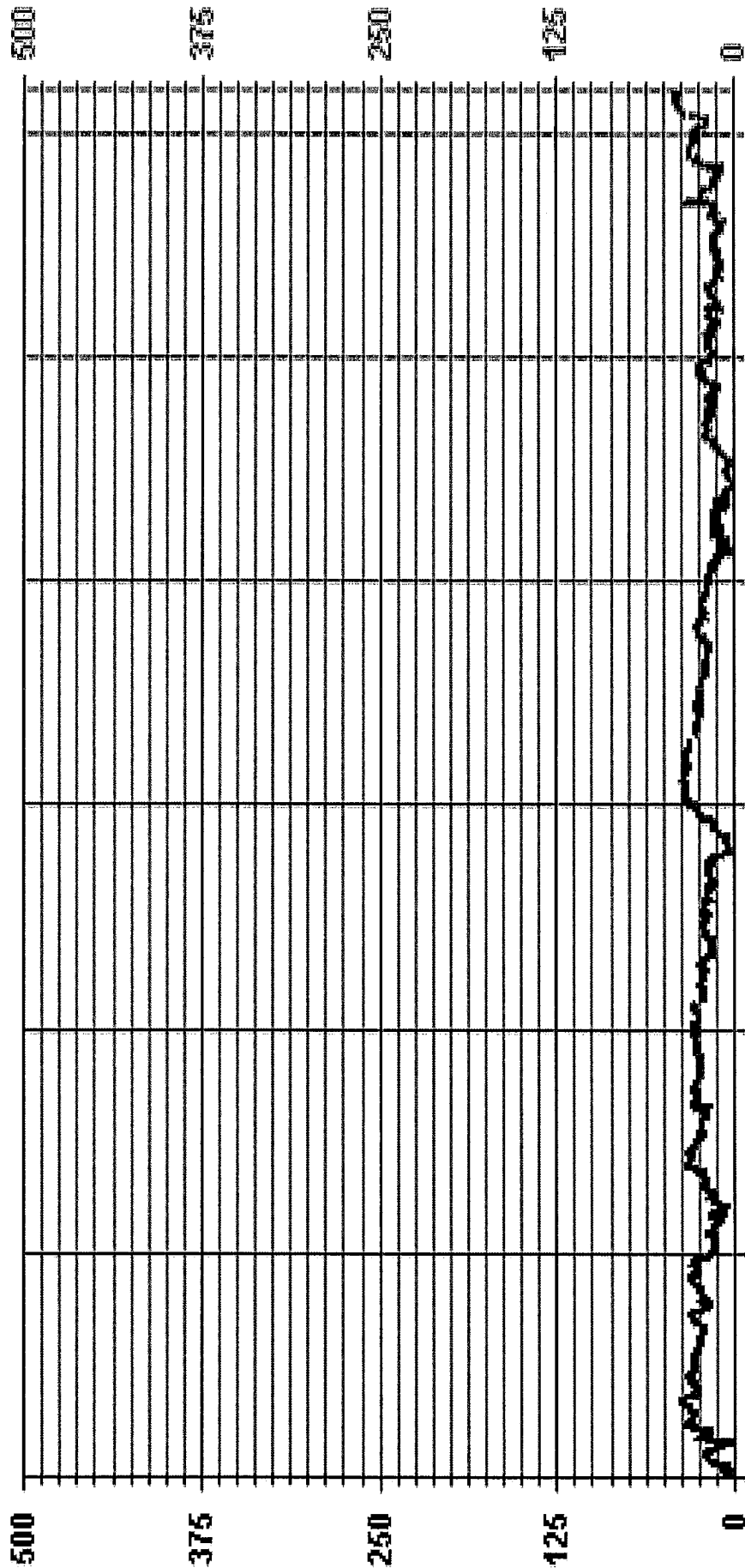
OZONE

01 Hour Averages



— LICA31 03_ PPB

01 Hour Averages



12:01:15 00:00:12:06:15 00:00:12:11:15 00:00:12:16:15 00:00:12:21:15 00:00:12:26:15 00:00:12:31:15 00:00

— LIC#31 O3MAX PPB

LiCA31
 O3_ / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 31
 Site Name : LiCA31
 Parameter : O3
 Units : PPM

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																NNW Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50	1.99	.85	2.99	4.13	6.83	10.68	5.98	6.12	8.40	11.25	13.24	7.40	6.83	6.26	5.27	1.70	100.00
< 110	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 210	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.99	.85	2.99	4.13	6.83	10.68	5.98	6.12	8.40	11.25	13.24	7.40	6.83	6.26	5.27	1.70	

Calm : .00 %

Total # Operational Hours : 702

Distribution By Samples

Limit	Direction																NNW Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50	14	6	21	29	48	75	42	43	59	79	93	52	48	44	37	12	702
< 110																	
< 210																	
>= 210																	
Totals	14	6	21	29	48	75	42	43	59	79	93	52	48	44	37	12	

Calm : .00 %

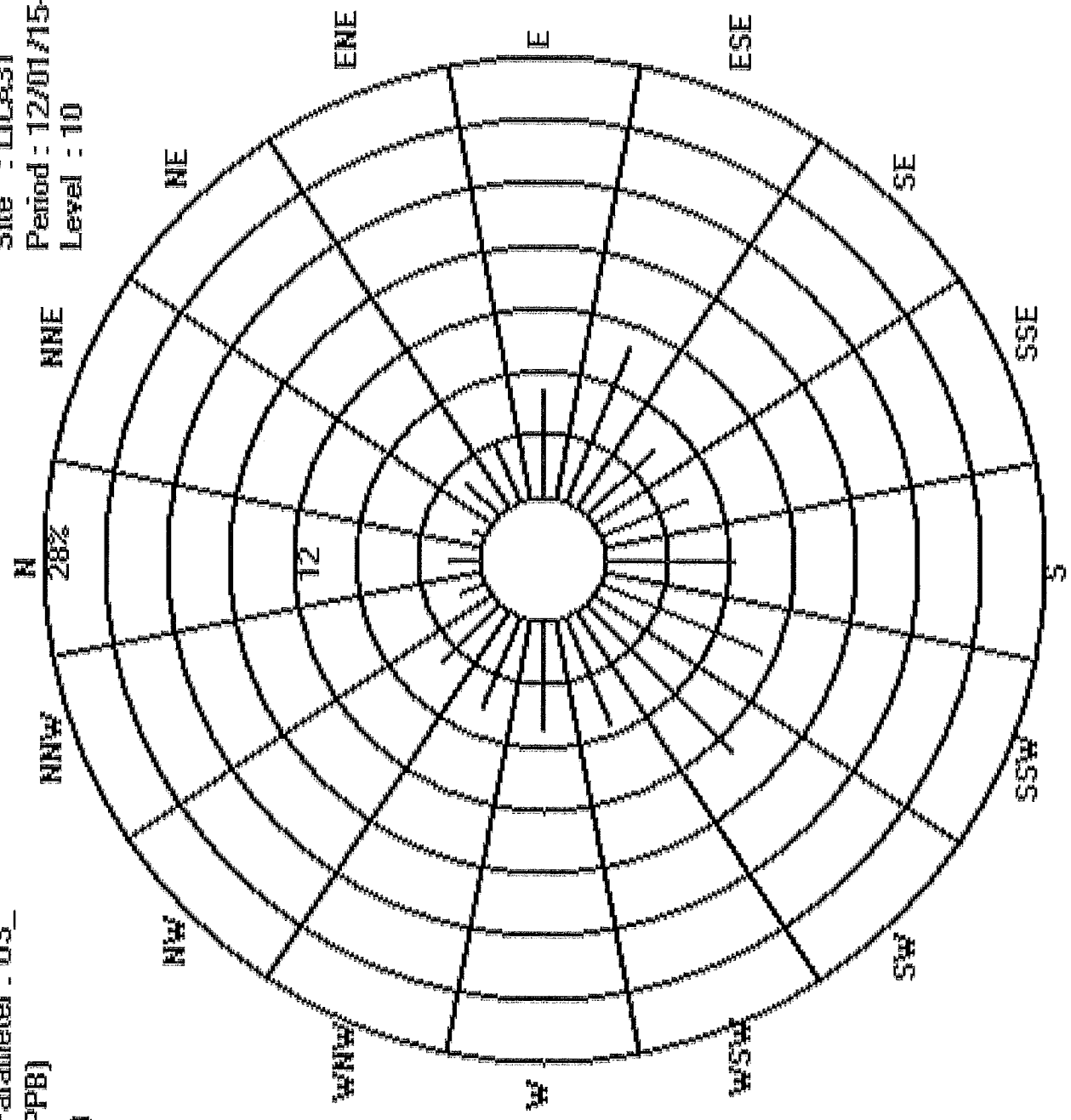
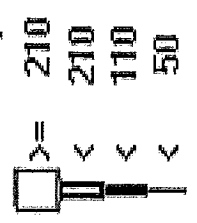
Total # Operational Hours : 702

Logger : 31 Parameter : D3_

Site : LIC#31

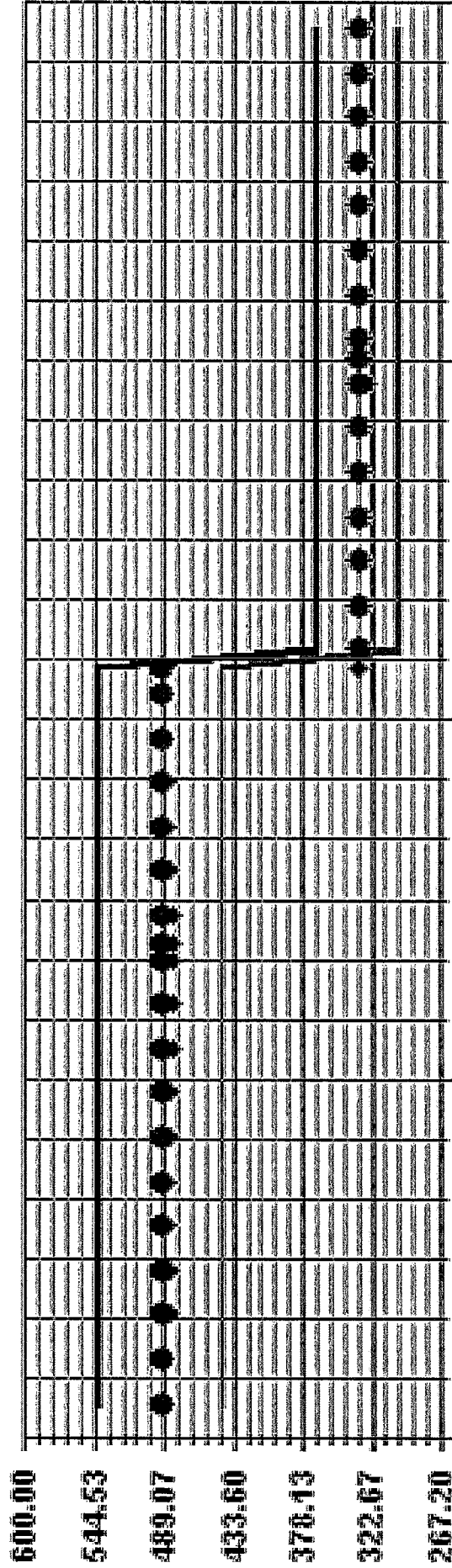
Class Limits (PPB)

Period : 12/01/15-12/31/15



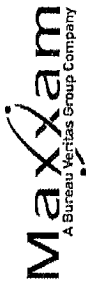
Level : 10

Calibration Graph for Site: LICA31 Parameter: O3 Sequence: 03 Phase: SPAN



12/1/16 12/10/16 12/16/16 12/24/16 1/1/16
 + Cal Value ● Exp Value - - - Exp Value +10% - - - Exp Value -10%

PARTICULATE MATTER 2.5



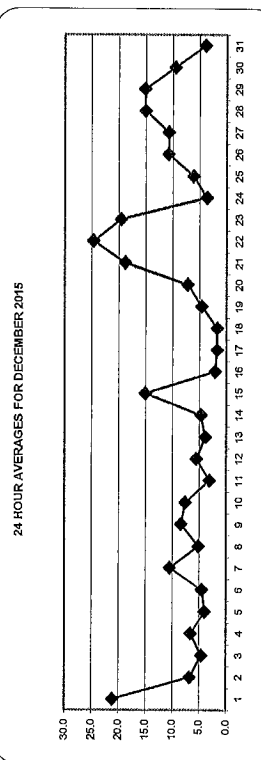
PARTICULATE MATTER 2.5 (LESS THAN 2.5 MICRONS) (PM2.5) hourly averages in ug/m3

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00		
1	23	23	22	24	22	20	24	25	25	25	23	17	20	22	18	16	23	21	23	22	23	17	16	14	25	21.2	
2	18	17	15	12	8	7	3	6	4	8	7	6	2	6	10	6	3	0	4	4	3	5	4	4	18	6.8	
3	6	9	5	10	7	8	9	5	5	2	6	4	4	0	0	0	2	1	4	0	0	3	10	4	10	4.6	
4	7	18	16	9	6	4	6	2	4	7	7	4	3	0	0	5	2	2	6	9	17	11	8	5	18	6.6	
5	8	10	6	6	3	2	4	0	5	1	1	0	0	4	1	2	6	2	3	1	2	11	11	7	11	4.0	
6	1	6	1	6	0	5	6	4	4	1	0	1	5	0	3	6	7	6	2	9	4	5	6	15	4.5		
7	11	19	24	20	18	15	12	16	15	15	13	7	3	4	3	6	0	7	7	8	7	11	4	6	24	10.5	
8	5	4	4	5	4	5	6	1	5	6	5	6	4	0	6	6	11	7	4	9	10	2	3	5	11	5.1	
9	2	7	9	6	10	7	7	6	5	5	7	7	6	11	18	8	9	10	6	5	11	3	5	10	18	7.6	
10	6	9	6	10	7	7	6	5	5	7	7	6	11	18	8	9	10	6	5	11	3	5	10	18	7.6		
11	9	9	8	5	4	5	0	1	0	0	0	0	0	0	0	3	0	0	2	5	6	3	5	7	9	3.1	
12	5	2	3	4	2	10	9	7	5	3	6	4	0	2	4	6	8	9	13	7	5	6	5	7	13	5.5	
13	6	8	9	5	7	4	6	3	1	3	2	3	1	4	1	6	5	2	2	1	2	5	6	2	9	3.9	
14	3	2	5	2	1	3	0	7	0	3	2	4	4	0	0	0	0	3	2	4	9	14	23	22	23	4.7	
15	25	26	19	22	22	17	17	17	16	16	16	19	18	15	11	18	18	12	7	5	5	11	4	4	26	15.0	
16	2	7	0	0	0	5	2	0	1	0	0	2	0	4	0	0	0	2	2	2	5	5	11	4	4	26	15.0
17	5	3	5	2	7	3	0	0	2	4	1	0	3	0	0	0	2	0	0	3	0	0	0	1	7	2.1	
18	0	6	0	1	0	0	2	2	6	0	0	3	4	2	0	5	3	0	1	0	3	2	0	1	6	1.7	
19	1	2	2	5	3	2	1	1	5	4	8	8	6	4	4	4	4	8	7	8	9	11	5	2	0	11	4.6
20	7	6	4	8	10	10	5	7	6	5	5	9	6	7	7	7	6	11	11	8	3	8	9	7	11	7.2	
21	12	10	9	13	10	12	10	10	13	9	18	27	24	25	30	27	24	29	26	18	21	25	26	23	30	18.8	
22	25	26	22	24	16	12	21	7	22	33	30	30	30	32	28	31	29	28	30	23	23	29	25	24	33	24.7	
23	25	24	23	25	20	24	26	21	26	24	25	25	25	26	23	23	20	20	16	11	1	3	7	6	26	19.6	
24	7	3	4	3	7	5	3	6	3	4	3	6	4	5	C	0	0	1	5	4	4	3	7	6	26	19.6	
25	7	9	10	6	10	12	11	4	11	4	5	7	3	6	5	7	5	8	4	3	4	2	7	6	11	6.1	
26	9	10	10	6	10	12	9	12	10	9	9	12	9	14	11	12	13	10	7	10	18	13	15	18	18	10.8	
27	15	8	11	12	14	6	14	11	6	11	11	13	10	9	10	11	8	6	10	13	15	12	9	13	15	10.8	
28	12	13	18	11	12	11	12	11	11	11	12	19	13	14	14	17	17	14	13	18	18	20	21	21	21	15.0	
29	20	17	17	15	11	12	14	13	13	13	16	17	13	19	12	9	13	16	14	20	17	20	20	20	20	15.2	
30	17	16	21	19	17	22	17	20	15	13	7	4	4	5	0	0	1	8	5	2	7	4	3	2	22	9.5	
31	3	9	3	3	10	8	7	9	11	3	3	0	5	2	0	1	1	0	1	4	1	0	6	4	11	3.9	
HOURLY MAX	26	26	24	25	24	24	26	25	26	25	33	30	30	32	30	31	29	29	30	23	23	29	26	24	24	24	
HOURLY AVG	9.9	10.6	10.3	9.2	9.8	8.9	8.6	8.4	7.9	7.9	8.6	8.7	8.3	7.7	7.9	7.9	7.9	8.2	8.1	7.6	8.3	8.8	8.9	8.5	8.5		

STATUS FLAG CODES

- C - CALIBRATION
- Y - MAINTENANCE
- S - DAILY ZERO/SPAN CHECK
- P - POWER FAILURE
- G - GOUT FOR REPAIR
- Q - QUALITY ASSURANCE
- R - RECOVERY
- X - MACHINE MALFUNCTION
- O - OPERATOR ERROR
- K - COLLECTION ERROR



OBJECTIVE LIMIT: 24-HR: 30 ug/m3

MONTHLY SUMMARY

ALBERTA ENVIRONMENT: 24-HR: 30 ug/m3

NUMBER OF 24-HR EXCEEDENCES: 0

NUMBER OF NON-ZERO READINGS: 671

MAXIMUM 1-HR AVERAGE: 33 ug/m3 @ HOUR(S) 10 ON DAY(S) 22

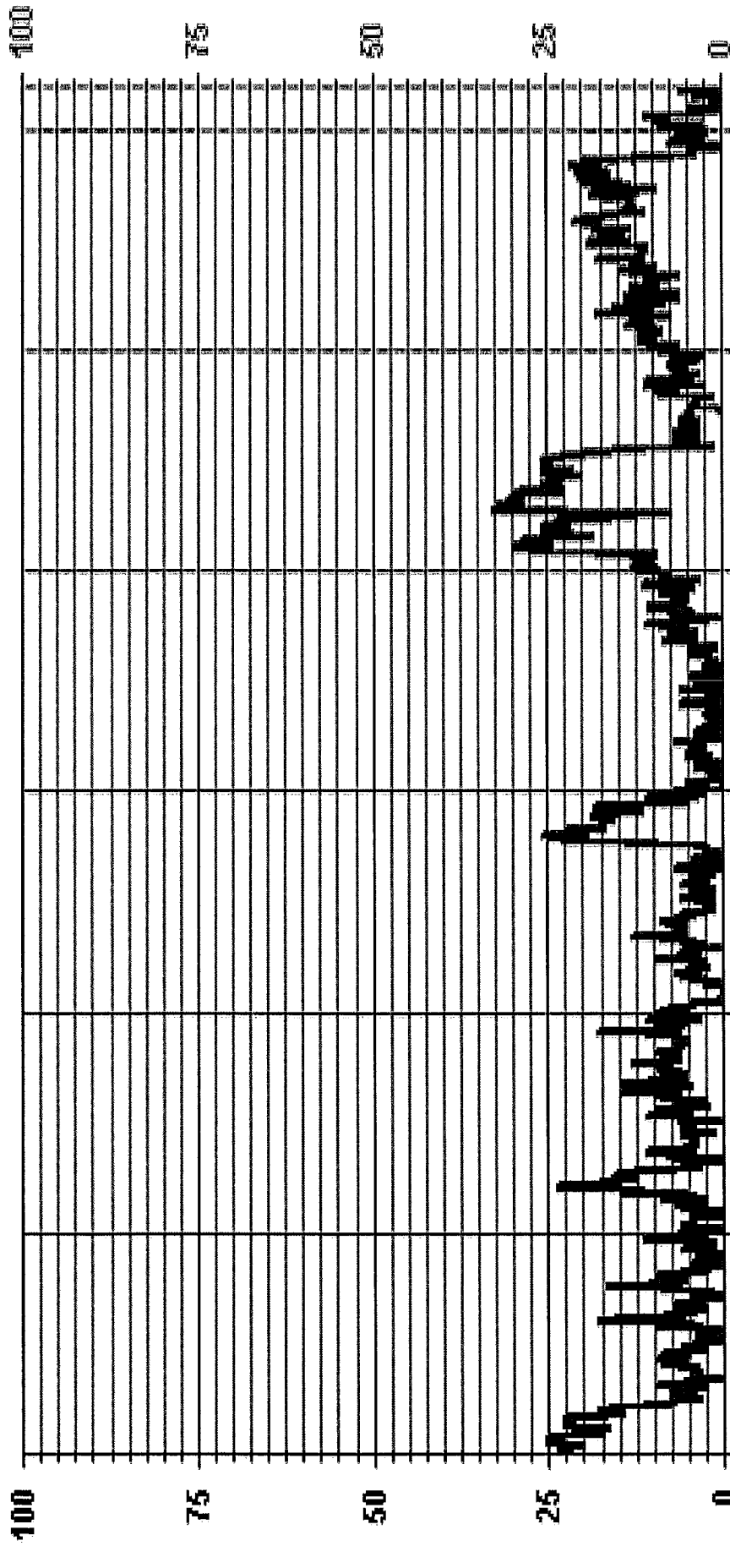
MAXIMUM 24-HR AVERAGE: 24.7 ug/m3 VAR-VARIOUS

MONTHLY CAUTION TIME: 2 HRS OPERATIONAL TIME: 743 HRS

STANDARD DEVIATION: 7.36 AMD OPERATION UPTIME: 99.9 %

MONTHLY AVERAGE: 8.6 ug/m3

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA31 PM2 UG/M3

LIC31
 PM2 / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 31
 Site Name : LIC31
 Parameter : PM2
 Units : UG/M3

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 30	2.02	.80	2.83	4.04	7.01	10.79	5.80	6.07	8.09	11.47	12.55	7.01	6.61	6.20	5.80	1.88	99.05
< 60	.00	.13	.00	.00	.00	.00	.00	.13	.13	.00	.53	.00	.00	.00	.00	.00	.94
< 80	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 120	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 240	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 240	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	2.02	.94	2.83	4.04	7.01	10.79	5.80	6.20	8.23	11.47	13.09	7.01	6.61	6.20	5.80	1.88	

Calm : .00 %

Total # Operational Hours : 741

Distribution By Samples

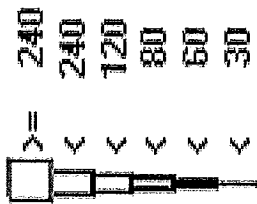
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 30	15	6	21	30	52	80	43	45	60	85	93	52	49	46	43	14	734
< 60		1						1	1	4							7
< 80																	
< 120																	
< 240																	
>= 240																	
Totals	15	7	21	30	52	80	43	46	61	85	97	52	49	46	43	14	

Calm : .00 %

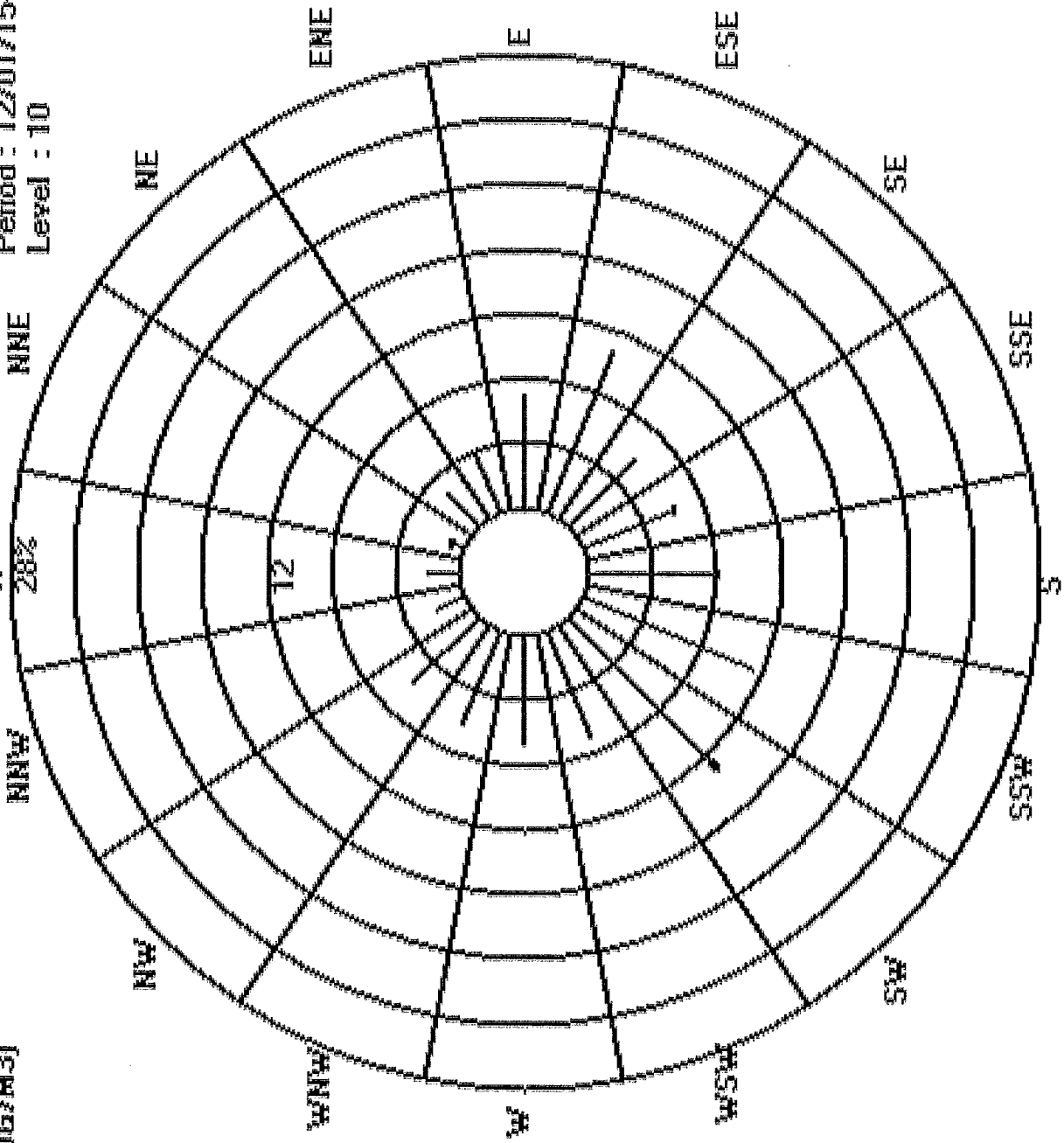
Total # Operational Hours : 741

Logger : 31 Parameter : PM2

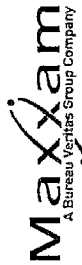
Class Limits (UG/M3)



