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Data Management
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March 28, 2013

RE: 2012 Ambient Air Monitoring Annual Reports

Attached are the annual 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

Lakeland Industry & Community Association

Cold Lake Monitoring Site
Ambient Air Monitoring Annual Data Report

For
2012

Prepared By:



February 22, 2013

Lakeland Industry & Community Association Ambient Air Monitoring

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Introduction

The following Ambient Air Monitoring report was prepared for:

Mr. Mike Bisaga
Lakeland Industry & Community Association
Box 8237
5107W – 50 Street
Bonnyville, Alberta
T9N 2J5

Monitoring Location: Cold Lake South
Data Period: January 2012 to December 2012

The annual ambient data report:

- Prepared by Katherine Rapske
- Reviewed by Lily Lin

The annual analytical report for passive monitoring:
Authorized by Levi Manchak

Calibration Procedure

The following calibration procedure applies to all calibrations conducted at the Lakeland Industry & Community Association Air Monitoring Station.

Calibration gas concentrations are generated using a dynamic mass flow controlled calibrator. EPA Protocol one gases are diluted with zero air generated on site. The Mass Flow Controllers in the calibrator are referenced using an NIST traceable flow meter once per month. All listed flows are reported as corrected to Standard Temperature and Pressure (STP).

Generated zero gas is introduced to the analyzer first. Three concentrations of calibration gas are then generated in order to introduce points at approximately 50-80%, 25-40% & 10-20% of the analyzer's full-scale range. An auto zero and span are then performed to validate the daily zero and span values recorded to the next multi-point calibration.

All indicated concentrations are taken from the ESC data logger used to collect the data for monthly reporting.

Conformance of each calibration to Alberta Environment regulations is outlined in the individual calibration reports. The slope and correlation coefficient are derived from the calculated and indicated analyzer responses. The percent change is calculated using the previous calibration correction factor and the current correction factor before adjustment. The calibration conforms to the procedure outlined in the *Air Monitoring Directive, Appendix A-10, Section 1.6*.

General Continuous Monitoring Annual Summary

AQM STATION – LICA – COLD LAKE SOUTH

A trailer audit was performed by Alberta Environment on March 15th and September 18th.

Sulphur Dioxide (PPB)

- Analyzer make / model – Thermo 43i, S/N: 806528242
 - ❖ No operation issues were observed during the year.

Total Reduced Sulphur (PPB)

- Analyzer make / model –TEI 450i, S/N: 812728560
- Converter - CD NOVA CDN 101, S/N: 250
 - ❖ The daily span system was not stable on June 5th. Suspected the issue was due to the temperature controller for the permeation tube oven.
 - ❖ The new perm tube was installed on July 9th but would not stabilize. The as found points checks and the 3-points calibrations were performed on the analyzer multiple times between July 9th and July 29th. All results showed that the analyzer was in a good working condition.
 - ❖ The perm tube was changed again on July 29th.
 - ❖ Following the as found points check on September 10th, the flow filter was replaced, the PMT voltage and the slope were adjusted.

Total Hydrocarbon (PPM)

- Analyzer make / model -TECO 51C-LT, S/N: 427408718
 - ❖ Two H2 gas cylinders were replaced on March 8th and 30th respectively following a daily zero/span check.
 - ❖ The span gas cylinder was changed on June 7th.
 - ❖ One H2 gas cylinder was replaced following a daily zero/span check in June.
 - ❖ The span gas was replaced in December.

General Continuous Monitoring Annual Summary

AQM STATION – LICA – COLD LAKE

Nitrogen Dioxide (PPB)

- Analyzer make / model - TECO 42C, S/N: 427408716
 - ❖ The external zero/span oven flow rate was increased to lower the span value after the monthly calibration was completed in January.
 - ❖ The analyzer spanned high on January 13th due to flow rate instability. The zero/span oven flow rate was checked and adjusted following the as found points on January 18th.
 - ❖ It was noticed that the analyzer spanned high on April 19th. An as found point check was performed on April 20th, and the result was good.
 - ❖ The pump for the daily calibration system was rebuilt on April 20th.
 - ❖ Following the as found points check, the permeation tube was replaced in July.
 - ❖ Following the as found points, the pump for the zero/span system was rebuilt, the flow rate was adjusted, and the exhausting pump was rebuilt on November 6th.
 - ❖ Hourly data of NO₂ were missing between December 4th at hour 15 and at hour 23 due to unknown reason. As a result both NO_x and NO data were invalidated at the same time period in order to meet CASA data submission requirement.

Ozone (PPB)

- Analyzer make / model - Thermo 49i, S/N: 700419951
 - ❖ Hourly maximum data recorded on September 21st at hour 6 was invalidated as less than 100% of the data were collected during that hour.
 - ❖ The span gas was replaced before the calibration was started in December.

General Continuous Monitoring Annual Summary

AQM STATION – LICA – COLD LAKE

Particulate Matter 2.5 (ug/m³)

- Analyzer make / model –TEOM1405F, S/N: 1405A201620804
 - ❖ Four hours of data were invalidated in January, as the data were below –3 ug/m³.
 - ❖ Three hours of data were invalidated in February, as the data were below –3 ug/m³.
 - ❖ Seven hours of data were invalidated in March, as the data were below –3 ug/m³.
 - ❖ Eight hours of data were invalidated in April, as the data were below –3 ug/m³.
 - ❖ Eleven hours of data were invalidated in May, as the data were below –3 ug/m³.
 - ❖ Five hours of data were invalidated in June, as the data were below –3 ug/m³.
 - ❖ Four hours of data were invalidated in July, as the data were below –3 ug/m³.
 - ❖ There were three 24-Hour PM_{2.5} contraventions recorded in July.
 - ❖ It was noticed that the hourly data showed larger than normal fluctuation, starting August 2nd, so a routine Teom audit was performed on August 7th. The audit passed all requirements. Therefore, all data were retained.
 - ❖ Following the August audit, the ambient pressure was calibrated and adjusted.
 - ❖ Nine hours of data were invalidated in August, as the data were below –3 ug/m³.
 - ❖ A Teom audit did not pass the leak check in September 17th so an ambient pressure calibration was performed on September 18th. It was found that one O-ring inside the switching valve was broken, and the other O-ring was crack. Temporary fixed the issue by switching these two O-ring and the Teom passed the leak check. Because we could not sure with certainty establish when the unit went out of specification, would have to invalidated the data back to the last valid leak check and flow audit, which was August 7th. A total of 443 hours of data were invalidated due to O-ring issue in September.
 - ❖ Four hours of data were invalidated in September, as the data were below –3 ug/m³.

General Continuous Monitoring Annual Summary

AQM STATION – LICA – COLD LAKE

Particulate Matter 2.5 (ug/m³) (continued)

- ❖ On October 2nd, it was noticed that there was a Teom dew point alarm. The dew point temperature cables were checked and reconnected and the alarm was cleared.
- ❖ On October 3rd, Teom reading was negative, the switching valve was checked and the Teom and FDMS filters were replaced again. A leak check was performed as well as a flow audit. Data was good.
- ❖ On October 9th, it was discovered that there was an “FDMS value position” alarm. The switching valve was disassembled and it was found that the screw that connects the motor with the valve was loose. The screw was tightened and a leak check was performed as well as a flow audit.
- ❖ On October 25th, the switching valve was replaced as per client’s suggestion.
- ❖ A total of 75 hours of data were invalidated in October.
- ❖ Fifty-nine hours of data were invalidated in November, as the data were below –3 ug/m3.
- ❖ The bracket for securing the switching valve was installed in December.
- ❖ A total of 56 hours of data were invalidated in December, as the data were below –3 ug/m3.

Vector Wind Speed (KPH) & Vector Wind Direction (DEG)

- System make / model – Met One 50.5, S/N: F1644 and RM Young, S/N: 46553
 - ❖ The Met One wind system was removed and sent to the manufacturer for a 2-Year calibration/maintenance on November 29th, and a temporary RM Young wind system was installed.
 - ❖ A wind system calibration on the RM Young was performed on November 28th

Relative Humidity (PERCENT)

- System make / model - Rotronic Hygroclip-S3
- No operational issue was observed during the year.

General Continuous Monitoring Annual Summary

AQM STATION – LICA – COLD LAKE

Ambient Temperature (DEGC)

- System make / model - Rotronic Hygroclip-S3
 - ❖ No operational issues observed during the year.

Trailer Temperature (DEGC)

- System make / model - R&R 61
 - ❖ No operational issues observed during the year.

Trailer

No issue was observed this year.

- ❖ A field camera was installed and mounted on the wind tower on May 15th.

Continuous Monitoring

Annual Summaries, Graphs & Wind Roses

Sulphur Dioxide

Current Date : 03/11/13
Current Time : 08:24

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA Logger Id : 01 Parameter : SO2_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	707	0	5	0
February	696	662	0	10	0
March	744	702	0	2	0
April	720	685	0	2	0
May	744	708	0	2	0
June	720	681	0	3	0
July	744	709	0	2	0
August	744	707	0	2	0
September	720	684	0	2	0
October	744	707	0	3	0
November	720	685	0	7	0
December	744	707	0	3	1
Yearly Total	8784	8344	0	10	0

SO₂ Monthly Averages and Frequency Distributions of One Hour Readings - 2012

Plant Operator: LICA

Plant Location: COLD LAKE SOUTH

Month	Valid Readings* Hours	Operational Time (%)	% Readings in Concentration Range (ppm SO ₂)						24-Hour Averages Above Guidelines	Hourly Readings Above Guidelines	SO ₂ ppm Monthly Average
			≤ 0.02 ppm	0.02 < C ≤ 0.06 ppm	0.06 < C ≤ 0.11 ppm	0.11 < C ≤ 0.17 ppm	0.17 < C ≤ 0.34 ppm	> 0.34 ppm			
January	707	99.9	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0.00
February	662	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0.00
March	702	99.9	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0.00
April	685	99.9	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0.00
May	708	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0.00
June	681	99.6	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0.00
July	709	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0.00
August	707	99.9	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0.00
September	684	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0.00
October	707	99.7	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0.00
November	685	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0.00
December	707	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0.00
									Annual Average	0.00	

C - Concentration

* Valid readings - does not include calibration hours and downtime hours

SO₂ Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Plant Location: COLD LAKE SOUTH

Month	SO2 ppb Peak Reading
January	5
February	10
March	2
April	2
May	2
June	3
July	2
August	2
September	2
October	3
November	7
December	3
ANNUAL PEAK	10

LICA
 SO2_ / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 01
 Site Name : LICA
 Parameter : SO2_
 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	
< 20	2.70	4.43	5.22	4.20	8.48	6.65	12.86	3.69	2.94	3.81	9.97	11.60	9.26	5.64	5.17	3.27	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	2.70	4.43	5.22	4.20	8.48	6.65	12.86	3.69	2.94	3.81	9.97	11.60	9.26	5.64	5.17	3.27	

Calm : .00 %

Total # Operational Hours : 8340

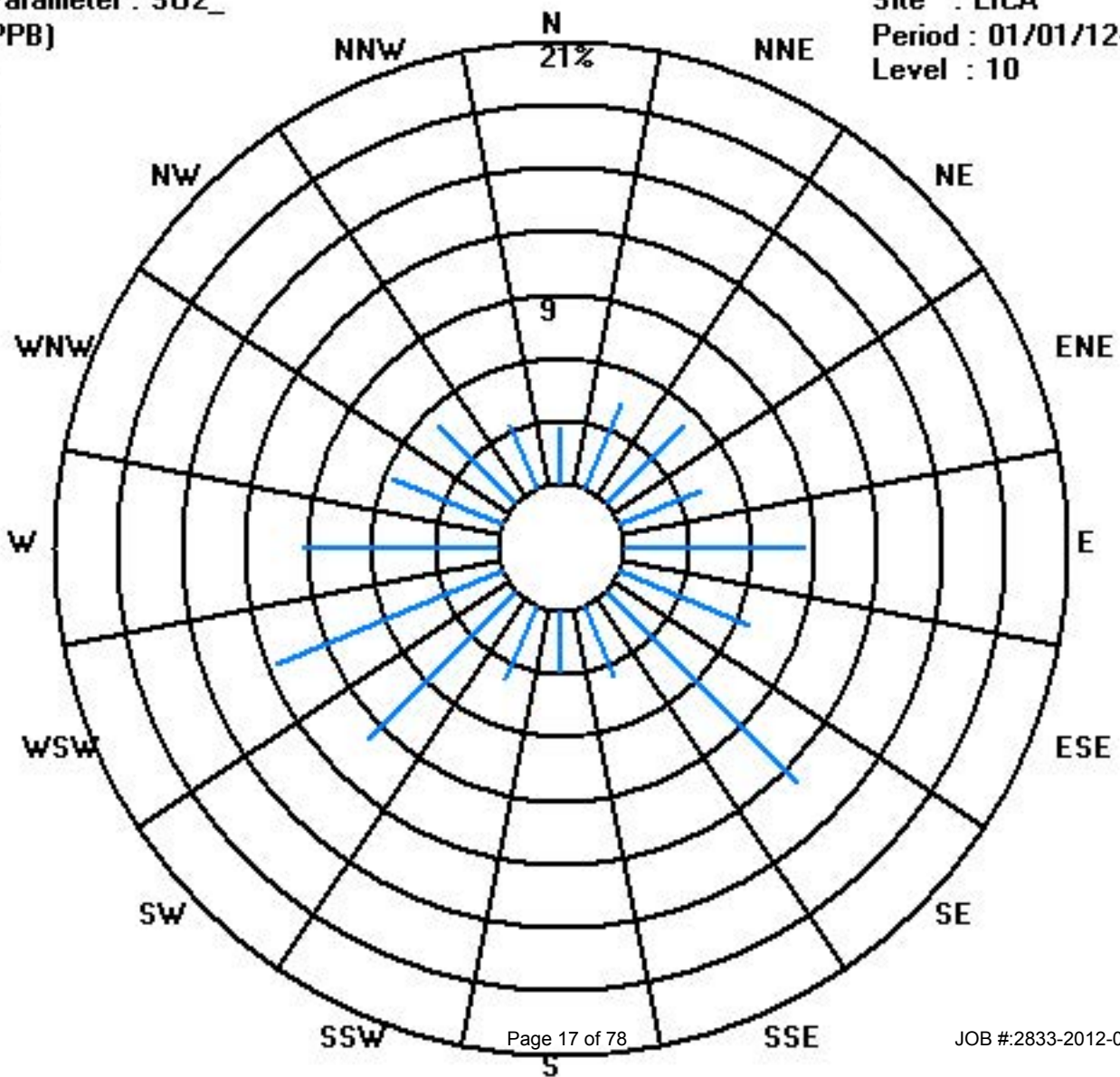
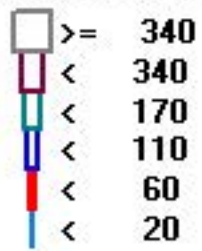
Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 20	226	370	436	351	708	555	1073	308	246	318	832	968	773	471	432	273	8340
< 60																	
< 110																	
< 170																	
< 340																	
>= 340																	
Totals	226	370	436	351	708	555	1073	308	246	318	832	968	773	471	432	273	

Calm : .00 %

Total # Operational Hours : 8340

Class Limits (PPB)



Total Reduced Sulphur

Current Date : 03/11/13
Current Time : 08:24

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA Logger Id : 01 Parameter : TRS_ Units : PPB

	Readings	Valid Readings	Total	Min	Max	Mean
January	744	707	0	0	0	
February	696	659	0	0	0	
March	744	702	0	0	0	
April	720	684	0	0	0	
May	744	706	0	0	0	
June	720	679	0	1	0	
July	744	673	0	4	0	
August	744	707	0	9	0	
September	720	679	0	1	0	
October	744	704	0	0	0	
November	720	684	0	0	0	
December	744	706	0	0	0	
Yearly Total	8784	8290	0	9	0	

TRS Monthly Averages and Frequency Distributions of One Hour Readings - 2012

Plant Operator: LICA

Plant Location: Cold Lake South

Month	Number of Readings	Operational Time (%)	% Readings in Concentration Range (ppb TRS)				TRS ppb Monthly Average
			0 to 3 ppb	4 to 10 ppb	11 to 50 ppb	>50 ppb	
January	707	99.9	100.0%	0.0%	0.0%	0.0%	0.00
February	659	99.9	100.0%	0.0%	0.0%	0.0%	0.00
March	702	99.9	100.0%	0.0%	0.0%	0.0%	0.00
April	684	99.9	100.0%	0.0%	0.0%	0.0%	0.00
May	706	99.7	100.0%	0.0%	0.0%	0.0%	0.00
June	679	99.6	100.0%	0.0%	0.0%	0.0%	0.00
July	673	99.6	100.0%	0.0%	0.0%	0.0%	0.01
August	707	99.9	100.0%	0.0%	0.0%	0.0%	0.03
September	679	99.7	100.0%	0.0%	0.0%	0.0%	0.00
October	704	99.5	100.0%	0.0%	0.0%	0.0%	0.00
November	684	99.9	100.0%	0.0%	0.0%	0.0%	0.00
December	706	99.9	100.0%	0.0%	0.0%	0.0%	0.00
						Annual Average	0.00

* Valid readings do not include daily and monthly calibration hours and downtime hours

TRS Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Plant Location: Cold Lake South

Month	TRS ppb Peak Reading
January	0
February	0
March	0
April	0
May	0
June	1
July	4
August	9
September	1
October	0
November	0
December	0
ANNUAL PEAK	9

LICA
 TRS_ / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

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

Wind Parameter : WDR
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3	2.65	4.40	5.24	4.17	8.54	6.73	12.84	3.64	2.94	3.78	9.93	11.59	9.20	5.66	5.23	3.34	99.96
< 10	.00	.00	.00	.00	.00	.01	.00	.00	.00	.01	.01	.00	.00	.00	.00	.00	.03
< 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	2.65	4.40	5.24	4.17	8.54	6.74	12.84	3.64	2.94	3.80	9.94	11.59	9.20	5.66	5.23	3.34	

Calm : .00 %

Total # Operational Hours : 8286

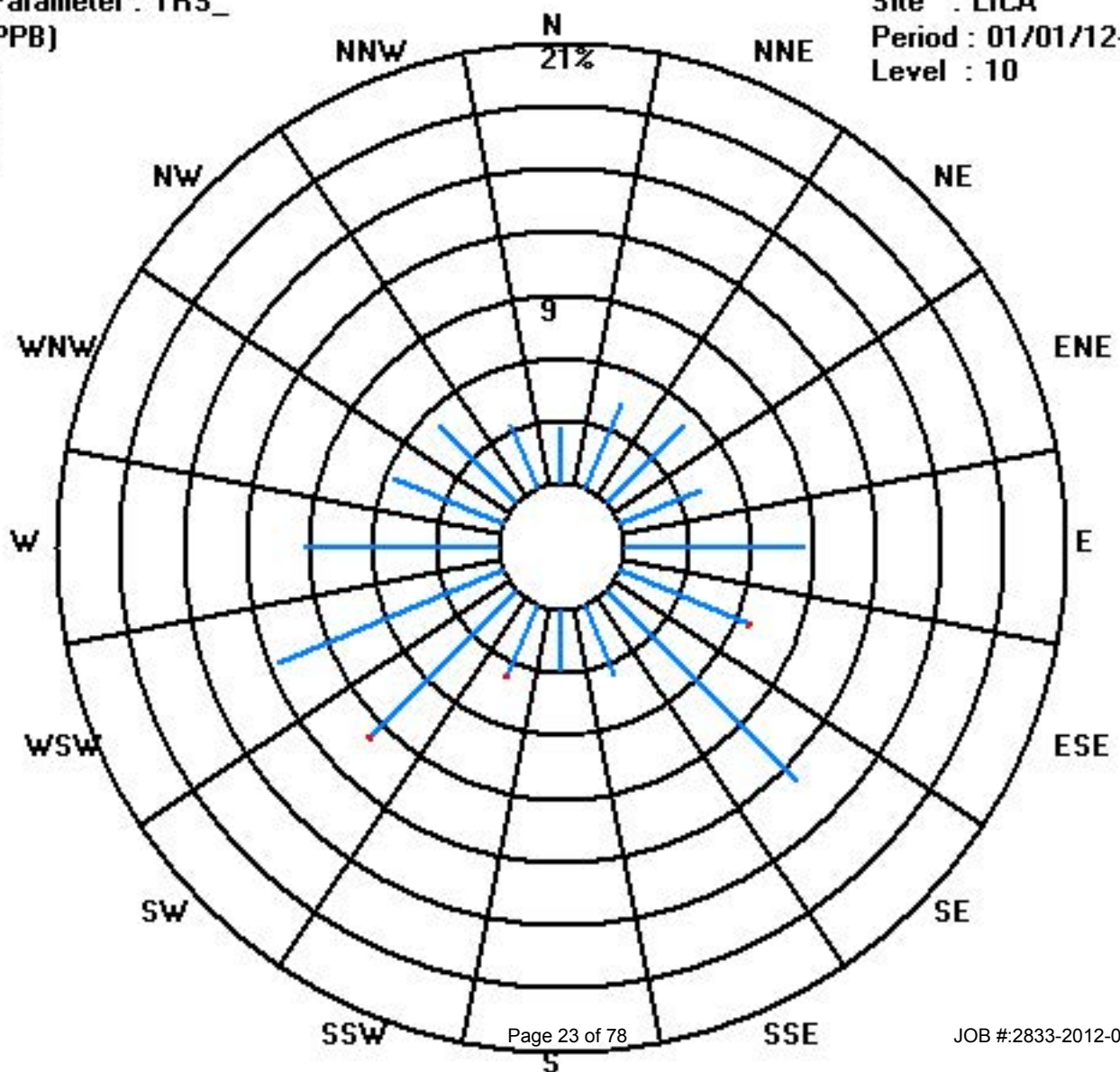
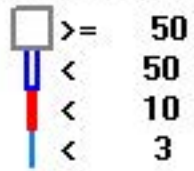
Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3	220	365	435	346	708	558	1064	302	244	314	823	961	763	469	434	277	8283
< 10						1				1	1						3
< 50																	
>= 50																	
Totals	220	365	435	346	708	559	1064	302	244	315	824	961	763	469	434	277	

Calm : .00 %

Total # Operational Hours : 8286

Class Limits (PPB)



Total Hydrocarbons

Current Date : 03/11/13
Current Time : 08:24

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

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

	Readings	Valid Readings	Min	Max	Mean
January	744	709	1.8	3.8	2.3
February	696	662	1.9	4.2	2.3
March	744	701	1.8	3.1	2.1
April	720	685	1.8	3	2
May	744	706	1.7	3.2	2
June	720	676	1.8	3.5	2.1
July	744	707	1.8	4	2.3
August	744	708	1.9	4.6	2.6
September	720	682	1.9	3.9	2.3
October	744	708	1.9	3.2	2.2
November	720	685	2	4	2.3
December	744	706	1.9	4.8	2.4
Yearly Total	8784	8335	1.7	4.8	2.2

THC Monthly Averages and Frequency Distributions of One Hour Readings - 2012

Plant Operator: LICA

Plant Location: COLD LAKE SOUTH

Month	Number of Readings	Operational Time (%)	% Readings in Concentration Range (ppm THC)				THC ppm Monthly Average
			0 to 3 ppm	4 to 10 ppm	11 to 50 ppm	>50 ppm	
January	709	100.0	95.6%	4.4%	0.0%	0.0%	2.27
February	662	99.9	89.1%	10.9%	0.0%	0.0%	2.35
March	701	99.9	99.6%	0.4%	0.0%	0.0%	2.08
April	685	100.0	99.9%	0.1%	0.0%	0.0%	1.95
May	706	99.9	99.7%	0.3%	0.0%	0.0%	2.01
June	676	99.7	97.9%	2.1%	0.0%	0.0%	2.07
July	707	100.0	94.1%	5.9%	0.0%	0.0%	2.26
August	708	99.9	75.6%	24.4%	0.0%	0.0%	2.58
September	682	100.0	96.5%	3.5%	0.0%	0.0%	2.27
October	708	99.9	98.9%	1.1%	0.0%	0.0%	2.22
November	684	99.9	92.1%	7.9%	0.0%	0.0%	2.33
December	706	99.9	86.5%	13.5%	0.0%	0.0%	2.41
						Annual Average	2.23

* Valid readings do not include daily and monthly calibration hours and downtime hours

THC Peak Reading of One Hour Averages for 2012

Plant Operator: _____ LICA _____

Plant Location: _____ COLD LAKE SOUTH _____

Month	THC ppm Peak Reading
January	3.8
February	4.2
March	3.1
April	3.0
May	3.2
June	3.5
July	4.0
August	4.6
September	3.9
October	3.2
November	4
December	4.8
ANNUAL PEAK	4.8

LICA
 THC / WD Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

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

Wind Parameter : WD
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3.0	2.60	4.29	4.99	3.94	8.22	6.37	12.31	3.31	2.64	3.39	9.33	10.45	8.57	5.38	4.83	3.07	93.77
< 10.0	.08	.12	.24	.27	.25	.30	.52	.33	.30	.40	.64	1.18	.69	.27	.36	.21	6.22
< 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	2.68	4.41	5.23	4.22	8.47	6.67	12.84	3.64	2.94	3.80	9.98	11.64	9.26	5.66	5.19	3.28	

Calm : .00 %

Total # Operational Hours : 8331

Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3.0	217	358	416	329	685	531	1026	276	220	283	778	871	714	449	403	256	7812
< 10.0	7	10	20	23	21	25	44	28	25	34	54	99	58	23	30	18	519
< 50.0																	
>= 50.0																	
Totals	224	368	436	352	706	556	1070	304	245	317	832	970	772	472	433	274	

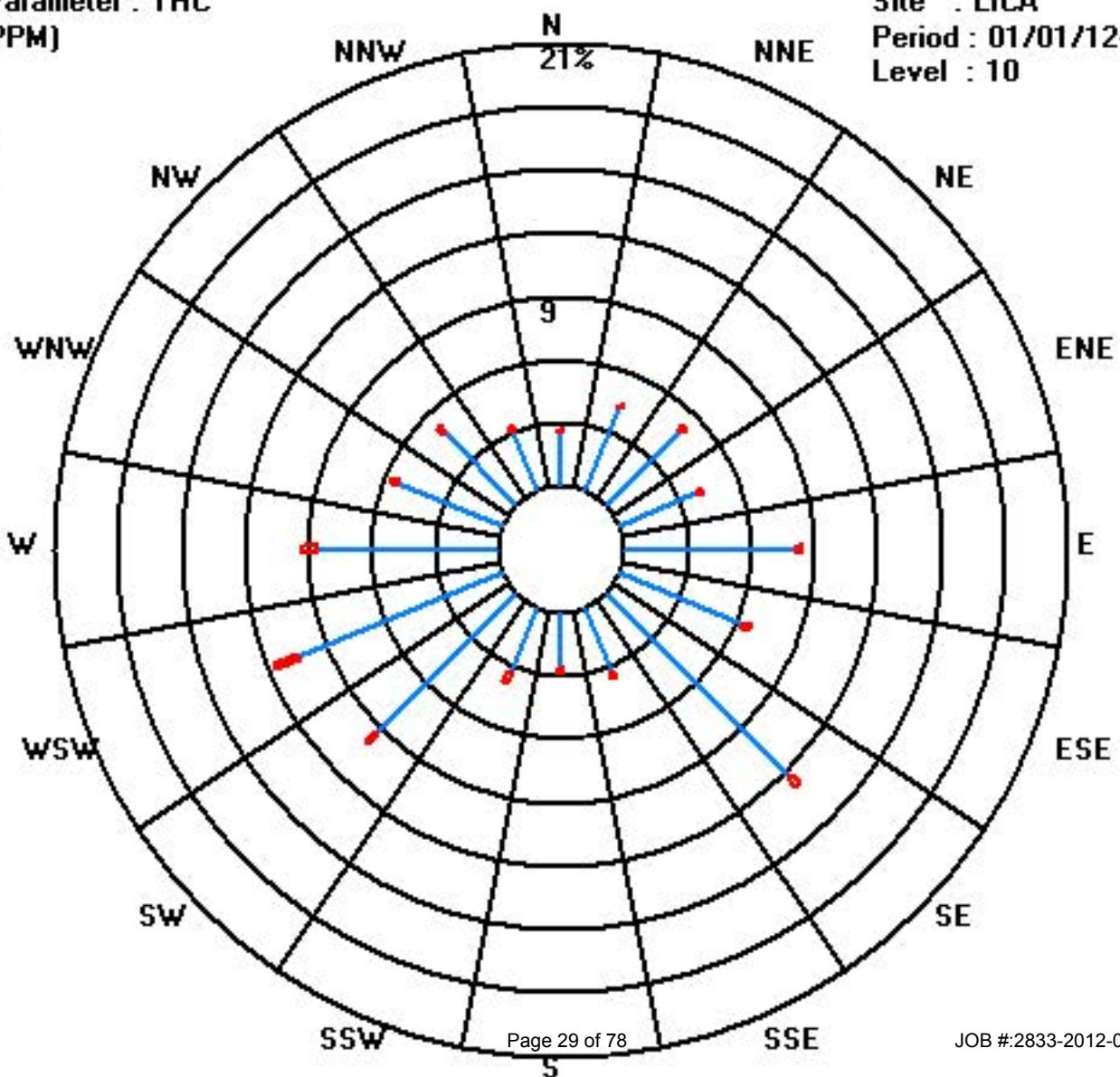
Calm : .00 %

Total # Operational Hours : 8331

Class Limits (PPM)

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

Level : 10



Particulate Matter 2.5

Current Date : 03/11/13
Current Time : 08:24

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

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

	Readings	Valid Readings	Min	Max	Mean
January	744	739	0	23	5
February	696	692	0	35	6
March	744	731	0	25	5
April	720	711	0	16	4
May	744	732	0	57	6
June	720	714	0	35	6
July	744	739	0	204	16
August	168	157	0	19	9
September	288	267	0	21	9
October	744	651	0	56	2
November	720	656	0	54	7
December	744	684	0	28	8
Yearly Total	7776	7473	0	204	7

PM 2.5 Monthly Averages and Frequency Distributions of Daily Average Readings - 2012

Plant Operator: LICA

Plant Location: COLD LAKE SOUTH

Month	Valid Readings* Hours	Operational Time (%)	% Readings in Concentration Range (ug/m ³)						Total Daily Readings > 30 ug/m ³	PM2.5 ug/m ³ Monthly Average
			≤ 30 ug/m ³	30 < C ≤ 60 ug/m ³	60 < C ≤ 80 ug/m ³	80 < C ≤ 120 ug/m ³	120 < C ≤ 240 ug/m ³	> 240 ug/m ³		
January	739	99.5	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	5.36
February	692	99.6	99.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0	6.60
March	731	99.1	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	4.92
April	711	98.9	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	4.14
May	732	98.5	98.9%	1.1%	0.0%	0.0%	0.0%	0.0%	0	6.55
June	714	99.3	99.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0	6.27
July	739	99.5	87.3%	8.5%	2.3%	1.2%	0.7%	0.0%	3	16.57
August	157	98.8	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	8.70
September	267	37.6	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	8.66
October	651	89.9	99.8%	0.2%	0.0%	0.0%	0.0%	0.0%	0	2.46
November	656	91.4	99.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0	7.24
December	684	92.5	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	7.56
									Annual Average	7.09

* Valid readings - does not include calibration hours and downtime hours

PM 2.5 Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Plant Location: COLD LAKE SOUTH

Month	PM 2.5 (ug/m3) Peak Reading
January	23
February	35
March	26
April	17
May	58
June	35
July	204
August	19
September	21
October	56
November	54
December	28
ANNUAL PEAK	204

LICA
PM2 / WD Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

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

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	
< 30	2.64	4.77	5.67	4.29	9.01	6.75	12.75	3.47	2.75	3.42	10.07	11.36	8.41	5.15	4.91	2.95	98.46
< 60	.01	.09	.02	.06	.01	.08	.48	.02	.04	.02	.04	.06	.06	.02	.02	.01	1.11
< 80	.00	.00	.00	.05	.01	.02	.06	.04	.04	.00	.00	.00	.00	.00	.00	.00	.24
< 120	.01	.01	.04	.01	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00	.01	.12
< 240	.04	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01	.00	.06
>= 240	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	2.71	4.88	5.74	4.42	9.04	6.86	13.30	3.54	2.83	3.45	10.11	11.42	8.51	5.19	4.95	2.98	

Calm : .00 %

Total # Operational Hours : 7473

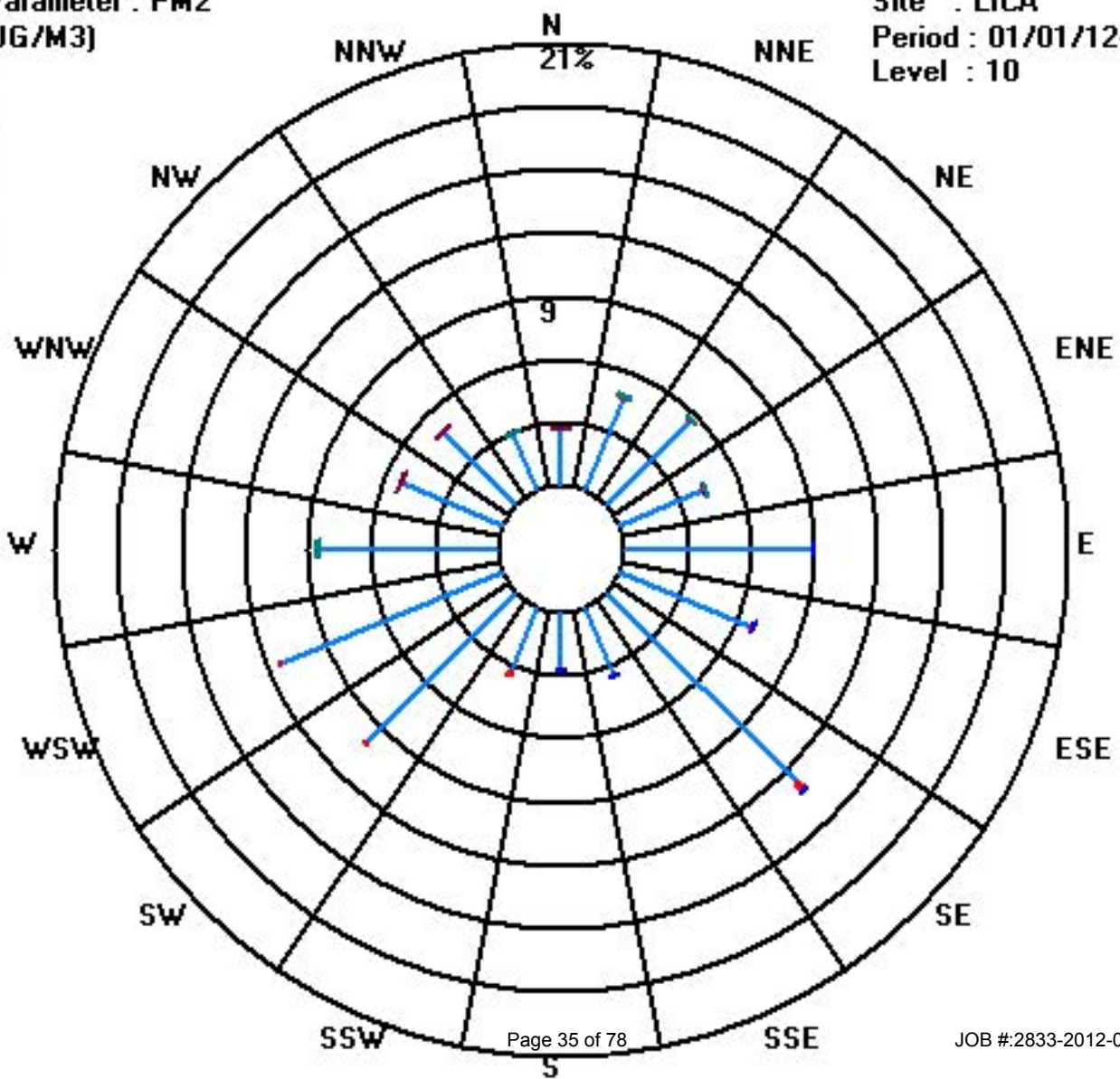
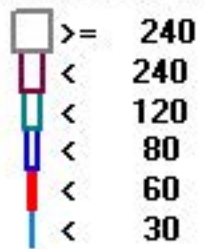
Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 30	198	357	424	321	674	505	953	260	206	256	753	849	629	385	367	221	7358
< 60	1	7	2	5	1	6	36	2	3	2	3	5	5	2	2	1	83
< 80				4	1	2	5	3	3								18
< 120	1	1	3	1									2			1	9
< 240	3													1	1		5
>= 240																	
Totals	203	365	429	331	676	513	994	265	212	258	756	854	636	388	370	223	

Calm : .00 %

Total # Operational Hours : 7473

Class Limits (UG/M3)



Nitrogen Dioxide

Current Date : 03/11/13
Current Time : 08:24

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA Logger Id : 01 Parameter : NO2_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	699	0.4	36.7	7
February	696	658	0.6	28.5	8.4
March	744	700	0.7	29.3	4.4
April	720	678	0.6	21	2.5
May	744	705	0.3	8.6	1.9
June	720	680	0.2	7.1	1.9
July	744	701	0	7	1.7
August	744	704	0	8.2	1.5
September	720	678	0	14	2.5
October	744	700	0.1	21.1	2.9
November	720	676	0.1	21.1	5.4
December	744	697	0.7	24.9	7.2
Yearly Total	8784	8276	0	21.1	3.9

