



Lakeland Industry & Community Association

NOVEMBER 2019

Monthly Ambient Air Quality Monitoring Report

LICA-201911

Operation and Maintenance:

Bureau Veritas Canada

Data Validation and Report:

Lakeland Industry & Community Association

December 17, 2019

Pages may be left blank for double-sided printing



Lakeland Industry & Community Association

5107 50 St

Bonnyville, AB, T9N 2J7

Phone #: 780-226-7068

E-mail: monitoring@lica.ca

www.lica.ca

December 17, 2019

Alberta Environment and Parks (AEP)

11th Floor, Oxbridge Place

9820 106 Street

Edmonton, AB, T5K 2J6

Emailed to: Air.Reporting@gov.ab.ca

RE: LICA – November 2019 Monthly Ambient Air Quality Monitoring Report

Enclosed is the November 2019 Monthly Ambient Air Quality Monitoring Report for the continuous ambient air quality monitoring stations of the Lakeland Industry & Community Association (LICA) regional air quality monitoring network.

The representative of the Person Responsible for this monitoring program is

LICA Airshed

Michael Bisaga, Monitoring Programs Manager

5107 50 Street

Bonnyville, AB, T9N 2J7

Phone #: 780-226-7068

E-mail: monitoring@lica.ca

This report has been reviewed by Michael Bisaga of the LICA Airshed.

TABLE OF CONTECTS

LIST OF ACRONYMS 5

NETWORK STATION SUMMARY 6

Listing of Continuous Monitoring Stations and Integrated Sampling Stations6

List of Contractors who performed the air monitoring activities7

Monitoring Notes during the Month of November 20197

Cold Lake South7

Maskwa8

St. Lina Station8

Bonnyville East Station9

Integrated Sampling10

Revisions to Alberta’s Ambient Air Quality Data Warehouse11

Deviations from Authorized Monitoring Methods11

Disclaimer11

Certification12

Map of LICA Continuous Monitoring Network13

CONTINUOUS NETWORK EQUIPMENT AND MONITORING RESULTS SUMMARY 14

Cold Lake South Station14

Maskwa Station17

St. Lina Station20

Bonnyville - East Station24

TABLES, CHARTS, WIND ROSES AND EQUIPMENT CALIBRATION RECORDS 27

COLD LAKE SOUTH STATION28

MASKWA STATION93

ST. LINA STATION152

BONNYVILLE -EAST STATION221

REFERENCE DOCUMENTS 282

HOURLY INSTANTANEOUS DATA 283

COLD LAKE SOUTH STATION 284

MASKWA STATION305

ST. LINA STATION324

BONNYVILLE -EAST STATION345

END OF REPORT366

LIST OF ACRONYMS

AAAQOs	Alberta Ambient Air Quality Objectives
AEP	Alberta Environment and Parks
AMD	Air Monitoring Directive
AT	Ambient Temperature
BP	Barometric Pressure
CH ₄	Methane
EPEA	Environmental Protection and Enhancement Act
H ₂ S	Hydrogen Sulphide
kph	kilometers per hour
LICA	Lakeland Industry & Community Association
mb	millibar
mm	millimeter
NMHC	Non-Methane Hydrocarbons
NO	Nitric Oxide
NO ₂	Nitrogen Dioxide
NO _x	Oxide of Nitrogen
PAC	Polycyclic Aromatic Compounds
ppb	parts per billion
ppm	parts per million
RH	Relative Humidity
SO ₂	Sulphur Dioxide
ST	Station Temperature
STDWD	Standard Deviation Wind Direction
THC	Total Hydrocarbons
TRS	Total Reduced Sulphur
VWD	Vector Wind Direction
VWS	Vector Wind Speed
WD	Wind Direction
WS	Wind Speed
°C	Degrees Celsius

NETWORK STATION SUMMARY

Listing of Continuous Monitoring Stations and Integrated Sampling Stations

Station Name		Cold Lake South	Maskwa	St. Lina	Bonnyville East
Station ID		1174	1248	1250	1608
Coordinates		54.41402,	54.604935,	54.215961,	54.252747,
		-110.23316	-110.452637	-111.503304	-110.690611
Continuous Monitoring Parameter	SO2	√	√	√	√
	TRS	√			
	H2S		√	√	√
	THC	√	√	√	√
	CH4	√	√	√	√
	NMHC	√	√	√	√
	NOX	√	√	√	√
	NO	√	√	√	√
	NO2	√	√	√	√
	O3	√		√	√
	PM2.5	√		√	√
	TPX	√	√	√	
	RH	√	√	√	
	BP		√	√	
	PRECIPTATION		√	√	
	WS	√	√	√	√
	WD	√	√	√	√
	STDWD	√	√	√	√
Integrated Sampling	VOCs	√			√
	PAHs	√			√
	Partisol	√			
	Passive	√			
	NMHC Canister				√
	PAC			√	

List of Contractors performing air monitoring activities

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Prepared By	Electronic Submission Conducted By
Continuous Monitoring Station	Bureau Veritas Canada	Bureau Veritas Canada	LICA / Bureau Veritas Canada	LICA
Intermittent (VOCs/PAHs)	Bureau Veritas Canada	InnoTech Alberta Inc	InnoTech Alberta Inc	LICA
Partisol	Bureau Veritas Canada	InnoTech Alberta Inc	InnoTech Alberta Inc	LICA
Passive	Bureau Veritas Canada	Bureau Veritas Canada	Bureau Veritas Canada	LICA
NMHC Canister	Bureau Veritas Canada	InnoTech Alberta Inc	InnoTech Alberta Inc	Not Applicable
PAC	Bureau Veritas Canada	ECCC	AEP	Not Applicable

Monitoring Notes during the Month of November 2019

Cold Lake South

- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement, except THC/CH4/NMHC (85.3%). AEP reference #: 361429.
- On November 7, the zero-span program was executed, but the results were not recorded. The results were manually entered to database using one-minute data average.
- **THC/CH4/NMHC:**
 - The Thermo 55i analyzer, s/n: 11800300034, exhibited poor injection issues on November 3. The analyzer failed the shut-down calibration on November 4. The Thermo 55i analyzer, s/n: 1236656107, was installed on November 4. Column conditioning was run overnight. A successful installation calibration was performed on November 5. Data were invalidated back to the last valid zero-span check, which was November 3 hour 22. Thirty-four hours of data were discarded due to this event.

- The Thermo 55i analyzer, s/n: 1236656107, was put offline on November 21 between hour 9 and hour 13 to verify the analyzer's functionality. No adjustment was made. Five hours of downtime was recorded due to this event.
- The Thermo 55i analyzer, s/n: 1236656107, exhibited poor injection issues on November 22 hour 19. A complete shut-down calibration could not be performed. Troubleshooting was performed offsite. A successful post-repair calibration was performed on November 25. Sixty-seven hours of data were invalidated due to this event.

Maskwa

- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- **THC/CH4/NMHC:** The analyzer malfunctioned on November 10 due to running empty of the N2 gas. The N2 gas cylinder was replaced on November 11. Thirty hours of data were invalidated due to this event.
- **RH/TPX:**
 - Both channels were put offline on November 14 hour 11 in order to service the sensor. The sensor, Campbell Scientific 070, s/n: 20221366, filter was washed, cleaned and dried. One hour of downtime was recorded due to this maintenance activity.
 - Both channels were put offline on November 29 hour 10. The sensor Campbell Scientific 070, s/n: 20221366 was removed and sent back to manufacture for re-certification on November 29. The Campbell Scientific 070, s/n: 20257103, was installed on November 29. One hour of downtime was recorded due to this event.
- **BP:** Hourly data collected on November 29 hour 10 was invalidated as the value was flagged as "Below Range". The root cause could not be determined. One hour of downtime was recorded.

St. Lina Station

- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- **H2S:**
 - The analyzer failed the daily span check on November 15. A repeat zero-span check was initiated on November 16 hour 8. The result met the check requirements. No data were discarded. However, one hour of downtime was recorded due to the additional zero-span check.
 - The analyzer failed the daily span check on November 17. A successful calibration was performed on November 18 to correct the drift issue. As the analyzer passed the calibration requirements, no data were discarded.

- **O3:**
 - The analyzer failed both the routine daily span check and repeat span check on November 4 as well as the routine daily span check on November 5. A successful shut-down calibration was performed on Thermo 49i, s/n: 1002240371, on November 5 before it was removed from the site for repair. The API 400A analyzer, s/n: 446, was installed on November 6. As the analyzer passed the shut-down calibration, no data were discarded. However, seventeen hours of downtime were recorded due to this event.
 - Data for November 11 from hour 10 to 12 and for November 15 hours 2 and 3 are missing. The root cause of the data loss could not be determined. Five hours of downtime were recorded.
 - The analyzer was put offline on November 15 between hour 10 and 12 in order to investigate causes for the missing data events. The O3 output was changed from RS232 port to analog output as the corrective action. Three hours of downtime were recorded.

Bonnyville East Station

- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- **All parameters:** A power outage occurred on November 8 between hour 11 and hour 15. Five hours of data were invalidated.
- **H2S:**
 - The analyzer spanned close to the +10% acceptable limit on November 17. An as found point check was performed on November 20 to confirm the analyzer's functionality. The analyzer passed the check requirements. Two hours of downtime were recorded due to this quality assurance check.
 - The analyzer spanned close to the +10% acceptable limit on November 24 and failed both the repeat zero-span check on November 24 and the routine zero-span check on November 25. As the span responses started improving on November 26, no further troubleshooting was performed. The analyzer has a known history of span drift related to ambient temperature/humidity. No data were discarded.
- **THC/CH4/NMHC:** The routine monthly calibration was interrupted by the power failure on November 8. The calibration was aborted. One hour of downtime was recorded.
- **NOx/NO/NO2:**
 - The analyzer spanned low after the monthly calibration was completed on November 7. A repeat zero-span check was initiated on November 8 during hour 7 and 8. The results met the check requirements. Two hours downtime were recorded due to this event.
 - The analyzer failed the daily span check on November 17. As the span responses started improving on November 18, no further troubleshooting was performed. No data were discarded.
 - The analyzer failed the daily span check on November 23. A repeat zero-span checks were initiated on November 23 hour 8. The check results were within the acceptable limits. One hour of downtime was recorded as a result.

- The analyzer failed the daily span check on November 26. An as found point check was performed on November 26 to confirm the analyzer's functionality. The analyzer passed the as found check requirements. No data were discarded.
- The analyzer has a history of unstable span results. Numerous as-found point checks and repeat calibrations have been completed since this analyser was installed. All the check results have demonstrated that this is a problem with the IZS circuit. Much time has been invested trying to solve this IZS circuit issue without success. Changes were made to the IZS program on the datalogger by giving a longer average period to try and limit the effect of this instability.
- **O3:** The routine monthly calibration was interrupted by the power failure on November 8. The calibration was aborted. One hour of downtime was recorded.

Integrated Sampling

All the integrated sampling analytical results are included in the November 2019 Integrated Sampling Report.

- **VOCs Sampling System:**
 - The VOC sampler is programed to collect a 24-hour sample of air every sixth day as per the North American Pollution Surveillance schedule (NAPS).
 - Five samples were collected this month: on November 5, 11, 17, 23 and 29.
- **PAHs Sampling System:**
 - The PAH sampler is programed to collect a 24-hour sample of air every sixth day as per the North American Pollution Surveillance schedule (NAPS).
 - Five samples were collected this month: on November 5, 11, 17, 23 and 29.
- **Partisol Sampling System:**
 - The Partisol sampler is programed to collect a 24-hour sample of air every sixth day as per the North American Pollution Surveillance schedule (NAPS).
 - Five samples were collected this month: November 5, 11, 17, 23 and 29.
- **Passive Sampling System:**
 - The passive sample filters were installed at the stations between October 31 and November 1, and were removed between December 2 and December 3.
 - A total of 9 duplicate samples were collected: 2 for H2S, 3 for SO2, 2 for NO2 and 2 for O3.
- **NMHC Canister System:**
 - The canister sampling program collects a 1-hour sample of air when the continuously non-methane hydrocarbon (NMHC) concentration reaches a specified trigger point. The current trigger point is 0.3 ppm and is based on real-time monitoring data that are averaged over a 5-minute period.
 - One canister event was recorded: on November 28 at 06:20, at concentration of 0.36 ppm.
- **PAC Sampling System:**
 - The PAC sampling program began in November 2019, and is designed to collect a 2-month integrated sample.
 - Sampling media were deployed at 6 sites at the beginning of November 2019 and will be collected for analysis at the end of December 2019.

Revisions to Alberta's Ambient Air Quality Data Warehouse

No revisions to historical data previously submitted to the Alberta's Ambient Air Quality Data Warehouse were made this month.

Deviations from Authorized Monitoring Methods

At the Maskwa station, nearby trees exceed the height allowed under section 2.3 of the wind speed and wind direction siting criteria in Chapter 3 of the AMD. This non-conformance was documented in the updated station site documents. Further actions are being considered including siting the wind sensor so that it meets AMD Chapter 3 siting requirements, or obtaining written authorization from "The Director" to deviate from AMD Siting requirements.

At the Cold Lake South station, the height of the existing wind sensor tower is shorter than the AMD requirements listed in section 2.3 of the wind speed and wind direction siting criteria in Chapter 3 of the AMD. This non-conformance was documented in the updated station site documents. Further actions are being considered including siting the wind sensor so that it meets AMD Chapter 3 siting requirements, or obtaining written authorization from "The Director" to deviate from AMD Siting requirements.

Disclaimer

Data verification/validation were performed on the 1-minute, 5-minute and 1-hour data. Hourly data that are included in this report are calculated based on the post-validation 1-minute data set.

Hourly instantaneous maximum data included in this report have not gone through data validation/verification steps and are considered raw data. The intention of including this data set in the report is for reference purposes and should not be used in published documents.

Equipment calibration / maintenance records were provided by Bureau Veritas Canada.

Certification

This report was prepared and submitted by Lily Lin in accordance with Chapter 9 of the Air Monitoring Directive (AMD 2016).



Lily Lin, Data & Reporting Specialist, LICA Airshed

This report was reviewed by Mike Bisaga in accordance with Chapter 9 of the Air Monitoring Directive (AMD 2016).

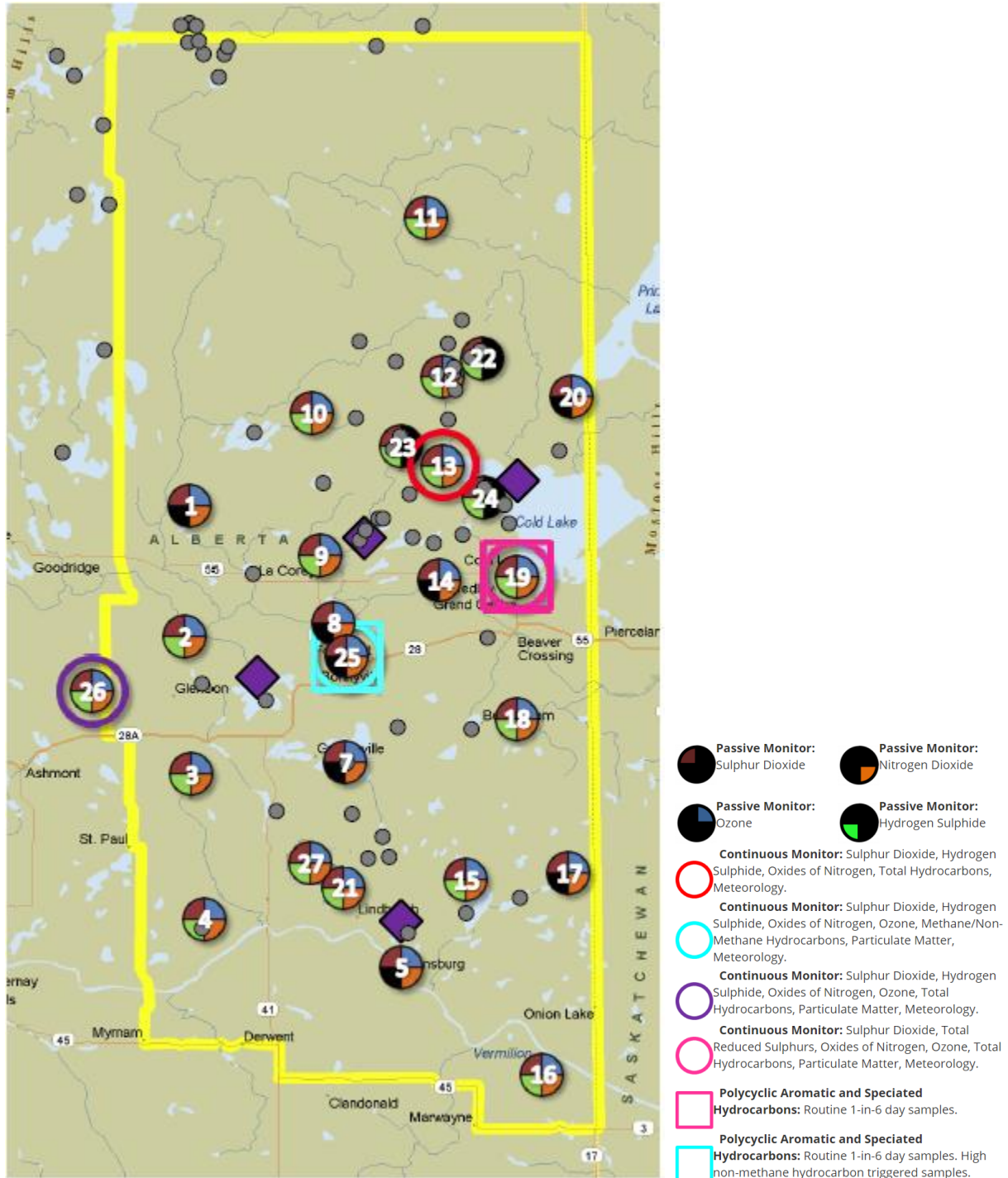
I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. I also certify that at the time of this report's submission, all air data have been electronically uploaded to Alberta's Ambient Air Quality Data Warehouse as required by the AMD, with the exception of electronic submission for the results of intermittent samples, Partisol samples and passive samples. Electronic submission for the intermittent sample, Partisol sample and passive sample results will be performed during the preparation of the November 2019 integrated sampling report. Uploading of VOC data from the canister sampling program was not required at the time of completing this report.



Michael Bisaga, Monitoring Programs Manager, LICA Airshed

December 17, 2019

Map of LICA Continuous Monitoring Network



CONTINUOUS NETWORK EQUIPMENT AND MONITORING RESULTS SUMMARY

Cold Lake South Station

Equipment Operation Summary

Parameter	Make / Model	Serial Number	Calibration Date
Sulphur Dioxide (SO₂)	Thermo / 43i-TLE	1180026018	November 21, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Total Reduced Sulphur (TRS)	Thermo / 450i	812728560	November 21, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Oxide of Nitrogen / Nitric Oxide/ Nitrogen Dioxide (NO_x/NO/NO₂)	Thermo / 42i	1505664393	November 21, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Ozone (O₃)	Thermo / 49i	700419951	November 22, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Total Hydrocarbons / Methane/ Non-methane Hydrocarbons (THC/CH₄/NMHC)	Thermo / 55i	11800300034/ 1236656107	November 25, 2019
<ul style="list-style-type: none"> The Thermo 55i analyzer, s/n: 11800300034, exhibited poor injection issues on November 3. The analyzer failed the shut-down calibration on November 4. The Thermo 55i analyzer, s/n: 1236656107, was installed on November 4. Column conditioning was run overnight. A successful installation calibration was performed on November 5. Data were invalidated back to the last valid zero-span check, which was November 3 hour 22. Thirty-four hours of data were discarded due to this event. The analyzer was put offline on November 21 between hour 9 and hour 13 to verify the analyzer's functionality. No adjustment was made. Five hours of downtime was recorded due to this event. The Thermo 55i analyzer, s/n: 1236656107, exhibited poor injection issues on November 22 hour 19. A complete shut-down calibration could not be performed. Troubleshooting was performed offsite. A successful post-repair calibration was performed on November 25. Sixty-seven hours of data were invalidated due to this event. 			

Parameter	Make / Model	Serial Number	Calibration Date
Particulate Matter 2.5 (PM2.5)	Thermo / Sharp 5030	CM-2209	November 25, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Relative Humidity (RH)	Rotronic / Hydroclip-S3	PFD919-121406 / Part 50.5PS	January 26, 2018
<ul style="list-style-type: none"> No issues were identified this month. 			
Ambient Temperature (AT)	Rotronic / Hydroclip-S3	PFD919-121406 / Part 50.5PS	January 26, 2018
<ul style="list-style-type: none"> No issues were identified this month. 			
Station Temperature (ST)	Maxxam-supplied	n/a	n/a
<ul style="list-style-type: none"> No issues were identified this month. 			
Wind Speed (WS) / Wind Direction (WD)/ Stand Deviation Wind Direction (STDWD)	Met One / 50.5H To RM Young /05305VK	F1644 to 161466	November 9, 2019
<ul style="list-style-type: none"> Wind direction data contained in this report represents where the wind is coming from. No issues were identified this month. 			

Monitored Data Summary for November 2019

Parameter	Objectives/Guidelines			Exceedances			Monthly Avg.	Min. 1-hr	Max. 1-hr	Date/Time	VWS (km/hr)	VWD (sector)	Max. 24-hr	Date	Operational Uptime (%)	Valid Data (%)
	1-hr	24-hr	30-day	1-hr	24-hr	30-day										
SO2 (ppb)	172	48	11	0	0	0	0.1	0	3	November 19 at hour 12	4.5	N	0.7	November 19	100.0	94.8
TRS (ppb)	10	3	-	-	-	-	0.0	0.00	1.00	November 2 at hour 20	2.1	W	0.52	November 27	100.0	94.8
Nox (ppb)	-	-	-	-	-	-	4.8	0	116	November 5 at hour 14	15.4	NW	22.9	November 5	100.0	94.6
NO (ppb)	-	-	-	-	-	-	1.1	0	101	November 5 at hour 14	15.4	NW	17.6	November 5	100.0	94.6
NO2 (ppb)	159	-	-	0	-	-	3.7	0	21	November 5 at hour 10	12.6	NNW	7.2	November 28	100.0	94.6
O3 (ppb)	76	-	-	0	-	-	22.1	1	40	November 23 at hour 13	17.2	W	33.3	November 23	100.0	94.8
THC (ppm)	-	-	-	-	-	-	2.09	1.92	2.49	November 8 at hour 10	2.9	WNW	2.24	November 7	85.3	80.8
CH4 (ppm)	-	-	-	-	-	-	2.09	1.92	2.49	November 8 at hour 10	2.9	WNW	2.24	November 7	85.3	80.8
NMHC (ppm)	-	-	-	-	-	-	0.00	0.00	0.07	November 28 at hour 6	0.7	W	0.01	November 28	85.3	80.8
PM2.5 (µg/m3)	80	30	-	0	0	-	2.9	0.0	17.0	November 12 at hour 20	0.3	W	9.0	November 15	100.0	99.9
RH (%)	-	-	-	-	-	-	77.3	42	98	November 16 at hour 3	5	W	93.9	November 16	100.0	100.0
Ext. Temp. (°C)	-	-	-	-	-	-	-5.0	-22.1	9.1	November 23 at hour 12	18.1	W	5.0	November 23	100.0	100.0
Stn. Temp. (°C)	-	-	-	-	-	-	21.4	17.3	24.1	November 18 at hour 15	10	WNW	23.6	November 18	100.0	100.0
WSV (km/hr)	-	-	-	-	-	-	2.3	0.2	19.3	November 23 at hour 11	19.3	W	10.3	November 18	100.0	100.0
WDV (sector)	-	-	-	-	-	-	281 (W)	-	-	-	-	-	-	-	100.0	100.0

1- Date/ Time given is the first minimum and maximum value that was recorded

Alberta Ambient Air Quality Objectives (AAQOs) Exceedances

The measured ambient air quality was within the AAQOs for all monitored parameters.

Maskwa Station

Equipment Operation Summary

Parameter	Make / Model	Serial Number	Calibration Date
Sulphur Dioxide (SO2)	Thermo / 43i-TLE	1180930031	November 13, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Hydrogen Sulphide (H2S)	Thermo / 450i	CM17360005	November 13, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Oxide of Nitrogen / Nitric Oxide/ Nitrogen Dioxide (NOx/NO/NO2)	Thermo / 42i	1180930028	November 13, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Total Hydrocarbons / Methane/ Non-methane Hydrocarbons (THC/CH4/NMHC)	Thermo / 55i	1180930026	November 14, 2019
<ul style="list-style-type: none"> The analyzer malfunctioned on November 10 due to running empty of the N2 gas. The N2 gas cylinder was replaced on November 11. Thirty hours of data were invalidated due to this event. Both H2 gas cylinder and N2 gas cylinder were replaced on November 13. 			
Relative Humidity (RH)	Campbell Scientific 070 / HC2A-S3	20221366 / 20257103	November 29, 2019
<ul style="list-style-type: none"> The channel was put offline on November 14 hour 11 in order to service the sensor. The sensor, Campbell Scientific 070, s/n: 20221366, filter was washed, cleaned and dried. A sensor audit was performed after the maintenance. One hour of downtime was recorded due to this maintenance activity. The channel was put offline on November 29 hour 10. The sensor was audited before it was removed and sent back to manufacture for re-certification on November 29. The Campbell Scientific 070, s/n: 20257103, was installed on November 29. One hour of downtime was recorded due to this event. 			

Parameter	Make / Model	Serial Number	Calibration Date
Ambient Temperature (AT)	Campbell Scientific 070 / HC2A-S3	20221366	November 29, 2019
<ul style="list-style-type: none"> The channel was put offline on November 14 hour 11 in order to service the sensor. The sensor, Campbell Scientific 070, s/n: 20221366, filter was washed, cleaned and dried. A sensor audit was performed after the maintenance. One hour of downtime was recorded due to this maintenance activity. The channel was put offline on November 29 hour 10. The sensor was audited before it was removed and sent back to manufacture for re-certification on November 29. The Campbell Scientific 070, s/n: 20257103, was installed on November 29. One hour of downtime was recorded due to this event. 			
Barometric Pressure (BP)	Met One / Part 090D	F4997	February 15, 2019
<ul style="list-style-type: none"> Hourly data collected on November 29 hour 10 was invalidated as the value was flagged as "Below Range". The cause could not be determined. One hour of downtime was recorded. 			
Station Temperature (ST)	Maxxam-supplied	n/a	n/a
<ul style="list-style-type: none"> No issues were identified this month. 			
Precipitation (PRECIP)	Met One / Part 387-Heated Rain Gauge	F4481	November 29, 2019
<ul style="list-style-type: none"> The precipitation sensor was checked and audited on November 29. The sensor passed the audit requirements. 			
Wind Speed (WS) / Wind Direction (WD)/ Stand Deviation Wind Direction (STDWD)	RM Young / 05305VK	161465	September 19, 2019
<ul style="list-style-type: none"> Wind direction data contained in this report represents where the wind is coming from. No issues were identified this month. 			

Monitored Data Summary for Maskwa Site

Parameter	Objectives/Guidelines			Exceedances			Monthly Avg.	Min. 1-hr	Max. 1-hr	Date/Time	VWS (km/hr)	VWD (sector)	Max. 24-hr	Date	Operational Uptime (%)	Valid Data (%)
	1-hr	24-hr	30-day	1-hr	24-hr	30-day										
SO2 (ppb)	172	48	11	0	0	0	0.8	0	12	November 24 at hour 14	6.7	WNW	2.4	November 15	100.0	95.1
H2S (ppb)	10	3	-	0	0	-	0.0	0	1	November 1 at hour 0	6.7	NW	0.2	November 2	100.0	95.0
Nox (ppb)	-	-	-	-	-	-	4.8	0	27	November 24 at hour 14	6.7	WNW	8.9	November 9	100.0	94.8
NO (ppb)	-	-	-	-	-	-	0.7	0	13	November 6 at hour 8	2.8	SSW	2.0	November 23	100.0	94.8
NO2 (ppb)	159	-	-	0	-	-	4.2	0	18	November 22 at hour 1	6.9	SSW	7.7	November 9	100.0	94.8
THC (ppm)	-	-	-	-	-	-	2.11	1.99	2.51	November 12 at hour 3	4.8	SW	2.22	November 3	96.0	91.2
CH4 (ppm)	-	-	-	-	-	-	2.11	1.99	2.51	November 12 at hour 3	4.8	SW	2.22	November 3	96.0	91.2
NMHC (ppm)	-	-	-	-	-	-	0.00	0.00	0.05	November 16 at hour 0	4.1	WNW	0.00	November 1	96.0	91.2
RH (%)	-	-	-	-	-	-	93.3	48	100	November 1 at hour 0	6.7	NW	100.0	November 23	99.7	99.7
BP (millibar)	-	-	-	-	-	-	937	917	957	November 10 at hour 8	3.7	WNW	955	November 24	99.9	99.9
Ext. Temp. (°C)	-	-	-	-	-	-	-5.6	-22.7	8.1	November 23 at hour 13	11.6	W	4.4	November 10	99.7	99.7
Stn. Temp. (°C)	-	-	-	-	-	-	20.7	19.7	22.1	November 13 at hour 12	4.6	SSW	21.4	November 3	100.0	100.0
Precipitation (mm)*	-	-	-	-	-	-	3.3	0.0	0.7	November 18 at hour 8	9.2	W	0.9	November 1	100.0	99.9
WSV (km/hr)	-	-	-	-	-	-	1.4	0.1	13.1	November 23 at hour 11	13.1	WNW	7.6	November 27	100.0	100.0
WDV (sector)	-	-	-	-	-	-	267 (W)	-	-	-	-	-	-	-	100.0	100.0

1- Date/ Time given is the first minimum and maximum value that was recorded

St. Lina Station

Equipment Operation Summary

Parameter	Make / Model	Serial Number	Calibration Date
Sulphur Dioxide (SO2)	Thermo / 43i-TLE	1180930030	November 19, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Hydrogen Sulphide (H2S)	Thermo / 450i	CM18010058	November 18, 2019
<ul style="list-style-type: none"> The analyzer failed the daily span check on November 15. A repeat zero-span check was initiated on November 16 hour 8. The result met the check requirements. No data were discarded. One hour of downtime was recorded due to the additional zero-span check. The analyzer failed the daily span check on November 17. A successful calibration was performed on November 18 to correct the drift issue. As the analyzer passed the calibration requirements, no data were discarded. 			
Oxide of Nitrogen / Nitric Oxide/ Nitrogen Dioxide (NOx/NO/NO2)	Thermo / 42i	1180930029	November 19, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Ozone (O3)	Thermo / 49i , API / 400A	1002240371 / 446	November 6, 2019
<ul style="list-style-type: none"> The analyzer failed both the routine daily span check and repeat span check on November 4 as well as the routine daily span check on November 5. A successful shut-down calibration was performed on Thermo 49i, s/n: 1002240371, on November 5. It was suspected the issue was from the faulty sample valve. The analyzer was removed from the site for repair. The API 400A analyzer, s/n: 446, was installed following an installation calibration on November 6. As the analyzer passed the shut-down calibration, no data were discarded. However, seventeen hours of downtime were recorded due to this event. Data for November 11 from hour 10 to 12 and for November 15 hours 2 and 3 are missing. The root cause of the data loss could not be determined. Five hours of downtime were recorded. The analyzer was put offline on November 15 between hour 10 and 12 in order to investigate causes for the missing data events. The O3 output was changed from RS232 port to analog output as the corrective action. Three hours of downtime were recorded. 			

Parameter	Make / Model	Serial Number	Calibration Date
Total Hydrocarbons / Methane/ Non-methane Hydrocarbons (THC/CH4/NMHC)	Thermo / 55i	1180930025	November 18, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Particulate Matter 2.5 (PM2.5)	Thermo / Sharp 5030i	CM17091001	November 28, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Relative Humidity (RH)	Vaisala Oyj. Finland / HMP155	R2640785	June 28, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Ambient Temperature (AT)	Vaisala Oyj. Finland / HMP155	R2640785	June 28, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Barometric Pressure (BP)	Met One / Part 090D	F4998	February 21, 2019
<ul style="list-style-type: none"> No issues were identified this month. 			
Station Temperature (ST)	Maxxam-supplied	n/a	n/a
<ul style="list-style-type: none"> No issues were identified this month. 			
Precipitation (PRECIP)	Met One / Part 387-Heated Rain Gauge	n/a	November 18, 2019
<ul style="list-style-type: none"> The precipitation sensor was checked and audited on November 29. The sensor passed the audit requirements. 			
Wind Speed (WS) / Wind Direction (WD)/ Stand Deviation Wind Direction (STDWD)	RM Young / 05305VK	65521	May 17, 2019
<ul style="list-style-type: none"> Wind direction data contained in this report represents where the wind is coming from No issues were identified this month. 			

Parameter	Make / Model	Serial Number	Calibration Date
Ambient Temperature (AT)	Campbell Scientific 070 / HC2A-S3	20221366	November 29, 2019
<ul style="list-style-type: none"> The channel was put offline on November 14 hour 11 in order to service the sensor. The sensor, Campbell Scientific 070, s/n: 20221366, filter was washed, cleaned and dried. A sensor audit was performed after the maintenance. One hour of downtime was recorded due to this maintenance activity. The channel was put offline on November 29 hour 10. The sensor was audited before it was removed and sent back to manufacture for re-certification on November 29. The Campbell Scientific 070, s/n: 20257103, was installed on November 29. One hour of downtime was recorded due to this event. 			
Barometric Pressure (BP)	Met One / Part 090D	F4997	February 15, 2019
<ul style="list-style-type: none"> Hourly data collected on November 29 hour 10 was invalidated as the value was flagged as "Below Range". The cause could not be determined. One hour of downtime was recorded. 			
Station Temperature (ST)	Maxxam-supplied	n/a	n/a
<ul style="list-style-type: none"> No issues were identified this month. 			
Precipitation (PRECIP)	Met One / Part 387-Heated Rain Gauge	F4481	November 29, 2019
<ul style="list-style-type: none"> The precipitation sensor was checked and audited on November 29. The sensor passed the audit requirements. 			
Wind Speed (WS) / Wind Direction (WD)/ Stand Deviation Wind Direction (STDWD)	RM Young / 05305VK	161465	September 19, 2019
<ul style="list-style-type: none"> Wind direction data contained in this report represents where the wind is coming from. No issues were identified this month. 			

Monitored Data Summary for November 2019

Parameter	Objectives/Guidelines			Exceedances			Monthly Avg.	Min. 1-hr	Max. 1-hr	Date/Time	VWS (km/hr)	VWD (sector)	Max. 24-hr	Date	Operational Uptime (%)	Valid Data (%)
	1-hr	24-hr	30-day	1-hr	24-hr	30-day										
SO2 (ppb)	172	48	11	0	0	0	0.1	0	2	November 11 at hour 1	7.8	SSW	1.0	November 21	100.0	95.1
H2S (ppb)	10	3	-	0	0	-	0.1	0	2	November 18 at hour 8	22.7	WNW	0.8	November 8	99.9	94.7
Nox (ppb)	-	-	-	-	-	-	2.2	0	14	November 21 at hour 19	16.3	SW	8.8	November 21	100.0	94.8
NO (ppb)	-	-	-	-	-	-	0.1	0	3	November 11 at hour 10	16.1	SSW	0.7	November 11	100.0	94.8
NO2 (ppb)	159	-	-	0	-	-	2.1	0	14	November 21 at hour 19	16.3	SW	8.1	November 21	100.0	94.8
O3 (ppb)	76	-	-	0	-	-	26.4	7	42	November 23 at hour 14	20.6	WNW	37.4	November 18	96.5	91.1
THC (ppm)	-	-	-	-	-	-	1.99	1.89	2.27	November 13 at hour 10	10	SSW	2.08	November 11	100.0	95.0
CH4 (ppm)	-	-	-	-	-	-	1.99	1.89	2.27	November 13 at hour 10	10	SSW	2.08	November 11	100.0	94.8
NMHC (ppm)	-	-	-	-	-	-	0.00	0.00	0.00	November 1 at hour 0	10.9	W	0.00	November 1	100.0	94.8
PM2.5 (µg/m3)	80	30	-	0	0	-	4.4	0.0	16.0	November 2 at hour 11	7.2	SW	10.8	November 15	100.0	99.6
RH (%)	-	-	-	-	-	-	81.7	42	99	November 2 at hour 22	8.1	NW	97.7	November 15	100.0	100.0
BP (millibar)	-	-	-	-	-	-	919	901	939	November 10 at hour 8	11.1	NNW	938	November 10	100.0	100.0
Ext. Temp. (°C)	-	-	-	-	-	-	-5.0	-21.0	8.3	November 17 at hour 14	17.3	WSW	5.0	November 23	100.0	100.0
Stn. Temp. (°C)	-	-	-	-	-	-	21.7	19.6	24.9	November 19 at hour 11	5.1	NNW	24.0	November 19	100.0	100.0
Precipitation (mm)*	-	-	-	-	-	-	26.3	0.0	1.3	November 16 at hour 1	14.8	NW	7.6	November 24	100.0	100.0
WSV (km/hr)	-	-	-	-	-	-	4.6	0.1	26.5	November 18 at hour 7	26.5	WNW	18.2	November 23	100.0	100.0
WDV (sector)	-	-	-	-	-	-	272 (W)	-	-	-	-	-	-	-	100.0	100.0

1- Date/ Time given is the first minimum and maximum value that was recorded

* Data represents the total (sum) for the indicated time frame

Alberta Ambient Air Quality Objectives (AAAQOs) Exceedances

The measured ambient air quality was within the AAAQOs for all monitored parameters.

Bonnyville - East Station

Equipment Operation Summary

Parameter	Make / Model	Serial Number	Calibration Date
Sulphur Dioxide (SO2)	Thermo / 43i-TLE	1180320046	November 7, 2019
<ul style="list-style-type: none"> A power outage occurred on November 8 between hour 11 and hour 15. Five hours of data were invalidated. 			
Hydrogen Sulphide (H2S)	Thermo / 450i	CM17360002	November 7, 2019
<ul style="list-style-type: none"> A power outage occurred on November 8 between hour 11 and hour 15. Five hours of data were invalidated. The analyzer spanned close to the +10% acceptable limit on November 17. An as found point check was performed on November 20 to confirm the analyzer's functionality. The analyzer passed the check requirements. Two hours of downtime were recorded due to this quality assurance check. The analyzer spanned close to the +10% acceptable limit again on November 24 and failed both the repeat zero-span check on November 24 and routine zero-span check on November 25. As the span responses started improving on November 26, no further troubleshooting was performed. The analyzer has a known history of span drift related to ambient temperature/humidity. No data were discarded due to this event. 			
Oxide of Nitrogen / Nitric Oxide/ Nitrogen Dioxide (NOx/NO/NO2)	Thermo / 42i	1180930027	November 7, 2019
<ul style="list-style-type: none"> The analyzer spanned low after the monthly calibration was completed on November 7. A repeat zero-span check was initiated on November 8 during hour 7 and 8. The results met the check requirements. Two hours downtime were recorded due to this event. The analyzer failed the daily span check on November 17. As the span responses started improving on November 18, no further troubleshooting was performed. No data were discarded. The analyzer failed the daily span check on November 23. A repeat zero-span check was initiated on November 23 hour 8. The check results were within the acceptable limits. One hour of downtime was recorded as a result. The analyzer failed the daily span check on November 26. An as found point check was performed on November 26 to confirm the analyzer's functionality. The analyzer passed the as found check requirements. No data were invalidated due to this event. The analyzer has a history of unstable span results. Numerous as-found point checks and repeat calibrations have been completed since this analyser was installed. All the check results have demonstrated that this is a problem with the IZS circuit. Much time has been invested trying to solve this IZS circuit issue without success. Changes were made to the IZS program on the datalogger by giving a longer average period to try and limit the effect of this instability. 			

Parameter	Make / Model	Serial Number	Calibration Date
Ozone (O3)	Thermo / 49i	1002240372	November 12, 2019
<ul style="list-style-type: none"> • A power outage occurred on November 8 between hour 11 and hour 15. Five hours of data were invalidated. • The routine monthly calibration was interrupted by the power failure on November 8. The calibration was aborted. One hour of downtime was recorded 			
Total Hydrocarbons / Methane/ Non-methane Hydrocarbons (THC/CH4/NMHC)	Thermo / 55i	1180320044	November 12, 2019
<ul style="list-style-type: none"> • A power outage occurred on November 8 between hour 11 and hour 15. Five hours of data were invalidated. • The routine monthly calibration was interrupted by the power failure on November 8. The calibration was aborted. One hour of downtime was recorded 			
Particulate Matter 2.5 (PM2.5)	Thermo / Sharp 5030i	CM17071016	November 26, 2019
<ul style="list-style-type: none"> • A power outage occurred on November 8 between hour 11 and hour 15. Five hours of data were invalidated. 			
Station Temperature (ST)	Maxxam-supplied	n/a	n/a
<ul style="list-style-type: none"> • A power outage occurred on November 8 between hour 11 and hour 15. Five hours of data were invalidated. 			
Wind Speed (WS) / Wind Direction (WD)/ Stand Deviation Wind Direction (STDWD)	RM Young / 05305VK	56778	October 25, 2019
<ul style="list-style-type: none"> • Wind direction data contained in this report represents where the wind is coming from. • A power outage occurred on November 8 between hour 11 and hour 15. Five hours of data were invalidated. 			

Monitored Data Summary for November 2019

Parameter	Objectives/Guidelines			Exceedances			Monthly Avg.	Min. 1-hr	Max. 1-hr	Date/Time	VWS (km/hr)	VWD (sector)	Max. 24-hr	Date	Operational Uptime (%)	Valid Data (%)
	1-hr	24-hr	30-day	1-hr	24-hr	30-day										
SO2 (ppb)	172	48	11	0	0	0	0.3	0	3	November 11 at hour 1	7.6	SW	1.0	November 11	99.3	94.1
H2S (ppb)	10	3	-	0	0	-	0.3	0	8	November 22 at hour 6	4.2	WSW	1.4	November 16	98.9	93.7
Nox (ppb)	-	-	-	-	-	-	4.4	0	122	November 28 at hour 6	3.9	NE	12.3	November 28	98.6	93.3
NO (ppb)	-	-	-	-	-	-	0.8	0	71	November 26 at hour 7	11.1	NNE	5.5	November 26	98.6	93.3
NO2 (ppb)	159	-	-	0	-	-	3.6	0	62	November 28 at hour 6	3.9	NE	6.8	November 28	98.6	93.3
O3 (ppb)	76	-	-	0	-	-	23.7	4	40	November 23 at hour 13	28.6	WNW	35.1	November 23	99.2	94.1
THC (ppm)	-	-	-	-	-	-	2.14	1.96	3.11	November 28 at hour 10	3.8	E	2.32	November 11	99.2	94.0
CH4 (ppm)	-	-	-	-	-	-	2.14	1.96	3.11	November 28 at hour 10	3.8	E	2.32	November 11	99.2	94.0
NMHC (ppm)	-	-	-	-	-	-	0.00	0.00	0.07	November 28 at hour 6	3.9	NE	0.00	November 28	99.2	94.0
PM2.5 (µg/m3)	80	30	-	0	0	-	4.5	0.0	20.0	November 20 at hour 11	7.6	WNW	12.7	November 15	99.3	99.0
Stn. Temp. (°C)	-	-	-	-	-	-	23.8	20.2	25.2	November 4 at hour 16	5.8	SSE	24.5	November 8	99.3	99.3
WSV (km/hr)	-	-	-	-	-	-	4.7	0.0	37.0	November 18 at hour 4	37	WNW	23.0	November 18	99.3	99.3
WDV (sector)	-	-	-	-	-	-	281 (W)	-	-	-	-	-	-	-	99.3	99.3

1- Date/ Time given is the first minimum and maximum value that was recorded

Alberta Ambient Air Quality Objectives (AAAQOs) Exceedances

The measured ambient air quality was within the AAAQOs for all monitored parameters.

TABLES, CHARTS, WIND ROSES AND EQUIPMENT CALIBRATION RECORDS

COLD LAKE SOUTH STATION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Averages

SULPHUR DIOXIDE (SO₂) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 172 ppb, 24-Hour 48 ppb, 30-Day 11 ppb

Number of 1-Hour Exceedences: 0 Number of 24-Hour Exceedences: 0 30-Day Exceedence: 0

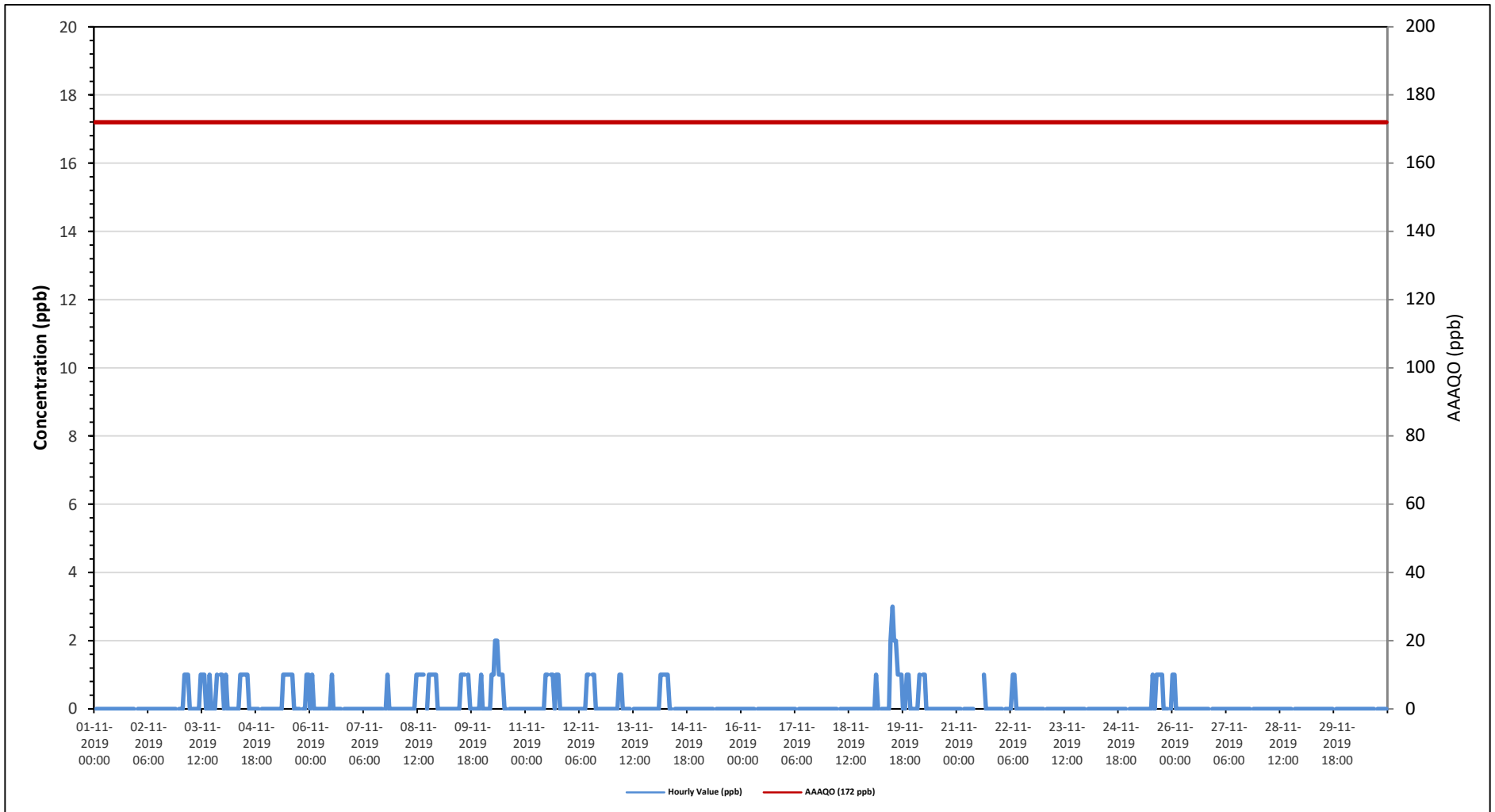
Maximum Hourly Value:	3 ppb on November 19 at hour 12	Hours in Service:	720
Maximum Daily Value:	0.7 ppb on November 19	Hours of Data:	683
Minimum Hourly Value:	0 ppb on November 1 at hour 1	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on November 1	Hours of Calibration:	37
Monthly Average:	0.1 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																								Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
Nov 1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0.0
Nov 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0.0
Nov 3	0	0	1	1	1	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	1	S	1	1	0	1	0.4	
Nov 4	0	1	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	S	0	0	0	0	1	0.3	
Nov 5	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	S	0	0	1	1	0	1	0.3	
Nov 6	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0.1	
Nov 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	0	0	0	0	0	0.0	
Nov 8	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	S	0	1	1	1	1	1	1	0	0	0.4	
Nov 9	0	0	0	0	0	0	0	0	0	0	0	1	1	1	S	1	0	0	0	0	0	0	0	1	0	1	0.2	
Nov 10	0	0	0	0	0	1	1	2	2	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0.4	
Nov 11	0	0	0	0	0	0	0	0	0	0	0	1	1	S	1	1	0	1	1	0	0	0	0	0	0	0	0.3	
Nov 12	0	0	0	0	0	0	0	0	0	0	1	1	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0.2	
Nov 13	0	0	0	0	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	
Nov 14	0	0	0	1	1	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	
Nov 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 16	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 19	0	0	0	1	0	S	0	0	0	0	0	2	3	2	2	1	1	1	0	0	1	1	0	0	0	0	0.7	
Nov 20	0	0	0	1	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	
Nov 21	0	0	0	S	0	0	0	0	0	0	C	C	C	C	C	1	0	0	0	0	0	0	0	0	0	0	0.1	
Nov 22	0	0	0	S	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	
Nov 23	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 24	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0.0	
Nov 25	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	S	0	0	0.2	
Nov 26	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0.1	
Nov 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0.0	
Nov 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0.0	
Nov 29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0.0	
Nov 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0.0	
Diurnal Maximum	1	1	1	1	1	1	1	2	2	1	1	2	3	2	2	1	1	1	1	1	1	1	1	1	1	1		
Daiurnal Average	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		

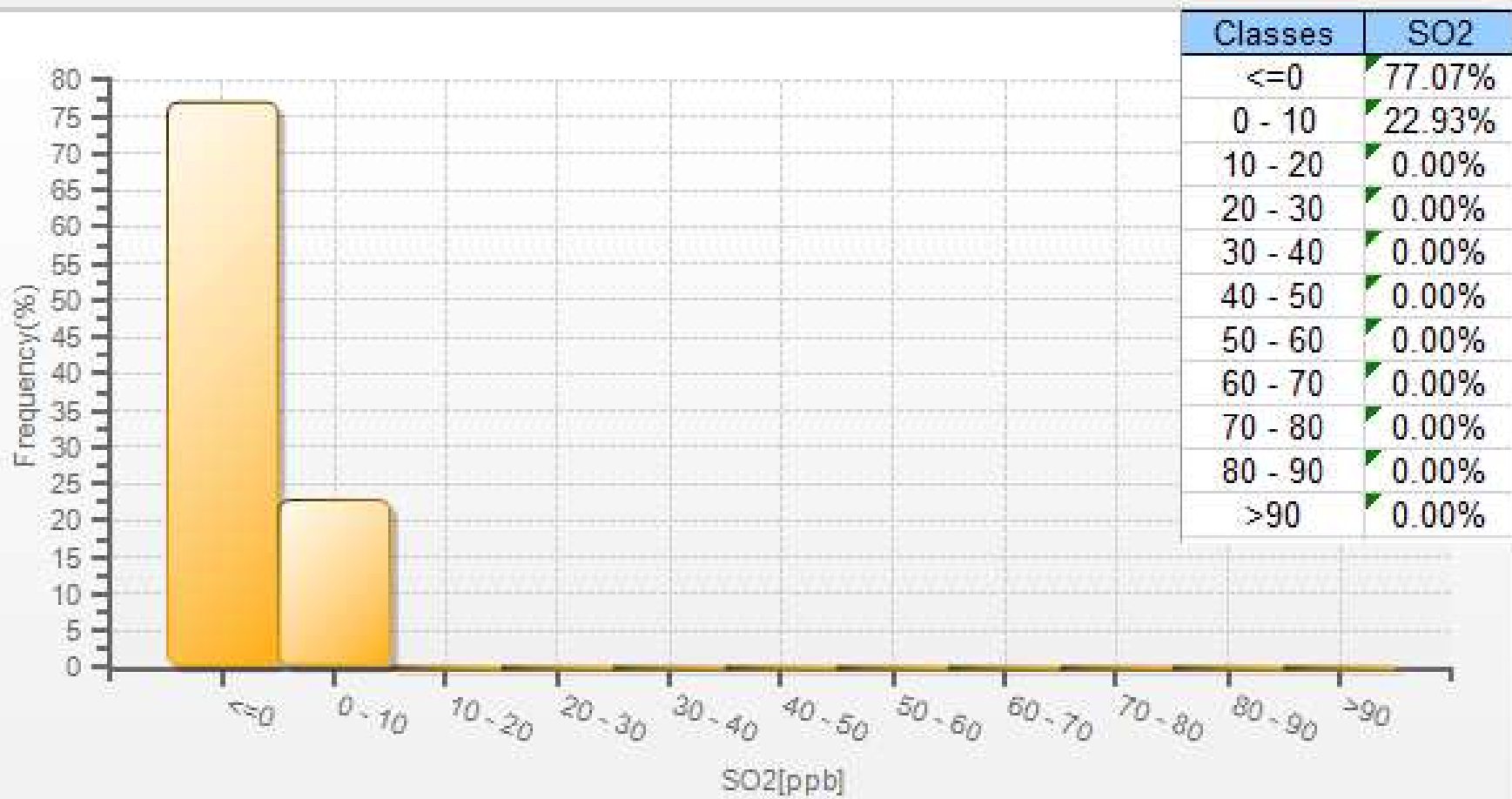
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for SO₂ - Cold Lake South Station

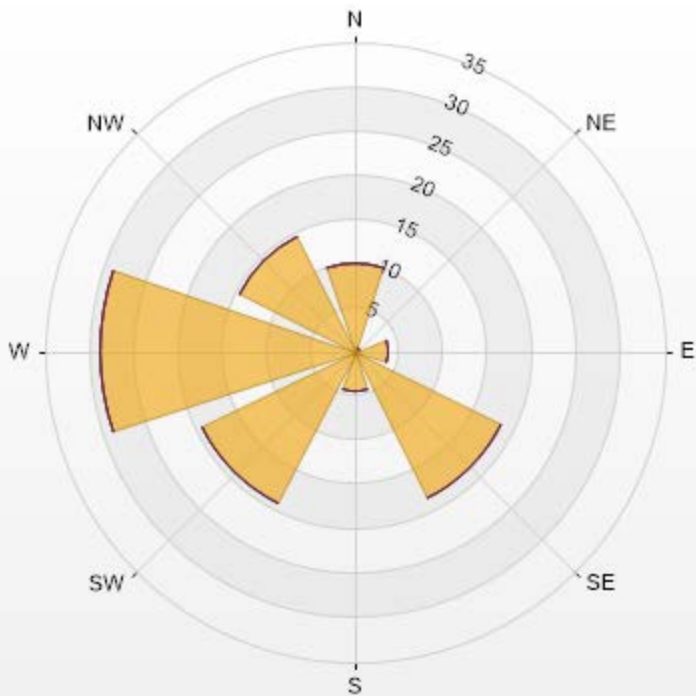


SO2[ppb] Histogram: Cold Lake South Monthly: 11-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-SO2[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.75% Calm Avg: 0.00 [ppb]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	10.07	0	0	0	0	10.07
NE	0.59	0	0	0	0	0.59
E	3.85	0	0	0	0	3.85
SE	18.52	0	0	0	0	18.52
S	4.44	0	0	0	0	4.44
SW	19.26	0	0	0	0	19.26
W	28.74	0	0	0	0	28.74
NW	14.52	0	0	0	0	14.52
Summary	100	0	0	0	0	100



LICA-201911-Revision 1

% Icon Classes (ppb)

100 0-10

0 10-30

0 50-100

0 100-172

0 >172.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Averages

TOTAL REDUCED SULPHUR (TRS) in ppb

Alberta Ambient Air Quality Objectives (AAAQO) for H2S: 1-Hour 10 ppb, 24-Hour 3 ppb
 Number of 1-Hour Exceedences: 0 Number of 24-Hour Exceedences: 0

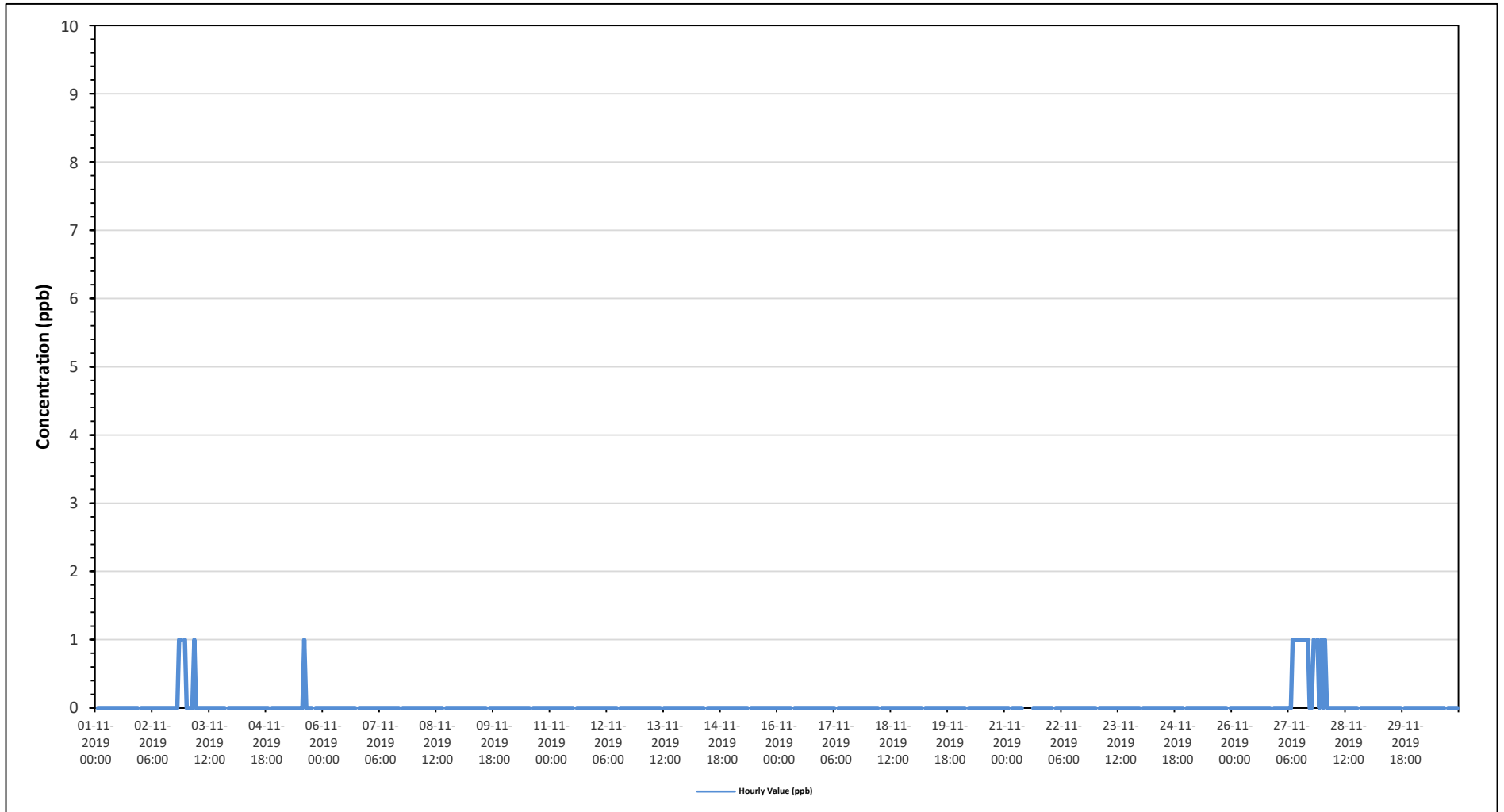
Maximum Hourly Value:	1 ppb on November 2 at hour 20	Hours in Service:	720
Maximum Daily Value:	1 ppb on November 27	Hours of Data:	683
Minimum Hourly Value:	0 ppb on November 1 at hour 1	Hours of Missing Data:	0
Minimum Daily Value:	0 ppb on November 1	Hours of Calibration:	37
Monthly Average:	0.03 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																								Daily Minimum	Daily Maximum	Daily Average
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
Nov 1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0.00
Nov 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	S	1	0	1	0.13
Nov 3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0.04
Nov 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	S	0	0	0	0	0.00
Nov 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	S	0	0	0	0	0	1	0.04
Nov 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0.00
Nov 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0.00
Nov 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0.00
Nov 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0.00
Nov 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov 11	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov 12	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov 13	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov 14	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov 15	0	0	0	0	0	0	0	0	S	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov 16	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov 17	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov 18	0	0	0	0	0	S	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov 19	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov 20	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov 21	0	0	S	S	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov 22	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov 23	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov 24	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0.00
Nov 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0.00
Nov 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0.00
Nov 27	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	1	S	1	0	1	0	1	0.52
Nov 28	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0.04
Nov 29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0.00
Nov 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0.00
Diurnal Maximum	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Diurnal Average	0.00	0.03	0.00	0.00	0.03	0.00	0.00	0.00	0.03	0.03	0.04	0.04	0.04	0.04	0.07	0.03	0.03	0.00	0.00	0.04	0.04	0.07	0.00	0.07			

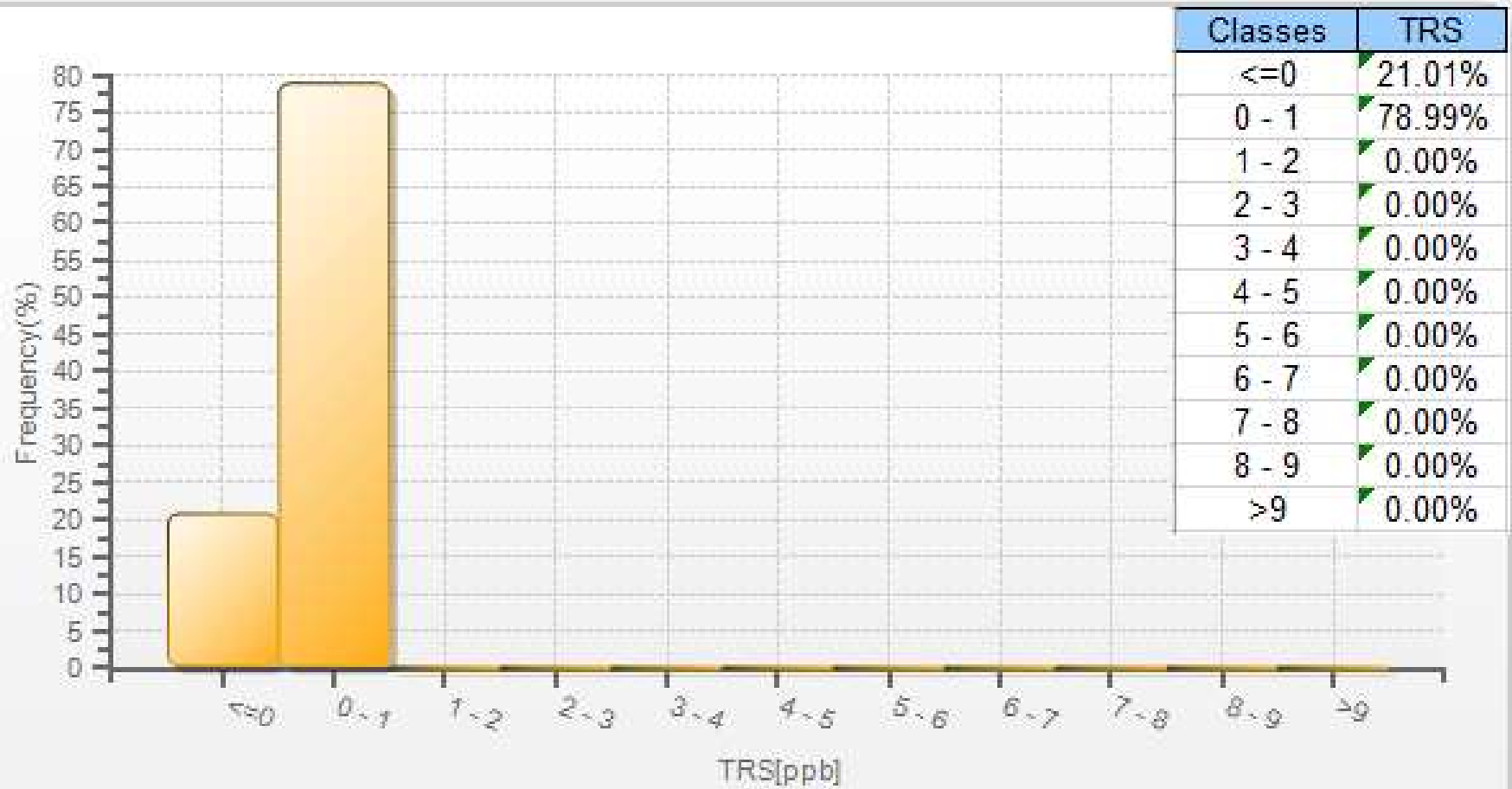
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for TRS - Cold Lake South Station

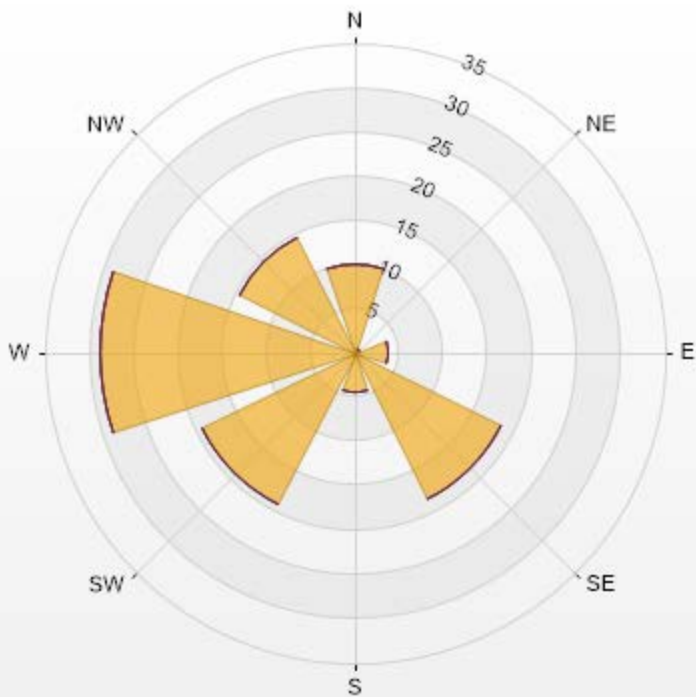


TRS[ppb] Histogram: Cold Lake South Monthly: 11-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-TRS[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.75% Calm Avg: 0.00 [ppb]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	10.07	0	0	0	0	10.07
NE	0.59	0	0	0	0	0.59
E	3.85	0	0	0	0	3.85
SE	18.52	0	0	0	0	18.52
S	4.44	0	0	0	0	4.44
SW	19.26	0	0	0	0	19.26
W	28.74	0	0	0	0	28.74
NW	14.52	0	0	0	0	14.52
Summary	100	0	0	0	0	100



LICA-201911-Revision 1

% Icon Classes (ppb)	100	0-2	0-5	5-10	0	10-50	0	>50.0
		0-2	0-5	5-10	0	10-50	0	>50.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Averages

OXIDES OF NITROGEN (NOx) in ppb

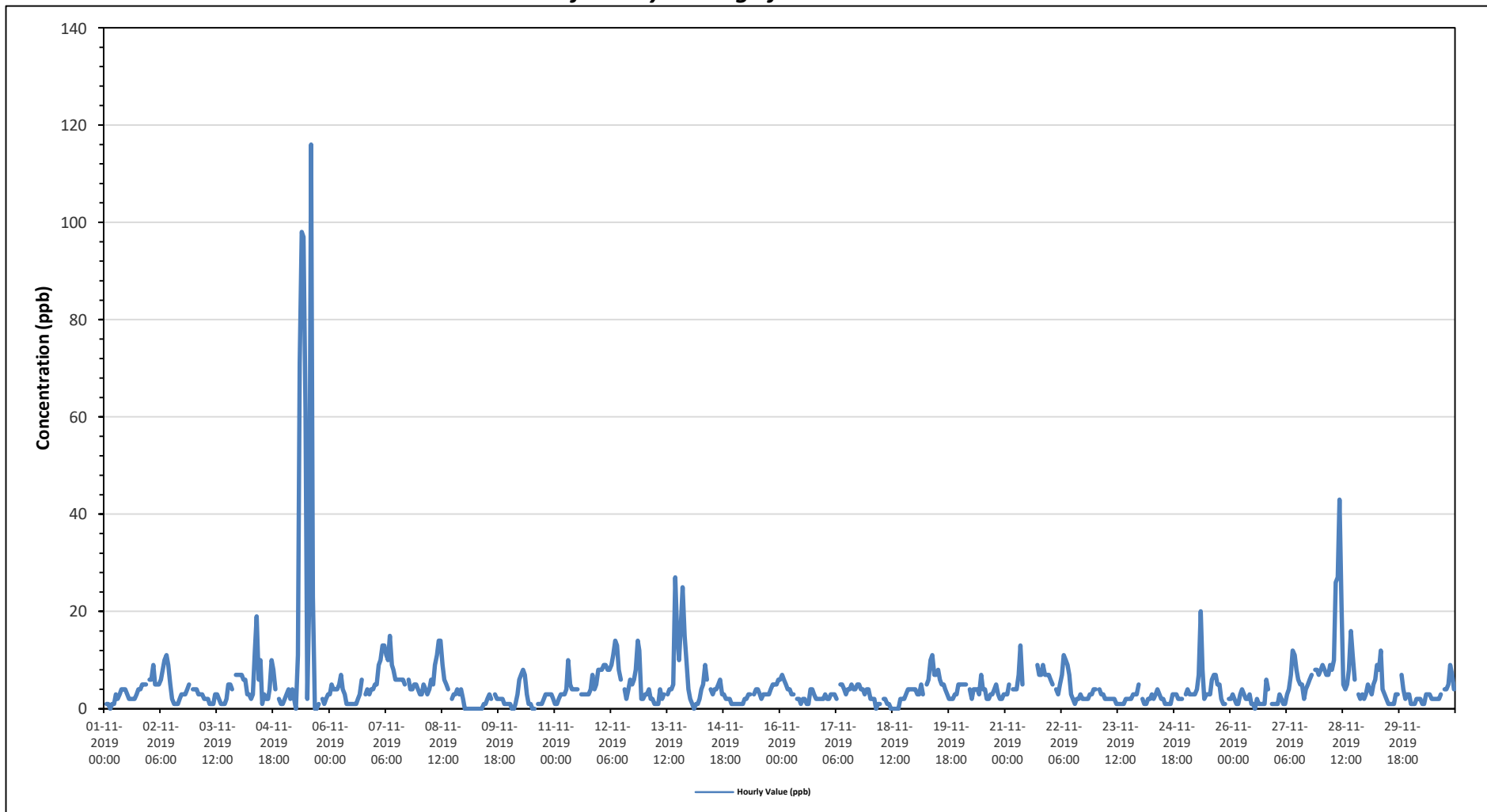
Maximum Hourly Value:	116 ppb on November 5 at hour 14	Hours in Service:	720
Maximum Daily Value:	22.9 ppb on November 5	Hours of Data:	681
Minimum Hourly Value:	0 ppb on November 1 at hour 3	Hours of Missing Data:	0
Minimum Daily Value:	1.0 ppb on November 9	Hours of Calibration:	39
Monthly Average:	4.8 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	S	1	1	0	1	1	3	2	3	4	4	4	3	2	2	2	3	4	4	5	5	5	S	0	5	2.8		
Nov 2	6	6	9	5	5	5	6	8	10	11	9	5	2	1	1	1	2	3	3	3	4	5	S	4	1	11	5.0	
Nov 3	4	4	3	3	3	2	2	2	1	1	1	3	3	2	1	1	1	2	5	5	4	S	7	1	7	2.9		
Nov 4	7	7	6	6	3	3	2	3	12	19	6	10	1	3	2	2	4	10	8	4	S	2	1	1	1	19	5.3	
Nov 5	2	3	4	2	4	2	0	11	71	98	97	61	2	21	116	23	0	0	1	S	2	1	2	3	0	116	22.9	
Nov 6	3	5	4	4	4	5	7	4	3	1	1	1	1	1	1	2	3	6	S	3	4	3	4	4	1	7	3.2	
Nov 7	5	5	9	10	13	13	11	10	15	9	8	6	6	6	6	6	5	S	S	6	4	4	5	5	4	4	15	7.4
Nov 8	3	3	5	4	3	4	6	5	9	11	14	14	9	6	5	4	S	2	3	3	4	3	4	2	2	14	5.5	
Nov 9	0	0	0	0	0	0	0	0	0	0	1	1	2	3	2	S	3	2	2	2	2	1	1	1	0	3	1.0	
Nov 10	1	0	0	1	3	6	7	8	7	3	1	1	0	0	S	1	1	1	2	3	3	3	3	2	0	8	2.5	
Nov 11	1	1	2	3	3	3	4	10	5	4	4	4	0	S	3	3	3	3	3	4	7	4	5	8	1	10	4.0	
Nov 12	8	8	9	9	8	8	9	11	14	13	8	6	S	4	2	4	6	5	6	8	14	12	2	2	2	14	7.7	
Nov 13	3	3	4	2	2	1	1	1	4	2	3	S	3	4	4	5	27	16	10	17	25	15	10	4	1	27	7.2	
Nov 14	2	1	0	1	1	2	4	5	9	6	S	4	3	4	4	5	6	3	3	2	2	1	1	0	9	3.1		
Nov 15	1	1	1	1	1	2	2	3	3	S	3	4	4	3	2	3	3	3	3	4	5	5	5	6	1	6	3.0	
Nov 16	6	7	6	5	4	4	3	3	S	2	2	1	2	2	1	1	4	4	3	2	2	2	2	2	1	7	3.0	
Nov 17	3	2	2	3	3	3	2	S	5	5	4	3	4	4	5	4	4	5	5	4	4	3	4	4	2	5	3.7	
Nov 18	2	2	2	0	1	1	S	2	2	1	1	0	0	0	0	2	2	2	3	4	4	4	4	0	4	1.7		
Nov 19	4	3	3	5	3	S	5	6	10	11	7	7	8	6	5	5	4	3	2	2	2	3	3	5	2	11	4.9	
Nov 20	5	5	5	5	S	4	2	4	4	4	3	7	4	4	2	2	3	3	4	5	3	2	2	3	2	7	3.7	
Nov 21	3	3	5	S	4	4	4	7	13	5	C	C	C	C	C	C	C	9	7	7	9	7	7	3	13	-		
Nov 22	6	5	S	4	3	5	7	11	10	9	7	3	2	1	2	2	3	2	2	2	2	3	3	4	1	11	4.3	
Nov 23	4	S	4	3	3	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	3	3	3	5	1	5	2.3	
Nov 24	S	2	1	1	2	2	3	2	3	4	3	2	2	1	1	1	1	3	3	3	2	2	2	S	1	4	2.1	
Nov 25	3	4	3	3	3	3	4	7	20	8	2	3	3	3	6	7	7	5	5	2	1	1	S	2	1	20	4.6	
Nov 26	2	3	2	1	1	3	4	3	2	2	3	1	1	0	2	1	1	1	6	4	S	1	1	1	0	6	2.0	
Nov 27	1	1	3	2	1	1	3	4	7	12	11	8	6	5	5	2	4	5	6	7	S	8	8	7	1	12	5.1	
Nov 28	8	9	8	7	7	9	8	10	26	27	43	21	5	4	5	8	16	11	6	S	3	2	3	2	2	43	10.8	
Nov 29	3	5	4	3	5	6	9	8	12	4	3	2	1	1	1	1	3	3	S	7	4	2	3	3	1	12	4.0	
Nov 30	1	1	1	2	2	2	1	1	3	3	3	2	2	2	2	3	S	4	4	5	9	7	4	1	9	2.9		
Diurnal Maximum	8	9	9	10	13	13	11	11	71	98	97	61	9	21	116	23	27	16	10	17	25	15	10	8				
Diurnal Average	3.5	3.4	3.7	3.3	3.3	3.7	4.2	5.3	9.8	9.7	9.1	6.6	3.0	3.4	6.8	3.5	4.4	4.2	4.0	4.4	4.8	4.2	3.8	3.6				

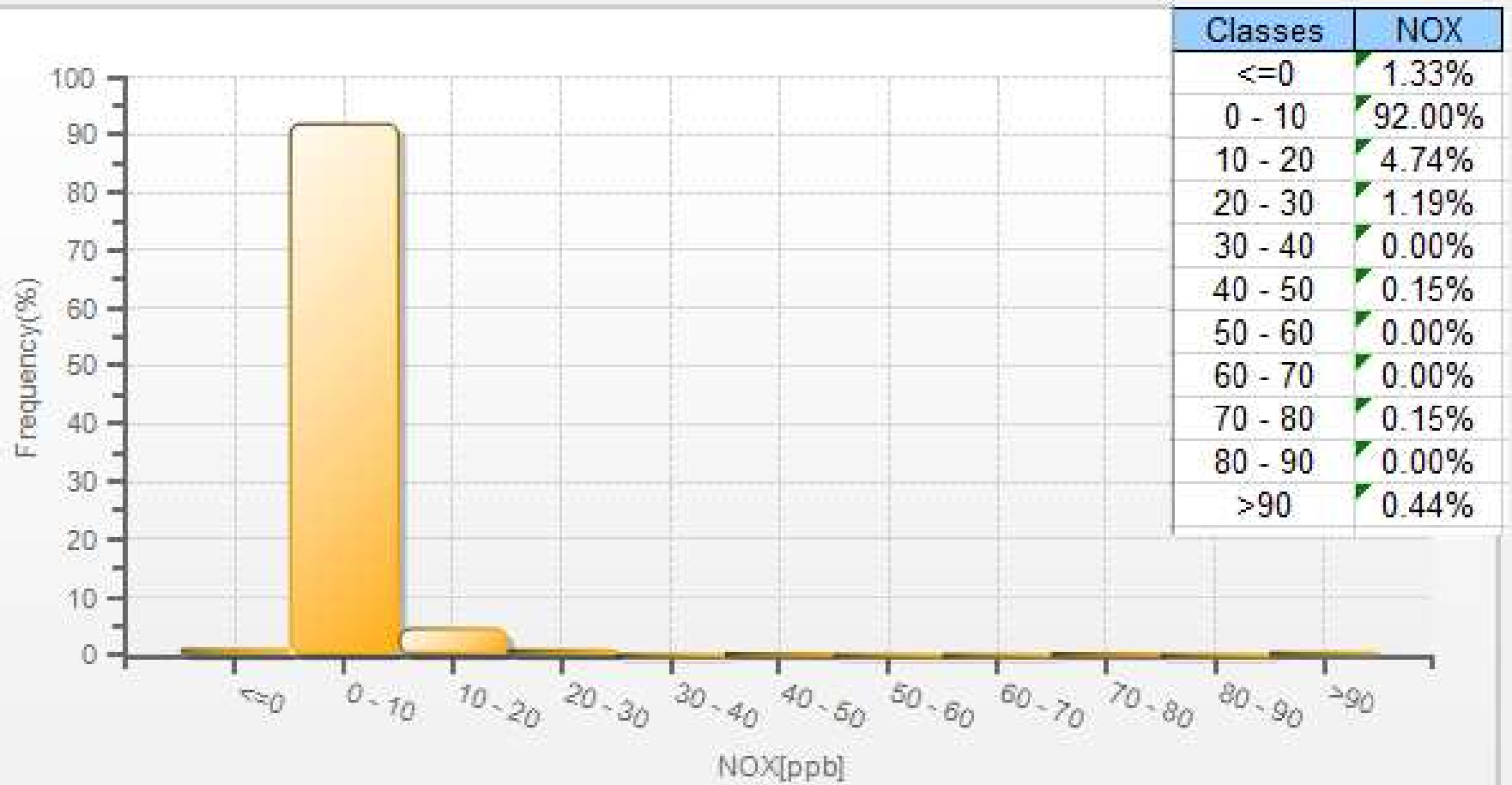
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for NOx - Cold Lake South Station

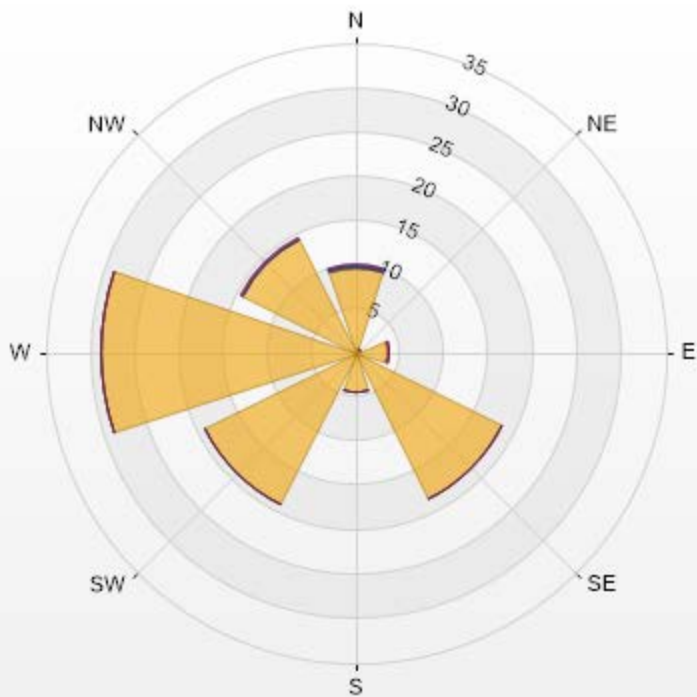


NOX[ppb] Histogram: Cold Lake South Monthly: 11-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-NOX[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.61% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	9.64	0	0.15	0.3	0	10.09
NE	0.59	0	0	0	0	0.59
E	3.71	0.15	0	0	0	3.86
SE	18.55	0	0	0	0	18.55
S	4.45	0	0	0	0	4.45
SW	19.14	0	0	0	0	19.14
W	28.78	0	0	0	0	28.78
NW	14.39	0	0	0.15	0	14.54
Summary	99.25	0.15	0.15	0.45	0	100



LICA-201911-Revision 1

% Icon Classes (ppb)	99	0-30	0	50-82	0	82-159	0	>159.0
	99	0-30	0	50-82	0	82-159	0	>159.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Averages

NITRIC OXIDE (NO) in ppb

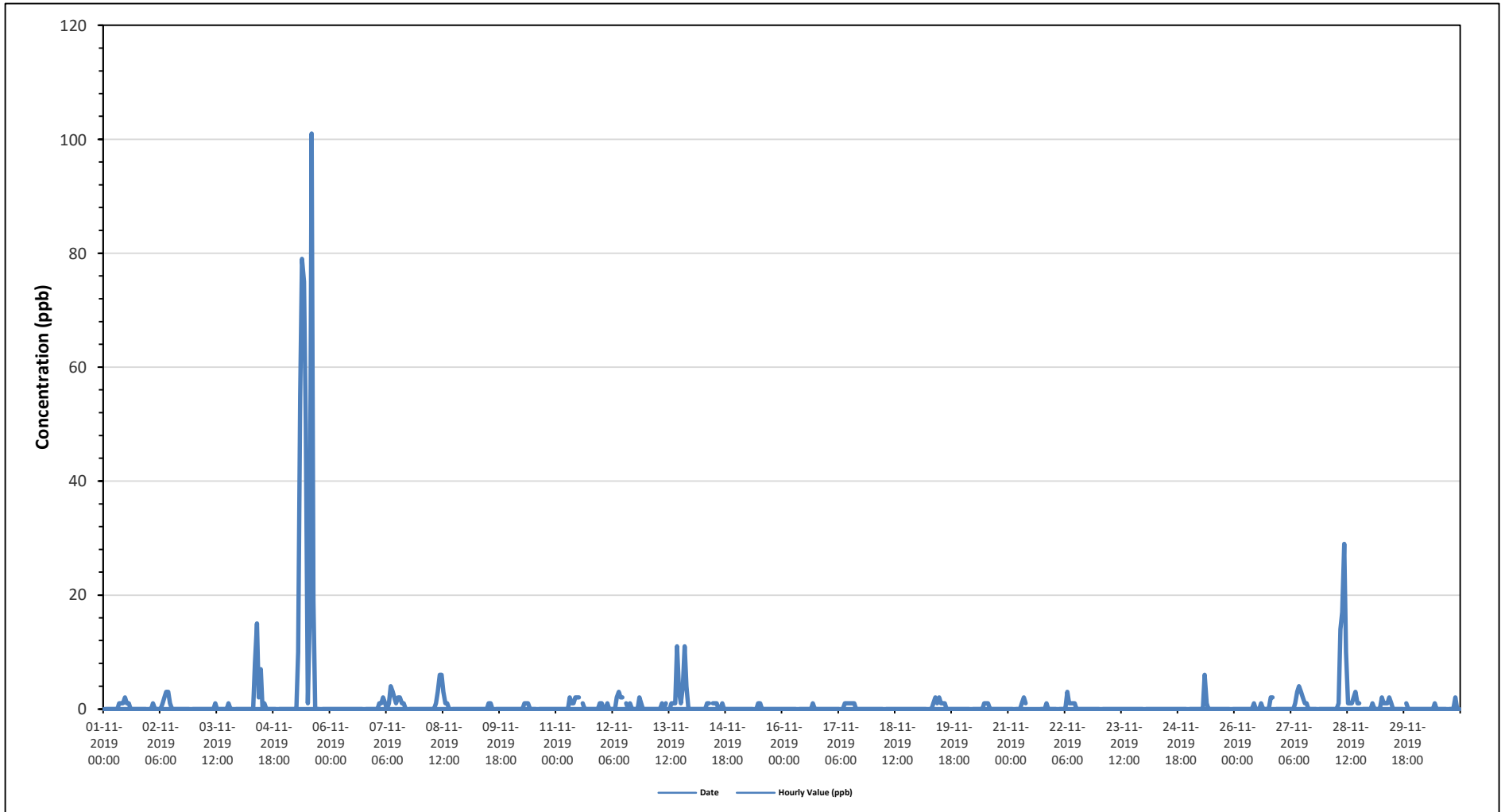
Maximum Hourly Value:	101 ppb on November 5 at hour 14	Hours in Service:	720
Maximum Daily Value:	17.6 ppb on November 5	Hours of Data:	681
Minimum Hourly Value:	0 ppb on November 1 at hour 1	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on November 6	Hours of Calibration:	39
Monthly Average:	1.1 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	S	0	0	0	0	0	0	0	1	1	1	2	1	13	0	0	0	0	0	0	0	0	0	S	0	0	2	0.3
Nov 2	0	0	1	0	0	0	0	1	2	3	3	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	3	0.5
Nov 3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	S	0	0	1	0.1	
Nov 4	0	0	0	0	0	0	0	0	8	15	2	7	0	1	0	0	0	0	0	0	0	S	0	0	0	0	15	1.4
Nov 5	0	0	0	0	0	0	0	10	55	79	75	50	1	15	101	19	0	0	0	S	0	0	0	0	0	0	101	17.6
Nov 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0.0
Nov 7	0	0	1	1	2	1	0	1	4	3	2	1	2	2	1	1	0	S	0	0	0	0	0	0	0	0	4	1.0
Nov 8	0	0	0	0	0	0	0	0	1	3	6	6	3	1	1	0	S	0	0	0	0	0	0	0	0	0	6	0.9
Nov 9	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	S	0	0	0	0	0	0	0	0	0	0	1	0.1
Nov 10	0	0	0	0	0	0	0	1	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Nov 11	0	0	0	0	0	0	0	2	1	1	2	2	2	S	1	0	0	0	0	0	0	0	0	0	1	0	2	0.5
Nov 12	1	0	0	1	0	0	0	0	2	3	2	2	S	1	0	1	0	0	0	0	0	2	1	0	0	0	3	0.7
Nov 13	0	0	0	0	0	0	0	0	1	0	1	S	0	1	1	1	11	3	1	4	11	4	0	0	0	0	11	1.7
Nov 14	0	0	0	0	0	0	0	0	1	1	S	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0.3
Nov 15	0	0	0	0	0	0	0	0	0	0	S	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Nov 16	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0.0
Nov 17	0	0	0	0	0	0	0	0	S	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0.3
Nov 18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 19	0	0	0	0	0	S	0	0	1	2	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	2	0.4
Nov 20	0	0	0	0	S	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Nov 21	0	0	0	S	0	0	0	1	2	1	C	C	C	C	C	C	C	0	0	0	0	1	0	0	0	0	2	-
Nov 22	0	0	S	0	0	0	0	3	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.0
Nov 23	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 24	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 25	0	0	0	0	0	0	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0.3	
Nov 26	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2	2	S	0	0	0	2	0.3
Nov 27	0	0	0	0	0	0	0	0	1	3	4	3	2	1	1	0	0	0	0	0	0	S	0	0	0	0	4	0.7
Nov 28	0	0	0	0	0	0	0	1	14	17	29	10	1	1	1	2	3	1	1	S	0	0	0	0	0	29	3.5	
Nov 29	0	1	0	0	0	0	2	1	1	1	2	1	0	0	0	0	0	0	S	1	0	0	0	0	0	2	0.4	
Nov 30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	S	0	0	2	2	0	0	0	2	0.1
Diurnal Maximum	1	1	1	1	2	1	2	10	55	79	75	50	3	15	101	19	11	3	1	4	11	4	0	1				
Diurnal Average	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.7	3.6	4.7	4.8	3.3	0.6	1.0	3.9	0.9	0.6	0.1	0.1	0.3	0.6	0.3	0.0	0.0				

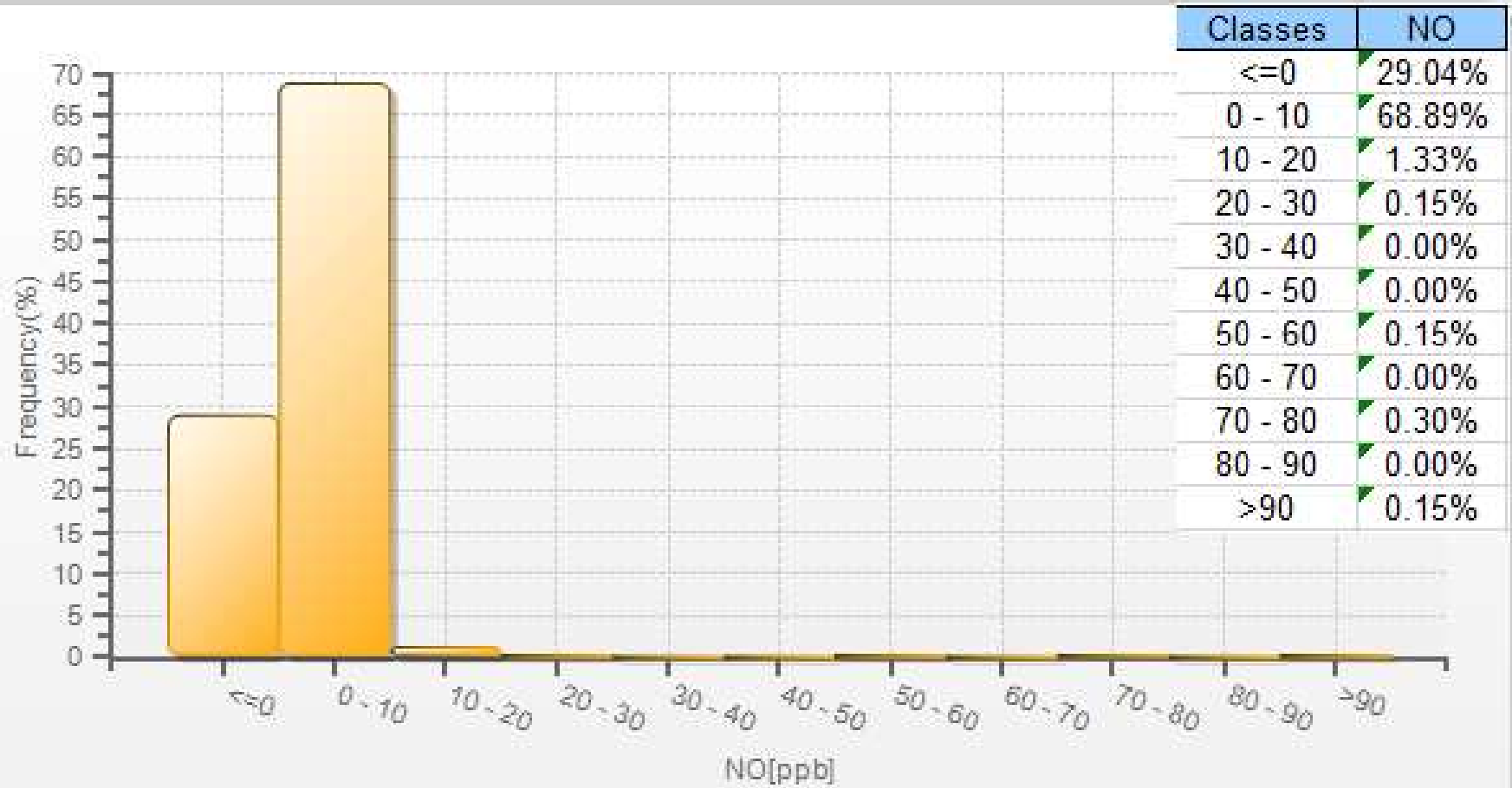
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for NO - Cold Lake South Station

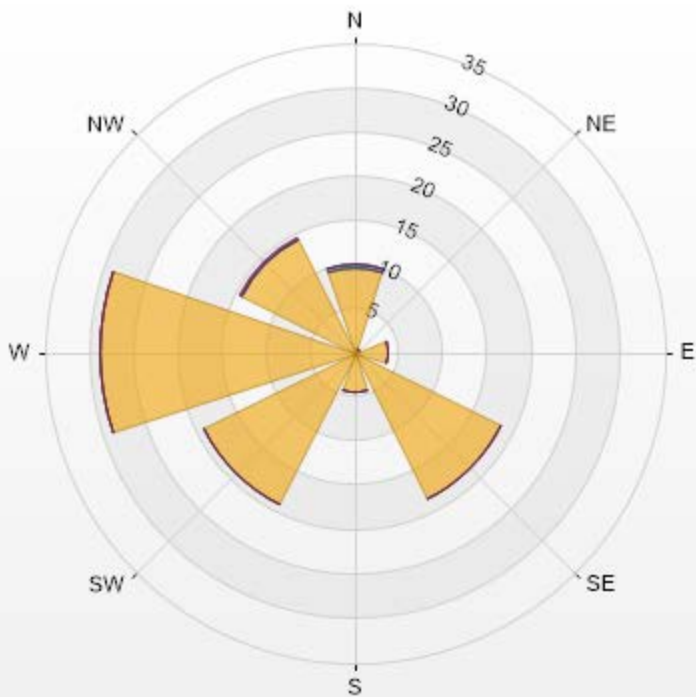


NO[ppb] Histogram: Cold Lake South Monthly: 11-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-NO[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.61% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	9.64	0	0.45	0	0	10.09
NE	0.59	0	0	0	0	0.59
E	3.86	0	0	0	0	3.86
SE	18.55	0	0	0	0	18.55
S	4.45	0	0	0	0	4.45
SW	19.14	0	0	0	0	19.14
W	28.78	0	0	0	0	28.78
NW	14.39	0	0	0.15	0	14.54
Summary	99.4	0	0.45	0.15	0	100



LICA-201911-Revision 1

% Icon Classes (ppb)	99	0-30	0	50-82	0	82-159	0	>159.0
	99	0-30	0	50-82	0	82-159	0	>159.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

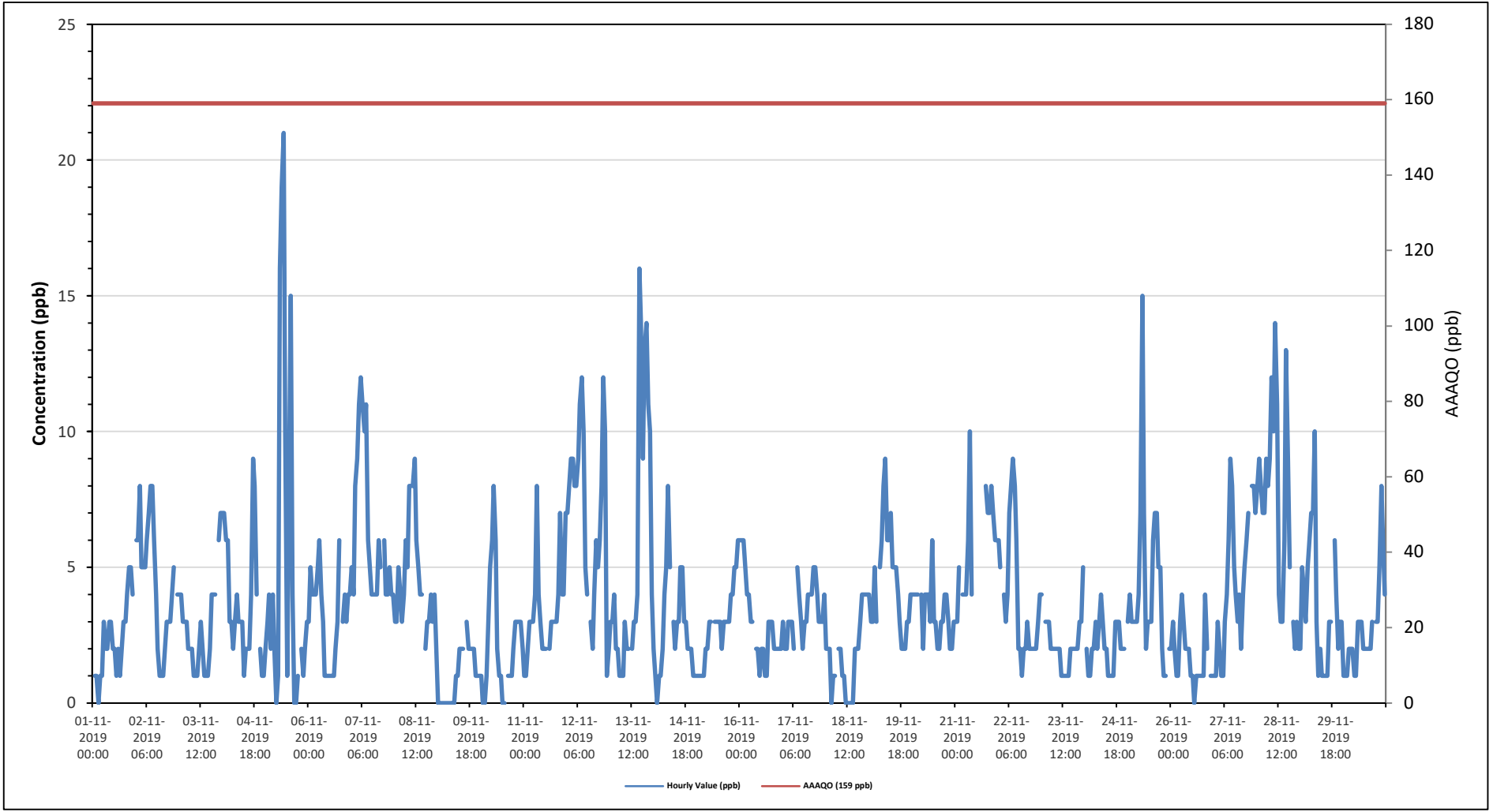
Summary of Hourly Averages

NITROGEN DIOXIDE (NO₂) in ppb

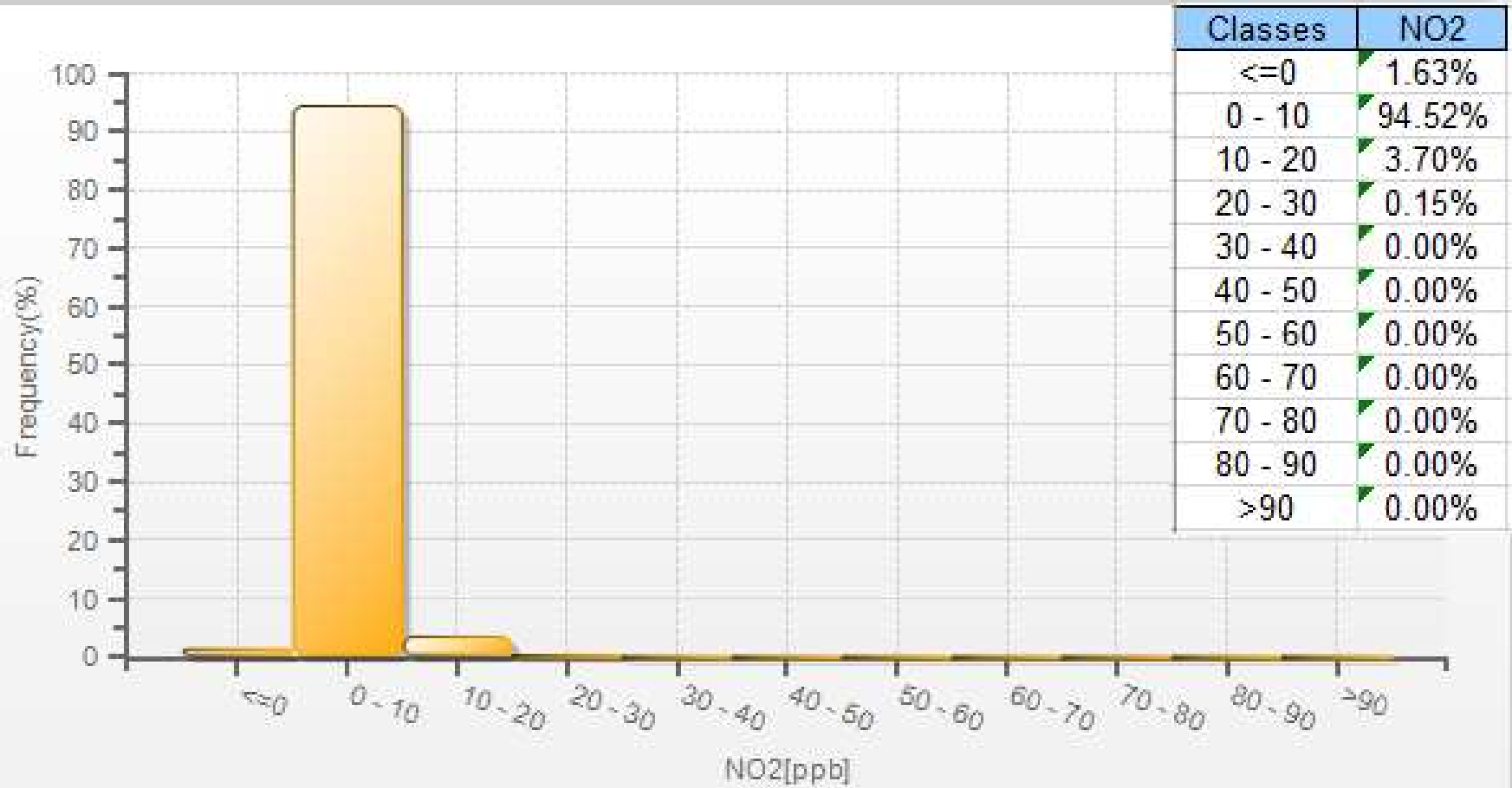
Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb																												
Number of 1-Hour Exceedences: 0																												
Maximum Hourly Value: 21 ppb on November 5 at hour 10												Hours in Service: 720																
Maximum Daily Value: 7.2 ppb on November 28												Hours of Data: 681																
Minimum Hourly Value: 0 ppb on November 1 at hour 3												Hours of Missing Data: 0																
Minimum Daily Value: 1.0 ppb on November 9												Hours of Calibration: 39																
Monthly Average: 3.7 ppb												Operational Uptime: 100.0																
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
Nov 1	S	1	1	0	1	1	3	2	2	3	3	2	2	1	2	1	2	3	3	4	5	5	4	S	0	5	2.3	
Nov 2	6	6	8	5	5	5	6	7	8	8	6	4	2	1	1	1	2	3	3	3	4	5	S	4	1	8	4.5	
Nov 3	4	4	3	3	3	2	2	2	1	1	1	2	3	2	1	1	1	2	4	4	4	S	6	7	1	7	2.7	
Nov 4	7	7	6	6	3	3	2	3	4	3	3	3	1	2	2	2	4	9	8	4	S	2	1	1	1	9	3.7	
Nov 5	2	3	4	2	4	2	0	1	16	19	21	10	1	7	15	4	0	0	1	S	2	1	2	3	0	21	5.2	
Nov 6	3	5	4	4	4	5	6	4	3	1	1	1	1	1	1	2	3	6	S	3	4	3	4	4	1	6	3.2	
Nov 7	5	4	8	9	11	12	11	10	11	6	5	4	4	4	4	6	5	S	6	4	4	5	4	4	4	4	12	6.3
Nov 8	3	3	5	4	3	4	6	5	8	8	8	9	6	5	4	4	S	2	3	3	4	3	4	2	2	9	4.6	
Nov 9	0	0	0	0	0	0	0	0	0	0	1	1	2	2	2	S	3	2	2	2	2	1	1	1	0	3	1.0	
Nov 10	1	0	0	1	3	5	6	8	6	2	1	1	0	0	S	1	1	1	2	3	3	3	3	2	0	8	2.3	
Nov 11	1	1	2	3	3	3	4	8	4	3	2	2	2	S	2	3	3	3	3	4	7	4	4	7	1	8	3.4	
Nov 12	7	8	9	9	8	8	9	11	12	10	5	4	S	3	2	4	6	5	6	8	12	10	1	2	1	12	6.9	
Nov 13	3	3	4	2	2	1	1	1	3	2	2	S	2	3	3	4	16	14	9	13	14	11	10	4	1	16	5.5	
Nov 14	2	1	0	1	1	2	4	5	8	5	S	3	2	3	3	5	5	3	3	2	2	2	1	1	0	8	2.8	
Nov 15	1	1	1	1	1	2	2	3	3	S	3	3	3	2	3	3	3	3	3	4	4	5	5	6	1	6	2.8	
Nov 16	6	6	6	5	4	4	3	3	S	2	2	1	2	2	1	1	3	3	3	2	2	2	2	2	1	6	2.9	
Nov 17	3	2	2	3	3	3	2	S	5	4	3	2	3	3	4	4	4	5	5	4	3	3	3	4	2	5	3.3	
Nov 18	2	2	2	0	1	1	S	2	2	1	1	0	0	0	0	0	2	2	2	3	4	4	4	4	0	4	1.7	
Nov 19	4	3	3	5	3	S	5	6	8	9	6	6	7	5	5	5	4	3	2	2	2	3	3	4	2	9	4.5	
Nov 20	4	4	4	4	S	4	2	4	4	4	3	6	3	3	2	2	3	3	4	4	3	2	2	3	2	6	3.3	
Nov 21	3	3	5	S	4	4	4	6	10	4	C	C	C	C	C	C	C	8	7	7	8	7	6	6	3	10	-	
Nov 22	6	5	S	4	3	4	7	8	9	8	6	2	2	1	2	2	3	2	2	2	2	2	3	4	1	9	3.9	
Nov 23	4	S	3	3	3	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2	2	2	3	3	5	1	5	2.2
Nov 24	S	2	1	1	2	2	3	2	3	4	3	2	2	1	1	1	1	3	3	3	2	2	2	S	1	4	2.1	
Nov 25	3	4	3	3	3	3	4	7	15	7	2	3	3	3	6	7	7	5	5	2	1	1	S	2	1	15	4.3	
Nov 26	2	3	2	1	1	3	4	3	2	2	1	1	0	1	1	1	1	1	1	4	2	S	1	1	0	4	1.7	
Nov 27	1	1	3	2	1	1	3	4	6	9	8	5	4	3	4	2	4	5	6	7	S	8	8	7	1	9	4.4	
Nov 28	8	9	8	7	7	9	8	9	12	10	14	11	4	3	3	6	13	9	5	S	3	2	3	2	2	14	7.2	
Nov 29	2	5	4	3	5	6	7	7	10	3	1	2	1	1	1	1	3	3	S	6	4	2	3	3	1	10	3.6	
Nov 30	1	1	1	2	2	1	1	3	3	3	2	2	2	2	2	2	3	S	3	3	5	8	6	4	1	8	2.7	
Diurnal Maximum	8	9	9	9	11	12	11	11	16	19	21	11	7	7	15	7	16	14	9	13	14	11	10	7				
Diurnal Average	3.4	3.3	3.5	3.2	3.2	3.6	4.0	4.6	6.2	4.9	4.2	3.3	2.4	2.3	2.8	2.7	3.8	3.9	3.8	4.0	4.1	3.9	3.5	3.5				
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span																			
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure																			
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service																			

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for NO2 - Cold Lake South Station

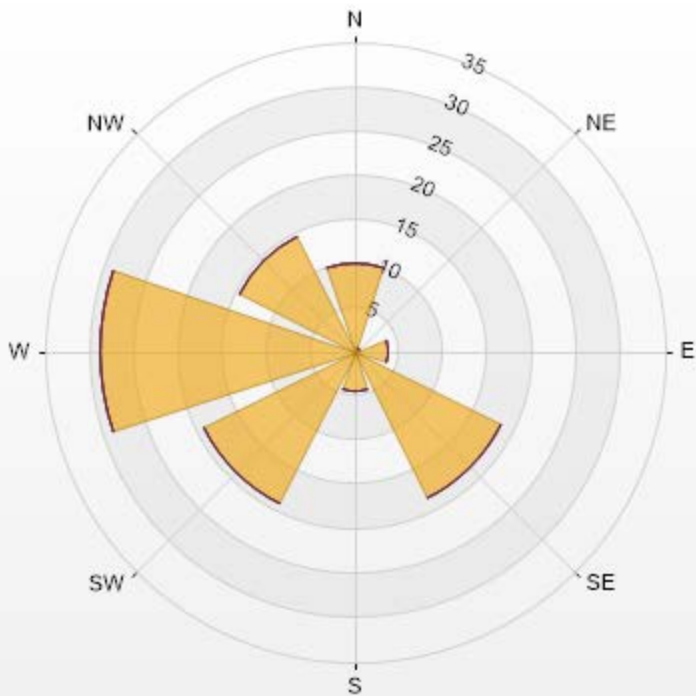


NO2[ppb] Histogram: Cold Lake South Monthly: 11-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-NO2[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.61% Calm Avg: 0.00 [ppb]

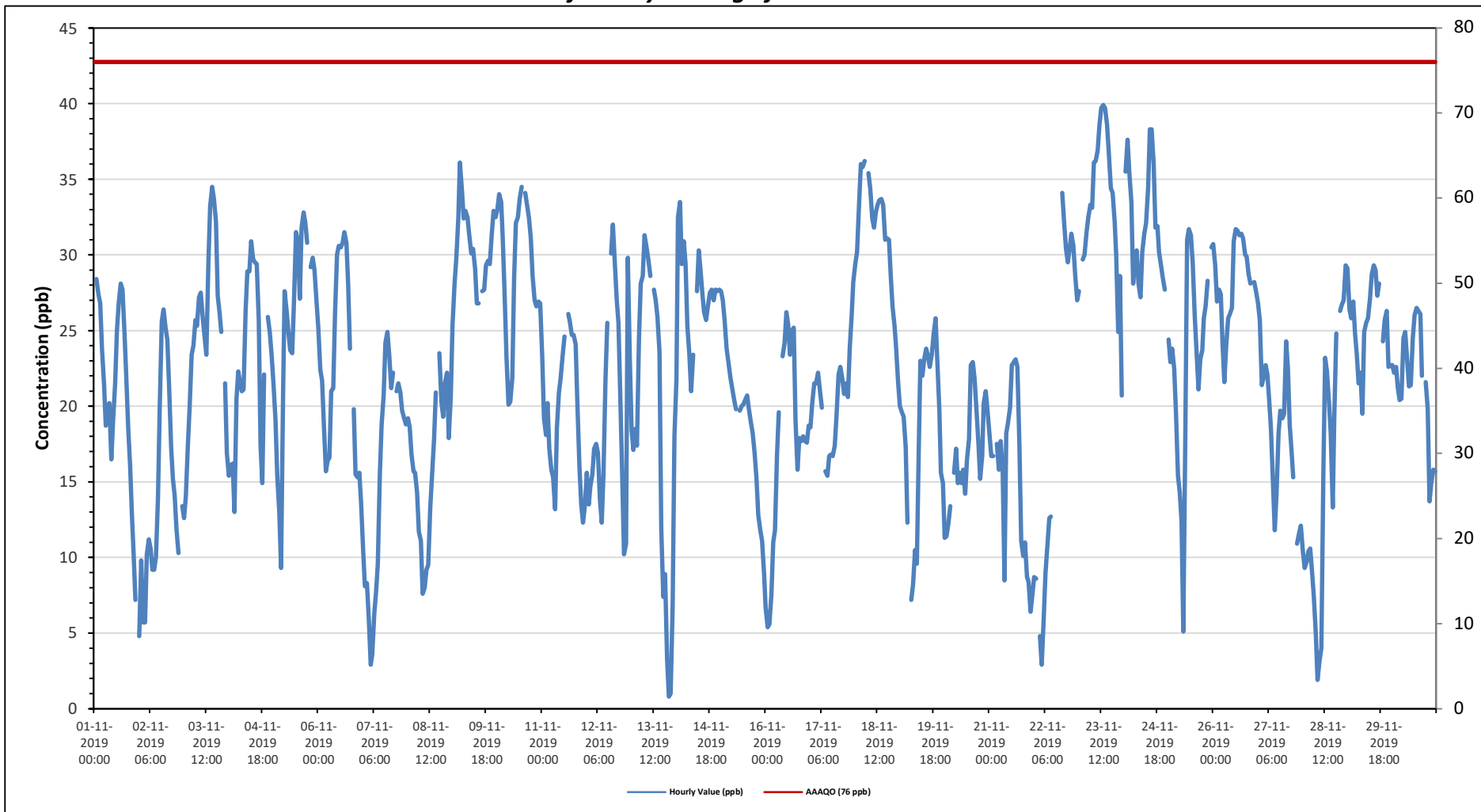
Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	10.09	0	0	0	0	10.09
NE	0.59	0	0	0	0	0.59
E	3.86	0	0	0	0	3.86
SE	18.55	0	0	0	0	18.55
S	4.45	0	0	0	0	4.45
SW	19.14	0	0	0	0	19.14
W	28.78	0	0	0	0	28.78
NW	14.54	0	0	0	0	14.54
Summary	100	0	0	0	0	100



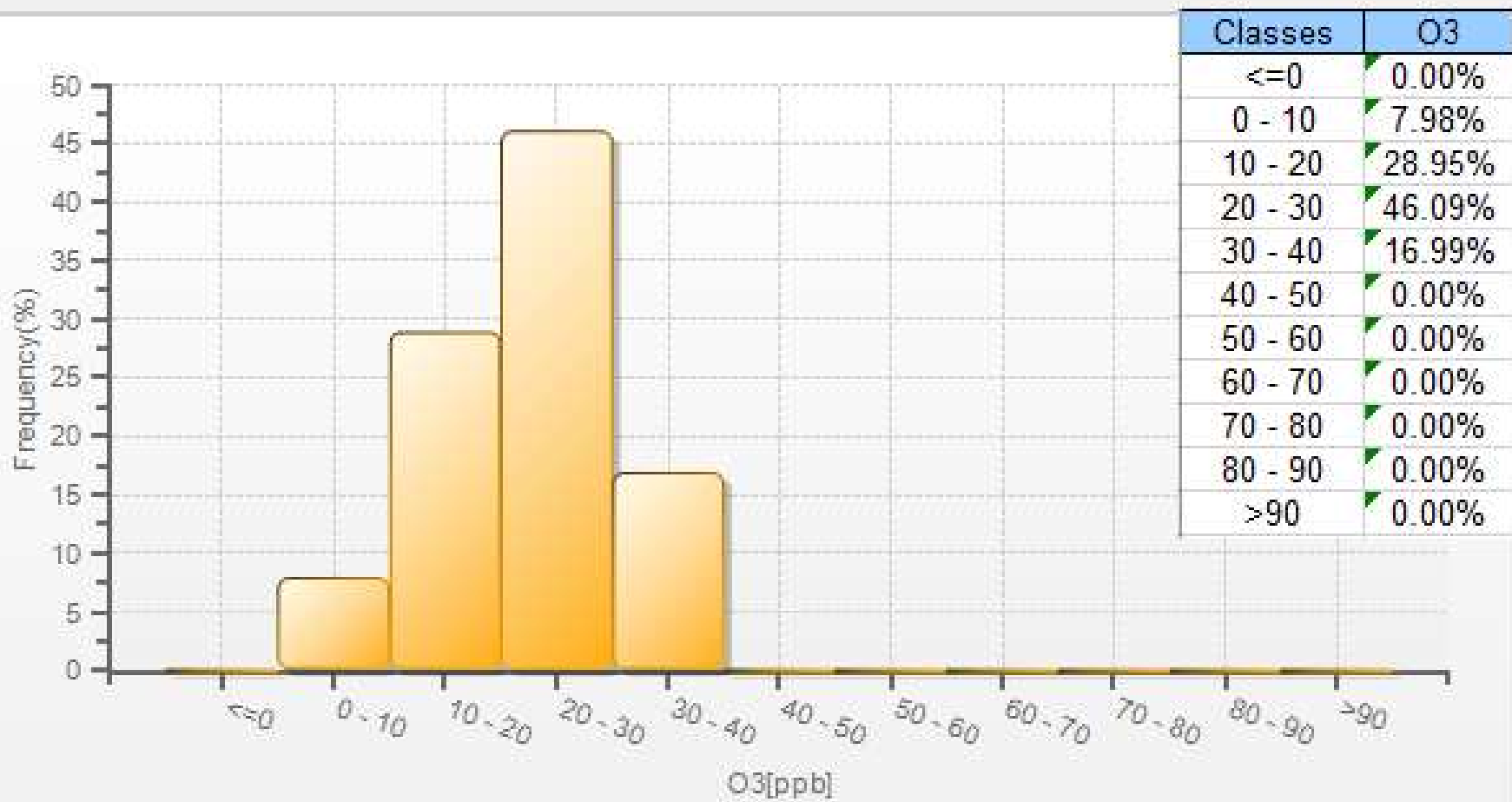
LICA-201911-Revision 1

% Icon Classes (ppb)	100	0-30	0	30-90	50-82	0	82-159	0	>159.0
----------------------	-----	------	---	-------	-------	---	--------	---	--------

Timeseries Chart of Hourly Average for O3 - Cold Lake South Station

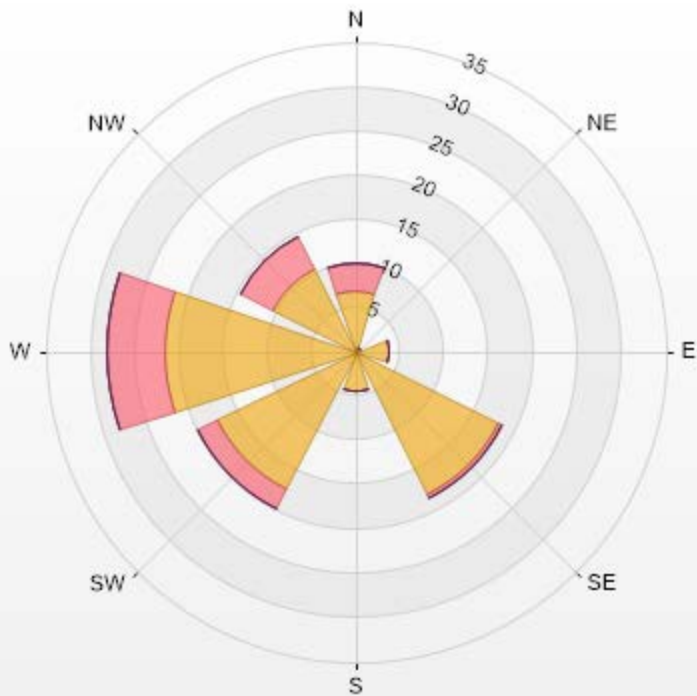


O3[ppb] Histogram: Cold Lake South Monthly: 11-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-O3[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.89% Calm Avg: 0.00 [ppb]

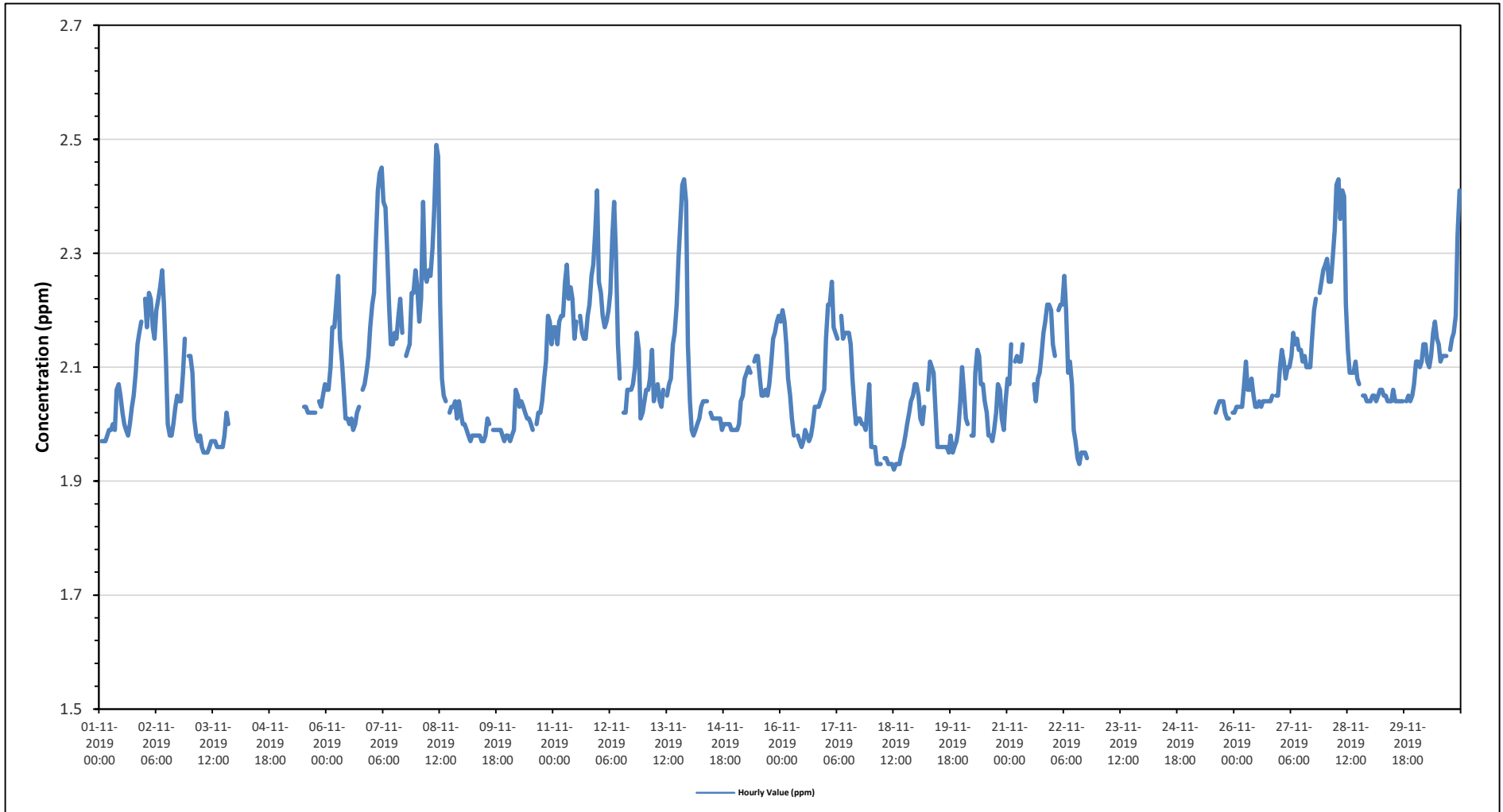
Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	6.8	3.25	0	0	0	10.05
NE	0.3	0.3	0	0	0	0.6
E	3.85	0	0	0	0	3.85
SE	18.05	0.44	0	0	0	18.49
S	4.44	0	0	0	0	4.44
SW	17.46	2.51	0	0	0	19.97
W	21.6	6.51	0	0	0	28.11
NW	10.5	3.99	0	0	0	14.49
Summary	83	17	0	0	0	100



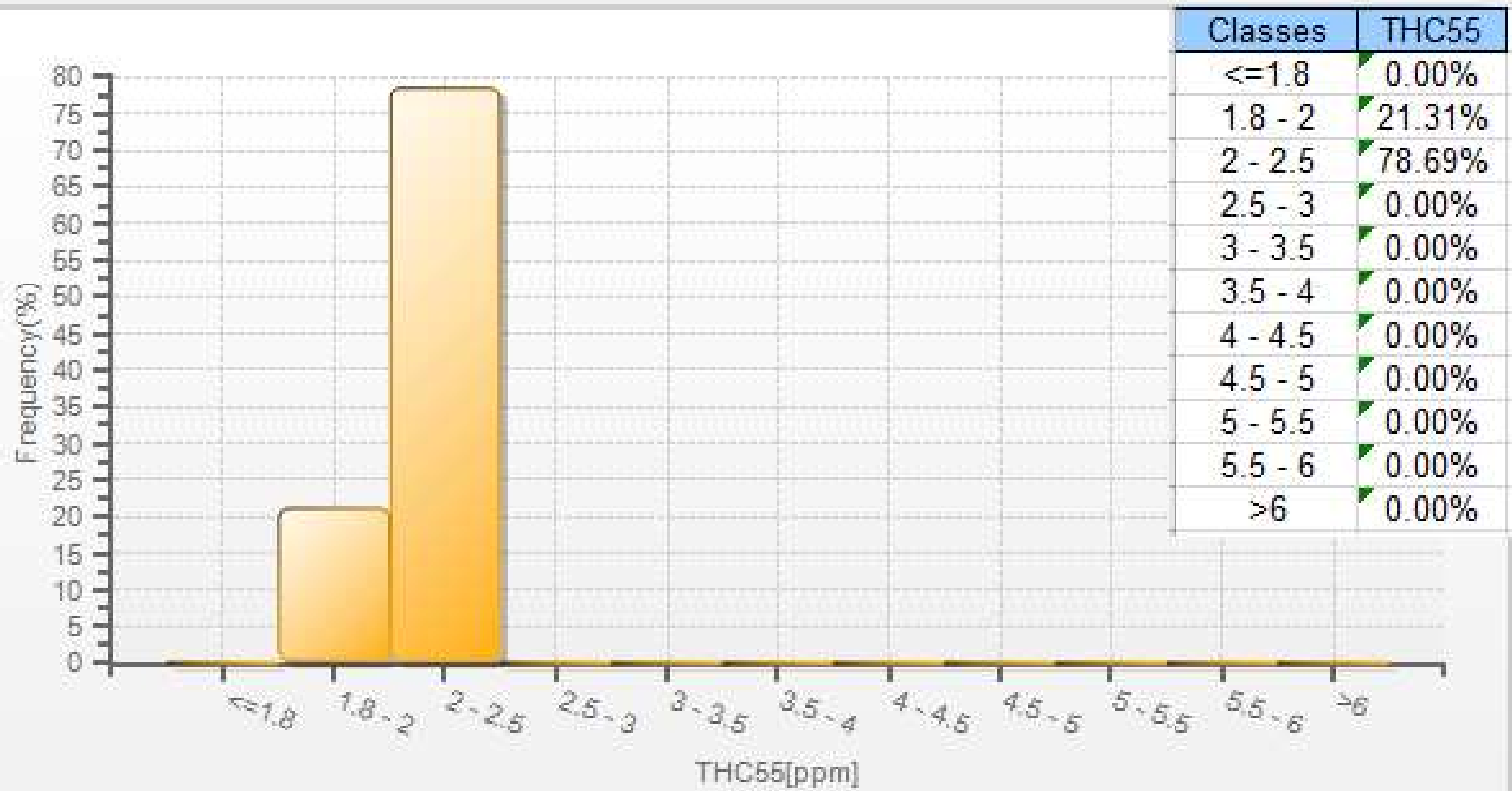
LICA-201911-Revision 1

%	Icon	Classes (ppb)	83	0-30	17	30-90	50-82	0	82-159	0	>159.0

Timeseries Chart of Hourly Average for THC - Cold Lake South Station

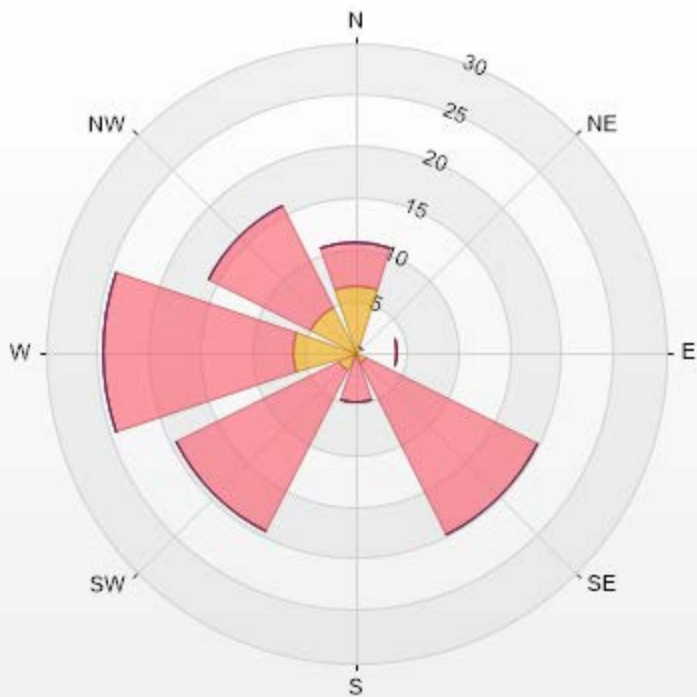


THC55[ppm] Histogram: Cold Lake South Monthly: 11-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-THC55[ppm] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 80.69% Calm Avg: 0.00 [ppm]

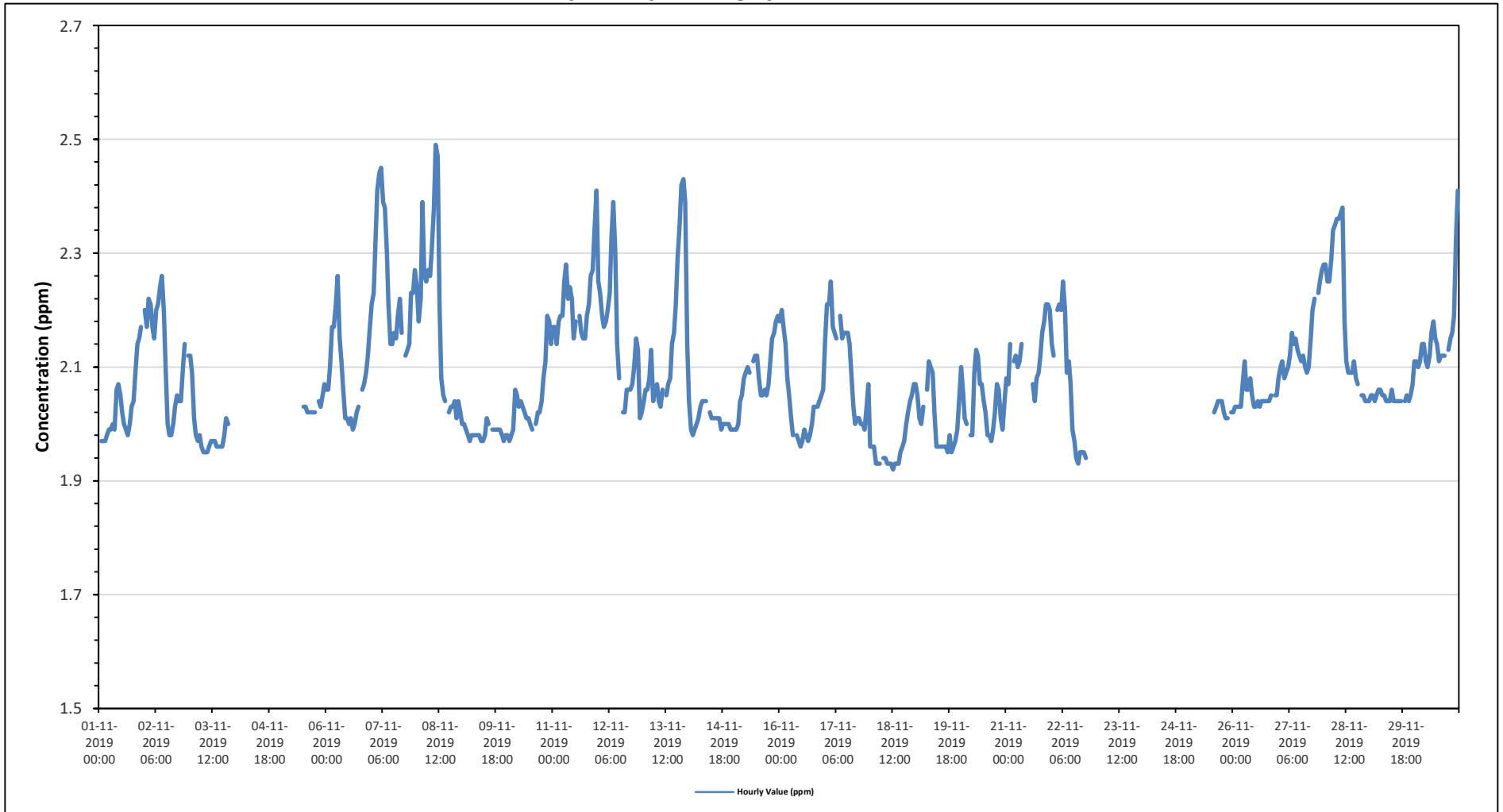
Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	6.54	4.13	0	0	0	10.67
NE	0.17	0.52	0	0	0	0.69
E	0.17	3.96	0	0	0	4.13
SE	1.2	18.59	0	0	0	19.79
S	0.34	4.48	0	0	0	4.82
SW	1.89	17.56	0	0	0	19.45
W	6.02	18.42	0	0	0	24.44
NW	4.99	11.02	0	0	0	16.01
Summary	21.32	78.68	0	0	0	100



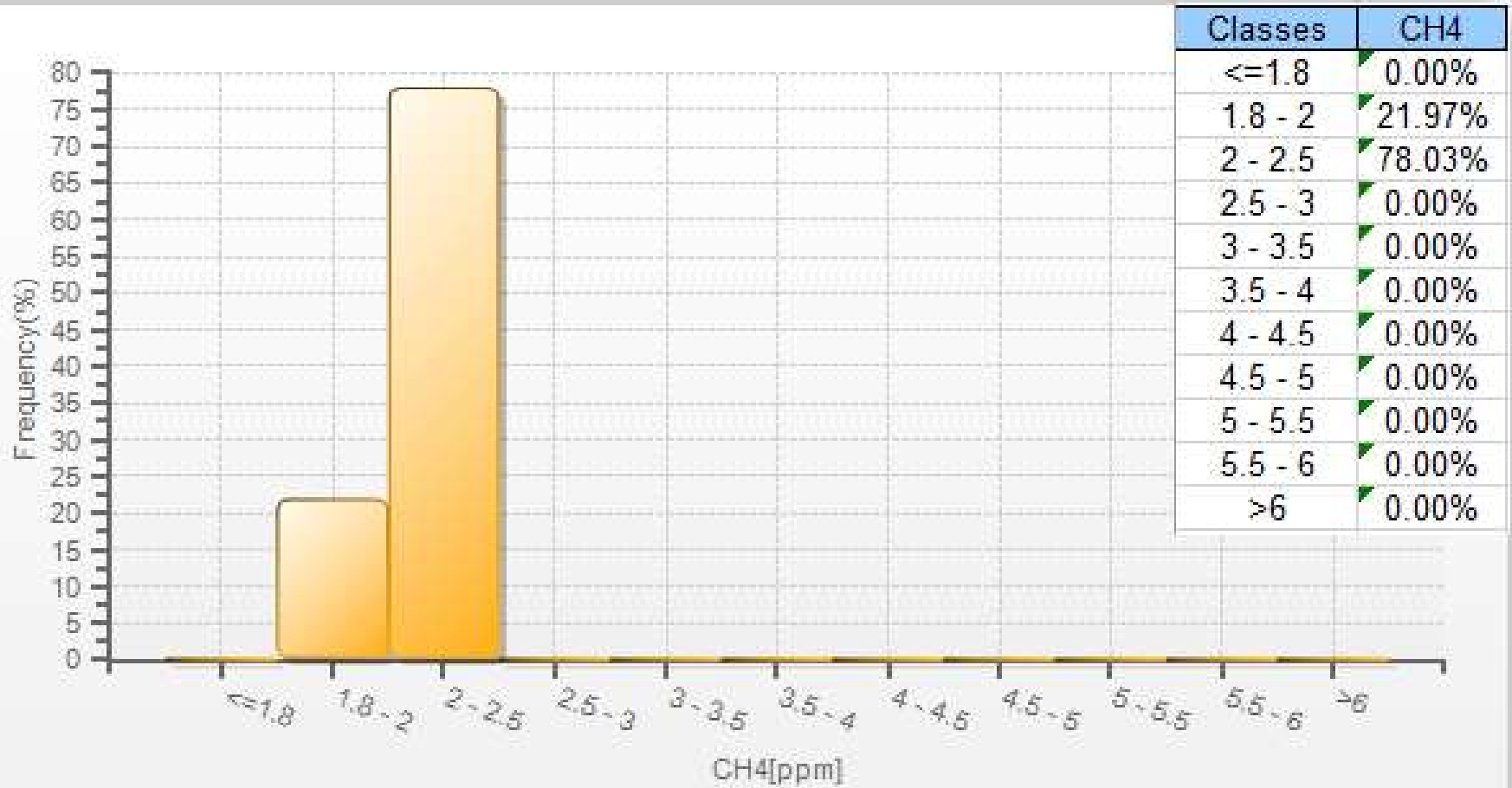
LICA-201911-Revision 1

% Icon Classes (ppm)	21	75	0	0
0-2	0-2	2-5	5-10	10-40
>40.0	>40.0	>40.0	>40.0	>40.0

Timeseries Chart of Hourly Average for CH4 - Cold Lake South Station

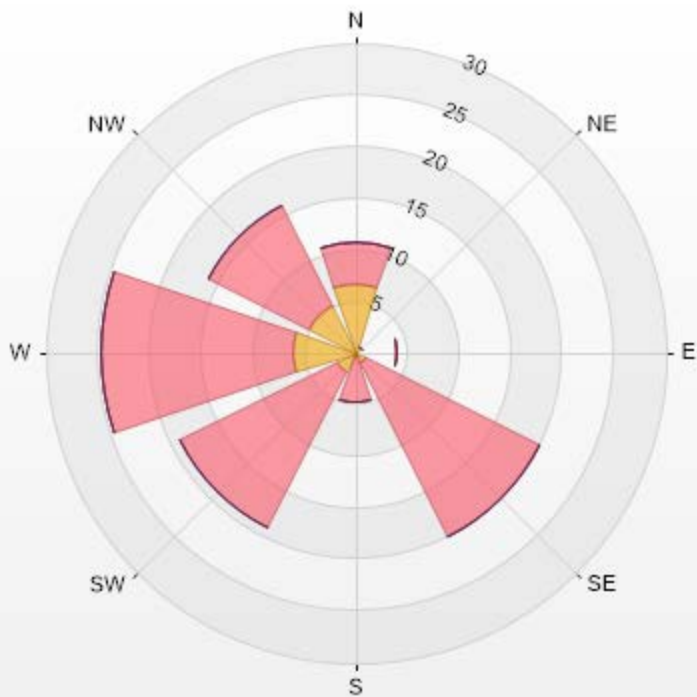


CH4[ppm] Histogram: Cold Lake South Monthly: 11-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-CH4[ppm] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 80.14% Calm Avg: 0.00 [ppm]

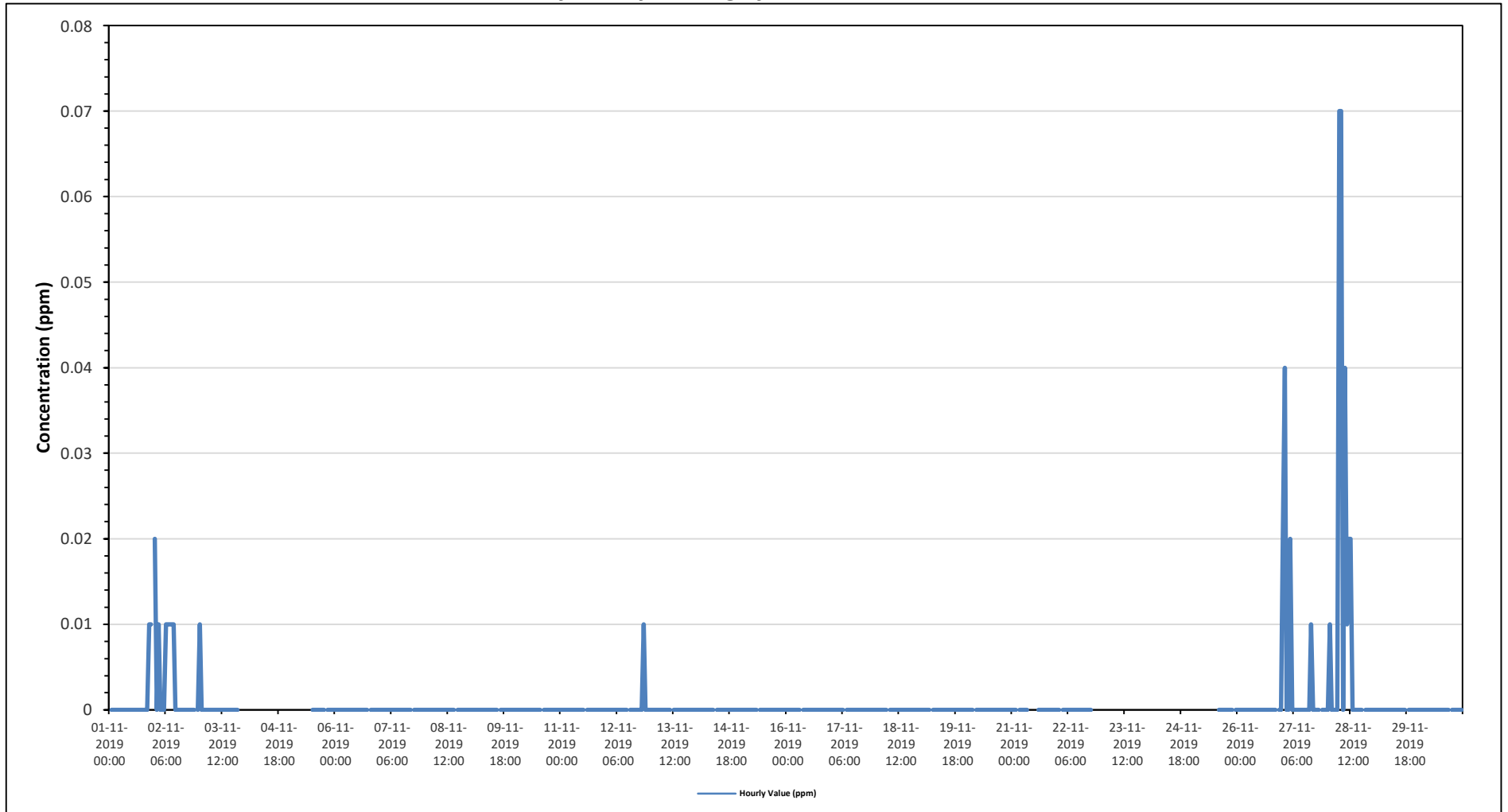
Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	6.59	4.16	0	0	0	10.75
NE	0.17	0.52	0	0	0	0.69
E	0.17	3.99	0	0	0	4.16
SE	1.21	18.72	0	0	0	19.93
S	0.35	4.51	0	0	0	4.86
SW	2.08	16.98	0	0	0	19.06
W	6.07	18.54	0	0	0	24.61
NW	5.2	10.75	0	0	0	15.95
Summary	21.84	78.17	0	0	0	100



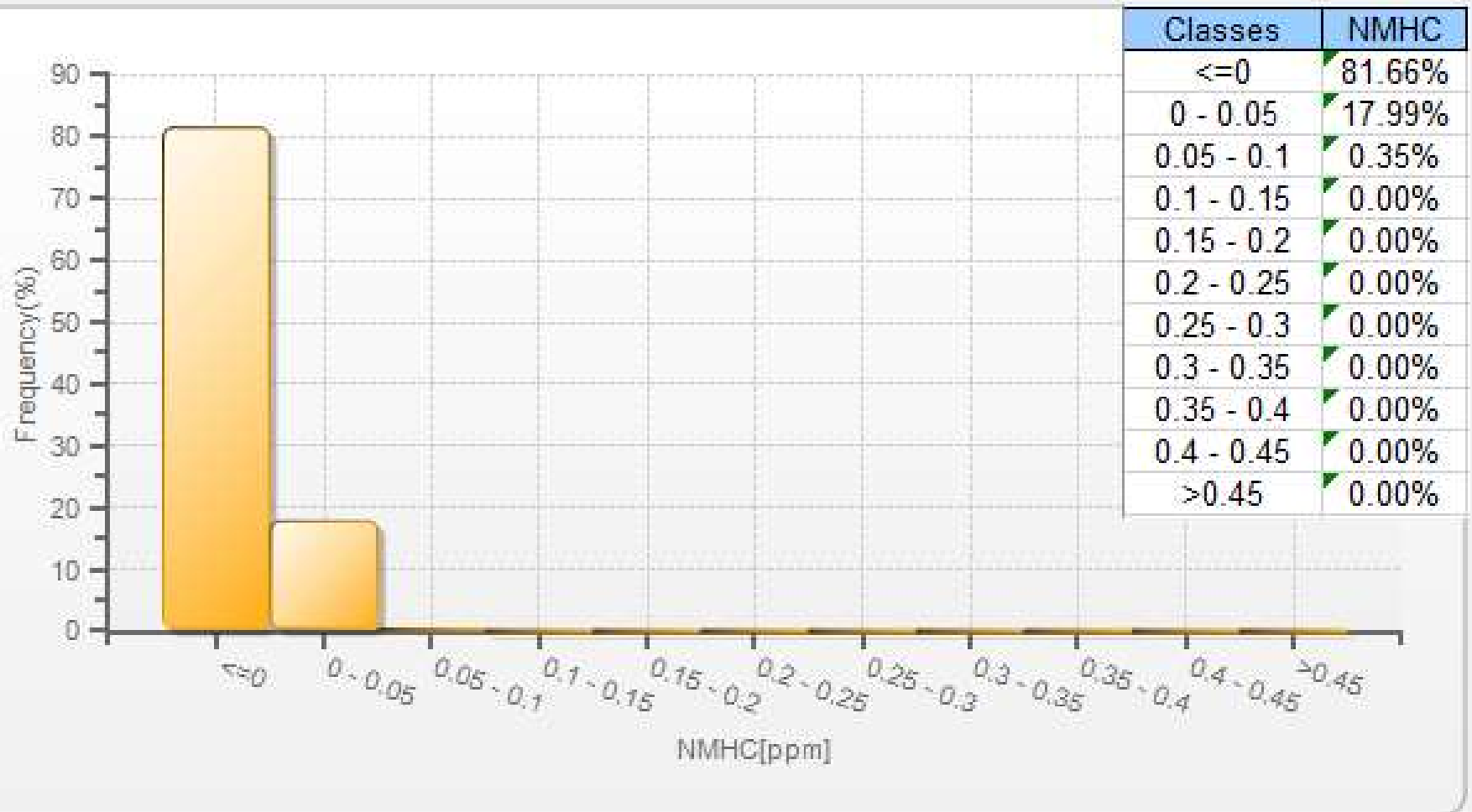
LICA-201911-Revision 1

% Icon Classes (ppm)	22	78	0	0
0-2	22	78	0	0
2-5				
5-10				
10-20				
>20.0				

Timeseries Chart of Hourly Average for NMHC - Cold Lake South Station

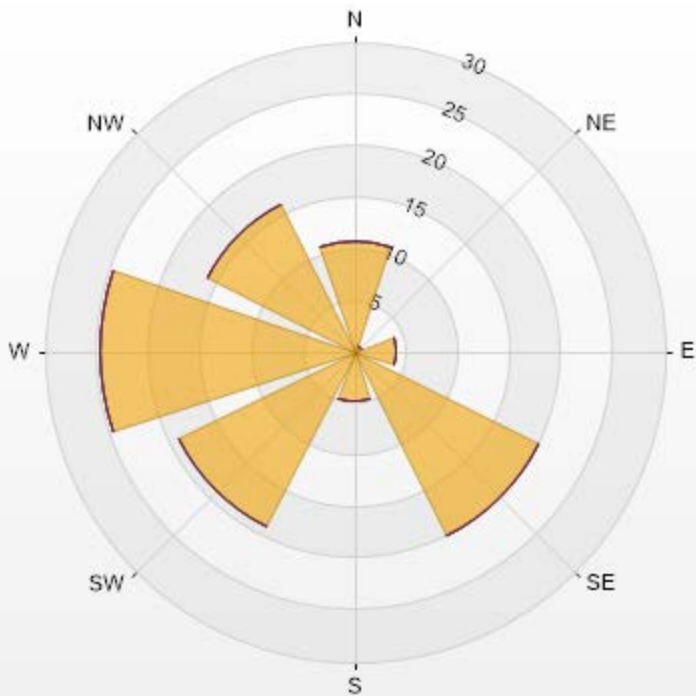


NMHC[ppm] Histogram: Cold Lake South Monthly: 11-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-NMHC[ppm] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 80.14% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-0.9	0.9-2	>2.0	Total
N	10.75	0	0	0	0	10.75
NE	0.69	0	0	0	0	0.69
E	4.16	0	0	0	0	4.16
SE	19.93	0	0	0	0	19.93
S	4.85	0	0	0	0	4.85
SW	19.06	0	0	0	0	19.06
W	24.61	0	0	0	0	24.61
NW	15.94	0	0	0	0	15.94
Summary	100	0	0	0	0	100



LICA-201911-Revision 1



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Averages

PARTICULATE MATTER 2.5 (PM_{2.5}) in µg/m³

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 80 µg/m³, 24-Hour 29 µg/m³
 Number of 1-Hour Exceedences: 0 Number of 24-Hour Exceedences: 0

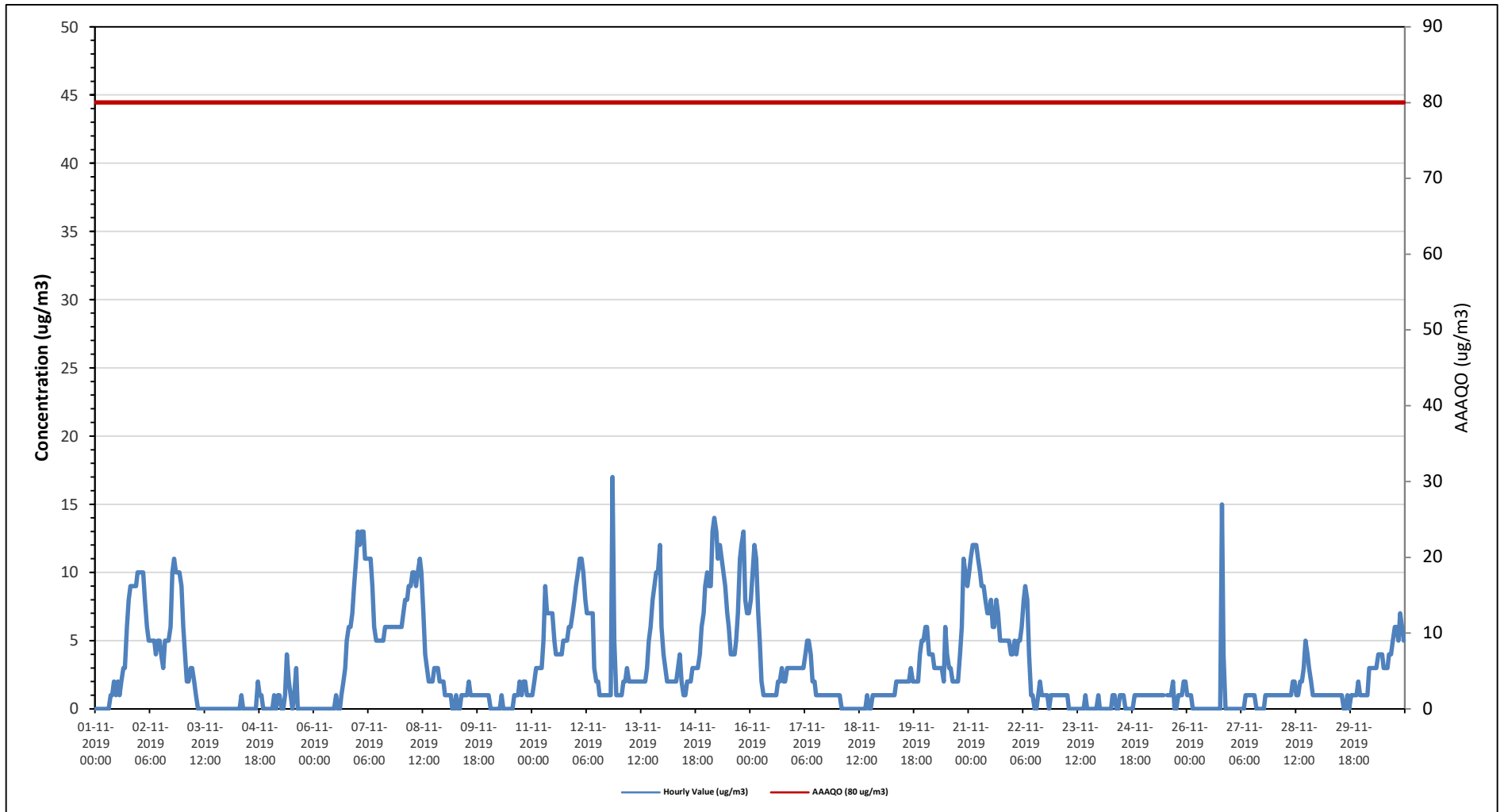
Maximum Hourly Value: 17 µg/m ³ on November 12 at hour 20	Hours in Service: 720
Maximum Daily Value: 9 µg/m ³ on November 15	Hours of Data: 719
Minimum Hourly Value: 0 µg/m ³ on November 1 at hour 0	Hours of Missing Data: 0
Minimum Daily Value: 0 µg/m ³ on November 4	Hours of Calibration: 1
Monthly Average: 2.9 µg/m ³	Operational Uptime: 100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	0	0	0	0	0	0	0	0	1	1	2	1	2	3	3	6	8	9	9	9	9	10	13	0	10	3.2	
Nov 2	10	10	10	8	6	5	5	5	5	4	5	5	4	3	5	5	5	6	10	11	10	10	10	9	3	11	6.9
Nov 3	6	4	2	2	3	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1.0
Nov 4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0	0	2	0.2
Nov 5	0	0	1	0	1	1	0	0	1	4	2	1	0	1	3	0	0	0	0	0	0	0	0	0	0	4	0.6
Nov 6	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	3	5	6	6	7	9	11	0	11	2.1
Nov 7	13	12	13	13	11	11	11	11	9	6	5	5	5	5	6	6	6	6	6	6	6	6	6	6	5	13	7.9
Nov 8	6	7	8	8	9	9	10	10	9	10	11	10	7	4	3	2	2	2	3	3	3	2	2	2	2	11	5.9
Nov 9	1	1	1	1	0	0	1	0	0	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	0	2	0.9
Nov 10	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	2	1	2	2	1	1	1	0	2	0.6
Nov 11	1	2	3	3	3	3	5	9	7	7	7	5	4	4	4	4	5	5	5	6	6	7	8	1	9	5.0	
Nov 12	9	10	11	11	10	8	7	7	7	7	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	17	5.2
Nov 13	1	1	2	2	3	2	2	2	2	2	2	2	2	2	3	5	6	8	9	10	10	12	6	1	12	4.1	
Nov 14	4	3	2	2	2	2	2	2	3	4	2	1	1	2	2	3	3	3	3	3	4	6	7	9	1	9	3.1
Nov 15	10	9	9	13	14	13	11	12	11	10	9	7	6	4	4	5	7	11	12	13	8	7	7	4	14	9.0	
Nov 16	8	10	12	11	7	5	2	1	1	1	1	1	1	1	2	2	3	2	2	3	3	3	3	1	12	3.6	
Nov 17	3	3	3	3	3	3	4	5	5	4	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	5	2.2
Nov 18	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1	1	0	1	0.3
Nov 19	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	2	2	2	2	2	2	4	5	5	1	5	2.0
Nov 20	6	6	4	4	4	3	3	3	3	3	2	6	4	3	3	2	2	2	2	4	6	11	10	9	2	11	4.4
Nov 21	10	11	12	12	12	11	10	9	9	8	7	7	8	6	6	8	7	5	5	5	5	5	5	4	4	12	7.8
Nov 22	4	5	4	5	5	6	8	9	8	4	1	1	0	0	1	2	1	1	1	1	0	1	1	1	0	9	2.9
Nov 23	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0.4
Nov 24	0	0	0	0	0	0	0	1	1	0	0	1	1	1	0	0	0	0	0	1	1	1	1	1	0	1	0.4
Nov 25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	0	0	1	1	1	2	2	0	2	1.0	
Nov 26	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	4	0	0	0	0	15	0.9
Nov 27	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	0	1	0.5
Nov 28	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	2	3	5	4	3	2	1	1	1	1	5	1.7
Nov 29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	1	1	2	1	0	2	0.9	
Nov 30	1	1	1	1	3	3	3	3	3	4	4	3	3	3	4	4	5	6	6	5	7	6	5	1	7	3.7	
Diurnal Maximum	13	12	13	13	14	13	11	12	11	10	11	10	8	6	6	8	7	7	11	15	17	11	12	11			
Diurnal Average	3.4	3.4	3.5	3.5	3.4	3.1	3.0	3.2	3.1	2.9	2.4	2.4	2.0	1.7	1.8	1.9	2.2	2.5	2.9	3.8	4.0	3.6	3.7	3.6			

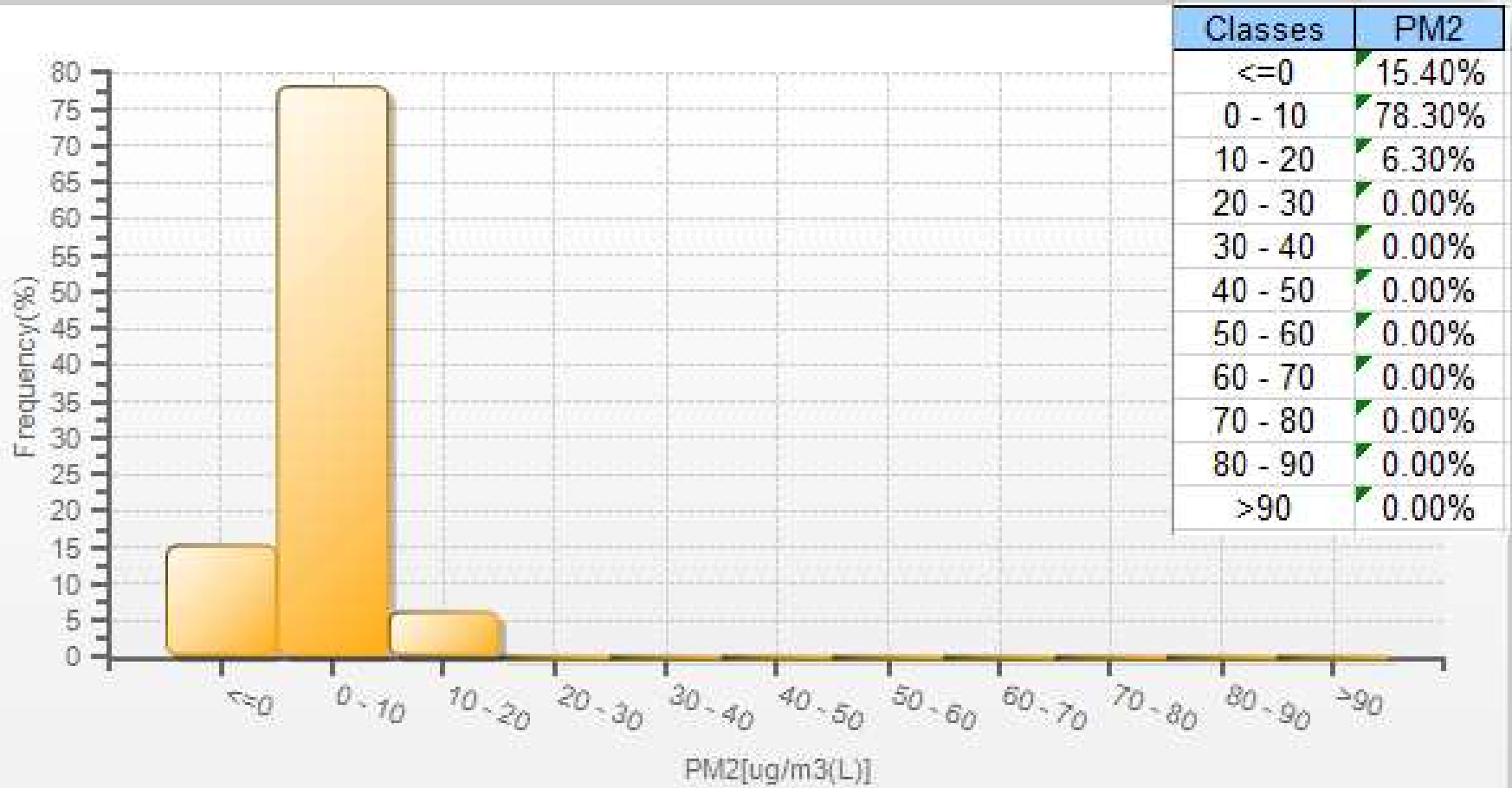
C Calibration	S Daily Zero/Span	Q Quality Assurance	C1 Repeat Calibration	S1 Repeat Daily Zero/Span
G Out for Repair	K Collection Error	N Not in Service	O Operator Error	P Power Failure
R Recovery	X Machine Malfunction	Y Maintenance	T Exceeds Temperature Limits	N Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for PM2.5 - Cold Lake South Station

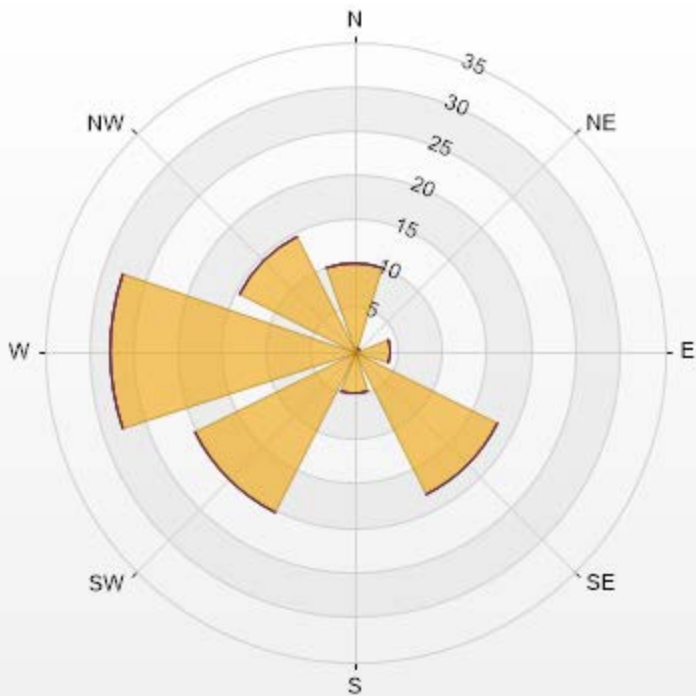


PM2[ug/m3(L)] Histogram: Cold Lake South Monthly: 11-2019 1 Hr.