Site : LICA31
Period : 12/01/15-12/31/15
Level : 10



WIND SPEED



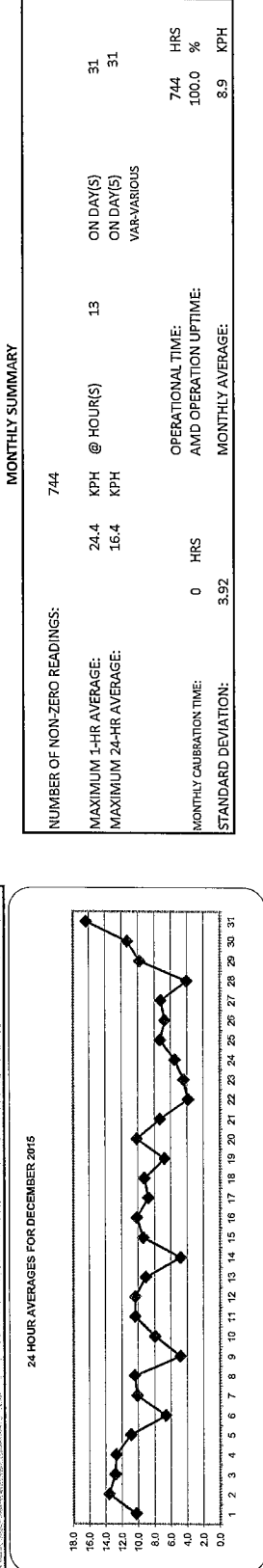
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 St. Lina Site - DECEMBER 2015
 JOB # 2833-2015-12-31 - C

WIND SPEED (WS) hourly averages in km/hr

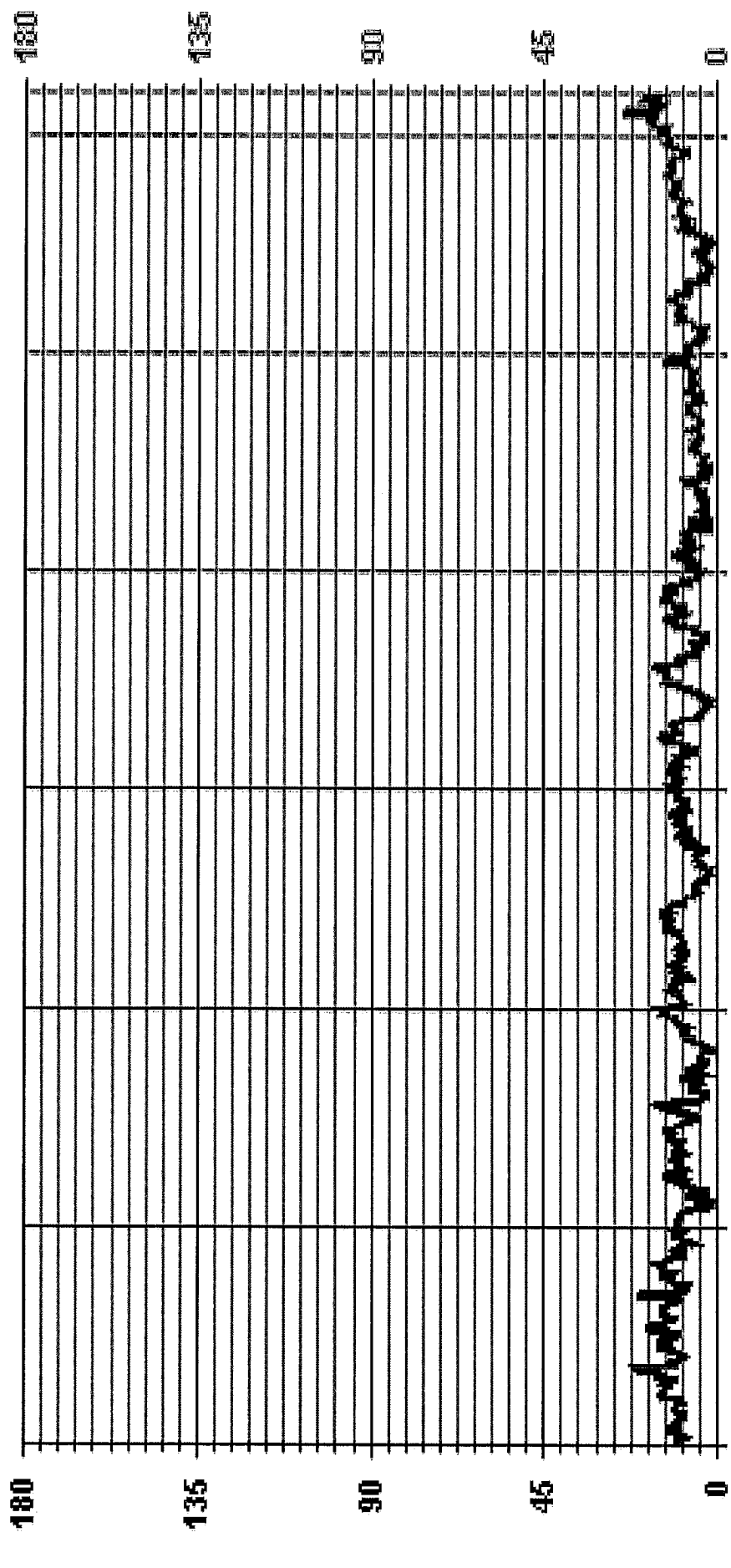
DAY	WIND SPEED (WS) hourly averages in km/hr																								DAILY MAX	24-HOUR AVG	RDGS		
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00					
1	10.8	10.7	10.6	9.1	8.4	11.0	9.8	10.7	12.7	12.6	9.4	10.3	11.7	10.7	10.9	10.3	9.1	7.7	9.6	10.6	11.0	11.0	10.5	8.9	12.7	10.3	24		
2	9.3	9.2	11.0	14.5	15.0	14.9	13.7	13.4	13.4	14.1	14.2	14.1	12.2	9.7	12.5	16.0	14.3	20.7	21.3	18.1	14.2	9.8	12.9	10.7	13.1	13.6	24		
3	10.1	8.8	9.3	9.6	11.1	12.5	14.5	14.6	14.7	14.1	15.0	10.9	8.9	12.3	17.4	18.6	16.4	16.7	13.4	11.8	11.2	11.2	12.1	18.6	12.9	24			
4	14.0	14.5	14.0	12.8	10.0	13.7	12.8	11.0	10.1	12.8	10.9	19.5	20.5	14.7	8.9	8.3	7.9	10.5	11.6	11.9	13.2	12.2	11.6	15.1	20.5	12.8	24		
5	14.0	13.8	14.0	14.7	15.8	14.6	13.5	12.0	9.0	7.4	10.9	11.6	10.6	8.1	9.4	5.8	6.5	8.4	9.7	11.3	11.1	10.2	9.4	11.6	15.8	11.0	24		
6	11.2	10.9	9.0	10.5	10.7	10.6	9.2	9.2	8.3	6.7	2.9	2.3	1.2	0.9	4.0	5.5	4.4	7.9	3.2	3.0	7.4	5.2	7.0	11.2	6.7	24			
7	9.5	8.6	10.9	12.7	13.0	14.4	9.5	9.9	8.2	10.9	9.4	8.2	11.6	12.2	9.3	8.5	10.1	11.9	8.9	10.6	8.2	10.3	9.7	14.4	10.2	24			
8	12.6	12.7	12.7	11.9	12.8	13.5	13.2	11.5	10.0	8.9	7.4	7.3	5.0	5.3	7.0	9.9	9.8	13.1	14.5	15.8	14.5	12.6	5.1	4.3	15.8	10.5	24		
9	3.0	3.2	2.0	4.7	6.4	6.6	5.2	4.4	5.2	3.9	9.9	5.7	3.1	3.9	7.5	7.8	7.1	4.0	3.5	1.5	4.7	4.6	4.5	9.9	4.9	24			
10	4.1	2.1	0.4	1.7	3.3	4.5	6.3	5.4	7.8	8.6	7.7	7.9	9.0	9.1	7.9	9.3	10.2	10.7	11.3	11.1	12.5	14.0	13.4	14.0	8.0	24			
11	14.9	13.4	10.4	8.4	9.2	9.0	8.9	9.3	10.4	11.8	12.6	11.3	11.9	11.8	10.7	11.1	9.6	7.0	7.4	9.0	10.9	10.0	9.6	11.7	14.9	10.4	24		
12	12.3	10.9	10.0	9.2	9.7	9.0	10.0	9.2	8.8	10.4	9.9	8.9	9.4	8.8	9.0	9.0	9.8	10.5	10.3	11.8	13.8	12.6	13.4	13.6	13.8	10.4	24		
13	12.4	11.9	13.0	12.8	14.3	12.5	13.5	12.5	12.4	12.0	9.0	9.4	9.0	8.6	7.3	6.4	5.1	5.6	6.1	6.4	6.2	5.3	5.1	2.7	14.3	9.1	24		
14	2.6	2.7	1.7	2.4	2.6	2.1	3.5	4.8	4.1	4.9	5.8	5.5	5.8	4.0	1.9	5.2	8.3	8.7	9.7	5.8	6.2	7.5	9.7	4.8	24				
15	10.3	10.0	7.6	7.4	9.2	10.4	9.3	10.0	9.2	8.8	8.6	12.5	9.9	10.5	7.8	8.2	9.3	9.4	9.2	7.1	10.7	10.6	10.2	10.3	12.5	9.4	24		
16	12.2	12.2	11.7	12.3	10.3	10.3	9.7	12.0	10.3	10.0	10.9	12.8	10.8	11.3	9.3	10.1	11.1	10.7	9.2	9.9	8.0	8.5	5.2	6.1	12.8	10.2	24		
17	9.4	7.1	9.4	13.9	14.6	13.6	13.9	11.3	10.4	11.2	11.1	9.9	11.4	11.4	10.2	9.1	6.5	5.7	4.1	4.3	3.4	3.1	2.0	14.6	8.8	24			
18	2.6	1.9	1.5	2.2	3.7	4.8	3.7	6.0	8.5	9.9	11.4	10.9	13.0	12.1	12.8	13.2	13.7	13.4	13.7	15.2	16.9	12.5	10.0	9.1	16.9	9.3	24		
19	9.6	10.9	8.6	5.3	4.7	5.0	4.6	5.0	5.9	6.3	3.8	1.9	3.0	2.8	2.8	2.5	2.7	11.6	10.1	6.5	9.3	5.9	5.1	5.4	14.8	10.2	24		
20	10.5	8.8	8.2	9.5	10.3	9.0	8.9	11.5	11.7	14.8	12.9	12.5	13.5	13.7	12.1	12.1	11.6	10.1	12.7	11.6	10.1	6.5	9.3	5.9	5.1	5.4	14.8	10.2	24
21	4.8	3.4	4.1	7.3	7.0	4.0	5.7	8.0	9.2	10.1	12.0	10.8	6.8	6.0	8.3	8.4	6.3	6.2	8.7	8.6	8.3	7.7	9.2	6.8	12.0	7.4	24		
22	5.7	1.2	6.2	1.6	7.6	5.9	2.3	2.6	3.6	3.3	4.5	3.9	2.1	4.0	1.4	4.7	2.8	4.0	5.8	4.0	5.8	2.3	5.1	5.3	7.6	3.9	24		
23	5.7	5.6	7.9	8.3	3.5	3.5	5.0	2.5	2.3	3.0	3.5	0.7	2.5	3.3	3.6	3.5	3.0	4.0	5.8	6.7	6.8	5.4	5.4	5.5	8.3	4.5	24		
24	6.0	4.7	4.4	4.1	4.3	5.0	7.2	6.6	5.5	5.3	4.3	3.9	4.2	5.1	5.9	5.9	7.1	7.1	7.1	7.1	7.1	7.5	5.6	4.3	4.8	7.5	5.5	24	
25	6.2	6.3	3.4	8.1	8.4	6.2	7.5	6.1	5.5	5.8	7.0	5.3	6.5	6.8	5.2	5.2	6.1	8.3	9.9	13.9	13.1	10.9	7.8	13.9	7.4	24			
26	6.9	7.8	6.8	6.9	8.0	8.0	5.8	5.9	4.0	3.3	4.5	3.6	3.5	4.3	3.8	6.2	6.3	6.8	9.9	9.5	9.1	10.9	10.7	10.0	10.9	6.8	24		
27	10.2	9.3	8.8	9.4	10.1	10.8	12.0	11.4	9.7	10.1	8.1	6.9	6.9	8.0	7.9	7.8	5.4	2.0	4.0	4.0	4.0	2.2	2.9	2.5	12.0	7.3	24		
28	0.5	1.2	2.2	3.1	3.6	4.4	4.4	3.7	5.8	5.9	2.7	2.3	2.8	1.0	0.3	2.4	4.5	3.4	4.3	5.8	8.3	9.5	8.8	7.7	9.5	4.1	24		
29	9.0	9.1	7.8	8.7	9.9	8.9	9.1	9.2	10.0	9.6	9.6	9.2	8.1	9.1	10.8	11.0	11.7	11.9	10.5	10.8	10.4	11.0	10.7	10.3	11.9	9.9	24		
30	11.3	12.6	13.3	12.4	12.2	11.7	11.8	12.2	12.6	12.1	11.5	11.6	8.9	8.9	8.8	7.2	8.6	11.0	10.8	12.9	13.5	12.6	11.1	12.8	13.5	11.4	24		
31	12.9	13.0	15.6	13.0	14.4	13.7	17.1	15.8	17.8	17.4	16.9	18.5	21.8	24.4	15.0	17.1	15.1	14.5	18.8	16.5	19.3	18.7	15.3	12.7	24.4	16.4	24		
HOURLY MAX	14.9	14.5	15.6	14.7	15.8	14.9	17.1	15.8	17.8	17.4	19.5	20.5	21.8	24.4	15.0	17.1	17.4	20.7	21.3	18.1	19.3	18.7	15.3	15.1	8.6	8.6	8.6		
HOURLY AVG	8.9	8.3	8.3	8.7	9.3	9.2	9.1	9.0	8.9	9.1	9.4	8.9	8.5	8.4	7.8	8.4	8.4	8.7	9.5	9.5	10.2	9.3	8.7	8.6	8.6	8.6	8.6		

LAST CALIBRATION: August 28, 2014
 DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST

STATUS FLAG CODES
 C - CALIBRATION
 Y - MAINTENANCE
 S - DAILY ZERO/SPAN CHECK
 P - POWER FAILURE
 G - GYRO REPAIR
 O - QUALITY ASSURANCE
 R - RECOVERY
 X - MACHINE MALFUNCTION
 O - OPERATOR ERROR
 K - COLLECTION ERROR



01 Hour Averages



— LICA31 WSP KPH



VECTOR WIND SPEED MAX instantaneous maximum in km/hr

MST

DAY	HOURS																								DAILY MAX.	24-HOUR AVG.	RODS.
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00			
1	16.0	14.2	14.2	11.6	10.5	13.8	13.9	20.9	21.4	26.4	20.5	24.9	20.8	21.0	16.4	15.7	16.8	14.2	12.3	12.0	13.4	15.1	17.1	11.2	26.4	16.4	24
2	12.2	17.9	23.1	28.7	28.5	28.0	29.7	28.9	28.7	25.4	21.7	18.1	16.6	20.7	27.6	26.0	27.0	33.9	35.9	34.5	27.1	19.3	20.6	17.1	35.9	25.1	24
3	16.5	12.4	17.5	21.0	21.0	24.7	26.5	25.0	26.0	29.5	31.5	29.7	36.3	21.9	23.7	38.3	35.0	36.1	31.9	36.0	36.1	31.9	26.0	29.8	47.0	27.4	24
4	30.0	28.7	32.6	29.3	32.2	28.4	22.3	18.8	21.2	31.1	40.4	46.6	32.4	27.8	19.5	16.1	15.3	16.2	19.0	18.2	24.5	24.5	19.5	33.2	46.6	26.2	24
5	31.5	24.7	21.8	24.0	24.5	29.1	20.5	20.8	14.4	11.6	19.7	19.5	19.1	16.4	17.4	12.3	12.0	12.7	16.6	19.9	23.9	21.2	22.5	31.5	20.0	24	
6	26.4	21.0	19.7	20.7	26.2	25.5	19.4	19.6	21.6	20.4	15.0	14.2	11.6	19.8	9.7	14.4	13.7	13.1	14.2	14.1	19.4	17.4	12.6	14.9	26.4	17.7	24
7	15.7	16.9	27.6	25.1	28.8	33.9	25.8	25.3	20.3	22.7	27.8	25.1	16.9	18.3	19.9	15.1	12.2	16.3	19.9	16.8	18.8	13.8	20.7	22.3	33.9	21.1	24
8	19.5	20.6	21.2	20.1	21.7	21.8	21.4	16.0	16.8	13.1	14.0	13.4	14.4	12.9	13.4	16.5	17.7	27.6	31.5	38.0	40.2	36.9	18.0	14.0	40.2	20.9	24
9	12.1	12.3	12.4	12.7	13.3	14.1	9.3	13.9	14.6	14.0	16.6	12.4	12.0	17.5	20.5	23.2	18.2	14.6	14.6	11.6	13.5	12.7	11.8	11.8	23.2	14.2	24
10	13.8	13.3	10.7	12.1	11.8	10.9	18.2	14.2	19.4	19.7	17.9	17.7	24.7	22.7	17.6	19.0	22.0	24.9	23.0	26.4	27.1	29.3	30.1	32.6	32.6	20.0	24
11	31.5	30.6	24.2	17.1	17.7	19.4	19.5	20.1	25.3	26.2	26.4	22.3	26.5	30.7	22.7	22.7	18.8	17.4	16.6	21.8	25.1	22.0	22.3	26.2	31.5	23.0	24
12	26.4	23.2	21.4	21.4	20.8	20.3	20.5	23.6	22.0	22.5	22.7	21.6	23.2	21.7	24.3	18.5	22.6	22.0	23.6	26.6	28.2	31.5	30.3	29.8	31.5	23.7	24
13	29.1	26.5	34.6	35.7	34.6	38.3	29.6	28.6	28.7	31.1	22.0	22.5	23.2	25.3	19.5	15.7	14.9	16.2	16.2	19.9	17.1	14.6	18.6	11.0	38.3	23.9	24
14	7.0	9.7	5.3	9.2	5.9	11.6	10.5	11.9	9.6	11.4	13.5	13.8	15.1	14.6	13.3	11.6	6.5	15.3	15.1	18.1	19.0	11.3	15.7	18.6	19.0	12.2	24
15	25.3	19.7	14.7	17.7	21.7	24.4	20.9	23.5	19.6	20.3	19.4	22.5	19.9	20.1	13.7	14.4	14.8	16.3	26.0	22.5	22.7	19.6	19.4	22.7	26.0	20.1	24
16	26.6	26.2	26.6	34.1	24.1	21.0	23.7	30.1	28.8	31.9	28.8	36.0	31.0	26.2	20.9	20.4	24.0	22.0	17.4	20.2	19.4	22.4	15.9	22.7	36.0	25.0	24
17	27.7	14.1	24.2	38.5	38.9	43.9	35.2	27.9	31.0	29.2	29.0	p	24.9	28.5	24.8	22.4	16.1	14.9	11.7	14.1	10.7	8.2	11.2	9.8	43.9	23.3	23
18	11.6	10.2	8.5	10.6	8.7	11.9	15.2	20.9	21.4	24.2	26.8	27.7	31.0	27.9	32.3	32.8	31.2	31.0	29.5	44.6	37.5	29.2	21.5	19.4	44.6	23.6	24
19	22.9	25.3	24.6	22.2	27.7	22.7	22.4	22.4	26.3	30.5	27.7	29.0	30.3	33.2	24.9	27.7	28.4	25.7	21.5	16.8	26.6	19.6	15.7	10.3	35.2	18.9	24
20	30.2	23.3	24.6	22.2	27.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	24
21	8.7	11.5	12.6	13.5	13.6	10.1	11.7	13.2	12.7	15.8	20.0	19.1	11.5	12.8	12.5	11.5	10.1	17.2	18.3	18.2	11.9	12.2	15.0	22.4	22.4	24.0	24
22	14.1	10.0	13.4	15.0	16.3	9.3	11.3	11.1	10.2	11.5	6.7	11.9	12.3	16.3	16.3	12.4	9.8	16.1	17.1	13.7	13.2	10.0	8.7	12.5	17.1	12.3	24
23	9.3	10.6	14.0	16.3	12.4	12.0	7.4	9.1	8.0	10.6	7.1	9.7	12.9	13.2	11.5	10.6	11.9	10.2	14.3	14.8	16.5	13.1	12.3	13.5	16.5	11.7	24
24	14.8	14.8	13.2	13.0	10.9	17.3	24.0	21.3	15.6	14.6	16.5	13.9	11.0	12.3	16.0	15.8	19.3	17.9	15.3	15.6	13.4	13.2	76.9	22.6	76.9	18.3	24
25	8.6	8.4	8.0	10.6	11.9	12.1	10.8	15.6	12.1	14.9	16.0	12.6	21.1	20.7	16.3	17.4	17.1	23.1	23.3	28.1	24.4	22.9	20.7	10.9	28.1	16.2	24
26	11.3	16.6	15.8	15.8	15.4	17.4	15.6	13.2	10.7	11.0	11.5	10.3	10.4	14.1	12.8	14.1	18.7	19.1	25.9	25.3	23.7	25.9	25.1	23.8	25.9	16.8	24
27	22.5	22.4	23.1	20.0	22.7	22.2	27.7	27.7	27.7	21.9	21.1	18.9	17.6	15.6	18.3	19.4	18.6	13.6	23.1	43.9	15.6	14.2	12.8	14.4	43.9	20.4	24
28	17.7	28.2	74.1	20.0	22.2	11.5	13.0	9.7	14.5	15.2	20.0	66.4	10.0	13.0	18.1	29.0	6.2	9.2	6.0	15.6	19.1	22.4	16.7	20.3	74.1	20.8	24
29	21.6	22.7	20.3	23.8	24.2	25.3	24.0	24.1	25.0	25.3	20.0	20.8	20.9	25.3	28.1	25.9	28.1	29.4	27.3	21.9	27.2	19.2	19.2	24.8	29.4	24.3	24
30	20.2	20.4	17.8	17.8	14.8	17.1	16.3	24.1	27.5	27.6	33.8	26.9	19.9	21.4	20.7	17.7	22.9	23.3	22.4	22.4	19.2	17.6	15.2	18.1	33.8	21.0	24
31	17.9	21.4	23.9	20.0	17.6	21.5	23.8	22.6	22.4	26.1	25.5	28.4	42.8	54.5	35.2	37.3	34.1	31.1	43.3	41.1	45.7	41.1	35.0	35.0	54.5	31.1	24
HOURLY MAX	31.5	30.6	74.1	38.5	38.9	43.9	35.2	30.1	31.0	31.9	40.4	66.4	42.8	54.5	35.2	37.3	47.0	38.3	43.9	44.6	45.7	41.1	76.9	35.2			
HOURLY AVG	19.3	18.6	20.7	19.7	19.8	20.3	19.4	19.7	19.6	21.0	21.2	22.3	20.5	21.8	19.1	19.3	19.0	20.3	21.9	22.4	22.6	20.5	21.3	20.5			

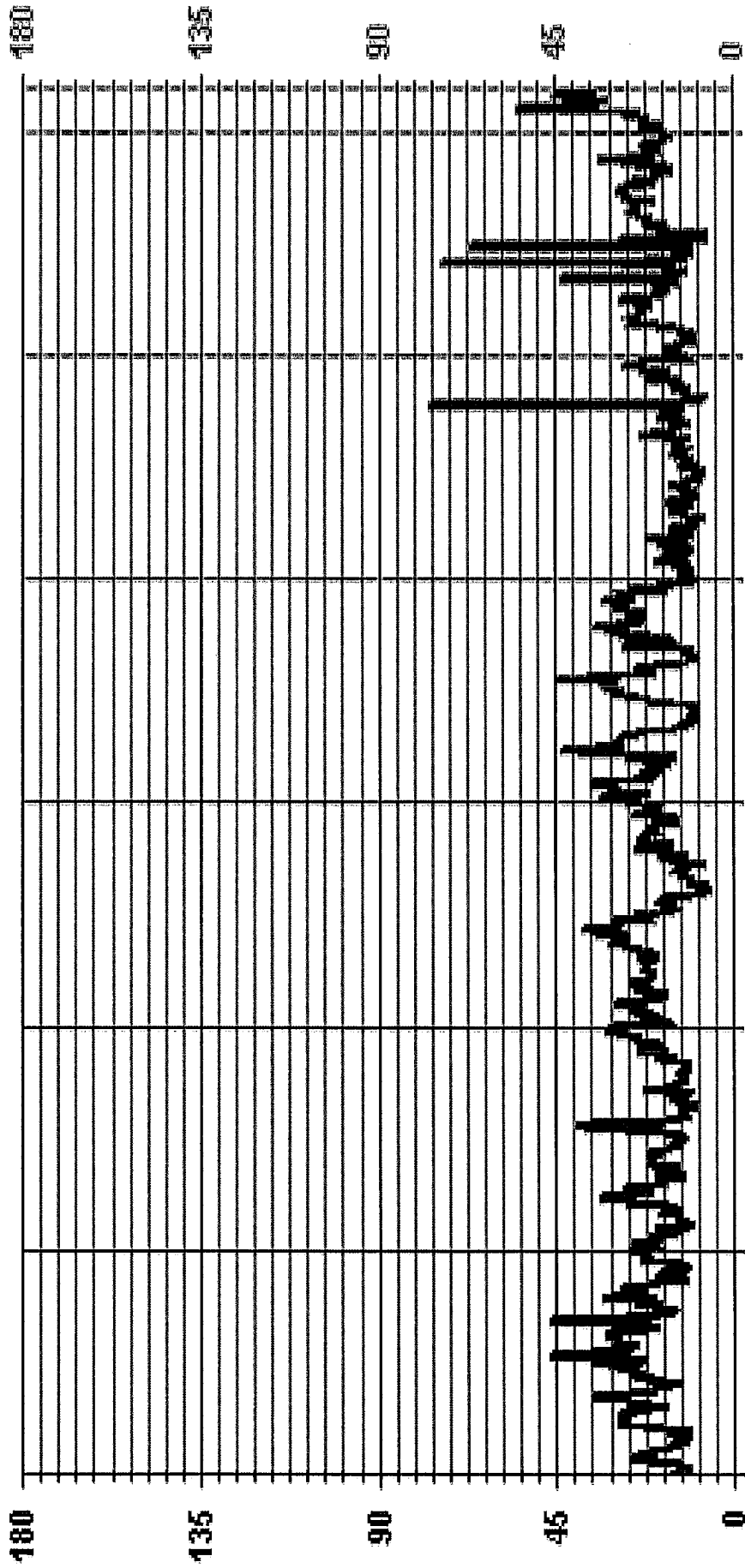
STATUS FLAG CODES

C	-CALIBRATION	Q	-QUALITY ASSURANCE
M	-MAINTENANCE	R	-RECOVERY
S	-DAILY ZERO/SPAN CHECK	X	-MACHINE W/ALFUNCTION
P	-POWER FAILURE	O	-OPERATOR ERROR
G	-OUT FOR REPAIR	K	-COLLECTION ERROR

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	76.9	KPH	@ HOUR(S)	22	ON DAY(S)	24
OPERATIONAL TIME:	743	HRS	VAR- VARIOUS			

01 Hour Averages



12:01:15 00:00:12:06:15 00:00:12:11:15 00:00:12:16:15 00:00:12:21:15 00:00:12:26:15 00:00:12:31:15 00:00

— LICA31 WSMAX KPH

LICA31
WSP / WDR Joint Frequency Distribution (Percent)

December 2015

Distribution By % Of Samples

Logger Id : 31
Site Name : LICA31
Parameter : WSP
Units : KPH

Wind Parameter : WDR
Instrument Height : 10 Meters

Limit	Direction																NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< 6.0	1.47	.53	2.41	1.74	1.07	.67	.67	1.47	2.28	1.74	2.15	1.74	1.47	2.82	2.55	1.61	26.47	
< 12.0	.53	.26	.40	1.61	4.30	6.85	4.30	2.68	4.16	9.00	6.31	2.95	2.95	2.68	2.55	.26	51.88	
< 20.0	.00	.00	.00	.67	1.61	3.36	.80	2.01	1.74	.67	4.43	2.01	1.88	.40	.80	.00	20.43	
< 29.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.13	.26	.13	.13	.00	.00	.67	
< 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
>= 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
Totals	2.01	.80	2.82	4.03	6.98	10.88	5.77	6.18	8.19	11.42	13.03	6.98	6.45	6.04	5.91	1.88		