NO₂ Monthly Averages and Frequency Distributions of One Hour Readings -2012

Plant Operator: LICA

Station: COLD LAKE SOUTH

Month	Number of Readings	Operational Time (%)	% Readings in Concentration Range (ppm NO ₂)				24-Hour Averages Above Guidelines	Hourly Readings Above Guidelines	NO ₂ ppm Monthly Average
			0 to 0.05 ppm	0.051 to 0.11 ppm	0.111 to 0.210 ppm	> 0.21 ppm			
January	699	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.01
February	658	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.01
March	700	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.00
April	678	99.7	100.0%	0.0%	0.0%	0.0%	0	0	0.00
May	705	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.00
June	680	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.00
July	701	100.0	100.0%	0.0%	0.0%	0.0%	0	0	0.00
August	705	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.00
September	678	100.0	100.0%	0.0%	0.0%	0.0%	0	0	0.00
October	704	99.7	100.0%	0.0%	0.0%	0.0%	0	0	0.00
November	676	99.6	100.0%	0.0%	0.0%	0.0%	0	0	0.01
December	697	98.8	100.0%	0.0%	0.0%	0.0%	0	0	0.01
							Annual Average	0.00	

* Valid readings do not include daily and monthly calibration hours and downtime hours

NO₂ Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Station: COLD LAKE SOUTH

Month	NO ₂ ppb Peak Reading
January	37
February	28
March	29
April	21
May	9
June	7
July	7
August	8
September	14
October	21
November	28
December	25
ANNUAL PEAK	37

LICA
 NO2_ / WD Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 01
 Site Name : LICA
 Parameter : NO2_
 Units : PPB

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	2.63	4.36	5.21	4.18	8.50	6.64	12.91	3.66	2.93	3.80	10.03	11.58	9.20	5.69	5.20	3.31	99.94
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.02
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.03	.00	.00	.00	.06
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.01
Totals	2.63	4.36	5.21	4.18	8.50	6.64	12.91	3.66	2.93	3.81	10.07	11.58	9.24	5.69	5.20	3.31	

Calm : .00 %

Total # Operational Hours : 8287

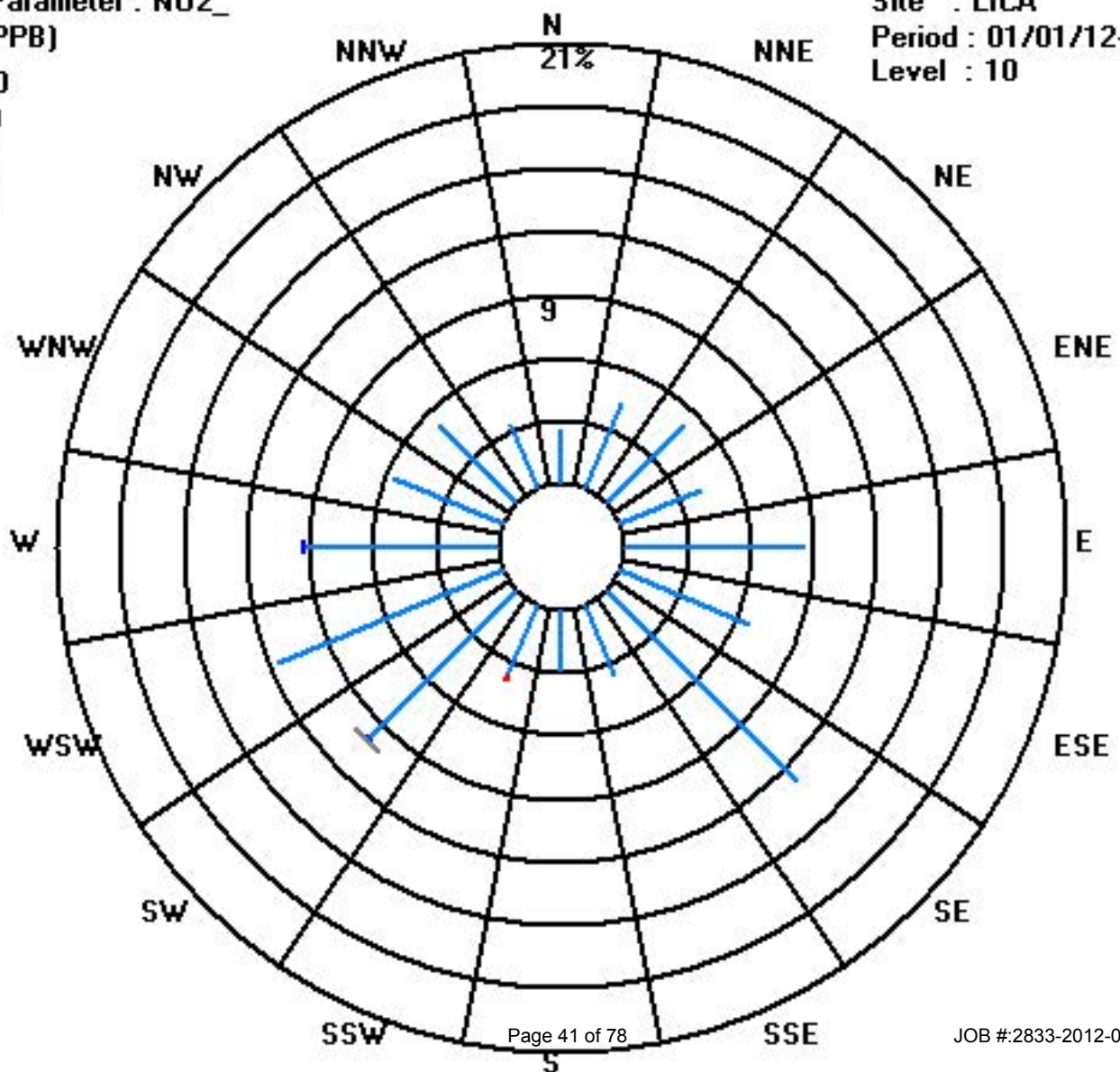
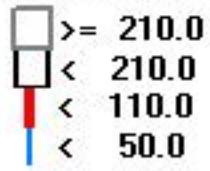
Distribution By Samples

Limit	Direction															Freq	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW		NNW
< 50.0	218	362	432	347	705	551	1070	304	243	315	832	960	763	472	431	275	8283
< 110.0																	2
< 210.0											2		3				5
>= 210.0											1						1
Totals	218	362	432	347	705	551	1070	304	243	316	835	960	766	472	431	275	

Calm : .00 %

Total # Operational Hours : 8287

Class Limits (PPB)



Nitric Oxide

Current Date : 03/11/13
Current Time : 08:24

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA Logger Id : 01 Parameter : NO_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	699	0	99.5	2.3
February	696	658	0	101.8	2.8
March	744	700	0	32	0.8
April	720	678	0	18.7	0.4
May	744	705	0	11.2	0.2
June	720	680	0	7.9	0.3
July	744	701	0	7.6	0.3
August	744	704	0	11.6	0.5
September	720	678	0	28	0.8
October	744	700	0	20	0.7
November	720	676	0	20.4	0.8
December	744	697	0	38	2
Yearly Total	8784	8276	0	101.8	1

NO Monthly Averages and Frequency Distributions of One Hour Readings -2012

Plant Operator: _____ LICA _____

Station: _____ COLD LAKE SOUTH _____

Month	Number of Readings	Operational Time (%)	% Readings in Concentration Range (ppm NO)				NO ppm Monthly Average
			0 to 0.05 ppm	0.051 to 0.11 ppm	0.111 to 0.210 ppm	> 0.21 ppm	
January	699	99.9	99.7%	0.3%	0.0%	0.0%	0.00
February	658	99.9	99.5%	0.5%	0.0%	0.0%	0.00
March	700	99.9	100.0%	0.0%	0.0%	0.0%	0.00
April	678	99.7	100.0%	0.0%	0.0%	0.0%	0.00
May	705	99.9	100.0%	0.0%	0.0%	0.0%	0.00
June	680	99.9	100.0%	0.0%	0.0%	0.0%	0.00
July	701	100.0	100.0%	0.0%	0.0%	0.0%	0.00
August	705	99.9	100.0%	0.0%	0.0%	0.0%	0.00
September	678	100.0	100.0%	0.0%	0.0%	0.0%	0.00
October	705	99.7	100.0%	0.0%	0.0%	0.0%	0.00
November	676	99.6	100.0%	0.0%	0.0%	0.0%	0.00
December	697	98.8	100.0%	0.0%	0.0%	0.0%	0.00
						Annual Average	0.00

* Valid readings do not include daily and monthly calibration hours and downtime hours

NO Peak reading of One Hour Averages for 2012

Plant Operator: LICA

Station: COLD LAKE SOUTH

Month	NO ppb Peak Reading
January	100
February	102
March	32
April	19
May	11
June	8
July	8
August	12
September	28
October	35
November	20
December	38
TOTAL EXCEED	
ANNUAL PEAK	102

LICA
NO_ / WD Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

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

Wind Parameter : WD
Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	2.63	4.37	5.22	4.17	8.51	6.66	12.92	3.67	2.93	3.82	9.98	11.59	9.18	5.70	5.21	3.32	99.93
< 110.0	.00	.00	.00	.02	.01	.00	.01	.00	.00	.00	.00	.01	.00	.00	.00	.00	.06
< 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	2.63	4.37	5.22	4.19	8.52	6.66	12.93	3.67	2.93	3.82	9.98	11.60	9.18	5.70	5.21	3.32	

Calm : .00 %

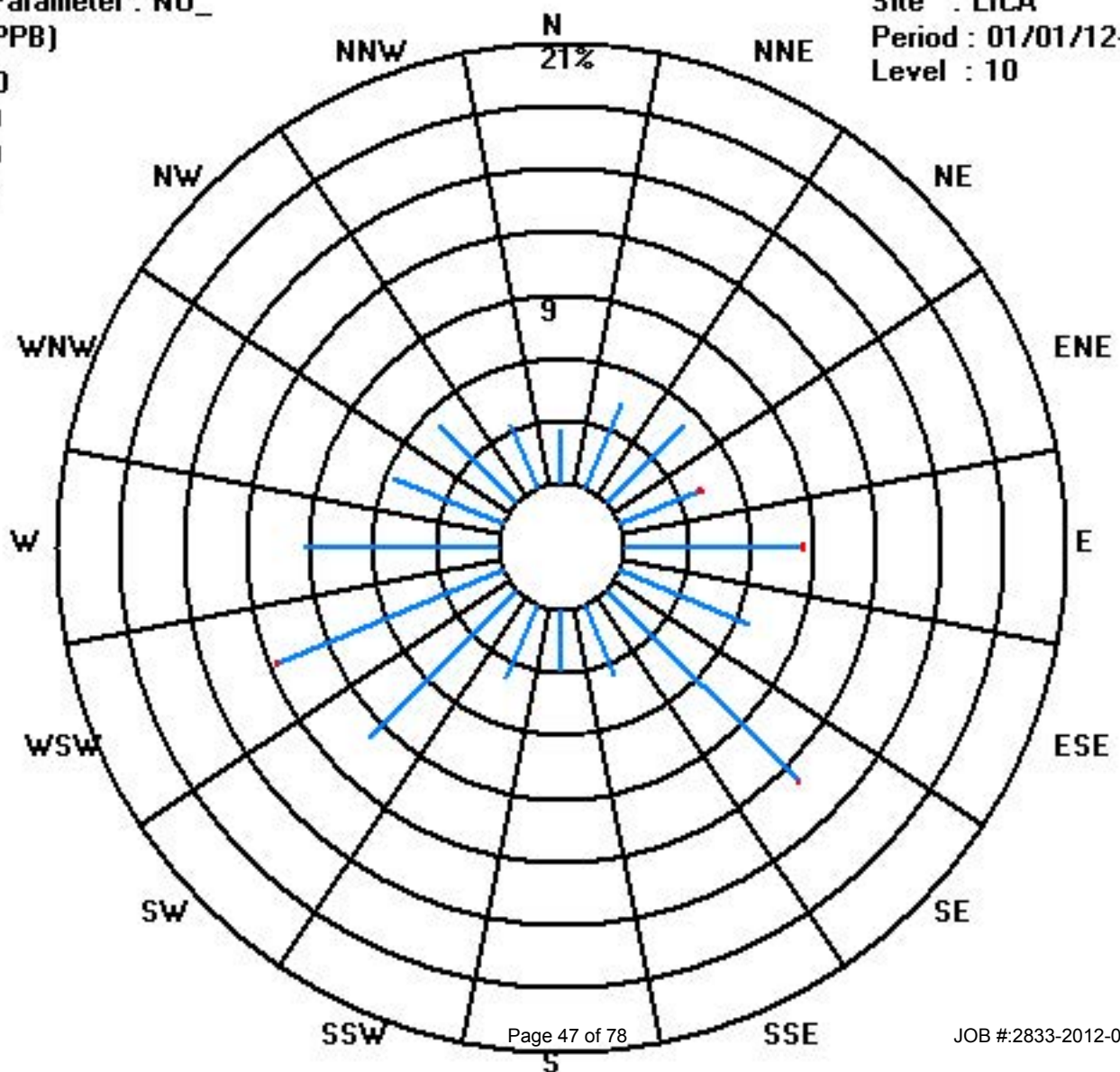
Total # Operational Hours : 8272

Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	218	362	432	345	704	551	1069	304	243	316	826	959	760	472	431	275	8267
< 110.0				2	1		1					1					5
< 210.0																	
>= 210.0																	
Totals	218	362	432	347	705	551	1070	304	243	316	826	960	760	472	431	275	

Calm : .00 %

Total # Operational Hours : 8272



Oxides of Nitrogen

Current Date : 03/11/13
Current Time : 08:24

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA Logger Id : 01 Parameter : NOX_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	699	0.4	133.7	9.3
February	696	658	0.7	124.2	11.1
March	744	700	0.6	51.4	5.1
April	720	678	0.6	39.6	2.8
May	744	705	0.3	13.6	2.1
June	720	680	0.1	11.6	2.1
July	744	701	0	11.3	2
August	744	704	0	15.3	2
September	720	678	0.1	38.7	3.2
October	744	700	0.1	40	3.6
November	720	676	0.1	6:07	6.2
December	744	697	0.8	62.1	9.2
Yearly Total	8784	8276	0	133.7	4.9

NO_x Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Station: COLD LAKE SOUTH

Month	NOx ppb Peak Reading
January	134
February	124
March	51
April	40
May	14
June	12
July	11
August	15
September	39
October	44
November	49
December	62
ANNUAL PEAK	134

LICA
 NOX_ / WD Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

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

Wind Parameter : WD
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	2.63	4.36	5.18	4.09	8.47	6.66	12.91	3.65	2.92	3.80	9.98	11.59	9.18	5.70	5.21	3.32	99.72
< 110.0	.00	.01	.03	.07	.04	.00	.02	.02	.01	.01	.00	.01	.00	.00	.00	.00	.25
< 210.0	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	2.63	4.37	5.22	4.19	8.52	6.66	12.93	3.67	2.93	3.82	9.98	11.60	9.18	5.70	5.21	3.32	

Calm : .00 %

Total # Operational Hours : 8272

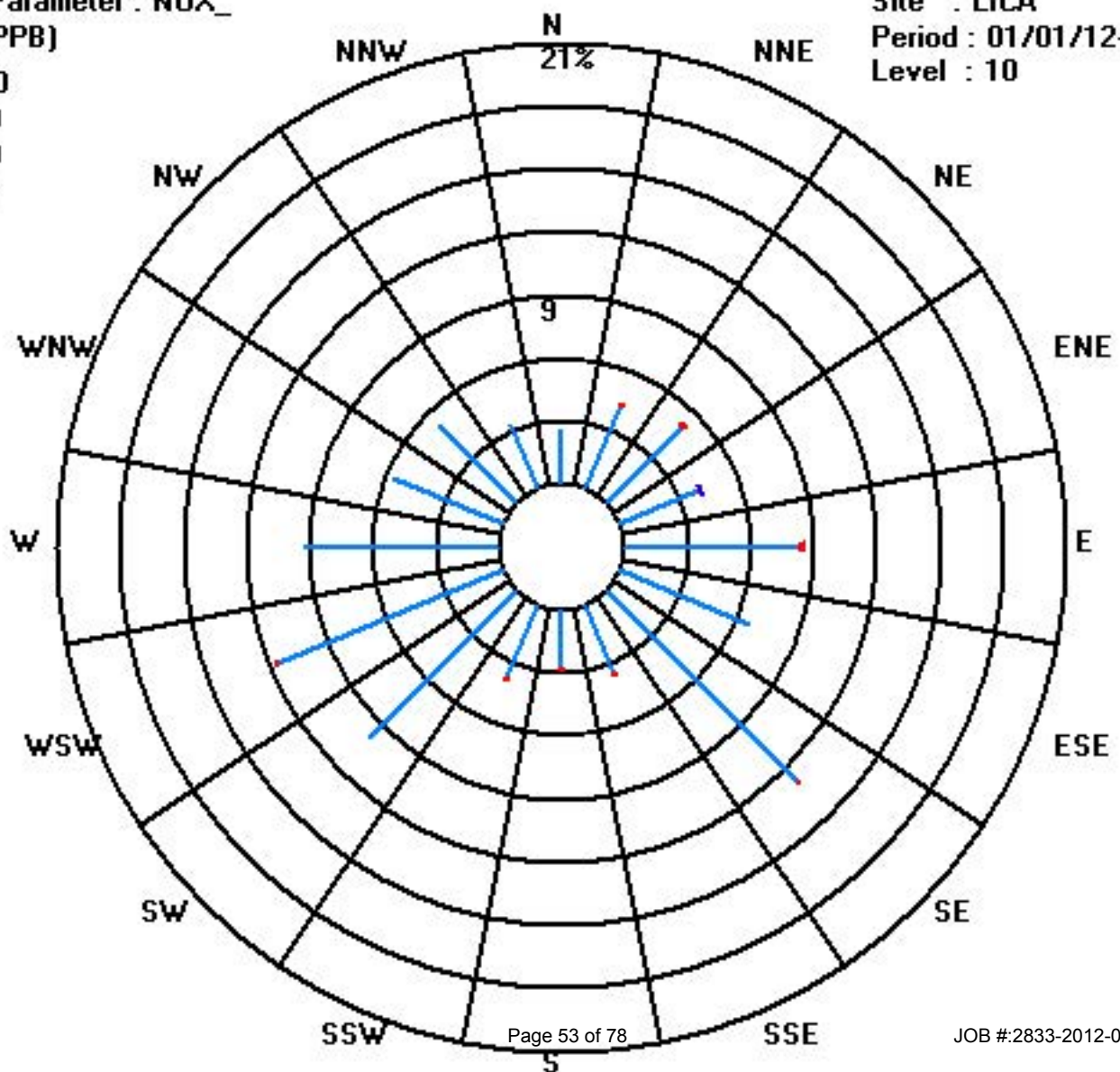
Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	218	361	429	339	701	551	1068	302	242	315	826	959	760	472	431	275	8249
< 110.0		1	3	6	4		2	2	1	1		1					21
< 210.0				2													2
>= 210.0																	
Totals	218	362	432	347	705	551	1070	304	243	316	826	960	760	472	431	275	

Calm : .00 %

Total # Operational Hours : 8272

Class Limits (PPB)



Ozone

Current Date : 03/11/13
Current Time : 08:24

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA Logger Id : 01 Parameter : O3_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	707	0	39	23
February	696	661	1	41	23
March	744	704	2	56	34
April	720	685	2	62	38
May	744	708	3	62	38
June	720	683	2	59	27
July	744	709	0	71	24
August	744	708	0	54	20
September	720	682	0	55	22
October	744	706	1	41	20
November	720	685	1	39	23
December	744	707	1	37	21
Yearly Total	8784	8345	0	71	26

O3 Monthly Averages and Frequency Distributions of One Hour Readings -2012

Plant Operator: _____ LICA

Station: COLD LAKE SOUTH

Month	Number of Readings	Operational Time (%)	% Readings in Concentration Range (ppm O3)				O3 ppm Monthly Average
			0 to 0.05 ppm	0.051 to 0.11 ppm	0.111 to 0.210 ppm	> 0.21 ppm	
January	707	99.9	100.0%	0.0%	0.0%	0.0%	0.02
February	638	100.0	100.0%	0.0%	0.0%	0.0%	0.02
March	704	99.9	98.7%	1.3%	0.0%	0.0%	0.03
April	685	99.9	91.7%	8.3%	0.0%	0.0%	0.04
May	708	100.0	84.5%	15.5%	0.0%	0.0%	0.04
June	683	99.9	96.3%	3.7%	0.0%	0.0%	0.03
July	709	100.0	99.2%	0.8%	0.0%	0.0%	0.02
August	708	99.9	99.3%	0.7%	0.0%	0.0%	0.02
September	682	100.0	99.1%	0.9%	0.0%	0.0%	0.02
October	706	99.7	100.0%	0.0%	0.0%	0.0%	0.02
November	685	100.0	100.0%	0.0%	0.0%	0.0%	0.02
December	707	100.0	100.0%	0.0%	0.0%	0.0%	0.02
						Annual Average	0.03

* Valid readings do not include daily and monthly calibration hours and downtime hours

O3 Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Station: COLD LAKE SOUTH

Month	O3 ppb Peak Reading
January	39
February	41
March	56
April	62
May	62
June	59
July	71
August	54
September	55
October	41
November	39
December	37
ANNUAL PEAK	71

LICA
O3_ / WD Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
Parameter : O3_
Units : PPB

Wind Parameter : WD
Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50	2.63	4.29	4.97	4.16	8.33	6.40	12.43	3.45	2.79	3.60	9.79	11.32	8.85	5.51	4.99	3.16	96.75
< 110	.07	.13	.25	.08	.16	.22	.45	.23	.15	.20	.17	.27	.39	.13	.15	.11	3.24
< 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	2.70	4.42	5.22	4.24	8.50	6.62	12.88	3.69	2.94	3.81	9.97	11.60	9.25	5.64	5.15	3.28	

Calm : .00 %

Total # Operational Hours : 8341

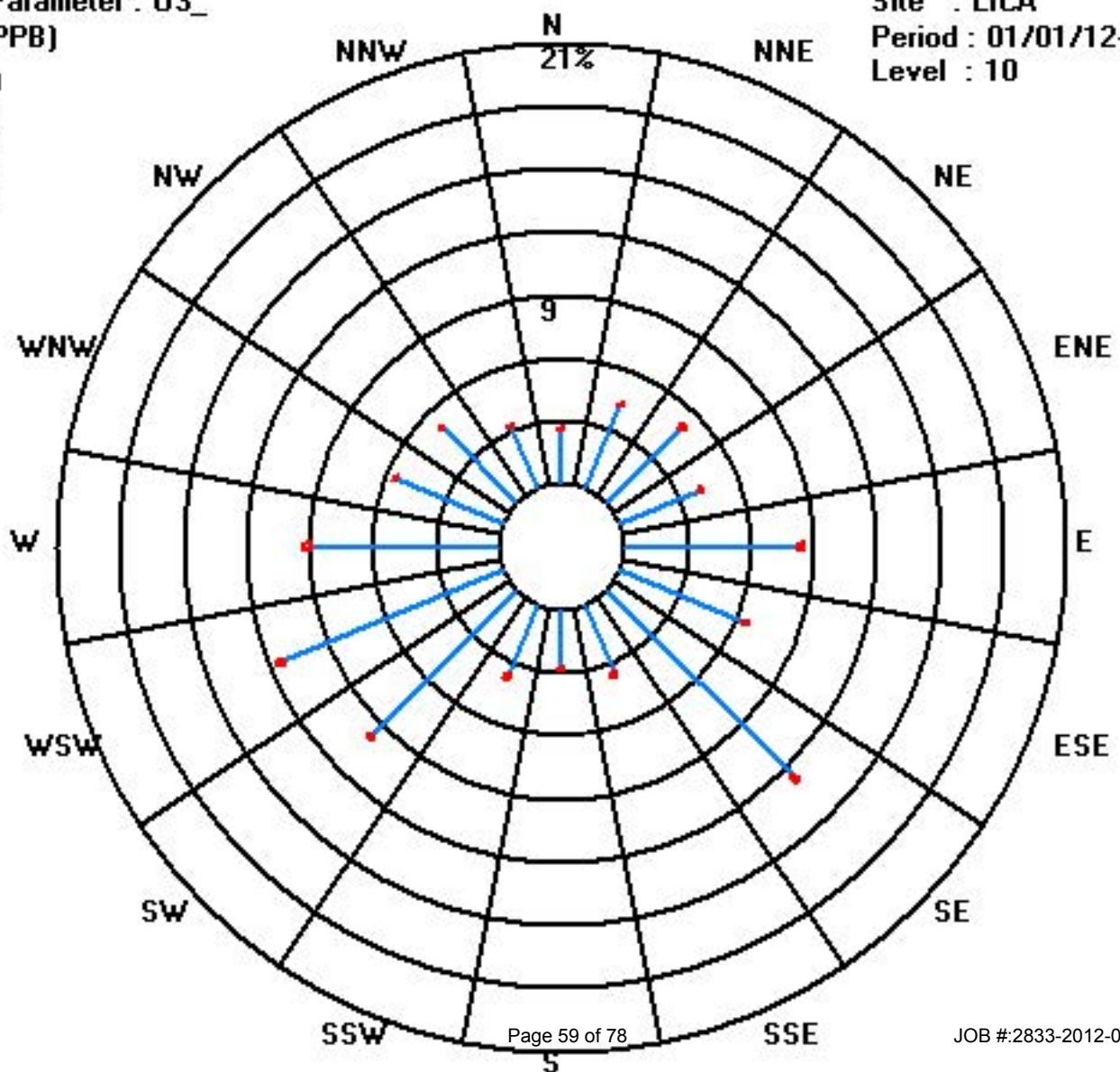
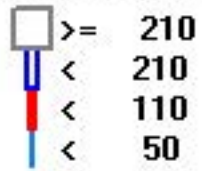
Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50	220	358	415	347	695	534	1037	288	233	301	817	945	739	460	417	264	8070
< 110	6	11	21	7	14	19	38	20	13	17	15	23	33	11	13	10	271
< 210																	
>= 210																	
Totals	226	369	436	354	709	553	1075	308	246	318	832	968	772	471	430	274	

Calm : .00 %

Total # Operational Hours : 8341

Class Limits (PPB)



Ambient Temperature

Current Date : 02/22/13
Current Time : 10:59

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA Logger Id : 01 Parameter : TPX Units : DGC

	Readings	Valid Readings	Min	Max	Mean
January	744	744	-35.9	8.7	-9.9
February	696	696	-31.3	5.3	-9
March	744	744	-15.7	12.9	-1.7
April	720	720	-9.8	19.3	3.4
May	744	744	-1.8	24.2	10.8
June	720	720	3.9	26.6	15.5
July	744	744	7.2	31.9	19.1
August	744	744	3.1	29.4	16.8
September	720	720	-0.5	25.4	12.1
October	744	744	-10.6	16.2	1
November	720	720	-22.6	8.6	-8.9
December	744	744	-32	0	-16.7
Yearly Total	8784	8784	-35.9	31.9	2.8

Temperature - Monthly Averages for 2012

Plant Operator: LICA

Plant Location: COLD LAKE SOUTH

Month	Operational Time (%)	Monthly Averages (Deg.C)	Maximum Hourly Average (Deg C)	Minimum Hourly Average (Deg C)	Maximum Daily Average (Deg C)
January	100.0	-9.89	8.7	-35.9	3.1
February	100.0	-9.03	5.3	-31.3	-1.1
March	100.0	-1.67	12.9	-15.7	6.1
April	100.0	3.44	19.3	-9.8	9.9
May	100.0	10.84	24.2	-1.8	16.4
June	100.0	15.53	26.6	3.9	21.0
July	100.0	19.14	31.9	7.2	24.7
August	100.0	16.83	29.4	3.1	21.0
September	100.0	12.13	25.4	-0.5	15.5
October	100.0	0.97	16.2	-10.6	9.3
November	100.0	-8.86	8.6	-22.6	4.1
December	100.0	-16.65	-4.4	-32.0	-8.9
ANNUAL AVERAGE		2.73	-	-	-

Relative Humidity

Current Date : 02/22/13
Current Time : 10:59

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA Logger Id : 01 Parameter : RH Units : %FS

	Readings	Valid Readings	Min	Max	Mean
January	744	744	32	96	71
February	696	696	28	91	70
March	744	744	24	98	69
April	720	720	16	100	61
May	744	744	10	100	52
June	720	720	19	100	69
July	744	744	30	100	75
August	744	744	32	100	74
September	720	720	27	97	68
October	744	744	31	98	76
November	720	720	41	97	78
December	744	744	58	89	76
Yearly Total	8784	8784	10	100	70

Relative Humidity - Monthly Averages for 2012

Plant Operator: LICA

Plant Location: COLD LAKE SOUTH

Month	Monthly Averages (%)	Maximum Hourly Average (%)	Maximum Daily Average (%)
January	71.11	96	87.5
February	70.16	91	80.6
March	69.32	98	85.5
April	60.97	100	93.4
May	52.37	100	86.0
June	68.70	100	89.5
July	74.58	100	86.8
August	73.91	100	93.5
September	67.96	97	94.0
October	75.96	98	96.3
November	77.56	97	94.4
December	76.29	89	85.3
ANNUAL AVERAGE	69.91	-	-

Vector Wind Speed

Current Date : 02/22/13
Current Time : 10:59

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA Logger Id : 01 Parameter : WSP Units : KPH

	Readings	Valid Readings	Min	Max	Mean
January	744	744	0.2	21.6	6.1
February	696	696	0	13.9	4.2
March	744	744	0.2	21	6.7
April	720	720	0	18.6	7.5
May	744	744	0	23.8	7.2
June	720	720	0.2	18.8	5.6
July	744	744	0.1	20.3	4.8
August	744	744	0.1	16.9	4.9
September	720	720	0.1	22.1	5.8
October	744	744	0.1	19.4	7
November	720	716	0.2	18	5.9
December	744	744	0	13.3	4.1
Yearly Total	8784	8780	0	23.8	5.8

LICA
WSP / WD Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
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	1.27	1.86	2.60	3.04	3.63	3.79	7.12	3.08	2.69	3.37	6.73	7.03	3.88	2.11	1.44	1.23	54.95
< 12.0	1.02	2.07	2.36	1.11	3.71	2.59	4.58	.35	.17	.27	2.94	3.75	3.10	2.28	2.31	1.30	34.00
< 20.0	.38	.28	.18	.15	.92	.18	.83	.02	.00	.01	.19	.61	2.05	1.12	1.11	.75	8.83
< 29.0	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.03	.03	.14	.01	.23
< 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	2.68	4.22	5.15	4.31	8.26	6.57	12.56	3.46	2.87	3.65	9.87	11.41	9.07	5.56	5.02	3.30	

Calm : 1.95 %

Total # Operational Hours : 8780

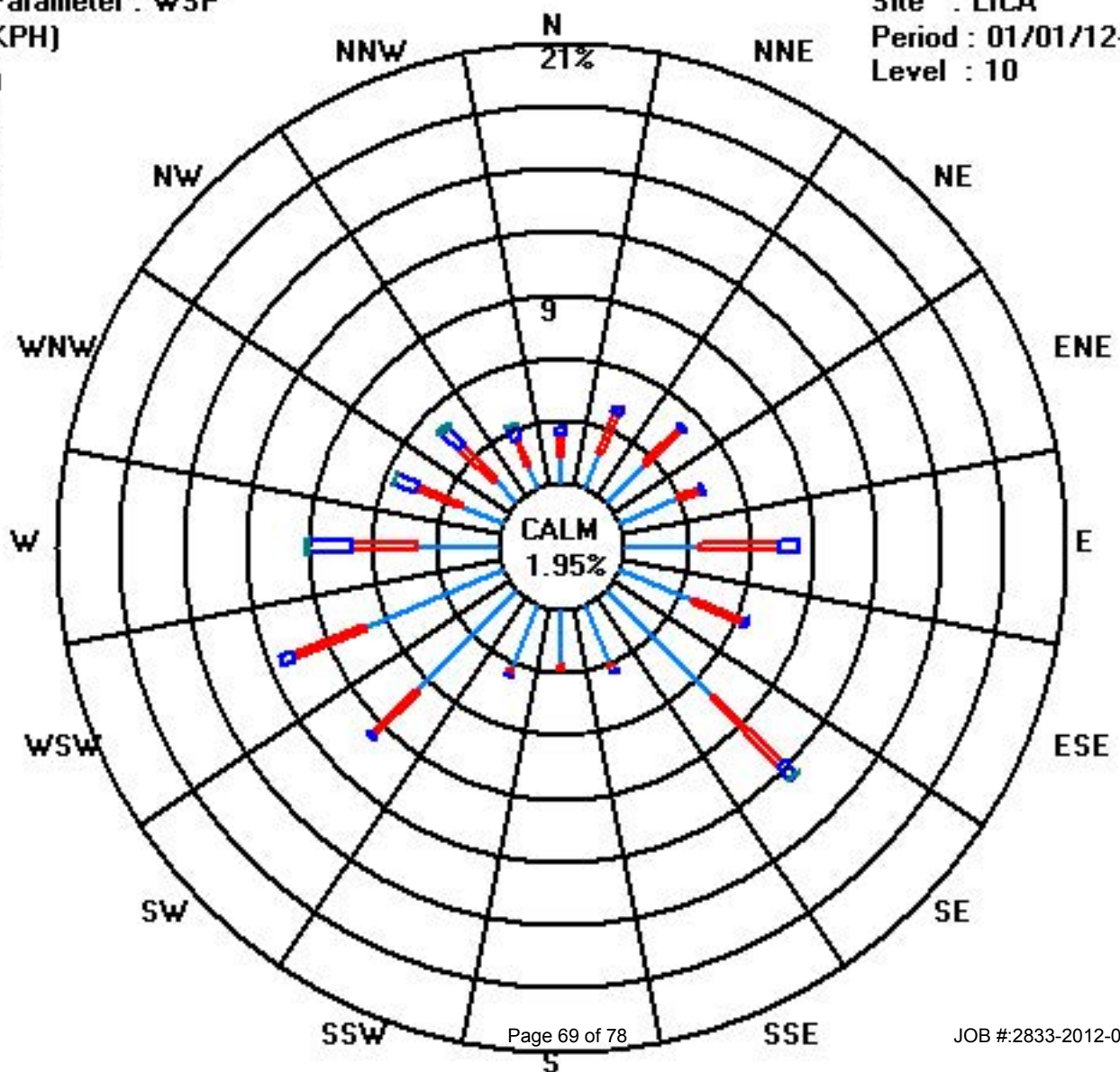
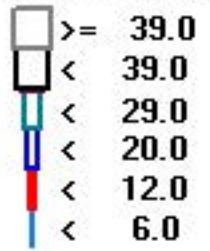
Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 6.0	112	164	229	267	319	333	626	271	237	296	591	618	341	186	127	108	4825
< 12.0	90	182	208	98	326	228	403	31	15	24	259	330	273	201	203	115	2986
< 20.0	34	25	16	14	81	16	73	2		1	17	54	180	99	98	66	776
< 29.0							1						3	3	13	1	21
< 39.0																	
>= 39.0																	
Totals	236	371	453	379	726	577	1103	304	252	321	867	1002	797	489	441	290	

Calm : 1.95 %

Total # Operational Hours : 8780

Class Limits (KPH)



Passive Monitoring Annual Summaries

Sulphur Dioxide

PASSIVE AMBIENT AIR MONITORING ANNUAL

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION

Company

LICA Airshed

Project Number

LICA Airshed

Location

12/29/2011

Date Samples Start

12/31/2012

Date Sampled End

SO2 (ppb)