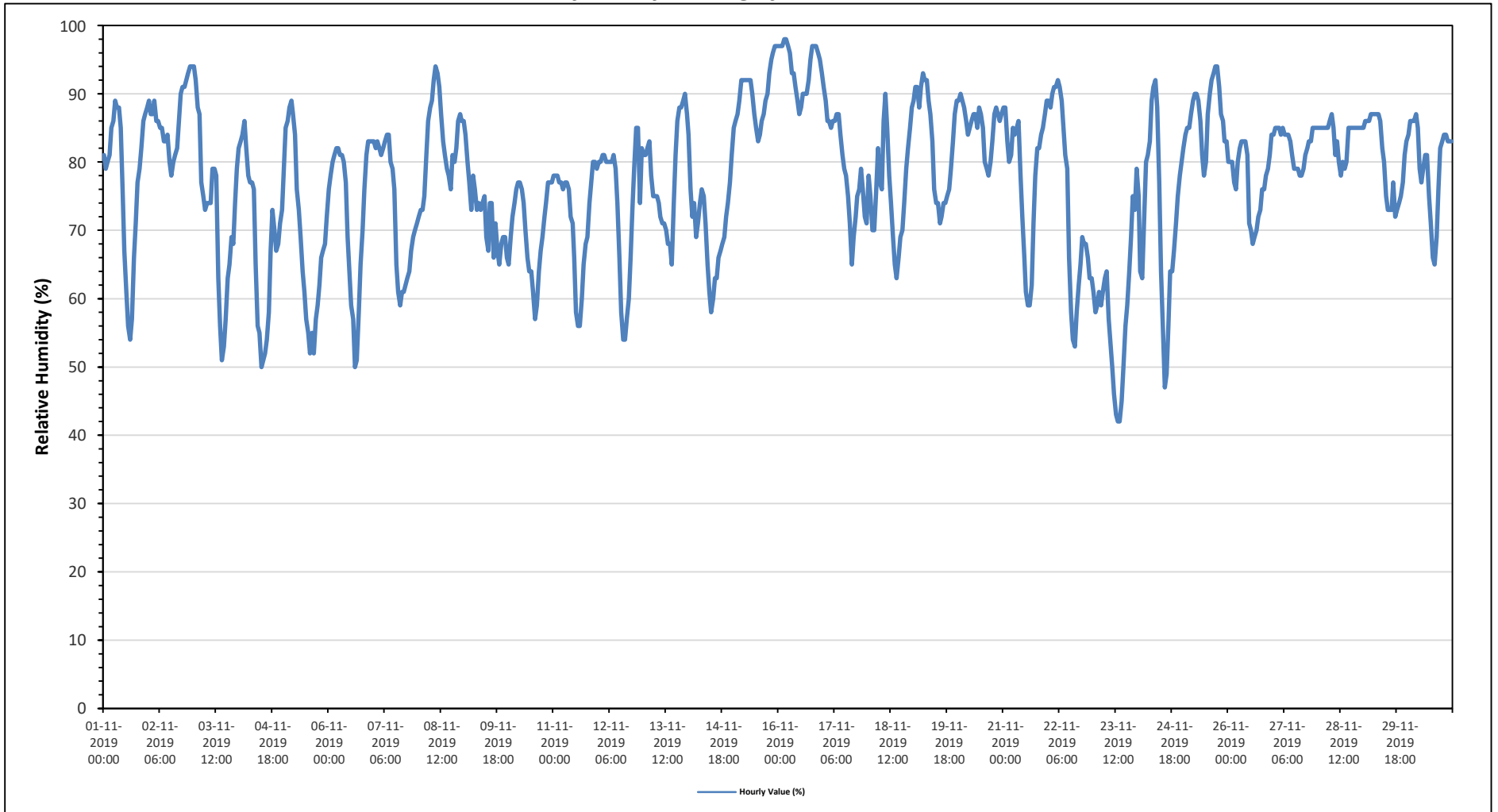
Wind: Cold Lake South Poll.: Cold Lake South-PM2[ug/m3(L)] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.58% Calm Avg: 0.00 [ug/m3(L)]

Direction	0-50	50-80	80-120	120-240	>240.0	Total
N	9.99	0	0	0	0	9.99
NE	0.59	0	0	0	0	0.59
E	4.11	0	0	0	0	4.11
SE	18.06	0	0	0	0	18.06
S	4.85	0	0	0	0	4.85
SW	20.26	0	0	0	0	20.26
W	27.61	0	0	0	0	27.61
NW	14.54	0	0	0	0	14.54
Summary	100	0	0	0	0	100

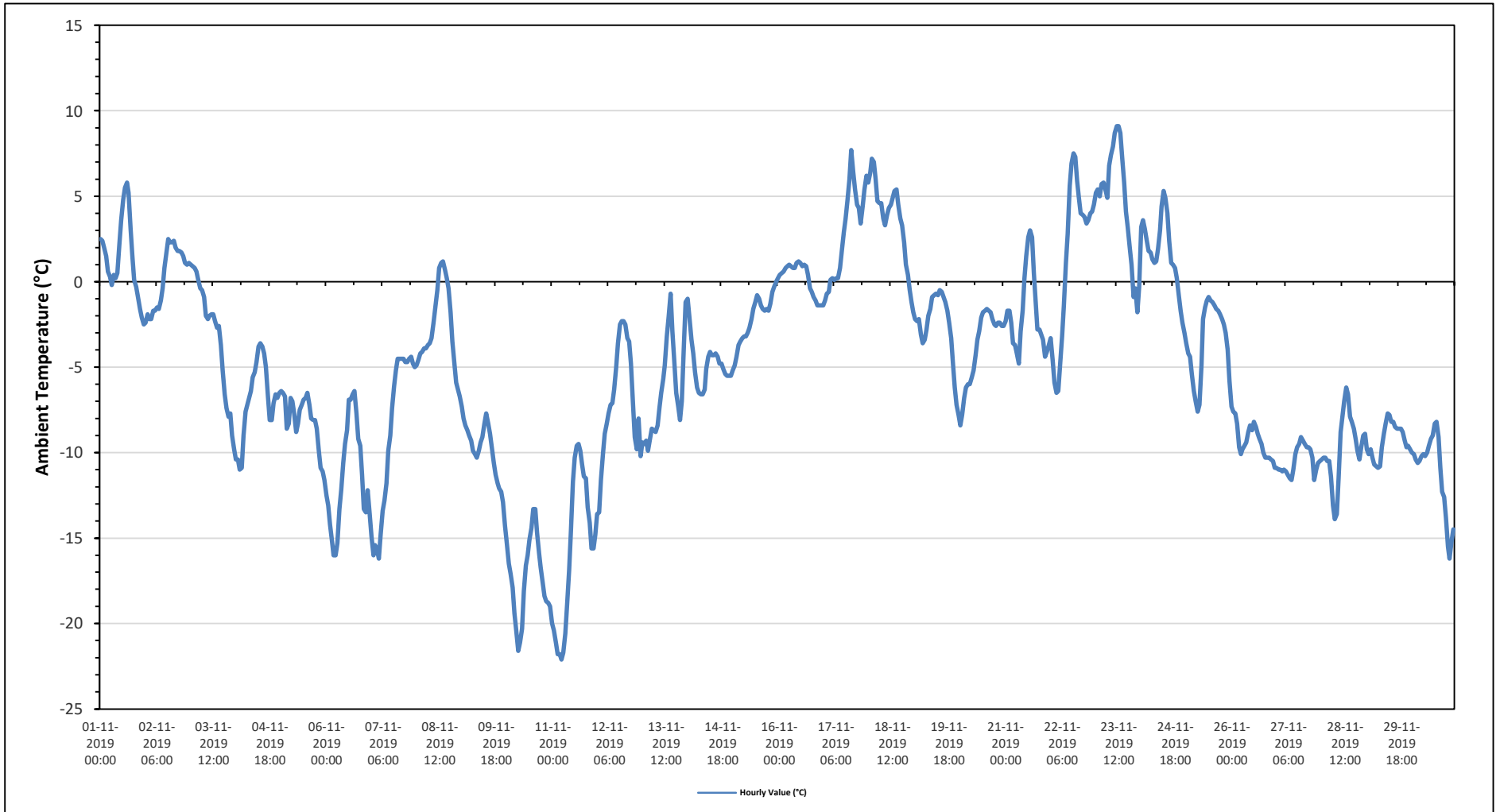


LICA-201911-Revision 1

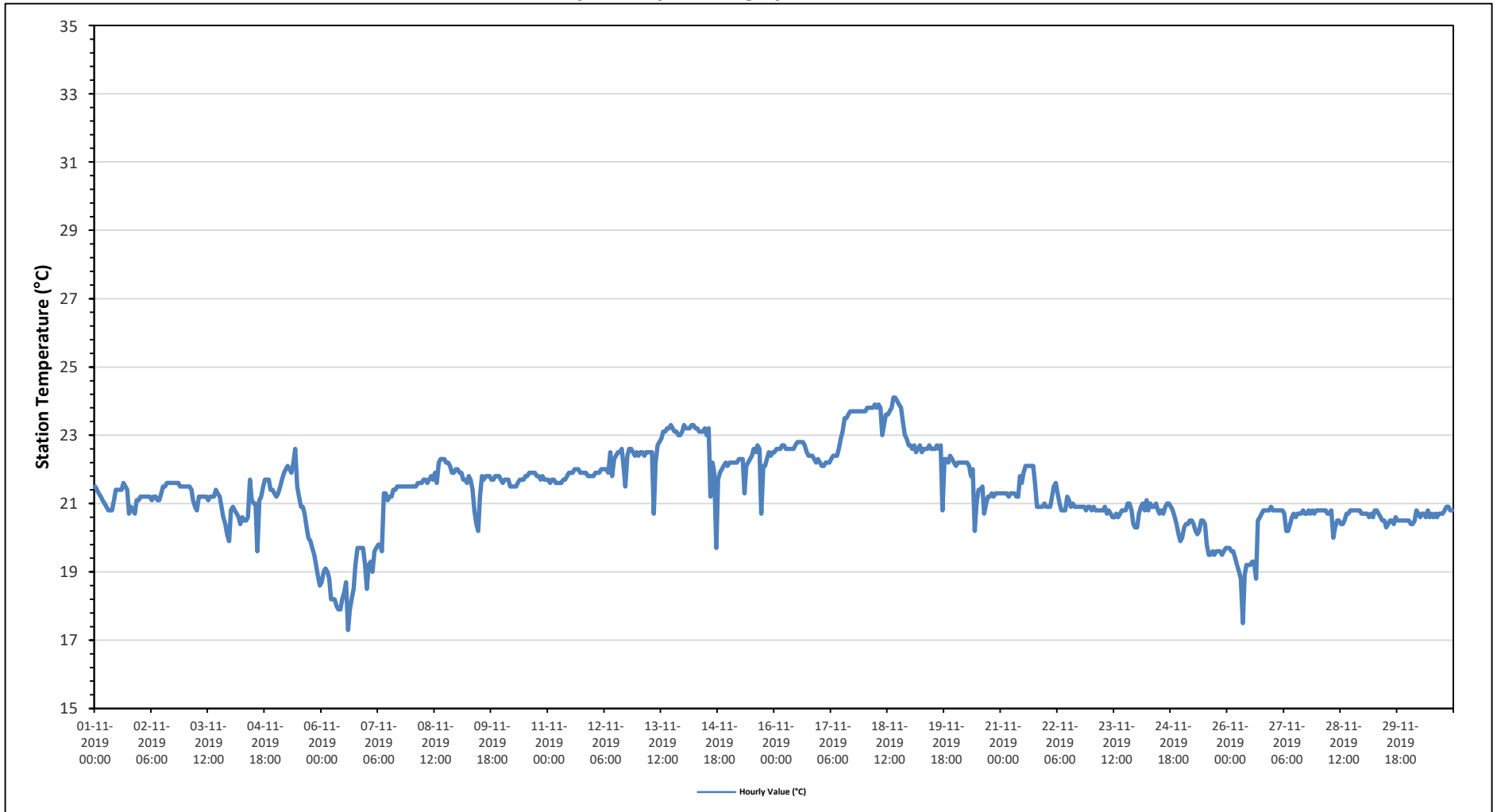
Timeseries Chart of Hourly Average for RH - Cold Lake South Station



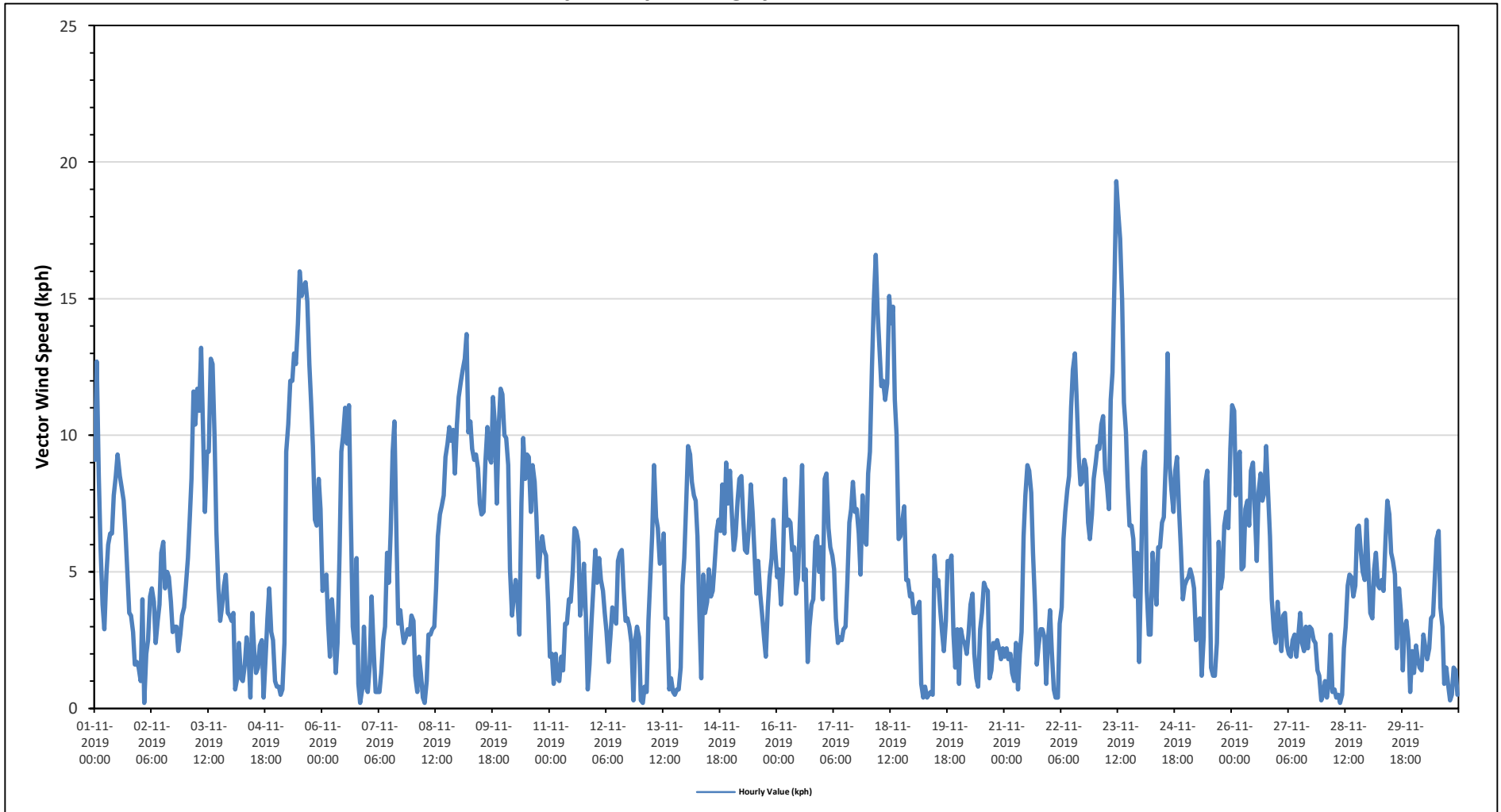
Timeseries Chart of Hourly Average for AT - Cold Lake South Station



Timeseries Chart of Hourly Average for ST - Cold Lake South Station



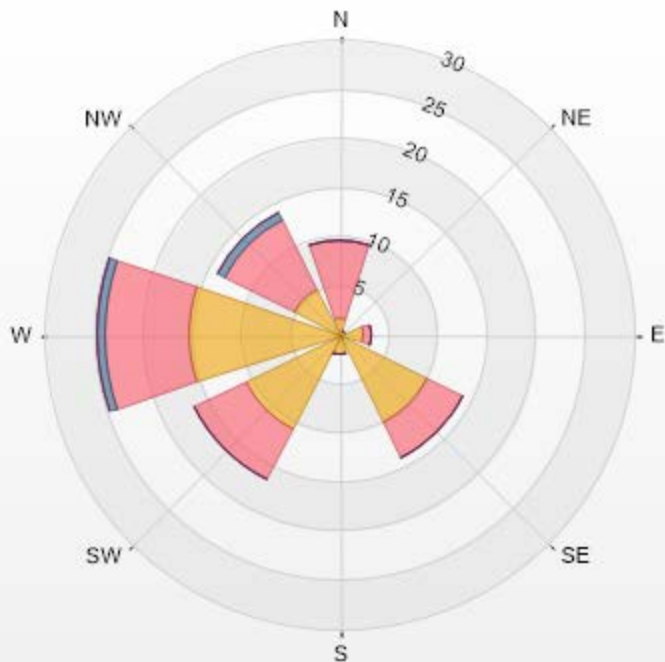
Timeseries Chart of Hourly Average for VWS - Cold Lake South Station



Wind: Cold Lake South Poll.: Cold Lake South-WDS[kph] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 15.44% Valid Data: 99.86% Calm Avg: 0.93 [kph]

Direction	0-6	6-15	15-29	29-39	>39.0	Total
N	1.81	7.79	0	0	0	9.6
NE	0.14	0.42	0	0	0	0.56
E	2.5	0.7	0	0	0	3.2
SE	9.87	4.17	0	0	0	14.04
S	1.95	0.14	0	0	0	2.09
SW	10.71	5.84	0	0	0	16.55
W	15.3	8.62	0.7	0	0	24.62
NW	5.15	8.07	0.7	0	0	13.92
Summary	47.43	35.75	1.4	0	0	84.58

Cold Lake South Poll.: Cold Lake South-WDS[kph] 01-11-2019 00:00 - 30-11-2019 23:00 Calm: 15.44% Calm
 Poll Avg: 0.93[kph]



LICA-201911-Revision 1

% Icon Classes (kph)	47	0-6	36	15-29	0	29-39	0	>39.0
----------------------	----	-----	----	-------	---	-------	---	-------



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Averages

WIND DIRECTION (VWD) in sector

Monthly Average:	281 (W) degree	Hours in Service:	720
		Hours of Data:	720
		Hours of Missing Data:	0
		Hours of Calibration:	0
		Operational Uptime:	100.0

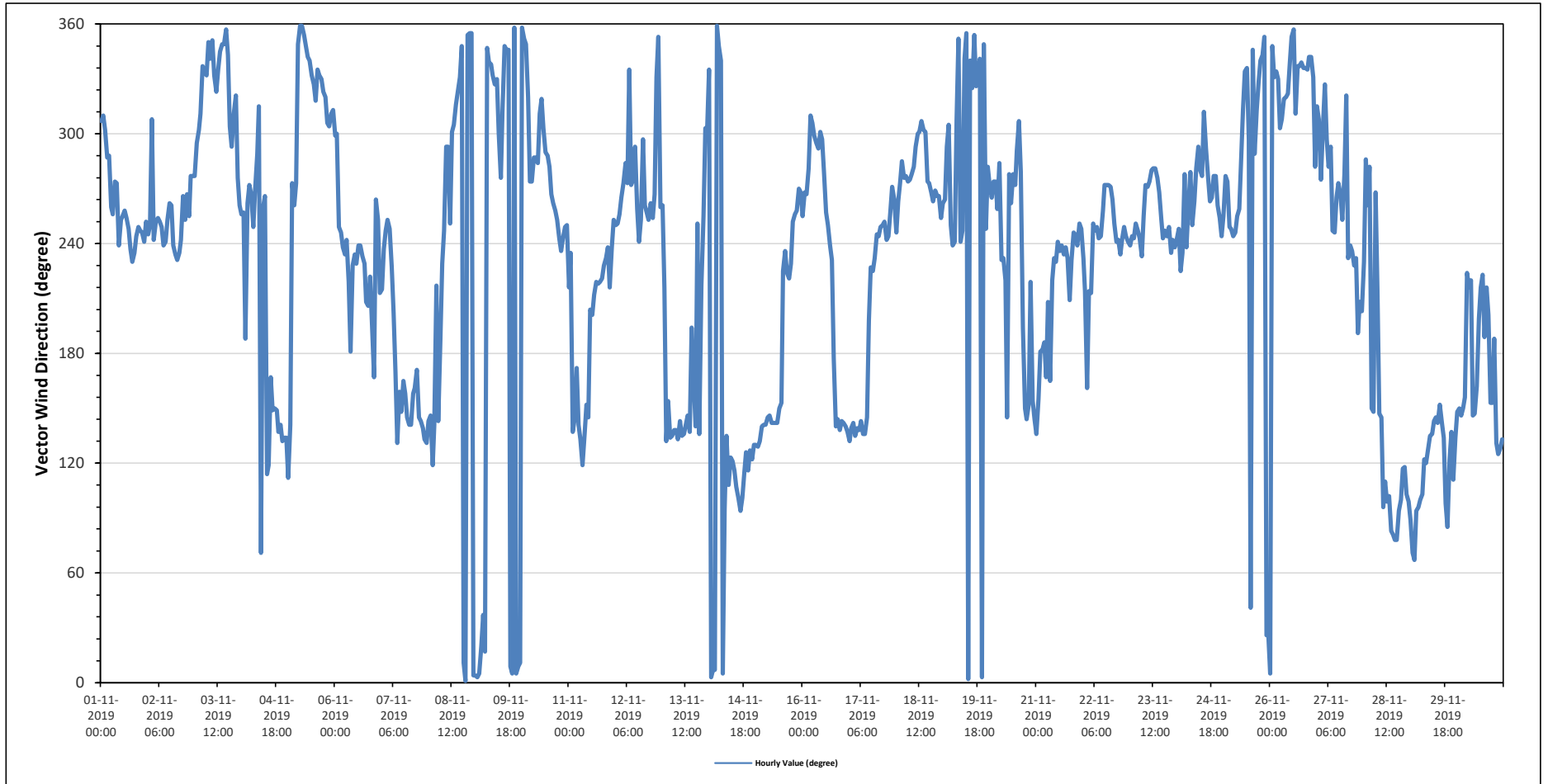
Day	Hourly Period Starting at (MST)																							Daily Average			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Degree	Quadrant	
Nov 1	NW	NW	WNW	WNW	WNW	WSW	WSW	W	W	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	265	W	
Nov 2	WSW	WSW	NW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	WSW	SW	SW	SW	WSW	W	WSW	W	WSW	W	W	251	WSW	
Nov 3	W	WNW	WNW	NW	NNW	NNW	NNW	N	NNW	N	NNW	NW	NNW	NNW	NNW	NNW	N	NNW	WNW	WNW	NW	NW	W	W	331	NNW	
Nov 4	WSW	WSW	S	W	W	W	WSW	W	WNW	NW	ENE	WSW	W	ESE	ESE	SSE	SSE	SSE	SSE	SE	SE	SE	SE	SE	202	SSW	
Nov 5	ESE	SE	W	W	W	NNW	N	N	N	NNW	NNW	NNW	NNW	NW	NW	NNW	NNW	NNW	NW	NW	NW	WNW	NW	NW	333	NNW	
Nov 6	WNW	WNW	WSW	WSW	SW	SW	WSW	SW	S	SW	SW	SW	WSW	WSW	SW	SW	SSW	SSW	SW	S	SSE	W	WSW	SSW	237	SW	
Nov 7	SSW	SW	WSW	WSW	WSW	SW	SSW	SE	SSE	SE	SSE	SSE	SE	SE	SE	SE	SSE	SSE	S	SE	SE	SE	SE	SE	156	SSE	
Nov 8	SE	SE	ESE	SE	SW	SE	S	SW	WSW	WNW	WNW	WSW	WNW	WNW	NW	NW	NNW	NNW	NNE	N	N	N	N	N	340	NNW	
Nov 9	N	N	N	NNE	NE	NNE	NNW	NNW	NNW	NNW	NW	NNW	WNW	W	NW	NNW	NNW	N	N	N	N	N	NNE	354	N		
Nov 10	N	N	NNW	NW	W	W	WNW	WNW	WNW	NW	NW	WNW	WNW	WNW	W	W	W	WSW	WSW	SW	WSW	WSW	WSW	WSW	290	WNW	
Nov 11	SW	SW	SE	SE	S	SE	SE	ESE	SE	SSE	SE	SSW	SSW	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	WSW	205	SSW	
Nov 12	WSW	WSW	WSW	W	W	WNW	W	NNW	W	W	WNW	WSW	WSW	WSW	WNW	W	WSW	WSW	W	WSW	W	NNW	N	WSW	269	W	
Nov 13	W	SW	SE	SSE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SSW	SSE	SE	WSW	SE	SW	WSW	WNW	WNW	145	SE	
Nov 14	NNW	N	N	N	N	NNW	NNW	N	E	SE	ESE	ESE	ESE	ESE	ESE	E	E	E	ESE	SE	ESE	SE	ESE	SE	77	ENE	
Nov 15	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SSE	SSE	SW	SW	SW	SW	WSW	WSW	WSW	W	W	W	167	SSE	
Nov 16	WSW	W	W	W	NW	NW	WNW	WNW	WNW	WNW	WNW	W	WSW	WSW	WSW	SW	S	SE	SE	SE	SE	SE	SE	SE	256	WSW	
Nov 17	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SSW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	208	SSW	
Nov 18	WSW	W	W	WNW	W	W	W	W	W	W	WNW	WNW	WNW	NW	WNW	WNW	W	W	W	W	W	W	W	WSW	281	W	
Nov 19	W	W	WNW	WNW	WSW	WSW	WSW	NW	N	WSW	WSW	NNW	N	N	NNW	NW	N	NW	NNW	NNW	N	NNW	WSW	W	324	NW	
Nov 20	W	W	W	W	WSW	WNW	SW	SW	SW	SE	W	W	W	WNW	NW	W	SSW	SSE	SE	SSE	SW	SSE	SE	SE	248	WSW	
Nov 21	SE	SSE	S	S	S	SSE	SSW	SSE	SW	SW	SW	WSW	SW	WSW	SW	SW	SSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	228	SW	
Nov 22	SW	SSW	SSE	SSW	SSW	WSW	WSW	WSW	WSW	WSW	W	W	W	W	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	253	WSW	
Nov 23	WSW	WSW	WSW	WSW	WSW	WSW	SW	WSW	W	W	W	W	W	W	W	W	WSW	WSW	WSW	WSW	WSW	WSW	SW	WSW	260	WSW	
Nov 24	WSW	WSW	SW	SW	W	SW	W	W	WSW	W	W	WNW	W	W	WNW	W	W	W	W	W	W	W	WSW	WSW	269	W	
Nov 25	WSW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	W	NW	NNW	NNW	NNW	NE	NNW	WNW	NW	NNW	NNW	NNW	N	NNE	NNE	316	NW	
Nov 26	N	NNW	NNW	NNW	NNW	WNW	NW	NW	NW	NW	NNW	N	N	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	W	335	NNW	
Nov 27	NW	NW	W	WNW	NW	WNW	W	WNW	WSW	WSW	W	W	W	WSW	W	NW	SW	WSW	SW	SW	S	SSW	SSW	272	W		
Nov 28	SW	WNW	W	W	SSE	SE	W	SSW	SE	SE	E	ESE	E	E	E	E	ENE	ENE	E	E	ESE	ESE	E	E	101	E	
Nov 29	E	ENE	ENE	E	E	E	ESE	ESE	ESE	SE	SE	SE	SE	SE	SE	SE	SSE	SE	SE	E	E	ESE	SE	ESE	SE	119	ESE
Nov 30	SE	SSE	SE	SSE	SSE	SW	SW	SW	SE	SE	SE	SSE	SSW	SW	SW	S	SW	SSW	SSE	SSE	S	SE	SE	SE	185	S	

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for VWD - Cold Lake South Station





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hour Standard Deviations

STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

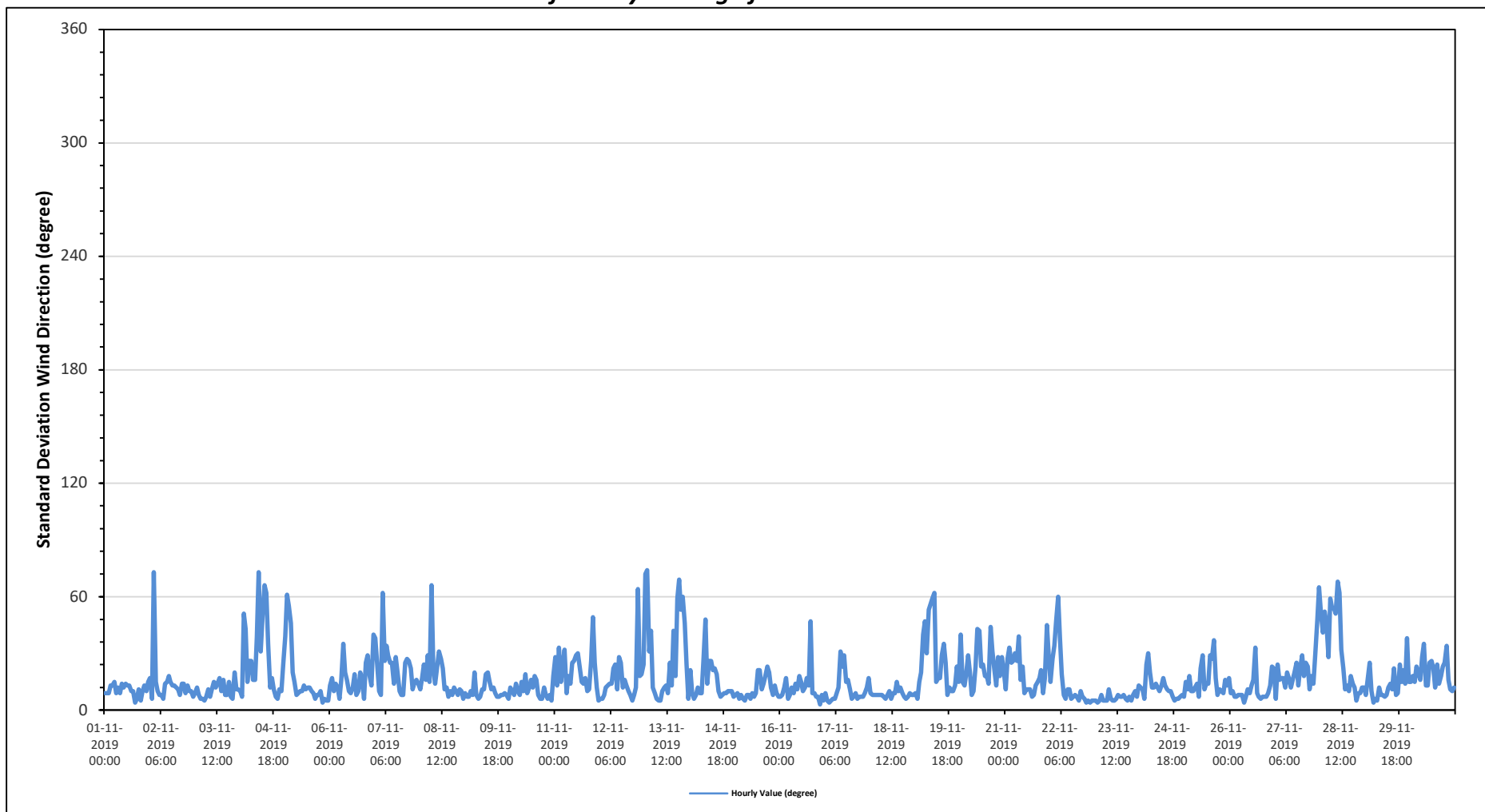
Maximum Hourly Value: 74 degree on November 13 at hour 1	Hours in Service: 720
	Hours of Data: 720
Minimum Hourly Value: 3 degree on November 16 at hour 21	Hours of Missing Data: 0
	Hours of Calibration: 0
	Operational Uptime: 100.0

Day	Hourly Period Starting at (MST)																							Daily	Daily	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Minimum	Maximum
Nov 1	9	9	9	13	13	15	9	12	9	14	12	14	13	13	10	10	4	6	11	5	10	13	10	15	4	15
Nov 2	17	6	73	15	10	8	8	6	14	15	18	15	13	13	12	11	8	14	14	9	13	10	10	7	6	73
Nov 3	9	12	8	6	6	5	7	11	7	11	15	12	14	17	10	16	8	8	15	7	6	20	11	11	5	20
Nov 4	10	7	51	43	15	26	26	16	16	39	73	31	49	66	62	35	12	17	11	7	6	11	10	24	6	73
Nov 5	39	61	55	46	20	15	8	9	10	10	13	11	12	12	10	9	6	8	8	10	4	6	5	5	4	61
Nov 6	13	17	10	14	12	6	16	35	20	16	10	9	12	19	8	10	20	17	6	25	29	18	13	40	6	40
Nov 7	38	25	10	8	62	26	34	29	25	25	14	28	20	10	8	8	25	27	26	22	11	15	16	14	8	62
Nov 8	11	17	24	16	29	15	66	21	14	23	31	27	22	11	12	7	10	8	12	10	8	11	10	6	6	66
Nov 9	9	7	7	10	8	20	8	6	7	11	11	19	20	15	11	12	9	7	7	8	8	9	8	6	6	20
Nov 10	12	10	8	14	10	8	15	10	19	9	12	16	12	18	16	8	6	6	12	8	6	8	5	18	5	19
Nov 11	28	13	33	15	24	32	9	18	14	25	26	29	30	23	15	14	17	10	11	26	49	25	12	5	5	49
Nov 12	6	6	8	12	13	14	14	22	24	11	28	25	12	16	13	10	8	5	8	12	64	18	19	24	5	64
Nov 13	72	74	31	42	12	9	6	5	5	10	12	13	9	25	13	42	18	59	69	53	60	46	24	6	5	74
Nov 14	21	9	6	8	12	9	9	26	48	14	26	26	21	22	19	10	7	8	9	9	10	10	10	7	6	48
Nov 15	8	9	6	8	6	5	8	8	6	9	7	9	21	21	11	14	18	23	20	12	8	13	9	7	5	23
Nov 16	7	8	12	17	6	8	12	9	14	11	18	15	10	12	17	13	47	9	9	7	7	3	8	5	3	47
Nov 17	9	5	4	5	6	6	9	12	31	23	29	15	16	11	6	7	9	6	7	7	7	9	12	17	4	31
Nov 18	9	8	8	8	8	8	8	7	6	8	10	6	9	9	15	10	12	9	7	6	7	9	8	8	6	15
Nov 19	9	6	15	20	40	47	30	53	56	59	62	15	17	17	29	35	25	8	12	10	10	13	23	15	6	62
Nov 20	40	15	13	20	29	20	8	10	23	43	42	23	24	18	18	14	44	31	22	13	28	18	28	21	8	44
Nov 21	11	27	33	25	26	30	26	39	16	23	9	11	11	7	8	13	15	17	21	9	17	45	29	7	45	
Nov 22	15	27	34	47	60	38	19	8	6	11	11	6	7	8	7	5	10	7	6	4	5	4	5	5	4	60
Nov 23	5	4	5	8	5	5	5	11	6	5	5	6	8	7	7	8	6	5	7	5	8	10	7	13	4	13
Nov 24	12	11	6	24	30	20	12	12	14	12	10	13	17	13	11	10	10	7	5	6	6	7	8	7	5	30
Nov 25	15	11	18	10	10	12	14	7	22	29	11	14	14	29	27	37	17	8	11	10	9	16	13	17	7	37
Nov 26	9	10	7	7	8	8	8	4	7	11	9	13	16	33	9	7	6	7	7	9	13	23	22	4	4	33
Nov 27	6	24	16	17	17	12	20	17	12	16	20	25	13	22	29	18	25	23	11	18	14	29	47	65	6	65
Nov 28	52	41	52	46	28	59	54	54	51	68	62	32	22	11	13	10	18	14	12	5	9	9	12	12	5	68
Nov 29	8	16	25	10	4	6	5	12	8	8	7	8	12	14	11	22	8	9	24	15	21	14	38	15	4	38
Nov 30	15	18	15	23	20	16	28	35	13	13	25	26	22	12	24	14	18	23	25	34	16	11	10	12	10	35
Diurnal Minimum	5	4	4	5	4	5	5	4	5	5	5	6	7	7	6	5	4	5	5	4	4	3	5	5		
Dalurnal Maximum	72	74	73	47	62	59	66	54	56	68	73	32	49	66	62	42	47	59	69	53	64	46	47	65		
C	Calibration				S	Daily Zero/Span				Q	Quality Assurance				C1	Repeat Calibration				S1	Repeat Daily Zero/Span					
G	Out for Repair				K	Collection Error				N	Not in Service				O	Operator Error				P	Power Failure					
R	Recovery				X	Machine Malfunction				Y	Maintenance				T	Exceeds Temperature Limits				N	Not in Service					

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for STDWD - Cold Lake South Station



MASKWA STATION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

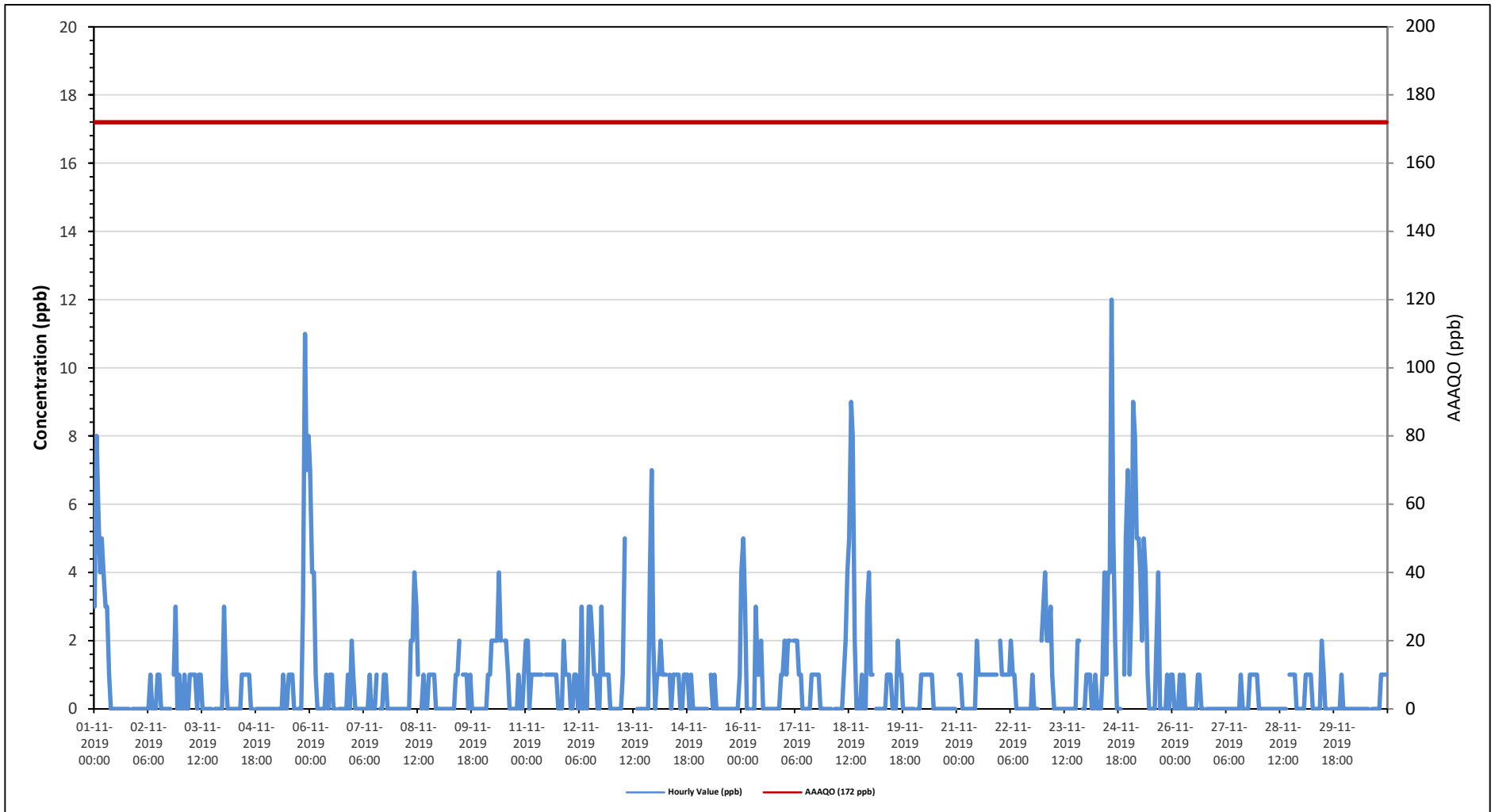
Summary of Hourly Averages

SULPHUR DIOXIDE (SO₂) in ppb

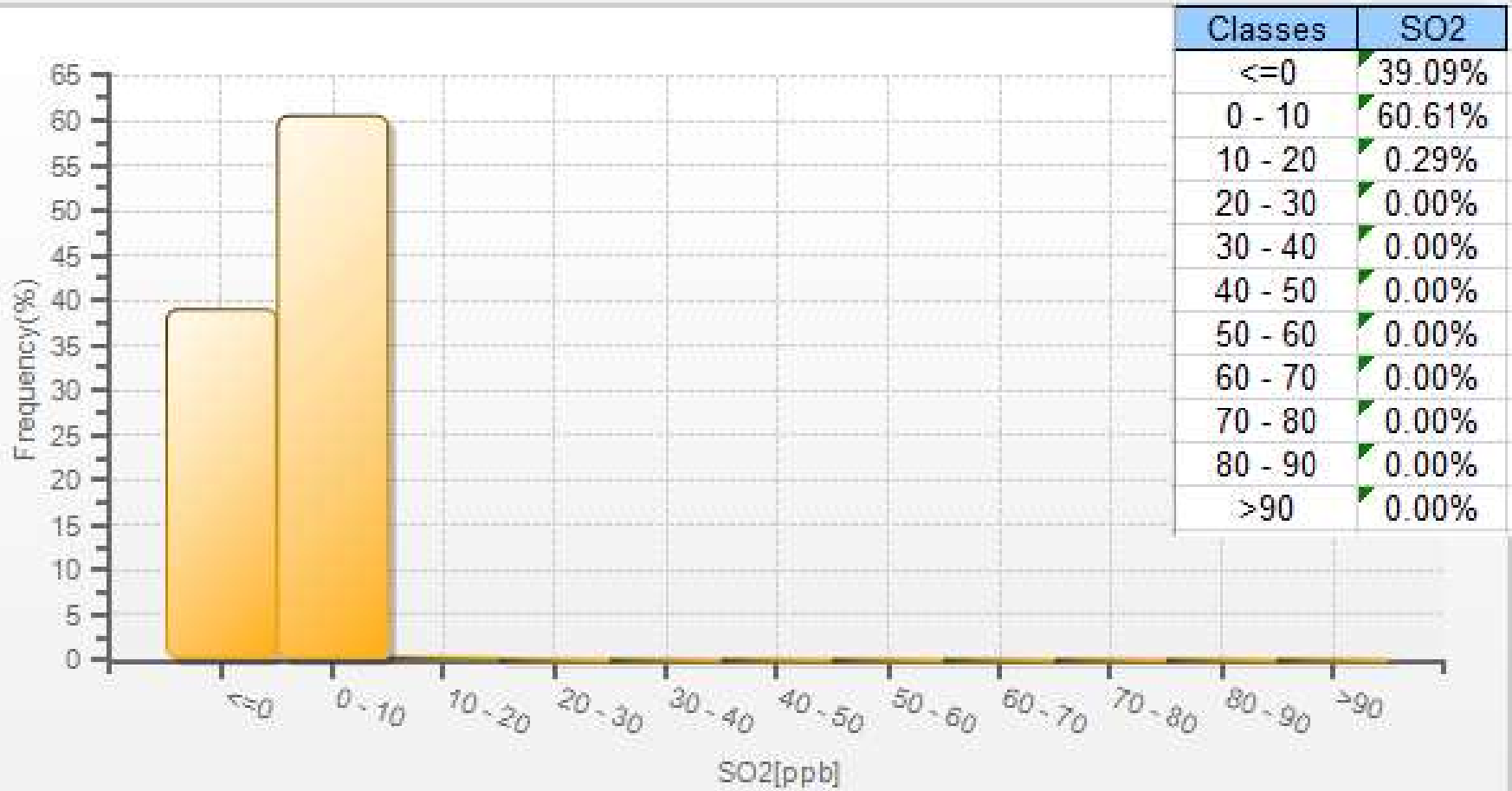
Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 172 ppb, 24-Hour 48 ppb, 30-Day 11 ppb																																			
Number of 1-Hour Exceedences:						0						Number of 24-Hour Exceedences:						0						30-Day Exceedence:						0					
Maximum Hourly Value:												12 ppb on November 24 at hour 14												Hours in Service:						720					
Maximum Daily Value:												2.4 ppb on November 25												Hours of Data:						685					
Minimum Hourly Value:												0 ppb on November 1 at hour 9												Hours of Missing Data:						0					
Minimum Daily Value:												0.1 ppb on November 15												Hours of Calibration:						35					
Monthly Average:												0.8 ppb												Operational Uptime:						100.0					
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average									
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23								
Nov 1	3	8	6	4	5	4	3	3	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	8	1.6							
Nov 2	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	S	1	3	0	1	0	3	0.3							
Nov 3	0	0	1	0	0	1	1	1	1	0	1	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0.3							
Nov 4	3	1	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	S	0	0	0	0	0	0	0	0	3	0.4							
Nov 5	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	0	S	0	0	0	0	3	11	7	8	0	11	1.4							
Nov 6	7	4	4	1	0	0	0	0	0	1	0	1	1	0	0	S	0	0	0	0	0	0	1	0	2	0	7	1.0							
Nov 7	1	0	0	0	0	0	0	0	0	1	0	0	0	1	S	0	0	1	1	0	0	0	1	0	0	0	1	0.2							
Nov 8	0	0	0	0	0	0	0	0	2	2	4	3	1	S	0	1	0	0	1	1	1	1	1	0	0	0	4	0.7							
Nov 9	0	0	0	0	0	0	0	0	0	1	1	2	S	1	1	1	0	1	0	0	0	0	0	0	0	0	2	0.3							
Nov 10	0	0	0	1	1	2	2	2	2	4	2	S	2	2	1	0	0	0	0	0	1	0	0	1	0	4	1.0								
Nov 11	2	2	0	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	0	0	0	2	1	1	0	2	1.0								
Nov 12	1	0	0	1	1	0	0	3	0	S	0	3	3	2	1	1	0	0	3	1	1	1	1	1	0	3	1.0								
Nov 13	0	0	0	0	0	0	1	5	S	2	C	C	C	C	0	0	0	0	0	0	0	0	4	7	2	0	7	1.1							
Nov 14	0	1	1	2	1	1	1	S	1	0	1	1	1	1	0	0	1	1	1	0	1	0	0	0	0	2	0	0.7							
Nov 15	0	0	0	0	0	0	S	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.1							
Nov 16	4	5	3	0	0	S	0	0	3	1	1	2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	5	0.9							
Nov 17	2	1	2	2	S	2	2	2	1	1	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	2	0.9							
Nov 18	0	0	0	S	0	0	0	0	0	1	2	4	5	9	8	2	0	0	0	1	0	0	3	4	0	9	1.7								
Nov 19	1	1	S	0	0	0	0	0	0	1	1	1	0	0	0	2	1	1	0	0	0	0	0	0	0	0	2	0.4							
Nov 20	0	S	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3							
Nov 21	S	1	1	0	0	0	0	0	0	0	0	2	1	1	1	1	1	1	1	1	1	1	1	1	S	0	2	0.7							
Nov 22	2	1	1	1	1	1	2	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	S	2	0	2	0.6								
Nov 23	3	4	2	2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	S	0	0	0	4	0.8								
Nov 24	1	1	1	0	0	1	0	0	0	1	4	1	4	4	12	5	2	0	0	0	S	1	5	7	0	12	2.2								
Nov 25	1	3	9	8	5	5	4	2	5	4	1	0	0	0	0	2	4	0	0	S	0	1	0	1	0	9	2.4								
Nov 26	1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	1	0	0	S	0	0	0	0	0	0	1	0.2								
Nov 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	S	0	1	1	1	1	1	0	1	0.3								
Nov 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	1	0	0	0	0	1	0.2								
Nov 29	0	0	1	1	1	1	0	0	0	0	2	1	0	0	0	S	0	0	0	0	0	0	1	0	0	2	0.3								
Nov 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	1	1	0	1	0.2								
Diurnal Maximum	7	8	9	8	5	5	4	5	5	4	4	4	5	9	12	5	4	1	3	2	3	11	7	8											
Diurnal Average	1.1	1.1	1.1	0.8	0.7	0.7	0.7	0.8	0.7	0.8	0.7	0.9	0.8	0.9	1.0	0.6	0.4	0.3	0.4	0.3	0.5	1.0	1.0	1.1											
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span																										
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure																										
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service																										

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for SO2 - Maskwa Site

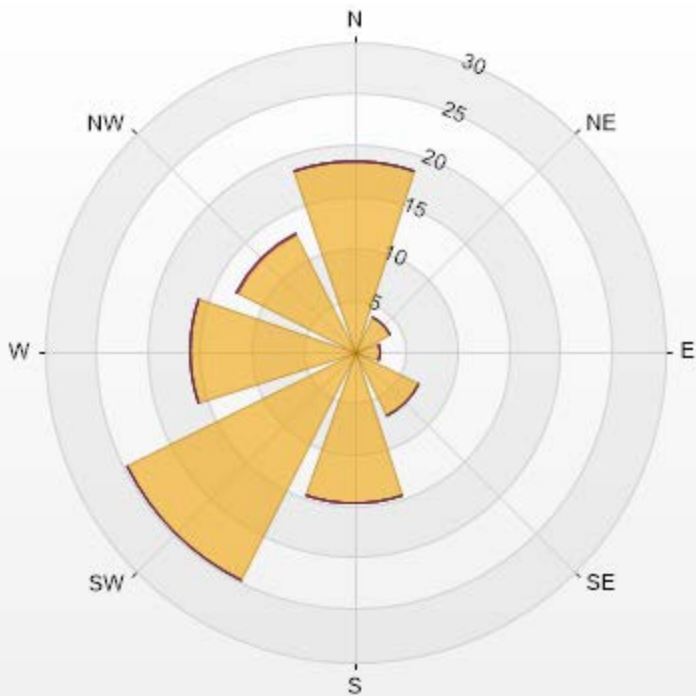


SO2[ppb] Histogram: Maskwa Monthly: 11-2019 1 Hr.



Wind: Maskwa Poll.: Maskwa-SO2[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.86% Calm Avg: 0.00 [ppb]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	18.45	0	0	0	0	18.45
NE	3.81	0	0	0	0	3.81
E	2.49	0	0	0	0	2.49
SE	6.88	0	0	0	0	6.88
S	14.79	0	0	0	0	14.79
SW	24.74	0	0	0	0	24.74
W	15.96	0	0	0	0	15.96
NW	12.59	0.29	0	0	0	12.88
Summary	100	0.29	0	0	0	100



LICA-201911-Revision 1

% Icon Classes (ppb)

100 0-10

0 10-50

0 50-100

0 100-172

0 >172.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Averages

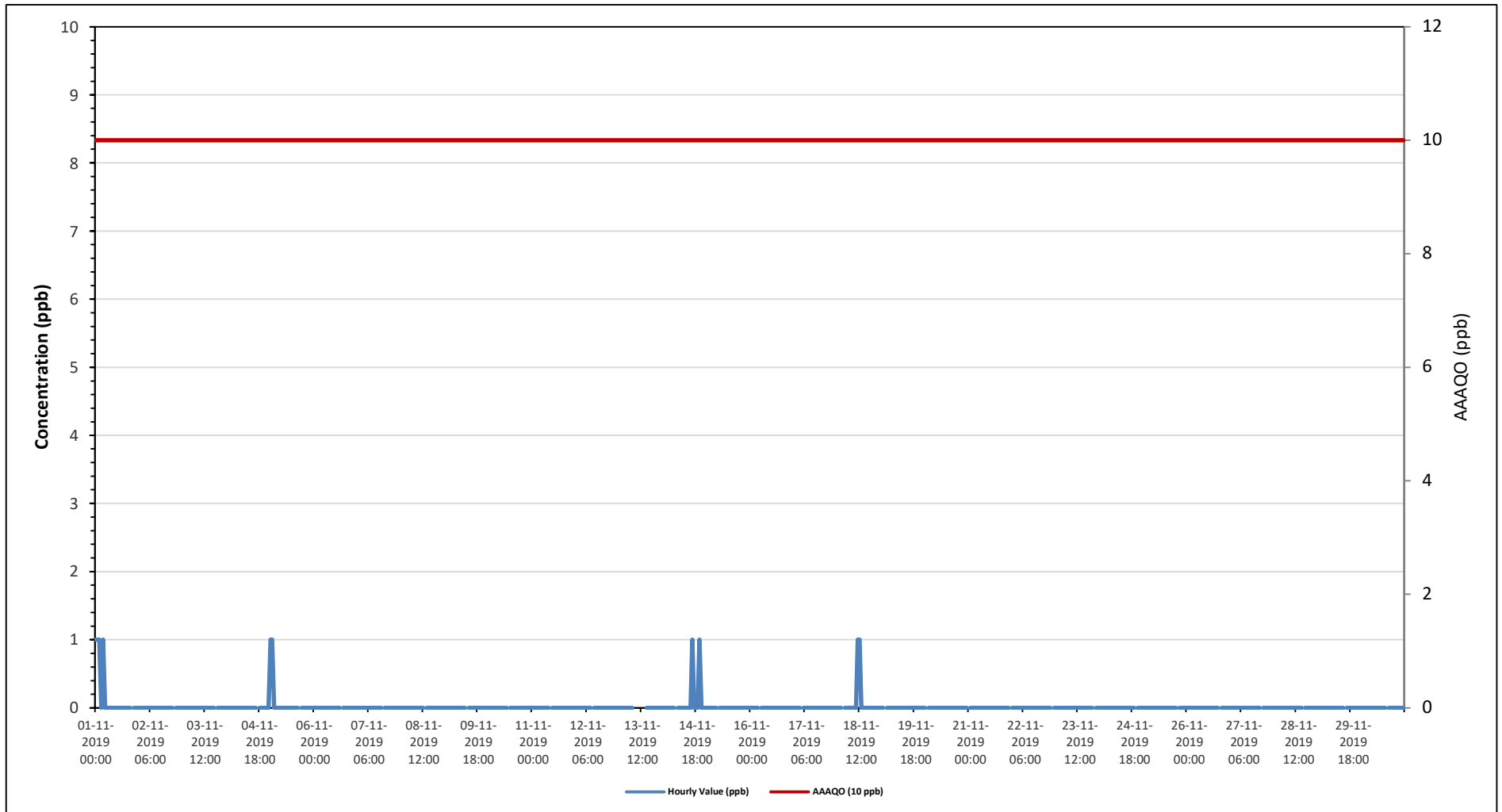
HYDROGEN SULPHIDE (H₂S) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 10 ppb, 24-Hour 3 ppb																												
Number of 1-Hour Exceedances: 0					Number of 24-Hour Exceedances: 0																							
Maximum Hourly Value: 1 ppb on November 1 at hour 0					Hours in Service: 720																							
Maximum Daily Value: 0.2 ppb on November 1					Hours of Data: 684																							
Minimum Hourly Value: 0 ppb on November 1 at hour 3					Hours of Missing Data: 0																							
Minimum Daily Value: 0.0 ppb on November 2					Hours of Calibration: 36																							
Monthly Average: 0.0 ppb					Operational Uptime: 100.0																							
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
Nov 1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0.2
Nov 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0.0
Nov 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0.0
Nov 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0.0
Nov 5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0.1
Nov 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 8	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 9	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 10	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 11	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 12	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 13	0	0	0	0	0	0	0	0	S	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 15	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Nov 16	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 17	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 18	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Nov 19	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 20	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 21	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0.0
Nov 22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0.0
Nov 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0.0
Nov 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0.0
Nov 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0.0
Nov 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0.0
Nov 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0.0
Nov 29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Diurnal Maximum	1	1	1	0	1	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
Diurnal Average	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

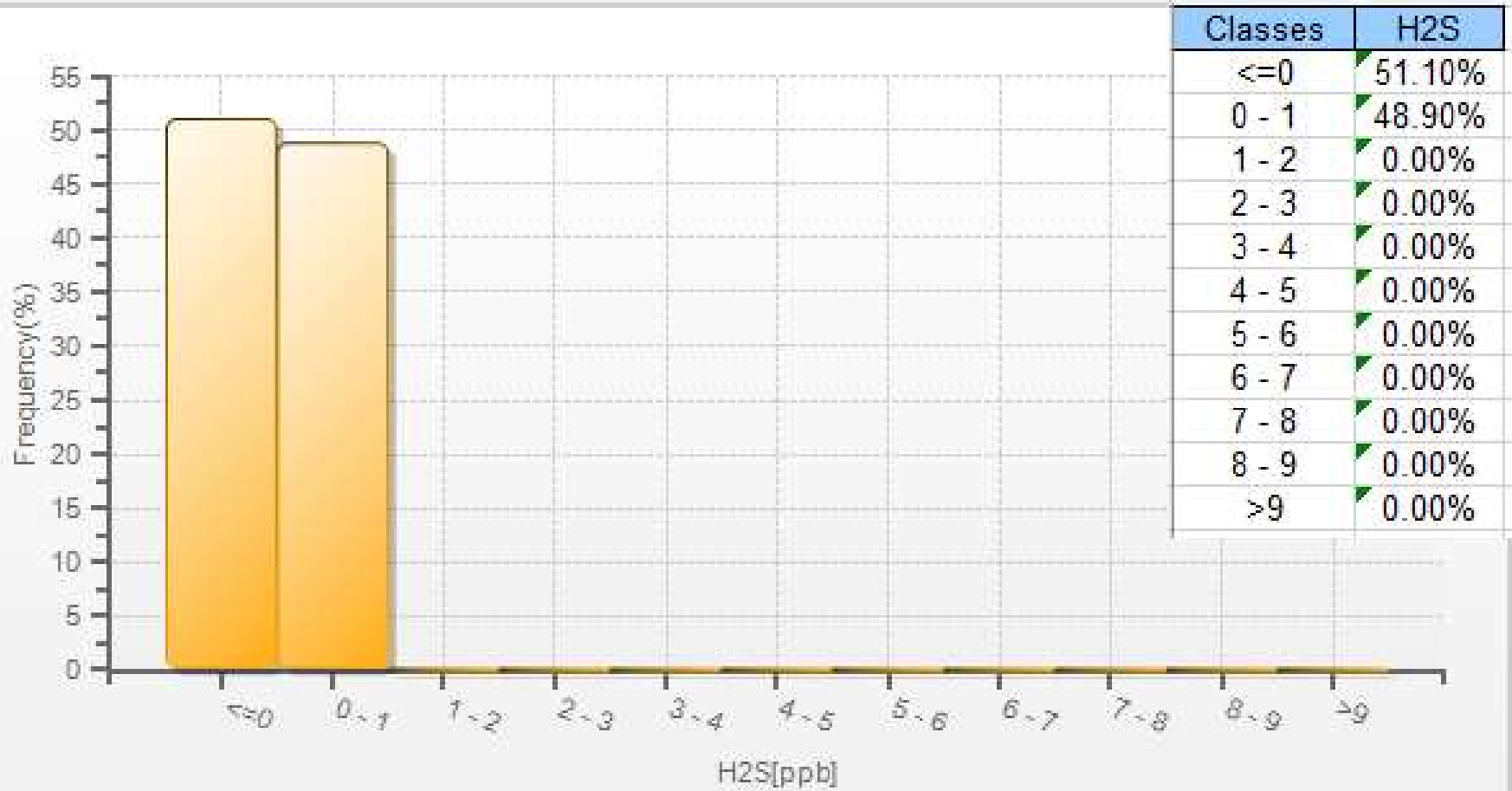
C Calibration S Daily Zero/Span Q Quality Assurance C1 Repeat Calibration S1 Repeat Daily Zero/Span
 G Out for Repair K Collection Error N Not in Service O Operator Error P Power Failure
 R Recovery X Machine Malfunction Y Maintenance T Exceeds Temperature Limits N Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for H2S - Maskwa Site

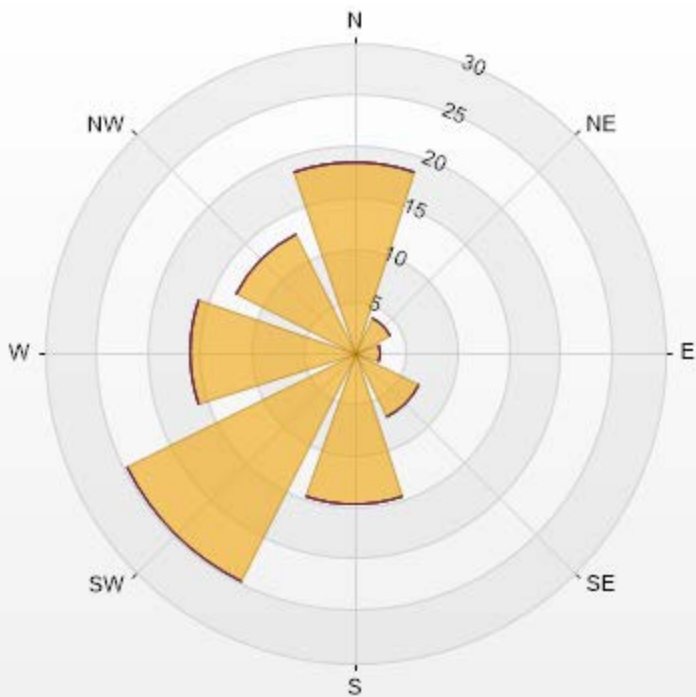


H2S[ppb] Histogram: Maskwa Monthly: 11-2019 1 Hr.



Wind: Maskwa Poll.: Maskwa-H2S[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.86% Calm Avg: 0.00 [ppb]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	18.45	0	0	0	0	18.45
NE	3.81	0	0	0	0	3.81
E	2.49	0	0	0	0	2.49
SE	6.88	0	0	0	0	6.88
S	14.79	0	0	0	0	14.79
SW	24.74	0	0	0	0	24.74
W	15.96	0	0	0	0	15.96
NW	12.88	0	0	0	0	12.88
Summary	100	0	0	0	0	100



LICA-201911-Revision 1



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Averages

OXIDES OF NITROGEN (NOx) in ppb

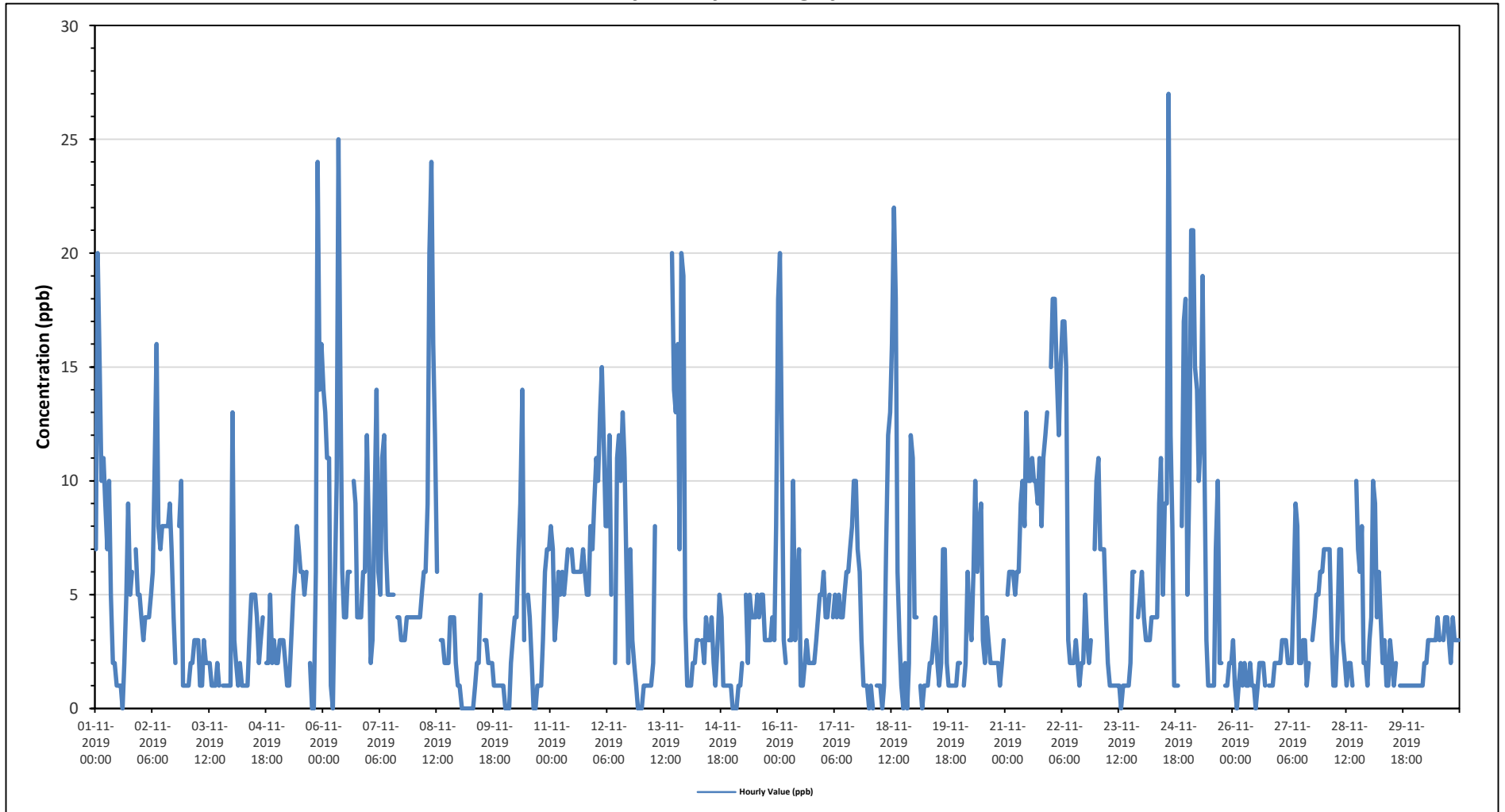
Maximum Hourly Value:	27 ppb on November 24 at hour 14	Hours in Service:	720
Maximum Daily Value:	8.9 ppb on November 21	Hours of Data:	683
Minimum Hourly Value:	0 ppb on November 1 at hour 14	Hours of Missing Data:	0
Minimum Daily Value:	1.3 ppb on November 9	Hours of Calibration:	37
Monthly Average:	4.8 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	7	20	15	10	11	9	7	10	5	2	2	1	1	13	0	2	5	9	5	6	S	7	5	5	0	20	6.3	
Nov 2	4	3	4	4	4	5	6	11	16	8	7	8	8	8	8	9	7	4	2	S	8	10	1	1	1	16	6.3	
Nov 3	1	1	2	2	3	3	3	1	1	3	2	2	2	1	1	1	2	1	S	1	1	1	1	1	1	3	1.6	
Nov 4	13	3	2	1	2	1	1	1	1	3	5	5	5	4	2	3	4	S	2	2	5	2	3	2	1	13	3.1	
Nov 5	2	3	3	3	2	1	1	3	5	6	8	7	6	6	5	6	S	2	0	0	6	24	14	16	0	24	5.6	
Nov 6	14	13	11	11	1	0	5	10	25	14	6	4	4	6	6	S	10	9	4	4	4	6	6	12	0	25	8.0	
Nov 7	8	2	3	8	14	6	5	11	12	7	5	5	5	5	S	4	4	3	3	3	4	4	4	4	2	14	5.6	
Nov 8	4	4	4	4	5	6	6	9	20	24	16	12	6	S	3	3	2	2	2	4	4	4	2	1	1	24	6.4	
Nov 9	1	0	0	0	0	0	0	0	1	2	2	5	S	3	3	2	2	2	1	1	1	1	1	1	0	5	1.3	
Nov 10	0	0	0	2	3	4	4	7	9	14	3	S	5	4	2	0	0	1	1	1	3	6	7	7	0	14	3.6	
Nov 11	8	7	3	4	6	5	6	5	6	7	S	7	6	6	6	6	7	6	5	5	8	7	9	3	9	6.1		
Nov 12	11	10	13	15	12	8	8	12	5	S	2	11	12	10	13	11	6	2	7	3	2	1	0	0	0	15	7.6	
Nov 13	0	1	1	1	1	1	2	8	S	8	C	C	C	C	C	C	20	14	13	16	7	20	19	4	0	20	-	
Nov 14	1	1	1	2	2	3	3	S	3	2	4	3	3	4	2	1	3	5	4	1	1	1	1	1	1	5	2.3	
Nov 15	0	0	0	1	1	2	S	5	2	5	4	4	4	5	4	5	5	3	3	3	3	4	3	8	0	8	3.2	
Nov 16	18	20	11	3	2	S	3	3	10	3	5	7	1	1	2	3	2	2	2	2	3	4	5	5	1	20	5.1	
Nov 17	6	4	4	5	S	4	5	4	5	4	4	5	6	6	7	8	10	10	7	6	3	1	1	1	1	10	5.0	
Nov 18	0	1	0	S	1	1	1	1	0	1	7	12	13	16	22	18	6	3	1	0	2	0	2	12	11	0	22	5.7
Nov 19	4	4	S	1	0	1	1	1	1	2	2	3	4	2	1	2	7	7	2	1	1	1	1	2	0	7	2.2	
Nov 20	2	S	1	2	6	4	3	6	10	6	8	9	3	2	4	3	2	2	2	2	2	1	2	3	1	10	3.7	
Nov 21	S	5	6	6	6	5	6	6	9	10	8	13	10	10	11	10	10	9	11	8	11	12	13	S	5	13	8.9	
Nov 22	15	18	18	15	12	15	17	17	15	3	2	2	2	3	2	1	2	2	5	3	2	3	S	7	1	18	7.9	
Nov 23	10	11	7	7	7	4	2	1	1	1	1	1	1	0	1	1	1	1	2	6	6	S	4	5	0	11	3.5	
Nov 24	6	4	3	3	3	4	4	4	4	9	11	5	9	9	27	12	8	1	1	1	S	8	17	18	1	27	7.4	
Nov 25	5	10	21	21	15	14	10	12	19	11	3	1	1	1	1	7	10	2	2	S	1	1	2	2	1	21	7.5	
Nov 26	3	1	0	1	2	1	2	1	1	2	1	1	0	1	2	2	2	1	S	1	1	1	2	2	0	3	1.3	
Nov 27	2	2	3	3	3	2	2	2	5	9	8	2	2	3	3	1	2	S	3	4	5	5	6	6	1	9	3.6	
Nov 28	7	7	7	7	3	1	1	3	7	7	3	2	1	2	2	1	S	10	7	6	8	2	2	1	1	10	4.2	
Nov 29	3	4	10	9	4	6	4	2	3	1	3	2	1	2	2	S	1	1	1	1	1	1	1	1	1	10	2.7	
Nov 30	1	1	1	1	1	2	2	3	3	3	3	3	4	3	S	3	4	4	3	2	4	3	3	3	1	4	2.6	
Diurnal Maximum	18	20	21	21	15	15	17	17	25	24	16	13	16	22	27	12	20	14	13	16	11	24	19	18				
Diurnal Average	5.4	5.5	5.3	5.2	4.6	4.1	4.1	5.4	7.1	6.3	5.0	5.2	4.5	4.6	5.1	4.4	5.0	4.0	3.6	3.4	3.6	5.0	5.0	4.8				

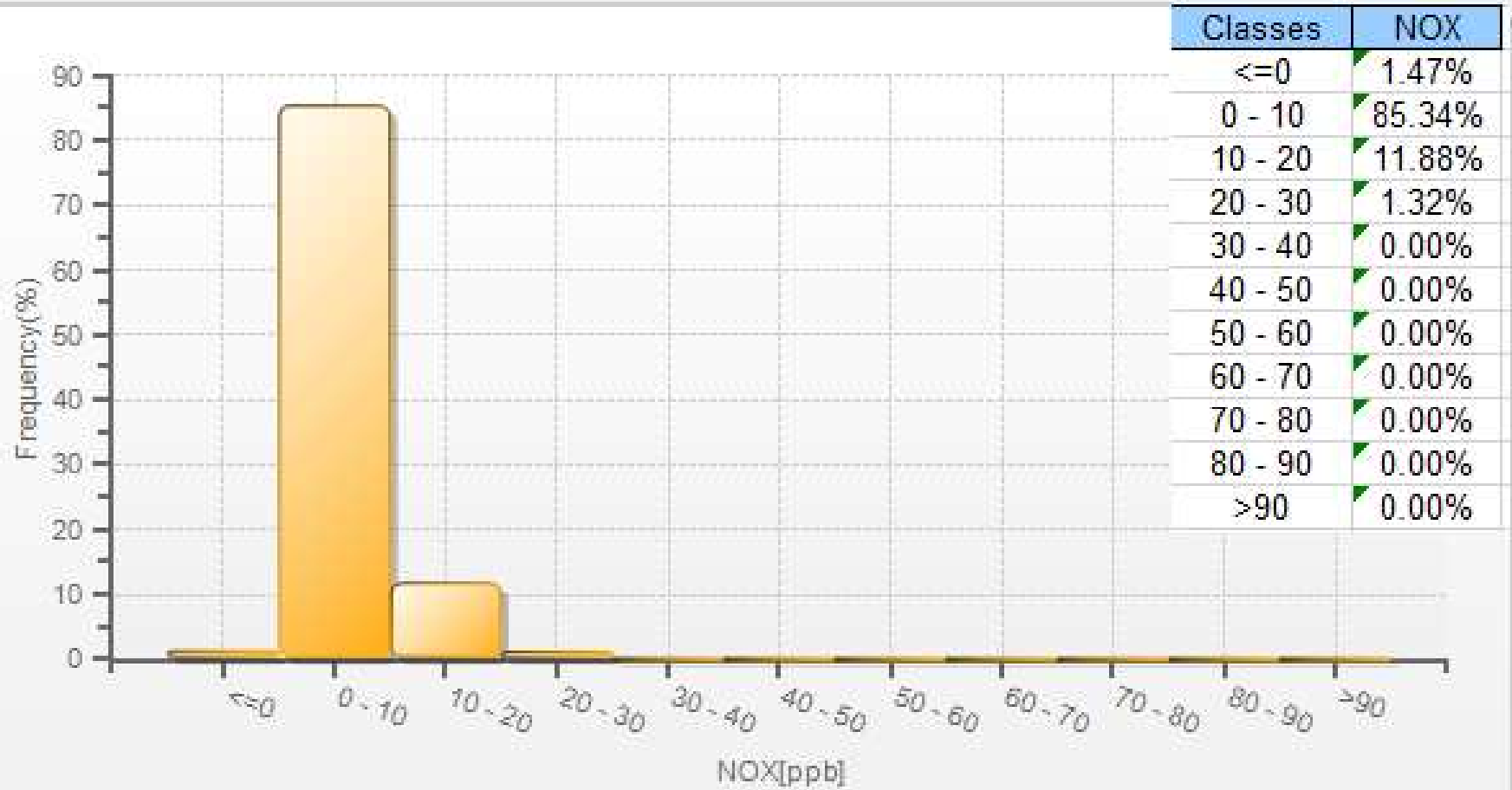
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	O1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	C	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for NOx - Maskwa Site

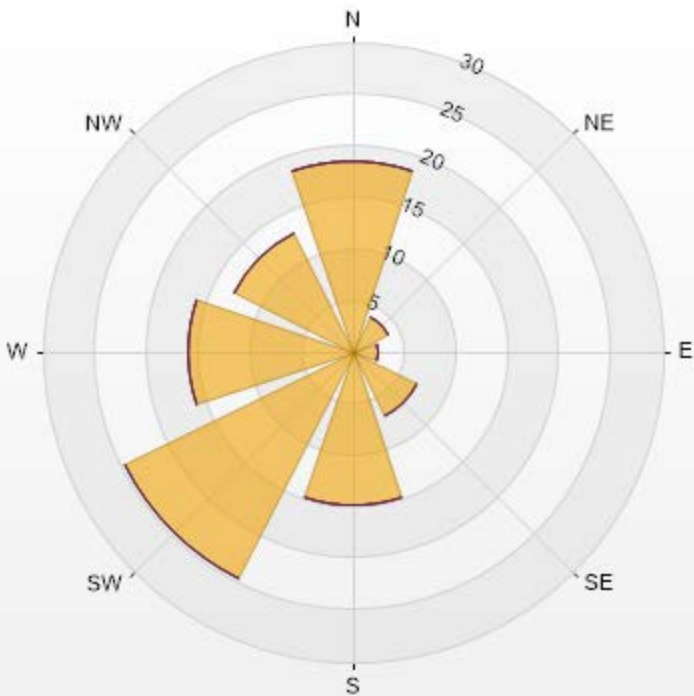


NOX[ppb] Histogram: Maskwa Monthly: 11-2019 1 Hr.



Wind: Maskwa Poll.: Maskwa-NOX[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.72% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	18.48	0	0	0	0	18.48
NE	3.81	0	0	0	0	3.81
E	2.49	0	0	0	0	2.49
SE	6.89	0	0	0	0	6.89
S	14.81	0	0	0	0	14.81
SW	24.63	0	0	0	0	24.63
W	15.98	0	0	0	0	15.98
NW	12.9	0	0	0	0	12.9
Summary	100	0	0	0	0	100



LICA-201911-Revision 1

% Icon Classes (ppb)	100	0-30	0	30-50	50-82	0	82-159	0	>159.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Averages

NITRIC OXIDE (NO) in ppb

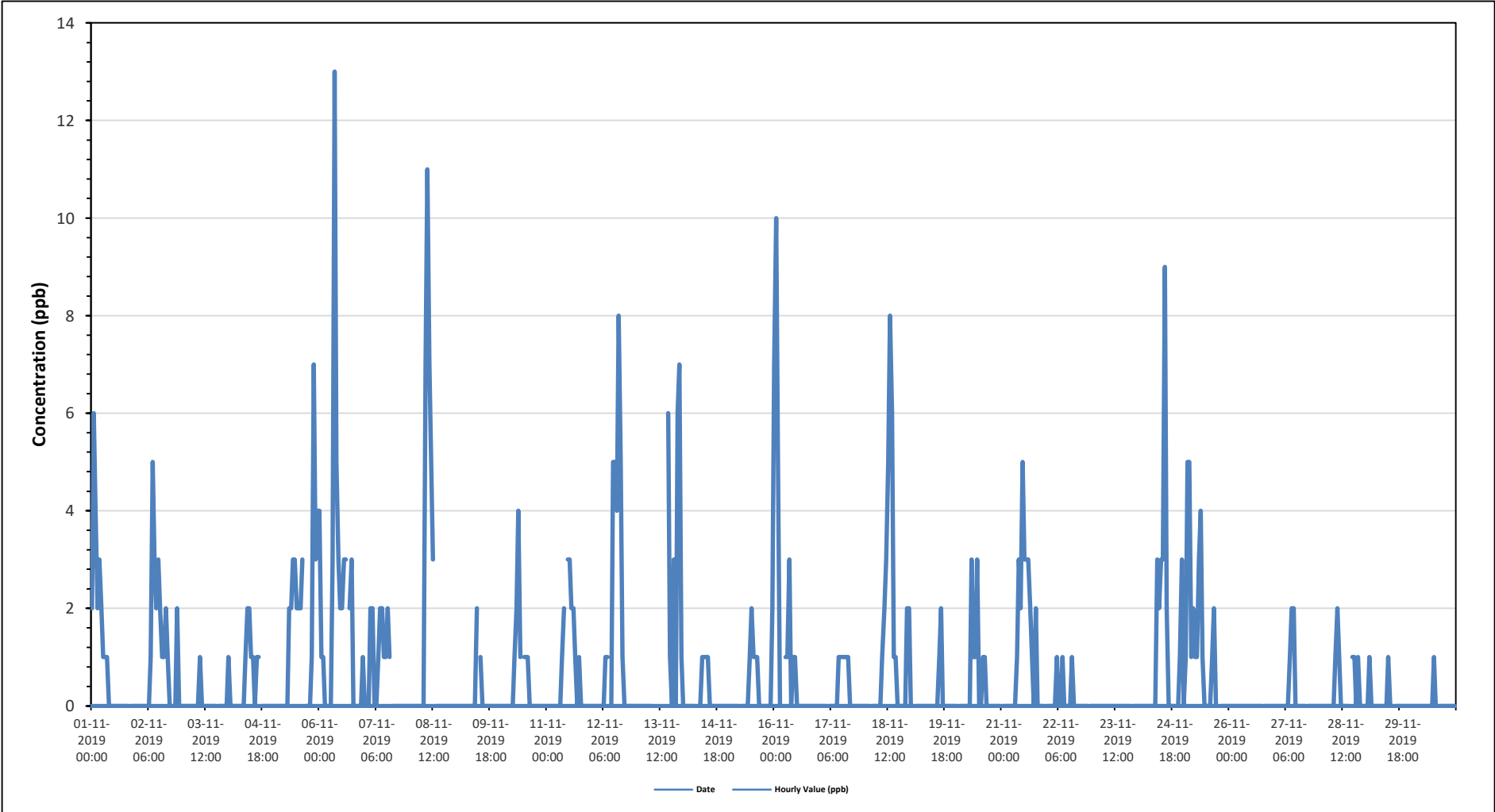
Maximum Hourly Value:	13 ppb on November 6 at hour 8	Hours in Service:	720
Maximum Daily Value:	2.0 ppb on November 6	Hours of Data:	683
Minimum Hourly Value:	0 ppb on November 1 at hour 9	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on November 23	Hours of Calibration:	37
Monthly Average:	0.7 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	2	6	4	2	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	6	1.0
Nov 2	0	0	0	0	0	0	0	1	5	3	2	3	2	1	1	2	1	0	0	S	0	2	0	0	0	5	1.0
Nov 3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0.0
Nov 4	1	0	0	0	0	0	0	0	0	1	2	2	1	1	0	0	1	1	S	0	0	0	0	0	0	2	0.4
Nov 5	0	0	0	0	0	0	0	0	2	2	3	3	2	2	2	3	S	0	0	0	0	1	7	3	4	7	1.5
Nov 6	4	1	1	0	0	0	0	3	13	5	3	2	2	3	3	S	2	3	0	0	0	0	0	0	1	13	2.0
Nov 7	0	0	0	2	2	0	0	1	2	2	1	1	2	1	2	1	S	0	0	0	0	0	0	0	0	2	0.6
Nov 8	0	0	0	0	0	0	0	0	7	11	7	5	3	S	0	0	0	0	0	0	0	0	0	0	0	11	1.4
Nov 9	0	0	0	0	0	0	0	0	0	0	0	2	S	1	0	0	0	0	0	0	0	0	0	0	0	2	0.1
Nov 10	0	0	0	0	0	0	0	1	2	4	1	S	1	1	1	0	0	0	0	0	0	0	0	0	0	4	0.5
Nov 11	0	0	0	0	0	0	0	0	1	2	S	3	3	2	2	1	0	1	0	0	0	0	0	0	0	3	0.7
Nov 12	0	0	0	0	0	0	0	1	1	S	0	5	5	4	8	5	1	0	0	0	0	0	0	0	0	8	1.3
Nov 13	0	0	0	0	0	0	0	0	S	2	C	C	C	C	C	C	6	1	0	3	0	6	7	1	0	7	-
Nov 14	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0.2
Nov 15	0	0	0	0	0	0	0	S	0	0	0	0	1	2	1	1	1	0	0	0	0	0	0	0	2	2	0.3
Nov 16	7	10	5	0	0	S	1	1	3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1.3
Nov 17	0	0	0	0	S	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0.3
Nov 18	0	0	0	S	0	0	0	0	0	1	2	3	5	8	6	1	1	0	0	0	0	0	0	2	2	8	1.3
Nov 19	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	2	0.1
Nov 20	0	S	0	0	0	0	0	0	3	1	1	3	0	0	1	1	0	0	0	0	0	0	0	0	0	3	0.4
Nov 21	S	0	0	0	0	0	0	0	1	3	2	5	3	3	3	2	1	0	2	0	0	0	0	0	0	5	1.1
Nov 22	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Nov 23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0.0
Nov 24	0	0	0	0	0	0	0	0	0	0	3	2	3	3	9	2	0	0	0	0	S	0	1	3	0	9	1.1
Nov 25	0	1	5	5	1	2	1	1	3	4	1	0	0	0	0	1	2	0	0	S	0	0	0	0	0	5	1.2
Nov 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0.0
Nov 27	0	0	0	0	0	0	0	0	1	2	2	0	0	0	0	0	0	0	S	0	0	0	0	0	0	2	0.2
Nov 28	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	S	1	1	0	1	0	0	0	2	0.3
Nov 29	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	S	0	0	0	0	0	0	0	0	0	1	0.1
Nov 30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	S	0	0	0	0	0	0	0	0	0	0	1	0.0
Diurnal Maximum	7	10	5	5	3	2	1	3	13	11	7	5	5	8	9	5	6	3	2	3	1	7	7	4			
Diurnal Average	0.5	0.6	0.6	0.3	0.2	0.2	0.1	0.3	1.6	1.6	1.2	1.5	1.4	1.2	1.4	0.8	0.6	0.2	0.1	0.1	0.1	0.5	0.4	0.4			

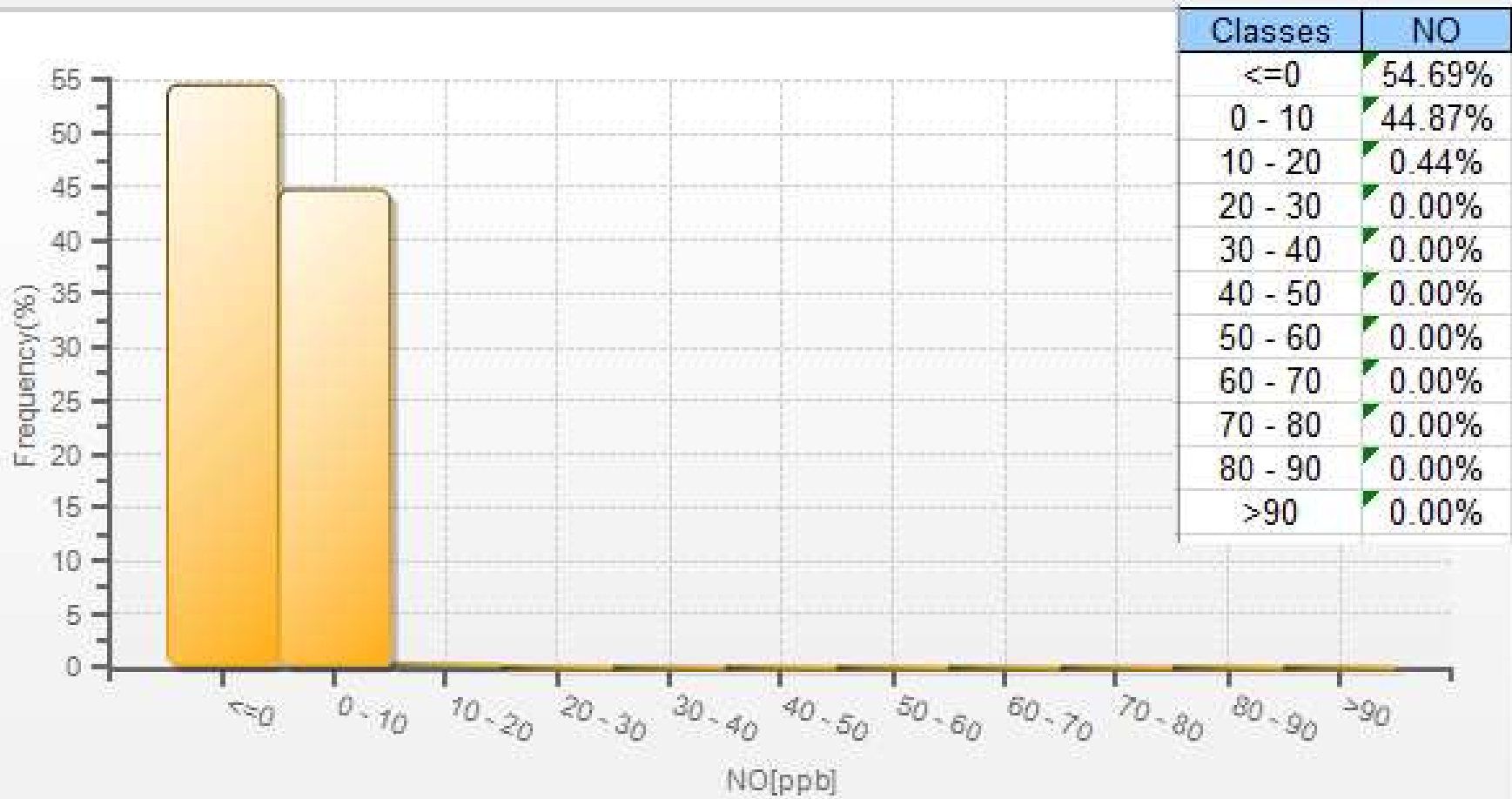
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	O1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	C	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for NO - Maskwa Site

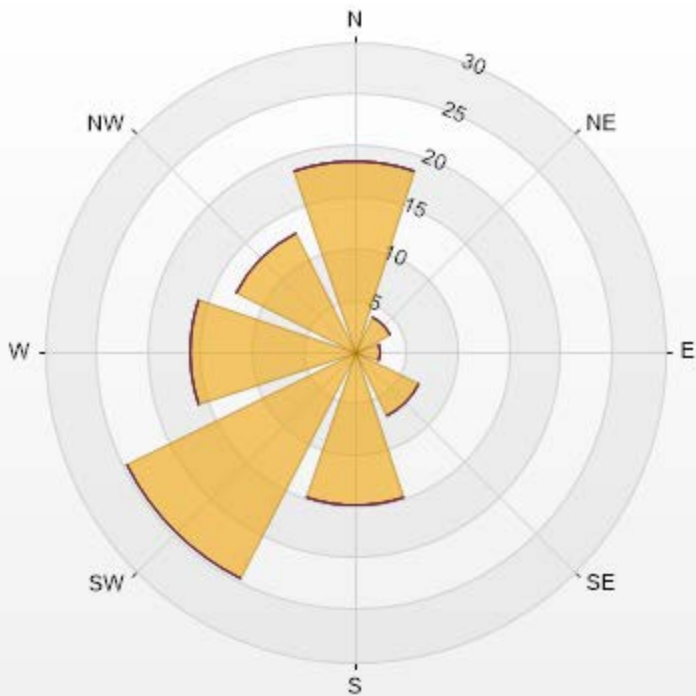


NO[ppb] Histogram: Maskwa Monthly: 11-2019 1 Hr.



Wind: Maskwa Poll.: Maskwa-NO[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.72% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	18.48	0	0	0	0	18.48
NE	3.81	0	0	0	0	3.81
E	2.49	0	0	0	0	2.49
SE	6.89	0	0	0	0	6.89
S	14.81	0	0	0	0	14.81
SW	24.63	0	0	0	0	24.63
W	15.98	0	0	0	0	15.98
NW	12.9	0	0	0	0	12.9
Summary	100	0	0	0	0	100



LICA-201911-Revision 1



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Averages

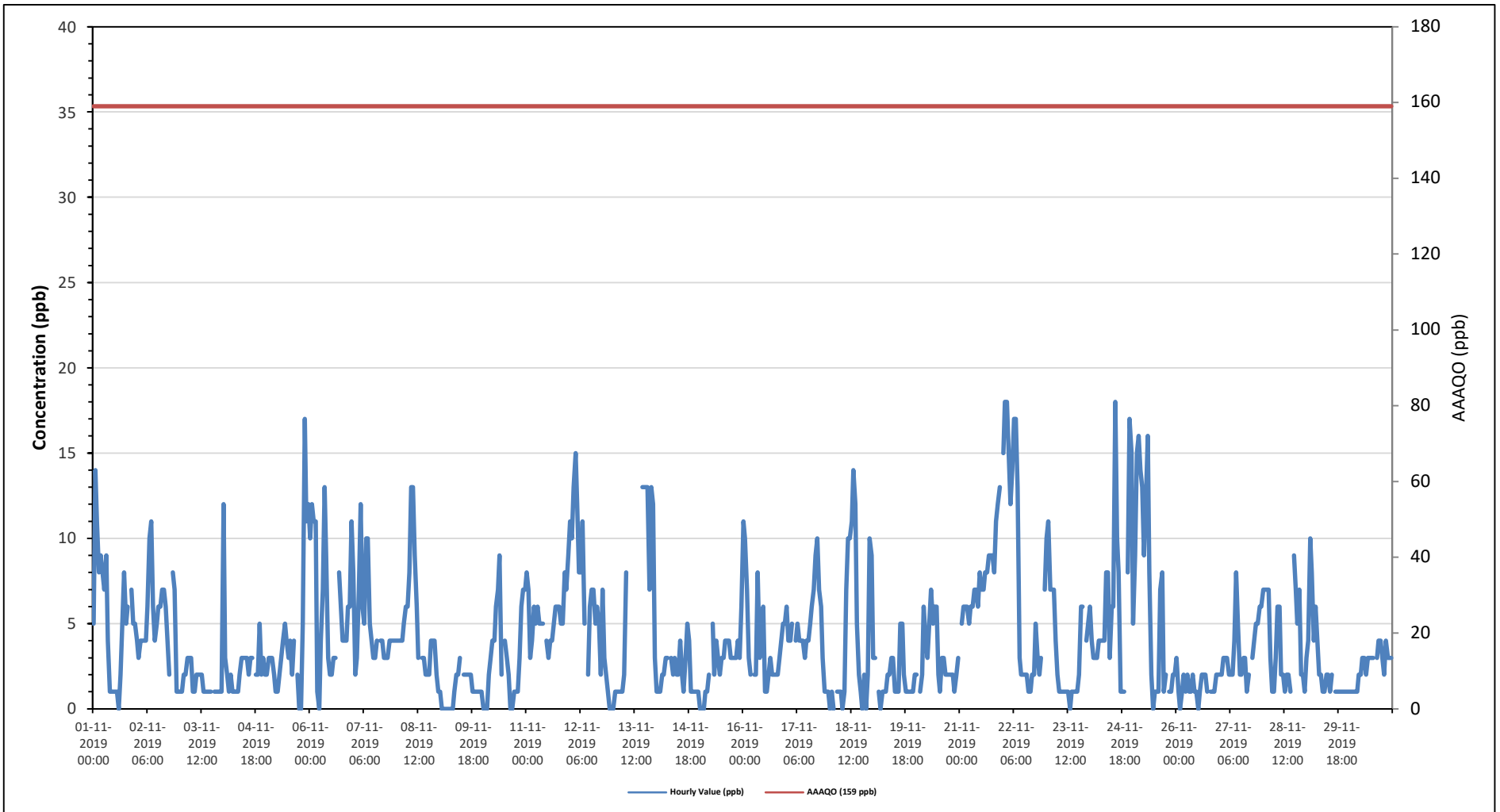
NITROGEN DIOXIDE (NO₂) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb																												
Number of 1-Hour Exceedences: 0																												
Maximum Hourly Value: 18 ppb on November 22 at hour 1												Hours in Service: 720																
Maximum Daily Value: 7.7 ppb on November 21												Hours of Data: 683																
Minimum Hourly Value: 0 ppb on November 1 at hour 14												Hours of Missing Data: 0																
Minimum Daily Value: 1.1 ppb on November 9												Hours of Calibration: 37																
Monthly Average: 4.2 ppb												Operational Uptime: 100.0																
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
Nov 1	5	14	11	8	9	8	7	9	4	1	1	1	1	1	0	2	5	8	5	6	S	7	5	5	0	14	5.3	
Nov 2	4	3	4	4	4	4	6	10	11	6	4	5	6	6	7	7	6	4	2	S	8	7	1	1	1	1	11	5.2
Nov 3	1	1	2	2	3	3	3	1	1	2	2	2	2	1	1	1	1	1	S	1	1	1	1	1	1	1	3	1.5
Nov 4	12	3	2	1	2	1	1	1	1	2	3	3	3	3	2	3	3	S	2	2	5	2	3	2	1	12	2.7	
Nov 5	2	3	3	3	2	1	1	2	3	4	5	4	3	4	2	4	S	2	0	0	5	17	11	12	0	17	4.0	
Nov 6	10	12	11	11	1	0	4	7	13	9	3	2	2	3	3	S	8	6	4	4	4	6	6	11	0	13	6.1	
Nov 7	8	2	3	7	12	6	5	10	10	5	4	3	3	4	S	4	4	3	3	3	4	4	4	4	2	12	5.0	
Nov 8	4	4	4	4	5	6	6	8	13	13	9	6	3	S	3	2	2	2	2	4	4	4	2	1	1	13	4.9	
Nov 9	1	0	0	0	0	0	0	0	1	2	2	3	S	2	2	2	2	2	1	1	1	1	1	1	0	3	1.1	
Nov 10	0	0	0	2	3	4	4	6	7	9	2	S	4	3	2	0	0	1	1	1	3	6	7	7	0	9	3.1	
Nov 11	8	7	3	4	6	5	6	5	5	5	S	4	3	4	5	6	6	6	5	5	8	7	9	3	9	5.5		
Nov 12	11	10	13	15	12	8	8	11	5	S	2	6	7	7	5	6	5	2	7	3	2	1	0	0	0	15	6.3	
Nov 13	0	1	1	1	1	1	2	8	S	6	C	C	C	C	C	C	13	13	13	13	7	13	12	3	0	13	-	
Nov 14	1	1	1	2	2	3	3	S	3	2	3	2	2	4	2	1	3	5	4	1	1	1	1	1	1	5	2.1	
Nov 15	0	0	0	1	1	2	S	5	2	4	3	2	3	3	4	4	4	3	3	3	3	4	3	6	0	6	2.7	
Nov 16	11	10	7	3	2	S	2	2	8	3	4	6	1	1	2	3	2	2	2	2	3	4	5	5	1	11	3.9	
Nov 17	6	4	4	5	S	4	5	4	4	4	3	4	4	5	6	7	9	10	7	6	3	1	1	1	1	10	4.7	
Nov 18	0	1	0	S	1	1	1	0	1	7	10	10	11	14	12	5	2	1	0	2	0	2	10	9	0	14	4.3	
Nov 19	3	3	S	1	0	1	1	1	2	2	3	3	1	1	1	5	5	2	1	1	1	1	1	2	0	5	1.8	
Nov 20	2	S	1	2	6	4	3	5	7	5	6	6	2	1	3	3	2	2	2	2	2	1	2	3	1	7	3.1	
Nov 21	S	5	6	6	6	5	6	6	7	7	6	8	7	7	8	8	9	9	9	8	11	12	13	S	5	13	7.7	
Nov 22	15	18	18	15	12	14	17	17	13	3	2	2	2	2	1	1	2	2	5	3	2	3	S	7	1	18	7.7	
Nov 23	10	11	7	7	7	4	2	1	1	1	1	1	1	0	1	1	1	1	1	2	6	6	S	4	5	0	11	3.5
Nov 24	6	4	3	3	3	4	4	4	4	8	8	3	6	6	18	10	8	1	1	1	S	8	17	15	1	18	6.3	
Nov 25	5	9	15	16	14	13	9	12	16	8	2	0	1	1	1	7	8	1	2	S	1	1	2	2	0	16	6.3	
Nov 26	3	1	0	1	2	1	2	1	1	2	1	0	1	0	1	2	2	1	S	1	1	1	2	2	0	3	1.3	
Nov 27	2	2	3	3	3	2	2	2	4	8	5	2	2	3	3	1	2	2	S	3	4	5	6	6	1	8	3.4	
Nov 28	7	7	7	7	3	1	1	3	6	6	2	2	1	2	2	1	S	9	7	5	7	2	2	1	1	9	4.0	
Nov 29	3	4	10	8	4	6	4	2	2	1	1	2	2	1	2	S	1	1	1	1	1	1	1	1	1	10	2.6	
Nov 30	1	1	1	1	1	2	2	3	3	2	3	3	3	3	S	3	4	4	4	3	2	4	3	3	1	4	2.5	
Diurnal Maximum	15	18	18	16	14	14	17	17	16	13	10	10	11	14	18	10	13	13	13	13	11	17	17	15				
Diurnal Average	4.9	4.9	4.8	4.9	4.4	3.9	4.0	5.0	5.4	4.7	3.6	3.4	3.1	3.3	3.7	3.7	4.3	3.7	3.5	3.3	3.6	4.4	4.6	4.3				
C	Calibration			S	Daily Zero/Span						Q	Quality Assurance			C1	Repeat Calibration				S1	Repeat Daily Zero/Span							
G	Out for Repair				K	Collection Error					N	Not in Service			O	Operator Error				P	Power Failure							
R	Recovery				X	Machine Malfunction					Y	Maintenance			T	Exceeds Temperature Limits				N	Not in Service							

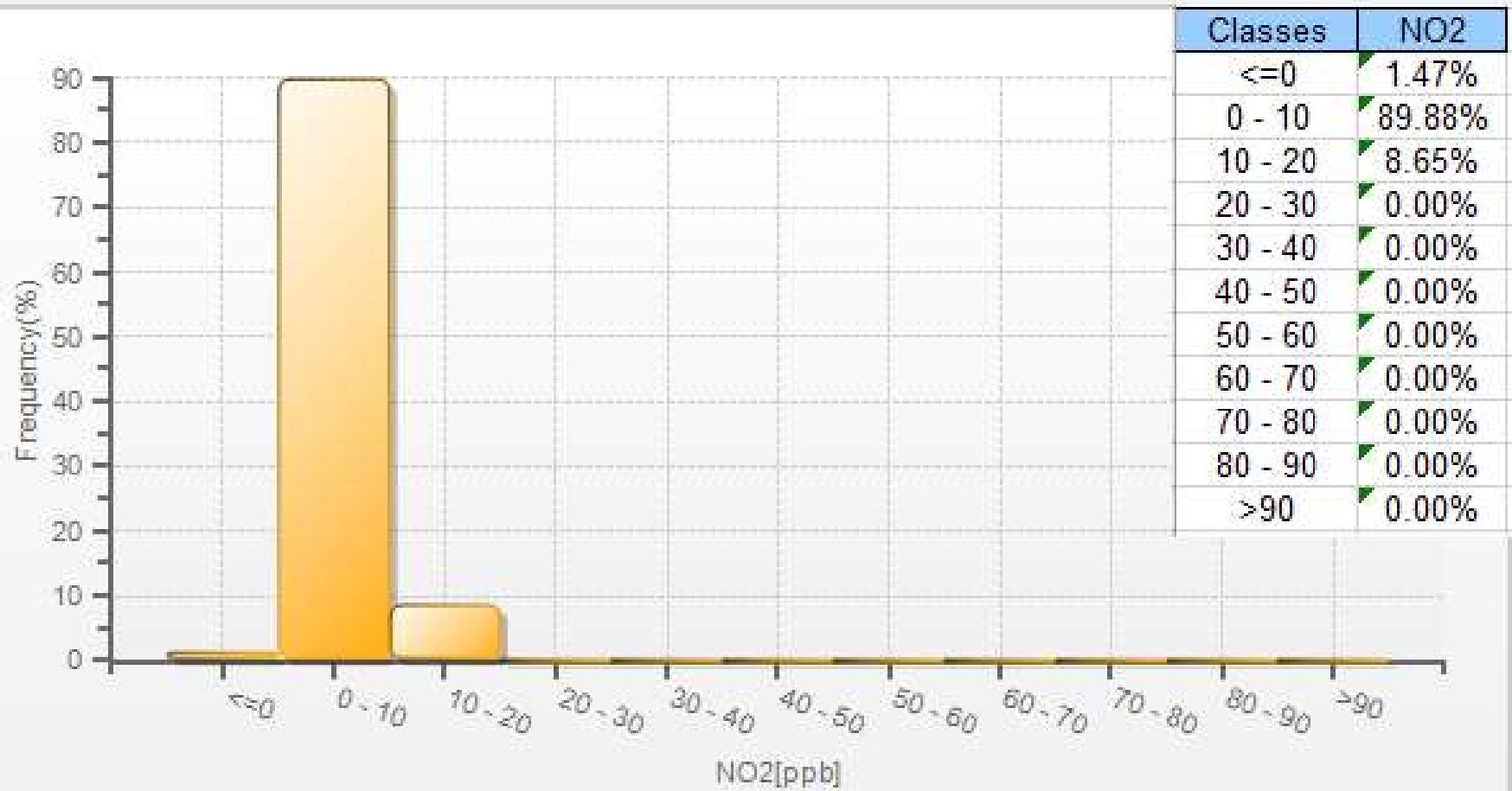
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for NO2 - Maskwa Site

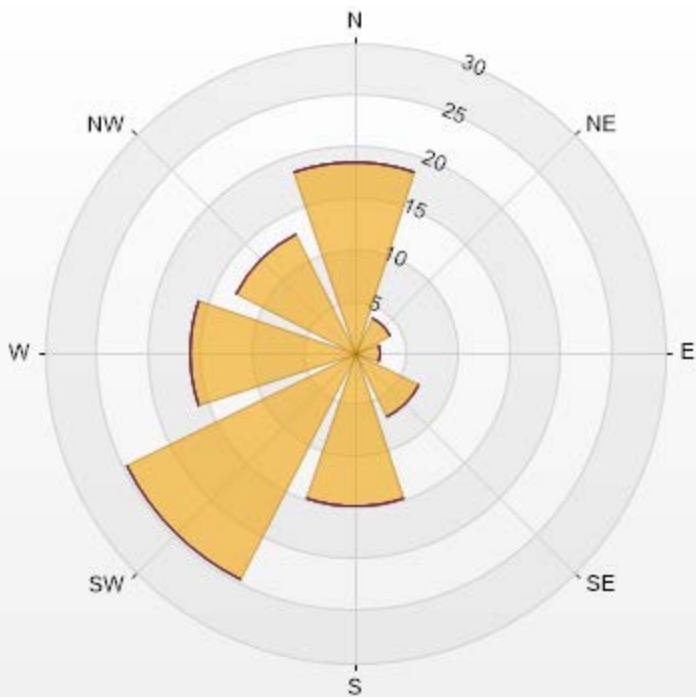


NO2[ppb] Histogram: Maskwa Monthly: 11-2019 1 Hr.



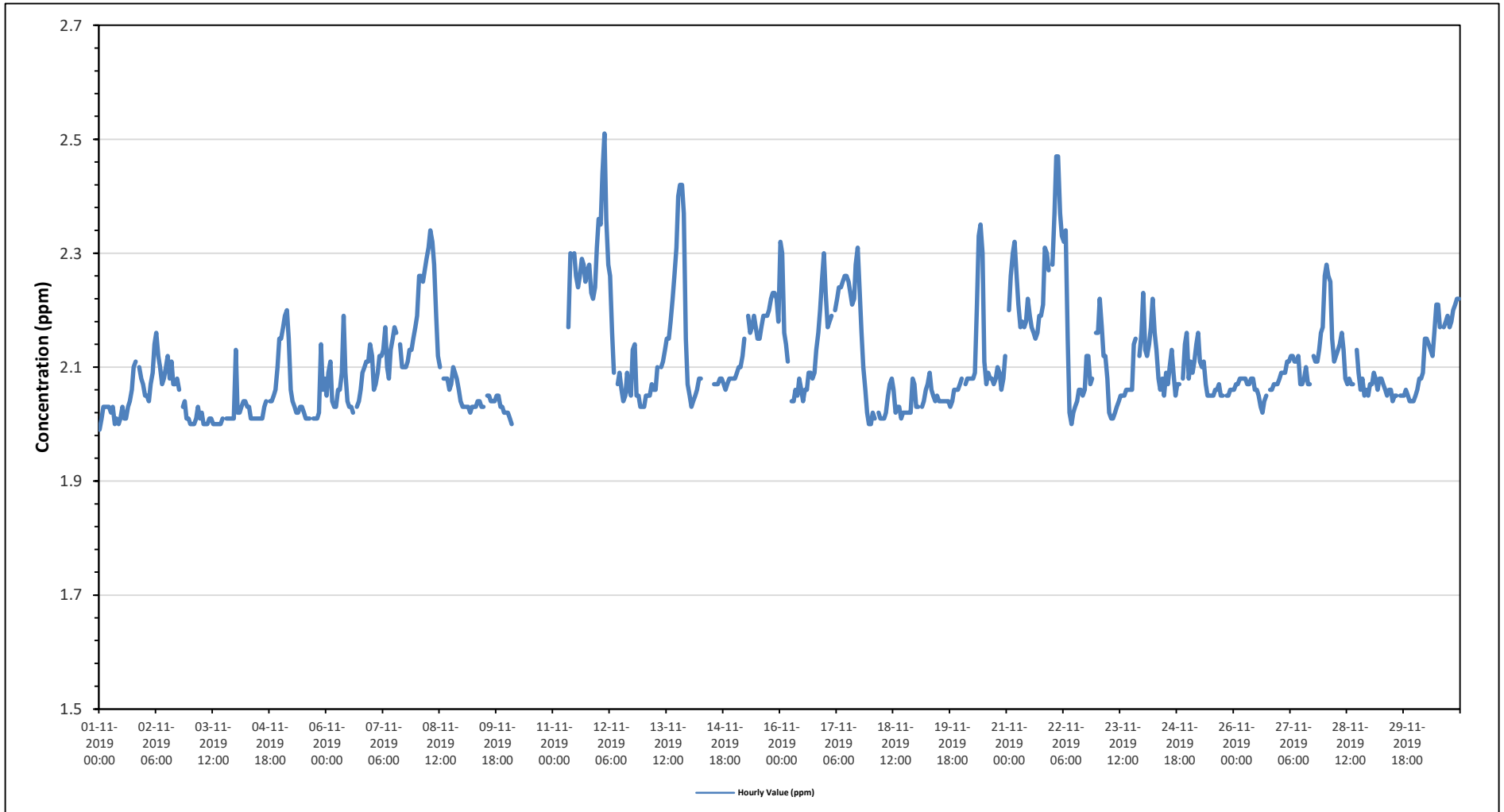
Wind: Maskwa Poll.: Maskwa-NO2[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.72% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	18.48	0	0	0	0	18.48
NE	3.81	0	0	0	0	3.81
E	2.49	0	0	0	0	2.49
SE	6.89	0	0	0	0	6.89
S	14.81	0	0	0	0	14.81
SW	24.63	0	0	0	0	24.63
W	15.98	0	0	0	0	15.98
NW	12.9	0	0	0	0	12.9
Summary	100	0	0	0	0	100

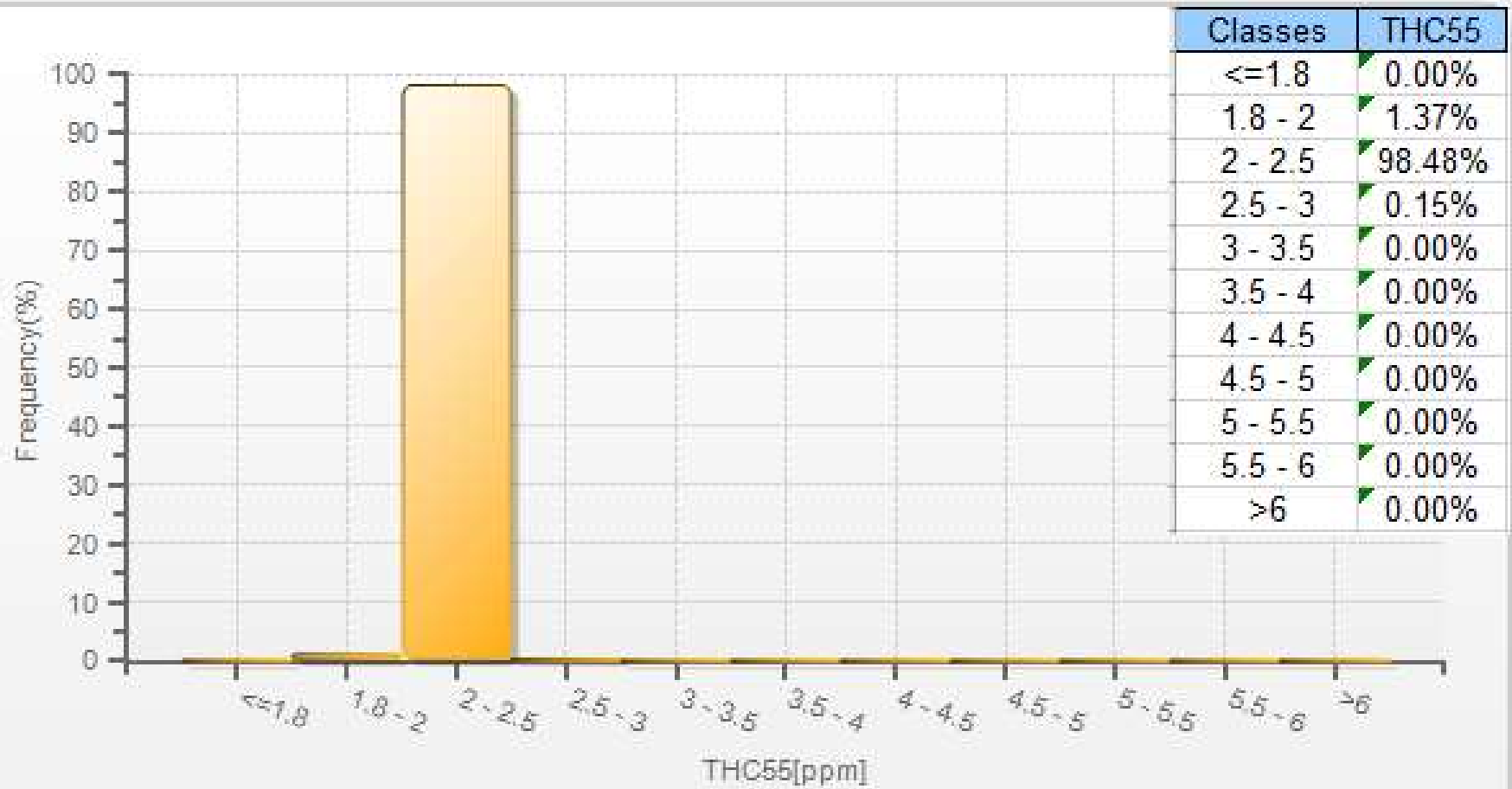


LICA-201911-Revision 1

Timeseries Chart of Hourly Average for THC - Maskwa Site

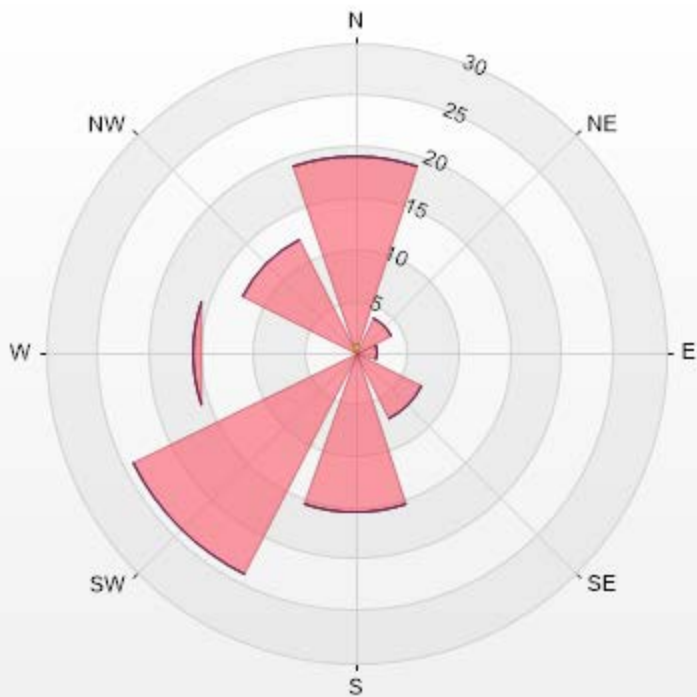


THC55[ppm] Histogram: Maskwa Monthly: 11-2019 1 Hr.



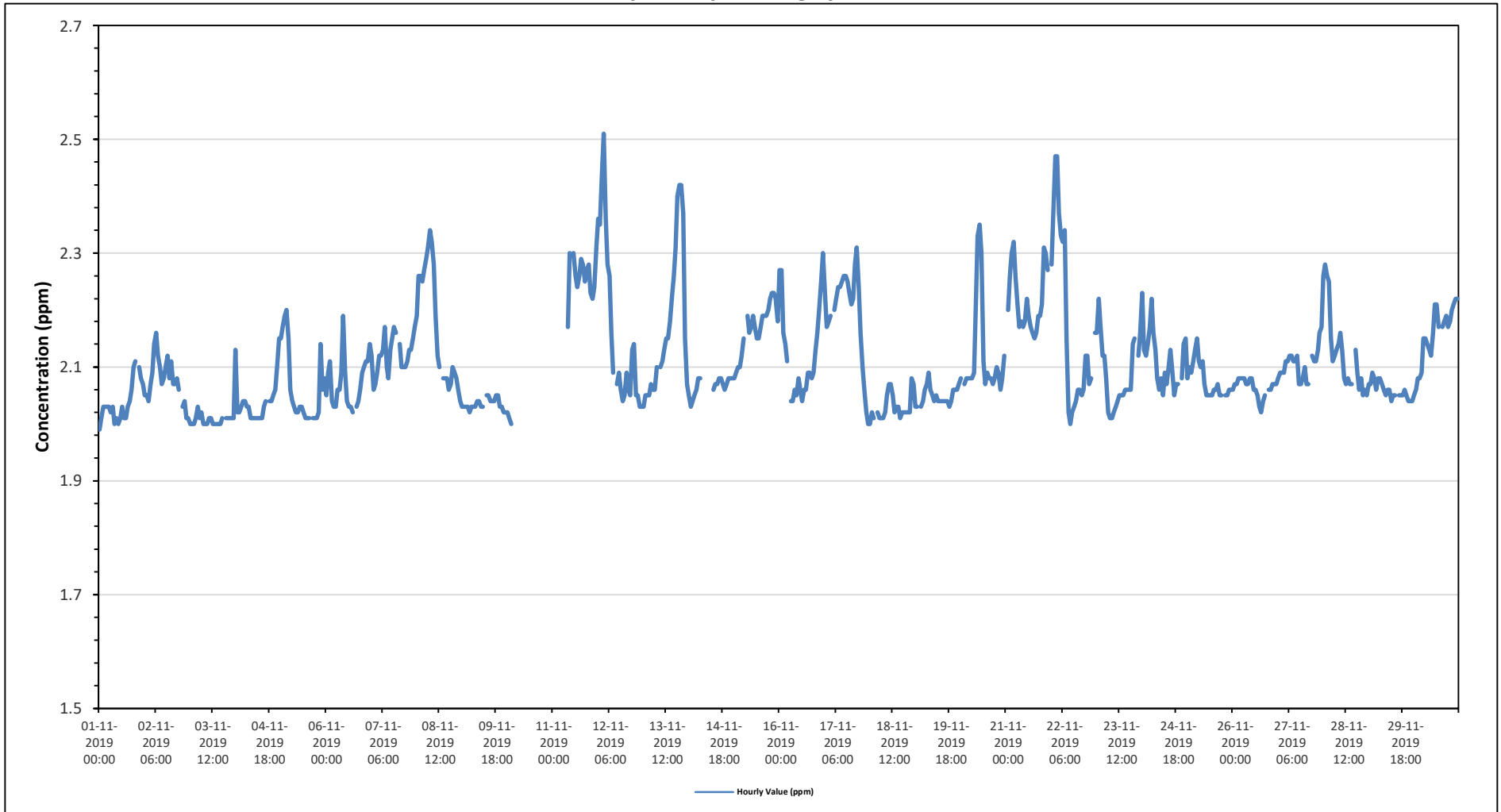
Wind: Maskwa Poll.: Maskwa-THC55[ppm] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 91.11% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	0.91	18.14	0	0	0	19.05
NE	0	3.81	0	0	0	3.81
E	0	2.13	0	0	0	2.13
SE	0	7.16	0	0	0	7.16
S	0	15.55	0	0	0	15.55
SW	0	24.09	0	0	0	24.09
W	0.15	15.7	0	0	0	15.85
NW	0.3	12.04	0	0	0	12.34
Summary	1.36	98.62	0	0	0	100

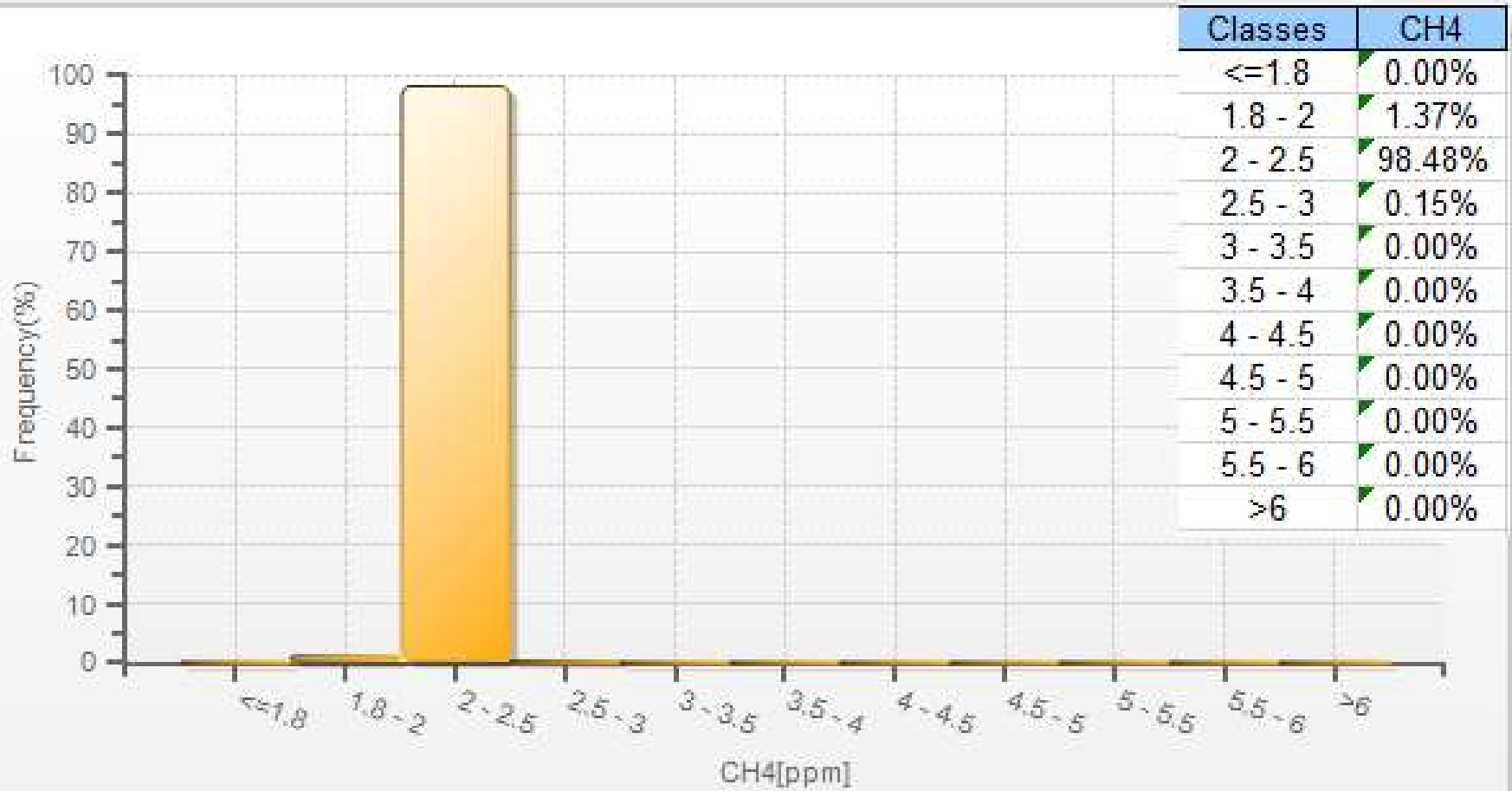


LICA-201911-Revision 1

Timeseries Chart of Hourly Average for CH4 - Maskwa Site

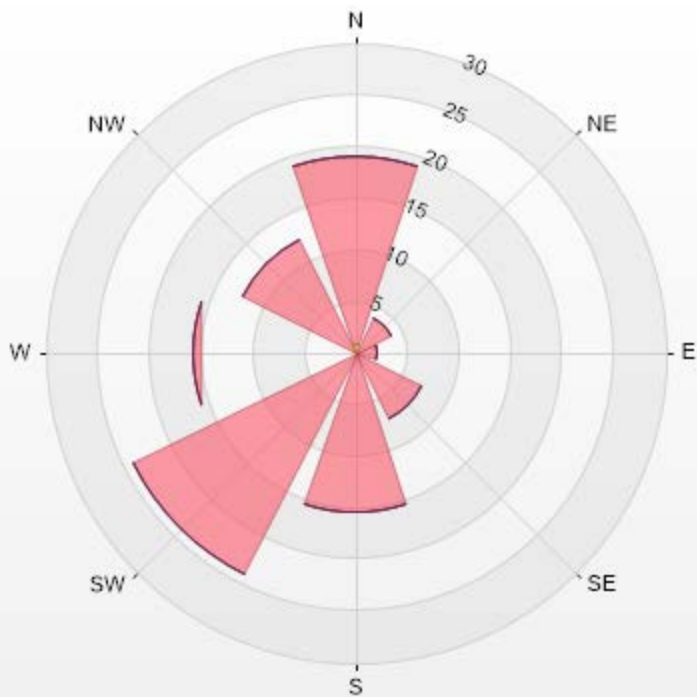


CH4[ppm] Histogram: Maskwa Monthly: 11-2019 1 Hr.



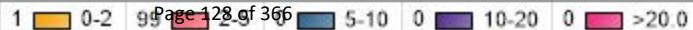
Wind: Maskwa Poll.: Maskwa-CH4[ppm] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 91.11% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	0.91	18.14	0	0	0	19.05
NE	0	3.81	0	0	0	3.81
E	0	2.13	0	0	0	2.13
SE	0	7.16	0	0	0	7.16
S	0	15.55	0	0	0	15.55
SW	0	24.09	0	0	0	24.09
W	0.15	15.7	0	0	0	15.85
NW	0.3	12.04	0	0	0	12.34
Summary	1.36	98.62	0	0	0	100



LICA-201911-Revision 1

% Icon Classes (ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Averages

NON-METHANE HYDROCARBONS (NMHC) in ppm

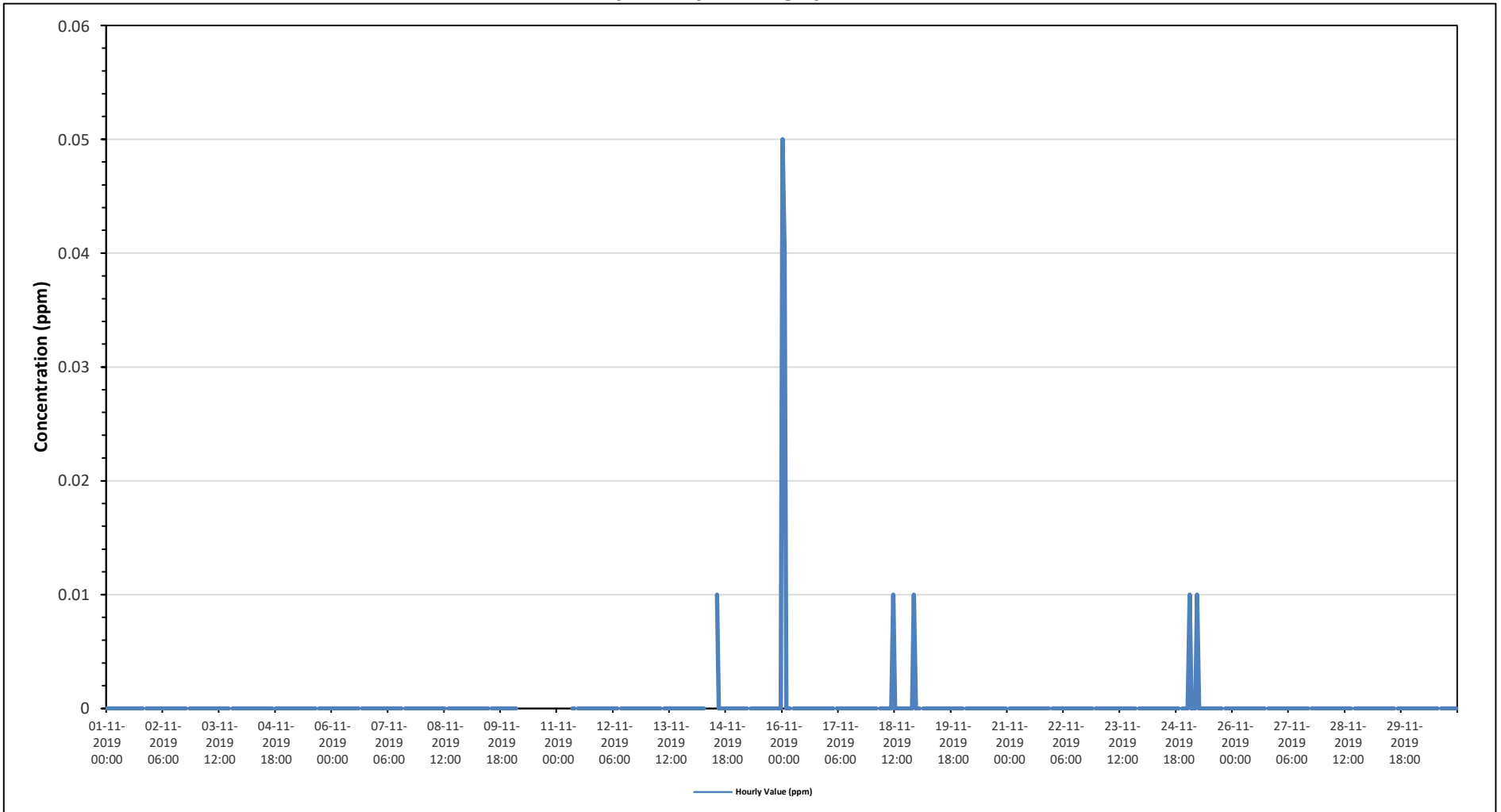
Maximum Hourly Value:	0.05 ppm on November 16 at hour 0	Hours in Service:	720
Maximum Daily Value:	0.00 ppm on November 16	Hours of Data:	657
Minimum Hourly Value:	0.00 ppm on November 1 at hour 0	Hours of Missing Data:	29
Minimum Daily Value:	0.00 ppm on November 1	Hours of Calibration:	34
Monthly Average:	0.00 ppm	Operational Uptime:	96.0

Day	Hourly Period Starting at (MST)																								Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
Nov 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 10	0.00	0.00	0.00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.00
Nov 11	X	X	X	X	X	X	X	X	X	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	C	C	C	C	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 15	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 16	0.05	0.04	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 17	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 18	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Nov 19	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 20	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 21	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00
Nov 22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	S	0.00	0.00
Nov 23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00
Nov 24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 25	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diurnal Maximum	0.05	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Diurnal Average	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

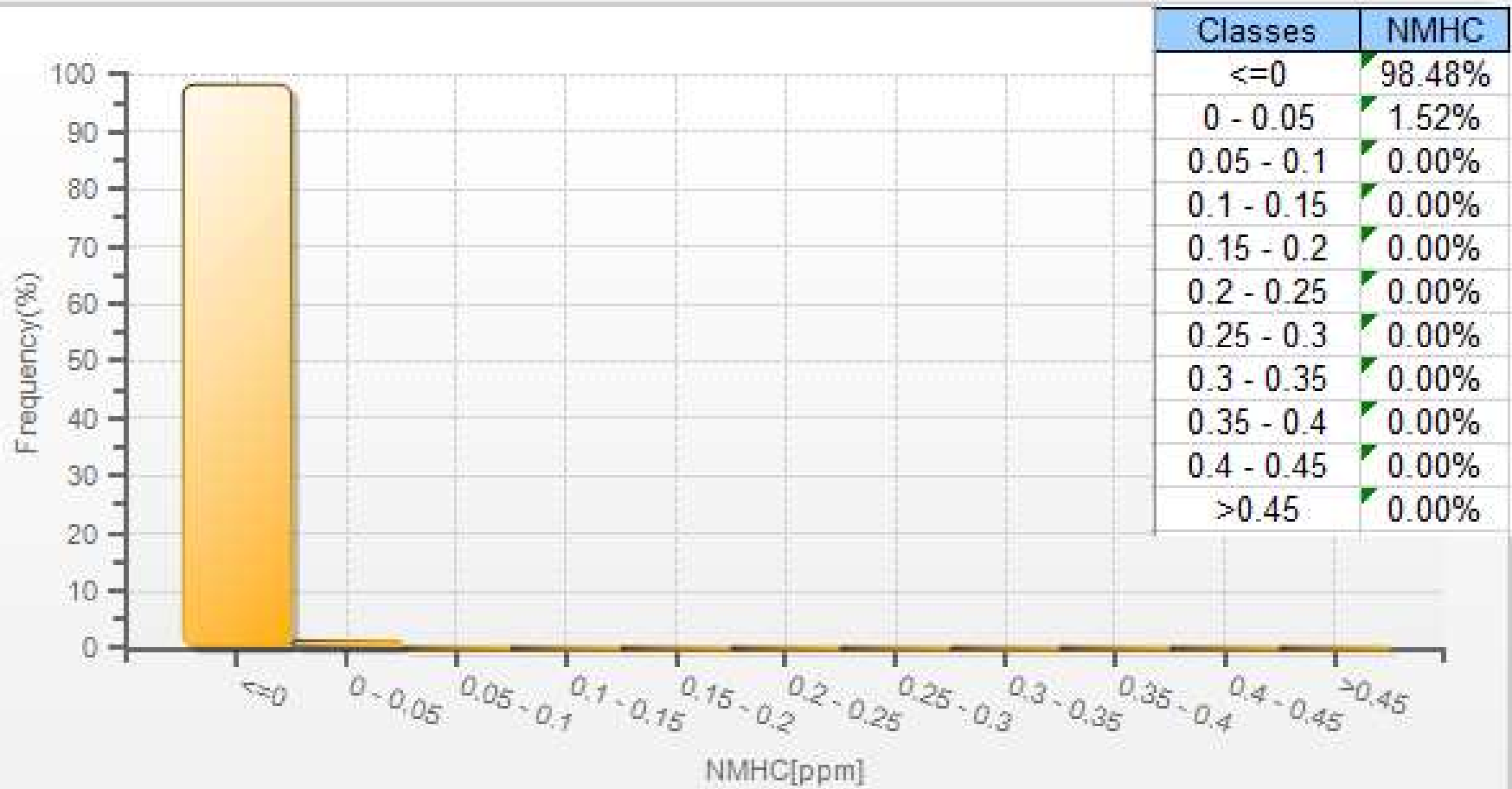
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for NMHC - Maskwa Site

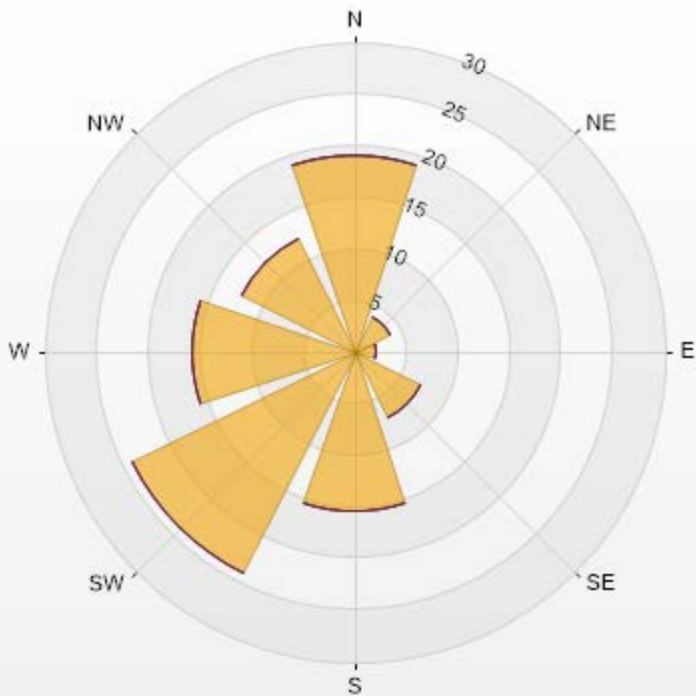


NMHC[ppm] Histogram: Maskwa Monthly: 11-2019 1 Hr.