Calm : .53 %

Total # Operational Hours : 744

Distribution By Samples

Limit	Direction																NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< 6.0	11	4	18	13	8	5	5	11	17	13	16	13	11	21	19	12	197	
< 12.0	4	2	3	12	32	51	32	20	31	67	47	22	22	20	19	2	386	
< 20.0				5	12	25	6	15	13	5	33	15	14	3	6		152	
< 29.0											1	2	1	1			5	
< 39.0																		
>= 39.0																		
Totals	15	6	21	30	52	81	43	46	61	85	97	52	48	45	44	14		

Calm : .53 %

Total # Operational Hours : 744

WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 St. Lina Site - DECEMBER 2015
 JOB # 2833-2015-12-31 - C

WIND DIRECTION (WD) hourly averages

MST

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	24-HOUR AVG			
QUADRANT																									24-HOUR AVG			
1	WSW	SSW	S	SSW	SSW	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	SW	24		
2	SSW	SSW	S	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSW	24	
3	SW	SW	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	SSE	24	
4	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	SW	24	
5	SW	SW	S	SW	SW	S	SW	SW	S	SW	SW	S	SW	SW	S	SW	SW	S	SW	SW	S	SW	SW	S	SW	SSW	24	
6	ESE	E	ENE	E	ENE	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	ESE	24	
7	SSW	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSW	24	
8	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SSW	24	
9	ENE	NE	NE	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	24	
10	WNW	WNW	W	S	SSE	SE	SSE	SE	SSE	SE	SSE	SE	SSE	SE	SSE	SE	SSE	SE	SSE	SE	SSE	SE	SSE	SE	W	WNW	24	
11	ESE	ESE	E	ENE	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	ESE	24	
12	ESE	ESE	SE	SE	ESE	E	ESE	E	ESE	E	ESE	E	ESE	E	ESE	E	ESE	E	ESE	E	ESE	E	ESE	E	ESE	ESE	24	
13	ESE	ESE	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	24
14	NE	NE	NNE	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	W	24	
15	SW	SW	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	SW	24	
16	WSW	W	W	WNW	WNW	W	WNW	WNW	W	WNW	WNW	W	WNW	WNW	W	WNW	WNW	W	WNW	WNW	W	WNW	WNW	W	WNW	SSW	24	
17	NW	NW	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	WNW	24	
18	N	NNE	ENE	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	24	
19	E	ESE	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	24	
20	SSE	SSE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	24	
21	ENE	ESE	S	SW	WSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24	
22	SW	WNW	WNW	NW	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSW	24	
23	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24	
24	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	NNW	24	
25	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24	
26	SW	WSW	W	W	WNW	WNW	W	WNW	WNW	W	WNW	WNW	W	WNW	WNW	W	WNW	WNW	W	WNW	WNW	W	WNW	WNW	W	SSW	24	
27	SE	ESE	ESE	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	ESE	24	
28	W	S	WSW	W	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	SSW	24	
29	SSW	S	SSW	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	SSW	24	
30	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	24	
31	SSW	SW	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	24	

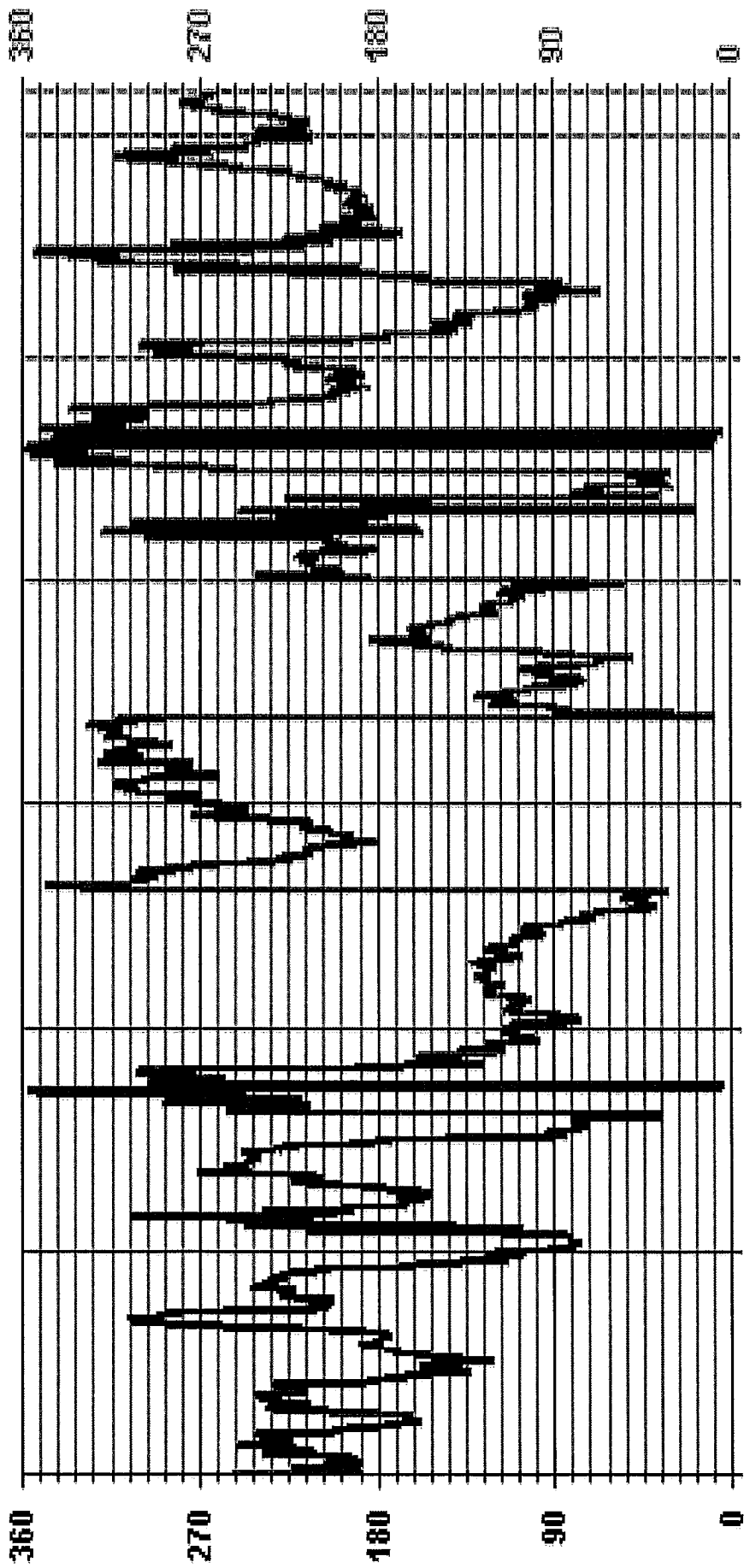
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
V	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	Y	MACHINE/AFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

LAST CALIBRATION: August 28, 2014
 DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	HRS	OPERATIONAL TIME:	744	HRS
STANDARD DEVIATION:	80.38		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	S	

01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA31 WDR DEG

STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 St. Lina Site - DECEMBER 2015
 JOB # 2833-2015-12-31-C

STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees

MST

DAY	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	
1	6	4	4	5	3	4	7	8	14	11	14	10	10	8	8	4	3	4	5	6
2	5	4	8	8	8	10	10	10	12	9	7	6	8	9	7	7	9	8	11	7
3	5	5	6	7	6	7	9	14	13	14	13	16	19	13	12	11	11	10	10	9
4	10	10	10	11	10	7	8	10	15	14	17	17	14	15	12	9	5	6	7	8
5	8	6	6	6	6	6	7	6	6	8	9	8	10	7	8	8	10	11	12	11
6	11	12	11	10	9	10	9	11	14	19	25	47	34	12	12	10	14	27	32	14
7	7	8	11	9	9	16	14	12	13	13	12	12	7	6	7	5	6	13	7	9
8	6	6	6	7	6	6	5	5	4	6	12	12	13	9	11	9	10	11	11	24
9	40	25	37	14	12	8	7	18	23	9	19	32	25	15	16	14	16	14	16	17
10	21	34	58	58	22	19	16	17	16	15	16	16	17	14	14	12	12	14	13	14
11	14	15	14	11	12	11	12	12	12	14	15	15	14	13	14	24	18	17	14	15
12	14	15	14	16	15	15	15	15	14	16	16	16	15	14	13	14	13	13	14	14
13	14	14	13	14	15	15	14	14	15	16	14	15	15	15	14	16	15	14	14	14
14	13	13	13	12	12	19	13	14	14	15	18	19	17	18	18	37	15	11	10	9
15	11	9	10	14	13	15	15	16	13	11	12	8	10	17	7	8	7	11	17	32
16	12	13	15	15	16	14	15	15	16	15	16	17	16	14	15	13	10	11	12	12
17	14	12	14	15	14	14	14	15	16	16	15	14	14	14	14	13	15	15	16	15
18	16	45	34	19	14	13	12	10	10	12	17	23	17	19	20	14	13	13	13	12
19	13	14	13	12	14	13	12	10	10	10	17	23	17	19	20	14	13	13	13	12
20	15	16	17	16	17	16	16	16	15	14	14	17	15	15	15	14	14	16	14	15
21	11	13	14	4	10	18	11	8	6	5	6	7	8	5	4	7	14	9	6	5
22	12	29	14	30	5	5	21	22	18	34	10	14	32	19	50	19	45	29	29	12
23	8	9	9	12	21	12	7	36	16	10	12	59	20	19	17	16	20	13	11	12
24	15	20	19	21	13	17	18	20	18	19	19	19	19	18	18	18	18	14	13	10
25	4	5	13	4	7	9	6	14	15	16	16	18	18	18	16	14	15	16	17	13
26	5	7	11	11	12	14	12	14	13	20	17	20	23	22	15	15	16	15	15	16
27	16	14	14	13	15	14	15	14	13	13	15	17	16	16	16	16	17	19	22	20
28	53	49	36	17	17	17	14	16	15	23	40	40	12	27	56	19	6	8	11	10
29	10	12	14	12	14	15	15	15	14	14	13	14	14	14	12	12	13	13	9	11
30	7	10	6	8	4	5	5	7	12	15	16	15	14	14	15	16	15	7	6	5
31	4	6	5	5	3	4	4	4	4	5	6	7	11	13	13	14	14	14	13	12

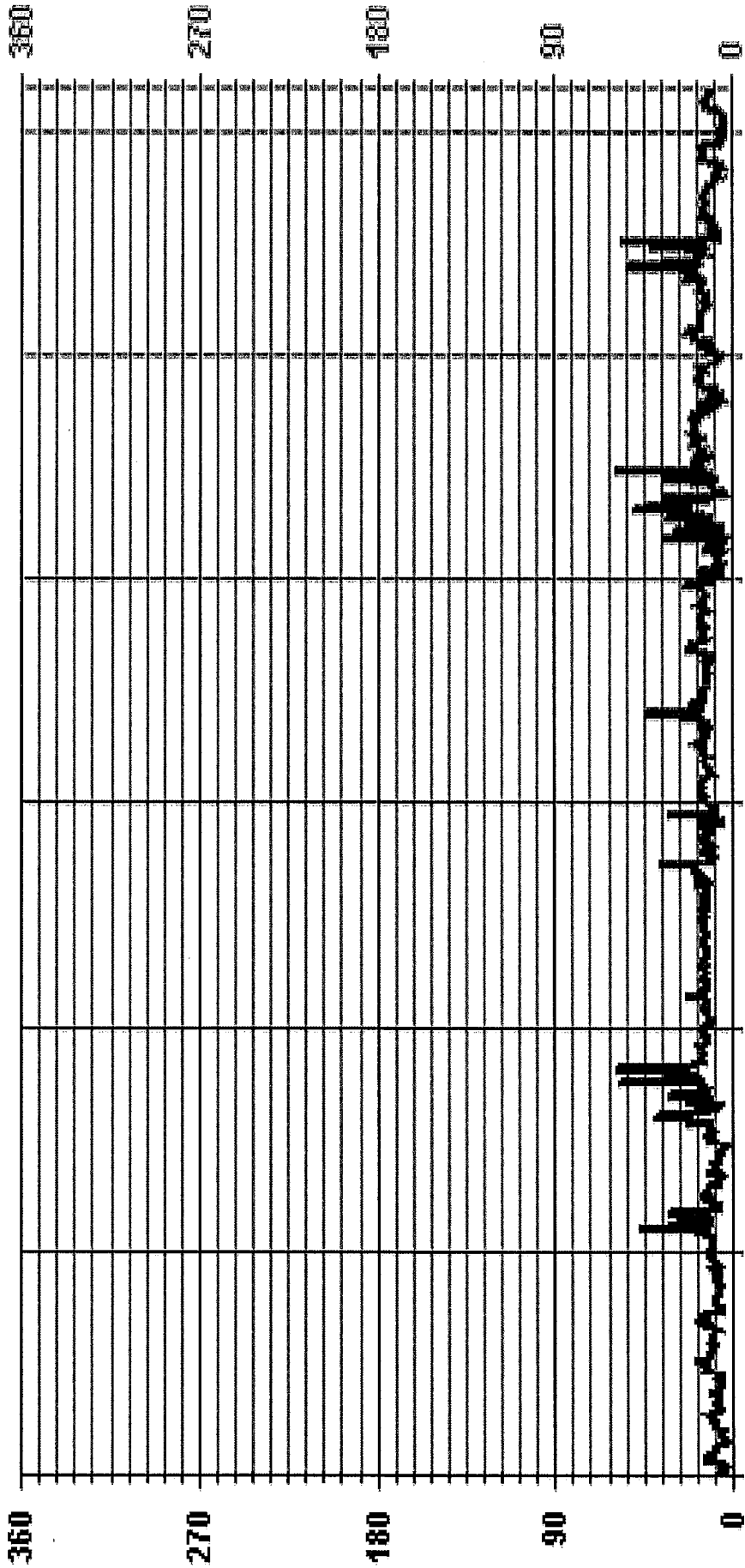
STATUS FLAG CODES

C	QUALITY ASSURANCE
O	RECOVERY
M	MAINTENANCE
D	DAILY ZERO/Span CHECK
P	POWER FAILURE
G	OUT FOR REPAIR
R	RECOVERY
X	MACHINE MALFUNCTION
O	OPERATOR ERROR
K	COLLECTION ERROR

LAST CALIBRATION: August 28, 2014

CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 744 HRS

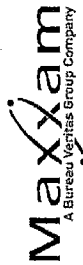
01 Hour Averages



12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA31 STDWDIR DEG

RELATIVE HUMIDITY



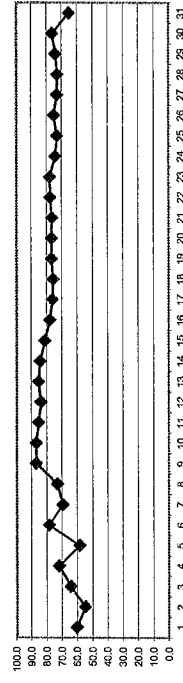
RELATIVE HUMIDITY (RH) hourly averages in %

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX	24-HOUR AVG.	ROSGS.	
1	59	71	70	67	66	67	69	67	66	59	57	54	52	51	52	54	57	58	61	64	64	55	54	57	57	71	60.4	24
2	59	56	55	55	51	45	48	54	56	58	59	60	54	50	54	55	54	56	52	54	55	55	57	57	58	60	54.9	24
3	56	54	57	62	61	58	58	50	54	58	54	58	61	62	66	70	72	73	74	76	77	78	78	79	79	79	64.4	24
4	78	69	79	78	80	81	80	78	81	80	78	68	62	59	56	59	63	69	72	74	74	72	74	71	81	72.0	24	
5	67	69	67	64	61	56	56	58	58	54	52	50	51	49	52	55	58	55	58	55	58	62	67	70	70	58.6	24	
6	72	76	77	79	79	81	83	84	84	84	80	75	71	73	73	75	78	81	79	78	79	82	81	83	84	78.6	24	
7	84	80	75	76	74	74	74	76	75	71	67	62	59	62	62	65	68	66	66	66	66	69	68	71	84	69.8	24	
8	71	69	68	69	69	69	69	69	71	70	68	69	68	68	71	72	72	75	85	86	86	86	86	86	86	73.2	24	
9	86	86	87	87	87	87	88	88	88	86	86	87	87	87	88	88	88	87	87	87	87	87	88	88	88	88	87.2	24
10	88	87	87	87	87	87	87	86	86	87	87	87	87	87	88	88	88	87	87	87	87	87	87	86	86	88	87.1	24
11	86	86	86	87	87	87	87	87	87	87	86	86	86	86	85	85	85	85	85	84	84	84	84	84	84	87	85.6	24
12	84	83	83	83	83	83	83	83	83	83	83	84	84	84	84	84	85	85	85	85	85	85	85	85	85	85	84.0	24
13	85	85	85	85	85	85	85	85	85	85	85	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85.6	24
14	86	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	86	84.6	24
15	83	82	81	79	78	78	78	78	78	79	79	79	81	82	83	83	83	83	85	85	85	84	83	84	84	85	81.5	24
16	84	83	83	82	82	82	80	80	79	79	78	76	74	73	73	74	76	76	76	76	76	76	77	78	79	84	78.2	24
17	78	78	78	77	77	77	77	77	77	77	76	75	74	75	75	75	76	76	76	76	77	77	77	77	77	78	76.4	24
18	77	77	77	77	77	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	77	77	77	76.0	24
19	77	77	77	77	77	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	79	77.0	24
20	78	78	78	78	77	75	75	75	75	75	75	75	74	74	74	74	74	74	74	74	74	74	74	74	74	78	77.0	24
21	76	77	77	76	76	75	74	73	73	73	74	75	77	77	78	78	79	79	79	80	80	79	79	79	80	76.8	24	
22	78	78	79	79	77	78	78	78	78	78	78	77	78	78	78	79	79	79	79	79	79	78	77	77	77	79	78.0	24
23	78	78	78	77	77	77	78	78	78	78	77	78	78	78	78	78	78	78	78	78	78	78	78	78	79	78.0	24	
24	77	76	76	76	76	76	76	76	75	74	74	73	72	72	73	74	74	74	74	74	74	74	74	74	74	77	74.5	24
25	73	72	72	72	71	71	70	71	71	71	71	72	73	74	74	75	75	75	75	75	74	74	74	75	76	76	73.2	24
26	76	76	76	76	76	75	75	75	75	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	75	75.5	24
27	75	75	75	74	74	74	74	74	74	73	72	72	71	69	71	71	73	74	74	74	74	74	74	74	75	75	73.3	24
28	75	75	75	75	75	75	75	75	75	75	74	70	66	64	63	66	72	75	77	77	76	75	74	75	77	77	73.1	24
29	75	75	75	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	78	74.3	24
30	75	74	73	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	78	74.3	24
31	79	79	77	77	77	77	76	76	75	75	72	67	62	58	53	54	58	61	58	55	54	54	56	57	57	79	65.4	24
HOURLY MAX	88	88	87	87	87	87	88	88	88	88	88	87	87	87	88	88	88	88	88	87	87	87	87	88	88	88	88	88
HOURLY AVG	76.6	76.7	76.4	76.3	75.8	75.4	75.5	75.5	75.6	74.9	73.6	72.7	72.1	71.8	72.7	73.9	75.3	75.8	75.7	76.2	76.1	76.3	76.4	76.4	76.4	76.8	76.8	76.8

STATUS FLAG CODES

C	- CALIBRATION	Q	- QUALITY ASSURANCE
Y	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- SOURCE REPAIR	K	- COLLECTION ERROR

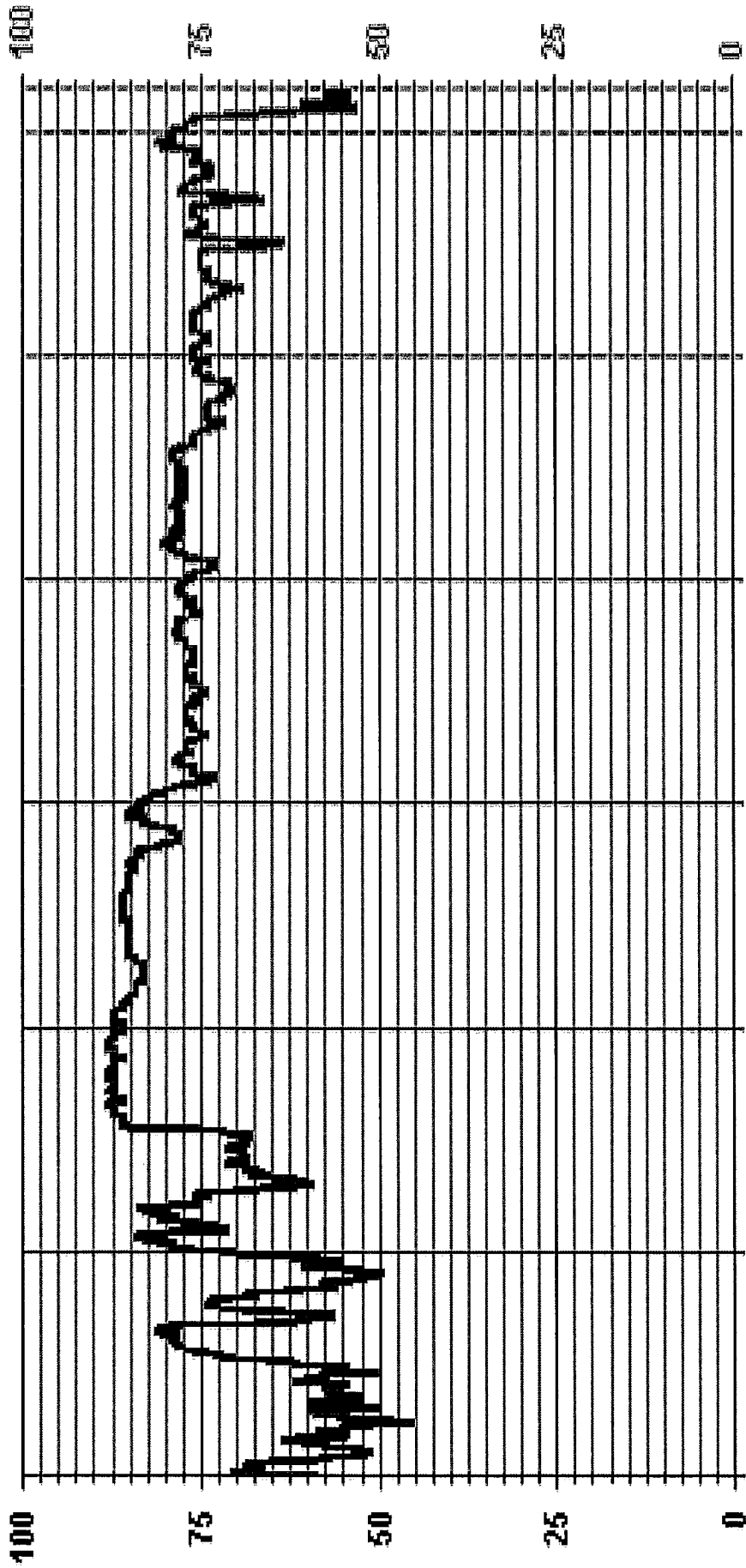
24 HOUR AVERAGES FOR DECEMBER 2015



MONTHLY SUMMARY

MAXIMUM 1-HR AVERAGE:	88	%	@ HOUR(S)	VAR	ON DAY(S)	9, 10
MAXIMUM 24-HR AVERAGE:	87.2	%			ON DAY(S)	9
					VAR-VARIOUS	
STANDARD DEVIATION:	8.86				OPERATIONAL TIME:	744 HRS
					AMD OPERATION UPTIME:	100.0 %
					MONTHLY AVERAGE:	75 %

01 Hour Averages



12:01:15 00:00:12:06:15 00:00:12:11:15 00:00:12:16:15 00:00:12:21:15 00:00:12:26:15 00:00:12:31:15 00:00:00

— LICA31 RH %FS

BAROMETRIC PRESSURE

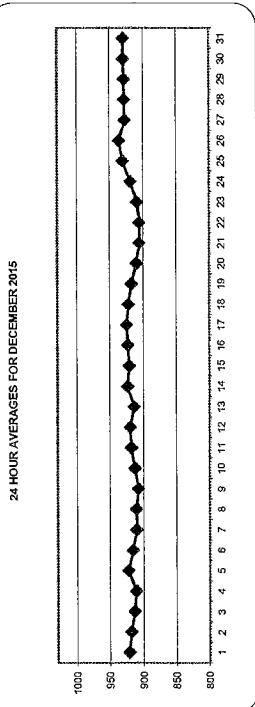


BAROMETRIC PRESSURE (BP) hourly averages in millibar

DAY	DAILY MAX																								RDGS.	
	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300		2400
1	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	24
2	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	24
3	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	24
4	906	906	906	906	906	906	906	906	906	906	906	906	906	906	906	906	906	906	906	906	906	906	906	906	906	24
5	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	24
6	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	24
7	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	24
8	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	24
9	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	24
10	913	913	913	913	913	913	913	913	913	913	913	913	913	913	913	913	913	913	913	913	913	913	913	913	913	24
11	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	24
12	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	24
13	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	24
14	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	24
15	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925	24
16	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	922	24
17	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	24
18	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	24
19	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	24
20	916	916	916	916	916	916	916	916	916	916	916	916	916	916	916	916	916	916	916	916	916	916	916	916	916	24
21	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	24
22	904	904	904	904	904	904	904	904	904	904	904	904	904	904	904	904	904	904	904	904	904	904	904	904	904	24
23	908	908	908	908	908	908	908	908	908	908	908	908	908	908	908	908	908	908	908	908	908	908	908	908	908	24
24	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	24
25	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	24
26	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	24
27	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	24
28	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	24
29	930	930	930	930	930	930	930	930	930	930	930	930	930	930	930	930	930	930	930	930	930	930	930	930	930	24
30	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	24
31	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	24
HOURLY MAX	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935
HOURLY AVG	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919