Station	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Average	Maximum
2	0.2	0.2	0.3	0.3	<0.1	<0.1	0.2	0.1	<0.1	0.1	0.2	0.3	0.2	0.3
2 DUP	NA	NA	NA	NA	NA	NA	NA	0.2	NA	NA	NA	NA	0.2	0.2
3	0.5	0.6	0.4	0.3	0.1	0.2	0.3	0.2	0.1	0.1	0.5	0.5	0.3	0.6
3 DUP	NA	NA	NA	NA	NA	NA	NA	0.2	NA	NA	NA	NA	0.2	0.2
4	0.7	0.7	0.5	0.4	0.2	0.2	0.5	0.4	0.5	0.4	0.6	0.8	0.5	0.8
4 DUP	NA	NA	NA	NA	NA	NA	NA	NA	0.6	NA	NA	NA	0.6	0.6
5	0.7	0.7	0.5	0.3	0.2	0.2	0.5	0.4	0.2	0.2	0.4	0.7	0.4	0.7
5 DUP	NA	NA	NA	NA	NA	NA	NA	NA	0.3	NA	NA	NA	0.3	0.3
6	0.5	0.5	0.4	0.3	NA	0.3	0.7	0.6	0.3	0.2	0.5	0.7	0.5	0.7
6 DUP	NA	NA	NA	NA	NA	NA	NA	NA	0.4	NA	NA	NA	0.4	0.4
8	NA	0.7	0.4	0.2	0.2	0.8	1.2	0.6	0.3	0.2	0.4	0.6	0.5	1.2
8 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4	NA	NA	0.4	0.4
9	0.6	0.7	0.4	0.4	0.2	0.2	0.4	0.3	0.2	0.2	0.4	0.5	0.4	0.7
9 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2	NA	NA	0.2	0.2
10	0.3	0.5	0.5	0.4	0.2	0.2	0.3	0.3	0.2	0.3	0.6	0.7	0.4	0.7
10 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4	NA	0.4	0.4
11	0.3	0.4	0.4	0.4	0.1	0.1	0.2	0.1	<0.1	0.4	0.4	0.5	0.3	0.5
11DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4	NA	0.4	0.4
12	0.5	0.9	0.4	0.3	0.1	0.1	0.5	0.2	0.2	0.4	0.5	0.6	0.4	0.9
12 DUP	0.5	0.8	NA	NA	NA	NA	NA	NA	NA	NA	0.5	NA	0.6	0.8
13	1	1	0.6	0.4	0.3	0.2	0.3	0.3	0.2	0.4	0.5	0.8	0.5	1
13 DUP	1.1	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.9	1.0	1.1
14	1.2	1.6	0.9	1	1	0.7	0.7	1.1	0.7	0.8	1	1.3	1.0	1.6
14 DUP	1.2	1.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2	1.3	1.6
15	0.5	0.7	0.4	0.3	0.2	0.4	0.4	0.3	0.2	0.3	0.5	0.6	0.4	0.7
15 DUP	NA	NA	0.4	NA	NA	NA	NA	NA	NA	0.3	NA	0.6	0.4	0.6
16	0.6	0.6	0.4	0.3	0.1	0.1	0.3	0.3	0.3	0.3	0.4	0.7	0.4	0.7
16 DUP	NA	NA	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.5	0.5
17	0.7	0.6	0.4	0.3	0.2	0.3	0.7	0.5	0.4	0.3	0.5	1	0.5	1
17 DUP	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4	0.4
18	0.4	0.6	0.3	0.4	0.2	<0.1	0.2	0.2	0.1	0.2	0.4	0.5	0.3	0.6
18 DUP	NA	NA	NA	0.3	NA	NA	NA	NA	NA	NA	NA	NA	0.3	0.3
19	0.5	0.6	0.4	0.3	0.2	<0.1	0.2	0.2	0.1	0.3	0.4	0.7	0.4	0.7
19 DUP	NA	NA	NA	0.3	NA	NA	NA	NA	NA	NA	NA	NA	0.3	0.3
22	0.4	0.6	0.2	0.3	0.1	0.2	0.3	0.2	0.2	0.3	0.3	0.5	0.3	0.6
22 DUP	NA	NA	NA	NA	0.1	NA	NA	NA	NA	NA	NA	NA	0.1	0.1
23	0.3	NA	0.4	0.3	<0.1	0.1	0.1	0.3	0.1	0.2	0.3	0.4	0.3	0.4
23 DUP	NA	NA	NA	NA	0.2	NA	NA	NA	NA	NA	NA	NA	0.2	0.2
24	0.4	0.5	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.7	0.3	0.7
24 DUP	NA	NA	NA	NA	0.1	NA	NA	NA	NA	NA	NA	NA	0.1	0.1
25	0.5	0.9	0.4	0.3	0.2	0.3	0.5	0.7	0.5	0.8	0.6	0.9	0.6	0.9
25 DUP	NA	NA	NA	NA	NA	0.3	NA	NA	NA	NA	NA	NA	0.3	0.3
26	0.7	1.1	0.9	0.7	0.6	0.3	0.6	0.3	0.6	0.4	0.9	0.9	0.7	1.1
26 DUP	NA	NA	NA	NA	NA	0.3	NA	NA	NA	NA	NA	NA	0.3	0.3
27	1.3	1.8	0.8	0.5	0.9	0.5	1.2	1.3	1.3	1	0.9	1	1.0	1.8
27 DUP	NA	NA	NA	NA	NA	0.5	NA	NA	NA	NA	NA	NA	0.5	0.5
28	0.5	0.6	0.4	0.4	0.6	0.4	1	0.6	0.6	0.5	0.5	0.6	0.6	1
28 DUP	NA	NA	NA	NA	NA	NA	0.9	NA	NA	NA	NA	NA	0.9	0.9
29	0.4	0.6	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.4	0.4	0.5	0.4	0.6
29 DUP	NA	NA	NA	NA	NA	NA	0.4	NA	NA	NA	NA	NA	0.4	0.4
32	0.6	0.6	0.6	0.4	0.2	0.2	0.3	0.3	0.2	0.4	0.8	0.8	0.5	0.8
32 DUP	NA	NA	NA	NA	NA	NA	0.3	NA	NA	NA	NA	NA	0.3	0.3
34	0.4	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.5	0.5
36	NA	NA	0.4	0.3	0.1	0.1	0.4	0.3	0.2	0.3	0.5	0.8	0.3	0.8
36 DUP	NA	NA	NA	NA	NA	NA	NA	0.3	NA	NA	NA	NA	0.3	0.3
Average	0.6	0.8	0.5	0.4	<0.3	<0.3	0.5	0.4	<0.3	0.4	0.5	0.7		
Maximum	1.3	1.8	0.9	1.0	1.0	0.8	1.2	1.3	1.3	1.0	1.0	1.3		

Hydrogen Sulphide

PASSIVE AMBIENT AIR MONITORING ANNUAL

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION

Company

LICA Airshed

Project Number

LICA Airshed

Location

12/29/2011

Date Samples Start

12/31/2012

Date Sampled End

H2S (ppb)

Station	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Average	Maximum
5	0.09	0.1	0.1	0.1	0.06	0.21	0.25	0.37	0.27	0.14	0.15	0.21	0.17	0.37
5 DUP	NA	NA	NA	NA	NA	NA	NA	0.39	NA	NA	NA	NA	0.39	0.39
3	0.09	0.1	0.11	0.11	0.11	0.11	0.2	0.17	0.15	0.09	0.15	0.18	0.13	0.2
3 DUP	NA	NA	NA	NA	NA	NA	0.22	NA	NA	NA	NA	NA	0.22	0.22
10	0.1	0.12	0.1	0.12	0.1	0.13	0.35	0.08	0.13	0.08	0.12	0.14	0.13	0.35
10 DUP	NA	NA	NA	NA	NA	NA	NA	0.15	NA	NA	NA	NA	0.15	0.15
11	0.07	0.08	0.07	0.06	0.07	0.04	0.12	0.08	0.09	0.07	0.14	0.15	0.09	0.15
11 DUP	NA	NA	NA	NA	NA	NA	NA	0.09	NA	NA	NA	NA	0.09	0.09
12	0.1	0.1	0.09	0.06	0.07	0.07	0.13	<0.02	0.09	0.08	0.11	0.16	<0.09	0.16
12 DUP	NA	NA	NA	NA	NA	NA	NA	0.07	NA	NA	NA	NA	0.07	0.07
13	0.1	0.09	0.07	0.06	0.06	0.07	0.14	<0.02	0.09	0.07	0.08	0.16	<0.08	0.16
13 DUP	NA	NA	NA	NA	NA	NA	NA	0.07	NA	0.07	NA	NA	0.07	0.07
14	0.15	0.14	0.12	0.1	0.06	0.12	0.12	0.09	0.14	0.1	0.16	0.2	0.13	0.2
14 DUP	0.13	0.19	NA	NA	NA	NA	NA	NA	NA	0.1	NA	NA	0.14	0.19
16	0.12	0.12	0.13	0.1	0.11	0.09	0.23	0.18	0.12	0.11	0.13	0.17	0.13	0.23
16 DUP	0.14	0.12	NA	NA	NA	NA	NA	NA	NA	NA	0.12	NA	0.13	0.14
17	0.07	0.17	0.13	0.13	0.09	0.15	0.55	0.37	0.34	0.11	0.12	0.23	0.21	0.55
17 DUP	NA	NA	0.13	NA	NA	NA	NA	NA	NA	NA	0.16	NA	0.14	0.16
18	0.1	0.12	0.09	0.07	0.06	0.08	0.16	0.14	0.1	0.09	0.13	0.11	0.1	0.16
18 DUP	NA	NA	0.1	NA	NA	NA	NA	NA	NA	NA	NA	0.14	0.12	0.14
22	0.1	0.09	0.08	0.08	0.06	0.13	0.16	0.18	0.12	0.07	0.11	0.15	0.11	0.18
22 DUP	NA	NA	NA	0.08	NA	NA	NA	NA	NA	NA	NA	NA	0.08	0.08
24	0.13	0.12	0.12	0.09	0.07	0.13	0.17	0.24	0.14	0.07	0.14	0.17	0.13	0.24
24 DUP	NA	NA	NA	0.1	NA	NA	NA	NA	NA	NA	NA	0.21	0.15	0.21
25	0.09	0.1	0.08	0.06	0.04	0.05	0.1	0.03	0.08	0.08	0.08	0.17	0.08	0.17
25 DUP	NA	NA	NA	NA	0.06	NA	NA	NA	NA	NA	NA	NA	0.06	0.06
26	0.17	0.14	0.15	0.07	0.2	0.11	0.17	0.14	0.07	0.12	0.22	0.28	0.15	0.28
26 DUP	NA	NA	NA	NA	0.24	NA	NA	NA	NA	NA	NA	NA	0.24	0.24
27	0.13	0.11	0.11	<0.02	0.23	0.11	0.66	0.74	0.37	0.36	0.21	0.2	<0.27	0.74
29	0.12	0.12	0.08	0.06	0.06	0.12	0.49	0.21	0.11	0.1	0.13	0.16	0.15	0.49
29 DUP	NA	NA	NA	NA	NA	0.11	NA	NA	NA	NA	NA	NA	0.11	0.11
32	0.1	0.13	0.1	0.13	0.09	0.16	0.23	0.1	0.16	0.11	0.14	0.19	0.14	0.23
32 DUP	NA	NA	NA	NA	NA	0.13	NA	NA	NA	NA	NA	NA	0.13	0.13
34	0.13	0.16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.14	0.16
36	NA	NA	0.09	0.09	0.07	0.11	0.19	0.13	0.16	0.11	0.12	0.23	0.13	0.23
36 DUP	NA	NA	NA	NA	NA	NA	0.22	NA	NA	NA	NA	NA	0.22	0.22
Average	0.11	0.12	0.1	<0.08	0.1	0.11	0.24	<0.19	0.14	0.11	0.14	0.18		
Maximum	0.17	0.19	0.15	0.13	0.24	0.21	0.66	0.74	0.37	0.36	0.22	0.28		

Nitrogen Dioxide

PASSIVE AMBIENT AIR MONITORING ANNUAL

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION

Company

LICA Airshed

Project Number

LICA Airshed

Location

12/29/2011

Date Samples Start

12/31/2012

Date Sampled End

NO2 (ppb)

Station	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Average	Maximum
2	1.5	1.5	0.9	0.6	0.4	0.7	0.5	0.4	0.4	0.8	2.5	3.6	1.2	3.6
2 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.1	NA	2.1	2.1
3	3	1.9	0.7	0.5	0.5	1	0.5	0.6	0.8	1.2	2.7	3.6	1.4	3.6
3 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.3	NA	2.3	2.3
4	1.7	1.6	0.6	0.4	0.4	0.8	0.5	0.5	0.8	1	2.3	3.7	1.2	3.7
4 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.5	3.5	3.5
5	2.2	1.9	1.1	0.4	0.3	0.8	0.4	0.4	0.7	0.9	2	3.2	1.2	3.2
5 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.2	3.2	3.2
6	2.7	2.5	1.4	0.9	NA	1.4	0.9	1.6	1.9	1.7	3.3	4.7	2.1	4.7
8	2	1.3	0.6	0.4	0.3	1	0.3	0.4	0.4	1	1.6	2.1	1	2.1
9	2.7	1.9	0.8	0.8	0.7	1	0.8	1.2	0.8	1.7	2.4	3.6	1.5	3.6
9 DUP	2.3	2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.2	2.3
10	4.9	4.2	1.3	1.4	1.3	1.5	1.5	1.8	1.8	2.9	3.7	5.2	2.6	5.2
10 DUP	3.9	4.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4	4.2
11	0.9	0.9	0.4	0.6	0.2	0.3	0.3	0.3	0.4	0.6	1.4	1.8	0.7	1.8
11 DUP	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4	0.4
12	1.8	2.2	0.9	0.7	1.2	3.5	0.4	0.8	1.4	1.4	2.2	4.4	1.7	4.4
12 DUP	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	1
13	2.5	1.4	0.5	0.5	0.3	0.8	0.4	0.4	0.7	0.7	2.2	1.8	1	2.5
13 DUP	NA	NA	NA	0.5	NA	NA	NA	NA	NA	NA	NA	NA	0.5	0.5
14	3.2	2.1	0.8	0.8	0.5	0.5	0.5	0.9	0.9	1.5	2.2	2.6	1.4	3.2
14 DUP	NA	NA	NA	0.8	NA	NA	NA	NA	NA	NA	NA	NA	0.8	0.8
15	2.6	2	0.8	0.3	0.4	0.6	0.6	0.8	1.1	1.5	2	2.9	1.3	2.9
15 DUP	NA	NA	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	0.4	0.4
16	3.8	2.6	1.2	0.7	0.6	0.7	1.5	0.8	1	1.5	3.7	4.9	1.9	4.9
16 DUP	NA	NA	NA	NA	0.6	NA	NA	NA	NA	NA	NA	NA	0.6	0.6
17	3.5	2.3	1.2	1.2	0.8	1.2	0.8	1.1	1.5	1.2	3.7	3.9	1.9	3.9
17 DUP	NA	NA	NA	NA	NA	1.6	NA	NA	NA	NA	NA	NA	1.6	1.6
18	2.5	1.6	0.7	0.6	0.5	0.6	0.4	0.4	0.8	1	2.5	2.7	1.2	2.7
18 DUP	NA	NA	NA	NA	NA	0.8	NA	NA	NA	NA	NA	NA	0.8	0.8
19	1.6	1.5	0.6	0.3	0.4	0.4	0.3	0.5	0.4	0.7	2	1.9	0.9	2
19 DUP	NA	NA	NA	NA	NA	NA	0.3	NA	NA	NA	NA	NA	0.3	0.3
22	3	2.8	1.3	1	0.6	0.6	0.4	0.5	0.9	1.7	2.7	3.2	1.6	3.2
22 DUP	NA	NA	NA	NA	NA	NA	0.4	NA	NA	NA	NA	NA	0.4	0.4
23	0.8	0.9	0.2	<0.1	<0.1	0.1	<0.1	0.1	0.2	0.3	0.8	1.2	<0.4	1.2
23 DUP	NA	NA	NA	NA	NA	NA	NA	0.1	NA	NA	NA	NA	0.1	0.1
24	3.6	2.9	1.6	1.3	1.1	1.5	1.3	1.4	2	2.1	4.4	6	2.4	6
24 DUP	NA	NA	NA	NA	NA	NA	NA	2.1	NA	NA	NA	NA	2.1	2.1
28	7	7.3	4.1	2.2	2	1.7	1.2	1.9	2.5	3.4	6.9	8.6	4.1	8.6
28 DUP	NA	NA	NA	NA	NA	NA	NA	NA	2.4	NA	NA	NA	2.4	2.4
29	4.3	3.7	1.4	0.7	0.5	0.5	0.4	0.9	0.7	1.3	2.5	4.8	1.8	4.8
29 DUP	NA	NA	NA	NA	NA	NA	NA	NA	0.8	NA	NA	NA	0.8	0.8
32	1.7	1.5	0.6	0.3	0.2	0.3	0.2	0.3	0.3	0.6	1.9	2.4	0.9	2.4
32 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6	NA	NA	0.6	0.6
34	4.5	4.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.3	4.5
36	NA	NA	2.1	1.1	1	1.3	1.2	1.5	2.5	3.4	3.9	6.3	2.4	6.3
36 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.2	NA	NA	3.2	3.2
Average	2.9	2.4	1	<0.7	<0.6	1	<0.6	0.8	1.1	1.5	2.7	3.7		
Maximum	7	7.3	4.1	2.2	2	3.5	1.5	2.1	2.5	3.4	6.9	8.6		

Ozone

PASSIVE AMBIENT AIR MONITORING ANNUAL

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION

Company

LICA Airshed

Project Number

LICA Airshed

Location

12/29/2011

Date Samples Start

12/31/2012

Date Sampled End

O3 (ppb)

Station	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Average	Maximum
2	22.3	26	29.9	32.2	26.3	25.8	17.2	13.3	12.8	14.6	22.8	17.6	21.7	32.2
2 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	21.3	NA	21.3	21.3
3	27.6	31.1	41.2	36.2	30	26.2	22.3	19.2	18.4	18.8	21.7	22.9	26.3	41.2
3 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23.8	NA	23.8	23.8
4	33.5	38.2	42.3	36.3	32.4	27.2	23.8	18.8	19.9	24.4	23.2	23.9	28.7	42.3
4 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	25.4	25.4	25.4
5	25.6	30	34.6	31.3	34.7	22.7	20.3	19	19.6	20.5	21.7	22.9	25.2	34.7
5 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22.9	22.9	22.9
6	25.7	28.8	37	31.9	34	31.3	21.6	19	17.5	23.8	24.3	22.3	26.4	37
8	32.6	35	38.6	38.8	NA	27.2	22.1	21.6	21.6	26.1	28	27.5	29	38.8
9	29.9	39.2	40.2	33.3	32.1	24.9	21.4	17.9	17.6	21.1	27	22.2	27.2	40.2
9 DUP	28.8	34.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31.9	34.9
10	24.6	29.1	35.4	31.3	28.8	20.7	19.1	15.1	18.1	16.1	22.8	20.7	23.5	35.4
10 DUP	24.9	29.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	27.1	29.3
11	23.9	28.8	33.1	30.5	28.3	21	16.2	12.3	12.4	13.5	18.9	19.6	21.5	33.1
11 DUP	NA	NA	31.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	31.1	31.1
12	27	28.3	33.7	32.9	24.1	23.5	20.4	18.9	13.9	17.5	23	21.3	23.7	33.7
12 DUP	NA	NA	32.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	32.5	32.5
13	29.4	37.6	38.9	34.2	33.3	24.9	22	15.9	18.6	20.6	27.3	23.3	27.2	38.9
13 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	27.3	29.9	37.4	35.5	34.3	25.8	24.1	20.1	17.8	18.3	21.9	21.6	26.2	37.4
14 DUP	NA	NA	NA	34.6	NA	NA	NA	NA	NA	NA	NA	NA	34.6	34.6
15	27	30.2	35.7	36.6	31.1	26.3	21	17.3	16.8	19.2	23.9	21.4	25.5	36.6
15 DUP	NA	NA	NA	NA	32.4	NA	NA	NA	NA	NA	NA	NA	32.4	32.4
16	24.3	29.8	38.1	36.3	30.7	24	25.5	18.7	18.4	19.7	22.7	21.4	25.8	38.1
16 DUP	NA	NA	NA	NA	31.4	NA	NA	NA	NA	NA	NA	NA	31.4	31.4
17	27.9	33.8	38.7	31.5	32.7	26.1	28.1	16.4	17.2	22.6	25.6	23.4	27	38.7
17 DUP	NA	NA	NA	NA	NA	26.3	NA	NA	NA	NA	NA	NA	26.3	26.3
18	25.2	30.8	33.6	33.8	27.9	21.3	19.4	15.8	16.4	18.3	24.5	22.8	24.2	33.8
18 DUP	NA	NA	NA	NA	NA	23.3	NA	NA	NA	NA	NA	NA	23.3	23.3
19	30.3	35.2	35.6	34.5	31.4	26.4	23.8	18.3	22.3	23.7	25.3	25.5	27.7	35.6
19 DUP	NA	NA	NA	NA	NA	NA	23	NA	NA	NA	NA	NA	23	23
22	24.8	28.4	35.1	35.2	28.3	22.5	19.6	15.2	16.4	19.1	22.3	20	23.9	35.2
22 DUP	NA	NA	NA	NA	NA	NA	18.8	NA	NA	NA	NA	NA	18.8	18.8
23	22.7	27.1	33.6	36.1	25.4	22.1	19	12.9	11.8	16.3	23	20.4	22.5	36.1
23 DUP	NA	NA	NA	NA	NA	NA	NA	12.6	NA	NA	NA	NA	12.6	12.6
24	26.1	30.3	37.9	31.1	32.3	26.5	24.4	19.1	17.5	23.5	24	19.6	26	37.9
24 DUP	NA	NA	NA	NA	NA	NA	NA	20.7	NA	NA	NA	NA	20.7	20.7
28	22.7	25.8	28.1	30.1	30.2	26.9	26.7	18.8	17.4	18.8	23.6	17.2	23.9	30.2
28 DUP	NA	NA	NA	NA	NA	NA	NA	NA	16.7	NA	NA	NA	16.7	16.7
29	25.5	26.1	33.2	33.1	33	26.2	22.6	18.1	17.9	21.6	24.5	21	25.2	33.2
29 DUP	NA	NA	NA	NA	NA	NA	NA	NA	17.1	NA	NA	NA	17.1	17.1
32	30.1	35.9	40.6	40.8	34.9	39	33.9	27.1	NA	27.8	26.1	24.4	32.8	40.8
32 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	22.4	NA	NA	22.4	22.4
34	25.6	30.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	28.2	30.7
36	NA	NA	26.1	33.1	31.8	32.8	29.3	24.1	21.2	18.4	23.2	21.2	26.1	33.1
36 DUP	NA	NA	NA	NA	NA	NA	NA	NA	NA	22.3	NA	NA	22.3	22.3
Average	26.7	31.2	35.5	34	30.9	25.8	22.5	17.9	17.4	20.3	23.7	22		
Maximum	33.5	39.2	42.3	40.8	34.9	39	33.9	27.1	22.3	27.8	28	27.5		

Lakeland Industry & Community Association

Maskwa Monitoring Site
Ambient Annual Data Report

For
2012

Prepared By:



March 11, 2013

Lakeland Industry & Community Association Ambient Air Monitoring Maskwa

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Introduction

The following Ambient Air Monitoring report was prepared for:

Mr. Mike Bisaga
Lakeland Industry & Community Association
Box 8237
5107W – 50 Street
Bonnyville, Alberta
T9N 2J5

Monitoring Location: Maskwa
Data Period: January 2012 to December 2012

The monthly ambient data report:

- Prepared by Katherine Rapske
- Reviewed by Lily Lin

Calibration Procedure

The following calibration procedure applies to all calibrations conducted at the Lakeland Industry & Community Association Air Monitoring Station.

Calibration gas concentrations are generated using a dynamic mass flow controlled calibrator. EPA Protocol one gases are diluted with zero air generated on site. The Mass Flow Controllers in the calibrator are referenced using an NIST traceable flow meter once per month. All listed flows are reported as corrected to Standard Temperature and Pressure (STP).

Generated zero gas is introduced to the analyzer first. Three concentrations of calibration gas are then generated in order to introduce points at approximately 50-80%, 25-40% & 10-20% of the analyzer's full-scale range. An auto zero and span are then performed to validate the daily zero and span values recorded to the next multi-point calibration.

All indicated concentrations are taken from the ESC data logger used to collect the data for monthly reporting.

The calibrations conducted at the LICA - Maskwa Air Monitoring Stations conform to the following Maxxam Analytics Standard Operation Procedures:

- CAL SOP-00211
- CAL SOP-00209
- CAL SOP-00213
- CAL SOP-00214
- CAL SOP-00208

Conformance of each calibration to Alberta Environment regulations is outlined in the individual calibration reports. The slope and correlation coefficient are derived from the calculated and indicated analyzer responses. The percent change is calculated using the previous calibration correction factor and the current correction factor before adjustment. All calibration's and maintenance conforms to the procedures outlined in the *Air Monitoring Directive, Appendix A-10, Section 1.6*.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – Maskwa

A trailer audit was performed by Alberta Environment in March 2012 and September 2012.

Sulphur Dioxide (PPB)

Analyzer make / model - API 100E, S/N: 508

- The analyzer spanned high on February 25th due to the zero/span pump failure. As found points check was performed on February 28th, and the result was good. The pump for the zero/span system was rebuilt following the as found points.
- A new cool fan in the analyzer was replaced on May 11th.
- Hourly data on June 10th at hour 5 is missing.
- One hourly maximum reading on August 19th at hour 6 was invalidated due to a small power outage.
- In November, following the as found points check, the UV lamp was peaked, and both the HVPS voltage and the slope were adjusted.

Hydrogen Sulphide (PPB)

Analyzer make / model - API 101E, S/N: 511

Analyzer make / model - API 101E, S/N: 511 (January 2012 to December 2012) replaced to API 101A, S/N: 324 (December 2012)

- Hourly data on June 10th at hour 5 is missing
- One hourly maximum reading on August 19th at hour 6 was invalidated due to a small power outage.
- The analyzer spanned low on September 20th. During the site visit on the 22nd, it was found that the wire for the daily calibration system was loose. Tightened the wire and ran a zero/span check on September 22nd. The check result was good. No data was invalidated due to this issue.
- In November, following the as found points check, the SO₂ scrubber material was replaced, the exhaust pump was rebuilt, the UV lamp was peaked, and both the HVPS voltage and the slope were adjusted.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – Maskwa

Hydrogen Sulphide (PPB) (continued)

Analyzer make / model - API 101E, S/N: 511

Analyzer make / model - API 101E, S/N: 511 (January 2012 to December 2012) replaced to API 101A, S/N: 324 (December 2012)

- The analyzer spanned low and the daily zero drifted on December 23rd. An as found points check was performed on December 24th, the result was outside -10% of the limited range. After the investigation, it was concluded that the issue was due to the relay board failure. As there was no spare part available, the analyzer was left on the Maintenance mode.
- The API 101A analyzer was installed on December 28th. The analyzer was allowed time to stabilize, then a daily zero/span check was performed. The check result was OK. An installation calibration was performed on API 101A analyzer on January 3rd, 2013. As we are not sure when the relay board failed, the data was invalidated back to the last good calibration check, which was hour 18 on December 22nd. A total of 137 hours of data was invalidated.

Total HydroCarbon (PPM)

Analyzer make / model –TECO 51C-LT, S/N: 436609738

- Both the H2 and CH4 gas cylinders were replaced on January 12th following a daily zero/span check.
- Both the H2 and CH4 gas cylinders were replaced on February 15th.
- Following an as found points check on May 11th, the inside pump was rebuilt.
- The H2 gas cylinder was replaced on April 25th.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – Maskwa

Total HydroCarbon (PPM) (continued)

Analyzer make / model –TECO 51C-LT, S/N: 436609738

- Hourly data on June 10th at hour 5 is missing. The H2 gas cylinder was replaced on June 11th. The CH4 gas cylinder was changed on June 25th. A daily calibration check was run following the CH₄ gas cylinder replacement.
- The H2 gas cylinder was replaced on July 10th
- The span gas cylinder was replaced on August 13th.
- One hourly maximum reading on August 19th at hour 6 was invalidated due to a small power outage.
- In December 2012, the last span point of the monthly calibration is missing due to operator error. However, the daily calibration results were good, which is indicative that the analyzer is functioning properly. Therefore, it is assumed that the data recorded this month is accurate.

Nitrogen Dioxide (PPB)

Analyzer make / model - API 200E, S/N: 594

- It was noticed that the analyzer spanned low on December 29th 2011. Following the as found points check on January 1st 2012, the permeation tube was replaced. The expected span value was adjusted after the perm tube was stabilized on January 5th.
- Hourly data on June 10th at hour 5 is missing.
- One hourly maximum reading on August 19th at hour 6 was invalidated due to a small power outage.
- In October 2012, the O-ring was replaced and the HVPS voltage and slope adjusted, as well as the IZS temperature.
- In November 2012, the exhaust scrubber material was replaced, and the exhaust pump was rebuilt.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – Maskwa

Vector Wind Speed (KPH) & Vector Wind Direction (DEG)

System make / model - RM Young 5103 VK, S/N: 56589 (January 2012 to February 2012)

System make / model - MetOne 50.5H Sonic, S/N: H10703 (February 2012 to December 2012)

- The MetOne wind system was installed on February 23rd, 2012. The manufacturer calibration was performed on December 20th, 2011.
- Wind speed maximum reading recorded on February 28th at hour of 2 was invalidated as the reading went above the full scale; reason unknown.
- Hourly data on June 10th at hour 5 is missing.
- WS maximum data on June 22nd at hour 22nd was invalidated as the reading went above the full scale.
- WS maximum data on July 9th at hour 2 was invalidated as the reading went above the full scale.
- One hourly maximum reading for wind speed on August 19th at hour 6 was invalidated due to a small power outage.
- Five hours of WS maximum data were invalidated as the reading went above the full scale.
- The wind speed maximum reading recorded on November 30th at hour 18 was invalidated, as the value went above the full scale.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – Maskwa

Relative Humidity (PERCENT)

System make / model - Met One 083

- The sensor was checked and audited on May 16th; the reading was good.
- Hourly data on June 10th at hour 5 is missing.

Precipitation (MM)

System make / model - Met One 387

- A new rain gauge was installed on April 10th. It was suspected the heater on the old rain gauge was not working properly.
- Hourly data on June 10th at hour 5 is missing.
- During the site visit on December 24th, the heater for the rain gauge sensor was checked. It was found that the heater was not working efficiently. The rain gauge sensor with a heater was replaced on January 16, 2013. Data collected in December should be used with caution.

Barometric Pressure (MILLIBAR)

System make / model - Met One 092

- The sensor was checked and audited on May 16th; the result was good.
- Hourly data on June 10th at hour 5 is missing.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – Maskwa

Ambient Temperature (DEGC)

System make / model - Met One 060

- Hourly data on June 10th at hour 5 is missing.

Trailer Temperature (DEG C)

System make / model – R&R 61

- The sensor was checked and audited on May 16th; the result was good.
- Hourly data on June 10th at hour 5 is missing.

Standard Deviation Wind Direction (DEG)

System make / model –Met One 50.5H

- Hourly data on June 10th at hour 5 is missing.

Datalogger

System make / model - ESC 8832

Software make/version - ESC v 5.51a

- No operational issues were observed during 2012.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – Maskwa

Trailer

- A throw-away filter for the HVAV heating/cooling system was replaced on May 11th.
- A field camera was installed and mounted on the wind tower on May 16th.
- The motor for the fan on the pump was replaced on May 31st.

Continuous Monitoring

Sulphur Dioxide

Current Date : 03/11/13
Current Time : 08:16

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA30 Logger Id : 30 Parameter : SO2_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	707	0	15	1
February	696	655	0	12	1
March	744	706	0	11	1
April	720	683	0	12	1
May	744	707	0	19	1
June	720	683	0	9	0
July	744	706	0	7	0
August	744	708	0	14	1
September	720	682	0	8	0
October	744	707	0	9	0
November	720	677	0	10	1
December	744	706	0	12	1
Yearly Total	8784	8327	0	19	1

SO₂ Peak Reading of One Hour Averages for 2012

Plant Operator: LICA Plant Location MASKWA

Month	SO2 ppb Peak Reading
January	15
February	12
March	11
April	12
May	19
June	9
July	7
August	14
September	8
October	9
November	10
December	12
ANNUAL PEAK	19

LICA30
SO2_ / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 30
Site Name : LICA30
Parameter : SO2_
Units : PPB

Wind Parameter : WDR
Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 20	4.97	6.54	8.37	5.41	4.57	5.53	5.77	4.90	5.86	11.14	8.01	5.31	6.17	7.77	5.32	4.27	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	4.97	6.54	8.37	5.41	4.57	5.53	5.77	4.90	5.86	11.14	8.01	5.31	6.17	7.77	5.32	4.27	

Calm : .00 %

Total # Operational Hours : 8323

Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 20	414	545	697	451	381	461	481	408	488	928	667	442	514	647	443	356	8323
< 60																	
< 110																	
< 170																	
< 340																	
>= 340																	
Totals	414	545	697	451	381	461	481	408	488	928	667	442	514	647	443	356	

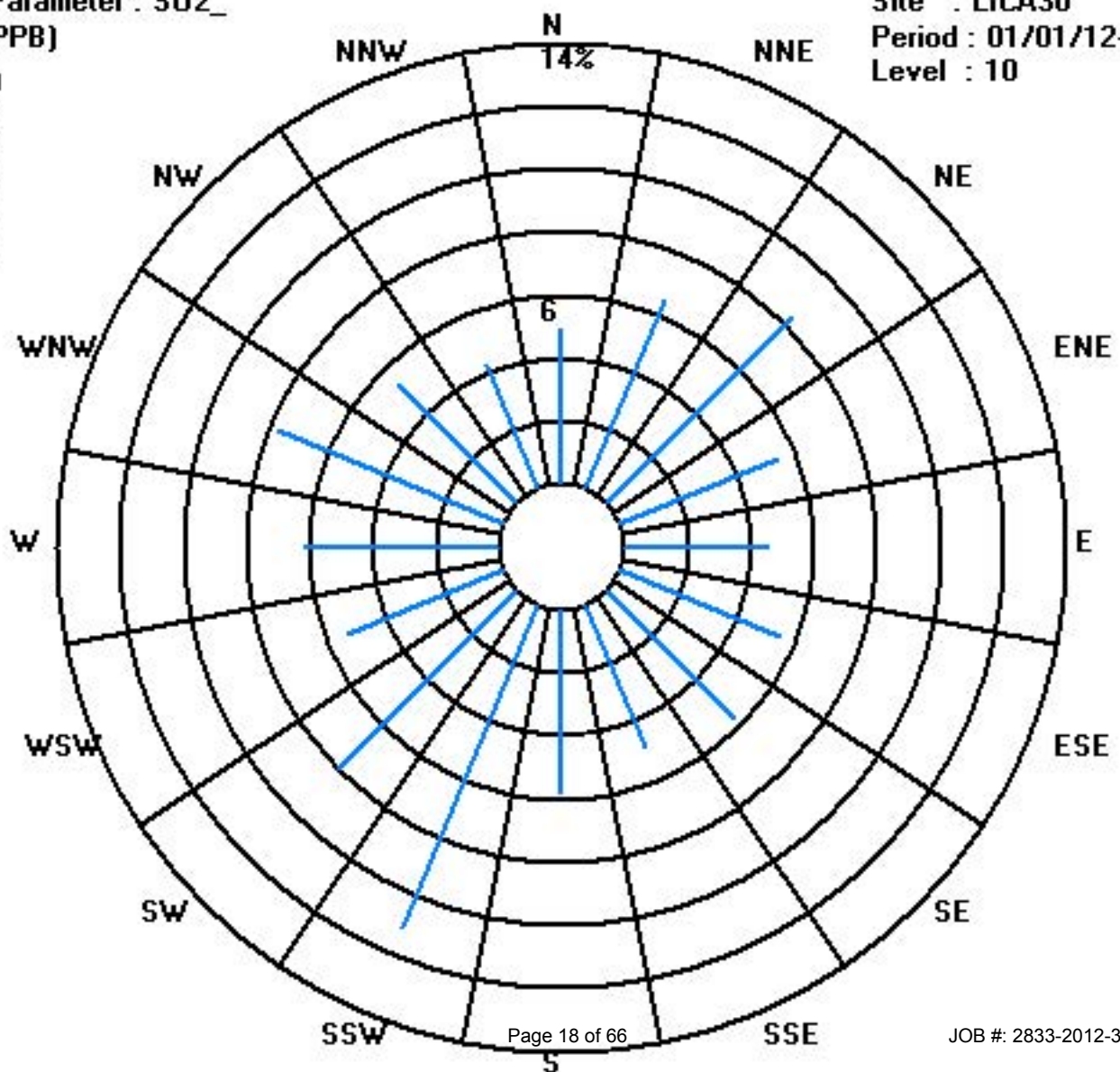
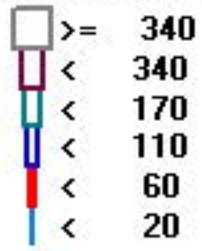
Calm : .00 %

Total # Operational Hours : 8323

Class Limits (PPB)

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

Level : 10



Hydrogen Sulphide

Current Date : 03/11/13
Current Time : 08:16

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA30 Logger Id : 30 Parameter : H2S_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	705	0	1	0
February	696	660	0	4	0
March	744	704	0	1	0
April	720	683	0	1	0
May	744	709	0	2	0
June	720	684	0	5	0
July	744	707	0	4	0
August	744	708	0	3	0
September	720	679	0	4	0
October	744	707	0	3	0
November	720	679	0	2	0
December	624	573	0	1	0
Yearly Total	8664	8198	0	5	0

H₂S Monthly Averages and Frequency Distributions of One Hour Readings - 2012

Plant Operator: LICA

Plant Location: MASKWA

Month	Number of Readings	Operational Time (%)	% Readings in Concentration Range (ppb H ₂ S)				24-Hour Averages Above Guidelines	Hourly Readings Above Guidelines	H ₂ S ppb Monthly Average
			0 to 3 ppb	4 to 10 ppb	11 to 50 ppb	>50 ppb			
January	705	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.14
February	660	99.9	99.8%	0.2%	0.0%	0.0%	0	0	0.19
March	704	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.26
April	683	100.0	100.0%	0.0%	0.0%	0.0%	0	0	0.30
May	709	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.21
June	684	99.9	99.6%	0.4%	0.0%	0.0%	0	0	0.17
July	707	100.0	99.9%	0.1%	0.0%	0.0%	0	0	0.23
August	708	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.30
September	679	100.0	99.7%	0.0%	0.0%	0.0%	0	0	0.28
October	707	100.0	100.0%	0.0%	0.0%	0.0%	0	0	0.17
November	679	99.3	100.0%	0.0%	0.0%	0.0%	0	0	0.21
December	573	81.5	100.0%	0.0%	0.0%	0.0%	0	0	0.23
							Annual Average		0.23

* Valid readings - does not include calibration hours and downtime hours.