Wind: Maskwa Poll.: Maskwa-NMHC[ppm] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 91.11% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-0.9	0.9-2	>2.0	Total
N	19.05	0	0	0	0	19.05
NE	3.81	0	0	0	0	3.81
E	2.13	0	0	0	0	2.13
SE	7.16	0	0	0	0	7.16
S	15.55	0	0	0	0	15.55
SW	24.09	0	0	0	0	24.09
W	15.85	0	0	0	0	15.85
NW	12.35	0	0	0	0	12.35
Summary	100	0	0	0	0	100



LICA-201911-Revision 1

% Icon Classes (ppm)	100	0	0	0	0
	0-0.1	0.1-0.3	0.3-0.9	0.9-2	>2.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Averages

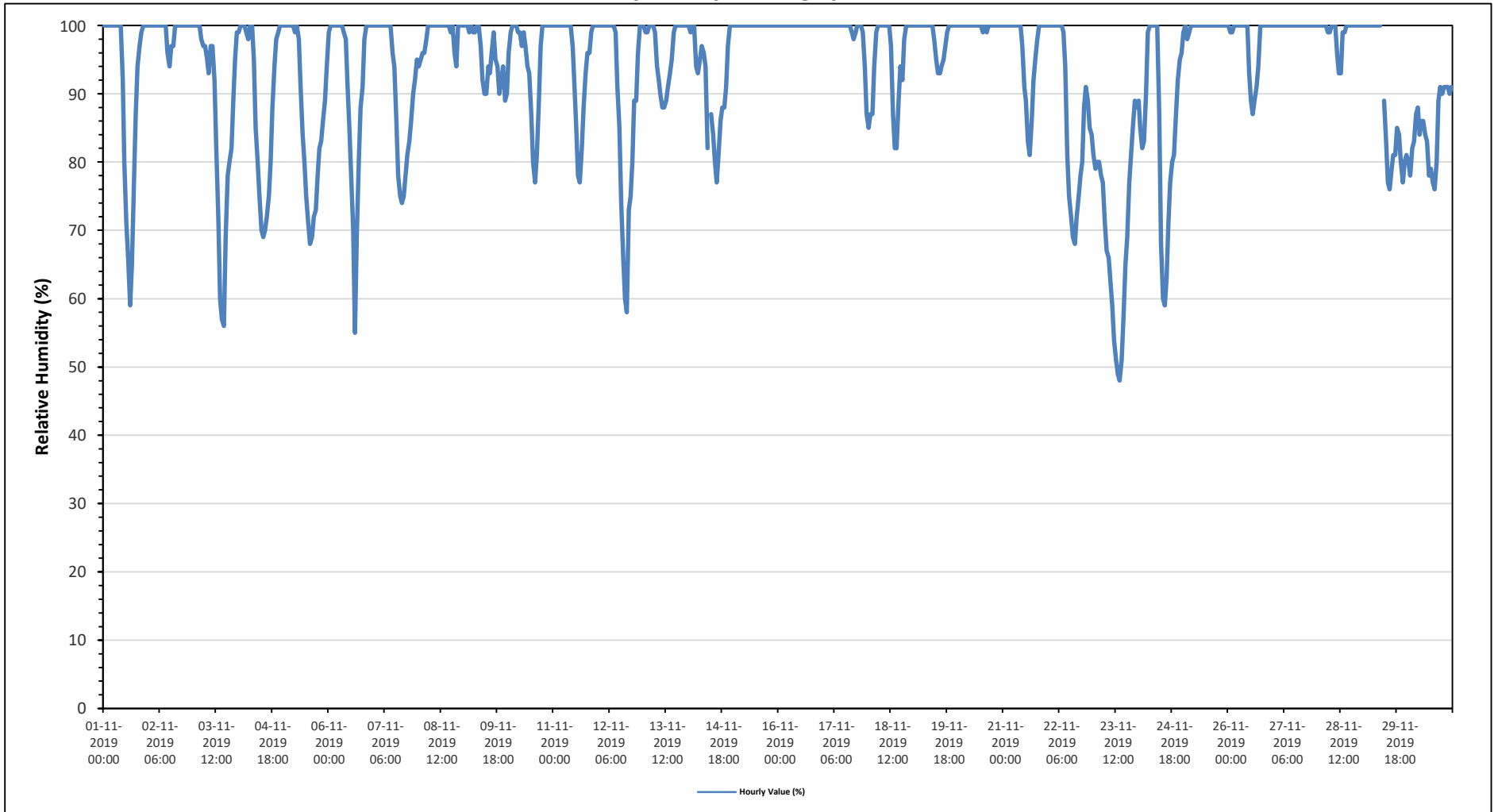
RELATIVE HUMIDITY (RH) in %

Maximum Hourly Value:	100 %	on November 1 at hour 0	Hours in Service:	720
Maximum Daily Value:	#### %	on November 15	Hours of Data:	718
Minimum Hourly Value:	48 %	on November 23 at hour 14	Hours of Missing Data:	2
Minimum Daily Value:	69.4 %	on November 23	Hours of Calibration:	0
Monthly Average:	93.3 %		Operational Uptime:	99.7

Day	Hourly Period Starting at (MST)																							Daily	Daily	Daily	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Minimum	Maximum	Average
Nov 1	100	100	100	100	100	100	100	100	100	100	92	80	71	66	59	65	77	87	94	97	99	100	100	100	59	100	91
Nov 2	100	100	100	100	100	100	100	100	100	100	96	94	97	97	100	100	100	100	100	100	100	100	100	100	94	100	99
Nov 3	100	100	100	100	98	97	97	95	93	97	97	92	82	72	60	57	56	69	78	80	82	89	95	99	56	100	87
Nov 4	99	100	100	100	99	98	100	100	95	85	80	75	70	69	70	72	75	80	88	94	98	99	100	100	69	100	89
Nov 5	100	100	100	100	100	100	99	100	98	91	84	80	75	71	68	69	72	73	78	82	83	86	89	94	68	100	87
Nov 6	99	100	100	100	100	100	100	100	99	98	91	85	78	70	55	69	80	88	91	98	100	100	100	100	55	100	92
Nov 7	100	100	100	100	100	100	100	100	100	100	96	94	86	78	75	74	75	78	81	83	86	90	92	95	74	100	91
Nov 8	94	95	96	96	98	100	100	100	100	100	100	100	100	100	100	100	100	99	100	96	94	100	100	100	94	100	99
Nov 9	100	100	100	99	100	99	99	100	100	97	92	90	90	94	93	96	99	95	94	90	92	94	89	90	89	100	96
Nov 10	96	99	100	100	100	99	99	97	99	97	94	93	87	80	77	81	89	97	100	100	100	100	100	100	77	100	95
Nov 11	100	100	100	100	100	100	100	100	100	100	97	92	86	78	77	82	88	93	96	96	99	100	100	100	77	100	95
Nov 12	100	100	100	100	100	100	100	100	100	99	91	85	74	66	60	58	73	75	80	89	89	96	100	100	58	100	89
Nov 13	100	99	99	100	100	100	99	94	92	90	88	88	89	91	93	95	99	100	100	100	100	100	100	100	88	100	97
Nov 14	100	99	100	100	94	93	95	97	96	94	82	Y	87	84	80	77	81	86	88	88	91	97	100	100	77	100	92
Nov 15	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Nov 16	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Nov 17	100	100	100	100	100	100	100	100	100	100	100	100	100	100	99	98	99	100	100	100	100	99	94	87	87	100	99
Nov 18	85	87	87	94	99	100	100	100	100	100	100	97	87	82	82	89	94	92	98	100	100	100	100	100	82	100	95
Nov 19	100	100	100	100	100	100	100	100	100	100	100	98	95	93	93	94	95	97	99	100	100	100	100	100	93	100	99
Nov 20	100	100	100	100	100	100	100	100	100	100	100	100	100	99	100	99	100	100	100	100	100	100	100	100	99	100	100
Nov 21	100	100	100	100	100	100	100	100	100	100	97	91	89	83	81	86	92	95	98	100	100	100	100	100	81	100	96
Nov 22	100	100	100	100	100	100	100	100	99	94	81	75	72	69	68	72	75	78	80	88	91	89	85	84	68	100	88
Nov 23	81	79	80	80	78	77	71	67	66	63	59	54	51	49	48	51	57	65	69	77	81	85	89	88	48	89	69
Nov 24	89	85	82	83	90	99	100	100	100	100	100	87	68	60	59	63	71	77	80	81	87	92	95	96	59	100	85
Nov 25	99	100	98	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	98	100	100
Nov 26	100	99	99	100	100	100	100	100	100	100	100	93	89	87	89	91	94	100	100	100	100	100	100	100	87	100	98
Nov 27	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Nov 28	100	100	100	100	100	99	99	100	100	100	96	93	93	99	99	100	100	100	100	100	100	100	100	100	93	100	99
Nov 29	100	100	100	100	100	100	100	100	100	100	Y	89	83	77	76	79	81	81	85	84	80	77	80	81	76	100	89
Nov 30	80	78	82	83	87	88	84	86	86	84	83	78	79	77	76	80	89	91	90	91	91	91	90	91	76	91	85
Diurnal Maximum	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100			
Daiurnal Average	97.4	97.3	97.4	97.8	98.1	98.3	98.1	97.9	97.4	96.3	93.0	89.9	86.3	83.2	81.3	83.0	86.8	89.9	92.0	93.7	94.8	96.1	96.6	96.8			

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for RH - Maskwa Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Averages

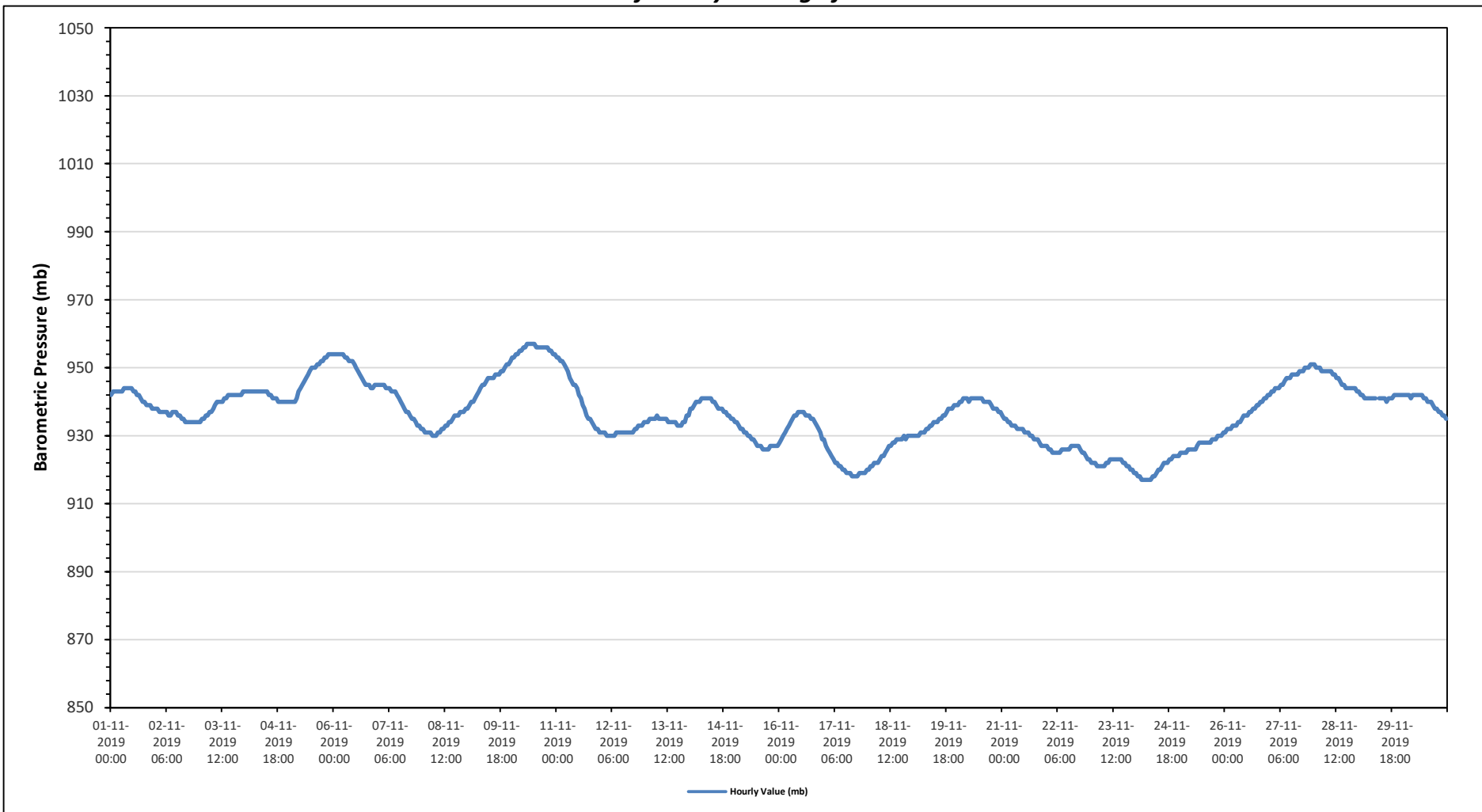
BAROMETRIC PRESSURE (BP) in millibar

Maximum Hourly Value:	957 mb on November 10 at hour 8	Hours in Service:	720
Maximum Daily Value:	955 mb on November 10	Hours of Data:	719
Minimum Hourly Value:	917 mb on November 24 at hour 3	Hours of Missing Data:	1
Minimum Daily Value:	920 mb on November 24	Hours of Calibration:	0
Monthly Average:	937 mb	Operational Uptime:	99.9

Day	Hourly Period Starting at (MST)																								Daily Minimum	Daily Maximum	Daily Average
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
Nov 1	942	943	943	943	943	943	943	944	944	944	944	944	943	943	942	942	941	940	940	939	939	939	938	938	938	944	942
Nov 2	938	938	937	937	937	937	937	936	936	937	937	937	936	936	935	935	934	934	934	934	934	934	934	934	934	938	936
Nov 3	934	935	935	936	936	937	937	938	939	940	940	940	941	941	942	942	942	942	942	942	942	942	942	942	943	943	940
Nov 4	943	943	943	943	943	943	943	943	943	943	943	943	943	942	942	941	941	941	940	940	940	940	940	940	940	943	942
Nov 5	940	940	940	940	941	943	944	945	946	947	948	949	950	950	950	951	951	952	952	953	953	954	954	954	954	954	948
Nov 6	954	954	954	954	954	954	953	953	952	952	952	951	950	949	948	947	946	945	945	945	944	944	945	945	945	954	950
Nov 7	945	945	945	945	944	944	944	943	943	942	941	940	939	938	937	937	936	935	935	935	934	933	933	932	932	945	940
Nov 8	932	931	931	931	931	930	930	930	931	931	932	932	933	933	934	934	935	936	936	936	937	937	937	938	938	938	933
Nov 9	938	939	940	940	941	942	943	944	945	945	946	947	947	947	947	948	948	948	949	949	950	951	951	952	952	946	946
Nov 10	953	953	954	954	955	955	956	956	957	957	957	957	956	956	956	956	956	956	956	955	955	954	954	954	955	955	942
Nov 11	953	953	952	952	951	950	949	947	946	945	944	942	941	939	938	936	935	935	934	933	932	932	931	931	931	931	942
Nov 12	931	931	931	930	930	930	930	930	931	931	931	931	931	931	931	931	931	931	932	932	933	933	933	934	934	934	931
Nov 13	934	934	935	935	935	935	936	935	935	935	935	935	935	934	934	934	934	934	933	933	933	934	934	936	936	936	935
Nov 14	938	938	939	940	940	940	941	941	941	941	941	940	940	939	938	938	938	938	937	937	936	935	935	935	935	939	939
Nov 15	934	934	933	932	932	931	931	930	930	929	929	928	927	927	926	926	926	926	926	927	927	927	927	927	927	927	929
Nov 16	928	929	930	931	932	933	934	935	936	936	937	937	937	937	936	936	936	935	935	934	933	932	931	929	928	934	934
Nov 17	929	927	926	925	924	923	922	922	921	921	920	919	919	919	918	918	918	918	919	919	919	919	920	920	920	929	929
Nov 18	920	921	921	922	922	922	923	924	925	926	927	927	928	928	929	929	929	929	930	929	930	930	930	930	930	930	936
Nov 19	930	930	930	930	931	931	931	932	932	933	933	934	934	934	935	935	936	936	937	938	938	938	939	939	939	939	934
Nov 20	939	940	940	941	941	941	940	941	941	941	941	941	941	941	940	940	940	940	939	938	938	938	937	937	937	941	940
Nov 21	936	935	935	934	934	933	933	933	932	932	932	931	931	931	930	930	929	929	929	928	927	927	927	927	927	931	931
Nov 22	927	926	926	925	925	925	925	925	926	926	926	926	927	927	927	927	927	926	925	925	924	923	923	923	923	927	926
Nov 23	922	922	922	921	921	921	921	921	922	922	923	923	923	923	923	923	922	922	921	921	920	920	919	919	919	923	922
Nov 24	919	918	918	917	917	917	917	917	917	918	918	919	920	920	921	922	922	922	923	923	924	924	924	924	924	924	920
Nov 25	925	925	925	925	926	926	926	926	926	927	928	928	928	928	928	928	929	929	929	930	930	930	931	931	931	931	928
Nov 26	931	932	932	932	933	933	933	934	934	935	936	936	936	937	937	938	938	939	939	940	940	941	941	942	942	942	936
Nov 27	942	943	943	944	944	944	945	945	946	947	947	947	948	948	948	948	949	949	949	950	950	950	951	951	951	947	947
Nov 28	951	950	950	950	949	949	949	949	949	949	948	948	947	947	946	945	945	944	944	944	944	944	943	943	943	943	947
Nov 29	943	942	942	941	941	941	941	941	941	941	X	941	941	941	941	940	941	941	941	942	942	942	942	942	942	941	941
Nov 30	942	942	942	942	941	942	942	942	942	942	942	941	941	940	940	940	939	938	938	937	937	936	936	935	935	941	941
Diurnal Maximum	954	954	954	954	955	955	956	956	957	957	957	957	956	956	956	956	956	956	956	955	955	954	954	954	954	954	954
Diurnal Average	936	936	936	936	936	937	937	937	937	937	937	937	937	937	937	937	936	936	936	936	936	936	936	936	936	936	936
C	Calibration	S						Daily Zero/Span	Q	Quality Assurance	C1						Repeat Calibration	S1						Repeat Daily Zero/Span			
G	Out for Repair	K						Collection Error	N	Not in Service	O						Operator Error	P						Power Failure			
R	Recovery	X						Machine Malfunction	Y	Maintenance	T						Exceeds Temperature Limits	N						Not in Service			

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for BP - Maskwa Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Averages

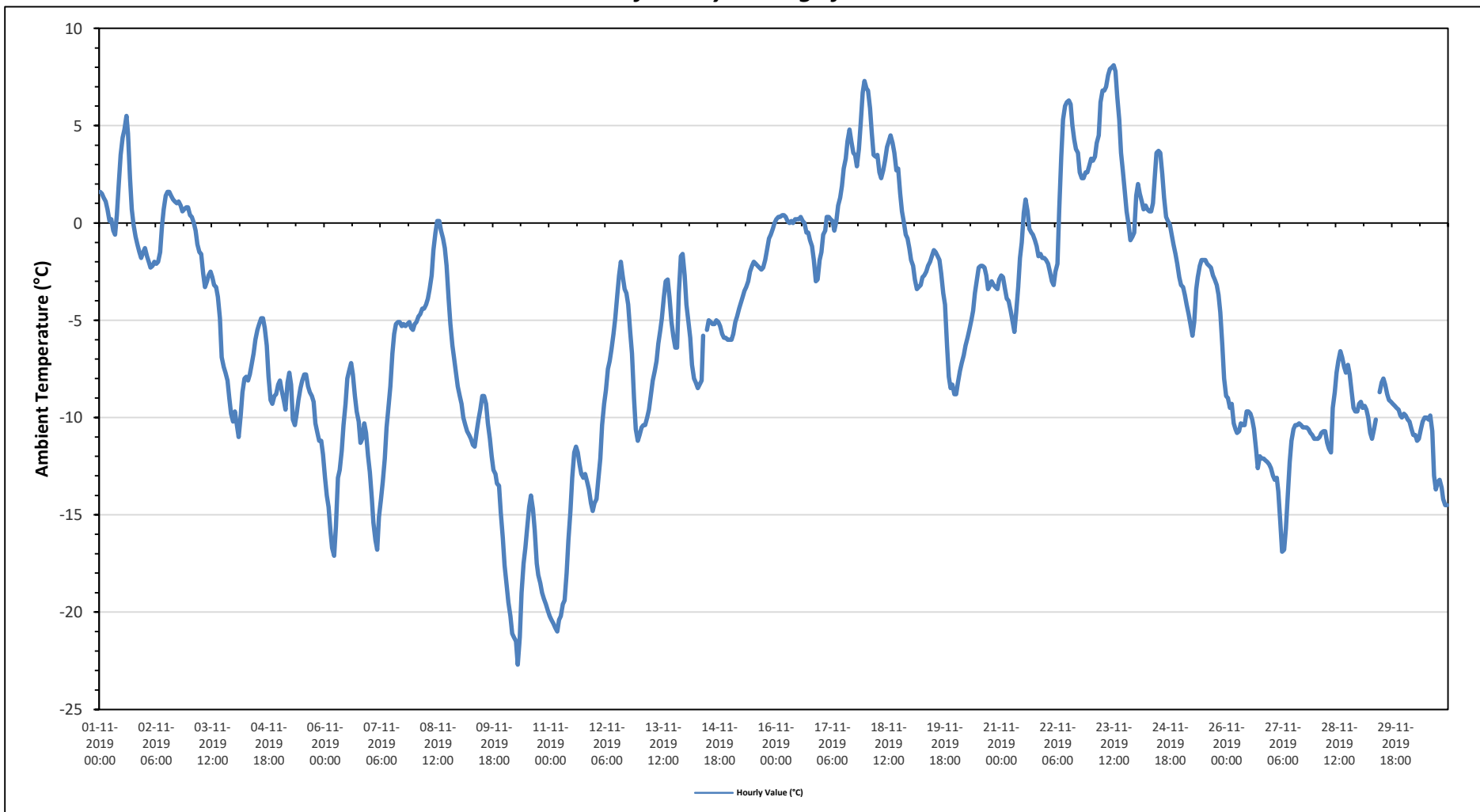
AMBIENT TEMPERATURE (AT) in Degree Celsius

Maximum Hourly Value:	8.1 °C on November 23 at hour 13	Hours in Service:	720
Maximum Daily Value:	4.4 °C on November 23	Hours of Data:	718
Minimum Hourly Value:	-22.7 °C on November 10 at hour 7	Hours of Missing Data:	2
Minimum Daily Value:	-18.5 °C on November 10	Hours of Calibration:	0
Monthly Average:	-5.6 °C	Operational Uptime:	99.7

Day	Hourly Period Starting at (MST)																								Daily	Daily	Daily
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Minimum	Maximum	Average
Nov 1	1.6	1.5	1.3	1.1	0.7	0.1	0.2	-0.4	-0.6	0.4	2.1	3.5	4.4	4.8	5.5	4.6	2.3	0.7	-0.1	-0.7	-1.1	-1.5	-1.8	-1.5	-1.8	5.5	1.1
Nov 2	-1.3	-1.7	-2.0	-2.3	-2.2	-2.0	-2.1	-2.0	-1.5	-0.2	0.7	1.4	1.6	1.6	1.4	1.2	1.1	1.0	1.1	0.9	0.6	0.7	0.8	0.8	-2.3	1.6	-0.1
Nov 3	0.4	0.3	0.0	-0.4	-1.1	-1.5	-1.6	-2.6	-3.3	-3.0	-2.7	-2.5	-2.8	-3.2	-3.3	-3.8	-4.9	-6.9	-7.4	-7.7	-8.1	-9.0	-9.8	-10.2	-10.2	0.4	-4.0
Nov 4	-9.7	-10.4	-11.0	-9.9	-8.7	-8.0	-7.9	-8.1	-7.8	-7.3	-6.7	-6.0	-5.5	-5.2	-4.9	-4.9	-5.4	-6.3	-7.9	-9.1	-9.3	-8.9	-8.8	-8.3	-11.0	-4.9	-7.8
Nov 5	-8.1	-8.6	-9.1	-9.6	-8.2	-7.7	-8.3	-10.1	-10.4	-9.8	-9.1	-8.5	-8.1	-7.8	-7.8	-8.4	-8.7	-8.9	-9.2	-10.3	-10.8	-11.2	-11.2	-11.9	-11.9	-7.7	-9.2
Nov 6	-13.1	-14.0	-14.6	-15.9	-16.7	-17.1	-15.6	-13.1	-12.7	-11.7	-10.4	-9.3	-8.0	-7.6	-7.2	-7.8	-8.9	-9.7	-10.2	-11.3	-11.1	-10.3	-10.8	-12.0	-17.1	-7.2	-11.6
Nov 7	-12.8	-14.2	-15.4	-16.3	-16.8	-15.1	-14.2	-13.3	-12.1	-10.5	-9.4	-8.4	-6.7	-5.7	-5.2	-5.1	-5.1	-5.3	-5.2	-5.3	-5.2	-5.1	-5.4	-5.5	-16.8	-5.1	-9.3
Nov 8	-5.2	-5.1	-4.8	-4.7	-4.4	-4.2	-3.9	-3.4	-2.7	-1.4	-0.5	0.1	0.1	0.4	-0.8	-1.3	-2.2	-3.9	-5.2	-6.3	-7.0	-7.7	-8.4	-8.4	0.1	-3.7	
Nov 9	-8.9	-9.3	-10.0	-10.4	-10.7	-10.9	-11.1	-11.4	-11.5	-10.7	-10.1	-9.6	-8.9	-8.9	-9.3	-10.3	-11.1	-12.0	-12.7	-12.9	-13.4	-13.5	-14.9	-16.2	-16.2	-8.9	-11.2
Nov 10	-17.6	-18.6	-19.5	-20.2	-21.1	-21.3	-21.5	-22.7	-21.3	-19.0	-17.5	-16.7	-15.7	-14.6	-14.0	-14.7	-15.8	-17.5	-18.1	-18.5	-19.0	-19.3	-19.6	-19.9	-22.7	-14.0	-18.5
Nov 11	-20.2	-20.4	-20.6	-20.8	-21.0	-20.4	-20.2	-19.6	-19.4	-18.0	-16.3	-14.8	-13.1	-11.8	-11.5	-11.8	-12.4	-12.9	-13.1	-12.9	-13.3	-13.7	-14.4	-14.8	-21.0	-11.5	-16.1
Nov 12	-14.4	-14.2	-13.2	-12.1	-10.4	-9.3	-8.6	-7.5	-7.1	-6.5	-5.7	-4.9	-3.7	-2.7	-2.0	-2.7	-3.4	-3.6	-4.2	-5.6	-6.7	-9.0	-10.6	-11.2	-14.4	-2.0	-7.5
Nov 13	-10.9	-10.5	-10.4	-10.4	-10.0	-9.6	-8.8	-8.1	-7.6	-7.1	-6.2	-5.5	-4.9	-3.8	-3.0	-2.9	-3.8	-5.1	-5.8	-6.4	-6.4	-3.6	-1.7	-1.6	-10.9	-1.6	-6.4
Nov 14	-2.7	-4.2	-5.1	-5.9	-7.3	-8.0	-8.2	-8.5	-8.3	-8.1	-5.8	Y	-5.5	-5.0	-5.1	-5.2	-5.2	-5.0	-5.1	-5.3	-5.7	-5.9	-5.9	-6.0	-8.5	-2.7	-6.0
Nov 15	-6.0	-6.0	-5.7	-5.1	-4.8	-4.4	-4.1	-3.8	-3.5	-3.3	-3.0	-2.5	-2.2	-2.0	-2.1	-2.2	-2.3	-2.4	-2.3	-1.9	-1.4	-0.8	-0.6	-0.3	-6.0	-0.3	-3.0
Nov 16	0.0	0.2	0.3	0.3	0.4	0.4	0.3	0.1	0.0	0.1	0.0	0.2	0.2	0.2	0.3	0.1	0.0	-0.5	-0.5	-0.9	-1.2	-1.9	-3.0	-2.9	-3.0	0.4	-0.3
Nov 17	-1.9	-1.5	-0.6	-0.4	0.3	0.3	0.2	0.1	-0.4	0.1	0.9	1.3	1.9	2.8	3.3	4.2	4.8	4.2	3.6	3.5	2.9	3.8	5.1	6.7	-1.9	6.7	1.9
Nov 18	7.3	6.9	6.8	5.9	4.6	3.5	3.4	3.5	2.6	2.3	2.7	3.2	3.9	4.2	4.5	4.1	3.6	2.7	2.8	1.5	0.6	0.0	-0.6	-0.8	-0.8	7.3	3.3
Nov 19	-1.3	-1.9	-2.2	-2.9	-3.4	-3.3	-3.2	-2.8	-2.7	-2.5	-2.2	-2.0	-1.7	-1.4	-1.5	-1.7	-1.9	-2.6	-3.6	-4.2	-6.3	-7.9	-8.5	-8.3	-8.5	-1.3	-3.3
Nov 20	-8.8	-8.8	-8.2	-7.6	-7.2	-6.8	-6.3	-5.9	-5.5	-5.0	-4.5	-3.6	-2.9	-2.3	-2.2	-2.2	-2.3	-2.7	-3.4	-3.2	-3.0	-3.2	-3.3	-3.4	-8.8	-2.2	-4.7
Nov 21	-2.9	-2.7	-2.8	-3.4	-3.9	-4.0	-4.5	-5.0	-5.6	-4.6	-3.3	-1.8	-1.0	0.5	1.2	0.6	-0.3	-0.5	-0.6	-0.9	-1.2	-1.7	-1.6	-1.8	-5.6	1.2	-2.2
Nov 22	-1.8	-1.9	-2.1	-2.5	-3.0	-3.2	-2.5	-2.1	0.7	3.4	5.3	6.0	6.2	6.3	6.1	5.0	4.3	3.8	3.6	2.6	2.3	2.3	2.6	2.6	-3.2	6.3	1.8
Nov 23	2.9	3.3	3.2	3.4	4.1	4.5	6.2	6.8	6.8	7.0	7.6	7.9	8.0	8.1	7.8	6.5	5.3	3.6	2.7	1.6	0.6	-0.1	-0.9	-0.7	-0.9	8.1	4.4
Nov 24	-0.5	1.4	2.0	1.5	1.1	0.7	0.9	0.7	0.6	0.6	1.0	2.5	3.6	3.7	3.6	2.5	1.3	0.3	0.1	-0.1	-0.6	-1.1	-1.6	-2.1	-2.1	3.7	0.9
Nov 25	-2.8	-3.2	-3.3	-3.7	-4.2	-4.7	-5.2	-5.8	-5.1	-3.4	-2.8	-2.2	-1.9	-1.9	-1.9	-2.1	-2.2	-2.3	-2.7	-2.9	-3.2	-3.7	-4.6	-6.3	-6.3	-1.9	-3.4
Nov 26	-8.0	-8.9	-9.0	-9.5	-9.3	-10.3	-10.6	-10.8	-10.7	-10.3	-10.4	-10.4	-9.7	-9.7	-9.8	-10.1	-10.6	-11.6	-12.6	-12.0	-12.1	-12.1	-12.2	-12.3	-12.6	-8.0	-10.5
Nov 27	-12.4	-12.6	-13.0	-13.2	-13.1	-13.8	-15.4	-16.9	-16.8	-15.7	-14.1	-12.3	-11.2	-10.6	-10.4	-10.4	-10.3	-10.4	-10.5	-10.5	-10.5	-10.6	-10.8	-10.9	-16.9	-10.3	-12.4
Nov 28	-11.1	-11.1	-11.1	-11.0	-10.8	-10.7	-10.7	-11.3	-11.6	-11.8	-9.5	-8.7	-7.7	-7.1	-6.6	-6.9	-7.4	-7.7	-7.3	-7.8	-8.6	-9.5	-9.7	-9.7	-11.8	-6.6	-9.4
Nov 29	-9.3	-9.2	-9.5	-9.4	-9.6	-10.0	-10.8	-11.1	-10.6	-10.1	Y	-8.7	-8.2	-8.0	-8.3	-8.8	-9.1	-9.2	-9.3	-9.4	-9.5	-9.6	-9.9	-10.0	-11.1	-8.0	-9.5
Nov 30	-9.8	-9.9	-10.1	-10.2	-10.6	-10.9	-10.9	-11.2	-11.1	-10.6	-10.2	-10.0	-10.1	-10.1	-9.9	-10.7	-13.0	-13.7	-13.3	-13.2	-13.6	-14.2	-14.5	-14.5	-14.5	-9.8	-11.5
Diurnal Maximum	7.3	6.9	6.8	5.9	4.6	4.5	6.2	6.8	6.8	7.0	7.6	7.9	8.0	8.1	7.8	6.5	5.3	4.2	3.6	3.5	2.9	3.8	5.1	6.7			
Daiurnal Average	-6.3	-6.5	-6.7	-6.9	-6.9	-6.9	-6.8	-6.9	-6.7	-5.9	-4.9	-4.2	-3.7	-3.2	-3.1	-3.5	-4.1	-4.8	-5.2	-5.6	-6.0	-6.3	-6.5	-6.7			
C	Calibration					S	Daily Zero/Span				Q	Quality Assurance			O	Repeat Calibration			S1	Repeat Daily Zero/Span							
G	Out for Repair					N	Collection Error				N	Not in Service			C1	Operator Error			P	Power Failure							
R	Recovery					X	Machine Malfunction				Y	Maintenance			T	Exceeds Temperature Limits			N	Not in Service							

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for AT - Maskwa Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Averages

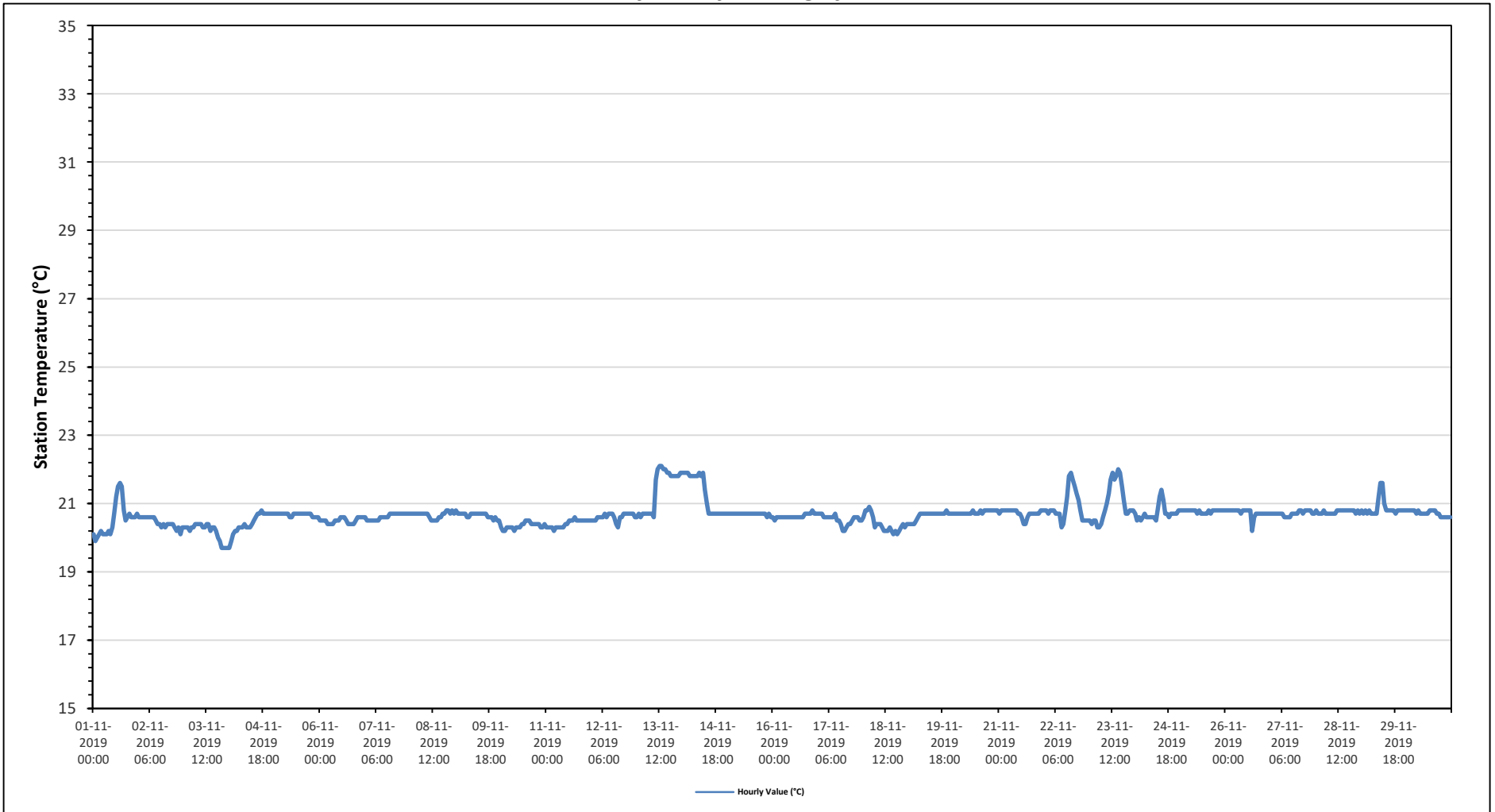
STATION TEMPERATURE (ST) in Degree Celsius

Maximum Hourly Value:	22.1 °C	on November 13 at hour 12	Hours in Service:	720
Maximum Daily Value:	21.4 °C	on November 13	Hours of Data:	720
Minimum Hourly Value:	19.7 °C	on November 3 at hour 20	Hours of Missing Data:	0
Minimum Daily Value:	20.2 °C	on November 3	Hours of Calibration:	0
Monthly Average:	20.7 °C		Operational Uptime:	100.0

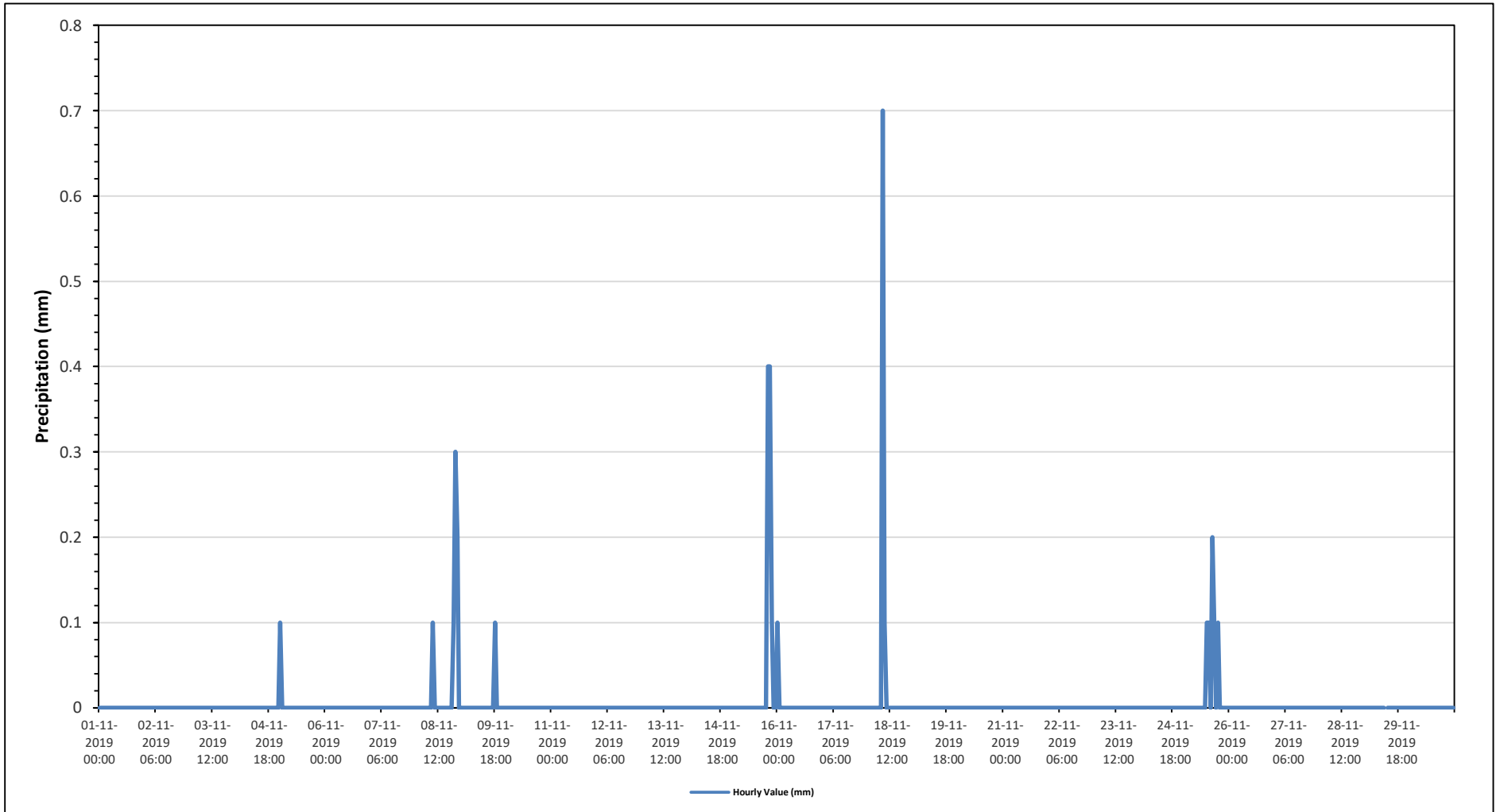
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	20.1	19.9	20.0	20.1	20.2	20.1	20.1	20.1	20.2	20.1	20.3	20.7	21.2	21.5	21.6	21.5	20.8	20.5	20.6	20.7	20.6	20.6	20.6	20.7	19.9	21.6	20.5
Nov 2	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.5	20.4	20.4	20.3	20.4	20.3	20.4	20.4	20.4	20.4	20.3	20.2	20.3	20.1	20.3	20.1	20.6	20.4
Nov 3	20.3	20.3	20.3	20.2	20.3	20.3	20.4	20.4	20.4	20.4	20.3	20.3	20.4	20.4	20.2	20.3	20.3	20.2	20.0	19.9	19.7	19.7	19.7	19.7	19.7	20.4	20.2
Nov 4	19.7	19.9	20.1	20.2	20.2	20.3	20.3	20.4	20.4	20.3	20.3	20.3	20.4	20.5	20.6	20.7	20.7	20.8	20.7	20.7	20.7	20.7	20.7	20.7	19.7	20.8	20.4
Nov 5	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.6	20.6	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.6	20.6	20.6	20.6	20.6	20.7	20.7
Nov 6	20.5	20.5	20.5	20.5	20.4	20.4	20.4	20.4	20.5	20.5	20.5	20.6	20.6	20.6	20.5	20.4	20.4	20.4	20.4	20.5	20.6	20.6	20.6	20.6	20.4	20.6	20.5
Nov 7	20.6	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.6	20.6	20.6	20.6	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.5	20.7	20.6
Nov 8	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.6	20.5	20.5	20.5	20.5	20.6	20.6	20.7	20.7	20.8	20.8	20.7	20.8	20.7	20.5	20.8	20.7
Nov 9	20.8	20.7	20.7	20.7	20.7	20.7	20.6	20.6	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.6	20.6	20.6	20.5	20.6	20.5	20.5	20.5	20.8	20.7
Nov 10	20.3	20.2	20.2	20.3	20.3	20.3	20.3	20.2	20.3	20.3	20.3	20.4	20.4	20.5	20.5	20.5	20.4	20.4	20.4	20.4	20.4	20.3	20.3	20.4	20.2	20.5	20.3
Nov 11	20.3	20.3	20.3	20.3	20.2	20.3	20.3	20.3	20.3	20.3	20.4	20.4	20.5	20.5	20.5	20.6	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.2	20.6	20.4
Nov 12	20.5	20.5	20.5	20.6	20.6	20.6	20.6	20.7	20.6	20.7	20.7	20.7	20.6	20.4	20.3	20.6	20.6	20.7	20.7	20.7	20.7	20.7	20.7	20.6	20.3	20.7	20.6
Nov 13	20.6	20.7	20.6	20.7	20.7	20.7	20.7	20.7	20.7	20.6	21.7	22.0	22.1	22.1	22.0	22.0	21.9	21.9	21.8	21.8	21.8	21.8	21.8	21.9	20.6	22.1	21.4
Nov 14	21.9	21.9	21.9	21.9	21.8	21.8	21.8	21.8	21.8	21.9	21.8	21.9	21.4	21.0	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	21.9	21.3
Nov 15	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.6	20.7	20.6	20.6	20.7	20.7
Nov 16	20.6	20.5	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.7	20.7	20.7	20.7	20.8	20.7	20.7	20.5	20.8	20.6
Nov 17	20.7	20.7	20.7	20.6	20.6	20.6	20.6	20.6	20.6	20.7	20.5	20.5	20.4	20.2	20.2	20.3	20.4	20.4	20.5	20.6	20.6	20.6	20.5	20.5	20.2	20.7	20.5
Nov 18	20.6	20.8	20.8	20.9	20.8	20.6	20.3	20.4	20.4	20.4	20.3	20.2	20.2	20.2	20.3	20.2	20.1	20.2	20.1	20.2	20.3	20.4	20.3	20.4	20.1	20.9	20.4
Nov 19	20.4	20.4	20.4	20.4	20.5	20.6	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.8	20.7	20.7	20.7	20.4	20.8	20.6
Nov 20	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.8	20.7	20.7	20.7	20.8	20.7	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.7	20.8	20.7
Nov 21	20.7	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.7	20.6	20.4	20.4	20.6	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.8	20.8	20.4	20.8	20.7
Nov 22	20.8	20.8	20.7	20.8	20.8	20.8	20.7	20.7	20.7	20.3	20.4	20.8	21.2	21.8	21.9	21.7	21.5	21.3	21.1	20.8	20.5	20.5	20.5	20.5	20.3	21.9	20.9
Nov 23	20.5	20.4	20.5	20.5	20.3	20.3	20.4	20.6	20.8	21.0	21.3	21.7	21.9	21.7	21.8	22.0	21.9	21.5	21.1	20.7	20.7	20.8	20.8	20.8	20.3	22.0	21.0
Nov 24	20.7	20.5	20.6	20.5	20.6	20.7	20.6	20.6	20.6	20.6	20.6	20.5	20.8	21.2	21.4	21.1	20.7	20.7	20.6	20.7	20.7	20.7	20.8	20.5	21.4	20.7	20.7
Nov 25	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.7	20.8	20.7	20.7	20.7	20.7	20.8	20.7	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.7	20.8	20.8
Nov 26	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.7	20.8	20.8	20.8	20.8	20.2	20.6	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.2	20.8	20.7
Nov 27	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.6	20.6	20.6	20.6	20.7	20.7	20.7	20.7	20.8	20.8	20.7	20.8	20.8	20.8	20.8	20.8	20.7	20.6	20.8	20.7
Nov 28	20.8	20.7	20.7	20.7	20.8	20.7	20.7	20.7	20.7	20.7	20.7	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.7	20.8	20.8
Nov 29	20.8	20.7	20.8	20.7	20.8	20.7	20.7	20.7	20.7	21.2	21.6	21.6	21.0	20.8	20.8	20.8	20.8	20.8	20.7	20.8	20.8	20.8	20.8	20.7	20.7	21.6	20.9
Nov 30	20.8	20.8	20.8	20.8	20.8	20.7	20.8	20.7	20.7	20.7	20.7	20.7	20.8	20.8	20.8	20.8	20.7	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.8	20.7
Diurnal Maximum	21.9	21.9	21.9	21.9	21.8	21.8	21.8	21.8	21.8	21.9	21.8	22.0	22.1	22.1	22.0	22.0	21.9	21.9	21.8	21.8	21.8	21.8	21.9	21.9	21.9	21.9	21.9
Daiurnal Average	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.7	20.8	20.8	20.8	20.8	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.6	20.6	20.6	20.7
C	Calibration				S	Daily Zero/Span				Q	Quality Assurance				C1	Repeat Calibration							S1	Repeat Daily Zero/Span			
G	Out for Repair				K	Collection Error				N	Not in Service				O	Operator Error								P	Power Failure		
R	Recovery				X	Machine Malfunction				Y	Maintenance				T	Exceeds Temperature Limits								N	Not in Service		

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for ST - Maskwa Site



Timeseries Chart of Hourly Average for Precipitation - Maskwa Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr

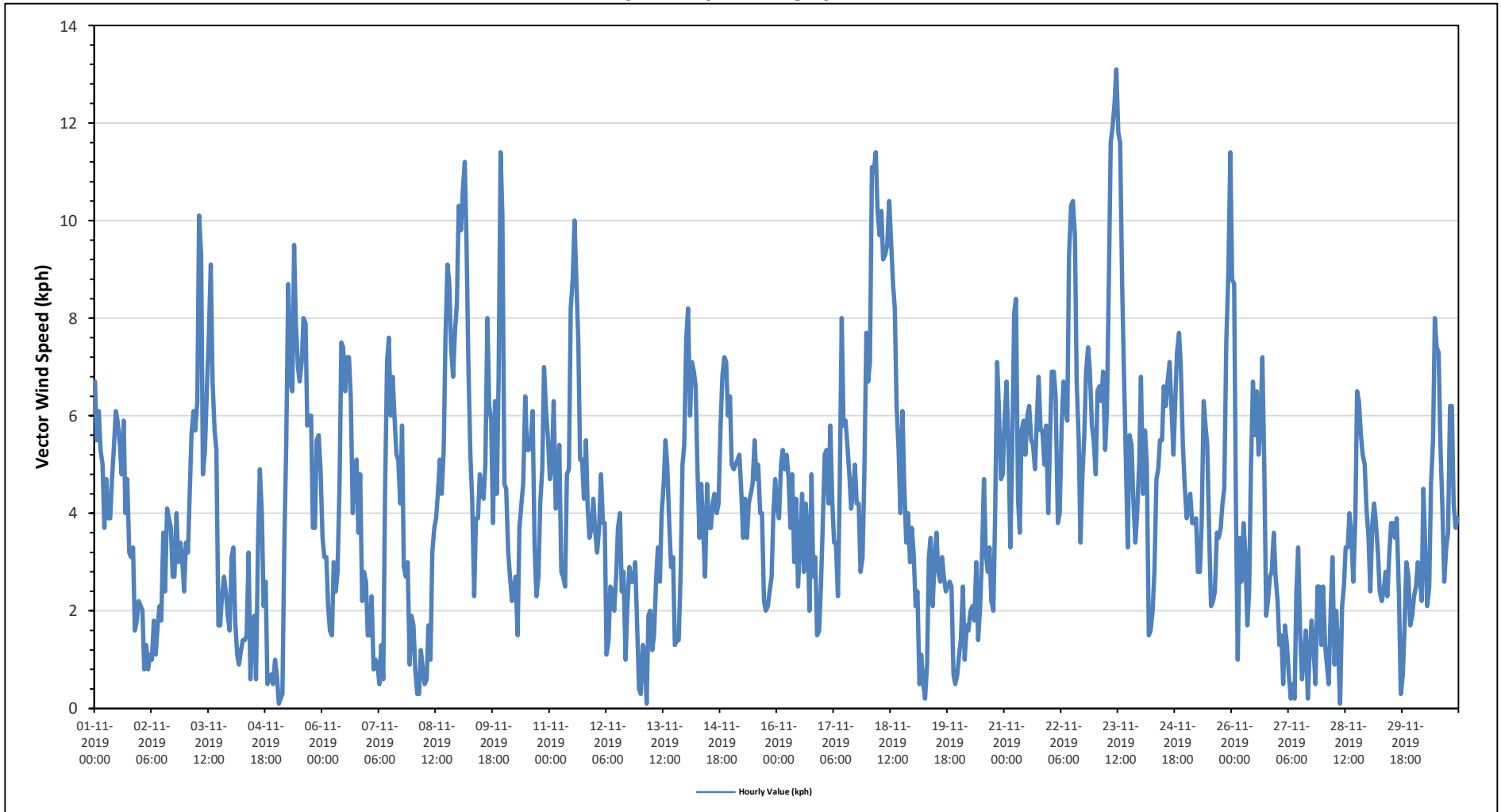
Maximum Hourly Value:	13.1 kph	on November 23 at hour 11	Hours in Service:	720
Maximum Daily Value:	7.6 kph	on November 18	Hours of Data:	720
Minimum Hourly Value:	0.1 kph	on November 5 at hour 1	Hours of Missing Data:	0
Minimum Daily Value:	1.3 kph	on November 27	Hours of Calibration:	0
Monthly Average:	1.4 kph		Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	6.7	5.5	6.1	5.3	5	3.7	4.7	3.9	3.9	4.7	5.3	6.1	5.9	5.4	4.8	5.9	4	4.7	3.2	3.1	3.3	1.6	1.8	2.2	1.6	6.7	4.5
Nov 2	2.1	2	0.8	1.3	0.8	1.1	1	1.8	1.1	1.7	2.1	1.8	3.6	2.4	4.1	3.9	3.7	2.7	2.7	4	3	3.4	3.1	2.4	0.8	4.1	2.4
Nov 3	3.4	3.2	4.4	5.6	6.1	5.7	6.3	10.1	9.3	4.8	5.3	6.6	7.6	9.1	6.7	5.7	5.3	1.7	1.7	2.3	2.7	2.4	1.9	1.6	1.6	10.1	5.0
Nov 4	3.1	3.3	1.8	1.1	0.9	1.2	1.4	1.4	1.5	3.2	0.6	1.5	1.9	0.6	3.4	4.9	4	2.1	2.6	0.5	0.6	0.7	0.5	1	0.5	4.9	1.8
Nov 5	0.7	0.1	0.2	0.3	3.5	5.4	8.7	6.7	6.5	9.5	7.9	7	6.7	7.1	8	7.9	5.8	6	6	3.7	3.7	5.5	5.6	4.9	0.1	9.5	5.3
Nov 6	3.5	3.1	3.1	2.1	1.6	1.5	3	2.4	2.8	4.6	7.5	7.4	6.5	7.2	7.2	6.4	4	4.9	5.1	3.6	4.8	2.2	2.8	2.6	1.5	7.5	4.2
Nov 7	1.5	1.5	2.3	0.8	1	0.9	0.5	1.3	0.6	4.4	7.1	7.6	6	6.8	6	5.2	5.1	4.2	5.8	2.9	2.7	3	0.9	1.9	0.5	7.6	3.3
Nov 8	1.7	0.8	0.3	0.3	1.2	0.8	0.5	0.6	1.7	1	3.2	3.7	3.9	4.4	5.1	4.4	5.3	7.6	9.1	8.7	7.4	6.8	7.7	8.3	0.3	9.1	3.9
Nov 9	10.3	9.8	10.6	11.2	9.5	7.1	5.2	4.3	2.3	3.9	3.9	4.8	4.5	4.3	5	8	6.2	5.9	3.8	6.3	4.4	6.7	11.4	10.1	2.3	11.4	6.6
Nov 10	4.6	4.5	3.2	2.7	2.2	2.4	2.7	1.5	3.7	4.2	4.6	6.4	5.3	5.3	5.5	6.1	3.3	2.3	2.7	4.2	4.9	7	6.1	5.5	1.5	7.0	4.2
Nov 11	4.7	5	6.3	4.1	4.2	5.4	2.8	2.7	2.5	4.8	4.9	8.2	8.8	10	8.8	7.5	5.1	5.1	4.3	5.5	4.1	3.5	3.7	4.3	2.5	10.0	5.3
Nov 12	3.6	3.2	3.7	4.8	3.8	3.8	1.1	1.4	2.5	2.4	2	2.7	3.7	4	2.4	2.8	1	2.1	2.9	2.6	2.6	3	1.8	0.4	0.4	4.8	2.7
Nov 13	0.3	1.3	1.1	0.1	1.9	2	1.2	1.5	2.6	3.3	2.6	4	4.6	5.5	5	3.8	2.9	3.1	1.3	1.4	1.4	2.8	5	5.4	0.1	5.5	2.7
Nov 14	7.6	8.2	6	7.1	6.9	6.6	4.9	3.5	4.6	3.6	2.7	4.6	3.7	3.7	4.2	4.4	4	4.2	5.8	6.8	7.2	7.1	6	6.4	2.7	8.2	5.4
Nov 15	5	4.9	5	5.1	5.2	4.4	3.5	4.3	3.5	4.2	4.4	4.6	5.5	4.7	5	4	4	2.2	2	2.1	2.4	2.7	4	4.7	2.0	5.5	4.1
Nov 16	4.1	3.9	5	5.3	4.9	5.2	4.7	3.7	4.8	3	4.3	2.5	3.3	4.4	2.8	4.2	3.6	2	4.8	2.7	3.1	1.5	1.6	2.5	1.5	5.3	3.7
Nov 17	3.7	5.2	5.3	4.2	5.8	4.2	3.4	3.4	2.3	4.5	8	5.8	5.9	5.4	4.8	4.1	4.4	5	4.2	4.2	2.8	3.1	4.8	7.7	2.3	8.0	4.7
Nov 18	6.7	7.1	11.1	11	11.4	10.2	9.7	10.2	9.2	9.3	9.5	10.4	9.6	8.7	8.2	6.2	5.3	4	6.1	4.6	3.4	4	3	3.7	3.0	11.4	7.6
Nov 19	3.2	2.1	2.4	0.5	1.1	0.5	0.2	0.9	3.1	3.5	2.1	3	3.6	2.8	2.6	3.1	2.7	2.4	2.5	2.6	2.5	0.7	0.5	0.7	0.2	3.6	2.1
Nov 20	1.1	1.4	2.5	1	1.7	1.6	2	2.1	1.8	3	1.4	2.1	3.1	4.7	3.2	2.8	3.3	2.2	2	4	7.1	6.1	4.7	4.8	1.0	7.1	2.9
Nov 21	5.9	6.7	5.5	3.3	5.2	8.1	8.4	4.3	3.6	5.7	5.9	5.2	6	6.2	5.5	5.4	4.9	5.9	6.8	5.7	5.7	5	5.8	4	3.3	8.4	5.6
Nov 22	5.5	6.9	6.9	6.4	3.8	4	5.8	6.7	6.2	5.9	9.3	10.3	10.4	9.7	6.7	5.5	3.4	4.7	5.6	6.9	7.4	6.9	5.8	5.5	3.4	10.4	6.5
Nov 23	4.8	6.5	6.6	6.3	6.9	5.3	6.1	8.9	11.6	11.9	12.4	13.1	11.8	11.6	8.7	6.9	5	3.3	5.6	5.4	4.3	3.4	4	5	3.3	13.1	7.3
Nov 24	6.8	4.4	5.7	5	1.5	1.6	2	2.8	4.7	4.9	5.5	5.5	6.6	6.2	6.7	7.1	6.2	5.2	6.3	7.3	7.7	7	5.4	4.6	1.5	7.7	5.3
Nov 25	3.9	4.1	4.4	3.8	3.8	3.9	2.8	3.8	3.8	6.3	5.8	5.4	3.5	2.1	2.2	2.4	3.6	3.5	3.7	4.2	4.5	7.5	8.9	11.4	2.1	11.4	4.5
Nov 26	8.8	8.7	4.1	1	3.5	2.6	3.8	3.2	1.7	2.4	4.9	6.7	5.6	6.5	5.2	5.9	7.2	4.8	1.9	2.2	2.7	2.8	3.6	2.7	1.0	8.8	4.3
Nov 27	2.2	1.3	1.5	0.5	1.7	1.3	0.7	0.2	0.5	0.2	2.4	3.3	1.5	0.6	1.1	1.6	0.2	1.1	1.8	1.2	0.5	2.5	2.5	1.3	0.2	3.3	1.3
Nov 28	2.5	1.3	0.9	0.5	2	3.1	0.9	2	1.1	0.1	2.1	2.5	3.3	3.3	4	3.5	2.6	3.9	6.5	6.3	5.6	5.2	5	4.1	0.1	6.5	3.0
Nov 29	3.5	2.4	3.8	4.2	3.8	3.2	2.4	2.2	2.4	2.8	2.3	3.2	3.8	3.8	3.5	3.9	2.3	0.3	0.7	1.7	3	2.7	1.7	1.9	0.3	4.2	2.7
Nov 30	2.3	2.5	3	2.8	2.2	4.5	3.2	2.1	2.5	4.6	5.5	8	7.4	7.3	5.4	4.1	2.6	3.3	3.6	6.2	6.2	4.2	3.7	3.9	2.1	8.0	4.2
Diurnal Maximum	10	10	11	11	11	10	10	10	12	12	12	13	12	12	9	8	7	8	9	9	8	8	11	11			
Diurnal Average	4.1	4.0	4.1	3.6	3.8	3.7	3.5	3.4	3.6	4.3	4.9	5.5	5.5	5.5	5.1	4.9	4.0	3.7	4.0	4.1	4.1	4.0	4.1	4.2			

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

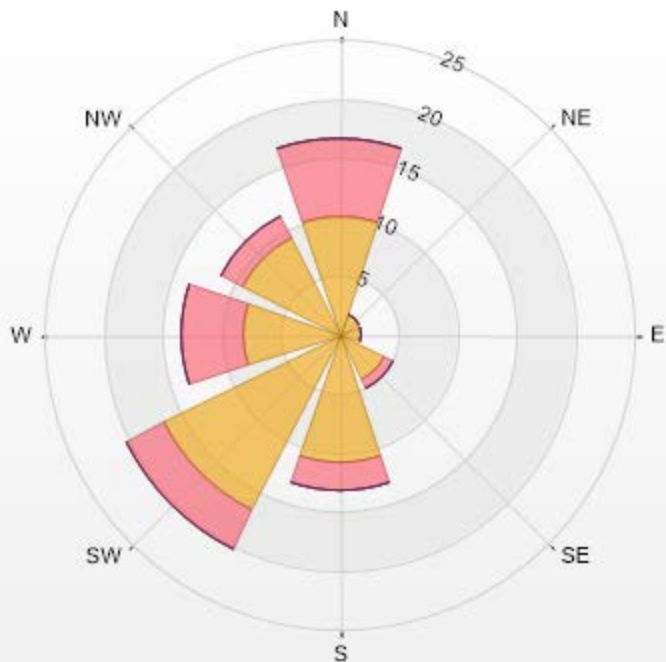
Timeseries Chart of Hourly Average for VWS - Maskwa Site



Wind: Maskwa Poll.: Maskwa-WDS[kph] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 16.11% Valid Data: 100.00% Calm Avg: 1.04 [kph]

Direction	0-6	6-15	15-29	29-39	>39.0	Total
N	10.14	6.53	0	0	0	16.67
NE	1.94	0	0	0	0	1.94
E	1.94	0	0	0	0	1.94
SE	4.31	0.83	0	0	0	5.14
S	10.83	2.36	0	0	0	13.19
SW	16.67	3.61	0	0	0	20.28
W	8.19	5.28	0	0	0	13.47
NW	9.31	1.94	0	0	0	11.25
Summary	63.33	20.55	0	0	0	83.88

Maskwa Poll.: Maskwa-WDS[kph] 01-11-2019 00:00 - 30-11-2019 23:00 Calm: 16.11% Calm Poll Avg: 1.04 [kph]



LICA-201911-Revision 1

% Icon Classes (kph)	63	0-6	21	6-10	0	15-29	0	29-39	0	>39.0
----------------------	----	-----	----	------	---	-------	---	-------	---	-------



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Averages

WIND DIRECTION (VWD) in sector

Monthly Average:	267 (W) degree	Hours in Service:	720
		Hours of Data:	720
		Hours of Missing Data:	0
		Hours of Calibration:	0
		Operational Uptime:	100.0

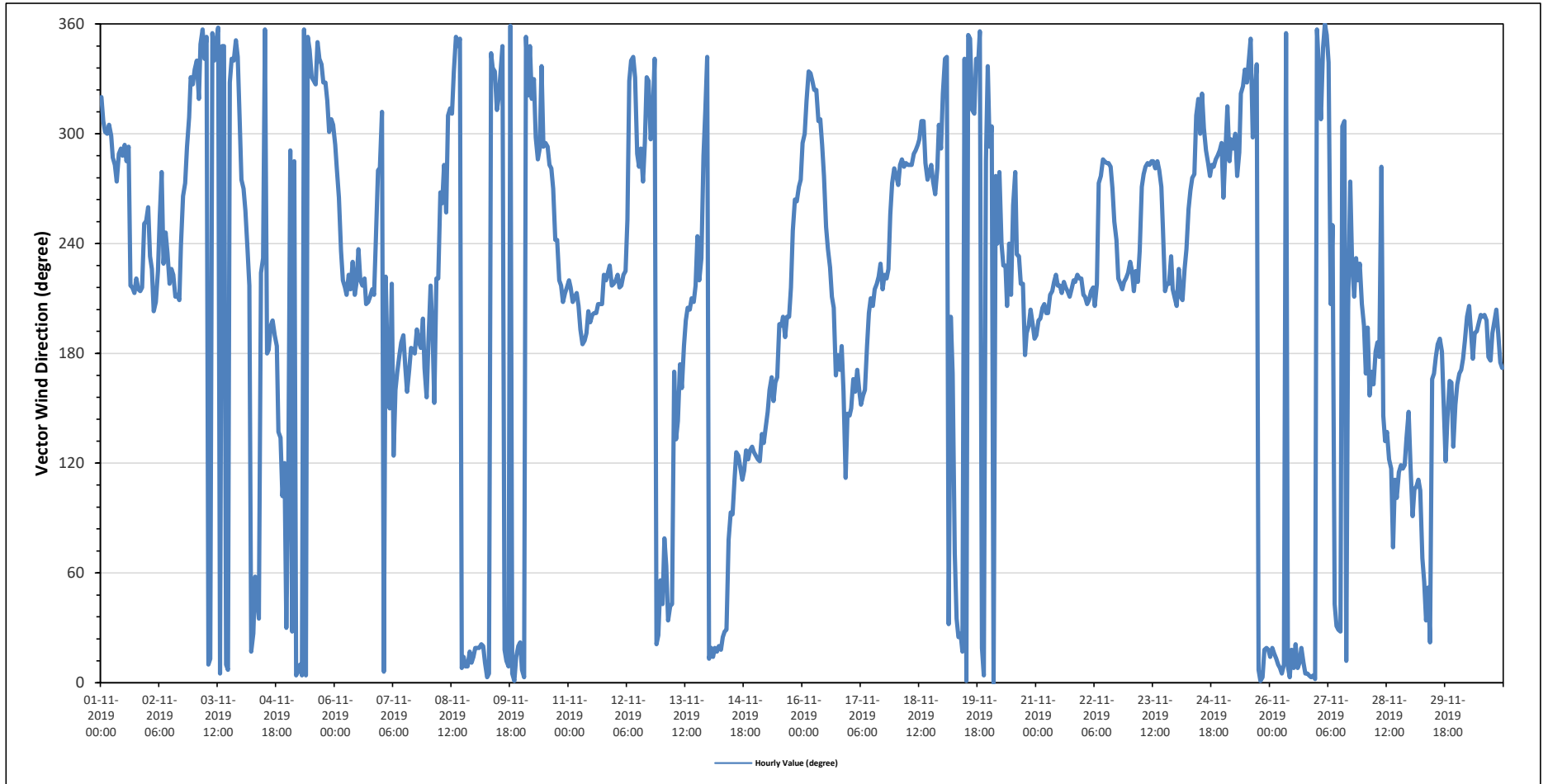
Day	Hourly Period Starting at (MST)																							Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Degree	Quadrant
Nov 1	NW	NW	WNW	WNW	WNW	WNW	WNW	W	W	WNW	WNW	WNW	WNW	WNW	SW	SW	SSW	SW	SSW	SSW	SW	WSW	WSW	277	W	
Nov 2	WSW	SW	SW	SSW	SSW	SW	WSW	W	SW	WSW	SW	SW	SW	SSW	SSW	SSW	WSW	W	W	WNW	NW	NNW	NW	248	WSW	
Nov 3	NNW	NNW	NW	NNW	N	NNW	N	N	NNE	N	NNW	N	N	NNW	NNW	N	N	NNW	NNW	NNW	N	NNW	NW	353	N	
Nov 4	W	W	WSW	SW	SW	NNE	NNE	ENE	NE	NE	SW	SW	N	S	S	SSW	SSW	S	S	SE	SE	E	ESE	NNE	212	SSW
Nov 5	ESE	WNW	NNE	WNW	N	N	N	N	N	N	N	NNW	NNW	NNW	NW	N	NNW	NNW	NNW	NNW	NW	WNW	NW	WNW	342	NNW
Nov 6	WNW	W	W	SW	SW	SW	SSW	SW	SSW	SW	SSW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	WSW	W	W	227	SW
Nov 7	NW	N	SW	S	SSE	SW	ESE	SSE	SSE	S	S	S	S	SSE	S	S	S	S	S	S	S	SSE	S	SSE	181	S
Nov 8	S	SW	S	SSE	SW	SW	W	W	W	WSW	NW	NW	NW	NNW	N	NNW	N	N	NNE	N	N	NNE	NNE	NNE	355	N
Nov 9	NNE	NNE	NNE	NNE	NNE	NNE	N	N	NNW	NNW	NNW	NNW	NNW	NNW	NNE	NNE	N	N	N	NNE	NNE	NNE	NNE	8	N	
Nov 10	N	N	N	NW	NNW	NW	NNW	WNW	WNW	WNW	NNW	NNW	WNW	WNW	W	W	WSW	WSW	SW	SW	SSW	SSW	SW	281	W	
Nov 11	SW	SW	SSW	SSW	SSW	SSW	S	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SW	207	SSW	
Nov 12	SW	SW	SW	SW	SW	SW	WSW	NNW	NNW	NNW	NNW	WNW	W	WNW	W	WNW	NNW	NNW	WNW	NW	NNW	NNE	NNE	280	W	
Nov 13	NE	ENE	ENE	NE	NE	NE	SSE	SE	SE	S	SSE	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	WNW	NW	NNW	207	SSW
Nov 14	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	ENE	E	E	ESE	SE	ESE	ESE	ESE	ESE	SE	ESE	SE	SE	73	ENE	
Nov 15	ESE	ESE	ESE	SE	SE	SE	SE	SSE	SSE	SSE	SSE	SSE	SSW	SSW	SSW	S	SSW	SSW	SSW	SSW	SSW	W	W	174	S	
Nov 16	WNW	WNW	NW	NNW	NNW	NNW	NW	NW	NW	NW	WNW	W	WSW	SW	SW	SSW	SSW	SSE	S	S	SSE	ESE	SE	277	W	
Nov 17	SE	SSE	SSE	SSE	S	SSE	SSE	SSE	SSE	S	SSW	SSW	SSW	SSW	SW	SW	SW	SSW	SW	SW	SW	WSW	W	202	SSW	
Nov 18	W	W	W	WNW	W	WNW	W	W	W	WNW	WNW	WNW	WNW	NW	NW	WNW	W	W	W	W	W	W	WNW	WNW	286	WNW
Nov 19	NW	NNW	NNW	NNE	SSW	SSE	ENE	NE	NNE	NNE	NNW	N	N	N	NW	NW	NNW	NNW	N	NNE	N	WNW	NNW	350	N	
Nov 20	WNW	WNW	N	W	WSW	W	WSW	SW	SW	SSW	WSW	SSW	W	W	SW	SW	SW	SW	S	S	SSW	SSW	SSW	S	222	SW
Nov 21	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	212	SSW	
Nov 22	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	243	WSW	
Nov 23	SW	SW	SSW	SW	SW	SW	W	W	W	WNW	W	WNW	WNW	W	WNW	W	W	WSW	SSW	SW	SW	SW	SSW	SSW	260	WSW
Nov 24	SSW	SW	SSW	SSW	SSW	SSW	WSW	W	W	W	NW	NW	WNW	NW	WNW	WNW	W	W	WNW	WNW	WNW	WNW	WNW	278	W	
Nov 25	W	WNW	NW	WNW	WNW	WNW	WNW	W	WNW	NW	NW	NNW	NNW	NNW	N	NNW	NW	NNW	N	N	N	NNE	NNE	334	NNW	
Nov 26	NNE	NNE	NNE	NNE	N	N	N	N	N	N	N	NNE	N	NNE	N	NNE	NNE	NNE	N	N	N	N	N	11	NNE	
Nov 27	N	NNW	NW	NNW	N	N	NNW	SSW	WSW	NE	NNE	NNE	NNE	WNW	NW	NNE	SSW	W	SSW	SSW	SSW	SSW	SSW	322	NW	
Nov 28	SSW	SSE	SSW	SSE	SSE	SSE	S	S	S	W	SE	SE	SE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SE	131	SE	
Nov 29	ESE	E	ESE	ESE	ESE	ESE	ENE	NE	NE	NE	NNE	SSE	SSE	S	S	S	SSE	ESE	SE	SSE	SSE	SE	SSE	130	SE	
Nov 30	SSE	SSE	S	S	S	SSW	SSW	S	S	S	S	SSW	SSW	SSW	SSW	SSW	S	S	S	SSW	SSW	S	S	191	S	

C Calibration S Daily Zero/Span Q Quality Assurance C1 Repeat Calibration S1 Repeat Daily Zero/Span
 G Out for Repair K Collection Error N Not in Service O Operator Error P Power Failure
 R Recovery X Machine Malfunction Y Maintenance T Exceeds Temperature Limits N Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for VWD - Maskwa Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hour Standard Deviations

STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

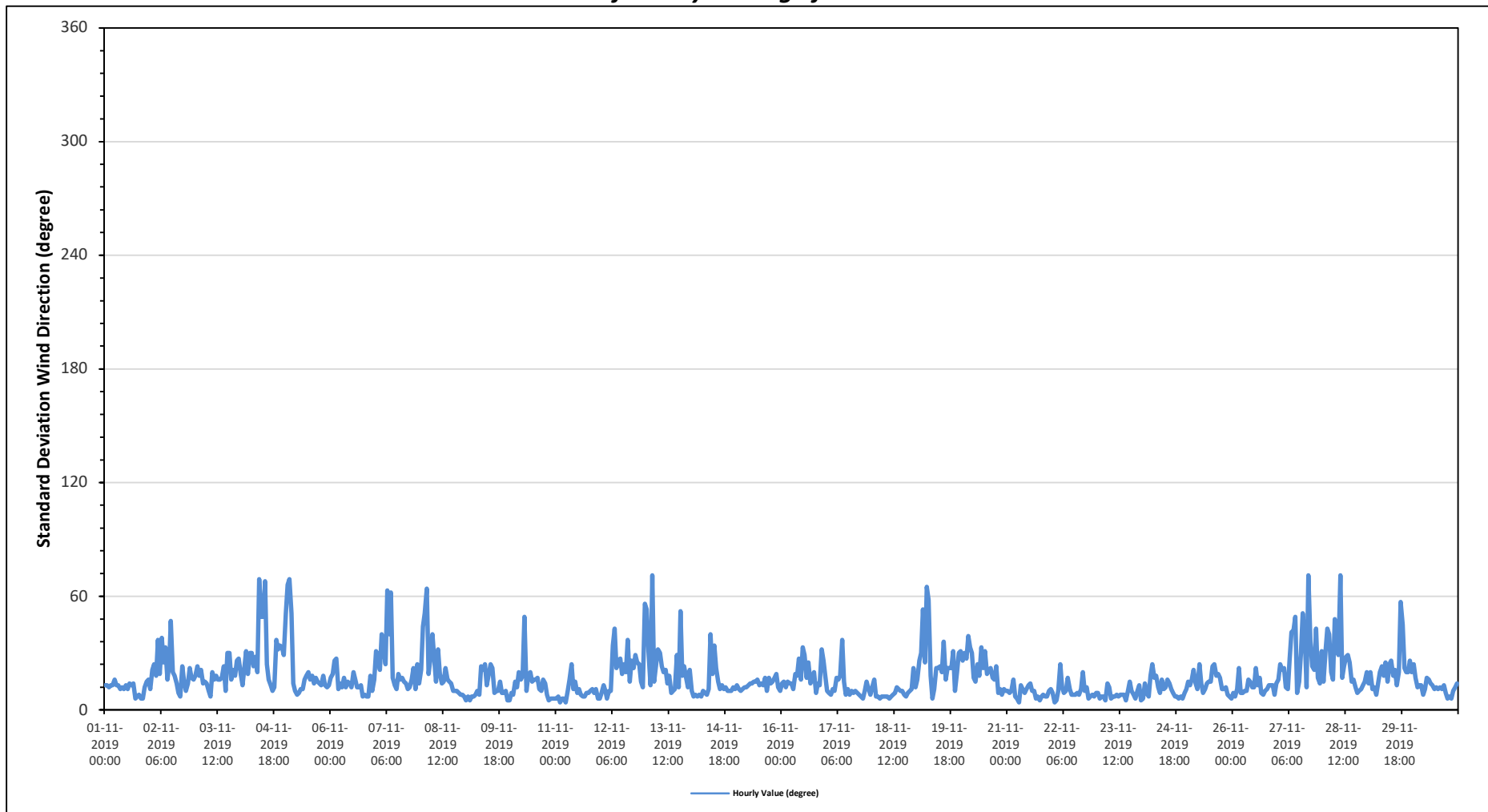
Maximum Hourly Value: 71 degree on November 13 at hour 3	Hours in Service: 720
	Hours of Data: 720
Minimum Hourly Value: 4 degree on November 11 at hour 2	Hours of Missing Data: 0
	Hours of Calibration: 0
	Operational Uptime: 100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22			23	
Nov 1	13	13	12	13	13	16	13	13	11	12	11	13	11	14	13	14	6	7	8	6	6	12	15	16	6	16	
Nov 2	11	21	24	18	37	19	38	25	33	16	24	47	20	18	14	9	7	23	15	10	14	22	17	16	7	47	
Nov 3	18	23	18	21	14	15	14	10	7	20	16	18	16	16	17	23	10	30	30	16	21	18	26	27	7	30	
Nov 4	19	13	22	31	19	30	30	23	28	20	69	49	49	68	24	16	13	10	12	37	32	34	33	29	10	69	
Nov 5	51	66	69	51	14	10	8	9	11	11	16	18	20	16	18	14	17	15	14	13	18	13	12	13	8	69	
Nov 6	17	19	26	27	11	14	12	17	12	15	14	12	20	16	12	12	13	7	8	7	7	18	10	16	7	27	
Nov 7	31	29	21	40	33	24	63	40	62	17	13	11	19	16	17	15	14	11	12	16	22	11	24	14	11	63	
Nov 8	21	44	51	64	19	27	40	27	15	32	19	14	15	22	16	15	14	10	10	10	9	8	8	7	7	64	
Nov 9	5	7	5	7	7	8	10	8	23	21	24	13	19	24	22	9	10	10	15	9	9	10	5	5	5	24	
Nov 10	9	8	15	12	20	16	18	49	10	18	20	15	16	16	17	11	10	16	14	8	5	6	6	6	5	49	
Nov 11	6	7	4	6	6	4	10	16	24	11	15	9	11	8	7	7	9	9	10	11	9	11	6	6	4	24	
Nov 12	9	13	10	6	10	10	34	43	22	26	27	19	24	20	37	15	26	22	29	25	24	15	12	56	6	56	
Nov 13	53	31	13	71	15	24	32	30	23	20	21	14	18	9	10	11	29	12	52	18	23	17	12	21	9	71	
Nov 14	10	7	8	7	8	7	10	9	8	11	40	19	34	22	15	11	13	11	12	10	10	10	12	11	7	40	
Nov 15	13	11	10	11	12	12	13	14	14	15	15	16	13	14	13	17	10	17	14	15	17	19	12	10	10	19	
Nov 16	14	15	12	15	14	14	11	19	18	27	16	33	29	17	25	14	17	20	9	14	13	32	26	19	9	33	
Nov 17	10	9	8	11	10	17	16	18	37	15	8	11	8	10	9	10	9	8	7	6	10	15	11	8	6	37	
Nov 18	12	16	7	7	6	7	7	7	7	6	7	8	9	12	11	10	10	8	7	9	10	11	22	12	6	22	
Nov 19	16	26	30	53	25	65	58	18	6	11	22	22	23	20	36	16	22	22	22	31	10	20	30	31	6	65	
Nov 20	26	30	27	39	33	30	17	15	24	18	33	22	31	19	21	22	17	16	23	9	11	8	11	10	8	39	
Nov 21	10	9	10	16	7	6	4	13	11	9	11	13	14	10	10	6	7	5	7	8	7	7	10	11	4	16	
Nov 22	9	4	5	10	24	12	9	10	17	11	8	8	8	9	8	11	20	10	12	6	7	8	7	9	4	24	
Nov 23	9	6	7	7	5	14	12	6	7	7	8	7	8	8	8	5	10	15	10	8	6	10	13	5	5	15	
Nov 24	6	14	9	7	18	24	17	18	12	9	16	11	12	16	14	11	9	7	7	6	7	6	9	11	6	24	
Nov 25	15	13	16	21	14	11	24	14	9	11	14	15	15	23	24	18	19	17	11	11	12	8	7	6	6	24	
Nov 26	9	7	11	22	9	9	10	10	16	15	12	12	22	13	17	9	8	10	11	13	13	13	8	14	7	22	
Nov 27	16	24	21	22	12	11	27	41	42	49	9	15	30	51	38	12	71	36	23	21	43	17	14	31	9	71	
Nov 28	15	31	43	40	20	16	48	35	29	71	17	23	28	29	25	15	16	12	9	10	11	13	15	20	9	71	
Nov 29	14	20	11	12	8	14	20	23	18	25	15	24	26	18	21	13	20	57	45	22	20	20	26	20	8	57	
Nov 30	24	17	12	13	13	8	11	17	16	14	13	11	12	11	12	11	13	9	6	7	6	10	12	14	6	24	
Diurnal Minimum	5	4	4	6	5	4	4	6	6	6	7	7	8	8	7	5	6	5	6	6	5	6	5	5	5	5	5
Dalurnal Maximum	53	66	69	71	37	65	63	49	62	71	69	49	49	68	38	23	71	57	52	37	43	34	33	56	56	56	

C Calibration	S Daily Zero/Span	Q Quality Assurance	C1 Repeat Calibration
G Out for Repair	K Collection Error	N Not in Service	O Operator Error
R Recovery	X Machine Malfunction	Y Maintenance	T Exceeds Temperature Limits
			S1 Repeat Daily Zero/Span
			P Power Failure
			N Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for STDWD - Maskwa Site



ST. LINA STATION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

SULPHUR DIOXIDE (SO₂) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 172 ppb, 24-Hour 48 ppb, 30-Day 11 ppb
 Number of 1-Hour Exceedences: 0 Number of 24-Hour Exceedences: 0 30-Day Exceedence: 0

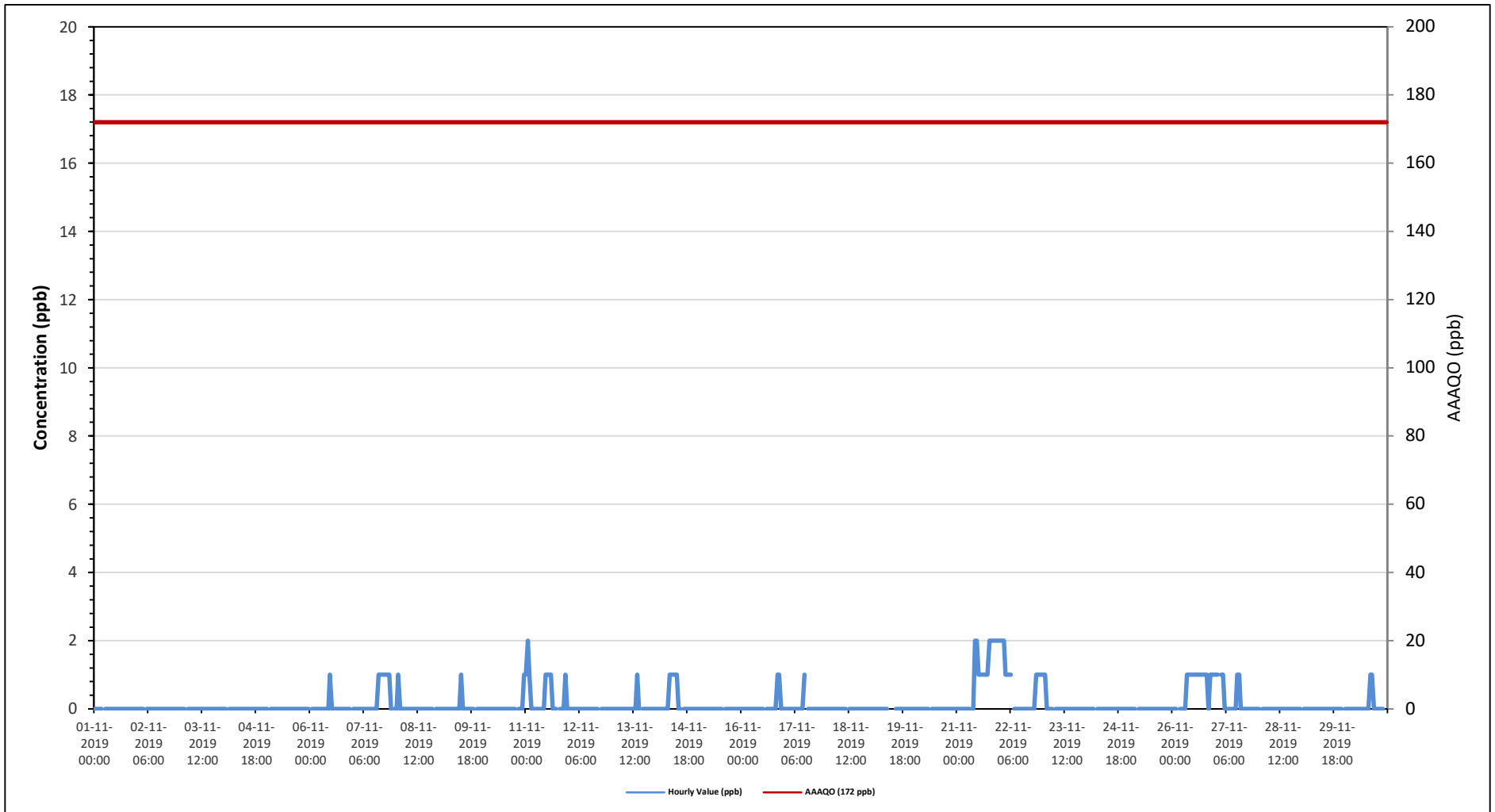
Maximum Hourly Value:	2 ppb on November 11 at hour 1	Hours in Service:	720
Maximum Daily Value:	1.0 ppb on November 21	Hours of Data:	685
Minimum Hourly Value:	0 ppb on November 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on November 1	Hours of Calibration:	35
Monthly Average:	0.1 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average										
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23									
Nov 1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 2	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 3	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 4	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 5	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 6	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0.0		
Nov 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0.3		
Nov 8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0.0			
Nov 9	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0.0			
Nov 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0.0			
Nov 11	1	2	1	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0			
Nov 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
Nov 13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0		
Nov 14	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	
Nov 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1		
Nov 17	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0		
Nov 18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 22	2	2	2	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0	
Nov 23	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	
Nov 24	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 25	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 26	0	0	0	S	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7		
Nov 27	1	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	
Nov 28	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Nov 29	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0.0		
Nov 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	1.1	
Diurnal Maximum	2	2	2	1	1	1	1	0	1	1	2	2	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Daiurnal Average	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	

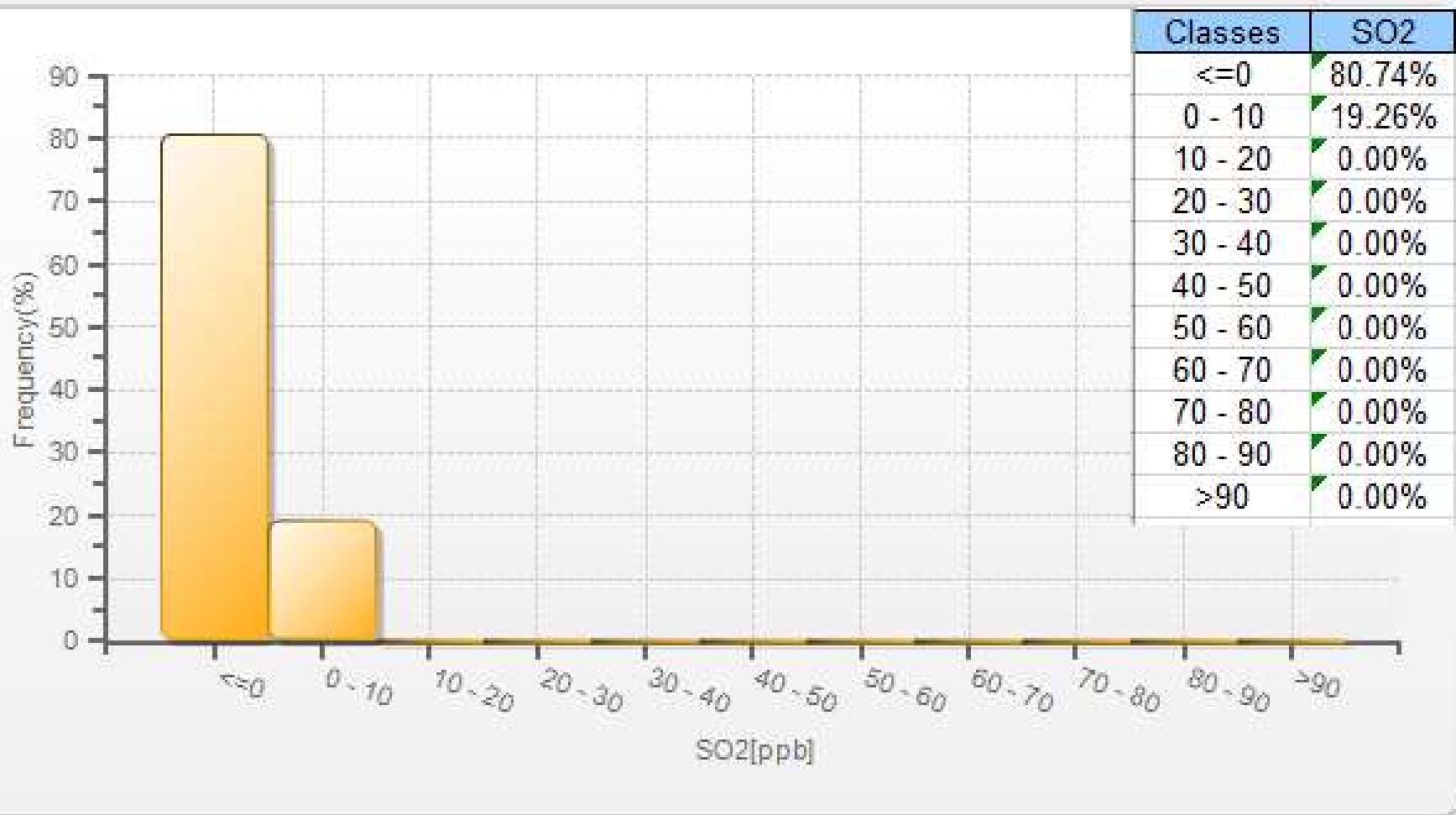
C Calibration S Daily Zero/Span Q Quality Assurance C1 Repeat Calibration S1 Repeat Daily Zero/Span
 G Out for Repair K Collection Error N Not in Service O Operator Error P Power Failure
 R Recovery X Machine Malfunction Y Maintenance T Exceeds Temperature Limits N Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for SO2 - St. Lina Site

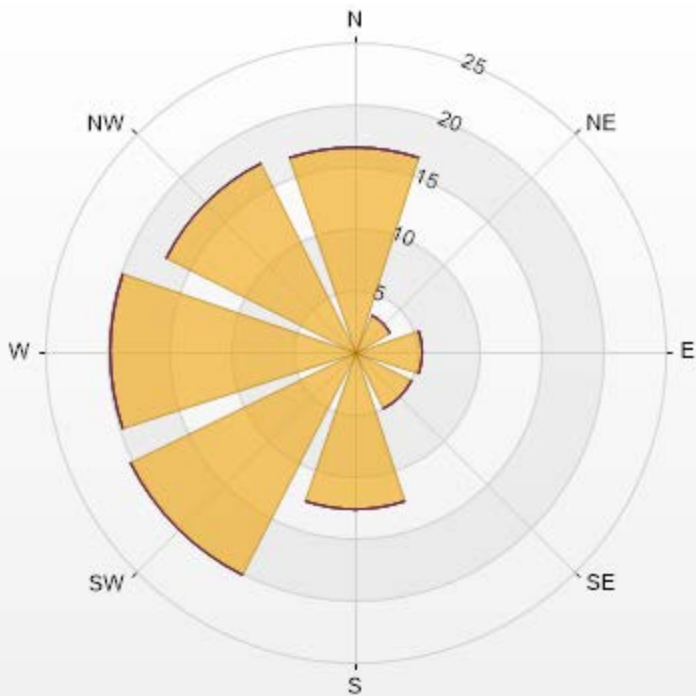


SO2[ppb] Histogram: St. Lina Monthly: 11-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-SO2[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.31% Calm Avg: 0.00 [ppb]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	16.49	0	0	0	0	16.49
NE	3.24	0	0	0	0	3.24
E	5.45	0	0	0	0	5.45
SE	5.15	0	0	0	0	5.15
S	12.67	0	0	0	0	12.67
SW	20.18	0	0	0	0	20.18
W	19.73	0	0	0	0	19.73
NW	17.08	0	0	0	0	17.08
Summary	100	0	0	0	0	100



LICA-201911-Revision 1

% Icon Classes (ppb)

100 0-10

0 10-30

0 50-100

0 100-172

0 >172.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

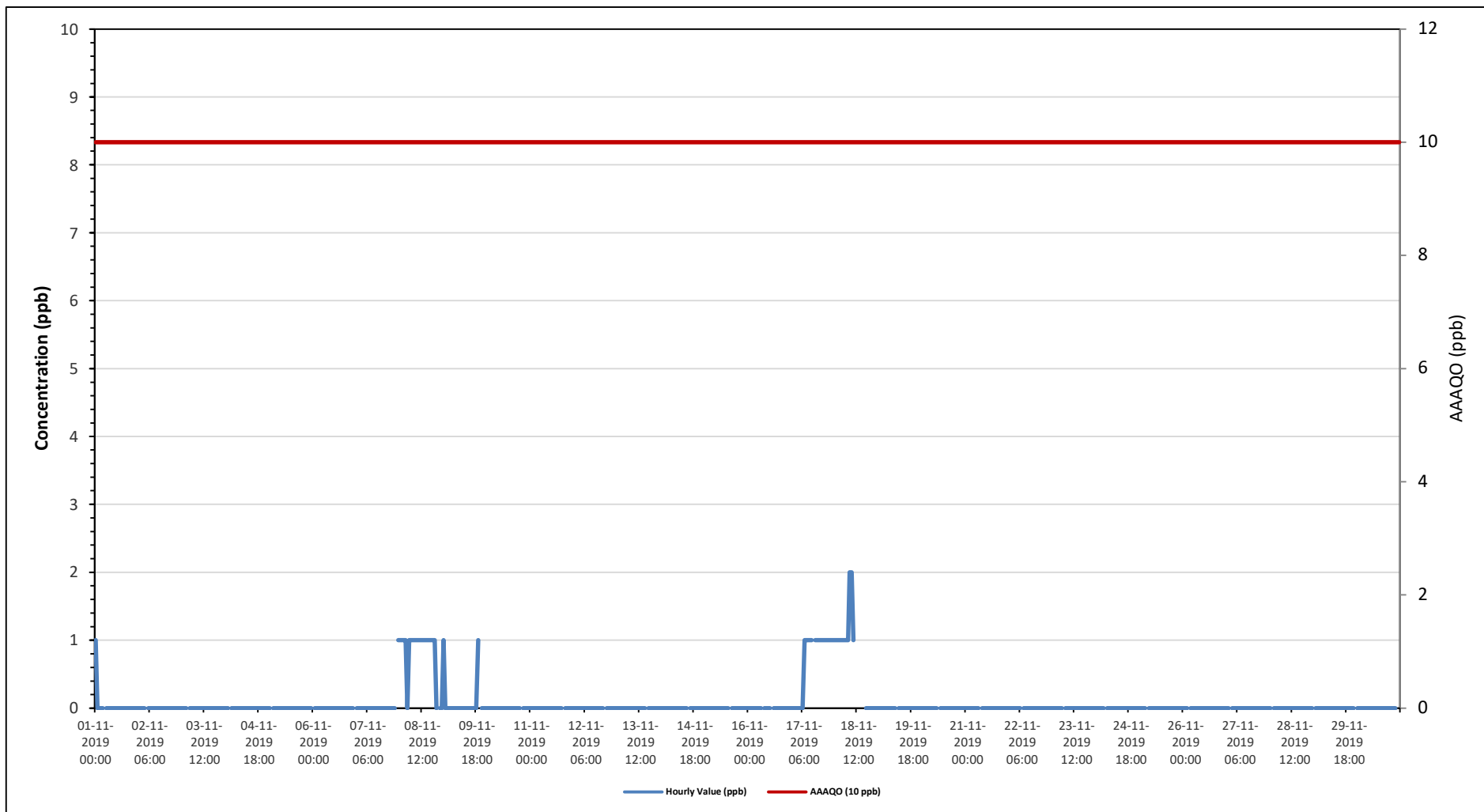
HYDROGEN SULPHIDE (H₂S) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 10 ppb, 24-Hour 3 ppb																																				
Number of 1-Hour Exceedances:					0					Number of 24-Hour Exceedances:					0																					
Maximum Hourly Value:					2 ppb on November 18 at hour 8					Hours in Service:					720																					
Maximum Daily Value:					0.8 ppb on November 8					Hours of Data:					682																					
Minimum Hourly Value:					0 ppb on November 1 at hour 1					Hours of Missing Data:					1																					
Minimum Daily Value:					0.0 ppb on November 2					Hours of Calibration:					37																					
Monthly Average:					0.1 ppb					Operational Uptime:					99.9																					
Day	Hourly Period Starting at (MST)																								Daily Minimum	Daily Maximum	Daily Average									
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23												
Nov 1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 2	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 3	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 4	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 5	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 6	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	
Nov 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	1	0.8	
Nov 9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S	0	0	0	0	0	0	0	0	0	0	0	1	0.1	
Nov 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 17	0	0	0	0	0	0	0	0	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	
Nov 18	1	1	1	1	1	1	1	1	2	2	1	S	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.7		
Nov 19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Diurnal Maximum	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Diurnal Average	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for H2S - St. Lina Site

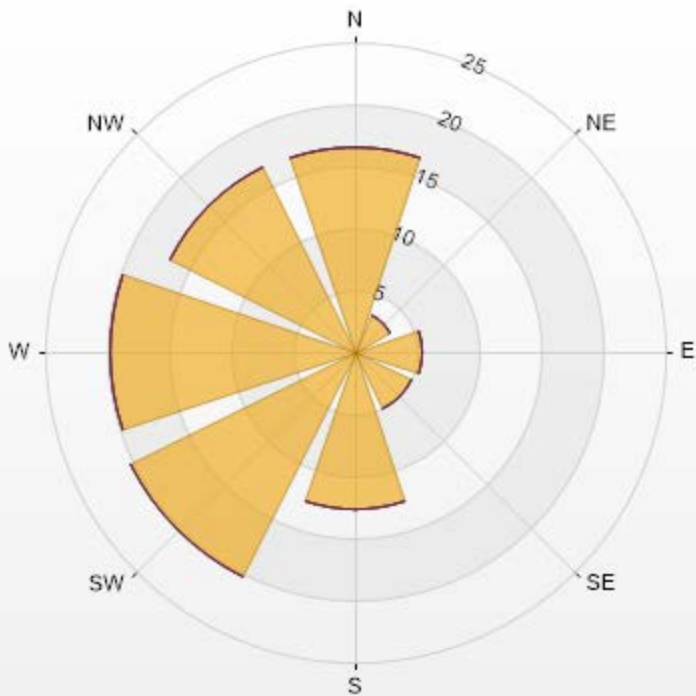


H2S[ppb] Histogram: St. Lina Monthly: 11-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-H2S[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.89% Calm Avg: 0.00 [ppb]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	16.57	0	0	0	0	16.57
NE	3.25	0	0	0	0	3.25
E	5.47	0	0	0	0	5.47
SE	5.18	0	0	0	0	5.18
S	12.72	0	0	0	0	12.72
SW	20.27	0	0	0	0	20.27
W	19.82	0	0	0	0	19.82
NW	16.72	0	0	0	0	16.72
Summary	100	0	0	0	0	100



LICA-201911-Revision 1



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

OXIDES OF NITROGEN (NOx) in ppb

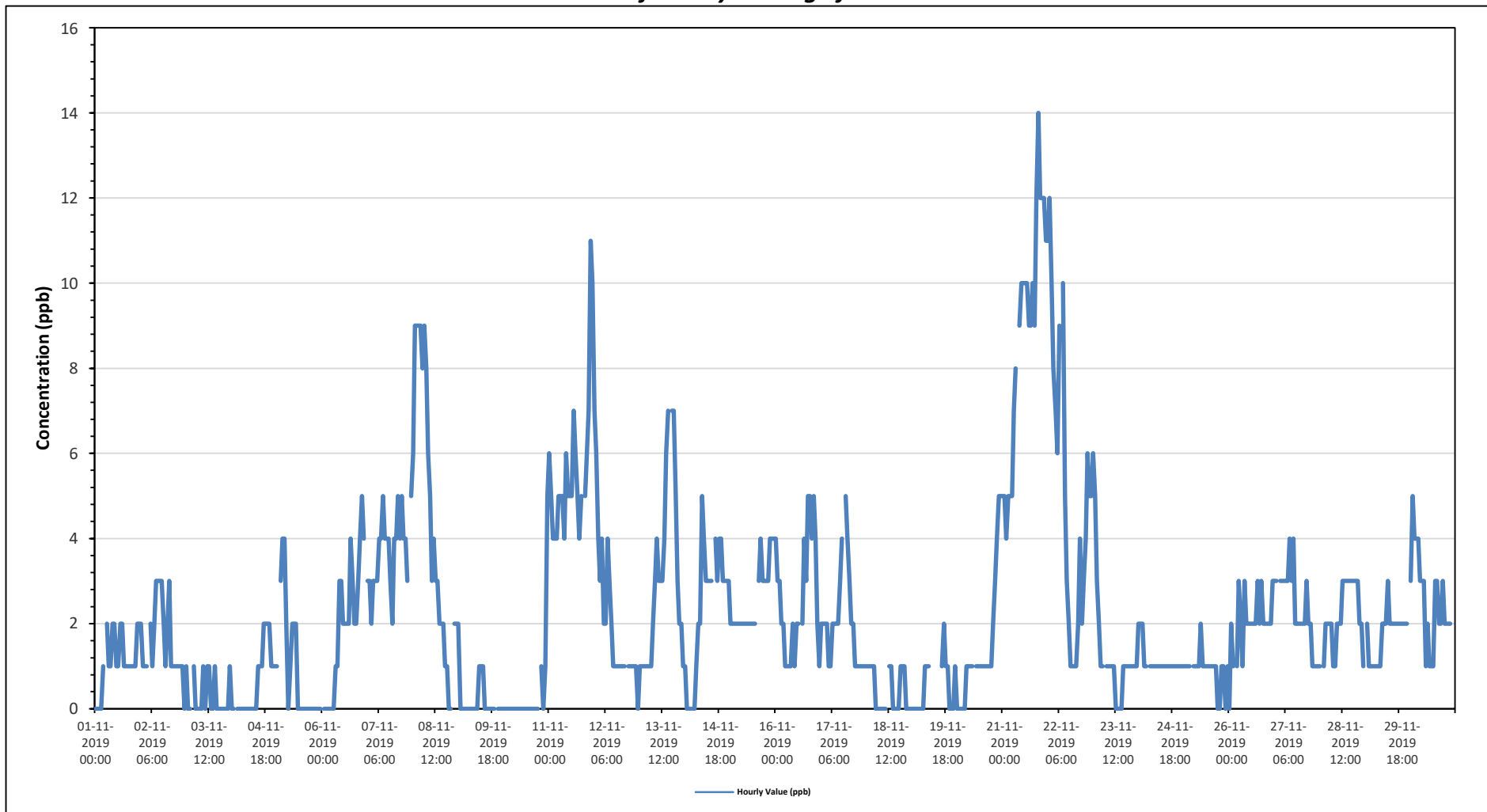
Maximum Hourly Value:	14 ppb on November 21 at hour 19	Hours in Service:	720
Maximum Daily Value:	8.8 ppb on November 21	Hours of Data:	683
Minimum Hourly Value:	0 ppb on November 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.2 ppb on November 9	Hours of Calibration:	37
Monthly Average:	2.2 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	0	0	0	0	1	S	2	1	1	2	2	1	1	2	2	1	1	1	1	1	1	1	2	2	0	2	1.1
Nov 2	2	1	1	1	S	2	1	2	3	3	3	3	2	1	2	3	1	1	1	1	1	1	1	0	0	3	1.6
Nov 3	1	0	0	S	1	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0.3
Nov 4	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	2	2	1	1	0	2	0.6
Nov 5	1	S	3	4	4	2	0	1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.9
Nov 6	S	0	0	0	0	0	0	1	1	3	3	2	2	2	4	3	2	2	3	4	5	4	S	0	5	2.0	
Nov 7	3	3	2	3	3	3	4	4	5	4	4	3	2	4	4	5	4	5	4	4	3	S	S	5	2	5	3.7
Nov 8	6	9	9	9	9	8	9	8	6	5	3	4	3	3	2	2	2	1	1	0	4	0	S	2	0	9	4.5
Nov 9	2	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	S	0	0	0	2	0.2
Nov 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	S	1	0	1	5	0	0.3
Nov 11	6	5	4	4	4	5	5	5	4	6	5	5	7	6	5	4	5	S	5	6	7	11	10	4	11	5.6	
Nov 12	7	6	4	3	4	2	2	4	3	2	1	1	1	1	1	1	S	1	1	1	1	1	1	0	0	7	2.1
Nov 13	1	1	1	1	1	1	1	2	3	4	3	3	3	4	6	7	S	7	7	5	3	2	2	1	1	7	3.0
Nov 14	1	0	0	0	0	0	1	2	2	5	4	3	3	3	S	S	4	3	4	4	3	3	3	3	0	5	2.3
Nov 15	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	3	4	3	3	3	3	4	4	4	2	4	2.6
Nov 16	4	3	3	2	2	1	1	1	1	2	1	2	2	S	2	4	3	5	5	4	5	4	2	1	1	5	2.6
Nov 17	2	2	2	2	1	1	2	2	2	2	3	4	S	5	4	3	2	2	1	1	1	1	1	1	1	5	2.0
Nov 18	1	1	1	1	1	0	0	0	0	0	0	S	1	1	0	0	0	0	1	1	1	0	0	0	0	1	0.4
Nov 19	0	0	0	0	0	0	0	1	1	1	C	C	C	C	C	1	2	1	1	0	0	0	1	0	2	0.5	
Nov 20	0	0	0	0	0	1	1	1	1	S	1	1	1	1	1	1	1	1	1	2	3	4	5	5	0	5	1.4
Nov 21	5	5	4	5	5	5	7	8	S	9	10	10	10	10	9	9	10	9	12	14	12	12	12	11	4	14	8.8
Nov 22	11	12	10	8	7	6	9	S	10	5	3	2	1	1	1	2	4	2	3	4	6	5	5	1	12	5.1	
Nov 23	6	5	3	2	1	1	S	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	0	6	1.3	
Nov 24	2	2	2	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1.1
Nov 25	1	1	1	1	S	1	1	1	1	2	1	1	1	1	1	1	1	0	0	1	1	0	1	0	2	0.9	
Nov 26	0	2	1	S	1	3	2	1	3	2	2	2	2	2	2	3	2	3	2	2	2	2	3	0	3	2.0	
Nov 27	3	3	S	3	3	3	3	3	4	3	4	2	2	2	2	2	2	3	2	2	1	1	1	1	1	4	2.4
Nov 28	1	S	1	2	2	2	2	1	1	2	2	2	3	3	3	3	3	3	3	3	3	2	2	1	1	3	2.2
Nov 29	S	2	1	1	1	1	1	1	1	2	2	2	3	2	2	2	2	2	2	2	2	2	2	S	S	3	1.7
Nov 30	3	5	4	4	4	3	3	3	1	2	1	1	1	3	3	2	2	3	2	2	2	2	S	3	1	5	2.6
Diurnal Maximum	11	12	10	9	9	8	9	8	10	9	10	10	10	10	9	9	10	9	12	14	12	12	12	11			
Diurnal Average	2.5	2.5	2.1	2.1	2.1	1.9	2.1	2.0	2.1	2.5	2.2	2.2	2.0	2.1	2.1	2.3	2.0	2.4	2.2	2.3	2.3	2.3	2.4	2.5			

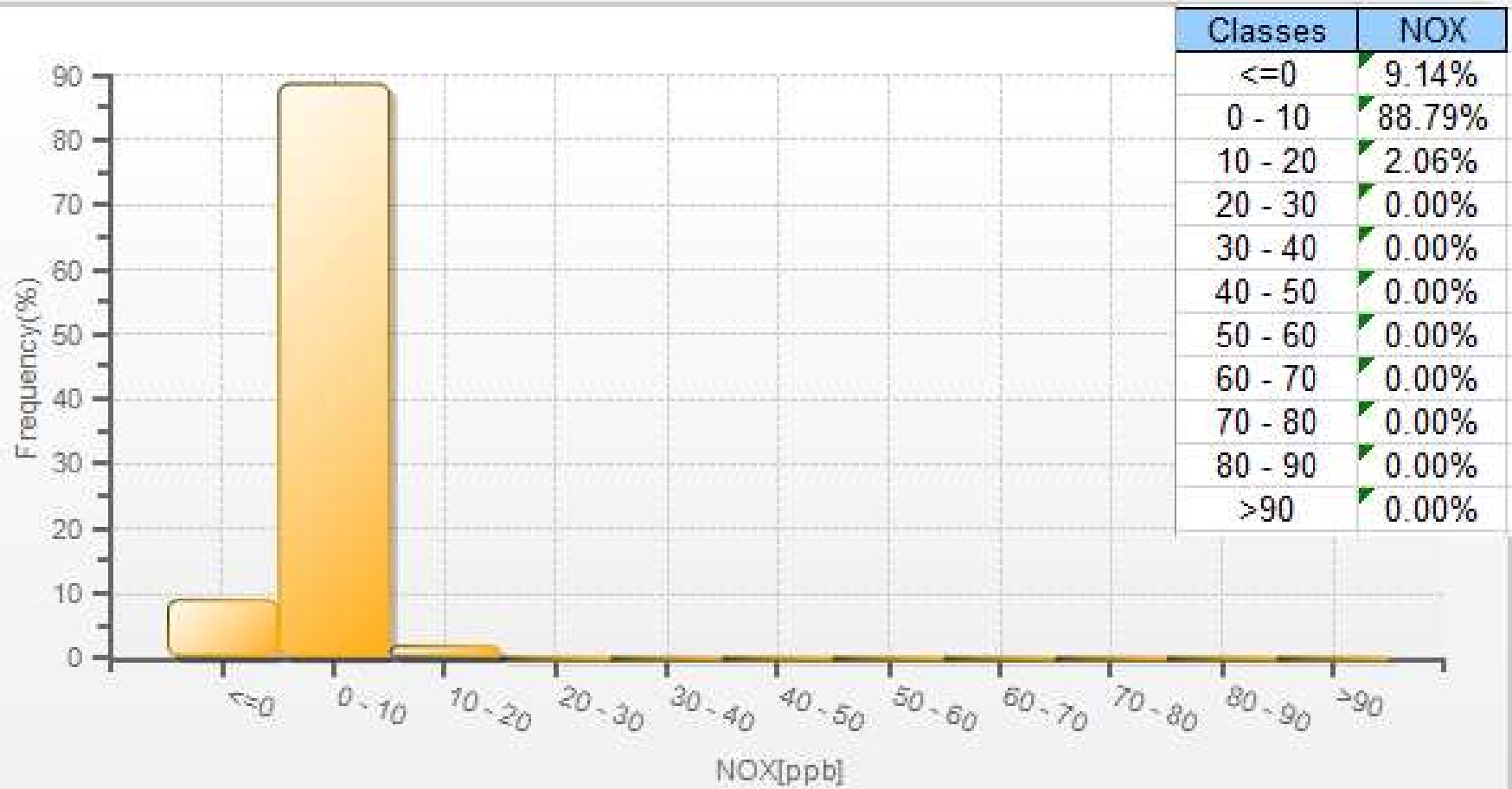
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for NOx - St. Lina Site

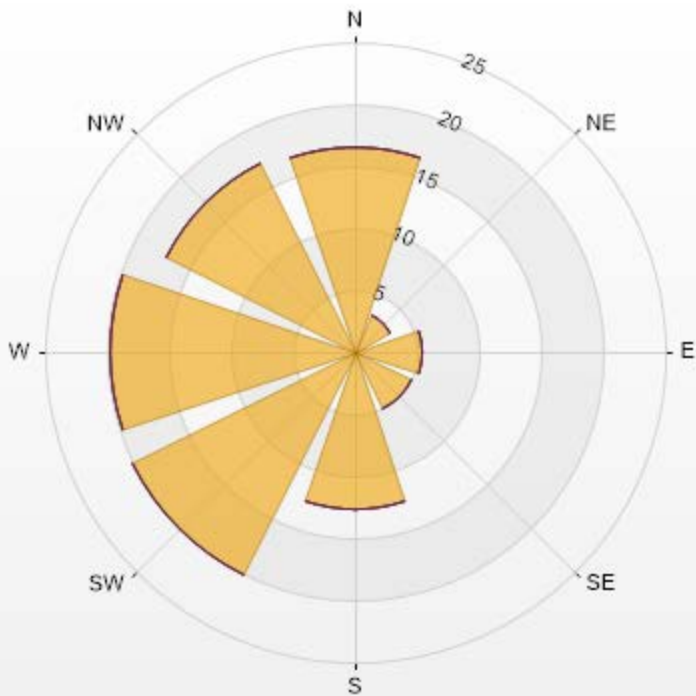


NOX[ppb] Histogram: St. Lina Monthly: 11-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-NOX[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.03% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	16.54	0	0	0	0	16.54
NE	3.25	0	0	0	0	3.25
E	5.47	0	0	0	0	5.47
SE	5.17	0	0	0	0	5.17
S	12.7	0	0	0	0	12.7
SW	20.09	0	0	0	0	20.09
W	19.79	0	0	0	0	19.79
NW	16.99	0	0	0	0	16.99
Summary	100	0	0	0	0	100



LICA-201911-Revision 1



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

NITRIC OXIDE (NO) in ppb

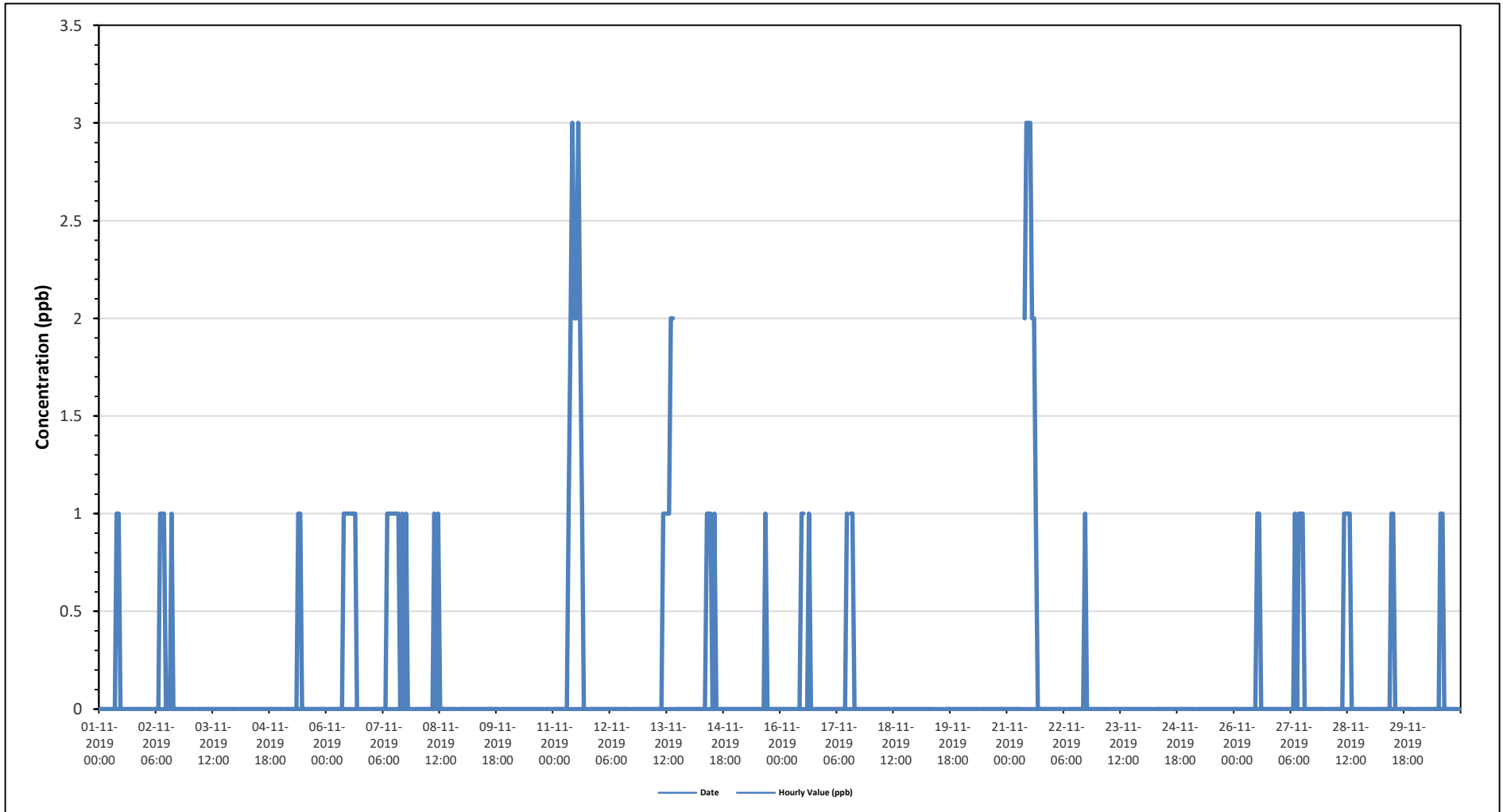
Maximum Hourly Value:	3 ppb	on November 11 at hour 10	Hours in Service:	720
Maximum Daily Value:	0.7 ppb	on November 11	Hours of Data:	683
Minimum Hourly Value:	0 ppb	on November 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb	on November 3	Hours of Calibration:	37
Monthly Average:	0.1 ppb		Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																								Daily Minimum	Daily Maximum	Daily Average
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
Nov 1	0	0	0	0	0	S	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 2	0	0	0	0	S	0	0	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
Nov 3	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 4	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 5	0	S	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 6	S	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	S	0	
Nov 7	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	1	0	1	0	0	0	S	S	0	
Nov 8	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	S	0	0	0	
Nov 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	
Nov 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	
Nov 11	0	0	0	0	0	0	0	0	1	2	3	2	2	3	2	1	0	0	0	S	0	0	0	0	0	0	
Nov 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	
Nov 13	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	S	0	0	0	0	0	0	0	0	
Nov 14	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	0	S	0	0	0	0	0	0	0	0	
Nov 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	0	0	0	0	0	0	
Nov 16	0	0	0	0	0	0	0	0	0	0	0	1	1	S	0	1	0	0	0	0	0	0	0	0	0	0	
Nov 17	0	0	0	0	0	0	0	0	0	0	0	1	S	1	1	0	0	0	0	0	0	0	0	0	0	0	
Nov 18	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 19	0	0	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	
Nov 20	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 21	0	0	0	0	0	0	0	0	0	0	S	2	3	3	3	2	2	1	0	0	0	0	0	0	0	0	
Nov 22	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
Nov 23	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 24	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 25	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 26	0	0	0	S	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	
Nov 27	0	0	S	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 28	0	S	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 29	S	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	S	0	
Nov 30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	S	0	0	
Diurnal Maximum	0	0	0	0	0	0	0	0	1	2	3	3	3	3	2	2	1	1	1	0	0	0	0	0	0	0	
Diurnal Average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.5	0.5	0.5	0.5	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

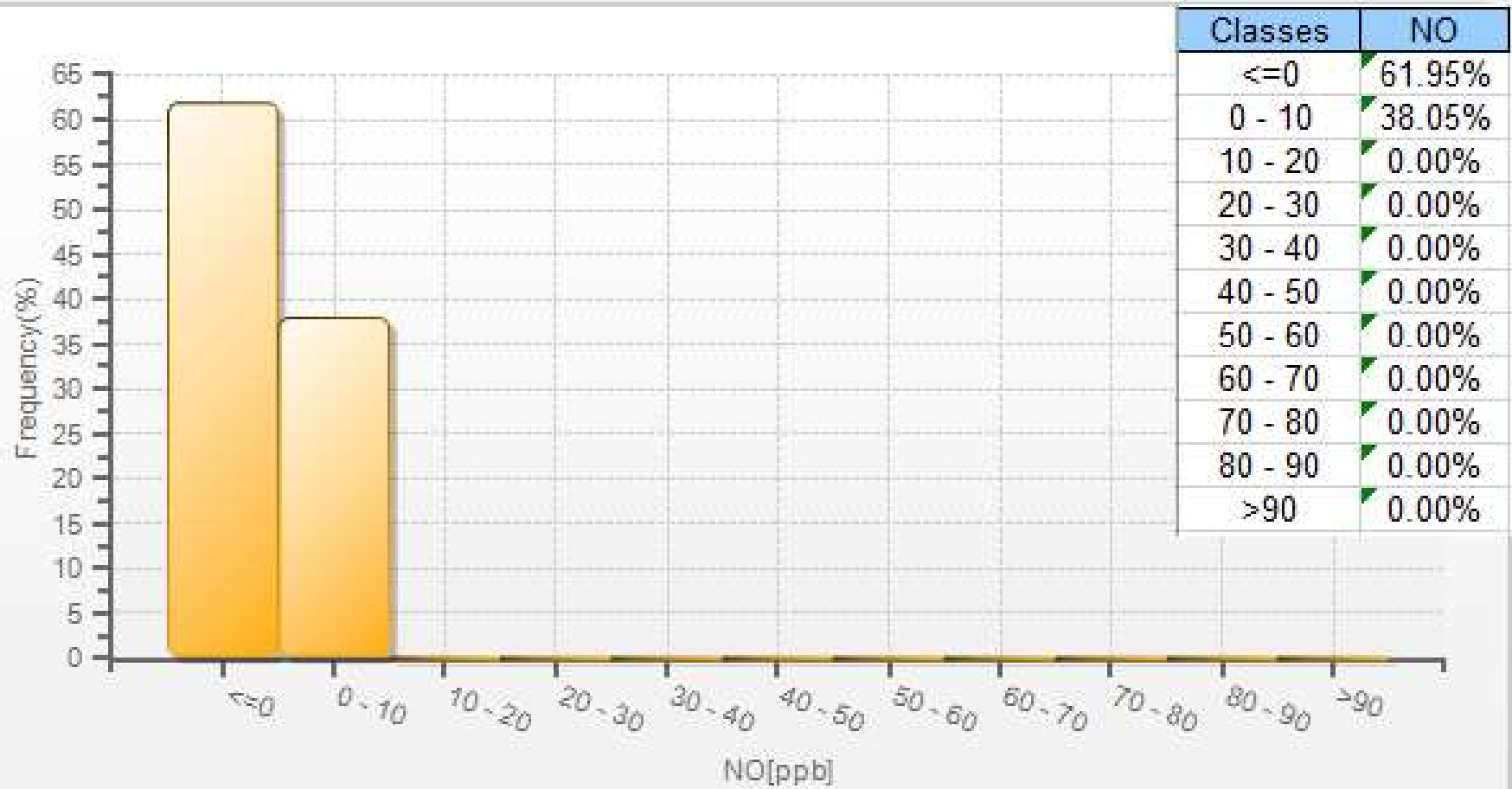
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for NO - St. Lina Site

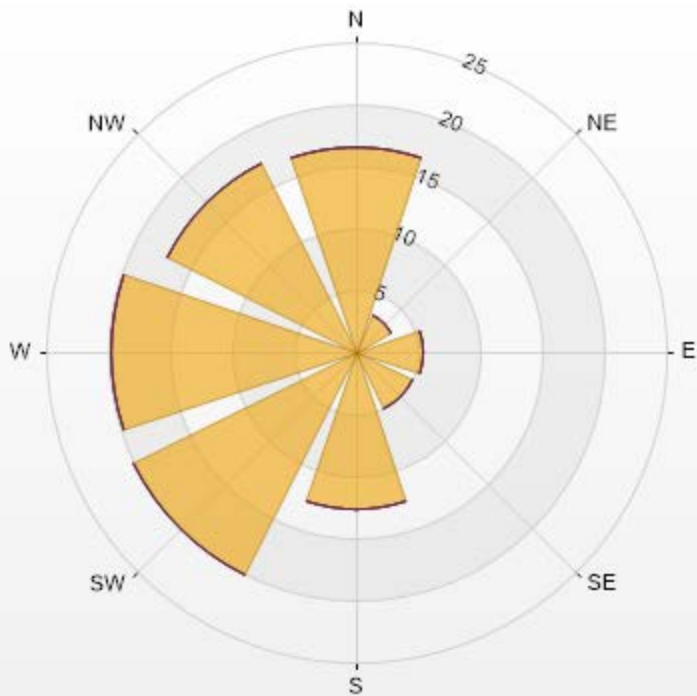


NO[ppb] Histogram: St. Lina Monthly: 11-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-NO[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.03% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	16.54	0	0	0	0	16.54
NE	3.25	0	0	0	0	3.25
E	5.47	0	0	0	0	5.47
SE	5.17	0	0	0	0	5.17
S	12.7	0	0	0	0	12.7
SW	20.09	0	0	0	0	20.09
W	19.79	0	0	0	0	19.79
NW	16.99	0	0	0	0	16.99
Summary	100	0	0	0	0	100



LICA-201911-Revision 1

% Icon Classes (ppb)	100	0-30	0	Page 172 of 366	50-82	0	82-159	0	>159.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

NITROGEN DIOXIDE (NO₂) in ppb

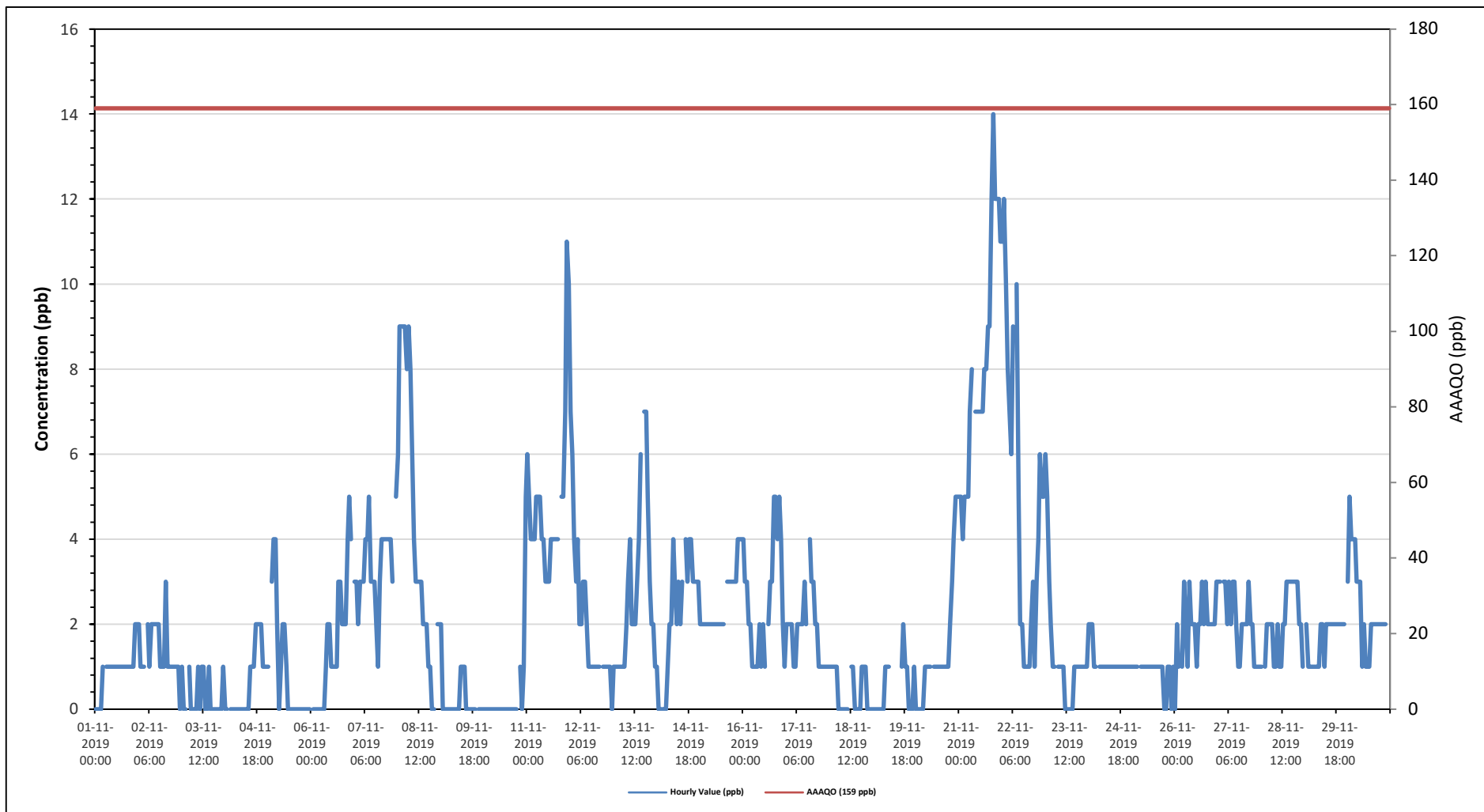
Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb				
Number of 1-Hour Exceedences:	0			
Maximum Hourly Value:	14 ppb	on November 21 at hour 19	Hours in Service:	720
Maximum Daily Value:	8.1 ppb	on November 21	Hours of Data:	683
Minimum Hourly Value:	0 ppb	on November 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.2 ppb	on November 9	Hours of Calibration:	37
Monthly Average:	2.1 ppb		Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	0	0	0	0	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	0	2	0.9		
Nov 2	2	1	1	1	S	2	1	2	2	2	2	2	1	1	1	3	1	1	1	1	1	1	1	0	0	3	1.3	
Nov 3	1	0	0	S	1	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0.3	
Nov 4	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	2	1	1	1	0	2	0.6	
Nov 5	1	S	3	4	4	2	0	1	2	2	1	0	0	0	0	0	0	0	0	0	2	2	0	0	0	4	0.9	
Nov 6	S	0	0	0	0	0	0	0	1	2	2	1	1	1	1	3	3	2	2	2	4	5	4	S	5	1.5		
Nov 7	3	3	2	3	3	3	4	4	5	3	3	3	2	1	3	4	4	4	4	4	4	3	S	5	1	5	3.3	
Nov 8	6	9	9	9	9	8	9	8	9	6	4	3	3	3	3	2	2	2	1	1	0	4	S	2	2	0	9	4.4
Nov 9	2	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	S	0	0	0	0	2	0.2	
Nov 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	1	5	0	5	0.3	
Nov 11	6	5	4	4	4	5	5	4	4	3	3	3	4	4	4	4	4	4	S	5	5	7	11	10	3	11	4.9	
Nov 12	7	6	4	3	4	2	2	3	3	2	1	1	1	1	1	1	1	1	S	1	1	1	1	0	0	7	2.1	
Nov 13	1	1	1	1	1	1	1	2	3	4	2	2	2	3	4	6	S	7	7	5	3	2	2	1	1	7	2.7	
Nov 14	1	0	0	0	0	0	1	2	2	4	3	2	3	2	3	S	4	3	4	4	3	3	3	3	0	4	2.2	
Nov 15	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	3	3	3	3	3	3	4	4	4	2	4	2.5	
Nov 16	4	3	3	2	2	1	1	1	1	2	1	2	1	S	2	3	3	3	5	5	4	5	4	2	1	1	5	2.5
Nov 17	2	2	2	2	1	1	2	2	2	2	3	2	S	4	3	3	2	2	1	1	1	1	1	1	1	4	1.9	
Nov 18	1	1	1	1	1	0	0	0	0	0	S	1	1	0	0	0	0	0	1	1	1	0	0	0	0	1	0.4	
Nov 19	0	0	0	0	0	0	0	1	1	1	C	C	C	C	C	C	1	2	1	1	0	0	0	1	0	2	0.5	
Nov 20	0	0	0	0	0	1	1	1	1	S	1	1	1	1	1	1	1	1	1	2	3	4	5	5	0	5	1.4	
Nov 21	5	5	4	5	5	5	7	8	S	7	7	7	7	7	8	8	9	9	12	14	12	12	12	11	4	14	8.1	
Nov 22	11	12	10	8	7	6	9	S	10	5	2	2	1	1	1	1	2	3	1	3	4	6	5	5	1	12	5.0	
Nov 23	6	5	3	2	1	1	S	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	1	0	6	1.3	
Nov 24	2	2	2	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1.1	
Nov 25	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	0	1	0.9	
Nov 26	0	2	1	S	1	3	2	1	3	2	2	1	2	2	3	2	3	2	2	2	2	2	2	3	0	3	2.0	
Nov 27	3	3	S	3	3	2	3	2	3	3	2	1	1	2	2	2	2	2	3	2	2	1	1	1	1	3	2.1	
Nov 28	1	S	1	2	2	2	2	1	1	2	1	1	2	2	3	3	3	3	3	3	3	2	2	1	1	3	2.0	
Nov 29	S	2	1	1	1	1	1	1	1	2	2	1	2	2	2	2	2	2	2	2	2	2	S	3	1	2	1.6	
Nov 30	3	5	4	4	4	3	3	3	1	2	1	1	1	2	2	2	2	2	2	2	2	2	S	3	1	5	2.4	
Diurnal Maximum	11	12	10	9	9	8	9	8	10	7	7	7	7	7	8	8	9	9	12	14	12	12	12	11	4	14	8.1	
Daiurnal Average	2.5	2.5	2.1	2.1	2.1	1.9	2.0	1.9	2.0	2.1	1.7	1.6	1.5	1.6	1.8	2.1	1.9	2.3	2.1	2.3	2.3	2.3	2.4	2.5				

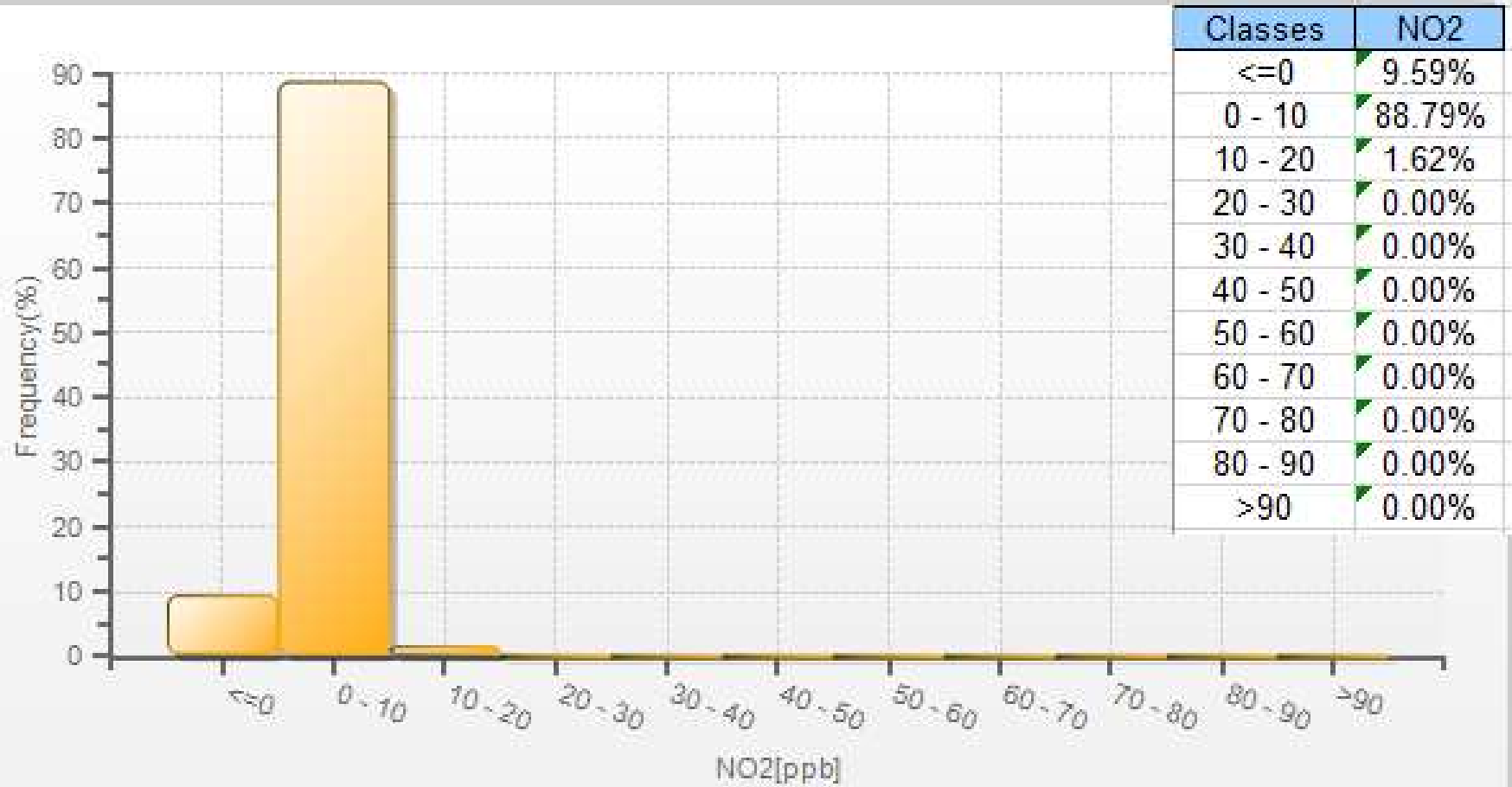
C Calibration S Daily Zero/Span N Quality Assurance C1 Repeat Calibration S1 Repeat Daily Zero/Span
 G Out for Repair K Collection Error O Not in Service O Operator Error P Power Failure
 R Recovery X Machine Malfunction Y Maintenance T Exceeds Temperature Limits N Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for NO2 - St. Lina Site

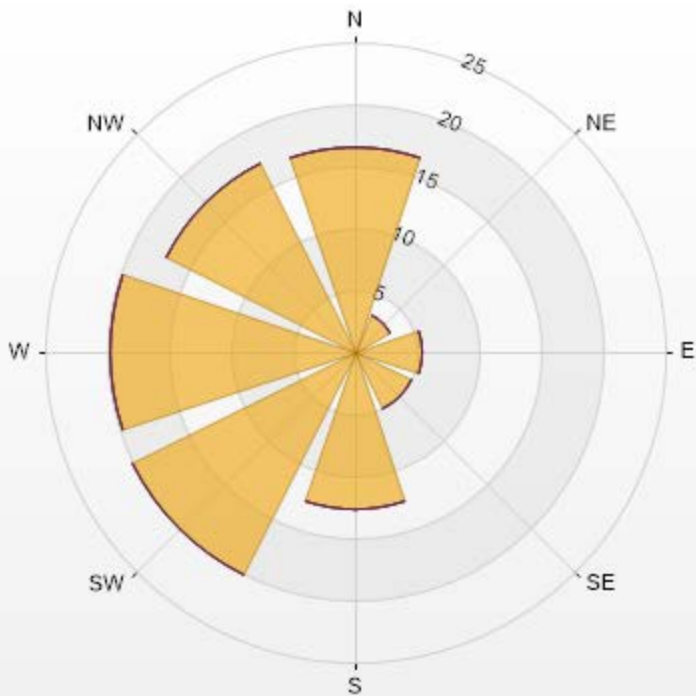


NO2[ppb] Histogram: St. Lina Monthly: 11-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-NO2[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.03% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	16.54	0	0	0	0	16.54
NE	3.25	0	0	0	0	3.25
E	5.47	0	0	0	0	5.47
SE	5.17	0	0	0	0	5.17
S	12.7	0	0	0	0	12.7
SW	20.09	0	0	0	0	20.09
W	19.79	0	0	0	0	19.79
NW	16.99	0	0	0	0	16.99
Summary	100	0	0	0	0	100



LICA-201911-Revision 1



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

OZONE (O₃) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 76 ppb

Number of 1-Hour Exceedences: 0

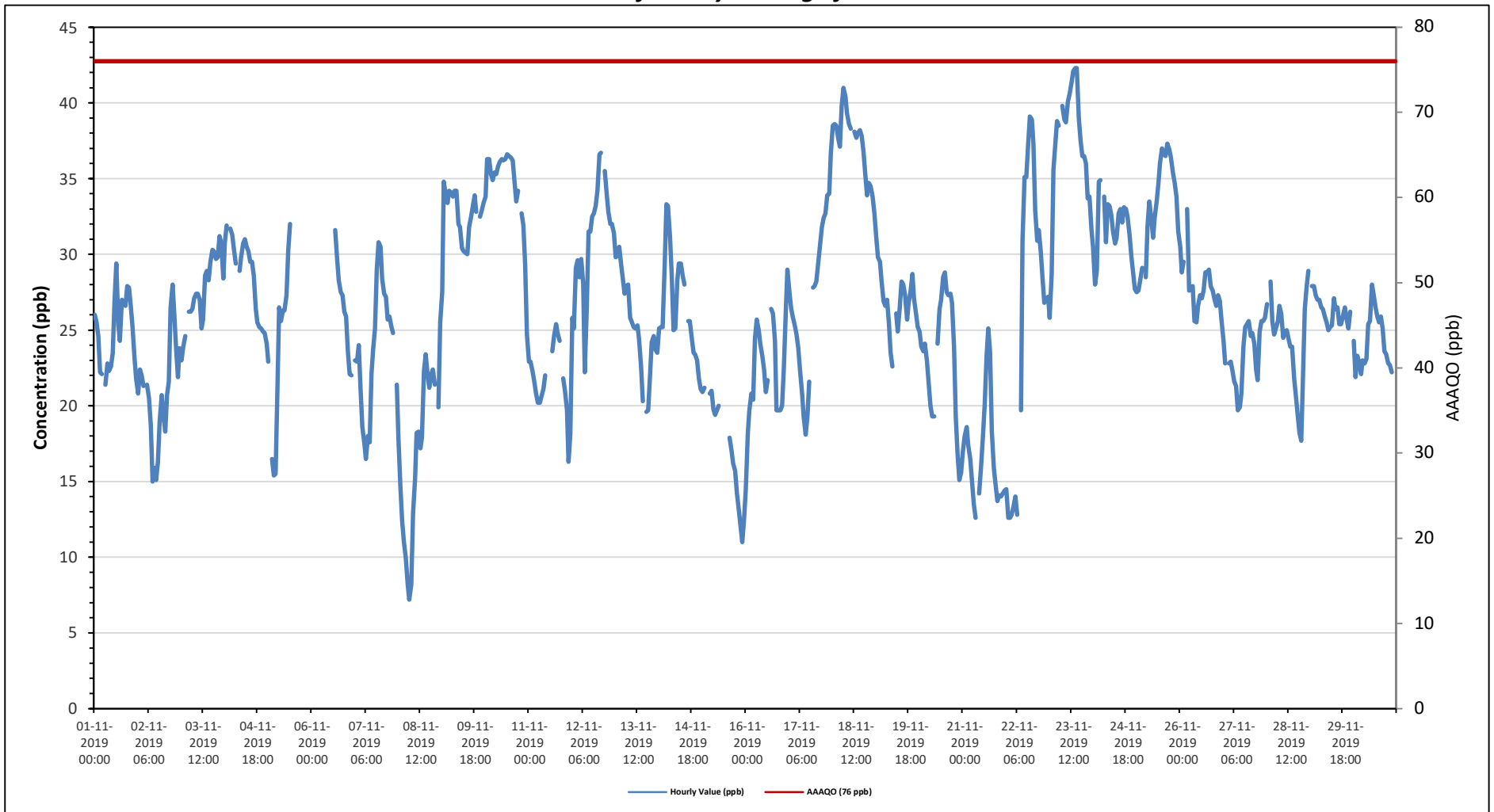
Maximum Hourly Value:	42.3 ppb	on November 23 at hour 14	Hours in Service:	720
Maximum Daily Value:	37.4 ppb	on November 18	Hours of Data:	656
Minimum Hourly Value:	7.2 ppb	on November 8 at hour 6	Hours of Missing Data:	25
Minimum Daily Value:	16.9 ppb	on November 21	Hours of Calibration:	39
Monthly Average:	26.4 ppb		Operational Uptime:	96.5

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	26	25.5	24.6	22.2	22.1	S	21.4	22.8	22.3	22.6	23.5	26.9	29.4	25.3	24.3	27	26.8	26.6	27.9	27.8	26.6	25.2	23.1	21.8	21.4	29.4	24.9
Nov 2	20.8	22.4	22	21.3	S	21.4	20.5	18.7	15	15.9	15.1	16.3	19	20.7	19.5	18.3	20.7	21.6	26.5	28	26.2	23.7	21.9	23.8	15.0	28.0	20.8
Nov 3	23	23.9	24.6	S	26.2	26.2	26.4	27.1	27.4	27.4	27	25.1	25.7	28.6	28.9	28.3	29.5	30.3	30.2	29.7	29.8	31.2	30.7	28.4	23.0	31.2	27.6
Nov 4	30.8	31.9	S	31.7	31.3	30.3	29.4	S1	28.9	29.8	30.7	31	30.5	30.2	29.5	29.5	28.6	26.4	25.5	25.2	25.1	24.9	24.8	24.1	24.1	31.9	28.6
Nov 5	22.9	S	16.5	15.4	15.5	20.9	26.5	25.6	26.3	27.3	30.3	32	C	C	C	C	X	X	X	X	X	X	X	15.4	32.0	-	
Nov 6	X	X	X	X	X	X	X	X	X	C	C	C	C	31.6	29.6	28.3	27.5	27.3	26.2	25.9	23.6	22.1	22	S	22.0	31.6	-
Nov 7	23	22.9	24	21.1	18.6	17.5	16.5	18	17.6	22.1	23.8	25.1	29	30.8	30.5	28.4	27.4	27.2	25.7	25.9	25.2	24.8	S	21.4	16.5	30.8	23.8
Nov 8	18	14.7	12.4	11	10	8.2	7.2	8.2	12.9	15.2	18.2	18.3	17.2	17.9	22.3	23.4	22.1	21.2	22.1	22.4	21.4	S	19.9	25.5	7.2	25.5	16.9
Nov 9	27.5	34.8	34	33.4	34.2	34.1	33.8	34.2	34.2	32	31.8	30.4	30.2	30.1	30	31.8	32.4	33.1	33.9	32.8	S	32.5	32.9	33.4	27.5	34.8	32.5
Nov 10	33.8	36.3	36.3	35.3	34.9	35.4	35.3	35.8	36.1	36.3	36.2	36.3	36.6	36.5	36.4	36.2	35	33.5	34.2	S	32.7	31.9	29.3	24.7	24.7	36.6	34.6
Nov 11	22.9	22.9	22.3	21.6	20.8	20.2	20.2	20.6	21.1	22	K	K	K	23.6	24.6	25.4	24.8	24.3	S	21.8	21	19.7	16.3	18.1	16.3	25.4	21.7
Nov 12	25.8	25.1	29.1	29.6	28.5	29.7	28	22.2	26.5	31.5	31.5	32.5	32.7	33.2	34.2	36.6	36.7	S	35.5	34.1	32.8	32	32	31.4	22.2	36.7	30.9
Nov 13	29.8	29.9	30.5	29.4	28.4	27.4	27.9	28	25.8	25.5	25.2	25.1	25.3	24.4	22.6	20.3	S	19.6	19.7	22.2	24.2	24.6	23.7	23.5	19.6	30.5	25.3
Nov 14	25.1	25.2	25.2	29.2	33.3	33.2	31.2	28.6	25	25.1	28.3	29.4	29.4	28.6	28	S	25.6	25.6	24.6	23.5	23.4	23	21.8	21.1	21.1	33.3	26.7
Nov 15	20.9	21.2	K	K	20.8	21	19.8	19.4	19.7	20	Y	Y	Y	18.6	S	17.9	17	16.2	15.7	14.2	13.2	12.1	11	12.5	11.0	21.2	17.3
Nov 16	14.5	18.2	19.7	20.8	20.4	24.4	25.7	25	24.1	23.3	22.4	20.9	21.7	S	26.4	26.1	24.3	19.7	19.7	19.7	20	22.5	26.4	29	14.5	29.0	22.4
Nov 17	27.5	26.4	25.9	25.3	24.7	23.8	22.3	20.8	19.3	18.1	19.3	21.6	S	27.8	27.9	28.2	29.5	30.5	31.8	32.4	32.7	33.9	34	36.6	18.1	36.6	27.0
Nov 18	38.5	38.6	38.5	37.7	37.1	39.8	41	40.4	39.3	38.6	38.3	S	38.1	37.7	38	38.2	37.8	36.8	35.3	33.9	34.7	34.5	33.8	32.7	32.7	41.0	37.4
Nov 19	31.2	29.8	29.5	28.3	26.9	26.6	27	25.5	23.5	22.6	S	26.1	24.9	26.5	28.2	28	27.3	25.7	26.8	27.6	28.7	27.1	26.1	25.2	22.6	31.2	26.9
Nov 20	24.9	23.9	23.6	24.1	23	21.5	20	19.3	19.3	S	24.1	26.4	27	28.5	28.8	27.5	27.3	27.4	26.8	23.9	19.2	16.8	15.1	15.6	15.1	28.8	23.2
Nov 21	17	18	18.6	17.4	16.5	15	13.5	12.6	S	14.2	16.1	18	20.1	23.2	25.1	23.6	18.3	15.9	14.9	13.7	14.1	14	14.2	14.4	12.6	25.1	16.9
Nov 22	14.5	12.6	12.6	12.8	13.4	14	12.8	S	19.7	30.9	35.1	35.1	37.2	39.1	38.9	37.3	32.9	30.9	31.6	30.2	28.4	26.8	27	27.2	12.6	39.1	26.1
Nov 23	25.8	28.7	35.6	37.2	38.8	38.5	S	39.8	38.9	38.7	40.1	40.6	41.3	42.1	42.3	42.3	39	37.5	36.5	36.5	36	33.7	33.8	31.6	25.8	42.3	37.2
Nov 24	30.5	28	28.9	34.8	34.9	S	33.8	30.8	33.3	33.2	32.6	31.5	30.7	31.1	32.7	33	32.1	33.1	33	32.5	31.3	29.9	28.8	27.7	27.7	34.9	31.7
Nov 25	27.5	27.6	28.3	29.1	S	28.5	31.9	33.5	32.5	31.1	32.4	33.5	34.7	36	37	36.6	36.5	37.3	36.9	36.4	35.4	34.7	33.8	31.5	27.5	37.3	33.2
Nov 26	30.5	28.8	29.5	S	33	27.6	27.8	27.9	25.6	25.5	26.6	27.3	27.1	27.6	28.8	28.8	29	27.9	27.6	27.1	26.6	27.3	26.9	25.6	25.5	33.0	27.8
Nov 27	24.2	22.8	S	22.8	22.9	22.3	21.6	21.3	19.7	19.9	20.8	23.9	25.2	25.4	25.6	24.6	24.8	24.1	22.4	21.7	24.9	25.6	25.6	25.8	19.7	25.8	23.4
Nov 28	26.7	S	28.2	25.6	24.7	25.1	25.6	26.6	26.1	24.5	24.9	25	24.4	23.9	23.9	21.8	20.8	19.4	18.2	17.7	22	26.4	27.8	28.9	17.7	28.9	24.3
Nov 29	S	27.9	27.9	27.3	27	27	26.5	26.4	25.9	25.5	25	25.2	25.3	27.1	26.4	26.5	25.4	25.4	25.9	26.5	25.8	25.1	26.2	S	25.0	27.9	26.2
Nov 30	24.3	21.9	23.3	22.9	22.1	23	22.8	23.1	25.4	25.6	28	27.4	26.5	25.9	25.5	25.9	25.1	23.6	23.4	22.8	22.7	22.2	S	20.4	20.4	28.0	24.1
Diurnal Maximum	39	39	39	38	39	40	41	40	39	39	40	41	41	42	42	42	39	38	37	37	36	35	34	37			
Daiurnal Average	25.3	25.6	25.8	25.7	25.6	25.3	24.9	25.3	25.4	25.8	27.1	27.3	28.5	28.6	29.1	28.6	28.0	26.7	27.1	26.3	26.0	26.0	25.5	25.3			

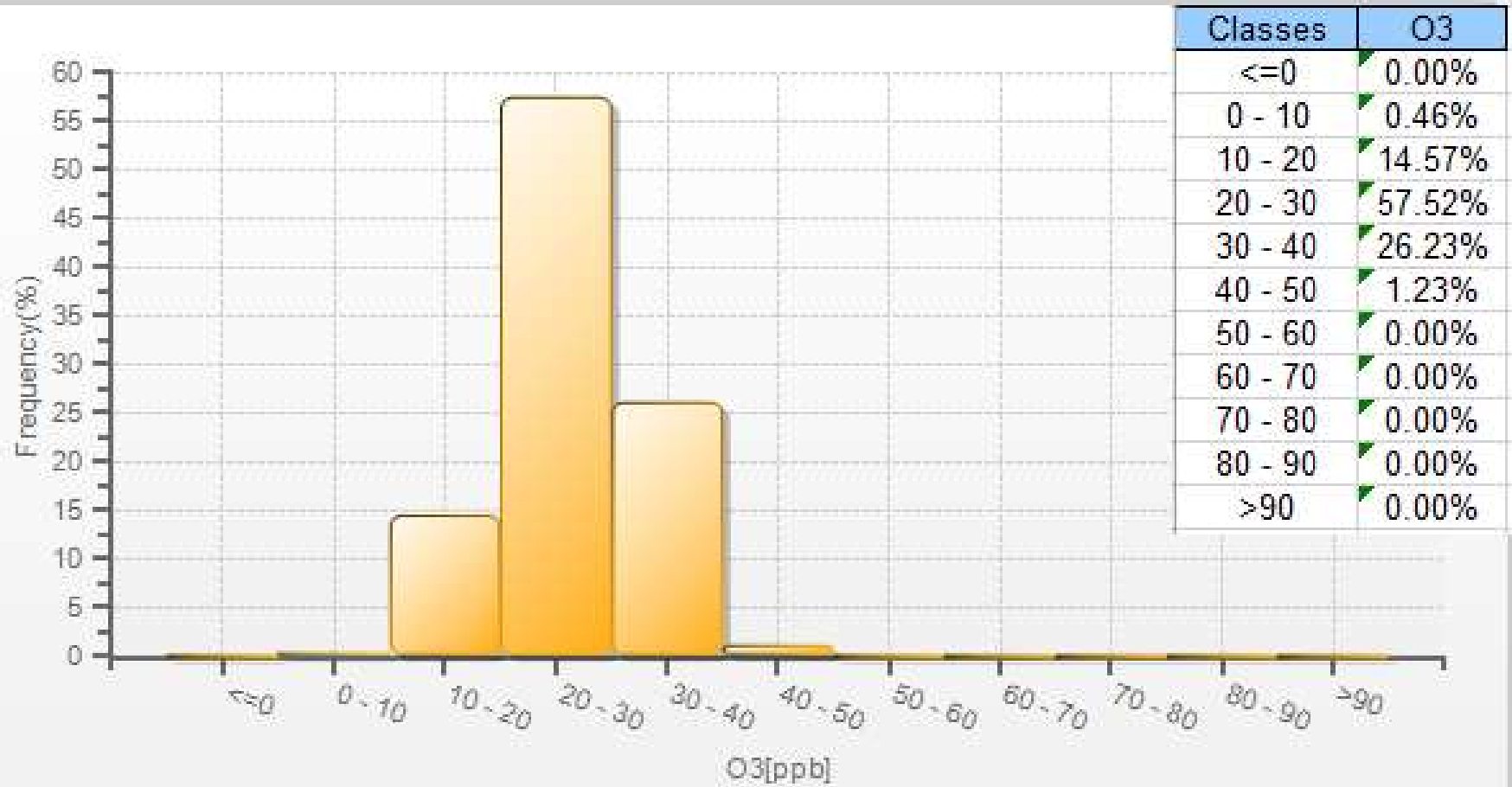
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for O3 - St. Lina Site

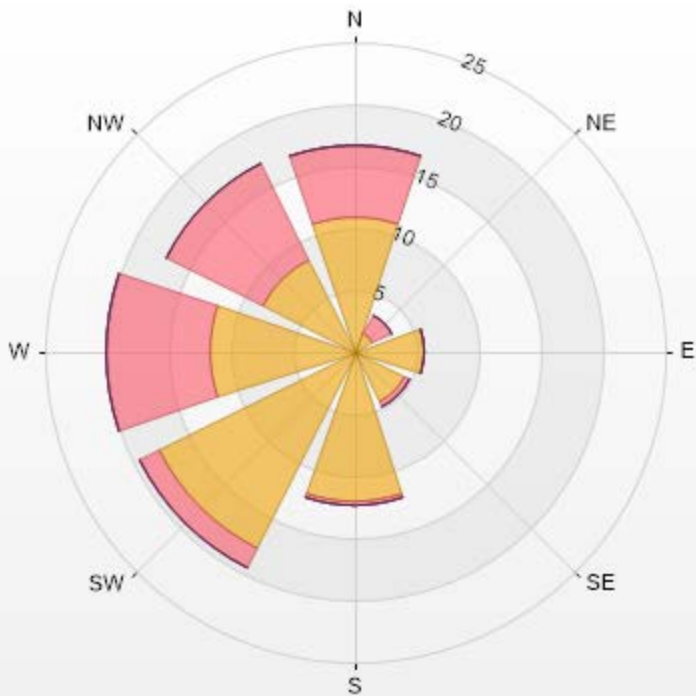


O3[ppb] Histogram: St. Lina Monthly: 11-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-O3[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 90.42% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	10.91	5.84	0	0	0	16.75
NE	1.69	1.69	0	0	0	3.38
E	5.68	0	0	0	0	5.68
SE	4.45	0.61	0	0	0	5.06
S	12.14	0.31	0	0	0	12.45
SW	17.67	1.84	0	0	0	19.51
W	11.67	8.45	0	0	0	20.12
NW	8.29	8.76	0	0	0	17.05
Summary	72.5	27.5	0	0	0	100



LICA-201911-Revision 1



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

TOTAL HYDROCARBONS (THC) in ppm

Maximum Hourly Value:	2.27 ppm on November 13 at hour 10	Hours in Service:	720
Maximum Daily Value:	2.08 ppm on November 11	Hours of Data:	684
Minimum Hourly Value:	1.89 ppm on November 23 at hour 7	Hours of Missing Data:	0
Minimum Daily Value:	1.92 ppm on November 25	Hours of Calibration:	36
Monthly Average:	1.99 ppm	Operational Uptime:	100.0

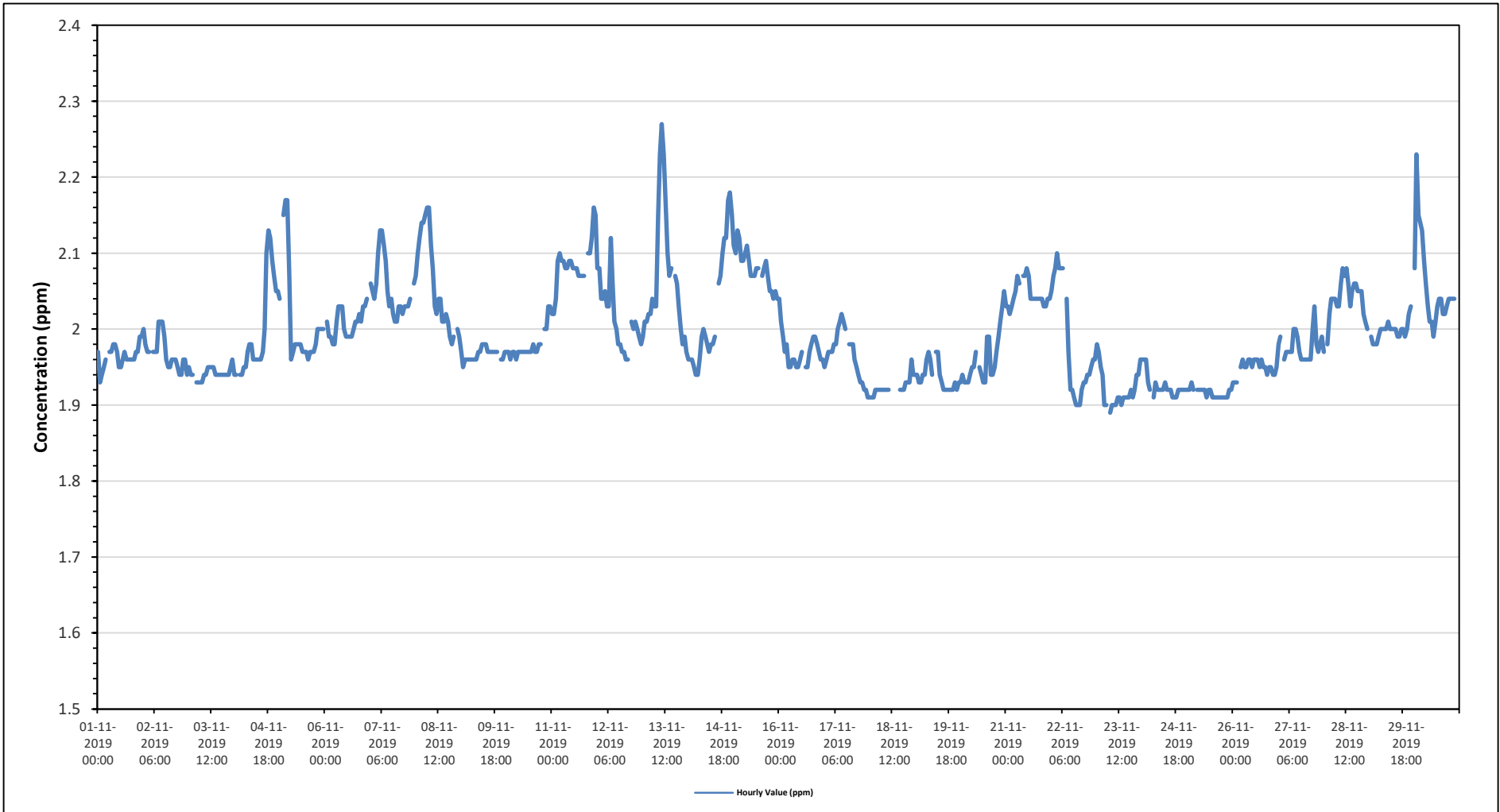
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	1.97	1.93	1.94	1.95	1.96	S	1.97	1.97	1.98	1.98	1.97	1.95	1.95	1.96	1.97	1.96	1.96	1.96	1.96	1.96	1.97	1.97	1.99	1.99	1.93	1.99	1.96	
Nov 2	2.00	1.98	1.97	1.97	S	1.97	1.97	1.97	2.01	2.01	2.01	1.99	1.96	1.95	1.95	1.96	1.96	1.96	1.95	1.94	1.94	1.96	1.96	1.94	1.94	2.01	1.97	
Nov 3	1.95	1.94	1.94	S	1.93	1.93	1.93	1.93	1.94	1.94	1.95	1.95	1.95	1.95	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.95	1.95	1.96	1.93	1.96	1.94	
Nov 4	1.94	1.94	S	1.94	1.94	1.95	1.95	1.95	1.97	1.98	1.98	1.96	1.96	1.96	1.96	1.97	2.00	2.10	2.13	2.12	2.09	2.07	2.05	2.05	1.94	2.13	2.00	
Nov 5	2.04	S	2.15	2.17	2.17	2.07	1.96	1.97	1.98	1.98	1.98	1.98	1.97	1.97	1.97	1.96	1.97	1.97	1.97	1.97	1.98	2.00	2.00	2.00	2.00	1.96	2.17	2.01
Nov 6	S	2.01	1.99	1.99	1.98	1.98	2.01	2.03	2.03	2.03	2.00	1.99	1.99	1.99	1.99	2.00	2.01	2.01	2.02	2.01	2.03	2.03	2.04	S	1.98	2.04	2.01	
Nov 7	2.06	2.05	2.04	2.06	2.10	2.13	2.13	2.11	2.09	2.05	2.03	2.04	2.02	2.01	2.01	2.03	2.03	2.02	2.03	2.03	2.03	2.04	S	2.06	2.01	2.13	2.05	
Nov 8	2.07	2.10	2.12	2.14	2.14	2.15	2.16	2.16	2.11	2.08	2.03	2.02	2.04	2.04	2.01	2.01	2.02	2.01	1.99	1.98	1.99	S	2.00	1.99	1.98	2.16	2.06	
Nov 9	1.97	1.95	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.97	1.97	1.98	1.98	1.98	1.97	1.97	1.97	1.97	1.97	1.97	S	1.96	1.96	1.97	1.95	1.98	1.97	
Nov 10	1.97	1.97	1.96	1.97	1.97	1.96	1.97	1.97	1.97	1.97	1.97	1.97	1.98	1.97	1.97	1.98	1.97	1.98	1.98	S	2.00	2.00	2.03	2.03	1.96	2.03	1.98	
Nov 11	2.02	2.02	2.04	2.09	2.10	2.09	2.09	2.08	2.08	2.09	2.09	2.08	2.08	2.08	2.07	2.07	2.07	2.07	S	2.10	2.10	2.12	2.16	2.15	2.02	2.16	2.08	
Nov 12	2.08	2.08	2.04	2.04	2.05	2.03	2.03	2.12	2.06	2.01	2.00	1.98	1.98	1.97	1.97	1.96	1.96	S	2.01	2.00	2.01	2.00	1.99	1.98	1.96	2.12	2.02	
Nov 13	1.99	2.01	2.01	2.02	2.02	2.04	2.03	2.03	2.15	2.23	2.27	2.23	2.17	2.10	2.07	2.08	S	2.07	2.06	2.03	2.00	1.98	1.99	1.97	1.97	2.27	2.07	
Nov 14	1.96	1.96	1.96	1.95	1.94	1.94	1.96	1.99	2.00	1.99	1.98	1.97	1.98	1.98	1.99	S	2.06	2.07	2.10	2.12	2.12	2.17	2.18	2.15	1.94	2.18	2.02	
Nov 15	2.11	2.10	2.13	2.12	2.09	2.09	2.10	2.11	2.09	2.07	2.07	2.07	2.08	2.08	S	2.07	2.08	2.09	2.07	2.05	2.05	2.04	2.05	2.04	2.04	2.13	2.08	
Nov 16	2.04	2.01	1.99	1.97	1.98	1.95	1.95	1.96	1.96	1.95	1.95	1.96	1.97	S	1.95	1.95	1.97	1.98	1.99	1.99	1.98	1.97	1.96	1.96	1.95	2.04	1.97	
Nov 17	1.95	1.96	1.97	1.97	1.97	1.98	1.98	2.00	2.01	2.02	2.01	2.00	S	1.98	1.98	1.98	1.96	1.95	1.94	1.93	1.93	1.92	1.92	1.91	1.91	2.02	1.97	
Nov 18	1.91	1.91	1.91	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	S	C	C	C	C	1.92	1.92	1.92	1.93	1.93	1.93	1.96	1.94	1.91	1.96	1.92	
Nov 19	1.94	1.94	1.93	1.93	1.94	1.94	1.96	1.97	1.96	1.94	S	1.97	1.97	1.94	1.93	1.92	1.92	1.92	1.92	1.92	1.92	1.93	1.92	1.93	1.92	1.97	1.94	
Nov 20	1.93	1.94	1.93	1.93	1.93	1.94	1.95	1.95	1.97	S	1.95	1.94	1.93	1.93	1.99	1.99	1.94	1.94	1.95	1.97	1.99	2.01	2.03	2.05	1.93	2.05	1.96	
Nov 21	2.03	2.03	2.02	2.03	2.04	2.05	2.07	2.06	S	2.07	2.07	2.08	2.07	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.03	2.03	2.04	2.04	2.02	2.08	2.05	
Nov 22	2.05	2.07	2.08	2.10	2.08	2.08	2.08	S	2.04	1.97	1.92	1.92	1.91	1.90	1.90	1.90	1.92	1.93	1.93	1.94	1.94	1.95	1.96	1.96	1.90	2.10	1.98	
Nov 23	1.98	1.97	1.95	1.94	1.90	1.90	S	1.89	1.90	1.90	1.90	1.91	1.91	1.90	1.91	1.91	1.91	1.91	1.91	1.92	1.91	1.92	1.94	1.94	1.96	1.89	1.98	1.92
Nov 24	1.96	1.96	1.96	1.93	1.92	S	1.91	1.93	1.92	1.92	1.92	1.92	1.92	1.93	1.92	1.92	1.92	1.91	1.91	1.91	1.91	1.92	1.92	1.92	1.91	1.96	1.92	
Nov 25	1.92	1.92	1.93	1.92	S	1.92	1.92	1.92	1.92	1.92	1.91	1.92	1.92	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.92	1.92	1.91	1.93	1.92	
Nov 26	1.93	1.93	1.93	S	1.95	1.96	1.95	1.95	1.96	1.96	1.95	1.96	1.96	1.95	1.96	1.95	1.95	1.94	1.95	1.95	1.94	1.95	1.94	1.95	1.93	1.96	1.95	
Nov 27	1.98	1.99	S	1.96	1.97	1.97	1.97	1.97	2.00	2.00	1.99	1.97	1.96	1.96	1.96	1.96	1.96	1.96	2.00	2.03	1.98	1.97	1.98	1.99	1.96	2.03	1.98	
Nov 28	1.97	S	1.98	2.02	2.04	2.04	2.04	2.03	2.03	2.06	2.08	2.07	2.08	2.06	2.03	2.05	2.06	2.06	2.05	2.05	2.05	2.02	2.01	2.00	1.97	2.08	2.04	
Nov 29	S	1.99	1.98	1.98	1.98	1.99	2.00	2.00	2.00	2.00	2.01	2.00	2.00	2.00	2.00	1.99	1.99	2.00	2.00	1.99	2.00	2.02	2.03	S	1.98	2.03	2.00	
Nov 30	2.08	2.23	2.15	2.14	2.13	2.09	2.06	2.03	2.01	2.01	1.99	2.01	2.03	2.04	2.04	2.02	2.02	2.03	2.04	2.04	2.04	2.04	S	2.03	1.99	2.23	2.06	
Diurnal Maximum	2.11	2.23	2.15	2.17	2.17	2.15	2.16	2.16	2.15	2.23	2.27	2.23	2.17	2.10	2.07	2.08	2.08	2.10	2.13	2.12	2.12	2.17	2.18	2.15				
Diurnal Average	1.99	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.99	1.99	1.99	1.98	1.98	1.98	1.98	1.99	1.99	1.99	1.99	1.99	2.00	1.99				

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

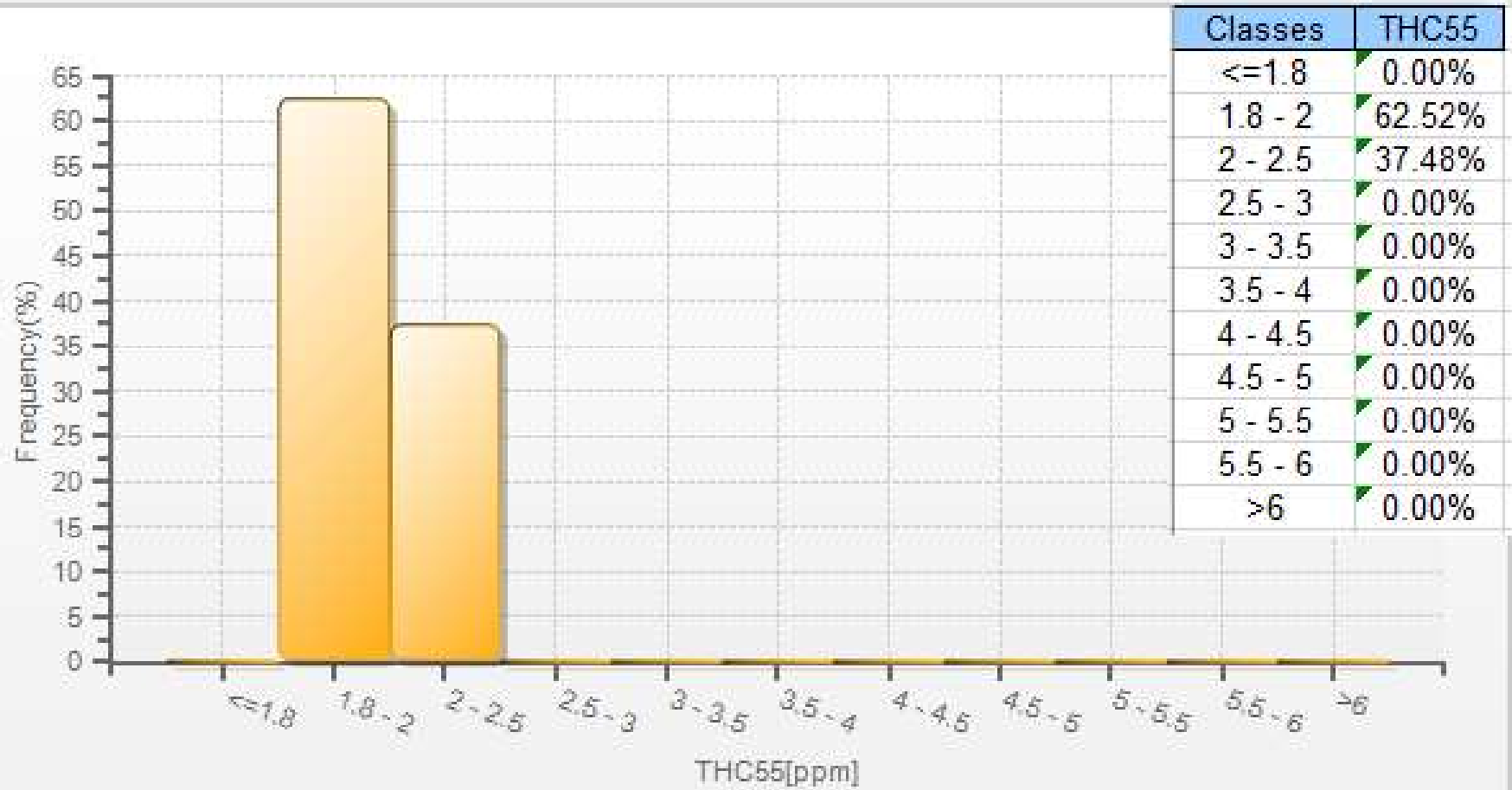
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for THC - St. Lina Site

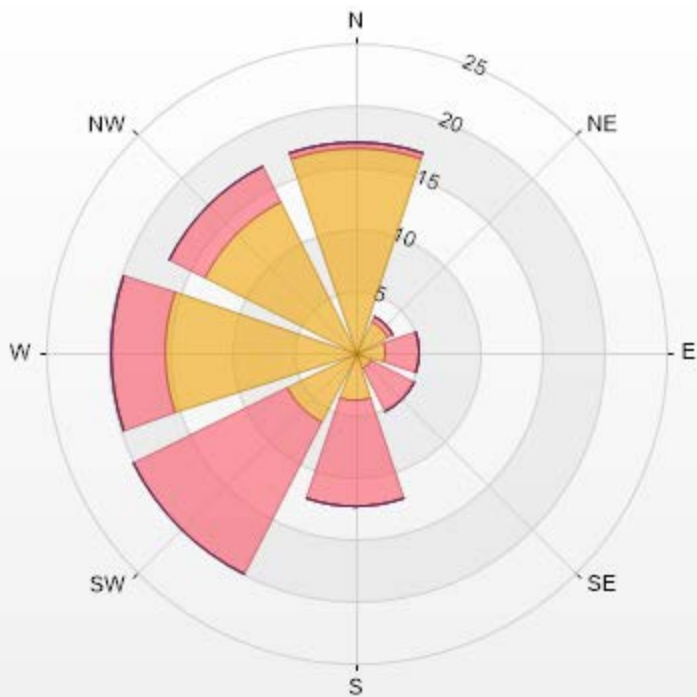


THC55[ppm] Histogram: St. Lina Monthly: 11-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-THC55[ppm] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 91.39% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	16.57	0.46	0	0	0	17.03
NE	2.89	0.46	0	0	0	3.35
E	2.43	2.74	0	0	0	5.17
SE	1.52	3.8	0	0	0	5.32
S	3.95	8.51	0	0	0	12.46
SW	6.23	13.83	0	0	0	20.06
W	15.35	4.41	0	0	0	19.76
NW	13.68	3.19	0	0	0	16.87
Summary	62.62	37.4	0	0	0	100



LICA-201911-Revision 1

% Icon Classes (ppm)	63	0-2	37	187	295	366	5-10	0	10-40	0	>40.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

METHANE (CH4) in ppm

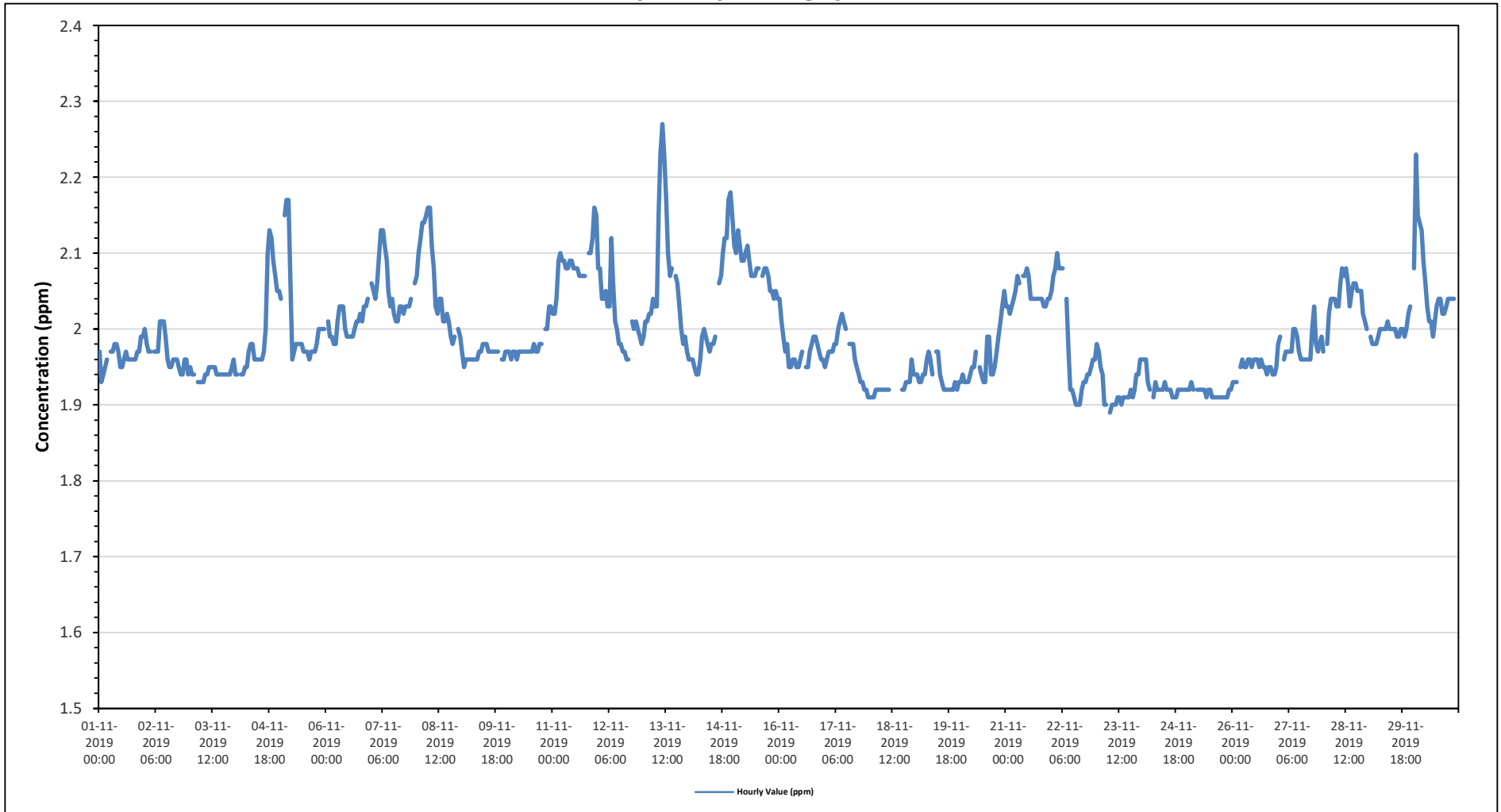
Summary statistics table including Maximum Hourly Value (2.27 ppm), Maximum Daily Value (2.08 ppm), Minimum Hourly Value (1.89 ppm), Minimum Daily Value (1.92 ppm), Monthly Average (1.99 ppm), Hours in Service (720), Hours of Data (683), Hours of Missing Data (0), Hours of Calibration (37), and Operational Uptime (100.0).