STATUS FLAG CODES

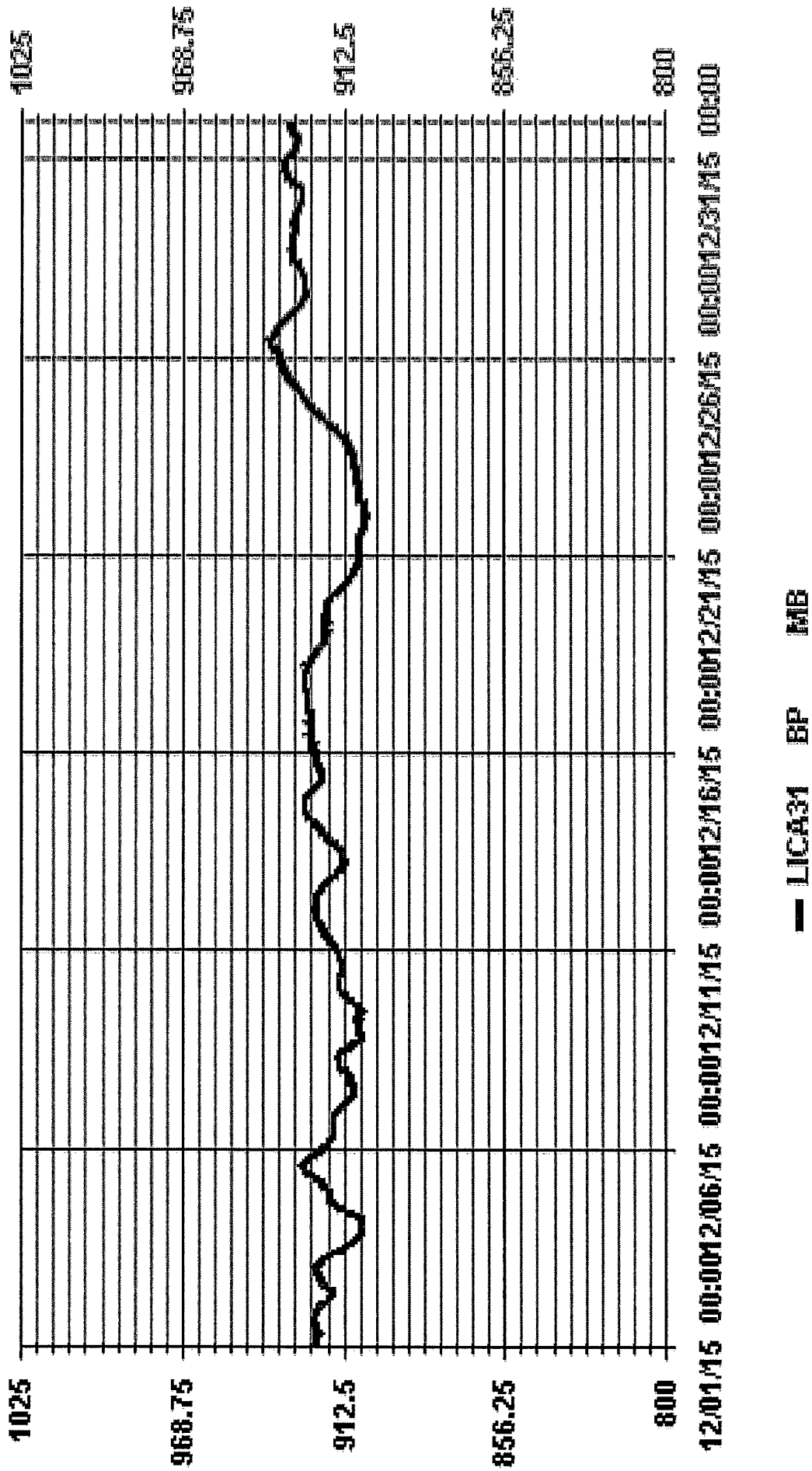
C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
D	DAILY ZERO/SPAN CHECK	Y	MACHINE/MALEFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	GOUT FOR REPAIR	K	COLLECTION ERROR



MONTHLY SUMMARY

MAXIMUM 1-HR AVERAGE:	939	MB	@ HOUR(S)	11	ON DAY(S)	26
MAXIMUM 24-HR AVERAGE:	937	MB			ON DAY(S)	26
STANDARD DEVIATION:	8.29				VAR-VARIOUS	
OPERATIONAL TIME:						744 HRS
AMD OPERATION UPTIME:						100.0 %
MONTHLY AVERAGE:						920 MB

01 Hour Averages



AMBIENT TEMPERATURE



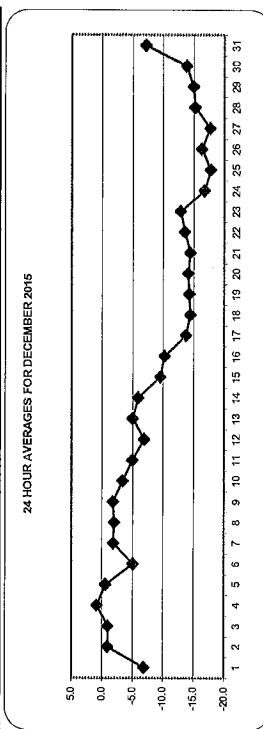
AMBIENT TEMPERATURE (TPX) hourly averages in Degrees Celsius

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	
HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	-5.7	-9.5	-9.2	-8.4	-8.1	-9.1	-9.1	-9.1	-9.2	-11.3	-9.7	-8.1	-5.8	-4.0	-2.9	-2.7	-3.6	-5.0	-5.6	-6.3	-7.3	-6.9	-5.3	-5.2	-6.1	-2.7
2	-6.2	-5.0	-5.2	-3.6	-3.6	-2.5	-2.5	-2.8	-3.2	-3.4	-2.9	-1.2	1.9	4.5	3.9	3.3	3.3	3.3	2.8	2.8	2.0	1.3	0.1	-0.5	-1.0	4.5
3	-0.8	-0.5	-1.5	-3.5	-3.3	-2.7	-2.5	-0.4	-1.4	-1.6	0.1	-1.1	-1.1	-0.4	-0.5	-0.9	-0.7	-0.1	0.0	0.1	0.0	0.3	0.3	0.3	0.3	-1.0
4	0.8	1.1	1.2	1.8	1.4	1.1	0.7	0.4	0.6	0.6	1.7	3.4	3.6	3.7	4.6	3.2	1.9	0.0	-1.2	-1.9	-2.0	-1.8	-2.6	-2.3	4.6	
5	-1.8	-2.7	-2.5	-2.6	-2.4	-1.6	-1.9	-2.4	-2.3	-0.7	0.2	1.4	2.3	3.8	3.1	1.8	1.0	0.0	0.1	0.0	0.0	-0.2	-1.0	-2.2	3.8	
6	-3.7	-5.0	-5.0	-5.3	-5.5	-6.0	-6.6	-6.9	-6.8	-6.8	-5.7	-3.9	-2.8	-3.2	-3.0	-3.7	-4.8	-5.3	-4.8	-4.5	-4.6	-5.5	-5.4	-6.1	-2.8	
7	-6.8	-5.7	-4.6	-5.4	-5.4	-4.8	-4.3	-4.8	-4.8	-4.3	-3.5	-1.6	0.9	2.0	2.3	1.9	1.9	0.9	-0.1	-0.4	0.0	-0.4	-0.8	-0.2	-0.9	
8	-1.2	-1.3	-1.5	-1.7	-2.0	-2.3	-2.6	-3.3	-3.3	-3.3	-3.2	-2.8	-2.7	-2.0	-1.4	-1.3	-1.4	-1.5	-1.2	-1.5	-2.1	-2.1	-2.1	-1.9	-1.7	
9	-1.7	-1.8	-2.0	-1.9	-1.5	-1.4	-1.5	-1.2	-1.1	-1.1	-1.6	-2.2	-2.2	-2.2	-2.2	-2.2	-2.0	-1.8	-1.7	-1.8	-1.8	-1.7	-1.9	-2.2	-2.5	
10	-2.9	-3.1	-3.2	-3.3	-3.7	-4.0	-4.2	-4.2	-4.2	-4.1	-3.7	-3.0	-2.6	-2.5	-2.5	-2.5	-2.4	-2.5	-2.7	-3.1	-3.2	-3.5	-3.8	-4.2	-4.1	
11	-4.2	-4.2	-4.2	-4.0	-3.9	-3.8	-3.7	-3.5	-3.4	-3.6	-4.0	-4.0	-3.9	-4.5	-4.9	-5.4	-5.7	-6.3	-6.5	-6.6	-6.9	-6.9	-7.0	-7.1	-3.4	
12	-7.4	-7.6	-7.9	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-7.8	-7.5	-7.0	-6.8	-6.6	-6.4	-6.1	-6.0	-6.0	-5.8	-5.6	-5.6	-5.7	-5.8	-5.6	
13	-5.8	-5.8	-5.8	-5.9	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2	
14	-4.9	-5.3	-5.7	-5.6	-5.5	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6	
15	-7.6	-10.0	-11.5	-13.0	-13.8	-13.8	-13.9	-13.7	-13.6	-13.1	-10.5	-9.1	-8.3	-7.7	-6.8	-7.4	-8.1	-8.1	-8.1	-8.1	-8.1	-8.1	-8.1	-8.1	-8.1	
16	-7.4	-7.8	-7.6	-7.5	-8.4	-9.4	-10.6	-10.6	-11.0	-11.3	-10.8	-9.4	-8.4	-8.9	-9.6	-10.8	-12.4	-12.9	-13.3	-12.4	-12.1	-11.4	-11.1	-10.9	-7.4	
17	-11.6	-13.3	-13.1	-13.1	-13.7	-13.9	-14.1	-14.1	-14.1	-14.0	-13.7	-13.5	-13.4	-13.3	-13.3	-13.3	-13.3	-13.3	-13.3	-13.3	-13.3	-13.3	-13.3	-13.3	-13.3	
18	-14.3	-14.4	-14.3	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	-14.4	
19	-14.8	-14.8	-14.8	-15.0	-15.3	-15.4	-15.4	-15.4	-15.4	-15.4	-15.3	-13.0	-13.0	-13.4	-13.5	-14.5	-14.5	-14.5	-14.6	-14.7	-14.7	-14.7	-14.9	-14.9	-13.8	
20	-13.2	-13.1	-13.4	-13.7	-14.4	-16.6	-17.2	-17.0	-16.2	-14.9	-13.5	-12.5	-12.0	-11.9	-12.4	-13.8	-14.2	-14.4	-13.8	-13.6	-13.6	-13.6	-13.8	-14.1	-15.4	
21	-15.6	-15.8	-15.9	-16.5	-16.5	-17.3	-18.3	-19.4	-19.8	-18.6	-16.0	-13.8	-10.6	-8.7	-9.6	-10.6	-12.4	-12.8	-12.9	-12.5	-12.9	-13.9	-14.7	-14.5	-11.9	
22	-14.3	-14.9	-13.3	-13.7	-15.1	-14.8	-14.3	-14.3	-13.4	-13.3	-12.2	-11.1	-9.1	-10.6	-11.3	-11.8	-12.7	-13.1	-14.3	-13.9	-13.9	-14.7	-14.5	-14.4	-9.1	
23	-15.8	-15.7	-15.5	-15.2	-15.7	-15.4	-15.5	-16.1	-16.7	-16.7	-16.3	-15.6	-14.9	-15.2	-15.7	-16.1	-17.1	-17.5	-17.9	-18.6	-19.2	-19.4	-19.8	-20.5	-9.1	
24	-20.8	-21.9	-22.1	-22.0	-22.8	-23.1	-23.2	-23.2	-23.2	-23.2	-23.2	-23.2	-23.2	-23.2	-23.2	-23.2	-23.2	-23.2	-23.2	-23.2	-23.2	-23.2	-23.2	-23.2	-23.2	
25	-16.2	-16.6	-16.7	-17.3	-17.4	-17.9	-18.5	-18.2	-17.5	-17.6	-17.4	-16.2	-15.4	-14.7	-14.3	-14.9	-15.6	-15.8	-15.7	-15.4	-15.5	-15.3	-15.5	-16.0	-16.3	
26	-16.3	-16.6	-17.3	-18.2	-18.2	-18.0	-18.4	-19.2	-19.8	-19.7	-18.7	-17.3	-16.0	-16.9	-17.3	-18.1	-18.7	-18.4	-17.5	-17.1	-16.9	-16.5	-16.9	-16.0	-14.3	
27	-16.2	-15.9	-16.4	-16.6	-16.6	-15.4	-15.4	-15.8	-16.6	-16.6	-15.9	-10.1	-9.6	-9.8	-11.1	-13.6	-15.7	-16.4	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0	
28	-17.6	-17.3	-16.4	-15.4	-14.8	-14.8	-15.7	-16.2	-16.4	-16.1	-14.8	-11.8	-10.6	-11.1	-11.8	-12.7	-13.5	-14.7	-15.8	-16.1	-16.7	-17.0	-18.0	-10.6	-14.9	
29	-18.6	-19.1	-19.7	-19.4	-19.5	-19.1	-17.8	-17.1	-15.0	-13.7	-11.5	-11.0	-9.3	-8.4	-7.7	-8.7	-9.9	-9.6	-10.8	-11.7	-12.9	-13.3	-13.8	-14.2	-7.7	
30	-13.8	-13.2	-12.3	-12.8	-12.9	-12.8	-12.7	-12.7	-12.2	-11.7	-9.7	-7.2	-4.3	-1.4	-0.9	-1.8	-2.3	-2.3	-2.0	-2.1	-1.9	-2.1	-2.8	-3.3	-0.9	
31	0.8	1.1	1.2	1.8	1.4	1.1	0.7	0.4	0.6	0.6	1.7	3.4	3.6	4.5	4.6	3.3	1.9	2.3	2.8	2.0	1.3	0.1	-0.1	0.3	-9.5	
HOURLY MAX	-9.7	-10.0	-10.0	-10.2	-10.4	-10.4	-10.5	-10.6	-10.7	-10.3	-9.1	-8.1	-7.2	-6.8	-6.9	-7.5	-8.2	-8.4	-8.5	-8.6	-8.8	-8.9	-9.2	-9.2	-9.5	
HOURLY AVG																										

STATUS FLAG CODES

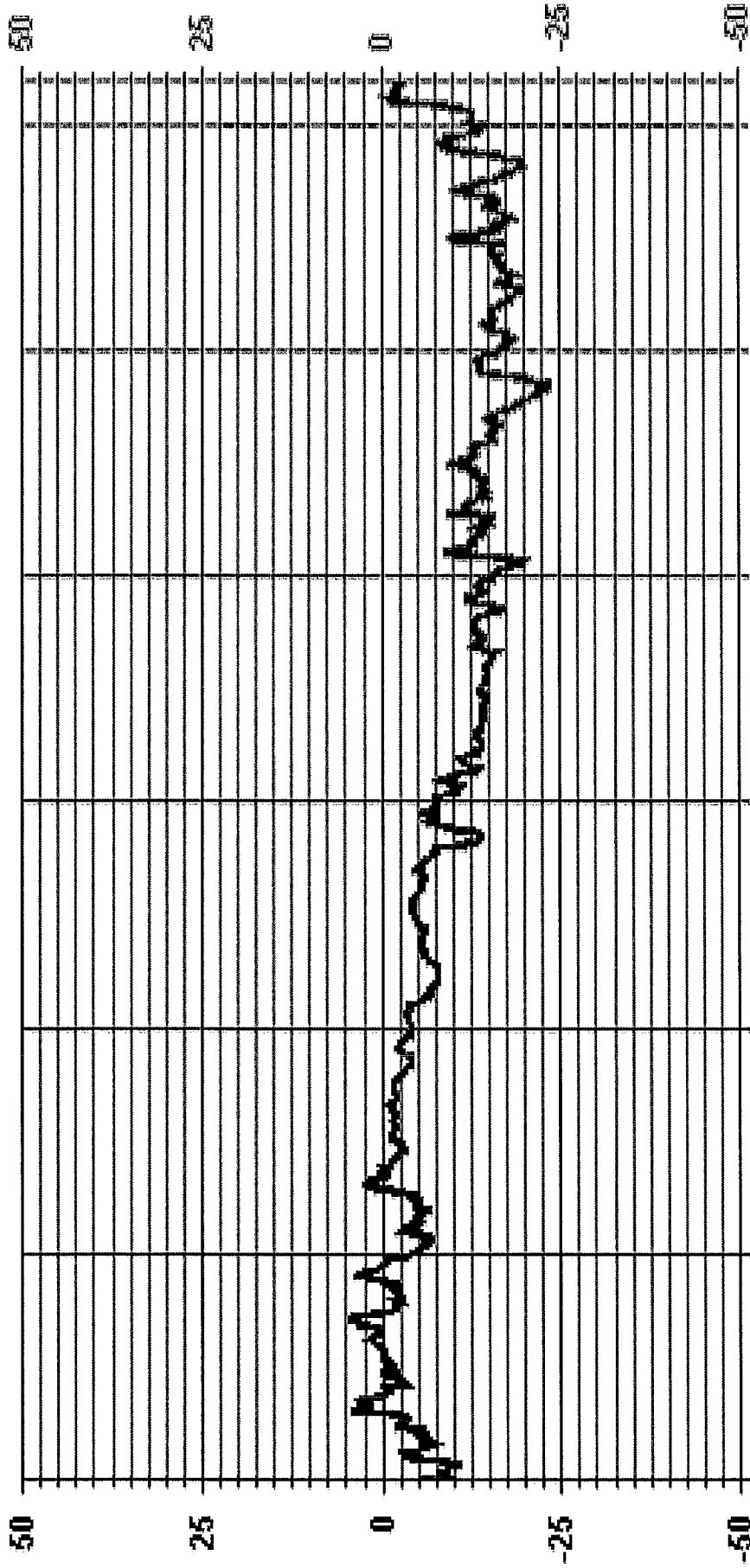
C	-CALIBRATION	O	-QUALITY ASSURANCE
Y	-MAINTENANCE	R	-RECOVERY
S	-DAILY ZERO/SPAN CHECK	X	-MACHINE MALFUNCTION
P	-POWER FAILURE	O	-OPERATOR ERROR
G	-OUT FOR REPAIR	K	-COLLECTION ERROR



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-23.2	°C	@ HOUR(S)	6	ON DAY(S)	25
MAXIMUM 1-HR AVERAGE:	4.6	°C	@ HOUR(S)	14	ON DAY(S)	4
MAXIMUM 24-HR AVERAGE:	0.8	°C			VAR-VARIOUS	4
STANDARD DEVIATION:	6.28					
OPERATIONAL TIME:						744 HRS
AMD OPERATION UPTIME:						100.0 %
MONTHLY AVERAGE:						-9.1 °C

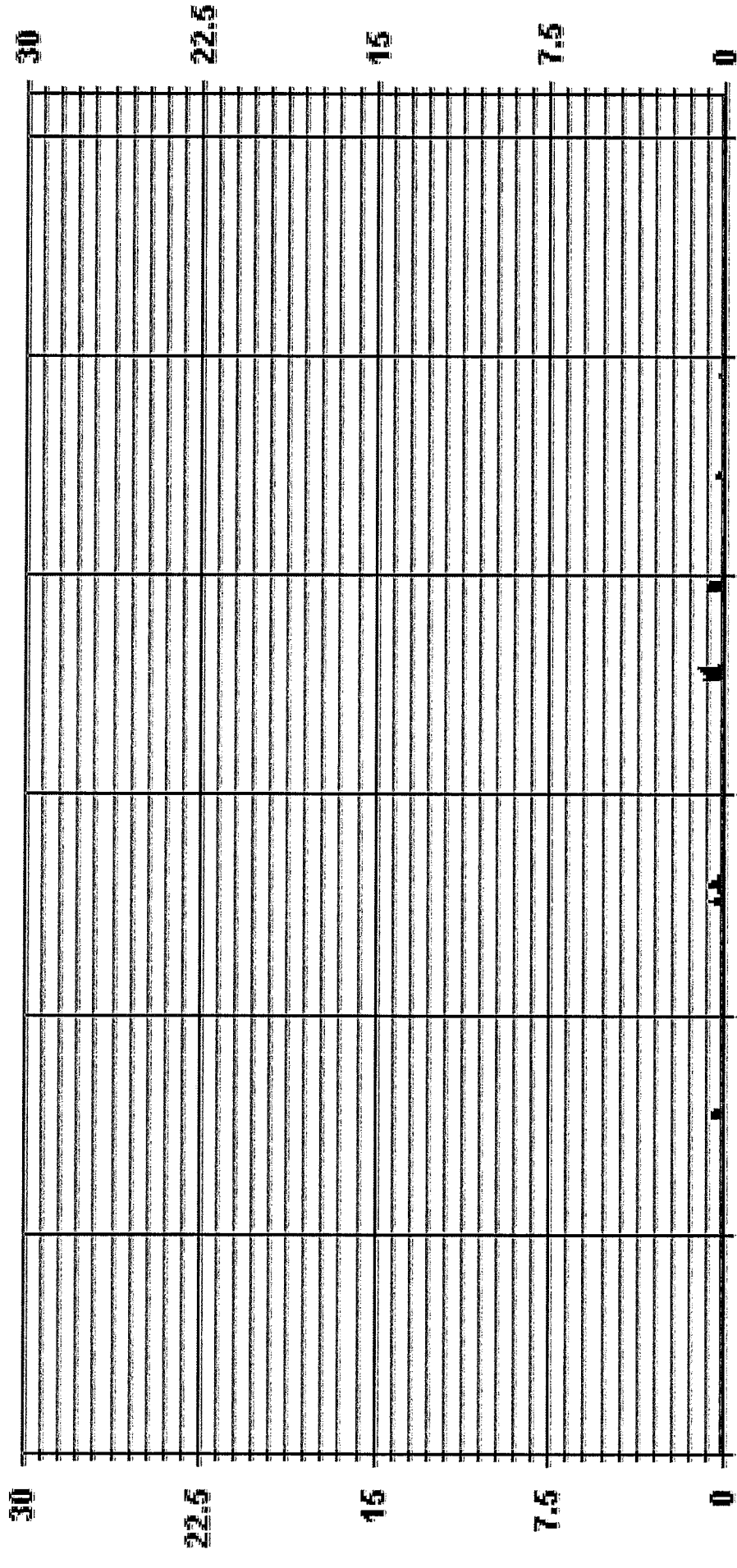
01 Hour Averages



— LICA31 TPX DGC

PRECIPITATION

01 Hour Averages




12/01/15 00:00 12/06/15 00:00 12/11/15 00:00 12/16/15 00:00 12/21/15 00:00 12/26/15 00:00 12/31/15 00:00

— LICA31 PRECIP MM

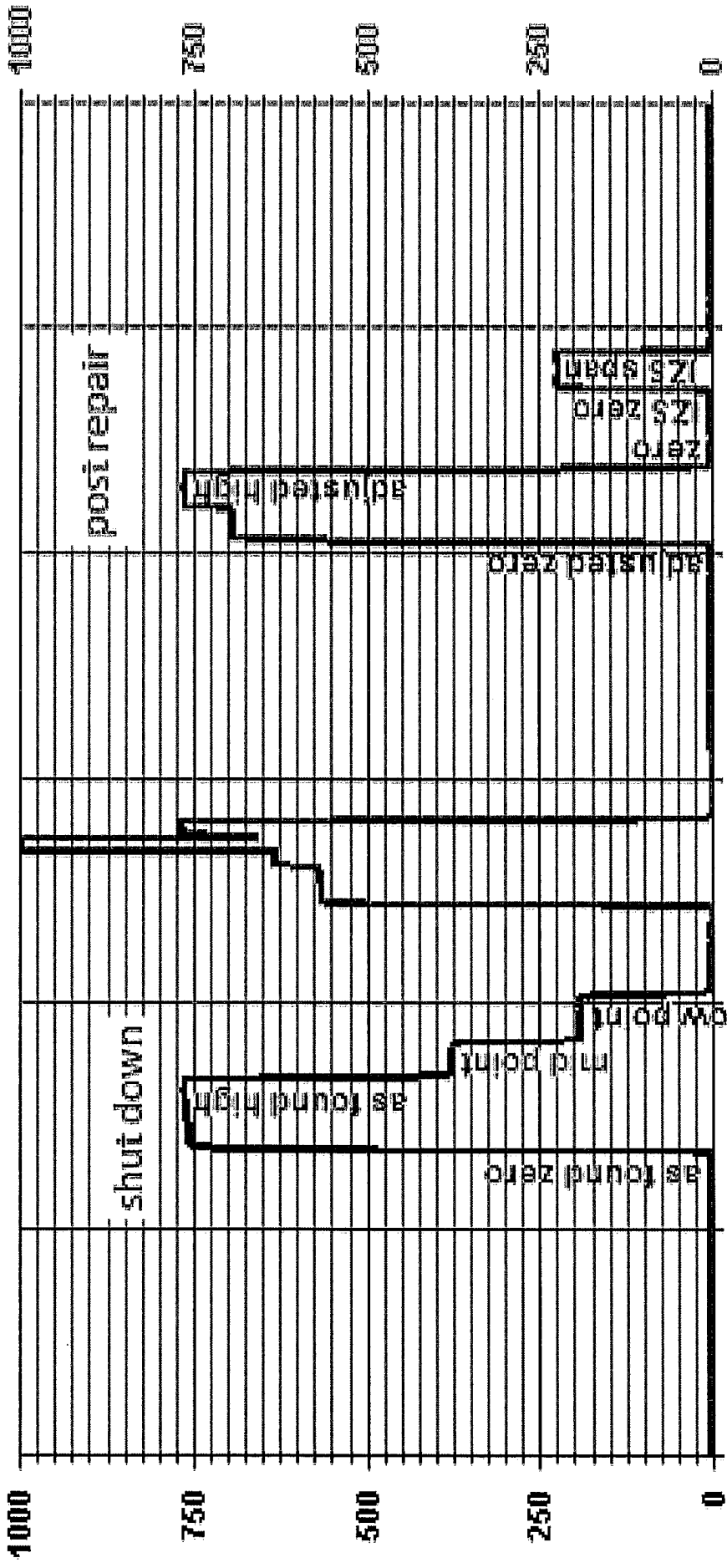
APPENDIX II
ANALYZER CALIBRATION RESULTS

SULPHUR DIOXIDE


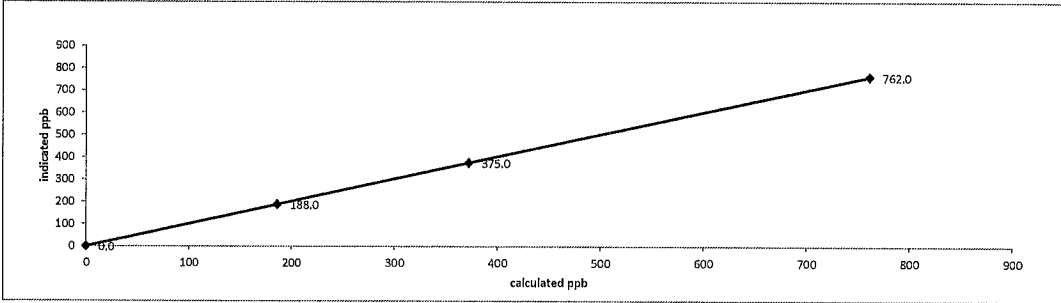
API 100E Sulphur Dioxide Analyzer Calibration																																																		
Date: December 10, 2015 Company/Alrshed: LICA Location/Station Name: St. Lina Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 11:27 End Time 24 hr. (mst): 14:02 Calibration Method: Gas Dilution	Barometric Pressure: 0.899 atm Station Temperature °C: 21 Weather Conditions: Fog Calibration Purpose: shut down Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: March 12, 2019 Converter Model & s/n (if applicable): n/a																																																	
Analyzer: Serial Number: 468 Range ppb: 1000 Last Calibration Date: November 2, 2015 As Found C.F.: 1.005 Previous C.F.: 1.000 New C.F.: n/a																																																		
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: BLM002073 Cal Gas Conc. (ppm): 49.5																																																		
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																																																		
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>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></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>5012</td> <td>0.00</td> <td>5012</td> <td>0.0</td> <td>4.0</td> <td>N/A</td> </tr> <tr> <td>as found high</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>762.0</td> <td>762.0</td> <td>1.005</td> </tr> <tr> <td>mid</td> <td>4976</td> <td>37.70</td> <td>5014</td> <td>372.2</td> <td>377.0</td> <td>0.998</td> </tr> <tr> <td>low</td> <td>4994</td> <td>18.90</td> <td>5013</td> <td>186.6</td> <td>191.0</td> <td>0.998</td> </tr> <tr> <td colspan="6" style="text-align: right;">Average C.F. =</td> <td>1.000</td> </tr> </tbody> </table>		Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):		Diluent	Cal Gas	Total	(ppb)	(ppb)		as found zero	5012	0.00	5012	0.0	4.0	N/A	as found high	4938	77.20	5015	762.0	762.0	1.005	mid	4976	37.70	5014	372.2	377.0	0.998	low	4994	18.90	5013	186.6	191.0	0.998	Average C.F. =						1.000
Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):																																												
	Diluent	Cal Gas	Total	(ppb)	(ppb)																																													
as found zero	5012	0.00	5012	0.0	4.0	N/A																																												
as found high	4938	77.20	5015	762.0	762.0	1.005																																												
mid	4976	37.70	5014	372.2	377.0	0.998																																												
low	4994	18.90	5013	186.6	191.0	0.998																																												
Average C.F. =						1.000																																												
Linear Regression/Calibration Results: Correlation Coefficient = 1.000 LIMITS > or = 0.995 Slope = 1.005 0.90-1.10 b (Intercept as % of full scale) = -0.51% ± 3% F.S. % change in C.F. from last cal = -0.52% ± 10%																																																		
API 100E Sulphur Dioxide Analyzer Calibration																																																		
<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: SLOPE: 0.898 OFFSET: 87.7 HVPS: 532 RCELL TEMP: 50.0 BOX TEMP: 27.8 PMT TEMP: 7.8 IZS TEMP: 40.0 PRES: 23.6 SAMP FL: 569 NORM PMT: 95.0 UV LAMP: 1773.3 LAMP RATIO: 71.7 STR. LGT: 39.4 DRK PMT: 15.8 DRK LMP: 3.5 Internal Span: 223 </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: 0.898 OFFSET: 87.7 HVPS: 532 RCELL TEMP: 50.0 BOX TEMP: 27.8 PMT TEMP: 7.8 IZS TEMP: 40.0 PRES: 23.6 SAMP FL: 569 NORM PMT: 95.0 UV LAMP: 1773.3 LAMP RATIO: 71.7 STR. LGT: 39.4 DRK PMT: 15.8 DRK LMP: 3.5 Internal Span: 223	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: 0.898 OFFSET: 87.7 HVPS: 532 RCELL TEMP: 50.0 BOX TEMP: 27.8 PMT TEMP: 7.8 IZS TEMP: 40.0 PRES: 23.6 SAMP FL: 569 NORM PMT: 95.0 UV LAMP: 1773.3 LAMP RATIO: 71.7 STR. LGT: 39.4 DRK PMT: 15.8 DRK LMP: 3.5 Internal Span: 223	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 performed to calibrate UV lamp of the analyzer and complete a factory calibration.																																																		