H2S Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Plant Location: MASKWA

Month	H2S ppb Peak Reading
January	1
February	4
March	1
April	1
May	2
June	5
July	4
August	3
September	4
October	3
November	2
December	1
ANNUAL PEAK	5

LICA30
H2S_ / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 30
Site Name : LICA30
Parameter : H2S_
Units : PPB

Wind Parameter : WDR
Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3	5.04	6.57	8.06	5.43	4.61	5.51	5.79	4.95	5.85	11.10	8.00	5.29	6.26	7.78	5.23	4.23	99.78
< 10	.01	.01	.02	.02	.02	.08	.01	.00	.00	.01	.00	.01	.00	.00	.00	.00	.21
< 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	5.05	6.59	8.09	5.45	4.63	5.60	5.80	4.95	5.85	11.11	8.00	5.30	6.26	7.78	5.23	4.23	

Calm : .00 %

Total # Operational Hours : 8194

Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3	413	539	661	445	378	452	475	406	480	910	656	434	513	638	429	347	8176
< 10	1	1	2	2	2	7	1			1		1					18
< 50																	
>= 50																	
Totals	414	540	663	447	380	459	476	406	480	911	656	435	513	638	429	347	

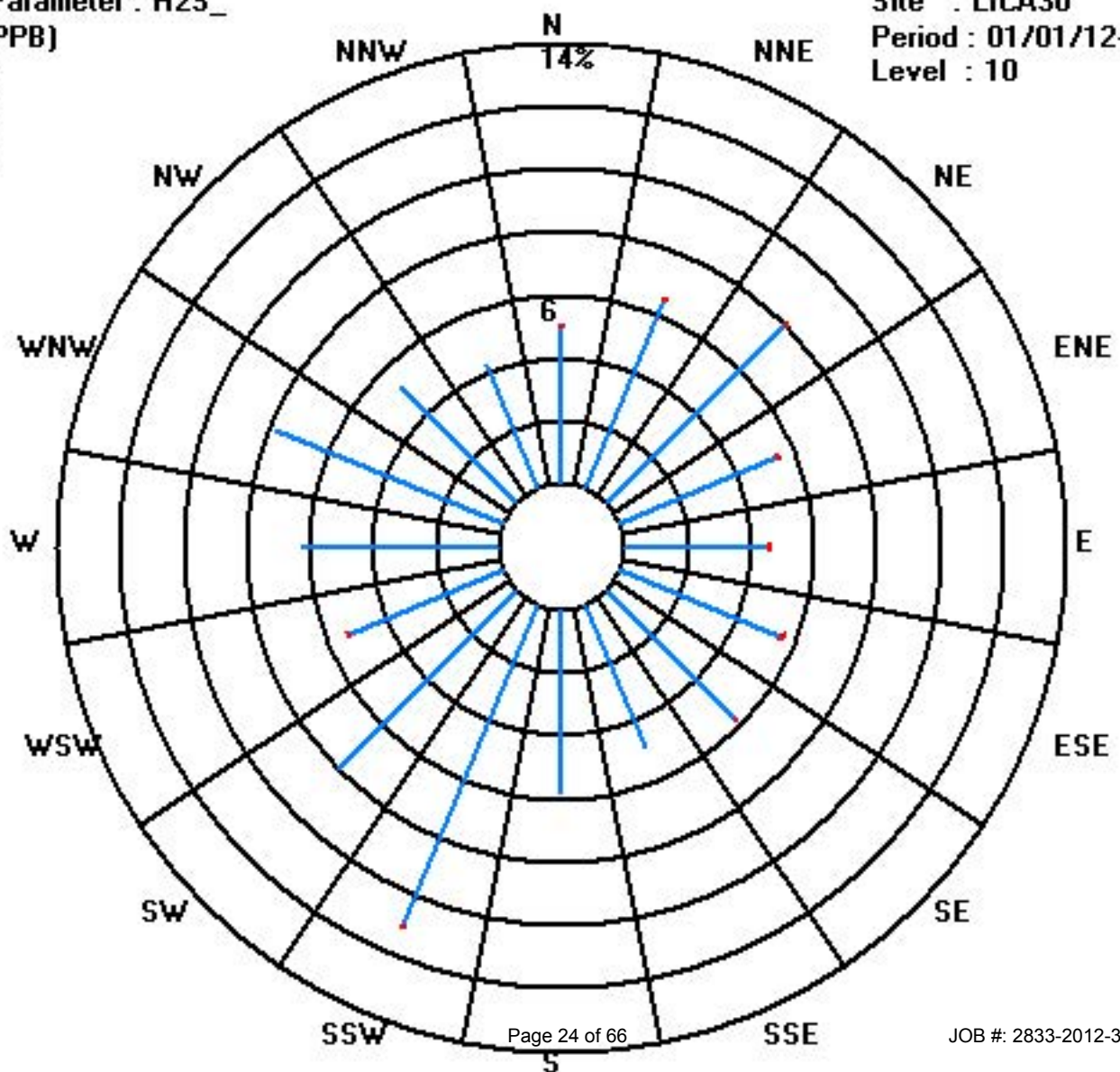
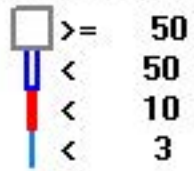
Calm : .00 %

Total # Operational Hours : 8194

Class Limits (PPB)

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

Level : 10



Total Hydrocarbons

Current Date : 03/11/13
Current Time : 08:16

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA30 Logger Id : 30 Parameter : THC Units : PPM

	Readings	Valid Readings	Min	Max	Mean
January	744	705	1.9	3.1	2.3
February	696	660	1.9	3.3	2.3
March	744	705	1.9	3.7	2.1
April	720	681	1.9	2.8	2.1
May	744	705	1.9	2.7	2.1
June	720	683	1.8	2.8	2
July	744	707	1.8	2.9	2.1
August	744	708	1.8	3.2	2.1
September	720	685	1.9	3.2	2.1
October	744	707	2	3.2	2.2
November	720	685	2	4	2.3
December	744	708	2	3.9	2.4
Yearly Total	8784	8339	1.8	4	2.2

THC Monthly Averages and Frequency Distributions of One Hour Readings - 2012

Plant Operator: LICA

Plant Location: MASKWA

Month	Number of Readings	Operational Time (%)	% Readings in Concentration Range (ppm THC)				THC ppm Monthly Average
			0 to 3 ppm	4 to 10 ppm	11 to 50 ppm	>50 ppm	
January	705	99.9	99.4%	0.6%	0.0%	0.0%	2.26
February	660	100.0	98.5%	1.5%	0.0%	0.0%	2.28
March	705	99.9	99.6%	0.4%	0.0%	0.0%	2.13
April	681	100.0	100.0%	0.0%	0.0%	0.0%	2.13
May	705	99.7	100.0%	0.0%	0.0%	0.0%	2.06
June	683	99.7	100.0%	0.0%	0.0%	0.0%	2.00
July	707	100.0	100.0%	0.0%	0.0%	0.0%	2.08
August	708	100.0	99.3%	0.7%	0.0%	0.0%	2.14
September	685	100.0	99.6%	0.4%	0.0%	0.0%	2.14
October	707	100.0	99.9%	0.1%	0.0%	0.0%	2.21
November	686	100.0	97.4%	2.6%	0.0%	0.0%	2.30
December	708	100.0	88.7%	11.3%	0.0%	0.0%	2.43
						Annual Average	2.18

* Valid readings do not include daily and monthly calibration hours and downtime hours

THC Peak Reading of One Hour Averages for 2012

Plant Operator: _____ LICA _____

Plant Location: _____ MASKWA _____

Month	THC ppm Peak Reading
January	3.1
February	3.3
March	3.7
April	2.8
May	2.7
June	2.8
July	2.9
August	3.2
September	3.2
October	3.2
November	4
December	3.9
ANNUAL PEAK	4

LICA30
 THC / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 Parameter : THC
 Units : PPM

Wind Parameter : WDR
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3.0	4.99	6.52	8.39	5.38	4.54	5.49	5.74	4.85	5.72	10.62	7.71	5.19	6.13	7.65	5.25	4.25	98.51
< 10.0	.00	.05	.08	.03	.01	.05	.03	.02	.11	.50	.27	.08	.04	.08	.04	.01	1.48
< 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	4.99	6.58	8.48	5.42	4.55	5.55	5.78	4.88	5.84	11.13	7.99	5.27	6.17	7.73	5.30	4.27	

Calm : .00 %

Total # Operational Hours : 8335

Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3.0	416	544	700	449	379	458	479	405	477	886	643	433	511	638	438	355	8211
< 10.0		5	7	3	1	5	3	2	10	42	23	7	4	7	4	1	124
< 50.0																	
>= 50.0																	
Totals	416	549	707	452	380	463	482	407	487	928	666	440	515	645	442	356	

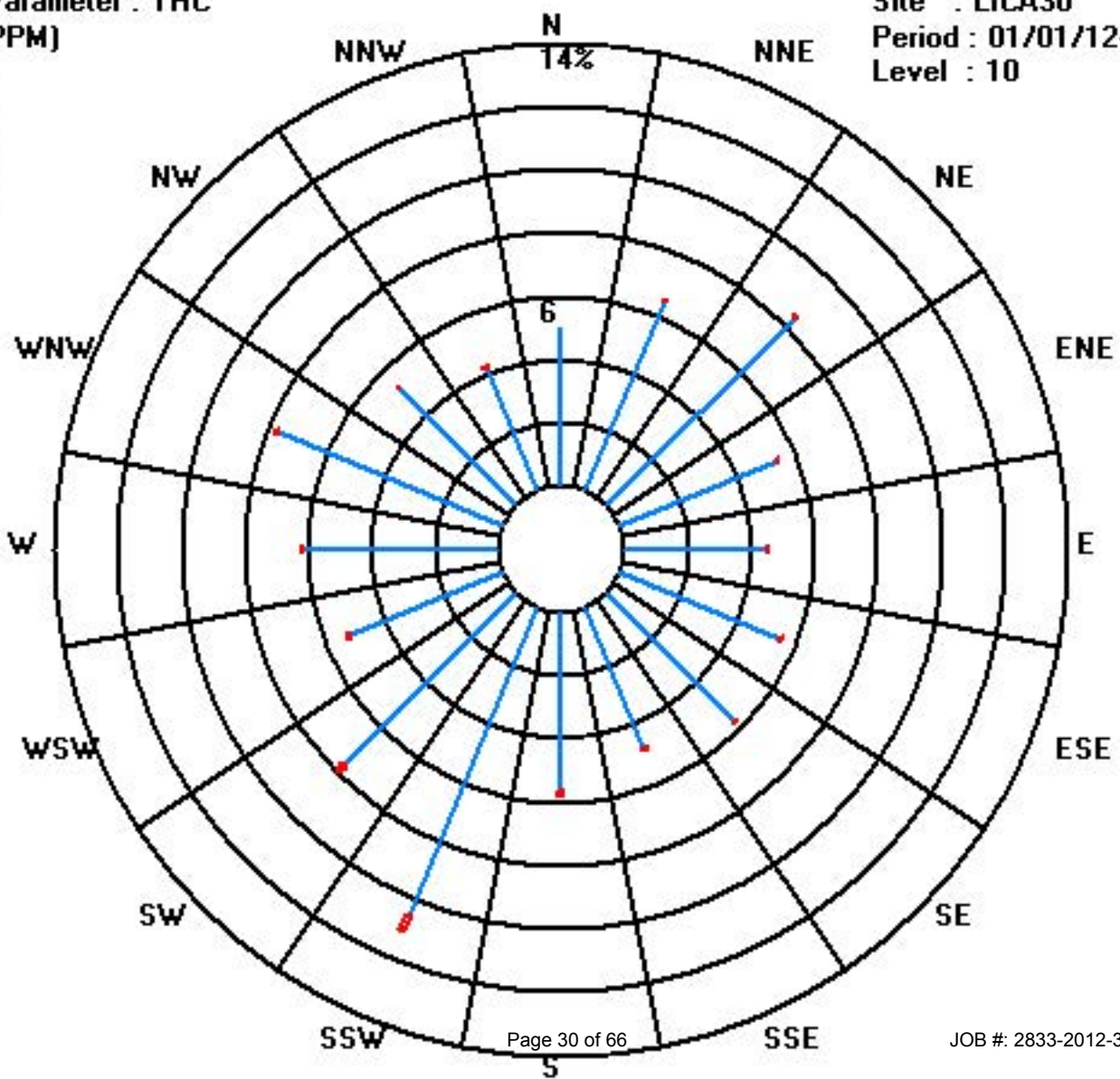
Calm : .00 %

Total # Operational Hours : 8335

Class Limits (PPM)

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

Level : 10



Nitrogen Dioxide

Current Date : 03/11/13
Current Time : 08:16

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA30 Logger Id : 30 Parameter : NO2_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	700	0	23.5	4.8
February	696	658	0	26.1	4.5
March	744	702	0	17.9	2.4
April	720	681	0	18.5	1.8
May	744	706	0	20.5	1.6
June	720	682	0	20.1	1.4
July	744	704	0	13.6	1.6
August	744	706	0	19.9	2.2
September	720	680	0	18.8	2.5
October	744	701	0	13.3	2.6
November	720	681	0	23.4	4.1
December	744	705	0	28.1	5.1
Yearly Total	8784	8306	0	28.1	2.9

NO₂ Monthly Averages and Frequency Distributions of One Hour Readings - 2012

Plant Operator: _____ LICA _____

Station: _____ MASKWA _____

Month	Number of Readings	Operational Time (%)	% Readings in Concentration Range (ppm NO ₂)				24-Hour Averages Above Guidelines	Hourly Readings Above Guidelines	NO ₂ ppm Monthly Average
			0 to 0.05 ppm	0.051 to 0.11 ppm	0.111 to 0.210 ppm	> 0.21 ppm			
January	700	99.7	100.0%	0.0%	0.0%	0.0%	0	0	0.00
February	658	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.00
March	702	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.00
April	681	100.0	100.0%	0.0%	0.0%	0.0%	0	0	0.00
May	706	100.0	100.0%	0.0%	0.0%	0.0%	0	0	0.00
June	682	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.00
July	704	100.0	100.0%	0.0%	0.0%	0.0%	0	0	0.00
August	706	100.0	100.0%	0.0%	0.0%	0.0%	0	0	0.00
September	680	100.0	100.0%	0.0%	0.0%	0.0%	0	0	0.00
October	701	100.0	100.0%	0.0%	0.0%	0.0%	0	0	0.00
November	681	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.00
December	705	100.0	100.0%	0.0%	0.0%	0.0%	0	0	0.01
							Annual Average		0.00

* Valid readings do not include daily and monthly calibration hours and downtime hours

NO₂ Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Station: MASKWA

Month	NO ₂ ppb Peak Reading
January	23
February	26
March	18
April	18
May	20
June	20
July	14
August	20
September	19
October	13
November	23
December	28
ANNUAL PEAK	28.1

LICA30
 NO2_ / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 Parameter : NO2_
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	5.01	6.56	8.45	5.43	4.56	5.56	5.76	4.89	5.86	11.12	7.91	5.27	6.16	7.76	5.33	4.28	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	5.01	6.56	8.45	5.43	4.56	5.56	5.76	4.89	5.86	11.12	7.91	5.27	6.16	7.76	5.33	4.28	

Calm : .00 %

Total # Operational Hours : 8302

Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	416	545	702	451	379	462	479	406	487	924	657	438	512	645	443	356	8302
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	416	545	702	451	379	462	479	406	487	924	657	438	512	645	443	356	

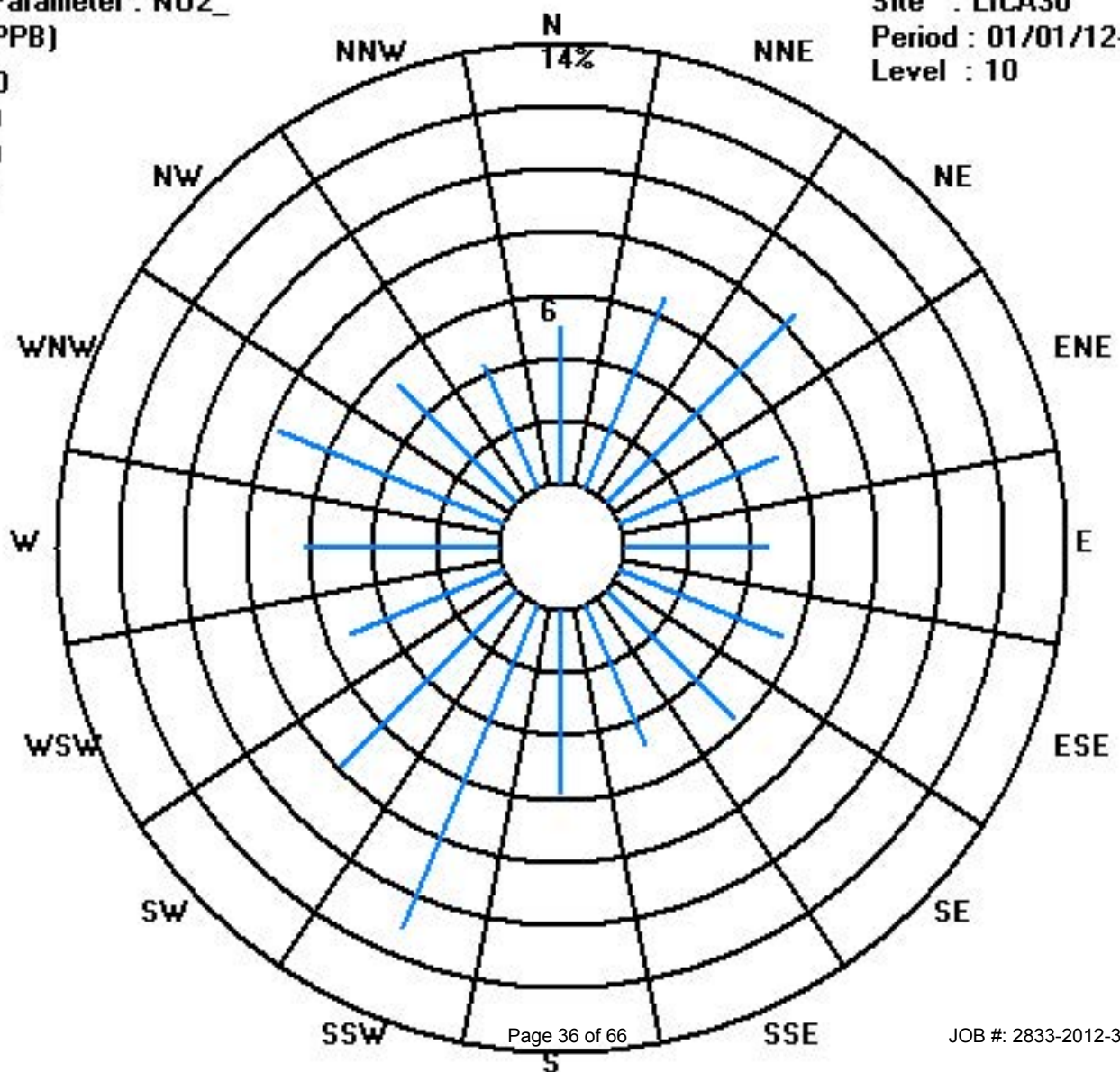
Calm : .00 %

Total # Operational Hours : 8302

Class Limits (PPB)

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

Level : 10



Nitric Oxide

Current Date : 03/11/13
Current Time : 08:16

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA30 Logger Id : 30 Parameter : NO_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	700	0	8.5	0.7
February	696	658	0	34.1	1.1
March	744	702	0	7.4	0.3
April	720	681	0	7.2	0.1
May	744	706	0	9	0.3
June	720	682	0	17.6	0.4
July	744	704	0	9.6	0.2
August	744	706	0	14.5	0.6
September	720	680	0	17.9	0.6
October	744	701	0	8	0.5
November	720	681	0	9.1	0.4
December	744	705	0	13.3	0.6
Yearly Total	8784	8306	0	34.1	0.5

NO Monthly Averages and Frequency Distributions of One Hour Readings - 2012

Plant Operator: LICA

Station: MASKWA

Month	Number of Readings	Operational Time (%)	% Readings in Concentration Range (ppm NO)				NO ppm Monthly Average
			0 to 0.05 ppm	0.051 to 0.11 ppm	0.111 to 0.210 ppm	> 0.21 ppm	
January	700	99.7	100.0%	0.0%	0.0%	0.0%	0.00
February	658	99.9	100.0%	0.0%	0.0%	0.0%	0.00
March	702	99.9	100.0%	0.0%	0.0%	0.0%	0.00
April	681	100.0	100.0%	0.0%	0.0%	0.0%	0.00
May	706	100.0	100.0%	0.0%	0.0%	0.0%	0.00
June	682	99.9	100.0%	0.0%	0.0%	0.0%	0.00
July	704	100.0	100.0%	0.0%	0.0%	0.0%	0.00
August	706	100.0	100.0%	0.0%	0.0%	0.0%	0.00
September	680	100.0	100.0%	0.0%	0.0%	0.0%	0.00
October	701	100.0	100.0%	0.0%	0.0%	0.0%	0.00
November	681	99.9	100.0%	0.0%	0.0%	0.0%	0.00
December	705	100.0	100.0%	0.0%	0.0%	0.0%	0.00
						Annual Average	0.00

* Valid readings do not include daily and monthly calibration hours and downtime hours

NO Peak reading of One Hour Averages for 2012

Plant Operator: LICA

Station: MASKWA

Month	NO ppb Peak Reading
January	8
February	34
March	7
April	7
May	9
June	18
July	10
August	14
September	18
October	8
November	9
December	13
ANNUAL PEAK	34

LICA30
 NO_ / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 Parameter : NO_
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	5.01	6.56	8.45	5.43	4.56	5.56	5.76	4.89	5.86	11.12	7.91	5.27	6.16	7.76	5.33	4.28	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	5.01	6.56	8.45	5.43	4.56	5.56	5.76	4.89	5.86	11.12	7.91	5.27	6.16	7.76	5.33	4.28	

Calm : .00 %

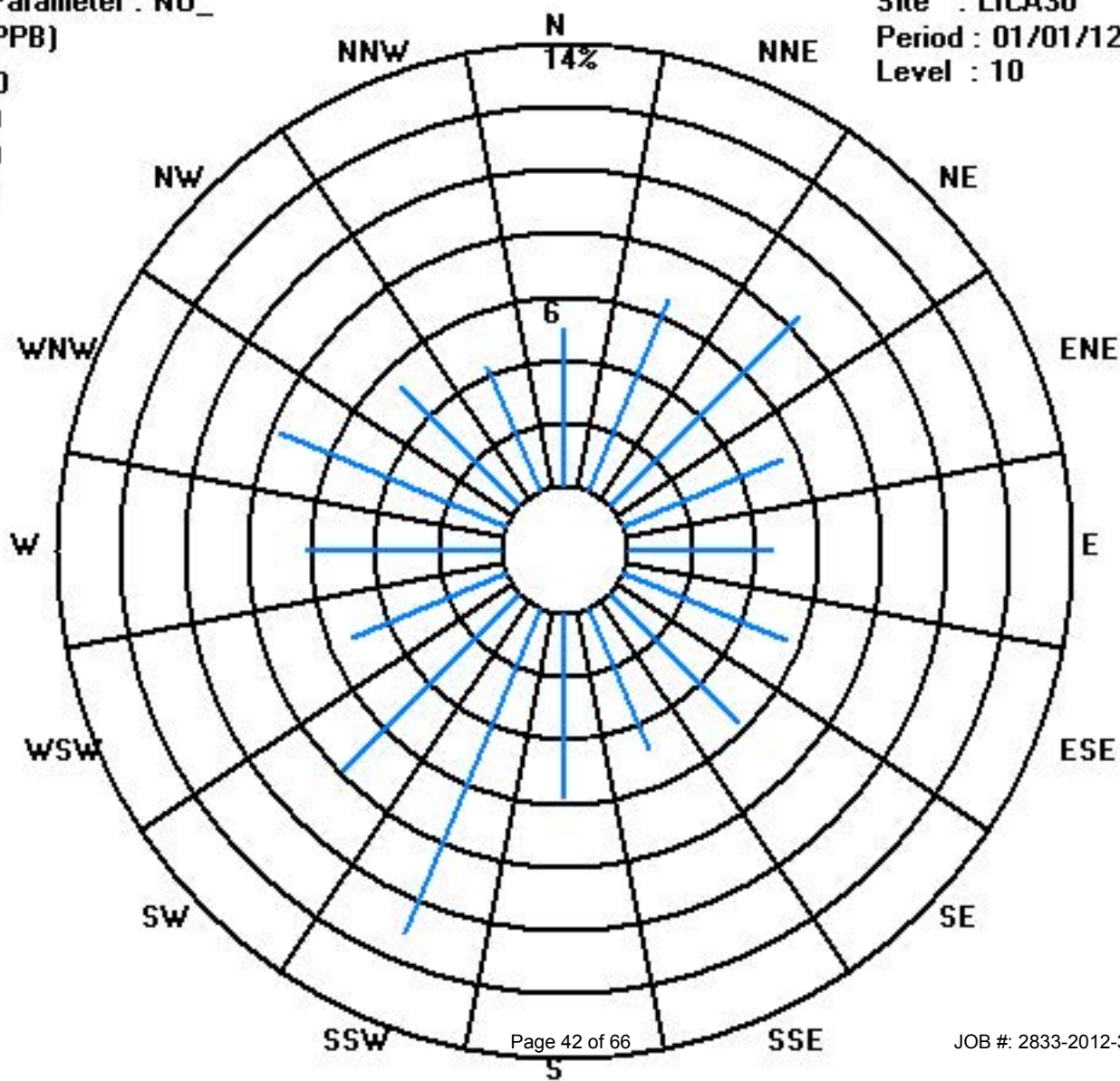
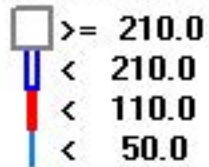
Total # Operational Hours : 8302

Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	416	545	702	451	379	462	479	406	487	924	657	438	512	645	443	356	8302
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	416	545	702	451	379	462	479	406	487	924	657	438	512	645	443	356	

Calm : .00 %

Total # Operational Hours : 8302



Oxides of Nitrogen

Current Date : 03/11/13
Current Time : 08:15

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA30 Logger Id : 30 Parameter : NOX_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	700	0	32	5.6
February	696	658	0	48.6	5.6
March	744	702	0	21.8	2.8
April	720	681	0	26	1.9
May	744	706	0	25.7	2.2
June	720	682	0	36.9	2.3
July	744	704	0	23.1	2
August	744	706	0	32.1	2.9
September	720	680	0	25.9	3.2
October	744	701	0	16.4	3.1
November	720	681	0	24.8	4.5
December	744	705	0	40.2	5.8
Yearly Total	8784	8306	0	48.6	3.5

NO_x Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Station: MASKWA

Month	NOx ppb Peak Reading
January	32
February	49
March	22
April	26
May	26
June	37
July	23
August	32
September	26
October	16
November	25
December	40
ANNUAL PEAK	49

LICA30
NOX_ / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 30
Site Name : LICA30
Parameter : NOX_
Units : PPB

Wind Parameter : WDR
Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	5.01	6.56	8.45	5.43	4.56	5.56	5.76	4.89	5.86	11.12	7.91	5.27	6.16	7.76	5.33	4.28	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	5.01	6.56	8.45	5.43	4.56	5.56	5.76	4.89	5.86	11.12	7.91	5.27	6.16	7.76	5.33	4.28	

Calm : .00 %

Total # Operational Hours : 8302

Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	416	545	702	451	379	462	479	406	487	924	657	438	512	645	443	356	8302
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	416	545	702	451	379	462	479	406	487	924	657	438	512	645	443	356	

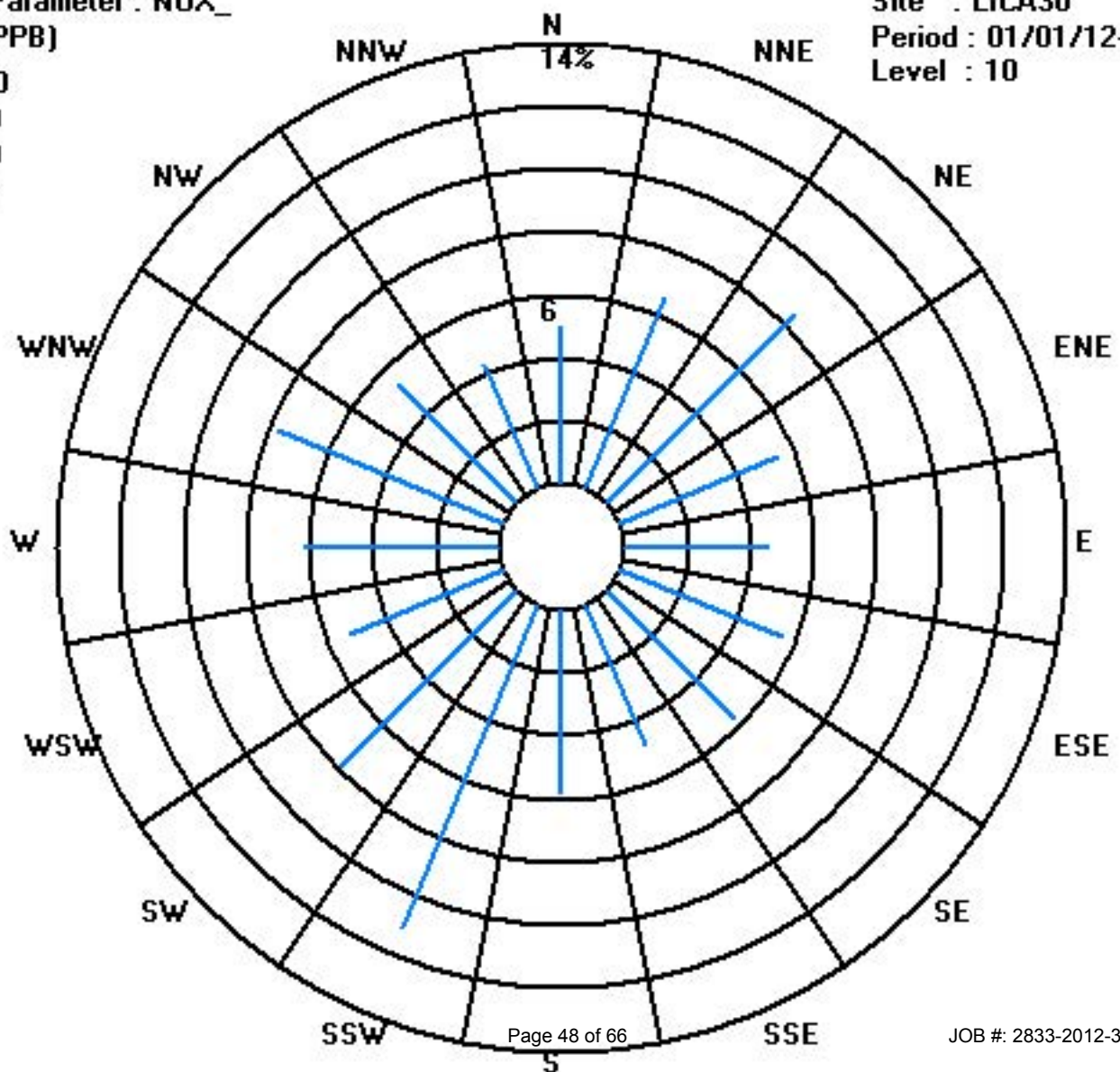
Calm : .00 %

Total # Operational Hours : 8302

Class Limits (PPB)

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

Level : 10



Temperature

Current Date : 02/22/13
Current Time : 11:21

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA30 Logger Id : 30 Parameter : TPX Units : DGC

	Readings	Valid Readings	Min	Max	Mean
January	744	744	-35.2	9.3	-10
February	696	696	-32.4	6.3	-8.4
March	744	744	-17	13.5	-1.8
April	720	720	-11.2	18.6	3
May	744	744	-2.6	24.1	10.8
June	720	719	3.2	26.9	15.4
July	744	744	6	32.3	19
August	744	744	1.8	29.9	16.6
September	720	720	-1.3	25.5	11.9
October	744	744	-11.8	15.9	0.4
November	720	720	-24.1	8.4	-9.3
December	744	744	-33	0	-16.7
Yearly Total	8784	8783	-35.2	32.3	2.6

Temperature - Monthly Averages for 2012

Plant Operator: LICA

Plant Location: MASKWA

Month	Operational Time (%)	Monthly Average (Deg.C)	Maximum Hourly Average (Deg C)	Minimum Hourly Average (Deg C)	Maximum Daily Average (Deg C)
January	100.0	-9.98	9.3	-35.2	2.8
February	100.0	-8.87	6.3	-32.4	-2.1
March	100.0	-1.75	13.5	-17.0	5.2
April	100.0	3.02	18.6	-11.2	9.4
May	100.0	10.82	24.1	-2.6	16.6
June	99.9	15.40	26.9	3.2	20.5
July	100.0	18.99	32.3	6.0	24.6
August	100.0	16.65	29.9	1.8	20.5
September	100.0	11.95	25.5	-1.3	15.7
October	100.0	0.40	15.9	-11.8	9.1
November	100.0	-9.26	8.4	-24.1	3.9
December	100.0	-16.68	-4.3	-33.0	-8.4
ANNUAL AVERAGE		2.56	-	-	-

Precipitation

Current Date : 02/22/13
Current Time : 11:21

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA30 Logger Id : 30 Parameter : PRECIP Units : MM

	Readings	Valid Readings	Min	Max	Mean
January	744	744	0	1.3	0
February	696	696	0	0.6	0
March	744	743	0	1.1	0
April	720	720	0	1.7	0.1
May	744	744	0	3.8	0.1
June	720	719	0	4.9	0.1
July	744	744	0	9	0.1
August	744	744	0	6.9	0.1
September	720	720	0	6.8	0.1
October	744	744	0	1.3	0
November	720	720	0	1.3	0
December	744	743	0	0.1	0
Yearly Total	8784	8781	0	9	0

Relative Humidity

Current Date : 02/22/13
Current Time : 11:21

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA30 Logger Id : 30 Parameter : RH Units : %

	Readings	Valid Readings	Min	Max	Mean
January	744	744	32	90	68
February	696	696	26	87	66
March	744	744	23	90	65
April	720	720	17	91	60
May	744	744	9	92	51
June	720	719	18	93	67
July	744	744	26	94	73
August	744	744	31	93	72
September	720	720	28	92	68
October	744	744	35	92	75
November	720	720	45	90	75
December	744	744	50	83	72
Yearly Total	8784	8783	9	94	68

Barometric Pressure

Current Date : 02/22/13
Current Time : 11:21

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA30 Logger Id : 30 Parameter : BP Units : MB

	Readings	Valid Readings	Min	Max	Mean
January	744	744	915	957	935
February	696	696	918	964	941
March	744	744	910	950	932
April	720	720	919	956	940
May	744	744	928	952	941
June	720	719	922	949	938
July	744	744	918	952	942
August	744	744	931	951	942
September	720	720	923	954	942
October	744	744	914	959	941
November	720	720	922	956	941
December	744	744	921	957	937
Yearly Total	8784	8783	910	964	939

BAROMETRIC PRESSURE - Monthly Averages for 2012

Plant Operator: LICA

Plant Location: MASKWA

Month	Operational Time (%)	Monthly Average (millibar)	Maximum Hourly Average (millibar)	Maximum Daily Average (millibar)
January	100.0	935	957	954.7
February	100.0	941	964	961.7
March	100.0	932	950	948.5
April	100.0	940	956	954.5
May	100.0	941	952	949.2
June	99.9	938	949	946.6
July	100.0	942	952	950.5
August	100.0	942	951	949.3
September	100.0	942	954	951.5
October	100.0	941	959	957.3
November	100.0	941	956	953.3
December	100.0	937	957	955.5
ANNUAL AVERAGE		939	-	-

Vector Wind Speed

Current Date : 02/22/13
Current Time : 11:21

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA30 Logger Id : 30 Parameter : WSP Units : KPH

	Readings	Valid Readings	Min	Max	Mean
January	744	744	0	15	5
February	696	692	0	16.3	4.6
March	744	744	0.2	17.4	6.5
April	720	720	0.3	16.8	6.9
May	744	744	0.2	18.3	6.5
June	720	719	0.1	17.5	5.1
July	744	744	0.2	13.6	4.4
August	744	744	0.1	15.1	4.3
September	720	720	0.1	16.2	5.2
October	744	744	0.1	15	5.7
November	720	720	0.1	17.9	5.6
December	744	744	0.1	13.9	4.3
Yearly Total	8784	8779	0	18.3	5.3

Current Date : 02/22/13
Current Time : 11:21

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA30 Logger Id : 30 Parameter : BP Units : MB

	Readings	Valid Readings	Min	Max	Mean
January	744	744	915	957	935
February	696	696	918	964	941
March	744	744	910	950	932
April	720	720	919	956	940
May	744	744	928	952	941
June	720	719	922	949	938
July	744	744	918	952	942
August	744	744	931	951	942
September	720	720	923	954	942
October	744	744	914	959	941
November	720	720	922	956	941
December	744	744	921	957	937
Yearly Total	8784	8783	910	964	939

BAROMETRIC PRESSURE - Monthly Averages for 2012

Plant Operator: LICA

Plant Location: MASKWA

Month	Operational Time (%)	Monthly Average (millibar)	Maximum Hourly Average (millibar)	Maximum Daily Average (millibar)
January	100.0	935	957	954.7
February	100.0	941	964	961.7
March	100.0	932	950	948.5
April	100.0	940	956	954.5
May	100.0	941	952	949.2
June	99.9	938	949	946.6
July	100.0	942	952	950.5
August	100.0	942	951	949.3
September	100.0	942	954	951.5
October	100.0	941	959	957.3
November	100.0	941	956	953.3
December	100.0	937	957	955.5
ANNUAL AVERAGE		939	-	-