Main data table with columns for Day, Hourly Period Starting at (MST) (0-23), Daily Minimum, Daily Maximum, and Daily Average. Rows include data for each day of November 2019 and summary rows for Diurnal Maximum and Diurnal Average.

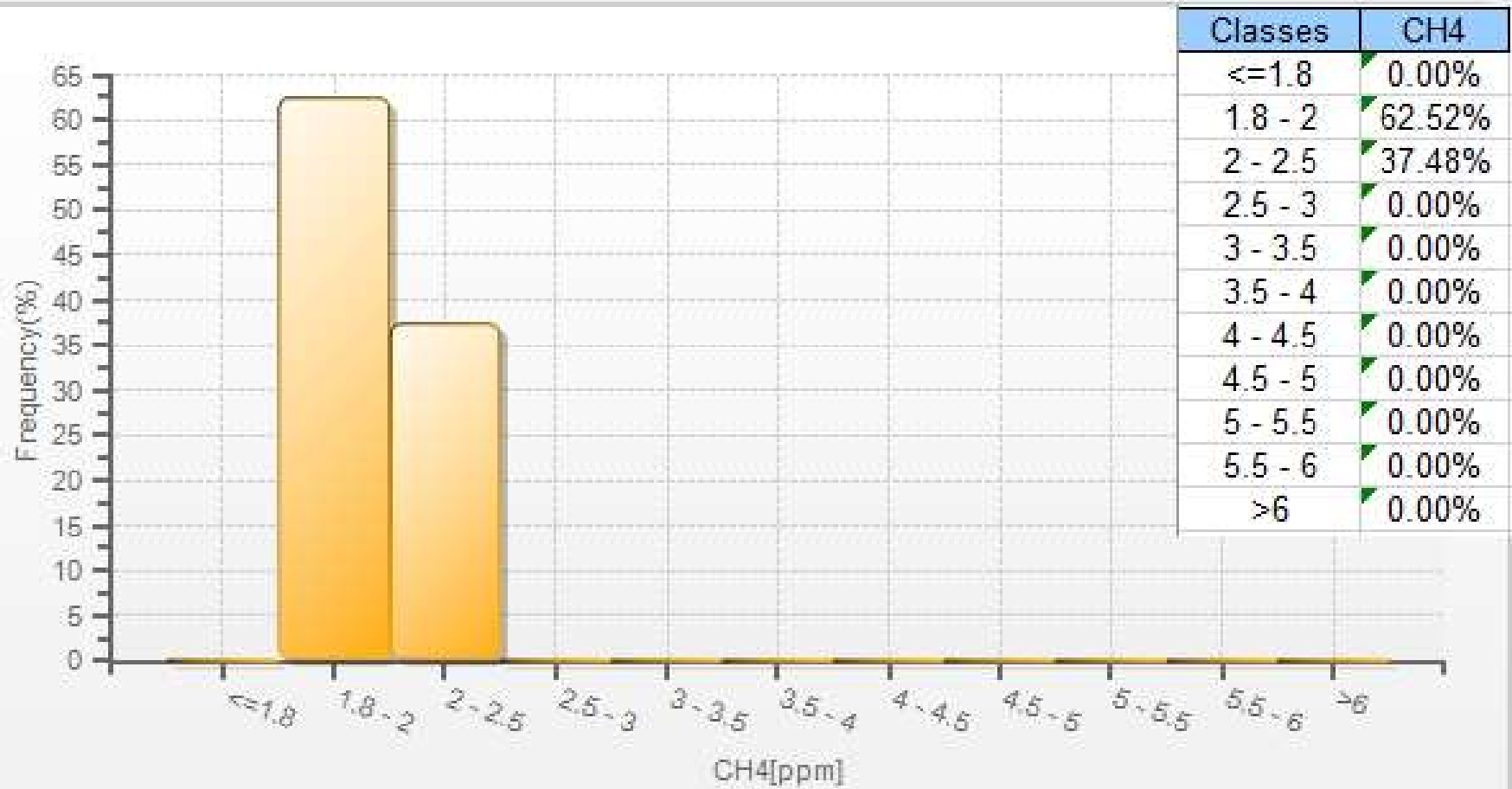
Legend table defining codes: C Calibration, G Out for Repair, R Recovery, S Daily Zero/Spin, K Collection Error, X Machine Malfunction, Q Quality Assurance, N Not in Service, Y Maintenance, C1 Repeat Calibration, O Operator Error, T Exceeds Temperature Limits, S1 Repeat Daily Zero/Spin, P Power Failure, N Not in Service.

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met. Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for CH4 - St. Lina Site

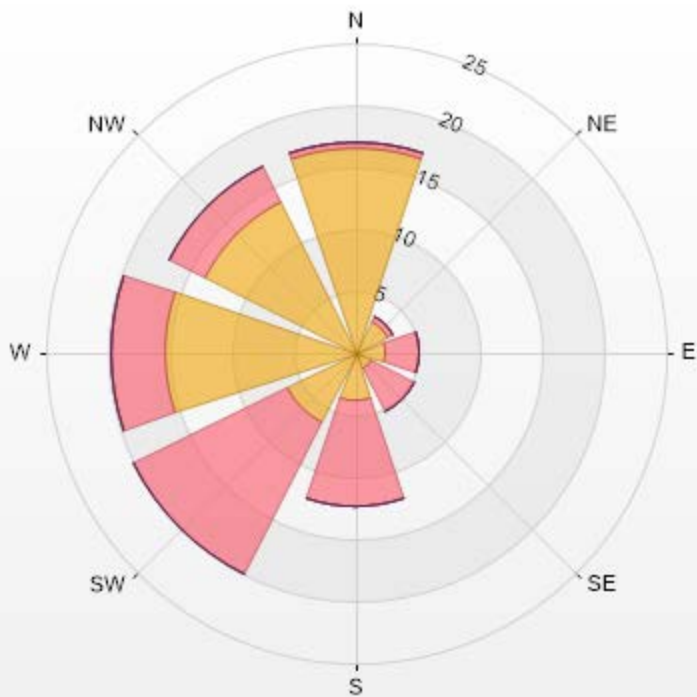


CH4[ppm] Histogram: St. Lina Monthly: 11-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-CH4[ppm] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 91.39% Calm Avg: 0.00 [ppm]

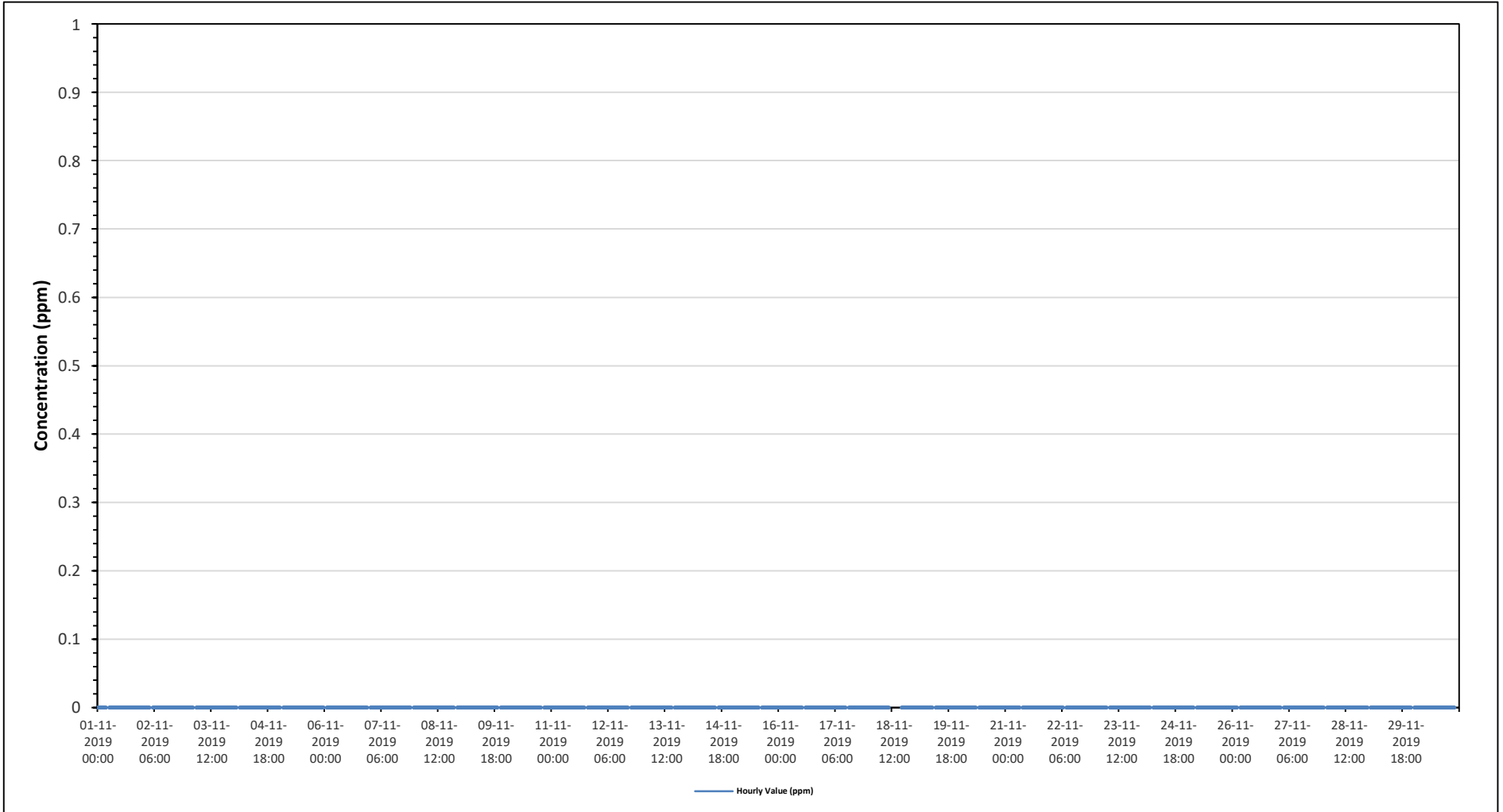
Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	16.57	0.46	0	0	0	17.03
NE	2.89	0.46	0	0	0	3.35
E	2.43	2.74	0	0	0	5.17
SE	1.52	3.8	0	0	0	5.32
S	3.95	8.51	0	0	0	12.46
SW	6.23	13.83	0	0	0	20.06
W	15.35	4.41	0	0	0	19.76
NW	13.68	3.19	0	0	0	16.87
Summary	62.62	37.4	0	0	0	100



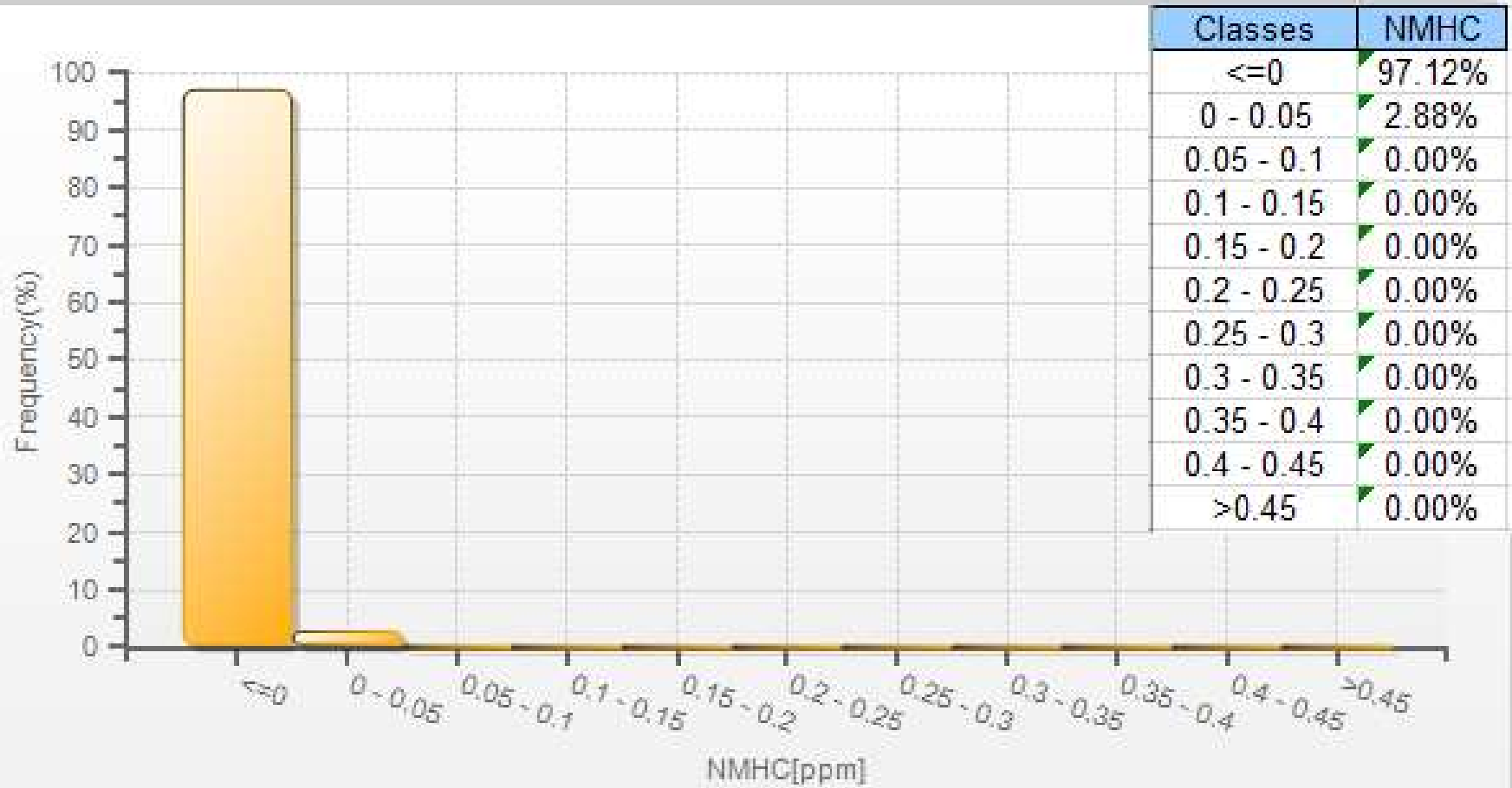
LICA-201911-Revision 1

% Icon Classes (ppm)	63	37	205	366	0	0
0-2	63	37	205	366	0	0
2-5						
5-10						
10-20						
>20.0						

Timeseries Chart of Hourly Average for NMHC - St. Lina Site

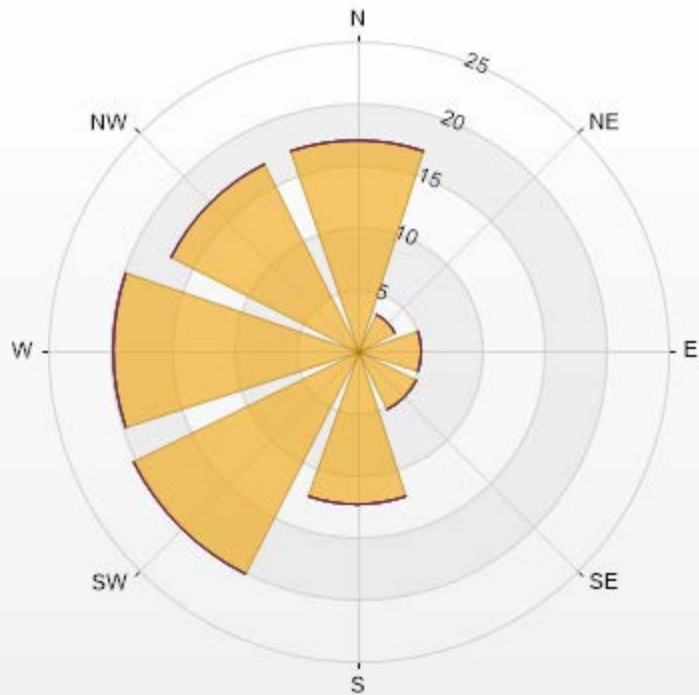


NMHC[ppm] Histogram: St. Lina Monthly: 11-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-NMHC[ppm] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 91.53% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-0.9	0.9-2	>2.0	Total
N	17	0	0	0	0	17
NE	3.34	0	0	0	0	3.34
E	5.16	0	0	0	0	5.16
SE	5.31	0	0	0	0	5.31
S	12.44	0	0	0	0	12.44
SW	20.18	0	0	0	0	20.18
W	19.73	0	0	0	0	19.73
NW	16.84	0	0	0	0	16.84
Summary	100	0	0	0	0	100



LICA-201911-Revision 1

% Icon	Classes (ppm)	0-0.1	0.1-0.3	0.3-0.9	0.9-2	>2.0
100	0-0.1	0	0	0	0	0
100	0.1-0.3	0	0	0	0	0
100	0.3-0.9	0	0	0	0	0
100	0.9-2	0	0	0	0	0
100	>2.0	0	0	0	0	0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

PARTICULATE MATTER 2.5 (PM_{2.5}) in µg/m³

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 80 µg/m³, 24-Hour 29 µg/m³			
Number of 1-Hour Exceedences:	0	Number of 24-Hour Exceedences:	0

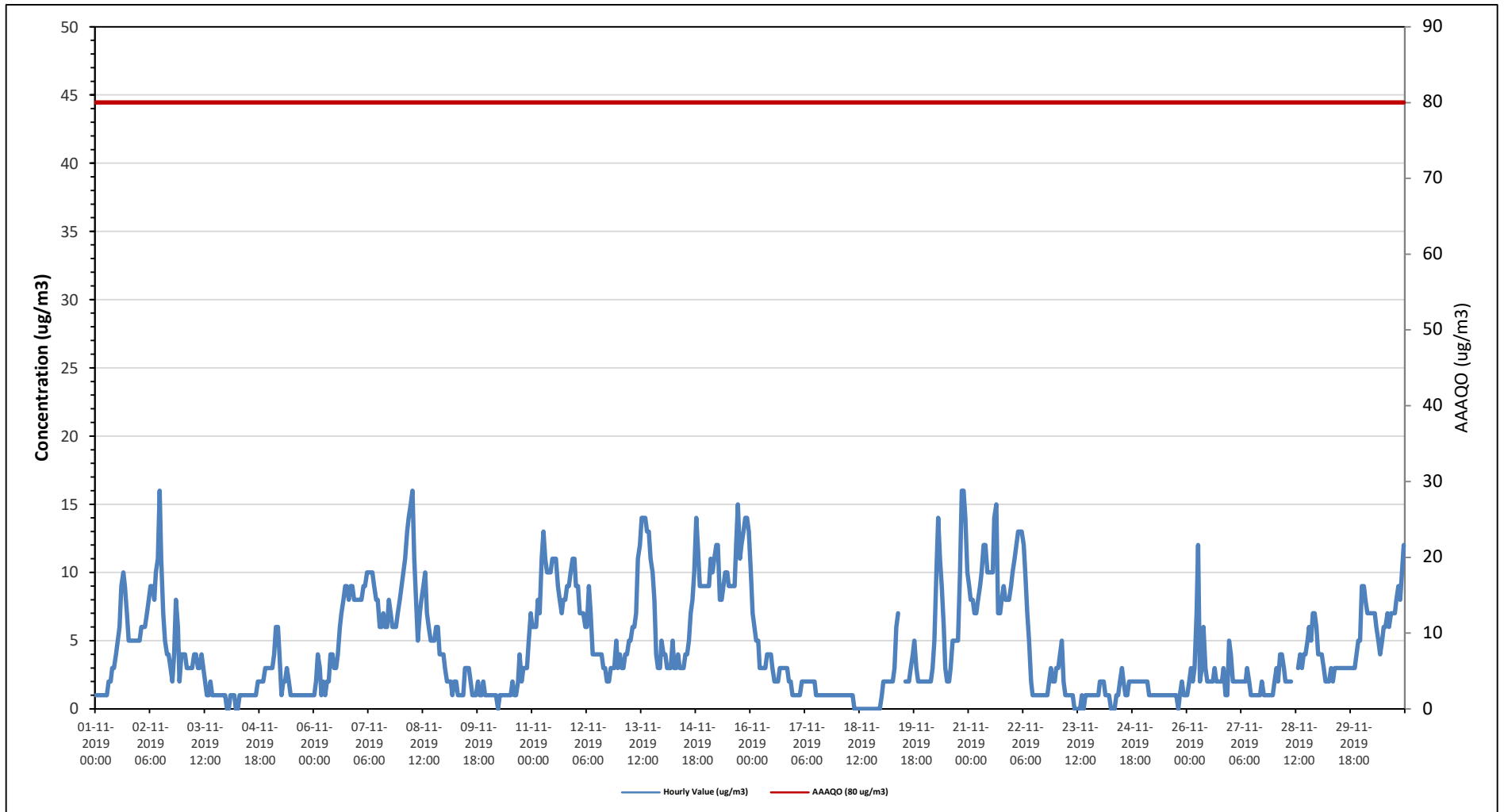
Maximum Hourly Value:	16 µg/m ³ on November 2 at hour 11	Hours in Service:	720
Maximum Daily Value:	11 µg/m ³ on November 15	Hours of Data:	717
Minimum Hourly Value:	0 µg/m ³ on November 4 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0 µg/m ³ on November 18	Hours of Calibration:	3
Monthly Average:	4.4 µg/m ³	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	1	1	1	1	1	1	1	2	2	3	3	4	5	6	9	10	9	7	5	5	5	5	5	5	1	10	4.0
Nov 2	5	6	6	6	7	8	9	9	8	10	11	16	11	7	5	4	4	3	2	4	8	6	2	4	2	16	6.7
Nov 3	4	4	3	3	3	3	4	4	3	3	4	3	2	1	1	2	1	1	1	1	1	1	1	1	1	4	2.3
Nov 4	0	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3	0	3	1.3
Nov 5	3	3	4	6	6	4	1	2	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	2.0
Nov 6	1	2	4	3	1	2	1	2	2	4	4	3	3	4	6	7	8	9	9	8	9	9	8	8	1	9	4.9
Nov 7	8	8	8	9	9	10	10	10	10	9	8	8	6	6	7	6	6	8	7	6	6	6	7	8	6	10	7.8
Nov 8	9	10	11	13	14	15	16	11	8	5	7	8	9	10	7	6	5	5	5	6	6	4	4	4	4	16	8.3
Nov 9	3	2	2	2	1	2	2	1	1	1	1	3	3	3	2	1	1	1	2	1	1	2	1	1	1	3	1.7
Nov 10	1	1	1	1	1	0	1	1	1	1	1	1	1	2	1	1	2	4	2	3	3	3	5	7	0	7	1.9
Nov 11	6	6	6	8	7	11	13	11	10	10	10	11	11	11	9	8	7	8	8	9	9	10	11	11	6	13	9.2
Nov 12	9	9	7	7	7	6	6	9	7	4	4	4	4	4	4	3	3	2	2	3	3	3	5	3	2	9	4.9
Nov 13	4	3	3	4	4	5	5	6	6	7	11	12	14	14	14	13	13	11	10	8	4	3	3	5	3	14	7.6
Nov 14	4	4	3	3	3	5	3	3	4	3	3	3	4	4	5	7	8	10	14	12	9	9	9	9	3	14	5.9
Nov 15	9	9	11	10	11	12	12	8	8	9	10	10	9	9	9	12	15	11	12	13	14	14	13	8	15	10.8	
Nov 16	10	7	6	5	5	3	3	3	3	4	4	4	3	2	2	2	3	3	3	3	2	2	1	1	1	10	3.6
Nov 17	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1.3
Nov 18	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4
Nov 19	1	2	2	2	2	2	2	3	6	7	3	3	2	2	2	3	4	5	3	2	2	2	2	1	7	2.8	
Nov 20	2	2	2	2	3	5	10	14	11	9	6	3	2	2	3	5	5	5	10	16	16	14	10	2	16	6.8	
Nov 21	9	8	8	7	7	8	9	10	12	12	10	10	10	10	14	15	7	7	8	9	8	8	8	9	7	15	9.3
Nov 22	10	11	12	13	13	13	12	10	7	5	2	1	1	1	1	1	1	1	1	1	2	3	2	2	1	13	5.3
Nov 23	3	3	4	5	2	1	1	1	1	1	0	0	0	0	1	0	1	1	1	1	1	1	1	1	0	5	1.3
Nov 24	2	2	2	1	1	1	0	0	0	1	1	2	3	2	1	1	2	2	2	2	2	2	2	2	0	3	1.5
Nov 25	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	2	1	1	0	2	1.1
Nov 26	1	2	3	2	3	7	12	2	3	6	3	2	2	2	2	3	2	2	2	2	3	1	1	5	1	12	3.0
Nov 27	4	2	2	2	2	2	2	2	2	3	2	1	1	1	1	1	1	2	1	1	1	1	1	1	1	4	1.6
Nov 28	2	3	2	4	4	3	2	2	2	2	C	C	C	3	4	3	4	4	5	6	5	7	7	6	2	7	3.8
Nov 29	4	4	4	3	2	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	4	5	5	2	5	3.2	
Nov 30	9	9	8	7	7	7	7	7	6	5	4	5	6	6	7	6	7	7	7	8	9	8	10	12	4	12	7.3
Diurnal Maximum	10	11	12	13	14	15	16	14	12	12	11	16	14	14	14	15	13	15	14	12	16	16	14	13			
Diurnal Average	4.3	4.2	4.3	4.4	4.4	4.7	5.0	4.7	4.4	4.5	4.2	4.3	4.1	4.0	4.1	4.1	4.1	4.3	4.2	4.4	4.6	4.6	4.5	4.7			

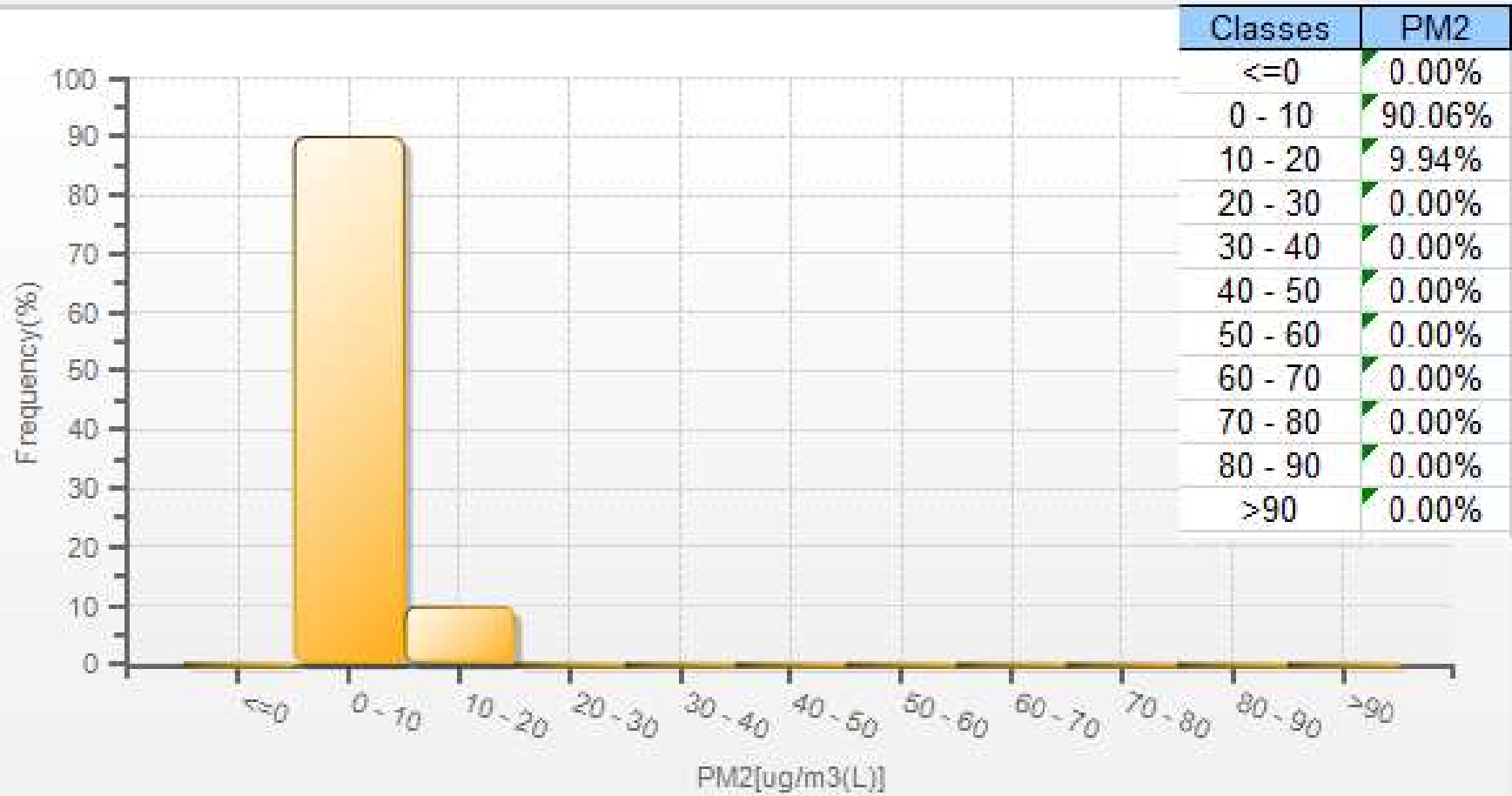
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for PM2.5 - St. Lina Site

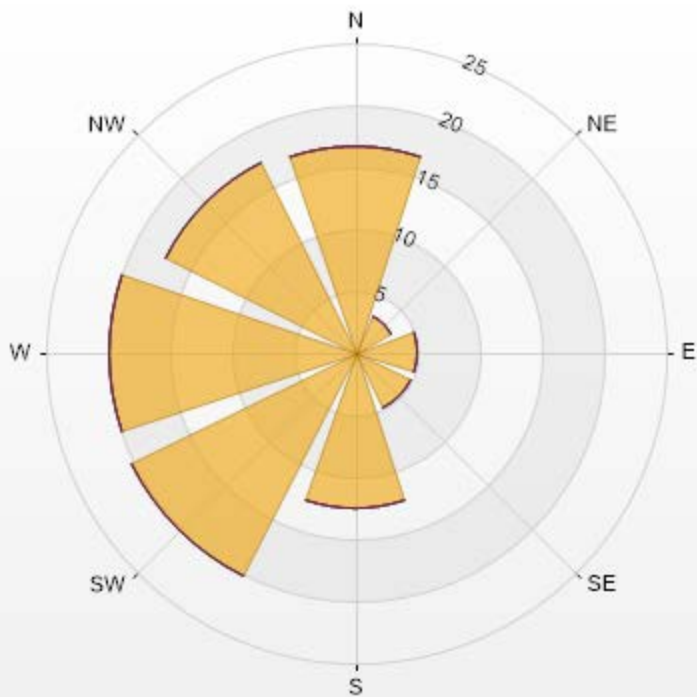


PM2[ug/m3(L)] Histogram: St. Lina Monthly: 11-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-PM2[ug/m3(L)] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 99.03% Calm Avg: 0.00 [ug/m3(L)]

Direction	0-50	50-80	80-120	120-240	>240.0	Total
N	16.69	0	0	0	0	16.69
NE	3.23	0	0	0	0	3.23
E	5.05	0	0	0	0	5.05
SE	5.05	0	0	0	0	5.05
S	12.62	0	0	0	0	12.62
SW	20.2	0	0	0	0	20.2
W	19.92	0	0	0	0	19.92
NW	17.25	0	0	0	0	17.25
Summary	100	0	0	0	0	100



LICA-201911-Revision 1





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

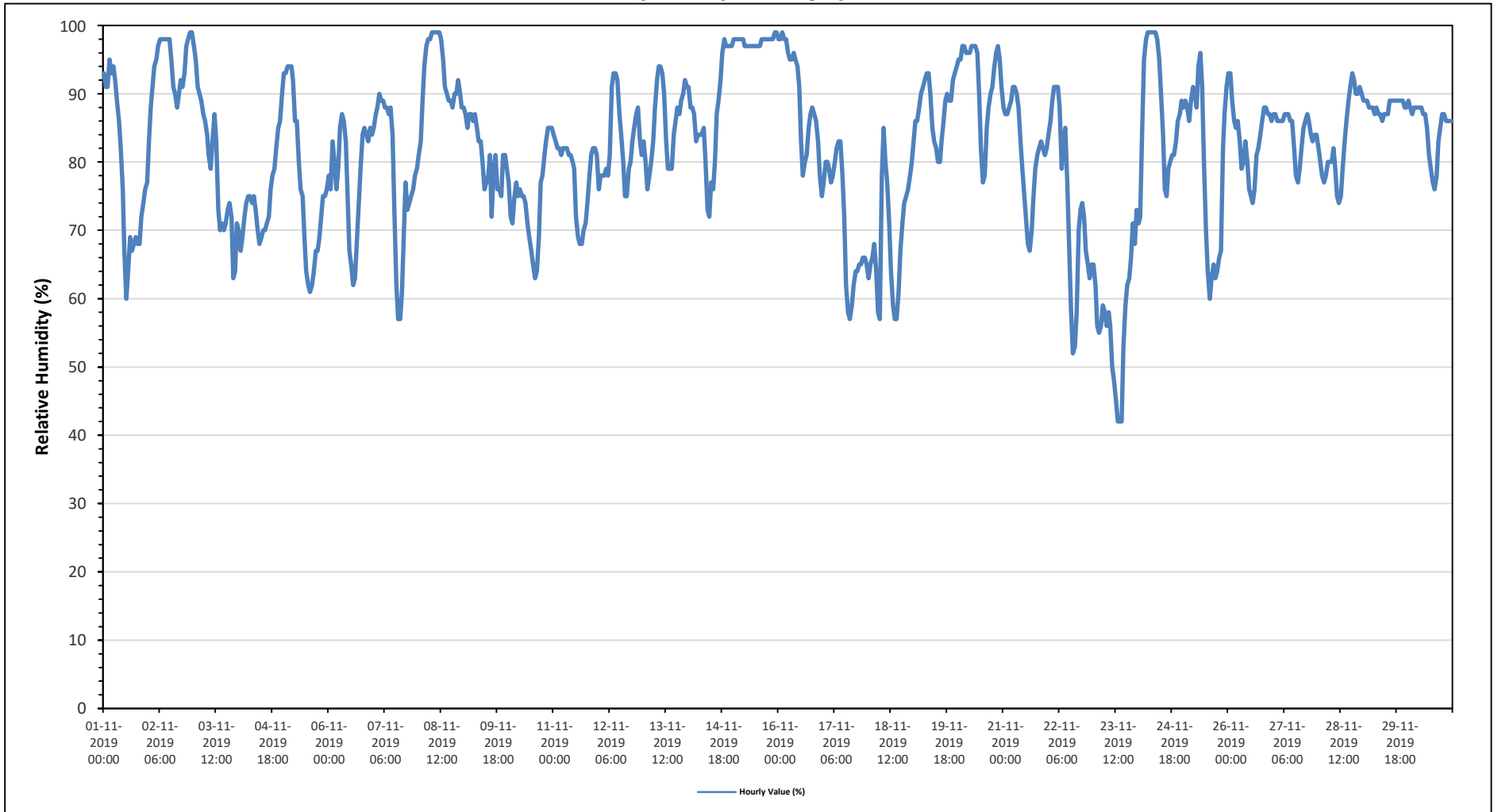
RELATIVE HUMIDITY (RH) in %

Maximum Hourly Value:	99 %	on November 2 at hour 22	Hours in Service:	720
Maximum Daily Value:	97.7 %	on November 15	Hours of Data:	720
Minimum Hourly Value:	42 %	on November 23 at hour 13	Hours of Missing Data:	0
Minimum Daily Value:	56.9 %	on November 23	Hours of Calibration:	0
Monthly Average:	81.7 %		Operational Uptime:	100.0

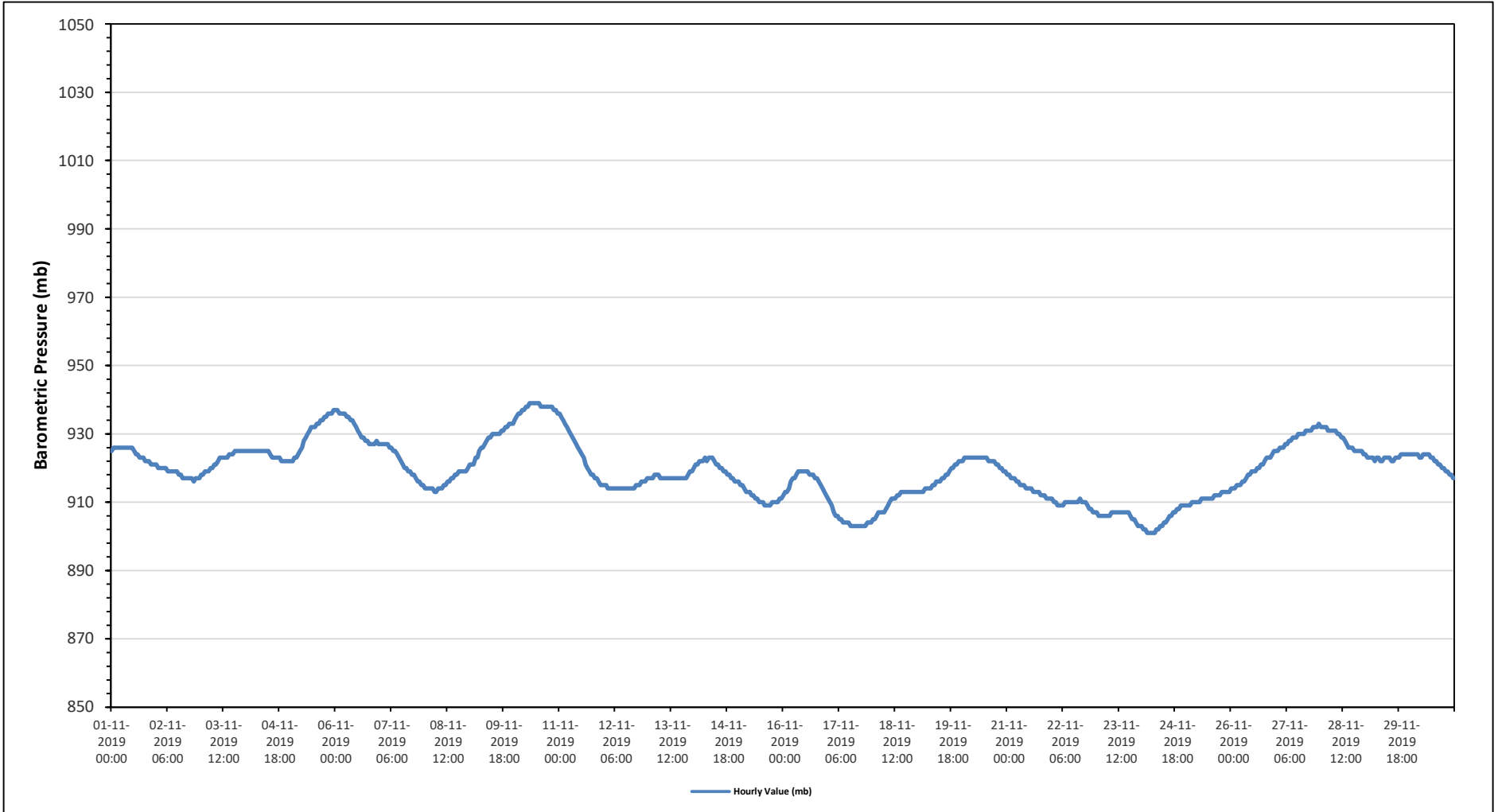
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	93	91	91	95	93	94	92	89	86	82	76	67	60	64	69	67	68	69	68	68	72	74	76	77	60	95	78
Nov 2	83	88	91	94	95	97	98	98	98	98	98	98	95	91	90	88	90	92	91	93	97	98	99	99	83	99	94
Nov 3	97	95	91	90	89	87	86	84	81	79	83	87	83	73	70	71	70	71	73	74	72	63	64	71	63	97	79
Nov 4	70	67	69	72	74	75	75	74	75	73	70	68	69	70	70	71	72	76	78	79	82	85	86	90	67	90	75
Nov 5	93	93	94	94	94	92	86	86	80	76	75	69	64	62	61	62	64	67	67	69	72	75	75	76	61	94	77
Nov 6	78	76	83	80	76	79	85	87	86	83	75	67	65	62	63	68	74	79	84	85	84	83	85	84	62	87	78
Nov 7	85	87	88	90	89	89	88	88	87	88	84	73	62	57	57	61	69	77	73	74	75	76	78	79	57	90	78
Nov 8	81	83	89	94	97	98	98	99	99	99	99	99	98	95	91	90	89	89	88	90	90	92	90	88	81	99	93
Nov 9	88	87	85	87	87	86	87	85	83	83	80	76	77	78	81	72	79	81	76	76	75	81	81	79	72	88	81
Nov 10	77	72	71	75	77	75	76	75	74	71	69	67	65	63	64	69	77	78	81	83	85	85	85	85	63	85	75
Nov 11	84	83	82	82	81	82	82	81	81	80	79	72	69	68	68	70	71	74	78	81	82	82	81	81	68	84	78
Nov 12	76	78	78	78	79	78	81	91	93	93	92	87	84	80	75	75	79	80	83	85	87	88	83	81	75	93	83
Nov 13	83	80	76	78	80	83	88	92	94	94	93	90	83	79	79	79	84	86	88	87	89	90	92	91	76	94	86
Nov 14	91	88	88	87	83	84	84	84	85	80	73	72	77	76	80	87	89	92	96	98	97	97	97	97	72	98	87
Nov 15	98	98	98	98	98	98	97	97	97	97	97	97	97	97	97	98	98	98	98	98	98	98	99	99	97	99	98
Nov 16	98	98	99	98	98	96	95	95	96	95	94	91	83	78	80	81	85	87	88	87	86	83	78	75	75	99	89
Nov 17	77	80	80	79	77	78	80	82	83	83	78	72	62	58	57	59	62	64	64	65	65	66	66	65	57	83	71
Nov 18	63	65	66	68	64	58	57	78	85	80	77	71	64	59	57	61	67	71	74	75	76	78	80	57	85	69	
Nov 19	83	86	86	88	90	91	92	93	93	90	85	83	82	80	80	83	86	89	90	89	89	92	93	94	80	94	88
Nov 20	95	95	97	97	96	96	96	97	97	97	96	90	82	77	78	85	88	90	91	94	96	97	95	91	77	97	92
Nov 21	88	87	87	88	89	91	91	90	88	83	79	75	72	68	67	70	75	79	81	82	83	82	81	82	67	91	82
Nov 22	84	86	89	91	91	91	88	79	83	85	77	68	58	52	53	58	70	73	74	72	67	65	63	65	52	91	74
Nov 23	65	62	56	55	56	59	58	56	58	56	50	48	45	42	42	42	53	59	62	63	66	71	68	73	42	73	57
Nov 24	71	72	85	95	98	99	99	99	99	99	98	95	90	84	76	75	79	80	81	81	83	86	87	89	71	99	88
Nov 25	88	89	88	86	89	91	90	88	94	96	91	80	70	64	60	63	65	63	64	66	67	82	87	91	60	96	80
Nov 26	93	93	89	86	85	86	83	79	80	83	80	76	75	74	76	81	82	84	86	88	88	87	87	86	74	93	84
Nov 27	87	87	86	86	86	86	87	87	87	86	86	82	78	77	79	82	85	86	87	86	84	83	84	84	77	87	85
Nov 28	82	80	78	77	78	80	80	80	82	79	75	74	75	79	83	86	89	91	93	92	90	90	91	90	74	93	83
Nov 29	89	89	89	88	88	88	87	88	87	87	86	87	87	87	89	89	89	89	89	89	89	89	88	88	86	89	88
Nov 30	89	88	87	88	88	88	88	88	87	87	85	81	79	77	76	78	83	85	87	87	86	86	86	86	76	89	85
Diurnal Maximum	98	98	99	98	98	99	99	99	99	99	99	99	98	97	97	98	98	98	98	98	98	98	99	99			
Daiurnal Average	84.3	84.1	84.5	85.5	85.5	85.8	85.8	86.3	86.6	85.5	82.8	79.0	75.2	72.5	72.2	73.7	77.2	79.7	80.8	81.7	82.3	83.4	83.5	83.9			
C	Calibration				S	Daily Zero/Span				Q	Quality Assurance				O	Repeat Calibration				S1	Repeat Daily Zero/Span						
G	Out for Repair				K	Collection Error				N	Not in Service				C1	Operator Error				P	Power Failure						
R	Recovery				X	Machine Malfunction				Y	Maintenance				T	Exceeds Temperature Limits				N	Not in Service						

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for RH - St. Lina Site



Timeseries Chart of Hourly Average for BP - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

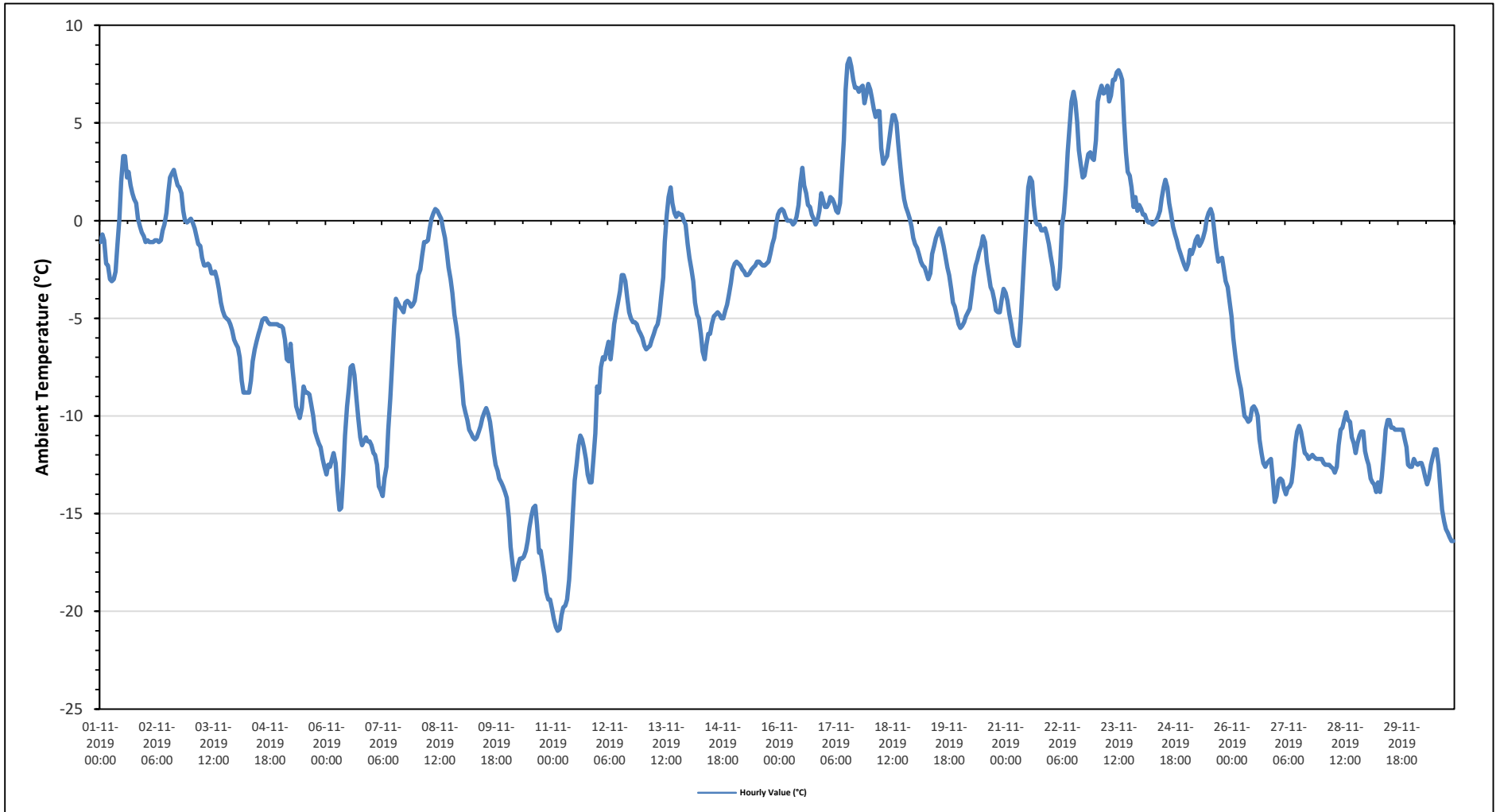
AMBIENT TEMPERATURE (AT) in Degree Celsius

Maximum Hourly Value:	8.3 °C	on November 17 at hour 14	Hours in Service:	720
Maximum Daily Value:	5.0 °C	on November 23	Hours of Data:	720
Minimum Hourly Value:	-21.0 °C	on November 11 at hour 3	Hours of Missing Data:	0
Minimum Daily Value:	-16.9 °C	on November 10	Hours of Calibration:	0
Monthly Average:	-5.0 °C		Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	-1.1	-0.7	-1.0	-2.2	-2.3	-3.0	-3.1	-3.0	-2.6	-1.3	0.1	2.0	3.3	3.3	2.2	2.5	1.8	1.4	1.1	0.9	0.1	-0.3	-0.6	-0.8	-3.1	3.3	-0.1
Nov 2	-1.1	-1.0	-1.1	-1.1	-1.1	-1.0	-1.0	-1.1	-1.0	-0.5	-0.2	0.4	1.4	2.2	2.4	2.6	2.2	1.8	1.7	1.4	0.5	0.0	-0.1	0.0	-1.1	2.6	0.3
Nov 3	0.1	-0.1	-0.4	-0.8	-1.2	-1.3	-1.9	-2.3	-2.3	-2.2	-2.3	-2.7	-2.7	-2.6	-3.0	-3.5	-4.2	-4.6	-4.9	-5.0	-5.1	-5.3	-5.6	-6.1	-6.1	0.1	-2.9
Nov 4	-6.3	-6.5	-7.0	-8.2	-8.8	-8.8	-8.8	-8.8	-8.2	-7.2	-6.6	-6.2	-5.8	-5.5	-5.1	-5.0	-5.0	-5.2	-5.3	-5.3	-5.3	-5.3	-5.4	-5.4	-8.8	-5.0	-6.5
Nov 5	-5.4	-5.5	-6.1	-7.1	-7.2	-6.3	-7.5	-8.4	-9.5	-9.8	-10.1	-9.6	-8.5	-8.8	-8.8	-8.9	-9.4	-10.0	-10.8	-11.1	-11.4	-11.6	-12.2	-12.6	-12.6	-5.4	-9.0
Nov 6	-13.0	-12.5	-12.6	-12.2	-11.9	-12.4	-13.7	-14.8	-14.7	-13.0	-11.0	-9.5	-8.6	-7.5	-7.4	-7.9	-9.1	-10.1	-11.1	-11.5	-11.3	-11.1	-11.3	-11.3	-14.8	-7.4	-11.2
Nov 7	-11.5	-11.9	-12.0	-12.5	-13.6	-13.8	-14.1	-13.2	-12.6	-10.7	-9.1	-7.4	-5.4	-4.0	-4.2	-4.4	-4.5	-4.7	-4.2	-4.1	-4.2	-4.4	-4.3	-4.1	-14.1	-4.0	-8.1
Nov 8	-3.5	-2.8	-2.5	-1.8	-1.1	-1.1	-1.0	-0.4	0.1	0.4	0.6	0.5	0.3	0.1	-0.4	-0.9	-1.6	-2.4	-3.0	-3.7	-4.8	-5.4	-6.1	-7.3	-7.3	0.6	-2.0
Nov 9	-8.3	-9.4	-9.8	-10.2	-10.7	-10.9	-11.1	-11.2	-11.1	-10.8	-10.5	-10.1	-9.8	-9.6	-9.9	-10.3	-11.1	-11.9	-12.5	-12.8	-13.2	-13.4	-13.6	-13.9	-13.9	-8.3	-11.1
Nov 10	-14.2	-15.2	-16.7	-17.6	-18.4	-18.1	-17.6	-17.3	-17.2	-16.9	-16.4	-15.7	-15.1	-14.7	-14.6	-15.6	-17.0	-16.9	-17.6	-18.2	-19.0	-19.4	-19.4	-19.4	-19.4	-14.2	-16.9
Nov 11	-19.9	-20.4	-20.8	-21.0	-20.9	-20.2	-19.8	-19.7	-19.4	-18.4	-16.9	-14.9	-13.3	-12.4	-11.5	-11.0	-11.2	-11.6	-12.2	-13.0	-13.4	-13.4	-12.1	-10.9	-21.0	-10.9	-15.8
Nov 12	-8.5	-8.8	-7.5	-7.0	-7.1	-6.6	-6.2	-7.1	-6.3	-5.3	-4.7	-4.2	-3.6	-2.8	-2.8	-3.1	-4.0	-4.7	-5.0	-5.2	-5.2	-5.3	-5.6	-5.8	-8.8	-2.8	-5.5
Nov 13	-6.0	-6.4	-6.6	-6.5	-6.4	-6.1	-5.8	-5.5	-5.3	-4.8	-3.9	-2.9	-1.1	0.3	1.2	1.7	0.9	0.4	0.2	0.4	0.3	0.3	0.0	-0.2	-6.6	1.7	-2.6
Nov 14	-1.2	-1.9	-2.5	-3.1	-4.2	-4.8	-5.0	-5.8	-6.7	-7.1	-6.4	-5.8	-5.8	-5.3	-4.9	-4.8	-4.7	-4.8	-5.0	-5.0	-4.6	-4.3	-3.8	-3.2	-7.1	-1.2	-4.6
Nov 15	-2.5	-2.2	-2.1	-2.2	-2.3	-2.5	-2.6	-2.8	-2.8	-2.7	-2.5	-2.4	-2.3	-2.1	-2.1	-2.2	-2.3	-2.3	-2.2	-2.1	-1.7	-1.2	-0.9	-0.2	-2.8	-0.2	-2.1
Nov 16	0.3	0.5	0.6	0.5	0.2	0.0	0.0	0.0	-0.2	-0.1	0.2	0.8	1.9	2.7	1.8	1.4	0.8	0.7	0.3	0.1	-0.2	0.0	0.5	1.4	-0.2	2.7	0.6
Nov 17	1.0	0.7	0.7	0.9	1.2	1.1	0.9	0.5	0.4	0.9	2.4	4.1	6.7	8.0	8.3	7.9	7.2	6.8	6.8	6.6	6.8	6.9	6.0	6.5	0.4	8.3	4.1
Nov 18	7.0	6.7	6.3	5.7	5.3	5.6	5.6	3.7	2.9	3.1	3.3	4.0	4.8	5.4	5.4	5.0	3.9	2.8	1.9	1.1	0.7	0.4	0.1	-0.3	-0.3	7.0	3.8
Nov 19	-0.9	-1.2	-1.4	-1.7	-2.1	-2.3	-2.4	-2.7	-3.0	-2.7	-1.7	-1.3	-0.9	-0.6	-0.4	-0.9	-1.3	-1.8	-2.4	-2.8	-3.5	-4.2	-4.4	-4.8	-4.8	-0.4	-2.1
Nov 20	-5.3	-5.5	-5.4	-5.2	-4.9	-4.7	-4.5	-3.7	-2.9	-2.3	-2.0	-1.6	-1.3	-0.8	-1.1	-2.1	-2.8	-3.4	-3.6	-4.1	-4.6	-4.7	-4.7	-4.0	-5.5	-0.8	-3.6
Nov 21	-3.5	-3.7	-4.1	-4.8	-5.3	-5.9	-6.3	-6.4	-6.4	-5.2	-3.3	-1.6	0.0	1.7	2.2	2.0	0.8	-0.1	-0.2	-0.2	-0.5	-0.5	-0.4	-0.7	-6.4	2.2	-2.2
Nov 22	-1.2	-1.8	-2.4	-3.3	-3.5	-3.4	-2.4	-0.2	0.4	1.8	3.5	4.9	6.1	6.6	6.1	5.1	3.6	2.9	2.2	2.3	2.9	3.4	3.5	3.2	-3.5	6.6	1.7
Nov 23	3.1	4.1	6.1	6.6	6.9	6.5	6.6	6.9	6.1	6.4	7.2	7.2	7.6	7.7	7.5	7.2	5.0	3.5	2.5	2.3	1.7	0.7	1.2	0.5	0.5	7.7	5.0
Nov 24	0.8	0.6	0.3	0.3	0.0	-0.1	-0.1	-0.2	-0.1	0.0	0.2	0.5	1.1	1.7	2.1	1.7	0.9	0.3	-0.3	-0.7	-1.0	-1.4	-1.7	-2.0	-2.0	2.1	0.1
Nov 25	-2.3	-2.5	-2.2	-1.5	-1.7	-1.4	-1.0	-0.8	-1.3	-1.1	-0.9	-0.5	0.1	0.4	0.6	0.3	-0.6	-1.4	-2.1	-2.0	-1.9	-2.5	-3.1	-3.4	-3.4	0.6	-1.4
Nov 26	-4.1	-4.9	-6.0	-6.9	-7.6	-8.2	-8.6	-9.2	-10.0	-10.1	-10.3	-10.2	-9.6	-9.5	-9.7	-10.0	-11.2	-11.9	-12.4	-12.6	-12.6	-12.3	-12.2	-13.3	-13.3	-4.1	-9.7
Nov 27	-14.4	-14.1	-13.3	-13.2	-13.3	-13.7	-14.0	-13.7	-13.6	-13.4	-12.6	-11.4	-10.8	-10.5	-10.8	-11.4	-11.9	-12.0	-12.2	-12.1	-12.0	-12.1	-12.2	-12.2	-14.4	-10.5	-12.5
Nov 28	-12.2	-12.2	-12.4	-12.5	-12.5	-12.5	-12.6	-12.7	-12.9	-12.6	-11.5	-10.7	-10.6	-10.2	-9.8	-10.2	-10.3	-11.1	-11.4	-11.9	-11.4	-11.0	-10.8	-10.8	-12.9	-9.8	-11.5
Nov 29	-11.8	-12.2	-12.5	-13.2	-13.4	-13.5	-13.9	-13.4	-13.9	-13.1	-11.9	-10.7	-10.2	-10.2	-10.6	-10.6	-10.7	-10.7	-10.7	-10.7	-10.7	-11.2	-11.6	-12.5	-13.9	-10.2	-11.8
Nov 30	-12.6	-12.6	-12.2	-12.4	-12.4	-12.5	-12.4	-12.4	-12.7	-13.1	-13.5	-13.2	-12.5	-11.7	-11.7	-12.5	-13.7	-14.8	-15.4	-15.8	-16.0	-16.2	-16.4	-16.4	-16.4	-11.7	-13.5
Diurnal Maximum	7.0	6.7	6.3	6.6	6.9	6.5	6.6	6.9	6.1	6.4	7.2	7.2	7.6	8.0	8.3	7.9	7.2	6.8	6.8	6.6	6.8	6.9	6.0	6.5			
Daiurnal Average	-5.3	-5.4	-5.6	-5.8	-6.0	-6.1	-6.1	-6.2	-6.2	-5.8	-5.0	-4.3	-3.5	-3.0	-3.0	-3.2	-3.9	-4.5	-4.9	-5.1	-5.3	-5.5	-5.6	-5.7			
C	Calibration				S	Daily Zero/Span				Q	Quality Assurance			O1	Repeat Calibration				S1	Repeat Daily Zero/Span							
G	Out for Repair				K	Collection Error				N	Not in Service			C0	Operator Error				P	Power Failure							
R	Recovery				X	Machine Malfunction				Y	Maintenance			T	Exceeds Temperature Limits				N	Not in Service							

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for AT - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

STATION TEMPERATURE (ST) in Degree Celsius

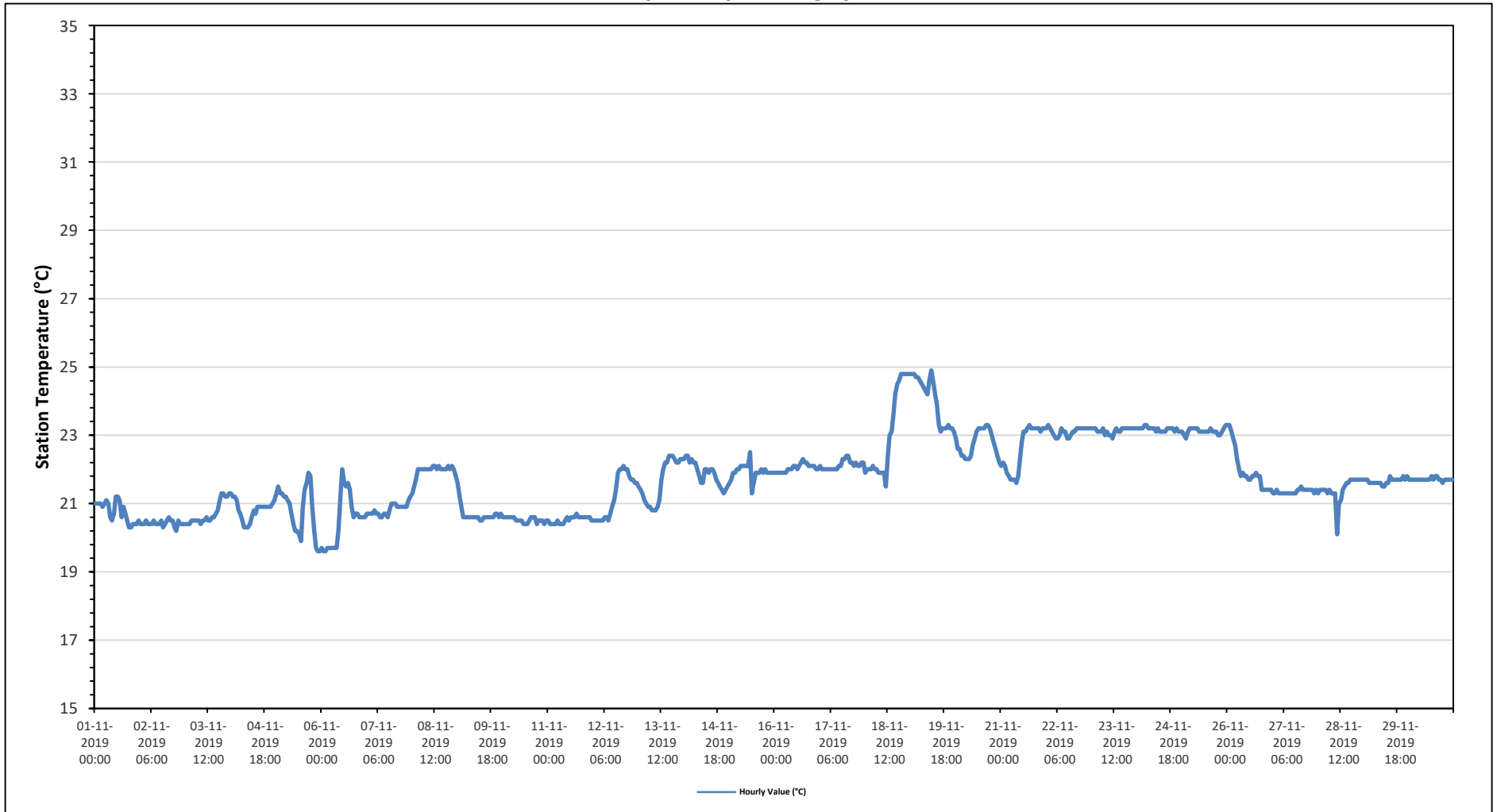
Maximum Hourly Value:	24.9 °C	on November 19 at hour 11	Hours in Service:	720
Maximum Daily Value:	24.0 °C	on November 19	Hours of Data:	720
Minimum Hourly Value:	19.6 °C	on November 5 at hour 22	Hours of Missing Data:	0
Minimum Daily Value:	20.4 °C	on November 2	Hours of Calibration:	0
Monthly Average:	21.7 °C		Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	21.0	21.0	21.0	21.0	20.9	21.0	21.1	21.0	20.6	20.5	20.7	21.2	21.2	21.1	20.6	20.9	20.7	20.5	20.3	20.3	20.4	20.4	20.4	20.5	20.3	21.2	20.8	
Nov 2	20.4	20.4	20.4	20.5	20.4	20.4	20.4	20.5	20.4	20.4	20.4	20.5	20.3	20.4	20.5	20.6	20.5	20.5	20.3	20.2	20.5	20.4	20.4	20.4	20.2	20.6	20.4	
Nov 3	20.4	20.4	20.4	20.5	20.5	20.5	20.5	20.5	20.4	20.5	20.5	20.6	20.5	20.5	20.6	20.6	20.7	20.8	21.1	21.3	21.3	21.2	21.2	21.3	20.4	21.3	20.7	
Nov 4	21.3	21.2	21.2	21.1	20.8	20.7	20.5	20.3	20.3	20.4	20.6	20.8	20.7	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	21.0	21.1	20.3	21.3	20.8	
Nov 5	21.3	21.5	21.3	21.3	21.2	21.2	21.1	21.0	20.7	20.4	20.2	20.2	20.1	19.9	20.9	21.4	21.6	21.9	21.8	20.9	20.2	19.7	19.6	19.6	19.6	21.9	20.8	
Nov 6	19.7	19.6	19.6	19.7	19.7	19.7	19.7	19.7	19.7	20.2	21.2	22.0	21.6	21.5	21.6	21.4	20.9	20.6	20.7	20.7	20.6	20.6	20.6	19.6	22.0	20.5		
Nov 7	20.7	20.7	20.7	20.7	20.8	20.7	20.7	20.6	20.7	20.7	20.6	20.8	21.0	21.0	21.0	20.9	20.9	20.9	20.9	20.9	20.9	20.9	21.1	21.2	20.6	21.2	20.8	
Nov 8	21.3	21.5	21.7	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.1	22.1	22.0	22.1	22.0	22.0	22.0	22.0	22.1	22.0	22.1	22.0	21.8	21.3	22.1	22.0	
Nov 9	21.6	21.2	20.9	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.5	20.5	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.7	20.7	20.6	20.7	20.5	21.6	20.7
Nov 10	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.5	20.5	20.5	20.5	20.4	20.4	20.4	20.5	20.6	20.6	20.6	20.4	20.5	20.5	20.5	20.4	20.5	20.4	20.6	20.5	
Nov 11	20.5	20.4	20.4	20.4	20.4	20.5	20.4	20.4	20.4	20.5	20.6	20.5	20.6	20.6	20.7	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.5	20.4	20.7	20.5	
Nov 12	20.5	20.5	20.5	20.5	20.5	20.5	20.6	20.6	20.5	20.7	20.9	21.1	21.4	21.9	22.0	22.0	22.1	22.0	22.0	21.8	21.7	21.7	21.6	21.6	20.5	22.1	21.2	
Nov 13	21.5	21.4	21.3	21.1	21.0	20.9	20.9	20.8	20.8	20.8	20.9	21.1	21.7	22.0	22.2	22.2	22.4	22.4	22.4	22.3	22.2	22.2	22.3	22.3	20.8	22.4	21.6	
Nov 14	22.3	22.4	22.4	22.2	22.3	22.2	22.2	22.2	21.8	21.6	21.6	22.0	22.0	21.9	22.0	22.0	21.9	21.7	21.6	21.5	21.4	21.3	21.4	21.5	21.3	22.4	21.9	
Nov 15	21.6	21.7	21.9	21.9	22.0	22.0	22.1	22.1	22.1	22.1	22.1	22.1	22.5	21.3	21.6	21.9	21.9	21.9	22.0	21.9	22.0	21.9	21.9	21.9	21.9	21.3	22.5	21.9
Nov 16	21.9	21.9	21.9	21.9	21.9	21.9	21.9	22.0	22.0	22.0	22.1	22.1	22.0	22.1	22.2	22.3	22.2	22.2	22.1	22.1	22.1	22.1	22.0	22.0	21.9	22.3	22.0	
Nov 17	22.1	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.1	22.1	22.3	22.3	22.4	22.4	22.2	22.2	22.1	22.2	22.1	22.1	22.2	22.2	22.0	22.4	22.1	
Nov 18	21.9	22.0	22.0	22.0	22.1	22.0	22.0	21.9	21.9	21.9	21.9	21.5	22.4	23.0	23.1	23.6	24.2	24.5	24.6	24.8	24.8	24.8	24.8	24.8	21.5	24.8	23.0	
Nov 19	24.8	24.8	24.8	24.7	24.7	24.6	24.5	24.4	24.3	24.2	24.6	24.9	24.6	24.2	23.9	23.6	23.1	23.2	23.2	23.2	23.3	23.2	23.2	23.1	23.1	24.9	24.0	
Nov 20	22.9	22.6	22.6	22.4	22.4	22.3	22.3	22.3	22.4	22.7	22.9	23.1	23.2	23.2	23.2	23.3	23.3	23.3	23.2	23.0	22.8	22.6	22.4	22.2	22.2	23.3	22.8	
Nov 21	22.1	22.2	22.1	21.9	21.8	21.7	21.7	21.7	21.6	21.8	22.3	22.8	23.1	23.1	23.2	23.3	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	21.6	23.3	22.6	
Nov 22	23.2	23.3	23.2	23.1	23.0	22.9	22.9	23.0	23.2	23.1	23.1	22.9	22.9	23.0	23.1	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	22.9	23.3	23.1	
Nov 23	23.2	23.2	23.2	23.1	23.1	23.1	23.2	23.0	23.1	23.0	23.0	22.9	23.1	23.2	23.1	23.1	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	22.9	23.2	23.1	
Nov 24	23.2	23.2	23.2	23.2	23.3	23.3	23.2	23.2	23.2	23.2	23.1	23.2	23.1	23.1	23.1	23.1	23.2	23.2	23.2	23.2	23.1	23.2	23.1	23.1	23.1	23.3	23.2	
Nov 25	23.1	23.0	22.9	23.1	23.2	23.2	23.2	23.2	23.2	23.1	23.1	23.1	23.1	23.1	23.1	23.2	23.1	23.1	23.1	23.0	23.0	23.1	23.2	23.3	22.9	23.3	23.1	
Nov 26	23.3	23.3	23.1	22.9	22.7	22.3	22.0	21.8	21.9	21.8	21.8	21.7	21.7	21.8	21.8	21.9	21.8	21.8	21.4	21.4	21.4	21.4	21.4	21.4	21.4	23.3	22.0	
Nov 27	21.3	21.3	21.4	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.4	21.4	21.5	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.3	21.3	21.5	21.4	
Nov 28	21.3	21.4	21.4	21.4	21.4	21.3	21.4	21.3	21.3	21.3	20.1	21.0	21.1	21.4	21.5	21.6	21.6	21.7	21.7	21.7	21.7	21.7	21.7	21.7	20.1	21.7	21.4	
Nov 29	21.7	21.7	21.7	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.5	21.5	21.6	21.6	21.8	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.8	21.5	21.8	21.7	
Nov 30	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.8	21.7	21.8	21.7	21.7	21.6	21.7	21.7	21.7	21.7	21.7	21.6	21.8	21.7	
Diurnal Maximum	24.8	24.8	24.8	24.7	24.7	24.6	24.5	24.4	24.3	24.2	24.6	24.9	24.6	24.2	23.9	23.6	24.2	24.5	24.6	24.8	24.8	24.8	24.8	24.8				
Daiurnal Average	21.7	21.7	21.7	21.7	21.7	21.6	21.6	21.6	21.5	21.6	21.6	21.7	21.8	21.8	21.9	21.9	21.9	21.9	21.9	21.8	21.8	21.8	21.8	21.8				
C	Calibration				S	Daily Zero/Span					Q	Quality Assurance			C1	Repeat Calibration			S1	Repeat Daily Zero/Span								
G	Out for Repair				K	Collection Error					N	Not in Service			O	Operator Error			P	Power Failure								
R	Recovery				X	Machine Malfunction					Y	Maintenance			T	Exceeds Temperature Limits			N	Not in Service								

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for ST - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

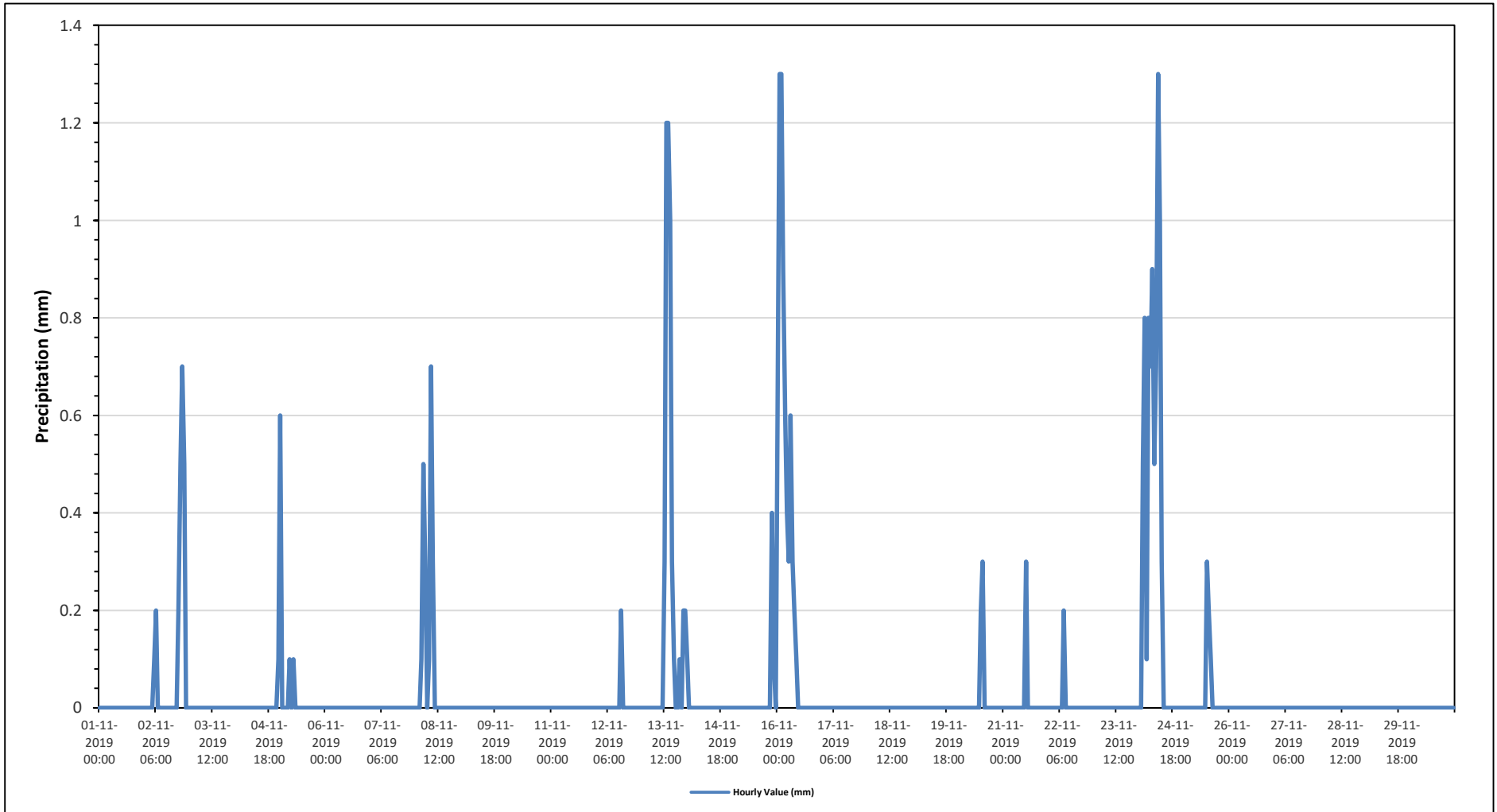
PRECIPITATION in mm

Maximum Hourly Value:	1.3 mm on November 16 at hour 1	Hours in Service:	720
Maximum Daily Value:	7.6 mm on November 24	Hours of Data:	720
Minimum Hourly Value:	0.0 mm on November 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0 mm on November 1	Hours of Calibration:	0
Monthly Total:	26.3 mm	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																								Daily Minimum	Daily Maximum	Daily Total						
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
Nov 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Nov 2	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 5	0.6	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 8	0.0	0.0	0.0	0.1	0.5	0.3	0.0	0.1	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2	1.2	1.0	0.3	0.1	0.0	0.0	0.1	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 14	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 16	0.6	1.3	1.3	0.9	0.6	0.4	0.3	0.6	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 24	0.0	0.0	0.5	0.8	0.1	0.8	0.7	0.9	0.5	0.7	1.3	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov 30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Diurnal Maximum	0.6	1.3	1.3	0.9	0.6	0.8	0.7	0.9	0.7	0.7	1.3	1.0	0.3	1.2	1.2	1.0	0.3	0.1	0.2	0.5	0.7	0.5	0.2	0.2									
Diurnal Average	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0										

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for Precipitation - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

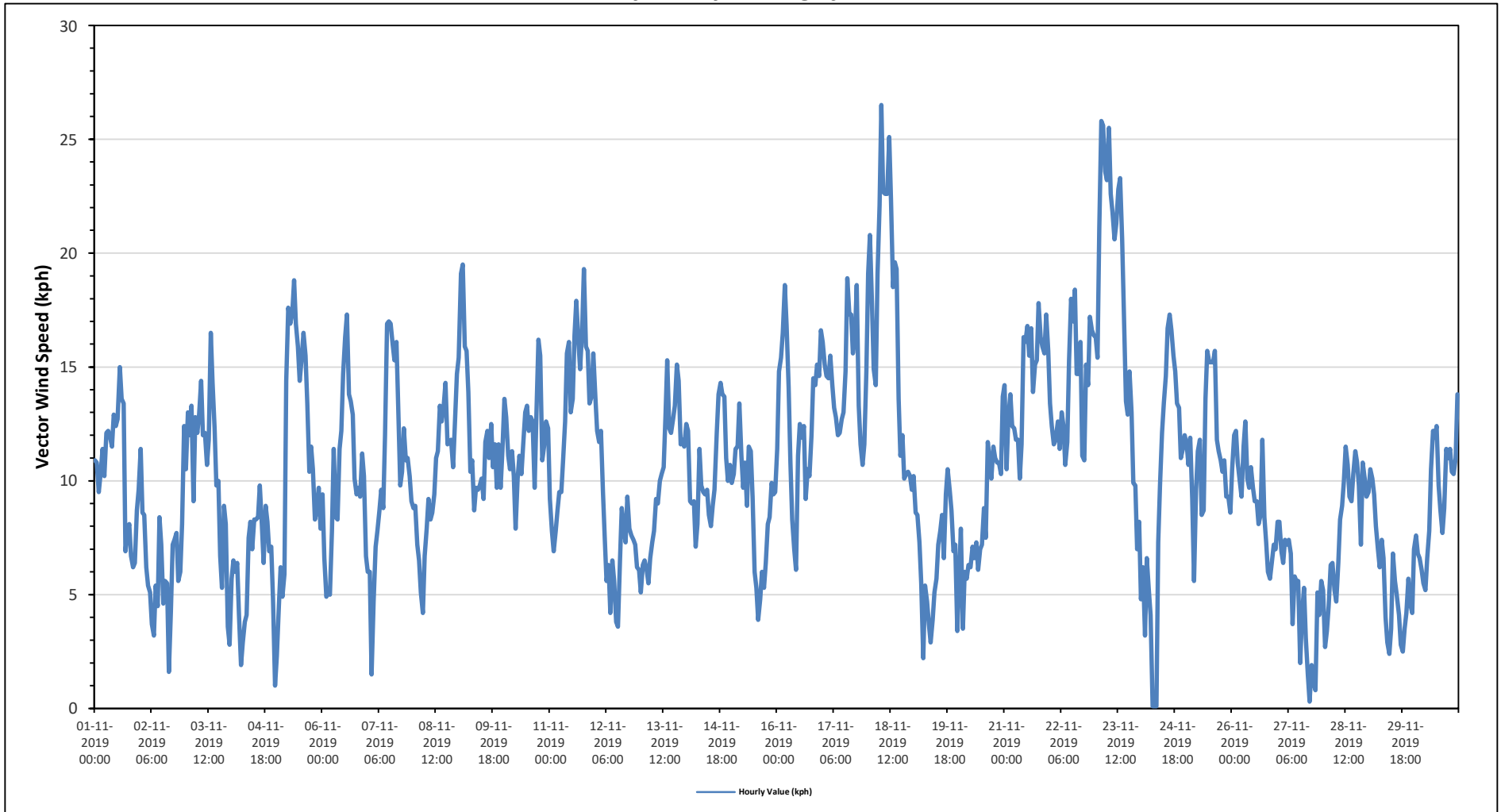
VECTOR WIND SPEED (VWS) in km/hr

Maximum Hourly Value:	26.5 kph on November 18 at hour 7	Hours in Service:	720
Maximum Daily Value:	18.2 kph on November 23	Hours of Data:	720
Minimum Hourly Value:	0.1 kph on November 24 at hour 6	Hours of Missing Data:	0
Minimum Daily Value:	4.8 kph on November 27	Hours of Calibration:	0
Monthly Average:	4.6 kph	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average								
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23							
Nov 1	10.9	10.8	9.5	10.3	11.4	10.2	12.1	12.2	11.9	11.5	12.9	12.4	12.7	15	13.6	13.4	6.9	7.7	8.1	6.7	6.2	6.4	8.7	9.6	6.2	15.0	10.5							
Nov 2	11.4	8.6	8.5	6.2	5.4	5.1	3.7	3.2	5.4	4.5	8.4	7.2	4.6	5.6	5.5	1.6	4.3	7.2	7.4	7.7	5.6	6	8.1	12.4	1.6	12.4	6.4							
Nov 3	10.5	13	12	13.3	9.1	12.8	12.1	12.9	14.4	12	12.1	10.7	11.8	16.5	14.3	12.3	9.8	10	6.7	5.3	8.9	8.1	3.6	2.8	2.8	16.5	10.6							
Nov 4	5.7	6.5	6	6.4	4.1	1.9	2.9	3.8	4.1	7.5	8.2	7	8.3	8.3	8.4	9.8	8.1	6.4	8.9	8.2	6.9	7.1	4.8	1	1.0	9.8	6.3							
Nov 5	2.3	4.5	6.2	4.9	5.9	14.4	17.6	16.9	17.4	18.8	16.9	15.9	14.4	15.4	16.5	15.5	13.4	10.4	11.5	10.5	8.3	8.7	9.7	7.9	2.3	18.8	11.8							
Nov 6	9.4	6.6	4.9	5.1	5	7.8	11.4	8.4	8.3	11.4	12.2	14.7	16.3	17.3	13.8	13.5	12.9	10.1	9.4	9.7	9.3	11.2	10.2	6.7	4.9	17.3	10.2							
Nov 7	6	6	1.5	4.7	7.1	7.8	8.7	9.6	8.8	12	16.9	17	16.9	16	15.3	16.1	13.2	9.8	10.4	12.3	10.9	11	10.2	9.1	1.5	17.0	10.7							
Nov 8	8.8	8.9	7.2	6.5	5.1	4.2	6.7	7.9	9.2	8.3	8.6	9.4	11	11.3	13.3	12.6	13.3	14.3	11.6	11.7	11.8	10.6	12.5	14.7	4.2	14.7	10.0							
Nov 9	15.4	19.1	19.5	15.9	15.7	13.9	10.4	10.9	8.7	9.7	9.6	9.8	10.1	9.2	11.7	12.2	11	12.5	10.6	11.6	9.7	11.6	9.7	11.3	8.7	19.5	12.1							
Nov 10	13.6	12.8	11.1	10.5	11.3	10.2	7.9	10.1	11.1	10.3	11.6	13	13.3	12.2	12.8	12.6	9.7	12.9	16.2	15.5	10.9	11.5	12.6	12.3	7.9	16.2	11.9							
Nov 11	9.2	7.8	6.9	7.8	8.7	9.5	9.5	10.9	12.6	15.6	16.1	13	13.6	16.4	17.9	16.2	14.9	16.6	19.3	15.9	15.7	13.4	13.7	15.6	6.9	19.3	13.2							
Nov 12	13.7	12.2	11.7	12.2	9.5	7.5	5.6	6.3	4.2	6.5	5.6	3.8	3.6	6.5	8.8	8	7.3	9.3	7.9	7.6	7.4	7.2	6.2	6.1	3.6	13.7	7.7							
Nov 13	5.1	6.3	6.5	6.1	5.5	6.6	7.3	7.8	9.2	9	10	10.3	10.6	12.8	15.3	12.3	12.1	12.7	13.3	15.1	14.4	11.6	11.8	11.5	5.1	15.3	10.1							
Nov 14	12.5	12.2	9.1	9	9.1	7.1	8.1	11.4	9.8	9.5	9.4	9.6	8.5	8	8.9	9.6	12.1	13.8	14.3	13.8	13.7	11	10	10.7	7.1	14.3	10.5							
Nov 15	9.9	10.3	11.4	11.5	13.4	11.1	9.7	10.8	8.9	11.5	11.3	9.3	6	5.3	3.9	4.8	6	5.3	6.4	8.1	8.4	9.9	9.4	9.5	3.9	13.4	8.8							
Nov 16	11.4	14.8	15.4	16.5	18.6	16.8	14.1	10.8	8.3	7	6.1	11.1	12.5	11.9	12.4	9.2	10.5	10.2	12	14.5	14.2	15.1	14.6	16.6	6.1	18.6	12.7							
Nov 17	16.1	15.1	14.6	14.5	15.5	14.2	13.2	12.8	12	12.1	12.7	13	14.8	18.9	17.3	17.3	15.6	16.3	18.6	13.3	11.6	10.7	11.6	14.8	10.7	18.9	14.4							
Nov 18	19.1	20.8	17.8	14.9	14.2	19.1	22.1	26.5	22.7	22.6	25.1	22.3	18.5	19.6	19.3	13.6	11.1	12	10.1	10.3	10.4	10.2	9.6	9.6	26.5	17.3								
Nov 19	10.2	8.6	8.5	7.3	5.5	2.2	5.4	4.7	3.7	2.9	3.9	5.1	5.7	7.2	7.8	8.5	6.6	9.4	10.5	9.6	8.7	6.9	7.2	3.4	2.2	10.5	6.6							
Nov 20	5.7	7.9	3.5	6	5.7	6.3	6.2	7.1	6.6	7.3	6.1	7	7.2	8.8	7.5	11.7	10.9	10.1	11.5	11	10.8	10.8	10.3	13.7	3.5	13.7	8.3							
Nov 21	14.2	10.5	12.8	13.8	12.4	12.3	11.8	11.8	10.1	11.6	16.3	16.1	16.8	15.5	16.7	13.9	15.1	15.3	17.8	16.3	15.9	15.6	17.3	15.7	10.1	17.8	14.4							
Nov 22	13.4	12.4	11.6	11.8	12.6	11.4	13	12.4	10.7	11.7	15.3	18	17	18.4	14.7	14.7	16.1	11.1	10.9	15.1	14.2	17.2	16.6	16.4	10.7	18.4	14.0							
Nov 23	16.3	15.4	21.1	25.8	25.6	23.6	23.2	25.5	22.6	21.8	20.6	21.3	22.8	23.3	20.6	17.3	13.5	12.9	14.8	13	9.9	9.8	7	8.2	7.0	25.8	18.2							
Nov 24	4.8	6.2	3.2	6.6	5.2	4.1	0.1	0.1	0.1	7.3	9.8	12.1	13.4	14.6	16.7	17.3	16.6	15.5	14.8	13.4	13.2	11	11.4	12	0.1	17.3	9.6							
Nov 25	11.6	10.7	11.9	9.2	5.6	9.6	11.3	11.8	8.5	8.7	13.6	15.7	15.2	15.2	15.7	11.8	11.3	10.9	10.4	10.9	9.3	9.3	8.6	5.6	15.7	11.3								
Nov 26	10.5	12	12.2	10.8	10	9.3	11.5	12.6	10.1	9.7	10.6	9.7	9.1	9.1	8.1	8.5	11.8	8.4	7.3	6	5.7	6.4	7.2	7	5.7	12.6	9.3							
Nov 27	8.2	8.2	6.9	6.4	7.4	7.2	7.4	6.8	3.7	5.8	5.6	5.6	2	4.1	5.3	3.1	1.5	0.3	1.9	1.1	0.8	5.1	4.1	5.6	0.3	8.2	4.8							
Nov 28	5.2	2.7	3.4	4.5	6.3	6.4	5.2	4.7	6.4	8.3	8.9	10	11.5	10.7	9.3	9.1	10.3	11.3	10.8	9.8	7.2	10.8	10.1	9.3	2.7	11.5	8.0							
Nov 29	9.5	10.5	10.1	9.4	8	7	6.2	7.4	6.6	4	2.9	2.4	3.5	6.8	5.6	5	4.1	2.8	2.5	3.5	4.2	5.7	4.6	4.2	2.4	10.5	5.7							
Nov 30	7	7.6	6.8	6.6	6.1	5.5	5.2	6.6	7.8	10.5	12.2	11.9	12.4	9.8	8.7	7.7	8.8	11.4	11	11.4	10.4	10.3	11	13.8	5.2	13.8	9.2							
Diurnal Maximum	19	21	21	26	26	24	23	27	23	23	23	25	23	23	21	19	17	17	19	16	16	17	17	17										
Diurnal Average	10.3	10.3	9.7	9.8	9.5	9.5	9.7	10.2	9.5	10.3	11.2	11.6	11.6	12.3	12.2	11.6	10.7	10.5	11.0	10.6	9.9	10.0	9.8	10.0										
C	Calibration				S	Daily Zero/Span					N	Quality Assurance			O1	Repeat Calibration								S1	Repeat Daily Zero/Span									
G	Out for Repair					K	Collection Error					N	Not in Service												P	Power Failure								
R	Recovery						X	Machine Malfunction					Y	Maintenance												T	Exceeds Temperature Limits						N	Not in Service

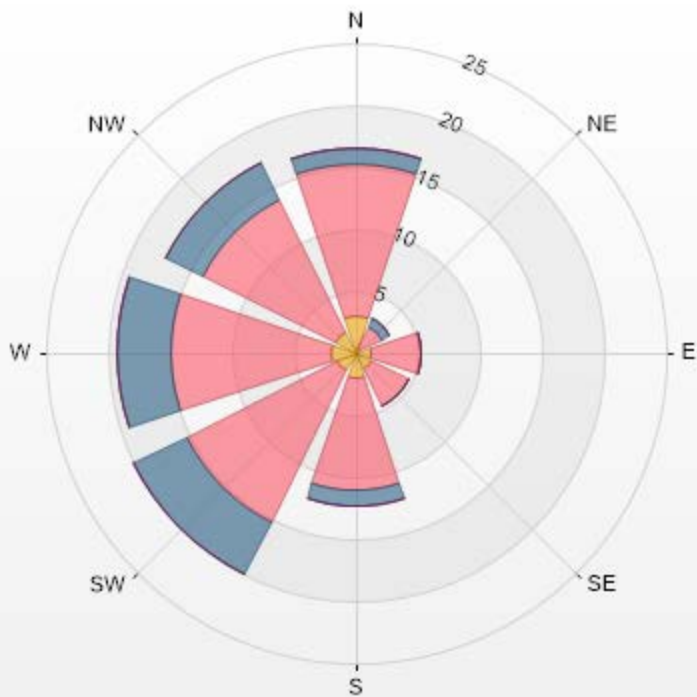
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for VWS - St. Lina Site



Wind: St. Lina Poll.: St. Lina-WDS[kph] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 1.39% Valid Data: 99.86% Calm Avg: 0.80 [kph]

Direction	0-6	6-15	15-29	29-39	>39.0	Total
N	3.06	12.24	1.25	0	0	16.55
NE	0.56	1.81	0.7	0	0	3.07
E	1.25	4.03	0	0	0	5.28
SE	1.39	3.48	0	0	0	4.87
S	2.09	9.04	1.25	0	0	12.38
SW	1.67	13.63	4.73	0	0	20.03
W	2.09	12.8	4.31	0	0	19.2
NW	1.81	11.96	3.48	0	0	17.25
Summary	13.92	68.99	15.72	0	0	98.63



LICA-201911-Revision 1



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Averages

WIND DIRECTION (VWD) in sector

Monthly Average:	272 (W) degree	Hours in Service:	720
		Hours of Data:	720
		Hours of Missing Data:	0
		Hours of Calibration:	0
		Operational Uptime:	100.0

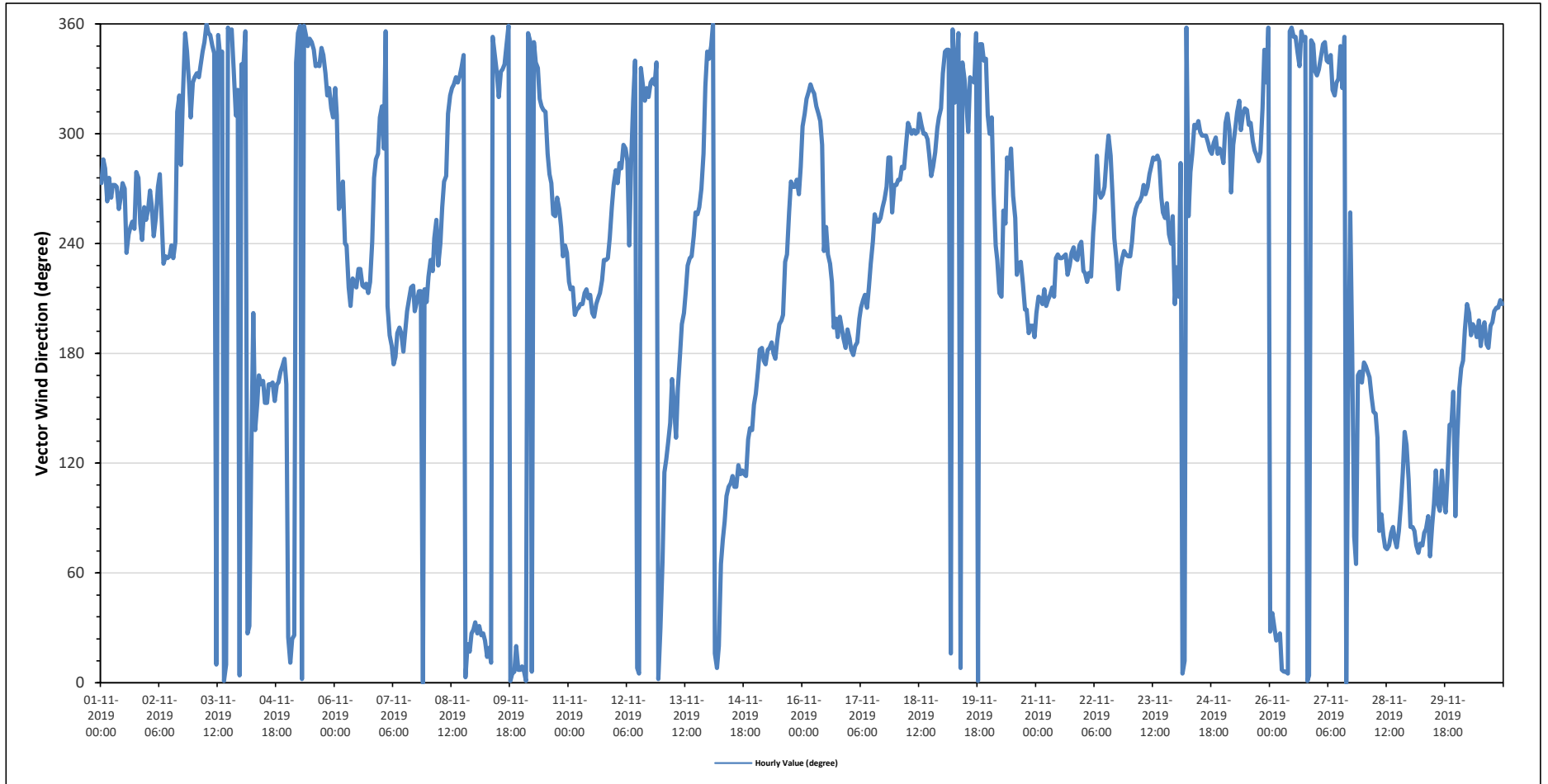
Day	Hourly Period Starting at (MST)																							Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Degree	Quadrant
Nov 1	W	WNW	W	W	W	W	W	W	WSW	W	W	W	SW	WSW	WSW	WSW	WSW	W	W	WSW	WSW	WSW	WSW	WSW	263	W
Nov 2	WSW	W	WSW	WSW	WSW	W	W	WSW	SW	SW	SW	SW	WSW	SW	WSW	NW	NW	W	NW	N	NNW	NW	NW	NNW	276	W
Nov 3	NNW	NNW	NNW	NNW	NNW	N	N	N	N	NNW	NNW	N	N	NNW	NNW	N	N	N	N	NNW	NW	NW	N	N	347	NNW
Nov 4	NNW	NNW	N	NNE	NNE	ESE	SSW	SE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	S	S	SSE	157	SSE	
Nov 5	NNE	NNE	NNE	NNE	NNW	N	N	N	N	N	NNW	N	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NW	NW	NW	NW	347	NNW
Nov 6	NW	NW	WSW	W	W	WSW	WSW	SW	SSW	SW	SW	SW	SW	SW	SW	SW	SSW	SW	WSW	W	WNW	WNW	NW	239	WSW	
Nov 7	NW	WNW	N	SSW	S	S	S	S	S	SSW	S	S	S	SSW	SSW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	204	SSW	
Nov 8	SW	SW	SW	WSW	WSW	SW	WSW	WSW	W	W	NW	NW	NW	NW	NNW	NNW	NNW	NNW	NNW	N	NNE	NNE	NNE	NNE	321	NW
Nov 9	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	N	NNW	NNW	NW	NNW	NNW	NNW	NNW	N	N	N	N	NNE	N	N	7	N
Nov 10	N	N	N	N	N	N	N	N	NNW	NNW	NW	NW	NW	WNW	W	W	WSW	WSW	W	WSW	WSW	WSW	WSW	301	WNW	
Nov 11	SW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	WSW	WSW	W	220	SW
Nov 12	W	W	WNW	W	WNW	WNW	WNW	WSW	WNW	NW	NNW	N	N	NNW	NW	NW	NW	NW	NNW	NNW	NW	NNE	N	NNE	310	NW
Nov 13	ENE	ESE	ESE	SE	SE	SSE	SSE	SE	SSE	S	SSW	SSW	SSW	SW	SW	SW	WSW	WSW	WSW	W	WNW	NW	NNW	225	SW	
Nov 14	NNW	NNW	N	NNE	N	NNE	ENE	ENE	E	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	SE	SSE	95	E
Nov 15	SSE	SSE	S	S	S	S	S	S	S	S	S	S	S	SSW	SSW	SSW	SW	SW	WSW	W	W	W	W	W	204	SSW
Nov 16	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	WNW	SW	WSW	SW	SW	SW	SSW	SSW	S	SSW	SSW	S	S	S	257	WSW
Nov 17	S	S	S	S	S	SSW	SSW	SSW	SSW	SSW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	WNW	WNW	WSW	W	231	SW
Nov 18	W	W	W	W	W	WNW	NW	WNW	WNW	WNW	WNW	NW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	WNW	WNW	NW	NW	295	WNW
Nov 19	NNW	NNW	NNW	NNW	NNE	N	NW	NNW	N	N	NNW	NNW	NW	WNW	NNW	NNW	NNW	N	N	NNW	NNW	NNW	NNW	NW	340	NNW
Nov 20	WNW	NW	W	WSW	SW	SSW	SSW	WSW	WSW	WNW	W	WNW	W	WSW	SW	SW	SW	SW	SSW	SSW	S	SSW	SSW	S	231	SW
Nov 21	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	WSW	WSW	225	SW
Nov 22	SW	SW	SW	SW	SW	WSW	WSW	WNW	W	W	W	W	WNW	WNW	WNW	W	WSW	SW	SSW	SW	SW	SW	SW	SW	250	WSW
Nov 23	SW	WSW	WSW	WSW	W	W	W	W	W	W	W	W	WNW	WNW	WNW	WNW	W	WSW	WSW	W	WSW	WSW	WSW	SSW	266	W
Nov 24	SW	SSW	WNW	N	NNE	N	WSW	W	WNW	WNW	WNW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	297	WNW
Nov 25	WNW	NW	NW	WNW	W	WNW	WNW	NW	NW	NW	NW	NW	WNW	NW	WNW	WNW	WNW	WNW	WNW	WNW	NW	NNW	NNW	N	306	NW
Nov 26	NNE	NE	NNE	NNE	NNE	NNE	N	N	N	N	N	N	N	N	NNW	NNW	N	N	N	N	N	N	NNW	NNW	5	N
Nov 27	NNW	NNW	NNW	NNW	N	NNW	NNW	NNW	NW	NW	NNW	NNW	NNW	NW	N	N	SSE	WSW	S	E	ENE	SSE	SSE	SSE	337	NNW
Nov 28	S	S	SSE	SSE	SSE	SE	SE	SE	SE	E	E	E	E	ENE	ENE	E	E	ENE	ENE	E	E	ESE	SE	ESE	103	ESE
Nov 29	E	E	E	ENE	ENE	ENE	ENE	E	E	E	ENE	E	E	ESE	E	E	ESE	E	E	ESE	SE	SE	SSE	E	93	E
Nov 30	SE	SSE	S	S	S	SSW	SSW	S	SSW	SSW	S	SSW	S	S	SSW	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	192	S

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for VWD - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hour Standard Deviations

STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

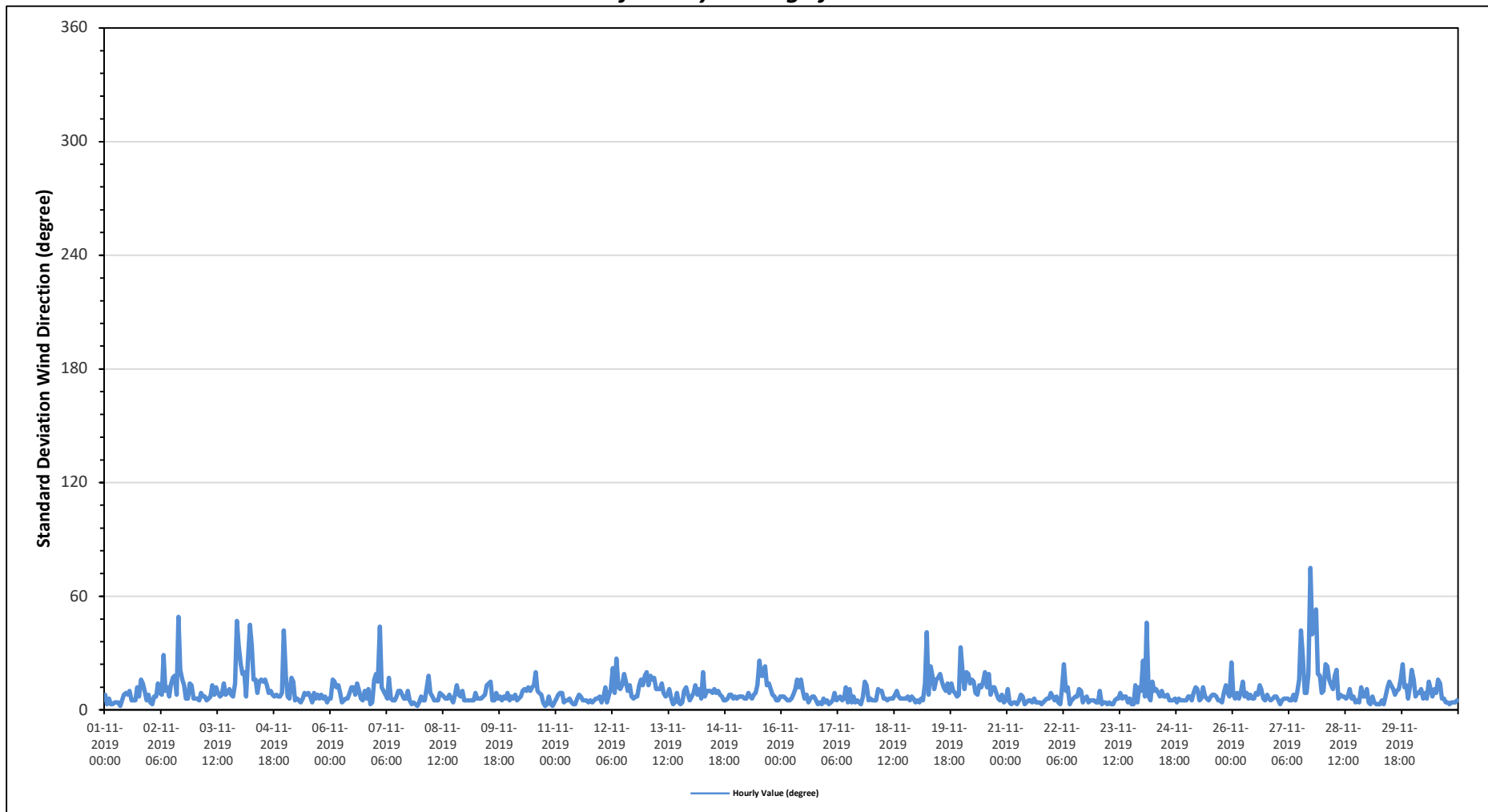
Maximum Hourly Value: 75 degree on November 27 at hour 17	Hours in Service: 720
	Hours of Data: 720
Minimum Hourly Value: 2 degree on November 1 at hour 8	Hours of Missing Data: 0
	Hours of Calibration: 0
	Operational Uptime: 100.0

Day	Hourly Period Starting at (MST)																							Daily	Daily		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Minimum	Maximum	
Nov 1	8	3	6	3	3	4	4	4	2	5	8	9	8	10	5	5	5	12	7	16	14	10	5	8	2	16	
Nov 2	4	3	7	7	14	9	8	29	10	12	7	13	17	18	8	49	21	16	13	6	6	14	13	6	3	49	
Nov 3	6	6	5	9	7	7	5	6	7	13	8	12	9	7	8	14	8	9	11	8	7	14	47	34	5	47	
Nov 4	24	19	20	7	26	45	34	16	16	9	15	16	15	16	13	9	10	8	7	8	7	7	9	42	7	45	
Nov 5	18	7	6	17	15	5	6	5	4	6	9	8	9	7	4	9	6	8	6	8	6	7	4	6	4	18	
Nov 6	6	16	15	12	13	9	4	5	6	6	9	12	12	8	14	10	6	5	10	6	11	3	4	16	3	16	
Nov 7	19	15	44	12	10	8	6	17	6	5	5	7	10	10	8	6	6	10	5	3	4	3	2	4	2	44	
Nov 8	7	5	5	12	18	9	7	5	5	5	9	8	7	6	6	8	6	4	8	13	8	7	10	5	4	18	
Nov 9	5	5	5	5	5	9	6	6	6	7	8	13	14	15	5	5	9	6	7	5	7	6	9	5	5	15	
Nov 10	7	6	8	5	6	7	10	11	10	12	10	12	13	20	10	9	8	4	2	3	7	3	2	4	2	20	
Nov 11	6	8	9	9	4	5	5	6	4	3	3	6	8	7	5	5	4	5	4	5	4	5	6	6	7	3	9
Nov 12	4	7	12	4	8	11	22	9	27	12	11	13	19	15	10	13	7	6	7	7	13	16	13	18	4	27	
Nov 13	20	13	18	16	17	11	11	11	14	9	7	8	11	6	3	4	9	4	3	4	10	12	8	5	3	20	
Nov 14	7	9	13	8	11	6	20	7	10	10	10	9	11	9	10	8	7	5	5	6	8	8	6	7	5	20	
Nov 15	6	7	7	7	6	6	9	7	6	8	9	13	26	18	18	23	13	14	11	8	7	5	5	7	5	26	
Nov 16	7	7	6	5	5	6	8	11	16	12	16	10	6	8	4	6	7	7	5	3	4	3	6	4	3	16	
Nov 17	5	3	4	5	9	5	6	7	5	6	12	4	11	4	7	4	5	4	3	7	15	13	5	6	3	15	
Nov 18	5	5	5	11	10	10	6	6	5	6	6	6	8	10	7	6	6	6	6	7	5	7	6	4	4	11	
Nov 19	5	4	6	5	14	41	8	23	18	11	16	17	19	15	12	10	14	9	14	10	9	7	8	33	4	41	
Nov 20	20	11	20	19	14	16	15	9	8	13	12	15	20	12	19	8	12	12	9	6	5	8	4	5	4	20	
Nov 21	11	4	3	4	4	3	5	8	7	3	4	5	5	4	6	4	4	4	3	4	5	6	6	9	3	11	
Nov 22	7	5	7	4	3	12	24	10	12	3	5	6	7	7	11	10	4	6	7	4	5	5	5	4	3	24	
Nov 23	4	10	3	4	4	3	4	3	3	5	6	6	9	6	7	7	4	6	3	3	13	4	12	10	3	13	
Nov 24	26	7	46	7	5	15	10	11	9	7	10	7	7	8	5	5	5	6	4	6	5	5	5	5	4	46	
Nov 25	7	7	5	9	12	11	5	6	12	7	6	5	7	8	8	7	5	5	4	9	13	9	7	25	4	25	
Nov 26	8	6	9	6	9	15	7	9	6	8	6	6	9	8	13	11	6	5	8	6	5	6	7	7	5	15	
Nov 27	5	3	5	6	6	6	5	5	8	5	9	16	42	29	9	9	19	75	40	44	53	19	18	9	3	75	
Nov 28	10	24	23	16	13	11	18	21	6	8	7	7	6	7	11	6	7	4	5	4	12	7	7	11	4	24	
Nov 29	4	3	7	4	3	3	3	5	3	7	12	15	13	11	8	10	11	16	24	12	13	6	12	21	3	24	
Nov 30	16	7	9	9	11	6	9	6	15	11	7	11	9	16	14	6	6	4	4	3	4	4	4	5	3	16	
Diurnal Minimum	4	3	3	3	3	3	3	3	2	3	3	4	5	4	3	4	4	4	2	3	4	3	2	4			
Diurnal Maximum	26	24	46	19	26	45	34	29	27	13	16	17	42	29	19	49	21	75	40	44	53	19	47	42			
C	Calibration		S	Daily Zero/Span		Q	Quality Assurance		C1	Repeat Calibration		S1	Repeat Daily Zero/Span														
G	Out for Repair		K	Collection Error		N	Not in Service		O	Operator Error		P	Power Failure														
R	Recovery		X	Machine Malfunction		Y	Maintenance		T	Exceeds Temperature Limits		N	Not in Service														

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for STDWD - St. Lina Site



BONNYVILLE -EAST STATION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

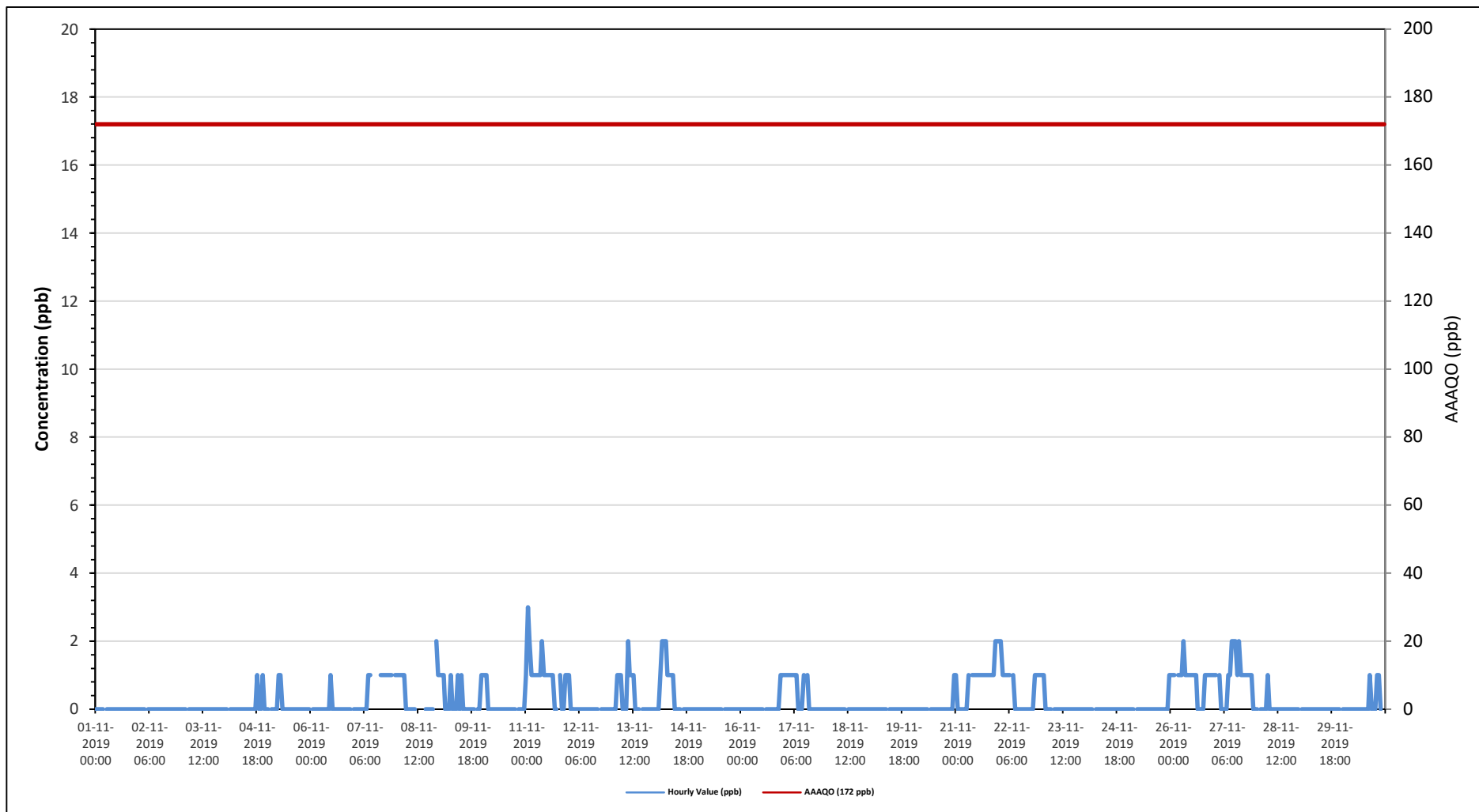
Summary of Hourly Averages

SULPHUR DIOXIDE (SO₂) in ppb

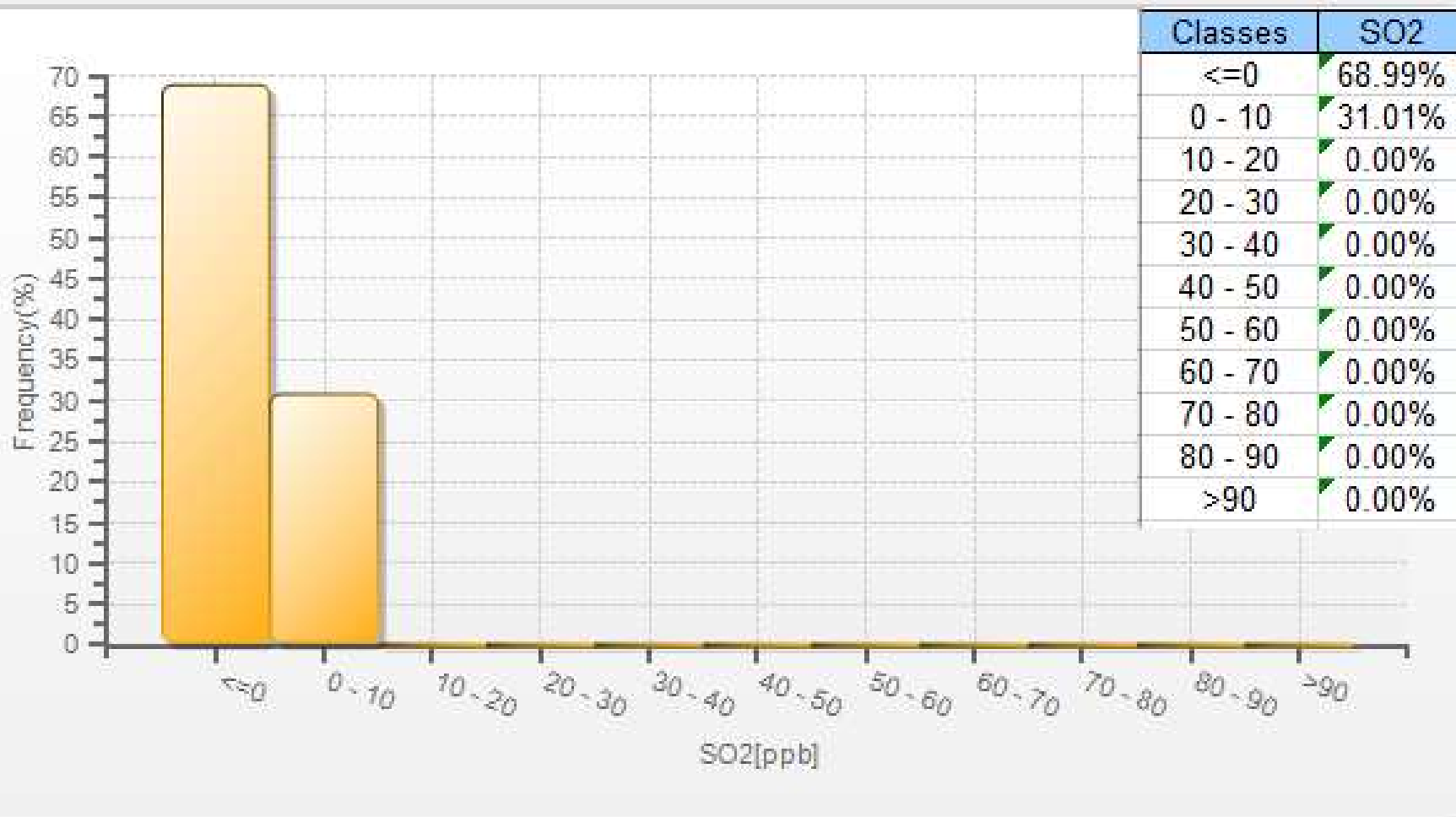
Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 172 ppb, 24-Hour 48 ppb, 30-Day 11 ppb																																					
Number of 1-Hour Exceedences:							0							Number of 24-Hour Exceedences:							0						30-Day Exceedence:			0							
Maximum Hourly Value:							3 ppb on November 11 at hour 1							Hours in Service:							720																
Maximum Daily Value:							1.0 ppb on November 11							Hours of Data:							678																
Minimum Hourly Value:							0 ppb on November 1 at hour 0							Hours of Missing Data:							5																
Minimum Daily Value:							0.0 ppb on November 1							Hours of Calibration:							37																
Monthly Average:							0.3 ppb							Operational Uptime:							99.3																
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average											
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23													
Nov 1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 2	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 3	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 4	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 5	0	S	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 6	S	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	
Nov 7	0	0	0	0	0	0	0	0	1	1	C	C	C	C	C	1	1	1	1	1	1	1	1	S	1	0	1	0	1	0	1	0	1	0	1	0	
Nov 8	1	1	1	1	1	0	0	0	0	0	0	C	P	P	P	P	P	0	0	0	0	0	S	2	1	0	2	1	0	2	1	0	2	0	4	0	
Nov 9	1	1	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	S	0	0	1	0	1	0	1	0	1	0	1	0	1	0	3
Nov 10	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Nov 11	1	3	2	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	0	0	S	1	0	0	1	1	0	3	1	0	3	1	0	3	1	1	
Nov 12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 13	0	0	0	1	1	1	0	0	0	2	1	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 14	0	0	0	1	2	2	2	1	1	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 17	1	1	1	1	1	1	1	1	0	0	0	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 18	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 19	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 20	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 21	1	0	0	0	0	0	0	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	0	2	0	8
Nov 22	2	2	1	1	1	1	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	2	0	6
Nov 23	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 24	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 25	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 26	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	0	2	1	0	2	0	2	0	9	0	
Nov 27	1	1	S	1	0	0	0	0	1	1	2	2	2	1	2	1	1	1	1	1	1	1	1	0	0	0	0	2	0	2	0	2	0	2	0	9	0
Nov 28	0	S	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 29	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	S	1	0	1	0	0	2
Diurnal Maximum	2	3	2	1	2	2	2	2	1	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	0	2	0	2	0	0	
Diurnal Average	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.4												
C	Calibration					S	Daily Zero/Span					Q	Quality Assurance					C1	Repeat Calibration					S1	Repeat Daily Zero/Span												
G	Out for Repair					K	Collection Error					N	Not in Service					O	Operator Error					P	Power Failure												
R	Recovery					X	Machine Malfunction					Y	Maintenance					T	Exceeds Temperature Limits					N	Not in Service												

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for SO₂ - Bonnyville - East Site

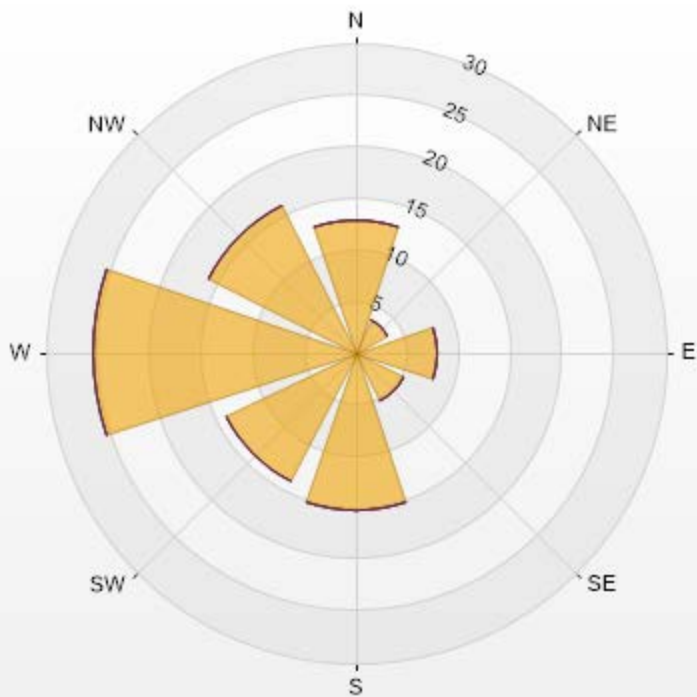


SO2[ppb] Histogram: Bonnyville East Monthly: 11-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-SO2[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.00% Calm Avg: 0.00 [ppb]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	12.91	0	0	0	0	12.91
NE	3.56	0	0	0	0	3.56
E	7.86	0	0	0	0	7.86
SE	5.19	0	0	0	0	5.19
S	15.28	0	0	0	0	15.28
SW	13.95	0	0	0	0	13.95
W	25.37	0	0	0	0	25.37
NW	15.88	0	0	0	0	15.88
Summary	100	0	0	0	0	100



LICA-201911-Revision 1

% Icon Classes (ppb)

100 0-10

0 10-50

0 50-100

0 100-172

0 >172.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Averages

HYDROGEN SULPHIDE (H₂S) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 10 ppb, 24-Hour 3 ppb
 Number of 1-Hour Exceedances: 0 Number of 24-Hour Exceedances: 0

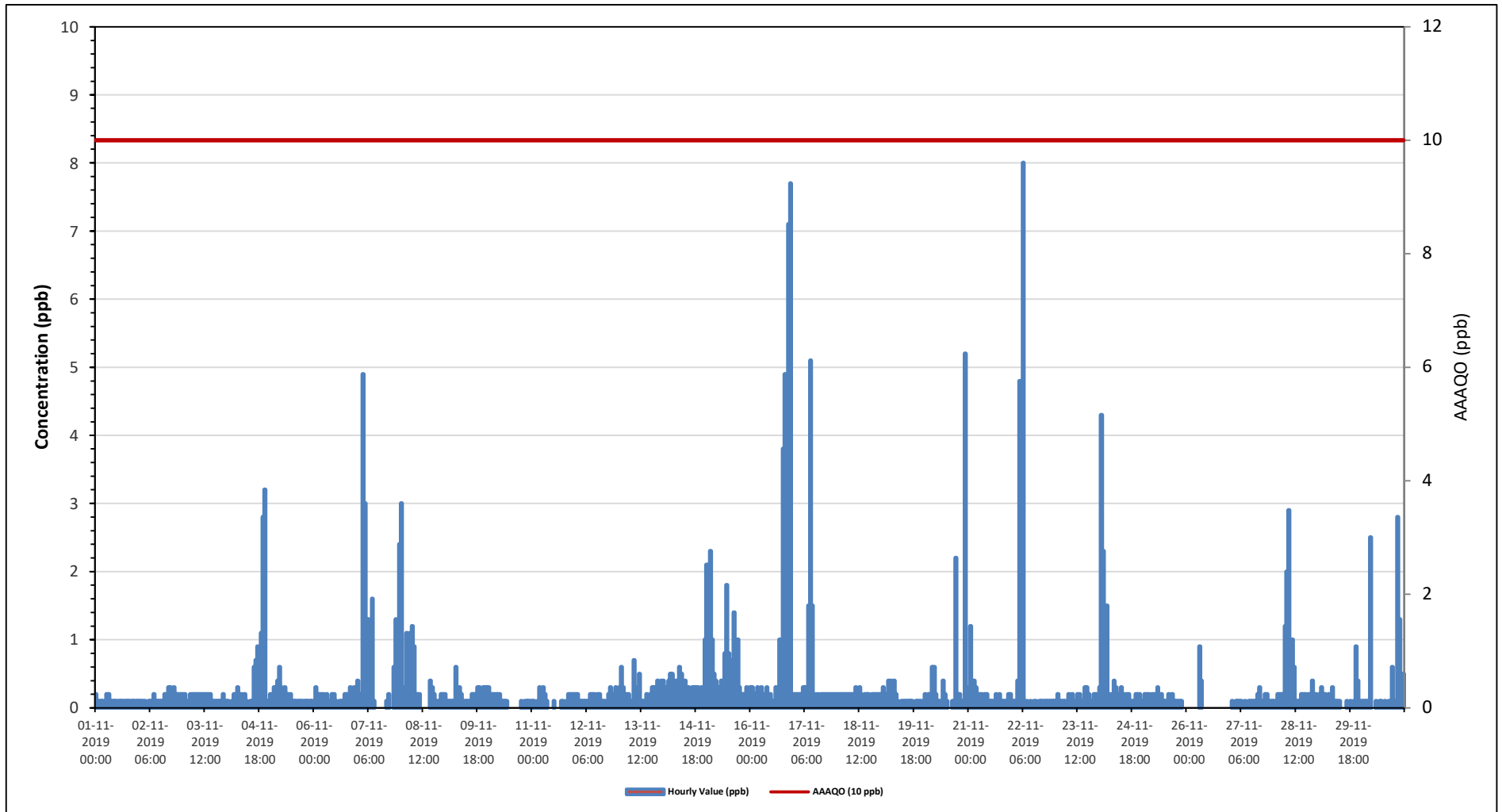
Maximum Hourly Value:	8 ppb on November 22 at hour 6	Hours in Service:	720
Maximum Daily Value:	1.4 ppb on November 16	Hours of Data:	675
Minimum Hourly Value:	0 ppb on November 4 at hour 12	Hours of Missing Data:	8
Minimum Daily Value:	0.1 ppb on November 26	Hours of Calibration:	37
Monthly Average:	0.3 ppb	Operational Uptime:	98.9

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	0.2	0.1	0.1	0.1	0.1	S	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0.1		
Nov 2	0.1	0.1	0.1	0.1	S	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0	0	0.2	
Nov 3	0.2	0.2	0.1	S	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0	0	0.2	
Nov 4	0.1	0.1	S	0.1	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0	0.1	0.1	0.6	0.7	0.9	0.1	1.1	2.8	3.2	0.1	0.1	0	3	0.5	
Nov 5	0.2	S	0.3	0.3	0.4	0.6	0.3	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	1	0.2		
Nov 6	S	0.3	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.3	S	0	0	0.2	
Nov 7	0.4	0.2	0.2	4.9	3	0	1.3	0.2	1.6	0.1	C	C	C	C	C	0	0.1	0.2	0	0	0.6	1.3	S	2.4	0	5	0.9	
Nov 8	3	0.3	0.2	1.1	0.3	1.1	1.2	0.9	0.2	0.2	0.2	P	P	P	P	P	0.4	0.3	0.2	0.1	0.1	S	0.2	0.2	0	3	0.6	
Nov 9	0.2	0.1	0.1	0.1	0.1	0.1	0.6	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	S	0.3	0.3	0.3	0	1	0.2	
Nov 10	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0.1	S	0.1	0.1	0.1	0.1	0	0	0.1
Nov 11	0.1	0.1	0	0.1	0.3	0.1	0.3	0.2	0.1	0	0	0	0.1	0	0	0	0.1	0.1	S	0.1	0.2	0.2	0.2	0.2	0	0	0.1	
Nov 12	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0	0.2	0.1	0.2	0.2	0.1	0.1	0.1	S	0.2	0.3	0.2	0.2	0.3	0.2	0	0	0.2
Nov 13	0.3	0.6	0.3	0.2	0.2	0.2	0.1	0.1	0.7	0.3	0.2	0.5	0.1	0.1	0.1	0.2	S	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0	1	0.3
Nov 14	0.4	0.3	0.3	0.4	0.5	0.5	0.4	0.4	0.4	0.6	0.5	0.3	0.4	0.3	0.3	S	0.3	0.3	0.3	0.3	0.2	0.3	0.2	1	0	1	0.4	
Nov 15	2.1	1.5	2.3	1	0.5	0.4	0.3	0.2	0.4	0.4	0.8	1.8	0.8	0.7	S	1.4	0.3	1	0.3	0.2	0.2	0.2	0.3	0.2	0	2	0.8	
Nov 16	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.3	0.1	0.2	0.1	S	0.3	0.2	1	0.3	3.8	4.9	2.8	7.1	7.7	0.2	0	8	1.4	
Nov 17	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	1.5	5.1	1.5	0.2	S	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0	5	0.5
Nov 18	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	S	0.3	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0	0	0.2
Nov 19	0.2	0.3	0.2	0.2	0.4	0.4	0.3	0.4	0.2	0.1	S	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1	0.1	0.1	0	0	0	0	0.2
Nov 20	0.2	0.1	0.2	0.2	0.6	0.6	0.2	0.1	0.1	S	0.4	0.2	0.1	C1	C1	0.1	0.1	2.2	0.2	0.2	0.1	0.1	5.2	0.1	0	5	0.5	
Nov 21	0.3	1.2	0.3	0.4	0.3	0.2	0.2	0.2	S	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0	1	0.2	
Nov 22	0.1	0.1	0.1	0.4	4.8	1.2	B	S	0.1	0	0.1	0	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	8	0.7	
Nov 23	0.1	0.2	0.1	0.1	0.1	0.1	S	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.3	0.3	0.2	0.1	0.1	0.2	0.2	0.1	0	0	0.2
Nov 24	0.3	4.3	2.3	1	1.5	S	0.2	S1	0.4	0.3	0.2	0.2	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0	4	0.6	
Nov 25	0.1	0.2	0.2	0.2	S	0.2	0.2	0.2	0.3	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0	0	0	0	0	0.1
Nov 26	0	0	0	S	0	0	0	0.9	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Nov 27	0	0.1	S	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0	0	0	0.1
Nov 28	0.1	S	0.2	0.2	0.2	0.2	1.2	2	2.9	0.5	1	0.6	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.2	0.2	0	3	0.5	
Nov 29	S	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.3	0.1	0.1	0.1	0.1	0	0	0	0.1	0	0.1	0	0.1	0.9	0.4	S	0	1	0.2	
Nov 30	0.1	0.1	0.1	0.1	0.1	2.5	0	0	0.1	0	0.1	0.1	0	0.1	0	0.1	0.1	0.6	0.1	0.1	2.8	1.3	S	0.5	0	3	0.4	
Diurnal Maximum	3	4	2	5	5	3	8	2	3	5	2	2	1	1	0	1	1	2	4	5	3	7	8	2				
Diurnal Average	0.4	0.4	0.3	0.5	0.5	0.4	0.6	0.3	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.6	0.6	0.3				

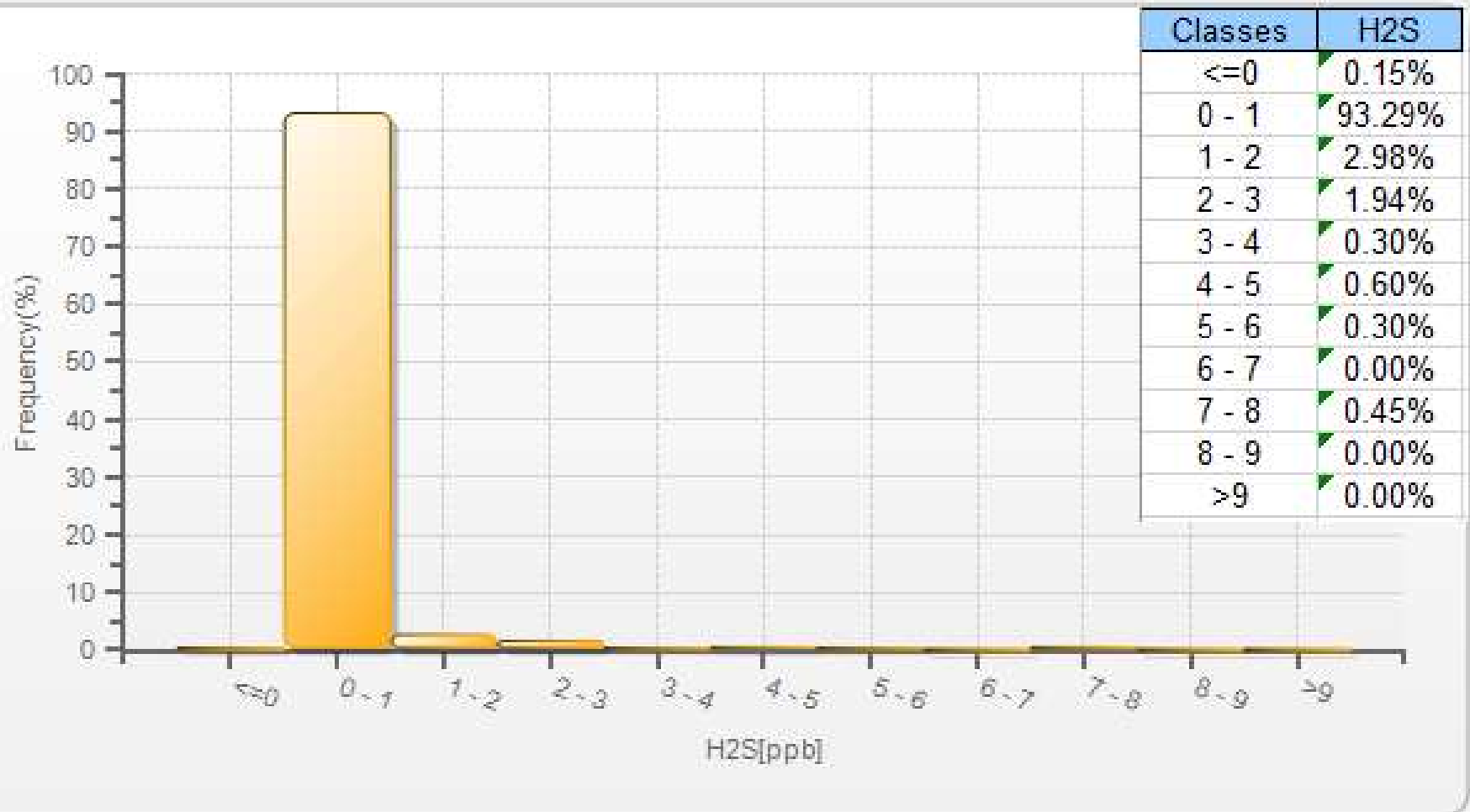
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for H2S - Bonnyville - East Site

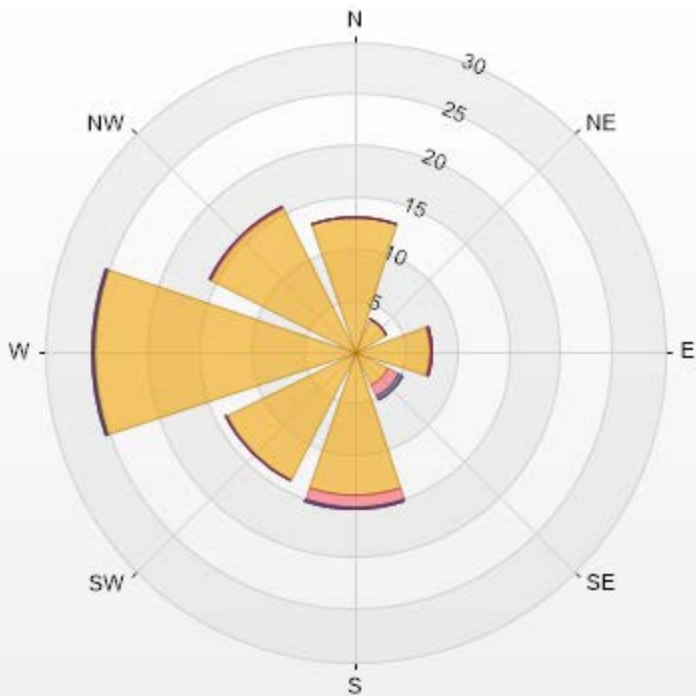


H2S[ppb] Histogram: Bonnyville East Monthly: 11-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-H2S[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.58% Calm Avg: 0.00 [ppb]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	12.97	0	0	0	0	12.97
NE	3.58	0	0	0	0	3.58
E	7.45	0.15	0	0	0	7.6
SE	3.73	1.19	0.3	0	0	5.22
S	13.86	1.19	0.3	0	0	15.35
SW	13.86	0.15	0	0	0	14.01
W	25.34	0	0.15	0	0	25.49
NW	15.65	0.15	0	0	0	15.8
Summary	96.44	2.83	0.75	0	0	100



LICA-201911-Revision 1

% Icon	Classes (ppb)	96	0-2	3	5-10	0	10-50	0	>50.0
				Page 231 of 366					



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Averages

OXIDES OF NITROGEN (NOx) in ppb

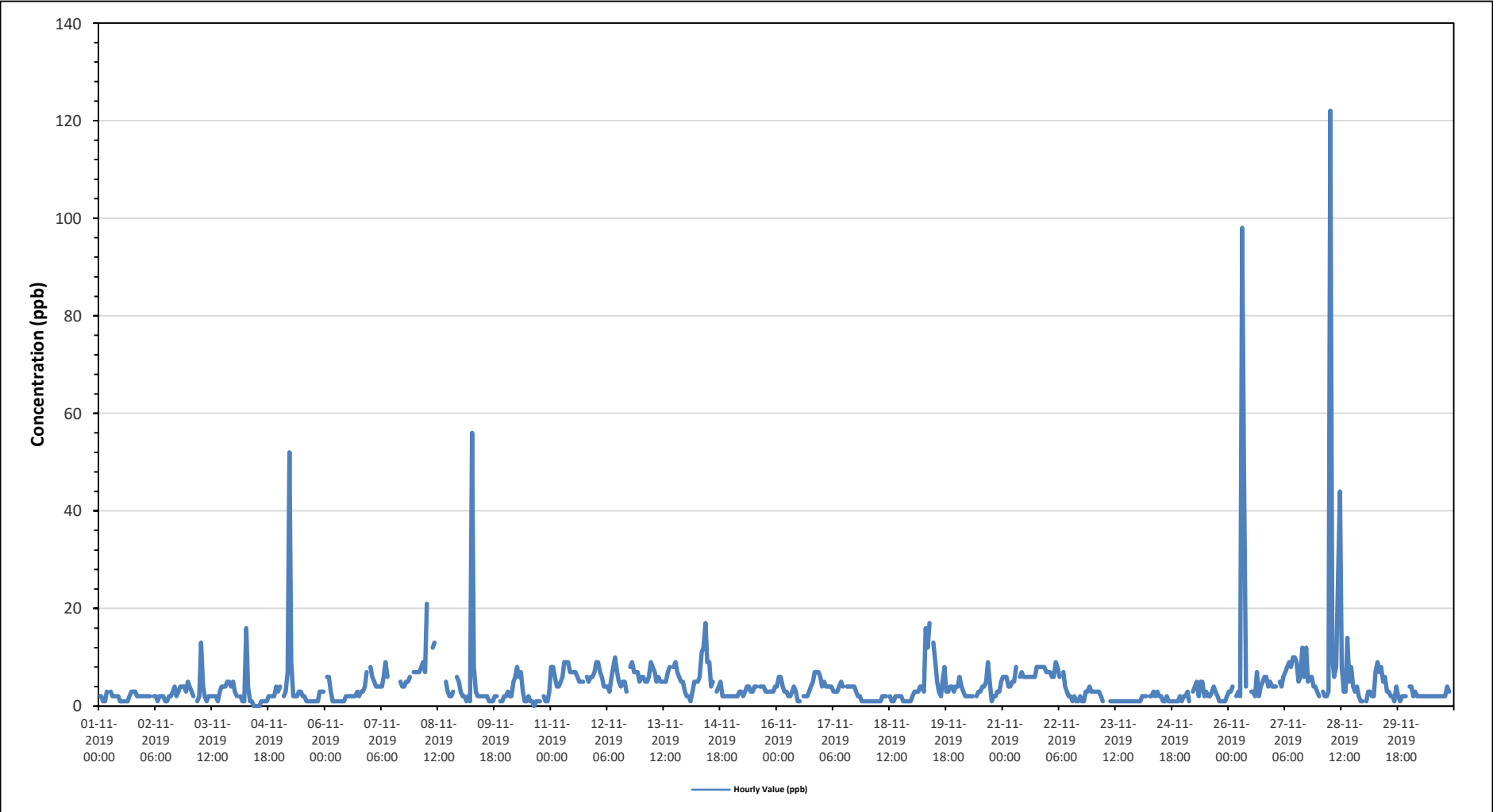
Maximum Hourly Value:	122 ppb	on November 28 at hour 6	Hours in Service:	720
Maximum Daily Value:	12.3 ppb	on November 28	Hours of Data:	672
Minimum Hourly Value:	0 ppb	on November 4 at hour 10	Hours of Missing Data:	10
Minimum Daily Value:	1.3 ppb	on November 18	Hours of Calibration:	38
Monthly Average:	4.4 ppb		Operational Uptime:	98.6