 API 100E Sulphur Dioxide Analyzer Calibration																																											
Date: December 10, 2015 Company/Atshed: LICA Location/Station Name: St. Lina Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 17:36 End Time 24 hr. (mst): 19:50 Calibration Method: Gas Dilution	Barometric Pressure: 0.899 atm Station Temperature °C: 21 Weather Conditions: Fog Calibration Purpose: post repair Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: March 12, 2019 Converter Model & s/n (if applicable): n/a																																										
Analyzer: Serial Number: 468 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: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: BLM002073 Cal Gas Conc. (ppm): 49.5																																											
Standard Calibration Points for Ranges																																											
<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																																										
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>5012</td> <td>0.00</td> <td>5012</td> <td>0.0</td> <td>0.0</td> <td>N/A</td> </tr> <tr> <td>adjusted high</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>762.0</td> <td>762.0</td> <td>1.000</td> </tr> <tr> <td>calibrator zero</td> <td>5012</td> <td>0.00</td> <td>5012</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>#VALUE!</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	5012	0.00	5012	0.0	0.0	N/A	adjusted high	4938	77.20	5015	762.0	762.0	1.000	calibrator zero	5012	0.00	5012	0.0	0.0	n/a	Average C.F.=						#VALUE!
Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):																																					
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)																																						
adjusted zero	5012	0.00	5012	0.0	0.0	N/A																																					
adjusted high	4938	77.20	5015	762.0	762.0	1.000																																					
calibrator zero	5012	0.00	5012	0.0	0.0	n/a																																					
Average C.F.=						#VALUE!																																					
Linear Regression/Calibration Results:																																											
Correlation Coefficient = n/a LIMITS > or = 0.995 Slope = n/a .95-1.05 b (Intercept as % of full scale) = n/a ± 3% F.S. % change in C.F. from last cal = n/a ± 10%																																											
<table style="width:100%;"> <tr> <td style="width:50%; text-align: center;"> 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 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> <td style="width:50%; text-align: center;"> As left: SLOPE: 0.983 OFFSET: 89.7 HVPS: 647 RCELL TEMP: 50.0 BOX TEMP: 27.1 PMT TEMP: 7.8 IZS TEMP: 40.0 PRES: 23.6 SAMP FL: 570 NORM PMT: 88.9 UV LAMP: 3509.0 LAMP RATIO: 100.2 STR. LGT: 44.1 DRK PMT: 5.9 DRK LMP: 6.9 Internal Span: 223 </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 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 left: SLOPE: 0.983 OFFSET: 89.7 HVPS: 647 RCELL TEMP: 50.0 BOX TEMP: 27.1 PMT TEMP: 7.8 IZS TEMP: 40.0 PRES: 23.6 SAMP FL: 570 NORM PMT: 88.9 UV LAMP: 3509.0 LAMP RATIO: 100.2 STR. LGT: 44.1 DRK PMT: 5.9 DRK LMP: 6.9 Internal Span: 223																																								
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 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 left: SLOPE: 0.983 OFFSET: 89.7 HVPS: 647 RCELL TEMP: 50.0 BOX TEMP: 27.1 PMT TEMP: 7.8 IZS TEMP: 40.0 PRES: 23.6 SAMP FL: 570 NORM PMT: 88.9 UV LAMP: 3509.0 LAMP RATIO: 100.2 STR. LGT: 44.1 DRK PMT: 5.9 DRK LMP: 6.9 Internal Span: 223																																										
Comments: Sample filter changed. One-point calibration performed after UV lamp had been calibrated and a factory calibration performed. EV has not been changed. After calibration it stayed the same.																																											

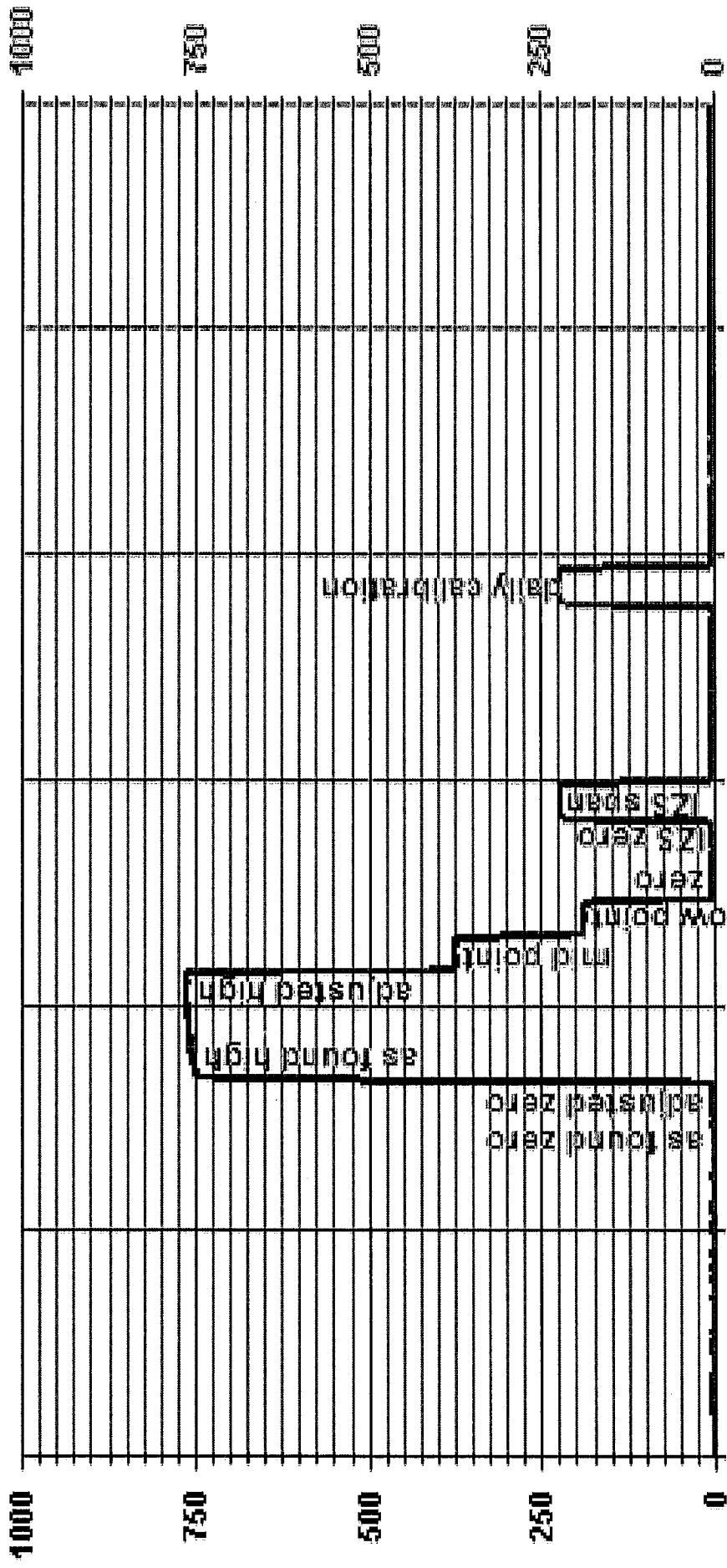
01 Minute Averages



— LICA31 SO2_ PPB


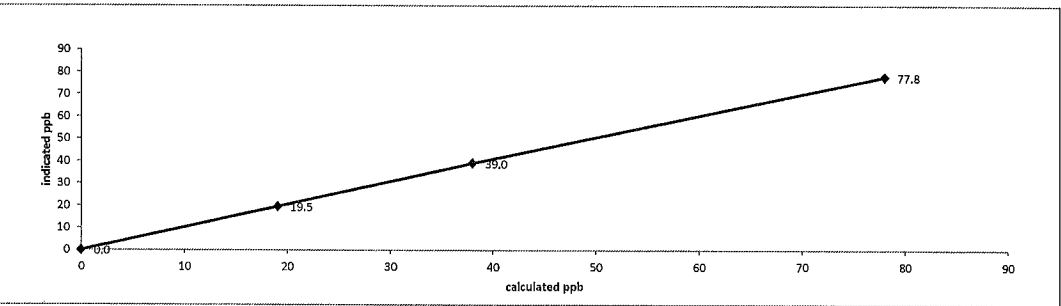
		API 100E Sulphur Dioxide Analyzer Calibration									
Date: December 11, 2015 Company/Airshed: LICA Location/Station Name: St. Lina Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 11:18 End Time 24 hr. (mst): 15:04 Calibration Method: Gas Dilution		Barometric Pressure: 0.904 atm Station Temperature °C: 21 Weather Conditions: Mainly cloudy with light snow Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov / Trina Whitsitt Cal Gas Expiry Date: March 12, 2019 Converter Model & s/n (if applicable): n/a									
Analyzer: Serial Number: 468 Last Calibration Date: December 10, 2015 Previous C.F.: 1.000		Range ppb: 1000 As Found C.F.: 1.004 New C.F.: 1.000									
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: BLM002073 Cal Gas Conc. (ppm): 49.5		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>											
Calibrator Flow Rates (cc/min)											
Point	Diluent	Cal Gas	Total	Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):					
as found zero	5012	0.00	5012	0.0	0.0	N/A					
as found high	4938	77.20	5015	762.0	759.0	1.004					
adjusted zero	5012	0.00	5012	0.0	0.0	n/a					
adjusted high	4938	77.20	5015	762.0	762.0	1.000					
mid	4976	37.70	5014	372.2	375.0	0.993					
low	4994	18.90	5013	186.6	188.0	0.993					
calibrator zero	5012	0.00	5012	0.0	1.0	n/a					
Average C.F. =						0.995					
Linear Regression/Calibration Results:											
Correlation Coefficient = 1.000				LIMITS > or = 0.995							
Slope = 1.000				.95-1.05							
b (Intercept as % of full scale) = -0.11%				± 3% F.S.							
% change in C.F. from last cal = -0.39%				± 10%							
API 100E Sulphur Dioxide Analyzer Calibration											
											
As found: SLOPE: 0.983 OFFSET: 89.7 HVPS: 647 RCELL TEMP: 50.0 BOX TEMP: 27.4 PMT TEMP: 7.8 IZS TEMP: 40.0 PRES: 23.8 SAMP FL: 574 NORM PMT: 88.9 UV LAMP: 3499.4 LAMP RATIO: 100.0 STR. LGT: 44.1 DRK PMT: 5.0 DRK LMP: 7.0 Internal Span: 223				As left: SLOPE: 0.987 OFFSET: 88.8 HVPS: 647 RCELL TEMP: 50.0 BOX TEMP: 26.7 PMT TEMP: 7.8 IZS TEMP: 40.0 PRES: 23.8 SAMP FL: 575 NORM PMT: 88.5 UV LAMP: 3496.8 LAMP RATIO: 99.8 STR. LGT: 43.8 DRK PMT: 4.9 DRK LMP: 7.0 Internal Span: 223							
Comments: <p style="text-align: center;">Sample filter changed on December 10, 2015. No EV changed.</p>											

01 Minute Averages



— LICA31 SO2_ PPB

HYDROGEN SULPHIDE

 API 100A Hydrogen Sulphide Analyzer Calibration																																																																													
Date: December 10, 2015 Company/Alrshed: LICA Location/Station Name: St. Lina Parameter: Hydrogen Sulphide Start Time 24 hr. (mst): 11:27 End Time 24 hr. (mst): 13:47 Calibration Method: Gas Dilution	Barometric Pressure: 0.899 atm Station Temperature °C: 21 Weather Conditions: Fog Calibration Purpose: shut down Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: July 15, 2017 Converter Model & s/n (if applicable): n/a																																																																												
Analyzer: Serial Number: 375 Last Calibration Date: November 3, 2015 Previous C.F.: 1.000	Range ppb: 100 As Found C.F.: 1.003 New C.F.: n/a																																																																												
Callibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 830 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																																																																													
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Callibrator Flow Rates (cc/mln)</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>7497</td> <td>0.00</td> <td>7497</td> <td>0.0</td> <td>0.0</td> <td>N/A</td> </tr> <tr> <td>as found high</td> <td>7440</td> <td>58.50</td> <td>7499</td> <td>78.0</td> <td>77.8</td> <td>1.003</td> </tr> <tr> <td>mid</td> <td>7472</td> <td>28.50</td> <td>7501</td> <td>38.0</td> <td>39.0</td> <td>0.974</td> </tr> <tr> <td>low</td> <td>7486</td> <td>14.30</td> <td>7500</td> <td>19.1</td> <td>19.5</td> <td>0.978</td> </tr> <tr> <td colspan="6" style="text-align: right;">Average C.F.=</td> <td>0.985</td> </tr> </tbody> </table>		Callibrator Flow Rates (cc/mln)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):	Point	Diluent	Cal Gas	Total	(ppb)	(ppb)		as found zero	7497	0.00	7497	0.0	0.0	N/A	as found high	7440	58.50	7499	78.0	77.8	1.003	mid	7472	28.50	7501	38.0	39.0	0.974	low	7486	14.30	7500	19.1	19.5	0.978	Average C.F.=						0.985																											
Callibrator Flow Rates (cc/mln)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):																																																																							
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)																																																																								
as found zero	7497	0.00	7497	0.0	0.0	N/A																																																																							
as found high	7440	58.50	7499	78.0	77.8	1.003																																																																							
mid	7472	28.50	7501	38.0	39.0	0.974																																																																							
low	7486	14.30	7500	19.1	19.5	0.978																																																																							
Average C.F.=						0.985																																																																							
Linear Regression/Calibration Results: Correlation Coefficient = 1.000 Slope = 1.003 b (Intercept as % of full scale) = -0.42% % change in C.F. from last cal = -0.28%		LIMITS > or = 0.995 0.90-1.10 ± 3% F.S. ± 10%																																																																											
API 100A Hydrogen Sulphide Analyzer Calibration 																																																																													
<table style="width:100%;"> <tr> <td colspan="2" style="text-align: center;">As found:</td> </tr> <tr><td>SLOPE:</td><td>1.058</td></tr> <tr><td>OFFSET:</td><td>30.0</td></tr> <tr><td>HVPS:</td><td>684</td></tr> <tr><td>DCPS:</td><td>2565</td></tr> <tr><td>RCCELL TEMP:</td><td>50.0</td></tr> <tr><td>BOX TEMP:</td><td>26.2</td></tr> <tr><td>PMT TEMP:</td><td>6.9</td></tr> <tr><td>IZS TEMP:</td><td>50.0</td></tr> <tr><td>Converter Temp:</td><td>315.7</td></tr> <tr><td>PRES:</td><td>22.2</td></tr> <tr><td>SAMP FL:</td><td>499</td></tr> <tr><td>PMT:</td><td>80.3</td></tr> <tr><td>UV LAMP:</td><td>3288.9</td></tr> <tr><td>LAMP RATIO:</td><td>93.8</td></tr> <tr><td>STR. LGT:</td><td>15.9</td></tr> <tr><td>DRK PMT:</td><td>55.1</td></tr> <tr><td>DRK LMP:</td><td>0.1</td></tr> <tr><td>Internal Span:</td><td>63</td></tr> </table>	As found:		SLOPE:	1.058	OFFSET:	30.0	HVPS:	684	DCPS:	2565	RCCELL TEMP:	50.0	BOX TEMP:	26.2	PMT TEMP:	6.9	IZS TEMP:	50.0	Converter Temp:	315.7	PRES:	22.2	SAMP FL:	499	PMT:	80.3	UV LAMP:	3288.9	LAMP RATIO:	93.8	STR. LGT:	15.9	DRK PMT:	55.1	DRK LMP:	0.1	Internal Span:	63	<table style="width:100%;"> <tr> <td colspan="2" style="text-align: center;">As left:</td> </tr> <tr><td>SLOPE:</td><td>n/a</td></tr> <tr><td>OFFSET:</td><td>n/a</td></tr> <tr><td>HVPS:</td><td>n/a</td></tr> <tr><td>DCPS:</td><td>n/a</td></tr> <tr><td>RCCELL TEMP:</td><td>n/a</td></tr> <tr><td>BOX TEMP:</td><td>n/a</td></tr> <tr><td>PMT TEMP:</td><td>n/a</td></tr> <tr><td>IZS TEMP:</td><td>n/a</td></tr> <tr><td>Converter Temp:</td><td>n/a</td></tr> <tr><td>PRES:</td><td>n/a</td></tr> <tr><td>SAMP FL:</td><td>n/a</td></tr> <tr><td>PMT:</td><td>n/a</td></tr> <tr><td>UV LAMP:</td><td>n/a</td></tr> <tr><td>LAMP RATIO:</td><td>n/a</td></tr> <tr><td>STR. LGT:</td><td>n/a</td></tr> <tr><td>DRK PMT:</td><td>n/a</td></tr> <tr><td>DRK LMP:</td><td>n/a</td></tr> <tr><td>Internal Span:</td><td>n/a</td></tr> </table>	As left:		SLOPE:	n/a	OFFSET:	n/a	HVPS:	n/a	DCPS:	n/a	RCCELL 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	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:	1.058																																																																												
OFFSET:	30.0																																																																												
HVPS:	684																																																																												
DCPS:	2565																																																																												
RCCELL TEMP:	50.0																																																																												
BOX TEMP:	26.2																																																																												
PMT TEMP:	6.9																																																																												
IZS TEMP:	50.0																																																																												
Converter Temp:	315.7																																																																												
PRES:	22.2																																																																												
SAMP FL:	499																																																																												
PMT:	80.3																																																																												
UV LAMP:	3288.9																																																																												
LAMP RATIO:	93.8																																																																												
STR. LGT:	15.9																																																																												
DRK PMT:	55.1																																																																												
DRK LMP:	0.1																																																																												
Internal Span:	63																																																																												
As left:																																																																													
SLOPE:	n/a																																																																												
OFFSET:	n/a																																																																												
HVPS:	n/a																																																																												
DCPS:	n/a																																																																												
RCCELL 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																																																																												
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 performed to replace a Maxxam's analyzer with LICA's analyzer after repair.																																																																													



API 101E Hydrogen Sulphide Analyzer Calibration

Date:	December 10, 2015	Barometric Pressure:	0.899 atm
Company/Alrshed:	LICA	Station Temperature °C:	21
Location/Station Name:	St. Iina	Weather Conditions:	Fog
Parameter:	Hydrogen Sulphide	Calibration Purpose:	Installation
Start Time 24 hr. (mst):	14:47	Performed By/Reviewer:	Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst):	17:55	Cal Gas Expiry Date:	July 15, 2017
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a

Analyzer:	
Serial Number:	509
Last Calibration Date:	n/a
Previous C.F.:	n/a
Range ppb:	100
As Found C.F.:	n/a
New C.F.:	0.998

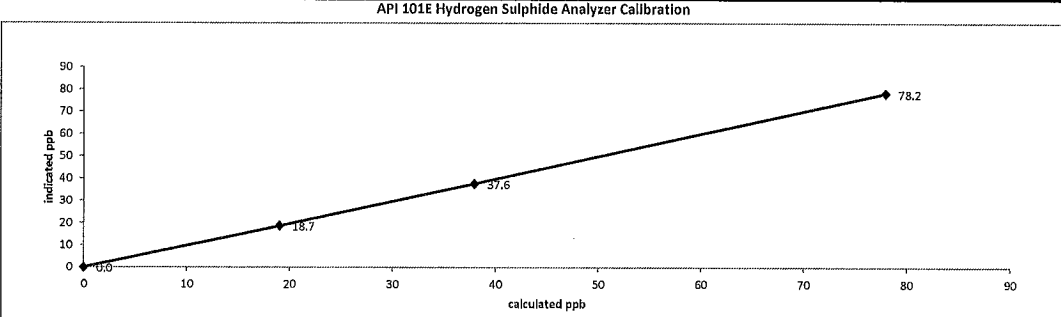
Calibrator:		Standard Calibration Points for Ranges	
Flow Meter ID's:	n/a	Point	Hydrogen Sulphide Standard Calibration Points
Make & Model:	API 700	High	78
Serial #:	830	Mid	38
Cal Gas Cylinder I.D. #:	LL36837	Low	19
Cal Gas Conc. (ppm):	10.0		

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	7497	0.00	7497	0.0	0.0	N/A
adjusted high	7440	58.50	7499	78.0	78.2	0.998
mid	7472	28.50	7501	38.0	37.6	1.011
low	7486	14.30	7500	19.1	18.7	1.020
calibrator zero	7497	0.00	7497	0.0	0.0	n/a
Average C.F.=						1.009

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.996		.95-1.05
b (Intercept as % of full scale)=	0.27%		± 3% F.S.
% change in C.F. from last cal=	n/a		± 10%

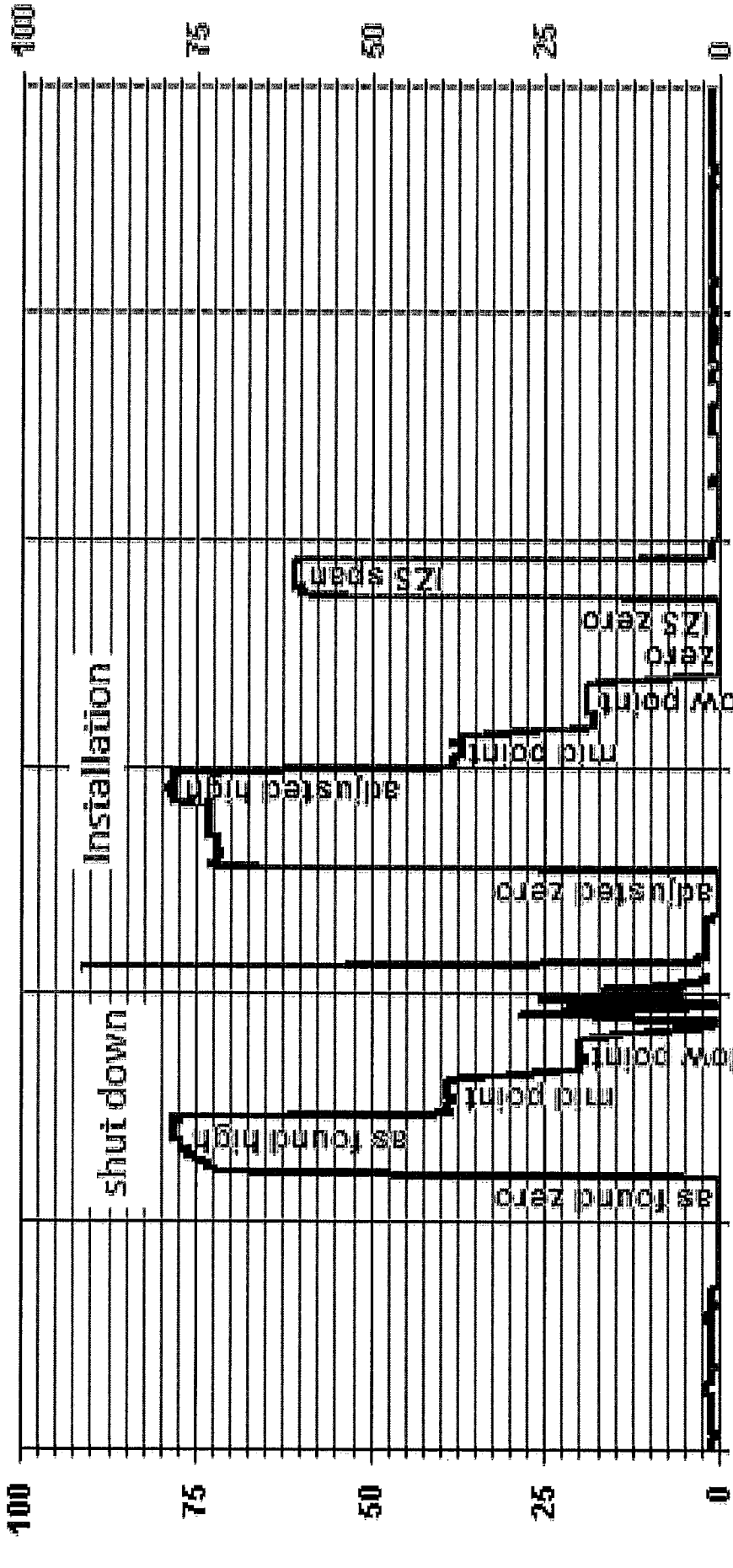


As found:	As left:
SLOPE: n/a	SLOPE: 1.071
OFFSET: n/a	OFFSET: 35.5
HVPS: n/a	HVPS: 651
RCELL TEMP: n/a	RCELL TEMP: 50.0
BOX TEMP: n/a	BOX TEMP: 28.8
PMT TEMP: n/a	PMT TEMP: 7.9
IZS TEMP: n/a	IZS TEMP: 48.0
Converter Temp: n/a	Converter Temp: 315.0
PRES: n/a	PRES: 20.0
SAMP FL: n/a	SAMP FL: 514
UV LAMP: n/a	UV LAMP: 3489.4
LAMP RATIO: n/a	LAMP RATIO: 99.7
STR. LGT: n/a	STR. LGT: 19.0
DRK PMT: n/a	DRK PMT: 4.4
DRK LMP: n/a	DRK LMP: 1.1
Internal Span: n/a	Internal Span: 60.9


Comments:

Sample filter changed. Installation calibration performed to replace a Maxxam's analyzer with a LICA's analyzer after repair.