LICA30
WSP / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 30
Site Name : LICA30
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	2.80	3.13	4.73	3.86	2.26	2.72	3.61	2.98	4.32	7.09	6.93	4.63	4.18	2.65	2.75	2.59	61.30
< 12.0	2.00	2.60	3.21	1.43	2.24	2.66	2.14	1.74	1.37	4.02	1.09	.61	1.86	4.14	2.23	1.53	34.94
< 20.0	.15	.79	.48	.03	.12	.18	.10	.10	.14	.09	.01	.00	.12	.95	.15	.07	3.56
< 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	4.96	6.53	8.44	5.33	4.63	5.57	5.85	4.82	5.85	11.20	8.04	5.25	6.17	7.75	5.14	4.21	

Calm : .18 %

Total # Operational Hours : 8779

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 6.0	246	275	416	339	199	239	317	262	380	623	609	407	367	233	242	228	5382
< 12.0	176	229	282	126	197	234	188	153	121	353	96	54	164	364	196	135	3068
< 20.0	14	70	43	3	11	16	9	9	13	8	1		11	84	14	7	313
< 29.0																	
< 39.0																	
>= 39.0																	
Totals	436	574	741	468	407	489	514	424	514	984	706	461	542	681	452	370	

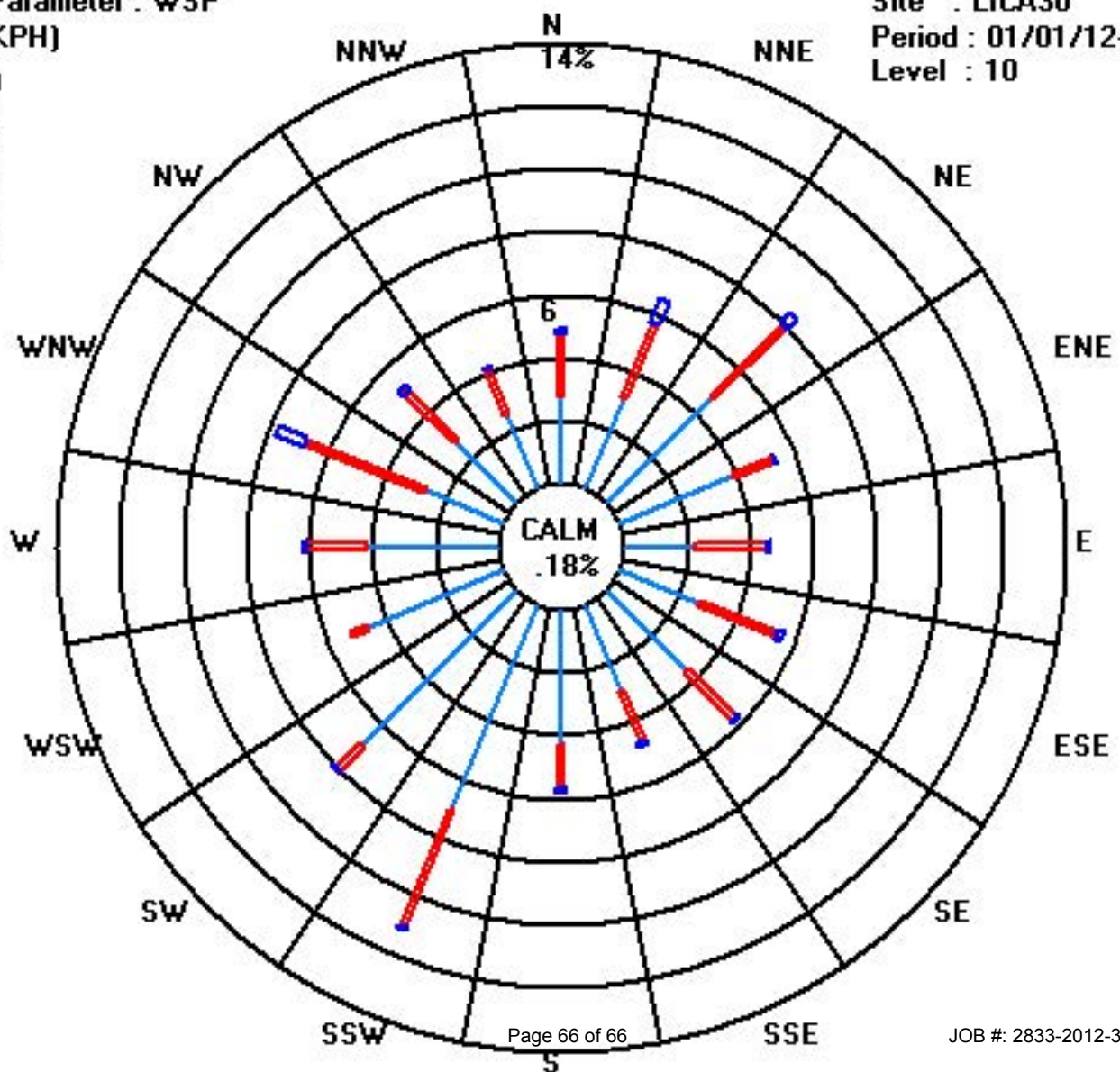
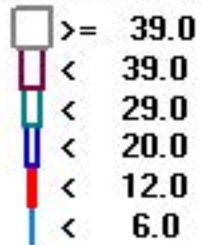
Calm : .18 %

Total # Operational Hours : 8779

Class Limits (KPH)

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

Level : 10



Lakeland Industry & Community Association

St. Lina Monitoring Site
Ambient Annual Data Report

For
2012

Prepared By:



March 12, 2013

Lakeland Industry & Community Association

St. Lina

Ambient Air Monitoring

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Introduction

The following Ambient Air Monitoring report was prepared for:

Mr. Mike Bisaga
Lakeland Industry & Community Association
Box 8237
5107W – 50 Street
Bonnyville, Alberta
T9N 2J5

Monitoring Location: St. Lina
Data Period: January 2012 to December 2012

The monthly ambient data report:

- Prepared by Katherine Rapske
- Reviewed by Lily Lin

Calibration Procedure

The following calibration procedure applies to all calibrations conducted at the Lakeland Industry & Community Association Air Monitoring Station.

Calibration gas concentrations are generated using a dynamic mass flow controlled calibrator. EPA Protocol one gases are diluted with zero air generated on site. The Mass Flow Controllers in the calibrator are referenced using an NIST traceable flow meter once per month. All listed flows are reported as corrected to Standard Temperature and Pressure (STP).

Generated zero gas is introduced to the analyzer first. Three concentrations of calibration gas are then generated in order to introduce points at approximately 50-80%, 25-40% & 10-20% of the analyzer's full-scale range. An auto zero and span are then performed to validate the daily zero and span values recorded to the next multi-point calibration.

All indicated concentrations are taken from the ESC data logger used to collect the data for monthly reporting.

Conformance of each calibration to Alberta Environment regulations is outlined in the individual calibration reports. The slope and correlation coefficient are derived from the calculated and indicated analyzer responses. The percent change is calculated using the previous calibration correction factor and the current correction factor before adjustment. The calibration conforms to the procedure outlined in the *Air Monitoring Directive, Appendix A-10, Section 1.6*.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – St. Lina

Sulphur Dioxide (PPB)

Analyzer make / model - API 100E, S/N: 468

- One hour of maximum data was invalidated due to a small power outage on January 5th. Two hourly average data were invalidated on January 13th due to a power failure.
- Maximum data on February 21st at hour of 16 was invalidated due to a small power outage.
- Data on February 23rd at hour of 5 is missing.
- Data on March 3rd between 19:00 and 21:59 and March 15 between 12:00 and 15:59 are invalidated due to power failures.
- Maximum hourly readings recorded at hour 11 on April 15 and at hour 15 on April 20th were invalidated due to power outages.
- The analyzer spanned high on May 10th and 11th. The as found points check was performed on May 11th. The result was good, but the sample flow was low. The sample pump was replaced on May 11th. The pump issue would not affect the data quality.
- Hourly data on June 28th at hour 12 and hour 13 were invalidated due to a power failure. Hourly data on June 28th at hour 14 was also invalid, as the analyzer was recovering from the power failure
- Following the as found points check on July 18th, the sample pump was replaced.
- Five hourly maximum readings were invalidated due to small power outages in July. Hourly maximum data on July 20th at hour 00 was also invalidated, as the analyzer was recovering from a small power outage.
- The analyzer spanned low on August 7th. An as found points check was performed on August 10th. The result was within 2%, and no issue was noticed. As a result, all data were kept.
- Five hourly maximum data were invalidated due to small power outage.
- A total of six hours of data were invalidated on October 22nd and 23rd due to a power failure.
- One hourly data collected on November 27th at hour 15 was invalidated due to a power failure.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – St. Lina

Hydrogen Sulphide (PPB)

Analyzer make / model - API 101E, S/N: 510

- One hour of maximum data was invalidated due to a small power outage on January 5th.
- Two hourly average data were invalidated on January 13th due to a power failure.
- Maximum data on February 21st at hour of 16 was invalidated due to a small power outage.
- Data on February 23rd at hour of 5 is missing.
- Data on March 3rd between 19:00 and 21:59 and March 15 between 12:00 and 15:59 are invalidated due to power failures. Data on March 3rd at hour of 22 was also invalid because the analyzer was recovering from the power failure.
- Maximum hourly readings recorded at hour 11 on April 15 and at hour 15 on April 20th were invalidated due to power outages.
- Hourly data on June 28th at hour 12 and hour 13 were invalidated due to a power failure. Hourly data on June 28th at hour 14 was also invalid, as the analyzer was recovering from the power failure.
- Five hourly maximum readings were invalidated due to small power outages this month.
- Five hourly maximum data were invalidated due to small power outage.
- A total of six hours of data were invalidated on October 22nd and 23rd due to a power failure this month
- One hourly data collected on November 27th at hour 15 was invalidated due to a power failure

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – St. Lina

Total HydroCarbon (PPM)

Analyzer make / model –TECO 51C, S/N: 77021-384

Analyzer make / model - API 101E, S/N: 510

Analyzer make / model – Thermo 51C-LT, S/N: 77021-384 replaced in October to Thermo 51C-LT, S/N: 04366-09739

- The sample pump failed after a small power outage on January 5th. The pump was restarted on January 5th. Nine hours of data was invalidated due to this event.
- The H2 gas cylinder was changed on January 6th.
- The analyzer flamed out due to a power failure on January 13th. It was re-lit on January 14th at hour of 15. 24 hours of data were invalidated due to this power failure.
- The sample pump was replaced following the as found point check on January 17th.
- Maximum data on February 21st at hour of 16 was invalidated due to a small power outage. Data on February 23rd at hour of 5 is missing.
- Data on March 3rd between 19:00 and 21:59 and March 15th at hour of 12 are invalidated due to power failures. The analyzer flamed out after the power failure on March 15th, and it was re-lit on March 16th. 19 hours of data was invalidated due to this issue.
- Both the H2 gas cylinder and CH4 gas cylinder were changed on April 2nd.
- Maximum hourly readings recorded at hour 11 on April 15 and at hour 15 on April 20th were invalidated due to power outages.
- The analyzer flamed out at hour 11 on May 15th due to a power outage. It was relit at hour 19. 8 hours of data were invalidated.
- Both the H2 gas cylinder and CH4 gas cylinder were changed on May 11th.
- Hourly data on June 28th at hour 12 and hour 13 were invalidated due to a power failure. The analyzer flamed out after the power failure, and it was re-lit on June 28th at hour 15.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – St. Lina

Total HydroCarbon (PPM) (continued)

Analyzer make / model –TECO 51C, S/N: 77021-384

Analyzer make / model - API 101E, S/N: 510

Analyzer make / model – Thermo 51C-LT, S/N: 77021-384 replaced in October to Thermo 51C-LT, S/N: 04366-09739

- The analyzer flamed out on July 7th at hour 19 due to a power failure. It was relit on July 8th. A total of 13 hours of data was invalidated due to this issue.
- Five hourly maximum readings were invalidated in July due to small power outages.
- The analyzer flamed out on August 7th at hour 0 and August 8th at hour 22 due to power failures. It was relit and a daily calibration was triggered to verify the analyzer's functionality on August 7th at hour 8 and on August 9 at hour 7, respectively. A total of 17 hours of data was invalidated.
- Five hourly maximum data were invalidated in August.
- The analyzer flamed out after power failures on September 11th at hour 19 and on September 26th at hour 14. It was relit on September 12 at hour 8 and September 27 at hour 10, respectively. A total of 33 hours of data was invalidated.
- Both H₂ and CH₄ gas cylinders were replaced before the monthly calibration was started on September 12th.
- The CH₄ gas cylinder was changed again on September 14th.
- The analyzer spanned low on September 20th. During the site visit on September 21st, an as found points check was performed. The analyzer failed the as found points check. Found that the sample pressure was low. Replaced the pump and cleaned the flow restrictors and tubing that are connected with the FID on September 21st. Data was invalidated back to the last good calibration date, which was September 19th. A total of 41 hours of data was invalidated due to this issue.
- Three hours of data were invalidated due to power failure in September.
- Five hourly maximum data were invalidated due to small power outages in September.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – St. Lina

Total HydroCarbon (PPM) (continued)

Analyzer make / model –TECO 51C, S/N: 77021-384

Analyzer make / model - API 101E, S/N: 510

Analyzer make / model – Thermo 51C-LT, S/N: 77021-384 replaced in October to Thermo 51C-LT, S/N: 04366-09739

- Hourly maximum data on September 27th at hour 15 and on September 28th at hour 16 were invalidated because less than 100% of data for the hour was collected; reason unknown.
- Following the as found points check on October 2nd, the sample pump was rebuilt.
- On October 17th the Thermo 51C-LT, S/N: 77021-384, THC analyzer was removed following a removal calibration as per client's request. A Thermo 51C-LT, S/N: 04366-09739, analyzer was installed following an installation calibration on October 18th.
- The H₂ gas cylinder was replaced on October 30th.
- A total of six hours of data were invalidated on October 22nd and 23rd due to a power failure in October.
- One hourly data collected on November 27th at hour 15 was invalidated due to a power failure.
- The CH₄ gas was changed on November 28th.

Ozone (PPB)

Analyzer make / model –Thermo 49C, S/N: 49C-54926-302

Analyzer make / model - API 101E, S/N: 510

- One hour of maximum data was invalidated due to a small power outage on January 5th.
- Two hourly average data were invalidated on January 13th due to a power failure.
- The Cell A and Cell B flow sensors were replaced following the as found point check on January 17th.
- Maximum data on February 21st at hour of 16 was invalidated due to a small power outage.
- Data on February 23rd at hour of 5 is missing.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – St. Lina

Ozone (PPB) (continued)

Analyzer make / model – Thermo 49C, S/N: 49C-54926-302

Analyzer make / model - API 101E, S/N: 510

- Data on March 3rd between 19:00 and 21:59 and March 15th between 12:00 and 15:59 are invalidated due to power failures.
- Maximum hourly readings recorded on April 15th at hour 11 and on April 20th at hour 15 were invalidated due to power outages.
- Maximum hourly reading recorded at hour 5 on May 31st went above the full scale. The actual hourly reading may be higher than the indicated.
- Hourly data on June 28th at hour 12 and hour 13 were invalidated due to a power failure. Hourly data on June 28th at hour 14 was also invalid, as the analyzer was recovering from the power failure.
- Hourly maximum value recorded on June 6th at hour 18 was invalid due to the analyzer spiked.
- Hourly maximum values recorded on July 2nd at hour 20 and July 9th at hour 5 were invalid due to the analyzer spiked.
- Five hourly maximum readings were invalidated due to small power outages in July.
- Hourly maximum value recorded on August 29th at hour 10 was invalid due to the analyzer spiked.
- Five hourly maximum data were invalidated due to small power outages in August.
- Three hours of data were invalidated due to power failures in September.
- Five hours of maximum data were invalidated due to small power outages in September.
- On October 4th a removal calibration of the analyzer (49C) was performed and the new analyzer was installed (49I). The zero reading was not stable and 49I analyzer was removed and 49C was re-installed.
- A total of six hours of data were invalidated on October 22nd and 23rd due to a power failure in October
- One hourly data collected on November 27th at hour 15 was invalidated due to a power failure.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – St. Lina

Nitrogen Dioxide (PPB)

Analyzer make / model - API 200E, S/N: 592

Analyzer make / model - API 101E, S/N: 510

- The exhaust pump was replaced following the as found point check on January 6th.
- One hour of maximum data was invalidated due to a small power outage on January 5th.
- Two hours of average data were invalidated on January 13th due to a power failure.
- Maximum data on February 21st at hour of 16 was invalidated due to a small power outage.
- Data on February 23rd at hour of 5 is missing.
- Data on March 3rd between 19:00 and 21:59 and March 15th between 12:00 and 15:59 are invalidated due to power failures.
- Some daily span results went below –10% of limited range because the expected span value was set too high after the monthly calibration in March.
- Maximum hourly readings recorded at hour 11 on April 15th and at hour 15 on April 20th were invalidated due to power outages.
- The hourly readings for the NO channel were false on June 5th. Found the wire connected between the analyzer and the datalogger was loose on June 6th. Tightened the wire on June 6th. Hourly data for NO between June 5th at hour 6 and June 6th at hour 7 were invalidated due to this issue.
- The analyzer spanned low on June 7th. Following the as found points check, the permeation tube was replaced. The expected span value was adjusted on June 20th.
- Hourly data on June 28th at hour 12 and hour 13 were invalidated due to a power failure. Hourly data on June 28th at hour 14 was also invalid, as the analyzer was recovering from the power failure.
- The hourly readings for NOx channel were false on June 28th. Found the wire connected between the analyzer and the datalogger was loose on June 29th. Tightened the wire and ran a daily calibration check on June 29th. Hourly data for NOx between June 28th at hour 18 and June 29th at hour 9 were invalidated due to this issue.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – St. Lina

Nitrogen Dioxide (PPB) (continued)

Analyzer make / model - API 200E, S/N: 592

Analyzer make / model - API 101E, S/N: 510

- Following the as found points check on July 17th, the HVPS voltage and the slope was adjusted.
- Five hourly maximum readings were invalidated due to small power outages in July.
- Five hourly maximum data were invalidated due to small power outages in August.
- Following the as found points check on September 12th, a maintenance was performed: the O-ring was replaced, 4-Mil orifice and sintered filter for the flow control system was changed, the optical filter was cleaned, the HVPS voltage and slope were adjusted, and the IZS temperature was adjusted.
- Three hours of data were invalidated due to power failure in September.
- Five hourly maximum data were invalidated due to small power outages.
- A total of six hours of data were invalidated due to a power failure in October.
- Hourly data collected on November 23rd at hour 9 was invalidated as uncorrected hourly reading for NO₂ was input while performing the NO_x-NO=NO₂ data correction, and the data could not be edited once the new value was input.
- One hourly data collected on November 27th at hour 15 was invalidated due to a power failure.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – St. Lina

Particulate Matter 2.5 (UG/M3)

Analyzer make / model – Thermo 1405F, S/N: 1405A208301003 replaced to Thermo 1405F, S/N: 1405A207691003

- All data was corrected using Alberta air quality guideline. If the data was between 0 to -3 , the data was corrected to 0. If the data was below -3 , the data was invalidated.
 - January - 162 hours of data were invalidated as the data were above -3 ug/m³.
 - February - 2 hours of data were invalidated as the data were below -3 ug/m³.
 - March - 7 hours of data were invalidated as the data were below -3 ug/m³.
 - April - 5 hours of data were invalidated as the data was below -3 ug/m³.
 - May - No hourly data was invalidated as all data was above -3 ug/m³.
 - June - One hour of data was invalidated as the data was below -3 ug/m³.
 - July - Four hours of data was invalidated as the data was below -3 ug/m³.
 - August - One hour of data was invalidated as the data was below -3 ug/m³.
 - September - Three hourly data were invalidated as the data were below -3 ug/m³.
 - October - Twenty-nine hourly data were invalidated as the data were below -3 ug/m³.
 - November - Five hourly data were invalidated as the data were below -3 ug/m³.
 - December - Nine hourly data were invalidated as the data were below -3 ug/m³.
- It was noticed that the Teom noise level was high during the site visit on January 10th. A new filter was put into the Teom box for conditioning on January 10th, and it was installed on January 11th.
- It was found that the V-ring seal for the mass transducer was cracked on January 11th. Temporary fixed the crack and then performed a leak check on January 11th. The V-ring seal was replaced on January 17th.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – St. Lina

Particulate Matter 2.5 (UG/M3) (continued)

Analyzer make / model – Thermo 1405F, S/N: 1405A208301003 replaced to Thermo 1405F, S/N: 1405A207691003

- Due to the poor stability of the Teom unit, the unit was replaced and brought back to Calgary shop for repair on January 19th. The Teom unit used at Portable station was installed. An installation audit was performed on January 19th.
- Data on February 23rd at hour of 5 is missing.
- Data on March 3rd between 19:00 and 21:59 and March 15 between 12:00 and 15:59 are invalidated due to power failures.
- Hourly data on June 28th at hour 12 and hour 13 were invalidated due to a power failure.
- Five hourly maximum readings were invalidated due to small power outages in July.
- Three 24-Hour PM2.5 contraventions recorded this month: reading of 92.6 ug/m3 on July 13th (AE Ref# 260735), reading of 44.3 ug/m3 on July 14th (AE Ref # 260777), and reading of 33.9 ug/m3 on July 16th (AE Ref # 260886).
- A total of six hours of data were invalidated due to a power failure in October.
- Following the audit on November 16th, the O-ring for the switch valve was replaced.
- It was noticed that the hourly data was higher than normal on November 21st. A leak check and a 3-point flow calibration were performed, both the Teom and FDMS filters were replaced, and the inlet was cleaned on November 21st.
- As the Teom unit showed its instability on data, the PM2.5 channel was put into the “Maintenance” mode for a major repair/check on November 26th and 27th, including the cooler cleaning, the switching valve re-installation, and the pump rebuilt. A total of 74 hours of data were invalidated for this repair. One hour of data collected on November 27th at hour 15 was invalidated due to a power failure.
- The PM2.5 channel was put into the Maintenance mode on December 11th at hour 11 to hour 15 for the flow check as the flow was higher than expected. After consulting with the manufacturer, a routine Teom audit with a leak check was performed on December 17th. The result was good.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – St. Lina

Temperature (Degree C)

Analyzer make / model – Met One 060

- One hour of average data were invalidated on January 13th due to a power failure.
- Data on February 23rd at hour of 5 is missing.
- Data on March 3rd between 19:00 and 21:59 and March 15 between 12:00 and 15:59 are invalidated due to power failures.
- Hourly data on June 28th at hour 12 and hour 13 were invalidated due to a power failure.
- Three hours of data were invalidated due to power failure in September.
- A total of six hours of data were invalidated on October 22nd and 23rd due to a power failure.
- One hour of data collected on November 27th at hour 15 was invalidated due to a power failure.

Barometric Pressure (Millibar)

Analyzer make / model - Met One 092

- Two hours of average data were invalidated on January 13th due to a power failure.
- Data on February 23rd at hour of 5 is missing.
- Data on March 3rd between 19:00 and 21:59 and March 15 between 12:00 and 15:59 are invalidated due to power failures.
- Hourly data on June 28th at hour 12 and hour 13 were invalidated due to a power failure.
- Three hours of data were invalidated due to power failure in September.
- A total of six hours of data were invalidated on October 22nd and 23rd due to a power failure.
- One hour of data collected on November 27th at hour 15 was invalidated due to a power failure.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – St. Lina

Relative Humidity (%)

Analyzer make / model - Met One 083

- Two hours of average data were invalidated on January 13th due to a power failure.
- Data on February 23rd at hour of 5 is missing.
- Data on March 3rd between 19:00 and 21:59 and March 15 between 12:00 and 15:59 are invalidated due to power failures.
- Hourly data on June 28th at hour 12 and hour 13 were invalidated due to a power failure.
- Three hours of data were invalidated due to power failure in June.
- Three hours of data were invalidated due to power failure in September.
- A total of six hours of data were invalidated on October 22nd and 23rd due to a power failure in October.
- One hourly data collected on November 27th at hour 15 was invalidated due to a power failure.

Precipitation (MM)

Analyzer make / model - Met One 387

- During the site visit on February 8th, it was found that the heater for the tipping bucket was not working. We are not sure when the heater failed. Although we still recorded some precipitation readings, we are not sure how accurate the readings were. Data should be used with caution.
- Data on February 23rd at hour of 5 is missing.
- Data on March 3rd between hour 19 and hour 20 and March 15 between hour 12 and hour 14 are invalidated due to power failures.
- A new tipping bucket funnel/heater assembly was installed on March 14th.
- Data on June 28th at hour 12 and hour 13 were invalidated due to a power failure.
- The rain gauge was checked and verified on August 7th.
- A total of six hours of data were invalidated on October 22nd and 23rd due to a power failure in October.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – St. Lina

Precipitation (MM) (Continued)

Analyzer make / model - Met One 387

- The heater for the rain gauge was checked and tested on December 20th.

Vector Wind Speed (KPH) & Vector Wind Direction (DEG)

System make / model – Met 50.5, S/N: H12635 replaced to RM Young5103VK, S/N: 56589

System make / model –MetOne 50.5H Sonic, S/N: H12635

- One hour of maximum data was invalidated due to a small power outage on January 5th.
- Two hours of average data were invalidated on January 13th due to a power failure.
- Maximum WS data on February 21st at hour of 16 was invalidated due to a small power outage.
- Data on February 23rd at hour of 5 is missing.
- Data on March 3rd between 19:00 and 21:59 and March 15 between 12:00 and 15:59 are invalidated due to power failures.
- Hourly maximum data for wind speed on March 12th at hour of 3 was invalidated because the reading went above the full scale.
- The Met 50.5 wind system was removed and sent back to the manufacturer for a 2-Year calibration/maintenance on May 15th. A temporary RM Young wind system was installed following an installation calibration on May 15th.
- Hourly data on June 28th at hour 12 and hour 13 were invalidated due to a power failure.
- Five hourly WS maximum data were invalidated due to small power outages in August.
- During the site visit on August 15th, it was noticed that the magnetic declination was not applied on the calculation when the wind system was re-installed after the 2-Year wind system calibration on August 18th. The wind direction sensor was adjusted so that it is facing the true north on August 15th. Hourly data for wind direction between August 1st t hour 0 and August 15th at hour 15 were corrected by subtracting 13 degrees.

General Monthly Summary

Equipment Operation

The following summary outlines the analyzer performance. Any non-conformances, problems or maintenance performed are detailed at the end of each section.

AQM STATION – LICA – St. Lina

Vector Wind Speed (KPH) & Vector Wind Direction (DEG) (continued)

System make / model – Met 50.5, S/N: H12635 replaced to RM Young5103VK, S/N: 56589

System make / model –MetOne 50.5H Sonic, S/N: H12635

- The wind system was checked on September 14th. It was found that the wind direction was 4 degree off from the true north. The wind direction sensor was adjusted so that it is facing the true north on September 14th.
- Three hours of data were invalidated due to power failure in September.
- Five hourly maximum data were invalidated due to small power outages in September.
- A total of six hours of data were invalidated on October 22nd and 23rd due to a power failure in October.
- Four hourly data and seven hourly maximum data for wind speed on November 19th and 20th were invalidated as the readings went above the full scale.
- One hourly data for both wind speed and wind direction collected on November 27th at hour 15 was invalidated due to a power failure.
- One hour of data for wind speed recorded on December 19th at hour 13 was invalidated as the reading went above the full scale. Data for both wind direction and standard deviation wind direction were invalidated at the same time period in order to meet the CASA data submission requirement.
- Three hourly maximum data for wind speed were invalidated as the readings went above the full scale in December.

Trailer

- A thrown-away filter for the heating/cooling system was replaced on May 23rd.

Continuous Monitoring

Annual Summaries Graphs & Wind Roses

Sulphur Dioxide

Current Date : 03/12/13
Current Time : 10:23

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA31 Logger Id : 31 Parameter : SO2_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	702	0	3	0
February	696	659	0	4	0
March	744	698	0	6	0
April	720	685	0	1	0
May	744	702	0	3	0
June	720	680	0	4	0
July	744	707	0	3	0
August	744	706	0	3	0
September	720	678	0	4	0
October	744	696	0	15	0
November	720	682	0	8	1
December	744	707	0	4	1
Yearly Total	8784	8302	0	15	0

SO₂ Peak Reading of One Hour Averages for 2012

Plant Operator: LICA _____

Plant Location: ST. LINA _____

Month	SO2 ppb Peak Reading
January	3
February	4
March	6
April	1
May	3
June	4
July	3
August	3
September	4
October	2
November	8
December	4
ANNUAL PEAK	8

LICA31
SO2_ / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 31
Site Name : LICA31
Parameter : SO2_
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	
< 20	4.66	3.83	4.94	6.47	5.59	5.14	5.34	5.63	5.96	5.79	6.63	7.35	8.04	8.22	9.31	7.02	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	4.66	3.83	4.94	6.47	5.59	5.14	5.34	5.63	5.96	5.79	6.63	7.35	8.04	8.22	9.31	7.02	

Calm : .00 %

Total # Operational Hours : 8294

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 20	387	318	410	537	464	427	443	467	495	481	550	610	667	682	773	583	8294
< 60																	
< 110																	
< 170																	
< 340																	
>= 340																	
Totals	387	318	410	537	464	427	443	467	495	481	550	610	667	682	773	583	

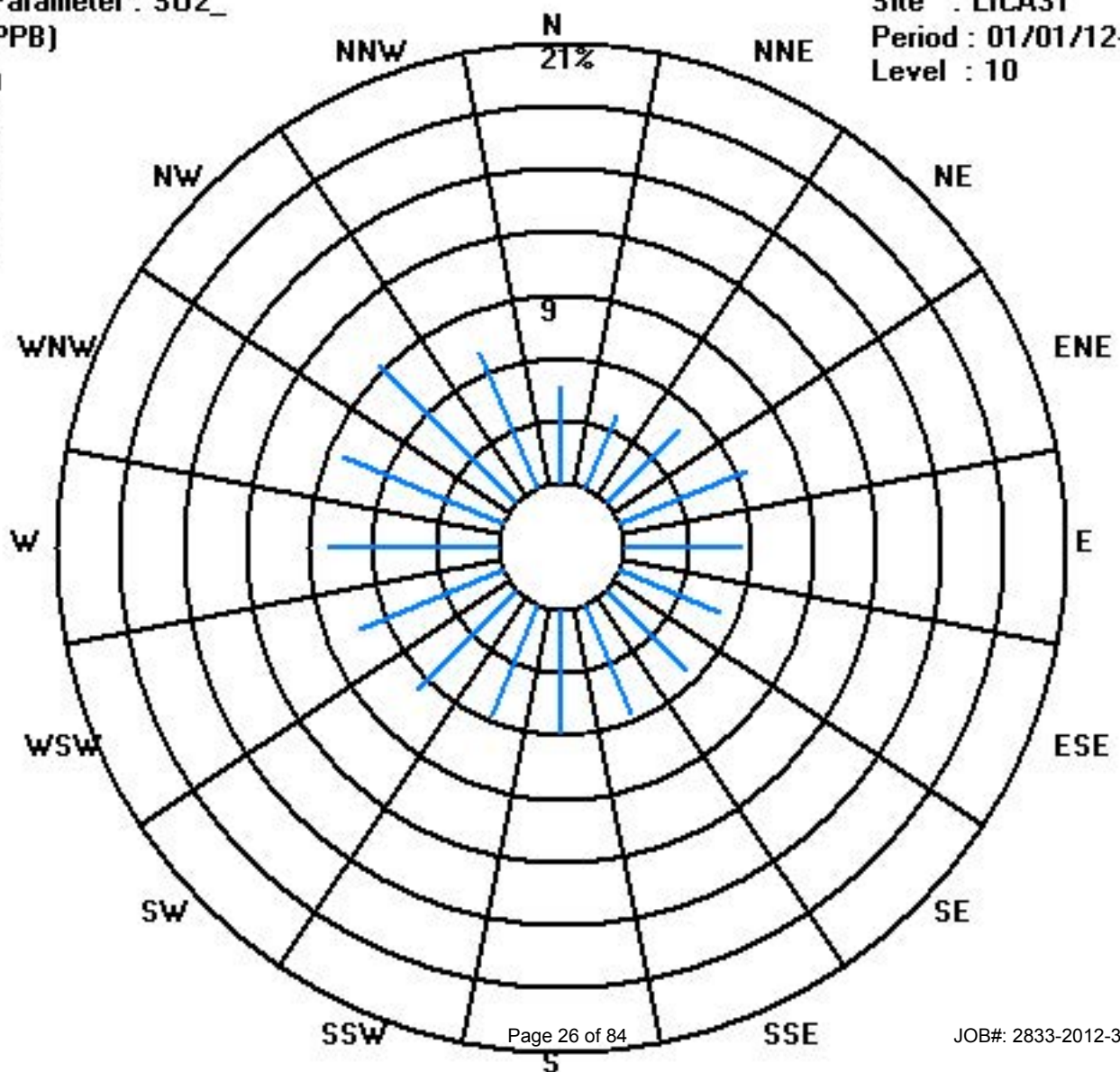
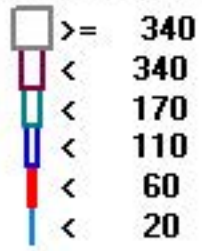
Calm : .00 %

Total # Operational Hours : 8294

Class Limits (PPB)

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

Level : 10



Hydrogen Sulphide

Current Date : 03/12/13
Current Time : 10:23

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA31 Logger Id : 31 Parameter : H2S_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	703	0	1	0
February	696	661	0	1	0
March	744	697	0	1	0
April	720	685	0	1	0
May	744	705	0	1	0
June	720	680	0	2	0
July	744	706	0	2	0
August	744	705	0	2	0
September	720	677	0	6	0
October	744	700	0	3	1
November	720	682	0	2	1
December	744	707	0	3	1
Yearly Total	8784	8308	0	6	0

H2S Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Plant Location: ST. LINA

Month	H2S ppb Peak Reading
January	1
February	1
March	1
April	1
May	1
June	2
July	2
August	2
September	6
October	3
November	2
December	3
ANNUAL PEAK	6

LICA31
H2S_ / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 31
Site Name : LICA31
Parameter : H2S_
Units : PPB

Wind Parameter : WDR
Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3	4.71	3.83	4.91	6.42	5.55	5.03	5.31	5.60	6.04	5.75	6.63	7.38	8.01	8.20	9.28	7.06	99.78
< 10	.00	.00	.00	.01	.00	.03	.01	.00	.00	.08	.01	.00	.01	.01	.03	.00	.21
< 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	4.71	3.83	4.91	6.43	5.55	5.07	5.32	5.60	6.04	5.84	6.65	7.38	8.02	8.21	9.32	7.06	

Calm : .00 %

Total # Operational Hours : 8300

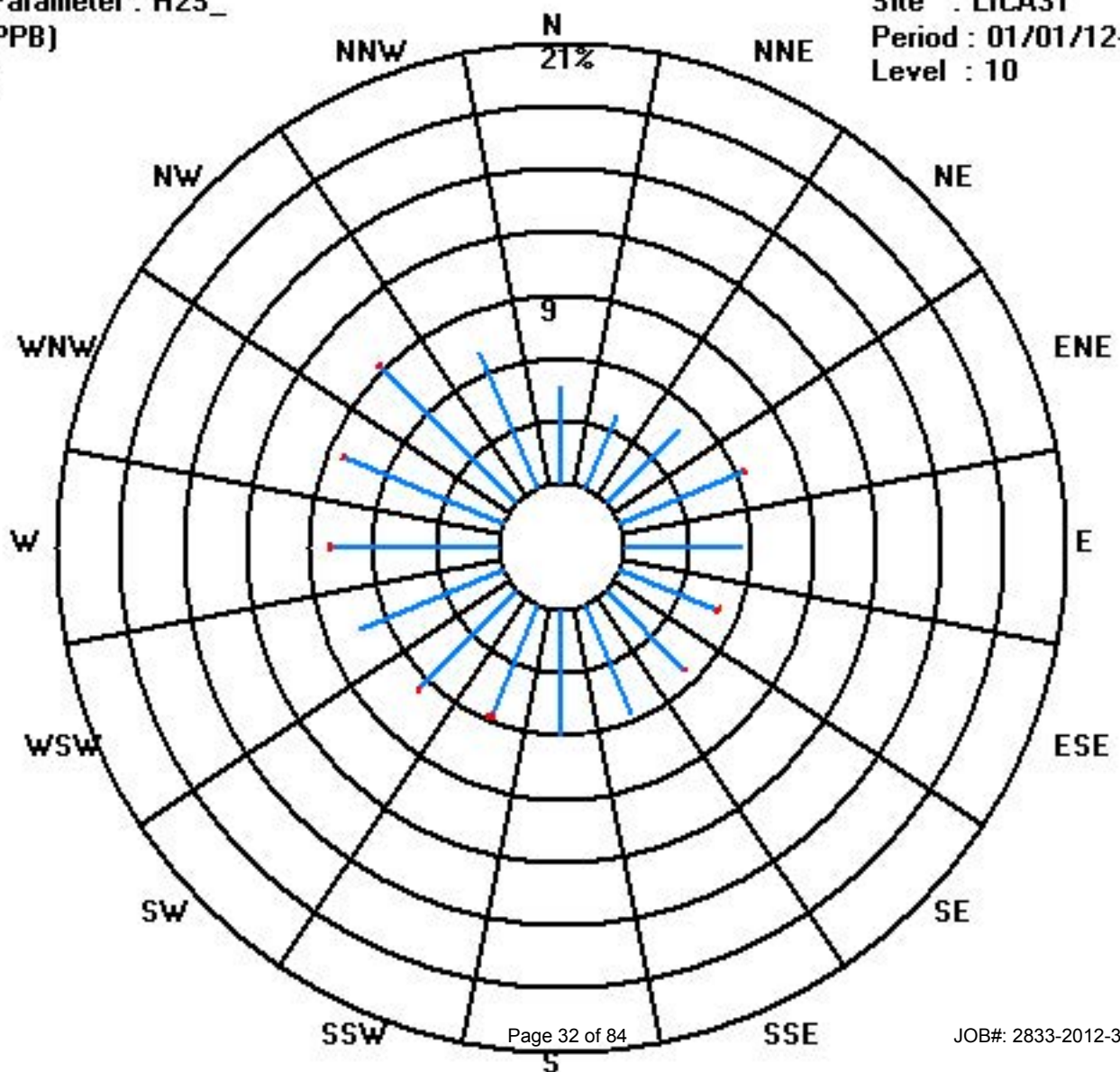
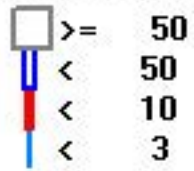
Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3	391	318	408	533	461	418	441	465	502	478	551	613	665	681	771	586	8282
< 10				1		3	1			7	1		1	1	3		18
< 50																	
>= 50																	
Totals	391	318	408	534	461	421	442	465	502	485	552	613	666	682	774	586	