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	2	2	1	1	3	S	3	2	2	2	2	1	1	13	1	1	2	3	3	3	2	2	2	2	1	3	1.9	
Nov 2	2	2	2	2	S	2	2	1	2	2	2	1	1	2	2	3	4	2	3	4	4	4	3	5	1	5	2.5	
Nov 3	4	3	2	S	1	2	13	4	2	1	2	2	2	2	1	3	4	4	4	5	5	4	5	1	13	3.3		
Nov 4	3	2	S	2	1	1	16	4	1	1	0	0	0	0	1	1	1	1	2	2	2	2	4	3	0	16	2.2	
Nov 5	4	S	2	3	7	52	9	2	2	2	3	3	2	2	1	1	1	1	1	1	1	3	3	3	1	52	4.7	
Nov 6	S	6	6	3	1	1	1	1	1	1	1	2	2	2	2	2	2	3	2	3	3	4	7	S	1	7	2.5	
Nov 7	8	6	5	4	4	4	4	6	9	6	C	C	C	C	C	C	5	4	4	5	6	6	S	7	4	9	-	
Nov 8	7	7	7	8	9	7	21	S1	S1	12	13	P	P	P	P	P	5	3	2	2	3	S	6	5	2	21	-	
Nov 9	3	2	2	1	2	1	56	8	3	2	2	2	2	2	2	1	1	1	2	2	S	1	1	2	1	56	4.4	
Nov 10	2	3	2	2	5	6	8	6	7	3	1	1	2	1	1	0	1	1	1	S	2	1	1	3	0	8	2.6	
Nov 11	8	8	6	4	4	5	6	9	9	9	7	7	7	7	6	5	5	5	S	6	5	6	6	7	4	9	6.4	
Nov 12	9	9	7	6	4	4	4	3	6	8	10	7	5	4	5	5	3	S	8	9	7	7	7	5	3	10	6.2	
Nov 13	6	6	5	5	6	9	8	7	5	6	5	5	5	5	7	8	S	8	9	7	6	5	5	3	3	9	6.1	
Nov 14	2	2	1	3	5	5	5	6	11	12	17	9	9	4	5	S	3	4	5	2	2	2	2	2	1	17	5.1	
Nov 15	2	2	2	2	3	3	2	3	4	4	3	3	4	4	S	4	4	4	3	3	3	3	3	4	2	4	3.1	
Nov 16	4	6	6	4	3	3	2	2	3	4	3	1	1	S	2	2	2	3	4	5	7	7	7	6	1	7	3.8	
Nov 17	4	5	4	4	4	4	3	3	3	4	5	4	S	4	4	4	4	4	3	2	2	1	1	1	1	5	3.3	
Nov 18	1	1	1	1	1	1	1	1	2	2	2	S	2	1	1	2	2	2	2	1	1	1	1	1	1	2	1.3	
Nov 19	2	3	3	3	4	4	3	16	12	17	S	13	9	5	3	2	5	8	3	3	4	4	3	4	2	17	5.8	
Nov 20	4	6	4	3	2	2	2	2	2	2	S	2	3	3	4	4	5	9	5	1	2	2	3	3	5	1	9	3.4
Nov 21	6	6	6	4	4	5	5	8	S	6	7	6	6	6	6	6	6	6	8	8	8	8	8	7	4	8	6.3	
Nov 22	7	7	6	6	9	8	6	S	7	4	3	2	2	1	2	1	1	2	1	1	3	3	4	3	1	9	3.9	
Nov 23	3	3	3	3	2	1	S	1	S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1.4	
Nov 24	1	1	2	2	2	S	2	2	3	2	3	2	2	1	1	2	1	1	1	1	1	1	2	1	1	3	1.6	
Nov 25	2	2	3	1	S	3	4	5	2	5	2	3	2	2	3	4	3	2	1	1	1	1	2	1	1	5	2.6	
Nov 26	3	3	4	S	2	3	2	98	49	4	C1	C1	3	3	2	7	2	4	5	6	6	4	5	4	2	98	10.4	
Nov 27	4	4	S	5	4	6	7	8	9	8	10	10	9	5	6	12	6	12	5	6	6	4	4	3	3	12	6.7	
Nov 28	2	S	3	2	2	3	122	10	6	8	25	44	8	3	3	3	14	5	8	4	3	4	2	1	1	122	12.3	
Nov 29	S	1	3	3	2	2	7	9	7	8	5	6	3	3	2	2	1	4	2	1	2	2	2	S	1	9	3.5	
Nov 30	4	4	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	3	S	4	2	4	2.4
Diurnal Maximum	9	9	7	8	9	52	122	98	49	17	25	44	9	7	7	14	9	12	9	9	8	8	8	7				
Diurnal Average	3.9	4.0	3.6	3.2	3.5	5.3	11.2	8.2	6.3	5.0	5.2	5.3	3.6	2.9	2.8	3.6	3.1	3.8	3.2	3.3	3.5	3.3	3.5	3.5				

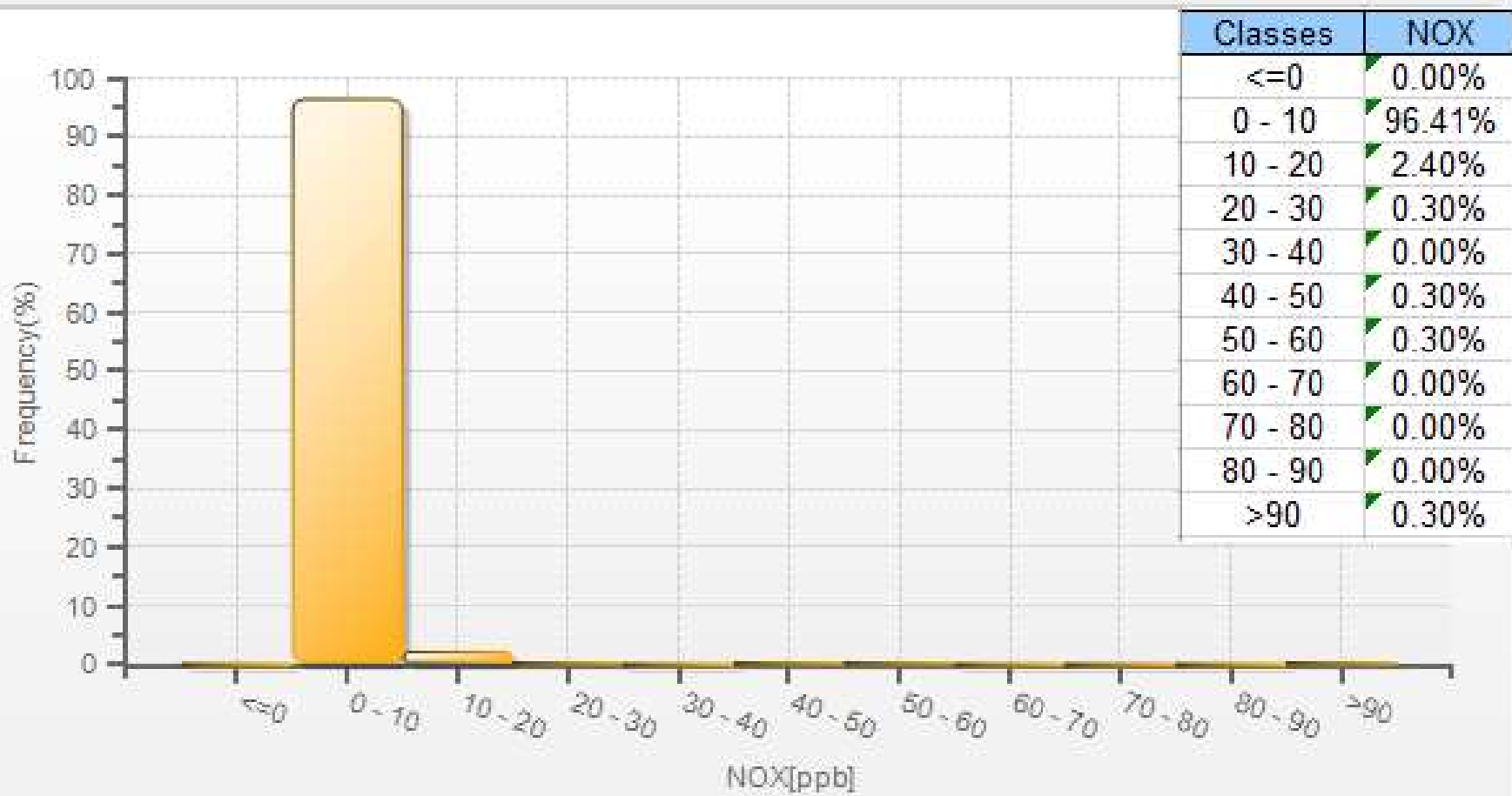
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for NOx - Bonnyville - East Site

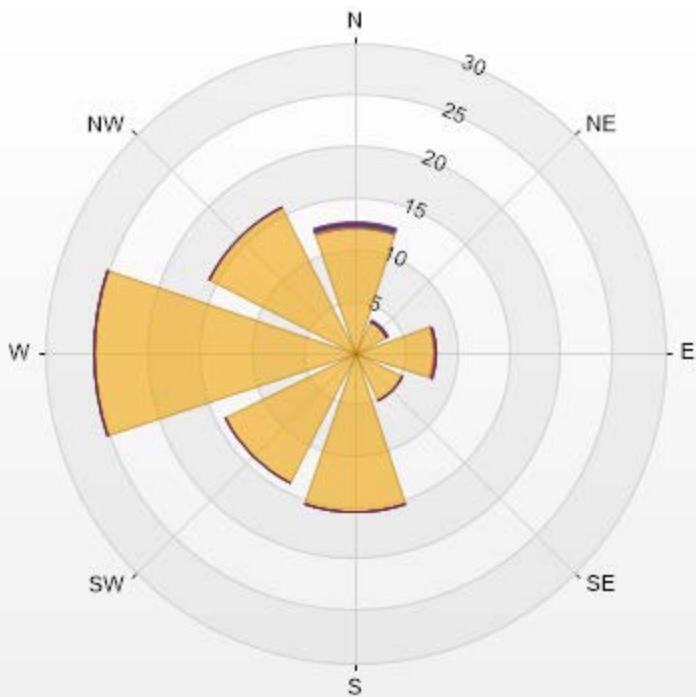


NOX[ppb] Histogram: Bonnyville East Monthly: 11-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-NOX[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.17% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	12.13	0.15	0.3	0.15	0	12.73
NE	3.44	0	0	0.15	0	3.59
E	7.78	0.15	0	0	0	7.93
SE	5.24	0	0	0	0	5.24
S	15.42	0	0	0	0	15.42
SW	14.07	0	0	0	0	14.07
W	25.3	0	0	0	0	25.3
NW	15.72	0	0	0	0	15.72
Summary	99.1	0.3	0.3	0.3	0	100



LICA-201911-Revision 1

% Icon Classes (ppb)	99	0-30	0	30-50	50-82	0	82-159	0	>159.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Averages

NITRIC OXIDE (NO) in ppb

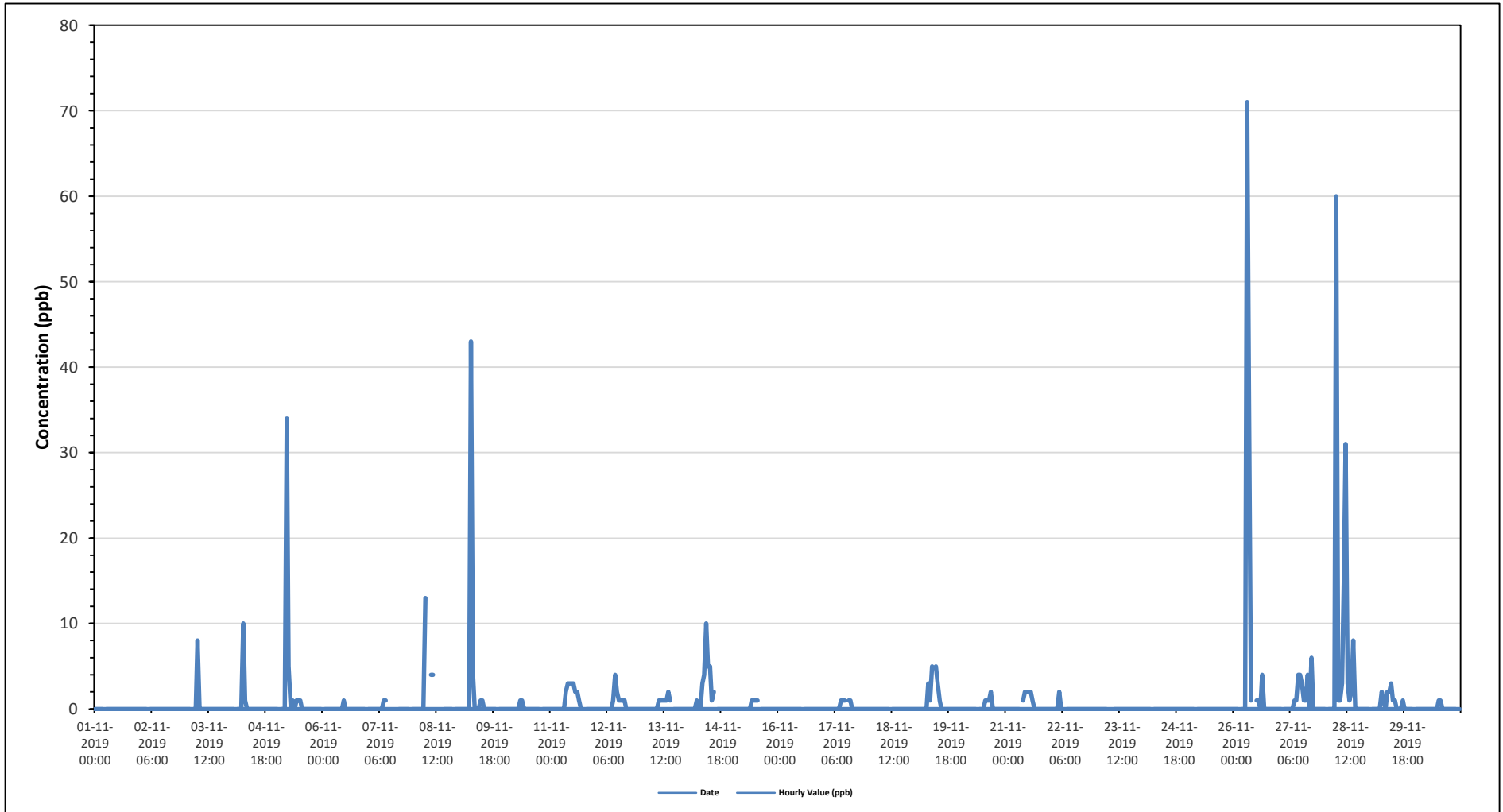
Maximum Hourly Value:	71 ppb	on November 26 at hour 7	Hours in Service:	720
Maximum Daily Value:	5.5 ppb	on November 26	Hours of Data:	672
Minimum Hourly Value:	0 ppb	on November 1 at hour 0	Hours of Missing Data:	10
Minimum Daily Value:	0.0 ppb	on November 1	Hours of Calibration:	38
Monthly Average:	0.8 ppb		Operational Uptime:	98.6

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average											
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23										
Nov 1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov 2	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nov 3	0	0	0	S	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0.3
Nov 4	0	0	S	0	0	0	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0.5
Nov 5	0	S	0	0	0	34	5	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	1.9	
Nov 6	S	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0	
Nov 7	0	0	0	0	0	0	0	1	1	1	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	-	
Nov 8	0	0	0	0	0	0	13	S1	S1	4	4	P	P	P	P	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	-		
Nov 9	0	0	0	0	0	0	43	4	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	2.1		
Nov 10	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1		
Nov 11	0	0	0	0	0	0	0	2	3	3	3	3	3	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.8		
Nov 12	0	0	0	0	0	0	0	0	1	4	2	1	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.5		
Nov 13	0	0	0	0	0	0	0	0	0	1	1	1	1	1	2	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.3		
Nov 14	0	0	0	0	0	1	0	0	3	4	10	5	5	1	2	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1.3			
Nov 15	0	0	0	0	0	0	0	0	0	0	1	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2			
Nov 16	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
Nov 17	0	0	0	0	0	0	0	0	0	1	1	1	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2			
Nov 18	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
Nov 19	0	0	0	0	0	0	0	3	1	5	S	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0.8			
Nov 20	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.2			
Nov 21	0	0	0	0	0	0	0	0	0	0	S	1	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.4			
Nov 22	0	0	0	0	0	2	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.1			
Nov 23	0	0	0	0	0	0	S	0	0	S1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
Nov 24	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
Nov 25	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
Nov 26	0	0	0	0	S	0	0	0	71	37	1	C1	C1	1	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71	5.5				
Nov 27	0	0	S	0	0	0	0	0	1	1	4	4	3	1	1	4	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1.1				
Nov 28	0	S	0	0	0	0	60	1	1	3	15	31	3	1	2	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	5.4				
Nov 29	S	0	0	0	0	0	2	1	0	2	2	3	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.6				
Nov 30	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	1	0.1			
Diurnal Maximum	0	0	0	0	2	34	60	71	37	5	15	31	5	2	2	8	2	6	0	0	0	0	0	0	0	0	0	0	0	0	1						
Diurnal Average	0.0	0.0	0.0	0.0	0.1	1.3	4.9	2.9	1.8	1.0	1.8	2.3	1.0	0.6	0.5	0.7	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

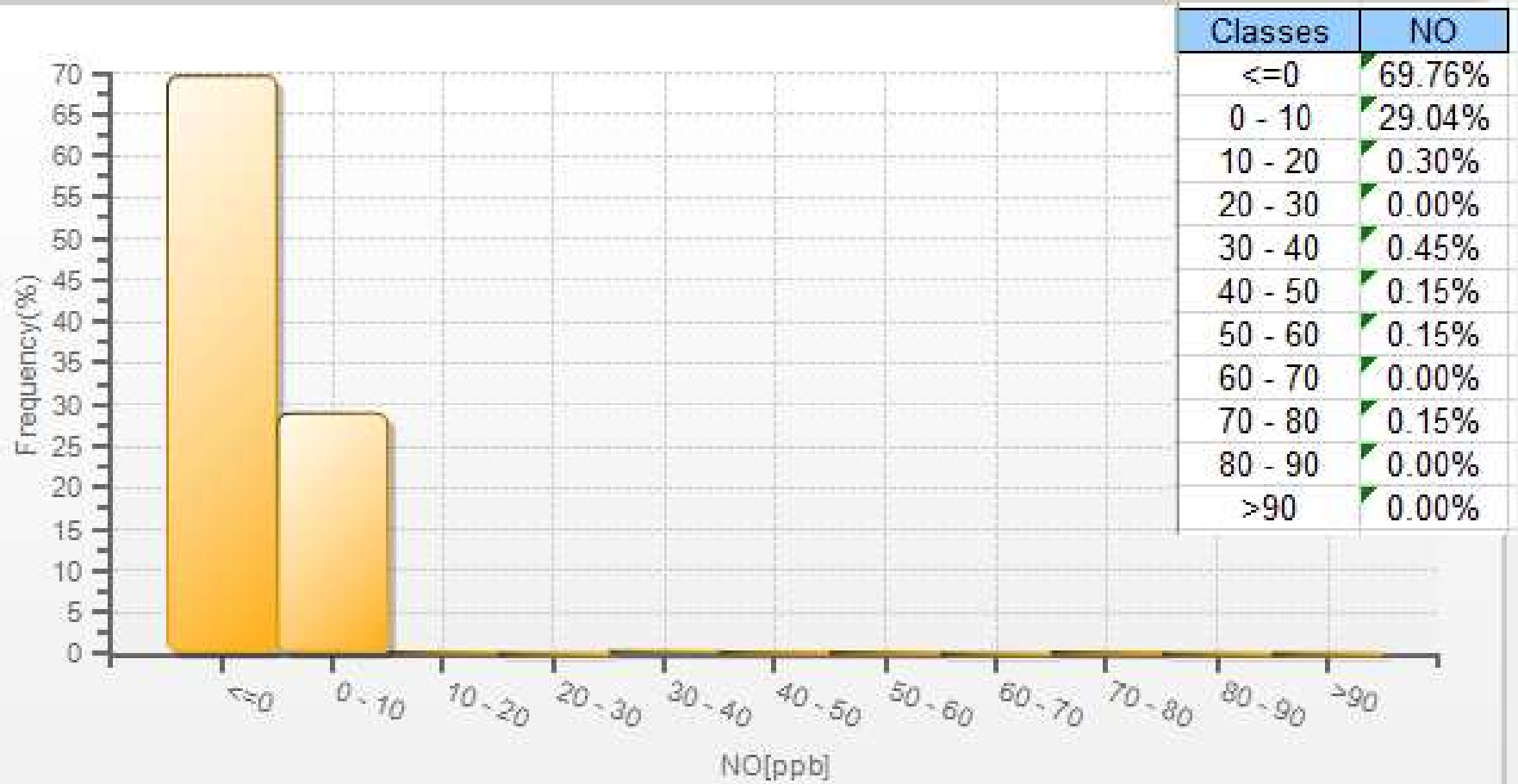
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for NO - Bonnyville - East Site

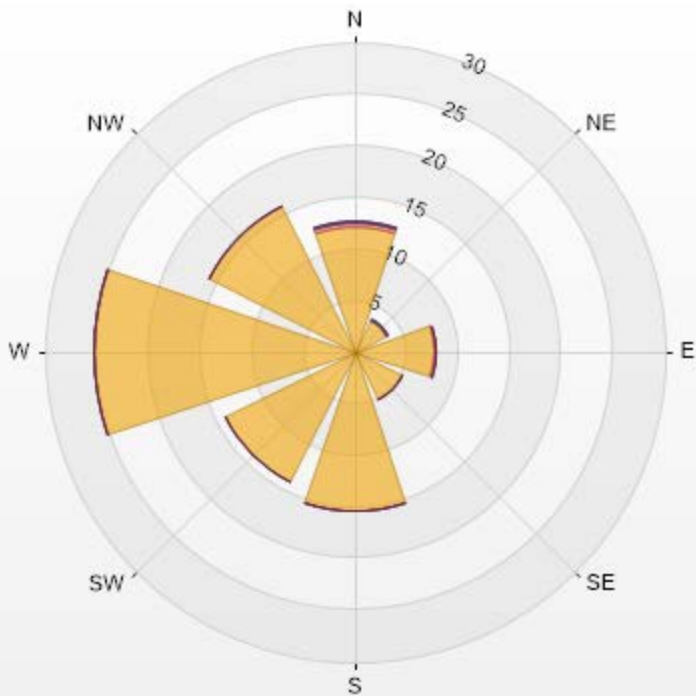


NO[ppb] Histogram: Bonnyville East Monthly: 11-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-NO[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.17% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	12.13	0.45	0.15	0	0	12.73
NE	3.44	0	0.15	0	0	3.59
E	7.78	0.15	0	0	0	7.93
SE	5.24	0	0	0	0	5.24
S	15.42	0	0	0	0	15.42
SW	14.07	0	0	0	0	14.07
W	25.3	0	0	0	0	25.3
NW	15.72	0	0	0	0	15.72
Summary	99.1	0.6	0.3	0	0	100



LICA-201911-Revision 1

% Icon Classes (ppb)	99	0-30	1	30-50	50-82	0	82-159	0	>159.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

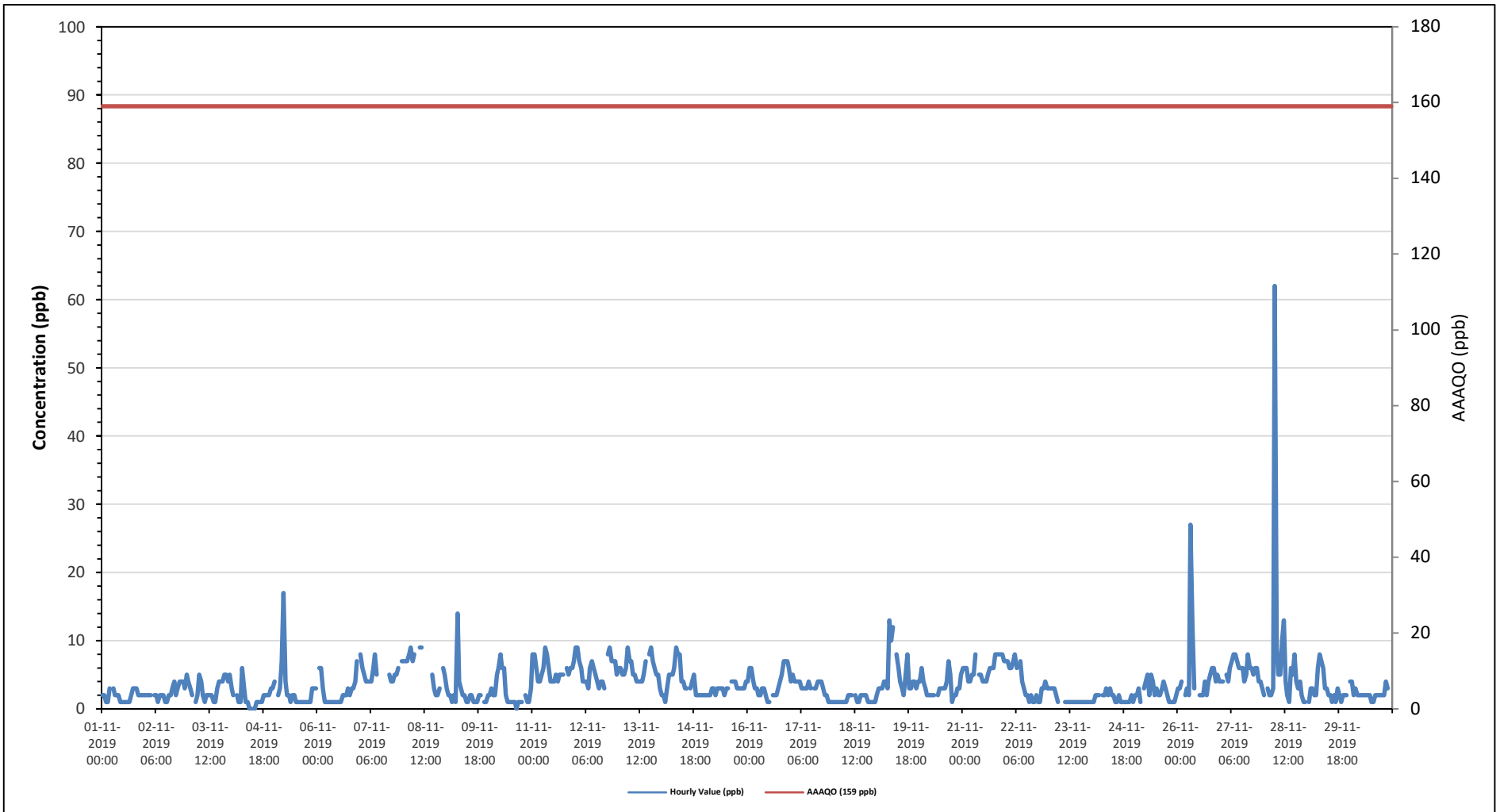
Summary of Hourly Averages

NITROGEN DIOXIDE (NO₂) in ppb

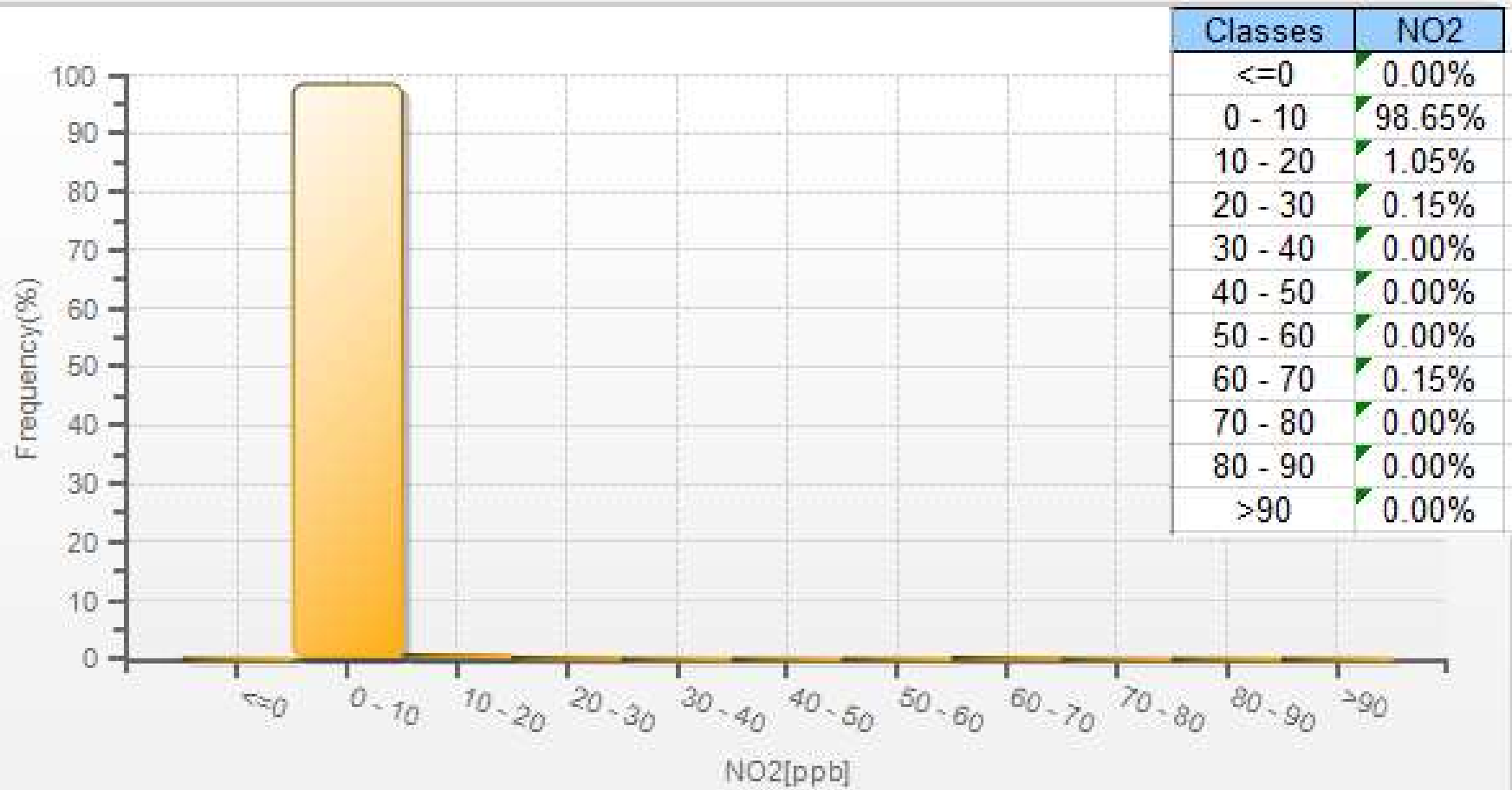
Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb																											
Number of 1-Hour Exceedences: 0																											
Maximum Hourly Value: 62 ppb on November 28 at hour 6												Hours in Service: 720															
Maximum Daily Value: 6.8 ppb on November 28												Hours of Data: 672															
Minimum Hourly Value: 0 ppb on November 4 at hour 10												Hours of Missing Data: 10															
Minimum Daily Value: 1.3 ppb on November 18												Hours of Calibration: 38															
Monthly Average: 3.6 ppb												Operational Uptime: 98.6															
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
Nov 1	2	2	1	1	3	S	3	2	2	2	1	1	1	1	1	1	2	3	3	3	2	2	2	2	1	3	1.9
Nov 2	2	2	2	2	S	2	2	1	2	2	2	1	1	2	2	3	4	2	3	4	4	4	3	5	1	5	2.5
Nov 3	4	3	2	S	1	2	5	4	2	1	2	2	2	2	1	1	3	4	4	4	5	5	4	5	1	5	3.0
Nov 4	3	2	S	2	1	1	6	3	1	1	0	0	0	0	1	1	1	1	2	2	2	2	3	3	0	6	1.7
Nov 5	4	S	2	3	7	17	4	2	2	1	2	2	1	1	1	1	1	1	1	1	1	3	3	3	1	17	2.8
Nov 6	S	6	6	3	1	1	1	1	1	1	1	1	1	1	2	2	2	3	2	3	3	4	7	S	1	7	2.4
Nov 7	8	6	5	4	4	4	4	6	8	5	C	C	C	C	C	C	5	4	4	5	5	6	S	7	4	8	-
Nov 8	7	7	7	8	9	7	8	S1	S1	9	9	P	P	P	P	P	5	3	2	2	3	S	6	5	2	9	-
Nov 9	3	2	2	1	2	1	14	4	3	2	2	1	1	2	2	1	1	1	2	2	S	1	1	2	1	14	2.3
Nov 10	2	3	2	2	5	6	8	6	6	2	1	1	1	1	1	0	1	1	1	S	2	1	1	3	0	8	2.5
Nov 11	8	8	6	4	4	5	6	9	8	6	4	4	5	4	5	5	5	S	S	6	5	6	6	7	4	9	5.7
Nov 12	9	9	7	6	4	4	4	3	6	7	6	5	4	3	4	4	3	S	8	9	7	7	7	5	3	9	5.7
Nov 13	6	6	5	5	6	9	7	7	5	5	4	4	4	4	5	7	S	8	9	7	6	5	5	3	3	9	5.7
Nov 14	2	2	1	3	5	5	5	6	9	8	8	4	4	3	3	S	3	4	5	2	2	2	2	2	1	9	3.9
Nov 15	2	2	2	2	3	3	2	3	3	3	3	2	3	3	S	4	4	4	3	3	3	3	3	4	2	4	2.9
Nov 16	4	6	6	4	3	3	2	2	3	3	2	1	1	S	2	2	2	3	4	5	7	7	7	6	1	7	3.7
Nov 17	4	5	4	4	4	4	3	3	3	3	4	3	S	3	3	4	4	4	3	2	2	1	1	1	1	5	3.1
Nov 18	1	1	1	1	1	1	1	1	2	2	2	S	2	1	1	2	2	2	2	1	1	1	1	1	1	2	1.3
Nov 19	2	3	3	3	4	4	3	13	10	12	S	8	6	4	3	2	5	8	3	3	4	4	3	4	2	13	5.0
Nov 20	4	6	4	3	2	2	2	2	2	S	2	3	3	3	3	4	7	5	1	2	2	3	3	5	1	7	3.2
Nov 21	6	6	6	4	4	5	5	8	S	5	5	4	4	4	5	6	6	6	8	8	8	8	8	7	4	8	5.9
Nov 22	7	7	6	6	7	8	6	S	7	4	3	2	2	1	2	1	1	2	1	1	3	3	4	3	1	8	3.8
Nov 23	3	3	3	3	2	1	S	1	S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1.4
Nov 24	1	1	2	2	2	S	2	2	3	2	3	2	2	2	1	1	2	1	1	1	1	1	2	1	1	3	1.6
Nov 25	2	2	3	1	S	3	4	5	2	5	4	2	3	2	2	3	4	3	2	1	1	1	2	1	5	2.5	
Nov 26	3	3	4	S	2	3	2	27	12	3	C1	C1	2	2	2	4	2	4	5	6	6	4	5	4	2	27	5.0
Nov 27	4	4	S	5	4	6	7	8	8	7	6	6	6	4	5	8	6	6	5	6	6	4	4	3	3	8	5.6
Nov 28	2	S	3	2	2	3	62	9	5	5	10	13	4	2	1	6	5	8	4	3	4	2	1	1	1	62	6.8
Nov 29	S	1	3	3	2	2	6	8	7	6	3	3	2	2	1	2	1	3	2	1	2	2	2	S	1	8	2.9
Nov 30	4	4	2	3	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	4	3	S	3	1	4	2.3
Diurnal Maximum	9	9	7	8	9	17	62	27	12	12	10	13	6	5	5	8	7	8	9	9	8	8	8	7			
Daiurnal Average	3.9	4.0	3.6	3.2	3.4	4.1	6.4	5.3	4.6	4.0	3.4	3.0	2.4	2.2	2.3	2.9	3.1	3.5	3.2	3.3	3.5	3.3	3.4	3.5			
C	Calibration			S	Daily Zero/Span					Q	Quality Assurance				C1	Repeat Calibration				S1	Repeat Daily Zero/Span						
G	Out for Repair			K	Collection Error					N	Not in Service				O	Operator Error				P	Power Failure						
R	Recovery			X	Machine Malfunction					Y	Maintenance				T	Exceeds Temperature Limits				N	Not in Service						

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for NO2 - Bonnyville - East Site

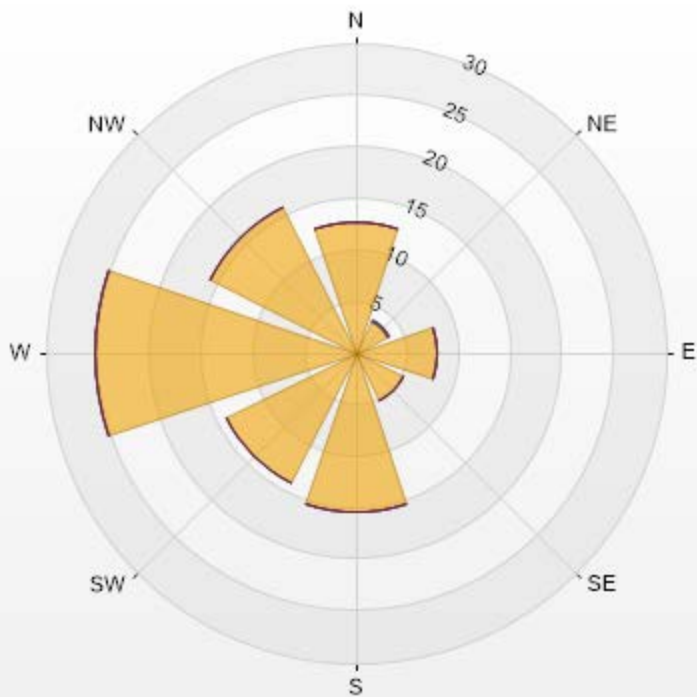


NO2[ppb] Histogram: Bonnyville East Monthly: 11-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-NO2[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.17% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	12.72	0	0	0	0	12.72
NE	3.44	0	0.15	0	0	3.59
E	7.93	0	0	0	0	7.93
SE	5.24	0	0	0	0	5.24
S	15.42	0	0	0	0	15.42
SW	14.07	0	0	0	0	14.07
W	25.3	0	0	0	0	25.3
NW	15.72	0	0	0	0	15.72
Summary	100	0	0.15	0	0	100



LICA-201911-Revision 1



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Averages

OZONE (O₃) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 76 ppb

Number of 1-Hour Exceedences: 0

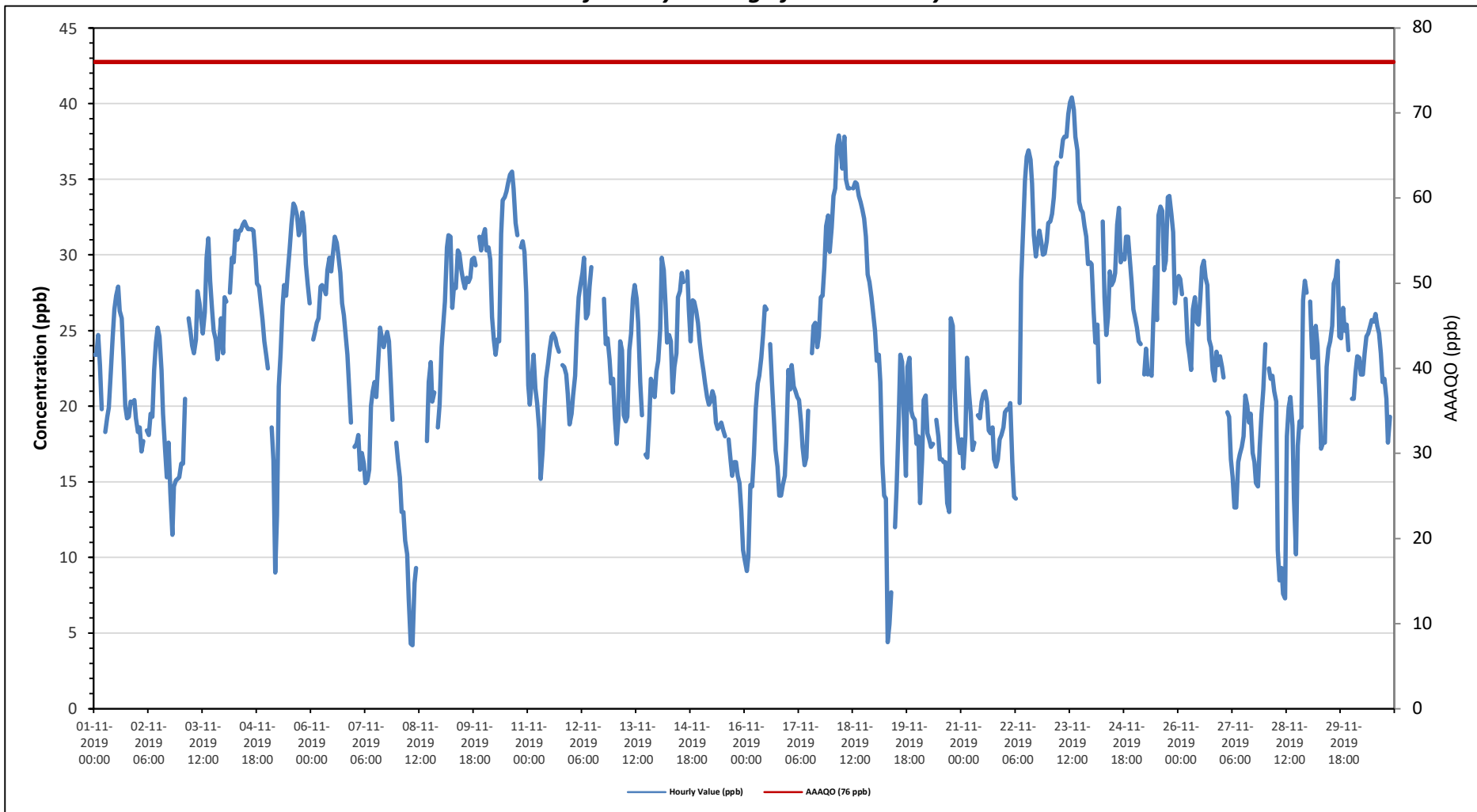
Maximum Hourly Value:	40.4 ppb on November 23 at hour 13	Hours in Service:	720
Maximum Daily Value:	35.1 ppb on November 23	Hours of Data:	678
Minimum Hourly Value:	4.2 ppb on November 8 at hour 8	Hours of Missing Data:	6
Minimum Daily Value:	17.5 ppb on November 19	Hours of Calibration:	36
Monthly Average:	23.7 ppb	Operational Uptime:	99.2

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	23.4	23.4	24.7	22.7	19.8	S	18.3	19.3	19.9	22.3	24.5	26.4	27.3	27.9	26.3	25.8	23.2	20	19.2	19.3	20.3	20.2	20.4	19.2	18.3	27.9	22.3
Nov 2	18.3	18.6	17	17.7	S	18.4	18.1	19.5	19.3	22.4	24.2	25.2	24.6	22.4	19.5	17.2	15.3	17.6	14.3	11.5	14.7	15.1	15.2	15.3	11.5	25.2	18.3
Nov 3	16.2	16.2	20.5	S	25.8	25	24	23.5	24.4	27.6	26.8	25.7	24.8	26.2	29.8	31.1	28.3	26.3	25	24.4	23.1	24.3	25.8	23.5	16.2	31.1	24.7
Nov 4	27.2	26.9	S	27.5	29.8	29.5	31.6	31	31.6	31.6	32	32.2	31.9	31.7	31.7	31.7	31.6	29.9	28.1	27.9	26.8	25.7	24.3	23.3	23.3	32.2	29.4
Nov 5	22.5	S	18.6	16.4	9	12.8	21.3	23.4	26.6	28	27.3	29	30.4	32	33.4	33.2	32.6	31.3	31.6	32.8	31.9	29.4	28.1	26.8	9.0	33.4	26.5
Nov 6	S	24.4	24.9	25.5	25.8	27.9	28	27.8	27.4	29	29.8	28.9	30.1	31.2	30.8	30	28.8	26.8	26	24.7	23.4	21.2	18.9	S	18.9	31.2	26.9
Nov 7	17.3	17.5	18.1	15.8	16.9	16.2	14.9	15.1	15.8	20	21	21.6	20.6	22.8	25.2	24.6	23.9	24.5	24.9	24.3	21.4	19.1	S	17.6	14.9	25.2	20.0
Nov 8	16.5	15.3	13	13	11.1	10.2	7.3	4.3	4.2	8.3	X	P	P	P	P	P	17.7	21.6	22.9	20.3	20.9	S	18.6	20.1	4.2	22.9	-
Nov 9	23.9	25.3	26.9	30.5	31.3	31.2	26.5	28	27.8	30.3	30.1	29	28.3	27.8	28.5	28.2	28.5	29.7	29.8	29.3	S	31.2	30.3	31.2	23.9	31.3	28.9
Nov 10	31.7	30.3	30.5	29.7	25.9	24.4	23.4	24.4	24.3	31.4	33.6	33.8	34.2	34.8	35.3	35.5	34.4	32.1	31.3	S	30.5	30.9	30.2	27.5	23.4	35.5	30.4
Nov 11	21.4	20.1	21.8	23.4	21.2	20.2	18.5	15.2	17.1	19.9	21.8	22.8	23.8	24.6	24.8	24.5	24	23.6	S	22.7	22.6	22.1	20.8	18.8	15.2	24.8	21.6
Nov 12	19.5	20.7	22	25.1	27.2	28	28.8	29.8	25.8	26.1	27.9	29.2	C	C	C	C	30.8	S	27.1	24.1	24.5	23.1	21.5	21.8	19.5	30.8	25.4
Nov 13	19.2	17.5	19.2	24.3	23.7	19.4	19	19.3	23.7	24.8	27.1	28	27.1	25.5	21.6	19.4	S	16.8	16.6	19.2	21.8	21.5	20.6	22.3	16.6	28.0	21.6
Nov 14	23	25.1	29.8	29	26.7	24.2	24.7	24.3	20.9	22.6	23.5	27.2	27.6	28.8	28.2	S	28.9	26.4	24.3	27	26.9	26.3	25.5	24.2	20.9	29.8	25.9
Nov 15	23.2	22.3	21.5	20.6	20.1	20.3	21	20.6	18.9	18.5	18.7	18.9	18.4	18	S	17.8	16.4	15.4	16.3	16.3	15.4	14.9	13.1	10.5	10.5	23.2	18.1
Nov 16	9.8	9.1	10.1	14.8	14.7	16.8	19.8	21.5	22	23.2	24.7	26.6	26.4	S	24.1	21.6	19.1	17.1	16	14.1	14.1	14.8	15.4	17.7	9.1	26.6	18.0
Nov 17	22.4	21.1	22.7	21.3	21	20.6	20.4	18.9	17.3	16.1	16.6	19.7	S	23.5	25.3	25.5	23.9	24.6	27.2	27.3	29.2	31.9	32.6	30.2	16.1	32.6	23.4
Nov 18	31.8	33.9	34.4	37.2	37.9	36.9	35.7	37.8	35	34.4	34.4	S	34.4	34.8	34.7	33.9	33.5	33	32.4	31.2	28.7	28.2	27.2	26.1	26.1	37.9	33.4
Nov 19	25	23	23.4	21.6	16.2	14.1	13.9	4.4	5.6	7.7	S	12	14.5	18.8	23.4	22.9	19.2	15.4	22.6	23.2	19.7	19.3	19.1	17.5	4.4	25.0	17.5
Nov 20	18	13.6	16.5	20.4	20.7	18.2	17.8	17.3	17.5	S	19.1	18	16.5	16.5	16.3	16.3	13.6	13	25.8	25.3	21.2	19	17.8	16.9	13.0	25.8	18.1
Nov 21	17.8	15.9	18.1	23.2	20.9	19.5	17.1	17.6	S	19.4	19.2	20.3	20.8	21	20.3	18.4	18.2	18.6	16.5	16	16.5	17.8	18.1	18.6	15.9	23.2	18.7
Nov 22	19.6	19.8	19.8	20.2	16.3	14	13.9	S	20.2	28.3	31.8	34.9	36.5	36.9	36.3	34.7	31.3	29.9	30.7	31.6	30.9	30	30.1	30.9	13.9	36.9	27.3
Nov 23	32.1	32.2	32.7	33.8	35.8	36.1	S	36.5	37.6	37.8	37.8	39.3	40.1	40.4	39.6	37.8	36.9	33.5	33	32.8	31.9	31.2	29.4	29.5	29.4	40.4	35.1
Nov 24	29.4	26.3	24.2	25.4	21.6	S	32.2	27.2	24.7	25.9	28.9	28	28.3	28.8	32	33.1	29.5	30	29.7	31.2	31.2	29.7	28.2	26.4	21.6	33.1	28.3
Nov 25	25.8	25.2	24.3	24.1	S	22.1	23.8	22.1	22.3	22	25.4	29.2	25.7	32.6	33.2	32.9	29	29.6	33.8	33.9	32.7	31.5	26.8	28	22.0	33.9	27.7
Nov 26	28.6	28.4	27.4	S	27.1	24.2	23.4	22.4	26.4	27.2	25.6	25.4	27.1	29.2	29.6	28.5	28	24.4	23.9	22.4	21.7	23.6	22.7	23.3	21.7	29.6	25.7
Nov 27	22.6	21.9	S	19.6	19.3	16.5	15.3	13.3	13.3	16.3	16.8	17.3	18	20.7	20.1	18.9	19.5	16.9	16.3	14.9	14.7	17.4	19.5	21.1	13.3	22.6	17.8
Nov 28	24.1	S	22.5	21.8	22	21	20.3	10.5	8.5	9.3	7.6	7.3	18	19.9	20.6	18.7	13.9	10.2	17.4	19	18.6	27	28.3	27.5	7.3	28.3	18.0
Nov 29	S	26.9	23.2	23.2	25.3	24	20.5	17.2	17.6	17.6	22.6	23.8	24.3	25.3	28.1	28.5	29.6	24.6	24.5	26.5	25	25.4	23.7	S	17.2	29.6	24.0
Nov 30	20.5	20.5	22.2	23.3	23.2	22.1	22.1	23.5	24.6	24.8	25.3	25.7	25.6	26.1	25.3	24.8	23.5	21.6	21.8	20.5	17.6	19.3	S	19.4	17.6	26.1	22.8
Diurnal Maximum	32	34	34	37	38	37	36	38	38	38	38	39	40	40	40	38	37	34	34	34	33	32	33	31			
Daiurnal Average	22.5	22.2	22.5	23.3	22.7	21.9	21.4	21.2	21.4	23.2	25.1	25.2	26.1	27.0	27.6	26.5	25.3	23.6	24.4	23.9	23.4	23.8	23.3	22.7			

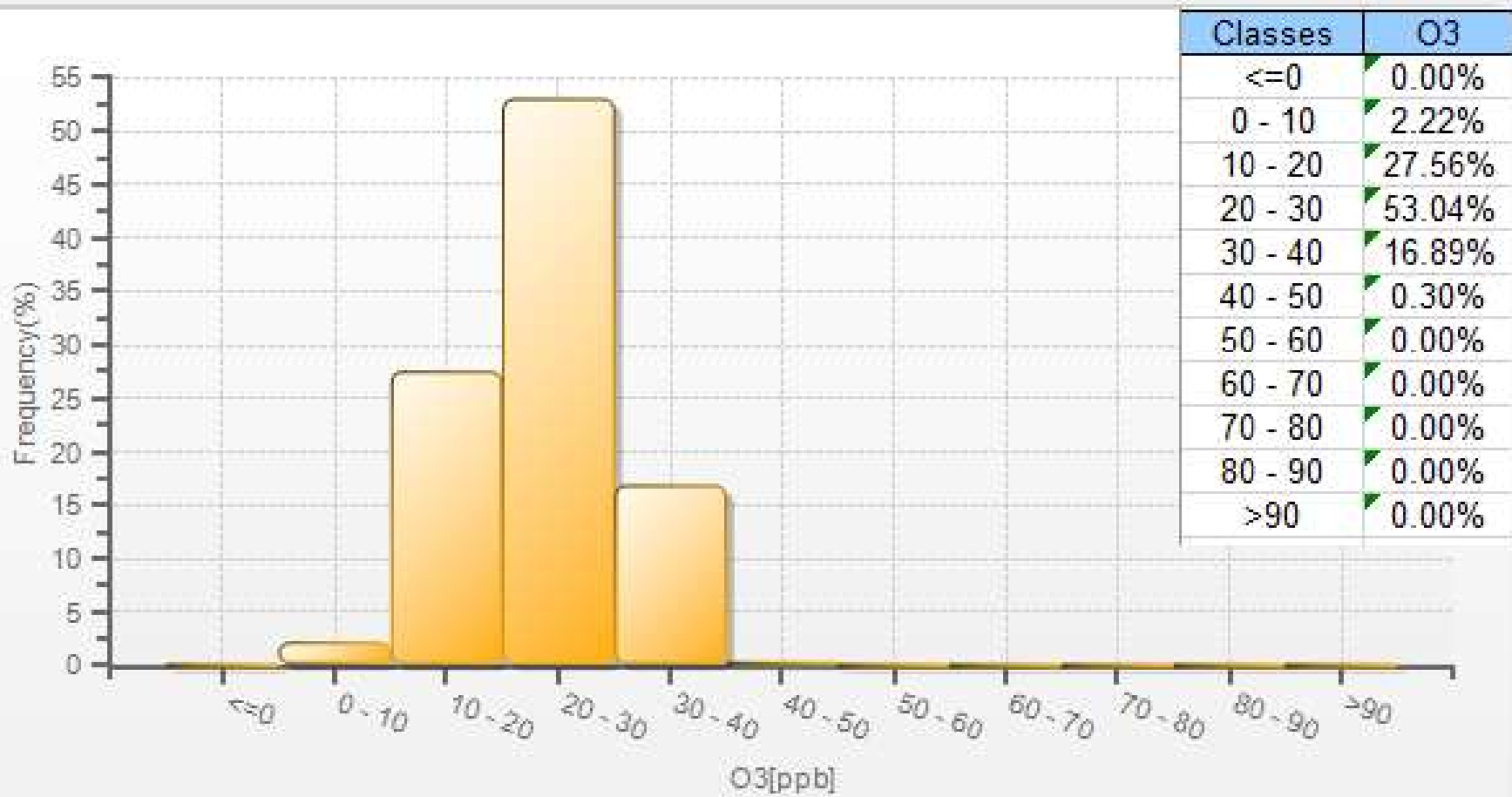
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for O3 - Bonnyville - East Site

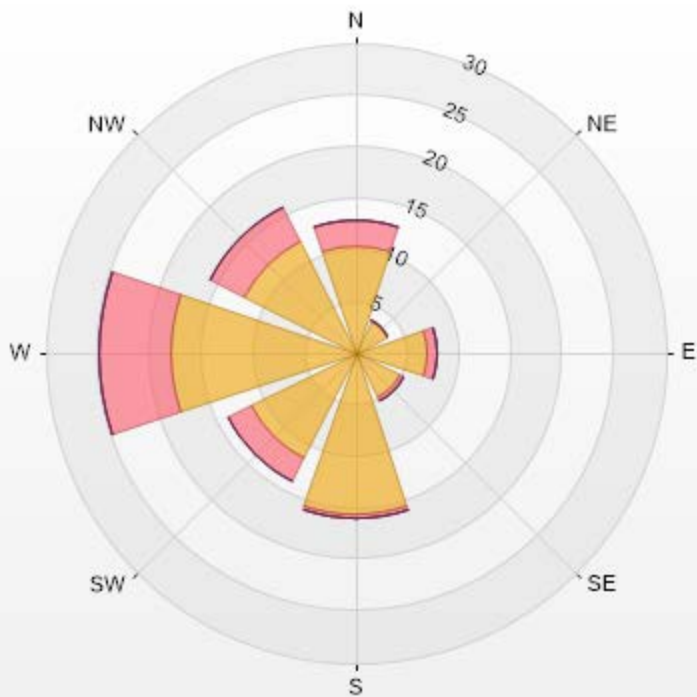


O3[ppb] Histogram: Bonnyville East Monthly: 11-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-O3[ppb] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.14% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	10.37	2.52	0	0	0	12.89
NE	3.41	0.15	0	0	0	3.56
E	6.96	0.89	0	0	0	7.85
SE	4.89	0.3	0	0	0	5.19
S	15.7	0.3	0	0	0	16
SW	11.41	2.52	0	0	0	13.93
W	17.93	6.96	0	0	0	24.89
NW	12.15	3.56	0	0	0	15.71
Summary	82.82	17.2	0	0	0	100



LICA-201911-Revision 1

%	Icon	Classes (ppb)	83	17	Page 251 of 366	0	0
0-30	Yellow	0-30	83	17	0	0	0
30-50	Red	30-50	0	0	0	0	0
50-82	Blue	50-82	0	0	0	0	0
82-159	Purple	82-159	0	0	0	0	0
>159.0	Pink	>159.0	0	0	0	0	0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Averages

TOTAL HYDROCARBONS (THC) in ppm

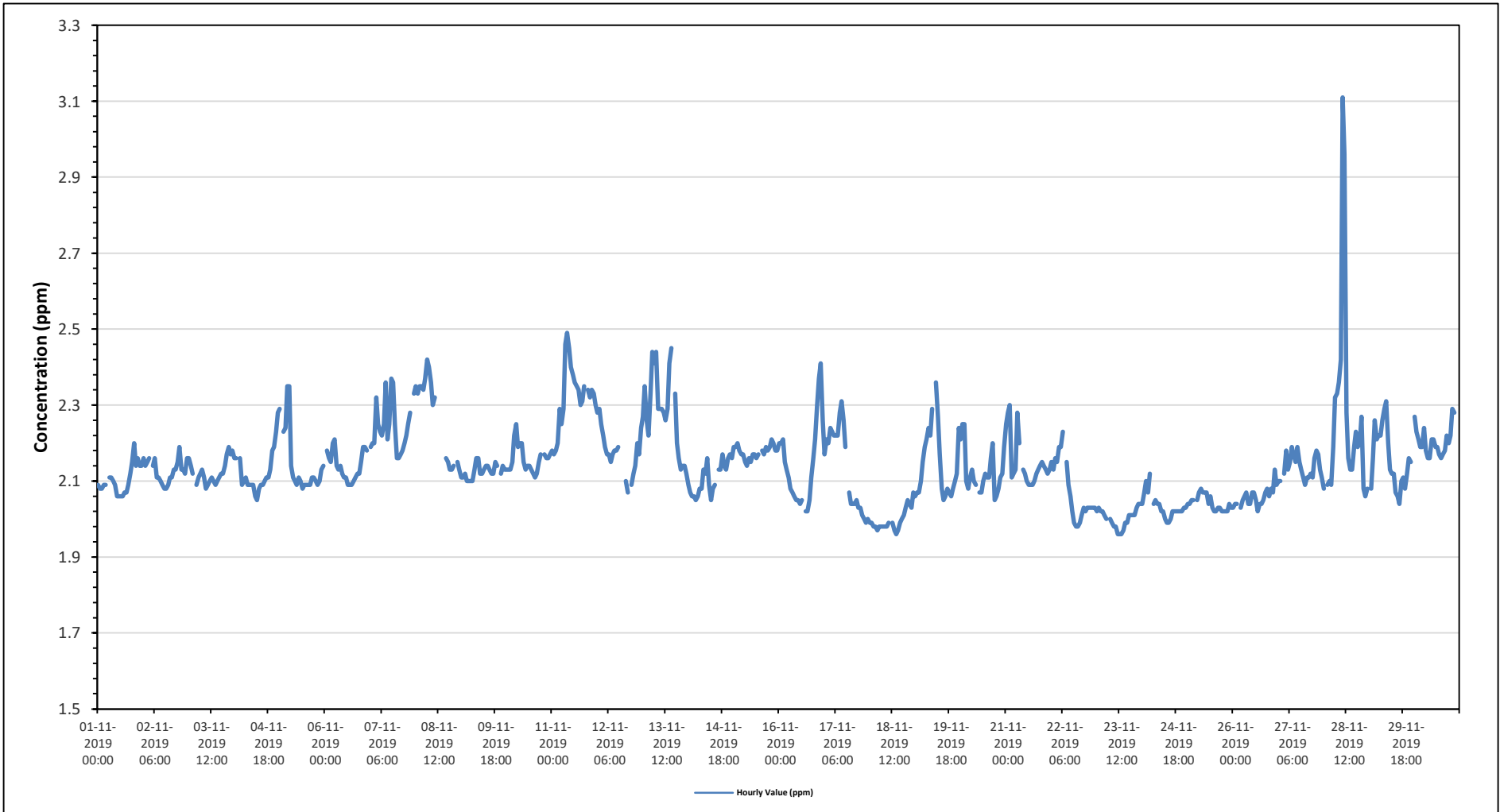
Maximum Hourly Value:	3.11 ppm on November 28 at hour 10	Hours in Service:	720
Maximum Daily Value:	2.32 ppm on November 11	Hours of Data:	677
Minimum Hourly Value:	1.96 ppm on November 18 at hour 14	Hours of Missing Data:	6
Minimum Daily Value:	2.00 ppm on November 18	Hours of Calibration:	37
Monthly Average:	2.14 ppm	Operational Uptime:	99.2

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	2.09	2.08	2.08	2.09	2.09	S	2.11	2.11	2.10	2.09	2.06	2.06	2.06	2.06	2.07	2.07	2.09	2.12	2.15	2.20	2.14	2.16	2.14	2.14	2.06	2.20	2.10
Nov 2	2.16	2.14	2.15	2.16	S	2.14	2.16	2.11	2.11	2.10	2.09	2.08	2.08	2.09	2.11	2.11	2.13	2.13	2.15	2.19	2.13	2.13	2.12	2.16	2.08	2.19	2.13
Nov 3	2.16	2.14	2.12	S	2.09	2.11	2.12	2.13	2.11	2.08	2.09	2.10	2.11	2.10	2.09	2.10	2.11	2.12	2.14	2.17	2.19	2.17	2.18	2.08	2.19	2.12	
Nov 4	2.16	2.16	S	2.16	2.09	2.10	2.11	2.09	2.09	2.09	2.09	2.06	2.05	2.08	2.09	2.09	2.10	2.11	2.11	2.13	2.18	2.19	2.23	2.28	2.05	2.28	2.12
Nov 5	2.29	S	2.23	2.24	2.35	2.35	2.14	2.11	2.10	2.09	2.11	2.10	2.08	2.09	2.09	2.09	2.09	2.11	2.11	2.10	2.09	2.10	2.13	2.14	2.08	2.35	2.14
Nov 6	S	2.18	2.16	2.15	2.20	2.21	2.14	2.13	2.14	2.12	2.11	2.11	2.09	2.09	2.09	2.10	2.11	2.12	2.12	2.15	2.19	2.19	2.18	S	2.09	2.21	2.14
Nov 7	2.19	2.20	2.20	2.32	2.25	2.23	2.22	2.25	2.36	2.21	2.25	2.37	2.36	2.25	2.16	2.16	2.17	2.18	2.20	2.22	2.25	2.28	S	2.33	2.16	2.37	2.24
Nov 8	2.35	2.33	2.35	2.35	2.34	2.37	2.42	2.40	2.36	2.30	X	P	P	P	P	P	2.16	2.15	2.13	2.13	2.14	S	2.15	2.13	2.13	2.42	-
Nov 9	2.11	2.11	2.12	2.10	2.10	2.10	2.10	2.13	2.16	2.16	2.12	2.12	2.13	2.14	2.14	2.13	2.12	2.12	2.15	2.14	S	2.12	2.14	2.13	2.10	2.16	2.13
Nov 10	2.13	2.13	2.13	2.15	2.22	2.25	2.19	2.20	2.20	2.15	2.13	2.14	2.14	2.13	2.12	2.11	2.12	2.15	2.17	S	2.17	2.16	2.16	2.17	2.11	2.25	2.16
Nov 11	2.18	2.17	2.18	2.20	2.29	2.25	2.29	2.46	2.49	2.45	2.40	2.38	2.36	2.35	2.34	2.30	2.31	2.35	S	2.34	2.32	2.34	2.33	2.30	2.17	2.49	2.32
Nov 12	2.28	2.29	2.25	2.22	2.19	2.17	2.17	2.15	2.17	2.18	2.18	C	C	C	C	C	2.07	S	2.09	2.12	2.14	2.20	2.17	2.24	2.07	2.29	2.18
Nov 13	2.27	2.35	2.26	2.22	2.33	2.44	2.41	2.44	2.29	2.29	2.29	2.28	2.26	2.29	2.41	2.45	S	2.33	2.20	2.16	2.13	2.14	2.14	2.12	2.12	2.45	2.28
Nov 14	2.09	2.07	2.06	2.06	2.05	2.06	2.08	2.13	2.12	2.16	2.09	2.05	2.08	2.09	S	S	2.13	2.13	2.17	2.14	2.13	2.16	2.17	2.16	2.05	2.17	2.11
Nov 15	2.19	2.19	2.20	2.18	2.17	2.17	2.15	2.14	2.16	2.15	2.17	2.17	2.16	2.17	S	2.18	2.17	2.19	2.18	2.19	2.21	2.20	2.18	2.18	2.14	2.21	2.18
Nov 16	2.20	2.20	2.21	2.15	2.13	2.11	2.08	2.07	2.06	2.05	2.05	2.04	2.05	S	2.02	2.02	2.05	2.11	2.16	2.21	2.30	2.37	2.41	2.26	2.02	2.41	2.14
Nov 17	2.17	2.21	2.20	2.24	2.23	2.22	2.22	2.22	2.28	2.31	2.26	2.19	S	2.07	2.04	2.04	2.04	2.05	2.03	2.03	2.01	2.00	1.99	2.00	1.99	2.31	2.13
Nov 18	1.99	1.99	1.98	1.98	1.97	1.98	1.98	1.98	1.98	1.98	1.99	S	1.99	1.97	1.96	1.97	1.99	2.00	2.01	2.03	2.05	2.04	2.03	2.07	1.96	2.07	2.00
Nov 19	2.06	2.07	2.07	2.10	2.15	2.19	2.21	2.24	2.22	2.29	S	2.36	2.27	2.17	2.08	2.05	2.06	2.08	2.07	2.06	2.08	2.10	2.12	2.24	2.05	2.36	2.15
Nov 20	2.21	2.25	2.25	2.10	2.08	2.11	2.13	2.10	2.09	S	2.07	2.07	2.10	2.12	2.11	2.11	2.16	2.20	2.05	2.06	2.08	2.11	2.12	2.19	2.05	2.25	2.12
Nov 21	2.25	2.28	2.30	2.11	2.12	2.13	2.28	2.20	S	2.13	2.12	2.10	2.09	2.09	2.09	2.10	2.12	2.13	2.14	2.15	2.14	2.13	2.12	2.13	2.09	2.30	2.15
Nov 22	2.15	2.13	2.16	2.15	2.19	2.19	2.23	S	2.15	2.09	2.06	2.02	1.99	1.98	1.98	1.99	2.01	2.03	2.02	2.03	2.03	2.03	2.03	2.03	1.98	2.23	2.07
Nov 23	2.02	2.03	2.02	2.02	2.01	2.00	S	2.00	1.99	1.98	1.98	1.96	1.96	1.96	1.97	1.99	1.99	2.01	2.01	2.01	2.01	2.01	2.03	2.04	1.96	2.04	2.00
Nov 24	2.04	2.07	2.10	2.07	2.12	S	2.04	2.05	2.04	2.04	2.02	2.02	2.00	1.99	1.99	2.00	2.02	2.02	2.02	2.02	2.02	2.02	2.03	2.03	1.99	2.12	2.03
Nov 25	2.04	2.04	2.05	2.05	S	2.05	2.07	2.08	2.07	2.07	2.07	2.04	2.06	2.03	2.02	2.02	2.03	2.03	2.02	2.02	2.02	2.02	2.04	2.03	2.02	2.08	2.04
Nov 26	2.03	2.04	2.04	S	2.03	2.05	2.06	2.07	2.04	2.04	2.07	2.07	2.05	2.02	2.04	2.04	2.05	2.07	2.08	2.06	2.08	2.07	2.13	2.09	2.02	2.13	2.06
Nov 27	2.10	2.10	S	2.12	2.18	2.13	2.15	2.19	2.17	2.15	2.19	2.15	2.13	2.11	2.09	2.11	2.11	2.12	2.11	2.16	2.18	2.17	2.13	2.11	2.09	2.19	2.14
Nov 28	2.08	S	2.09	2.10	2.09	2.19	2.32	2.33	2.36	2.42	3.11	2.96	2.28	2.16	2.13	2.13	2.19	2.23	2.19	2.20	2.27	2.08	2.06	2.08	2.06	3.11	2.26
Nov 29	S	2.08	2.16	2.26	2.21	2.22	2.22	2.26	2.29	2.31	2.20	2.13	2.12	2.12	2.07	2.06	2.04	2.10	2.11	2.08	2.12	2.16	2.15	S	2.04	2.31	2.16
Nov 30	2.27	2.23	2.21	2.19	2.19	2.24	2.18	2.16	2.16	2.21	2.21	2.19	2.19	2.17	2.16	2.17	2.18	2.22	2.20	2.22	2.29	2.28	S	2.24	2.16	2.29	2.21
Diurnal Maximum	2.35	2.35	2.35	2.35	2.35	2.44	2.42	2.46	2.49	2.45	3.11	2.96	2.36	2.35	2.41	2.45	2.31	2.35	2.20	2.34	2.32	2.37	2.41	2.33			
Diurnal Average	2.15	2.15	2.15	2.15	2.16	2.17	2.17	2.17	2.17	2.16	2.17	2.16	2.12	2.11	2.09	2.10	2.10	2.13	2.11	2.13	2.14	2.14	2.14	2.15			

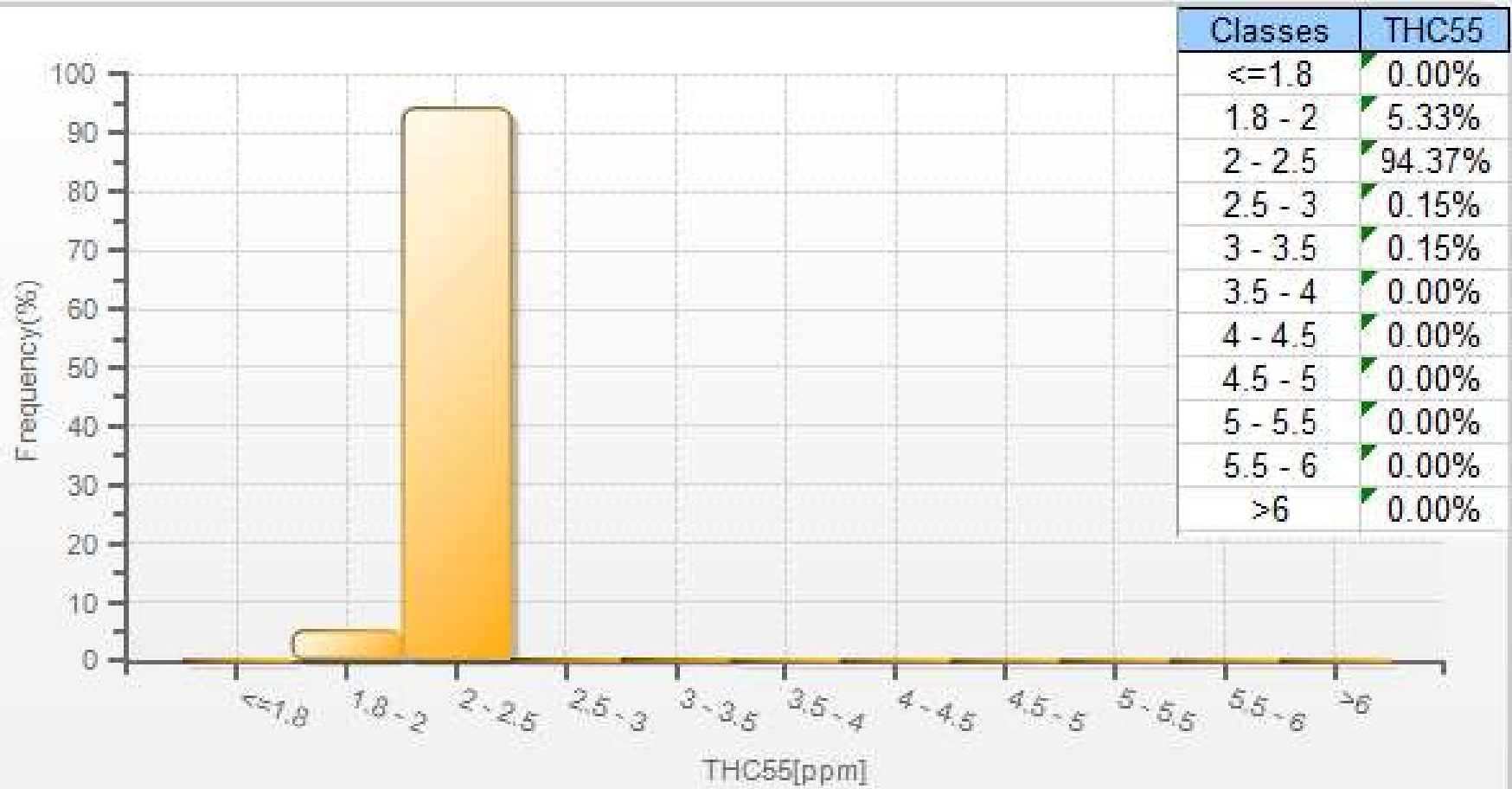
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for THC - Bonnyville - East Site

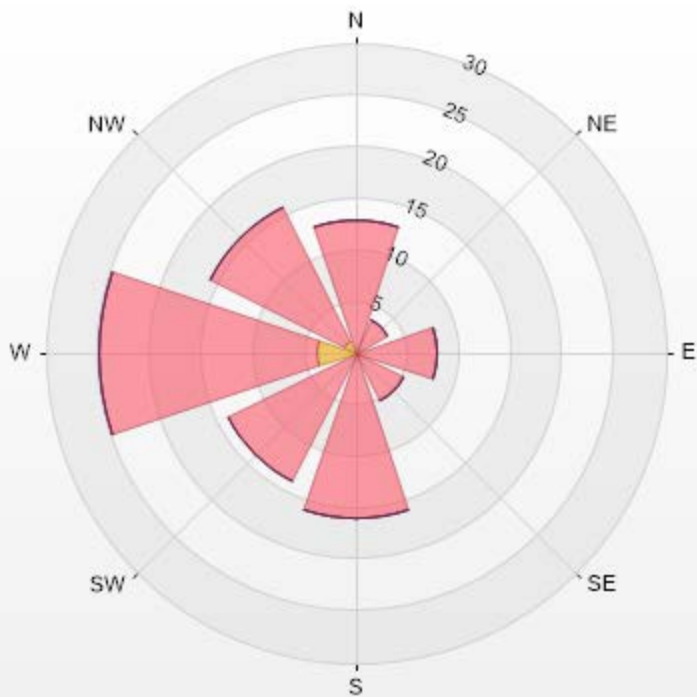


THC55[ppm] Histogram: Bonnyville East Monthly: 11-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-THC55[ppm] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.14% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	0	12.89	0	0	0	12.89
NE	0	3.56	0	0	0	3.56
E	0	7.85	0	0	0	7.85
SE	0	5.19	0	0	0	5.19
S	0	16	0	0	0	16
SW	0	13.93	0	0	0	13.93
W	3.85	21.04	0	0	0	24.89
NW	1.33	14.37	0	0	0	15.7
Summary	5.18	94.83	0	0	0	100



LICA-201911-Revision 1



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Averages

METHANE (CH₄) in ppm

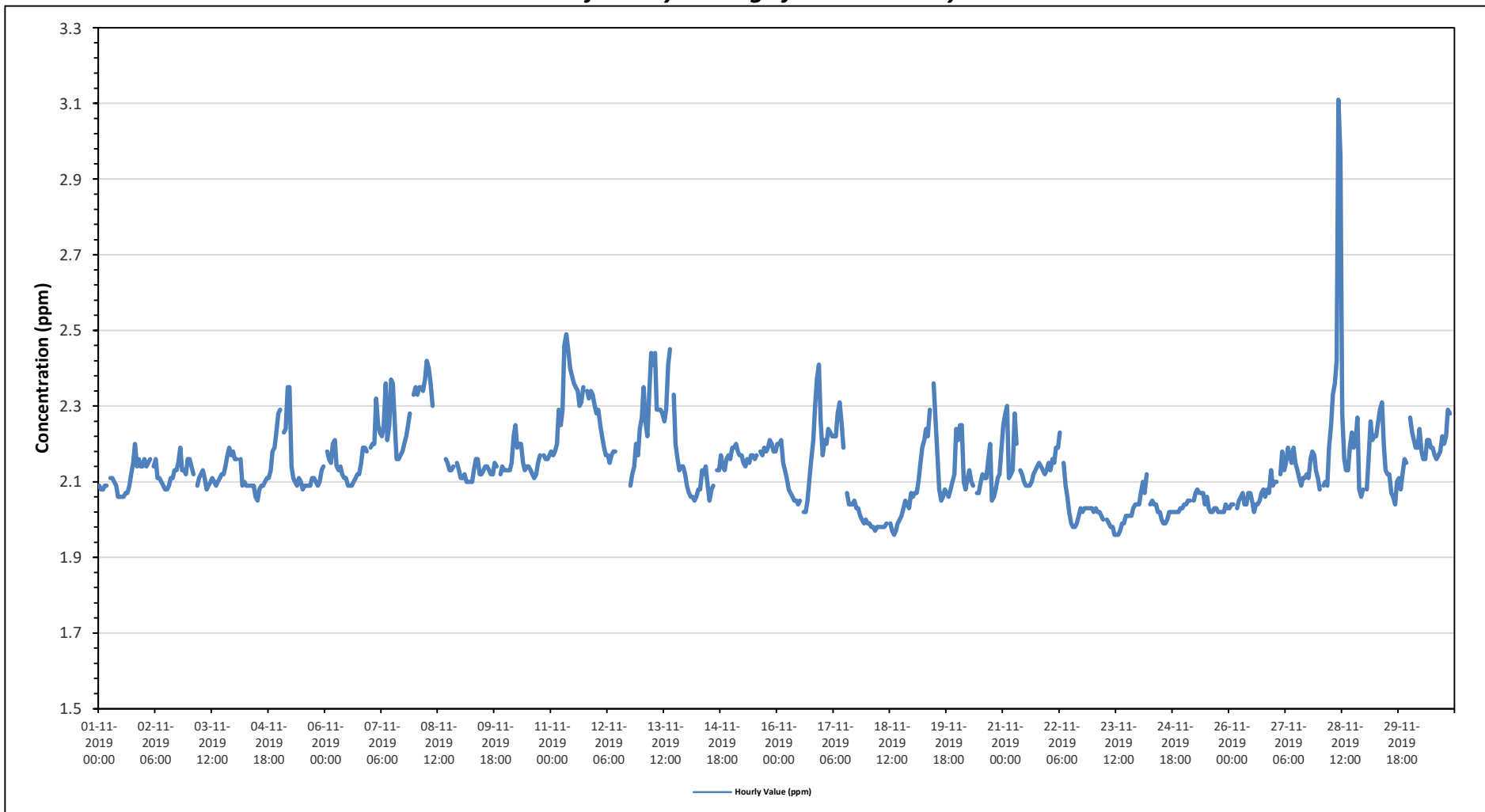
Maximum Hourly Value:	3.11 ppm on November 28 at hour 10	Hours in Service:	720
Maximum Daily Value:	2.32 ppm on November 11	Hours of Data:	677
Minimum Hourly Value:	1.96 ppm on November 18 at hour 14	Hours of Missing Data:	6
Minimum Daily Value:	2.00 ppm on November 18	Hours of Calibration:	37
Monthly Average:	2.14 ppm	Operational Uptime:	99.2

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	2.09	2.08	2.08	2.09	2.09	S	2.11	2.11	2.10	2.09	2.06	2.06	2.06	2.06	2.07	2.07	2.09	2.12	2.15	2.20	2.14	2.16	2.14	2.14	2.06	2.20	2.10
Nov 2	2.16	2.14	2.15	2.16	S	2.14	2.16	2.11	2.11	2.10	2.09	2.08	2.08	2.09	2.11	2.11	2.13	2.13	2.15	2.19	2.13	2.13	2.12	2.16	2.08	2.19	2.13
Nov 3	2.16	2.14	2.12	S	2.09	2.11	2.12	2.13	2.11	2.08	2.09	2.10	2.11	2.10	2.09	2.10	2.11	2.12	2.14	2.17	2.19	2.17	2.18	2.08	2.19	2.12	
Nov 4	2.16	2.16	S	2.16	2.09	2.10	2.09	2.09	2.09	2.09	2.09	2.06	2.05	2.08	2.09	2.09	2.10	2.11	2.11	2.13	2.18	2.19	2.23	2.28	2.05	2.28	2.12
Nov 5	2.29	S	2.23	2.24	2.35	2.35	2.14	2.11	2.10	2.09	2.11	2.10	2.08	2.09	2.09	2.09	2.09	2.11	2.11	2.10	2.09	2.10	2.13	2.14	2.08	2.35	2.14
Nov 6	S	2.18	2.16	2.15	2.20	2.21	2.14	2.13	2.14	2.12	2.11	2.11	2.09	2.09	2.09	2.10	2.11	2.12	2.12	2.15	2.19	2.19	2.18	S	2.09	2.21	2.14
Nov 7	2.19	2.20	2.20	2.32	2.25	2.23	2.22	2.25	2.36	2.21	2.25	2.37	2.36	2.25	2.16	2.16	2.17	2.18	2.20	2.22	2.25	2.28	S	2.33	2.16	2.37	2.24
Nov 8	2.35	2.33	2.35	2.35	2.34	2.37	2.42	2.40	2.36	2.30	X	P	P	P	P	P	2.16	2.15	2.13	2.13	2.14	S	2.15	2.13	2.13	2.42	-
Nov 9	2.11	2.11	2.12	2.10	2.10	2.10	2.10	2.13	2.16	2.16	2.12	2.12	2.13	2.14	2.14	2.13	2.12	2.12	2.15	2.14	S	2.12	2.14	2.13	2.10	2.16	2.13
Nov 10	2.13	2.13	2.13	2.15	2.22	2.25	2.19	2.20	2.20	2.15	2.13	2.14	2.14	2.13	2.12	2.11	2.12	2.15	2.17	S	2.17	2.16	2.16	2.17	2.11	2.25	2.16
Nov 11	2.18	2.17	2.18	2.20	2.29	2.25	2.29	2.46	2.49	2.45	2.40	2.38	2.36	2.35	2.34	2.30	2.31	2.35	S	2.34	2.32	2.34	2.33	2.30	2.17	2.49	2.32
Nov 12	2.28	2.29	2.25	2.22	2.19	2.17	2.17	2.15	2.17	2.18	2.18	C	C	C	C	C	2.07	S	2.09	2.12	2.14	2.20	2.17	2.24	2.07	2.29	2.18
Nov 13	2.27	2.35	2.26	2.22	2.33	2.44	2.41	2.44	2.29	2.29	2.29	2.28	2.26	2.29	2.41	2.45	S	2.33	2.20	2.16	2.13	2.14	2.14	2.12	2.12	2.45	2.28
Nov 14	2.09	2.07	2.06	2.06	2.05	2.06	2.08	2.13	2.12	2.14	2.09	2.05	2.08	2.09	S	2.13	2.13	2.17	2.14	2.13	2.16	2.17	2.16	2.16	2.05	2.17	2.11
Nov 15	2.19	2.19	2.20	2.18	2.17	2.17	2.15	2.14	2.16	2.15	2.17	2.17	2.16	2.17	S	2.18	2.17	2.19	2.18	2.19	2.21	2.20	2.18	2.18	2.14	2.21	2.18
Nov 16	2.20	2.20	2.21	2.15	2.13	2.11	2.08	2.07	2.06	2.05	2.05	2.04	2.05	S	2.02	2.02	2.05	2.11	2.16	2.21	2.30	2.37	2.41	2.26	2.02	2.41	2.14
Nov 17	2.17	2.21	2.20	2.24	2.23	2.22	2.22	2.22	2.28	2.31	2.26	2.19	S	2.07	2.04	2.04	2.04	2.05	2.03	2.03	2.01	2.00	1.99	2.00	1.99	2.31	2.13
Nov 18	1.99	1.99	1.98	1.98	1.97	1.98	1.98	1.98	1.98	1.98	1.99	S	1.99	1.97	1.96	1.97	1.99	2.00	2.01	2.03	2.05	2.04	2.03	2.07	1.96	2.07	2.00
Nov 19	2.06	2.07	2.07	2.10	2.15	2.19	2.21	2.24	2.22	2.29	S	2.36	2.27	2.17	2.08	2.05	2.06	2.08	2.07	2.06	2.08	2.10	2.12	2.24	2.05	2.36	2.15
Nov 20	2.21	2.25	2.25	2.10	2.08	2.11	2.13	2.10	2.09	S	2.07	2.07	2.10	2.12	2.11	2.11	2.16	2.20	2.05	2.06	2.08	2.11	2.12	2.19	2.05	2.25	2.12
Nov 21	2.25	2.28	2.30	2.11	2.12	2.13	2.28	2.20	S	2.13	2.12	2.10	2.09	2.09	2.09	2.10	2.12	2.13	2.14	2.15	2.14	2.13	2.12	2.13	2.09	2.30	2.15
Nov 22	2.15	2.13	2.16	2.15	2.19	2.19	2.23	S	2.15	2.09	2.06	2.02	1.99	1.98	1.98	1.99	2.01	2.03	2.02	2.03	2.03	2.03	2.03	2.03	1.98	2.23	2.07
Nov 23	2.02	2.03	2.02	2.02	2.01	2.00	S	2.00	1.99	1.98	1.98	1.96	1.96	1.96	1.97	1.99	1.99	2.01	2.01	2.01	2.01	2.01	2.03	2.04	1.96	2.04	2.00
Nov 24	2.04	2.07	2.10	2.07	2.12	S	2.04	2.05	2.04	2.04	2.02	2.02	2.00	1.99	1.99	2.00	2.02	2.02	2.02	2.02	2.02	2.02	2.03	2.03	1.99	2.12	2.03
Nov 25	2.04	2.04	2.05	2.05	S	2.05	2.07	2.08	2.07	2.07	2.07	2.04	2.06	2.03	2.02	2.02	2.03	2.03	2.02	2.02	2.02	2.02	2.04	2.03	2.02	2.08	2.04
Nov 26	2.03	2.04	2.04	S	2.03	2.05	2.06	2.07	2.04	2.04	2.07	2.07	2.05	2.02	2.04	2.04	2.05	2.07	2.08	2.06	2.08	2.07	2.13	2.09	2.02	2.13	2.06
Nov 27	2.10	2.10	S	2.12	2.18	2.13	2.15	2.19	2.17	2.15	2.19	2.15	2.13	2.11	2.09	2.11	2.11	2.12	2.11	2.16	2.18	2.17	2.13	2.11	2.09	2.19	2.14
Nov 28	2.08	S	2.09	2.10	2.09	2.19	2.25	2.33	2.36	2.42	3.11	2.96	2.28	2.16	2.13	2.13	2.19	2.23	2.19	2.20	2.27	2.08	2.06	2.08	2.06	3.11	2.26
Nov 29	S	2.08	2.16	2.26	2.21	2.22	2.22	2.26	2.29	2.31	2.20	2.13	2.12	2.12	2.07	2.06	2.04	2.10	2.11	2.08	2.12	2.16	2.15	S	2.04	2.31	2.16
Nov 30	2.27	2.23	2.21	2.19	2.19	2.24	2.18	2.16	2.16	2.21	2.21	2.19	2.19	2.17	2.16	2.17	2.18	2.22	2.20	2.22	2.29	2.28	S	2.24	2.16	2.29	2.21
Diurnal Maximum	2.35	2.35	2.35	2.35	2.35	2.44	2.42	2.46	2.49	2.45	3.11	2.96	2.36	2.35	2.41	2.45	2.31	2.35	2.20	2.34	2.32	2.37	2.41	2.33			
Diurnal Average	2.15	2.15	2.15	2.15	2.16	2.17	2.17	2.17	2.17	2.16	2.17	2.16	2.12	2.11	2.09	2.10	2.10	2.13	2.11	2.13	2.14	2.14	2.14	2.15			

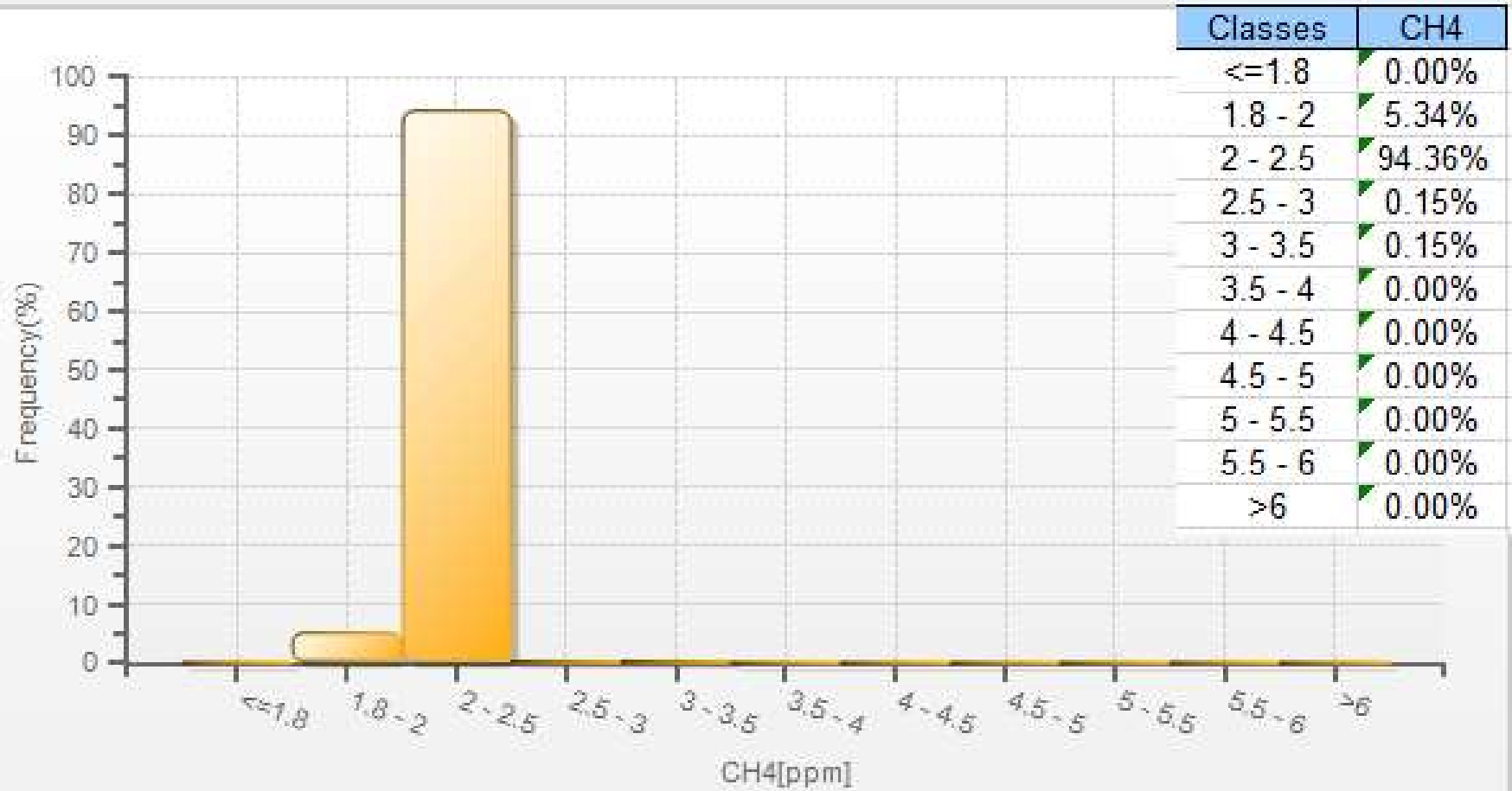
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for CH4 - Bonnyville - East Site

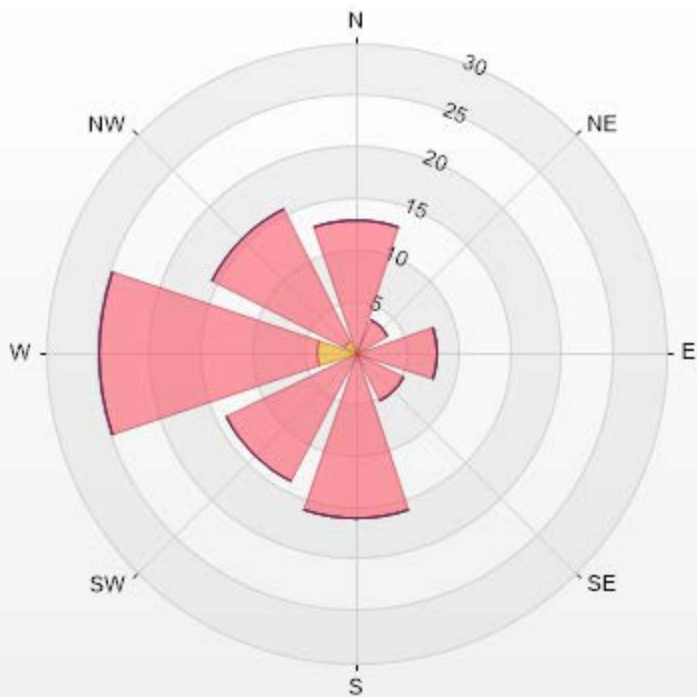


CH4[ppm] Histogram: Bonnyville East Monthly: 11-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-CH4[ppm] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.00% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	0	12.91	0	0	0	12.91
NE	0	3.56	0	0	0	3.56
E	0	7.86	0	0	0	7.86
SE	0	5.19	0	0	0	5.19
S	0	16.02	0	0	0	16.02
SW	0	13.95	0	0	0	13.95
W	3.86	21.07	0	0	0	24.93
NW	1.34	14.24	0	0	0	15.58
Summary	5.2	94.8	0	0	0	100



LICA-201911-Revision 1



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Averages

NON-METHANE HYDROCARBONS (NMHC) in ppm

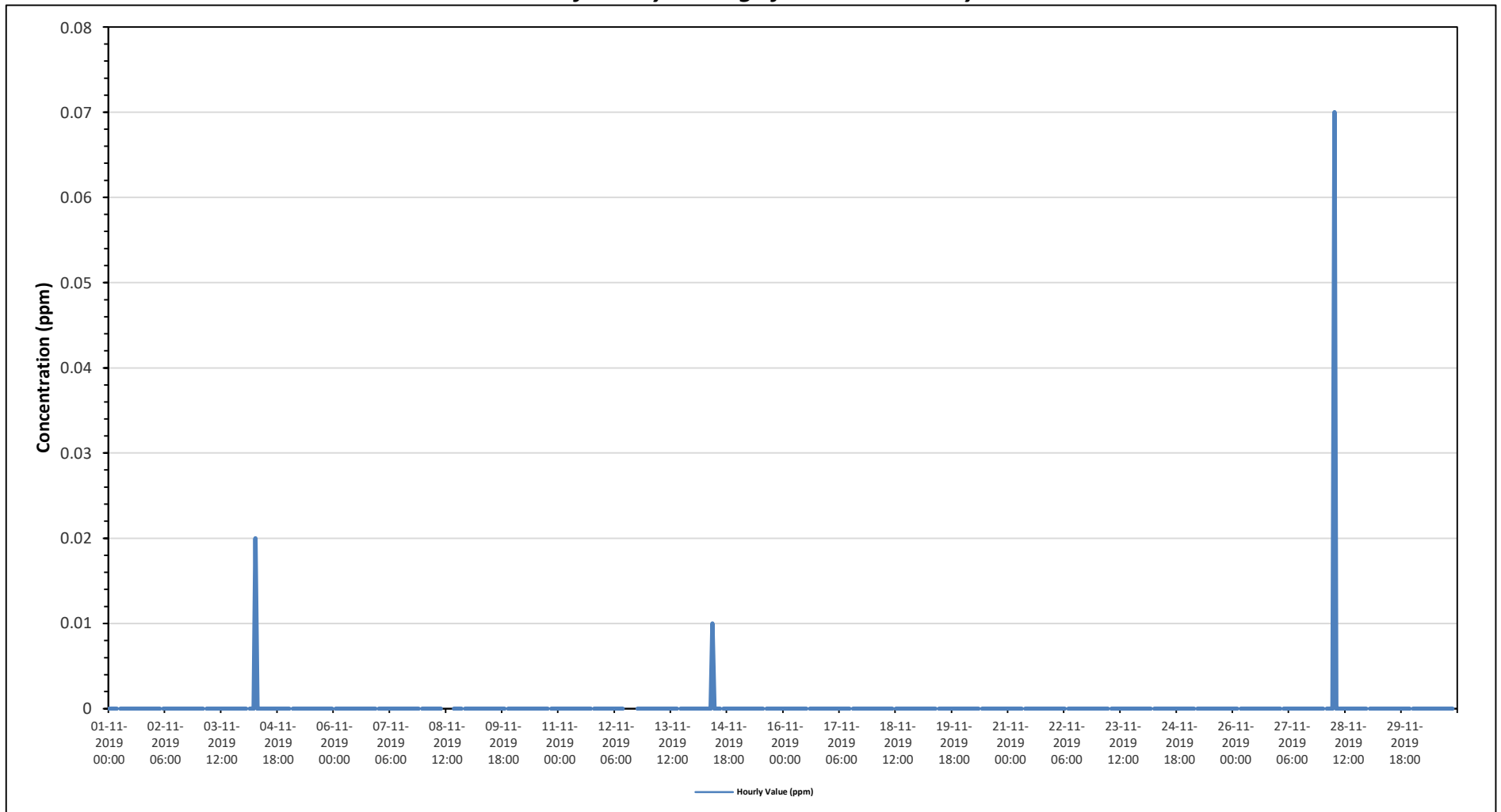
Maximum Hourly Value:	0.07 ppm on November 28 at hour 6	Hours in Service:	720
Maximum Daily Value:	0.00 ppm on November 28	Hours of Data:	677
Minimum Hourly Value:	0.00 ppm on November 1 at hour 0	Hours of Missing Data:	6
Minimum Daily Value:	0.00 ppm on November 1	Hours of Calibration:	37
Monthly Average:	0.00 ppm	Operational Uptime:	99.2

Day	Hourly Period Starting at (MST)																							Daily	Daily	Daily		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Minimum	Maximum	Average	
Nov 1	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 2	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 3	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 4	0.00	0.00	S	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 5	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 6	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00
Nov 7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00
Nov 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	X	P	P	P	P	P	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	-
Nov 9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00
Nov 10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C	C	C	C	C	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 23	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 24	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 25	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 26	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 27	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 28	0.00	S	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 29	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00
Nov 30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00
Diurnal Maximum	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diurnal Average	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

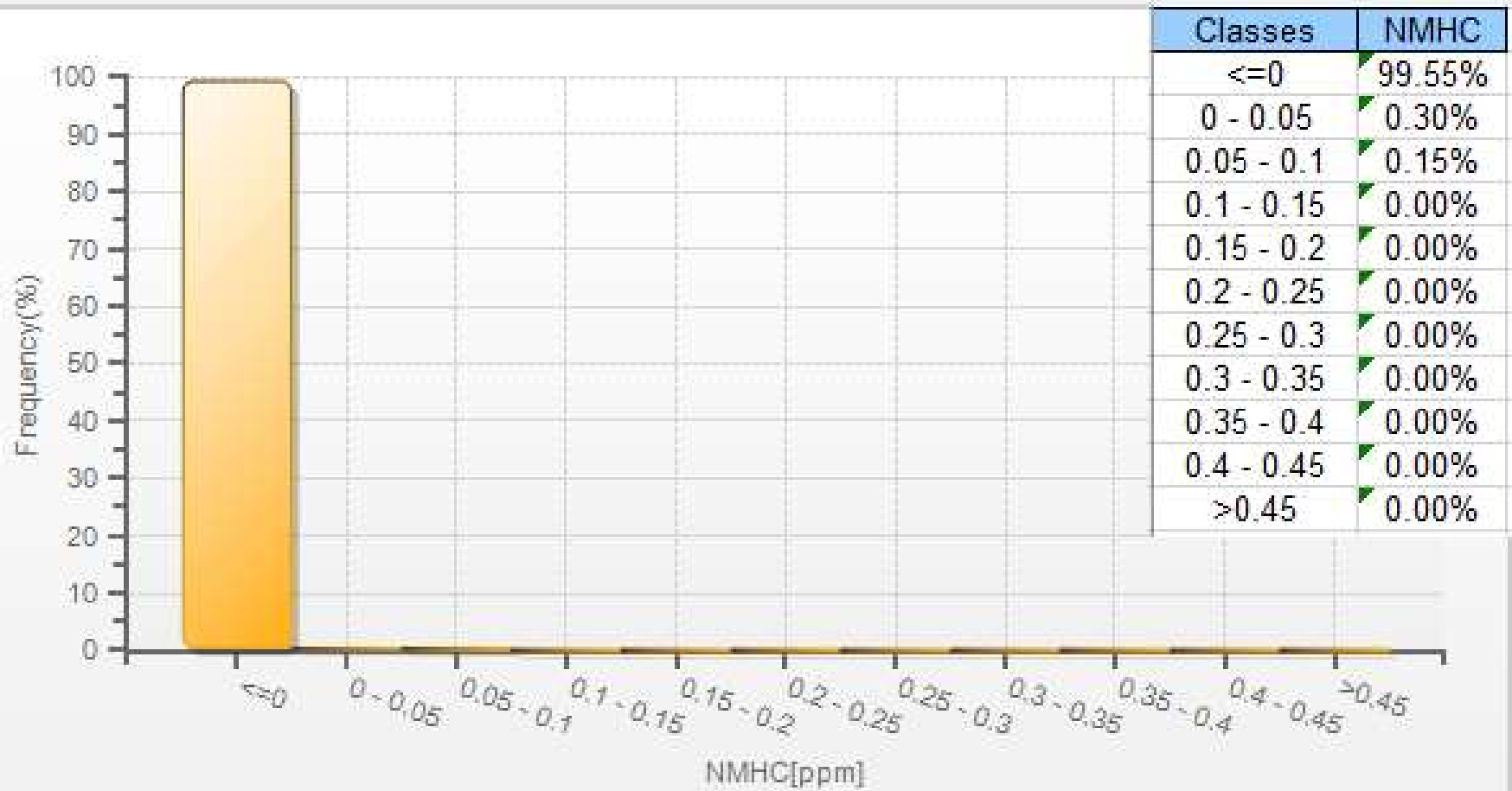
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for NMHC - Bonnyville - East Site

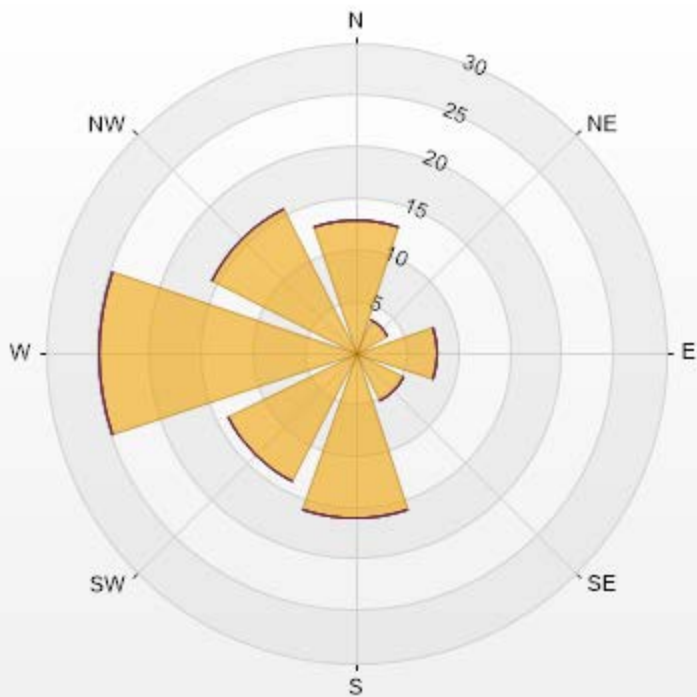


NMHC[ppm] Histogram: Bonnyville East Monthly: 11-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-NMHC[ppm] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.14% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-0.9	0.9-2	>2.0	Total
N	12.89	0	0	0	0	12.89
NE	3.56	0	0	0	0	3.56
E	7.85	0	0	0	0	7.85
SE	5.19	0	0	0	0	5.19
S	16.15	0	0	0	0	16.15
SW	13.93	0	0	0	0	13.93
W	24.89	0	0	0	0	24.89
NW	15.56	0	0	0	0	15.56
Summary	100	0	0	0	0	100



LICA-201911-Revision 1

% Icon Classes (ppm)	100	0	0	0	0
	0-0.1	0.1-0.3	0.3-0.9	0.9-2	>2.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Averages

PARTICULATE MATTER 2.5 (PM_{2.5}) in µg/m³

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 80 µg/m³, 24-Hour 29 µg/m³
 Number of 1-Hour Exceedences: 0 Number of 24-Hour Exceedences: 0

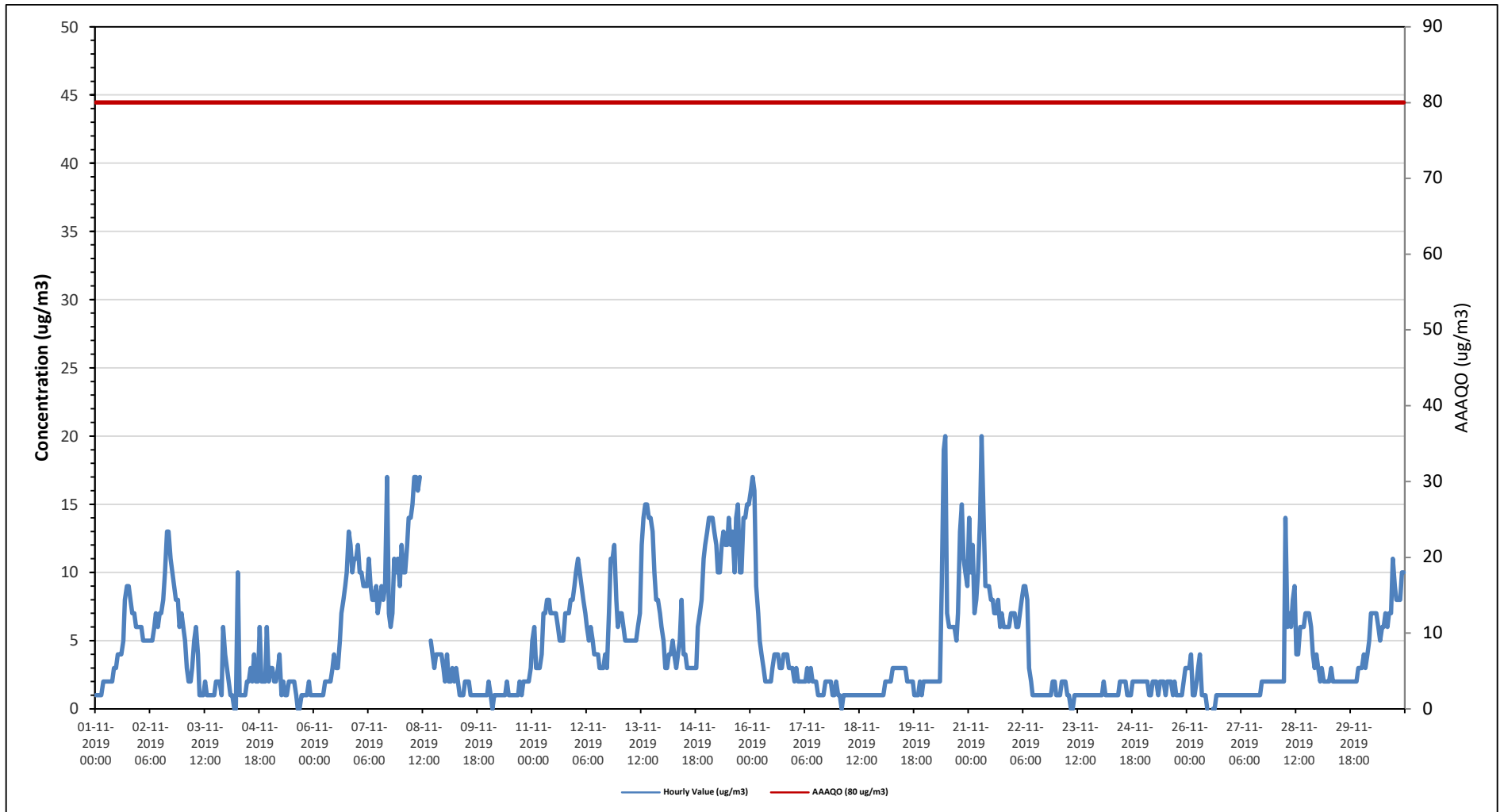
Maximum Hourly Value:	20 µg/m ³ on November 20 at hour 11	Hours in Service:	720
Maximum Daily Value:	13 µg/m ³ on November 15	Hours of Data:	713
Minimum Hourly Value:	0 µg/m ³ on November 4 at hour 4	Hours of Missing Data:	5
Minimum Daily Value:	1 µg/m ³ on November 18	Hours of Calibration:	2
Monthly Average:	4.5 µg/m ³	Operational Uptime:	99.3

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	1	1	1	1	2	2	2	2	2	2	3	3	4	4	4	5	8	9	9	8	7	6	6	1	9	4.1		
Nov 2	6	6	5	5	5	5	5	5	6	7	6	7	7	8	10	13	13	11	10	9	8	8	6	7	5	13	7.4	
Nov 3	6	5	3	2	2	3	5	6	4	1	1	1	2	1	1	1	1	2	2	2	2	1	6	4	1	6	2.6	
Nov 4	3	2	1	1	0	0	10	1	1	1	1	2	2	3	2	4	2	2	6	2	2	2	6	2	0	10	2.4	
Nov 5	3	3	2	2	3	4	1	2	1	1	2	2	2	2	1	0	0	1	1	1	1	2	1	1	0	4	1.6	
Nov 6	1	1	1	1	1	1	2	2	2	2	3	4	3	3	5	7	8	9	10	13	12	10	11	11	1	13	5.1	
Nov 7	12	10	10	9	9	9	11	9	8	8	9	7	8	9	8	9	17	7	6	7	11	10	11	9	6	17	9.3	
Nov 8	12	10	10	12	14	14	15	17	17	16	17	P	P	P	P	P	5	4	3	4	4	4	4	3	3	17	9.7	
Nov 9	2	4	2	2	3	2	3	2	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	4	1.6
Nov 10	2	1	0	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	2	2	2	2	3	0	3	1.3	
Nov 11	5	6	3	3	3	4	7	7	8	8	7	7	7	7	6	5	5	5	7	7	7	8	8	9	3	9	6.2	
Nov 12	10	11	10	9	8	7	6	5	6	5	4	4	4	3	3	3	4	3	7	11	11	12	8	6	3	12	6.7	
Nov 13	7	7	6	5	5	5	5	5	5	5	6	7	12	14	15	15	14	14	13	10	8	8	7	6	5	15	8.5	
Nov 14	5	3	3	4	4	5	4	3	4	5	8	4	4	3	3	3	3	3	3	6	7	8	11	12	3	12	4.9	
Nov 15	13	14	14	14	13	12	10	10	12	13	12	12	14	12	13	10	14	15	10	14	14	15	15	15	10	15	12.7	
Nov 16	16	17	16	9	7	5	4	3	2	2	2	2	3	4	4	4	3	3	4	4	4	3	3	3	2	17	5.3	
Nov 17	2	3	2	2	2	2	2	3	2	3	2	2	2	1	1	1	1	2	2	2	2	1	1	2	1	3	1.9	
Nov 18	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1.0	
Nov 19	1	1	2	2	2	2	3	3	3	3	3	3	3	2	2	2	2	1	1	1	1	2	1	2	1	3	2.1	
Nov 20	2	2	2	2	2	2	2	2	2	9	19	20	7	6	6	6	6	5	7	13	15	11	10	9	2	20	7.0	
Nov 21	14	10	12	7	8	10	14	20	14	9	9	9	8	8	7	7	8	6	7	6	6	6	6	7	6	20	9.1	
Nov 22	7	7	6	6	7	8	9	9	8	3	2	1	1	1	1	1	1	1	1	1	1	1	2	2	1	9	3.6	
Nov 23	1	1	1	2	2	2	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	2	1.0	
Nov 24	1	1	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	2	2	2	2	2	1	2	1.5	
Nov 25	2	2	2	1	1	2	2	2	1	2	2	2	1	2	2	2	1	2	1	1	1	1	2	3	1	3	1.7	
Nov 26	3	3	4	1	1	2	3	4	1	1	1	0	C	C	0	0	1	1	1	1	1	1	1	0	4	1.5		
Nov 27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	2	1.3		
Nov 28	2	2	2	2	2	2	14	6	7	6	8	9	4	4	6	6	6	7	7	7	6	4	3	4	2	14	5.3	
Nov 29	3	2	3	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	3	2.2	
Nov 30	3	4	3	4	5	7	7	7	7	6	5	6	6	7	6	7	7	11	9	8	8	8	10	10	3	11	6.7	
Diurnal Maximum	16	17	16	14	14	14	15	20	17	16	19	20	14	14	15	15	17	15	13	13	15	14	15	15				
Diurnal Average	4.9	4.7	4.3	3.8	3.9	4.1	5.1	4.8	4.3	4.2	4.7	4.3	4.1	4.1	4.0	4.1	4.6	4.5	4.6	4.8	5.0	4.8	5.0	4.9				

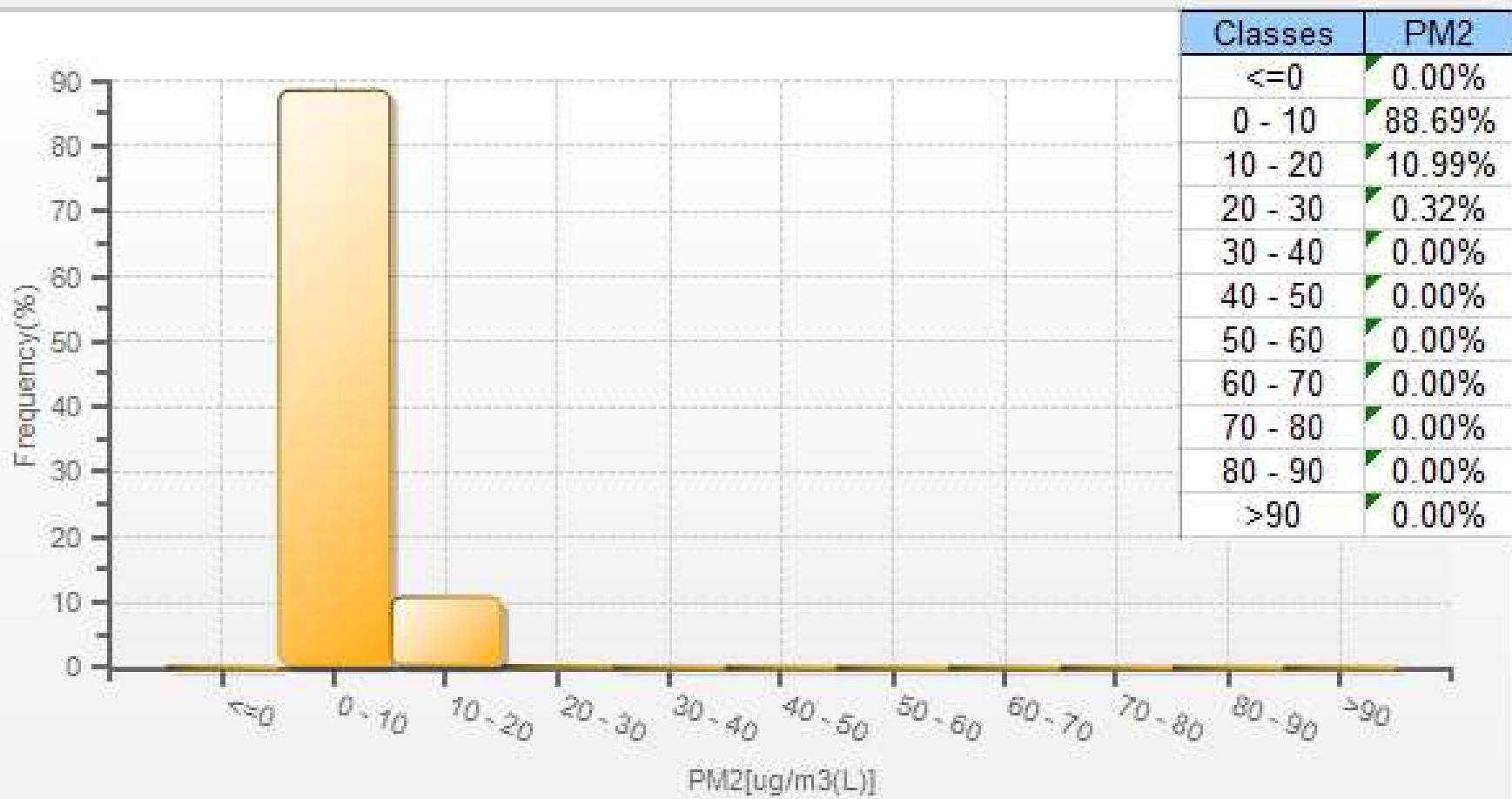
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for PM2.5 - Bonnyville - East Site

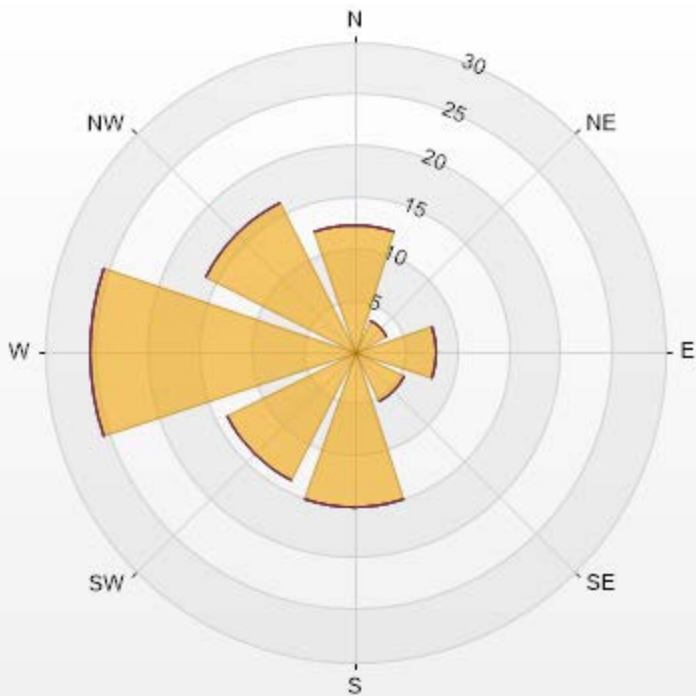


PM2[ug/m3(L)] Histogram: Bonnyville East Monthly: 11-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-PM2[ug/m3(L)] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 86.33% Calm Avg: 0.00 [ug/m3(L)]

Direction	0-50	50-80	80-120	120-240	>240.0	Total
N	12.28	0	0	0	0	12.28
NE	3.39	0	0	0	0	3.39
E	7.92	0	0	0	0	7.92
SE	5.49	0	0	0	0	5.49
S	15.19	0	0	0	0	15.19
SW	13.89	0	0	0	0	13.89
W	25.69	0	0	0	0	25.69
NW	16.16	0	0	0	0	16.16
Summary	100	0	0	0	0	100



LICA-201911-Revision 1

% Icon Classes (ug/m3(L))	100	0-50	0-50	80-120	0	120-240	0	>240.0
---------------------------	-----	------	------	--------	---	---------	---	--------



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Averages

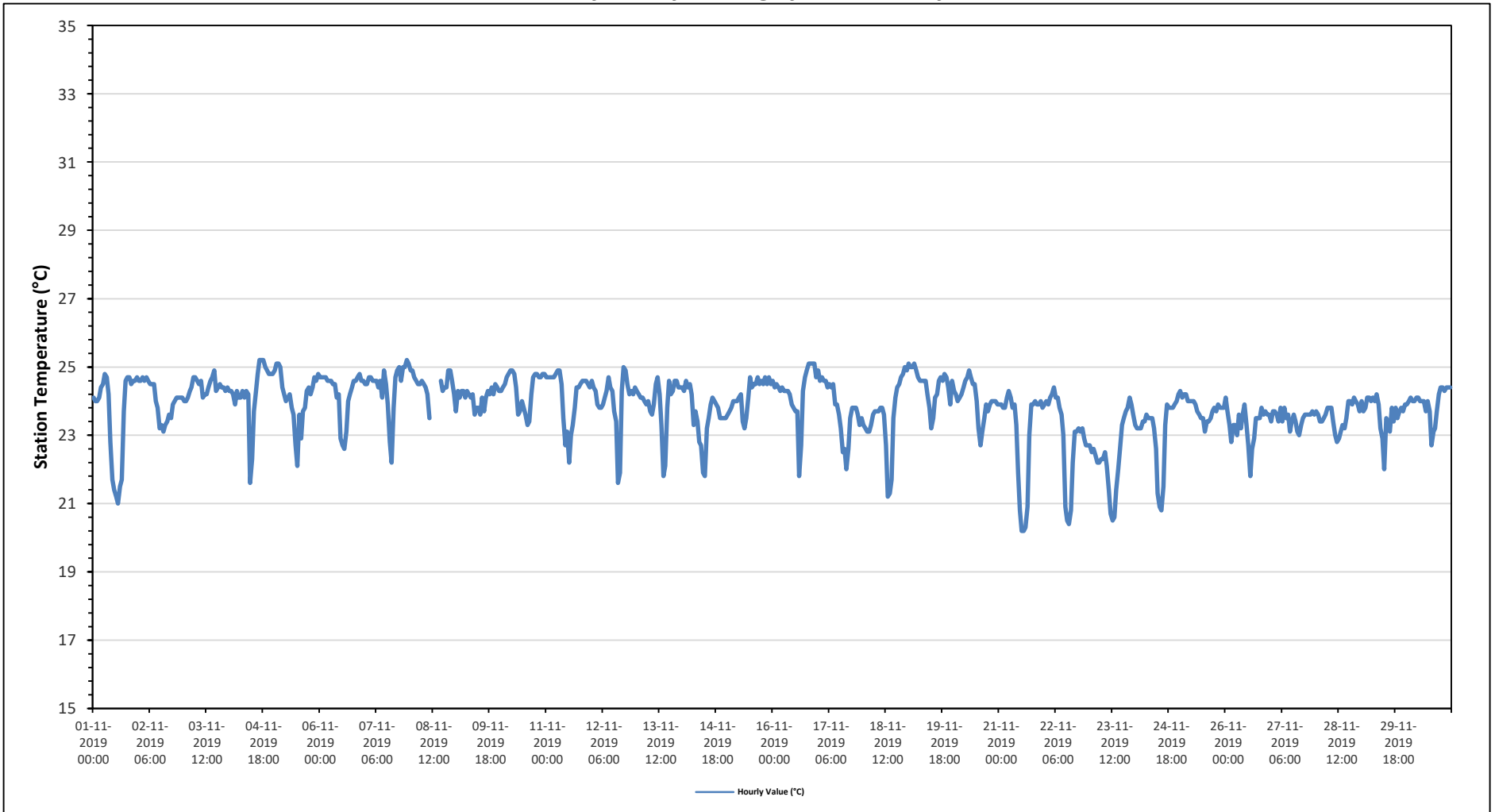
STATION TEMPERATURE (ST) in Degree Celsius

Maximum Hourly Value:	25.2 °C	on November 4 at hour 16	Hours in Service:	720
Maximum Daily Value:	24.5 °C	on November 8	Hours of Data:	715
Minimum Hourly Value:	20.2 °C	on November 21 at hour 12	Hours of Missing Data:	5
Minimum Daily Value:	22.5 °C	on November 23	Hours of Calibration:	0
Monthly Average:	23.8 °C		Operational Uptime:	99.3

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	24.1	24.0	24.0	24.1	24.4	24.5	24.8	24.7	24.2	22.8	21.7	21.4	21.2	21.0	21.5	21.7	23.7	24.6	24.7	24.7	24.5	24.6	24.6	24.7	21.0	24.8	23.6
Nov 2	24.6	24.6	24.7	24.6	24.7	24.6	24.5	24.5	24.5	24.0	23.8	23.2	23.3	23.1	23.3	23.4	23.6	23.5	23.9	24.0	24.1	24.1	24.1	24.1	23.1	24.7	24.0
Nov 3	24.0	24.0	24.1	24.3	24.4	24.7	24.7	24.6	24.5	24.6	24.1	24.2	24.2	24.4	24.6	24.7	24.9	24.3	24.4	24.5	24.4	24.4	24.3	24.4	24.0	24.9	24.4
Nov 4	24.3	24.3	24.2	23.9	24.3	24.1	24.1	24.3	24.1	24.3	24.2	21.6	22.3	23.7	24.2	24.8	25.2	25.2	25.2	25.0	24.9	24.8	24.8	24.8	21.6	25.2	24.3
Nov 5	24.9	25.1	25.1	25.0	24.4	24.2	24.0	24.1	24.2	23.8	23.6	22.7	22.1	23.6	22.9	23.7	23.8	24.3	24.4	24.2	24.4	24.7	24.6	24.8	22.1	25.1	24.1
Nov 6	24.7	24.7	24.7	24.7	24.6	24.6	24.6	24.5	24.5	24.1	24.2	22.9	22.7	22.6	23.1	24.0	24.2	24.4	24.6	24.6	24.7	24.8	24.6	24.6	22.6	24.8	24.2
Nov 7	24.5	24.5	24.7	24.7	24.6	24.6	24.6	24.4	24.6	24.1	24.9	24.5	23.9	22.8	22.2	23.8	24.7	24.9	25.0	24.6	25.0	25.0	25.2	25.1	22.2	25.2	24.5
Nov 8	24.9	24.9	24.7	24.6	24.5	24.5	24.6	24.5	24.4	24.2	23.5	P	P	P	P	P	24.6	24.3	24.4	24.4	24.9	24.9	24.6	24.2	23.5	24.9	24.5
Nov 9	23.7	24.3	24.1	24.3	24.3	24.1	24.3	24.2	24.1	24.2	23.6	23.8	23.8	23.6	24.1	23.7	24.1	24.3	24.2	24.4	24.2	24.5	24.4	24.3	23.6	24.5	24.1
Nov 10	24.3	24.4	24.5	24.7	24.8	24.9	24.9	24.8	24.4	23.6	23.7	24.0	23.8	23.6	23.3	23.4	24.2	24.7	24.8	24.8	24.7	24.7	24.8	24.8	23.3	24.9	24.4
Nov 11	24.7	24.7	24.7	24.7	24.7	24.8	24.9	24.9	24.5	23.5	22.7	23.1	22.2	23.0	23.3	23.8	24.4	24.4	24.5	24.6	24.6	24.6	24.5	24.4	22.2	24.9	24.2
Nov 12	24.6	24.4	24.3	23.9	23.8	23.8	23.9	24.1	24.3	24.7	24.4	24.3	23.7	23.4	21.6	21.9	24.3	25.0	24.9	24.5	24.2	24.3	24.2	24.4	21.6	25.0	24.0
Nov 13	24.3	24.2	24.1	24.1	24.0	23.9	24.0	23.7	23.6	23.9	24.5	24.7	24.2	23.3	21.8	22.1	23.8	24.6	24.2	24.3	24.6	24.6	24.4	24.4	21.8	24.7	24.0
Nov 14	24.4	24.3	24.6	24.4	24.5	24.2	23.3	23.7	23.4	22.8	22.7	21.9	21.8	23.2	23.5	23.9	24.1	24.0	23.9	23.8	23.5	23.5	23.5	23.5	21.8	24.6	23.6
Nov 15	23.6	23.7	23.8	24.0	24.0	24.0	24.1	24.2	23.4	23.2	23.5	24.1	24.7	24.4	24.5	24.5	24.7	24.5	24.6	24.5	24.7	24.5	24.7	24.5	23.2	24.7	24.2
Nov 16	24.6	24.4	24.5	24.4	24.3	24.4	24.3	24.3	24.3	24.2	23.9	23.8	23.7	23.7	21.8	22.7	24.3	24.7	24.9	25.1	25.1	25.1	25.1	24.7	21.8	25.1	24.3
Nov 17	24.9	24.6	24.7	24.6	24.6	24.4	24.5	24.4	24.5	23.9	23.9	23.6	23.2	22.5	22.6	22.0	22.6	23.5	23.8	23.8	23.8	23.6	23.3	23.5	22.0	24.9	23.8
Nov 18	23.3	23.2	23.1	23.1	23.3	23.6	23.7	23.7	23.8	23.8	23.8	23.6	22.7	21.2	21.3	21.7	23.5	24.1	24.4	24.5	24.7	24.8	25.0	24.9	21.2	25.0	23.5
Nov 19	25.1	25.0	25.0	25.1	24.9	24.7	24.6	24.6	24.6	24.2	24.2	23.8	23.2	23.5	24.1	24.2	24.6	24.7	24.6	24.8	24.7	24.4	23.9	24.6	23.2	25.1	24.5
Nov 20	24.3	24.2	24.0	24.1	24.2	24.4	24.6	24.7	24.9	24.7	24.5	24.5	24.0	23.2	22.7	23.1	23.5	23.9	23.7	23.9	24.0	24.0	24.0	23.9	22.7	24.9	24.0
Nov 21	23.9	23.9	23.8	23.8	24.1	24.3	24.1	23.8	23.9	23.3	21.9	20.8	20.2	20.2	20.3	20.9	23.0	23.9	23.9	24.0	23.9	23.9	24.0	23.8	20.2	24.3	23.1
Nov 22	23.9	24.0	23.9	24.1	24.2	24.4	24.1	24.1	23.8	23.6	23.0	20.9	20.5	20.4	20.8	22.2	23.1	23.1	23.2	23.1	23.2	22.9	22.7	22.7	20.4	24.4	23.0
Nov 23	22.7	22.5	22.6	22.4	22.2	22.2	22.3	22.3	22.5	22.1	21.4	20.7	20.5	20.6	21.4	22.0	22.6	23.3	23.5	23.7	23.8	24.1	23.9	23.6	20.5	24.1	22.5
Nov 24	23.3	23.2	23.2	23.2	23.4	23.4	23.6	23.5	23.5	23.5	23.2	22.6	21.3	20.9	20.8	21.5	23.3	23.9	23.8	23.8	23.8	23.9	24.0	24.2	20.8	24.2	23.1
Nov 25	24.3	24.1	24.2	24.2	24.0	24.0	24.0	24.0	23.9	23.7	23.6	23.5	23.5	23.1	23.4	23.4	23.5	23.7	23.8	23.7	23.9	23.8	23.8	23.8	23.1	24.3	23.8
Nov 26	24.1	23.7	23.3	22.8	23.3	23.3	23.0	23.6	23.2	23.6	23.9	23.3	22.7	21.8	22.6	22.9	23.5	23.5	23.5	23.8	23.6	23.7	23.6	23.6	21.8	24.1	23.3
Nov 27	23.4	23.7	23.7	23.6	23.4	23.8	23.4	23.8	23.5	23.6	23.1	23.4	23.6	23.4	23.1	23.0	23.3	23.5	23.6	23.6	23.6	23.6	23.7	23.6	23.0	23.8	23.5
Nov 28	23.7	23.6	23.4	23.4	23.5	23.6	23.8	23.8	23.8	23.4	23.0	22.8	22.9	23.1	23.3	23.2	23.5	24.0	24.0	23.9	24.1	24.0	23.9	23.7	22.8	24.1	23.6
Nov 29	24.0	23.7	23.8	24.1	24.1	24.0	24.1	24.0	24.2	23.9	23.2	22.9	22.0	23.5	23.4	23.1	23.8	23.4	23.8	23.5	23.7	23.8	23.7	23.9	22.0	24.2	23.7
Nov 30	23.9	24.0	24.1	24.0	24.0	24.1	24.1	24.0	24.0	24.0	23.7	24.0	23.7	22.7	23.1	23.2	23.7	24.2	24.4	24.4	24.4	24.4	24.4	24.4	22.7	24.4	24.0
Diurnal Maximum	25.1	25.1	25.1	25.1	24.9	24.9	24.9	24.9	24.9	24.7	24.9	24.7	24.7	24.4	24.6	24.8	25.2	25.2	25.2	25.1	25.1	25.1	25.2	25.1			
Diurnal Average	24.2	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.0	23.8	23.5	23.1	22.8	22.7	22.7	23.1	23.9	24.1	24.2	24.2	24.3	24.3	24.2	24.2			
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span																		
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure																		
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service																		

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for ST - Bonnyville - East Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr

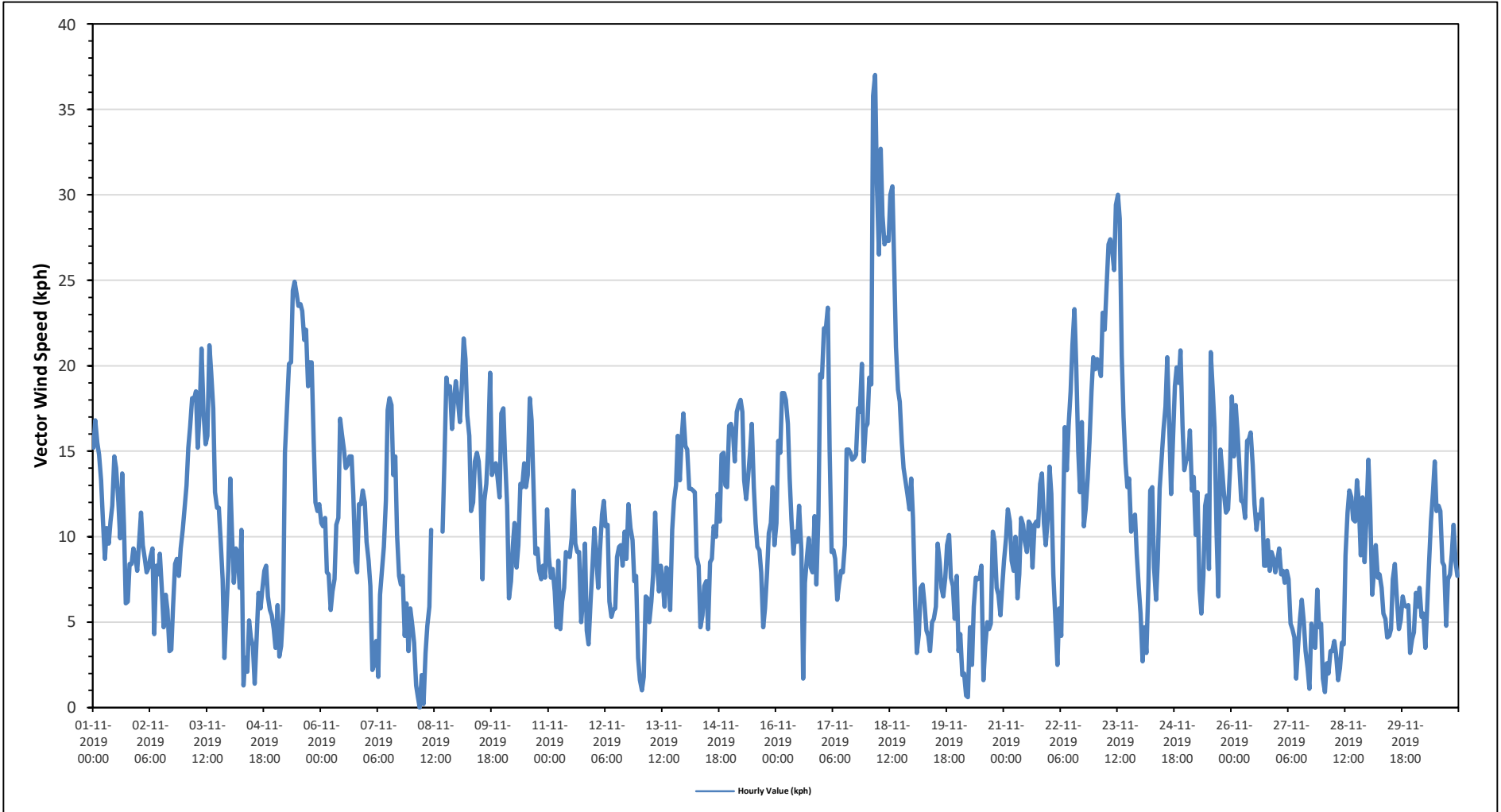
Maximum Hourly Value:	37.0 kph	on November 18 at hour 4	Hours in Service:	720
Maximum Daily Value:	23.0 kph	on November 18	Hours of Data:	715
Minimum Hourly Value:	0.0 kph	on November 8 at hour 4	Hours of Missing Data:	5
Minimum Daily Value:	5.1 kph	on November 20	Hours of Calibration:	0
Monthly Average:	4.7 kph		Operational Uptime:	99.3

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	15.2	16.8	15.5	14.8	13.3	11	8.7	10.5	9.6	10.9	11.8	14.7	14	12	9.9	13.7	10.6	6.1	6.2	8.4	8.4	9.3	8.8	8	6.1	16.8	11.2
Nov 2	9.8	11.4	9.5	8.7	7.9	8.2	8.8	9.3	4.3	8.3	7.8	9	6.9	4.7	6.6	5.7	3.3	3.4	5.9	8.4	8.7	7.7	9.3	10.4	3.3	11.4	7.7
Nov 3	11.6	13	15.2	16.4	18.1	18	18.5	15.2	17.5	21	17.2	15.4	15.9	21.2	19.6	17.5	12.6	11.7	11.7	9.8	7.5	2.9	5.7	8	2.9	21.2	14.2
Nov 4	13.4	10.1	7.3	9.3	9.1	7	10.4	1.3	2.9	2.1	5.1	4.1	3.6	1.4	4.2	6.7	5.8	6.9	8	8.3	6.5	5.7	5.4	4.6	1.3	13.4	6.2
Nov 5	3.5	6	3	3.6	5.7	14.9	17.5	20.1	20.2	24.4	24.9	24.2	23.5	23.6	23.2	21.5	22.1	18.8	20.2	20.2	15.6	12	11.5	11.9	3.0	24.9	16.3
Nov 6	10.8	10.6	11.1	7.9	7.8	5.7	6.8	7.5	10.7	11.1	16.9	16	15.1	14	14.2	14.7	14.7	12.4	8.5	7.9	11.9	11.9	12.7	12	5.7	16.9	11.4
Nov 7	9.7	8.6	7.1	2.2	2.6	3.9	1.8	6.6	8.1	9.4	12.1	17.4	18.1	17.7	13.6	14.7	10.1	7.7	7.2	7.7	4.2	6.1	3.3	5.8	1.8	18.1	8.6
Nov 8	4.8	3.8	1.3	0.6	0	1.9	0.2	3.2	4.8	5.9	10.4	P	P	P	P	P	10.3	14.3	19.3	18.4	18.8	16.3	17.8	19.1	0.0	19.3	9.0
Nov 9	18.2	16.7	18.6	21.6	20.4	17.1	15.9	11.5	12	14.4	14.9	14.4	12.7	7.5	12.1	13.1	15.2	19.6	13.6	14	14.3	13.5	12.3	17.2	7.5	21.6	15.0
Nov 10	17.5	14.5	11.8	6.4	7.4	9.4	10.8	8.2	9.5	13.1	12.9	14.3	12.9	13.6	18.1	16.8	12.7	9	9.3	8	7.5	8.3	7.6	11.6	6.4	18.1	11.3
Nov 11	8.8	7.6	8.1	6.8	4.7	8.6	4.6	6.2	7	9.1	8.9	8.8	10	12.7	9.6	9.1	9.1	5	6.3	9.6	4.5	3.7	6.2	8.1	3.7	12.7	7.6
Nov 12	10.5	8.9	7	9.2	11.3	12.1	10.6	10.7	6.2	5.3	5.7	5.8	8.8	9.4	9.5	8.3	10.3	8.7	11.9	10.5	9.8	7.4	7.7	2.9	2.9	12.1	8.7
Nov 13	1.6	1	1.8	6.5	6.4	5	6.2	7.8	11.4	8.5	6.8	8.3	7.3	5.9	8.2	8	5.7	10.4	12.1	13	15.9	13.3	15.7	17.2	1.0	17.2	8.5
Nov 14	15.3	15.1	12.8	12.8	12.7	12.6	8.8	8.3	4.7	5.4	7.1	7.4	4.6	8.5	8.7	10.6	10	12.5	10.9	14.8	14.9	13	12.9	16.5	4.6	16.5	10.9
Nov 15	16.6	16.1	14.4	17.3	17.7	18	17.3	13.3	12.2	13.4	14.9	16.6	12.9	10.8	9.4	9.2	7.9	4.7	5.8	7.9	10.2	10.8	12.9	9.5	4.7	18.0	12.5
Nov 16	10.8	15.6	14.9	18.4	18.4	18	16.6	13.4	11	9	10.3	9.7	11.8	9.2	1.7	7.3	8.8	9.9	8.2	7.9	11.2	7.2	11.2	19.5	1.7	19.5	11.7
Nov 17	19.3	22.2	22.1	23.4	15.2	9.1	9.2	8.7	6.3	7.2	8	7.9	9.5	15.1	15.1	14.9	14.5	14.6	14.8	17.5	17.3	20.1	14.4	16.4	6.3	23.4	14.3
Nov 18	16.6	19.3	18.9	35.8	37	30.6	26.5	32.7	28.8	27.1	27.5	27.3	30	30.5	25.9	21.1	18.6	17.9	15.5	14	13.2	12.5	11.6	13.4	11.6	37.0	23.0
Nov 19	11.1	6.3	3.2	4.3	7	7.2	6.1	4.5	4.2	3.3	5	5.2	5.9	9.6	8.5	7	6.5	7.6	9.5	10.1	7.6	7.1	5.2	7.7	3.2	11.1	6.7
Nov 20	3.3	4.3	1.9	2	0.7	0.6	4.7	2.5	5.9	7.6	7.5	7.6	8.3	1.6	3.6	5	4.6	4.9	10.3	9.7	7	6.6	5.4	7.1	0.6	10.3	5.1
Nov 21	8.6	9.9	11.6	10.9	8.6	8	10	6.4	7.8	11.1	10.7	9.7	9.1	10.9	10.7	8.2	10.7	10.9	10.6	13.1	13.7	10.8	9.5	11.1	6.4	13.7	10.1
Nov 22	14.1	12.5	7.8	5.5	2.5	5.8	4.2	10.8	16.4	13.9	16.5	18.5	21.2	23.3	20	15	12.6	16.7	10.6	11.6	13.4	15.5	18.5	20.5	2.5	23.7	13.6
Nov 23	19.8	20.4	20	19.4	23.1	22.1	24.5	27.1	27.4	26.8	25.6	29.4	30	28.6	20.6	17	14.3	12.9	13.4	10.3	10.7	11.3	9	7	7.0	30.0	19.6
Nov 24	5.5	2.7	4.7	3.2	7.3	12.7	12.9	8.2	6.3	8.7	12.8	14.6	16.2	17.6	20.5	16.4	12.5	15.9	18.8	19.9	19	20.9	16.5	13.9	2.7	20.9	12.8
Nov 25	14.5	14.6	16.2	12.7	13.5	10.1	12.6	6.9	5.5	7.7	11.8	12.4	8.1	20.8	18.5	16.4	10.2	6.5	15.1	13.9	12.5	11.4	11.6	14	5.5	20.8	12.4
Nov 26	18.2	14.7	17.7	16.2	14	12.1	12	11.1	15.6	15.7	16.1	14.2	11.9	10.4	11.3	11.1	12.2	8.3	8.3	9.8	8	9.1	8.7	7.9	7.9	18.2	12.3
Nov 27	8.6	9.3	7.8	8	7.3	8	7.5	4.9	4.6	4.1	1.7	3.5	5.2	6.3	5	3.3	2.3	1.1	4.9	3.6	3.5	6.9	4.7	4.9	1.1	9.3	5.3
Nov 28	1.7	0.9	2.6	2	3.3	3.3	3.9	3.1	1.6	2.3	3.8	3.7	8.9	11.4	12.7	12.3	11	10.9	13.3	12.1	8.9	12.3	8.5	11	0.9	13.3	6.9
Nov 29	14.5	11.7	6.6	8	9.5	7.6	7.8	7	5.5	5.2	4.1	4.2	4.6	7.5	8.4	6.6	4.6	5.1	6.5	6	5.9	6	3.2	4	3.2	14.5	6.7
Nov 30	4.4	6.7	5.9	7	5.3	5.5	3.5	5.8	8.6	10.9	12.6	14.4	11.5	11.8	11.5	8.5	8.3	4.8	7.5	7.8	9	10.7	8.5	7.7	3.5	14.4	8.3
Diurnal Maximum	20	22	22	36	37	31	27	33	29	27	28	29	30	31	26	22	22	20	20	20	19	21	19	21			
Diurnal Average	11.3	11.0	10.2	10.7	10.6	10.5	10.3	9.8	9.9	10.8	11.7	12.4	12.4	13.0	12.4	11.7	10.4	10.0	10.8	11.1	10.7	10.3	9.9	11.0			

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

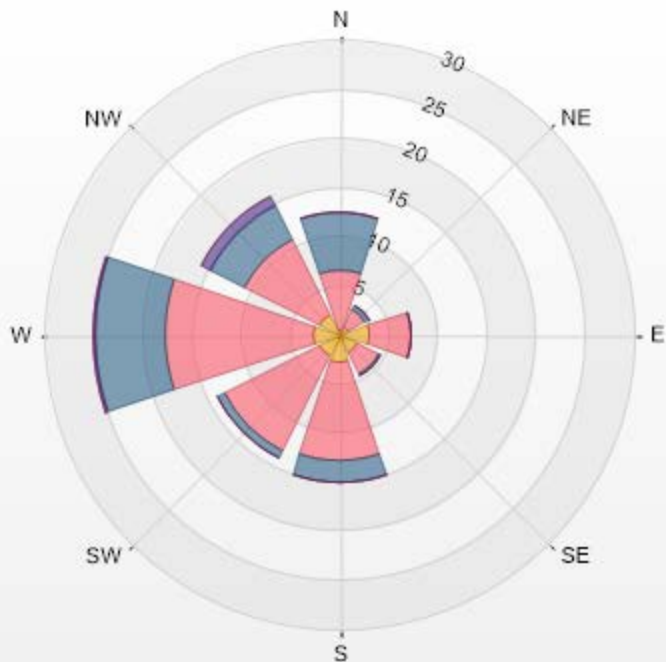
Timeseries Chart of Hourly Average for VWS - Bonnyville - East Site



Wind: Bonnyville East Poll.: Bonnyville East-WDS[kph] Monthly: 11-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 2.38% Valid Data: 99.72% Calm Avg: 1.12 [kph]

Direction	0-6	6-15	15-29	29-39	>39.0	Total
N	0.56	6.15	5.73	0	0	12.44
NE	0.98	1.96	0.42	0	0	3.36
E	3.08	4.2	0	0	0	7.28
SE	2.1	2.38	0.28	0	0	4.76
S	2.94	9.93	2.1	0	0	14.97
SW	2.38	10.77	0.84	0	0	13.99
W	2.8	14.97	7.13	0.28	0	25.18
NW	2.38	8.53	3.92	0.84	0	15.67
Summary	17.22	58.89	20.42	1.12	0	97.65

Bonnyville East Poll.: Bonnyville East-WDS[kph] 01-11-2019 00:00 - 30-11-2019 23:00 Calm: 2.38% Calm Poll
 Avg: 1.12[kph]



LICA-201911-Revision 1

% Icon	Classes (kph)	17	0-6	59	7-14	29	15-29	1	29-39	0	>39.0
--------	---------------	----	-----	----	------	----	-------	---	-------	---	-------



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Averages

WIND DIRECTION (VWD) in sector

Monthly Average:	281 (W) degree	Hours in Service:	720
		Hours of Data:	715
		Hours of Missing Data:	5
		Hours of Calibration:	0
		Operational Uptime:	99.3

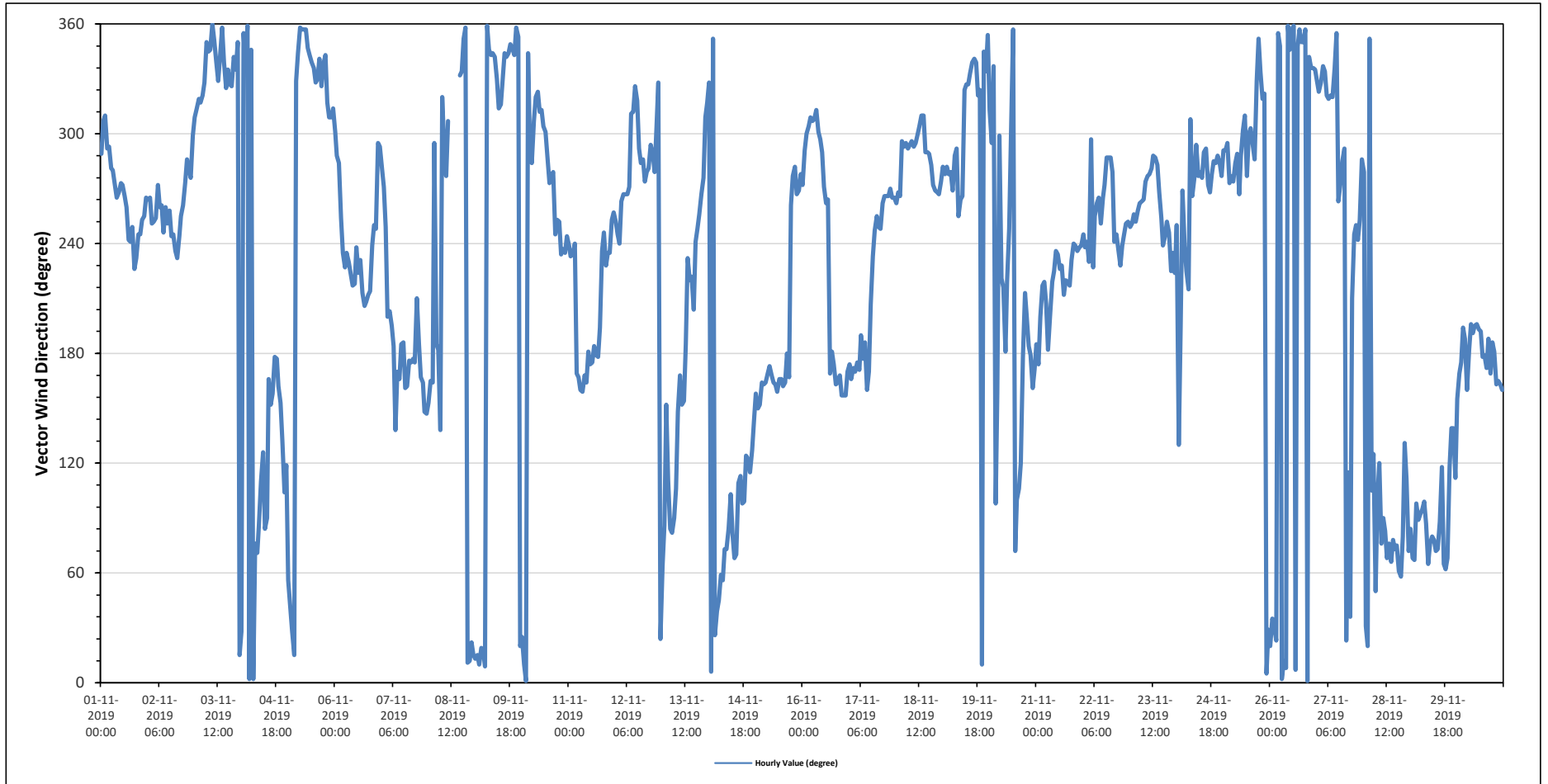
Day	Hourly Period Starting at (MST)																							Daily Average			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Degree	Quadrant	
Nov 1	WNW	NW	NW	WNW	WNW	W	W	W	W	W	W	W	W	WSW	WSW	WSW	WSW	SW	SW	WSW	WSW	WSW	WSW	W	270	W	
Nov 2	W	W	WSW	WSW	WSW	W	WSW	W	WSW	WSW	WSW	WSW	WSW	SW	SW	WSW	WSW	W	W	WNW	W	W	WNW	W	262	W	
Nov 3	NW	NW	NW	NW	NW	NNW	N	NNW	NNW	N	N	NNW	NNW	NNW	N	NNW	NW	NNW	NW	NNW	NNW	NNW	N	NNE	337	NNW	
Nov 4	NNE	N	NNW	N	N	NNW	N	ENE	ENE	E	ESE	SE	E	E	SSE	SSE	SSE	S	S	SSE	SSE	SE	ESE	ESE	77	ENE	
Nov 5	NE	NE	NNE	NNE	NNW	NNW	N	N	N	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NW	NNW	NNW	NW	NW	NW	NW	341	NNW	
Nov 6	WNW	WNW	WNW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	WSW	WSW	WSW	WNW	WNW	239	WSW	
Nov 7	W	W	WSW	SSW	SSW	SSW	S	SE	SSE	SSE	S	S	SSE	SSE	S	S	S	S	SSW	S	SSE	SSE	SE	SE	182	S	
Nov 8	SSE	SSE	SSE	WNW	S	S	SE	NW	WNW	W	NW	P	P	P	P	P	NNW	NNW	N	N	NNE	NNE	NNE	NNE	354	N	
Nov 9	NNE	NNE	N	NNE	NNE	N	N	NNW	NNW	NNW	NNW	NNW	NW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	N	NNE	354	N	
Nov 10	NNE	N	N	NNW	WNW	WNW	NW	NW	NW	NW	NW	WNW	WNW	WNW	W	W	W	WSW	WSW	WSW	SW	SW	SW	WSW	295	WNW	
Nov 11	WSW	SW	SW	WSW	SSE	SSE	SSE	SSE	SSE	SSE	S	S	S	S	S	S	SSW	SW	WSW	SW	SW	SW	WSW	WSW	201	SSW	
Nov 12	WSW	WSW	WSW	W	W	W	W	NW	NW	NW	NW	WNW	WNW	WNW	W	W	W	WNW	WNW	W	WNW	NNW	NNW	NNE	282	W	
Nov 13	ENE	E	SSE	ESE	E	E	E	ESE	SE	SSE	SSE	S	SW	SW	SW	SSW	WSW	WSW	WSW	W	W	NW	NW	226	SW		
Nov 14	NNW	N	N	NNE	NE	NE	ENE	NE	ENE	ENE	E	ESE	E	ENE	ENE	ESE	ESE	E	E	ESE	ESE	SE	SE	SE	78	ENE	
Nov 15	SSE	SSE	SSE	SSE	SSE	SSE	SSE	S	SSE	SSE	SSE	SSE	SSE	SSE	SSE	S	SSE	W	W	W	W	W	W	W	177	S	
Nov 16	W	WNW	WNW	WNW	NW	NW	NW	NW	WNW	WNW	WNW	W	W	W	SSE	S	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	265	W	
Nov 17	S	SSE	S	SSE	S	S	S	S	S	SSE	SSE	SSW	SW	WSW	WSW	WSW	WSW	W	W	W	W	W	W	W	221	SW	
Nov 18	W	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	NNW	NNW	WNW	W	W	W	W	W	W	290	WNW	
Nov 19	W	W	W	W	W	W	WNW	WNW	WSW	W	W	NW	NW	NW	NNW	NNW	NNW	NNW	NW	NW	N	NNW	NNW	N	314	NW	
Nov 20	NW	WNW	NNW	E	SSE	WNW	SW	SW	S	SW	WSW	WNW	N	ENE	E	ESE	ESE	S	SSW	SSW	S	S	SSE	S	201	SSW	
Nov 21	S	S	SSW	SW	SW	SSW	S	SSW	SW	SW	SW	SW	SW	SSW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	220	SW	
Nov 22	WSW	SW	WSW	SW	WNW	SW	WSW	W	W	WSW	W	W	WNW	WNW	WNW	W	WSW	WSW	SW	SW	WSW	WSW	WSW	WSW	258	WSW	
Nov 23	WSW	WSW	WSW	WSW	WSW	W	W	W	W	W	W	W	WNW	WNW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	264	W	
Nov 24	WSW	SE	SSW	W	WSW	SW	SSW	NW	W	W	WNW	W	W	WNW	WNW	W	W	W	WNW	WNW	WNW	WNW	W	W	275	W	
Nov 25	WNW	WNW	WNW	W	W	W	WNW	WNW	W	WNW	WNW	NW	W	WNW	WNW	WNW	WNW	NNW	N	NNW	NW	NW	N	NNE	305	WNW	
Nov 26	NNE	NE	NNE	NNE	N	NNW	N	NNE	N	N	NNW	N	N	N	NNW	N	N	N	N	N	NNW	NNW	NNW	NNW	2	N	
Nov 27	NNW	NW	NNW	NNW	NNW	NW	NW	NW	NW	NNW	N	W	W	WNW	WNW	NNE	ESE	NE	SSW	WSW	WSW	WSW	WNW	WNW	306	NW	
Nov 28	W	NNE	NNE	N	ESE	NE	NE	E	ESE	ENE	E	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	SE	ESE	ENE	78	ENE
Nov 29	E	ENE	ENE	E	E	E	E	E	E	ENE	ENE	E	ENE	ENE	ENE	E	ESE	ENE	ENE	ENE	ENE	ESE	SE	ESE	86	E	
Nov 30	SSE	SSE	S	SSW	S	SSE	S	SSW	S	SSW	SSW	S	S	S	S	S	SSE	S	S	S	SSE	SSE	SSE	SSE	180	S	