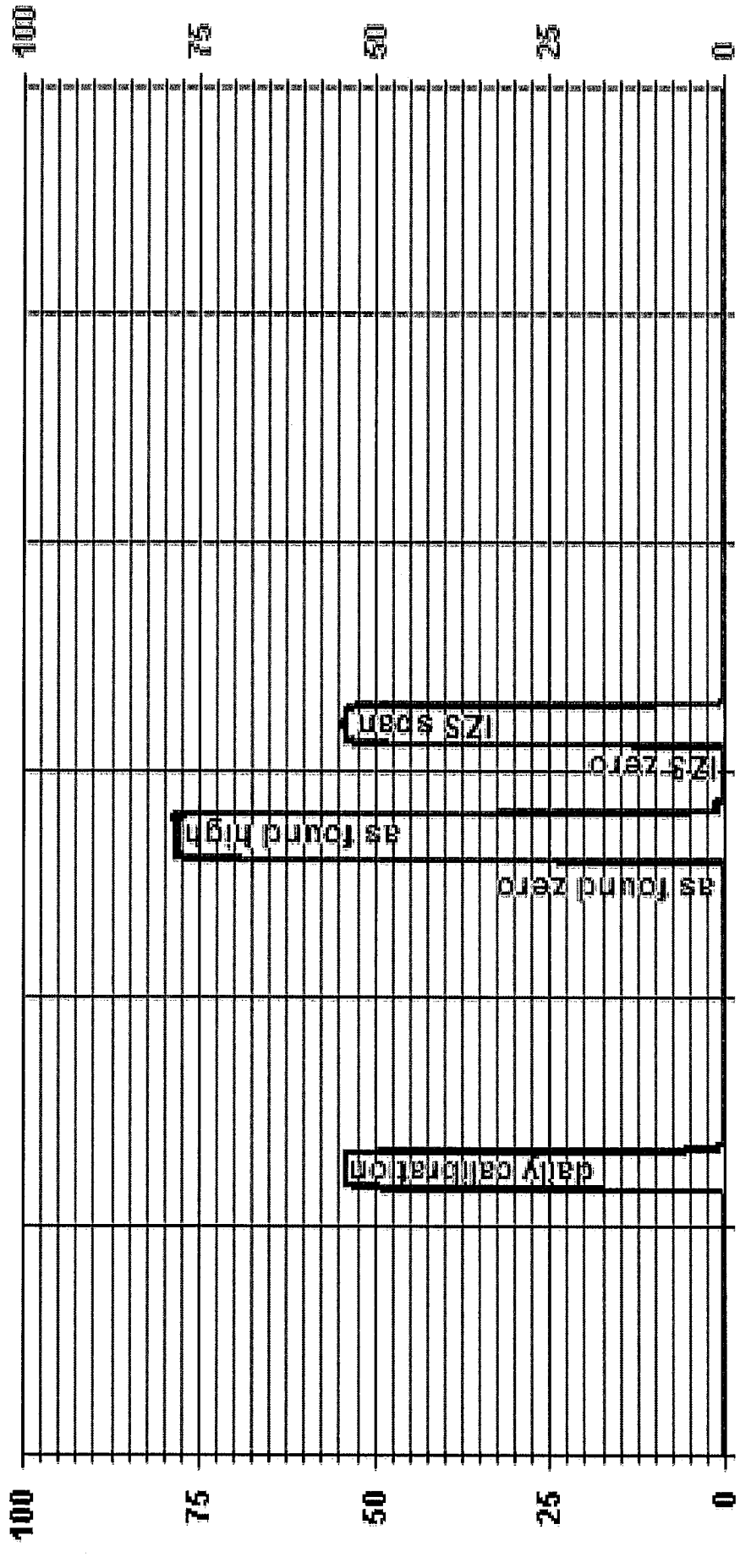
01 Minute Averages



— LICA31 H2S_ PPB

		API 101E Hydrogen Sulphide Analyzer Calibration									
Date: December 30, 2015 Company/Alrshed: LICA Location/Station Name: St. Ilna Parameter: Hydrogen Sulphide Start Time 24 hr. (mst): 14:52 End Time 24 hr. (mst): 16:39 Calibration Method: Gas Dilution	Barometric Pressure: 0.925 atm Station Temperature °C: 20 Weather Conditions: Mainly cloudy with clear breaks Calibration Purpose: as found Performed By/Reviewer: Alex Yakupov Tirna Whitsitt Cal Gas Expiry Date: July 15, 2017 Converter Model & s/n (if applicable): n/a										
Analyzer: Serial Number: 509 Last Calibration Date: December 10, 2015 Previous C.F.: 0.998		Range ppb: 100 As Found C.F.: 0.996 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 29, 2015											
Calibrator Flow Rates (cc/mln)											
Point	Diluent	Cal Gas	Total	Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):					
as found zero	7497	0.00	7497	0.0	0.0	N/A					
as found high	7440	58.50	7499	78.0	78.3	0.996					
Average C.F.=						n/a					
Linear Regression/Calibration Results:											
Correlation Coefficient = n/a Slope = n/a b (Intercept as % of full scale) = n/a % change in C.F. from last cal = 0.16%				LIMITS > or = 0.995 .95-1.05 ± 3% F.S. ± 10%							
As found:				As left:							
SLOPE: 1.071		SLOPE: 1.071		SLOPE: 1.071		SLOPE: 1.071					
OFFSET: 35.5		OFFSET: 35.5		OFFSET: 35.5		OFFSET: 35.5					
HVPS: 651		HVPS: 651		HVPS: 651		HVPS: 651					
RCELL TEMP: 50.0		RCELL TEMP: 50.0		RCELL TEMP: 50.0		RCELL TEMP: 50.0					
BOX TEMP: 29.5		BOX TEMP: 29.5		BOX TEMP: 30.3		BOX TEMP: 30.3					
PMT TEMP: 8.0		PMT TEMP: 8.0		PMT TEMP: 8.0		PMT TEMP: 8.0					
IZS TEMP: 48.0		IZS TEMP: 48.0		IZS TEMP: 48.0		IZS TEMP: 48.0					
Converter Temp: 315.0		Converter Temp: 315.0		Converter Temp: 315.1		Converter Temp: 315.1					
PRES: 20.7		PRES: 20.7		PRES: 20.7		PRES: 20.7					
SAMP FL: 524		SAMP FL: 524		SAMP FL: 524		SAMP FL: 524					
UV LAMP: 3492.0		UV LAMP: 3492.0		UV LAMP: 3489.4		UV LAMP: 3489.4					
LAMP RATIO: 99.8		LAMP RATIO: 99.8		LAMP RATIO: 99.8		LAMP RATIO: 99.8					
STR. LGT: 19.0		STR. LGT: 19.0		STR. LGT: 19.0		STR. LGT: 19.0					
DRK PMT: 0.2		DRK PMT: 0.2		DRK PMT: 0.2		DRK PMT: 0.2					
DRK LMP: 0.7		DRK LMP: 0.7		DRK LMP: 0.8		DRK LMP: 0.8					
Internal Span: 60.9		Internal Span: 60.9		Internal Span: 60.9		Internal Span: 60.9					
Comments:											
"As Found" calibration performed because according to a daily report SPAN check was low (-11.48%)											

01 Minute Averages

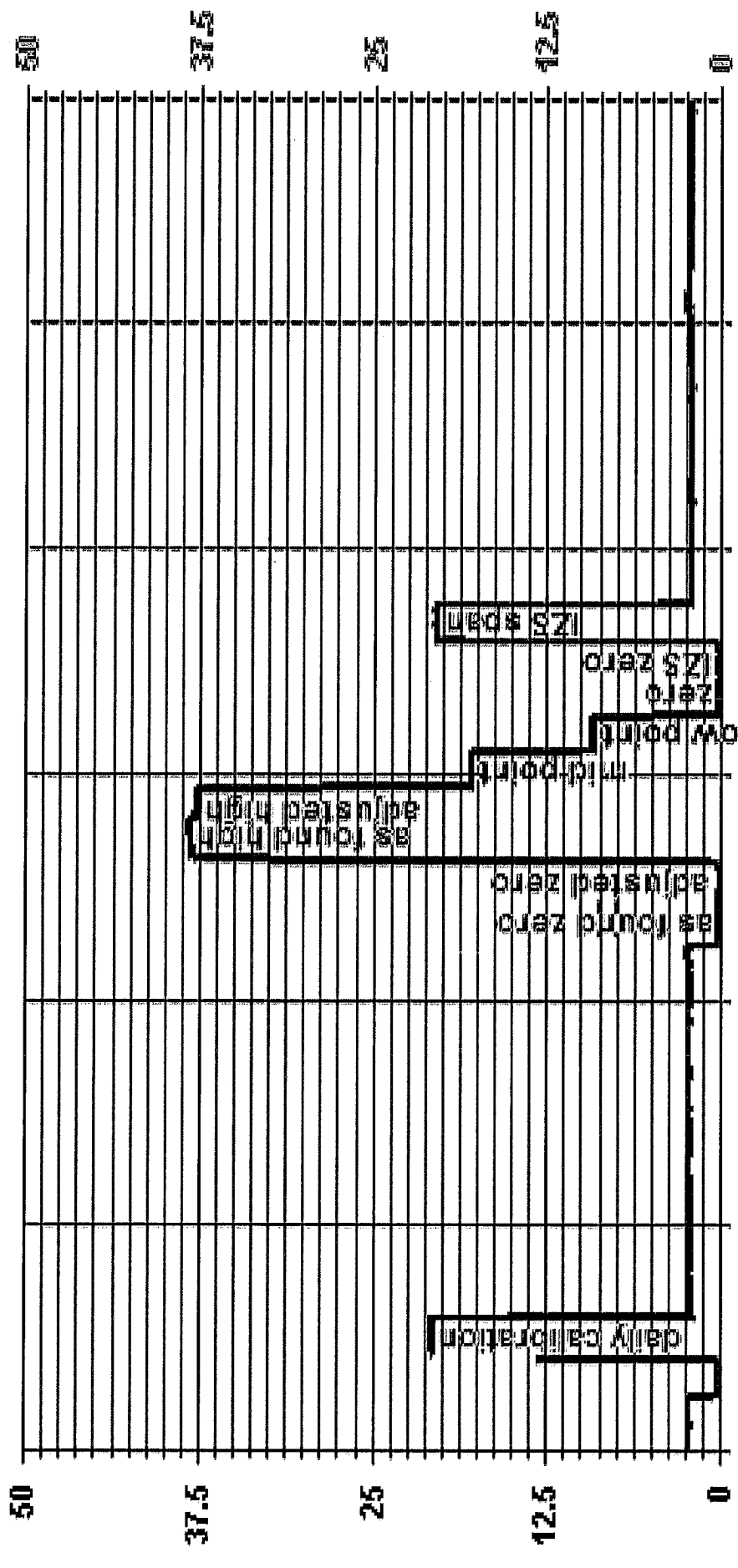


— LICA31 H2S_ PPB

TOTAL HYDROCARBON


Maxxam <small>ANALYTICAL INSTRUMENTS COMPANY</small>		Thermo 51C Total Hydrocarbon Analyzer Calibration																																																																		
Date: December 11, 2015		Barometric Pressure: 0.904 atm																																																																		
Company/At/hshead: LICA		Station Temperature °C: 21																																																																		
Location/Station Name: St. Lina		Weather Conditions: Mainly cloudy with snow																																																																		
Parameter: Total Hydrocarbon		Calibration Purpose: routine monthly																																																																		
Start/End Time 24 hr. (mst): 11:18 / 14:35		Performed By/Reviewer: Alex Yakupov / Trina Whitsitt																																																																		
Calibration Method: Gas Dilution		Cal Gas Expiry Date: March 26, 2017																																																																		
Analyzer:																																																																				
Serial Number: 51CLT-77021-384		Range ppm: 50																																																																		
Last Calibration Date: November 2, 2015		As Found C.F.: 0.991																																																																		
Previous Cal High Point C.F.: 1.000		New C.F.: 0.999																																																																		
Calibrator:																																																																				
Flow Meter ID's: n/a		Standard Calibration Points for a Range of: 50 ppm																																																																		
Make & Model: API 700		<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target ppm</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mid</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </tbody> </table>		Point	Target ppm	High	38	Mid	18	Low	9																																																									
Point	Target ppm																																																																			
High	38																																																																			
Mid	18																																																																			
Low	9																																																																			
Serial #: 830																																																																				
Cal Gas Cylinder I.D. #: LL33674																																																																				
CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm): 601.4	202.0																																																																			
CH ₄ as propane/total CH ₄ equivalents (ppm): 555.5	1156.9																																																																			
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																																				
Calibrator Flow Rates (cc/min)																																																																				
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Point</th> <th rowspan="2">Diluent</th> <th rowspan="2">Cal Gas</th> <th rowspan="2">Total</th> <th>Calculated Concentration:</th> <th>Indicated Concentration:</th> <th rowspan="2">Correction Factors:</th> </tr> <tr> <th>(ppm)</th> <th>(ppm)</th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>1999</td> <td>0.00</td> <td>1999</td> <td>0.0</td> <td>0.10</td> <td>n/a</td> </tr> <tr> <td>as found high</td> <td>1932</td> <td>65.00</td> <td>1997</td> <td>37.66</td> <td>38.10</td> <td>0.991</td> </tr> <tr> <td>adjusted zero</td> <td>1999</td> <td>0.00</td> <td>1999</td> <td>0.00</td> <td>0.00</td> <td>n/a</td> </tr> <tr> <td>adjusted high</td> <td>1932</td> <td>65.00</td> <td>1997</td> <td>37.66</td> <td>37.70</td> <td>0.999</td> </tr> <tr> <td>mid</td> <td>1969</td> <td>31.00</td> <td>2000</td> <td>17.93</td> <td>17.90</td> <td>1.002</td> </tr> <tr> <td>low</td> <td>1984</td> <td>16.00</td> <td>2000</td> <td>9.26</td> <td>9.20</td> <td>1.006</td> </tr> <tr> <td>calibrator zero</td> <td>1999</td> <td>0.00</td> <td>1999</td> <td>0.0</td> <td>0.10</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	Diluent	Cal Gas	Total	Calculated Concentration:	Indicated Concentration:	Correction Factors:	(ppm)	(ppm)	as found zero	1999	0.00	1999	0.0	0.10	n/a	as found high	1932	65.00	1997	37.66	38.10	0.991	adjusted zero	1999	0.00	1999	0.00	0.00	n/a	adjusted high	1932	65.00	1997	37.66	37.70	0.999	mid	1969	31.00	2000	17.93	17.90	1.002	low	1984	16.00	2000	9.26	9.20	1.006	calibrator zero	1999	0.00	1999	0.0	0.10	n/a	Average C.F. =						1.002
Point	Diluent	Cal Gas	Total					Calculated Concentration:	Indicated Concentration:		Correction Factors:																																																									
				(ppm)	(ppm)																																																															
as found zero	1999	0.00	1999	0.0	0.10	n/a																																																														
as found high	1932	65.00	1997	37.66	38.10	0.991																																																														
adjusted zero	1999	0.00	1999	0.00	0.00	n/a																																																														
adjusted high	1932	65.00	1997	37.66	37.70	0.999																																																														
mid	1969	31.00	2000	17.93	17.90	1.002																																																														
low	1984	16.00	2000	9.26	9.20	1.006																																																														
calibrator zero	1999	0.00	1999	0.0	0.10	n/a																																																														
Average C.F. =						1.002																																																														
Linear Regression/Calibration Results:																																																																				
Correlation Coefficient = 1.000		LIMITS > or = 0.995																																																																		
Slope = 0.998		.95-1.05																																																																		
b (Intercept as % of full scale) = 0.08%		± 3% F.S.																																																																		
% change in C.F. from last cal = 0.91%		± 10%																																																																		
Thermo 51C Total Hydrocarbon Analyzer Calibration																																																																				
As found: H2 cylinder (psi): 2100 H2 cylinder reg set (psi): 27 Span Cylinder (psi): 400 Span Cylinder Reg Set (psi): 19 Zero Air Gen Pressure: 42 measurement alarms: None service alarms: None cnt: 1615 rng: 1 try: 1 flm: 188.1 det: 125.9 Flame: 188 Filter: 125 Base: 125 Sample psi: 06.92 Internal Air Pressure: 13 Internal Fuel Pressure: 19 Internal Pressure Gauge psi: 27 Internal Span: 20.59		As left: H2 cylinder (psi): 2100 H2 cylinder reg set (psi): 27 Span Cylinder (psi): 400 Span Cylinder Reg Set (psi): 19 Zero Air Gen Pressure: 42 measurement alarms: None service alarms: None cnt: 1648 rng: 1 try: 1 flm: 188.4 det: 125.8 Flame: 188 Filter: 125 Base: 125 Sample psi: 06.90 Internal Air Pressure: 13 Internal Fuel Pressure: 19 Internal Pressure Gauge psi: 27 Internal Span: 20.46																																																																		
Comments:																																																																				
Sample filter changed.																																																																				

01 Minute Averages



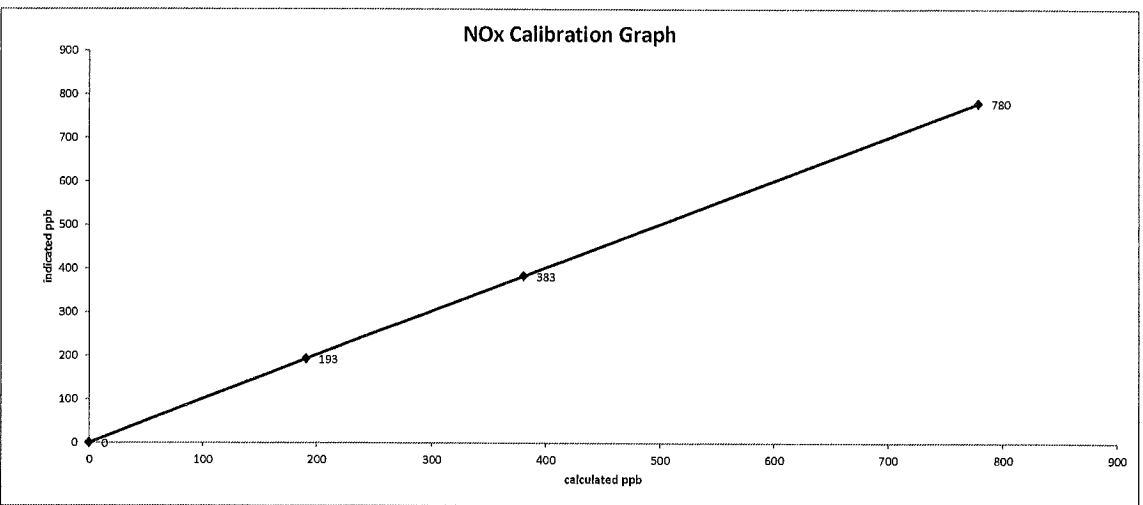
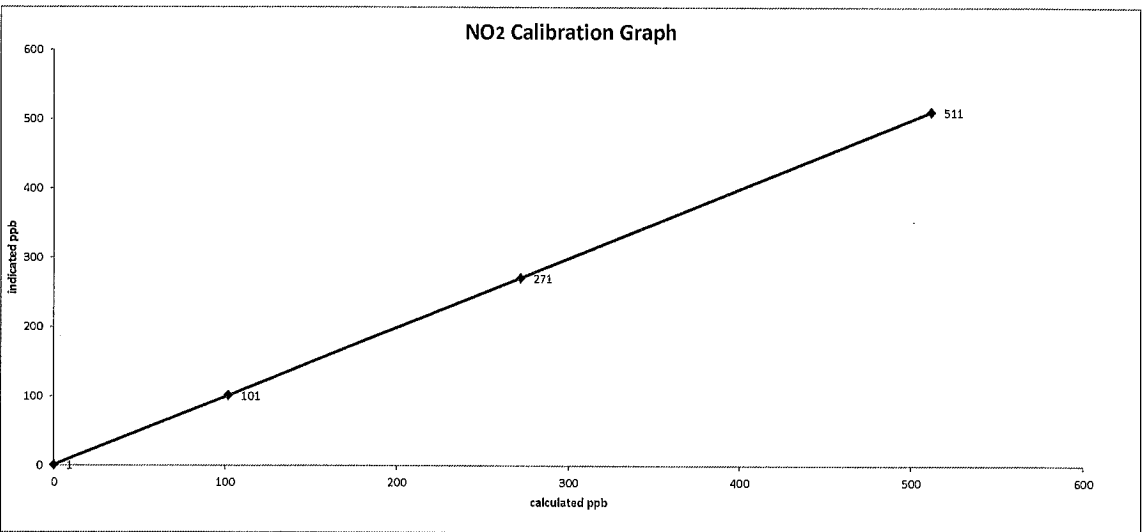
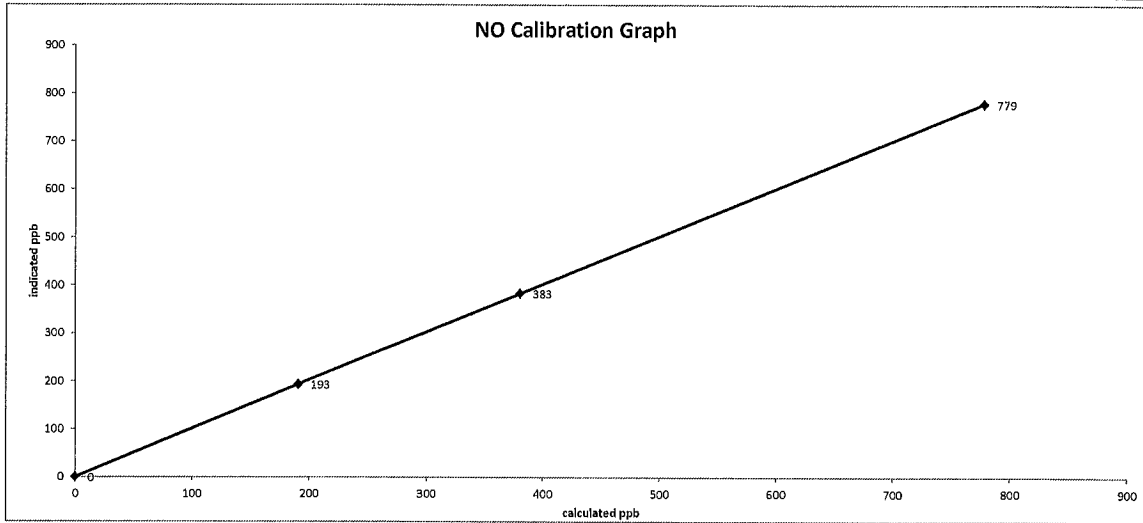
— LICA31 THC PPM