Calm : .00 %

Total # Operational Hours : 8300

Class Limits (PPB)



Total Hydrocarbons

Current Date : 03/12/13
Current Time : 10:23

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA31 Logger Id : 31 Parameter : THC Units : PPM

	Readings	Valid Readings	Min	Max	Mean
January	744	663	1.6	3.1	2.2
February	696	661	1.8	3.5	2.2
March	744	682	1.9	3.1	2.1
April	720	677	2	2.8	2.1
May	744	704	2	3	2.1
June	720	679	1.9	2.8	2.1
July	744	693	1.9	2.7	2.1
August	744	685	1.9	3.3	2.1
September	696	600	1.9	3.7	2.1
October	744	688	1.8	3.5	2.1
November	720	680	1.9	3.8	2.2
December	744	707	2	3.7	2.4
Yearly Total	8760	8119	1.6	3.8	2.2

LICA31
 THC / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

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	4.62	3.77	4.96	6.46	5.30	4.83	5.07	5.52	5.94	5.80	6.64	7.43	8.03	8.17	9.18	7.02	98.81
< 10.0	.06	.01	.04	.07	.25	.16	.20	.06	.04	.04	.03	.00	.03	.01	.06	.04	1.18
< 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	4.68	3.78	5.01	6.53	5.56	4.99	5.28	5.58	5.99	5.85	6.68	7.43	8.07	8.18	9.24	7.07	

Calm : .00 %

Total # Operational Hours : 8111

Distribution By Samples

Limit	Direction															Freq	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW		NNW
< 3.0	375	306	403	524	430	392	412	448	482	471	539	603	652	663	745	570	8015
< 10.0	5	1	4	6	21	13	17	5	4	4	3		3	1	5	4	96
< 50.0																	
>= 50.0																	
Totals	380	307	407	530	451	405	429	453	486	475	542	603	655	664	750	574	

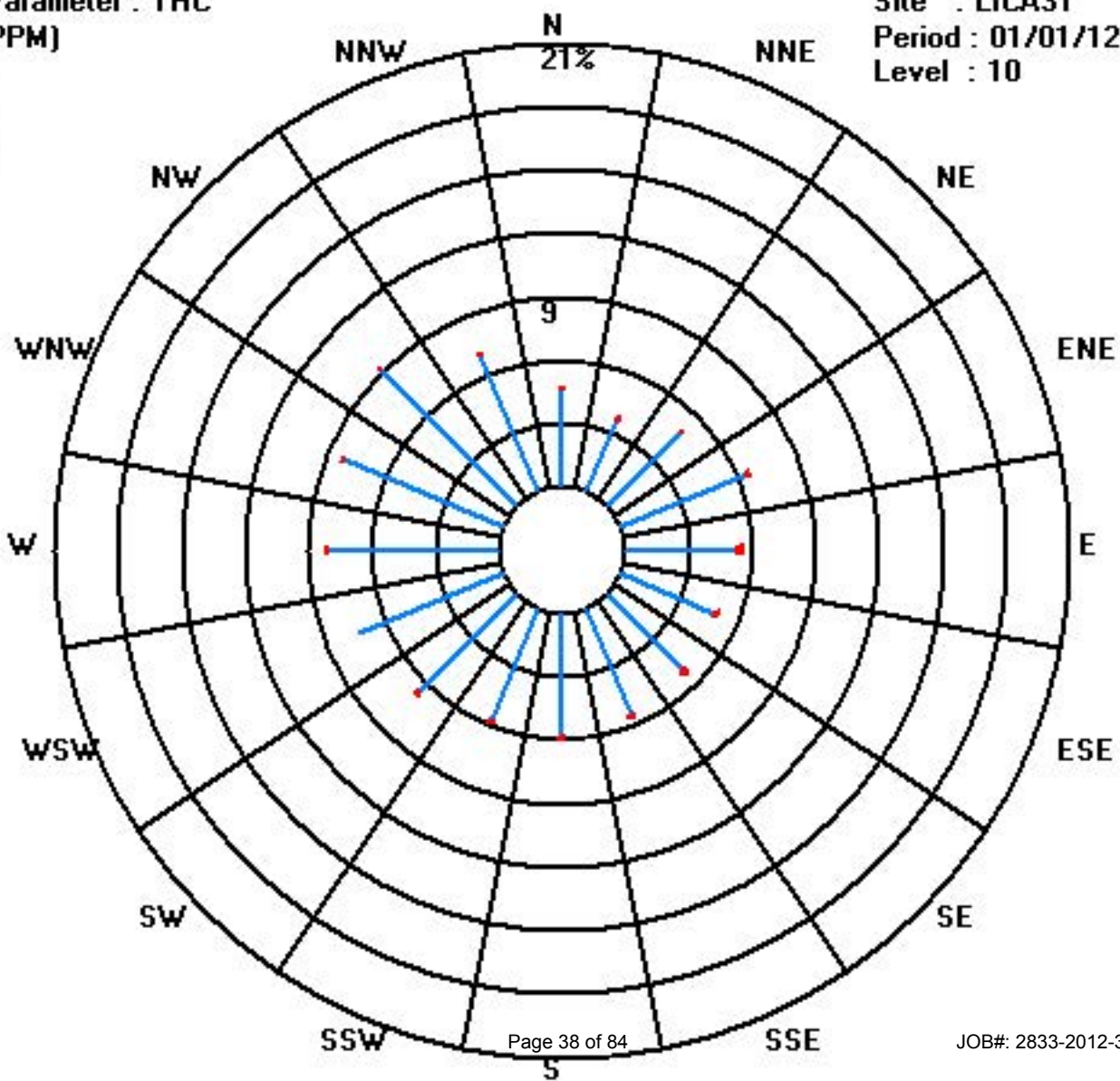
Calm : .00 %

Total # Operational Hours : 8111

Class Limits (PPM)

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

Level : 10



Ozone

Current Date : 03/12/13
Current Time : 10:33

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA31 Logger Id : 31 Parameter : O3_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	699	6	38	26
February	696	659	7	40	29
March	744	698	15	51	35
April	720	685	13	58	37
May	744	704	10	58	40
June	720	681	10	57	32
July	744	708	8	63	29
August	744	706	7	54	26
September	720	678	7	51	27
October	744	691	0	41	23
November	720	683	5	41	24
December	744	707	2	37	23
Yearly Total	8784	8299	0	63	29

O3 Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Station: St. Lina

Month	O3 ppb Peak Reading
January	38
February	40
March	51
April	58
May	58
June	57
July	63
August	54
September	51
October	41
November	41
December	37
ANNUAL PEAK	63

LICA31
O3_ / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 31
Site Name : LICA31
Parameter : O3
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	4.67	3.78	4.87	6.35	5.55	5.02	5.13	5.47	5.76	5.64	6.45	7.06	7.92	8.16	9.26	6.84	98.02
< 110	.01	.07	.07	.10	.04	.13	.18	.14	.21	.12	.13	.27	.10	.07	.09	.18	1.97
< 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	4.69	3.85	4.94	6.46	5.60	5.16	5.31	5.61	5.98	5.76	6.58	7.34	8.03	8.23	9.35	7.03	

Calm : .00 %

Total # Operational Hours : 8292

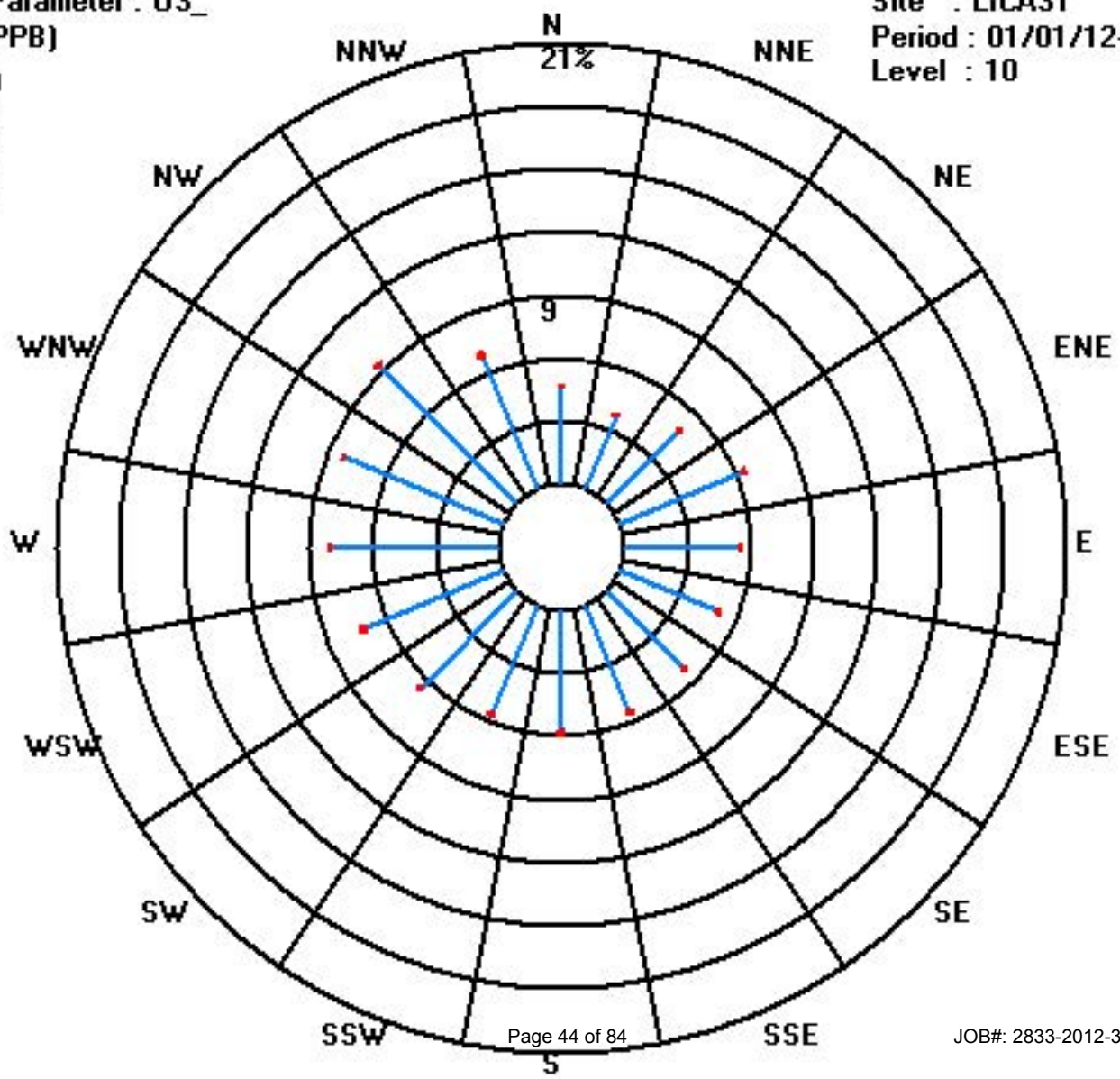
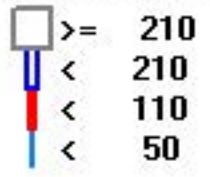
Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50	388	314	404	527	461	417	426	454	478	468	535	586	657	677	768	568	8128
< 110	1	6	6	9	4	11	15	12	18	10	11	23	9	6	8	15	164
< 210																	
>= 210																	
Totals	389	320	410	536	465	428	441	466	496	478	546	609	666	683	776	583	

Calm : .00 %

Total # Operational Hours : 8292

Class Limits (PPB)



Nitrogen Dioxide

Current Date : 03/12/13
Current Time : 10:22

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA31 Logger Id : 31 Parameter : NO2_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	699	-0.4	19.2	3
February	696	659	-0.3	25.8	2.8
March	744	694	-0.4	8.4	1.7
April	720	682	-0.4	6.3	0.9
May	744	702	-0.5	5	0.6
June	720	671	-0.5	4.1	0.8
July	744	703	-0.5	3	0.8
August	744	703	-0.5	8.8	0.6
September	720	667	-0.5	6.2	1.1
October	744	698	0	11.7	1.3
November	720	678	0	19.1	3.5
December	744	704	0	24.7	4.5
Yearly Total	8784	8260	-0.5	25.8	1.8

NO₂ Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Station: ST. LINA

Month	NO2 ppb Peak Reading
January	19
February	26
March	8
April	6
May	5
June	4
July	3
August	9
September	6
October	12
November	19
December	25
ANNUAL PEAK	26

LICA31
 NO2_ / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 31
 Site Name : LICA31
 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	4.72	3.78	4.93	6.45	5.52	5.02	5.33	5.57	6.03	5.86	6.68	7.39	7.98	8.26	9.33	7.07	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	4.72	3.78	4.93	6.45	5.52	5.02	5.33	5.57	6.03	5.86	6.68	7.39	7.98	8.26	9.33	7.07	

Calm : .00 %

Total # Operational Hours : 8252

Distribution By Samples

Limit	Direction															Freq	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW		NNW
< 50.0	390	312	407	533	456	415	440	460	498	484	552	610	659	682	770	584	8252
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	390	312	407	533	456	415	440	460	498	484	552	610	659	682	770	584	

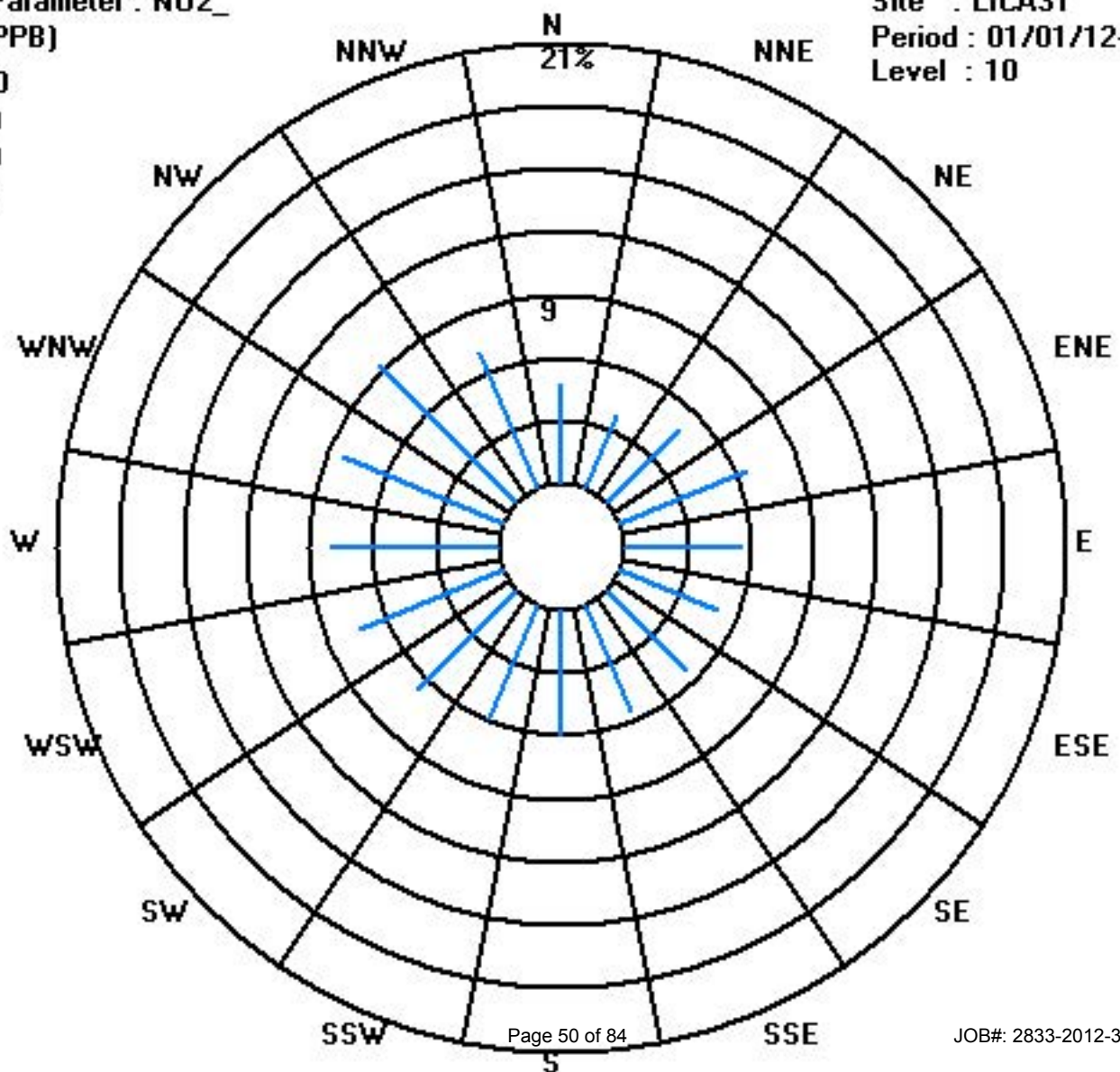
Calm : .00 %

Total # Operational Hours : 8252

Class Limits (PPB)

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

Level : 10



Nitric Oxide

Current Date : 03/12/13
Current Time : 10:22

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA31 Logger Id : 31 Parameter : NO_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	699	-0.5	20.7	0.6
February	696	659	-0.5	5.7	0.6
March	744	694	-0.5	11	0.3
April	720	682	-0.5	2	0.1
May	744	702	-0.5	6	0.3
June	720	646	-0.5	3.5	0.4
July	744	703	-0.5	2.4	0.2
August	744	703	-0.5	7.3	0.3
September	720	667	-0.5	13.2	0.3
October	744	698	0	6.2	0.4
November	720	678	0	8.2	0.5
December	744	704	0	9.2	0.6
Yearly Total	8784	8235	-0.5	20.7	0.4

NO Peak reading of One Hour Averages for 2012

Plant Operator: LICA

Station: ST. LINA

Month	NO ppb Peak Reading
January	21
February	6
March	11
April	2
May	6
June	4
July	2
August	7
September	13
October	6
November	8
December	9
ANNUAL PEAK	21

LICA31
 NO_ / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 31
 Site Name : LICA31
 Parameter : NO_
 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	4.74	3.79	4.92	6.22	5.51	5.04	5.34	5.59	6.05	5.88	6.70	7.41	8.01	8.28	9.35	7.09	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	4.74	3.79	4.92	6.22	5.51	5.04	5.34	5.59	6.05	5.88	6.70	7.41	8.01	8.28	9.35	7.09	

Calm : .00 %

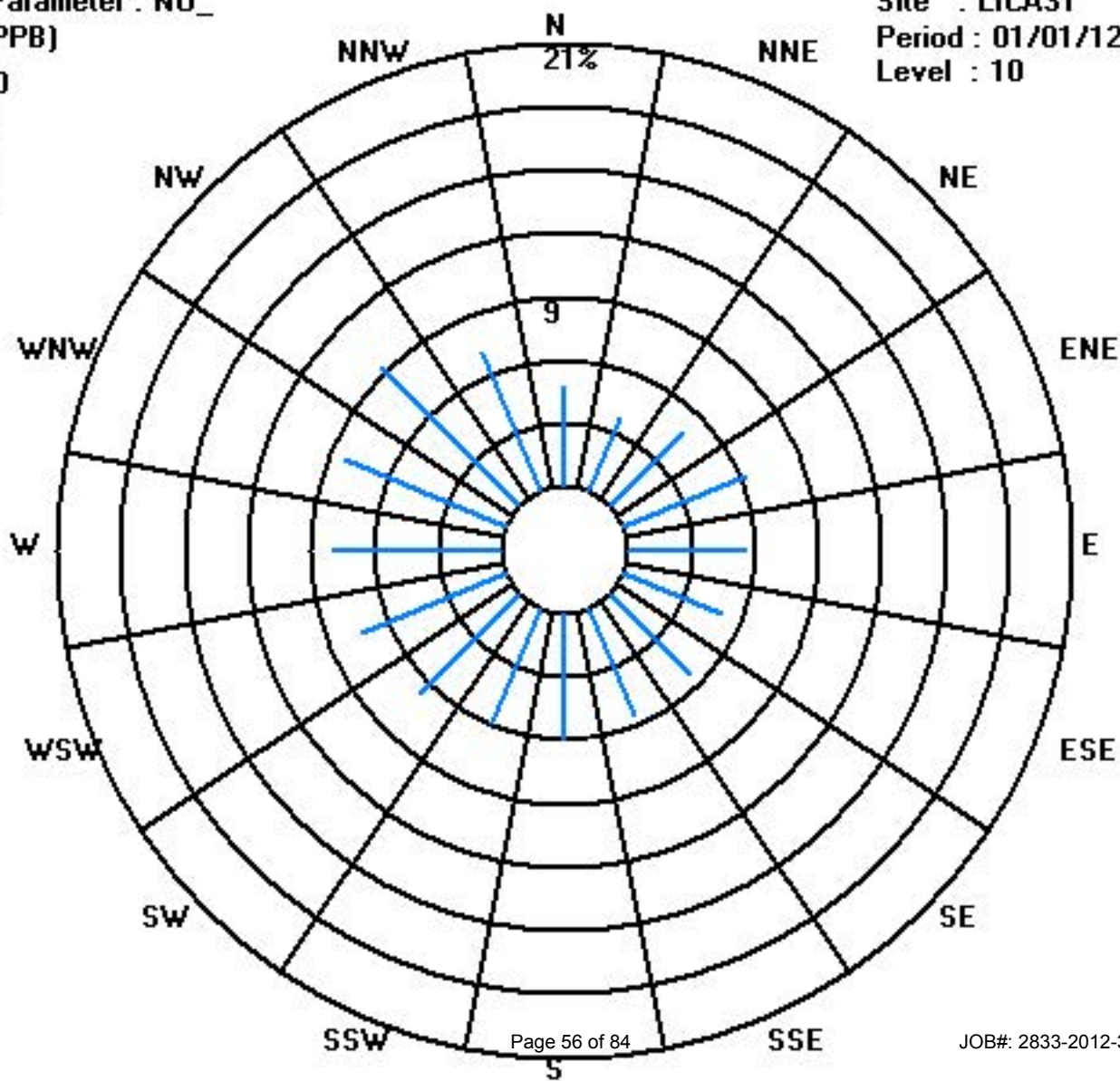
Total # Operational Hours : 8227

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	390	312	405	512	454	415	440	460	498	484	552	610	659	682	770	584	8227
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	390	312	405	512	454	415	440	460	498	484	552	610	659	682	770	584	

Calm : .00 %

Total # Operational Hours : 8227



Oxides of Nitrogen

Current Date : 03/12/13
Current Time : 10:23

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA31 Logger Id : 31 Parameter : NOX_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	744	699	0	39.5	3.8
February	696	659	0	26	3.5
March	744	694	0	11.3	2.1
April	720	682	0	6.9	1.2
May	744	702	0	5.9	0.9
June	720	655	0	5.4	1.2
July	744	703	0	4.1	0.9
August	744	703	0	15.7	1
September	720	667	0	13.6	1.5
October	744	698	0	17.4	1.7
November	720	678	0	21.5	4
December	744	704	0	26.1	5
Yearly Total	8784	8244	0	39.5	2.2

NO_x Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Station: ST. LINA

Month	NOx ppb Peak Reading
January	40
February	26
March	11
April	7
May	6
June	5
July	4
August	16
September	14
October	17
November	22
December	26
ANNUAL PEAK	40

LICA31
 NOX_ / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 31
 Site Name : LICA31
 Parameter : NOX_
 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	4.73	3.78	4.94	6.47	5.52	5.03	5.34	5.58	5.98	5.82	6.67	7.37	7.98	8.28	9.34	7.09	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	4.73	3.78	4.94	6.47	5.52	5.03	5.34	5.58	5.98	5.82	6.67	7.37	7.98	8.28	9.34	7.09	

Calm : .00 %

Total # Operational Hours : 8236

Distribution By Samples

Limit	Direction															Freq	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW		NNW
< 50.0	390	312	407	533	455	415	440	460	493	480	550	607	658	682	770	584	8236
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	390	312	407	533	455	415	440	460	493	480	550	607	658	682	770	584	

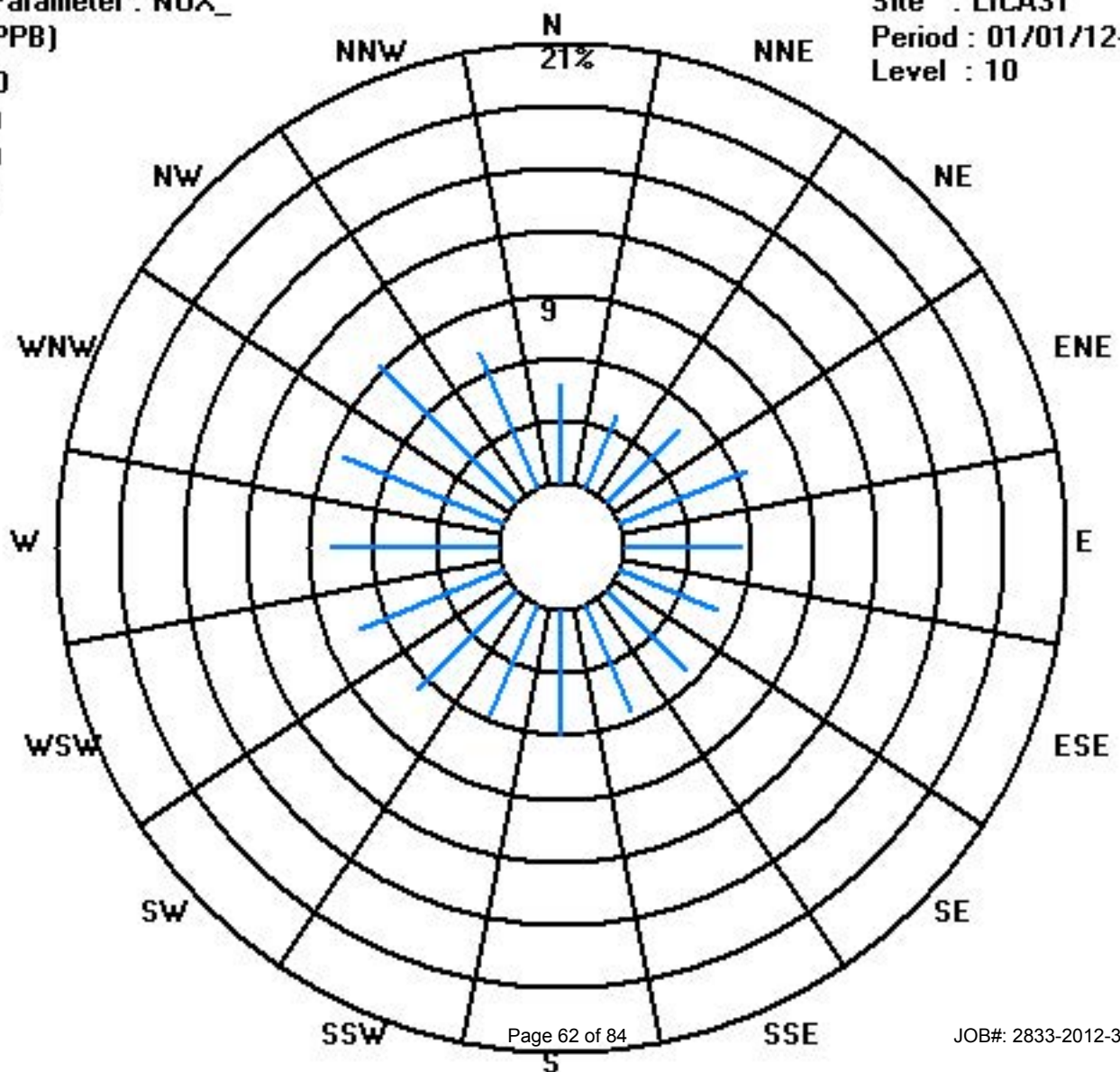
Calm : .00 %

Total # Operational Hours : 8236

Class Limits (PPB)

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

Level : 10



Particulate Matter 2.5

Current Date : 03/12/13
Current Time : 10:24

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA31 Logger Id : 31 Parameter : PM2 Units : UG/M3

	Readings	Valid Readings	Min	Max	Mean
January	744	570	0	47	5
February	696	689	0	35	6
March	744	726	0	28	5
April	720	714	0	36	4
May	744	743	0	23	5
June	720	716	0	17	5
July	744	739	0	186	13
August	744	741	0	21	6
September	720	713	0	31	6
October	744	707	0	22	3
November	672	631	0	57	10
December	744	728	0	36	7
Yearly Total	8736	8417	0	186	6

PM 2.5 Monthly Averages and Frequency Distributions of Daily Average Readings - 2012

Plant Operator: LICA

Plant Location: ST. LINA

Month	Valid Readings* Hours	Operational Time (%)	% Readings in Concentration Range (ug/m ³)						Total Daily Readings > 30 ug/m ³	PM2.5 ug/m ³ Monthly Average
			≤ 30 ug/m ³	30 < C ≤ 60 ug/m ³	60 < C ≤ 80 ug/m ³	80 < C ≤ 120 ug/m ³	120 < C ≤ 240 ug/m ³	> 240 ug/m ³		
January	570	77.3	99.3%	0.7%	0.0%	0.0%	0.0%	0.0%	3	4.73
February	689	99.6	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0	5.68
March	726	98.1	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	4.76
April	714	99.3	99.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0	4.24
May	743	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	4.86
June	716	99.6	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	5.15
July	739	99.5	91.7%	5.1%	1.9%	0.1%	1.1%	0.0%	3	12.63
August	741	99.9	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	5.66
September	713	99.6	99.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0	6.12
October	707	95.3	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	3.08
November	631	88.3	96.5%	3.5%	0.0%	0.0%	0.0%	0.0%	0	10.46
December	728	98.4	99.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0	7.19
									Annual Average	6.21

* Valid readings - does not include calibration hours and downtime hours

PM 2.5 Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Plant Location: ST. LINA

Month	PM 2.5 (ug/m3) Peak Reading
January	47
February	35
March	28
April	36
May	23
June	17
July	186
August	21
September	31
October	22
November	57
December	36
ANNUAL PEAK	186

LICA31
 PM2 / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 31
 Site Name : LICA31
 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	4.48	3.73	4.85	6.36	5.22	4.87	5.11	5.63	6.12	5.82	6.61	7.22	8.04	8.32	9.41	6.98	98.85
< 60	.10	.05	.01	.02	.07	.09	.15	.13	.04	.02	.02	.02	.02	.01	.01	.04	.86
< 80	.00	.00	.02	.00	.03	.02	.05	.01	.01	.00	.00	.00	.00	.00	.00	.00	.16
< 120	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
< 240	.00	.05	.02	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09
>= 240	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	4.59	3.85	4.92	6.40	5.33	4.99	5.33	5.78	6.18	5.85	6.63	7.24	8.06	8.34	9.42	7.03	

Calm : .00 %

Total # Operational Hours : 8405

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 30	377	314	408	535	439	410	430	474	515	490	556	607	676	700	791	587	8309
< 60	9	5	1	2	6	8	13	11	4	2	2	2	2	1	1	4	73
< 80			2		3	2	5	1	1								14
< 120			1														1
< 240		5	2	1													8
>= 240																	
Totals	386	324	414	538	448	420	448	486	520	492	558	609	678	701	792	591	

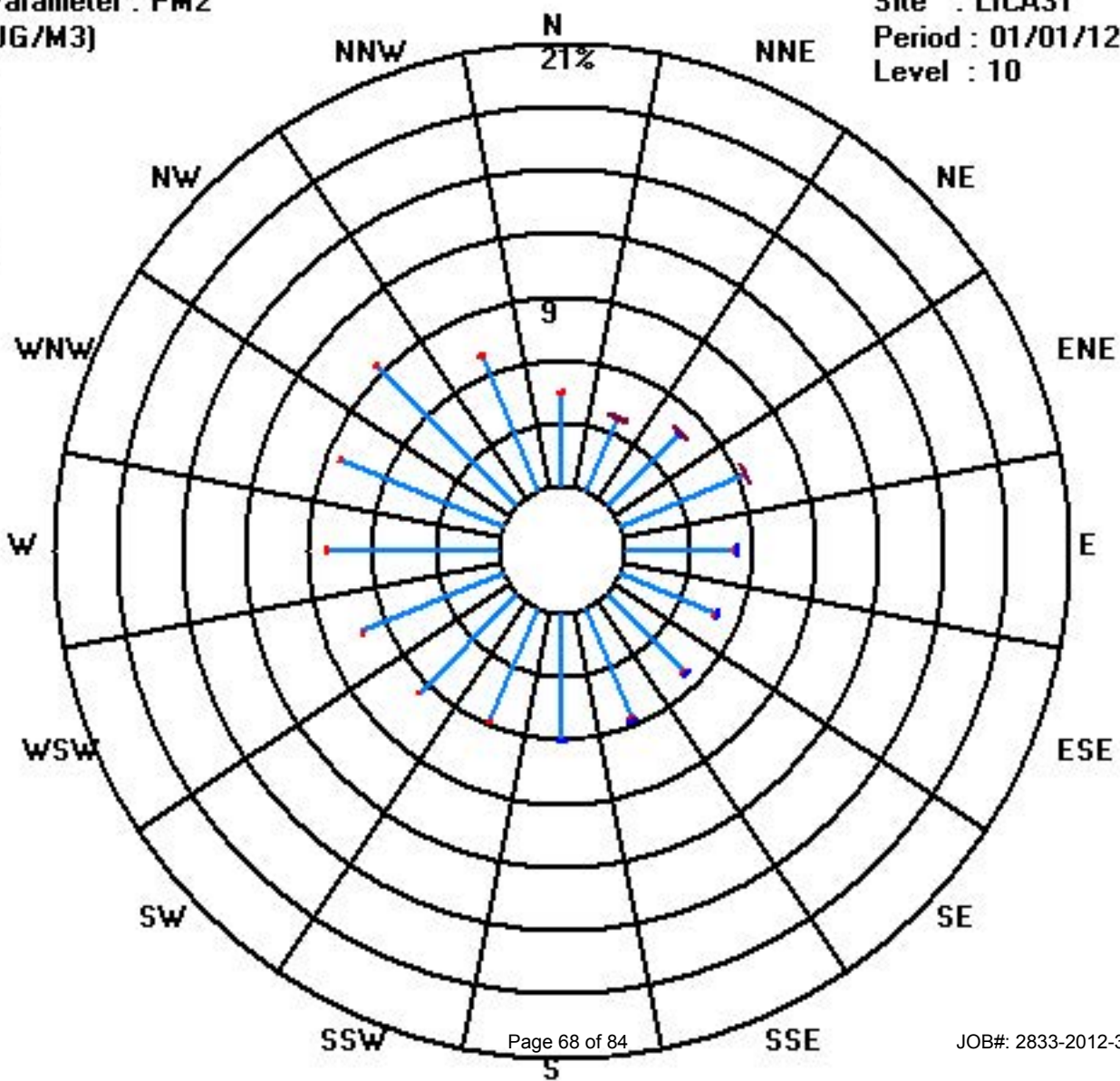
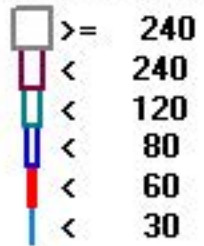
Calm : .00 %

Total # Operational Hours : 8405

Class Limits (UG/M3)

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

Level : 10



Temperature

Current Date : 03/12/13
Current Time : 12:37

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA31 Logger Id : 31 Parameter : TPX Units : DGC

	Readings	Valid Readings	Min	Max	Mean
January	744	742	-35.2	9.7	-9.1
February	696	695	-23.9	6	-7.4
March	744	737	-16.5	12.3	-1.5
April	720	720	-6.7	18.7	3.5
May	744	744	0.5	24.2	11.3
June	720	718	6.3	25.5	15.9
July	744	744	9.4	30.7	19.1
August	744	744	7	29.7	17.5
September	720	717	3	25.8	13.3
October	744	739	-11.9	16.7	0.8
November	720	719	-21.8	10.1	-9
December	744	744	-27.6	0	-15.8
Yearly Total	8784	8763	-35.2	30.7	3.3