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for VWD - Bonnyville - East Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hour Standard Deviations

STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

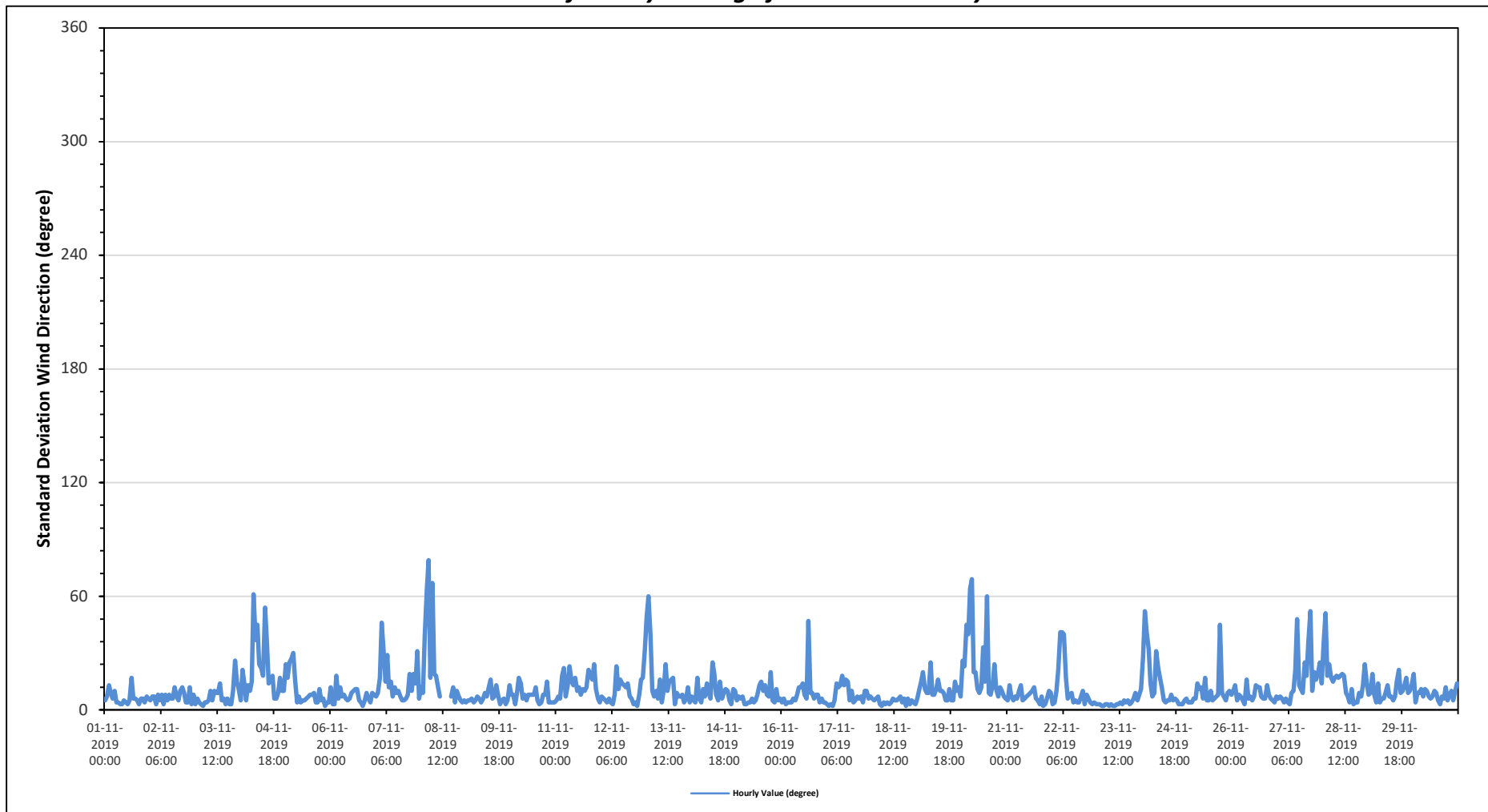
Maximum Hourly Value:	79 degree on November 8 at hour 4	Hours in Service:	720
Minimum Hourly Value:	2 degree on November 3 at hour 4	Hours of Data:	715
		Hours of Missing Data:	5
		Hours of Calibration:	0
		Operational Uptime:	99.3

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22			23
Nov 1	5	7	13	9	6	10	4	4	3	3	5	4	3	5	17	6	6	5	3	6	6	4	7	6	3	17
Nov 2	5	7	7	3	8	5	8	3	8	5	8	6	6	12	7	5	10	12	9	4	4	12	3	8	3	12
Nov 3	3	6	4	3	2	4	4	5	10	5	10	9	9	14	5	6	3	6	3	3	10	26	15	11	2	26
Nov 4	5	21	14	5	13	10	15	61	37	45	24	22	18	54	36	14	16	18	6	6	9	17	10	10	5	61
Nov 5	24	17	25	27	30	16	4	7	4	5	5	6	7	8	8	9	4	4	11	5	6	2	4	4	2	30
Nov 6	12	3	3	18	6	12	7	8	6	5	6	9	10	11	11	5	4	2	5	9	6	4	9	8	2	18
Nov 7	7	9	17	46	32	15	29	12	15	7	12	9	10	7	5	5	6	8	19	10	19	14	31	6	5	46
Nov 8	12	9	39	63	79	17	67	19	18	12	7	P	P	P	P	P	7	12	4	10	7	5	4	5	4	79
Nov 9	4	5	5	6	4	5	7	6	4	6	9	7	12	16	6	7	13	8	3	5	6	3	5	13	3	16
Nov 10	8	8	3	9	17	14	6	8	5	8	8	8	8	12	5	3	4	8	8	15	4	4	4	4	3	17
Nov 11	5	7	6	18	22	7	13	23	15	13	17	10	12	8	11	10	12	21	18	16	24	11	6	4	4	24
Nov 12	7	6	5	4	6	4	3	8	23	11	16	14	13	12	14	7	6	3	4	2	8	16	17	32	2	32
Nov 13	49	60	39	10	7	10	6	16	4	10	24	10	15	16	17	3	9	7	7	8	4	6	12	4	3	60
Nov 14	7	5	4	17	6	4	11	7	14	9	6	25	19	8	5	15	6	9	11	10	5	3	11	10	3	25
Nov 15	5	7	6	7	3	3	4	4	6	4	5	8	13	15	10	13	8	7	20	5	4	11	5	6	3	20
Nov 16	4	6	3	4	4	4	6	5	8	12	12	14	8	6	47	9	9	6	8	8	4	6	4	4	3	47
Nov 17	3	2	3	2	5	14	12	13	18	13	16	15	5	10	4	5	7	6	7	4	10	10	6	7	2	18
Nov 18	6	5	6	7	3	2	4	3	4	3	4	6	5	5	6	7	4	6	2	6	3	5	4	3	2	7
Nov 19	6	11	15	20	11	9	9	25	8	8	11	16	10	10	9	5	5	11	5	5	15	10	12	7	5	25
Nov 20	26	23	45	40	64	69	20	20	11	9	12	33	15	60	9	8	13	24	11	7	12	10	7	6	6	69
Nov 21	5	13	7	5	7	6	10	13	5	6	7	8	9	10	12	6	5	3	7	2	3	6	10	9	2	13
Nov 22	3	4	10	21	41	41	40	17	6	8	9	4	5	4	4	7	10	3	8	6	4	3	4	3	3	41
Nov 23	3	3	2	2	3	3	2	3	2	2	3	3	4	3	5	4	5	3	4	6	9	5	8	11	2	11
Nov 24	28	52	41	32	14	7	9	31	22	17	12	5	4	5	5	8	5	6	5	3	3	3	5	6	3	52
Nov 25	4	4	4	6	6	14	11	12	6	17	5	5	10	5	6	7	8	45	9	7	5	9	10	8	4	45
Nov 26	10	13	5	8	7	5	3	16	6	7	5	7	13	12	12	7	6	6	13	8	6	5	4	7	3	16
Nov 27	6	7	6	4	6	4	3	9	10	21	48	13	11	9	25	18	36	52	10	20	16	19	25	14	3	52
Nov 28	34	51	18	24	17	15	17	18	17	18	19	18	9	7	4	11	3	4	4	9	7	13	24	14	3	51
Nov 29	8	9	19	8	4	14	4	6	6	9	13	7	7	5	7	15	21	9	10	13	17	9	10	13	4	21
Nov 30	19	4	9	9	11	7	11	10	7	6	7	10	9	5	3	7	6	12	5	8	10	5	10	14	3	19
Diurnal Minimum	3	2	2	2	2	2	2	3	2	2	3	3	3	3	3	3	3	2	2	2	3	2	3	3	3	3
Dalurnal Maximum	49	60	45	63	79	69	67	61	37	45	48	33	19	60	47	18	36	52	20	20	24	26	31	32	32	32
C	Calibration				S	Daily Zero/Span				Q	Quality Assurance				C1	Repeat Calibration				S1	Repeat Daily Zero/Span					
G	Out for Repair				K	Collection Error				N	Not in Service				O	Operator Error				P	Power Failure					
R	Recovery				X	Machine Malfunction				Y	Maintenance				T	Exceeds Temperature Limits				N	Not in Service					

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for STDWD - Bonnyville - East Site



REFERENCE DOCUMENTS

HOURLY INSTANTANEOUS DATA

COLD LAKE SOUTH STATION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Instantaneous Maximums

SULPHUR DIOXIDE (SO₂) in ppb

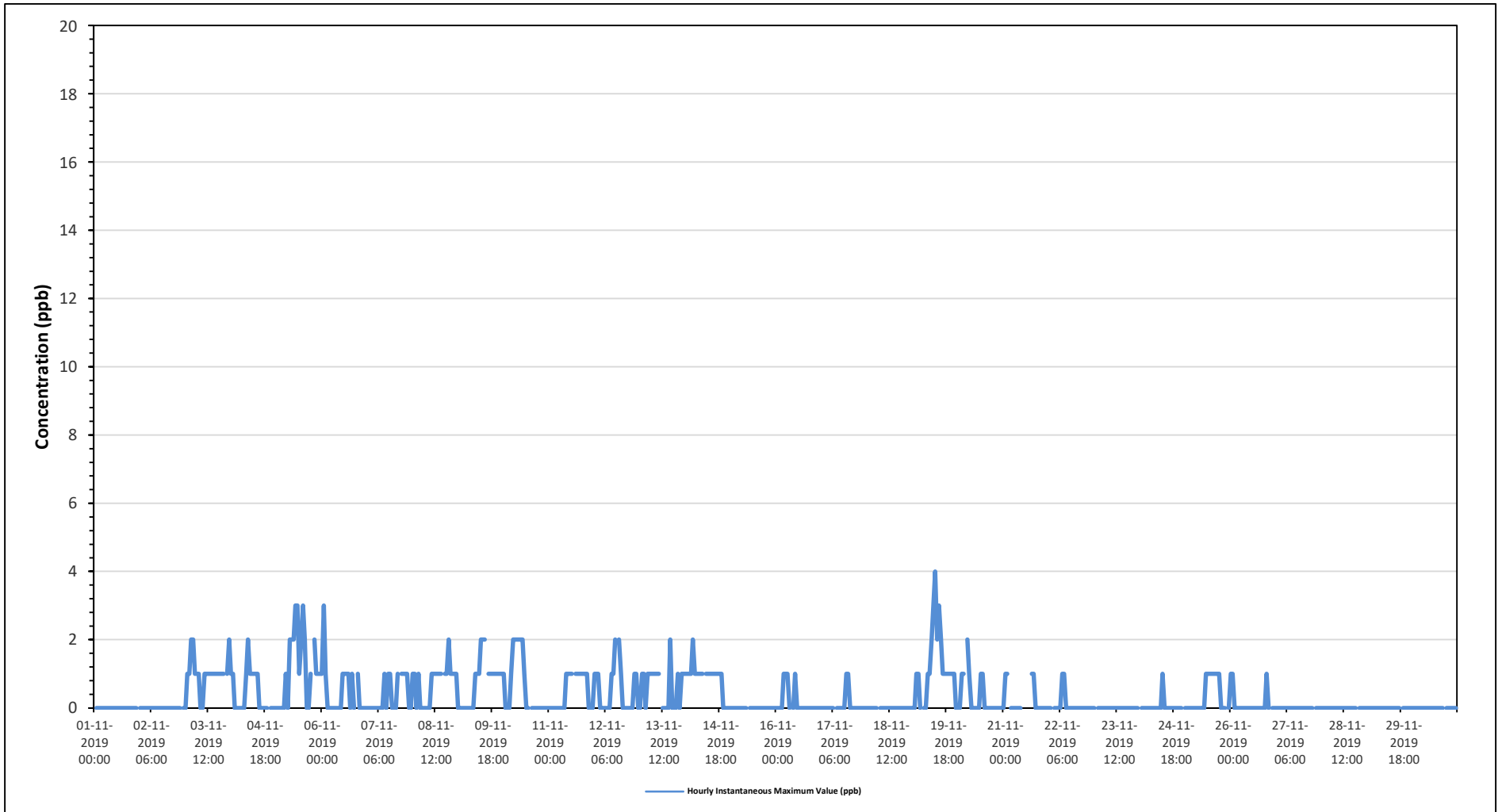
Maximum Hourly Value:	4 ppb on November 19 at hour 12	Hours in Service:	720
Maximum Daily Value:	1.2 ppb on November 5	Hours of Data:	683
Minimum Hourly Value:	0 ppb on November 1 at hour 1	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on November 1	Hours of Calibration:	37
Monthly Average:	0.4 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0.0	
Nov 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0.0	
Nov 3	0	1	1	2	2	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	2	0	2	1.0
Nov 4	1	1	0	0	0	0	0	0	1	2	1	1	1	1	1	0	0	0	0	0	0	S	0	0	0	0	2	0.4
Nov 5	0	0	0	0	0	1	0	2	2	2	3	3	1	2	3	2	0	0	1	S	2	1	1	1	1	0	3	1.2
Nov 6	1	3	1	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	S	1	0	0	0	0	0	0	3	0.5
Nov 7	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	S	1	1	1	1	1	0	0	0	1	0.3
Nov 8	1	1	0	1	0	0	0	0	0	0	1	1	1	1	1	1	S	1	1	2	1	1	1	1	1	0	2	0.7
Nov 9	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	S	1	1	1	1	1	1	1	1	1	0	2	0.7
Nov 10	1	0	0	0	1	2	2	2	2	2	2	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	2	0.7
Nov 11	0	0	0	0	0	0	0	0	0	1	1	1	1	S	1	1	1	1	1	1	1	1	0	0	0	0	1	0.5
Nov 12	1	1	1	0	0	0	0	0	0	1	1	2	S	2	1	0	0	0	0	0	0	0	1	1	0	0	2	0.5
Nov 13	0	1	1	0	1	1	1	1	1	1	1	S	0	0	0	0	2	0	0	0	0	1	0	1	1	0	2	0.6
Nov 14	1	1	1	1	2	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	2	0.9
Nov 15	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 16	0	0	0	0	1	1	1	0	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2
Nov 17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0.1
Nov 18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 19	0	0	1	1	0	S	0	0	1	1	2	3	4	2	3	2	1	1	1	1	1	1	1	1	0	0	4	1.2
Nov 20	0	0	1	1	S	2	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0.3
Nov 21	0	1	1	S	0	0	0	0	0	0	C	C	C	C	C	1	1	0	0	0	0	0	0	0	0	0	1	0.2
Nov 22	0	0	0	S	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Nov 23	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 24	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0
Nov 25	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	0.3
Nov 26	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	S	0	0	0	1	0.1
Nov 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0.0
Nov 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0.0
Nov 29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0.0
Nov 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0.0
Diurnal Maximum	1	3	1	2	2	2	2	2	2	2	3	3	4	2	3	2	2	2	1	1	2	2	1	1	2			
Diurnal Average	0.3	0.4	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.4	0.5	0.6	0.6	0.6	0.6	0.3	0.4	0.3	0.3	0.4	0.3	0.2	0.3	0.2				

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for SO2 - Cold Lake South Station





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Instantaneous Maximums

TOTAL REDUCED SULPHUR (TRS) in ppb

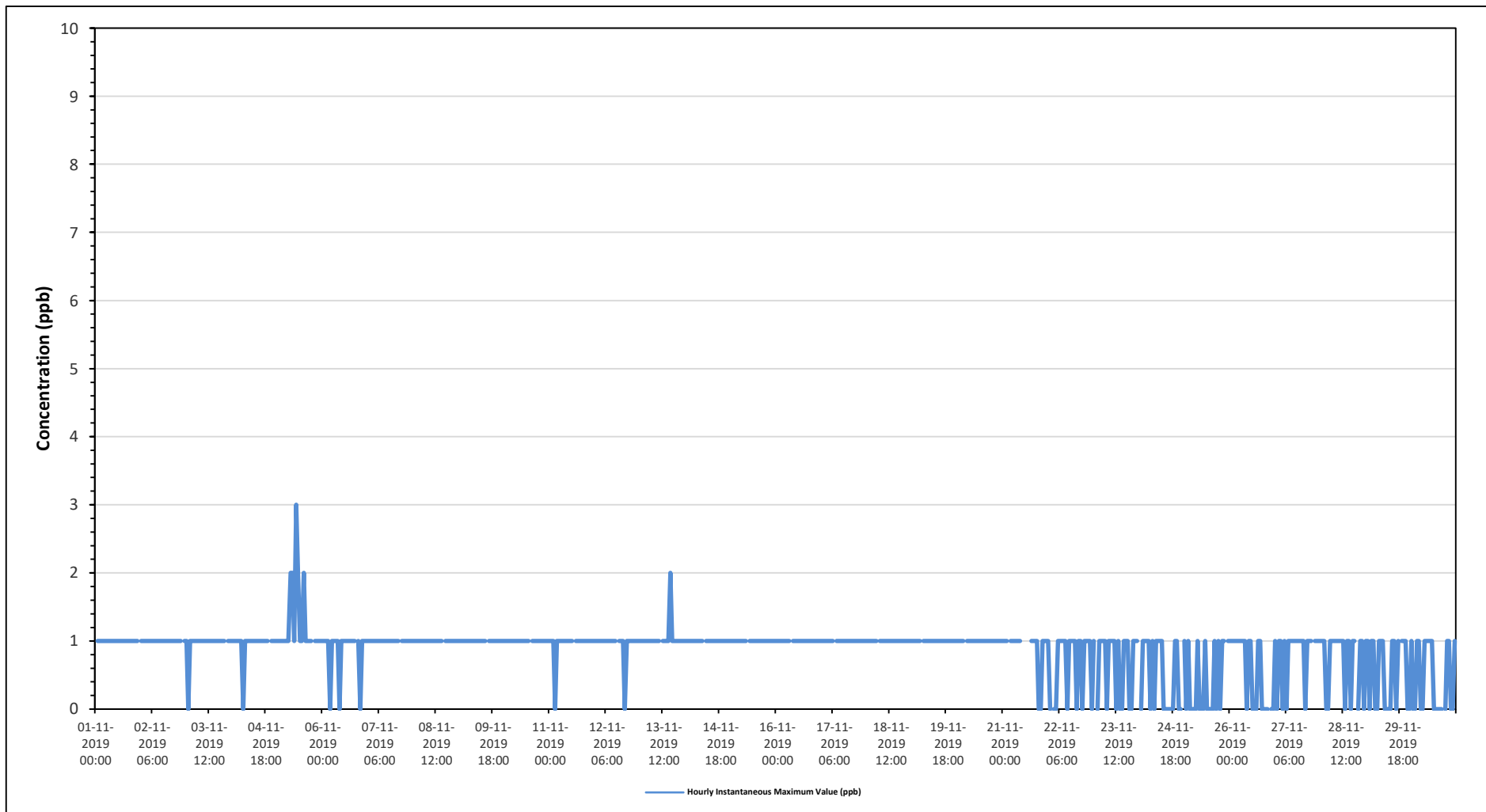
Maximum Hourly Value:	3 ppb on November 5 at hour 10	Hours in Service:	720
Maximum Daily Value:	1 ppb on November 5	Hours of Data:	683
Minimum Hourly Value:	0 ppb on November 3 at hour 1	Hours of Missing Data:	0
Minimum Daily Value:	0 ppb on November 25	Hours of Calibration:	37
Monthly Average:	0.88 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1.00
Nov 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1.00
Nov 3	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	0.96	
Nov 4	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	0.96	
Nov 5	1	1	1	1	1	1	1	2	2	1	3	2	1	1	2	1	1	1	1	S	1	1	1	1	1	3	1.26
Nov 6	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	S	1	0	1	1	1	1	0.87	
Nov 7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1.00	
Nov 8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1.00	
Nov 9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1.00	
Nov 10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1.00	
Nov 11	1	1	1	0	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	0.96	
Nov 12	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	0	1	1	1	1	1	1	1	1	1	0.96	
Nov 13	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	2	1	1	1	1	1	1	1	1	1	1.04	
Nov 14	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
Nov 15	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
Nov 16	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
Nov 17	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
Nov 18	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
Nov 19	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
Nov 20	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
Nov 21	1	1	1	S	1	1	1	1	1	1	C	C	C	C	C	1	1	1	1	0	0	1	1	1	0	0.89	
Nov 22	1	0	S	0	0	1	1	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	0	0	0.70	
Nov 23	1	S	0	1	1	1	0	1	1	1	1	0	1	0	0	1	1	1	0	1	0	1	1	1	1	0.70	
Nov 24	S	0	1	1	1	1	0	1	0	1	1	1	1	0	0	0	0	0	0	1	1	0	0	S	1	0.50	
Nov 25	1	0	1	0	0	0	1	0	0	0	1	0	0	0	0	1	0	1	0	1	1	0	S	1	0	0.39	
Nov 26	1	1	1	1	1	1	1	1	0	1	1	0	0	0	1	1	0	0	0	0	0	S	0	0	0	0.57	
Nov 27	1	0	1	1	0	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	S	1	1	1	0	0.83	
Nov 28	1	1	1	0	0	1	1	1	1	1	1	1	0	1	1	0	1	1	S	0	1	1	0	0	0	0.74	
Nov 29	1	1	0	1	0	0	1	1	1	0	0	0	0	1	0	1	0	1	S	1	1	1	0	0	0	0.57	
Nov 30	1	0	0	1	1	0	0	1	1	1	1	0	0	0	0	0	S	0	1	1	0	0	1	0	0	0.48	
Diurnal Maximum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	3.00	2.00	1.00	1.00	2.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Diurnal Average	1.00	0.79	0.90	0.86	0.83	0.90	0.79	1.00	0.97	0.90	0.96	1.00	0.82	0.79	0.86	0.83	0.83	0.89	0.86	0.86	0.82	0.93	0.86	0.86			

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for TRS - Cold Lake South Station





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Instantaneous Maximums

OXIDES OF NITROGEN (NOx) in ppb

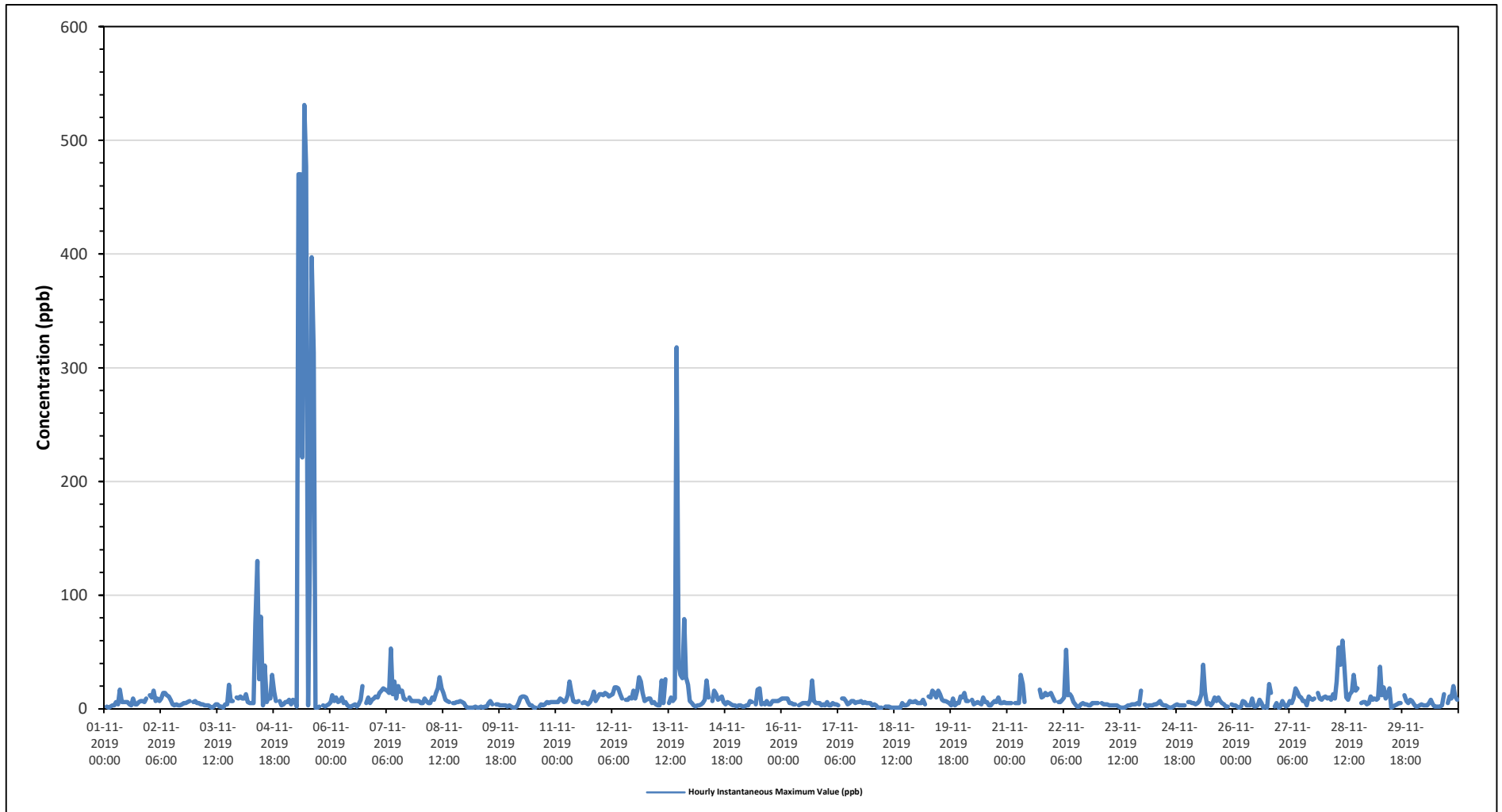
Maximum Hourly Value:	531 ppb on November 5 at hour 10	Hours in Service:	720
Maximum Daily Value:	#### ppb on November 5	Hours of Data:	681
Minimum Hourly Value:	1 ppb on November 1 at hour 2	Hours of Missing Data:	0
Minimum Daily Value:	2.5 ppb on November 9	Hours of Calibration:	39
Monthly Average:	12.9 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	S	2	1	2	3	3	6	4	17	6	6	6	6	4	3	9	4	4	6	7	7	6	9	S	1	17	5.5	
Nov 2	12	10	16	7	9	7	9	14	14	12	11	8	4	3	4	3	3	4	5	5	6	7	S	6	3	16	7.8	
Nov 3	7	5	5	4	4	3	3	2	1	2	4	4	2	2	1	4	4	4	21	7	7	S	10	9	1	21	5.0	
Nov 4	11	9	9	13	6	5	5	5	75	130	26	81	3	38	6	11	9	30	15	7	S	7	3	4	3	130	22.1	
Nov 5	6	6	8	4	8	7	2	470	470	221	531	477	3	133	397	313	1	1	2	S	3	2	3	4	1	531	133.6	
Nov 6	6	12	7	10	6	7	10	5	6	3	2	2	3	4	2	4	8	20	S	5	10	5	8	9	2	20	6.7	
Nov 7	11	10	14	16	18	17	16	14	53	13	24	9	20	15	16	9	8	S	10	7	7	7	7	7	7	53	14.3	
Nov 8	5	5	9	7	5	5	10	8	14	18	28	18	14	8	7	6	S	5	5	6	6	7	6	5	5	28	9.0	
Nov 9	2	1	1	1	1	2	1	1	2	1	2	2	5	7	4	S	4	4	3	3	3	3	2	3	1	7	2.5	
Nov 10	2	1	1	2	5	10	11	11	10	6	3	3	1	1	S	2	4	3	4	6	5	6	6	6	1	11	4.7	
Nov 11	6	6	9	8	6	7	12	24	15	7	6	6	7	S	5	6	5	4	6	9	15	7	10	13	4	24	8.7	
Nov 12	13	12	14	13	11	12	13	19	19	18	13	9	S	8	8	10	9	16	9	16	28	24	14	7	7	28	13.7	
Nov 13	8	9	9	5	6	4	3	3	25	5	26	S	5	10	7	9	318	39	30	27	79	28	21	7	3	318	29.7	
Nov 14	5	3	2	3	3	4	5	8	25	10	S	7	16	13	8	9	11	6	4	6	5	4	3	3	2	25	7.1	
Nov 15	2	3	3	2	2	3	3	7	6	S	4	17	18	4	5	4	7	4	4	7	7	7	7	8	2	18	5.8	
Nov 16	9	9	9	9	5	5	4	4	S	3	4	5	5	5	4	8	25	7	5	5	5	3	4	3	3	25	6.3	
Nov 17	6	3	3	5	4	4	3	S	9	9	7	4	5	7	7	5	6	6	7	5	6	5	5	5	3	9	5.5	
Nov 18	3	4	3	1	1	1	S	2	2	2	1	1	1	1	1	1	5	3	3	4	7	6	6	7	1	7	2.9	
Nov 19	5	5	5	8	4	S	11	10	16	14	10	16	13	8	7	7	6	5	3	9	3	5	5	11	3	16	8.1	
Nov 20	10	14	7	7	S	8	4	5	6	5	4	10	6	6	3	3	5	7	6	10	5	5	6	5	3	14	6.4	
Nov 21	5	5	5	S	5	5	5	30	22	6	C	C	C	C	C	C	C	17	10	11	14	12	13	14	5	30	-	
Nov 22	10	7	S	6	6	8	10	52	12	13	11	6	4	2	2	4	5	4	4	3	3	5	5	5	2	52	8.1	
Nov 23	5	S	5	4	4	4	3	3	3	3	3	2	1	1	1	2	3	4	4	4	4	4	5	4	16	1	16	3.8
Nov 24	S	4	2	3	3	3	4	4	5	7	4	3	3	2	1	1	2	3	4	3	3	3	3	S	1	7	3.2	
Nov 25	6	6	5	5	4	5	7	13	39	15	4	5	3	5	10	7	10	7	5	4	2	2	S	4	2	39	7.5	
Nov 26	3	3	2	1	2	7	6	3	3	3	9	2	2	3	8	5	1	2	1	22	14	S	2	5	1	22	4.7	
Nov 27	1	2	7	4	2	3	7	5	9	18	15	11	10	7	7	3	11	9	8	9	S	14	9	8	1	18	7.8	
Nov 28	10	11	9	10	8	13	9	24	54	39	60	39	10	8	13	15	30	16	18	S	5	6	6	4	4	60	18.1	
Nov 29	5	11	8	9	8	9	37	12	19	9	13	18	1	2	3	4	5	5	S	12	7	5	8	7	1	37	9.4	
Nov 30	4	2	2	3	4	3	3	3	5	8	4	2	2	2	2	3	13	S	5	11	9	20	11	8	2	20	5.6	
Diurnal Maximum	13	14	16	16	18	17	37	470	470	221	531	477	20	133	397	313	318	39	30	27	79	28	21	16				
Diurnal Average	6.4	6.2	6.2	5.9	5.3	6.0	7.7	26.4	33.0	20.9	29.8	27.6	6.3	11.0	19.4	16.6	18.6	8.5	7.4	8.2	9.8	7.7	7.0	6.9				

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for NOx - Cold Lake South Station





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Instantaneous Maximums

NITRIC OXIDE (NO) in ppb

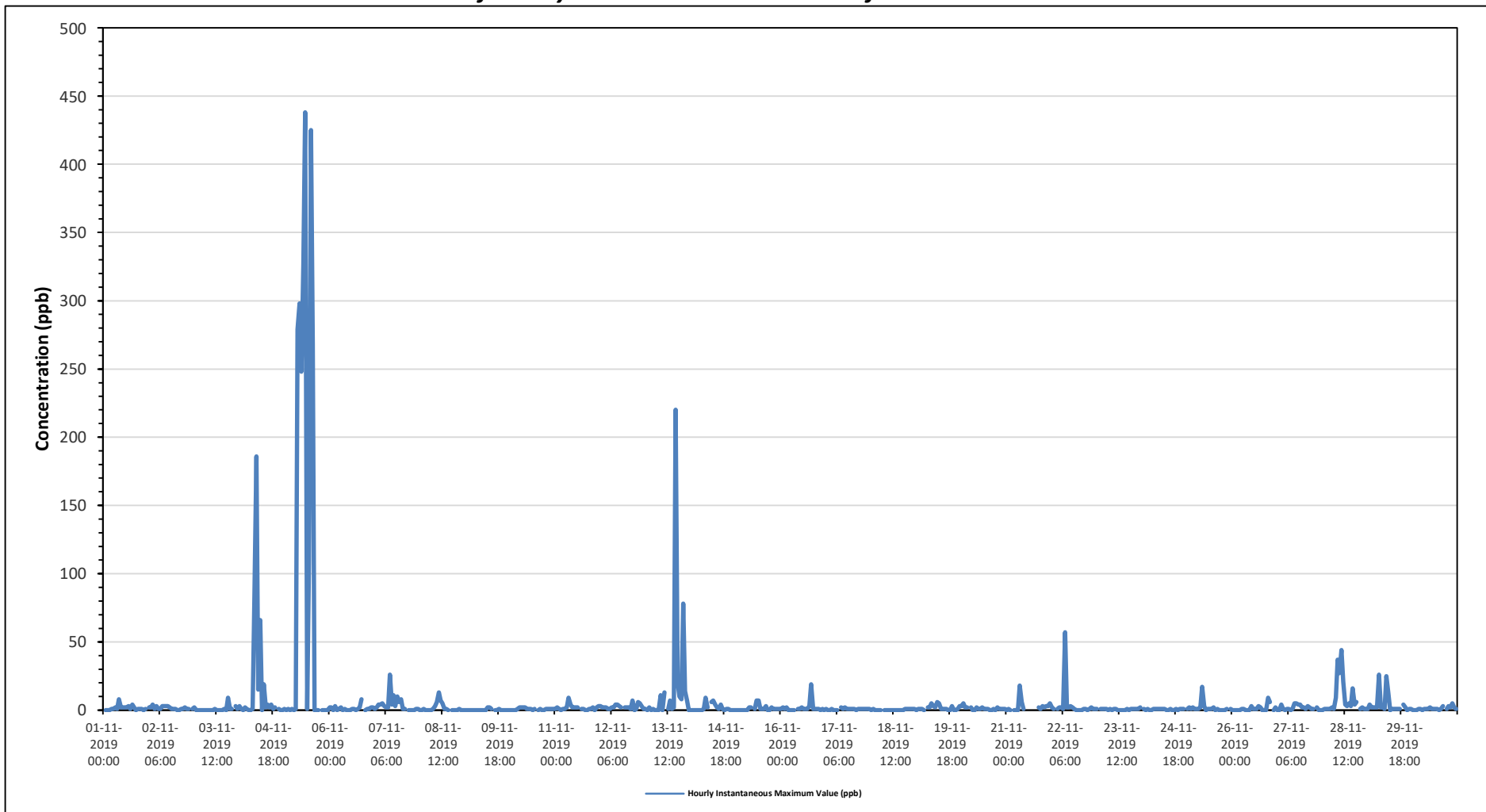
Maximum Hourly Value:	438 ppb on November 5 at hour 11	Hours in Service:	720
Maximum Daily Value:	#### ppb on November 5	Hours of Data:	681
Minimum Hourly Value:	0 ppb on November 1 at hour 1	Hours of Missing Data:	0
Minimum Daily Value:	0.3 ppb on November 9	Hours of Calibration:	39
Monthly Average:	6.4 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	S	0	0	0	1	1	2	1	8	2	2	2	2	3	1	4	2	0	1	1	1	0	1	S	0	8	1.6	
Nov 2	2	2	4	1	3	1	1	3	3	3	3	2	1	1	1	0	0	1	1	2	1	1	S	1	0	4	1.7	
Nov 3	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	9	1	1	S	3	1	0	9	0.8		
Nov 4	3	1	0	2	1	0	0	1	82	186	15	66	0	19	2	4	2	4	1	2	S	1	0	0	0	186	17.0	
Nov 5	1	0	1	0	1	0	1	279	298	248	327	438	1	108	425	268	0	0	0	S	0	0	0	0	0	438	104.2	
Nov 6	2	2	0	3	0	1	2	0	1	0	0	0	1	1	0	1	2	8	S	0	1	1	2	2	0	8	1.3	
Nov 7	1	2	4	4	5	3	2	2	26	4	11	3	10	6	8	1	1	S	0	0	0	0	1	1	0	26	4.1	
Nov 8	0	0	1	0	0	0	0	1	3	6	13	7	5	1	1	0	S	0	0	0	0	1	0	0	0	13	1.7	
Nov 9	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	S	0	0	1	0	0	0	0	0	0	2	0.3	
Nov 10	0	0	0	0	1	2	2	2	2	1	1	1	0	1	S	0	1	0	0	1	1	1	1	1	0	2	0.8	
Nov 11	1	2	1	0	1	1	2	9	4	2	2	2	2	S	1	1	0	0	1	1	2	0	2	3	0	9	1.7	
Nov 12	3	2	2	2	1	1	2	2	4	4	3	2	S	2	2	2	1	7	0	1	6	5	3	1	0	7	2.5	
Nov 13	1	0	2	0	1	0	0	0	11	0	13	S	1	7	1	2	220	20	10	8	78	14	7	0	0	220	17.2	
Nov 14	0	0	0	0	0	0	0	1	9	2	S	6	7	4	2	1	4	1	0	1	1	0	0	0	0	9	1.7	
Nov 15	0	0	0	0	0	0	0	2	2	S	1	7	7	1	1	1	3	0	0	2	1	1	1	1	0	7	1.3	
Nov 16	1	2	1	2	0	0	0	0	S	1	1	2	1	1	1	3	19	1	1	1	1	0	1	0	0	19	1.7	
Nov 17	1	0	0	1	0	0	0	S	2	1	2	1	1	1	1	0	1	1	1	1	1	1	1	1	0	2	0.8	
Nov 18	0	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0.3	
Nov 19	0	1	1	1	0	S	2	2	5	3	2	6	5	1	1	1	0	0	0	3	0	0	1	3	0	6	1.7	
Nov 20	3	5	2	2	S	2	0	0	2	1	1	2	1	1	1	0	0	1	0	2	1	1	1	1	0	5	1.3	
Nov 21	0	1	0	S	0	0	0	18	6	1	C	C	C	C	C	C	C	2	1	3	2	3	3	5	0	18	-	
Nov 22	2	1	S	1	2	2	1	57	2	2	3	2	1	0	0	0	0	1	1	0	1	2	1	1	0	57	3.6	
Nov 23	1	S	1	1	1	0	1	0	1	1	0	0	0	0	0	1	0	1	1	1	1	1	1	2	0	2	0.7	
Nov 24	S	1	0	1	0	0	1	1	1	1	1	1	1	0	0	1	0	0	1	0	1	1	1	S	0	1	0.6	
Nov 25	1	2	1	2	1	1	2	17	3	0	1	1	1	1	2	0	1	0	0	0	0	1	S	1	0	17	1.7	
Nov 26	0	0	0	0	0	1	1	0	0	0	3	1	1	1	1	3	2	0	0	0	9	6	S	0	2	0	9	1.3
Nov 27	0	0	4	1	0	1	1	0	1	5	5	4	4	2	2	1	3	2	1	1	S	2	0	0	0	5	1.7	
Nov 28	0	1	1	1	1	2	1	9	37	27	44	21	4	3	5	3	16	4	6	S	1	2	1	1	0	44	8.3	
Nov 29	1	4	2	2	2	2	26	2	2	1	25	12	0	1	1	1	1	1	S	4	2	0	1	1	0	26	4.1	
Nov 30	0	0	0	1	1	0	1	1	1	2	1	1	1	1	0	1	3	S	1	3	2	5	2	1	0	5	1.3	
Diurnal Maximum	3	5	4	4	5	3	26	279	298	248	327	438	10	108	425	268	220	20	10	9	78	14	7	5				
Diurnal Average	0.9	1.0	1.0	1.0	0.8	0.8	1.7	13.7	18.2	17.5	17.1	21.1	2.1	6.0	16.5	10.7	10.1	1.9	1.4	1.8	4.0	1.6	1.3	1.1				

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for NO - Cold Lake South Station





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Instantaneous Maximums

NITROGEN DIOXIDE (NO₂) in ppb

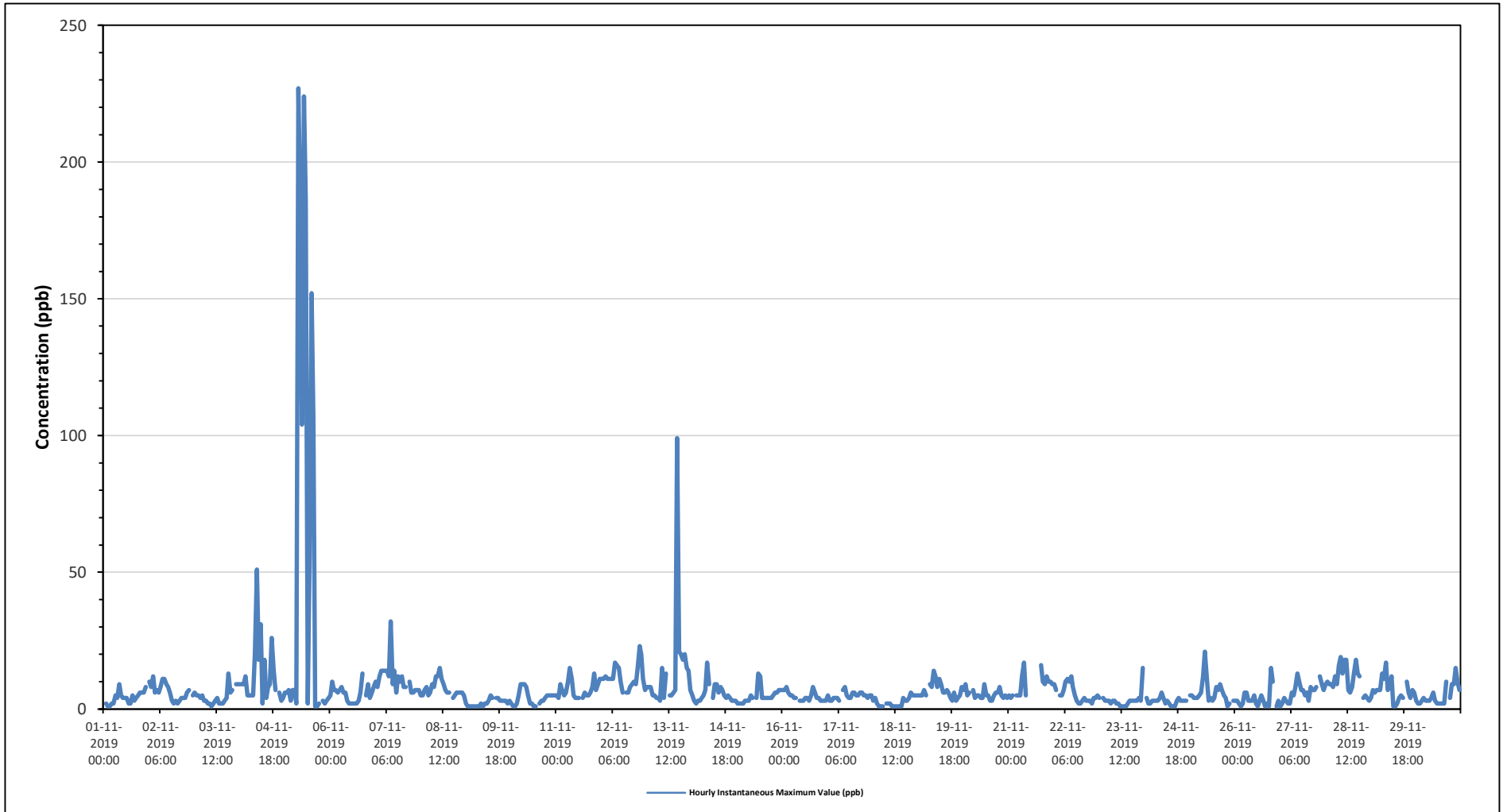
Maximum Hourly Value:	227 ppb on November 5 at hour 7	Hours in Service:	720
Maximum Daily Value:	56.3 ppb on November 5	Hours of Data:	681
Minimum Hourly Value:	1 ppb on November 1 at hour 2	Hours of Missing Data:	0
Minimum Daily Value:	2.3 ppb on November 9	Hours of Calibration:	39
Monthly Average:	8.0 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily	Daily	Daily		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Minimum	Maximum	Average	
Nov 1	S	2	1	1	2	2	5	4	9	5	4	4	4	2	2	5	3	4	5	6	6	6	8	S	1	9	4.1	
Nov 2	10	8	12	6	7	6	8	11	11	9	8	6	3	2	3	2	3	4	4	4	6	7	S	5	2	12	6.3	
Nov 3	6	5	5	4	5	3	3	2	2	1	2	3	4	2	2	2	3	4	4	13	6	7	S	9	1	13	4.4	
Nov 4	9	9	9	12	5	5	5	5	20	51	18	31	2	18	4	8	9	26	14	7	S	6	3	4	2	51	12.2	
Nov 5	6	6	7	3	7	7	2	227	184	104	224	186	2	55	152	106	1	1	2	S	3	2	3	4	1	227	56.3	
Nov 6	5	10	7	7	6	7	8	6	6	3	2	2	2	2	2	3	6	13	S	5	9	4	6	8	2	13	5.6	
Nov 7	10	8	12	14	14	14	14	12	32	9	14	6	12	10	12	8	8	S	10	6	6	6	7	7	7	6	32	11.0
Nov 8	5	5	7	8	5	6	9	8	12	12	15	11	9	7	6	6	S	4	5	6	6	6	6	5	4	15	7.3	
Nov 9	2	1	1	1	1	1	1	1	2	1	2	2	3	5	4	S	4	4	3	3	3	3	2	3	1	5	2.3	
Nov 10	2	1	1	2	5	9	9	9	8	5	2	2	1	1	S	2	3	3	4	5	5	5	5	5	1	9	4.1	
Nov 11	5	4	9	7	5	6	10	15	11	5	4	4	4	S	4	6	5	5	6	8	13	7	9	11	4	15	7.1	
Nov 12	11	11	12	11	11	11	11	17	16	15	10	6	S	6	6	8	9	10	9	15	23	20	11	7	6	23	11.6	
Nov 13	8	8	8	5	5	4	4	3	15	4	13	S	5	5	6	7	99	21	20	18	20	15	14	7	3	99	13.7	
Nov 14	5	3	2	3	3	4	5	7	17	9	S	4	9	9	6	8	7	5	4	5	4	3	3	3	2	17	5.6	
Nov 15	2	2	2	2	3	3	3	5	4	S	4	13	12	4	4	4	4	4	4	5	6	6	7	7	2	13	4.8	
Nov 16	7	7	8	6	5	5	4	4	S	3	3	3	4	4	3	5	8	6	4	4	3	3	3	3	3	3	8	4.6
Nov 17	5	3	3	4	4	4	3	S	7	8	5	4	4	6	6	5	5	6	6	5	5	4	5	5	3	8	4.9	
Nov 18	3	4	2	1	1	S	2	2	2	1	1	1	1	1	1	1	4	3	3	4	6	5	5	5	1	6	2.6	
Nov 19	5	5	5	7	5	S	9	8	14	12	8	11	9	6	6	7	6	4	3	6	3	4	5	8	3	14	6.8	
Nov 20	7	9	5	6	S	7	4	5	5	4	4	9	5	5	3	3	5	6	6	8	5	4	5	4	3	9	5.4	
Nov 21	5	4	5	S	5	5	5	12	17	5	C	C	C	C	C	C	C	16	10	9	12	10	10	9	4	17	-	
Nov 22	9	7	S	5	5	7	10	11	10	12	8	5	3	2	2	3	4	3	3	3	2	4	4	5	2	12	5.5	
Nov 23	4	S	4	3	3	3	2	3	3	2	2	1	1	1	1	2	3	3	3	3	3	3	3	3	3	4	3	15
Nov 24	S	4	2	2	3	3	3	3	4	6	4	2	3	2	1	1	1	3	4	3	3	3	3	3	S	1	6	2.9
Nov 25	5	5	4	4	4	5	6	12	21	11	3	4	3	4	8	7	9	7	5	4	1	2	S	3	1	21	6.0	
Nov 26	3	3	2	1	2	6	6	3	3	3	5	2	1	3	5	3	1	2	1	15	10	S	1	3	1	15	3.7	
Nov 27	1	2	4	3	2	2	6	5	8	13	10	7	7	5	6	3	8	7	7	8	S	12	9	7	1	13	6.2	
Nov 28	9	10	9	9	8	12	9	16	19	13	18	18	7	6	8	13	18	13	12	S	4	5	4	3	3	19	10.6	
Nov 29	4	7	6	7	7	13	11	17	7	8	12	1	1	2	4	5	4	S	10	6	4	7	6	1	17	6.8		
Nov 30	3	2	2	3	4	3	3	3	4	6	3	2	2	2	2	10	S	4	9	9	15	10	7	2	15	4.8		
Diurnal Maximum	11	11	12	14	14	14	14	227	184	104	224	186	12	55	152	106	99	26	20	18	23	20	14	15				
Diurnal Average	5.6	5.3	5.4	5.1	4.9	5.4	6.2	14.8	16.7	11.7	14.4	12.9	4.4	6.3	9.5	8.4	9.0	6.8	6.2	6.8	6.8	6.3	6.0	6.0				

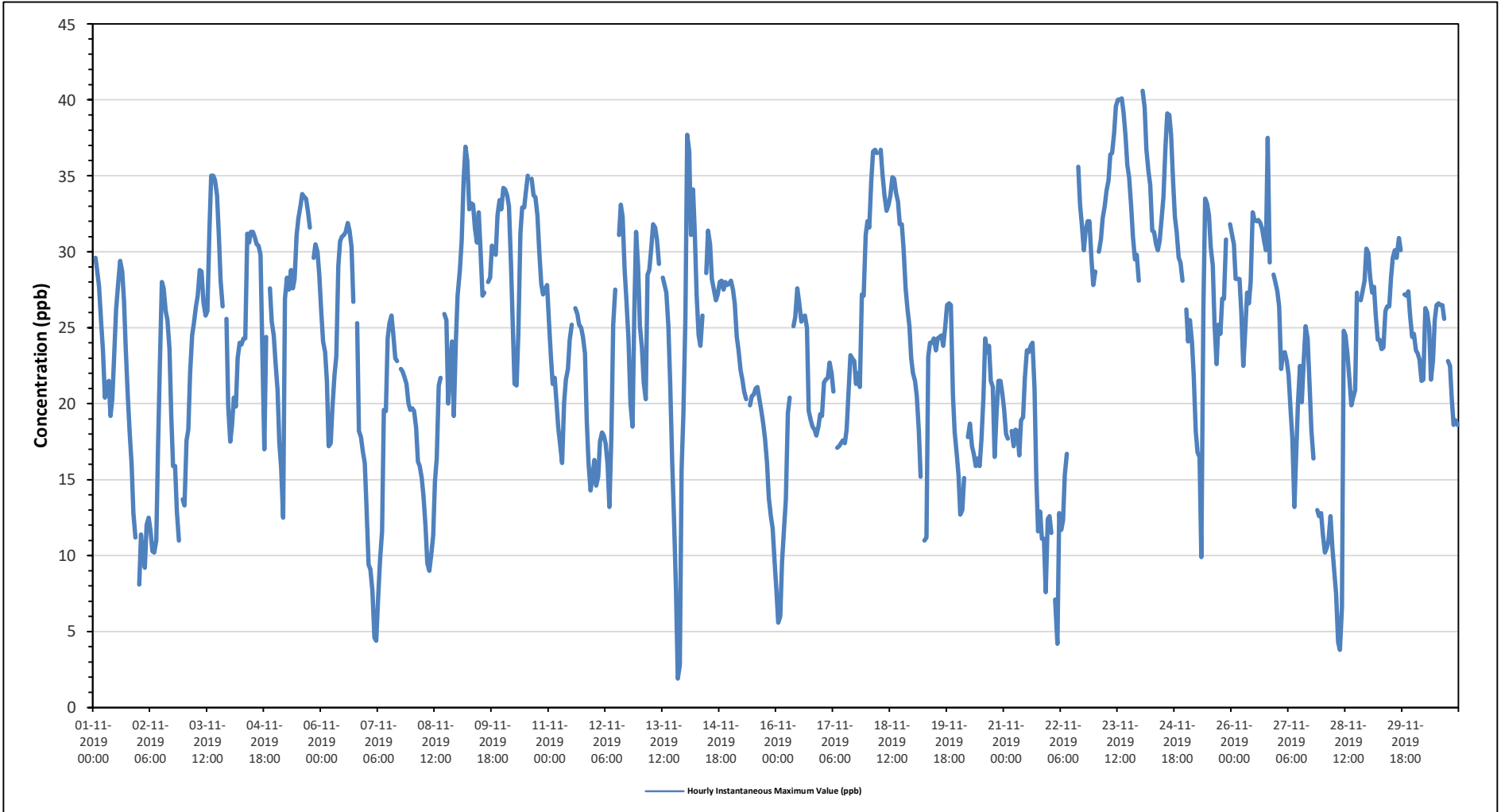
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	O1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	C	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for NO2 - Cold Lake South Station



Timeseries Chart of Hourly Instantaneous Maximum for O3 - Cold Lake South Station





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Instantaneous Maximums

TOTAL HYDROCARBONS (THC) in ppm

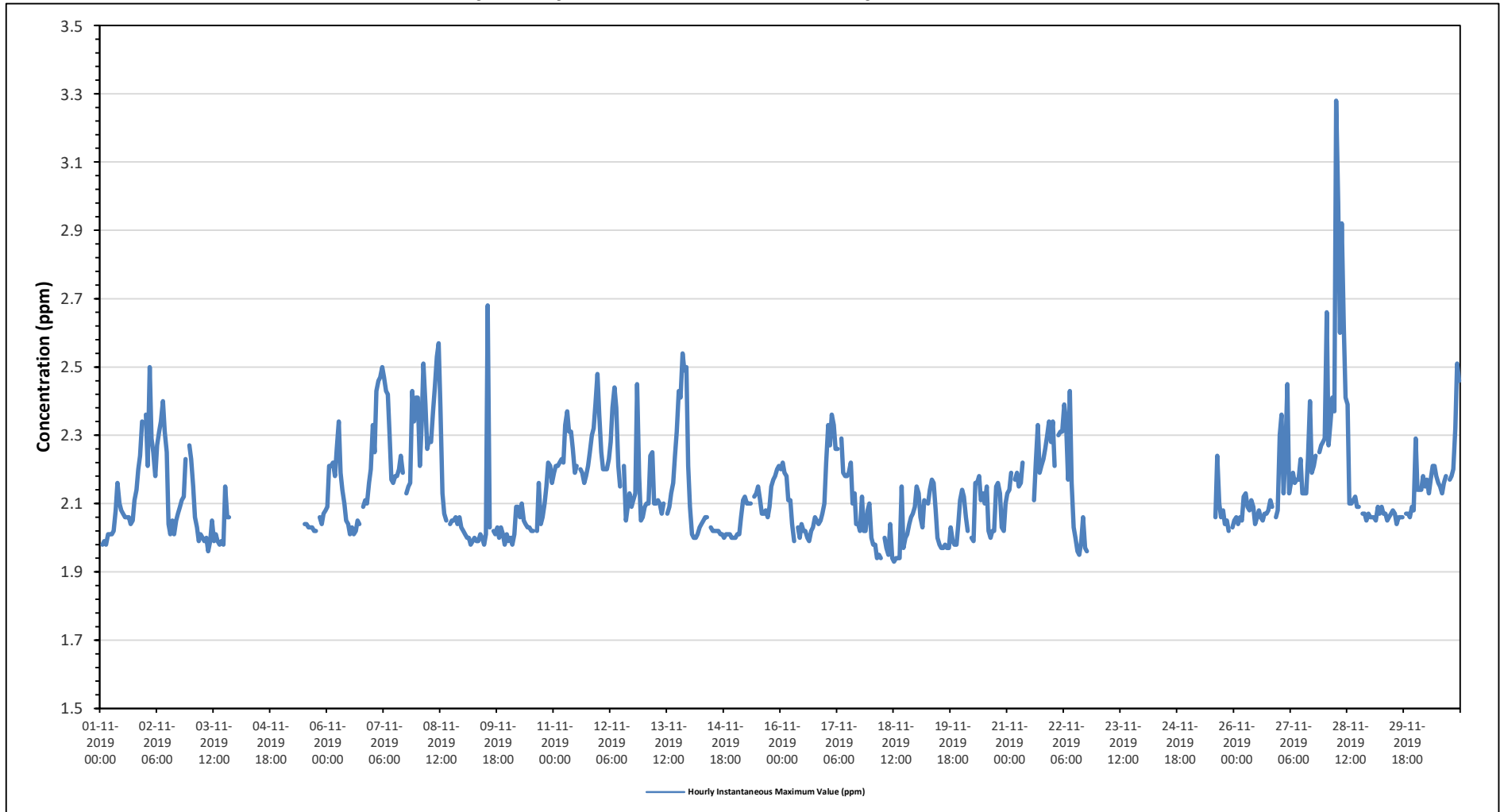
Maximum Hourly Value:	3.28 ppm on November 28 at hour 6	Hours in Service:	720
Maximum Daily Value:	2.37 ppm on November 28	Hours of Data:	582
Minimum Hourly Value:	1.93 ppm on November 18 at hour 12	Hours of Missing Data:	106
Minimum Daily Value:	1.99 ppm on November 18	Hours of Calibration:	32
Monthly Average:	2.14 ppm	Operational Uptime:	85.3

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	S	1.98	1.99	1.98	2.01	2.01	2.01	2.02	2.08	2.16	2.10	2.08	2.07	2.06	2.06	2.06	2.04	2.05	2.11	2.14	2.20	2.24	2.34	S	1.98	2.34	2.08	
Nov 2	2.36	2.21	2.50	2.29	2.25	2.18	2.27	2.31	2.34	2.40	2.31	2.25	2.04	2.01	2.05	2.01	2.05	2.07	2.09	2.11	2.12	2.23	S	2.27	2.01	2.50	2.21	
Nov 3	2.23	2.15	2.06	2.03	1.99	2.01	2.00	1.99	2.00	1.96	1.99	2.05	1.99	2.01	1.99	1.98	1.99	1.98	2.15	2.06	2.06	S	X	X	1.96	2.23	2.03	
Nov 4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Nov 5	X	X	X	X	X	X	X	X	C	C	C	C	2.04	2.04	2.03	2.03	2.03	2.02	2.02	S	2.06	2.04	2.07	2.08	2.02	2.08	-	
Nov 6	2.09	2.21	2.21	2.22	2.18	2.26	2.34	2.19	2.14	2.10	2.05	2.04	2.01	2.03	2.01	2.02	2.05	2.04	S	2.09	2.11	2.10	2.16	2.20	2.01	2.34	2.12	
Nov 7	2.33	2.25	2.43	2.46	2.47	2.50	2.47	2.43	2.42	2.30	2.17	2.16	2.18	2.20	2.24	2.19	S	2.13	2.15	2.16	2.43	2.34	2.41	2.13	2.50	2.30		
Nov 8	2.41	2.21	2.33	2.51	2.39	2.26	2.29	2.28	2.37	2.44	2.53	2.57	2.38	2.13	2.07	2.05	S	2.04	2.05	2.06	2.04	2.06	2.03	2.03	2.03	2.57	2.24	
Nov 9	2.02	2.01	2.00	2.00	1.98	1.99	2.00	1.99	1.99	2.01	2.00	1.98	2.01	2.68	2.03	S	2.02	2.01	2.03	2.00	2.03	2.01	1.98	2.01	1.98	2.68	2.03	
Nov 10	1.99	2.00	1.98	2.01	2.09	2.09	2.06	2.10	2.05	2.04	2.03	2.03	2.02	2.02	S	2.02	2.16	2.04	2.06	2.10	2.15	2.22	2.21	2.16	1.98	2.22	2.07	
Nov 11	2.19	2.21	2.21	2.22	2.23	2.22	2.33	2.37	2.31	2.26	2.19	2.21	S	2.20	2.19	2.16	2.18	2.21	2.25	2.30	2.32	2.39	2.48	2.16	2.48	2.26		
Nov 12	2.36	2.25	2.20	2.20	2.20	2.23	2.28	2.38	2.44	2.38	2.21	2.15	S	2.21	2.05	2.09	2.13	2.09	2.11	2.13	2.45	2.18	2.05	2.06	2.05	2.45	2.21	
Nov 13	2.09	2.10	2.10	2.24	2.25	2.10	2.10	2.11	2.10	2.07	2.10	S	2.07	2.09	2.13	2.16	2.24	2.31	2.43	2.41	2.54	2.49	2.50	2.21	2.07	2.54	2.21	
Nov 14	2.09	2.01	2.00	2.00	2.01	2.03	2.04	2.05	2.06	2.06	S	2.03	2.02	2.02	2.02	2.02	2.01	2.01	2.00	2.01	2.01	2.00	2.00	2.00	2.00	2.09	2.02	
Nov 15	2.00	2.01	2.01	2.06	2.11	2.12	2.10	2.10	2.10	2.10	S	2.12	2.13	2.15	2.11	2.07	2.07	2.08	2.06	2.09	2.15	2.17	2.18	2.20	2.21	2.00	2.21	
Nov 16	2.20	2.22	2.19	2.18	2.11	2.11	2.04	1.99	S	2.03	2.00	2.04	2.02	2.02	2.00	1.99	2.02	2.03	2.06	2.05	2.04	2.05	2.07	2.10	1.99	2.22	2.07	
Nov 17	2.22	2.33	2.27	2.36	2.33	2.26	2.26	S	2.29	2.19	2.18	2.18	2.19	2.22	2.10	2.13	2.04	2.04	2.02	2.12	2.02	2.02	2.08	2.10	2.02	2.36	2.17	
Nov 18	2.00	1.98	1.98	1.94	1.95	1.94	S	2.00	1.97	1.95	2.04	1.94	1.93	1.94	1.94	1.94	2.15	1.97	2.00	2.01	2.04	2.06	2.07	2.09	1.93	2.15	1.99	
Nov 19	2.15	2.13	2.06	2.03	2.11	S	2.10	2.14	2.17	2.16	2.08	2.00	1.98	1.97	1.97	1.98	1.97	1.97	2.03	1.99	1.98	1.98	2.04	2.11	1.97	2.17	2.05	
Nov 20	2.14	2.12	2.06	2.02	S	2.00	1.99	2.16	2.16	2.18	2.11	2.13	2.10	2.15	2.02	2.00	2.02	2.02	2.15	2.16	2.13	2.03	2.02	2.10	1.99	2.18	2.09	
Nov 21	2.13	2.14	2.19	S	2.17	2.19	2.15	2.16	2.22	Y	Y	Y	Y	Y	2.11	2.22	2.33	2.19	2.21	2.23	2.26	2.30	2.34	2.28	2.11	2.34	2.21	
Nov 22	2.34	2.21	S	2.30	2.31	2.31	2.39	2.34	2.17	2.43	2.16	2.03	2.00	1.96	1.95	1.99	2.06	1.97	1.96	X	X	X	X	X	1.95	2.43	2.16	
Nov 23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nov 24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nov 25	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	2.06	2.24	2.10	2.06	2.08	2.04	2.05	2.02	S	2.03	2.02	2.24	-	
Nov 26	2.05	2.06	2.04	2.06	2.05	2.12	2.13	2.09	2.08	2.11	2.09	2.04	2.06	2.08	2.06	2.05	2.07	2.07	2.08	2.11	2.09	S	2.06	2.08	2.04	2.13	2.08	
Nov 27	2.30	2.36	2.13	2.24	2.45	2.13	2.16	2.19	2.16	2.17	2.17	2.23	2.13	2.13	2.13	2.23	2.40	2.19	2.21	2.24	S	2.25	2.27	2.28	2.13	2.45	2.22	
Nov 28	2.29	2.66	2.27	2.34	2.41	2.37	3.28	2.98	2.60	2.92	2.62	2.41	2.39	2.10	2.10	2.11	2.12	2.09	2.09	S	2.07	2.07	2.05	2.07	2.05	3.28	2.37	
Nov 29	2.06	2.06	2.06	2.05	2.09	2.07	2.09	2.07	2.07	2.05	2.06	2.07	2.08	2.07	2.04	2.06	2.06	2.06	S	2.07	2.07	2.06	2.09	2.08	2.04	2.09	2.07	
Nov 30	2.29	2.14	2.14	2.14	2.18	2.15	2.17	2.13	2.17	2.21	2.21	2.18	2.16	2.15	2.13	2.16	2.18	S	2.17	2.18	2.20	2.32	2.51	2.46	2.13	2.51	2.21	
Diurnal Maximum	2.41	2.66	2.50	2.51	2.47	2.50	3.28	2.98	2.60	2.92	2.62	2.57	2.39	2.68	2.20	2.24	2.40	2.31	2.43	2.41	2.54	2.49	2.51	2.48				
Diurnal Average	2.18	2.16	2.14	2.16	2.18	2.15	2.21	2.19	2.19	2.20	2.16	2.13	2.09	2.10	2.06	2.08	2.10	2.06	2.10	2.12	2.13	2.15	2.17	2.16				

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for THC - Cold Lake South Station





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Instantaneous Maximums

METHANE (CH4) in ppm

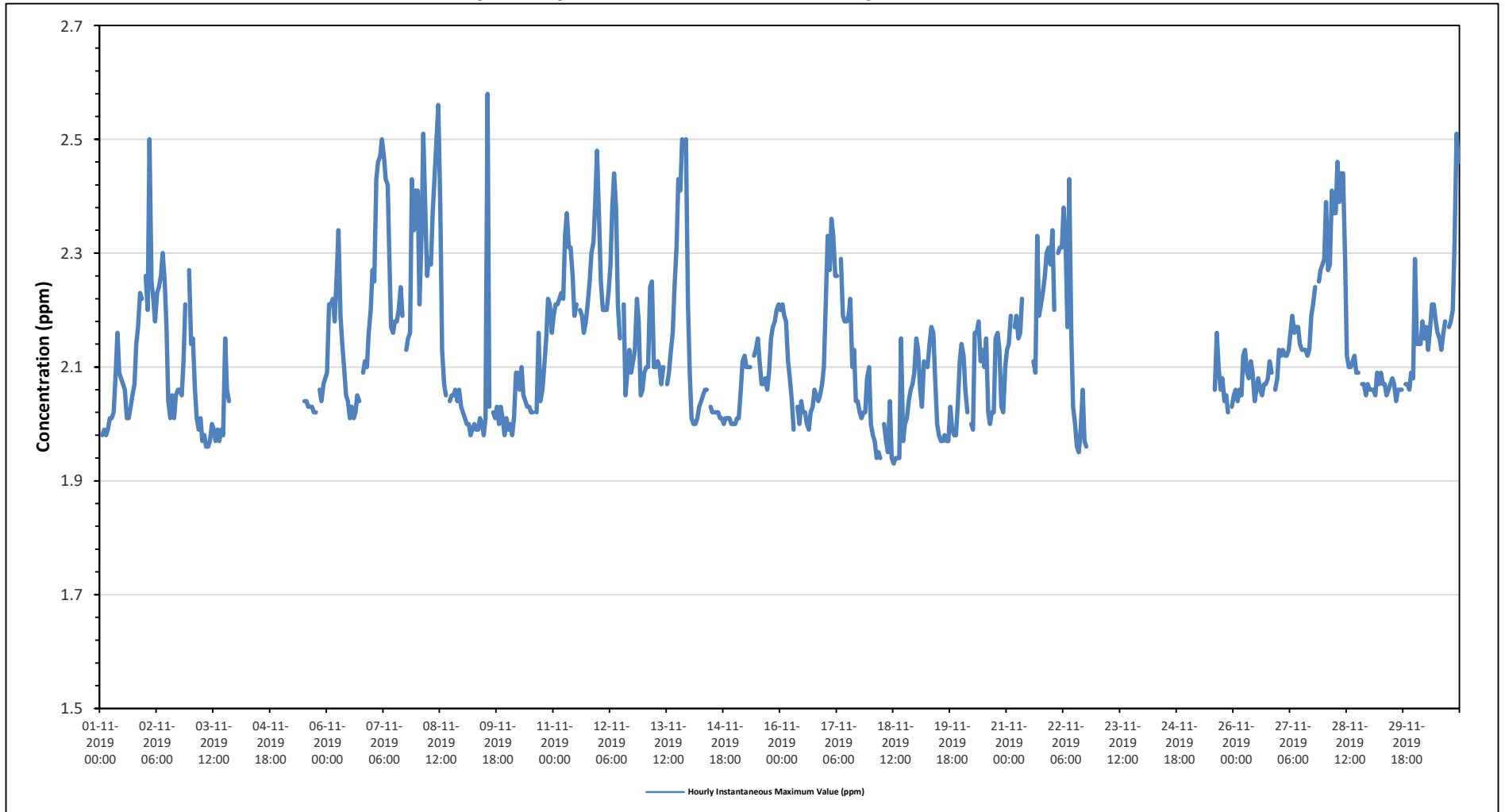
Maximum Hourly Value:	2.58 ppm on November 9 at hour 13	Hours in Service:	720
Maximum Daily Value:	2.30 ppm on November 7	Hours of Data:	582
Minimum Hourly Value:	1.93 ppm on November 18 at hour 12	Hours of Missing Data:	106
Minimum Daily Value:	1.99 ppm on November 18	Hours of Calibration:	32
Monthly Average:	2.13 ppm	Operational Uptime:	85.3

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	S	1.98	1.99	1.98	1.99	2.01	2.01	2.02	2.08	2.16	2.09	2.08	2.07	2.06	2.01	2.01	2.03	2.05	2.07	2.14	2.17	2.23	2.22	S	1.98	2.23	2.07
Nov 2	2.26	2.20	2.50	2.25	2.22	2.18	2.23	2.24	2.26	2.30	2.25	2.17	2.04	2.01	2.05	2.01	2.05	2.06	2.06	2.05	2.11	2.21	S	2.27	2.01	2.50	2.17
Nov 3	2.14	2.15	2.06	2.01	1.99	2.01	1.97	1.98	1.96	1.96	1.97	2.00	1.99	1.97	1.99	1.97	1.99	1.98	2.15	2.06	2.04	S	X	X	1.96	2.15	2.02
Nov 4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nov 5	X	X	X	X	X	X	X	X	C	C	C	C	2.04	2.04	2.03	2.03	2.03	2.02	2.02	S	2.06	2.04	2.07	2.08	2.02	2.08	-
Nov 6	2.09	2.21	2.21	2.22	2.18	2.26	2.34	2.19	2.14	2.10	2.05	2.04	2.01	2.03	2.01	2.02	2.05	2.04	S	2.09	2.11	2.10	2.16	2.20	2.01	2.34	2.12
Nov 7	2.27	2.25	2.43	2.46	2.47	2.50	2.47	2.43	2.42	2.30	2.17	2.16	2.18	2.18	2.20	2.24	2.19	S	2.13	2.15	2.16	2.43	2.34	2.41	2.13	2.50	2.30
Nov 8	2.41	2.21	2.33	2.51	2.39	2.26	2.29	2.28	2.37	2.44	2.50	2.56	2.38	2.13	2.07	2.05	S	2.04	2.05	2.05	2.06	2.04	2.06	2.03	2.03	2.56	2.24
Nov 9	2.02	2.01	2.00	2.00	1.98	1.99	2.00	1.99	1.99	2.01	2.00	1.98	2.01	2.58	2.03	S	2.02	2.01	2.03	2.00	2.03	2.01	1.98	2.01	1.98	2.58	2.03
Nov 10	1.99	2.00	1.98	2.01	2.09	2.09	2.06	2.10	2.05	2.04	2.03	2.03	2.02	2.02	S	2.02	2.16	2.04	2.06	2.10	2.15	2.22	2.21	2.16	1.98	2.22	2.07
Nov 11	2.19	2.21	2.21	2.22	2.23	2.22	2.33	2.37	2.31	2.26	2.19	2.21	S	2.20	2.19	2.16	2.18	2.21	2.25	2.30	2.32	2.39	2.48	2.16	2.48	2.26	2.16
Nov 12	2.36	2.25	2.20	2.20	2.20	2.23	2.28	2.38	2.44	2.38	2.21	2.15	S	2.21	2.05	2.09	2.13	2.09	2.11	2.13	2.22	2.18	2.05	2.06	2.05	2.44	2.20
Nov 13	2.09	2.10	2.10	2.24	2.25	2.10	2.10	2.11	2.10	2.07	2.10	S	2.07	2.09	2.13	2.16	2.24	2.31	2.43	2.41	2.50	2.49	2.50	2.21	2.07	2.50	2.21
Nov 14	2.09	2.01	2.00	2.00	2.01	2.03	2.04	2.05	2.06	2.06	S	2.03	2.02	2.02	2.02	2.02	2.01	2.01	2.00	2.01	2.01	2.00	2.00	2.00	2.00	2.09	2.02
Nov 15	2.00	2.01	2.01	2.06	2.11	2.12	2.10	2.10	2.10	2.10	S	2.12	2.13	2.15	2.11	2.07	2.07	2.08	2.06	2.09	2.15	2.17	2.18	2.20	2.21	2.00	2.21
Nov 16	2.20	2.21	2.19	2.18	2.11	2.08	2.04	1.99	S	2.03	2.00	2.04	2.02	2.02	2.00	1.99	2.02	2.03	2.06	2.05	2.04	2.05	2.07	2.10	1.99	2.21	2.07
Nov 17	2.22	2.33	2.27	2.36	2.33	2.26	2.26	S	2.29	2.19	2.18	2.18	2.19	2.22	2.10	2.13	2.04	2.04	2.02	2.01	2.02	2.02	2.08	2.10	2.01	2.36	2.17
Nov 18	2.00	1.98	1.97	1.94	1.95	1.94	S	2.00	1.97	1.95	2.04	1.94	1.93	1.94	1.94	1.94	2.15	1.97	2.00	2.01	2.04	2.06	2.07	2.09	1.93	2.15	1.99
Nov 19	2.15	2.13	2.06	2.03	2.11	S	2.10	2.14	2.17	2.16	2.08	2.00	1.98	1.97	1.97	1.98	1.97	2.03	1.99	1.98	1.98	2.04	2.11	1.97	2.17	2.05	
Nov 20	2.14	2.12	2.06	2.02	S	2.00	1.99	2.16	2.16	2.18	2.11	2.13	2.10	2.15	2.02	2.00	2.02	2.02	2.15	2.16	2.13	2.03	2.02	2.10	1.99	2.18	2.09
Nov 21	2.13	2.14	2.19	S	2.17	2.19	2.15	2.16	2.22	Y	Y	Y	Y	Y	2.11	2.09	2.33	2.19	2.21	2.23	2.26	2.30	2.31	2.28	2.09	2.33	2.20
Nov 22	2.34	2.20	S	2.30	2.31	2.31	2.38	2.31	2.17	2.43	2.16	2.03	2.00	1.96	1.95	1.99	2.06	1.97	1.96	X	X	X	X	X	1.95	2.43	2.16
Nov 23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nov 24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nov 25	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	2.06	2.16	2.10	2.06	2.08	2.04	2.05	2.02	S	2.03	2.02	2.16	-
Nov 26	2.05	2.06	2.04	2.06	2.05	2.12	2.13	2.09	2.08	2.11	2.09	2.04	2.06	2.08	2.06	2.05	2.07	2.07	2.08	2.11	2.09	S	2.06	2.08	2.04	2.13	2.08
Nov 27	2.13	2.12	2.13	2.12	2.12	2.13	2.16	2.19	2.16	2.17	2.17	2.14	2.13	2.13	2.13	2.12	2.13	2.19	2.21	2.24	S	2.25	2.27	2.28	2.12	2.28	2.17
Nov 28	2.29	2.39	2.27	2.28	2.41	2.37	2.37	2.46	2.39	2.44	2.44	2.29	2.12	2.10	2.10	2.11	2.12	2.09	2.09	S	2.07	2.07	2.05	2.07	2.05	2.46	2.23
Nov 29	2.06	2.06	2.06	2.05	2.09	2.07	2.09	2.07	2.07	2.05	2.06	2.07	2.08	2.07	2.04	2.06	2.06	2.06	S	2.07	2.07	2.06	2.09	2.08	2.04	2.09	2.07
Nov 30	2.29	2.14	2.14	2.14	2.18	2.15	2.17	2.13	2.17	2.21	2.21	2.18	2.16	2.15	2.13	2.16	2.18	S	2.17	2.18	2.20	2.32	2.51	2.46	2.13	2.51	2.21
Diurnal Maximum	2.41	2.39	2.50	2.51	2.47	2.50	2.47	2.46	2.44	2.44	2.50	2.56	2.38	2.58	2.20	2.24	2.33	2.31	2.43	2.41	2.50	2.49	2.51	2.48			
Diurnal Average	2.16	2.14	2.14	2.15	2.16	2.15	2.17	2.16	2.17	2.18	2.14	2.11	2.08	2.09	2.06	2.06	2.09	2.06	2.10	2.11	2.12	2.15	2.16	2.16			

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for CH4 - Cold Lake South Station





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Instantaneous Maximums

NON-METHANE HYDROCARBONS (NMHC) in ppm

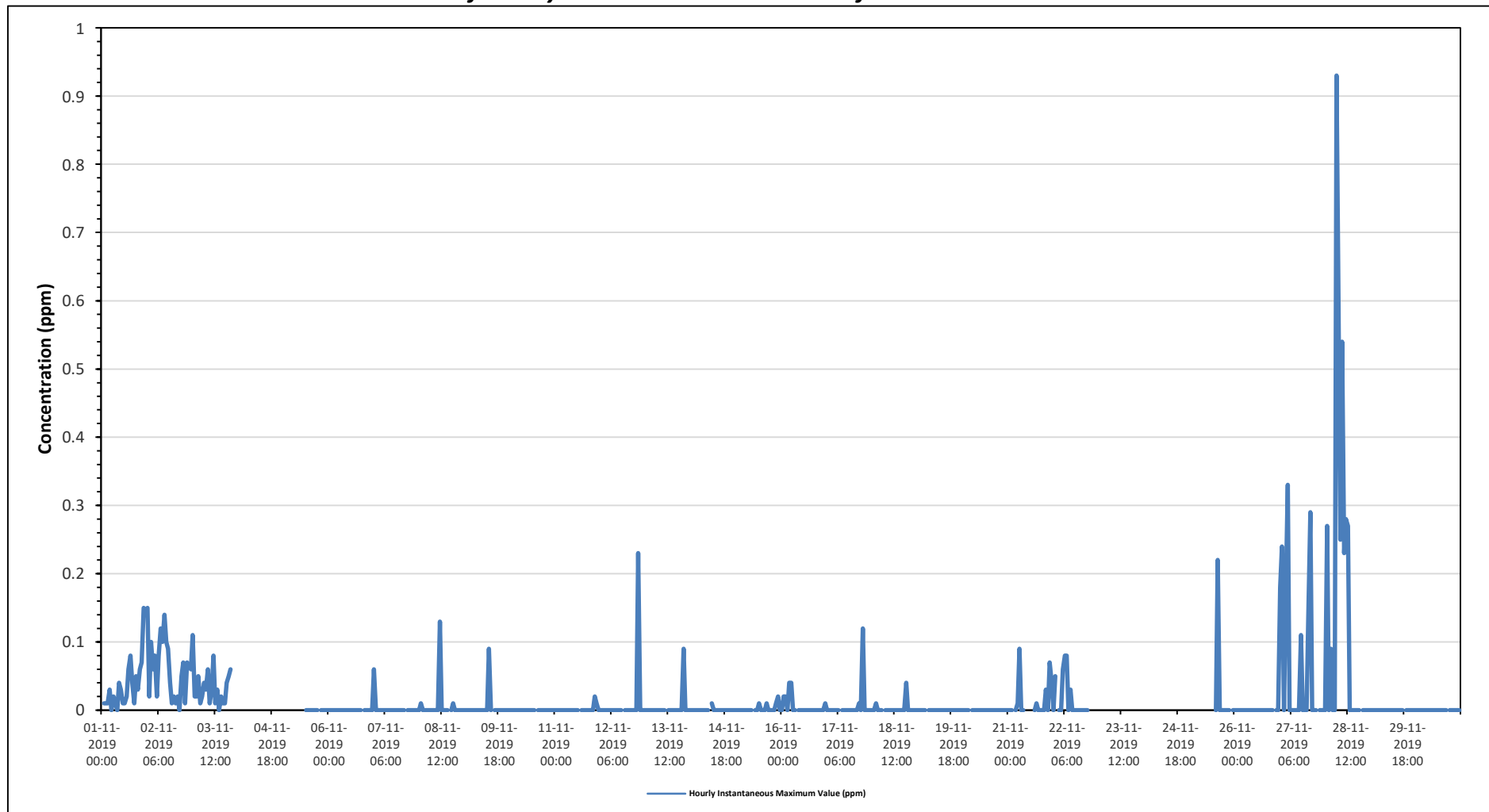
Maximum Hourly Value:	0.93 ppm on November 28 at hour 6	Hours in Service:	720
Maximum Daily Value:	0.15 ppm on November 28	Hours of Data:	582
Minimum Hourly Value:	0.00 ppm on November 1 at hour 5	Hours of Missing Data:	106
Minimum Daily Value:	0.00 ppm on November 6	Hours of Calibration:	32
Monthly Average:	0.02 ppm	Operational Uptime:	85.3

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	S	0.01	0.01	0.01	0.03	0.00	0.02	0.01	0.00	0.04	0.03	0.01	0.01	0.02	0.06	0.08	0.04	0.01	0.05	0.03	0.06	0.07	0.15	S	0.00	0.15	0.03
Nov 2	0.15	0.02	0.10	0.06	0.08	0.02	0.08	0.12	0.10	0.14	0.10	0.09	0.04	0.01	0.02	0.01	0.02	0.00	0.05	0.07	0.01	0.07	S	0.06	0.00	0.15	0.06
Nov 3	0.11	0.02	0.02	0.05	0.01	0.02	0.04	0.03	0.06	0.01	0.03	0.08	0.01	0.03	0.00	0.02	0.01	0.01	0.04	0.05	0.06	S	X	X	0.00	0.11	0.03
Nov 4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nov 5	X	X	X	X	X	X	X	X	C	C	C	C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	-
Nov 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 7	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 8	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	S	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00
Nov 12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00
Nov 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
Nov 14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.00
Nov 16	0.00	0.02	0.02	0.00	0.04	0.04	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04	0.01
Nov 17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 18	0.00	0.00	0.01	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 19	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 20	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 21	0.00	0.00	0.00	S	0.00	0.01	0.09	0.00	0.00	Y	Y	Y	Y	Y	0.00	0.01	0.00	0.00	0.00	0.00	0.03	0.00	0.07	0.04	0.00	0.00	0.00
Nov 22	0.00	0.05	S	0.00	0.00	0.06	0.08	0.08	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	X	X	X	X	X	0.00	0.08	0.02
Nov 23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nov 24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nov 25	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	-
Nov 26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00
Nov 27	0.18	0.24	0.00	0.17	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.14	0.29	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.06
Nov 28	0.00	0.27	0.00	0.09	0.00	0.00	0.93	0.63	0.25	0.54	0.23	0.28	0.27	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diurnal Maximum	0.18	0.27	0.10	0.17	0.33	0.06	0.93	0.63	0.25	0.54	0.23	0.28	0.27	0.09	0.06	0.22	0.29	0.01	0.05	0.12	0.23	0.07	0.15	0.06			
Diurnal Average	0.02	0.03	0.01	0.02	0.02	0.01	0.05	0.04	0.02	0.03	0.02	0.03	0.01	0.01	0.00	0.02	0.01	0.00	0.01	0.01	0.02	0.01	0.01	0.00			

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for NMHC - Cold Lake South Station





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - November 2019

Summary of Hourly Instantaneous Maximums

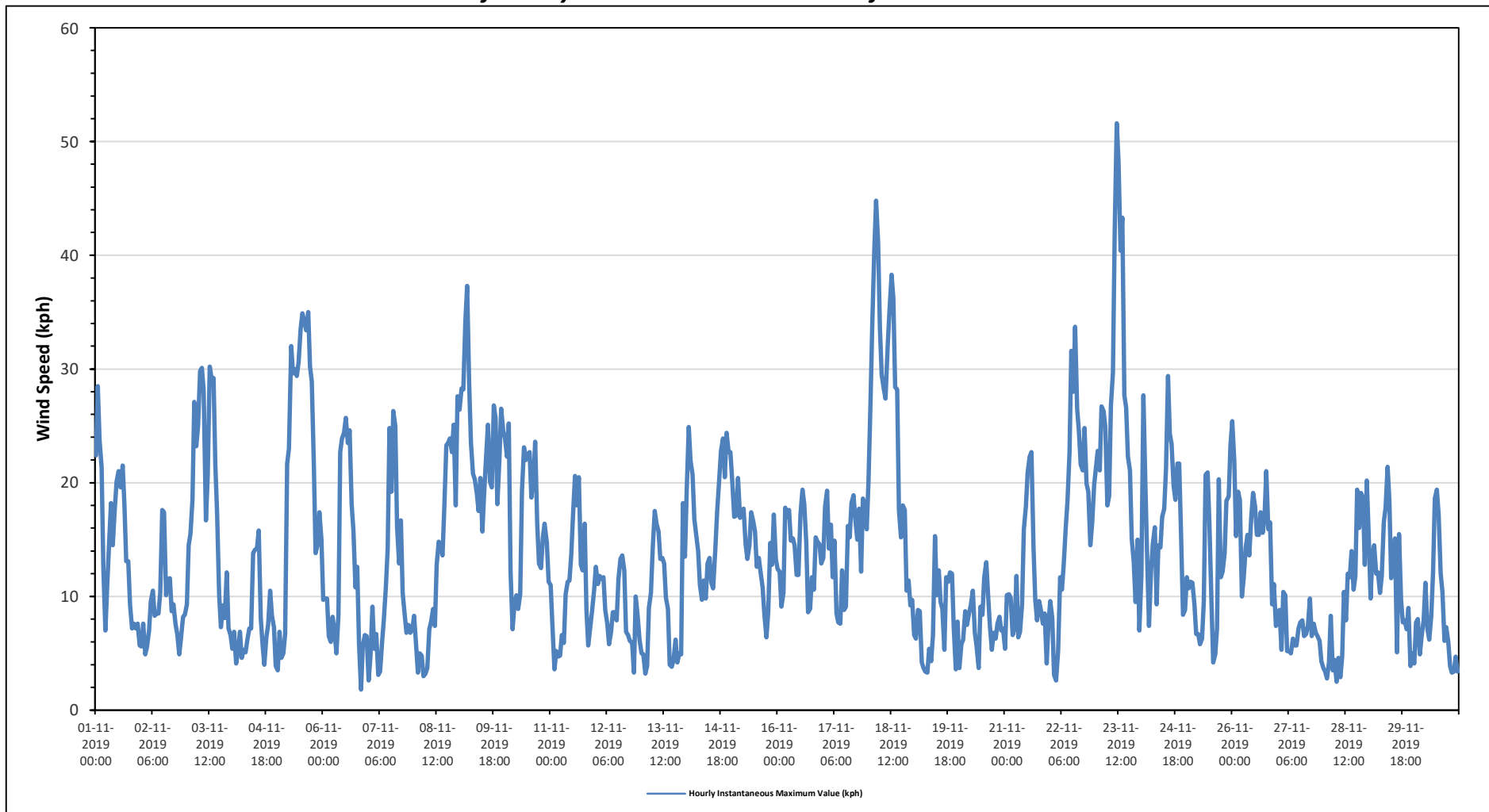
WIND SPEED (WS) in km/hr

Maximum Hourly Value:	51.6 kph on November 23 at hour 11	Hours in Service:	720
Maximum Daily Value:	26.4 kph on November 18	Hours of Data:	720
Minimum Hourly Value:	1.8 kph on November 6 at hour 20	Hours of Missing Data:	0
Minimum Daily Value:	6.9 kph on November 27	Hours of Calibration:	0
Monthly Average:	13.9 kph	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	22.4	28.5	23.7	21.4	12.4	7.0	10.9	14.9	18.2	14.5	17.7	20.1	21.0	19.6	21.5	18.0	13.1	13.1	9.3	7.2	7.6	7.2	7.6	5.7	5.7	28.5	15.1
Nov 2	5.6	7.6	4.9	5.6	7.0	9.6	10.5	8.3	8.5	8.5	10.3	17.6	17.4	10.1	11.5	11.6	8.7	9.3	7.6	6.7	4.9	6.4	8.2	8.4	4.9	17.6	9.0
Nov 3	9.3	14.5	15.5	18.5	27.1	23.2	25.0	29.8	30.1	28.1	16.7	20.6	30.2	29.2	29.2	21.6	17.3	10.2	7.3	9.2	8.1	12.1	7.2	6.6	6.6	30.2	18.6
Nov 4	5.4	6.9	4.1	5.1	6.9	4.6	5.3	5.1	6.3	7.2	7.2	13.8	14.1	14.2	15.8	8.1	5.8	4.0	6.4	7.5	10.5	8.3	7.3	3.9	3.9	15.8	7.7
Nov 5	3.5	6.9	4.6	5.0	6.7	21.7	23.0	32.0	29.6	30.0	29.4	30.6	33.5	34.9	34.1	33.4	35.0	30.2	28.9	21.7	13.8	14.6	17.4	15.0	3.5	35.0	22.3
Nov 6	9.7	9.8	9.8	6.5	6.0	8.2	6.9	5.0	8.4	22.7	23.9	24.4	25.7	23.5	24.6	18.1	15.8	10.8	12.6	5.9	1.8	5.7	6.6	6.5	1.8	25.7	12.5
Nov 7	2.6	4.7	9.1	5.4	6.7	3.1	3.4	6.0	8.0	10.9	14.2	24.8	19.2	26.3	25.0	16.1	12.9	16.7	10.3	8.4	6.8	7.5	6.8	7.1	2.6	26.3	10.9
Nov 8	8.3	5.7	3.3	5.0	4.8	3.0	3.2	3.7	7.1	7.8	8.9	7.4	12.8	14.8	14.4	13.6	17.8	23.3	23.5	23.9	22.7	25.1	18.0	27.6	3.0	27.6	12.7
Nov 9	26.4	28.3	28.2	34.2	37.3	28.6	23.5	20.8	20.3	19.1	17.5	20.4	15.7	19.1	22.4	25.1	20.1	19.6	26.8	25.7	18.1	22.0	26.5	24.6	15.7	37.3	23.8
Nov 10	23.9	22.3	25.2	12.2	7.1	9.2	10.1	8.9	10.2	19.3	23.1	22.0	22.5	22.7	18.7	20.2	23.6	16.4	12.9	12.5	15.1	16.4	14.7	11.3	7.1	25.2	16.7
Nov 11	11.0	7.4	3.6	5.2	4.7	4.8	6.6	5.9	10.2	11.3	11.4	13.6	17.6	20.6	18.0	20.5	12.8	12.3	16.4	8.8	5.7	7.3	8.7	10.5	3.6	20.6	10.6
Nov 12	12.6	11.1	11.8	11.5	11.7	8.8	7.6	5.8	6.9	8.6	8.6	7.9	11.5	13.3	13.6	12.3	6.9	6.6	6.1	5.9	3.3	10.0	8.2	6.2	3.3	13.6	9.0
Nov 13	5.0	4.9	3.2	3.9	9.0	10.3	14.2	17.5	16.4	15.7	13.3	13.4	12.9	9.9	8.9	4.0	3.8	4.4	6.2	4.2	5.0	4.9	18.2	13.5	3.2	18.2	9.3
Nov 14	19.4	24.9	21.9	20.7	16.8	15.5	14.0	11.0	9.7	11.4	9.8	12.9	13.4	11.2	10.7	13.9	17.5	20.3	22.8	23.9	20.5	24.4	22.7	22.7	9.7	24.9	17.2
Nov 15	19.9	17.0	17.1	20.4	16.9	17.4	17.7	14.6	13.3	14.5	17.4	16.6	15.7	12.6	13.4	12.1	10.8	8.4	6.4	8.6	14.7	12.8	17.2	13.3	6.4	20.4	14.5
Nov 16	12.4	12.2	9.1	10.3	17.8	17.0	17.6	14.9	15.1	14.5	11.9	11.9	17.2	19.4	18.1	14.7	8.6	8.9	11.7	10.6	15.2	14.8	14.6	12.9	8.6	19.4	13.8
Nov 17	13.4	17.9	19.3	14.2	16.3	11.7	14.9	8.5	7.7	7.6	12.3	8.8	9.1	16.2	15.2	18.2	18.9	16.8	15.0	17.7	12.2	18.6	18.1	15.9	7.6	19.3	14.4
Nov 18	20.1	27.1	34.0	40.5	44.8	41.1	33.6	29.5	28.3	27.4	32.2	35.2	38.3	36.2	28.4	28.2	17.6	15.2	18.0	17.6	10.5	11.4	9.2	9.7	9.2	44.8	26.4
Nov 19	6.6	6.3	8.8	8.7	4.2	3.7	3.4	3.3	5.4	4.3	6.6	15.3	10.1	12.3	9.5	8.9	5.3	11.7	11.3	12.1	12.0	7.2	3.6	7.8	3.3	15.3	7.9
Nov 20	3.7	5.8	6.2	8.7	7.5	8.5	9.2	10.5	6.8	5.6	3.7	9.1	8.4	11.7	13.0	10.2	7.5	5.3	6.8	6.3	7.6	8.2	7.0	7.2	3.7	13.0	7.7
Nov 21	5.4	10.1	10.2	9.9	6.6	7.2	11.8	6.4	6.9	9.3	15.9	17.9	20.9	22.3	22.7	14.4	9.7	7.9	9.6	8.8	7.6	8.5	4.1	7.6	4.1	22.7	10.9
Nov 22	9.6	8.1	3.1	2.6	5.2	11.7	10.6	12.8	16.0	18.4	22.7	31.6	28.0	33.7	26.5	24.5	21.6	21.1	24.8	19.9	19.2	14.5	16.4	19.8	2.6	33.7	17.6
Nov 23	21.3	22.8	21.1	26.7	26.3	24.9	18.0	18.8	26.8	29.7	42.2	51.6	48.2	40.4	43.3	27.7	26.6	22.3	21.1	15.1	13.0	9.5	15.0	7.0	7.0	51.6	25.8
Nov 24	11.8	27.7	20.6	13.2	7.4	12.2	14.6	16.1	9.3	14.5	14.3	17.0	17.7	21.2	29.4	24.3	23.4	19.7	18.5	21.7	21.7	14.8	8.4	8.8	7.4	29.4	17.0
Nov 25	11.7	10.7	11.3	11.2	9.3	6.7	6.7	5.8	6.3	9.6	20.7	20.9	16.4	9.6	4.2	4.9	7.2	20.3	11.7	12.2	13.8	18.4	18.8	23.3	4.2	23.3	12.2
Nov 26	25.4	21.9	15.3	19.2	18.5	10.0	11.6	14.3	15.4	13.6	17.0	19.1	17.9	15.4	15.4	17.4	15.6	16.9	21.0	15.9	16.5	9.3	11.1	7.4	7.4	25.4	15.9
Nov 27	8.0	8.8	5.3	10.4	10.1	5.2	5.2	5.0	6.3	5.7	5.7	7.2	7.7	7.9	6.5	6.7	7.4	9.8	6.5	7.6	6.8	6.5	6.1	4.3	4.3	10.4	6.9
Nov 28	3.7	3.4	2.8	4.2	8.3	3.5	4.4	2.5	4.6	2.9	4.7	10.4	7.9	12.0	11.7	14.0	10.6	11.8	19.4	16.0	19.1	18.7	12.8	20.2	2.5	20.2	9.6
Nov 29	15.7	9.8	13.7	14.5	12.0	12.1	10.3	11.8	16.5	17.8	21.4	18.4	11.6	12.8	15.1	5.1	15.5	9.7	7.7	7.9	7.1	9.0	3.9	5.0	3.9	21.4	11.9
Nov 30	4.1	7.7	8.0	4.9	6.5	7.9	11.2	7.1	6.2	8.3	12.1	18.6	19.4	17.2	12.0	10.4	6.1	7.3	6.0	3.9	3.3	3.4	4.7	3.4	3.3	19.4	8.3
Diurnal Maximum	26.4	28.5	34.0	40.5	44.8	41.1	33.6	32.0	30.1	30.0	42.2	51.6	48.2	40.4	43.3	33.4	35.0	30.2	28.9	25.7	22.7	25.1	26.5	27.6			
Diurnal Average	11.9	13.4	12.5	12.7	12.7	11.9	12.2	11.9	12.7	14.0	15.8	18.6	18.7	19.0	18.4	15.9	14.1	13.7	13.8	12.4	11.5	11.9	11.6	11.4			
C	Calibration				S	Daily Zero/Span					Q	Quality Assurance			C1	Repeat Calibration					S1	Repeat Daily Zero/Span					
G	Out for Repair					K	Collection Error				N	Not in Service			O	Operator Error					P	Power Failure					
R	Recovery					X	Machine Malfunction				Y	Maintenance			T	Exceeds Temperature Limits					N	Not in Service					

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for WS - Cold Lake South Station



MASKWA STATION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Instantaneous Maximums

SULPHUR DIOXIDE (SO₂) in ppb

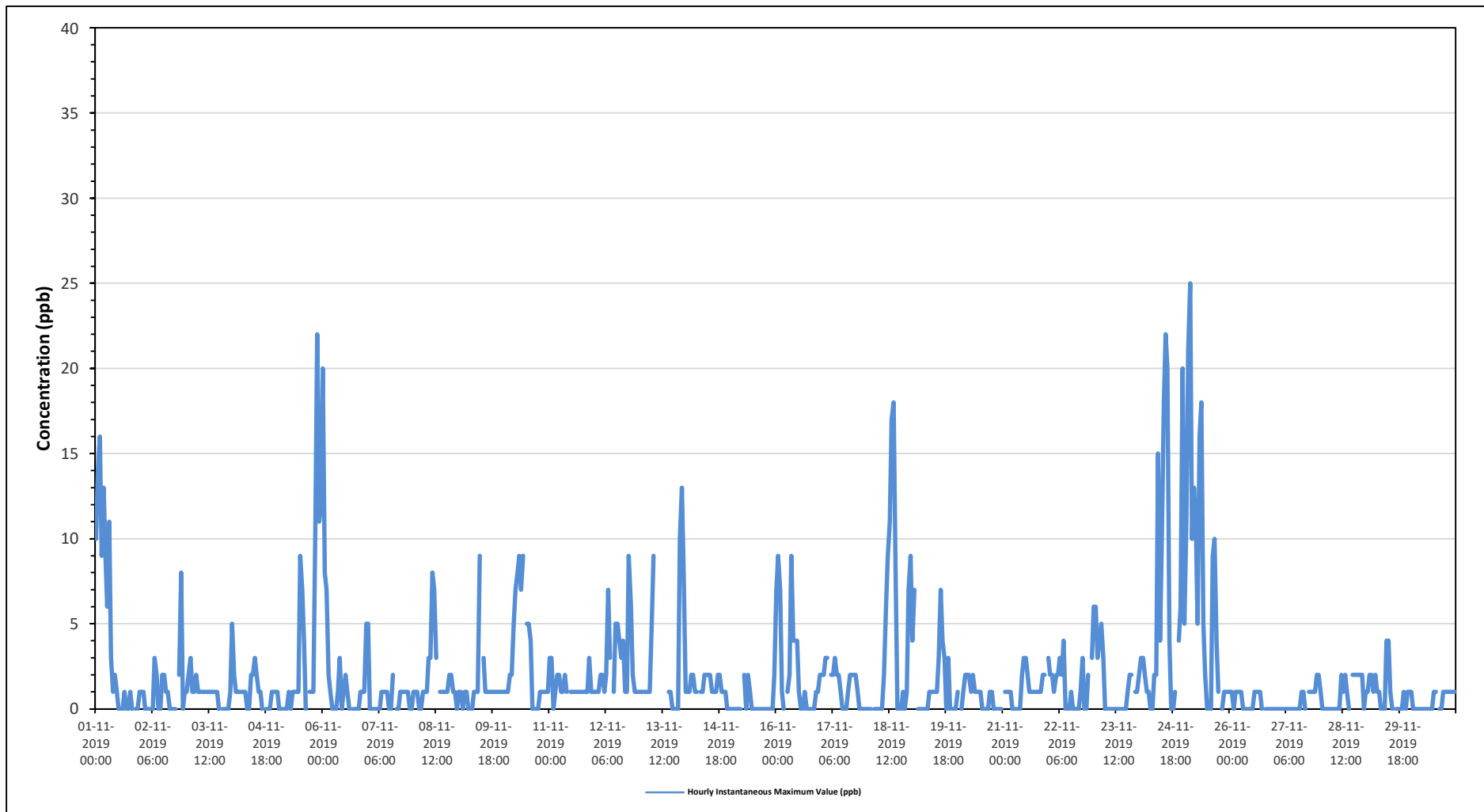
Maximum Hourly Value:	25 ppb on November 25 at hour 3	Hours in Service:	720
Maximum Daily Value:	7.3 ppb on November 25	Hours of Data:	684
Minimum Hourly Value:	0 ppb on November 1 at hour 12	Hours of Missing Data:	0
Minimum Daily Value:	0.3 ppb on November 15	Hours of Calibration:	36
Monthly Average:	2.0 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	10	14	16	9	13	9	6	11	3	1	2	1	0	13	0	1	0	0	1	0	S	0	0	1	0	16	4.3	
Nov 2	1	1	0	0	0	0	0	3	2	0	0	2	2	1	1	0	0	0	0	0	S	2	8	0	1	0	8	1.0
Nov 3	1	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	S	0	0	0	0	1	0	3	1.0
Nov 4	5	2	1	1	1	1	1	1	0	0	2	2	3	2	1	1	0	S	0	0	0	0	1	1	1	0	5	1.2
Nov 5	1	0	0	0	0	0	1	0	1	1	1	1	9	7	4	0	S	1	1	1	1	11	22	11	12	0	22	3.7
Nov 6	20	8	7	2	1	0	0	0	1	3	0	1	2	1	0	S	0	0	0	0	1	1	1	5	0	20	2.3	
Nov 7	5	0	0	0	0	0	1	1	1	1	1	0	0	2	S	0	0	1	1	1	1	1	1	0	0	5	0.7	
Nov 8	1	1	1	0	0	1	1	1	3	3	8	7	3	S	1	1	1	1	1	2	2	1	1	0	0	8	1.8	
Nov 9	1	1	0	1	1	0	0	0	1	1	1	9	S	3	1	1	1	1	1	1	1	1	1	1	1	0	9	1.3
Nov 10	1	1	1	2	2	5	7	8	9	7	9	S	5	5	4	0	0	0	1	1	1	1	1	1	0	9	3.1	
Nov 11	3	3	0	1	2	2	1	1	2	1	S	1	1	1	1	1	1	1	1	1	1	1	3	1	1	0	3	1.3
Nov 12	1	1	1	2	2	1	2	7	3	S	1	5	5	4	3	4	1	1	9	6	2	1	1	1	1	1	9	2.8
Nov 13	1	1	1	1	1	1	5	9	S	4	C	C	C	C	C	1	1	0	0	0	0	10	13	8	0	13	3.2	
Nov 14	1	1	1	2	2	1	1	S	1	1	2	2	2	2	1	1	1	2	2	1	1	1	0	0	0	2	1.3	
Nov 15	0	0	0	0	0	0	S	2	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0.3	
Nov 16	7	9	7	1	0	S	1	2	9	4	4	4	1	0	0	1	0	0	0	0	0	1	1	2	0	9	2.3	
Nov 17	2	2	3	3	S	2	2	3	2	2	1	0	0	0	1	2	2	2	2	1	0	0	0	0	0	3	1.4	
Nov 18	0	0	0	S	0	0	0	0	0	0	2	6	9	11	17	18	9	0	0	0	1	0	1	7	9	0	18	3.9
Nov 19	4	7	S	0	0	0	0	0	1	1	1	1	1	1	3	7	4	3	0	3	0	0	0	0	0	7	1.6	
Nov 20	1	S	0	1	2	2	2	1	2	1	1	1	1	0	0	0	0	1	1	0	0	0	0	0	0	2	0.7	
Nov 21	S	1	1	1	1	0	0	0	0	0	2	3	3	2	1	1	1	1	1	1	1	2	2	S	0	3	1.1	
Nov 22	3	2	2	1	2	2	3	2	4	0	0	0	1	0	0	0	1	3	0	0	2	S	3	0	4	1.3		
Nov 23	6	6	3	4	5	3	0	0	0	0	0	0	0	0	0	0	0	1	2	2	S	1	1	0	6	1.5		
Nov 24	2	3	3	2	1	1	0	0	2	2	15	4	10	18	22	20	4	0	0	1	S	4	6	20	0	22	6.1	
Nov 25	5	11	21	25	10	13	11	5	16	18	5	2	0	0	0	9	10	4	1	S	0	1	1	1	0	25	7.3	
Nov 26	1	1	0	1	1	1	1	0	0	0	0	0	0	0	1	1	1	0	S	0	0	0	0	0	0	1	0.4	
Nov 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	S	1	1	1	1	2	2	0	2	0.4	
Nov 28	1	0	0	0	0	0	0	0	0	0	2	1	2	1	0	S	2	2	2	2	2	2	2	0	0	2	0.8	
Nov 29	1	1	2	2	1	2	1	1	0	0	4	4	1	0	S	0	0	0	0	1	0	1	1	1	0	4	1.0	
Nov 30	1	0	0	0	0	0	0	0	0	0	0	0	1	1	S	0	0	1	1	1	1	1	1	1	0	1	0.4	
Diurnal Maximum	20	14	21	25	13	13	11	11	16	18	15	9	11	18	22	20	10	4	9	6	11	22	13	20				
Diurnal Average	3.0	2.7	2.6	2.2	1.7	1.7	1.6	2.0	2.2	1.9	2.3	2.2	2.4	2.6	2.4	2.3	1.0	0.8	1.1	1.0	1.1	2.3	1.9	2.6				

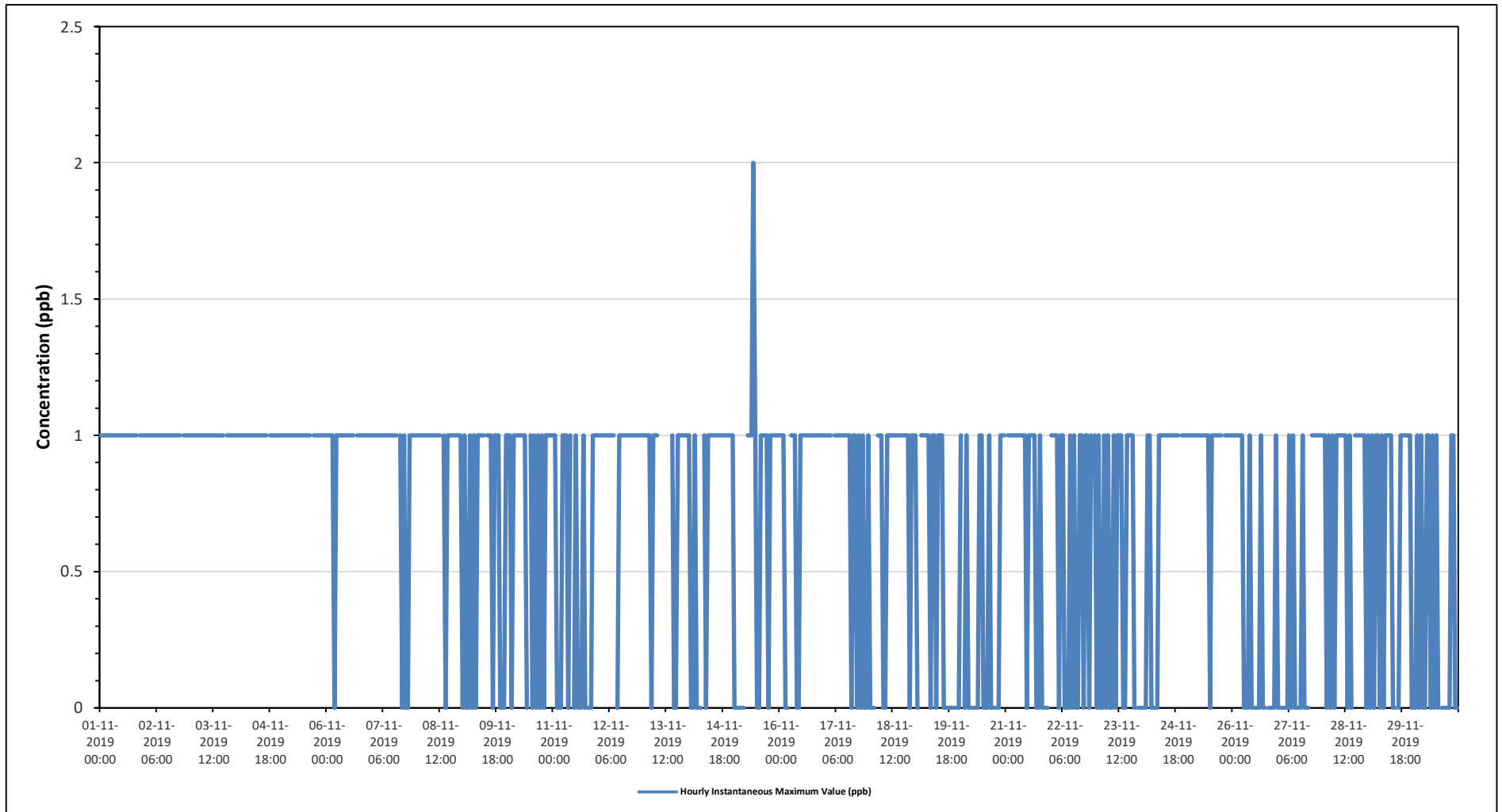
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for SO2 - Maskwa Site



Timeseries Chart of Hourly Instantaneous Maximum for H2S - Maskwa Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Instantaneous Maximums

OXIDES OF NITROGEN (NOx) in ppb

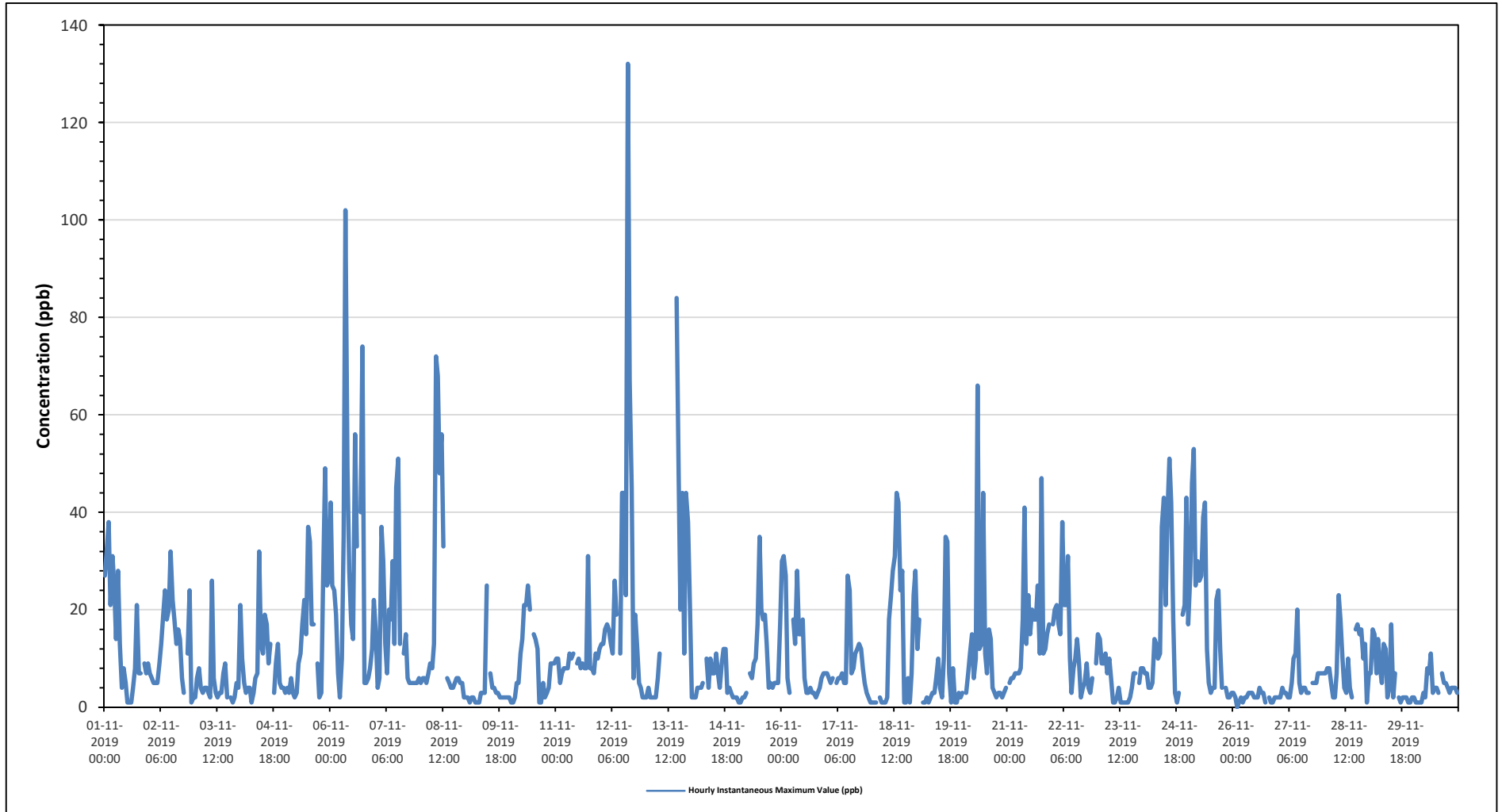
Maximum Hourly Value: 132 ppb on November 12 at hour 14	Hours in Service: 720
Maximum Daily Value: 27.6 ppb on November 6	Hours of Data: 683
Minimum Hourly Value: 0 ppb on November 26 at hour 2	Hours of Missing Data: 0
Minimum Daily Value: 2.0 ppb on November 26	Hours of Calibration: 37
Monthly Average: 11.6 ppb	Operational Uptime: 100.0

Day	Hourly Period Starting at (MST)																							Daily	Daily	Daily	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Minimum	Maximum	Average
Nov 1	27	32	38	21	31	25	14	28	13	4	8	5	1	1	4	8	21	7	7	S	9	7	9	1	38	14.0	
Nov 2	7	6	5	5	5	9	13	19	24	18	20	32	22	18	13	16	14	6	3	S	11	24	1	2	1	32	12.7
Nov 3	2	6	8	4	3	4	4	3	2	26	6	3	2	3	3	7	9	2	S	2	1	2	5	4	1	26	4.8
Nov 4	21	10	5	3	4	4	1	3	6	7	32	13	11	19	17	9	13	S	3	9	13	5	4	4	1	32	9.4
Nov 5	3	4	3	6	3	2	3	9	11	17	22	15	37	34	17	17	S	9	2	3	26	49	25	26	2	49	14.9
Nov 6	42	25	24	19	7	2	10	35	102	49	28	17	14	56	33	S	40	74	5	5	6	8	12	22	2	102	27.6
Nov 7	16	4	6	37	30	13	7	20	18	30	13	45	51	13	S	11	15	6	5	5	5	5	5	6	4	51	15.9
Nov 8	5	6	6	5	7	9	8	13	72	68	48	56	33	S	6	5	4	4	5	6	6	5	5	2	2	72	16.7
Nov 9	2	2	1	2	2	1	1	1	3	3	3	25	S	7	4	4	3	3	2	2	2	2	2	2	1	25	3.4
Nov 10	1	1	2	5	5	11	14	21	21	25	20	S	15	14	12	1	1	5	2	3	4	9	9	1	25	9.1	
Nov 11	10	10	5	7	8	8	8	11	10	11	S	9	10	8	9	8	8	31	8	8	7	11	10	12	5	31	9.9
Nov 12	13	13	16	17	16	13	11	26	19	S	11	44	44	23	132	67	45	6	19	12	5	4	2	2	2	132	24.3
Nov 13	2	4	2	2	2	2	6	11	S	49	C	C	C	C	C	C	84	48	20	44	11	44	38	22	2	84	-
Nov 14	2	2	2	4	4	4	5	S	10	4	10	7	7	11	7	4	9	12	12	3	4	3	2	2	2	12	5.7
Nov 15	2	1	1	2	2	3	S	7	6	9	10	17	35	20	18	19	13	4	5	4	5	5	5	17	1	35	9.1
Nov 16	30	31	27	6	3	S	18	13	28	15	15	18	6	3	3	4	3	3	2	3	4	6	7	7	2	31	11.1
Nov 17	7	6	5	6	S	5	6	6	7	5	5	27	24	7	8	11	12	13	12	8	5	3	2	1	1	27	8.3
Nov 18	1	1	1	S	2	1	1	1	2	18	23	28	31	44	42	24	28	1	1	6	1	7	23	28	1	44	13.7
Nov 19	12	18	S	1	1	2	1	2	3	3	6	10	4	2	10	35	34	7	1	8	1	1	3	2	1	35	7.3
Nov 20	3	S	3	7	11	15	6	10	66	12	13	44	11	7	16	14	4	3	2	3	3	2	3	4	2	66	11.4
Nov 21	S	5	6	6	7	7	7	8	18	41	13	23	15	20	18	18	25	11	47	11	12	15	17	S	5	47	15.9
Nov 22	17	20	21	17	15	38	21	21	31	10	3	8	10	14	9	2	4	5	9	4	3	6	S	9	2	38	12.9
Nov 23	15	14	9	9	11	7	10	6	1	1	2	4	1	1	1	1	1	2	4	7	7	S	5	8	1	15	5.5
Nov 24	8	7	7	4	4	5	14	13	10	11	37	43	21	41	51	42	18	3	1	3	S	19	21	43	1	51	18.5
Nov 25	17	27	46	53	25	30	26	27	39	42	12	5	3	4	4	22	24	12	4	S	4	2	2	3	2	53	18.8
Nov 26	3	2	0	1	2	1	2	2	3	3	2	2	2	2	4	3	3	1	S	2	1	1	2	2	0	4	2.0
Nov 27	2	2	4	3	3	2	2	5	10	11	20	5	3	4	4	3	3	S	5	5	5	7	7	7	2	20	5.3
Nov 28	7	7	8	8	5	2	2	7	23	18	10	4	3	10	4	2	S	16	17	15	16	10	13	1	1	23	9.0
Nov 29	7	7	16	15	7	14	8	5	13	12	2	4	17	2	7	S	2	1	2	2	2	1	1	2	1	17	6.5
Nov 30	2	1	1	1	1	3	2	8	7	11	3	4	4	3	S	7	5	5	4	3	4	4	4	3	1	11	3.9
Diurnal Maximum	42	32	46	53	31	38	26	35	102	68	48	56	51	56	132	67	84	74	47	44	26	49	38	43			
Daiurnal Average	9.9	9.4	9.6	9.5	7.8	8.3	8.0	11.8	19.9	18.4	14.2	18.5	15.6	14.0	16.8	13.3	15.4	11.2	7.5	6.9	6.2	9.3	8.3	9.0			

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for NOx - Maskwa Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Instantaneous Maximums

NITRIC OXIDE (NO) in ppb

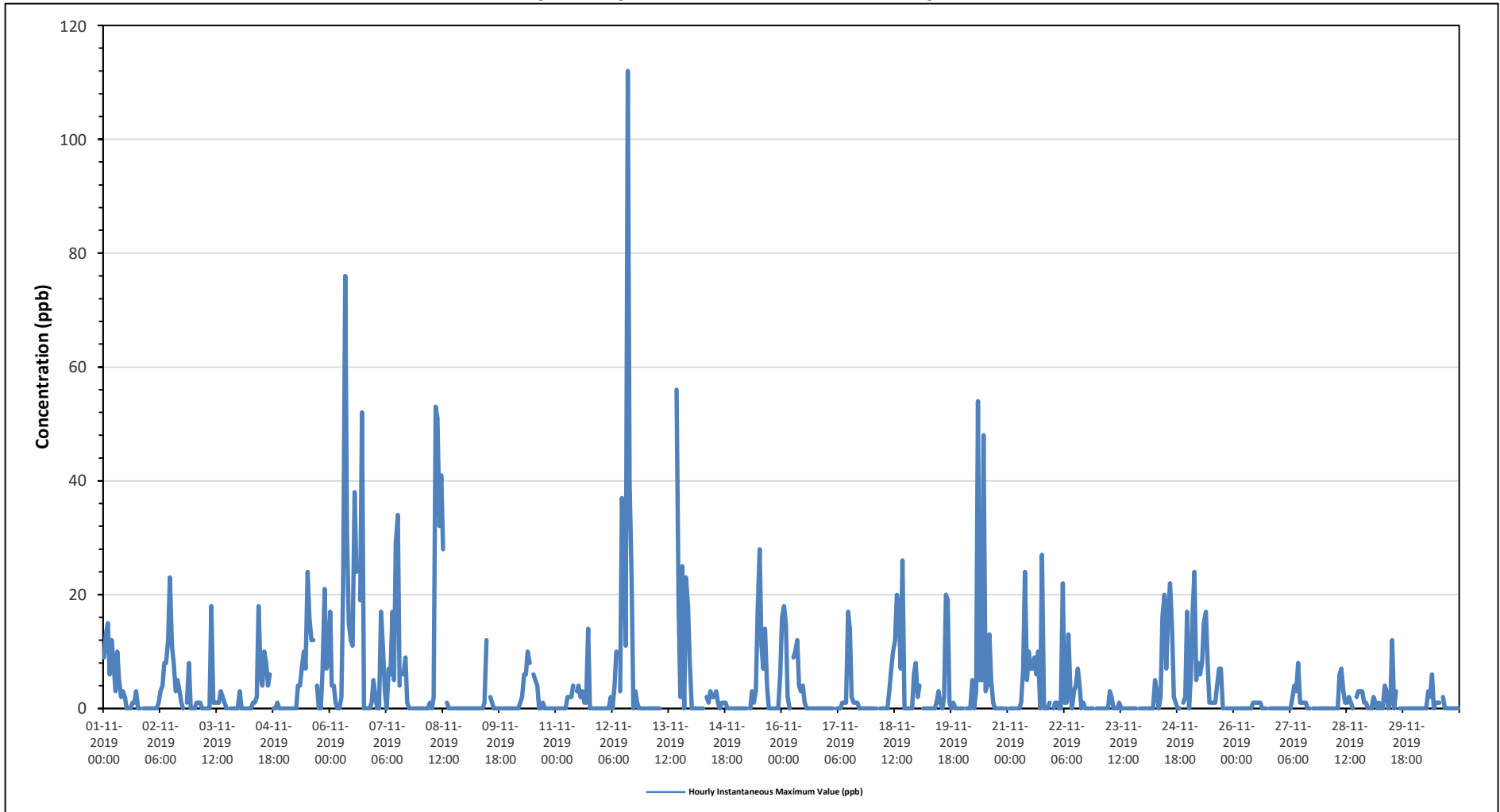
Maximum Hourly Value:	112 ppb on November 12 at hour 14	Hours in Service:	720
Maximum Daily Value:	14.5 ppb on November 6	Hours of Data:	683
Minimum Hourly Value:	0 ppb on November 1 at hour 12	Hours of Missing Data:	0
Minimum Daily Value:	0.2 ppb on November 26	Hours of Calibration:	37
Monthly Average:	4.1 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	9	13	15	6	12	8	3	10	5	2	3	2	0	13	0	1	1	3	0	0	S	0	0	0	0	0	15	4.0
Nov 2	0	0	0	0	0	1	3	4	8	8	12	23	11	8	3	5	3	1	0	S	1	8	0	0	0	0	23	4.3
Nov 3	0	1	1	1	0	0	0	0	1	18	1	1	1	3	2	1	0	S	0	0	0	0	0	0	0	0	18	1.3
Nov 4	3	0	0	0	0	0	0	1	2	18	6	4	10	8	4	6	S	0	1	0	0	0	0	0	0	0	18	2.8
Nov 5	0	0	0	0	0	0	0	4	4	7	10	7	24	16	12	12	S	4	0	0	7	21	7	8	0	24	6.2	
Nov 6	17	4	4	1	0	0	2	22	76	31	15	12	11	38	24	S	19	52	0	0	0	0	1	5	0	76	14.5	
Nov 7	2	0	0	17	11	3	0	7	6	17	5	29	34	4	S	6	9	1	0	0	0	0	0	0	0	0	34	6.6
Nov 8	0	0	0	0	0	1	0	2	53	51	32	41	28	S	1	0	0	0	0	0	0	0	0	0	0	0	53	9.1
Nov 9	0	0	0	0	0	0	0	0	0	0	1	12	S	2	1	0	0	0	0	0	0	0	0	0	0	0	12	0.7
Nov 10	0	0	0	0	0	1	2	6	6	10	8	S	6	5	4	0	0	1	0	0	0	0	0	0	0	0	10	2.1
Nov 11	0	0	0	0	0	0	2	2	2	4	S	3	4	2	3	1	1	14	0	0	0	0	0	0	0	0	14	1.7
Nov 12	0	0	0	0	0	2	0	4	10	S	3	37	26	11	112	40	23	0	3	1	0	0	0	0	0	0	112	11.8
Nov 13	0	0	0	0	0	0	0	0	S	37	C	C	C	C	C	C	56	18	2	25	0	23	18	8	0	56	-	
Nov 14	0	0	0	0	0	0	0	S	2	1	3	2	2	3	1	0	1	1	1	0	0	0	0	0	0	0	3	0.7
Nov 15	0	0	0	0	0	0	S	0	3	1	3	17	28	11	7	14	4	0	0	0	0	0	0	6	0	28	4.1	
Nov 16	16	18	15	2	0	S	9	10	12	4	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	18	4.1
Nov 17	0	0	0	0	S	0	0	0	1	1	1	17	14	2	1	1	1	0	0	0	0	0	0	0	0	0	17	1.7
Nov 18	0	0	0	S	0	0	0	0	0	3	7	10	12	20	18	7	26	0	0	0	0	0	6	8	0	26	5.1	
Nov 19	2	4	S	0	0	0	0	0	0	0	1	3	1	0	2	20	19	1	0	1	0	0	0	0	0	0	20	2.3
Nov 20	0	S	0	0	0	5	0	3	54	5	5	48	3	4	13	5	1	0	0	0	0	0	0	0	0	0	54	6.3
Nov 21	S	0	0	0	0	0	0	1	7	24	5	10	7	7	9	6	10	0	27	0	0	0	1	S	0	27	5.2	
Nov 22	0	1	1	0	0	22	1	1	13	3	0	3	4	7	4	0	1	0	0	0	0	0	S	S	0	0	22	2.7
Nov 23	0	0	0	0	0	0	3	2	0	0	0	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	3	0.3
Nov 24	0	0	0	0	0	0	5	3	0	2	16	20	7	17	22	14	2	1	0	0	S	1	2	17	0	22	5.6	
Nov 25	0	6	17	24	5	8	6	8	15	17	8	1	1	1	1	4	7	7	0	S	0	0	0	0	0	0	24	5.9
Nov 26	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	S	0	0	0	0	0	0	1	0.2
Nov 27	0	0	0	0	0	0	0	2	4	3	8	1	1	1	1	0	0	S	0	0	0	0	0	0	0	0	8	0.9
Nov 28	0	0	0	0	0	0	0	6	7	3	1	1	2	1	0	S	2	3	3	3	3	1	1	0	0	7	1.5	
Nov 29	0	0	2	1	0	1	0	4	3	0	1	12	0	3	S	0	0	0	0	0	0	0	0	0	0	0	12	1.2
Nov 30	0	0	0	0	0	0	0	3	2	6	0	1	1	1	S	2	0	0	0	0	0	0	0	0	0	0	6	0.7
Diurnal Maximum	17	18	17	24	12	22	9	22	76	51	32	48	34	38	112	40	56	52	27	25	7	23	18	17				
Diurnal Average	1.7	1.6	1.9	1.8	1.0	1.8	1.2	3.3	10.1	9.2	6.1	11.2	8.8	6.2	9.4	5.3	6.8	3.8	1.3	1.1	0.4	1.9	1.2	1.8				

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for NO - Maskwa Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Instantaneous Maximums

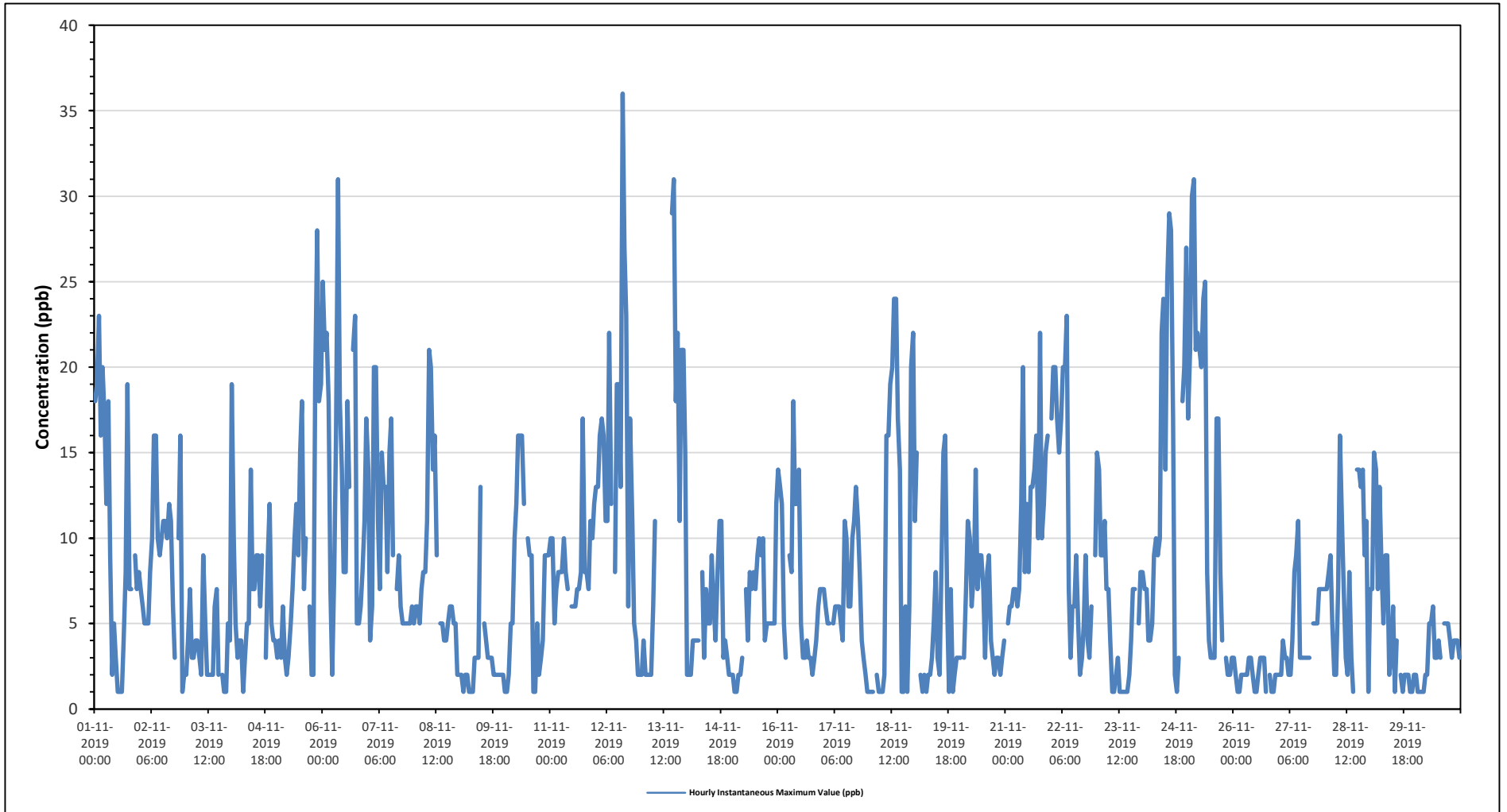
NITROGEN DIOXIDE (NO₂) in ppb

Maximum Hourly Value:	36 ppb on November 12 at hour 14	Hours in Service:	720
Maximum Daily Value:	14.1 ppb on November 6	Hours of Data:	683
Minimum Hourly Value:	1 ppb on November 1 at hour 12	Hours of Missing Data:	0
Minimum Daily Value:	2.0 ppb on November 26	Hours of Calibration:	37
Monthly Average:	7.9 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	18	19	23	16	20	17	12	18	9	2	5	3	1	1	1	4	8	19	7	7	S	9	7	8	1	23	10.2
Nov 2	7	6	5	5	5	8	10	16	16	10	9	10	11	11	10	12	11	6	3	S	10	16	1	2	1	16	8.7
Nov 3	2	4	7	3	3	4	4	3	2	9	5	2	2	2	2	6	7	2	S	2	1	1	5	4	1	9	3.6
Nov 4	19	10	5	3	4	4	1	3	5	5	14	7	7	9	9	6	9	S	3	9	12	5	4	4	1	19	6.8
Nov 5	3	4	3	6	3	2	3	5	7	10	12	9	15	18	7	10	S	6	2	2	19	28	18	19	2	28	9.2
Nov 6	25	21	22	18	7	2	8	16	31	18	14	8	8	18	13	S	21	23	5	5	6	8	11	17	2	31	14.1
Nov 7	14	4	6	20	20	11	7	15	13	13	8	15	17	9	S	7	9	6	5	5	5	5	5	6	4	20	9.8
Nov 8	5	6	6	5	7	8	8	11	21	20	14	16	9	S	5	5	4	4	5	6	6	5	5	2	2	21	8.0
Nov 9	2	2	1	2	2	1	1	1	3	3	3	13	S	5	4	3	3	3	2	2	2	2	2	2	1	13	2.8
Nov 10	1	1	2	5	5	10	12	16	16	16	12	S	10	9	9	1	1	5	2	3	4	9	9	9	1	16	7.3
Nov 11	10	10	5	7	8	8	8	10	8	7	S	6	6	6	7	7	8	17	8	8	7	11	10	12	5	17	8.4
Nov 12	13	13	16	17	16	11	11	22	12	S	8	19	19	13	36	27	23	6	17	11	5	4	2	2	2	36	14.0
Nov 13	2	4	2	2	2	2	6	11	S	15	C	C	C	C	C	C	29	31	18	22	11	21	21	15	2	31	-
Nov 14	2	2	2	4	4	4	4	S	8	3	7	5	5	9	6	4	8	11	11	3	4	3	2	2	2	11	4.9
Nov 15	2	1	1	2	2	3	S	7	4	8	7	8	7	9	10	9	10	4	5	5	5	5	5	12	1	12	5.7
Nov 16	14	13	12	5	3	S	9	8	18	12	12	14	5	3	3	4	3	3	2	3	4	6	7	7	2	18	7.4
Nov 17	7	6	5	5	S	5	6	6	6	5	4	11	10	6	6	10	11	13	11	8	4	3	2	1	1	13	6.6
Nov 18	1	1	1	S	2	1	1	1	2	16	16	19	20	24	24	17	14	1	1	6	1	6	20	22	1	24	9.4
Nov 19	11	15	S	2	1	2	1	2	2	3	5	8	3	2	8	15	16	6	1	7	1	2	3	3	1	16	5.2
Nov 20	3	S	3	7	11	10	6	8	14	7	9	9	7	3	8	9	4	3	2	3	3	2	3	4	2	14	6.0
Nov 21	S	5	6	6	7	7	6	7	12	20	8	12	8	13	13	14	16	10	22	10	12	15	16	S	5	22	11.1
Nov 22	17	20	20	17	15	17	20	20	23	7	3	6	6	9	5	2	3	5	9	4	3	6	S	9	2	23	10.7
Nov 23	15	14	9	9	11	7	7	4	1	1	2	3	1	1	1	1	1	2	4	7	7	S	5	8	1	15	5.3
Nov 24	8	7	7	4	4	5	9	10	9	10	22	24	14	25	29	28	17	2	1	3	S	18	20	27	1	29	13.2
Nov 25	17	21	30	31	21	22	21	20	24	25	8	4	3	3	3	17	17	8	4	S	3	2	2	3	2	31	13.4
Nov 26	3	2	1	1	2	2	2	2	3	3	2	1	1	2	3	3	3	1	S	2	1	1	2	2	1	3	2.0
Nov 27	2	2	4	3	3	2	2	4	8	9	11	3	3	3	3	3	3	S	5	5	5	7	7	7	2	11	4.5
Nov 28	7	7	8	9	5	2	2	7	16	11	7	3	2	8	3	1	S	14	14	13	14	9	11	1	1	16	7.6
Nov 29	7	7	15	14	7	13	8	5	9	2	3	6	1	4	S	2	1	2	2	2	2	1	1	2	1	15	5.3
Nov 30	2	1	1	1	1	2	2	5	5	6	3	3	4	3	S	5	5	4	3	4	4	4	4	3	1	6	3.3
Diurnal Maximum	25	21	30	31	21	22	21	22	31	25	22	24	20	25	36	28	29	31	22	22	19	28	21	27			
Diurnal Average	8.2	7.9	7.9	7.9	6.9	6.6	6.8	9.1	10.6	9.8	8.3	8.7	7.5	8.0	8.6	8.5	9.5	7.8	6.3	5.9	5.8	7.4	7.2	7.4			
C	Calibration				S	Daily Zero/Span				Q	Quality Assurance				C1	Repeat Calibration				S1	Repeat Daily Zero/Span						
G	Out for Repair				K	Collection Error				N	Not in Service				O	Operator Error				P	Power Failure						
R	Recovery				X	Machine Malfunction				Y	Maintenance				T	Exceeds Temperature Limits				N	Not in Service						

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for NO2 - Maskwa Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Instantaneous Maximums

TOTAL HYDROCARBONS (THC) in ppm

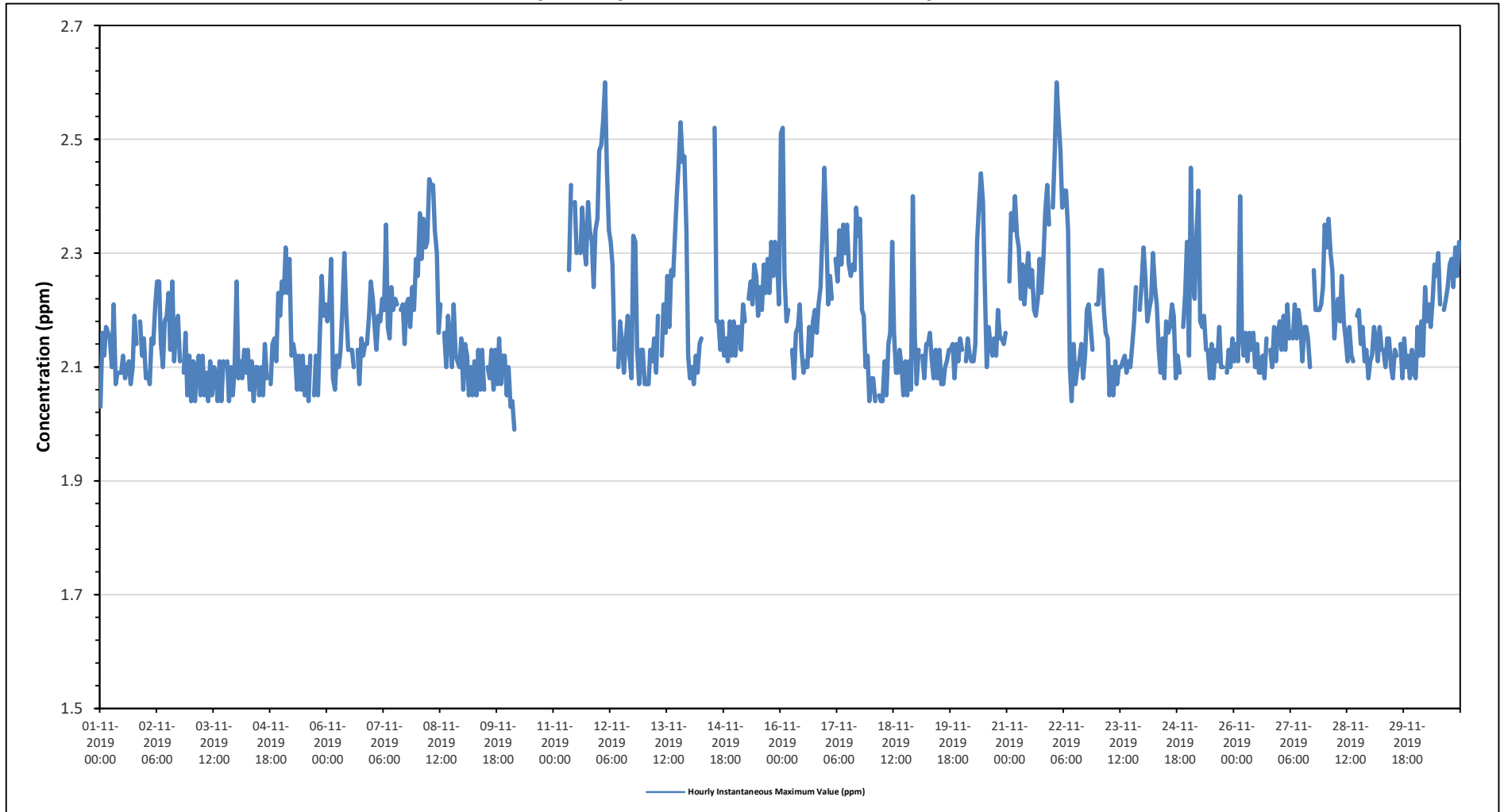
Maximum Hourly Value:	2.60 ppm on November 12 at hour 3	Hours in Service:	720
Maximum Daily Value:	2.29 ppm on November 21	Hours of Data:	658
Minimum Hourly Value:	1.99 ppm on November 10 at hour 3	Hours of Missing Data:	28
Minimum Daily Value:	2.08 ppm on November 3	Hours of Calibration:	34
Monthly Average:	2.18 ppm	Operational Uptime:	96.1

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	2.03	2.16	2.12	2.17	2.16	2.15	2.10	2.21	2.07	2.09	2.09	2.09	2.12	2.08	2.10	2.11	2.07	2.10	2.19	2.14	S	2.18	2.12	2.15	2.03	2.21	2.12	
Nov 2	2.08	2.09	2.07	2.15	2.14	2.21	2.25	2.25	2.14	2.10	2.18	2.19	2.23	2.13	2.25	2.11	2.17	2.19	2.11	S	2.09	2.16	2.05	2.12	2.05	2.25	2.15	
Nov 3	2.04	2.11	2.04	2.10	2.12	2.05	2.12	2.05	2.09	2.04	2.11	2.05	2.10	2.09	2.04	2.11	2.04	2.11	S	2.11	2.04	2.10	2.05	2.10	2.04	2.12	2.08	
Nov 4	2.25	2.08	2.11	2.08	2.13	2.09	2.13	2.06	2.11	2.04	2.10	2.10	2.05	2.10	2.05	2.14	2.08	S	2.07	2.14	2.15	2.11	2.23	2.19	2.04	2.25	2.11	
Nov 5	2.25	2.23	2.31	2.23	2.29	2.12	2.14	2.12	2.06	2.12	2.06	2.12	2.05	2.10	2.04	2.12	S	2.05	2.12	2.05	2.15	2.26	2.19	2.21	2.04	2.31	2.15	
Nov 6	2.18	2.20	2.29	2.08	2.06	2.12	2.10	2.13	2.20	2.30	2.20	2.13	2.13	2.10	S	2.13	2.07	2.15	2.12	2.14	2.14	2.19	2.25	2.06	2.30	2.15		
Nov 7	2.22	2.17	2.13	2.19	2.18	2.22	2.20	2.35	2.17	2.15	2.24	2.20	2.22	2.21	S	2.20	2.21	2.14	2.21	2.22	2.17	2.24	2.20	2.29	2.13	2.35	2.21	
Nov 8	2.26	2.37	2.29	2.36	2.31	2.32	2.43	2.42	2.42	2.34	2.30	2.16	2.21	S	2.16	2.10	2.19	2.15	2.10	2.21	2.12	2.11	2.10	2.15	2.10	2.43	2.24	
Nov 9	2.06	2.14	2.12	2.05	2.10	2.05	2.11	2.05	2.13	2.06	2.13	2.06	S	2.10	2.08	2.13	2.06	2.13	2.07	2.15	2.07	2.12	2.12	2.05	2.05	2.15	2.09	
Nov 10	2.10	2.03	2.04	1.99	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1.99	2.10	-		
Nov 11	X	X	X	X	X	X	X	X	X	2.27	2.42	S	2.39	2.30	2.31	2.30	2.38	2.31	2.28	2.39	2.34	2.32	2.24	2.34	2.26	2.24	2.42	-
Nov 12	2.48	2.49	2.53	2.60	2.45	2.34	2.32	2.28	2.13	S	2.10	2.18	2.14	2.09	2.15	2.19	2.12	2.08	2.33	2.32	2.13	2.07	2.13	2.13	2.07	2.60	2.25	
Nov 13	2.07	2.07	2.07	2.13	2.11	2.15	2.09	2.19	S	2.12	2.21	2.16	2.26	2.17	2.27	2.26	2.33	2.40	2.46	2.53	2.46	2.47	2.34	2.12	2.07	2.53	2.24	
Nov 14	2.08	2.10	2.07	2.12	2.09	2.14	2.15	S	2.17	C	C	C	C	2.52	2.18	2.18	2.13	2.18	2.12	2.15	2.11	2.18	2.12	2.18	2.07	2.52	2.16	
Nov 15	2.12	2.17	2.17	2.13	2.21	2.18	S	2.22	2.25	2.21	2.28	2.26	2.19	2.24	2.20	2.28	2.23	2.29	2.23	2.32	2.26	2.32	2.29	2.21	2.12	2.32	2.23	
Nov 16	2.51	2.52	2.26	2.18	2.20	S	2.13	2.08	2.16	2.17	2.21	2.13	2.09	2.11	2.10	2.17	2.12	2.18	2.20	2.16	2.21	2.24	2.33	2.45	2.08	2.52	2.21	
Nov 17	2.35	2.21	2.26	2.22	S	2.29	2.25	2.34	2.28	2.35	2.30	2.35	2.28	2.26	2.28	2.27	2.38	2.33	2.36	2.20	2.19	2.10	2.12	2.04	2.04	2.38	2.26	
Nov 18	2.08	2.08	2.04	S	2.05	2.04	2.04	2.11	2.05	2.14	2.16	2.32	2.16	2.09	2.09	2.13	2.10	2.05	2.11	2.05	2.11	2.06	2.40	2.15	2.04	2.40	2.11	
Nov 19	2.07	2.13	S	2.12	2.08	2.14	2.14	2.16	2.11	2.08	2.13	2.08	2.13	2.07	2.07	2.10	2.11	2.13	2.13	2.14	2.08	2.14	2.11	2.15	2.07	2.16	2.11	
Nov 20	2.13	S	2.11	2.15	2.12	2.11	2.11	2.14	2.32	2.39	2.44	2.39	2.25	2.10	2.17	2.14	2.12	2.15	2.12	2.20	2.15	2.15	2.14	2.16	2.10	2.44	2.19	
Nov 21	S	2.25	2.37	2.34	2.40	2.33	2.31	2.22	2.28	2.21	2.26	2.30	2.24	2.27	2.20	2.19	2.22	2.29	2.23	2.29	2.37	2.42	2.35	S	2.19	2.42	2.29	
Nov 22	2.38	2.47	2.60	2.54	2.48	2.38	2.41	2.41	2.34	2.10	2.04	2.14	2.07	2.10	2.11	2.14	2.08	2.12	2.20	2.21	2.17	2.13	S	2.21	2.04	2.60	2.25	
Nov 23	2.21	2.27	2.27	2.20	2.16	2.15	2.05	2.10	2.05	2.11	2.07	2.10	2.10	2.11	2.12	2.09	2.11	2.10	2.14	2.18	2.24	S	2.20	2.25	2.05	2.27	2.15	
Nov 24	2.31	2.25	2.18	2.20	2.22	2.30	2.24	2.21	2.13	2.09	2.15	2.08	2.18	2.16	2.17	2.21	2.19	2.08	2.12	2.09	S	2.17	2.23	2.32	2.08	2.32	2.19	
Nov 25	2.12	2.45	2.25	2.22	2.33	2.41	2.18	2.17	2.19	2.13	2.13	2.08	2.14	2.08	2.13	2.11	2.17	2.10	2.10	S	2.09	2.13	2.10	2.15	2.08	2.45	2.17	
Nov 26	2.11	2.14	2.11	2.40	2.16	2.12	2.16	2.11	2.16	2.13	2.16	2.10	2.14	2.09	2.09	2.12	2.08	2.15	S	2.13	2.10	2.17	2.11	2.16	2.08	2.40	2.14	
Nov 27	2.18	2.13	2.19	2.13	2.21	2.15	2.16	2.15	2.21	2.15	2.20	2.17	2.11	2.17	2.17	2.15	2.10	S	2.27	2.20	2.20	2.20	2.21	2.24	2.10	2.27	2.18	
Nov 28	2.35	2.31	2.36	2.30	2.27	2.15	2.20	2.22	2.18	2.26	2.18	2.15	2.11	2.17	2.12	2.11	S	2.19	2.20	2.14	2.17	2.11	2.13	2.08	2.08	2.36	2.19	
Nov 29	2.11	2.12	2.17	2.15	2.11	2.17	2.13	2.13	2.10	2.15	2.15	2.10	2.08	2.13	2.12	S	2.14	2.08	2.15	2.10	2.12	2.08	2.13	2.09	2.08	2.17	2.12	
Nov 30	2.08	2.17	2.12	2.18	2.12	2.24	2.18	2.21	2.17	2.22	2.28	2.26	2.30	2.21	S	2.20	2.22	2.24	2.28	2.29	2.24	2.31	2.26	2.32	2.08	2.32	2.22	
Diurnal Maximum	2.51	2.52	2.60	2.60	2.48	2.41	2.43	2.42	2.42	2.42	2.44	2.39	2.30	2.52	2.30	2.38	2.38	2.40	2.46	2.53	2.46	2.47	2.40	2.45				
Diurnal Average	2.19	2.21	2.20	2.20	2.19	2.19	2.18	2.19	2.18	2.17	2.18	2.17	2.16	2.16	2.14	2.16	2.16	2.16	2.19	2.19	2.17	2.18	2.19	2.19				

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for THC - Maskwa Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Instantaneous Maximums