NITROGEN DIOXIDE

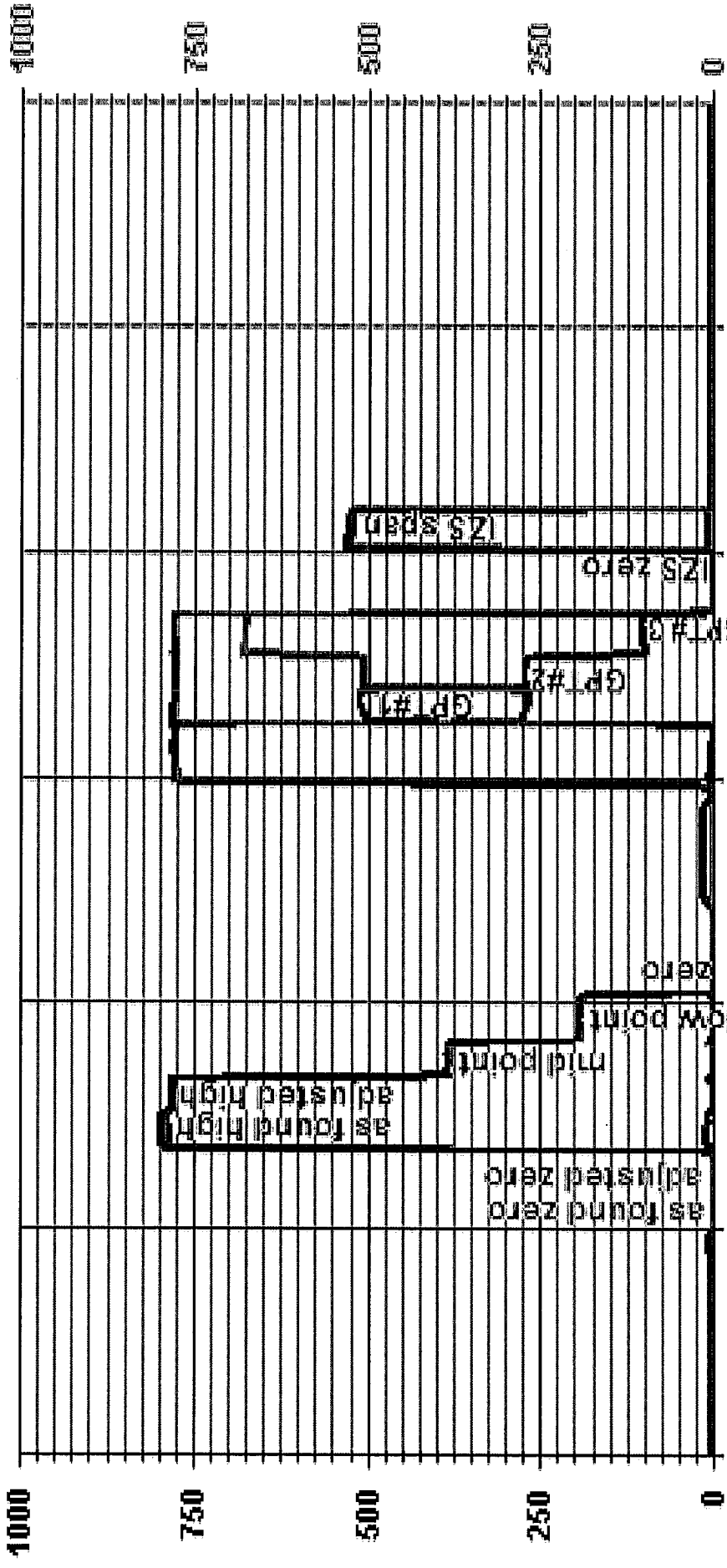
 API 200E NO-NO2-NOx Analyzer Calibration																																																																																											
Date: December 10, 2015 Company/Airshed: LICA Location/Station Name: St. Lina Start/End Time 24 hr. (mst): 11:27 / 18:27 G.P.T. to be used for Ozone?: No Calibration Method: Gas Dilution & Varying UV Lamp Power	Barometric Pressure: 0.899 atm Station Temperature °C: 21 Weather Conditions: Fog Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: March 12, 2019																																																																																										
Analyzer: Serial Number: 594 Last Calibration Date: November 2, 2015 Range ppb: 1000	Correction Factors: <table border="1" style="width:100%; text-align: center;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>0.999</td> <td>0.990</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.002</td> <td>1.002</td> </tr> <tr> <td>NOx =</td> <td>0.999</td> <td>0.986</td> <td>0.999</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	0.990	1.000	NO ₂ =	1.000	1.002	1.002	NOx =	0.999	0.986	0.999																																																																										
	Previous C.F.:	As Found C.F.:	New C.F.:																																																																																								
NO =	0.999	0.990	1.000																																																																																								
NO ₂ =	1.000	1.002	1.002																																																																																								
NOx =	0.999	0.986	0.999																																																																																								
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: 8LM002073 NO/NOx Gas Conc. (ppm): 50.6 50.6	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width:100%; text-align: center;"> <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>600</td> <td>n/a</td> </tr> <tr> <td>Mld</td> <td>380</td> <td>276</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	600	n/a	Mld	380	276	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	600	n/a																																																																																								
Mld	380	276	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%; text-align: center;"> <thead> <tr> <th>Point</th> <th>Diluent</th> <th>Cal Gas</th> <th>Total Flow</th> <th>Calculated NO (ppb)</th> <th>Calculated NOx (ppb)</th> <th>Indicated NO (ppb)</th> <th>Indicated NOx (ppb)</th> <th>NO C.F.</th> <th>NOx C.F.</th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>5012</td> <td>0.0</td> <td>5012</td> <td>0</td> <td>0</td> <td>0.0</td> <td>6.0</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>as found high</td> <td>4938</td> <td>77.2</td> <td>5015</td> <td>778.9</td> <td>778.9</td> <td>787.0</td> <td>796.0</td> <td>0.990</td> <td>0.986</td> </tr> <tr> <td>adjusted zero</td> <td>5012</td> <td>0.00</td> <td>5012</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>adjusted high</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>778.9</td> <td>778.9</td> <td>779.0</td> <td>780.0</td> <td>1.000</td> <td>0.999</td> </tr> <tr> <td>mld</td> <td>4976</td> <td>37.70</td> <td>5014</td> <td>380.5</td> <td>380.5</td> <td>383.0</td> <td>383.0</td> <td>0.993</td> <td>0.993</td> </tr> <tr> <td>low</td> <td>4994</td> <td>18.90</td> <td>5013</td> <td>190.8</td> <td>190.8</td> <td>193.0</td> <td>193.0</td> <td>0.988</td> <td>0.988</td> </tr> <tr> <td>calibrator zero</td> <td>5013</td> <td>0.00</td> <td>5013</td> <td>0</td> <td>0</td> <td>-1.0</td> <td>0.0</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td colspan="8"></td> <td>Average C.F.=</td> <td>0.994 0.993</td> </tr> </tbody> </table>		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	5012	0.0	5012	0	0	0.0	6.0	n/a	n/a	as found high	4938	77.2	5015	778.9	778.9	787.0	796.0	0.990	0.986	adjusted zero	5012	0.00	5012	0.0	0.0	0.0	0.0	n/a	n/a	adjusted high	4938	77.20	5015	778.9	778.9	779.0	780.0	1.000	0.999	mld	4976	37.70	5014	380.5	380.5	383.0	383.0	0.993	0.993	low	4994	18.90	5013	190.8	190.8	193.0	193.0	0.988	0.988	calibrator zero	5013	0.00	5013	0	0	-1.0	0.0	n/a	n/a									Average C.F.=	0.994 0.993
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	5012	0.0	5012	0	0	0.0	6.0	n/a	n/a																																																																																		
as found high	4938	77.2	5015	778.9	778.9	787.0	796.0	0.990	0.986																																																																																		
adjusted zero	5012	0.00	5012	0.0	0.0	0.0	0.0	n/a	n/a																																																																																		
adjusted high	4938	77.20	5015	778.9	778.9	779.0	780.0	1.000	0.999																																																																																		
mld	4976	37.70	5014	380.5	380.5	383.0	383.0	0.993	0.993																																																																																		
low	4994	18.90	5013	190.8	190.8	193.0	193.0	0.988	0.988																																																																																		
calibrator zero	5013	0.00	5013	0	0	-1.0	0.0	n/a	n/a																																																																																		
								Average C.F.=	0.994 0.993																																																																																		
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																																																											
<table border="1" style="width:100%; text-align: center;"> <thead> <tr> <th>Point</th> <th>Diluent</th> <th>Cal Gas</th> <th>Total Flow</th> <th>Callibrator Setting (volts or ppb)</th> <th>Indicated NO (ppb)</th> <th>Indicated NOx (ppb)</th> <th>Indicated NO₂ (ppb)</th> <th>NO drop (ppb)</th> <th>NO₂ gain (ppb)</th> <th>NO₂ C.F. (ppb)</th> </tr> </thead> <tbody> <tr> <td>NOx reference</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>0.0</td> <td>778.0</td> <td>779.0</td> <td>1.0</td> <td>0.0</td> <td>1.0</td> <td></td> </tr> <tr> <td>as found high NO2</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>540.0</td> <td>266.0</td> <td>779.0</td> <td>512.0</td> <td>512.0</td> <td>511.0</td> <td>1.002</td> </tr> <tr> <td>gpt mld</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>275.0</td> <td>506.0</td> <td>778.0</td> <td>272.0</td> <td>272.0</td> <td>271.0</td> <td>1.004</td> </tr> <tr> <td>gpt low</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>100.0</td> <td>676.0</td> <td>779.0</td> <td>102.0</td> <td>102.0</td> <td>101.0</td> <td>1.010</td> </tr> <tr> <td colspan="10"></td> <td>Average NO₂ C.F.=</td> <td>1.005</td> </tr> </tbody> </table>		Point	Diluent	Cal Gas	Total Flow	Callibrator 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. (ppb)	NOx reference	4938	77.20	5015	0.0	778.0	779.0	1.0	0.0	1.0		as found high NO2	4938	77.20	5015	540.0	266.0	779.0	512.0	512.0	511.0	1.002	gpt mld	4938	77.20	5015	275.0	506.0	778.0	272.0	272.0	271.0	1.004	gpt low	4938	77.20	5015	100.0	676.0	779.0	102.0	102.0	101.0	1.010											Average NO ₂ C.F.=	1.005																							
Point	Diluent	Cal Gas	Total Flow	Callibrator 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. (ppb)																																																																																	
NOx reference	4938	77.20	5015	0.0	778.0	779.0	1.0	0.0	1.0																																																																																		
as found high NO2	4938	77.20	5015	540.0	266.0	779.0	512.0	512.0	511.0	1.002																																																																																	
gpt mld	4938	77.20	5015	275.0	506.0	778.0	272.0	272.0	271.0	1.004																																																																																	
gpt low	4938	77.20	5015	100.0	676.0	779.0	102.0	102.0	101.0	1.010																																																																																	
										Average NO ₂ C.F.=	1.005																																																																																
Linear Regression/Calibration Results:																																																																																											
Correlation Coefficient = Slope = b (Intercept as % of full scale) = % change in C.F. from last cal = NO2 converter efficiency	<table border="1" style="width:100%; text-align: center;"> <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>1.001</td> <td>0.999</td> <td>1.003</td> </tr> <tr> <td>0.14%</td> <td>0.12%</td> <td>0.02%</td> </tr> <tr> <td>0.93%</td> <td>1.31%</td> <td>-0.20%</td> </tr> <tr> <td></td> <td></td> <td>1.00</td> </tr> </tbody> </table>	NO	NOx	NO ₂	1.000	1.000	1.000	1.001	0.999	1.003	0.14%	0.12%	0.02%	0.93%	1.31%	-0.20%			1.00																																																																								
NO	NOx	NO ₂																																																																																									
1.000	1.000	1.000																																																																																									
1.001	0.999	1.003																																																																																									
0.14%	0.12%	0.02%																																																																																									
0.93%	1.31%	-0.20%																																																																																									
		1.00																																																																																									
	LIMITS > or = 0.995 .95-1.05 ± 3% F.S. ± 10% 0.96 to 1.04																																																																																										
As found: NOx SLOPE: 0.956 NOx OFFS: 0.7 NO SLOPE: 0.950 NO OFFS: -0.3 SAMP FLW: 446 OZONE FL: 77 PMT: 29.1 NORM PMT: -2.2 AZERO: 15.9 HVPS: 771 RCELL TEMP: 50.0 BOX TEMP: 27.6 PMT TEMP: 6.6 IZS TEMP: 45.0 MOLY TEMP: 316.4 RCEL: 6.8 SAMP: 26.4 Internal Span NO: 8 Internal Span NO2: 524.5 Internal Span NOx: 532.6	As left: NOx SLOPE: 0.937 NOx OFFS: 2.9 NO SLOPE: 0.938 NO OFFS: 2.2 SAMP FLW: 446 OZONE FL: 77 PMT: 20.3 NORM PMT: 2.5 AZERO: 15.7 HVPS: 771 RCELL TEMP: 50.0 BOX TEMP: 26.7 PMT TEMP: 6.6 IZS TEMP: 45.4 MOLY TEMP: 314.2 RCEL: 6.8 SAMP: 26.0 Internal Span NO: 6.3 Internal Span NO2: 520.3 Internal Span NOx: 526.8																																																																																										
Comments: <p style="text-align: center;">Sample filter changed. No NO2 adjustment made. Calibration stopped at 14:51 for SO2 analyzer's UV lamp and factory calibration. GPT starts at 16:00.</p>																																																																																											

Date: December 10, 2015
Company/Alrshed: LICA
Location/Station Name: St. Lina


Start/End Time 24 hr. (mst): 11:27 / 18:27
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Varying UV Lamp Power



01 Minute Averages

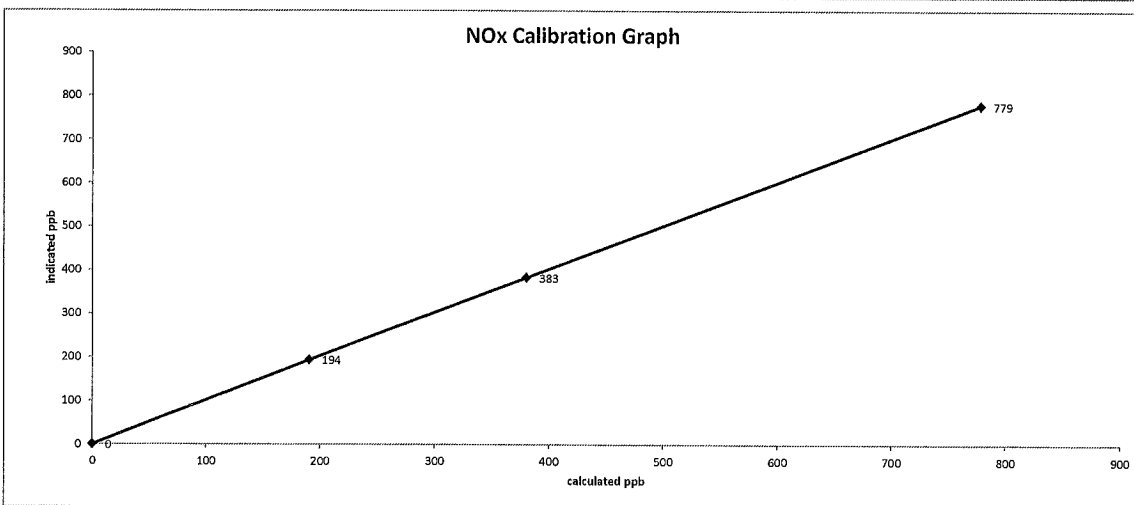
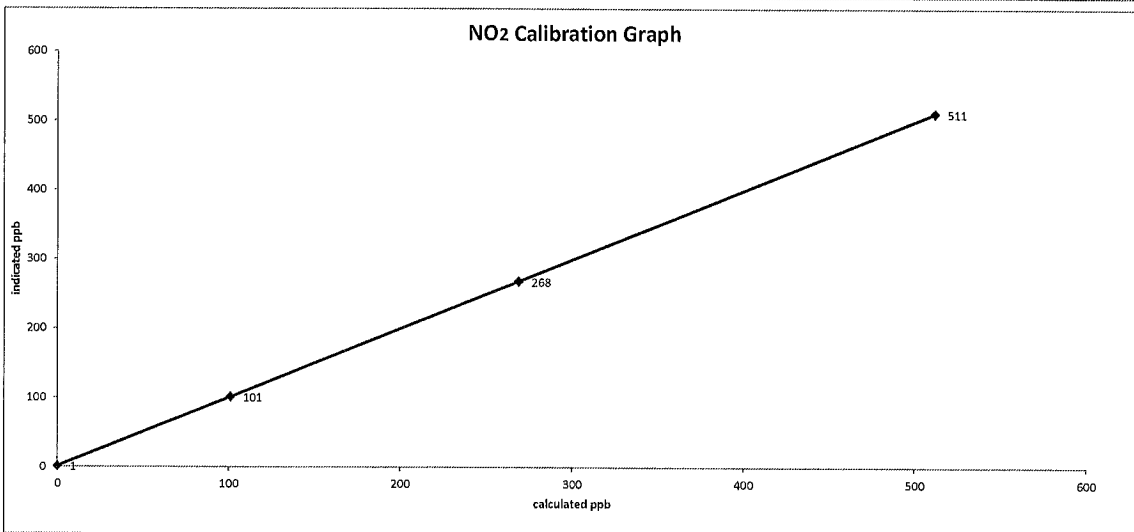
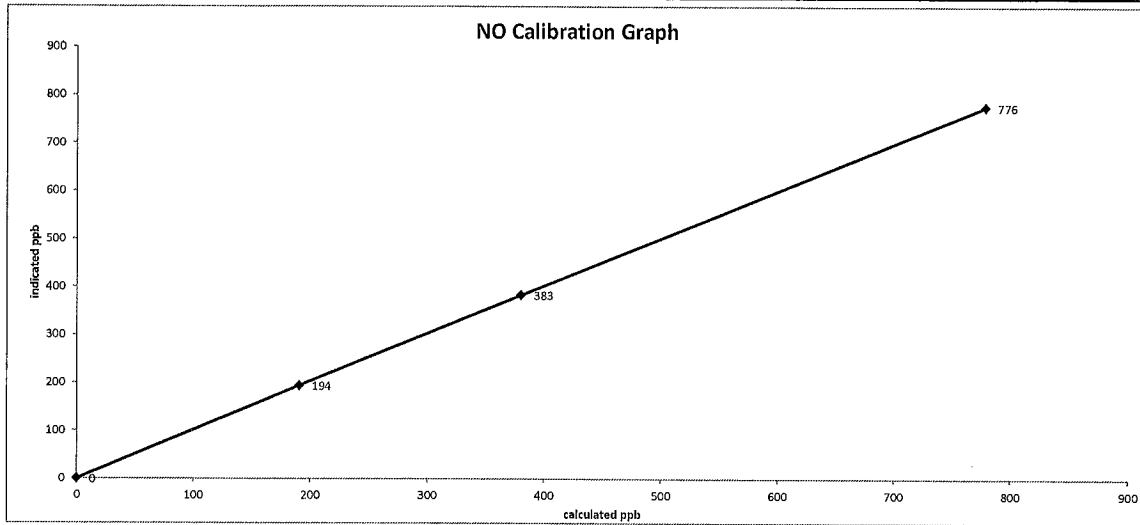


— LICA31 NOX_ PPB — LICA31 NO_ PPB — LICA31 NO2_ PPB

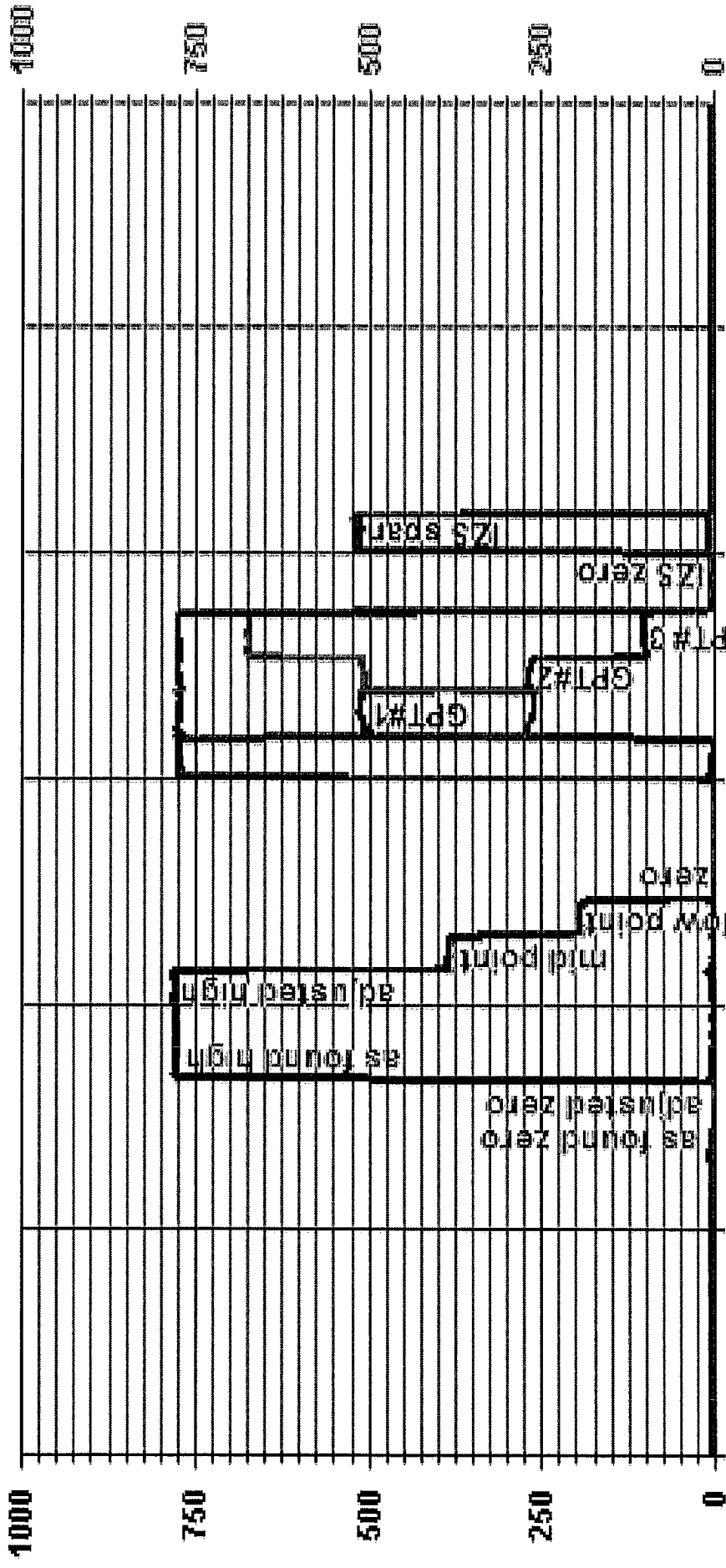
 API 200E NO-NO2-NOx Analyzer Calibration																																																																																																					
Date: December 11, 2015 Company/At/shed: LICA Location/Station Name: St. Lina Start/End Time 24 hr. (mst): 11:18 / 17:21 G.P.T. to be used for Ozone? No Calibration Method: Gas Dilution & Varying UV Lamp Power	Barometric Pressure: 0.904 atm Station Temperature °C: 21 Weather Conditions: Mainly cloudy with light snow Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: March 12, 2019																																																																																																				
Analyzer: Serial Number: 594 Last Calibration Date: December 10, 2015 Range ppb: 1000	Correction Factors: <table border="1" style="width:100%; 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>1.000</td> <td>1.001</td> <td>1.004</td> </tr> <tr> <td>NO₂ =</td> <td>1.002</td> <td>1.002</td> <td>1.002</td> </tr> <tr> <td>NOx =</td> <td>0.999</td> <td>1.005</td> <td>1.000</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.001	1.004	NO ₂ =	1.002	1.002	1.002	NOx =	0.999	1.005	1.000																																																																																				
	Previous C.F.:	As Found C.F.:	New C.F.:																																																																																																		
NO =	1.000	1.001	1.004																																																																																																		
NO ₂ =	1.002	1.002	1.002																																																																																																		
NOx =	0.999	1.005	1.000																																																																																																		
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: BLM002073 NO/NOx Gas Conc. (ppm): 50.6 50.6	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width:100%; 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>780</td> <td>600</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	600	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	600	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%; text-align: center;"> <tr> <th colspan="4">Calibrator Flow Rates (cc/mln)</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> <tr> <td>as found zero</td> <td>5012</td> <td>0.0</td> <td>5012</td> <td>0</td> <td>0</td> <td>-1.0</td> <td>3.0</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>as found high</td> <td>4938</td> <td>77.2</td> <td>5015</td> <td>778.9</td> <td>778.9</td> <td>777.0</td> <td>778.0</td> <td>1.001</td> <td>1.005</td> </tr> <tr> <td>adjusted zero</td> <td>5012</td> <td>0.00</td> <td>5012</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>adjusted high</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>778.9</td> <td>778.9</td> <td>776.0</td> <td>779.0</td> <td>1.004</td> <td>1.000</td> </tr> <tr> <td>mid</td> <td>4976</td> <td>37.70</td> <td>5014</td> <td>380.5</td> <td>380.5</td> <td>383.0</td> <td>383.0</td> <td>0.993</td> <td>0.993</td> </tr> <tr> <td>low</td> <td>4994</td> <td>18.90</td> <td>5013</td> <td>190.8</td> <td>190.8</td> <td>194.0</td> <td>194.0</td> <td>0.983</td> <td>0.983</td> </tr> <tr> <td>calibrator zero</td> <td>5013</td> <td>0.00</td> <td>5013</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 colspan="8"></td> <td>Average C.F.=</td> <td>0.994 0.992</td> </tr> </table>		Calibrator Flow Rates (cc/mln)				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	5012	0.0	5012	0	0	-1.0	3.0	n/a	n/a	as found high	4938	77.2	5015	778.9	778.9	777.0	778.0	1.001	1.005	adjusted zero	5012	0.00	5012	0.0	0.0	0.0	0.0	n/a	n/a	adjusted high	4938	77.20	5015	778.9	778.9	776.0	779.0	1.004	1.000	mid	4976	37.70	5014	380.5	380.5	383.0	383.0	0.993	0.993	low	4994	18.90	5013	190.8	190.8	194.0	194.0	0.983	0.983	calibrator zero	5013	0.00	5013	0	0	0.0	0.0	n/a	n/a									Average C.F.=	0.994 0.992
Calibrator Flow Rates (cc/mln)				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	5012	0.0	5012	0	0	-1.0	3.0	n/a	n/a																																																																																												
as found high	4938	77.2	5015	778.9	778.9	777.0	778.0	1.001	1.005																																																																																												
adjusted zero	5012	0.00	5012	0.0	0.0	0.0	0.0	n/a	n/a																																																																																												
adjusted high	4938	77.20	5015	778.9	778.9	776.0	779.0	1.004	1.000																																																																																												
mid	4976	37.70	5014	380.5	380.5	383.0	383.0	0.993	0.993																																																																																												
low	4994	18.90	5013	190.8	190.8	194.0	194.0	0.983	0.983																																																																																												
calibrator zero	5013	0.00	5013	0	0	0.0	0.0	n/a	n/a																																																																																												
								Average C.F.=	0.994 0.992																																																																																												
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																																																																					
<table border="1" style="width:100%; text-align: center;"> <tr> <th colspan="4">Calibrator Flow Rates (cc/mln)</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> <tr> <td>NOx reference</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>0.0</td> <td>773.0</td> <td>774.0</td> <td>1.0</td> <td>0.0</td> <td>1.0</td> <td></td> </tr> <tr> <td>as found high NO2</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>540.0</td> <td>261.0</td> <td>774.0</td> <td>512.0</td> <td>512.0</td> <td>511.0</td> <td>1.002</td> </tr> <tr> <td>gpt mid</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>275.0</td> <td>504.0</td> <td>774.0</td> <td>269.0</td> <td>269.0</td> <td>268.0</td> <td>1.004</td> </tr> <tr> <td>gpt low</td> <td>4938</td> <td>77.20</td> <td>5015</td> <td>100.0</td> <td>672.0</td> <td>775.0</td> <td>102.0</td> <td>101.0</td> <td>101.0</td> <td>1.000</td> </tr> <tr> <td colspan="10"></td> <td>Average NO₂ C.F.=</td> <td>1.002</td> </tr> </table>		Calibrator Flow Rates (cc/mln)				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	4938	77.20	5015	0.0	773.0	774.0	1.0	0.0	1.0		as found high NO2	4938	77.20	5015	540.0	261.0	774.0	512.0	512.0	511.0	1.002	gpt mid	4938	77.20	5015	275.0	504.0	774.0	269.0	269.0	268.0	1.004	gpt low	4938	77.20	5015	100.0	672.0	775.0	102.0	101.0	101.0	1.000											Average NO ₂ C.F.=	1.002																						
Calibrator Flow Rates (cc/mln)				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	4938	77.20	5015	0.0	773.0	774.0	1.0	0.0	1.0																																																																																												
as found high NO2	4938	77.20	5015	540.0	261.0	774.0	512.0	512.0	511.0	1.002																																																																																											
gpt mid	4938	77.20	5015	275.0	504.0	774.0	269.0	269.0	268.0	1.004																																																																																											
gpt low	4938	77.20	5015	100.0	672.0	775.0	102.0	101.0	101.0	1.000																																																																																											
										Average NO ₂ C.F.=	1.002																																																																																										
Linear Regression/Calibration Results:																																																																																																					
Correlation Coefficient = 1.000 Slope = 1.005 b (Intercept as % of full scale) = 0.24% % change in C.F. from last cal = -0.12% NO2 converter efficiency = 0.999	<table border="1" style="width:100%; text-align: center;"> <tr> <th>NO</th> <th>NOx</th> <th>NO₂</th> </tr> <tr> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>1.005</td> <td>1.001</td> <td>1.004</td> </tr> <tr> <td>0.24%</td> <td>0.18%</td> <td>0.06%</td> </tr> <tr> <td>-0.12%</td> <td>-0.60%</td> <td>0.00%</td> </tr> <tr> <td>0.999</td> <td>0.999</td> <td>1.00</td> </tr> </table>	NO	NOx	NO ₂	1.000	1.000	1.000	1.005	1.001	1.004	0.24%	0.18%	0.06%	-0.12%	-0.60%	0.00%	0.999	0.999	1.00																																																																																		
NO	NOx	NO ₂																																																																																																			
1.000	1.000	1.000																																																																																																			
1.005	1.001	1.004																																																																																																			
0.24%	0.18%	0.06%																																																																																																			
-0.12%	-0.60%	0.00%																																																																																																			
0.999	0.999	1.00																																																																																																			
<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: NOx SLOPE: 0.937 NOx OFFS: 2.9 NO SLOPE: 0.938 NO OFFS: 2.2 SAMP FLW: 449 OZONE FL: 78 PMT: 37.3 NORM PMT: 0.2 AZERO: 15.8 HVPS: 771 RCELL TEMP: 50.0 BOX TEMP: 26.6 PMT TEMP: 6.6 IZS TEMP: 45.0 MOLY TEMP: 316.4 RCEL: 6.9 SAMP: 26.1 Internal Span NO: 6.3 Internal Span NO2: 520.3 Internal Span NOx: 526.8 </td> <td style="width:50%; vertical-align: top;"> As left: NOx SLOPE: 0.939 NOx OFFS: 1.1 NO SLOPE: 0.937 NO OFFS: -0.7 SAMP FLW: 450 OZONE FL: 78 PMT: 15.4 NORM PMT: 2.8 AZERO: 15.8 HVPS: 771 RCELL TEMP: 50.0 BOX TEMP: 26.3 PMT TEMP: 6.6 IZS TEMP: 45.2 MOLY TEMP: 315.7 RCEL: 6.9 SAMP: 26.2 Internal Span NO: 7.4 Internal Span NO2: 512.8 Internal Span NOx: 520.3 </td> </tr> </table>		As found: NOx SLOPE: 0.937 NOx OFFS: 2.9 NO SLOPE: 0.938 NO OFFS: 2.2 SAMP FLW: 449 OZONE FL: 78 PMT: 37.3 NORM PMT: 0.2 AZERO: 15.8 HVPS: 771 RCELL TEMP: 50.0 BOX TEMP: 26.6 PMT TEMP: 6.6 IZS TEMP: 45.0 MOLY TEMP: 316.4 RCEL: 6.9 SAMP: 26.1 Internal Span NO: 6.3 Internal Span NO2: 520.3 Internal Span NOx: 526.8	As left: NOx SLOPE: 0.939 NOx OFFS: 1.1 NO SLOPE: 0.937 NO OFFS: -0.7 SAMP FLW: 450 OZONE FL: 78 PMT: 15.4 NORM PMT: 2.8 AZERO: 15.8 HVPS: 771 RCELL TEMP: 50.0 BOX TEMP: 26.3 PMT TEMP: 6.6 IZS TEMP: 45.2 MOLY TEMP: 315.7 RCEL: 6.9 SAMP: 26.2 Internal Span NO: 7.4 Internal Span NO2: 512.8 Internal Span NOx: 520.3																																																																																																		
As found: NOx SLOPE: 0.937 NOx OFFS: 2.9 NO SLOPE: 0.938 NO OFFS: 2.2 SAMP FLW: 449 OZONE FL: 78 PMT: 37.3 NORM PMT: 0.2 AZERO: 15.8 HVPS: 771 RCELL TEMP: 50.0 BOX TEMP: 26.6 PMT TEMP: 6.6 IZS TEMP: 45.0 MOLY TEMP: 316.4 RCEL: 6.9 SAMP: 26.1 Internal Span NO: 6.3 Internal Span NO2: 520.3 Internal Span NOx: 526.8	As left: NOx SLOPE: 0.939 NOx OFFS: 1.1 NO SLOPE: 0.937 NO OFFS: -0.7 SAMP FLW: 450 OZONE FL: 78 PMT: 15.4 NORM PMT: 2.8 AZERO: 15.8 HVPS: 771 RCELL TEMP: 50.0 BOX TEMP: 26.3 PMT TEMP: 6.6 IZS TEMP: 45.2 MOLY TEMP: 315.7 RCEL: 6.9 SAMP: 26.2 Internal Span NO: 7.4 Internal Span NO2: 512.8 Internal Span NOx: 520.3																																																																																																				
Comments: No NO2 adjustment made. Re-calibration required because NO hourly readings drifted -1.0 ppb after calibration on December 10. After "Calibrator ZERO" calibration stopped (14:16). Single phase ZERO check started. GPT calibration started at 15:00. Sample filter changed on December 10, 2015.																																																																																																					