Temperature - Monthly Averages for 2012

Plant Operator: LICA

Plant Location: ST. LINA

Month	Operational Time (%)	Monthly Average (Deg.C)	Maximum Hourly Average (Deg C)	Minimum Hourly Average (Deg C)	Maximum Daily Average (Deg C)
January	99.7	-9.09	9.7	-35.2	3.3
February	99.9	-7.45	6.0	-23.9	-1.3
March	99.1	-1.47	12.3	-16.5	6.0
April	100.0	3.54	18.7	-6.7	12.1
May	100.0	11.31	24.2	0.5	17.6
June	99.7	15.93	25.5	6.3	20.1
July	100.0	19.14	30.7	9.4	25.5
August	100.0	17.50	29.7	7.0	22.7
September	99.6	13.29	25.8	3.0	18.2
October	99.3	0.80	16.7	-11.9	10.3
November	99.9	-8.99	10.1	-21.8	5.3
December	100.0	-15.75	-0.8	-27.6	-6.2
ANNUAL AVERAGE		3.23	-	-	-

Barometric Pressure

Current Date : 03/12/13
Current Time : 12:37

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA31 Logger Id : 31 Parameter : BP Units : MB

	Readings	Valid Readings	Min	Max	Mean
January	744	742	901	943	921
February	696	695	906	949	927
March	744	737	898	937	919
April	720	720	907	944	928
May	744	744	916	942	930
June	720	718	914	940	928
July	744	744	908	943	929
August	744	744	917	936	928
September	720	717	911	938	927
October	744	739	899	943	925
November	720	719	905	939	925
December	744	744	904	939	920
Yearly Total	8784	8763	898	949	926

BAROMETRIC PRESSURE - Monthly Averages for 2012

Plant Operator: LICA

Plant Location: ST. LINA

Month	Operational Time (%)	Monthly Average (millibar)	Maximum Hourly Average (millibar)	Maximum Daily Average (millibar)
January	99.7	921	943	940.3
February	99.9	928	949	946.9
March	99.1	919	937	934.5
April	100.0	928	944	941.8
May	100.0	930	942	939.3
June	99.7	928	940	937.2
July	100.0	929	943	939.7
August	100.0	928	936	934.5
September	99.6	927	938	936.4
October	99.3	925	943	941.3
November	99.9	925	939	935.7
December	100.0	920	939	937.4
ANNUAL AVERAGE		926	-	-

Relative Humidity

Current Date : 03/12/13
Current Time : 12:37

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA31 Logger Id : 31 Parameter : RH Units : %FS

	Readings	Valid Readings	Min	Max	Mean
January	744	742	30	89	66
February	696	695	33	85	66
March	744	737	25	90	66
April	720	720	14	91	58
May	744	744	10	91	47
June	720	718	22	92	63
July	744	744	31	92	70
August	744	744	29	92	67
September	720	717	25	91	61
October	744	739	27	91	71
November	720	719	34	89	75
December	744	744	48	83	73
Yearly Total	8784	8763	10	92	65

Precipitation

Current Date : 03/12/13
Current Time : 12:37

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA31 Logger Id : 31 Parameter : PRECIP Units : MM

	Readings	Valid Readings	Min	Max	Mean
January	744	744	0	1.4	0
February	696	694	0	0	0
March	744	737	0	3.6	0
April	720	720	0	3.6	0.1
May	744	744	0	3.6	0.1
June	720	718	0	5.7	0.1
July	744	744	0	16.9	0.2
August	744	743	0	11.8	0.1
September	720	720	0	3	0.1
October	744	738	0	1.1	0
November	720	720	0	0.7	0
December	744	742	0	0.3	0
Yearly Total	8784	8764	0	16.9	0.1

Vector Wind Speed

Current Date : 03/12/13
Current Time : 10:24

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA31 Logger Id : 31 Parameter : WSP Units : KPH

	Readings	Valid Readings	Min	Max	Mean
January	744	742	0.8	25.3	10.2
February	696	695	0.7	21.8	9.7
March	744	737	0.1	27.6	10.5
April	720	720	0.4	25.6	9.9
May	744	741	1.1	23.5	9.8
June	720	718	0.8	28	9.6
July	744	741	0.5	25.1	9
August	744	743	1.3	25.9	8.8
September	720	716	0.8	32.3	10.9
October	744	738	0.1	27.2	11.8
November	720	715	1.1	33.1	11
December	744	743	0.4	29.6	9.9
Yearly Total	8784	8749	0.1	33.1	10.1

LICA31
WSP / WDR Joint Frequency Distribution (Percent)

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 31
Site Name : LICA31
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	1.06	1.17	1.23	1.01	.92	.73	1.04	.92	1.29	1.25	1.20	.88	1.06	1.12	1.16	1.05	17.14
< 12.0	2.35	1.79	2.35	3.08	2.59	2.35	2.34	3.33	3.29	3.42	4.11	4.24	4.19	3.80	4.97	4.35	52.62
< 20.0	1.13	.84	1.16	1.78	1.85	1.80	1.84	1.25	1.40	1.10	1.32	2.03	2.37	2.65	2.80	1.42	26.81
< 29.0	.10	.03	.17	.40	.19	.17	.17	.05	.02	.00	.02	.25	.42	.58	.41	.17	3.18
< 39.0	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.02	.05	.00	.01	.10
>= 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	4.65	3.85	4.92	6.28	5.56	5.07	5.39	5.57	6.01	5.79	6.66	7.40	8.08	8.21	9.34	7.01	

Calm : .12 %

Total # Operational Hours : 8749

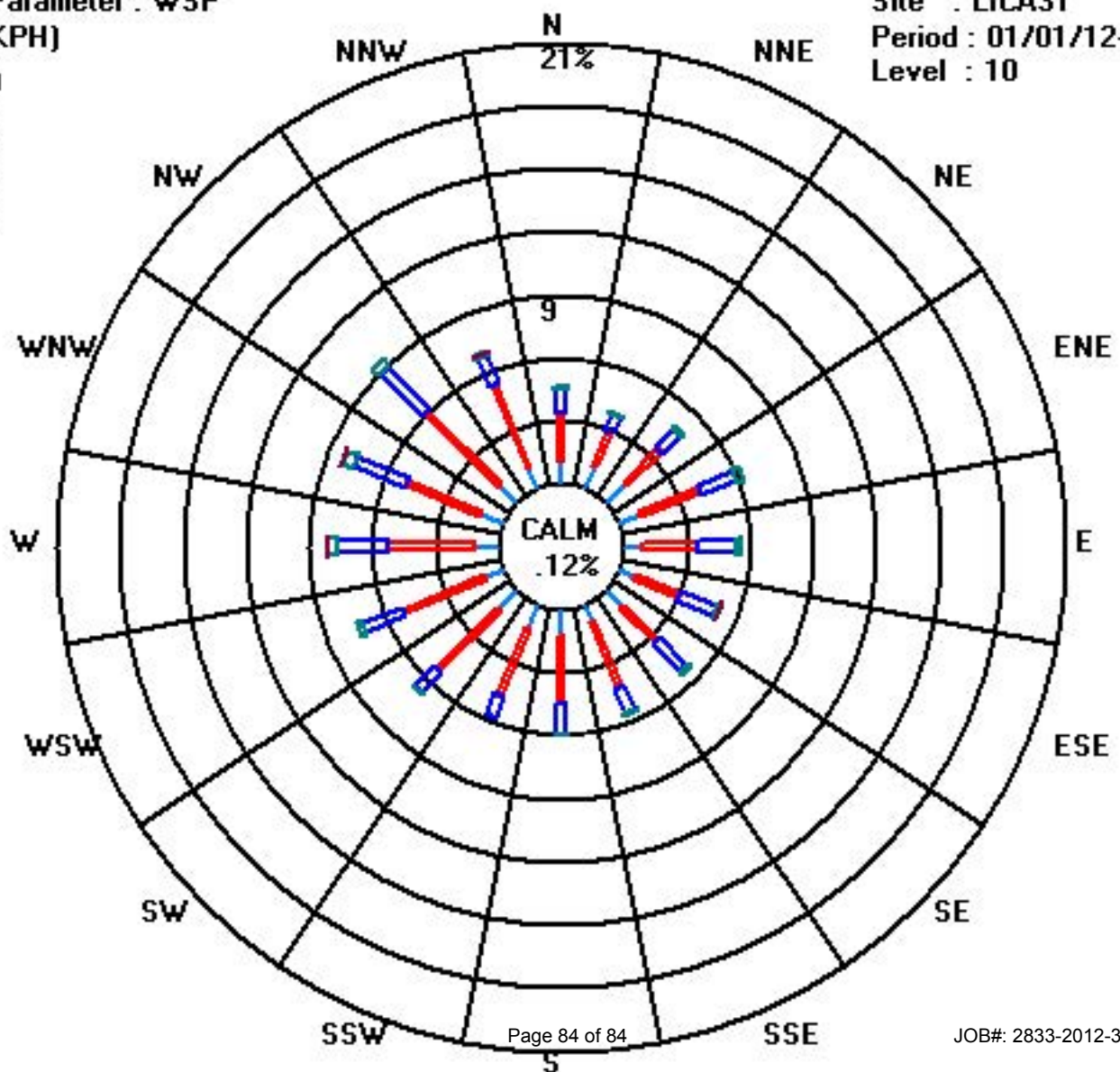
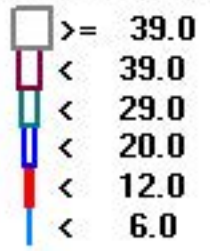
Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 6.0	93	103	108	89	81	64	91	81	113	110	105	77	93	98	102	92	1500
< 12.0	206	157	206	270	227	206	205	292	288	300	360	371	367	333	435	381	4604
< 20.0	99	74	102	156	162	158	161	110	123	97	116	178	208	232	245	125	2346
< 29.0	9	3	15	35	17	15	15	5	2		2	22	37	51	36	15	279
< 39.0								1					2	5		1	9
>= 39.0																	
Totals	407	337	431	550	487	444	472	488	526	507	583	648	707	719	818	614	

Calm : .12 %

Total # Operational Hours : 8749

Class Limits (KPH)



Lakeland Industry & Community Association

Portable / Elk Point Airport Monitoring Site
Ambient Annual Data Report

For
2012

Prepared By:



March 12, 2013

Lakeland Industry & Community Association Portable / Elk Point Airport Ambient Air Monitoring

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Introduction

The following Ambient Air Monitoring report was prepared for:

Mr. Mike Bisaga
Lakeland Industry & Community Association
Box 8237
5107W – 50 Street
Bonnyville, Alberta
T9N 2J5

Monitoring Location: Portable / Elk Point Airport
Data Period: March 2012 to December 2012

The monthly ambient data report:

- Prepared by Lily Lin
- Reviewed by Katherine Rapske

Calibration Procedure

The following calibration procedure applies to all calibrations conducted at the Lakeland Industry & Community Association Air Monitoring Station.

Calibration gas concentrations are generated using a dynamic mass flow controlled calibrator. EPA Protocol one gases are diluted with zero air generated on site. The Mass Flow Controllers in the calibrator are referenced using an NIST traceable flow meter once per month. All listed flows are reported as corrected to Standard Temperature and Pressure (STP).

Generated zero gas is introduced to the analyzer first. Three concentrations of calibration gas are then generated in order to introduce points at approximately 50-80%, 25-40% & 10-20% of the analyzer's full-scale range. An auto zero and span are then performed to validate the daily zero and span values recorded to the next multi-point calibration.

All indicated concentrations are taken from the ESC data logger used to collect the data for monthly reporting.

Conformance of each calibration to Alberta Environment regulations is outlined in the individual calibration reports. The slope and correlation coefficient are derived from the calculated and indicated analyzer responses. The percent change is calculated using the previous calibration correction factor and the current correction factor before adjustment. The calibration conforms to the procedure outlined in the *Air Monitoring Directive, Appendix A-10, Section 1.6*.

General Annual Summary

AQM STATION – LICA – PORTABLE

Sulphur Dioxide (PPB)

- Analyzer make / model - API 100E, S/N: 467
 - ❖ The analyzer was installed on March 3rd. Data collection started on March 4th. An installation calibration was performed on March 8th. As the daily calibration results were within +/-10% of limited range before the installation calibration, data before calibration were considered good and were kept.
 - ❖ Data on March 9th at hour of 5 is missing.
 - ❖ The analyzer did not function properly for 12 hours after a power failure on May 8th. A daily zero/span check was run on May 9th to ensure the analyzer's functionality. The check result was within the acceptable range.
 - ❖ The exhausting pump was rebuilt following the as found points check on May 9th. The UV lamp was also peaked on the same day.
 - ❖ The analyzer spanned low on July 28th due to the permeation tube depleting. Following the as found points check on July 30th, the perm tube was replaced.
 - ❖ Hourly data on August 23rd at hour 9 was invalidated due to a power failure.
 - ❖ The SO2 channel was put into the Maintenance mode on September 14th at hour 11 for the wind system repair.
 - ❖ The span went below -10% of the accepted range limit on October 25th. An as found points check was performed on October 29th to verify functionality of the analyzer, it was concluded that the analyzer was functioning well and the data was kept.

General Annual Summary

AQM STATION – LICA – PORTABLE

Hydrogen Sulphide (PPB)

- Analyzer make / model - API 101E, S/N: 509
 - ❖ The analyzer was installed on March 3rd. Data collection started on March 4th. An installation calibration was performed on March 7th. As the daily calibration results were within +/-10% of limited range before the installation calibration, data before calibration were considered good and were kept.
 - ❖ Data on March 9th at hour of 5 is missing.
 - ❖ The daily span for March drifted upward after the installation calibration. It is likely because the analyzer was still stabilizing from the installation.
 - ❖ The analyzer did not function properly for 12 hours after a power failure on May 8th. A daily zero/span check was run on May 9th to ensure the analyzer's functionality. The check result was within the acceptable range.
 - ❖ Following the as found points check on July 11th, the UV lamp was peaked, the offset and slope were adjusted.
 - ❖ Hourly data on August 23rd at hour 9 was invalidated due to a power failure.
 - ❖ The H2S channel was put into the Maintenance mode on September 14th at hour 11 for the wind system repair.
 - ❖ Following the as found points on October 16th, the exhaust pump rebuilt.

Nitrogen Dioxide (PPB)

- Analyzer make / model - API 200E, S/N: 593
 - ❖ The analyzer was installed on March 3rd. Data collection started on March 4th. An installation calibration was performed on March 7th. As the daily calibration results were outside +/-10% of limited range before the installation calibration, data before an installation calibration were considered bad and were not included in the report.
 - ❖ Data on March 9th at hour of 5 is missing.
 - ❖ Hourly data at hour 9 on May 8th was invalidated due to a power failure. Hourly data at hour 10 was also invalid because the analyzer was recovering from the power failure. A daily zero/span check was run on May 9th to ensure the analyzer's functionality. The check result was within the acceptable range.
 - ❖ The analyzer spanned low on May 18th due to the permeation tube depleting. The perm tube was replaced following the as found points check on May 18th.
 - ❖ Following the as found points check on June 14th, the exhaust pump was replaced and the exhaust scrubber was replaced.

General Annual Summary

AQM STATION – LICA – PORTABLE

Nitrogen Dioxide (PPB) (Continued)

- Analyzer make / model - API 200E, S/N: 593
 - ❖ Hourly data on August 23rd at hour 9 was invalidated due to a power failure.
 - ❖ Following the as found points check on September 4th, the O-ring and sintered filter for the flow control system were replaced, the optical filter was cleaned, and both HVPS voltage and slope were adjusted.
 - ❖ The NO₂ channel was put into the Maintenance mode on September 14th at hour 11 for the wind system repair.
 - ❖ The daily spanned went below -10% of the limited range on December 21st. An as found points check was performed on December 24th, and the result was good. The permeation tube was replaced following the as found points check. The expected value was adjusted on December 30th. This issue did not affect data quality.

Ozone (PPB)

- Analyzer make / model - API 700, S/N: 446 and Thermo 49i, S/N: 1002240372
 - ❖ The analyzer was installed on March 3rd. Data collection started on March 4th. An installation calibration was performed on March 8th. As the daily calibration results were within +/-10% of limited range before the installation calibration, data before calibration were considered good and were kept.
 - ❖ Data on March 9th at hour of 5 is missing.
 - ❖ The analyzer did not function properly for 12 hours after a power failure on May 8th. A daily zero/span check was run on May 9th to ensure the analyzer's functionality. The check result was within the acceptable range.
 - ❖ The reading on the data logger stuck at 6 ppb on August 10th. Re-started the analyzer and run a daily calibration checked on August 10th. One hour of data was invalidated due to this issue.
 - ❖ Hourly data on August 23rd at hour 9 was invalidated due to a power failure.
 - ❖ O₃ channel was put into the Maintenance mode on September 14th at hour 11 for the wind system repair.
 - ❖ The analyzer spanned high on October 3rd. An as found points check was performed on October 3rd to verify the functionality of the analyzer. The analyzer was functioning well. The pump for the daily calibration system was rebuilt following the as found points check.

General Annual Summary

AQM STATION – LICA – PORTABLE

Particulate Matter 2.5 (ug/m³)

- Analyzer make / model – TEOM 1400a, S/N: 30002 and TEOM 1405F, S/N: 1405A208301003
 - ❖ The Teom unit was installed on March 3rd. Data collection started on March 4th.
 - ❖ The Teom exhausting pump was rebuilt on March 7th.
 - ❖ The Teom's stability was poor after the audit. Maintenance was performed on the Teom unit on March 10th to try to reduce the instability issue. However, the issue of instability was not improved after the maintenance. A replacement Teom unit attempted to be installed on March 15th, but the mass transducer for the unit broken during the installation. Both units was removed from the site and sent back to manufacturer for repair on March 15th.
 - ❖ A contravention of the "below 90% of operational uptime" was reported to AE (AE Ref # 256799).
 - ❖ Data on March 9th at hour of 5 is missing.
 - ❖ 35 hours of data were invalidated as they were below -3.0 ug/m^3 in March.
 - ❖ Two 24-Hour contraventions were recorded in March.
 - ❖ No hourly data was recorded in April as the Teom unit was removed from the trailer and sent to the manufacturer for repair on March 15th.
 - ❖ No hourly data was recorded between May 1st and May 15th at hour 12 as the Teom unit was removed from the trailer and sent to the manufacturer for repair on March 15th. The Teom unit was put back to the service on May 15th. A Teom audit and a leak check were performed after the unit installation.
 - ❖ 19 hours of data were invalidated as they were below -3.0 ug/m^3 in May.
 - ❖ 44 hours of data were invalidated as they were below -3.0 ug/m^3 in June.
 - ❖ 67 hours of data were invalidated as they were below -3.0 ug/m^3 in July.
 - ❖ There were two 24-Hour PM2.5 contraventions recorded in July (AE Ref # 260778).
 - ❖ The PM2.5 reading stuck at -50 ug/m^3 on August 10th. Performed troubleshooting by re-starting the Teom unit on August 10th. One hour of data were invalidated due to this issue.
 - ❖ Following the audit on August 15th, the Teom was replaced to Teom 1400a. The configuration changes were made before the unit installation. An installation audit was performed on the Teom 1400a on August 15th. Temperature, pressure and flow rate calibrations were performed during the installation audit.
 - ❖ 40 hours of data were invalidated as they were below -3.0 ug/m^3 in August.
 - ❖ Hourly data on August 23rd at hour 9 was invalidated due to a power failure.

General Annual Summary

AQM STATION – LICA – PORTABLE

Particulate Matter 2.5 (ug/m³) (Continued)

- Analyzer make / model – TEOM 1400a, S/N: 30002 and TEOM 1405F, S/N: 1405A208301003
 - ❖ It was noticed that the Ko number was input incorrectly when the unit was installed on August 15th. A Teom audit was performed on September 20th to verify the Ko with the standard Ko. The result showed 1.7% drift.
 - ❖ One hour of data was invalidated as it was below -3.0 ug/m^3 in September.
 - ❖ The Teom 1405F unit was installed after the audit on the 1400a was completed on December 20th. Following the installation, a 3-point flow calibration, a leak check and the flow audit were performed.
 - ❖ It shows differences between data analyzed by the 1400a and the 1405F. However, as the unit passed the manufacturer requirements. All data was kept. Twelve hours of data were invalidated this month as the data were below -3 ug/m^3 in December.

THC (PPM)

- Analyzer make / model – TECO 51C, S/N: 04366-09739 and Thermo 51C, S/N: 77021-384
 - ❖ The analyzer was installed on March 3rd and was lit on March 5th. An installation calibration was performed on March 7th. As the daily calibration results were within +/-10% of limited range before the installation calibration, data before calibration were considered good and were kept.
 - ❖ Data on March 9th at hour of 5 is missing.
 - ❖ Hourly data at hour 9 on May 8th was invalidated due to a power failure. Hourly data at hour 10 and 11 were also invalid because the analyzer was recovering from the power failure.
 - ❖ The inside pump was rebuilt following the as found points check on May 9th.
 - ❖ The H₂ gas cylinder was replaced on June 7th. A daily calibration check was run after the cylinder replacement.
 - ❖ The span gas cylinder was replaced on July 11th.
 - ❖ The sample pump stopped on July 13th causing the analyzer to flame out. Performed troubleshooting on July 14th. 25hours of the hourly data were invalidated due to this issue.
 - ❖ The H₂ gas cylinder was replaced on August 14th.
 - ❖ Hourly data on August 23rd at hour 9 was invalidated due to a power failure.
 - ❖ The analyzer flamed out after the power failure. It was re-lit on August 23rd at hour 11. One hour of data was invalidated due to this issue.

General Annual Summary

AQM STATION – LICA – PORTABLE

THC (PPM) (Continued)

- Analyzer make / model – TECO 51C, S/N: 04366-09739 and Thermo 51C, S/N: 77021-384
 - ❖ The hourly reading was low on August 30th due to the pump issue. Following the as found points check on August 30th, a new inside pump was replaced on August 30th. Six hours of data was invalidated due to this issue.
 - ❖ The THC channel was put into the Maintenance mode on September 14th at hour 11 for the wind system repair.
 - ❖ The analyzer spanned high on September 16th. Upon arrival on September 17th, it was noticed that the analyzer had a “flow high” alarm. Performed an as found points check on the 17th and then cleared the alarm. Also, the sample pressure was increased from 7.2 psi to 7.5 psi. A post repair calibration was then performed.
 - ❖ The analyzer failed the AE audit on September 19th. It was found that the sample pressure was high (9.0psi) on September 20th. Performed troubleshooting by cleaning the flow restrictors and tubing that is connected with FID. An as found points check was then performed. Following the as found points check, a cool fan was installed and the sample pressure was lowered to 6.8 psi from 7.5 psi. A post –repair calibration was performed after the troubleshooting on September 20th. Because the analyzer failed the AE audit, data from the last valid calibration on September 17th until the analyzer was repaired and recalibrated on September 20th were invalidated. A total of 65 hours of data was invalidated. Data was corrected using daily zero information.
 - ❖ On October 17th a removal calibration was performed and another analyzer was installed as per client’s request. The new analyzer was left overnight to stabilize and the channel was put into maintenance mode until hour 13:00 on October 18th. A total of 24 hours were invalidated.
 - ❖ The analyzer did not span on November 13th. Performed the as found points check on November 13th, the zero was high, but still within acceptable range. A full calibration was then performed.
 - ❖ The span gas was replaced on November 14th.
 - ❖ The analyzer did not span again on November 14th. It was found that the connector of the zero/span system was not connected to the datalogger properly. Reconnected the wire and performed a post-repair calibration on November 14th. The connector was replaced on November 15th. The issue did not affect data quality.
 - ❖ The thermocouple temperature for the zero air supply was checked on December 20th, and the result was good.
 - ❖ Both the pressures for the zero air and for the air gauge were adjusted on December 20th in order to increase the stability of the daily zero.
 - ❖ Two hourly data collected on Dec 16th were invalidated, as the data were below 1.5 ppm of the background concentration after the daily zero information was applied on the data.

General Annual Summary

AQM STATION – LICA – PORTABLE

Vector Wind Speed (KPH) & Vector Wind Direction (DEG)

- System make / model – RM Young 5103VK, S/N: 41334 and S/N: 43708
 - ❖ The latest wind system calibration was done on RM Young, S/N: 41334 on November 24th, 2011 by manufacturer
 - ❖ The wind system was installed on March 3rd. Data collection started on March 4th.
 - ❖ Data on March 9th at hour of 5 is missing.
 - ❖ The wind system failed on September 11th. It was replaced on September 14th. A total of 77 hours of data was invalidated. The latest wind system calibration for the replacement (RM Young, S/N: 43708) was done on May 15th, 2012.

Datalogger

- System make / model - ESC 8832, S/N: AO717
- Software make / version - ESC v 5.51a
 - ❖ The ESC 8832 is connected to a modem with DSL for continuous connection with the base computer.
 - ❖ No issues were recorded this year.

Trailer

- ❖ The trailer was installed on March 3rd.
- ❖ A field camera was installed and mounted on the wind tower on May 15th.

Continuous Monitoring

Annual Summaries Graphs & Wind Roses

Sulphur Dioxide

Current Date : 03/12/13
Current Time : 10:24

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA35 Logger Id : 35 Parameter : SO2_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	0	0			
February	0	0			
March	672	634	0	3	0
April	720	685	0	1	0
May	744	690	0	2	0
June	720	685	0	2	0
July	744	705	0	2	0
August	744	706	0	1	0
September	720	679	0	1	0
October	744	706	0	2	0
November	720	685	0	2	0
December	744	708	0	4	0
Yearly Total	7272	6883	0	4	0

SO₂ Peak Reading of One Hour Averages for 2012

Plant Operator:

LICA _____

Plant Location:

PORTABLE _____

Month	SO ₂ ppb Peak Reading
January	NA
February	NA
March	3
April	1
May	2
June	2
July	2
August	1
September	1
October	2
November	2
December	4
ANNUAL PEAK	4

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

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : SO2_
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 20	3.99	2.71	2.70	4.18	8.78	13.44	10.54	3.70	2.67	1.73	1.85	4.03	9.60	10.84	11.54	7.63	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	3.99	2.71	2.70	4.18	8.78	13.44	10.54	3.70	2.67	1.73	1.85	4.03	9.60	10.84	11.54	7.63	

Calm : .00 %

Total # Operational Hours : 6808

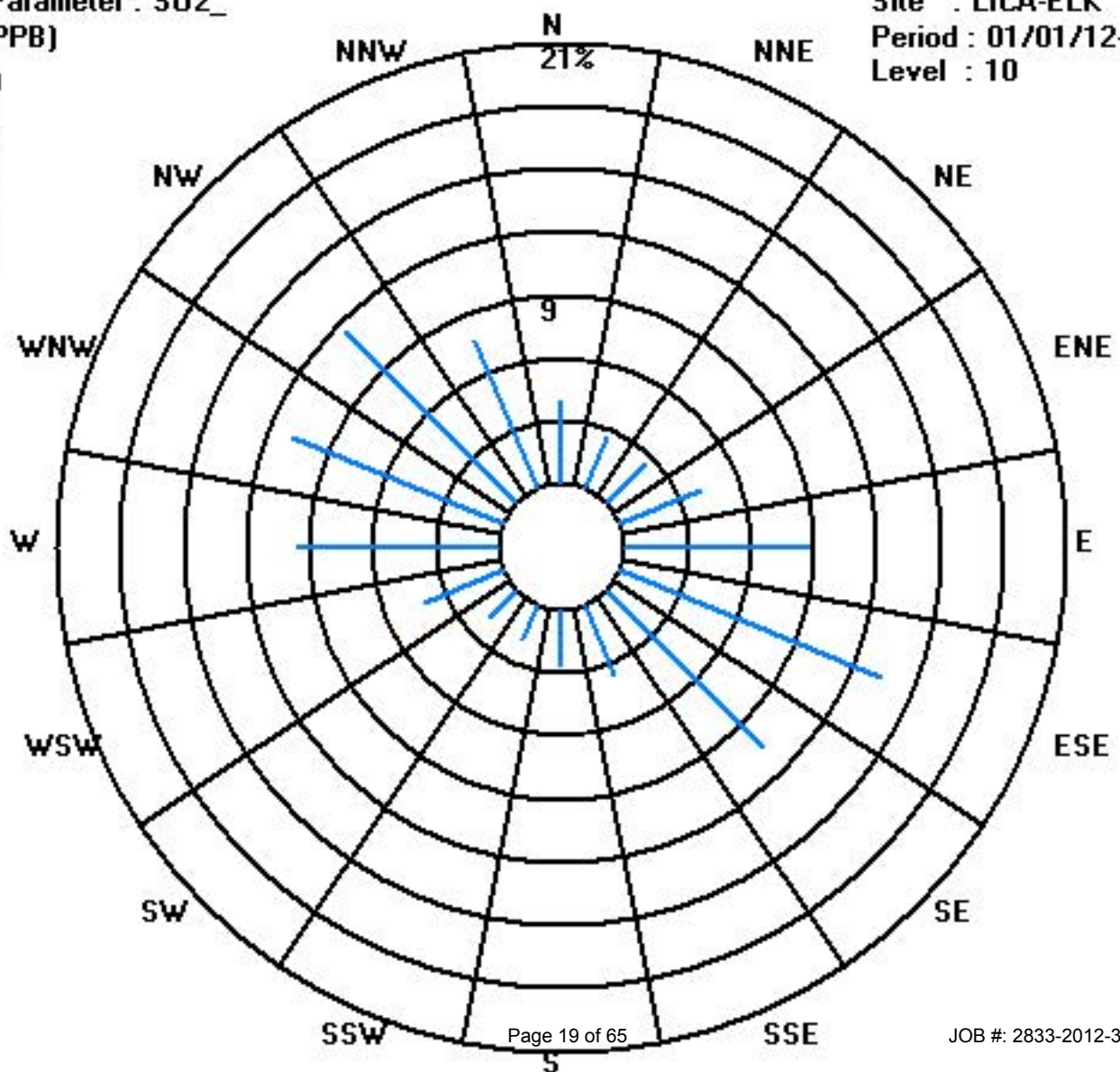
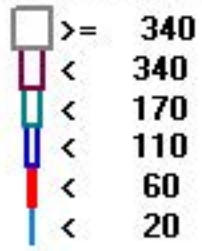
Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 20	272	185	184	285	598	915	718	252	182	118	126	275	654	738	786	520	6808
< 60																	
< 110																	
< 170																	
< 340																	
>= 340																	
Totals	272	185	184	285	598	915	718	252	182	118	126	275	654	738	786	520	

Calm : .00 %

Total # Operational Hours : 6808

Class Limits (PPB)



Hydrogen Sulphide

Current Date : 03/12/13
Current Time : 10:24

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA35 Logger Id : 35 Parameter : H2S_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	0	0			
February	0	0			
March	672	635	0	1	0
April	720	682	0	1	0
May	744	693	0	2	0
June	720	684	0	3	0
July	744	703	0	6	0
August	744	704	0	2	0
September	720	680	0	1	0
October	744	702	0	2	0
November	720	684	0	1	0
December	744	707	0	1	0
Yearly Total	7272	6874	0	6	0

H₂S Monthly Averages and Frequency Distributions of One Hour Readings - 2012

Plant Operator: LICA

Plant Location: PORTABLE

Month	Number of Readings	Operational Time (%)	% Readings in Concentration Range (ppb H ₂ S)				24-Hour Averages Above Guidelines	Hourly Readings Above Guidelines	H ₂ S ppb Monthly Average
			0 to 3 ppb	4 to 10 ppb	11 to 50 ppb	>50 ppb			
January	NA	NA	NA	NA	NA	NA	NA	NA	NA
February	NA	NA	NA	NA	NA	NA	NA	NA	NA
March	635	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.02
April	682	100.0	100.0%	0.0%	0.0%	0.0%	0	0	0.01
May	693	98.1	100.0%	0.0%	0.0%	0.0%	0	0	0.06
June	684	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.10
July	703	99.9	99.9%	0.1%	0.0%	0.0%	0	0	0.25
August	704	99.6	100.0%	0.0%	0.0%	0.0%	0	0	0.10
September	680	99.7	100.0%	0.0%	0.0%	0.0%	0	0	0.04
October	702	100.0	100.0%	0.0%	0.0%	0.0%	0	0	0.08
November	684	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.09
December	707	99.9	100.0%	0.0%	0.0%	0.0%	0	0	0.09
							Annual Average		0.08

* Valid readings - does not include calibration hours and downtime hours.