METHANE (CH4) in ppm

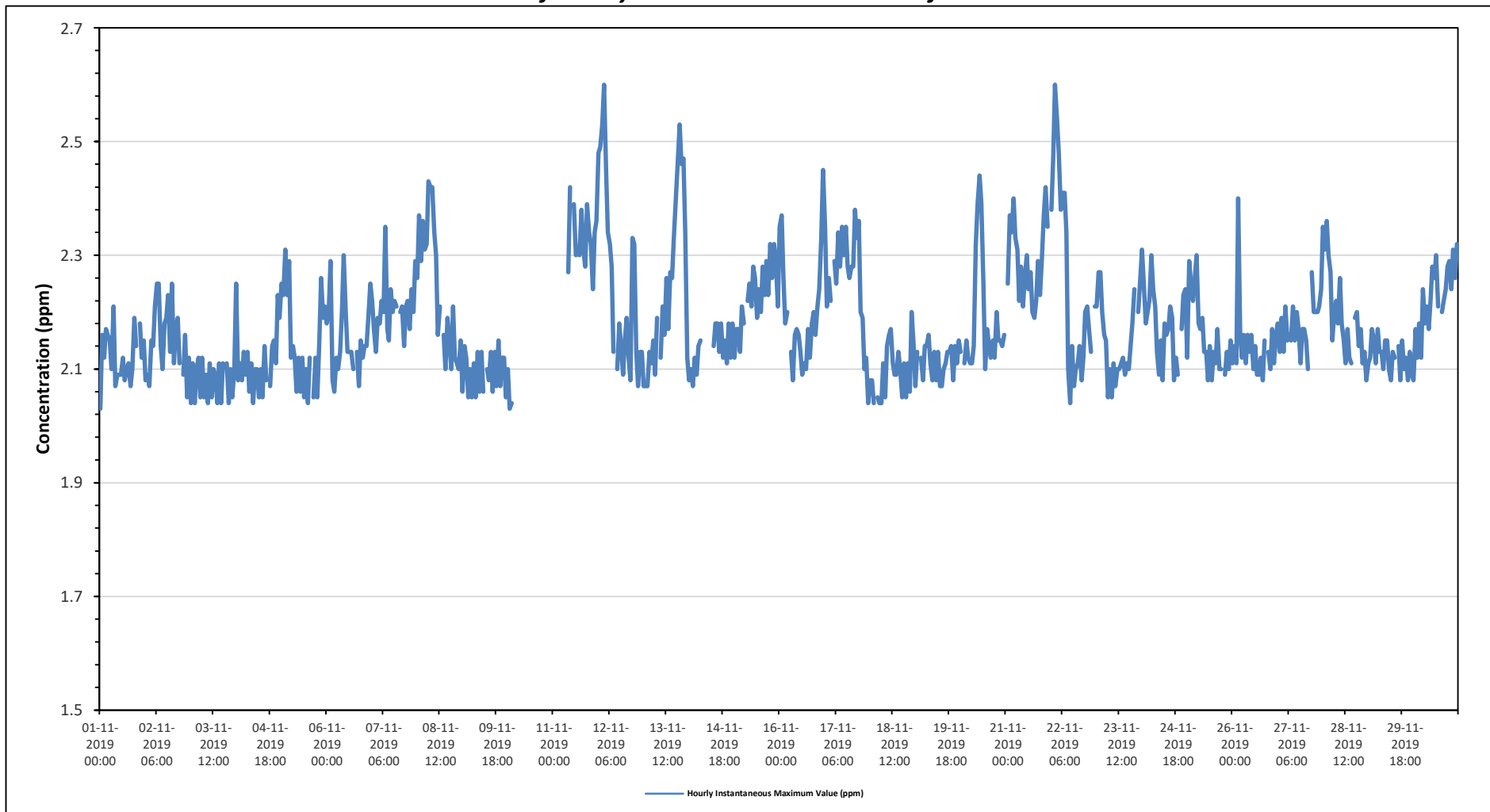
Maximum Hourly Value:	2.60 ppm on November 12 at hour 3	Hours in Service:	720
Maximum Daily Value:	2.29 ppm on November 21	Hours of Data:	657
Minimum Hourly Value:	2.03 ppm on November 1 at hour 0	Hours of Missing Data:	29
Minimum Daily Value:	2.08 ppm on November 3	Hours of Calibration:	34
Monthly Average:	2.18 ppm	Operational Uptime:	96.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	2.03	2.16	2.12	2.17	2.16	2.15	2.10	2.21	2.07	2.09	2.09	2.09	2.12	2.08	2.10	2.11	2.07	2.10	2.19	2.14	S	2.18	2.12	2.15	2.03	2.21	2.12
Nov 2	2.08	2.09	2.07	2.15	2.14	2.21	2.25	2.25	2.14	2.10	2.18	2.19	2.23	2.13	2.25	2.11	2.17	2.19	2.11	S	2.09	2.16	2.05	2.12	2.05	2.25	2.15
Nov 3	2.04	2.11	2.04	2.10	2.12	2.05	2.12	2.05	2.09	2.04	2.11	2.05	2.10	2.09	2.04	2.11	2.04	2.11	S	2.11	2.04	2.10	2.05	2.10	2.04	2.12	2.08
Nov 4	2.25	2.08	2.11	2.08	2.13	2.09	2.13	2.06	2.11	2.04	2.10	2.10	2.05	2.10	2.05	2.14	2.08	S	2.07	2.14	2.15	2.11	2.23	2.19	2.04	2.25	2.11
Nov 5	2.25	2.23	2.31	2.23	2.29	2.12	2.14	2.12	2.06	2.12	2.06	2.12	2.05	2.10	2.04	2.12	S	2.05	2.12	2.05	2.15	2.26	2.19	2.21	2.04	2.31	2.15
Nov 6	2.18	2.20	2.29	2.08	2.06	2.12	2.10	2.13	2.20	2.30	2.20	2.13	2.13	2.10	S	2.13	2.07	2.15	2.12	2.14	2.14	2.19	2.25	2.06	2.30	2.15	
Nov 7	2.22	2.17	2.13	2.19	2.18	2.22	2.20	2.35	2.17	2.15	2.24	2.20	2.22	2.21	S	2.20	2.21	2.14	2.21	2.22	2.17	2.24	2.20	2.29	2.13	2.35	2.21
Nov 8	2.26	2.37	2.29	2.36	2.31	2.32	2.43	2.42	2.42	2.34	2.30	2.16	2.21	S	2.16	2.10	2.19	2.15	2.10	2.21	2.12	2.11	2.10	2.15	2.10	2.43	2.24
Nov 9	2.06	2.14	2.12	2.05	2.10	2.05	2.11	2.05	2.13	2.06	2.13	2.06	S	2.10	2.08	2.13	2.06	2.13	2.07	2.15	2.07	2.12	2.12	2.05	2.05	2.15	2.09
Nov 10	2.10	2.03	2.04	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.03	2.10	-	
Nov 11	X	X	X	X	X	X	X	X	X	2.27	2.42	S	2.39	2.30	2.31	2.30	2.38	2.31	2.28	2.39	2.34	2.32	2.24	2.34	2.24	2.42	-
Nov 12	2.48	2.49	2.53	2.60	2.45	2.34	2.32	2.28	2.13	S	2.10	2.18	2.14	2.09	2.15	2.19	2.12	2.08	2.33	2.32	2.13	2.07	2.13	2.13	2.07	2.60	2.25
Nov 13	2.07	2.07	2.07	2.13	2.11	2.15	2.09	2.19	S	2.12	2.21	2.16	2.26	2.17	2.27	2.26	2.33	2.40	2.46	2.53	2.46	2.47	2.34	2.12	2.07	2.53	2.24
Nov 14	2.08	2.10	2.07	2.12	2.09	2.14	2.15	S	2.17	C	C	C	C	2.14	2.18	2.18	2.13	2.18	2.12	2.15	2.11	2.18	2.12	2.18	2.07	2.18	2.14
Nov 15	2.12	2.17	2.17	2.13	2.21	2.18	S	2.22	2.25	2.21	2.28	2.26	2.19	2.24	2.20	2.28	2.23	2.29	2.23	2.32	2.26	2.32	2.29	2.21	2.12	2.32	2.23
Nov 16	2.35	2.37	2.26	2.18	2.20	S	2.13	2.08	2.16	2.17	2.16	2.13	2.09	2.11	2.10	2.17	2.12	2.18	2.20	2.16	2.21	2.24	2.33	2.45	2.08	2.45	2.20
Nov 17	2.35	2.21	2.26	2.22	S	2.29	2.25	2.34	2.28	2.35	2.30	2.35	2.28	2.26	2.28	2.28	2.38	2.33	2.36	2.20	2.19	2.10	2.12	2.04	2.04	2.38	2.26
Nov 18	2.08	2.08	2.04	S	2.05	2.04	2.04	2.11	2.05	2.14	2.16	2.17	2.11	2.09	2.09	2.13	2.10	2.05	2.11	2.05	2.11	2.06	2.20	2.15	2.04	2.20	2.10
Nov 19	2.07	2.13	S	2.12	2.08	2.14	2.14	2.16	2.11	2.08	2.13	2.08	2.13	2.07	2.07	2.10	2.11	2.13	2.13	2.14	2.08	2.14	2.11	2.15	2.07	2.16	2.11
Nov 20	2.13	S	2.11	2.15	2.12	2.11	2.11	2.14	2.32	2.39	2.44	2.39	2.25	2.10	2.17	2.14	2.12	2.15	2.12	2.20	2.15	2.15	2.14	2.16	2.10	2.44	2.19
Nov 21	S	2.25	2.37	2.34	2.40	2.33	2.31	2.22	2.28	2.21	2.26	2.30	2.24	2.27	2.20	2.19	2.22	2.29	2.23	2.29	2.37	2.42	2.35	S	2.19	2.42	2.29
Nov 22	2.38	2.47	2.60	2.54	2.48	2.38	2.41	2.41	2.34	2.10	2.04	2.14	2.07	2.10	2.11	2.14	2.08	2.12	2.20	2.21	2.17	2.13	S	2.20	2.04	2.60	2.25
Nov 23	2.21	2.27	2.27	2.20	2.16	2.15	2.05	2.10	2.05	2.11	2.07	2.10	2.10	2.11	2.12	2.09	2.11	2.10	2.14	2.18	2.24	S	2.20	2.25	2.05	2.27	2.15
Nov 24	2.31	2.25	2.18	2.20	2.22	2.30	2.24	2.21	2.13	2.09	2.15	2.08	2.18	2.16	2.17	2.21	2.19	2.08	2.12	2.09	S	2.17	2.23	2.24	2.08	2.31	2.18
Nov 25	2.12	2.29	2.25	2.22	2.26	2.30	2.18	2.17	2.19	2.13	2.13	2.08	2.14	2.08	2.13	2.11	2.17	2.10	2.10	S	2.09	2.13	2.10	2.15	2.08	2.30	2.16
Nov 26	2.11	2.14	2.11	2.40	2.16	2.12	2.16	2.11	2.16	2.13	2.16	2.10	2.14	2.09	2.09	2.12	2.08	2.15	S	2.13	2.10	2.17	2.11	2.16	2.08	2.40	2.14
Nov 27	2.18	2.13	2.19	2.13	2.21	2.15	2.16	2.15	2.21	2.15	2.20	2.17	2.11	2.17	2.17	2.15	2.10	S	2.27	2.20	2.20	2.20	2.21	2.24	2.10	2.27	2.18
Nov 28	2.35	2.31	2.36	2.30	2.27	2.15	2.20	2.22	2.18	2.26	2.18	2.15	2.11	2.17	2.12	2.11	S	2.19	2.20	2.14	2.17	2.11	2.13	2.08	2.08	2.36	2.19
Nov 29	2.11	2.12	2.17	2.15	2.11	2.17	2.13	2.13	2.10	2.15	2.10	2.08	2.13	2.12	S	2.14	2.08	2.15	2.10	2.12	2.08	2.13	2.09	2.08	2.17	2.12	2.12
Nov 30	2.08	2.17	2.12	2.18	2.12	2.24	2.18	2.21	2.17	2.22	2.28	2.26	2.30	2.21	S	2.20	2.22	2.24	2.28	2.29	2.24	2.31	2.26	2.32	2.08	2.17	2.22
Diurnal Maximum	2.48	2.49	2.60	2.60	2.48	2.38	2.43	2.42	2.42	2.42	2.44	2.39	2.30	2.31	2.30	2.38	2.38	2.40	2.46	2.53	2.46	2.47	2.35	2.45			
Diurnal Average	2.18	2.20	2.20	2.21	2.19	2.19	2.18	2.19	2.18	2.17	2.18	2.17	2.16	2.14	2.14	2.16	2.16	2.16	2.19	2.19	2.17	2.18	2.18	2.19			

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for CH4 - Maskwa Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Instantaneous Maximums

NON-METHANE HYDROCARBONS (NMHC) in ppm

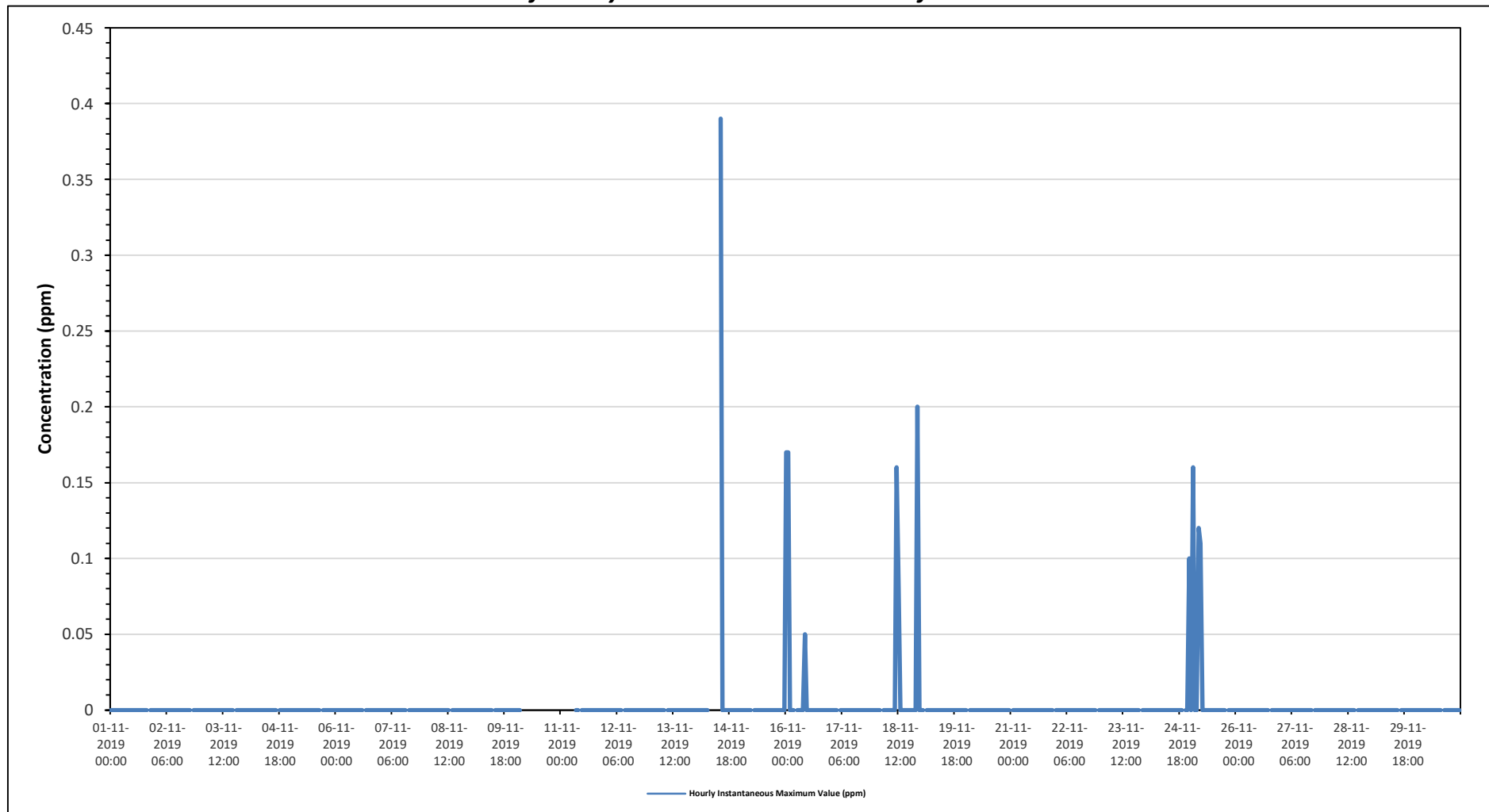
Maximum Hourly Value: 0.39 ppm on November 14 at hour 13	Hours in Service: 720
Maximum Daily Value: 0.02 ppm on November 14	Hours of Data: 657
Minimum Hourly Value: 0.00 ppm on November 1 at hour 0	Hours of Missing Data: 29
Minimum Daily Value: 0.00 ppm on November 1	Hours of Calibration: 34
Monthly Average: 0.00 ppm	Operational Uptime: 96.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 10	0.00	0.00	0.00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.00
Nov 11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.00
Nov 12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	C	C	C	C	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 15	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 16	0.17	0.17	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 17	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 18	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00
Nov 19	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 20	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 21	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00
Nov 22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	S	0.00	0.00
Nov 23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00
Nov 24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.10	0.00	0.00	0.00
Nov 25	0.00	0.16	0.00	0.00	0.12	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov 30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diurnal Maximum	0.17	0.17	0.00	0.00	0.12	0.11	0.00	0.00	0.00	0.00	0.05	0.16	0.08	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.10	0.00	0.00	0.00
Diurnal Average	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for NMHC - Maskwa Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - November 2019

Summary of Hourly Instantaneous Maximums

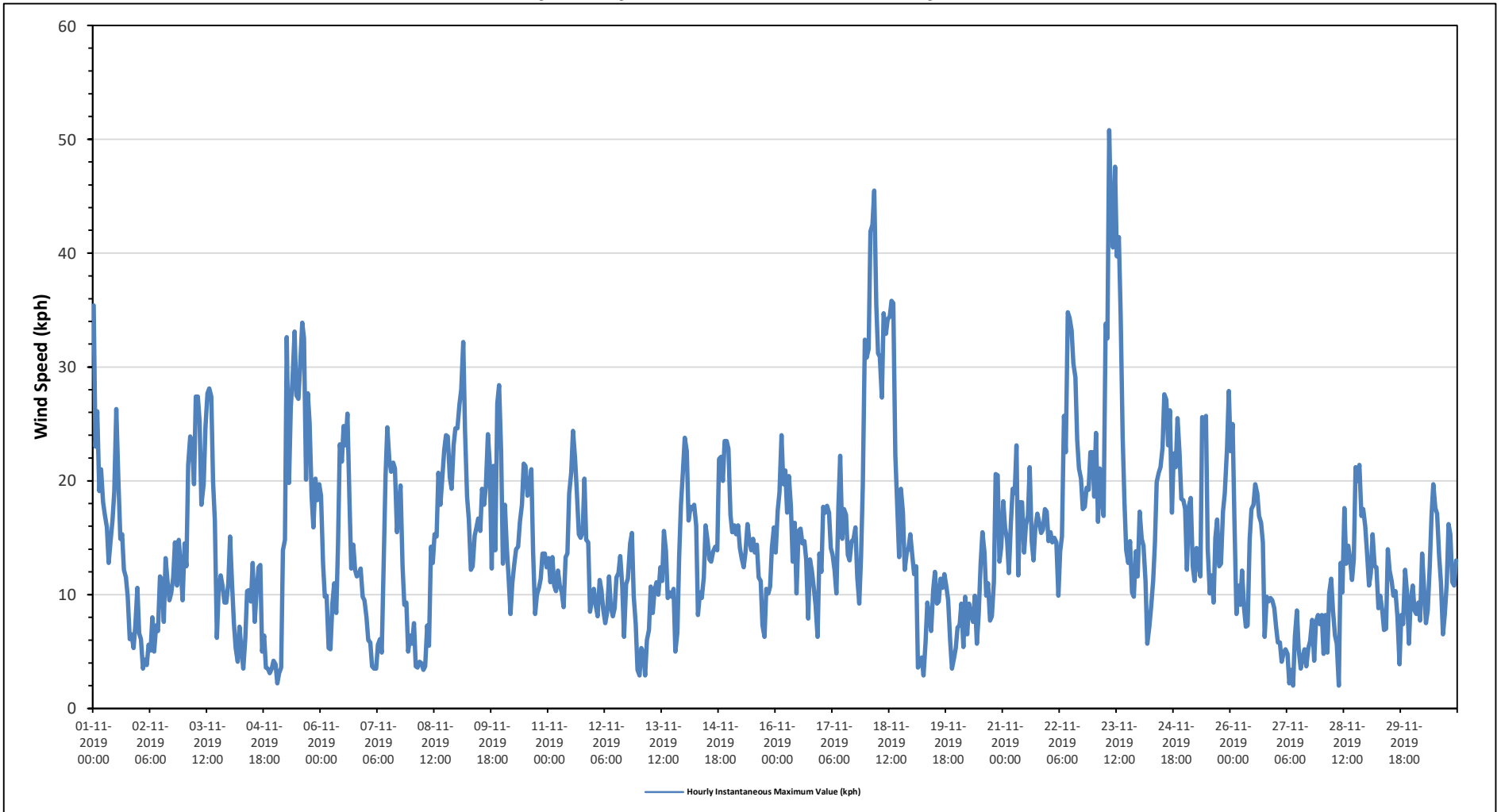
WIND SPEED (WS) in km/hr

Maximum Hourly Value:	50.8 kph on November 23 at hour 8	Hours in Service:	720
Maximum Daily Value:	27.9 kph on November 18	Hours of Data:	720
Minimum Hourly Value:	2.0 kph on November 27 at hour 9	Hours of Missing Data:	0
Minimum Daily Value:	5.4 kph on November 27	Hours of Calibration:	0
Monthly Average:	14.6 kph	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	35.4	23.0	26.1	19.1	21.0	18.1	17.0	15.9	12.8	14.6	16.5	19.0	26.3	20.2	14.9	15.3	12.2	11.5	9.8	6.1	6.5	5.3	7.3	10.6	5.3	35.4	16.0	
Nov 2	6.6	6.1	3.5	4.3	3.8	5.6	5.1	8.0	5.0	7.3	6.8	11.6	11.3	7.6	13.2	11.1	9.5	10.1	11.5	14.6	10.8	14.8	12.3	9.5	3.5	14.8	8.8	
Nov 3	14.5	12.5	21.4	23.9	23.2	19.7	27.4	27.4	25.2	17.9	19.7	24.7	27.7	28.1	27.4	19.9	16.5	6.2	10.4	11.7	10.8	9.3	9.3	11.0	6.2	28.1	18.6	
Nov 4	15.1	11.3	7.5	5.3	4.1	7.2	5.1	3.5	6.2	10.3	10.4	9.4	12.8	7.6	10.1	12.4	12.6	5.0	6.4	3.6	3.5	3.1	3.5	4.2	3.1	15.1	7.5	
Nov 5	3.9	2.2	3.1	3.6	13.9	14.8	32.6	19.8	26.5	29.0	33.1	27.5	27.2	30.1	33.9	32.5	20.1	27.7	25.1	18.6	15.9	20.2	18.3	19.7	2.2	33.9	20.8	
Nov 6	18.7	12.7	9.8	9.9	5.3	5.2	9.3	11.0	8.4	14.5	23.2	21.7	24.8	23.1	25.9	18.3	12.3	14.4	12.2	11.6	11.8	12.3	9.8	9.5	5.2	25.9	14.0	
Nov 7	8.0	6.0	5.8	3.7	3.5	3.5	5.6	6.1	4.9	13.1	20.4	24.7	21.8	20.8	21.6	21.1	15.5	17.4	19.6	12.5	9.1	9.3	5.0	6.4	3.5	24.7	11.9	
Nov 8	5.7	7.5	3.7	3.6	4.1	4.0	3.4	3.7	7.3	5.5	14.2	12.8	15.3	15.1	20.7	17.9	20.1	22.7	24.0	23.9	20.3	19.3	23.1	24.6	3.4	24.6	13.4	
Nov 9	24.6	26.7	28.0	32.2	24.3	18.6	16.6	12.2	12.5	15.2	15.9	16.7	15.6	19.3	17.9	19.5	24.1	21.6	12.3	21.3	13.9	26.8	28.4	22.6	12.2	32.2	20.3	
Nov 10	12.7	17.9	14.3	11.7	8.3	11.0	12.7	14.0	14.2	16.4	17.9	21.5	21.3	18.7	19.2	21.0	13.7	8.3	10.0	10.6	11.4	13.6	13.6	12.4	8.3	21.5	14.4	
Nov 11	13.2	11.1	13.3	10.8	10.3	12.1	10.8	10.2	8.9	13.3	13.6	18.9	20.7	24.4	22.0	19.1	15.3	15.0	15.5	20.2	14.8	14.6	8.5	9.6	8.5	24.4	14.4	
Nov 12	10.5	9.0	8.1	11.3	10.4	8.7	7.5	8.4	11.6	8.9	8.1	8.8	11.5	11.9	13.4	10.7	6.3	10.9	11.4	14.5	15.4	9.9	7.4	3.4	3.4	15.4	9.9	
Nov 13	2.9	5.3	4.9	2.9	6.0	6.9	10.7	8.4	10.4	11.1	10.0	12.4	11.2	15.6	13.8	9.7	10.2	9.8	10.5	5.0	6.7	13.4	17.9	20.9	2.9	20.9	9.9	
Nov 14	23.8	22.6	16.5	17.7	17.5	17.9	16.1	16.1	8.2	10.2	9.7	11.5	16.1	14.7	13.1	12.9	13.8	14.2	13.9	21.9	22.1	20.0	23.5	23.5	22.8	8.2	23.8	16.8
Nov 15	17.0	15.5	16.1	15.3	16.1	14.1	13.2	12.4	13.7	16.2	14.8	13.9	14.9	13.7	14.4	11.5	11.2	7.3	6.3	10.5	10.1	10.7	14.1	15.9	6.3	17.0	13.3	
Nov 16	13.7	17.4	19.0	24.0	19.7	20.9	17.2	20.4	17.7	12.9	16.3	10.1	15.6	15.8	14.5	14.7	13.1	7.9	13.1	12.0	10.6	9.1	6.3	13.6	6.3	24.0	14.8	
Nov 17	12.0	17.7	17.2	17.8	17.2	14.1	13.5	12.1	10.1	17.8	22.2	14.9	17.5	17.0	13.5	13.0	14.7	14.8	15.9	11.6	9.2	13.3	19.6	32.4	9.2	32.4	15.8	
Nov 18	30.8	31.6	41.9	42.5	45.5	35.5	31.2	30.9	27.3	34.7	32.9	34.2	34.4	35.8	35.6	22.3	18.1	13.3	19.3	17.2	12.2	13.7	14.1	15.3	12.2	45.5	27.9	
Nov 19	13.4	11.8	12.5	3.6	3.9	4.5	2.9	5.8	9.3	8.0	6.8	10.4	12.0	9.2	9.4	11.4	10.6	11.8	10.7	9.5	5.9	3.5	4.4	5.3	2.9	13.4	8.2	
Nov 20	7.1	7.3	9.2	5.4	9.8	6.5	9.2	8.3	7.6	9.9	5.7	8.2	12.8	15.5	13.7	9.9	11.0	7.7	8.1	11.1	20.6	20.5	12.9	14.2	5.4	20.6	10.5	
Nov 21	18.2	15.9	14.8	11.9	16.3	19.3	18.9	23.1	11.7	18.1	18.1	13.7	16.1	16.9	21.2	14.7	13.0	15.8	17.1	16.4	15.4	15.7	17.5	17.3	11.7	23.1	16.5	
Nov 22	14.7	15.5	14.6	15.0	14.6	9.9	13.8	15.1	25.7	22.5	34.8	34.3	33.2	30.3	29.1	23.6	21.1	20.2	17.5	17.7	19.4	19.2	22.5	22.5	9.9	34.8	21.1	
Nov 23	18.6	24.2	16.4	21.1	18.5	16.9	33.8	32.5	50.8	42.4	40.5	47.6	39.7	41.4	34.7	23.9	18.2	13.9	12.8	14.7	10.2	9.8	13.8	11.6	9.8	50.8	25.3	
Nov 24	17.3	14.9	14.3	11.2	5.7	7.2	8.9	11.2	14.5	19.9	20.7	21.2	22.9	27.6	27.1	23.1	26.2	17.2	22.4	21.2	25.5	22.4	18.4	18.3	5.7	27.6	18.3	
Nov 25	17.5	12.2	17.8	18.5	12.5	11.2	14.1	12.8	11.6	25.6	25.2	25.7	14.0	10.1	11.7	9.3	15.0	16.6	12.5	12.7	17.3	18.9	22.9	27.9	9.3	27.9	16.4	
Nov 26	22.6	25.0	16.6	8.3	10.8	9.1	12.1	8.8	7.2	7.3	14.8	17.5	17.9	19.7	18.9	16.9	16.3	14.6	6.3	9.8	9.4	9.7	9.5	8.8	6.3	25.0	13.2	
Nov 27	7.2	5.8	5.8	4.1	4.9	5.2	4.8	2.2	3.4	2.0	6.3	8.6	5.2	3.5	4.4	5.2	3.7	5.3	5.9	7.8	4.2	7.6	8.2	7.4	2.0	8.6	5.4	
Nov 28	8.2	4.8	8.2	4.9	10.1	11.4	8.6	6.4	5.7	2.0	12.8	10.2	17.6	12.7	14.3	13.2	11.3	13.1	21.2	20.0	21.4	16.9	17.5	16.0	2.0	21.4	12.0	
Nov 29	13.7	10.8	11.9	15.3	12.5	12.4	8.8	9.9	8.6	6.9	7.0	14.0	12.1	11.2	9.9	10.3	8.0	3.9	8.2	7.4	12.2	10.3	5.7	9.5	3.9	15.3	10.0	
Nov 30	10.8	8.6	8.3	9.3	7.7	13.6	10.8	7.5	8.6	12.5	16.9	19.7	17.6	17.1	13.4	11.1	6.5	8.2	11.0	16.2	15.3	11.1	10.8	13.0	6.5	19.7	11.9	
Diurnal Maximum	35.4	31.6	41.9	42.5	45.5	35.5	33.8	32.5	50.8	42.4	40.5	47.6	39.7	41.4	35.6	32.5	26.2	27.7	25.1	23.9	25.5	26.8	28.4	32.4				
Diurnal Average	14.6	13.8	13.7	12.9	12.7	12.2	13.4	12.5	13.3	14.9	17.2	18.3	18.9	18.4	18.4	15.9	14.0	12.9	13.6	13.7	13.0	13.6	13.5	14.5				
C	Calibration				S	Daily Zero/Span				Q	Quality Assurance			C1	Repeat Calibration					S1	Repeat Daily Zero/Span							
G	Out for Repair				K	Collection Error				N	Not in Service			O	Operator Error					P	Power Failure							
R	Recovery				X	Machine Malfunction				Y	Maintenance			T	Exceeds Temperature Limits					N	Not in Service							

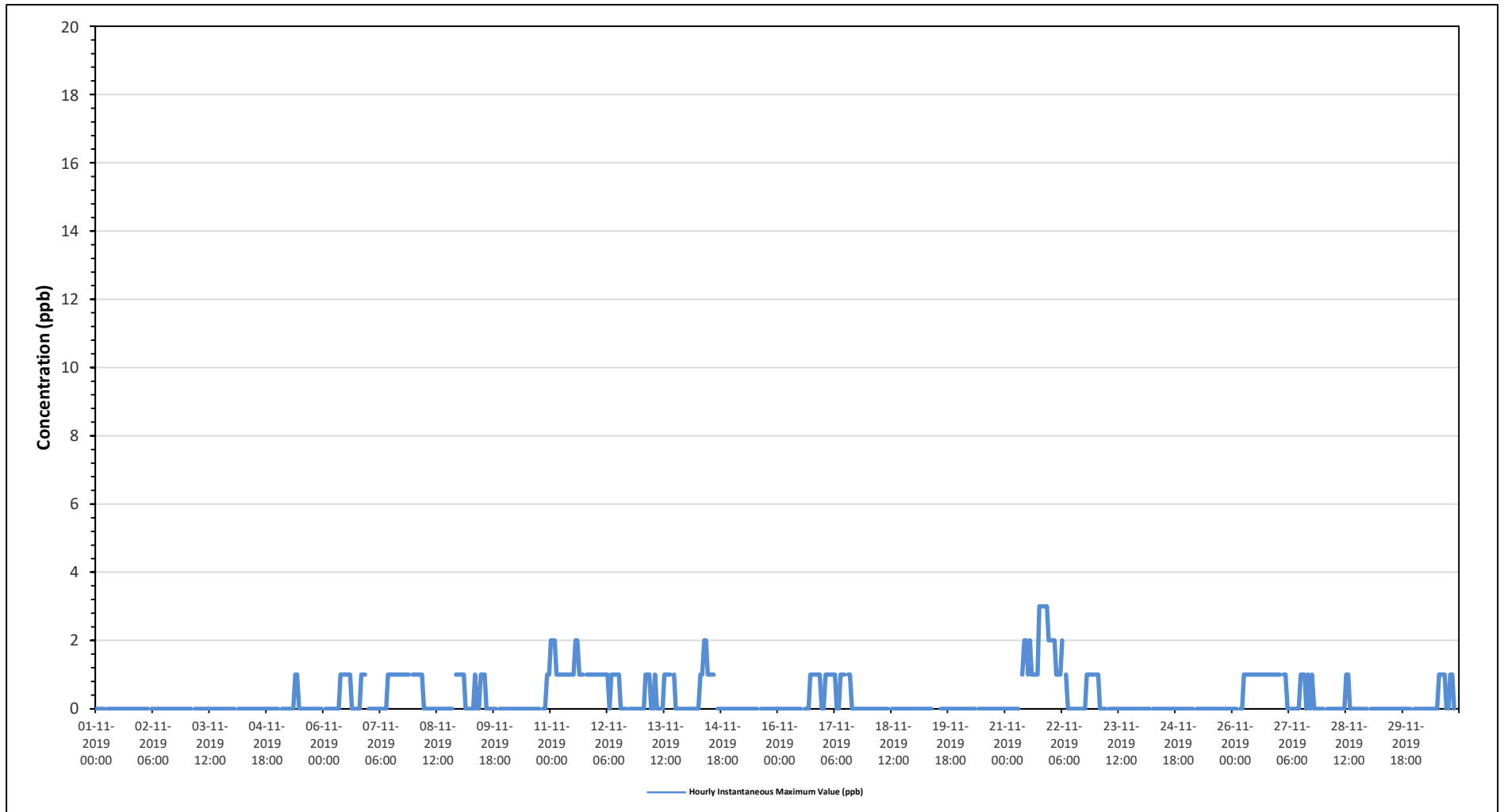
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for WS - Maskwa Site

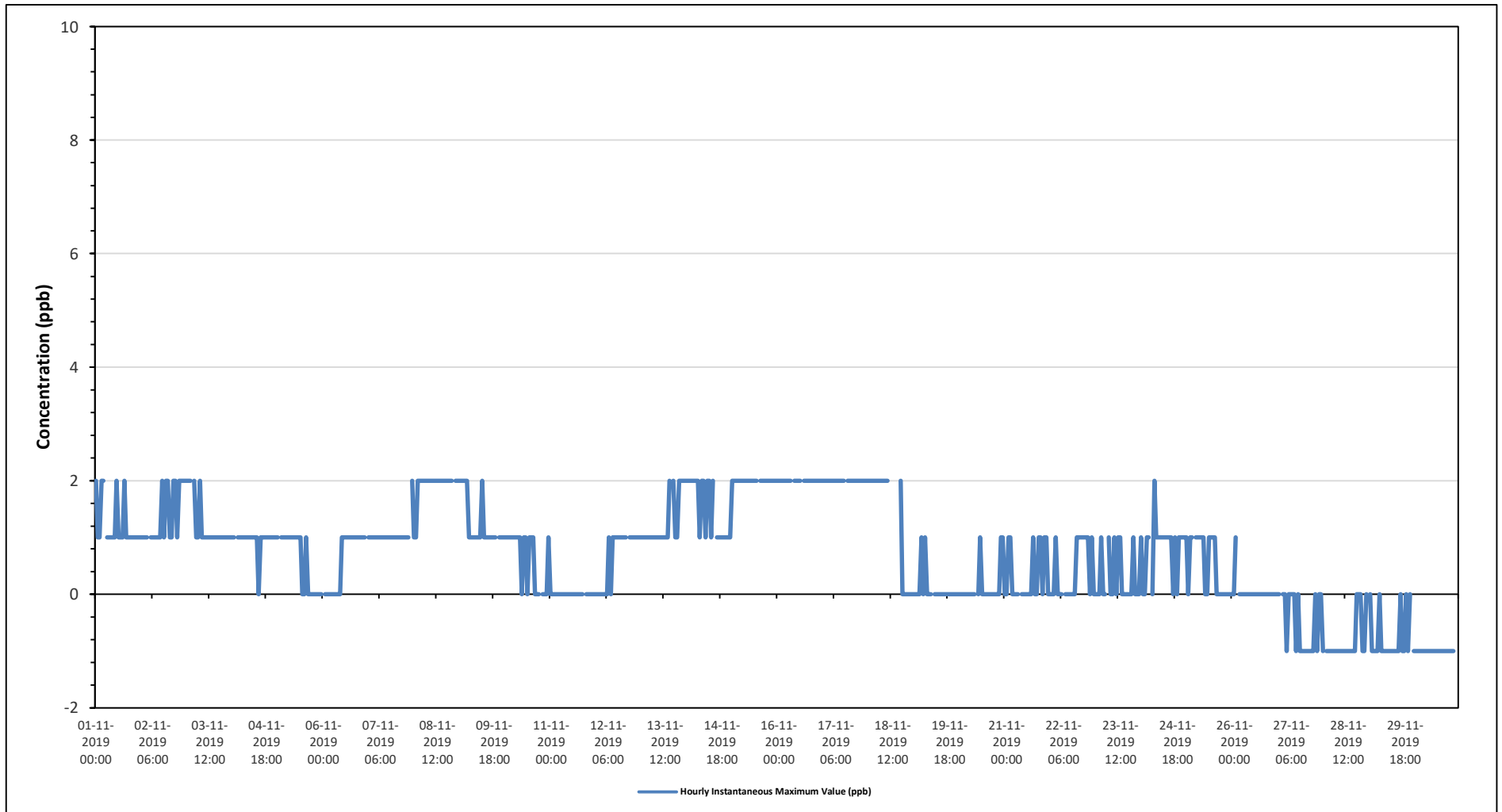


ST. LINA STATION

Timeseries Chart of Hourly Instantaneous Maximum for SO2 - St. Lina Site



Timeseries Chart of Hourly Instantaneous Maximum for H2S - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Instantaneous Maximums

OXIDES OF NITROGEN (NOx) in ppb

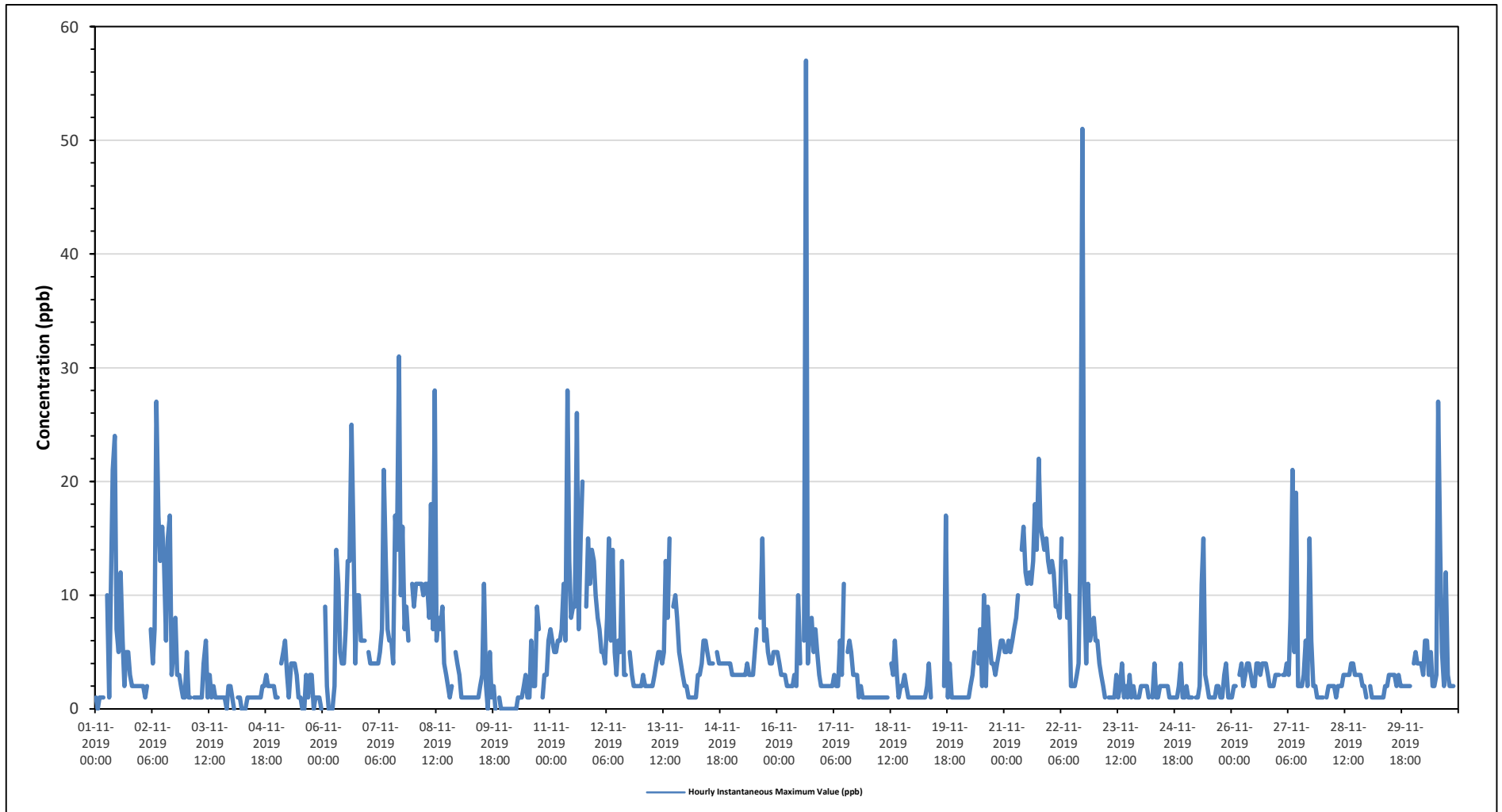
Maximum Hourly Value:	57 ppb on November 16 at hour 15	Hours in Service:	720
Maximum Daily Value:	11.7 ppb on November 21	Hours of Data:	683
Minimum Hourly Value:	0 ppb on November 1 at hour 1	Hours of Missing Data:	0
Minimum Daily Value:	1.2 ppb on November 4	Hours of Calibration:	37
Monthly Average:	4.7 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	1	0	1	1	1	S	10	1	11	21	24	7	5	12	6	2	5	5	3	2	2	2	2	0	24	5.5		
Nov 2	2	2	1	2	S	7	4	7	27	17	13	16	13	6	15	17	3	5	8	3	3	2	1	1	1	27	7.6	
Nov 3	5	1	1	S	1	1	1	1	1	4	6	1	3	1	2	1	1	1	1	1	1	0	2	2	0	6	1.7	
Nov 4	1	0	S	1	1	0	0	0	1	1	1	1	1	1	1	1	2	2	3	2	2	2	2	1	0	3	1.2	
Nov 5	1	S	4	5	6	3	1	4	4	4	3	1	1	0	0	3	1	3	3	0	1	1	1	1	0	6	2.2	
Nov 6	S	9	2	0	0	0	2	14	11	5	4	4	7	13	13	25	16	4	10	10	6	6	6	S	0	25	7.6	
Nov 7	5	4	4	4	4	4	5	7	21	13	7	6	6	4	17	14	31	10	16	7	9	6	S	S	11	4	31	9.3
Nov 8	9	11	11	11	11	10	11	11	8	18	7	28	6	8	7	9	4	3	2	1	2	S	5	4	1	28	8.6	
Nov 9	3	1	1	1	1	1	1	1	1	1	1	2	3	11	2	0	5	1	2	0	S	1	0	0	0	11	1.7	
Nov 10	0	0	0	0	0	0	0	1	1	1	2	3	1	1	6	2	2	9	7	S	S	1	3	3	6	0	9	2.1
Nov 11	7	6	5	5	6	6	7	11	6	28	13	8	9	9	26	7	15	20	S	9	15	11	14	13	5	28	11.1	
Nov 12	10	8	7	5	5	4	8	15	6	14	5	3	6	5	13	3	3	S	5	3	2	2	2	2	2	2	15	5.9
Nov 13	2	3	2	2	2	2	2	3	4	5	5	4	5	13	8	15	S	9	10	8	5	4	3	2	2	15	5.1	
Nov 14	2	1	1	1	1	1	3	3	4	6	6	5	4	4	S	5	4	4	4	4	4	4	4	4	4	1	6	3.4
Nov 15	3	3	3	3	3	3	3	3	4	3	3	3	3	5	7	S	8	15	6	7	5	4	4	5	5	3	15	4.7
Nov 16	5	4	3	3	3	2	2	2	2	3	2	10	4	S	6	57	4	7	8	5	7	5	3	2	2	57	6.5	
Nov 17	2	2	2	2	2	2	3	2	2	6	3	11	S	5	6	5	3	3	3	1	2	1	1	1	1	11	3.0	
Nov 18	1	1	1	1	1	1	1	1	1	1	1	1	S	4	3	6	3	1	2	2	3	2	1	1	1	6	1.7	
Nov 19	1	1	1	1	1	1	1	2	4	1	C	C	C	C	C	C	2	17	1	4	1	1	1	1	1	17	2.3	
Nov 20	1	1	1	1	1	1	2	3	5	S	4	7	2	10	2	9	6	4	4	3	4	5	6	6	6	10	3.8	
Nov 21	5	5	6	5	6	7	8	10	S	14	16	12	11	12	11	13	18	14	22	16	15	14	15	13	5	22	11.7	
Nov 22	12	13	12	9	9	8	15	S	13	8	10	2	2	2	3	4	14	51	11	4	11	6	7	8	2	51	10.2	
Nov 23	6	6	4	3	2	1	S	1	1	1	1	3	1	2	4	1	2	1	3	1	2	1	1	1	1	6	2.1	
Nov 24	2	2	2	2	1	S	1	4	1	1	2	2	2	2	2	1	1	1	1	1	2	4	1	1	1	4	1.7	
Nov 25	2	1	1	1	S	1	1	2	11	15	3	2	1	1	1	2	2	1	1	3	4	1	1	1	1	15	2.6	
Nov 26	1	2	2	S	3	4	2	3	4	4	3	2	2	4	4	3	4	4	4	3	2	2	2	3	1	4	2.9	
Nov 27	3	3	S	3	3	4	3	8	21	5	19	2	2	2	3	6	2	15	6	2	2	1	1	1	1	21	5.1	
Nov 28	1	S	1	2	2	2	2	1	2	2	2	3	3	3	3	4	4	3	3	3	3	2	2	1	1	4	2.3	
Nov 29	S	2	1	1	1	1	1	1	1	2	2	3	3	3	3	2	3	2	2	2	2	2	2	S	S	3	1.9	
Nov 30	4	5	4	4	4	3	6	6	3	5	2	2	3	27	14	5	2	12	3	2	2	2	S	4	2	27	5.4	
Diurnal Maximum	12	13	12	11	11	10	15	15	27	28	24	28	13	27	26	57	31	51	22	16	15	14	15	13				
Diurnal Average	3.5	3.5	3.0	2.8	2.9	2.9	3.7	4.4	6.2	7.2	5.9	5.5	4.1	6.1	6.7	7.9	6.1	7.6	5.3	3.7	4.0	3.4	3.4	3.5				

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for NOx - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Instantaneous Maximums

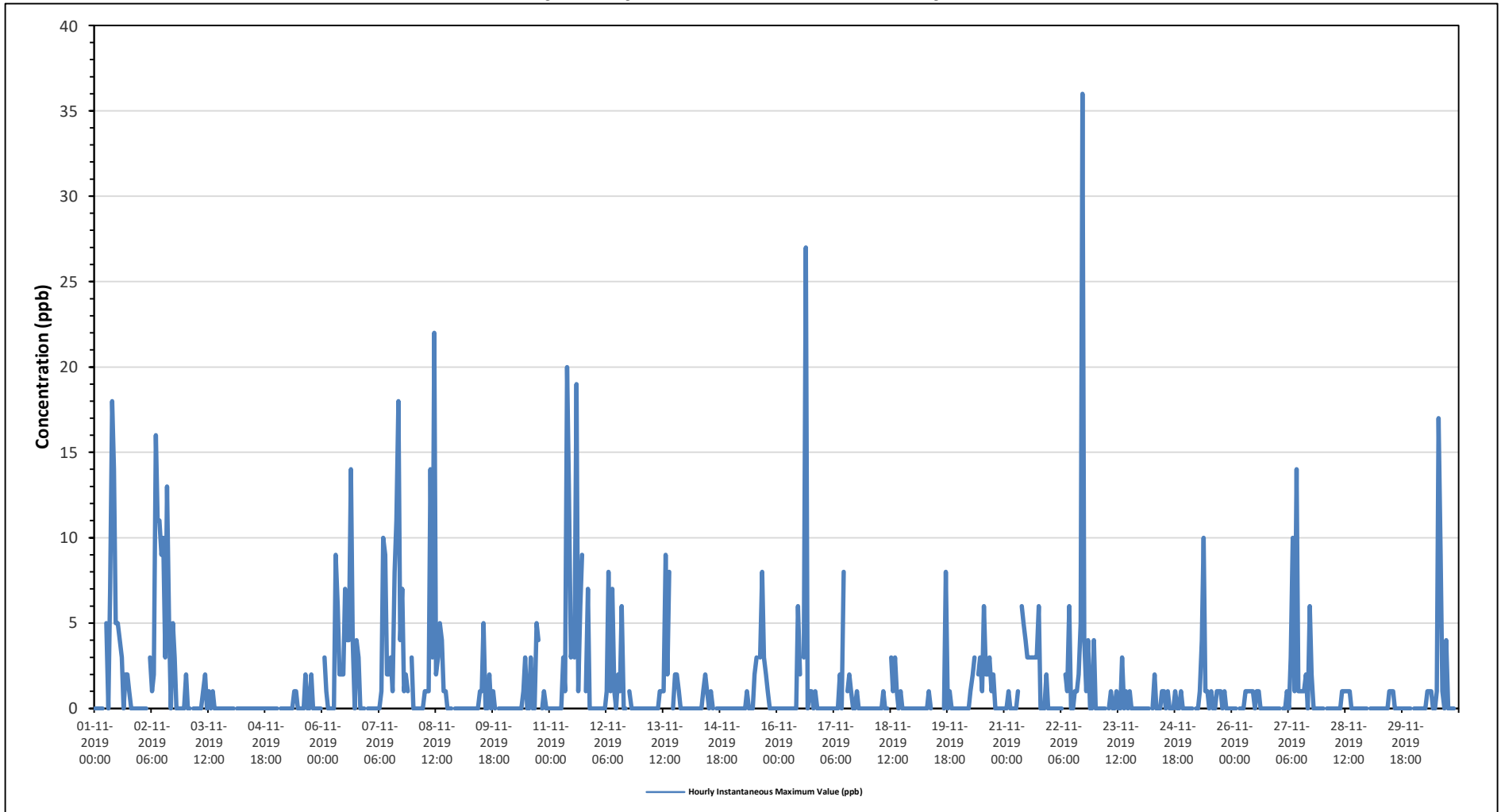
NITRIC OXIDE (NO) in ppb

Maximum Hourly Value:	36 ppb	on November 22 at hour 17	Hours in Service:	720
Maximum Daily Value:	4.0 ppb	on November 2	Hours of Data:	683
Minimum Hourly Value:	0 ppb	on November 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb	on November 4	Hours of Calibration:	37
Monthly Average:	1.3 ppb		Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	0	0	0	0	0	S	5	0	7	18	14	5	5	4	3	0	2	2	1	0	0	0	0	0	0	0	18	2.9
Nov 2	0	0	0	0	S	3	1	2	16	11	11	9	10	3	13	5	0	5	3	0	0	0	0	0	0	0	16	4.0
Nov 3	2	0	0	S	0	0	0	0	0	1	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0.3
Nov 4	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Nov 5	0	S	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	2	0.3
Nov 6	S	3	1	0	0	0	0	9	6	2	2	2	7	4	4	14	4	0	4	3	0	0	0	0	S	14	3.0	
Nov 7	0	0	0	0	0	0	1	10	9	2	2	3	1	8	11	18	4	7	1	2	1	S	S	3	0	18	3.6	
Nov 8	0	0	0	0	0	0	1	1	1	14	3	22	2	3	5	4	1	1	0	0	0	S	0	0	0	22	2.5	
Nov 9	0	0	0	0	0	0	0	0	0	0	0	1	1	5	0	0	2	0	1	0	S	0	0	0	0	5	0.4	
Nov 10	0	0	0	0	0	0	0	0	0	0	1	3	0	0	3	0	0	5	4	S	S	0	1	0	0	0	5	0.7
Nov 11	0	0	0	0	0	0	0	3	1	20	13	3	4	3	19	1	6	9	S	1	7	0	0	0	0	20	3.9	
Nov 12	0	0	0	0	0	0	1	8	1	7	1	0	2	1	6	0	0	S	1	0	0	0	0	0	0	0	8	1.2
Nov 13	0	0	0	0	0	0	0	0	0	0	1	1	1	9	2	8	S	0	2	2	1	0	0	0	0	0	9	1.2
Nov 14	0	0	0	0	0	0	0	0	0	1	2	1	0	1	0	S	0	0	0	0	0	0	0	0	0	0	2	0.2
Nov 15	0	0	0	0	0	0	0	0	1	0	0	0	2	3	S	3	8	3	2	1	0	0	0	0	0	0	8	1.0
Nov 16	0	0	0	0	0	0	0	0	0	0	6	2	S	3	27	0	1	1	0	1	0	0	0	0	0	0	27	1.8
Nov 17	0	0	0	0	0	0	0	0	0	2	0	8	S	1	2	1	0	0	1	0	0	0	0	0	0	0	8	0.7
Nov 18	0	0	0	0	0	0	0	0	1	0	0	S	3	1	3	1	0	1	0	0	0	0	0	0	0	0	3	0.4
Nov 19	0	0	0	0	0	0	0	0	1	0	C	C	C	C	C	C	0	8	0	1	0	0	0	0	0	0	8	0.6
Nov 20	0	0	0	0	0	1	2	3	S	2	3	1	6	2	2	3	1	2	0	0	0	0	0	0	0	0	6	1.2
Nov 21	0	0	1	0	0	0	1	S	6	5	4	3	3	3	3	3	3	6	0	0	0	2	0	0	0	6	1.9	
Nov 22	0	0	0	0	0	0	0	S	2	1	6	0	0	1	1	2	5	36	4	1	4	0	0	4	0	36	2.9	
Nov 23	0	0	0	0	0	S	0	1	0	0	1	0	0	3	0	1	0	1	0	0	0	0	0	0	0	3	0.3	
Nov 24	0	0	0	0	0	S	0	2	0	0	0	1	1	0	1	0	0	0	1	0	0	1	0	0	0	2	0.3	
Nov 25	0	0	0	0	S	0	0	1	4	10	1	1	0	1	0	1	1	1	1	0	1	0	0	0	0	10	1.0	
Nov 26	0	0	0	S	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0.3	
Nov 27	0	0	S	0	0	1	0	3	10	1	14	1	1	1	1	2	0	6	2	0	0	0	0	0	0	14	1.9	
Nov 28	0	S	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0.2	
Nov 29	S	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0.1	
Nov 30	0	0	0	0	0	0	0	1	1	1	0	0	1	17	9	1	0	4	0	0	0	0	0	0	S	1	1.6	
Diurnal Maximum	2	3	1	0	0	3	5	9	16	20	14	22	10	17	19	27	18	36	7	3	7	1	2	4				
Diurnal Average	0.1	0.1	0.1	0.0	0.0	0.1	0.3	1.2	2.3	3.7	2.9	2.8	1.9	2.5	3.4	3.1	1.9	3.1	1.6	0.3	0.6	0.1	0.1	0.3				
C	Calibration			S	Daily Zero/Span					Q	Quality Assurance				C1	Repeat Calibration					S1	Repeat Daily Zero/Span						
G	Out for Repair			K	Collection Error					N	Not in Service				O	Operator Error					P	Power Failure						
R	Recovery			X	Machine Malfunction					Y	Maintenance				T	Exceeds Temperature Limits					N	Not in Service						

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for NO - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Instantaneous Maximums

NITROGEN DIOXIDE (NO₂) in ppb

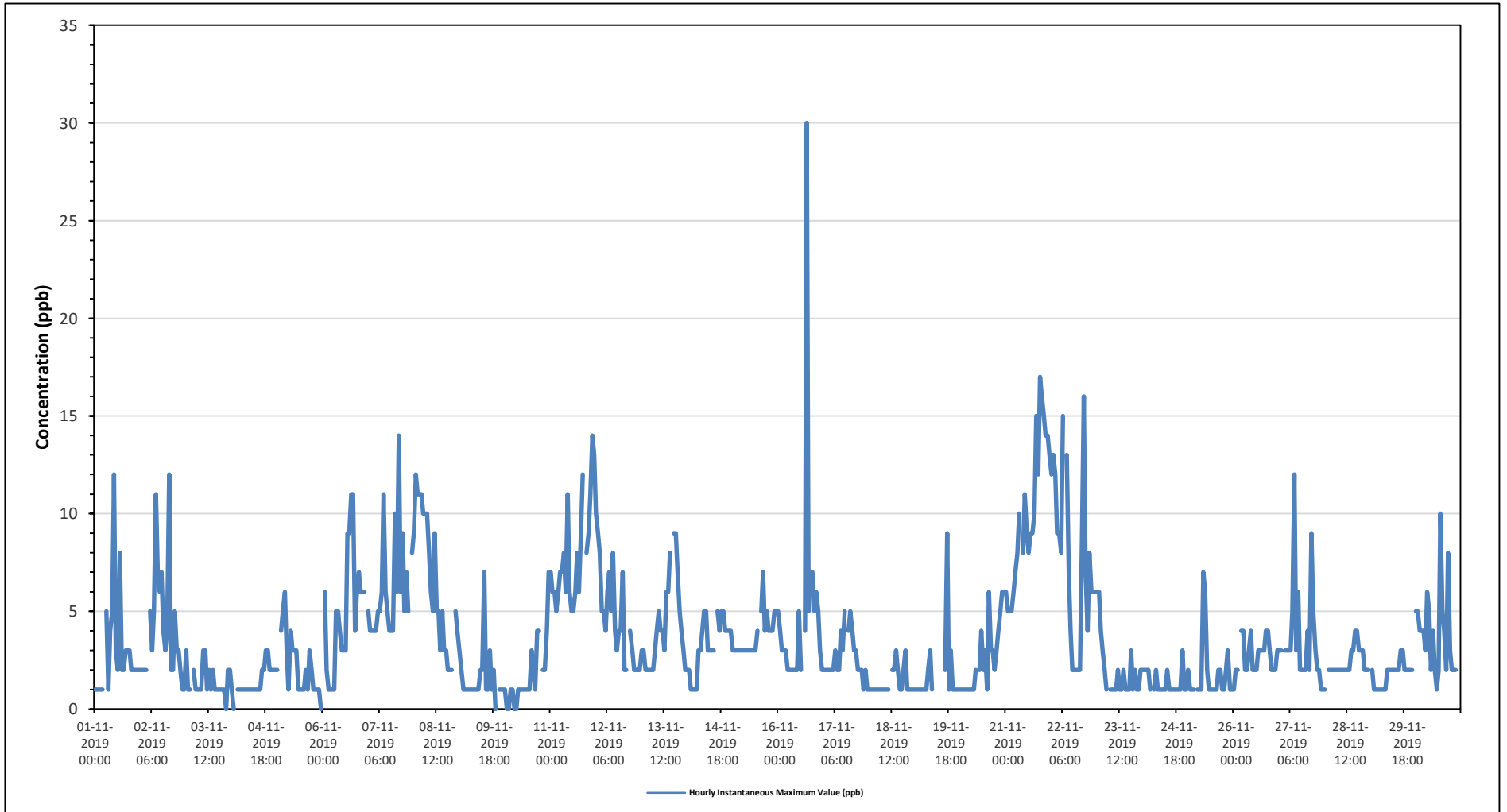
Maximum Hourly Value:	30 ppb on November 16 at hour 15	Hours in Service:	720
Maximum Daily Value:	10.1 ppb on November 21	Hours of Data:	683
Minimum Hourly Value:	0 ppb on November 3 at hour 21	Hours of Missing Data:	0
Minimum Daily Value:	1.3 ppb on November 18	Hours of Calibration:	37
Monthly Average:	3.6 ppb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	1	1	1	1	1	S	5	1	4	5	12	3	2	8	2	2	3	3	3	2	2	2	2	2	1	12	3.0	
Nov 2	2	2	2	2	S	5	3	5	11	7	6	7	4	3	4	12	2	2	5	3	3	2	1	1	1	12	4.1	
Nov 3	3	1	1	S	2	1	1	1	1	3	3	1	2	1	2	1	1	1	1	1	0	2	2	2	0	3	1.4	
Nov 4	1	0	S	1	1	1	1	1	1	1	1	1	1	1	1	2	2	3	3	2	2	2	2	2	0	3	1.4	
Nov 5	2	S	4	5	6	3	1	4	3	3	3	1	1	1	2	1	3	2	1	1	1	1	1	0	6	2.2		
Nov 6	S	6	2	1	1	1	1	5	5	4	3	3	9	9	11	11	4	6	7	6	6	6	S	1	11	5.0		
Nov 7	5	4	4	4	4	5	5	6	11	6	5	4	4	10	6	14	6	9	5	7	5	S	S	8	4	14	6.1	
Nov 8	9	12	11	11	11	10	10	10	8	6	5	9	5	5	3	5	3	3	2	2	S	S	5	4	2	12	6.6	
Nov 9	3	2	1	1	1	1	1	1	1	1	1	2	2	7	1	1	3	1	2	0	S	1	1	1	0	7	1.6	
Nov 10	1	0	0	1	1	0	0	1	1	1	1	1	1	1	3	2	1	4	4	S	S	2	2	4	7	0	1.7	
Nov 11	7	6	6	5	6	7	7	8	6	11	6	5	5	6	8	6	9	12	S	8	9	11	14	13	5	14	7.9	
Nov 12	10	9	8	5	5	4	6	7	5	8	4	3	4	4	7	2	2	S	4	3	2	2	2	2	2	2	10	4.7
Nov 13	3	3	2	2	2	2	2	3	4	5	4	4	3	6	6	8	S	9	9	7	5	4	3	2	2	9	4.3	
Nov 14	2	2	1	1	1	1	3	3	4	5	5	3	3	3	3	S	5	4	5	5	4	4	4	4	1	5	3.3	
Nov 15	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	S	5	7	4	5	4	4	4	5	3	7	3.7	
Nov 16	5	4	3	3	3	2	2	2	2	2	2	5	2	S	4	30	5	7	7	5	6	5	3	2	2	30	4.8	
Nov 17	2	2	2	2	2	2	3	2	2	4	3	5	S	4	5	4	3	3	2	2	2	1	2	1	1	5	2.6	
Nov 18	1	1	1	1	1	1	1	1	1	1	1	1	S	2	2	3	2	1	1	2	3	1	1	1	1	3	1.3	
Nov 19	1	1	1	1	1	1	1	2	3	1	C	C	C	C	C	C	2	9	1	3	1	1	1	1	1	9	1.8	
Nov 20	1	1	1	1	1	1	1	1	2	S	2	4	2	3	1	6	3	3	2	3	4	5	6	6	1	6	2.6	
Nov 21	6	5	5	5	6	7	8	10	S	8	11	9	8	9	9	10	15	12	17	16	15	14	14	13	5	17	10.1	
Nov 22	12	13	12	9	9	8	15	S	13	7	4	2	2	2	2	9	16	7	4	8	6	6	6	6	2	16	7.6	
Nov 23	6	6	4	3	2	1	S	1	1	1	1	2	1	1	2	1	1	3	1	2	1	1	2	1	1	6	2.0	
Nov 24	2	2	2	2	1	S	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	3	1	1	1	3	1.3	
Nov 25	2	1	1	1	S	1	1	1	7	6	2	1	1	1	1	2	2	1	1	2	3	1	1	1	1	7	1.8	
Nov 26	1	2	2	S	4	4	2	2	3	4	2	2	2	3	3	3	4	4	3	2	2	2	3	1	4	2.7		
Nov 27	3	3	S	3	3	3	3	5	12	3	6	2	2	2	4	2	9	5	3	2	2	1	1	1	12	3.5		
Nov 28	1	S	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	4	3	3	3	2	2	2	1	4	2.3	
Nov 29	S	2	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	2	2	2	2	2	2	S	3	1.8		
Nov 30	5	5	4	4	4	3	6	5	2	4	2	1	2	10	5	4	2	8	3	2	2	2	S	4	1	10	3.9	
Diurnal Maximum	12	13	12	11	11	10	15	10	13	11	12	9	8	10	10	30	15	16	17	16	15	14	14	13				
Diurnal Average	3.6	3.5	3.1	2.9	3.0	2.9	3.3	3.3	4.1	4.0	3.6	3.1	2.6	3.8	3.7	4.9	4.1	4.9	4.1	3.6	3.6	3.3	3.4	3.5				

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for NO2 - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - November 2019

Summary of Hourly Instantaneous Maximums

OZONE (O₃) in ppb

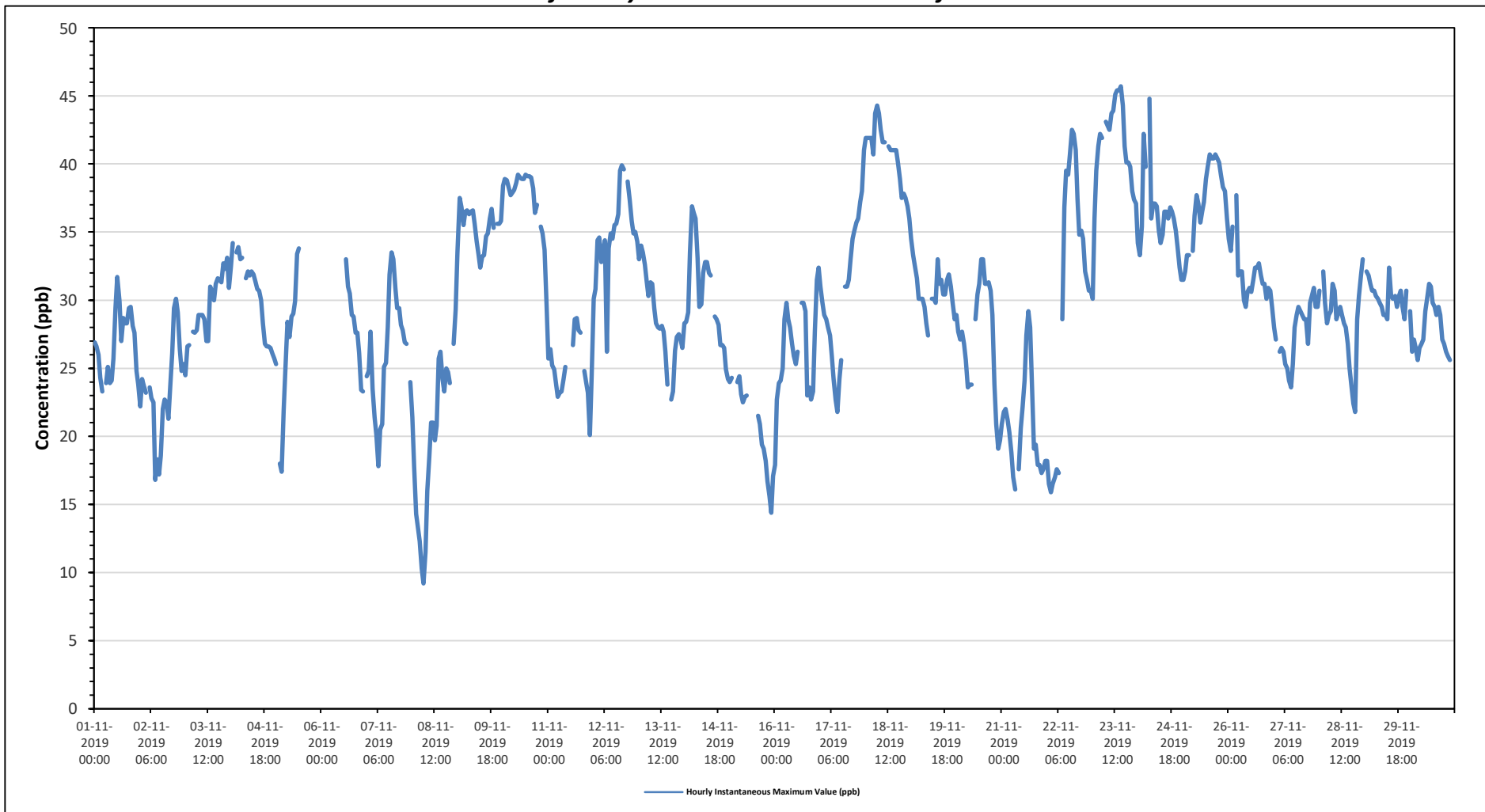
Maximum Hourly Value:	45.7 ppb on November 23 at hour 15	Hours in Service:	720
Maximum Daily Value:	41.2 ppb on November 23	Hours of Data:	656
Minimum Hourly Value:	9.2 ppb on November 8 at hour 6	Hours of Missing Data:	25
Minimum Daily Value:	19.8 ppb on November 8	Hours of Calibration:	39
Monthly Average:	29.8 ppb	Operational Uptime:	96.5

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	26.9	26.6	26	24.3	23.3	S	23.9	25.1	23.9	24.1	25.7	29.4	31.7	29.9	27	28.7	28.3	28.3	29.4	29.5	28.1	27.6	24.8	23.8	23.3	31.7	26.8
Nov 2	22.2	24.2	23.7	23.2	S	23.6	22.8	22.5	16.8	18.3	17.2	18.6	22	22.7	22.5	21.3	23.9	26.1	29.4	30.1	29.1	26.4	24.8	25.3	16.8	30.1	23.3
Nov 3	24.5	26.6	26.7	S	27.7	27.6	27.8	28.9	28.9	28.6	27	27	31	30.6	30	31.2	31.6	31.5	31.3	32.7	32.3	33.1	30.9	24.5	33.1	29.4	
Nov 4	32.5	34.2	S	33.5	33.9	33	33.1	S1	31.6	32.1	31.8	32.1	31.9	31.4	30.8	30.7	30	28.3	26.8	26.6	26.5	26.1	25.7	25.7	34.2	30.4	
Nov 5	25.3	S	18	17.4	21.9	25	28.4	27.3	28.8	29	29.9	33.4	33.8	C	C	C	C	X	X	X	X	X	X	X	17.4	33.8	-
Nov 6	X	X	X	X	X	X	X	X	X	C	C	C	C	33	31	30.5	28.9	28.8	27.6	27.6	26.1	23.4	23.3	S	23.3	33.0	-
Nov 7	24.4	24.8	27.7	23.5	21.4	20.1	17.8	20.5	20.9	25.1	25.4	28	31.9	33.5	33	30.9	29.4	29.4	28.2	27.8	26.9	26.8	S	24	17.8	33.5	26.1
Nov 8	21.4	17.8	14.3	13.3	12.3	10.3	9.2	11.5	16	18.5	21	21	19.7	20.8	25.7	26.2	24.2	23.3	25	24.7	23.9	S	26.8	29.3	9.2	29.3	19.8
Nov 9	33.5	37.5	36.8	35.5	36.5	36.6	36.3	36.5	36.6	35.6	34.3	33.4	32.4	33.2	33.3	34.7	34.9	36	36.7	35.3	S	35.6	35.6	35.8	32.4	37.5	35.3
Nov 10	38.4	38.9	38.8	38.3	37.7	37.9	38.1	38.6	39.2	39	38.9	38.9	39.2	39.1	39.1	39	38.2	36.4	37	S	35.4	34.9	33.7	29.6	29.6	39.2	37.6
Nov 11	25.7	26.4	25.2	24.9	23.9	22.9	23.2	23.3	24.2	25.1	K	K	K	26.7	28.6	28.7	27.8	27.6	S	24.8	24	23.2	20.1	24.5	20.1	28.7	25.0
Nov 12	30.1	30.8	34.4	34.6	32.8	33.6	34.4	26.2	33.8	34.9	34.5	35.5	35.6	36.3	39.5	39.9	39.6	S	38.7	37.4	35.8	34.9	35	34.3	26.2	39.9	34.9
Nov 13	33	34	33.5	32.6	31.4	30.3	31.3	31.2	29.4	28.3	28	27.9	28.1	27.7	26.2	23.8	S	22.7	23.3	26.3	27.3	27.5	27.1	26.5	22.7	34.0	28.6
Nov 14	28.3	28.4	29.1	33.5	36.9	36.4	36	33.1	29.5	29.7	32	32.8	32.8	32	31.8	S	28.8	28.6	28.2	26.7	26.7	26.5	24.9	24.2	24.2	36.9	30.3
Nov 15	24	24.3	K	K	24	24.4	23.1	22.5	22.9	23	Y	Y	Y	21.8	S	21.5	20.9	19.4	19.1	18.2	16.7	15.6	14.4	17.1	14.4	24.4	20.7
Nov 16	17.9	22.7	23.9	24.1	25	28.6	29.8	28.6	28	26.8	25.9	25.3	26.2	S	29.8	29.8	29.2	23	23.6	22.7	23.3	27.7	31.5	32.4	17.9	32.4	26.3
Nov 17	31	29.8	28.9	28.6	28	27.4	25.9	24.2	22.7	21.8	24.2	25.6	S	31	31	31.5	33	34.5	35.1	35.7	36	37.2	38	41	21.8	41.0	30.5
Nov 18	41.9	41.9	41.9	41.9	40.7	43.7	44.3	43.7	42.5	41.6	41.6	S	41.3	41	41	41	41	40.1	38.9	37.5	37.8	37.5	36.9	36	36.0	44.3	40.7
Nov 19	34.5	33.3	32.5	31.6	30.1	30.1	30.1	29.5	28.3	27.4	S	30.1	30.1	29.8	33	31.2	31.5	30.4	30.4	31.5	31.9	31	29.8	28.6	27.4	34.5	30.7
Nov 20	28.9	27.7	27.1	27.7	26.8	25.6	23.6	23.8	23.8	S	28.6	30.4	31.2	33	33	31.2	31.2	31.3	30.7	28.9	23.8	20.9	19.1	19.7	19.1	33.0	27.3
Nov 21	20.9	21.8	22	21.2	20.3	18.8	17	16.1	S	17.6	20.6	22.1	24.1	27.4	29.2	28	23.3	19.1	19.4	17.9	17.9	17.3	17.6	18.2	16.1	29.2	20.8
Nov 22	18.2	16.5	15.9	16.5	17	17.6	17.3	S	28.6	36.8	39.5	39.2	40.7	42.5	42.2	41	37.4	34.8	35.1	34.5	32.1	31.5	30.7	30.7	15.9	42.5	30.3
Nov 23	30.1	36	39.5	41.3	42.2	41.9	S	43.1	42.8	42.5	43.7	43.9	45.1	45.4	45.4	45.7	44.3	41.3	40.1	39.8	38	37.4	37.1	30.1	45.7	41.2	
Nov 24	34.2	33.3	35.4	42.2	39.8	S	44.8	36	37.1	37.1	36.9	35.1	34.2	34.8	36.5	36.5	36	36.8	36.5	36	35.1	33.9	32.4	31.5	31.5	44.8	36.2
Nov 25	31.5	32.1	33.3	33.3	S	33.6	36.2	37.7	37.1	35.7	36.5	37.2	38.9	39.8	40.7	40.4	40.4	40.7	40.4	40.1	39.2	38.3	38	36	31.5	40.7	37.3
Nov 26	34.5	33.6	35.4	S	37.7	31.8	32.1	32.1	30	29.5	30.6	30.9	30.6	31.5	32.4	32.4	32.7	31.8	31.2	31.2	30.1	30.9	30.7	29.5	29.5	37.7	31.9
Nov 27	28	27.1	S	26.2	26.5	26.2	25.3	25	24.1	23.6	25.3	28	28.9	29.5	29.2	28.9	28.6	28.6	26.8	29.8	30.3	30.9	29.5	29.5	23.6	30.9	27.6
Nov 28	30.7	S	32.1	29.8	28.3	28.9	29.2	31.2	30.7	28.6	29.1	29.5	28.9	28.3	28	26.8	25	23.6	22.4	21.8	28.6	30.3	31.8	33	21.8	33.0	28.5
Nov 29	S	32.1	31.8	31.2	30.7	30.7	30.3	30.1	29.8	29.5	28.9	28.9	28.6	32.4	30.3	30.1	30.3	29.5	30.3	30.7	29.5	28.6	30.7	S	28.6	32.4	30.2
Nov 30	29.2	26.2	27.1	26.5	25.6	26.5	26.8	27.1	29.2	30.1	31.2	31	29.8	29.5	28.9	29.5	28.9	27.1	26.8	26.2	25.9	25.6	S	24.4	24.4	31.2	27.8
Diurnal Maximum	42	42	42	42	42	44	45	44	43	43	44	44	45	45	45	46	44	41	40	40	40	38	38	41			
Diurnal Average	28.6	29.2	29.3	29.1	29.0	28.6	28.5	28.7	29.2	29.3	30.4	30.6	31.7	32.0	32.5	31.8	31.4	30.0	30.3	29.7	29.3	29.3	29.0	28.8			

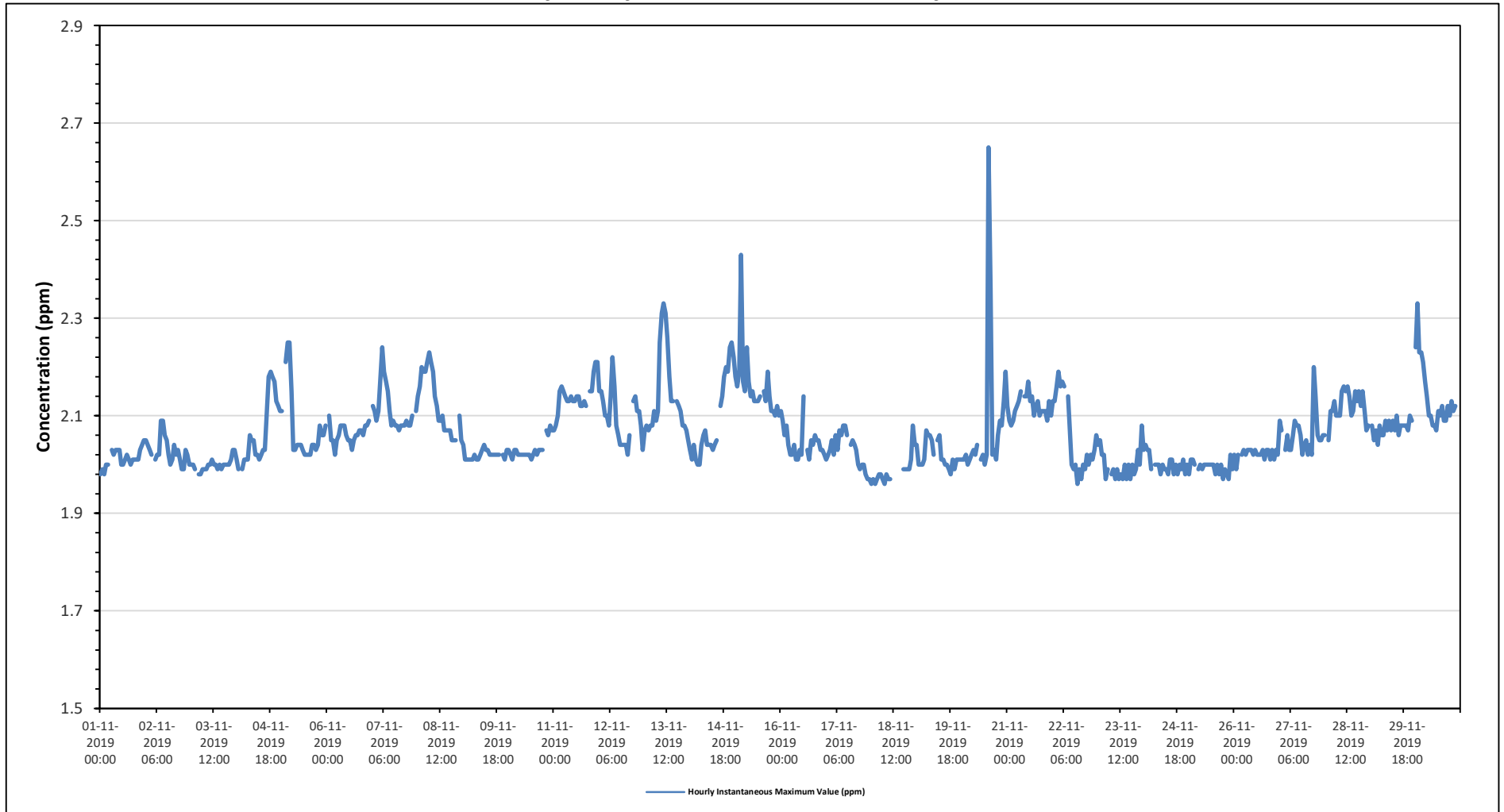
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	N	Not in Service	O	Operator Error	P	Power Failure	N	Not in Service
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

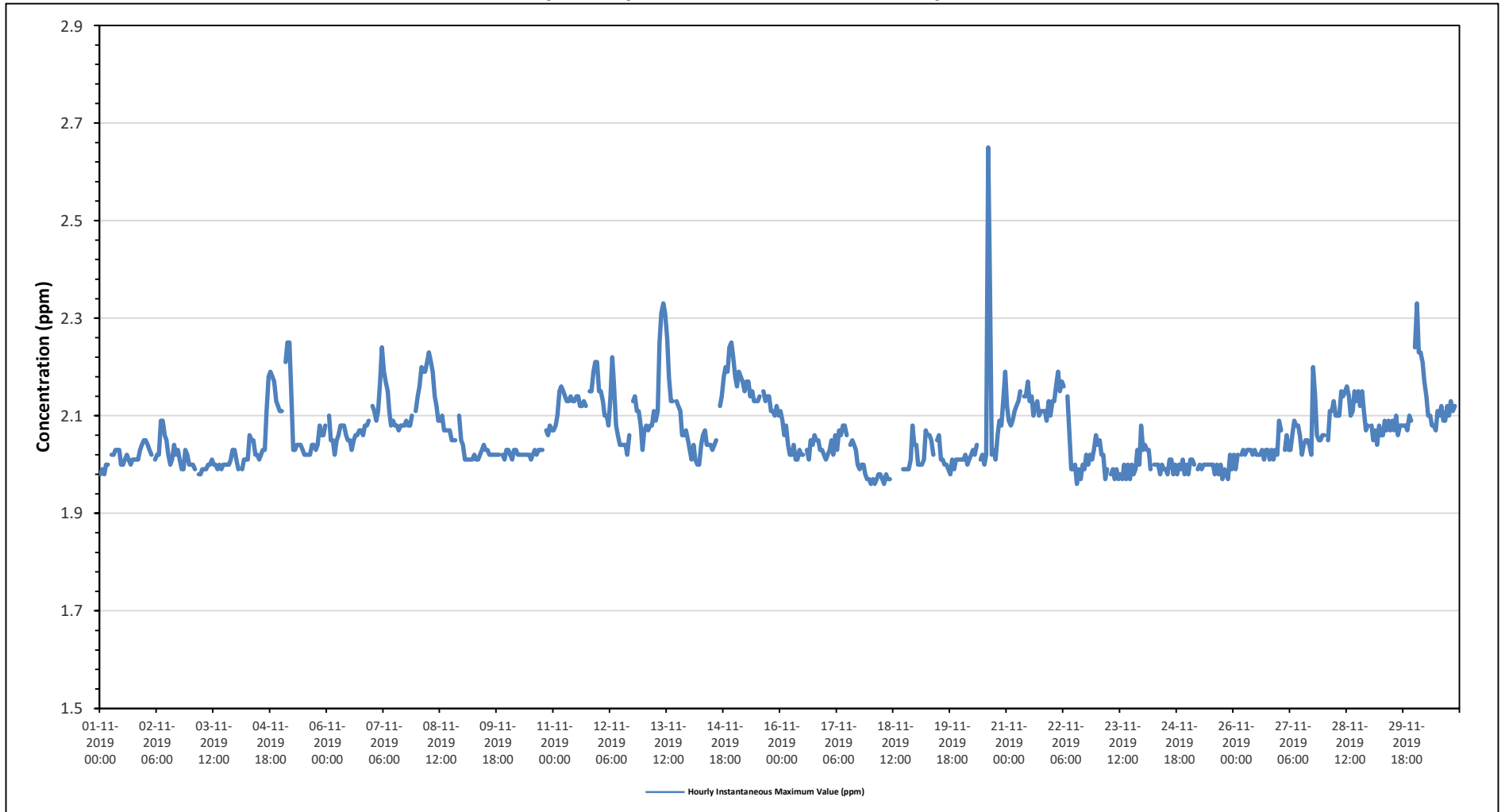
Timeseries Chart of Hourly Instantaneous Maximum for O3 - St. Lina Site



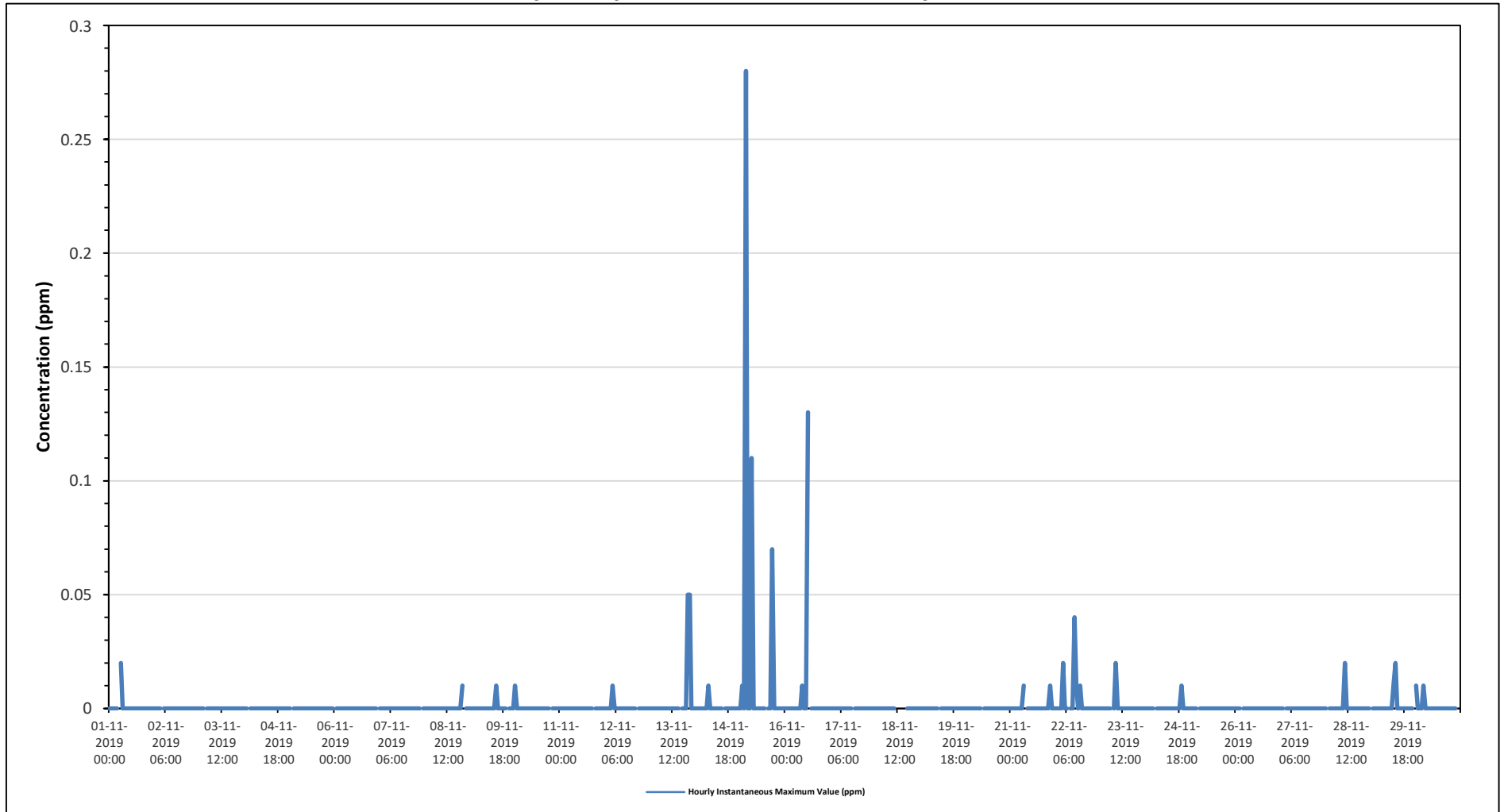
Timeseries Chart of Hourly Instantaneous Maximum for THC - St. Lina Site



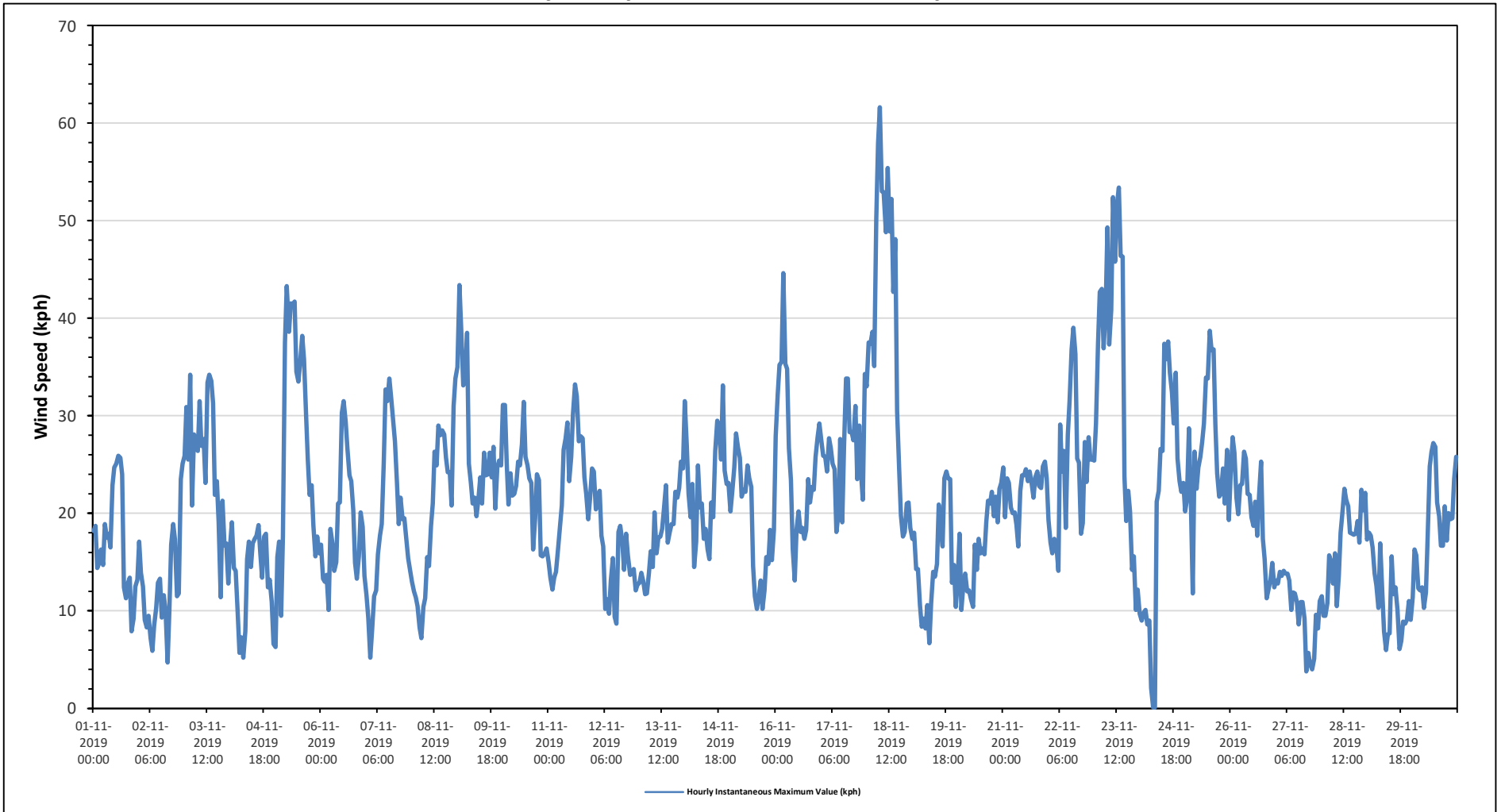
Timeseries Chart of Hourly Instantaneous Maximum for CH4 - St. Lina Site



Timeseries Chart of Hourly Instantaneous Maximum for NMHC - St. Lina Site

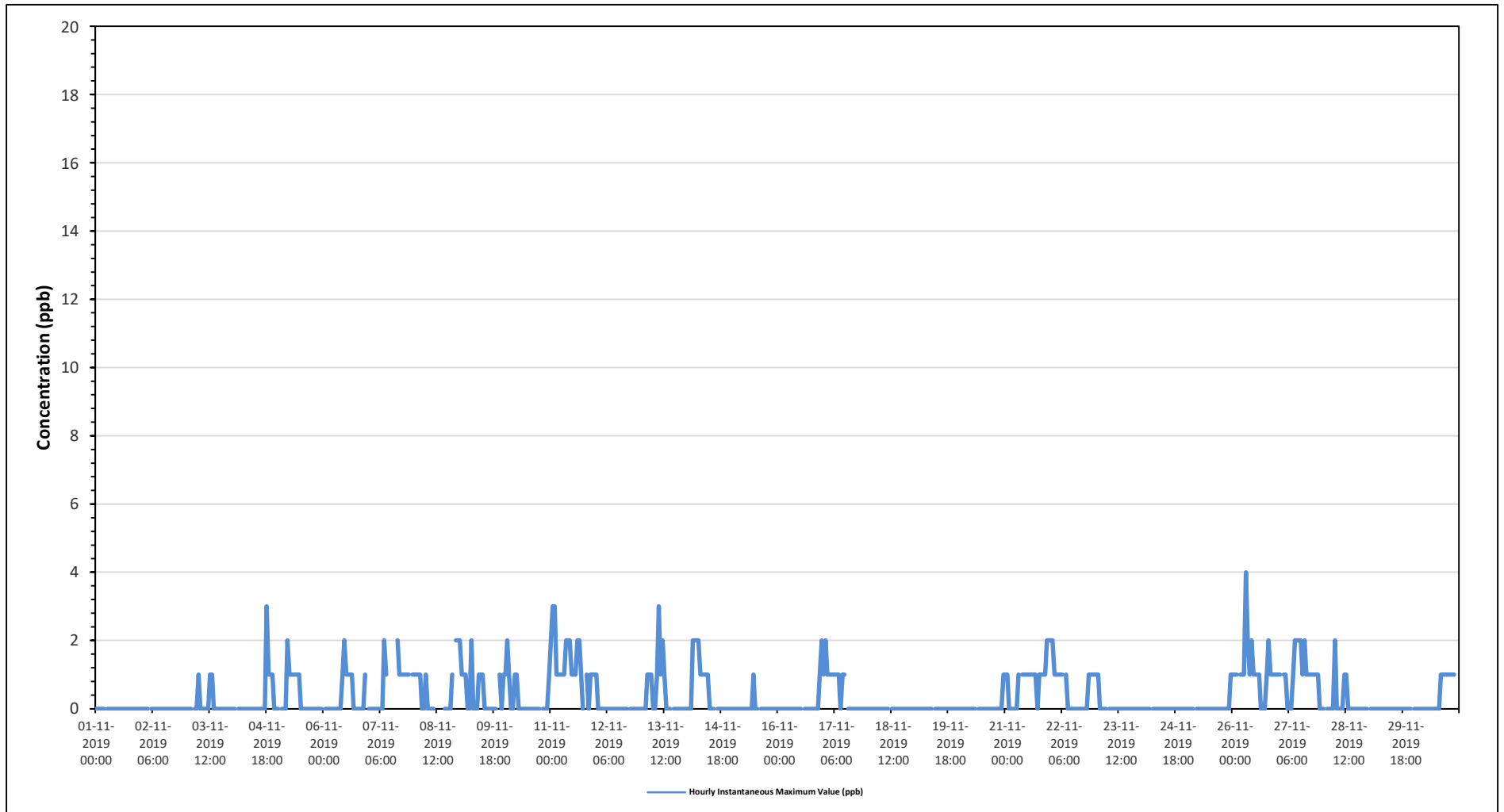


Timeseries Chart of Hourly Instantaneous Maximum for WS - St. Lina Site



BONNYVILLE -EAST STATION

Timeseries Chart of Hourly Instantaneous Maximum for SO2 - Bonnyville - East Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Instantaneous Maximums

HYDROGEN SULPHIDE (H₂S) in ppb

Maximum Hourly Value:	65 ppb on November 22 at hour 6	Hours in Service:	720
Maximum Daily Value:	7.3 ppb on November 16	Hours of Data:	674
Minimum Hourly Value:	0 ppb on November 3 at hour 21	Hours of Missing Data:	8
Minimum Daily Value:	0.1 ppb on November 6	Hours of Calibration:	38
Monthly Average:	2.7 ppb	Operational Uptime:	98.9

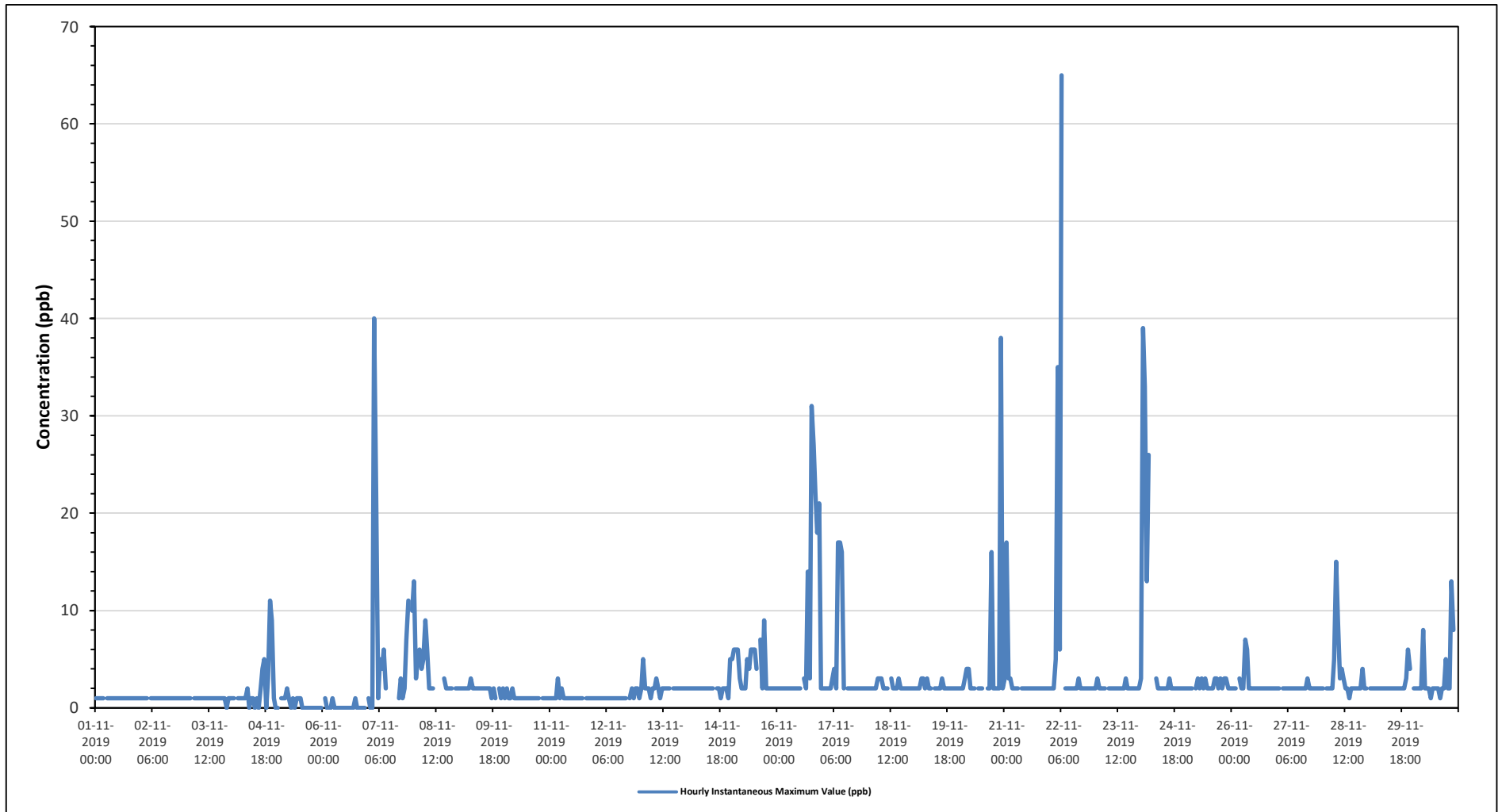
Day	Hourly Period Starting at (MST)																							Daily	Daily	Daily										
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Minimum	Maximum	Average									
Nov 1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0
Nov 2	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	
Nov 3	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	1	0	1	1	1.0		
Nov 4	1	1	S	1	1	1	1	1	2	0	1	1	0	1	0	2	4	5	0	3	11	9	1	0	0	0	0	0	0	0	0	0	0	0	2.0	
Nov 5	0	S	1	1	1	2	1	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4		
Nov 6	S	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0.1		
Nov 7	1	0	0	40	22	1	5	4	6	2	C	C	C	C	C	C	1	3	1	2	7	11	S	10	0	0	0	0	0	0	0	0	40	-		
Nov 8	13	3	5	6	4	5	9	6	2	2	2	P	P	P	P	P	3	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	13	4.0		
Nov 9	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	1	2	1	S	2	1	2	1	3	1	3	1	2	1	3	1.9			
Nov 10	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	2	1.1		
Nov 11	1	1	1	1	3	1	2	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	3	1.1		
Nov 12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	2	1	2	2	1	1	2	2	1	1	2	2	1	2	1.1		
Nov 13	2	5	2	2	2	1	2	2	3	2	1	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	5	2.1		
Nov 14	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	1	2	2	2	2	2	1	5	1	5	2	2	2	2	31	2.0			
Nov 15	5	6	6	6	3	2	2	2	5	4	6	6	6	4	S	7	2	9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	9	4.0		
Nov 16	2	2	2	2	2	2	2	2	2	2	2	2	2	S	3	2	14	3	31	27	22	18	21	2	2	2	31	7.3	2	2	2	7.3				
Nov 17	2	2	2	2	2	3	4	2	17	17	16	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	17	4.0			
Nov 18	2	2	2	2	2	3	3	3	2	2	2	S	3	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2.2			
Nov 19	2	2	2	2	3	3	2	3	2	2	S	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2.2		
Nov 20	2	2	2	3	4	4	2	2	2	S	2	2	2	C1	C1	2	2	16	2	2	2	2	38	2	2	2	38	4.6	2	2	2	4.6				
Nov 21	3	17	3	3	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	17	2.8			
Nov 22	2	2	2	5	35	6	65	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	65	6.5			
Nov 23	2	3	2	2	2	2	S	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2.1			
Nov 24	3	39	33	13	26	S	2	S1	3	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	39	6.8				
Nov 25	2	2	2	2	S	2	3	2	3	2	3	2	2	2	2	3	3	2	3	2	3	3	2	2	2	2	2	2	2	2	2	3	2.3			
Nov 26	2	2	2	S	3	2	2	7	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	7	2.4			
Nov 27	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2.0			
Nov 28	2	S	2	2	2	2	5	15	9	3	4	3	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	15	3.2			
Nov 29	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	6	4	2	2	6	2	6	2	6	2.3				
Nov 30	2	2	2	2	2	8	2	2	2	1	2	2	2	2	1	2	2	5	2	2	13	8	S	6	1	13	6	1	13	3.2	3.2	3.2				
Diurnal Maximum	13	39	33	40	35	8	65	15	17	17	16	6	6	4	3	7	14	16	31	27	22	18	38	10												
Diurnal Average	2.2	3.9	3.0	3.9	4.8	2.3	4.5	2.5	2.9	2.2	2.4	1.8	1.8	1.7	1.5	2.0	2.3	2.7	2.6	2.6	3.3	3.2	3.6	2.2												

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for H2S - Bonnyville - East Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Instantaneous Maximums

OXIDES OF NITROGEN (NOx) in ppb

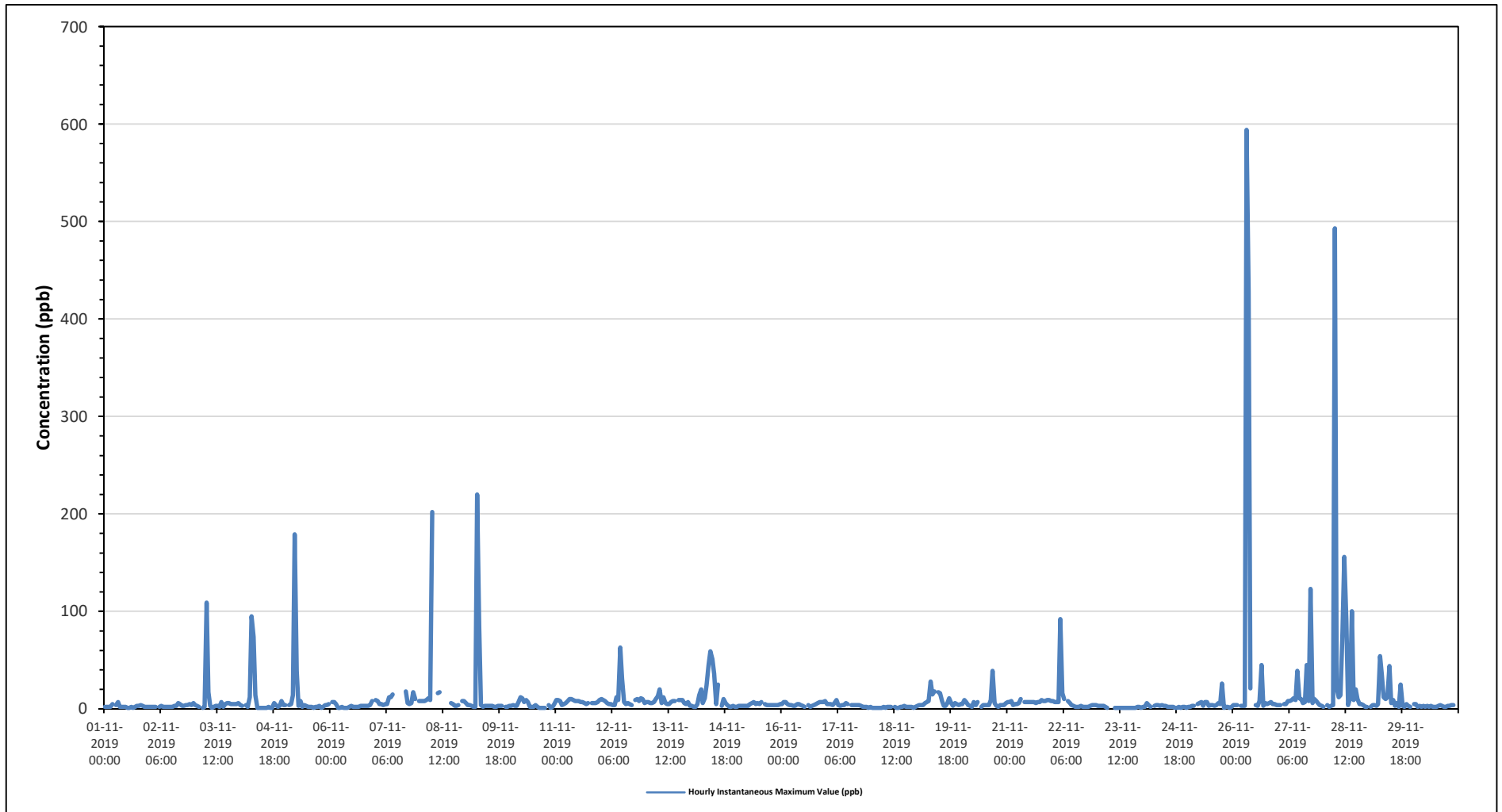
Maximum Hourly Value:	594 ppb on November 26 at hour 7	Hours in Service:	720
Maximum Daily Value:	55.5 ppb on November 26	Hours of Data:	671
Minimum Hourly Value:	1 ppb on November 1 at hour 12	Hours of Missing Data:	11
Minimum Daily Value:	1.5 ppb on November 23	Hours of Calibration:	38
Monthly Average:	10.4 ppb	Operational Uptime:	98.5

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	2	2	2	2	5	S	4	7	2	2	2	2	1	1	2	1	2	3	3	4	3	2	2	2	1	7	2.5	
Nov 2	2	2	2	2	S	2	3	2	2	2	2	2	3	3	3	6	5	3	3	4	4	5	4	6	2	6	3.1	
Nov 3	4	3	2	S	4	1	109	17	3	1	2	3	3	2	7	2	5	6	6	5	5	5	6	1	109	8.9		
Nov 4	4	3	S	4	2	12	95	74	14	1	1	1	1	1	2	1	1	1	6	4	2	3	8	4	1	95	10.7	
Nov 5	4	S	4	5	14	179	39	3	8	2	4	3	2	2	2	1	2	2	3	1	2	4	4	5	1	179	12.8	
Nov 6	S	7	7	5	1	1	2	1	1	1	2	3	2	2	2	2	3	3	3	3	3	4	8	S	1	8	3.0	
Nov 7	9	8	5	5	4	5	5	12	12	15	C	C	C	C	C	C	18	6	5	6	17	10	S	S	4	18	-	
Nov 8	8	8	8	9	11	9	202	S1	S1	16	17	P	P	P	P	P	6	5	3	3	4	S	8	8	3	202	-	
Nov 9	6	4	4	3	2	2	220	85	4	2	3	3	3	3	3	2	2	3	3	3	S	2	2	3	2	220	16.0	
Nov 10	3	4	3	3	7	12	11	7	9	7	2	2	2	4	2	1	1	1	1	S	4	1	2	5	1	12	4.1	
Nov 11	9	9	8	4	5	6	8	10	10	9	8	8	8	7	7	6	5	6	S	6	6	6	7	9	4	10	7.3	
Nov 12	10	9	8	6	5	5	4	4	12	9	63	31	7	5	6	5	4	S	9	10	8	11	10	6	4	63	10.7	
Nov 13	7	7	6	6	7	10	13	20	6	12	6	5	5	7	8	8	S	9	9	9	6	5	7	3	3	20	7.9	
Nov 14	3	2	2	5	14	20	6	11	24	45	59	51	36	5	25	S	3	10	6	4	2	2	3	2	2	59	14.8	
Nov 15	2	3	3	3	3	3	3	5	6	7	5	6	5	7	S	5	4	4	4	4	4	4	4	5	2	7	4.3	
Nov 16	5	7	7	5	4	4	3	3	5	5	4	3	2	S	4	2	3	4	5	6	7	7	7	8	2	8	4.8	
Nov 17	5	5	5	4	6	9	4	3	4	4	6	5	S	4	4	4	4	4	3	2	2	2	1	2	1	9	4.0	
Nov 18	1	1	1	1	1	2	1	2	2	2	2	S	2	1	1	2	2	3	2	2	2	2	1	2	1	3	1.6	
Nov 19	3	4	4	4	6	7	8	28	15	18	S	17	16	8	3	3	6	11	6	3	6	5	4	5	3	28	8.3	
Nov 20	5	9	7	4	3	2	7	4	7	S	2	4	4	4	4	9	39	6	3	2	4	4	4	6	2	39	6.2	
Nov 21	7	7	8	4	5	5	6	10	S	7	7	7	7	7	7	6	7	7	9	8	8	9	9	8	4	10	7.2	
Nov 22	8	7	7	7	92	16	10	S	8	6	4	3	2	2	2	3	2	2	2	2	3	4	4	4	2	92	8.7	
Nov 23	3	3	3	3	2	1	S	S1	S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	3	1.5
Nov 24	2	2	6	4	2	S	3	4	4	3	4	3	3	2	2	2	2	1	1	2	1	2	2	1	1	6	2.5	
Nov 25	2	2	3	3	S	5	6	7	3	7	3	4	4	3	4	6	5	26	1	2	2	1	2	1	26	4.7		
Nov 26	4	4	4	S	3	3	3	594	428	21	C1	C1	4	3	8	45	3	6	5	6	7	5	5	4	3	594	55.5	
Nov 27	4	4	S	5	5	8	8	9	11	9	39	11	10	6	7	45	8	123	6	10	8	6	4	3	3	123	15.2	
Nov 28	2	S	4	2	3	4	493	22	12	14	79	156	92	4	10	100	9	20	10	5	5	4	2	2	2	493	45.8	
Nov 29	S	2	4	4	3	5	54	35	12	10	12	44	6	9	3	6	2	25	3	2	5	3	2	S	2	54	11.4	
Nov 30	5	5	2	3	2	3	2	3	2	3	2	2	2	3	4	3	2	2	3	3	4	4	S	33	2	33	4.2	
Diurnal Maximum	10	9	8	9	92	179	493	594	428	45	79	156	92	9	25	100	39	123	26	10	17	11	10	33				
Diurnal Average	4.6	4.8	4.6	4.1	7.8	12.2	46.0	36.3	23.2	8.3	12.8	14.6	8.6	4.0	4.9	10.2	5.4	9.7	5.1	4.2	4.7	4.3	4.4	5.5				

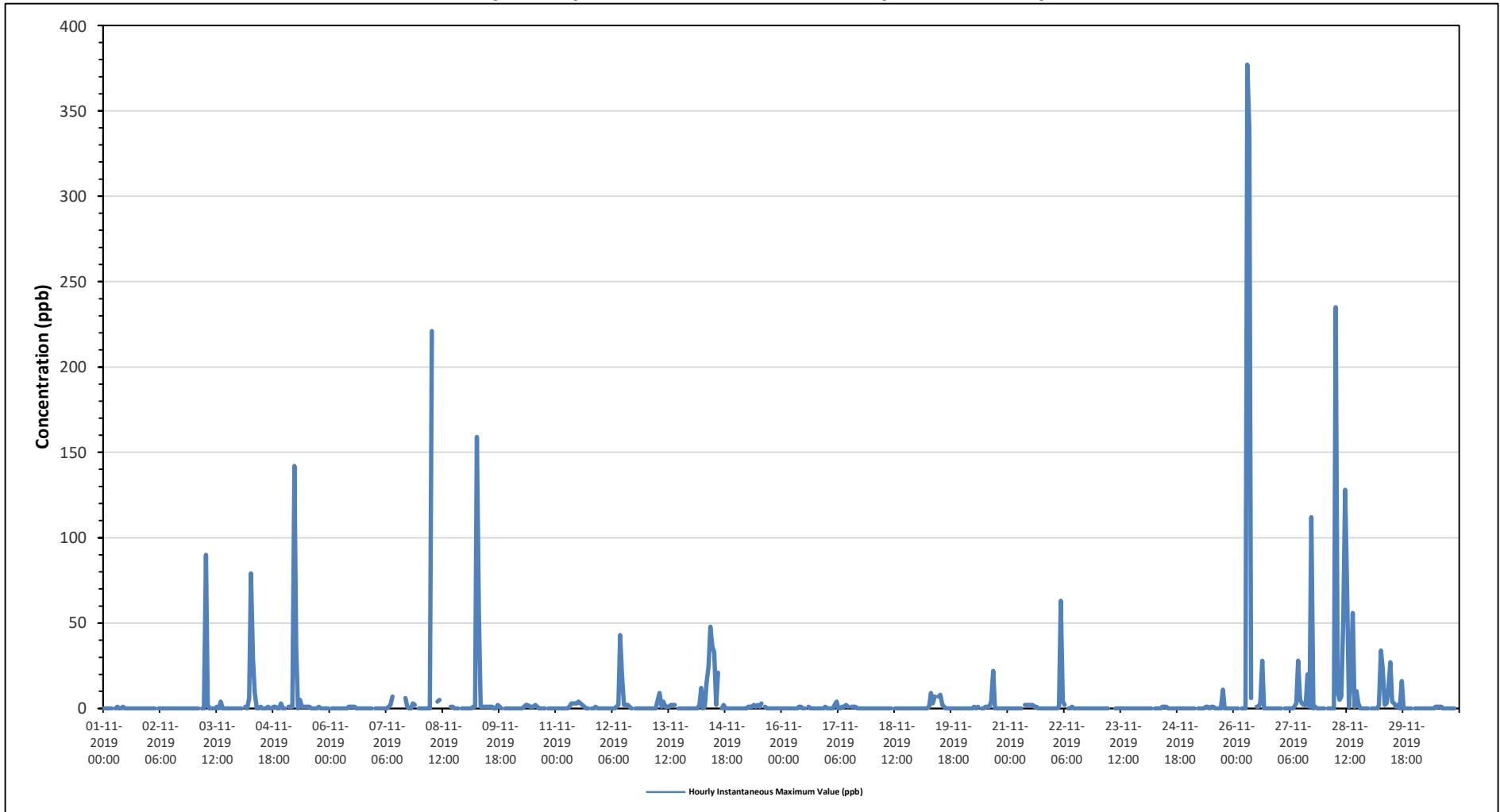
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for NOx - Bonnyville - East Site



Timeseries Chart of Hourly Instantaneous Maximum for NO - Bonnyville - East Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Instantaneous Maximums

NITROGEN DIOXIDE (NO₂) in ppb

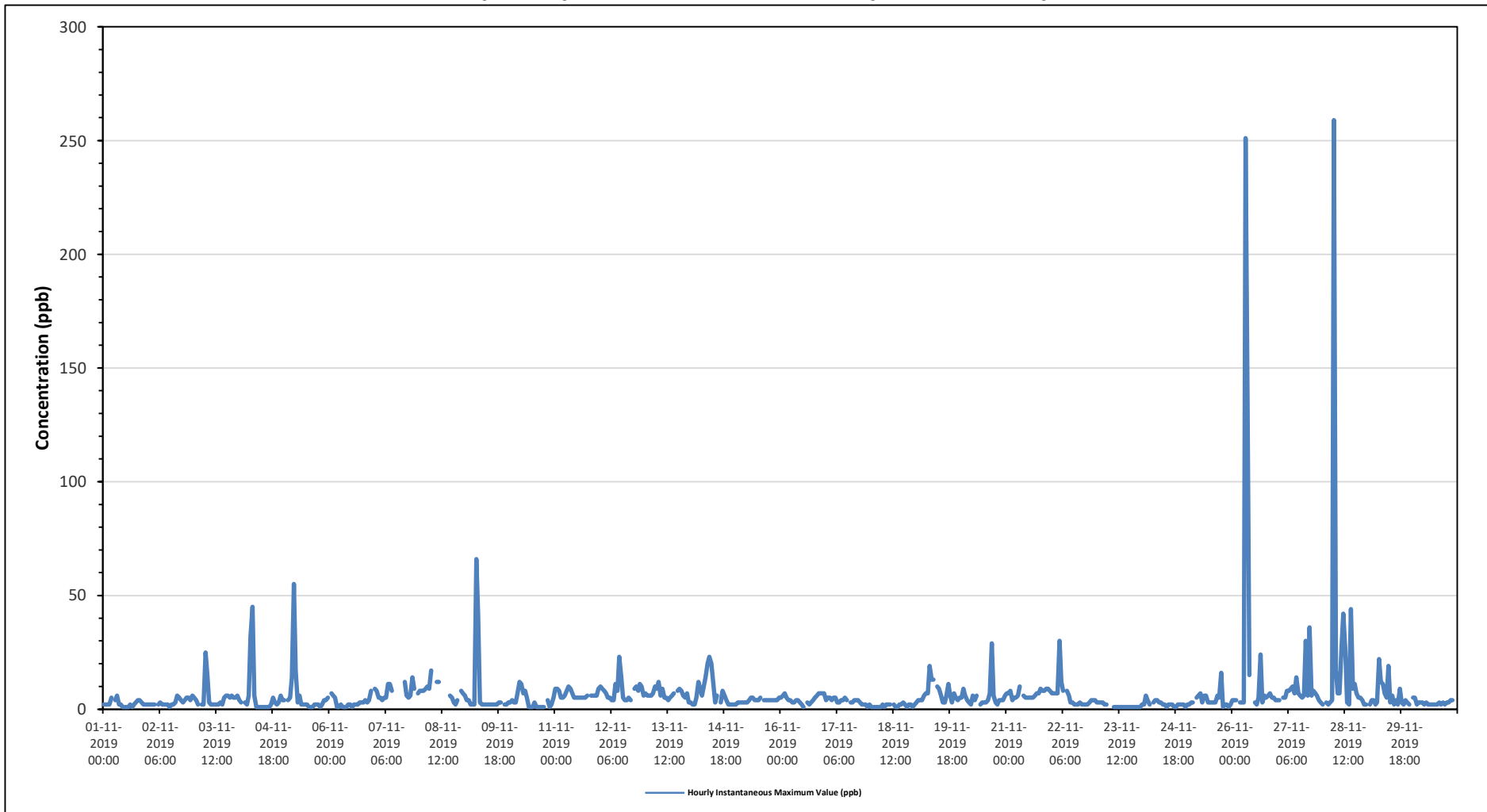
Maximum Hourly Value:	259 ppb on November 28 at hour 6	Hours in Service:	720
Maximum Daily Value:	23.4 ppb on November 26	Hours of Data:	671
Minimum Hourly Value:	1 ppb on November 1 at hour 10	Hours of Missing Data:	11
Minimum Daily Value:	1.5 ppb on November 23	Hours of Calibration:	38
Monthly Average:	6.3 ppb	Operational Uptime:	98.5

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	2	2	2	2	5	S	4	6	2	2	1	1	1	1	2	1	2	3	4	4	3	2	2	2	1	6	2.4	
Nov 2	2	2	2	2	S	2	3	2	2	2	2	1	2	2	3	6	5	4	3	4	5	5	4	6	1	6	3.1	
Nov 3	5	4	2	S	2	2	25	15	3	2	2	2	2	2	3	2	5	6	6	5	6	5	5	6	2	25	5.1	
Nov 4	4	3	S	3	2	6	32	45	6	1	1	1	1	1	1	1	1	2	5	3	2	3	6	4	1	45	5.8	
Nov 5	4	S	4	5	14	55	17	3	6	2	2	2	2	1	1	1	2	2	2	1	2	4	4	5	1	55	6.1	
Nov 6	S	7	6	5	1	1	2	1	1	1	2	2	2	2	2	2	3	3	3	4	3	4	8	S	1	8	2.9	
Nov 7	9	8	5	5	4	5	5	11	11	8	C	C	C	C	C	C	12	6	5	6	14	9	S	S	7	4	14	-
Nov 8	8	8	8	9	10	9	17	S1	S1	12	12	P	P	P	P	P	6	5	3	2	4	S	8	7	2	17	-	
Nov 9	6	4	4	2	2	2	66	41	3	2	2	2	2	2	2	2	2	2	3	3	S	2	2	3	2	66	7.0	
Nov 10	3	4	3	3	7	12	11	7	8	5	1	1	1	3	1	1	1	1	1	S	4	1	2	5	1	12	3.7	
Nov 11	9	9	8	5	5	6	8	10	9	7	5	5	5	5	5	5	6	S	6	6	6	6	9	5	10	6.5	5	
Nov 12	10	9	8	7	5	5	4	4	11	8	23	14	5	4	4	5	4	S	9	10	8	11	10	6	4	23	8.0	
Nov 13	7	6	6	6	7	10	9	12	6	9	5	5	4	5	6	7	S	8	9	8	6	5	7	3	3	12	6.8	
Nov 14	3	2	2	5	12	9	6	10	14	20	23	20	12	3	6	S	3	8	6	4	2	2	2	2	2	23	7.7	
Nov 15	2	3	3	3	3	3	3	4	5	5	4	4	4	5	S	4	4	4	4	4	4	4	4	5	2	5	3.8	
Nov 16	5	6	7	5	4	4	3	3	4	4	3	2	1	S	3	2	3	4	5	6	7	7	7	7	1	7	4.4	
Nov 17	4	5	5	4	5	5	3	3	4	4	5	4	S	3	3	4	4	4	3	2	2	2	1	2	1	5	3.5	
Nov 18	1	1	1	1	1	2	1	2	2	2	S	2	1	1	1	2	2	3	2	1	2	2	1	2	1	3	1.6	
Nov 19	3	4	4	4	6	7	7	19	13	13	S	10	9	6	3	3	6	11	6	3	7	5	4	5	3	19	6.9	
Nov 20	5	9	6	4	3	2	6	4	6	S	2	3	3	3	4	7	29	6	3	2	4	4	4	6	2	29	5.4	
Nov 21	7	7	8	4	5	5	6	10	S	6	5	5	5	5	6	7	7	9	8	8	9	9	8	4	10	6.7		
Nov 22	7	7	7	7	30	12	8	S	8	6	3	3	2	2	3	2	2	2	2	3	4	4	4	4	2	30	5.7	
Nov 23	3	3	3	3	2	2	S	S1	S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1.5	
Nov 24	2	2	6	4	2	S	3	4	4	3	3	2	2	1	2	2	2	1	1	2	2	2	2	1	1	6	2.4	
Nov 25	2	2	3	3	S	5	6	7	3	6	6	3	3	3	3	6	5	16	1	2	2	1	2	1	16	4.0		
Nov 26	4	4	4	S	3	3	3	251	130	15	C1	C1	3	2	5	24	3	6	5	6	7	5	5	4	2	251	23.4	
Nov 27	4	4	S	5	5	8	8	9	10	7	14	7	6	5	6	30	6	36	6	8	7	6	4	3	3	36	8.9	
Nov 28	2	S	3	2	3	4	259	17	7	7	27	42	26	3	2	44	9	11	7	5	5	4	2	2	2	259	21.4	
Nov 29	S	2	4	4	2	3	22	12	11	7	5	19	3	6	2	4	2	9	3	2	4	3	2	2	2	22	6.0	
Nov 30	5	5	2	3	3	3	2	3	2	2	2	2	2	2	3	2	3	2	3	3	4	4	4	S	12	2	12	3.2
Diurnal Maximum	10	9	8	9	30	55	259	251	130	20	27	42	26	6	6	44	29	36	16	10	14	11	10	12				
Diurnal Average	4.6	4.7	4.5	4.1	5.5	6.8	19.0	19.0	10.8	5.8	6.0	6.3	4.1	2.9	3.0	6.4	4.8	5.8	4.7	4.0	4.6	4.2	4.2	4.6				

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	O1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	C1	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for NO2 - Bonnyville - East Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Instantaneous Maximums

OZONE (O₃) in ppb

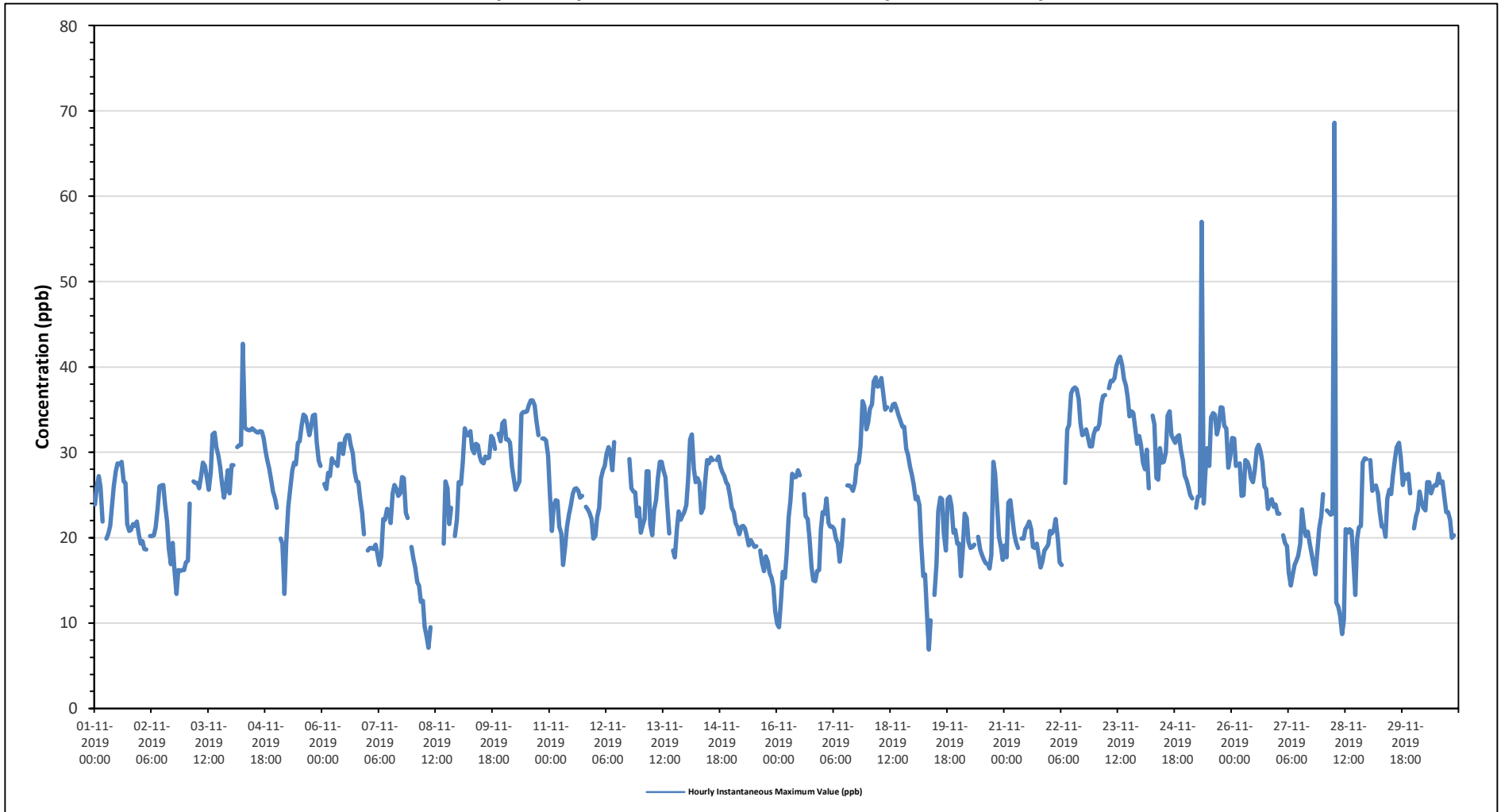
Maximum Hourly Value:	68.6 ppb on November 28 at hour 6	Hours in Service:	720
Maximum Daily Value:	36.3 ppb on November 23	Hours of Data:	677
Minimum Hourly Value:	6.9 ppb on November 19 at hour 8	Hours of Missing Data:	6
Minimum Daily Value:	18.8 ppb on November 15	Hours of Calibration:	37
Monthly Average:	25.5 ppb	Operational Uptime:	99.2

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	23.9	25.9	27.2	25.9	21.9	S	19.9	20.4	21.4	23.7	26	27.8	28.7	28.6	28.9	26.6	26.4	21.6	20.8	20.9	21.6	21.4	21.9	20.5	19.9	28.9	24.0
Nov 2	19.3	19.6	18.7	18.6	S	20.2	20.2	20.3	21.2	23.5	26	26.1	26.2	23.9	21.9	18.7	16.9	19.4	16.2	13.4	16.2	16.1	16.2	16.2	13.4	26.2	19.8
Nov 3	17.1	17.3	24	S	26.6	26.4	26.4	25.8	27.2	28.8	28.4	27	25.6	27.7	32.1	32.3	30.6	29.6	28.3	26.4	24.7	26	27.9	25.2	17.1	32.3	26.6
Nov 4	28.5	28.5	S	30.6	30.8	30.9	42.7	32.9	32.7	32.6	32.6	32.8	32.6	32.4	32.3	32.5	32.4	31.7	30.1	29	28.1	26.7	25.4	24.6	24.6	42.7	31.0
Nov 5	23.5	S	19.9	19.3	13.4	19.4	23.6	25.8	27.9	28.8	28.6	31.1	31.3	33.2	34.4	34.2	33.3	32	33	34.3	34.4	31.2	29	28.4	13.4	34.4	28.3
Nov 6	S	26.3	25.7	27.6	27.2	29.3	28.8	28.8	28.4	31	31	29.8	31.6	32	32	30.8	29.9	27.8	26.6	26.5	24.6	22.9	20.4	S	20.4	32.0	28.1
Nov 7	18.5	18.8	18.8	18.7	19.2	18.1	16.8	17.8	22.2	22.1	23.4	23.2	21.7	25.2	26.2	25.7	24.9	25.2	27.1	27	22.9	22.3	S	18.9	16.8	27.1	21.9
Nov 8	17.5	16.5	14.8	14.4	12.5	12.6	9.6	8.4	7.1	9.5	X	P	P	P	P	P	19.3	26.6	25.8	21.6	23.5	S	20.2	22.1	7.1	26.6	-
Nov 9	26.5	26.3	28.8	32.8	32	32	32.5	30.4	29.9	31	30.8	29.5	28.9	28.7	29.5	29.3	29.4	31.9	31.6	30.4	S	32.2	31.3	33.4	26.3	33.4	30.4
Nov 10	33.7	31.5	31.5	31.1	28.3	26.9	25.6	26.1	26.6	34.5	34.7	34.7	34.8	35.5	36.1	36.1	35.5	33.7	32	S	31.6	31.6	31.4	29.6	25.6	36.1	31.9
Nov 11	25.2	20.8	23.7	24.4	24.3	21.3	20.5	16.8	18.9	21.2	22.7	23.7	25.1	25.7	25.8	25.5	24.7	24.9	S	23.6	23.3	22.9	22.2	19.9	16.8	25.8	22.9
Nov 12	20.2	22.4	23.5	26.9	27.9	28.4	29.8	30.6	30	27.9	31.2	C	C	C	C	C	32.2	S	29.2	25.8	25.4	25.3	22.5	23.5	20.2	32.2	26.8
Nov 13	20.6	21.5	22.2	27.8	27.8	21.6	20.3	23.2	24.4	26.9	28.9	28.9	27.8	27.1	23.9	20.5	S	18.5	17.7	21	23.1	22.1	22.6	23	17.7	28.9	23.5
Nov 14	23.8	26.7	31.5	32.1	28	26.5	27	26.4	22.9	23.5	26.5	29.1	28.7	29.4	29.1	S	29.1	29.5	28.3	27.7	27.2	26.5	26.2	24.9	22.9	32.1	27.4
Nov 15	23.5	23	21.7	21.2	20.4	21.3	21.4	21.1	20.1	19.1	19.7	19.3	18.9	19	S	18.5	17.1	16.1	17.8	17.2	15.9	15.3	14.3	11.4	11.4	23.5	18.8
Nov 16	9.9	9.5	12.7	16	15.3	18	22.4	24.3	27.5	27.1	27.1	27.9	27.3	S	25.1	22.5	22.2	20	16.6	15	14.9	16.1	16.2	21	9.5	27.9	19.8
Nov 17	23	22.8	24.6	21.7	21.3	21.3	21	19.9	19.3	17.2	19.1	22.1	S	26.1	26.1	25.9	25.5	26.4	28.5	28.8	30.7	36	35.4	32.7	17.2	36.0	25.0
Nov 18	33.5	35.1	35.6	38.3	38.8	37.7	37.8	38.7	37	35	35.3	S	34.9	35.6	35.7	35.1	34.3	33.7	33	33	30.4	29.7	28.3	27.4	27.4	38.8	34.5
Nov 19	26.3	24.5	24.8	23.8	19.3	15.5	15.7	10.9	6.9	10.3	S	13.3	16.9	23.1	24.7	24.5	20.5	18.5	24.5	24.8	23.7	20.6	20.9	19.3	6.9	26.3	19.7
Nov 20	19.3	15.5	18.8	22.8	22.3	19.5	18.8	18.9	19.2	S	20.1	18.6	18	17.4	17	16.9	16.4	18	28.9	27.5	23.7	20.1	18.9	17.4	15.5	28.9	19.7
Nov 21	19.1	17.7	24.1	24.4	22.5	20.5	19.5	18.8	S	19.9	19.9	21	21.4	21.9	21	18.9	18.8	19.3	18	16.5	17.2	18.5	18.8	19.2	16.5	24.4	19.9
Nov 22	20.8	20.5	20.9	22.2	19.8	17.1	16.8	S	26.4	32.7	33.2	36.9	37.4	37.6	37.4	36.2	33.4	32	32.2	32.7	31.7	30.7	30.7	32.1	16.8	37.6	29.2
Nov 23	32.8	32.7	33.3	35.6	36.6	36.7	S	37.5	38.4	38.3	38.7	40.1	40.8	41.2	40.2	38.6	37.8	36.4	34.2	34.8	34.6	32.7	31	31.9	31.0	41.2	36.3
Nov 24	30.9	28.8	28	30.3	25.8	S	34.3	33.3	27	26.8	30.5	28.8	28.9	30	34.3	34.8	32	31.5	31.1	31.8	32	30.3	29.1	27.3	25.8	34.8	30.3
Nov 25	26.7	25.9	25	24.6	S	23.5	24.8	24.9	57	24	27.8	30.5	28.4	34.1	34.6	34.4	32.1	33	35.3	35.2	33.1	32.8	28.2	29.6	23.5	57.0	30.7
Nov 26	31.7	31.6	28.4	S	28.7	24.9	25	29.1	28.9	28.3	27	26.5	27.9	30.4	30.9	30.1	28.9	26	25.7	23.4	24.2	24.5	23.6	23.9	23.4	31.7	27.4
Nov 27	22.8	22.8	S	20.3	19.4	19	15.9	14.4	15.6	16.8	17.3	17.9	19.3	23.3	21.2	20.2	20.7	19.4	18.1	16.8	15.7	18.6	21.1	22.5	14.4	23.3	19.1
Nov 28	25.1	S	23.2	23	22.7	22.8	68.6	12.4	11.9	10.9	8.7	10.4	21	20.6	21	20.8	17.6	13.3	19.8	21.2	21.4	28.8	29.3	29.2	8.7	68.6	21.9
Nov 29	S	29.1	25.5	26	26.1	25.2	23.1	21.3	21.4	20.1	24.6	25.6	25.1	27.3	29.2	30.6	31.1	29.4	26.2	27.4	26.9	27.5	25.2	S	20.1	31.1	26.1
Nov 30	21.1	22.5	23.2	25.4	24.2	23.5	23.2	26.5	25.2	25.9	26.2	26.1	27.5	26.4	26.6	24.9	23	23	22.1	20	20.3	S	20.6	20.0	27.5	24.1	
Diurnal Maximum	34	35	36	38	39	38	69	39	57	38	39	40	41	41	40	39	38	36	35	35	35	36	35	33			
Diurnal Average	23.7	23.7	24.3	25.2	24.4	23.6	25.2	23.6	25.0	24.7	26.6	26.3	27.2	28.3	28.8	27.7	26.8	25.8	26.2	25.4	24.9	25.2	24.6	24.1			

C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	O1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for O3 - Bonnyville - East Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Instantaneous Maximums

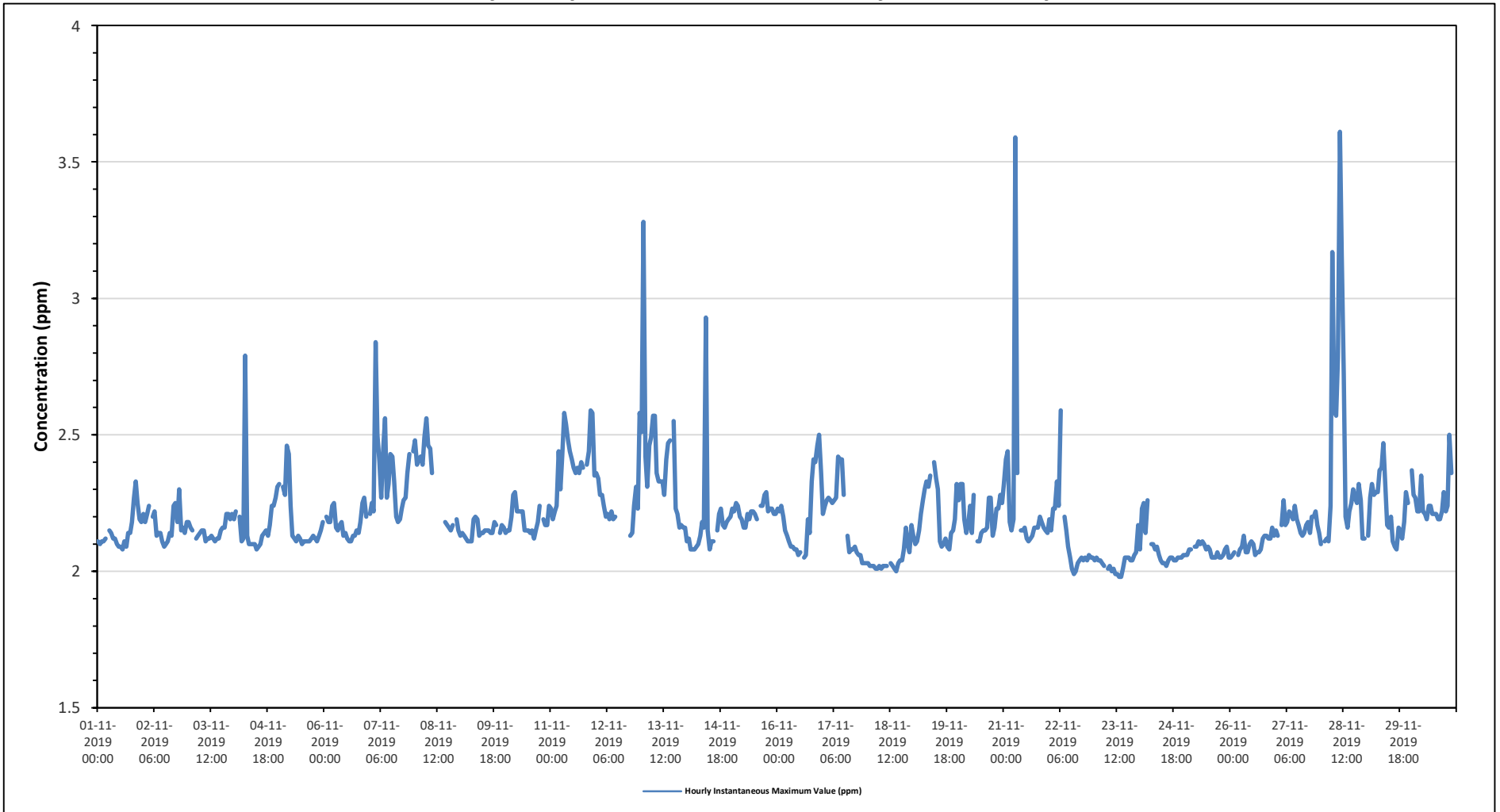
TOTAL HYDROCARBONS (THC) in ppm

Maximum Hourly Value:	3.61 ppm on November 28 at hour 10	Hours in Service:	720
Maximum Daily Value:	2.42 ppm on November 28	Hours of Data:	677
Minimum Hourly Value:	1.98 ppm on November 23 at hour 13	Hours of Missing Data:	6
Minimum Daily Value:	2.03 ppm on November 23	Hours of Calibration:	37
Monthly Average:	2.20 ppm	Operational Uptime:	99.2

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Nov 1	2.11	2.10	2.11	2.11	2.12	S	2.15	2.14	2.12	2.12	2.10	2.09	2.09	2.08	2.11	2.09	2.14	2.14	2.18	2.27	2.33	2.25	2.19	2.18	2.08	2.33	2.14	
Nov 2	2.21	2.18	2.21	2.24	S	2.20	2.22	2.13	2.14	2.14	2.11	2.09	2.10	2.11	2.14	2.13	2.24	2.25	2.18	2.30	2.15	2.16	2.14	2.18	2.09	2.30	2.17	
Nov 3	2.18	2.16	2.15	S	2.12	2.13	2.14	2.15	2.15	2.11	2.12	2.12	2.13	2.12	2.11	2.12	2.12	2.15	2.16	2.16	2.21	2.21	2.19	2.21	2.11	2.21	2.15	
Nov 4	2.19	2.22	S	2.20	2.11	2.12	2.12	2.12	2.13	2.10	2.10	2.10	2.10	2.08	2.09	2.10	2.13	2.14	2.15	2.13	2.17	2.24	2.24	2.27	2.31	2.08	2.79	2.18
Nov 5	2.32	S	2.31	2.28	2.46	2.43	2.24	2.13	2.12	2.11	2.13	2.12	2.10	2.11	2.11	2.11	2.11	2.12	2.13	2.12	2.11	2.13	2.15	2.18	2.10	2.46	2.18	
Nov 6	S	2.20	2.18	2.18	2.24	2.25	2.16	2.15	2.17	2.18	2.13	2.14	2.12	2.11	2.11	2.13	2.13	2.15	2.14	2.18	2.25	2.27	2.20	S	2.11	2.27	2.17	
Nov 7	2.21	2.25	2.22	2.84	2.50	2.40	2.27	2.45	2.56	2.27	2.32	2.43	2.42	2.33	2.20	2.18	2.19	2.23	2.26	2.27	2.36	2.43	S	2.44	2.18	2.84	2.35	
Nov 8	2.48	2.39	2.41	2.42	2.39	2.49	2.56	2.46	2.45	2.36	X	P	P	P	P	P	2.18	2.17	2.16	2.15	2.17	S	2.19	2.15	2.15	2.56	-	
Nov 9	2.13	2.14	2.13	2.12	2.11	2.11	2.11	2.19	2.20	2.19	2.13	2.14	2.14	2.15	2.15	2.15	2.14	2.14	2.18	2.17	S	2.14	2.17	2.16	2.11	2.20	2.15	
Nov 10	2.14	2.15	2.15	2.20	2.28	2.29	2.22	2.22	2.22	2.22	2.15	2.15	2.15	2.14	2.15	2.12	2.15	2.18	2.24	S	2.19	2.17	2.17	2.24	2.12	2.29	2.19	
Nov 11	2.23	2.19	2.22	2.24	2.44	2.30	2.42	2.58	2.54	2.48	2.44	2.41	2.38	2.36	2.38	2.36	2.40	2.38	S	2.39	2.44	2.59	2.58	2.35	2.19	2.59	2.40	
Nov 12	2.36	2.34	2.28	2.28	2.24	2.20	2.21	2.19	2.22	2.19	2.20	C	C	C	C	C	2.11	S	2.13	2.14	2.24	2.31	2.23	2.58	2.11	2.58	2.25	
Nov 13	2.51	3.28	2.42	2.31	2.46	2.49	2.57	2.57	2.36	2.33	2.33	2.33	2.28	2.41	2.47	2.48	S	2.55	2.23	2.21	2.16	2.17	2.16	2.16	2.16	3.28	2.40	
Nov 14	2.11	2.12	2.08	2.08	2.08	2.09	2.10	2.13	2.18	2.16	2.93	2.15	2.08	2.11	2.11	S	2.15	2.21	2.23	2.17	2.16	2.18	2.19	2.20	2.08	2.93	2.17	
Nov 15	2.23	2.22	2.25	2.24	2.20	2.19	2.16	2.16	2.21	2.19	2.22	2.22	2.21	2.19	S	2.24	2.24	2.28	2.29	2.22	2.23	2.23	2.21	2.21	2.16	2.29	2.22	
Nov 16	2.23	2.22	2.24	2.20	2.15	2.13	2.11	2.09	2.09	2.08	2.08	2.06	2.07	S	2.05	2.06	2.19	2.14	2.33	2.41	2.40	2.46	2.50	2.36	2.05	2.50	2.20	
Nov 17	2.21	2.24	2.26	2.27	2.26	2.25	2.26	2.27	2.42	2.41	2.41	2.28	S	2.13	2.07	2.08	2.08	2.09	2.07	2.06	2.06	2.03	2.03	2.03	2.03	2.42	2.19	
Nov 18	2.03	2.02	2.02	2.02	2.01	2.01	2.02	2.01	2.02	2.02	2.02	S	2.03	2.02	2.01	2.00	2.03	2.04	2.04	2.08	2.16	2.10	2.07	2.17	2.00	2.17	2.04	
Nov 19	2.13	2.10	2.11	2.15	2.21	2.26	2.30	2.33	2.31	2.35	S	2.40	2.34	2.30	2.11	2.09	2.10	2.12	2.09	2.08	2.14	2.15	2.19	2.32	2.08	2.40	2.20	
Nov 20	2.26	2.32	2.32	2.19	2.14	2.17	2.24	2.14	2.28	S	2.11	2.11	2.14	2.15	2.15	2.16	2.27	2.27	2.13	2.16	2.23	2.23	2.28	2.25	2.11	2.32	2.20	
Nov 21	2.32	2.41	2.44	2.18	2.15	2.19	3.59	2.36	S	2.15	2.15	2.16	2.12	2.11	2.12	2.13	2.16	2.16	2.16	2.20	2.18	2.16	2.15	2.14	2.11	3.59	2.26	
Nov 22	2.19	2.15	2.23	2.23	2.33	2.24	2.59	S	2.20	2.15	2.09	2.05	2.01	1.99	2.00	2.03	2.04	2.05	2.04	2.05	2.04	2.06	2.05	2.05	1.99	2.59	2.12	
Nov 23	2.04	2.05	2.04	2.04	2.03	2.02	S	2.01	2.02	2.00	2.01	1.99	1.99	1.98	1.98	2.01	2.05	2.05	2.05	2.04	2.04	2.06	2.07	2.17	1.98	2.17	2.03	
Nov 24	2.08	2.23	2.25	2.14	2.26	S	2.10	2.10	2.08	2.09	2.06	2.04	2.03	2.03	2.02	2.04	2.05	2.05	2.04	2.04	2.05	2.05	2.06	2.02	2.26	2.08	2.08	
Nov 25	2.06	2.06	2.08	2.08	S	2.09	2.09	2.11	2.10	2.11	2.10	2.08	2.09	2.08	2.05	2.05	2.05	2.07	2.05	2.05	2.06	2.08	2.09	2.05	2.05	2.11	2.08	
Nov 26	2.05	2.06	2.07	S	2.06	2.08	2.09	2.13	2.07	2.07	2.10	2.11	2.10	2.06	2.07	2.07	2.08	2.12	2.13	2.13	2.12	2.12	2.16	2.13	2.05	2.16	2.09	
Nov 27	2.15	2.13	S	2.17	2.26	2.17	2.18	2.22	2.21	2.19	2.24	2.19	2.17	2.14	2.13	2.14	2.17	2.18	2.14	2.20	2.20	2.22	2.17	2.14	2.13	2.26	2.18	
Nov 28	2.10	S	2.11	2.12	2.11	2.24	3.17	2.59	2.57	2.78	3.61	3.16	2.72	2.20	2.16	2.22	2.25	2.30	2.27	2.25	2.32	2.26	2.12	2.12	2.10	3.61	2.42	
Nov 29	S	2.13	2.27	2.32	2.28	2.29	2.29	2.37	2.38	2.47	2.33	2.17	2.16	2.20	2.11	2.09	2.08	2.16	2.15	2.12	2.18	2.29	2.25	S	2.08	2.47	2.23	
Nov 30	2.37	2.28	2.27	2.22	2.22	2.35	2.22	2.21	2.19	2.24	2.24	2.21	2.21	2.21	2.19	2.19	2.22	2.29	2.22	2.24	2.50	2.36	S	2.34	2.19	2.50	2.26	
Diurnal Maximum	2.51	3.28	2.44	2.84	2.50	2.49	3.59	2.59	2.57	2.78	3.61	3.16	2.72	2.41	2.47	2.48	2.40	2.55	2.33	2.41	2.50	2.59	2.58	2.58				
Diurnal Average	2.20	2.23	2.21	2.22	2.22	2.22	2.33	2.23	2.23	2.22	2.25	2.20	2.17	2.14	2.12	2.13	2.15	2.18	2.16	2.17	2.20	2.21	2.19	2.21				
C	Calibration				S	Daily Zero/Span				Q	Quality Assurance			C1	Repeat Calibration				S1	Repeat Daily Zero/Span								
G	Out for Repair				K	Collection Error				N	Not in Service			O	Operator Error				P	Power Failure								
R	Recovery				X	Machine Malfunction				Y	Maintenance			T	Exceeds Temperature Limits				N	Not in Service								

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for THC - Bonnyville - East Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Instantaneous Maximums

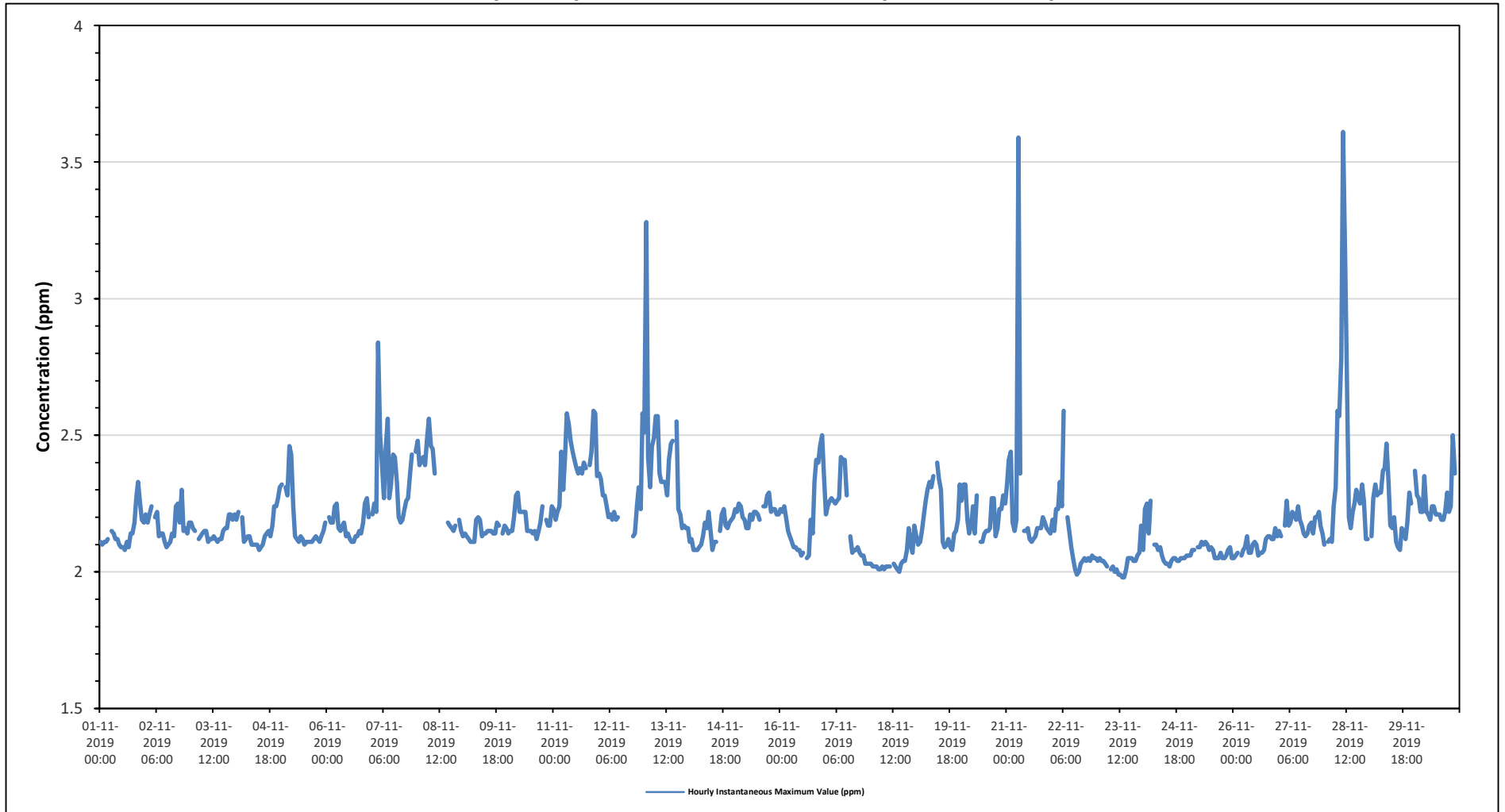
METHANE (CH₄) in ppm

Maximum Hourly Value:	3.61 ppm on November 28 at hour 10	Hours in Service:	720
Maximum Daily Value:	2.40 ppm on November 13	Hours of Data:	677
Minimum Hourly Value:	1.98 ppm on November 23 at hour 13	Hours of Missing Data:	6
Minimum Daily Value:	2.03 ppm on November 23	Hours of Calibration:	37
Monthly Average:	2.20 ppm	Operational Uptime:	99.2