Date: December 11, 2015
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 11:18 / 17:21
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Varying UV Lamp Power

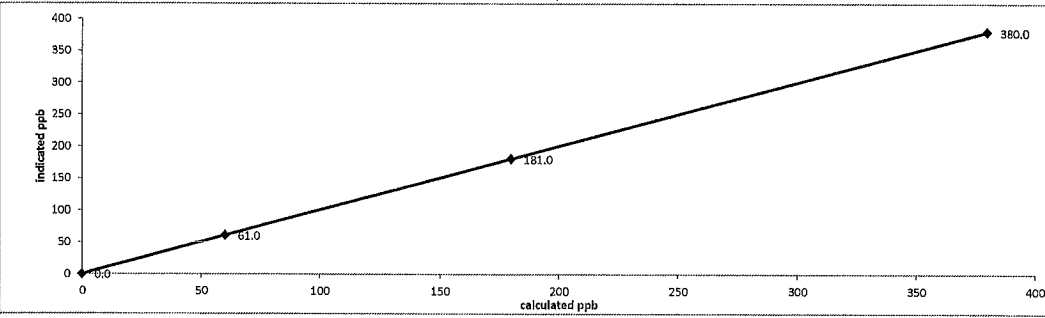


01 Minute Averages

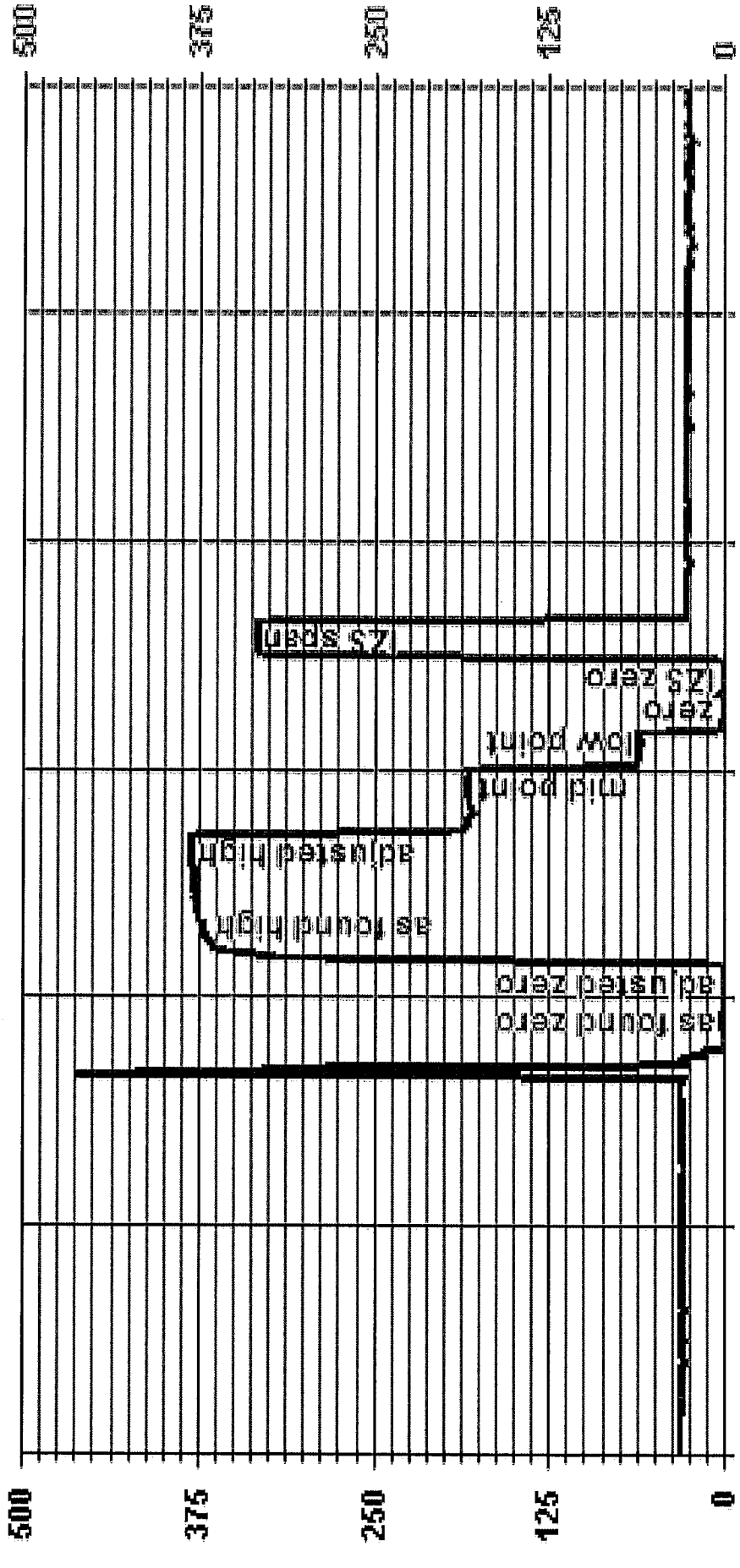


— LICA31 NOX_ PPB — LICA31 NO_ PPB — LICA31 NO2_ PPB

OZONE

Thermo 49i Ozone Analyzer Calibration <small>A Bureau Veritas Group Company</small>																																																																					
Date: <u>December 17, 2015</u> Company/Attn: <u>LICA</u> Location/Station Name: <u>St. Lina</u> Start/End Time 24 hr. (mst): <u>11:39 / 15:50</u> Ozone Calibration Method: <u>Varying UV Lamp Power</u> G.P.T. Date: <u>n/a-done by Varying UV Lamp Power</u>	Barometric Pressure: <u>0.918 atm</u> Station Temperature °C: <u>20</u> Weather Conditions: <u>Mainly cloudy with snow</u> Calibration Purpose: <u>routine monthly</u> Performed By/Reviewer: <u>Alex Yakupov</u> / <u>Trina Whitsitt</u> Cal Gas Expiry Date: <u>n/a</u>																																																																				
Analyzer: Serial Number: <u>1002240371</u> Ozone Range ppb: <u>500</u> Last Calibration Date: <u>November 4, 2015</u> As Found C.F.: <u>1.008</u> Previous Cal High Point C.F.: <u>1.000</u> New C.F.: <u>1.000</u>																																																																					
Callibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>SABIO 2010 D</u> Serial #: <u>11900613</u> Cal Gas Cylinder I.D. #: <u>n/a</u>																																																																					
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="2">Callibrator Flow Rate (cc/min)</th> <th>Calculated Concentration:</th> <th>Corrected Calculated Concentration:</th> <th>Indicated Concentration:</th> <th rowspan="2">Correction Factors:</th> </tr> <tr> <th>Total Flow @ Point Start</th> <th>Total Flow @ Point Finish</th> <th>(ppb)</th> <th>(ppb)</th> <th>(ppb)</th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>5013</td> <td>5013</td> <td>0.0</td> <td>n/a</td> <td>1.0</td> <td>n/a</td> </tr> <tr> <td>as found high</td> <td>5013</td> <td>5013</td> <td>380.0</td> <td>380.0</td> <td>378.0</td> <td>1.008</td> </tr> <tr> <td>adjusted zero</td> <td>5013</td> <td>5013</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>n/a</td> </tr> <tr> <td>adjusted high</td> <td>5013</td> <td>5013</td> <td>380.0</td> <td>380.0</td> <td>380.0</td> <td>1.000</td> </tr> <tr> <td>mid</td> <td>5013</td> <td>5013</td> <td>180.0</td> <td>180.0</td> <td>181.0</td> <td>0.994</td> </tr> <tr> <td>low</td> <td>5013</td> <td>5013</td> <td>60.0</td> <td>60.0</td> <td>61.0</td> <td>0.984</td> </tr> <tr> <td>calibrator zero</td> <td>5013</td> <td>5013</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>		Point	Callibrator 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	5013	5013	0.0	n/a	1.0	n/a	as found high	5013	5013	380.0	380.0	378.0	1.008	adjusted zero	5013	5013	0.0	0.0	0.0	n/a	adjusted high	5013	5013	380.0	380.0	380.0	1.000	mid	5013	5013	180.0	180.0	181.0	0.994	low	5013	5013	60.0	60.0	61.0	0.984	calibrator zero	5013	5013	0.0	n/a	0.0	n/a	Average C.F.:=						0.993
Point	Callibrator 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	5013	5013	0.0	n/a	1.0	n/a																																																															
as found high	5013	5013	380.0	380.0	378.0	1.008																																																															
adjusted zero	5013	5013	0.0	0.0	0.0	n/a																																																															
adjusted high	5013	5013	380.0	380.0	380.0	1.000																																																															
mid	5013	5013	180.0	180.0	181.0	0.994																																																															
low	5013	5013	60.0	60.0	61.0	0.984																																																															
calibrator zero	5013	5013	0.0	n/a	0.0	n/a																																																															
Average C.F.:=						0.993																																																															
Linear Regression/Calibration Results: Correlation Coefficient = <u>1.000</u> LIMITS > or = 0.995 Slope = <u>1.001</u> .95-1.05 b (Intercept as % of full scale)= <u>-0.13%</u> ± 3% F.S. % change in C.F. from last cal= <u>-0.80%</u> ± 10%																																																																					
Thermo 49i Ozone Analyzer Calibration 																																																																					
<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: O3 Bkg: <u>-0.2</u> O3 Coef: <u>0.973</u> Photo Lamp: <u>9.4</u> O3 Lamp: <u>7.8</u> Bench: <u>26.5</u> Bench Lamp: <u>53.5</u> O3 Lamp: <u>67.8</u> Pressure: <u>673.8</u> Cell A lpm: <u>0.726</u> Cell B lpm: <u>0.720</u> O3 ppb: <u>2.2</u> Cell A ppb: <u>4.0</u> Cell B ppb: <u>2.3</u> Cell A int: <u>57223</u> Cell B int: <u>70194</u> Internal Span: <u>491</u> </td> <td style="width:50%; vertical-align: top;"> As left: O3 Bkg: <u>-0.3</u> O3 Coef: <u>0.978</u> Photo Lamp: <u>9.4</u> O3 Lamp: <u>7.8</u> Bench: <u>26.4</u> Bench Lamp: <u>53.5</u> O3 Lamp: <u>67.8</u> Pressure: <u>676.1</u> Cell A lpm: <u>0.726</u> Cell B lpm: <u>0.720</u> O3 ppb: <u>0.6</u> Cell A ppb: <u>5.5</u> Cell B ppb: <u>-4.3</u> Cell A int: <u>57230</u> Cell B int: <u>70197</u> Internal Span: <u>333</u> </td> </tr> </table>		As found: O3 Bkg: <u>-0.2</u> O3 Coef: <u>0.973</u> Photo Lamp: <u>9.4</u> O3 Lamp: <u>7.8</u> Bench: <u>26.5</u> Bench Lamp: <u>53.5</u> O3 Lamp: <u>67.8</u> Pressure: <u>673.8</u> Cell A lpm: <u>0.726</u> Cell B lpm: <u>0.720</u> O3 ppb: <u>2.2</u> Cell A ppb: <u>4.0</u> Cell B ppb: <u>2.3</u> Cell A int: <u>57223</u> Cell B int: <u>70194</u> Internal Span: <u>491</u>	As left: O3 Bkg: <u>-0.3</u> O3 Coef: <u>0.978</u> Photo Lamp: <u>9.4</u> O3 Lamp: <u>7.8</u> Bench: <u>26.4</u> Bench Lamp: <u>53.5</u> O3 Lamp: <u>67.8</u> Pressure: <u>676.1</u> Cell A lpm: <u>0.726</u> Cell B lpm: <u>0.720</u> O3 ppb: <u>0.6</u> Cell A ppb: <u>5.5</u> Cell B ppb: <u>-4.3</u> Cell A int: <u>57230</u> Cell B int: <u>70197</u> Internal Span: <u>333</u>																																																																		
As found: O3 Bkg: <u>-0.2</u> O3 Coef: <u>0.973</u> Photo Lamp: <u>9.4</u> O3 Lamp: <u>7.8</u> Bench: <u>26.5</u> Bench Lamp: <u>53.5</u> O3 Lamp: <u>67.8</u> Pressure: <u>673.8</u> Cell A lpm: <u>0.726</u> Cell B lpm: <u>0.720</u> O3 ppb: <u>2.2</u> Cell A ppb: <u>4.0</u> Cell B ppb: <u>2.3</u> Cell A int: <u>57223</u> Cell B int: <u>70194</u> Internal Span: <u>491</u>	As left: O3 Bkg: <u>-0.3</u> O3 Coef: <u>0.978</u> Photo Lamp: <u>9.4</u> O3 Lamp: <u>7.8</u> Bench: <u>26.4</u> Bench Lamp: <u>53.5</u> O3 Lamp: <u>67.8</u> Pressure: <u>676.1</u> Cell A lpm: <u>0.726</u> Cell B lpm: <u>0.720</u> O3 ppb: <u>0.6</u> Cell A ppb: <u>5.5</u> Cell B ppb: <u>-4.3</u> Cell A int: <u>57230</u> Cell B int: <u>70197</u> Internal Span: <u>333</u>																																																																				
Comments: Sample filter changed. LEVEL 3 of SPAN concentration has been adjusted from 24% to 20% to reduce SPAN concentration from 490 ppb because a sampling range of the analyzer is 500 ppb.																																																																					

01 Minute Averages



PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: December 11, 2015
 Company: LICA
 Station Name/Location: St. Lina
 Previous Audit Date: November 26, 2015
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 12:33
 End Time (mst): 13:18
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Mainly cloudy with light snow

1400A Information and Status:

Serial Number: 1405A208301003 As Found Filter Loading %: 42.48
 Ko Factor: 13125.0 As Left Filter Loading %: 20.42
 Ambient Temperature °C: -3.55 As Found Noise: 0.008
 Ambient Pressure atm: 0.905 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.26
 Aux Flow Reading lpm: 13.68 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	Dwyer	Fisher	Fisher
Model:	475 Mark III	FB 1291	FB 1291
Serial Number:	n/a	130168457	130168457
Calibration Date:	n/a	18-Mar-15	18-Mar-15

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	-0.01	-0.08	-0.01	-0.08
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-1.67	0.00	-1.67
	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	-0.08	-0.01	-0.08
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-1.67	0.00	-1.67
	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: -3.6	1405F pressure atm: 0.905
reference temperature °C: -3.8	reference pressure: 0.913
difference °C: -0.3	difference: -0.008

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: -3.8	1405F pressure atm: 0.913
reference temperature °C: -3.8	reference pressure: 0.913
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: 3.04	reference total/aux flow lpm: 16.73
difference lpm: 0.04	difference lpm: 0.06

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

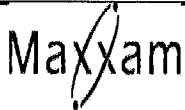
main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: 3.00	1400A total/aux flow lpm: 16.67
reference main flow lpm: 3.04	reference total/aux flow lpm: 16.73
difference lpm: 0.04	difference lpm: 0.06

K_o Audit:

Last K_o audit date: 17-Jul-15
 1405F K_o factor: 13125.0
 Measured K_o factor: 13184.8000
 % difference: 0.46

Comments:

47 mm FDMS filter changed and TEOM sampling filter changed.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: December 24, 2015
 Company: LICA
 Station Name/Location: St. Lina
 Previous Audit Date: December 11, 2015
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 14:42
 End Time (mst): 15:31
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: Mainly cloudy with light snow

1400A Information and Status:

Serial Number: 1405A208301003 As Found Filter Loading %: 30.43
 Ko Factor: 13125.0 As Left Filter Loading %: 31.86
 Ambient Temperature °C: -16.15 As Found Noise: 0.007
 Ambient Pressure atm: 0.917 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.26
 Aux Flow Reading lpm: 13.68 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	Dwyer	Fisher	Fisher
Model:	475 Mark III	FB 1291	FB 1291
Serial Number:	n/a	130168457	130168457
Calibration Date:	n/a	18-Mar-15	18-Mar-15

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	-0.01	-0.07	-0.01	-0.07
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-1.67	0.00	-1.67
	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	-0.07	-0.01	-0.07
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-1.67	0.00	-1.67
	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: -16.2	1405F pressure atm: 0.917
reference temperature °C: -15.9	reference pressure: 0.917
difference °C: 0.2	difference: 0.000

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: -15.9	1405F pressure atm: 0.917
reference temperature °C: -15.9	reference pressure: 0.917
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: 2.97	reference total/aux flow lpm: 16.23
difference lpm: -0.03	difference lpm: -0.44

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: 16.67
reference main flow lpm: 2.97	reference total/aux flow lpm: 16.23
difference lpm: -0.03	difference lpm: -0.44

K_o Audit:

Last K_o audit date: 17-Jul-15
 1405F K_o factor: 13125.0
 Measured K_o factor: 13184.8000
 % difference: 0.46

Comments:

47 mm FDMS filter changed.

WIND SYSTEM

Mel One Instruments

3208 Main St., Suite 105
 Regional Service Center
 Rowlett, TX. 75088

Wind Tunnel Calibration

Data Sheet

80.6-8100

Model No. 17041

Serial No. 3909

Model No. 801B

Serial No. 1263

Wind speed in feet/min. 11.19

Angle	WD Output Volts	WD Reading feet/min	WD Error ± 0.2 Deg	WS Standard mps	WS Output Volts	WS Reading mps	WS Error ± 0.24 MP/S
0	0.000	29.8	-0.4	11.21	0.224	11.19	-0.02
10	0.154	59.8	-1.0	11.17	0.227	11.23	0.10
20	0.307	119.1	-0.9	11.88	0.221	11.68	-0.62
30	0.459	151.3	1.3	11.23	0.222	11.11	-0.19
40	0.612	209.4	-0.6	11.25	0.223	11.16	-0.09
50	0.765	236.4	0.5	11.19	0.226	11.32	0.14
60	0.918	300.3	0.5	11.16	0.224	11.19	0.02
70	0.877	330.4	0.0	11.16	0.223	11.15	-0.03

Wind speed in feet/min. 2.21

Angle	WD Output Volts	WD Reading feet/min	WD Error ± 0.2 Deg	WS Standard mps	WS Output Volts	WS Reading mps	WS Error ± 0.26 MP/S
0	0.000	2.98	-0.2	2.19	0.042	2.08	-0.10
10	0.154	5.98	-0.3	2.20	0.043	2.14	-0.06
20	0.307	11.95	-0.1	2.21	0.042	2.09	-0.13
30	0.459	15.13	0.1	2.22	0.042	2.07	-0.15
40	0.612	20.94	-0.1	2.20	0.042	2.12	-0.09
50	0.765	23.64	0.1	2.21	0.042	2.10	-0.13
60	0.918	30.03	0.1	2.19	0.043	2.19	-0.04
70	0.877	33.04	0.0	2.17	0.043	2.17	-0.04

H12635

0-50 MP/S

11/17/88

01010151

METEOROLOGICAL SYSTEM CHECK

Meteorological System Checklist

Date: **11-Dec-15**
 Performed by: **Alex Yakupov**
 Station: **St. Lina**
 Start: **13:19** End: **13:43**

PRECIPITATION SENSOR CHECK

Previous check date: **December 11, 2015**

	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)		NO
Is the upper screen on the housing? (screen should be on between July and September)		NO
Is the housing clean?	YES	
Is the area around the housing clean and free from obstacle?	YES	
Is the tipping sensor working properly? (13:38 - live test / water) (test amount - 2.0 mm)	YES	
	PASS	

Comments: the rain gauge has been tested with water. Response is timely and accurate. No issues.

Field Technician: **Alexander Yakupov** December 11, 2015

CALIBRATORS

Company: Maxxam **Operator:** Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>N/A</u>
Serial Number	<u>11900613</u>	Serial Number	<u>N/A</u>
Oven Temperature	<u>N/A</u>	Temperature (°C)	<u>N/A</u>
Last Verification Date	<u>N/A</u>	Barometric Pressure	<u>N/A</u>

Flow Measurements

Pt. No. 1 5000 **Pt. No. 2** 5000 **Pt. No. 3** 5000

Calibrator Flow (sccm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
5013	0.000	0.001		
5013	0.400	0.407	1%	± 10%
5013	0.200	0.204	1%	± 10%
5014	0.100	0.101	0%	± 10%
Absolute Average Percent Difference			1%	± 10%

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

O₃		LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	1.0163	0.90-1.10
b (Intercept % of FS)=	0.0800	± 3% F.S.

AENV Standards		Ozone Analyzer	
Audit Calibrator		Make/Model	<u>Teco 49i</u>
Make/Model	<u>Teco 49i PS</u>	Serial/AMU Number	<u>AMU 1843</u>
Serial/AMU Number	<u>AMU 1808</u>	Last Calibration Date	<u>May 21, 2015</u>
Ozone Standard	<u>Primary</u>	Full Scale (ppm)	<u>0.5</u>

COMMENTS: _____

Auditor: Al Clark Date: May 21, 2015
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibrator Performance Audit

Sulphur Dioxide (by Cylinder Dilution)

File No. 2014-258A

Company: Maxxam Operator: Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>N/A</u>
Serial Number	<u>830</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>Oct 2013</u>	Temperature (°C)	<u>N/A</u>
SO ₂ Cylinder Conc.	<u>50.3</u>	Barometric Pressure	<u>N/A</u>
SO ₂ Cylinder S/N	<u>LL42475</u>		

Flow Measurements

Pt. No. 1 79.5 Pt. No. 2 39.8 Pt. No. 3 19.9

Calibrator Flow (sccm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
Zero Air	0.000	0.000		
4918	0.800	0.798	0%	± 10%
4960	0.400	0.398	-1%	± 10%
4977	0.200	0.200	0%	± 10%
Absolute Average Percent Difference			0%	± 10%

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

<u>SO₂</u>	<u>LIMITS</u>
Correlation=	1.0000 ≥ 0.995
m (Slope)=	0.9971 0.90-1.10
b (Intercept % of FS)=	0.0000 ± 3% F.S.

AENV Standards	SO ₂ Analyzer
Audit Calibrator	Make/Model <u>Teco 43C</u>
Make/Model <u>R&R MFC 201</u>	Serial/AMU Number <u>AMU 1623</u>
Serial/AMU Number <u>AMU 1690</u>	Last Calibration Date <u>Dec 15/14</u>
	Full Scale (ppm) <u>1.0</u>

COMMENTS: H2S gas was slow to move through the calibrator. Check for contamination inside calibrator. SO2 moves through quickly.

Auditor: Al Clark Date: December 16, 2014
 Operator Signature: _____ Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-344CGA

Company: Maxxam Operator's Name: Limin Li
Cylinder #: BLM002073 Concentration PPM: 49.5 Tolerance(%): 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
Serial Number: AMU 1690
Last Verification Date: March 31, 2015
Gas Type: SO2 Conc. 98.57
Cylinder Number: CAL016720

Flow Measurement Device:

Make/Model: Blos DC2
Serial Number: AMU 1659
Temp. °C: 22.5 C
B.P. 690 mmhg

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623
Instrument Settings: Zero: 7.9 Span: 1.028 Range: 1.0
Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.000	0.000	0.000
4976	82.6	0.801	0.01660	60.242	48.3
4993	41.0	0.396	0.00821	121.780	48.2
4977	20.2	0.193	0.00406	246.386	47.6
Average Cylinder Concentration:					48.0

Previous Stated Concentration PPM: 49.5

Percent variance from Stated: 3.0

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: March 31, 2015
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: Alr 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	132.442	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00363	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

Date: December 16, 2014

Operator Signature: *Al Clark*

Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-345CGA

Company: Maxxam **Operators name:** Limin Li
Cylinder #: BLM002073 **Conc (PPM)** 50.6/50.6 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146I</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>AMU 1659</u>
Last Verification Date	<u>March 31, 2015</u>			Temp. °C	<u>22.5 C</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>690 mmhg</u>
Cylinder Number	<u>CAL018024</u>				

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

Callibrator Flows (scem)		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	51.5	51.1
4976	82.6	0.855	0.848	0.01660	60.242	51.5	51.1
4993	41.0	0.427	0.421	0.00821	121.780	52.0	51.3
4977	20.2	0.213	0.209	0.00406	246.386	52.5	51.5
Average Cylinder Concentration:						52.0	51.3

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.6</u>	<u>50.6</u>
Percent variance from Stated: <u>2.8</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 49.5 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



Praxair Canada, Inc.
 9501-34th Street
 Edmonton, AB T6B 2X9
 Tel: 780-449-0778
 Fax: 780-449-5302

03/27/2014

MAXXAM ANALYTICS INC "NA"
 9373 49TH ST
 EDMONTON, AB T6B 2L7

Work Order No. 20248656
 Customer Reference No.

Product Lot/Batch No. Z582 4 085 02
 Product Part No. NI ME600P2P-AQ

CERTIFICATE OF ANALYSIS
Primary Standard

Component	Requested Concentration	Certified Concentration	Analytical Principle	Analytical Accuracy
Methane	600.0ppm	601.4ppm	U	±1% rel
Propane	200.0ppm	202ppm	U	±1% rel
Nitrogen	Balance	Balance		

Analytical Instruments: Mettler-Toledo Analytical Balance-ID2sx/USA--
 Hewlett-Packard (Agilent)-6890--GC-FID

Cylinder Style: AQ
 Cylinder Pressure @70F: 2200 psig
 Cylinder Volume: 82.0 ft3
 Valve Outlet Connection: CGA-350
 Cylinder No(s): LL33874

Filling Method: Gravimetric
 Date of Fill: 03/26/2014
 Expiration Date: 03/26/2017

Analyst: Todd Hryniv

This certificate of analysis was prepared by Praxair Canada, Inc. It is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure methods. The calibration standard provided is certified against Praxair Canada, Inc. Reference Materials which are either prepared by weight traceable to the National Institute of Standards and Technology (NIST), Massachusetts Institute of Technology (MIT), or National Institute of Standards and Technology (NIST) Standard Reference Material (SRM) system.

- Praxair Canada, Inc. warrants that the information provided on this certificate is true and correct to the best of our knowledge and belief.
- | | | |
|--|--|--|
| 1. Gas Chromatography with Thermal Conductivity Detector | 4. Gas Chromatography with Thermal Conductivity Detector | 7. Gas Chromatography with Flame Ionization Detector |
| 2. Gas Chromatography with Thermal Conductivity Detector | 5. Gas Chromatography with Thermal Conductivity Detector | 8. Gas Chromatography with Flame Ionization Detector |
| 3. Gas Chromatography with Thermal Conductivity Detector | 6. Gas Chromatography with Thermal Conductivity Detector | 9. Gas Chromatography with Flame Ionization Detector |

Praxair Canada, Inc. warrants that the information provided on this certificate is true and correct to the best of our knowledge and belief. While we believe the information is accurate within the limits of the analytical methods employed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The user assumes all responsibility for the use of the information and the user shall indemnify and hold Praxair Canada, Inc. harmless from and against all claims, damages, and costs of the user, arising out of the use of the information provided herein, except to the extent that such claims, damages, and costs are caused by Praxair Canada, Inc. negligence.


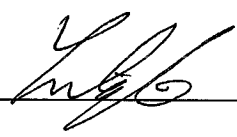
APPENDIX III
CHAIN OF CUSTODY



Maxxam Analytics - Air Services Group

Project Chain of Custody

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2015-12-31- C</u>
Site: <u>St. Lina Site</u>	Contact: <u>Mike Bisaga</u>

QA Check Complete	<u></u>	Date	<u>20-Jan-16</u>
QA Check Review	<u>_____</u>	Date	<u>_____</u>
Report Complete	<u>E. Tangang</u>	Date	<u>21-Jan-16</u>
Report Reviewed	<u></u>	Date	<u>21-Jan-16</u>
Report Shipped	<u>_____</u>	Date	<u>_____</u>

Notes