H2S Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Plant Location: PORTABLE

Month	H2S ppb Peak Reading
January	NA
February	NA
March	1
April	1
May	2
June	3
July	6
August	2
September	1
October	2
November	1
December	1
ANNUAL PEAK	6

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

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 35
Site Name : LICA-ELK
Parameter : H2S_
Units : PPB

Wind Parameter : WDR
Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3	3.97	2.76	2.70	4.19	8.73	13.44	10.60	3.73	2.67	1.76	1.85	4.04	9.57	10.75	11.51	7.61	99.95
< 10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.01	.00	.01	.04
< 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	3.97	2.76	2.70	4.19	8.73	13.44	10.60	3.73	2.67	1.76	1.85	4.05	9.57	10.76	11.51	7.63	

Calm : .00 %

Total # Operational Hours : 6799

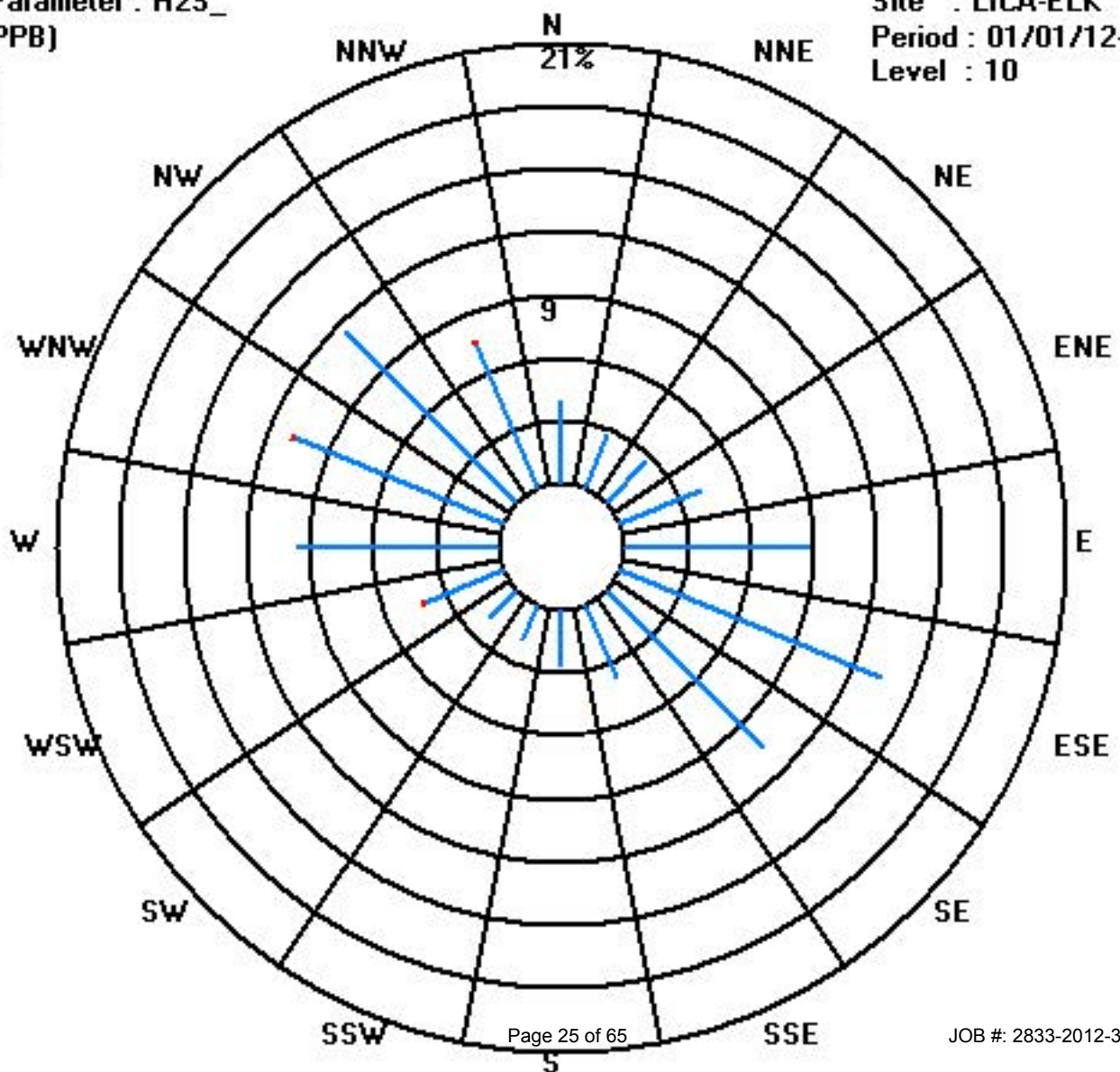
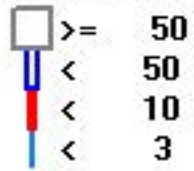
Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3	270	188	184	285	594	914	721	254	182	120	126	275	651	731	783	518	6796
< 10												1		1		1	3
< 50																	
>= 50																	
Totals	270	188	184	285	594	914	721	254	182	120	126	276	651	732	783	519	

Calm : .00 %

Total # Operational Hours : 6799

Class Limits (PPB)



Particulate Matter 2.5

Current Date : 03/12/13
Current Time : 11:03

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA35 Logger Id : 35 Parameter : PM2 Units : UG/M3

	Readings	Valid Readings	Min	Max	Mean
January	0	0			
February	0	0			
March	288	221	0	120	11
April	0	0			
May	408	374	0	35	7
June	720	675	0	61	7
July	744	674	0	176	15
August	744	700	0	33	7
September	720	711	0	44	8
October	744	739	0	20	5
November	720	718	1	16	6
December	744	726	0	65	11
Yearly Total	5832	5538	0	176	8

PM 2.5 Monthly Averages and Frequency Distributions of Daily Average Readings - 2012

Plant Operator: LICA

Plant Location: PORTABLE

Month	Valid Readings* Hours	Operational Time (%)	% Readings in Concentration Range (ug/m ³)						Total Daily Readings > 30 ug/m ³	PM2.5 ug/m ³ Monthly Average
			≤ 30 ug/m ³	30 < C ≤ 60 ug/m ³	60 < C ≤ 80 ug/m ³	80 < C ≤ 120 ug/m ³	120 < C ≤ 240 ug/m ³	> 240 ug/m ³		
January	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
February	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
March	221	33.9	94.1%	3.2%	1.4%	0.9%	0.5%	0.0%	2	10.89
April	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
May	374	50.5	99.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0	6.56
June	675	93.9	99.9%	0.0%	0.1%	0.0%	0.0%	0.0%	0	6.81
July	674	91.0	89.9%	6.5%	1.9%	0.6%	1.0%	0.0%	2	14.80
August	700	94.4	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0	6.74
September	711	99.9	99.6%	0.4%	0.0%	0.0%	0.0%	0.0%	0	7.77
October	715	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	4.54
November	691	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	6.18
December	704	98.3	94.0%	5.7%	0.3%	0.0%	0.0%	0.0%	0	11.04
									Annual Average	8.37

C - Concentration

* Valid readings - does not include calibration hours and downtime hours

PM 2.5 Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Plant Location: PORTABLE

Month	PM 2.5 (ug/m3) Peak Reading
January	NA
February	NA
March	120
April	NA
May	35
June	61
July	176
August	33
September	44
October	20
November	16
December	65
ANNUAL PEAK	176

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

01/01/12 thru 12/31/12

Distribution By % Of Samples

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

Wind Parameter : WDR
Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 30	3.81	2.36	2.54	3.66	8.46	13.50	8.90	3.57	2.63	1.63	1.74	4.15	9.50	11.02	12.52	7.25	97.30
< 60	.00	.07	.10	.16	.32	.36	.31	.10	.01	.03	.01	.05	.20	.05	.14	.09	2.08
< 80	.00	.00	.00	.01	.14	.07	.01	.01	.00	.00	.01	.00	.01	.01	.01	.00	.34
< 120	.00	.01	.00	.05	.01	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.10
< 240	.01	.03	.01	.05	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.14
>= 240	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	3.82	2.49	2.67	3.95	8.95	13.94	9.23	3.70	2.65	1.66	1.81	4.21	9.72	11.10	12.69	7.34	

Calm : .00 %

Total # Operational Hours : 5459

Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 30	208	129	139	200	462	737	486	195	144	89	95	227	519	602	684	396	5312
< 60		4	6	9	18	20	17	6	1	2	1	3	11	3	8	5	114
< 80				1	8	4	1	1			1		1	1	1		19
< 120		1		3	1						1						6
< 240	1	2	1	3							1						8
>= 240																	
Totals	209	136	146	216	489	761	504	202	145	91	99	230	531	606	693	401	

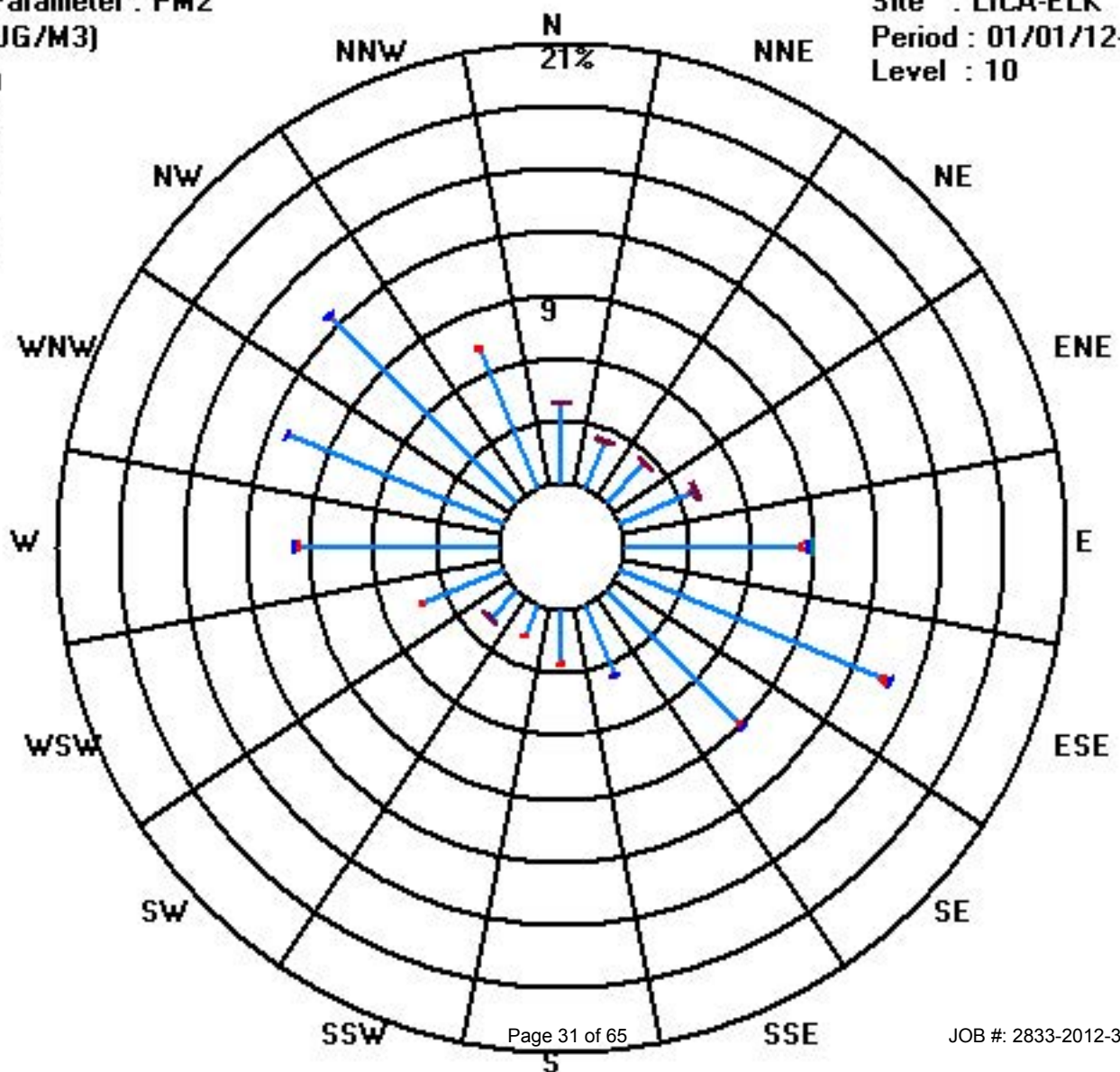
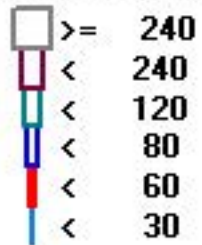
Calm : .00 %

Total # Operational Hours : 5459

Class Limits (UG/M3)

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

Level : 10



Nitrogen Dioxide

Current Date : 03/12/13
Current Time : 10:25

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA35 Logger Id : 35 Parameter : NO2_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	0	0			
February	0	0			
March	600	551	0	27.1	3
April	720	682	0	23.4	2.7
May	744	697	0	15.3	3.1
June	720	679	0	24.6	3.6
July	744	704	0	17.6	3.3
August	744	702	0	24.4	4
September	720	669	0	29.6	4.8
October	744	703	0	23.1	4.2
November	720	680	0	34.3	7.8
December	744	700	0	31.6	9.5
Yearly Total	7200	6767	0	34.3	4.6

NO₂ Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Station: PORTABLE

Month	NO2 ppb Peak Reading
January	NA
February	NA
March	27
April	23
May	15
June	25
July	18
August	24
September	30
October	23
November	34
December	32
ANNUAL PEAK	34.3

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

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : NO2_
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	3.94	2.73	2.58	4.10	8.83	13.64	10.75	3.79	2.82	1.83	1.83	3.97	9.32	10.65	11.47	7.66	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	3.94	2.73	2.58	4.10	8.83	13.64	10.75	3.79	2.82	1.83	1.83	3.97	9.32	10.65	11.47	7.66	

Calm : .00 %

Total # Operational Hours : 6692

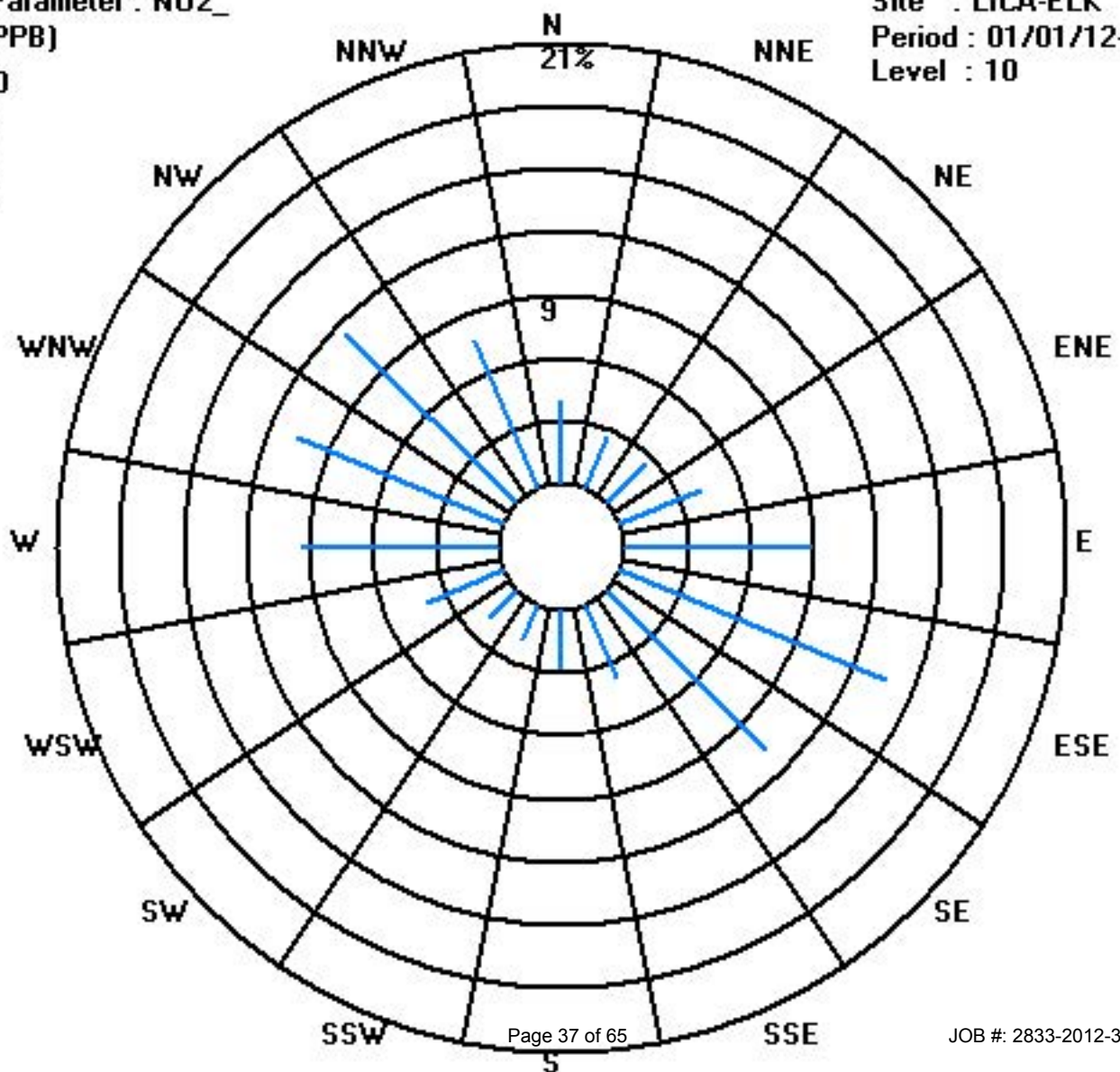
Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	264	183	173	275	591	913	720	254	189	123	123	266	624	713	768	513	6692
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	264	183	173	275	591	913	720	254	189	123	123	266	624	713	768	513	

Calm : .00 %

Total # Operational Hours : 6692

Class Limits (PPB)



Nitric Oxide

Current Date : 03/12/13
Current Time : 10:25

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA35 Logger Id : 35 Parameter : NO_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	0	0			
February	0	0			
March	600	551	0	26.6	0.9
April	720	682	0	13.2	0.5
May	744	697	0	11.8	0.4
June	720	679	0	25.1	0.7
July	744	704	0	30.9	1
August	744	702	0	33.1	1.5
September	720	669	0	44.2	2
October	744	703	0	64.6	2
November	720	680	0	32.5	2.4
December	744	700	0	43.8	3.5
Yearly Total	7200	6767	0	64.6	1.5

NO Peak reading of One Hour Averages for 2012

Plant Operator: LICA

Station: PORTABLE

Month	NO ppb Peak Reading
January	NA
February	NA
March	27
April	13
May	12
June	25
July	31
August	33
September	44
October	65
November	33
December	44
ANNUAL PEAK	65

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

01/01/12 thru 12/31/12

Distribution By % Of Samples

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

Wind Parameter : WDR
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	3.94	2.73	2.58	4.10	8.83	13.64	10.75	3.79	2.82	1.83	1.83	3.97	9.32	10.63	11.47	7.66	99.98
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.01
< 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	3.94	2.73	2.58	4.10	8.83	13.64	10.75	3.79	2.82	1.83	1.83	3.97	9.32	10.65	11.47	7.66	

Calm : .00 %

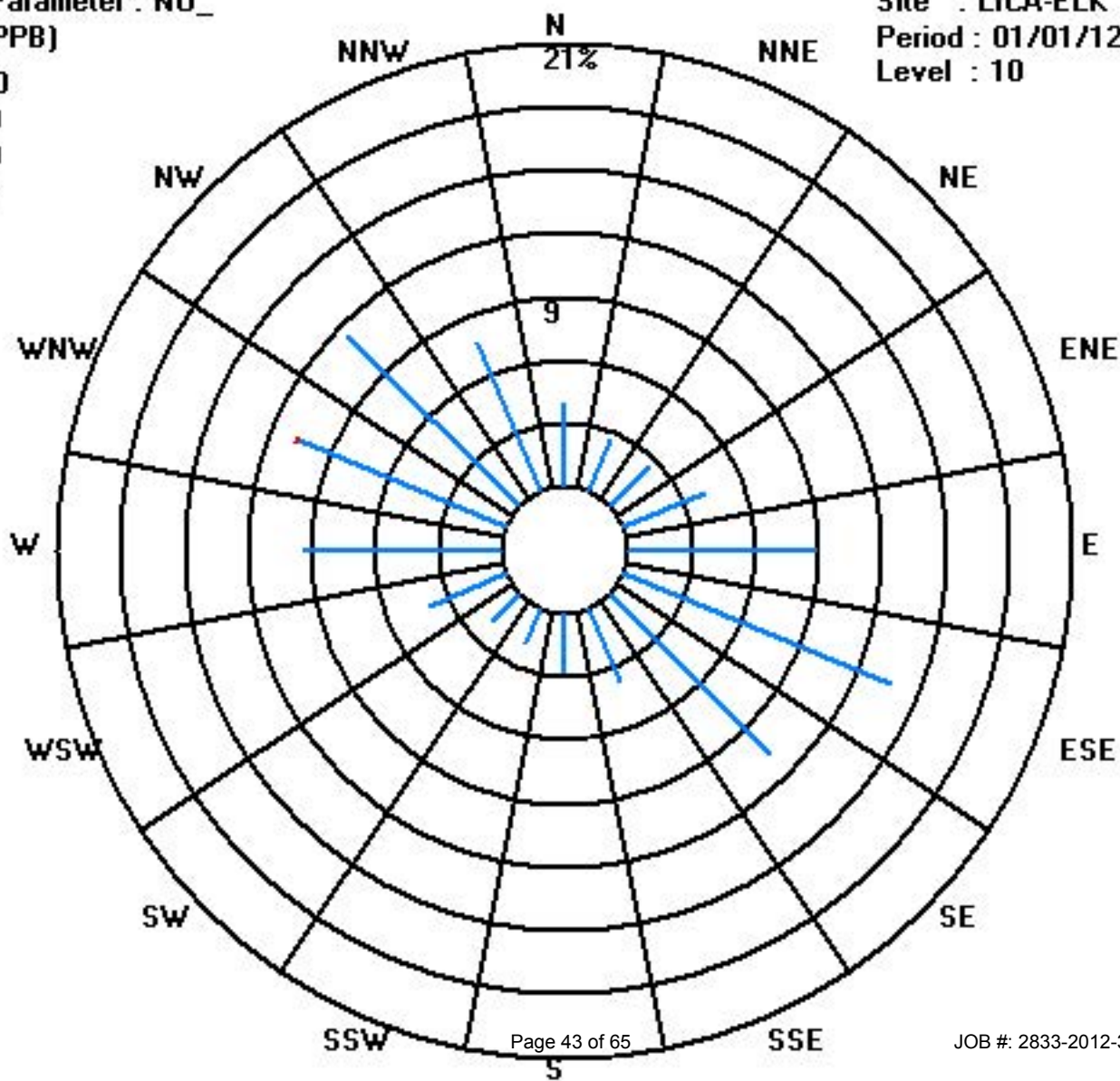
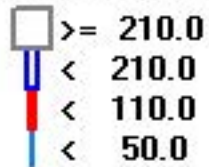
Total # Operational Hours : 6692

Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	264	183	173	275	591	913	720	254	189	123	123	266	624	712	768	513	6691
< 110.0														1			1
< 210.0																	
>= 210.0																	
Totals	264	183	173	275	591	913	720	254	189	123	123	266	624	713	768	513	

Calm : .00 %

Total # Operational Hours : 6692



Oxides of Nitrogen

Current Date : 03/12/13
Current Time : 10:25

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA35 Logger Id : 35 Parameter : NOX_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	0	0			
February	0	0			
March	600	551	0	45.9	3.9
April	720	682	0	32	3.4
May	744	697	0	21.9	3.5
June	720	679	0	39.3	4.1
July	744	704	0	42	4.2
August	744	702	0	42.4	5.3
September	720	669	0	56.3	6.9
October	744	703	0.1	82.2	6.2
November	720	680	0	62	10.2
December	744	700	0	73.1	12.9
Yearly Total	7200	6767	0	82.2	6.1

NO_x Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Station: PORTABLE

Month	NO _x ppb Peak Reading
January	NA
February	NA
March	46
April	32
May	22
June	39
July	42
August	42
September	56
October	82
November	62
December	73
ANNUAL PEAK	82

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

01/01/12 thru 12/31/12

Distribution By % Of Samples

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

Wind Parameter : WDR
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	3.94	2.73	2.58	4.09	8.77	13.56	10.71	3.78	2.82	1.83	1.82	3.97	9.24	10.63	11.47	7.66	99.68
< 110.0	.00	.00	.00	.01	.05	.07	.04	.01	.00	.00	.01	.00	.07	.01	.00	.00	.31
< 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	3.94	2.73	2.58	4.10	8.83	13.64	10.75	3.79	2.82	1.83	1.83	3.97	9.32	10.65	11.47	7.66	

Calm : .00 %

Total # Operational Hours : 6692

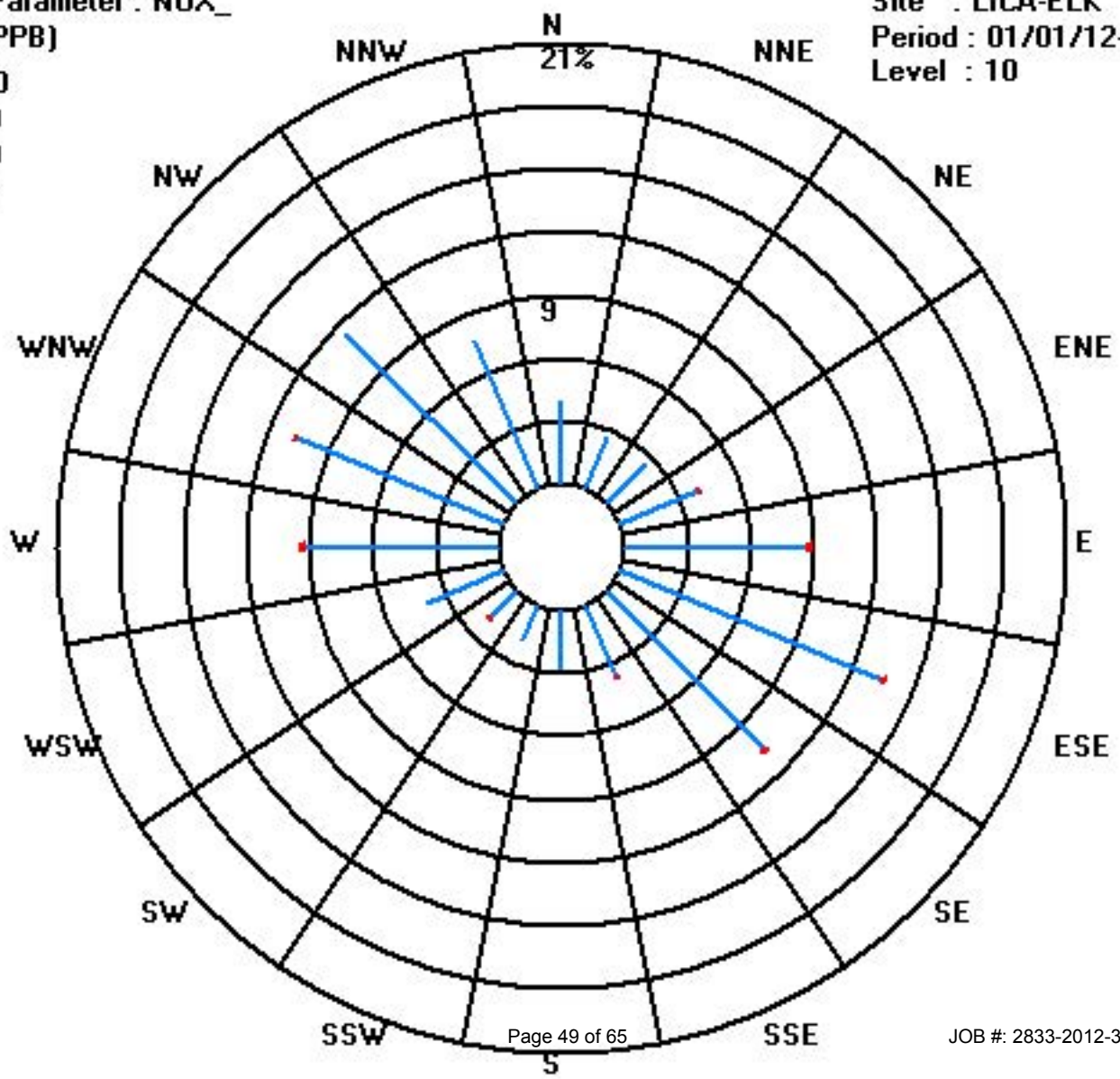
Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	264	183	173	274	587	908	717	253	189	123	122	266	619	712	768	513	6671
< 110.0				1	4	5	3	1			1		5	1			21
< 210.0																	
>= 210.0																	
Totals	264	183	173	275	591	913	720	254	189	123	123	266	624	713	768	513	

Calm : .00 %

Total # Operational Hours : 6692

Class Limits (PPB)



Ozone

Current Date : 03/12/13
Current Time : 10:25

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA35 Logger Id : 35 Parameter : O3_ Units : PPB

	Readings	Valid Readings	Min	Max	Mean
January	0	0			
February	0	0			
March	672	634	1	53	32
April	720	685	5	63	36
May	744	693	4	62	38
June	720	685	1	62	30
July	744	707	0	83	26
August	744	704	0	60	22
September	720	681	0	53	22
October	744	703	0	40	19
November	720	684	1	41	21
December	744	708	0	37	19
Yearly Total	7272	6884	0	83	26

O3 Peak Reading of One Hour Averages for 2012

Plant Operator: LICA

Station: PORTABLE

Month	O3 ppb Peak Reading
January	NA
February	NA
March	53
April	63
May	62
June	62
July	83
August	60
September	53
October	40
November	41
December	37
ANNUAL PEAK	83

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

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : O3_
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50	3.70	2.57	2.49	4.05	8.48	13.14	10.10	3.21	2.24	1.45	1.68	3.78	9.38	10.29	11.45	7.15	95.24
< 110	.27	.14	.20	.13	.27	.27	.42	.48	.44	.30	.13	.26	.19	.45	.20	.52	4.75
< 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	3.98	2.71	2.70	4.18	8.76	13.42	10.53	3.70	2.68	1.76	1.82	4.05	9.57	10.75	11.66	7.68	

Calm : .00 %

Total # Operational Hours : 6809

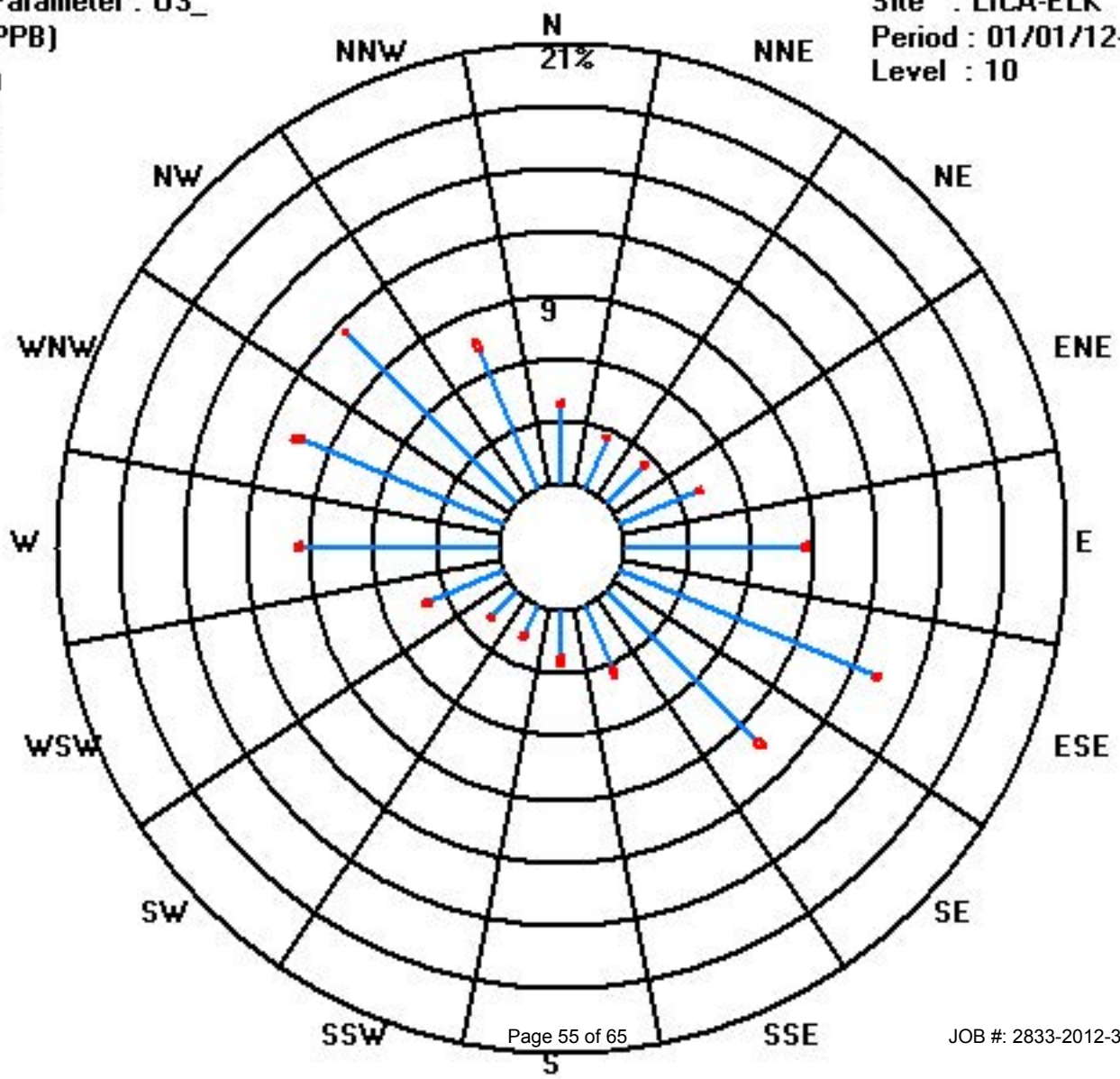
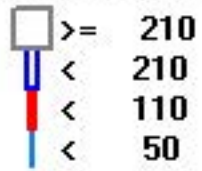
Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50	252	175	170	276	578	895	688	219	153	99	115	258	639	701	780	487	6485
< 110	19	10	14	9	19	19	29	33	30	21	9	18	13	31	14	36	324
< 210																	
>= 210																	
Totals	271	185	184	285	597	914	717	252	183	120	124	276	652	732	794	523	

Calm : .00 %

Total # Operational Hours : 6809

Class Limits (PPB)



Total Hydrocarbons

Current Date : 03/12/13
Current Time : 10:25

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA35 Logger Id : 35 Parameter : THC Units : PPM

	Readings	Valid Readings	Min	Max	Mean
January	0	0			
February	0	0			
March	648	598	1.7	8.1	2.6
April	720	685	1.5	8.7	2.5
May	744	698	1.8	7	2.5
June	720	681	1.8	8.1	2.6
July	744	681	1.8	7.2	2.6
August	744	688	1.8	8.6	2.8
September	672	601	1.8	10	3
October	744	676	1.8	12.8	2.8
November	720	668	1.9	12	3.6
December	744	702	1.5	16.1	3.8
Yearly Total	7200	6678	1.5	16.1	2.9

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

01/01/12 thru 12/31/12

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : THC
 Units : PPM

Wind Parameter : WDR
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3.0	3.57	2.60	2.43	3.22	4.99	6.49	6.60	2.93	2.24	1.46	1.28	2.83	7.36	7.86	8.98	7.20	72.11
< 10.0	.48	.21	.30	.95	3.71	6.98	4.17	.89	.51	.37	.51	1.01	1.89	2.40	2.28	.71	27.44
< 50.0	.00	.00	.00	.01	.07	.18	.06	.00	.00	.00	.00	.01	.01	.03	.04	.00	.43
>= 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	4.05	2.81	2.74	4.19	8.78	13.66	10.84	3.83	2.75	1.84	1.80	3.86	9.26	10.29	11.31	7.92	

Calm : .00 %

Total # Operational Hours : 6603

Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3.0	236	172	161	213	330	429	436	194	148	97	85	187	486	519	593	476	4762
< 10.0	32	14	20	63	245	461	276	59	34	25	34	67	125	159	151	47	1812
< 50.0				1	5	12	4					1	1	2	3		29
>= 50.0																	
Totals	268	186	181	277	580	902	716	253	182	122	119	255	612	680	747	523	

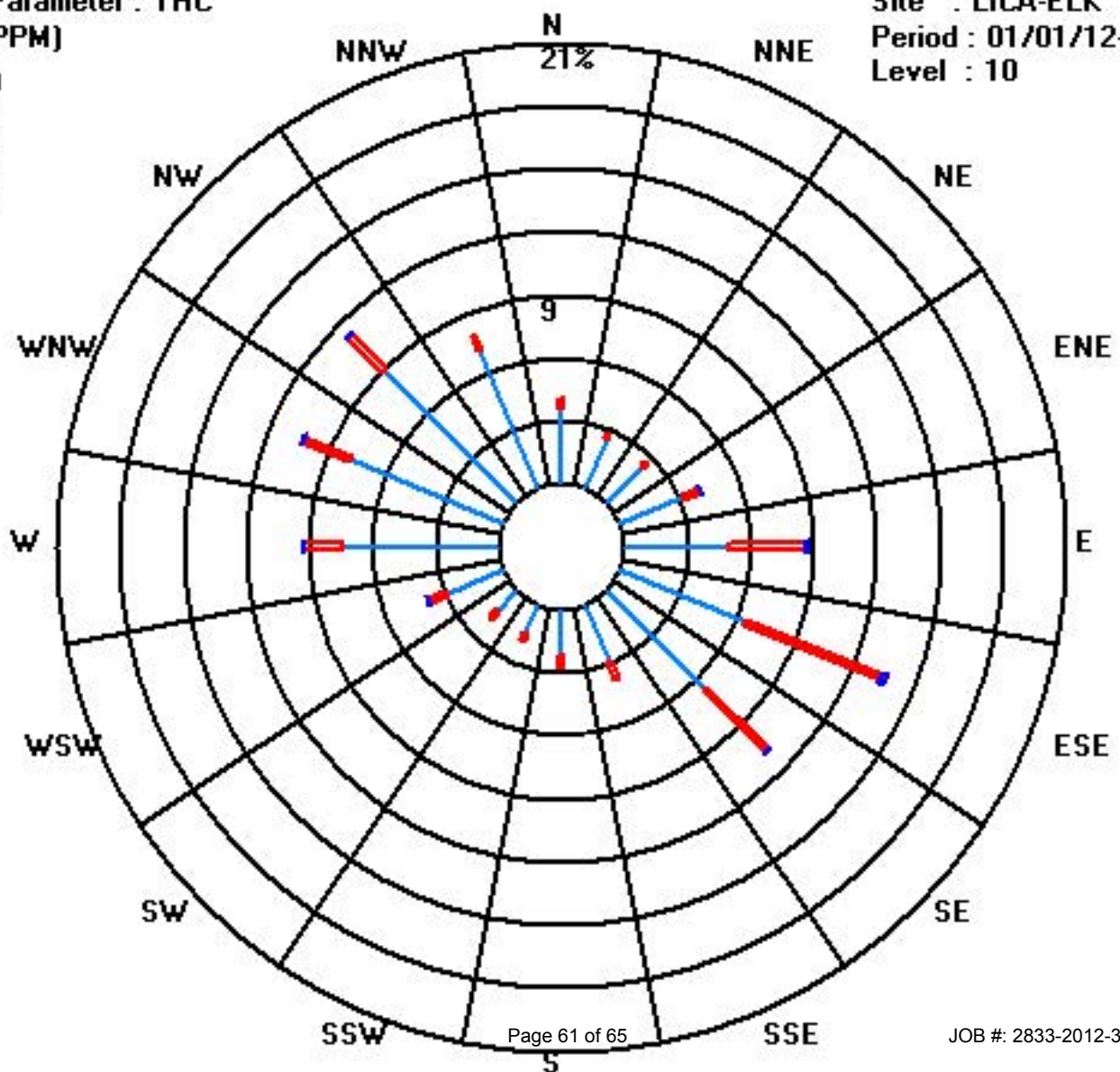
Calm : .00 %

Total # Operational Hours : 6603

Class Limits (PPM)

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

Level : 10



Vector Wind Speed

Current Date : 03/12/13
Current Time : 10:25

Annual Parameter Summary Report - Hourly
Maxxam Analytics

Year : 2012

Logger Name : LICA35 Logger Id : 35 Parameter : WSP Units : KPH

	Readings	Valid Readings	Min	Max	Mean
January	0	0			
February	0	0			
March	672	671	0.4	36.5	11.7
April	720	720	0.2	38.9	13.2
May	744	743	0.1	42.6	13.3
June	720	720	0.5	38	11.5
July	744	744	0.3	40.5	10.2
August	744	743	0.1	36.7	10
September	672	641	0.1	41.9	11.5
October	744	744	0.3	38.4	13.4
November	720	720	0.1	38.7	10.9
December	744	744	0.1	37.9	9.1
Yearly Total	7224	7190	0.1	42.6	11.5

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

01/01/12 thru 12/31/12

Distribution By % Of Samples

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

Wind Parameter : WDR
Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 6.0	1.15	.84	.80	1.34	3.29	3.42	2.43	1.00	.73	.73	.91	1.14	2.08	2.32	2.30	1.40	25.96
< 12.0	1.09	1.07	1.25	1.64	3.18	5.22	2.99	1.44	.97	.61	.58	1.97	5.06	3.04	2.87	2.14	35.18
< 20.0	1.05	.69	.65	1.15	1.89	2.46	3.26	1.00	.72	.38	.23	.76	1.59	2.42	3.31	2.46	24.08
< 29.0	.61	.13	.01	.00	.37	1.87	1.37	.23	.31	.02	.08	.11	.52	1.87	2.36	1.61	11.55
< 39.0	.09	.01	.00	.00	.00	.45	.38	.00	.00	.00	.00	.00	.15	1.14	.76	.12	3.14
>= 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.05
Totals	4.01	2.76	2.72	4.14	8.74	13.44	10.45	3.68	2.75	1.76	1.82	3.99	9.42	10.80	11.68	7.74	

Calm : .00 %

Total # Operational Hours : 7190

Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 6.0	83	61	58	97	237	246	175	72	53	53	66	82	150	167	166	101	1867
< 12.0	79	77	90	118	229	376	215	104	70	44	42	142	364	219	207	154	2530
< 20.0	76	50	47	83	136	177	235	72	52	28	17	55	115	174	238	177	1732
< 29.0	44	10	1		27	135	99	17	23	2	6	8	38	135	170	116	831
< 39.0	7	1				33	28						11	82	55	9	226
>= 39.0															4		4
Totals	289	199	196	298	629	967	752	265	198	127	131	287	678	777	840	557	

Calm : .00 %

Total # Operational Hours : 7190

Class Limits (KPH)

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

Level : 10