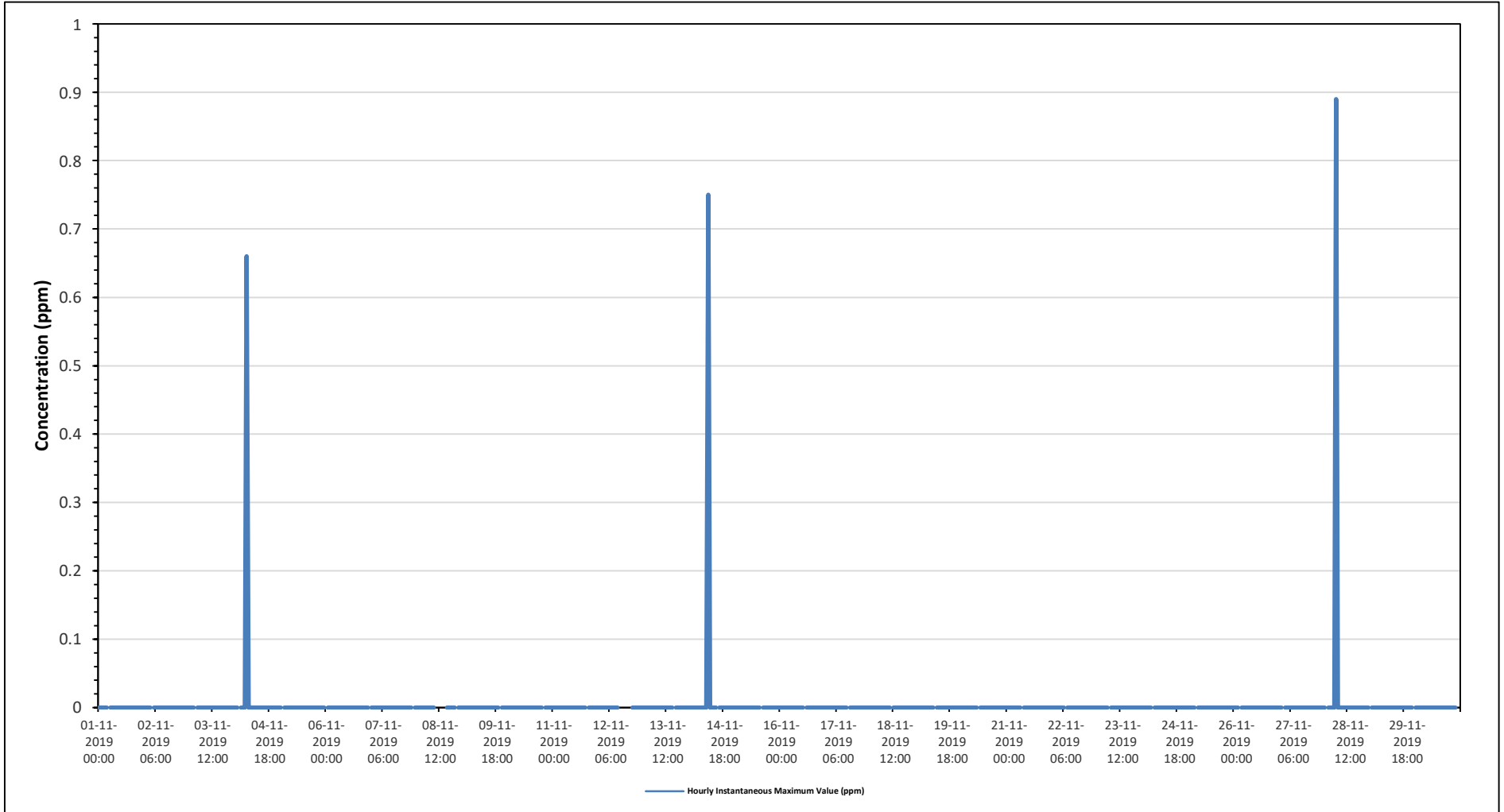
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	2.11	2.10	2.11	2.11	2.12	S	2.15	2.14	2.12	2.12	2.10	2.09	2.09	2.08	2.11	2.09	2.14	2.14	2.18	2.27	2.33	2.25	2.19	2.18	2.08	2.33	2.14
Nov 2	2.21	2.18	2.21	2.24	S	2.20	2.22	2.13	2.14	2.14	2.11	2.09	2.10	2.11	2.14	2.13	2.24	2.25	2.18	2.30	2.15	2.16	2.14	2.18	2.09	2.30	2.17
Nov 3	2.18	2.16	2.15	S	2.12	2.13	2.14	2.15	2.15	2.11	2.12	2.12	2.13	2.12	2.11	2.12	2.12	2.15	2.16	2.16	2.21	2.21	2.19	2.21	2.11	2.21	2.15
Nov 4	2.19	2.22	S	2.20	2.11	2.12	2.13	2.13	2.10	2.10	2.10	2.10	2.08	2.09	2.10	2.13	2.14	2.15	2.13	2.17	2.24	2.24	2.27	2.31	2.08	2.31	2.15
Nov 5	2.32	S	2.31	2.28	2.46	2.43	2.24	2.13	2.12	2.11	2.13	2.12	2.10	2.11	2.11	2.11	2.11	2.12	2.13	2.12	2.11	2.13	2.15	2.18	2.10	2.46	2.18
Nov 6	S	2.20	2.18	2.18	2.24	2.25	2.16	2.15	2.17	2.18	2.13	2.14	2.12	2.11	2.11	2.13	2.13	2.15	2.14	2.18	2.25	2.27	2.20	S	2.11	2.27	2.17
Nov 7	2.21	2.25	2.22	2.84	2.50	2.40	2.27	2.45	2.56	2.27	2.32	2.43	2.42	2.33	2.20	2.18	2.19	2.23	2.26	2.27	2.36	2.43	S	2.44	2.18	2.84	2.35
Nov 8	2.48	2.39	2.41	2.42	2.39	2.49	2.56	2.46	2.45	2.36	X	P	P	P	P	P	2.18	2.17	2.16	2.15	2.17	S	2.19	2.15	2.15	2.56	-
Nov 9	2.13	2.14	2.13	2.12	2.11	2.11	2.11	2.19	2.20	2.19	2.13	2.14	2.14	2.15	2.15	2.15	2.14	2.14	2.18	2.17	S	2.14	2.17	2.16	2.11	2.20	2.15
Nov 10	2.14	2.15	2.15	2.20	2.28	2.29	2.22	2.22	2.22	2.22	2.15	2.15	2.15	2.14	2.15	2.12	2.15	2.18	2.24	S	2.19	2.17	2.17	2.24	2.12	2.29	2.19
Nov 11	2.23	2.19	2.22	2.24	2.44	2.30	2.42	2.58	2.54	2.48	2.44	2.41	2.38	2.36	2.38	2.36	2.40	2.38	S	2.39	2.44	2.59	2.58	2.35	2.19	2.59	2.40
Nov 12	2.36	2.34	2.28	2.28	2.24	2.20	2.21	2.19	2.22	2.19	2.20	C	C	C	C	C	2.11	S	2.13	2.14	2.24	2.31	2.23	2.58	2.11	2.58	2.25
Nov 13	2.51	3.28	2.42	2.31	2.46	2.49	2.57	2.57	2.36	2.33	2.33	2.33	2.28	2.41	2.47	2.48	S	2.55	2.23	2.21	2.16	2.17	2.16	2.16	2.16	3.28	2.40
Nov 14	2.11	2.12	2.08	2.08	2.08	2.09	2.10	2.13	2.18	2.16	2.22	2.15	2.08	2.11	2.11	S	2.15	2.21	2.23	2.17	2.16	2.18	2.19	2.20	2.08	2.23	2.14
Nov 15	2.23	2.22	2.25	2.24	2.20	2.19	2.16	2.16	2.21	2.19	2.22	2.22	2.21	2.19	S	2.24	2.24	2.28	2.29	2.22	2.23	2.23	2.21	2.21	2.16	2.29	2.22
Nov 16	2.23	2.22	2.24	2.20	2.15	2.13	2.11	2.09	2.09	2.08	2.08	2.06	2.07	S	2.05	2.06	2.19	2.14	2.33	2.41	2.40	2.46	2.50	2.36	2.05	2.50	2.20
Nov 17	2.21	2.24	2.26	2.27	2.26	2.25	2.26	2.27	2.42	2.41	2.41	2.28	S	2.13	2.07	2.08	2.08	2.09	2.07	2.06	2.06	2.03	2.03	2.03	2.03	2.42	2.19
Nov 18	2.03	2.02	2.02	2.02	2.01	2.01	2.02	2.01	2.02	2.02	2.02	S	2.03	2.02	2.01	2.00	2.03	2.04	2.04	2.08	2.16	2.10	2.07	2.17	2.00	2.17	2.04
Nov 19	2.13	2.10	2.11	2.15	2.21	2.26	2.30	2.33	2.31	2.35	S	2.40	2.34	2.30	2.11	2.09	2.10	2.12	2.09	2.08	2.14	2.15	2.19	2.32	2.08	2.40	2.20
Nov 20	2.26	2.32	2.32	2.19	2.14	2.17	2.24	2.14	2.28	S	2.11	2.11	2.14	2.15	2.15	2.16	2.27	2.27	2.13	2.16	2.23	2.23	2.28	2.25	2.11	2.32	2.20
Nov 21	2.32	2.41	2.44	2.18	2.15	2.19	3.59	2.36	S	2.15	2.15	2.16	2.12	2.11	2.12	2.13	2.16	2.16	2.16	2.20	2.18	2.16	2.15	2.14	2.11	3.59	2.26
Nov 22	2.19	2.15	2.23	2.23	2.33	2.24	2.59	S	2.20	2.15	2.09	2.05	2.01	1.99	2.00	2.03	2.04	2.05	2.04	2.05	2.04	2.06	2.05	2.05	1.99	2.59	2.12
Nov 23	2.04	2.05	2.04	2.04	2.03	2.02	S	2.01	2.02	2.00	2.01	1.99	1.99	1.98	1.98	2.01	2.05	2.05	2.05	2.04	2.04	2.06	2.07	2.17	1.98	2.17	2.03
Nov 24	2.08	2.23	2.25	2.14	2.26	S	2.10	2.10	2.08	2.09	2.06	2.04	2.03	2.03	2.02	2.04	2.05	2.05	2.04	2.04	2.05	2.05	2.06	2.02	2.26	2.08	
Nov 25	2.06	2.06	2.08	2.08	S	2.09	2.09	2.11	2.10	2.11	2.10	2.08	2.09	2.08	2.05	2.05	2.05	2.07	2.05	2.05	2.06	2.08	2.09	2.05	2.05	2.11	2.08
Nov 26	2.05	2.06	2.07	S	2.06	2.08	2.09	2.13	2.07	2.07	2.10	2.11	2.10	2.06	2.07	2.07	2.08	2.12	2.13	2.13	2.12	2.12	2.16	2.13	2.05	2.16	2.09
Nov 27	2.15	2.13	S	2.17	2.26	2.17	2.18	2.22	2.21	2.19	2.24	2.19	2.17	2.14	2.13	2.14	2.17	2.18	2.14	2.20	2.20	2.22	2.17	2.14	2.13	2.26	2.18
Nov 28	2.10	S	2.11	2.12	2.11	2.24	2.31	2.59	2.57	2.78	3.61	3.16	2.72	2.20	2.16	2.22	2.25	2.30	2.27	2.25	2.32	2.26	2.12	2.12	2.10	3.61	2.39
Nov 29	S	2.13	2.27	2.32	2.28	2.29	2.29	2.37	2.38	2.47	2.33	2.17	2.16	2.20	2.11	2.09	2.08	2.16	2.15	2.12	2.18	2.29	2.25	S	2.08	2.47	2.23
Nov 30	2.37	2.28	2.27	2.22	2.22	2.35	2.22	2.21	2.19	2.24	2.24	2.21	2.21	2.21	2.19	2.19	2.22	2.29	2.22	2.24	2.50	2.36	S	2.34	2.19	2.50	2.26
Diurnal Maximum	2.51	3.28	2.44	2.84	2.50	2.49	3.59	2.59	2.57	2.78	3.61	3.16	2.72	2.41	2.47	2.48	2.40	2.55	2.33	2.41	2.50	2.59	2.58	2.58			
Diurnal Average	2.20	2.23	2.21	2.22	2.22	2.22	2.28	2.23	2.23	2.22	2.22	2.20	2.17	2.14	2.12	2.13	2.15	2.18	2.16	2.17	2.20	2.21	2.19	2.21			
C	Calibration				S	Daily Zero/Span				Q	Quality Assurance			C1	Repeat Calibration				S1	Repeat Daily Zero/Span							
G	Out for Repair				K	Collection Error				N	Not in Service			O	Operator Error												
R	Recovery				X	Machine Malfunction				Y	Maintenance			T	Exceeds Temperature Limits												

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for CH4 - Bonnyville - East Site



Timeseries Chart of Hourly Instantaneous Maximum for NMHC - Bonnyville - East Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - November 2019

Summary of Hourly Instantaneous Maximums

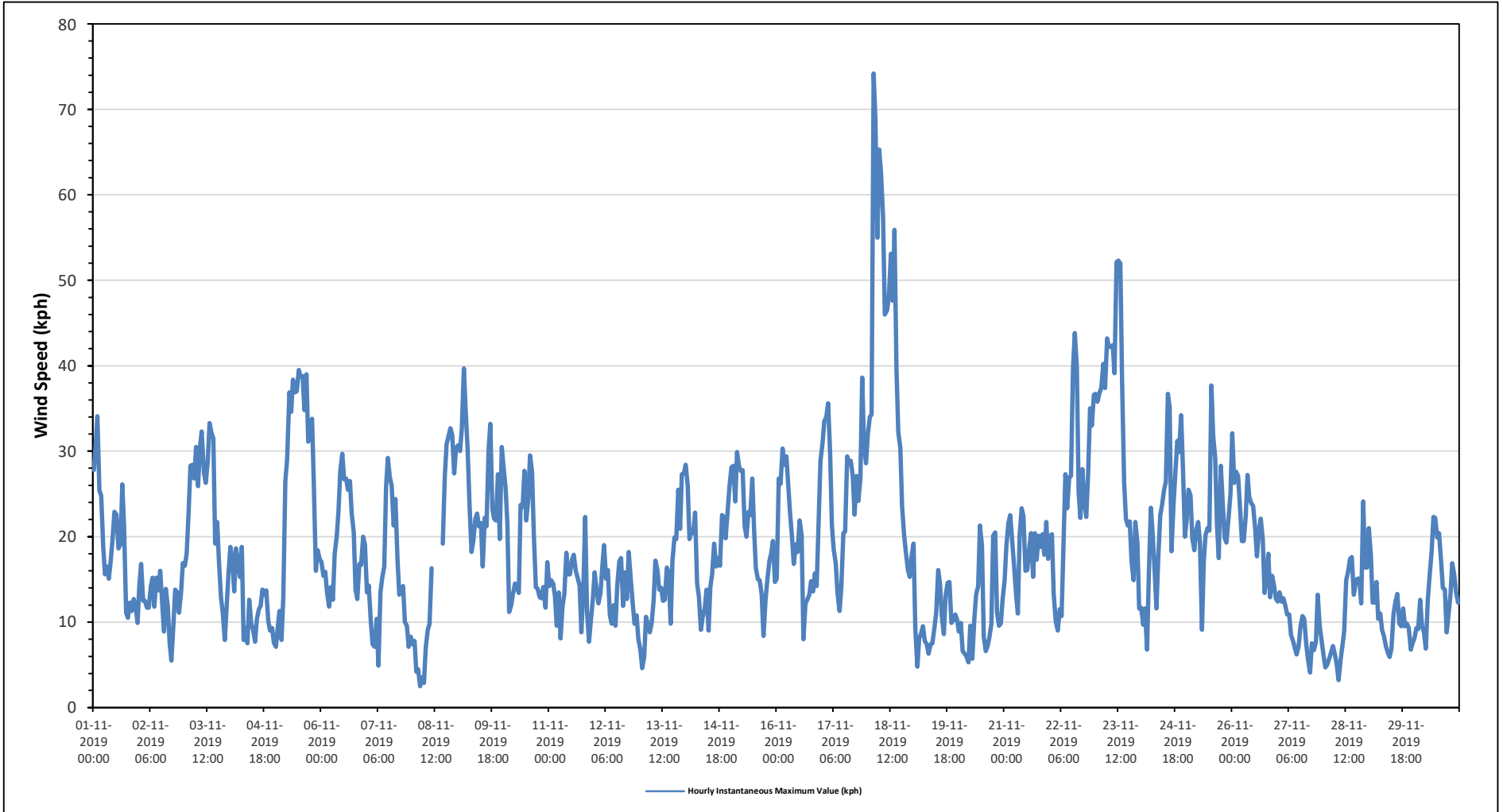
WIND SPEED (WS) in km/hr

Maximum Hourly Value:	74.2 kph on November 18 at hour 3	Hours in Service:	720
Maximum Daily Value:	41.4 kph on November 18	Hours of Data:	715
Minimum Hourly Value:	2.5 kph on November 8 at hour 4	Hours of Missing Data:	5
Minimum Daily Value:	9.2 kph on November 27	Hours of Calibration:	0
Monthly Average:	18.8 kph	Operational Uptime:	99.3

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Nov 1	27.8	30.5	34.1	25.4	24.8	18.8	15.6	16.5	15.1	17.0	19.8	22.9	22.6	18.6	19.1	26.1	21.2	11.1	10.5	12.3	11.3	12.7	11.9	9.9	9.9	34.1	19.0
Nov 2	14.3	16.8	12.5	12.5	11.7	11.7	14.1	15.2	11.8	15.2	13.7	16.0	12.6	8.9	13.9	11.8	7.6	5.5	9.7	13.8	13.5	11.1	13.5	16.9	5.5	16.9	12.7
Nov 3	16.6	18.0	22.4	28.3	28.4	26.8	30.5	25.9	30.4	32.3	27.5	26.3	28.8	33.3	32.1	31.5	19.2	21.7	17.1	12.9	11.1	7.9	11.7	15.9	7.9	33.3	23.2
Nov 4	18.8	17.5	13.6	18.6	17.2	15.3	18.8	7.9	9.3	7.5	12.6	9.8	9.1	7.7	10.3	11.5	11.9	13.8	13.2	13.7	10.1	9.0	9.3	7.6	7.5	18.8	12.3
Nov 5	7.1	9.3	11.3	7.9	12.9	26.5	29.0	36.9	34.6	38.4	36.9	37.0	39.5	38.7	38.8	34.8	39.0	31.1	32.8	33.8	26.2	16.0	18.4	17.4	7.1	39.5	27.3
Nov 6	17.0	15.4	15.9	13.5	11.8	14.1	12.6	18.0	20.0	23.0	27.7	29.7	26.7	26.8	25.5	26.5	22.7	20.5	13.8	12.7	16.8	16.7	20.0	19.1	11.8	29.7	19.4
Nov 7	13.5	14.3	10.1	7.4	7.1	10.4	4.9	13.5	15.2	16.5	25.8	29.2	26.9	26.0	21.3	24.4	17.3	13.2	13.9	14.2	10.0	9.6	7.1	8.3	4.9	29.2	15.0
Nov 8	7.4	7.8	4.2	4.5	2.5	3.5	2.9	7.0	9.1	9.8	16.3	P	P	P	P	P	19.2	27.1	30.8	31.7	32.7	31.9	27.4	30.3	2.5	32.7	16.1
Nov 9	30.7	30.0	32.7	39.7	34.8	30.0	23.9	18.2	19.5	22.1	22.7	21.2	21.6	16.5	22.2	21.2	30.1	33.2	23.2	22.1	21.9	27.3	19.7	30.5	16.5	39.7	25.6
Nov 10	28.1	25.7	21.5	11.2	12.0	13.3	14.5	14.1	13.4	23.7	23.5	27.7	21.9	24.3	29.5	27.6	20.3	14.1	13.9	12.9	12.8	14.1	11.7	17.0	11.2	29.5	18.7
Nov 11	14.2	14.9	14.5	13.1	9.6	13.5	8.1	11.9	13.3	18.1	15.6	15.6	17.3	17.9	16.0	15.2	14.3	8.8	14.3	22.3	11.3	7.7	10.1	12.6	7.7	22.3	13.8
Nov 12	15.8	13.7	12.2	13.4	16.3	19.0	15.1	16.1	10.8	9.8	12.0	9.6	14.3	17.1	17.5	11.9	15.8	12.7	18.2	14.7	12.1	9.8	10.8	8.0	8.0	19.0	13.6
Nov 13	6.8	4.6	5.9	10.6	9.8	8.8	9.8	12.5	17.2	16.1	13.8	14.0	12.5	12.6	16.4	15.8	9.8	17.2	19.9	19.7	25.5	20.9	27.3	27.4	4.6	27.4	14.8
Nov 14	28.4	26.0	19.7	20.8	20.4	22.8	14.5	13.0	9.1	10.6	11.6	13.8	9.0	14.1	15.6	19.2	16.5	17.5	16.6	22.5	22.3	19.8	22.9	25.8	9.0	28.4	18.0
Nov 15	28.1	28.3	24.1	29.9	28.2	27.7	27.8	21.2	20.0	22.9	22.5	26.8	20.8	16.3	15.0	14.9	13.2	8.4	12.6	14.9	17.1	18.0	19.5	14.7	8.4	29.9	20.5
Nov 16	15.1	26.8	26.2	30.3	28.4	29.4	26.2	22.9	20.0	16.8	19.1	18.2	21.9	20.1	8.0	12.2	12.6	13.2	14.8	13.6	15.7	14.2	22.0	28.9	8.0	30.3	19.9
Nov 17	30.9	33.5	34.0	35.6	29.7	21.3	18.5	16.9	13.4	11.3	14.1	20.4	20.6	29.4	28.7	28.9	27.1	22.6	27.1	24.2	26.8	38.6	30.9	28.6	11.3	38.6	25.5
Nov 18	31.9	34.0	34.3	74.2	68.8	55.0	65.3	62.6	57.5	46.0	46.5	48.1	53.1	47.6	55.9	39.4	32.2	30.4	23.5	20.1	18.1	16.1	15.3	17.7	15.3	74.2	41.4
Nov 19	19.2	9.1	4.8	8.1	8.7	9.5	7.8	7.4	6.3	7.4	7.5	9.3	11.1	16.1	14.5	10.7	8.6	13.1	14.6	14.7	9.9	10.2	10.9	10.3	4.8	19.2	10.4
Nov 20	8.9	9.9	6.6	6.3	6.0	5.3	9.6	5.7	10.4	13.2	14.2	21.3	18.9	8.3	6.6	7.2	8.2	9.8	20.1	20.5	11.2	9.6	9.8	12.6	5.3	21.3	10.8
Nov 21	14.9	18.9	21.6	22.5	19.4	16.7	13.3	11.0	20.1	23.3	22.4	16.0	16.1	18.7	20.4	15.3	20.4	17.3	20.1	18.8	20.3	17.9	21.7	17.4	11.0	23.3	18.5
Nov 22	20.0	20.3	13.3	10.1	9.0	11.5	10.7	18.5	27.3	23.3	26.9	27.1	39.8	43.8	39.8	25.2	22.2	27.9	24.2	22.3	27.1	35.0	33.0	36.6	9.0	43.8	24.8
Nov 23	36.7	35.8	36.8	37.4	40.2	37.4	43.2	42.2	42.2	42.4	39.1	52.1	52.3	52.0	38.0	26.3	22.1	21.3	21.8	17.2	14.9	21.7	19.3	11.6	11.6	52.3	33.5
Nov 24	11.7	9.7	11.6	6.8	15.5	23.4	20.4	15.9	11.6	17.5	22.5	23.7	25.5	26.4	36.7	35.1	18.3	23.7	27.3	31.2	29.9	34.2	28.2	20.0	6.8	36.7	22.0
Nov 25	22.0	25.5	24.8	19.8	18.4	20.7	21.7	19.3	9.1	17.1	20.2	21.0	20.7	37.7	31.8	29.2	21.4	17.5	28.3	24.3	19.9	19.3	22.4	25.0	9.1	37.7	22.4
Nov 26	32.1	26.3	27.6	27.1	23.7	19.5	19.5	22.4	27.2	24.6	23.9	23.6	21.0	17.7	20.7	22.1	19.7	13.4	14.9	18.0	12.9	15.4	14.3	12.7	12.7	32.1	20.8
Nov 27	12.4	13.5	12.4	12.8	11.9	10.9	10.9	8.5	7.8	7.0	6.2	7.2	9.4	10.7	10.4	7.4	5.6	4.1	7.5	6.7	7.7	13.2	9.5	7.9	4.1	13.5	9.2
Nov 28	6.1	4.7	5.0	5.7	6.4	7.2	6.3	5.0	3.2	5.6	7.2	8.9	14.9	15.8	17.4	17.6	13.2	14.5	15.1	15.1	12.2	24.1	16.4	16.4	3.2	24.1	11.0
Nov 29	21.0	17.8	12.3	12.3	14.7	10.4	11.0	9.1	8.3	7.2	6.4	5.9	6.9	10.9	12.3	13.3	9.8	9.5	11.6	9.5	9.8	9.3	6.8	7.5	5.9	21.0	10.6
Nov 30	8.2	9.3	9.2	12.6	9.6	8.8	6.9	12.7	15.4	18.3	22.3	22.2	19.9	20.4	17.2	14.0	13.8	8.8	11.1	13.2	16.9	15.5	13.5	12.3	6.9	22.3	13.8
Diurnal Maximum	36.7	35.8	36.8	74.2	68.8	55.0	65.3	62.6	57.5	46.0	46.5	52.1	53.1	52.0	55.9	39.4	39.0	33.2	32.8	33.8	32.7	38.6	33.0	36.6			
Diurnal Average	18.9	18.9	17.8	19.3	18.6	18.3	17.8	17.6	17.6	18.8	20.0	21.5	21.9	22.6	22.5	20.6	17.8	16.8	18.1	18.1	16.9	17.6	17.2	17.6			
C	Calibration				S	Daily Zero/Span				N	Quality Assurance				C1	Repeat Calibration				S1	Repeat Daily Zero/Span						
G	Out for Repair				K	Collection Error				Q	Not in Service				O	Operator Error				P	Power Failure						
R	Recovery				X	Machine Malfunction				Y	Maintenance				T	Exceeds Temperature Limits				N	Not in Service						

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Instantaneous Maximum for WS - Bonnyville - East Site



END OF REPORT

This report, 366 of 366, ends the November 2019 Monthly Ambient Air Quality Monitoring Report.



Lakeland Industry & Community Association

NOVEMBER 2019
Ambient Air Monitoring Calibration Report
- COLD LAKE SOUTH STATION-
CAL-LICA-201911-01174

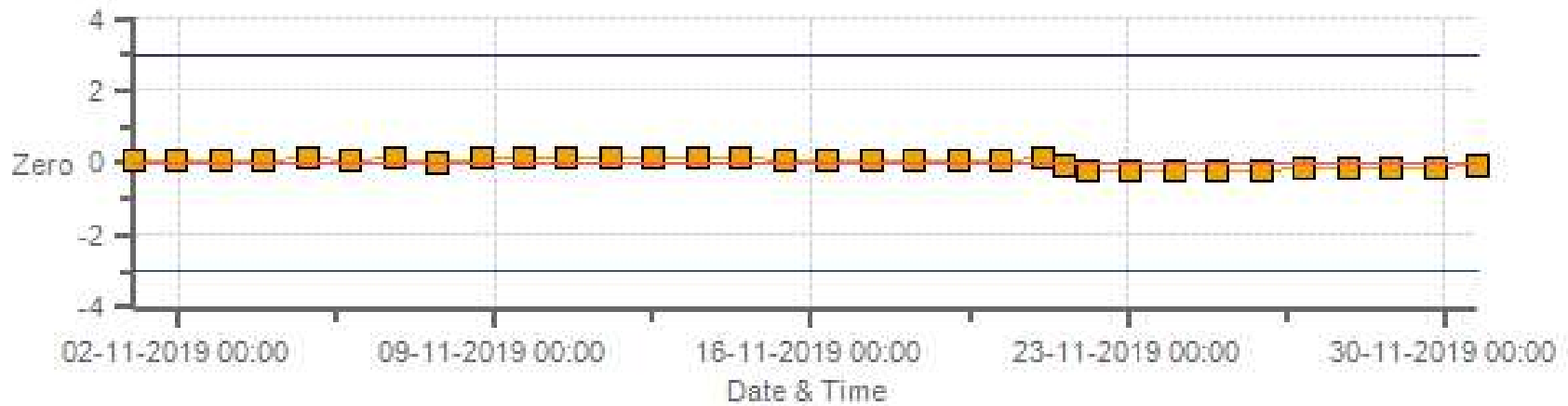
Station Operation and Maintenance:
Bureau Veritas Canada

Data Validation and Report:
Bureau Veritas Canada

December 17, 2019

DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2 [ppb] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Zero



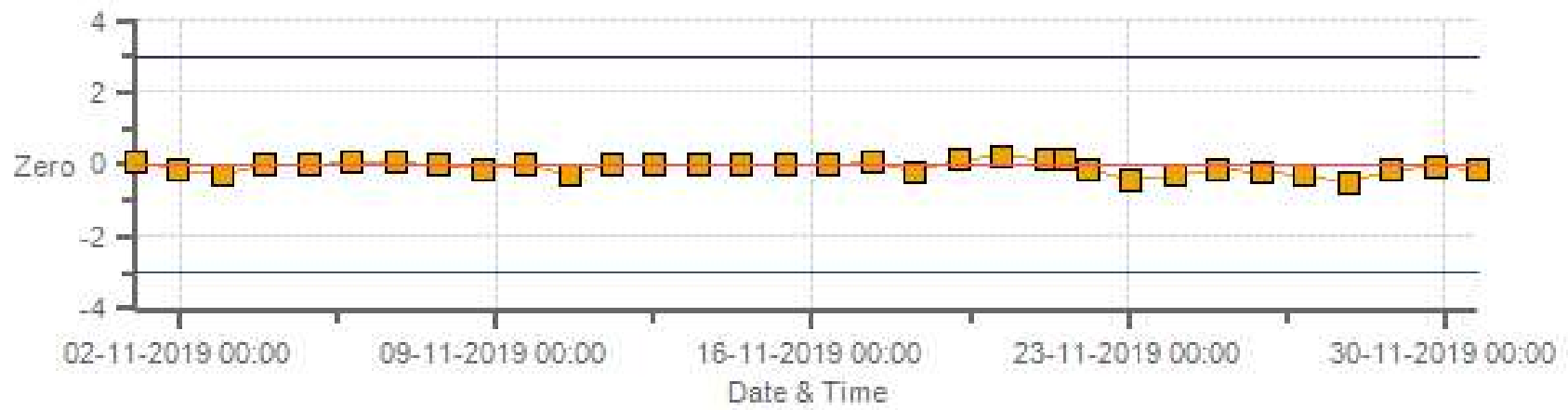
Zero Zero Ref Zero Low Zero High

SO2 [ppb] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Span



Span SpanRef Span Low Span High

TRS [ppb] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

TRS [ppb] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Span



Span SpanRef Span Low Span High

NOx [ppb] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

NOx [ppb] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Span



Span SpanRef Span Low Span High

NO2 [ppb] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Zero



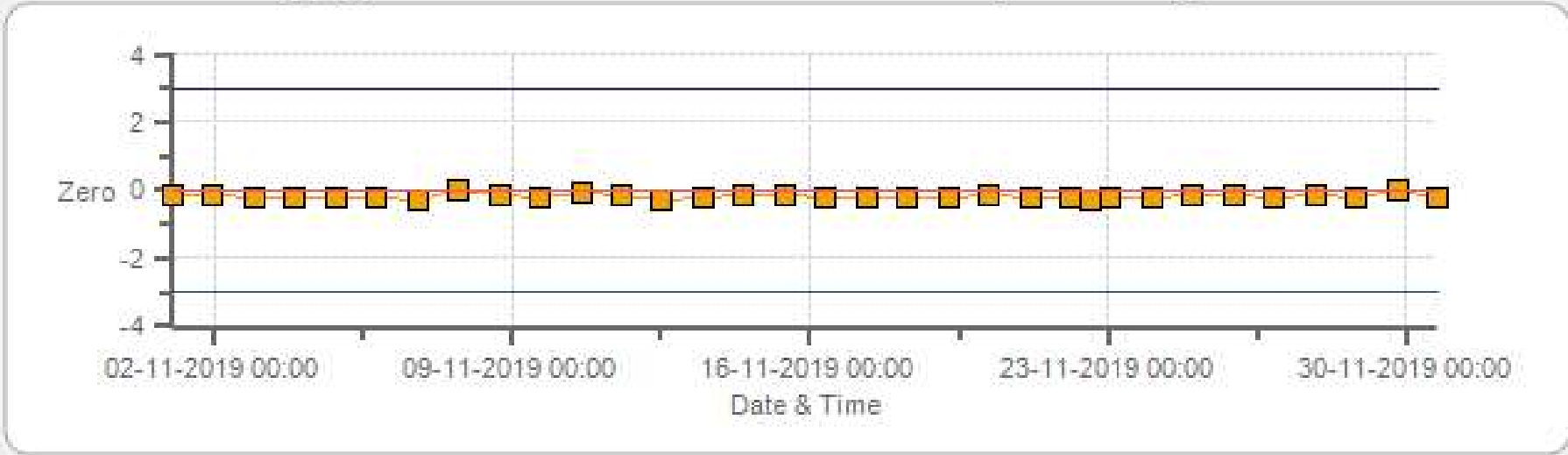
Zero Zero Ref Zero Low Zero High

NO2 [ppb] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Span



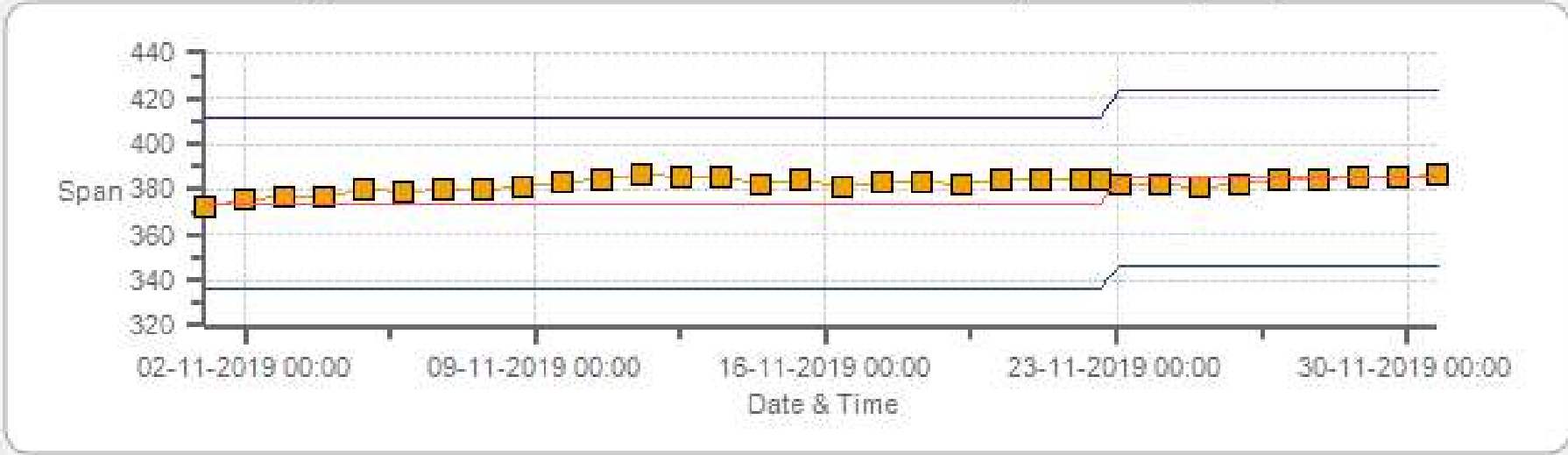
Span SpanRef Span Low Span High

O3 [ppb] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Zero



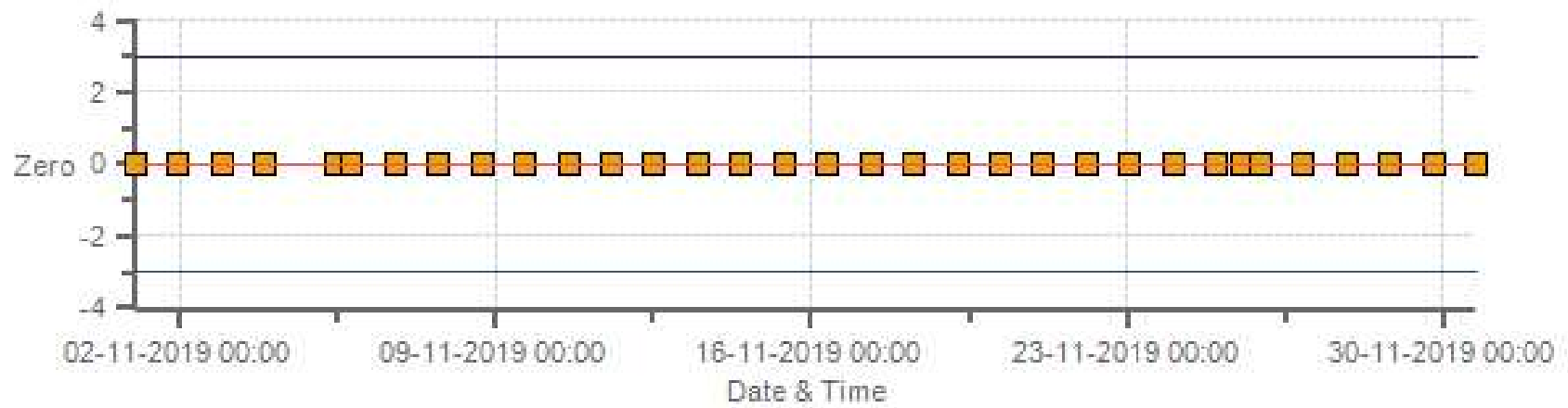
Zero Zero Ref Zero Low Zero High

O3 [ppb] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Span



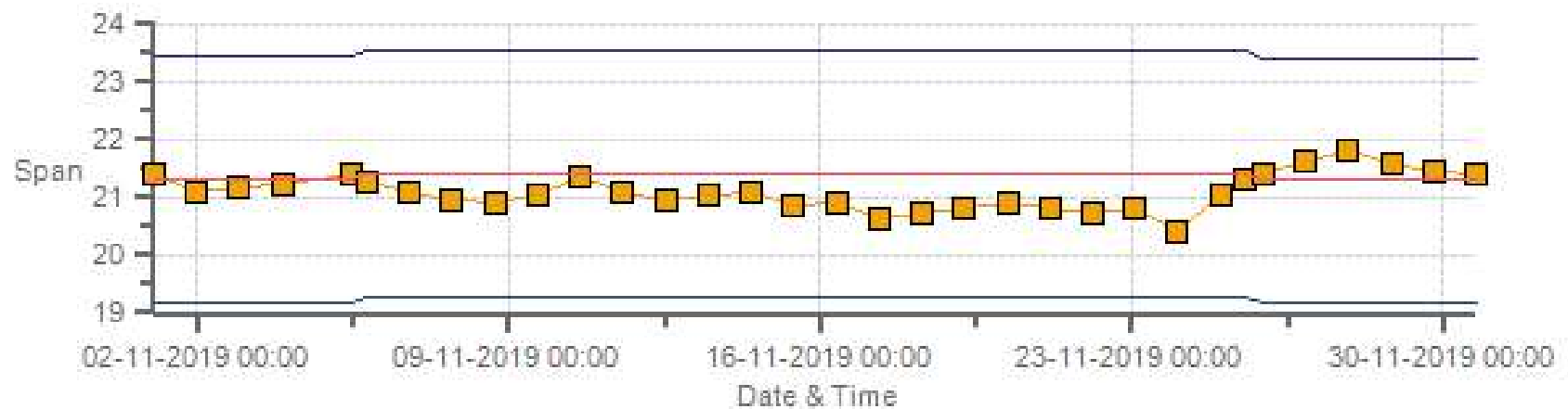
Span SpanRef Span Low Span High

THC [ppm] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Zero



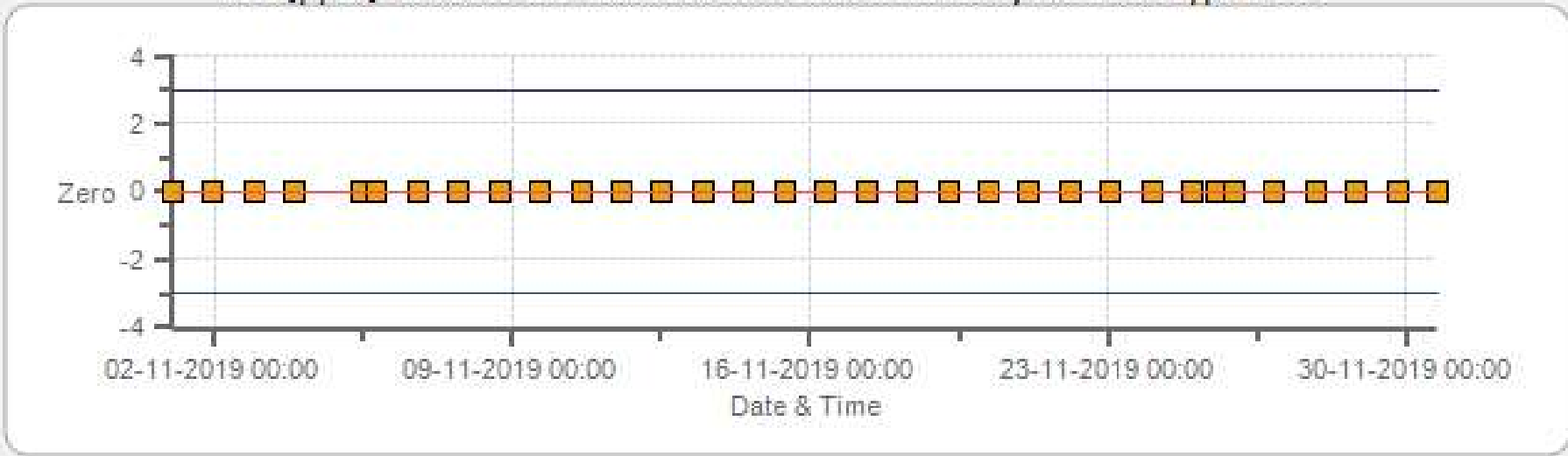
Zero Zero Ref Zero Low Zero High

THC [ppm] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Span



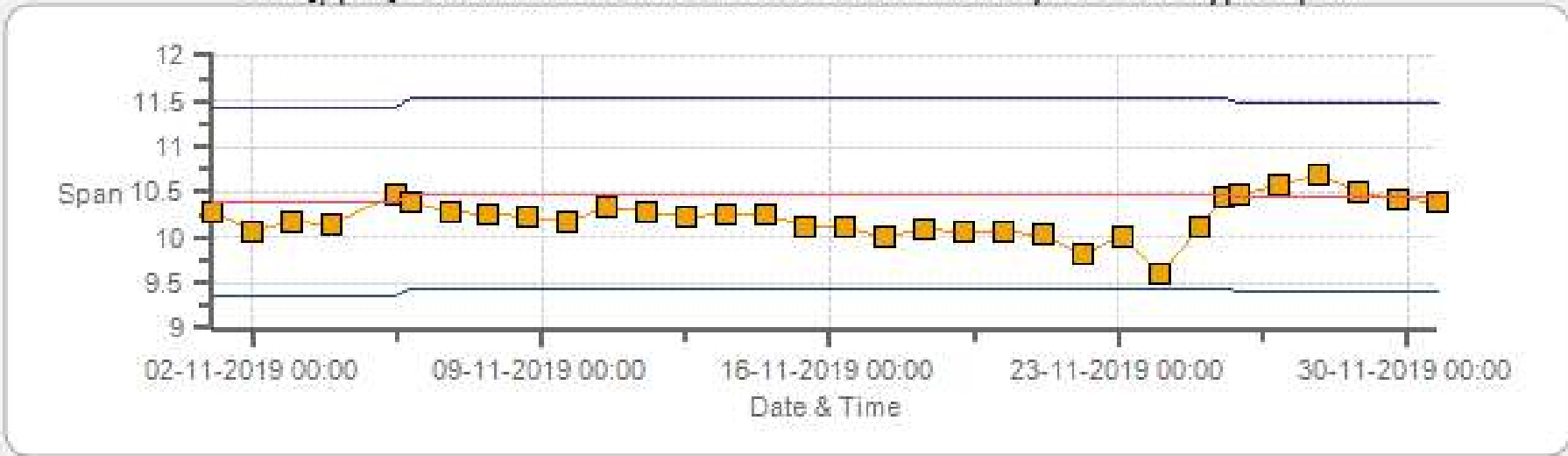
Span Span Ref Span Low Span High

CH4 [ppm] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Zero



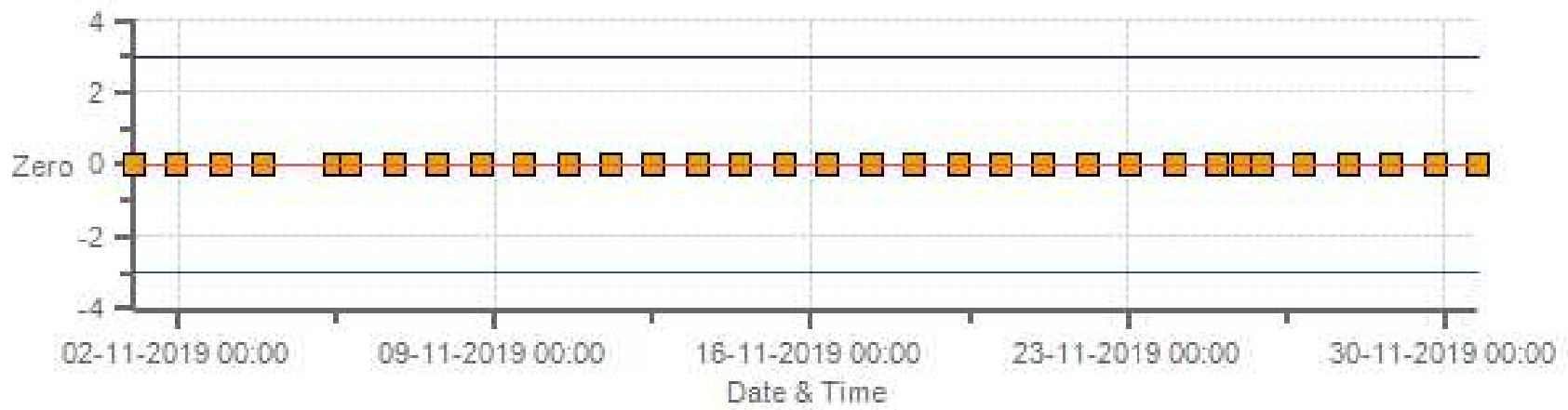
Zero Zero Ref Zero Low Zero High

CH4 [ppm] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Span



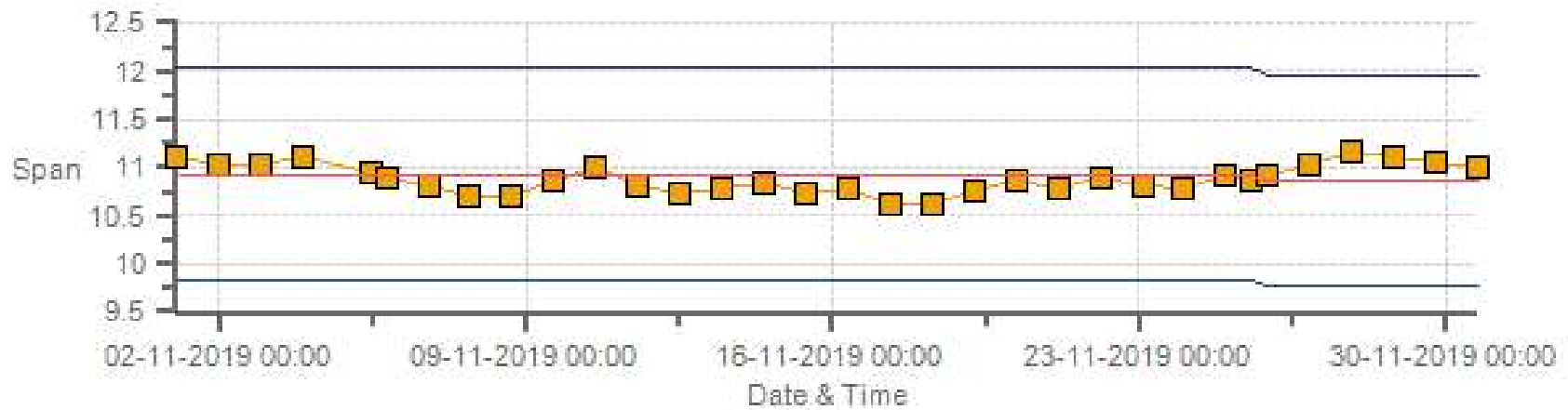
Span SpanRef Span Low Span High

NMHC [ppm] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

NMHC [ppm] Calibration: LICA Cold Lake South Monthly: 11-2019 Type: Span



Span SpanRef Span Low Span High

MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



DATE:	21-Nov-2019	PREVIOUS CALIBRATION DATE:	02-Oct-2019
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	1.001
CLIENT:	LICA	TEMPERATURE (°C):	21.0
LOCATION:	Cold Lake South	BAROMETRIC (mBar):	946
PURPOSE:	Routine	START TIME (MST):	10:15
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:25

ANALYZER:

MAKE/MODEL	Thermo 43I-TLE	RANGE	500 ppb
SERIAL #	1180026018	FLOW (mL/min)	448
INITIAL		FINAL	
BKG/OFFSET	17.4	BKG/OFFSET	2.05
COEF/SLOPE	0.99	COEF/SLOPE	1.006
Expected (reference) Value	266	Expected (reference) Value	269

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	API	MAKE:	Teledyne
MODEL:	700	MODEL:	T701
ID:	690	ID:	132
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 107918	HIGH ID	n/a
CONC (ppm):	49.50	EXPIRY DATE	n/a
CYLINDER (psi):	800	LOW ID	n/a
EXPIRY DATE	20-Aug-2026	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	390	190	95
RANGE	300 - 400	150 - 200	50 - 100

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	n/a	SO2 Conc (ppb)	n/a
END TIME:	n/a	Analyzer Response (ppb)	n/a

CALIBRATION:

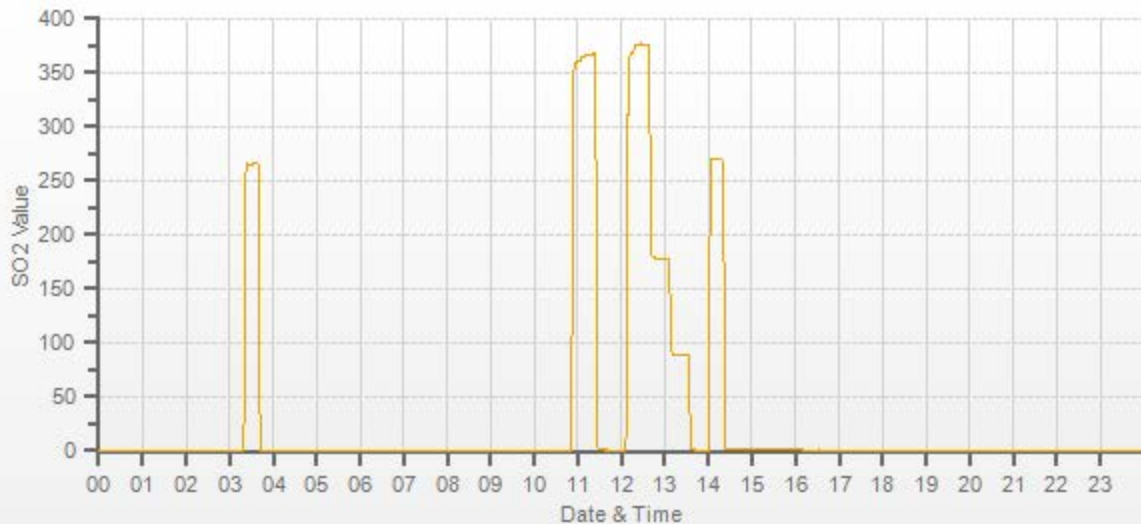
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	37.90	5000	0.00	0	0	1.017	1.001
4962	37.90	5000	375.21	369	375	1.017	1.001
4982	18.00	5000	178.20	n/a	178	n/a	1.001
4991	8.90	5000	88.11	n/a	88	n/a	1.001

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.999	0.0%

COMMENTS:

Sample inlet filter was changed.



TRS Analyzer Calibration by Dilution



DATE:	21-Nov-2019	PREVIOUS CALIBRATION DATE:	02-Oct-2019
PARAMETER:	TRS	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	21.0
LOCATION:	Cold Lake South	BAROMETRIC (mBar):	946
PURPOSE:	Routine	START TIME (MST):	10:15
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:25

ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	812728560	FLOW (mL/min)	483
INITIAL		FINAL	
BKG/OFFSET	17.5	BKG/OFFSET	17.4
COEF/SLOPE	0.973	COEF/SLOPE	0.951
Expected (reference) Value	40	Expected (reference) Value	39.8

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 19174	HIGH ID	n/a
CONC (ppm):	10.00	EXPIRY DATE	n/a
CYLINDER (psi):	1900	LOW ID	n/a
EXPIRY DATE	16-Jul-2022	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	78	38	19
RANGE	60 - 80	30 - 40	10 - 20

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	10:21	SO2 Conc (ppb)	380
END TIME:	10:36	Analyzer Response (ppb)	0.0

CALIBRATION:

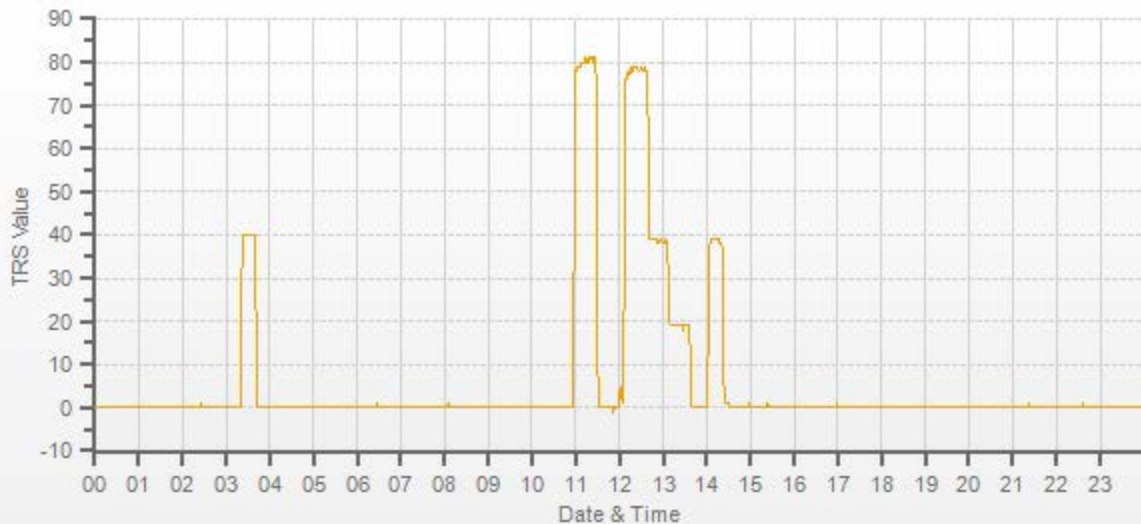
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	58.50	7500	0.00	0	0	0.969	1.000
7442	58.50	7500	78.00	80.5	78	0.969	1.000
7472	28.50	7500	38.00	n/a	38.1	n/a	0.997
7486	14.20	7500	18.93	n/a	18.9	n/a	1.002

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	0.0%

COMMENTS:

Sample inlet filter was changed.



Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	05-Nov-2019	PREVIOUS CALIBRATION DATE:	n/a	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1236656107	1200
LOCATION:	Cold Lake South	BAROMETRIC (mBar):	950	PARAMETER:	CH4	NMHC	THC
PURPOSE:	Install/Post-Repair	START TIME (MST):	08:36	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	11:22	PREVIOUS CF:	n/a	n/a	n/a

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	API	MAKE:	Teledyne	CYLINDER ID:	LL 29687	HIGH ID:	n/a
MODEL:	700	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	598.0 198.0	HIGH EXPIRY:	n/a
ID:	690	ID:	132	CYLINDER (psi):	800	LOW ID:	n/a
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	115	EXPIRY DATE:	01-Aug-2026	LOW EXPIRY:	n/a

CALIBRATION PARAMETERS:

POINT (CH ₄ /NMHC)	HIGH	MID	LOW	CH ₄ EQUIVILANCE		
TARGET	14	7	3.5	C ₃ H ₈ as CH ₄		544.5
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄		1142.5

EXPECTED (REFERENCE) VALUE:

INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	n/a	n/a	n/a		n/a	10.48	10.93

CALIBRATION:

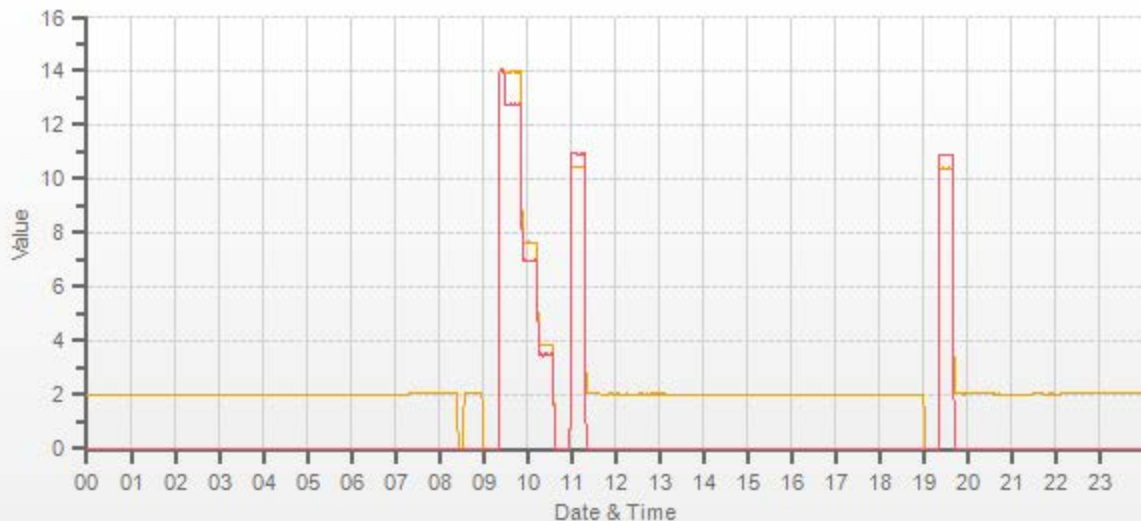
FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC
3000	X	3000	0.00	0.00	0.00	n/a	n/a	n/a	0.00	0.00	0.00	X	X	X	X	X	X
2930	70.00	3000	13.95	12.71	26.66	n/a	n/a	n/a	13.95	12.71	26.66	n/a	n/a	n/a	1.000	1.000	1.000
2962	38.00	3000	7.57	6.90	14.47	n/a	n/a	n/a	7.66	6.93	14.60	n/a	n/a	n/a	0.989	0.995	0.991
2981	19.00	3000	3.79	3.45	7.24	n/a	n/a	n/a	3.87	3.47	7.34	n/a	n/a	n/a	0.979	0.994	0.986

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
CH ₄	1.000	0.999	0.2%
NMHC	1.000	1.000	0.1%
THC	1.000	1.000	0.2%

COMMENTS:

Installation calibration was completed to install a spare LICA analyzer and to remove a faulty AE analyzer because of frequent bad injections issue. Sample filter was changed. Column conditioning was completed overnight prior to the installation.



CAL-LICA-201911-01174

Page 17 of 32
CH4 [ppm] NMHC [ppm]

Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	25-Nov-2019	PREVIOUS CALIBRATION DATE:	05-Nov-2019	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1236656107	1200
LOCATION:	Cold Lake South	BAROMETRIC (mBar):	941	PARAMETER:	CH4	NMHC	THC
PURPOSE:	Repeat	START TIME (MST):	09:31	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	13:15	PREVIOUS CF:	n/a	n/a	n/a

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	API	MAKE:	Teledyne	CYLINDER ID:	LL 296687	HIGH ID:	n/a
MODEL:	700	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	598.0 198.0	HIGH EXPIRY:	n/a
ID:	690	ID:	132	CYLINDER (psi):	600	LOW ID:	n/a
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	115	EXPIRY DATE	01-Aug-2026	LOW EXPIRY:	n/a

CALIBRATION PARAMETERS:

POINT (CH ₄ /NMHC)	HIGH	MID	LOW	CH ₄ EQUIVILANCE		
TARGET	14	7	3.5	C ₃ H ₈ as CH ₄		544.5
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄		1142.5

EXPECTED (REFERENCE) VALUE:

INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	10.48	10.93	21.41		10.44	10.86	21.30

CALIBRATION:

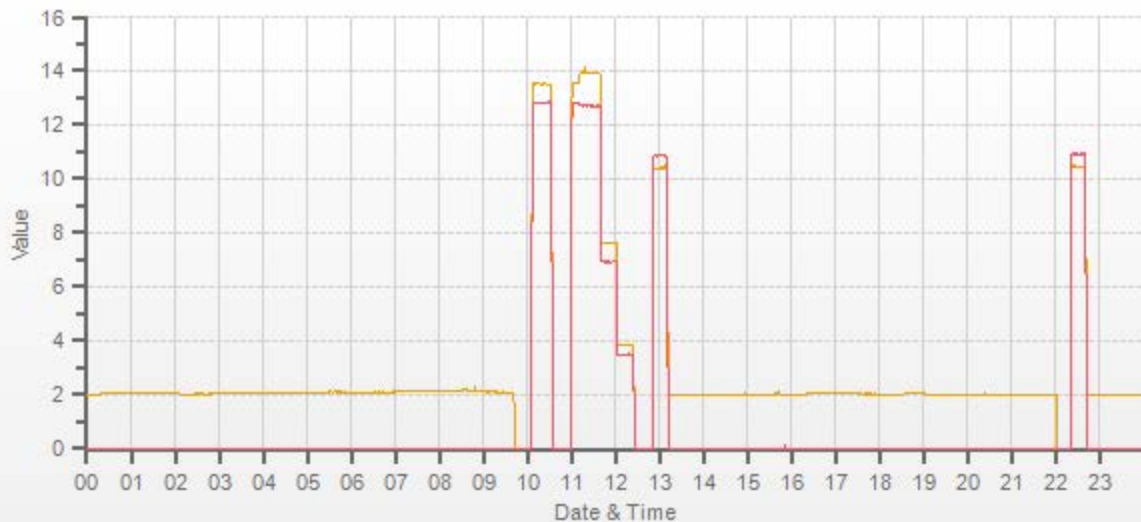
FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC
3000	X	3000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	X	X	X	X	X	X
2930	70.00	3000	13.95	12.71	26.66	13.53	12.82	26.35	13.95	12.71	26.66	1.031	0.991	1.012	1.000	1.000	1.000
2962	38.00	3000	7.57	6.90	14.47	n/a	n/a	n/a	7.64	6.90	14.55	n/a	n/a	n/a	0.991	1.000	0.995
2981	19.00	3000	3.79	3.45	7.24	n/a	n/a	n/a	3.87	3.46	7.33	n/a	n/a	n/a	0.979	0.997	0.987

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
CH ₄	1.000	0.999	0.2%
NMHC	1.000	1.000	0.0%
THC	1.000	0.999	0.1%

COMMENTS:

The bad injection issue was fixed offsite, and the analyzer required repeat calibration. A new SPAN gas cylinder was connected.



CAL-LICA-201911-01174

NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	21-Nov-2019	PREVIOUS CALIBRATION DATE:	02-Oct-2019	MAKE/MODEL:	Thermo 42i	PREVIOUS CF.	
CLIENT:	LICA	TEMPERATURE (°C):	21.0	SERIAL #:	1505664393	NOx	0.999
LOCATION:	Cold Lake South	BAROMETRIC (mBar):	946.00	FLOW (mL/min)	765	NO	0.999
PURPOSE:	Routine	START TIME (MST):	10:15	RANGE (ppb)	500	NO2	1.000
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:15	GPT FOR O3?		No	

CALIBRATION SYSTEM:							
CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	API	MAKE:	Teledyne	CYLINDER ID:	LL 107918	HIGH ID:	n/a
MODEL:	700	MODEL:	T701	NO/NOx (PPM):	50.1 50.2	HIGH EXPIRY:	n/a
ID:	690	ID:	132	CYLINDER (psi):	800	LOW ID:	n/a
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a	EXPIRY DATE	20-Aug-2026	LOW EXPIRY:	n/a

CALIBRATION SETTINGS:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
BKG/OFFSET:	5	5	n/a	BKG/OFFSET:	5	5	n/a
SLOPE/COEF/CE:	1	1	1.0	SLOPE/COEF/CE:	1	1	1.0

EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	256	2	254.0		261	2	259.0

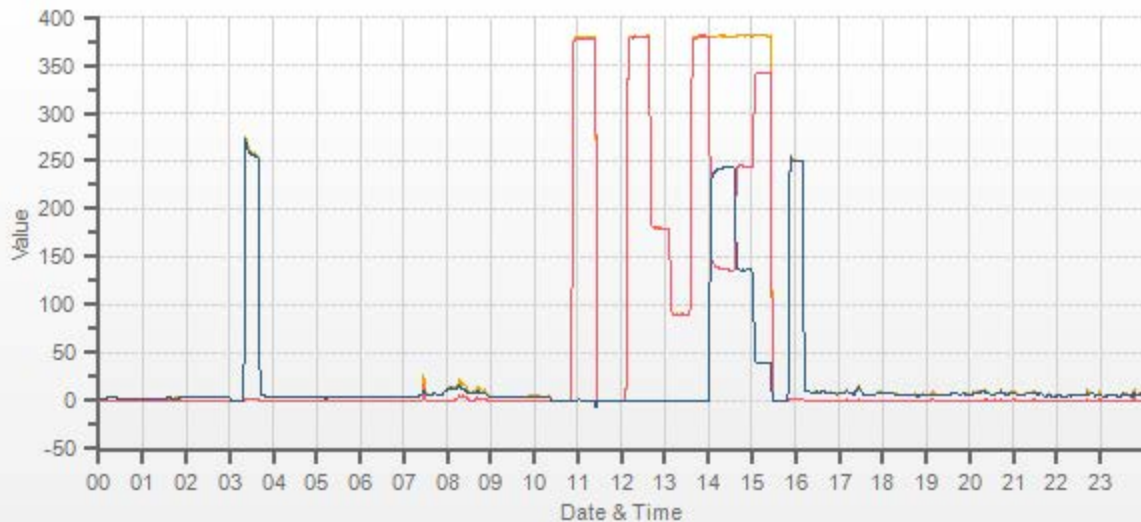
CALIBRATION PARAMETERS:				
POINT	NO TARGET (PPB)	NO2 TARGET (PPB)	NO2 RANGE	O3 POINT
HIGH	380	250	230-265	n/a
MID	180	125	115-150	n/a
LOW	90	45	40-55	n/a
EXTRA 1	n/a	n/a	n/a	n/a

NO/NOx CALIBRATION:																	
FLOW RATE			CONCENTRATION (ppb)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2
5000	37.90	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.005	1.004	0.999	0.999	0.999	0.999
4962	37.90	5000	379.8	380.5	0.8	378.0	379.0	1.0	380.0	381.0	1.0	1.005	1.004	0.999	0.999	0.999	0.999
4982	18.00	5000	180.4	180.7	0.4	n/a	n/a	n/a	180.0	181.0	1.0	n/a	n/a	1.002	0.998	0.998	0.998
4991	8.90	5000	89.2	89.4	0.2	n/a	n/a	n/a	90.0	91.0	1.0	n/a	n/a	0.991	0.982	0.982	0.982

GPT CALIBRATION:										
Point	CALIBRATOR			INDICATED (ppb)			NO DROP / O3 Conc (ppb)	NO2 GAIN (ppb)	NO2 Corr. FACTOR	CONV. EFFICIENCY
	GAS	TOTAL	O3 SETPOINT	NO	NOx	NO2				
REFERENCE	37.90	5000	0	380.0	381.0	1.0	242	242	1.000	100.00%
AS-FOUND HIGH	37.90	5000	245	138.0	381.0	243.0	242	242	1.000	100.00%
ADJUSTED HIGH	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MID	37.90	5000	140	245.0	382.0	136.0	135	135	1.000	100.00%
LOW	37.90	5000	45	341.0	381.0	40.0	39	39	1.000	100.00%
NO2 adjustment not required.									AVERAGE:	100.00%

LINEAR REGRESSION ANALYSIS:				COMMENTS:
	CORRELATION	SLOPE	INTERCEPT	
NO	1.000	1.000	0.04%	
NOx	1.000	1.000	0.12%	
NO2	1.000	1.000	0.00%	

Sample inlet filter was changed.



CAL-LICA-201911-01174

Ozone Calibration by Direct GPT



DATE:	22-Nov-2019	PREVIOUS CALIBRATION DATE:	04-Oct-2019
PARAMETER:	Ozone	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	20.0
LOCATION:	Cold Lake South	BAROMETRIC (mBar):	939
PURPOSE:	Routine	START TIME (MST):	10:11
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:18

ANALYZER:

MAKE/MODEL	Thermo 49i	RANGE	500 ppb
SERIAL #	700419951	FLOW (mL/min)	1455
INITIAL		FINAL	
BKG/OFFSET	0	BKG/OFFSET	0
COEF/SLOPE	1.039	COEF/SLOPE	1.034
Expected (reference) Value	374	Expected (reference) Value	385

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a
CALIBRATION METHOD:		DIRECT GPT	
GPT DATE:	n/a	GPT END TIME:	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
RANGE	300 - 400	150 - 200	50 - 100

CALIBRATION:

FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	XXXX	5000	0.0	0.0	0.0	XXXX	XXXX
5000	XXXX	5000	380.0	380.0	380.0	1.000	1.000
5000	XXXX	5000	181.0	n/a	181.0	n/a	1.000
5000	XXXX	5000	62.0	n/a	63.0	n/a	0.984

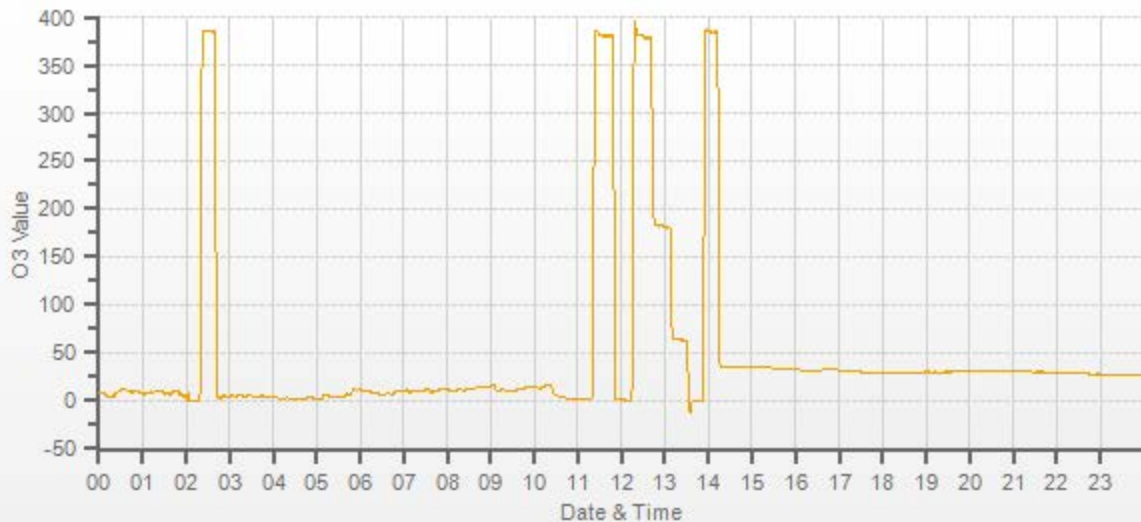
LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.999	0.1%

COMMENTS:

Sample inlet filter was changed.

O3[ppb] Station: Cold Lake South Daily: 22-11-2019 Type: AVG 1 Min. [1 Min.]



CAL-LICA-201911-01174

Thermo 5030 SHARP Monitor Monthly Check



Date: November 25, 2019
Company: LICA
Station Name/Location: Cold Lake South
Previous Audit Date: October 24, 2019
Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Wunmi Adekanmbi
Start Time (mst): 12:37
End Time (mst): 13:09
Calibration Purpose: routine monthly
Weather Conditions: Mainly sunny

SHARP Information and Status:

Serial Number: CM-2209 **Status:** 0.00
Approx Tape remaining: 2/10 **Error Code:** 0.00

Reference Standards:

Air Flow

	Manometer	Orifice	Pressure:		Temperature:	
Make:	Dwyer	Chinook	Fisher Scientific		Fisher Scientific	
Model:	475 Mk. III	170101	FB61291		11-661-7B	11745843
Serial Number:	#3	#4	130168457	17-Jan-20	160348895	
Calibration Expiration Date:	January 17, 2020	January 31, 2020	January 17, 2020		June 19, 2020	

As found temperature and pressure:

<p style="text-align: center;">Tolerance +/- 4°C</p> <p>SHARP T1 °C: <u>-1.0</u></p> <p>Reference °C: <u>-1.1</u></p> <p>Difference °C: <u>-0.1</u></p>	<p style="text-align: center;">Tolerance +/- 13.33 hPa</p> <p>SHARP P3 (hPa): <u>941.000</u></p> <p>Reference (hPa): <u>941.000</u></p> <p>Difference (hPa) : <u>0.000</u></p>
---	--

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

<p style="text-align: center;">Tolerance +/- 4°C</p> <p>SHARP T1 °C: <u>-1.0</u></p> <p>Reference °C: <u>-1.1</u></p> <p>Difference °C: <u>-0.1</u></p>	<p style="text-align: center;">Tolerance +/- 13.33 hPa</p> <p>SHARP P3 (hPa): <u>941.000</u></p> <p>Reference (hPa): <u>941.000</u></p> <p>Difference : <u>0.000</u></p>
---	--

As found flows:

<p>Targets: 1000 l/hr / <90%</p> <p>SHARP AirFlow l/hr <u>1000.00</u></p> <p>Pump Voltage (%) <u>50.00</u></p>	<p>Flow Tolerance 16.67 lpm +/- 0.67 lpm</p> <p>SHARP Airflow (l/min) <u>16.67</u></p> <p>Reference AirFlow (l/min) <u>16.66</u></p> <p>Difference (l/min) <u>-0.01</u></p>
---	---

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

<p>Targets: 1000 l/hr / <90%</p> <p>SHARP AirFlow l/hr <u>1000.00</u></p> <p>Pump Voltage (%) <u>50.00</u></p>	<p>Flow Tolerance 16.67 lpm +/- 0.67 lpm</p> <p>SHARP Airflow (l/min) <u>16.67</u></p> <p>Reference AirFlow (l/min) <u>16.66</u></p> <p>Difference (l/min) <u>-0.01</u></p>
---	---

Inlet Assembly:

	Yes/No?	If No, give reason
PM10 Inlet Cleaned	yes	
PM2.5 Cyclone Cleaned	yes	

Comments:

Leak check: 16.62 vs 16.60, 0.02 < 0.8 lpm, passed.



Meteorological Sensor Audit/Calibration

Location Information

Company:	LICA	Performed By:	Alex Yakupov
Audit Location:	Cold Lake South	Reviewed By:	Wunmi Adekanmbi
Audit Date:	October 9, 2019	Start/End Time (mst):	10:23 / 13:57
Calibration Purpose:	installation	Weather Conditions:	Mainly sunny

Wind Sensor Information

Sensor ID Data:		Sensor Outputs:	
Sensor Make:	RM Young	Velocity Voltage Output Range:	0-1 V
Sensor Model:	05305VK	Velocity Unit Output Range:	0-200 km/h
Serial #:	161466	Direction Voltage Output Range:	0-1 V
Previous Cal/Audit Date:	:July 25, 2019	Direction Unit Output Range:	0-360 degrees

Wind Calibrator Information

Calibrator I.D. and Expiry Date: _____ n/a

Wind Speed Audit Data ****+/- 2% of the average correction factor is the limit****

RPM	Wind Speed Generated kph	Clockwise Wind Speed kph	Counter Clockwise Wind Speed kph	Correction Factor
0	0	0.0	0.0	-
1000	18.4	18.5	18.4	0.997
2000	36.9	36.9	36.9	1.000
3000	55.3	55.4	55.4	0.998
4000	73.7	73.9	73.9	0.997
5000	92.2	92.4	92.4	0.998
6000	110.6	110.9	110.9	0.997
7000	129.0	129.4	129.4	0.997
8000	147.4	148.0	148.0	0.996
9000	165.9	166.6	166.6	0.996
10000	184.3	185.0	185.0	0.996
The audit meets AMD requirements.			Average Correction Factor=	0.997

Wind Direction Audit Data ****+/- 3° of the absolute average degrees difference for all points is the limit****

Generated Wind Direction 0-360 (Up)	Generated Wind Direction 360-0 (Down)	Indicated Wind Direction 0-360 (Up)	Indicated Wind Direction 360-0 (Down)	Degrees Difference 0-360 (Up)	Degrees Difference 360-0 (Down)	Average Absolute Degrees Difference
0	355	0	355	0.3	0.0	0.2
30	330	31	329	-0.8	1.0	0.9
60	300	61	300	-1.1	0.3	0.7
90	270	94	269	-4.0	0.6	2.3
120	240	123	241	-3.3	-0.8	2.1
150	210	152	211	-1.9	-1.2	1.6
180	180	181	181	-1.2	-0.7	0.9
210	150	211	152	-1.3	-1.6	1.5
240	120	241	121	-0.5	-1.2	0.9
270	90	269	93	0.6	-2.8	1.7
300	60	299	62	1.0	-1.8	1.4
330	30	329	30	1.0	0.3	0.7
355	0	355	1	0.3	0.5	0.4
The audit meets AMD requirements.				Average Absolute Degrees Difference=		1.2

Comments:

Calibrator ID and expiry date: Model 18860-90/18802 SN: CA 4744, calibration expires - June 19, 2020, (ownership - LICA). Replacement for by-annual re-certification.

End of Report

Company Maxxam Operator: Tom Bourque

Calibrator:				Flow Measurement Device:			
Make/Model	<u>API 700</u>			Make/Model	<u>N/A</u>		
Serial Number	<u>690</u>			Serial Number	<u>N/A</u>		
Last Verification Date	<u>March 2018</u>			Temperature (°C)	<u>24.4 C</u>		
NO Cylinder S/N	<u>EY0000769</u>			Barometric Pressure	<u>699 mmHg</u>		
NO [PPM]	<u>51.1</u>	NOx [PPM]	<u>51.2</u>				
Expiry Date	<u>December 2019</u>						

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	-0.001	-0.001	Limit ± 10%	
5083	80.0	0.804	0.806	0.802	-0.011	0.791	0%	-2%
5044	40.0	0.405	0.406	0.403	-0.006	0.397	-1%	-2%
5022	20.0	0.204	0.204	0.202	-0.004	0.198	-1%	-2%
Absolute Average Percent Difference							1%	2%

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

<u>NO</u>	<u>LIMITS</u>	<u>NOx</u>
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 0.9974	0.90-1.10	m (Slope)= 0.9833
b (Intercept % of FS)= -0.0592	± 3% F.S.	b (Intercept % of FS)= -0.1772

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5083	0.000	0.000	0.802	-0.011	0.791	NO ₂	% Diff. Limit
5083	0.500	0.518	0.284	0.488	0.771	-4%	± 10%
5083	0.300	0.323	0.479	0.294	0.774	-6%	± 10%
5083	0.150	0.167	0.635	0.142	0.777	-8%	± 10%
						6%	± 10%

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

<u>NO₂</u>	<u>LIMITS</u>	
Correlation= 0.9998	≥ 0.995	Big shift down in NOx when entering GPT function. Possible flow change.
m (Slope)= 0.9649	0.90-1.10	
b (Intercept % of FS)= -1.4907	± 3% F.S.	

AENV Standards Audit Calibrator	NO _x Analyzer
Make/Model <u>Teco 146i</u>	Make/Model <u>Teco 42i</u>
Serial/AMU Number <u>AMU 1809</u>	Serial/AMU Number <u>AMU 2265</u>
SRM Gas Cylinder No. <u>APEX1236646</u>	Last Calibration Date <u>April 15, 2019</u>
Cylinder Conc. (ppm) <u>50.04</u>	Full Scale (ppm) <u>1.0</u>
	Cylinder Gas Expiry Date <u>June 2021</u>

COMMENTS: With ZAG Teledyne 701 Maxxam ID 11986.

Auditor: Al Clark Date: April 16, 2019
 Operator Signature: Location: McIntyre Center Edmonton

Company Maxxam Operator: Tom Bourque

Calibrator:				Flow Measurement Device:			
Make/Model	<u>Sabio 2010</u>			Make/Model	<u>N/A</u>		
Serial Number	<u>11900613</u>			Serial Number	<u>N/A</u>		
Last Verification Date	<u>August 2018</u>			Temperature (°C)	<u>24.4 C</u>		
NO Cylinder S/N	<u>EY0000769</u>			Barometric Pressure	<u>699 mmHg</u>		
NO [PPM]	<u>51.1</u>	NOx [PPM]	<u>51.2</u>				
Expiry Date	<u>December 2019</u>						

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	-0.002	-0.002	Limit ± 10%	
5080	80.0	0.805	0.806	0.815	-0.007	0.808	1%	0%
5041	40.0	0.405	0.406	0.414	-0.004	0.410	2%	1%
5019	20.0	0.204	0.204	0.210	-0.004	0.206	3%	2%
Absolute Average Percent Difference							2%	1%

LINEAR REGRESSION ANALYSIS

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

<u>NO</u>	<u>LIMITS</u>	<u>NOx</u>
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0117	0.90-1.10	m (Slope)= 1.0039
b (Intercept % of FS)= 0.2171	± 3% F.S.	b (Intercept % of FS)= -0.0020

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5080	0.000	0.000	0.815	-0.009	0.806	NO ₂	% Diff. Limit
5080	1.400	0.517	0.298	0.511	0.809	1%	± 10%
5080	0.900	0.308	0.507	0.299	0.806	0%	± 10%
5080	0.500	0.140	0.675	0.130	0.805	-1%	± 10%
						0%	± 10%

LINEAR REGRESSION ANALYSIS

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

<u>NO₂</u>	<u>LIMITS</u>
Correlation= 1.0000	≥ 0.995
m (Slope)= 1.0062	0.90-1.10
b (Intercept % of FS)= -1.0004	± 3% F.S.

AENV Standards Audit Calibrator	NO _x Analyzer
Make/Model <u>Teco 146i</u>	Make/Model <u>Teco 42i</u>
Serial/AMU Number <u>AMU 1809</u>	Serial/AMU Number <u>AMU 2265</u>
SRM Gas Cylinder No. <u>APEX1236646</u>	Last Calibration Date <u>April 15, 2019</u>
Cylinder Conc. (ppm) <u>50.04</u>	Full Scale (ppm) <u>1.0</u>
	Cylinder Gas Expiry Date <u>June 2021</u>

COMMENTS: With ZAG Teledyne 701 Maxxam ID: 11981. Should have Maxxam ID 11986 instead

Auditor: Al Clark Date: April 16, 2019
 Operator Signature: Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2019-392CGA

Company: Maxxam **Operator's Name:** Alex

Cylinder #: LL107918 Concentration PPM: 49.5 Tolerance(%) 1 Certified By: Praxair

Expiry Date: August 2026

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>Sabio 2010</u>	Make/Model: <u>Mesa Definer 220</u>
Serial Number: <u>AMU 2092</u>	Serial Number: <u>H-133034 / L-132702</u>
Last Verification Date: <u>January 14, 2019</u>	Temp. °C: <u>22.7 C</u>
Gas Type: <u>SO2</u> Conc. <u>50.26</u>	B.P. <u>707 mmHg</u>
Cylinder Number: <u>FF28071</u>	
Expiry Date: <u>March 2020</u>	

Reference Analyzer:

Make/Model: Teco 43i Serial/AMU Number: 2195

Instrument Settings: Zero: 11.8 Span: 0.980 Range: 1.0

Last Calibration: Date: Jan 14/19 C.F. 1.000 Done By: Shea Beaton

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.0000	0.0000	0.0000
4898	78.1	0.790	0.01595	62.714	49.5
4893	38.7	0.389	0.00791	126.434	49.2
4894	19.3	0.192	0.00394	253.575	48.7
Average Cylinder Concentration:					49.1

Previous Stated Concentration PPM: 49.5

Percent variance from Stated: 1

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration _____

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

Auditor: Al Clark

Operator Signature:

Date: January 15, 2019

Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2019 - 326CGA

Company: Maxxam **Operator's Name:** Limin
Cylinder #: LL19174 **Concentration PPM:** 10.0 **Tolerance(%)** 2 **Certified By:** Praxair
Expiry Date: July 2022

Reference Calibrator and Gas:

Make/Model: Sabio 2010
Serial Number: AMU 2092
Last Verification Date: September 16, 2019
Gas Type: H2S **Conc.** 20.43
Cylinder Number: CAL015146
Expiry Date: March 2022

Flow Measurement Device:

Make/Model: Mesa Defender 530+
Serial Number: H-153961 / L-153874
Temp.°C: 23.2 C
B.P. 694 mmHg

Reference Analyzer:

Make/Model: Teco 450i **Serial/AMU Number:** 1980
Instrument Settings: **Zero:** 22.4 **Span:** 1.106 **Range:** 0.1
Last Calibration: **Date:** Sep 16/19 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	123.292	10.1
4981	40.4	0.0819	0.00811	123.292	10.1
4971	20.2	0.0406	0.00406	246.089	10.0
4990	10.0	0.0201	0.00200	499.000	10.0
Average Cylinder Concentration:					10.0

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 0

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

Auditor: Al Clark
Operator Signature: *Al Clark*

Date: September 17, 2019
Location: McIntyre Center Edmonton



Calibration Gas Audit

CH₄ / C₃H₈ Cylinder Gas

File No. 2019-393CGA

Company: Maxxam **Operators name:** Alex
Cylinder #: LL29687 **Conc CH₄ (PPM)** 598/198 **Tolerance (%)** 1 **Certified By:** Praxair
Expiry Date: August 2026

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>			Make/Model	<u>Mesa Definer 220</u>
Serial Number	<u>AMU 2092</u>			Serial Number	<u>H-133034 / L-132702</u>
Last Verification Date	<u>January 14, 2019</u>			Temp. °C	<u>23.8 C</u>
Gas Type	<u>CH₄</u>	Conc.	<u>990.4</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>05604875</u>	Expiry Date	<u>July 2021</u>		
Gas Type	<u>C₃H₈</u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF003845B</u>	Expiry Date	<u>July 2022</u>		

Reference Analyzer:
Make/Model Teco 55i **Serial/AMU Number:** 2221
Instrument Settings **Zero:** N/A **Span:** N/A **Range:** 20.0
Last Calibration: **Date:** Jan 14/19 **C.F.** 1.000 **Done By:** Shea Beaton

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH ₄	C ₃ H ₈			CH ₄	C ₃ H ₈
5000	0.0	0.00	0.00	0.02	51.48	603	209
3990	77.5	11.71	11.18	0.02	51.48	603	209
3976	39.1	5.87	5.71	0.01	101.69	597	211
3986	20.0	2.96	2.86	0.01	199.30	590	207
Average Cylinder Concentration:						597	209

<u>CH₄</u>	<u>C₃H₈</u>
Previous Stated Concentration PPM: <u>598</u>	<u>198</u>
Percent variance from Stated: <u>0</u>	<u>6</u>

Cylinder gas tolerances based on CH₄ only

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

Auditor: Al Clark **Date:** January 15, 2019
Operator Signature: **Location:** McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2019-391CGA

Company: Maxxam **Operators name:** Alex

Cylinder #: LL107918 Conc (PPM) 50.1/50.2 Tolerance (%) 1 Certified By: Praxair

Expiry Date: August 2026

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Mesa Definer 220</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>H-133034 / L-132702</u>
Last Verification Date	<u>January 14, 2019</u>			Temp. °C	<u>22.7 C</u>
Gas Type	<u>NO</u>	Conc.	<u>50.05</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>APEX1236645</u>				
Expiry Date	<u>June 2021</u>				

Reference Analyzer:

Make/Model Teco 42i Serial/AMU Number: 2268

Instrument Settings Zero: 9.2 Span: 1.223 Range: 1.0

Last Calibration: Date: Jan 14/19 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4898	78.1	0.792	0.793	0.016	62.714	49.7	49.7
4893	38.7	0.395	0.395	0.008	126.434	49.9	49.9
4894	19.3	0.195	0.195	0.004	253.575	49.4	49.4
Average Cylinder Concentration:						49.7	49.7

NO	NOx
Previous Stated Concentration PPM: <u>50.1</u>	<u>50.2</u>
Percent variance from Stated: <u>1</u>	<u>1</u>

Cylinder gas tolerances based on NO only

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration

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

Auditor: Al Clark Date: Janaury 15, 2019

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



Lakeland Industry & Community Association

NOVEMBER 2019

Ambient Air Monitoring Calibration Report

- MASKWA STATION-

CAL-LICA-201911-01248

Station Operation and Maintenance:

Bureau Veritas Canada

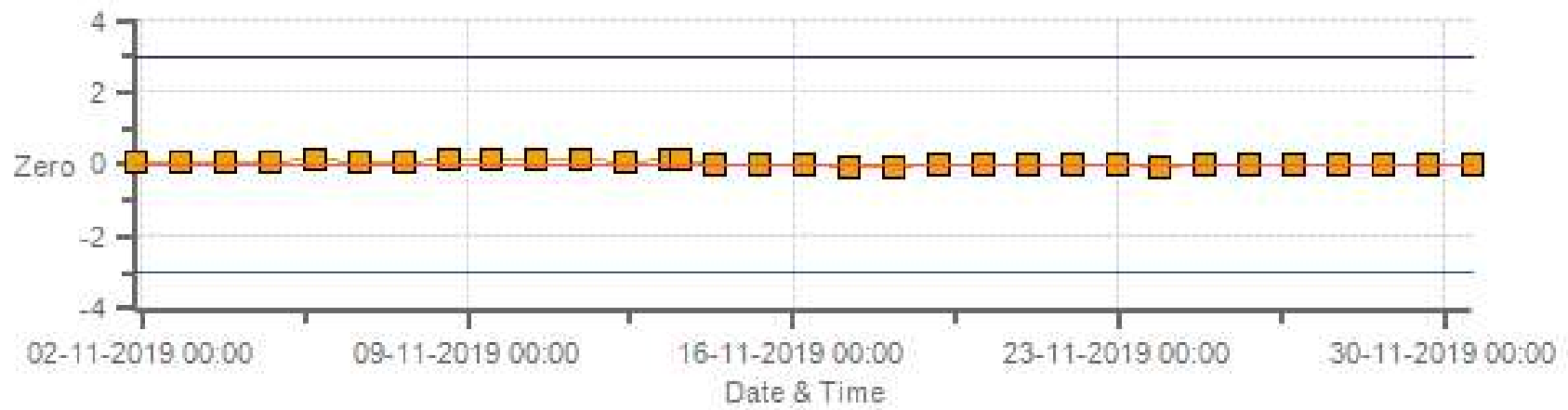
Data Validation and Report:

Bureau Veritas Canada

December 17, 2019

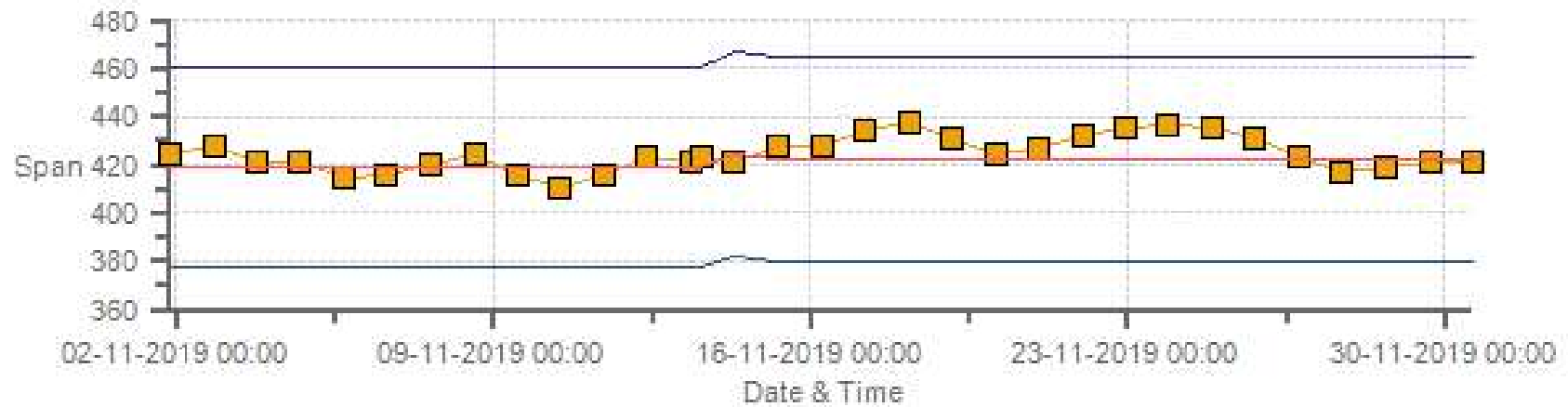
DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2 [ppb] Calibration: LICA Maskwa Monthly: 11-2019 Type: Zero



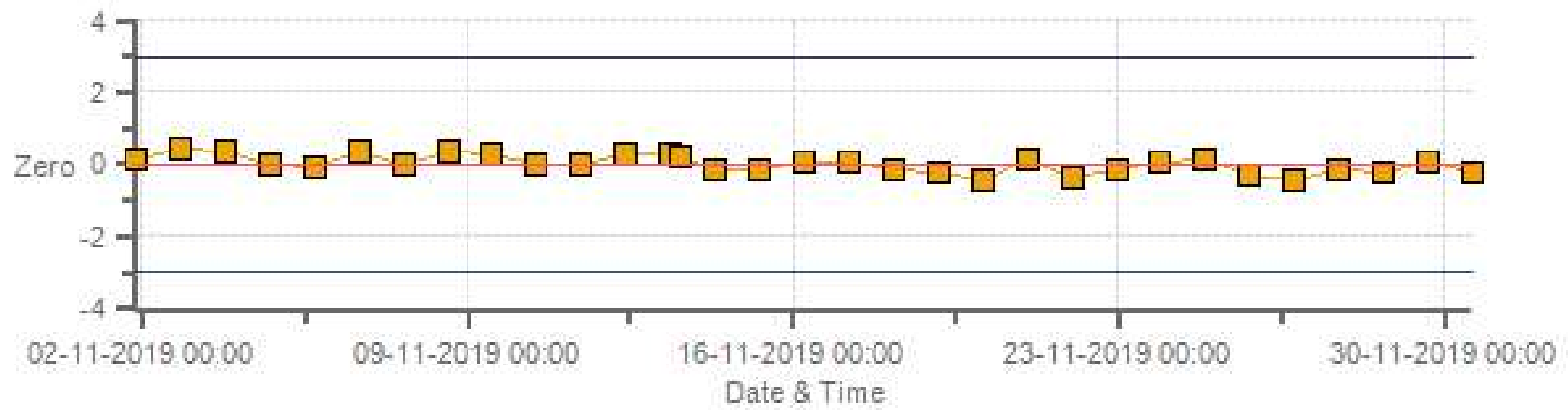
Zero Zero Ref Zero Low Zero High

SO2 [ppb] Calibration: LICA Maskwa Monthly: 11-2019 Type: Span



Span Span Ref Span Low Span High

H2S [ppb] Calibration: LICA Maskwa Monthly: 11-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

H2S [ppb] Calibration: LICA Maskwa Monthly: 11-2019 Type: Span



Span Span Ref Span Low Span High

NOx [ppb] Calibration: LICA Maskwa Monthly: 11-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

NOx [ppb] Calibration: LICA Maskwa Monthly: 11-2019 Type: Span



Span SpanRef Span Low Span High

NO2 [ppb] Calibration: LICA Maskwa Monthly: 11-2019 Type: Zero



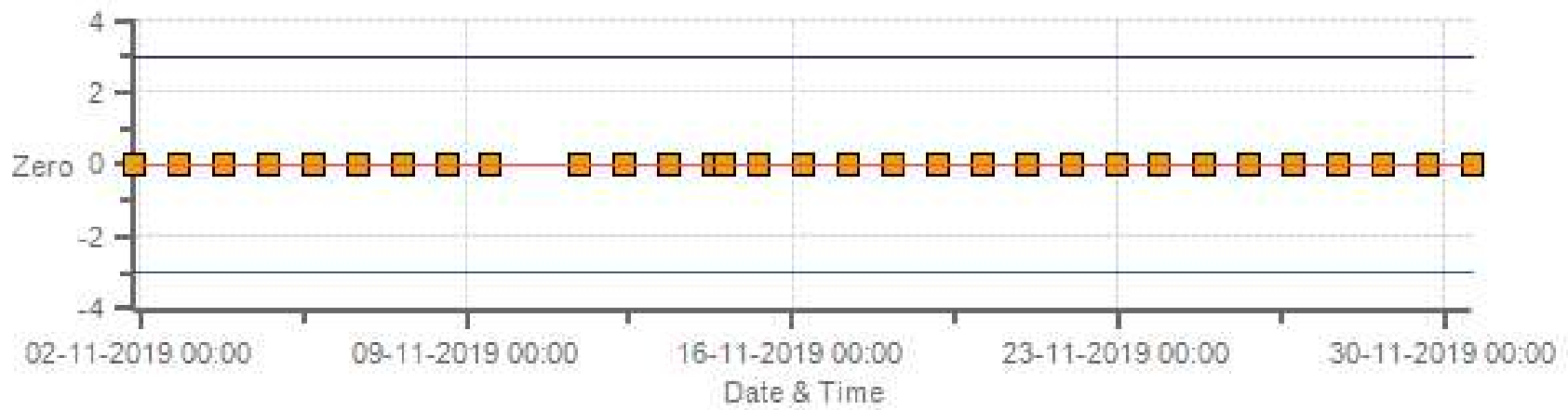
Zero Zero Ref Zero Low Zero High

NO2 [ppb] Calibration: LICA Maskwa Monthly: 11-2019 Type: Span



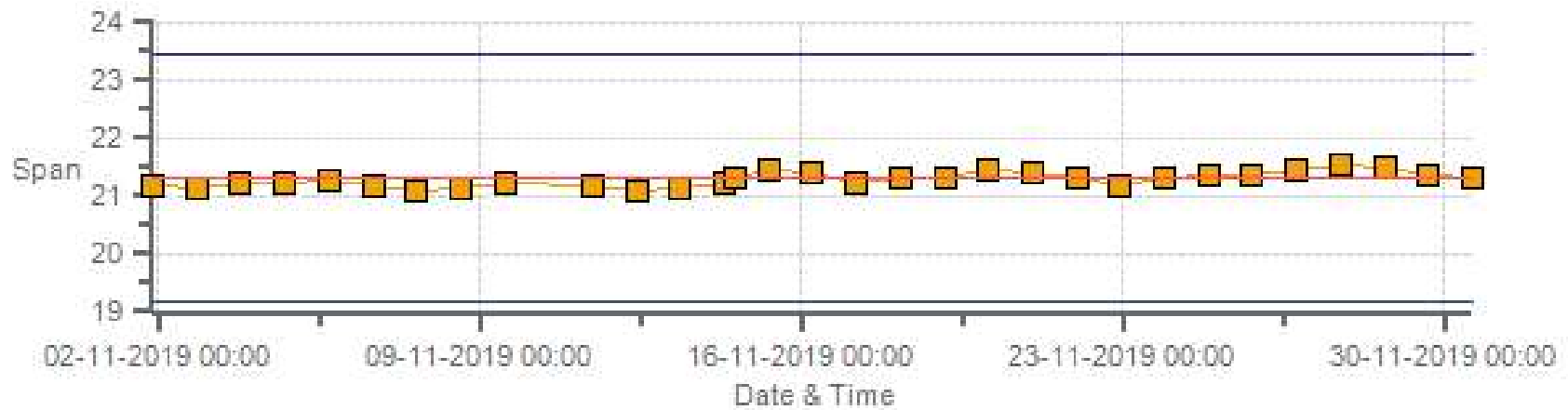
Span SpanRef Span Low Span High

THC [ppm] Calibration: LICA Maskwa Monthly: 11-2019 Type: Zero



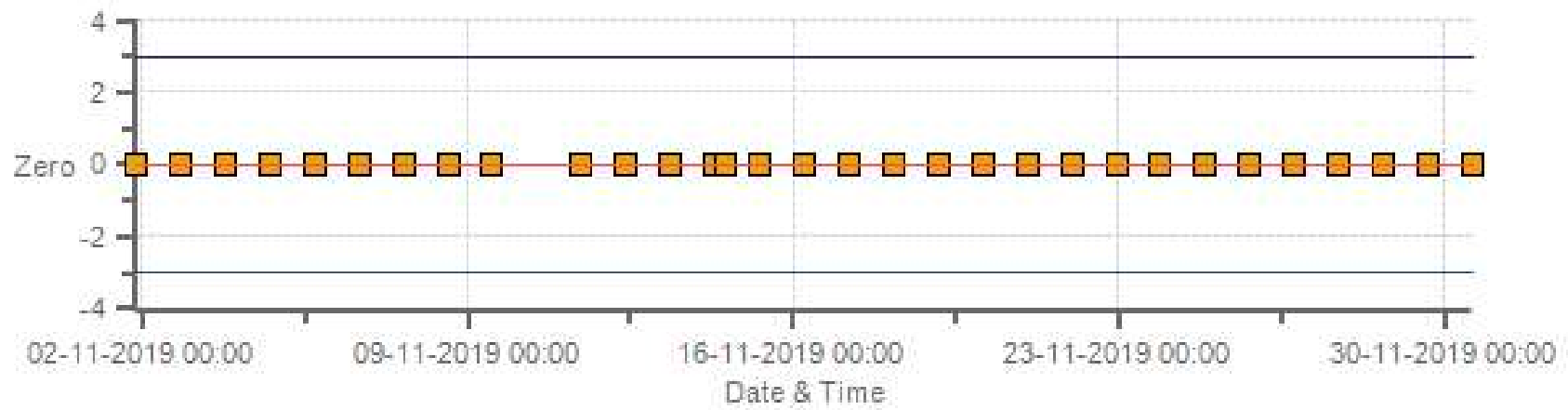
Zero Zero Ref Zero Low Zero High

THC [ppm] Calibration: LICA Maskwa Monthly: 11-2019 Type: Span



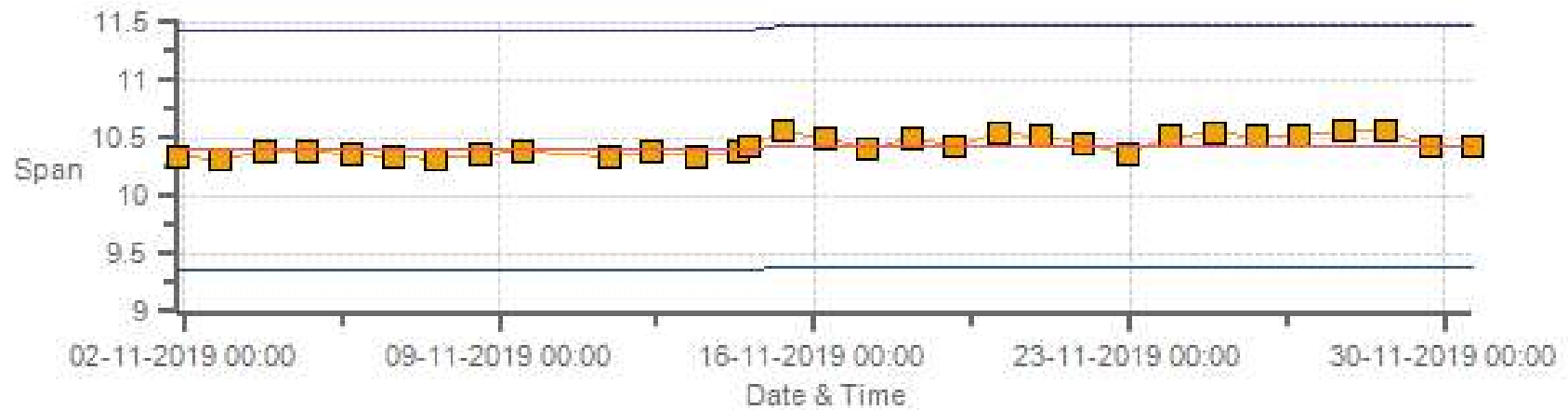
Span SpanRef Span Low Span High

CH4 [ppm] Calibration: LICA Maskwa Monthly: 11-2019 Type: Zero



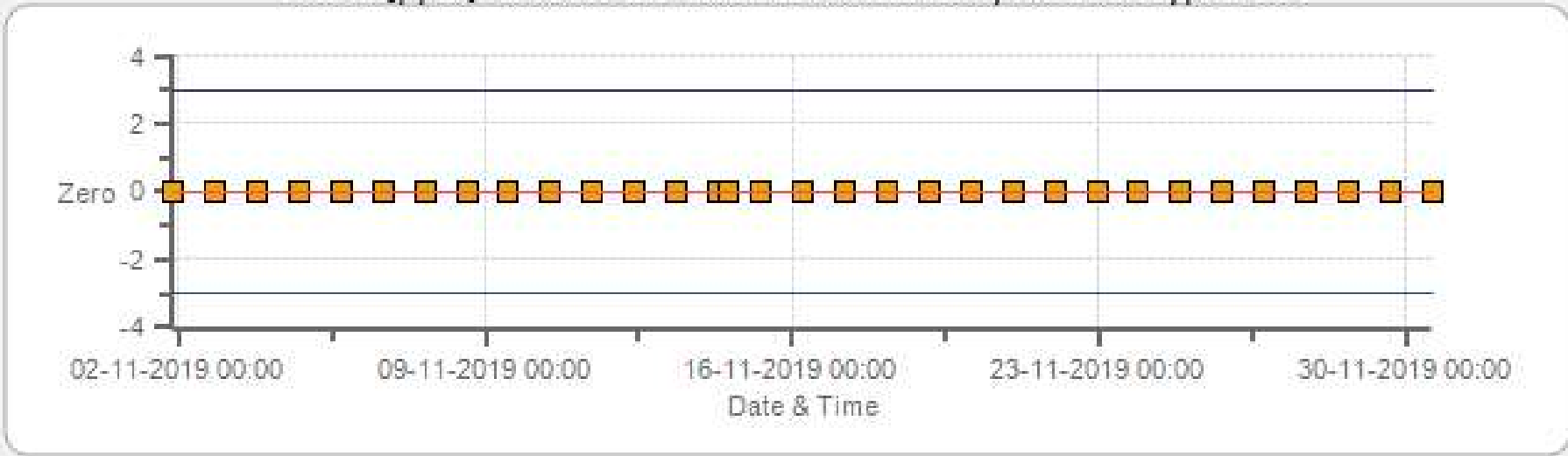
Zero Zero Ref Zero Low Zero High

CH4 [ppm] Calibration: LICA Maskwa Monthly: 11-2019 Type: Span



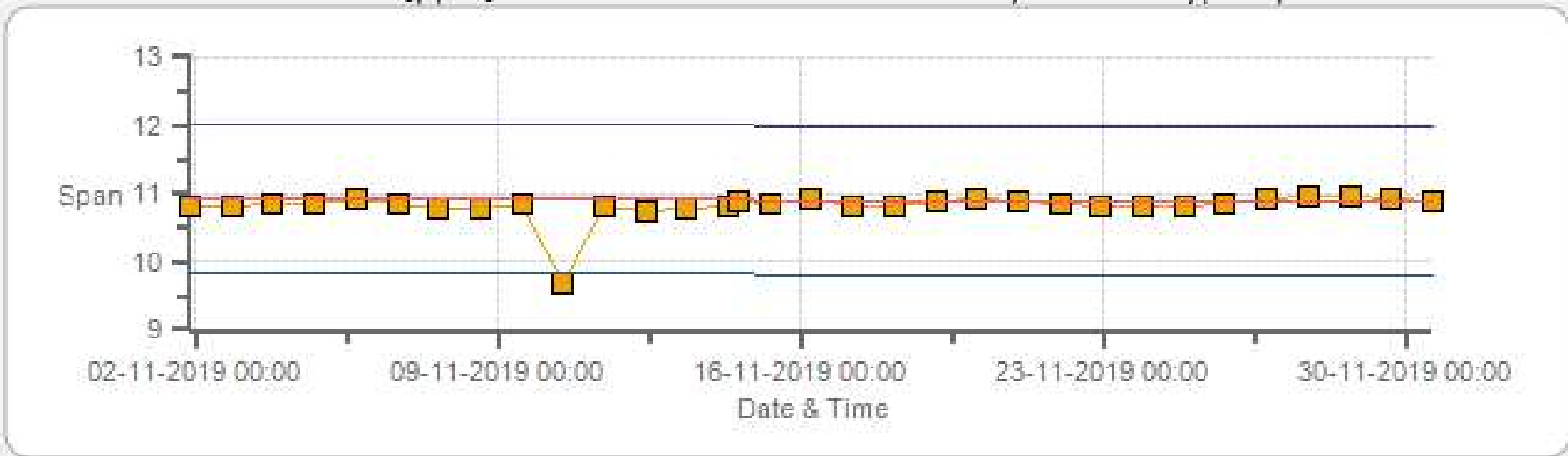
Span SpanRef Span Low Span High

NMHC [ppm] Calibration: LICA Maskwa Monthly: 11-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

NMHC [ppm] Calibration: LICA Maskwa Monthly: 11-2019 Type: Span



Span SpanRef Span Low Span High

MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



DATE:	13-Nov-2019	PREVIOUS CALIBRATION DATE:	10-Oct-2019
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	Maskwa	BAROMETRIC (mBar):	935
PURPOSE:	Routine	START TIME (MST):	10:18
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:00

ANALYZER:

MAKE/MODEL	Thermo 43I-TLE	RANGE	1000 ppb
SERIAL #	1180930031	FLOW (mL/min)	454
INITIAL		FINAL	
BKG/OFFSET	2.15	BKG/OFFSET	2.28
COEF/SLOPE	0.979	COEF/SLOPE	0.982
Expected (reference) Value	419	Expected (reference) Value	422

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	API	MAKE:	Teledyne
MODEL:	700	MODEL:	T701
ID:	690	ID:	132
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 107918	HIGH ID	n/a
CONC (ppm):	49.50	EXPIRY DATE	n/a
CYLINDER (psi):	800	LOW ID	n/a
EXPIRY DATE	20-Aug-2026	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	780	380	190
RANGE	600 - 800	300 - 400	100 - 200

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	n/a	SO2 Conc (ppb)	n/a
END TIME:	n/a	Analyzer Response (ppb)	n/a

CALIBRATION:

FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	77.80	5000	0.00	0	0	1.007	1.000
4922	77.80	5000	770.22	765	770	1.007	1.000
4962	37.90	5000	375.21	n/a	375	n/a	1.001
4981	18.90	5000	187.11	n/a	186	n/a	1.006

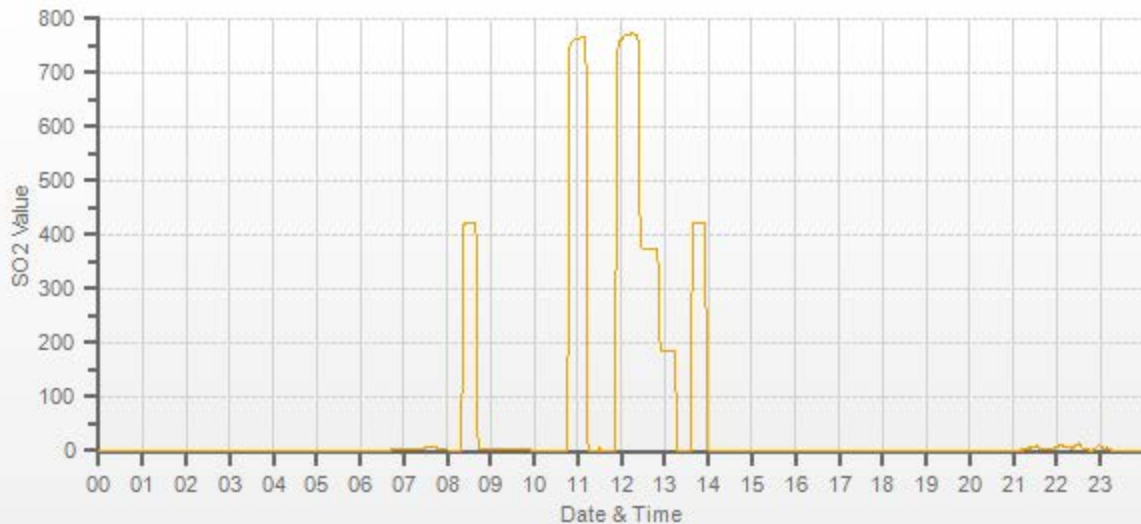
LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	0.0%

COMMENTS:

Sample inlet filter was changed.

SO2[ppb] Station: Maskwa Daily: 13-11-2019 Type: AVG 1 Min. [1 Min.]



CAL-LICA-201911-01248

H2S Analyzer Calibration by Dilution



DATE:	13-Nov-2019	PREVIOUS CALIBRATION DATE:	18-Sep-2019
PARAMETER:	H2S	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	Maskwa	BAROMETRIC (mBar):	935
PURPOSE:	Routine	START TIME (MST):	10:18
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:23

ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	CM 17360005	FLOW (mL/min)	908
INITIAL		FINAL	
BKG/OFFSET	23.9	BKG/OFFSET	24.2
COEF/SLOPE	0.849	COEF/SLOPE	0.835
Expected (reference) Value	51.8	Expected (reference) Value	48.5

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 19174	HIGH ID	n/a
CONC (ppm):	10.00	EXPIRY DATE	n/a
CYLINDER (psi):	1900	LOW ID	n/a
EXPIRY DATE	16-Jul-2022	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	78	38	19
RANGE	60 - 80	30 - 40	10 - 20

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	10:22	SO2 Conc (ppb)	780
END TIME:	10:37	Analyzer Response (ppb)	0.0

CALIBRATION:

FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	58.50	7500	0.00	0	0	0.976	1.000
7441	58.50	7499	78.01	79.9	78	0.976	1.000
7470	28.50	7498	38.01	n/a	38	n/a	1.000
7486	14.20	7500	18.93	n/a	18.9	n/a	1.002

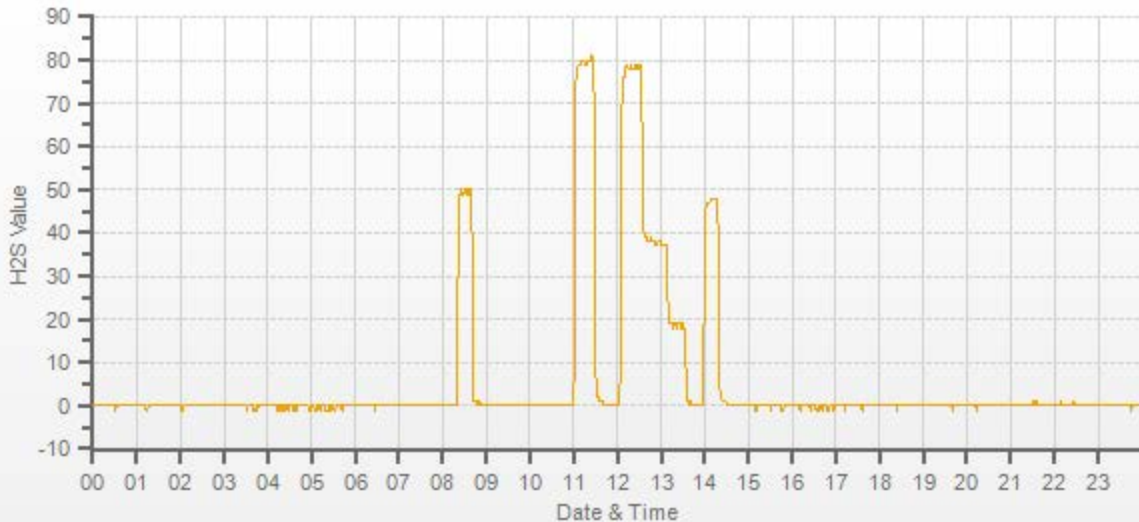
LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	0.0%

COMMENTS:

Sample inlet filter was changed.

H2S[ppb] Station: Maskwa Daily: 13-11-2019 Type: AVG 1 Min. [1 Min.]



CAL-LICA-201911-01248

Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	14-Nov-2019	PREVIOUS CALIBRATION DATE:	23-Oct-2019	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1180930026	1110
LOCATION:	Maskwa	BAROMETRIC (mBar):	941	PARAMETER:	CH4	NMHC	THC
PURPOSE	Routine	START TIME (MST):	09:34	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	12:55	PREVIOUS CF:	1.000	1.000	1.000

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	API	MAKE:	Teledyne	CYLINDER ID:	LL 29687	HIGH ID:	n/a
MODEL:	700	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	598.0 198.0	HIGH EXPIRY:	n/a
ID:	690	ID:	132	CYLINDER (psi):	800	LOW ID:	n/a
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	115	EXPIRY DATE	01-Aug-2026	LOW EXPIRY:	n/a

CALIBRATION PARAMETERS:

POINT (CH ₄ /NMHC)	HIGH	MID	LOW	CH ₄ EQUIVILANCE		
TARGET	14	7	3.5	C ₃ H ₈ as CH ₄		544.5
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄		1142.5

EXPECTED (REFERENCE) VALUE:

INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	10.41	10.91	21.31		10.44	10.90	21.33

CALIBRATION:

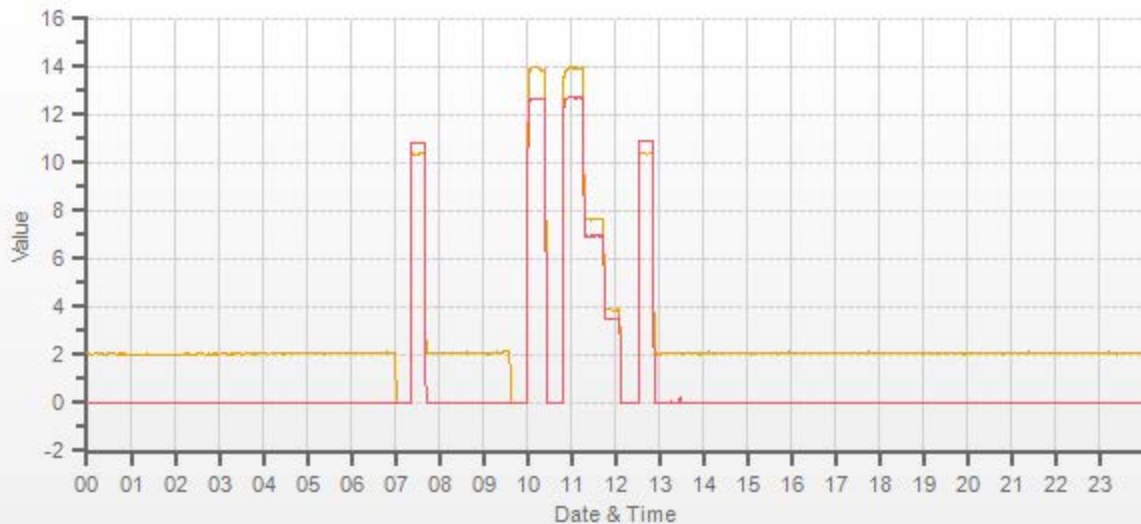
FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC
3000	X	3000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	X	X	X	X	X	X
2930	70.00	3000	13.95	12.71	26.66	13.87	12.68	26.56	13.95	12.71	26.66	1.006	1.002	1.004	1.000	1.000	1.000
2962	38.00	3000	7.57	6.90	14.47	n/a	n/a	n/a	7.67	6.92	14.59	n/a	n/a	n/a	0.988	0.997	0.992
2981	19.00	3000	3.79	3.45	7.24	n/a	n/a	n/a	3.92	3.55	7.48	n/a	n/a	n/a	0.966	0.971	0.967

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
CH ₄	1.000	0.998	0.4%
NMHC	1.000	1.000	0.2%
THC	1.000	0.998	0.3%

COMMENTS:

Sample inlet filter was changed.



CAL-LICA-201911-01248

NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	13-Nov-2019	PREVIOUS CALIBRATION DATE:	18-Sep-2019	MAKE/MODEL:	Thermo 42i	PREVIOUS CF.	
CLIENT:	LICA	TEMPERATURE (°C):	22.0	SERIAL #:	1180930028	NOx	1.000
LOCATION:	Maskwa	BAROMETRIC (mBar):	935.00	FLOW (mL/min)	531	NO	0.999
PURPOSE:	Routine	START TIME (MST):	10:18	RANGE (ppb)	1000	NO2	1.000
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:41	GPT FOR O3?		No	

CALIBRATION SYSTEM:							
CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	API	MAKE:	Teledyne	CYLINDER ID:	LL 107918	HIGH ID:	n/a
MODEL:	700	MODEL:	T701	NO/NOx (PPM):	50.1 50.2	HIGH EXPIRY:	n/a
ID:	690	ID:	132	CYLINDER (psi):	800	LOW ID:	n/a
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a	EXPIRY DATE	20-Aug-2026	LOW EXPIRY:	n/a

CALIBRATION SETTINGS:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
BKG/OFFSET:	3	3	n/a	BKG/OFFSET:	3	3	n/a
SLOPE/COEF/CE:	1	1	1.0	SLOPE/COEF/CE:	1	1	1.0

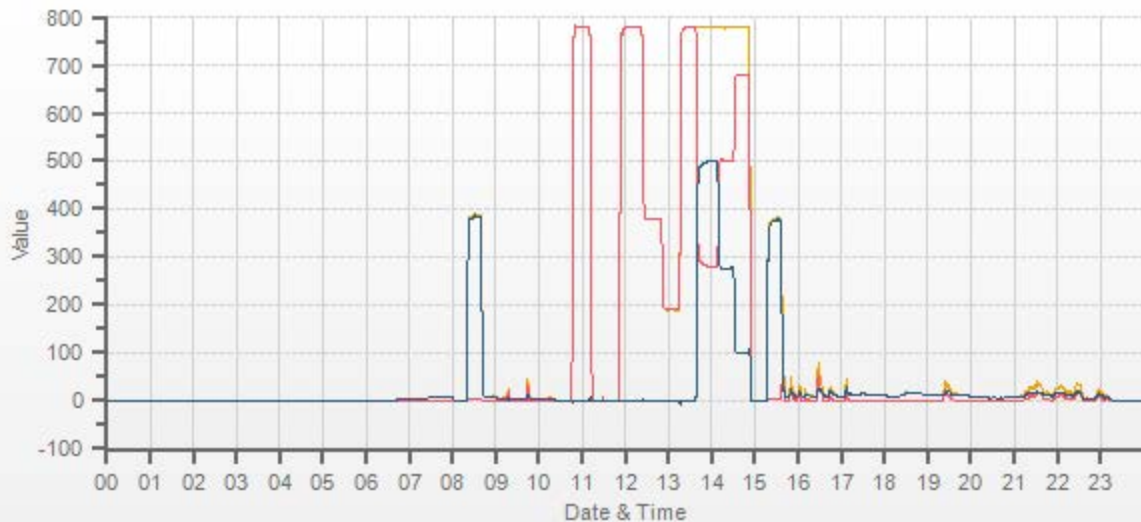
EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	383	5	378.0		386	4	382.0

CALIBRATION PARAMETERS:				
POINT	NO TARGET (PPB)	NO2 TARGET (PPB)	NO2 RANGE	O3 POINT
HIGH	780	500	470-540	n/a
MID	380	275	235-310	n/a
LOW	190	90	80-115	n/a
EXTRA 1	n/a	n/a	n/a	n/a

NO/NOx CALIBRATION:																	
FLOW RATE			CONCENTRATION (ppb)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2
5000	77.80	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.999	1.001	n/a	0.999	1.000	n/a
4922	77.80	5000	779.6	781.1	1.6	780.0	780.0	0.0	780.0	781.0	1.0	0.999	1.001	n/a	0.999	1.000	n/a
4962	37.90	5000	379.8	380.5	0.8	n/a	n/a	n/a	380.0	380.0	0.0	n/a	n/a	n/a	0.999	1.001	n/a
4981	18.90	5000	189.4	189.8	0.4	n/a	n/a	n/a	191.0	191.0	0.0	n/a	n/a	n/a	0.992	0.993	n/a

GPT CALIBRATION:										
Point	CALIBRATOR			INDICATED (ppb)			NO DROP / O3 Conc (ppb)	NO2 GAIN (ppb)	NO2 Corr. FACTOR	CONV. EFFICIENCY
	GAS	TOTAL	O3 SETPOINT	NO	NOx	NO2				
REFERENCE	77.80	5000	0	779.0	780.0	1.0	n/a	n/a	n/a	n/a
AS-FOUND HIGH	77.80	5000	500	280.0	780.0	500.0	499	499	1.000	100.00%
ADJUSTED HIGH	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MID	77.80	5000	275	502.0	781.0	278.0	277	277	1.000	100.00%
LOW	77.80	5000	100	679.0	780.0	101.0	100	100	1.000	100.00%
NO2 adjustment not required.									AVERAGE:	100.00%

LINEAR REGRESSION ANALYSIS:				COMMENTS:
	CORRELATION	SLOPE	INTERCEPT	
NO	1.000	1.000	0.06%	
NOx	1.000	1.000	0.04%	
NO2	1.000	1.000	0.00%	



CAL-LICA-201911-01248

Meteorological System Checklist



Date:	November 14, 2019		
Technician:	Alex Yakupov		
Reviewer:	Wunmi Adekanmbi		
Station:	Maskwa		
Unit:	Make:	Model:	Serial #:
Temperature Sensor:	Campbell Scientific Make 070	Campbell Scientific, Model HC2A-S3;	20221366
Barometric Pressure Sensor:	n/a	n/a	n/a
Relative Humidity Sensor:	Campbell Scientific Make 070	Campbell Scientific, Model HC2A-S3;	20221366
Anemometer:	n/a	n/a	n/a
AMBIENT TEMPERATURE SENSOR CHECK			
Previous check date:	October 23, 2019		
Parameter:	Temperature @ 2 metres		
Reference Thermometer ID:	Fisher Scientific, Make and Model:11-661-7B, 11755843; S/n#160348895, expires June 19, 2020		
Reference Temperature (°C):	-5.8		
Station - Ambient Temperature (°C):	-5.8		
Temperature Difference (°C):	0.0		
RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK			
Previous check date:	February 19, 2019		
Reference Hygrometer ID:	Fisher Scientific, Make and Model:11-661-7B, 11755843; S/n#160348895, expires June 19, 2020		
Reference Hygrometer % RH- Reading:	67.60		
Station Hygrometer % RH- Reading:	67.40		
RH Tolerance +/- 15% of difference:	57.46 - 77.74	0.3%	
Comments	The TPX/RH sensor was checked and tested. Filter was cleaned (11:24 - 11:48)		

Meteorological System Checklist



Date:	November 29, 2019
Technician:	Alex Yakupov
Reviewer:	Wunmi Adekanmbi
Station:	Maskwa

Unit:	Make:	Model:	Serial #:
Temperature Sensor:	Campbell Scientific Make 070	Campbell Scientific, Model HC2A-S3;	20221366
Barometric Pressure Sensor:	n/a	n/a	n/a
Relative Humidity Sensor:	Campbell Scientific Make 070	Campbell Scientific, Model HC2A-S3;	20221366
Anemometer:	n/a	n/a	n/a

AMBIENT TEMPERATURE SENSOR CHECK

Previous check date:	October 23, 2019
Parameter:	Temperature @ 2 metres
Reference Thermometer ID:	Fisher Scientific, Make and Model:11-661-7B, 11755843; S/n#160348895, expires June 19, 2020
Reference Temperature (°C):	-10.8
Station - Ambient Temperature (°C):	-9.9
Temperature Difference (°C):	-0.9

RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK

Previous check date:	October 23, 2019
Reference Hygrometer ID:	Fisher Scientific, Make and Model:11-661-7B, 11755843; S/n#160348895, expires June 19, 2020
Reference Hygrometer % RH- Reading:	87.20
Station Hygrometer % RH- Reading:	99.90
RH Tolerance +/- 15% of difference:	74.12 - 100.28 -14.6%

Comments

The TPX/RH sensor was removed for repair and certification by the manufacturer (Campbell Scientific). Audit and Removal: 09:57 - 10:34.

Meteorological System Checklist



Date:	November 29, 2019		
Technician:	Alex Yakupov		
Reviewer:	Adewunmi Adekanmbi		
Station:	Maskwa		
Unit:	Make:	Model:	Serial #:
Temperature Sensor:	Campbell Scientific Make 070	Campbell Scientific, Model HC2A-S3;	20257103
Barometric Pressure Sensor:	n/a	n/a	n/a
Relative Humidity Sensor:	Campbell Scientific Make 070	Campbell Scientific, Model HC2A-S3;	20257103
Anemometer:	n/a	n/a	n/a
AMBIENT TEMPERATURE SENSOR CHECK			
Previous check date:	n/a (Installation)		
Parameter:	Temperature @ 2 metres		
Reference Thermometer ID:	Fisher Scientific, Make and Model:11-661-7B, 11755843; S/n#160348895, expires June 19, 2020		
Reference Temperature (°C):	-9.5		
Station - Ambient Temperature (°C):	-9.0		
Temperature Difference (°C):	-0.5		
RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK			
Previous check date:	n/a (Installation)		
Reference Hygrometer ID:	Fisher Scientific, Make and Model:11-661-7B, 11755843; S/n#160348895, expires June 19, 2020		
Reference Hygrometer % RH- Reading:	88.00		
Station Hygrometer % RH- Reading:	90.10		
RH Tolerance +/- 15% of difference:	74.80 - 101.20	-2.4%	
Comments			
This TPX/RH sensor was repaired and calibrated at the Manufacturer facility (Campbell Scientific). Installation and Audit: 10:34 - 11:11.			

Meteorological System Checklist



Date:	November 29, 2019		
Technician:	Alex Yakupov		
Reviewer:	Wunmi Adekanmbi		
Station:	Maskwa		
Unit:	Make:	Model:	Serial #:
Precipitation Sampler:	Met One	Part 387 - Heated Rain Gauge	F 4481
PRECIPITATION SENSOR CHECK			
Checklist:	Reply:	Comments:	
Previous check date:	August 20, 2019	n/a	
Is the sensor Level?	yes	n/a	
Is the heater operating properly?	yes	n/a	
Are the bucket drain holes clean?	yes	n/a	
Is the screen on the housing? (screen should be on between July and September)	no	Removed for Winter	
Is the housing clean?	yes	n/a	
Is the area around the housing clean and free from obstacles?	yes	n/a	
TIP TEST - Slowly pour water until 10 tip are heard. (10 tips = 1 ml)			
# of Tips	Data Logger Response (ml):	Manual Specification = +/- 0.1 ml	
10	1.00		
Comments			
11:31 - 11:53 - "M" mode for water test. No issues.			



Meteorological Sensor Audit/Calibration

Location Information

Company: LICA	Performed By: Alex Yakupov
Audit Location: Maskwa	Reviewed By: Wunmi Adekanmbi
Audit Date: September 19, 2019	Start/End Time (mst): 12:24 / 13:21
Calibration Purpose: routine annual	Weather Conditions: Mainly cloudy with sunny breaks

Wind Sensor Information

Sensor ID Data:		Sensor Outputs:	
Sensor Make: RM Young	05305VK	Velocity Voltage Output Range:	0-1 V
Sensor Model:	161465	Velocity Unit Output Range:	0-200 km/h
Serial #:	September 17, 2018	Direction Voltage Output Range:	0-1 V
Previous Cal/Audit Date:		Direction Unit Output Range:	0-360 degrees

Wind Calibrator Information

Calibrator I.D. and Expiry Date: _____ n/a

Wind Speed Audit Data ****+/- 2% of the average correction factor is the limit****

RPM	Wind Speed Generated kph	Clockwise Wind Speed kph	Counter Clockwise Wind Speed kph	Correction Factor
0	0	0.0	0.0	-
1000	18.4	18.5	18.5	0.995
2000	36.9	37.0	37.0	0.997
3000	55.3	55.4	55.4	0.998
4000	73.7	73.9	73.9	0.997
5000	92.2	92.4	92.4	0.998
6000	110.6	111.0	111.0	0.996
7000	129.0	129.5	129.5	0.996
8000	147.4	148.1	148.1	0.995
9000	165.9	166.1	166.1	0.999
10000	184.3	184.5	184.5	0.999
The audit meets AMD requirements.			Average Correction Factor=	0.997

Wind Direction Audit Data ****+/- 3° of the absolute average degrees difference for all points is the limit****

Generated Wind Direction 0-360 (Up)	Generated Wind Direction 360-0 (Down)	Indicated Wind Direction 0-360 (Up)	Indicated Wind Direction 360-0 (Down)	Degrees Difference 0-360 (Up)	Degrees Difference 360-0 (Down)	Average Absolute Degrees Difference
0	355	0	355	0.3	0.0	0.2
30	330	30	330	-0.2	0.4	0.3
60	300	62	300	-1.8	0.0	0.9
90	270	91	270	-1.3	-0.3	0.8
120	240	121	241	-1.0	-0.7	0.8
150	210	152	212	-1.5	-1.7	1.6
180	180	181	182	-1.2	-2.1	1.6
210	150	211	152	-1.2	-1.8	1.5
240	120	241	122	-0.6	-1.9	1.3
270	90	270	91	-0.1	-0.9	0.5
300	60	300	61	0.3	-0.7	0.5
330	30	330	31	-0.3	-0.8	0.6
355	0	355	0	0.0	0.3	0.2
The audit meets AMD requirements.				Average Absolute Degrees Difference=		0.8

Comments:

Calibrator ID and expiry date: Model 18860-90/18802 SN: CA 4744, calibration expires - June 19, 2020, (ownership - LICA).

End of Report



Lakeland Industry & Community Association

NOVEMBER 2019

Ambient Air Monitoring Calibration Report

- ST. LINA STATION-

CAL-LICA-201911-01250

Station Operation and Maintenance:

Bureau Veritas Canada

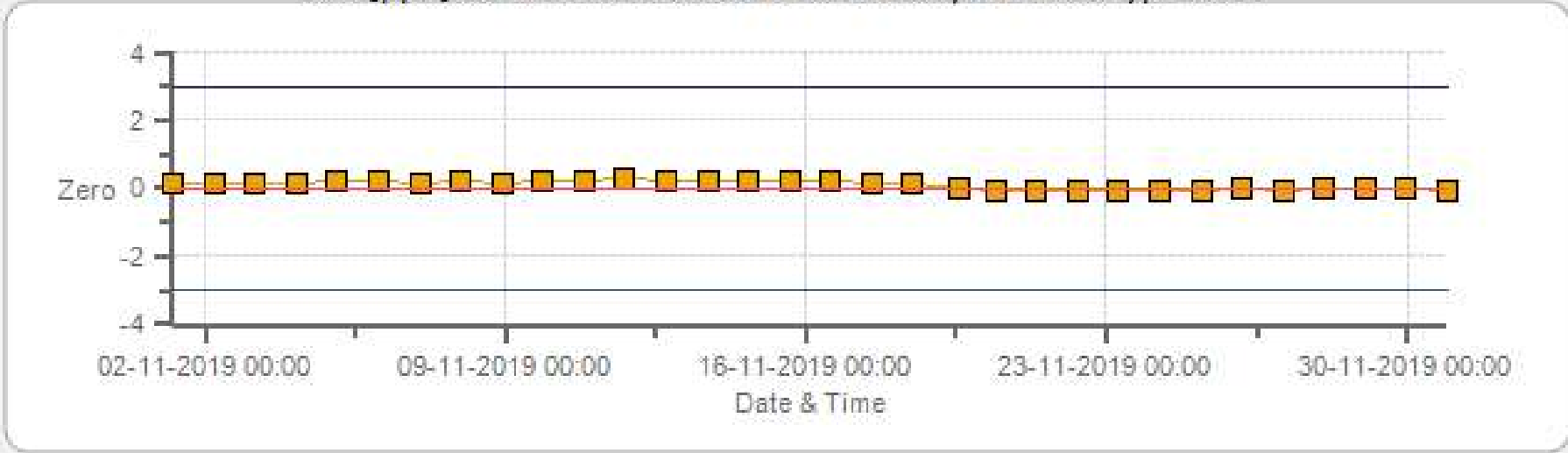
Data Validation and Report:

Bureau Veritas Canada

December 17, 2019

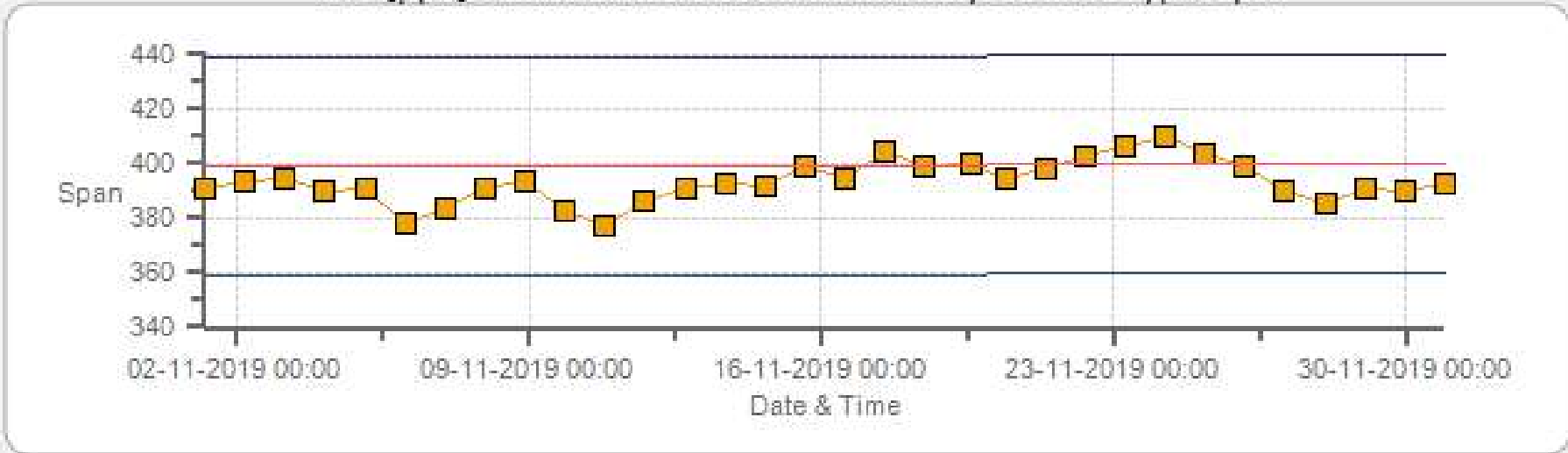
DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2 [ppb] Calibration: LICA St. Lina Monthly: 11-2019 Type: Zero



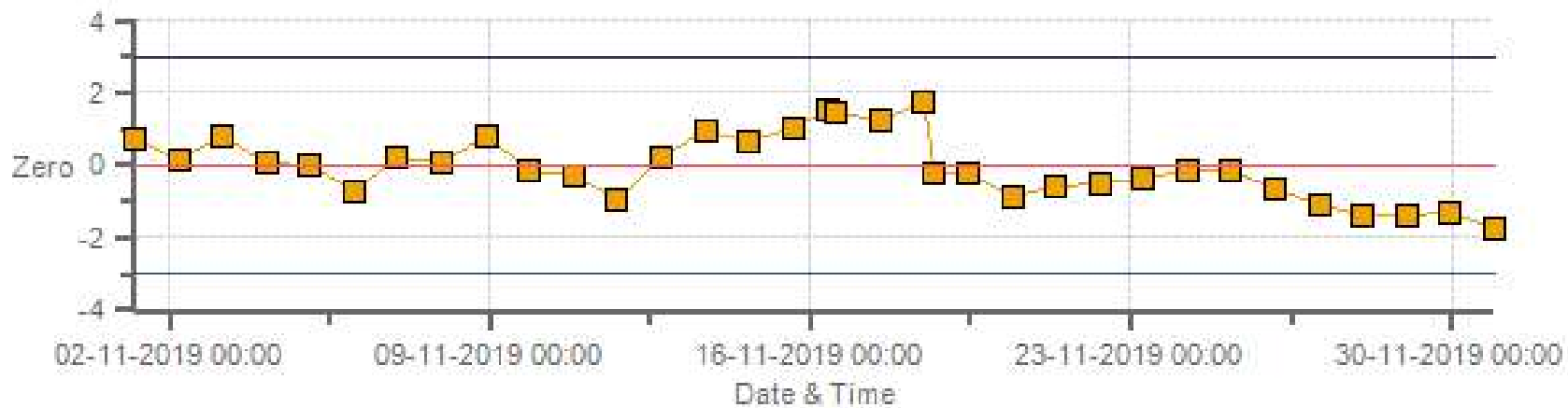
Zero Zero Ref Zero Low Zero High

SO2 [ppb] Calibration: LICA St. Lina Monthly: 11-2019 Type: Span



Span Span Ref Span Low Span High

H2S [ppb] Calibration: LICA St. Lina Monthly: 11-2019 Type: Zero



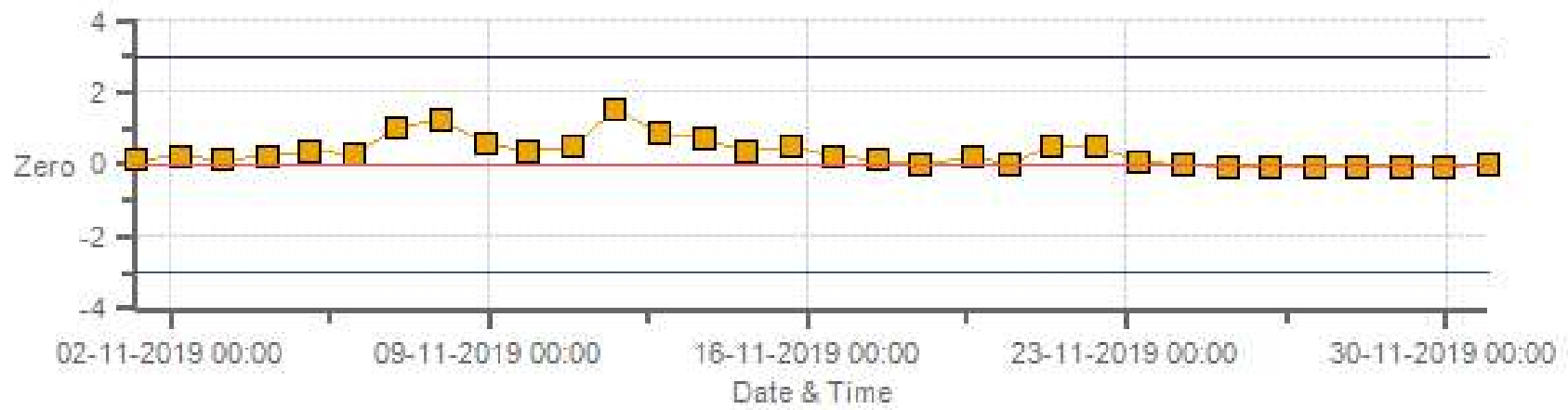
Zero Zero Ref Zero Low Zero High

H2S [ppb] Calibration: LICA St. Lina Monthly: 11-2019 Type: Span



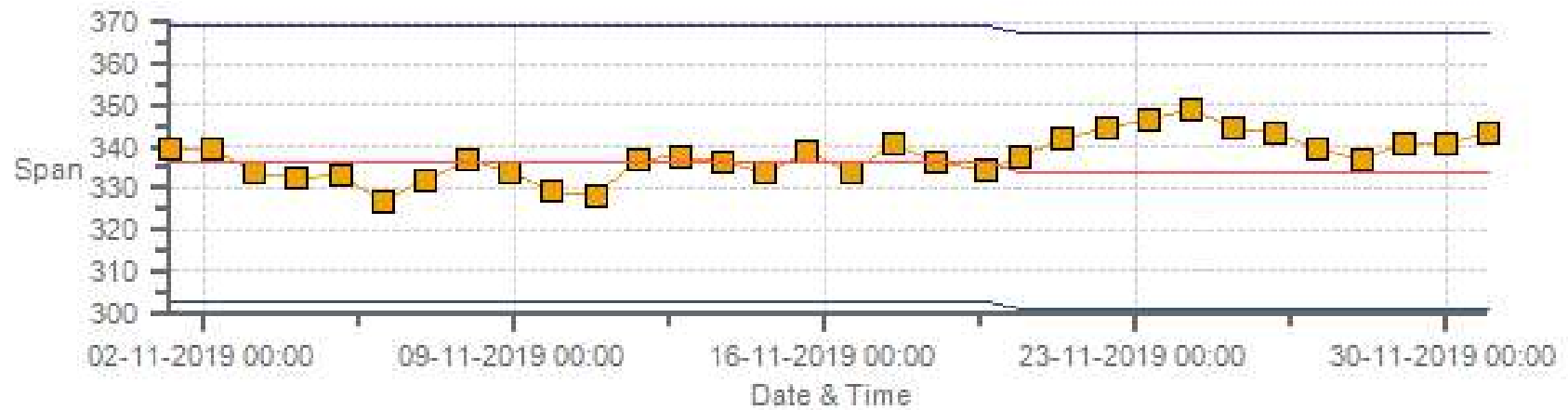
Span SpanRef Span Low Span High

NOx [ppb] Calibration: LICA St. Lina Monthly: 11-2019 Type: Zero



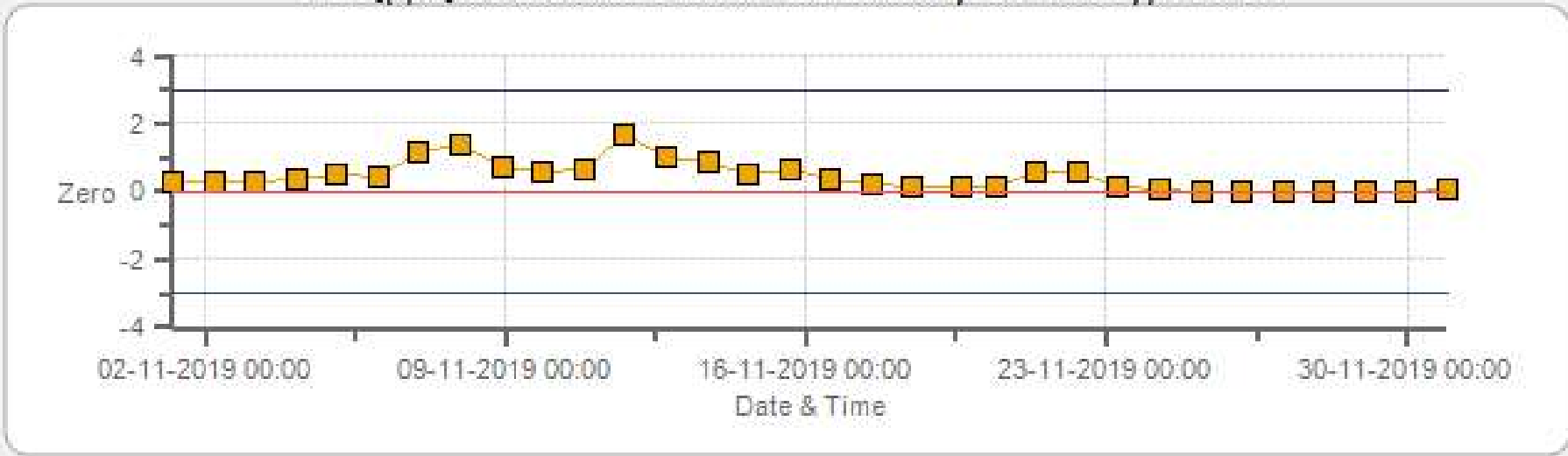
Zero Zero Ref Zero Low Zero High

NOx [ppb] Calibration: LICA St. Lina Monthly: 11-2019 Type: Span



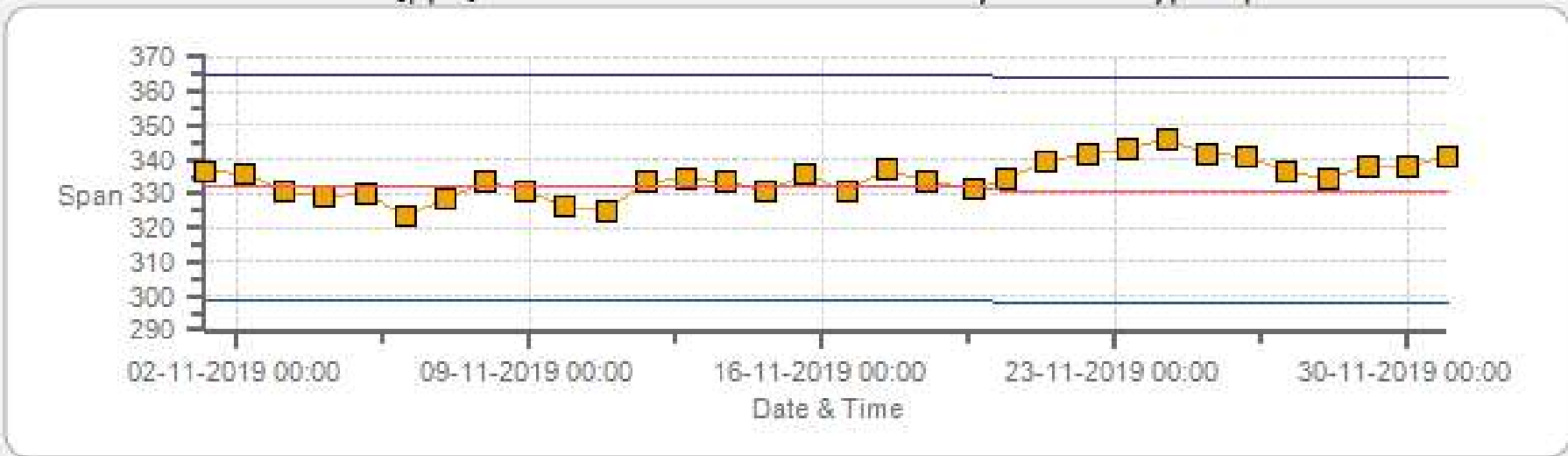
Span SpanRef Span Low Span High

NO2 [ppb] Calibration: LICA St. Lina Monthly: 11-2019 Type: Zero



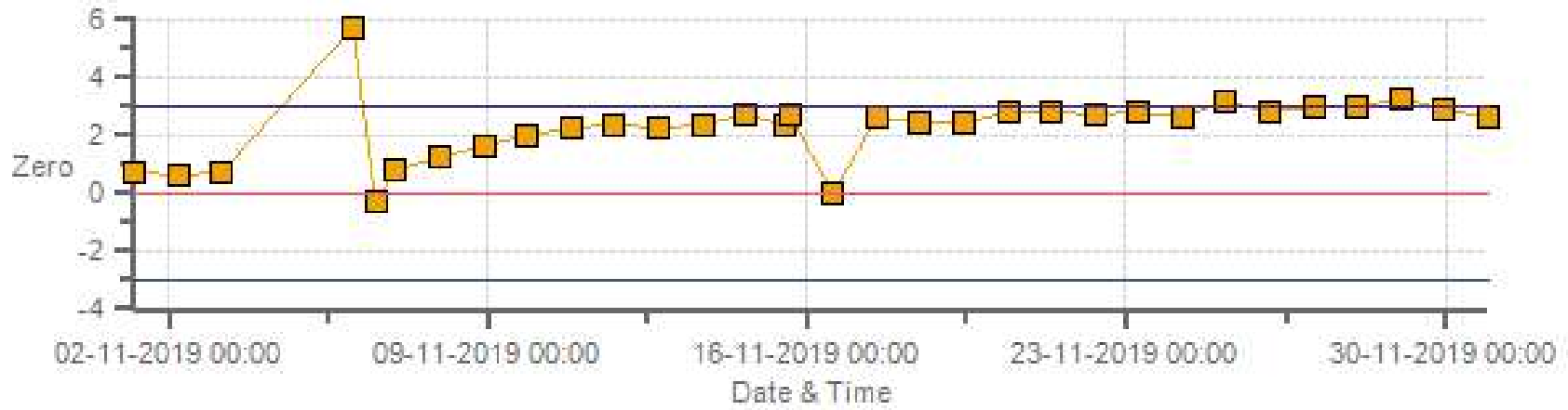
Zero Zero Ref Zero Low Zero High

NO2 [ppb] Calibration: LICA St. Lina Monthly: 11-2019 Type: Span



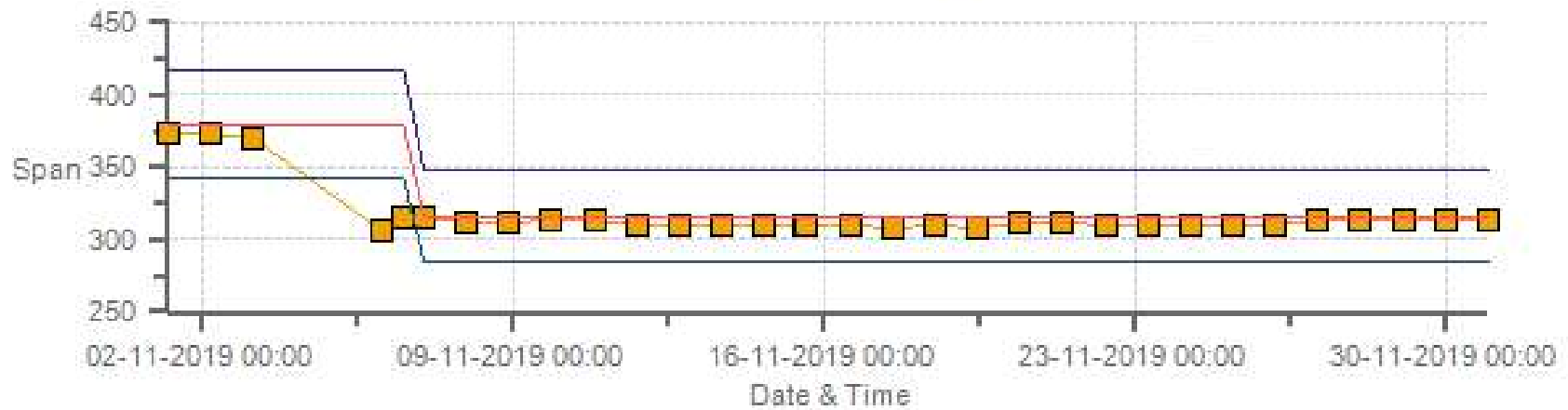
Span SpanRef Span Low Span High

O3 [ppb] Calibration: LICA St. Lina Monthly: 11-2019 Type: Zero



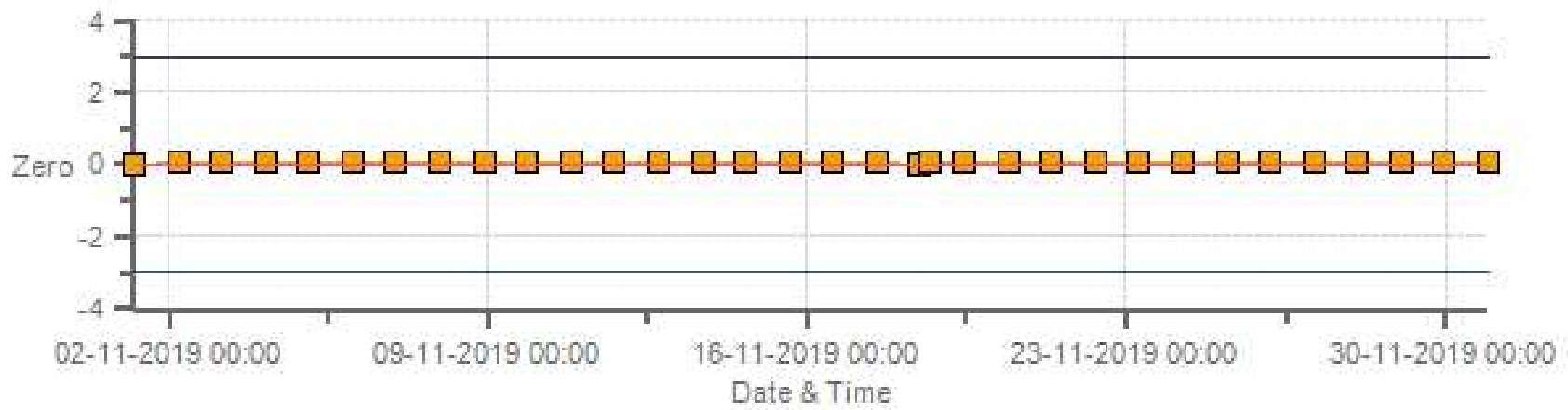
Zero Zero Ref Zero Low Zero High

O3 [ppb] Calibration: LICA St. Lina Monthly: 11-2019 Type: Span



Span Span Ref Span Low Span High

THC [ppm] Calibration: LICA St. Lina Monthly: 11-2019 Type: Zero



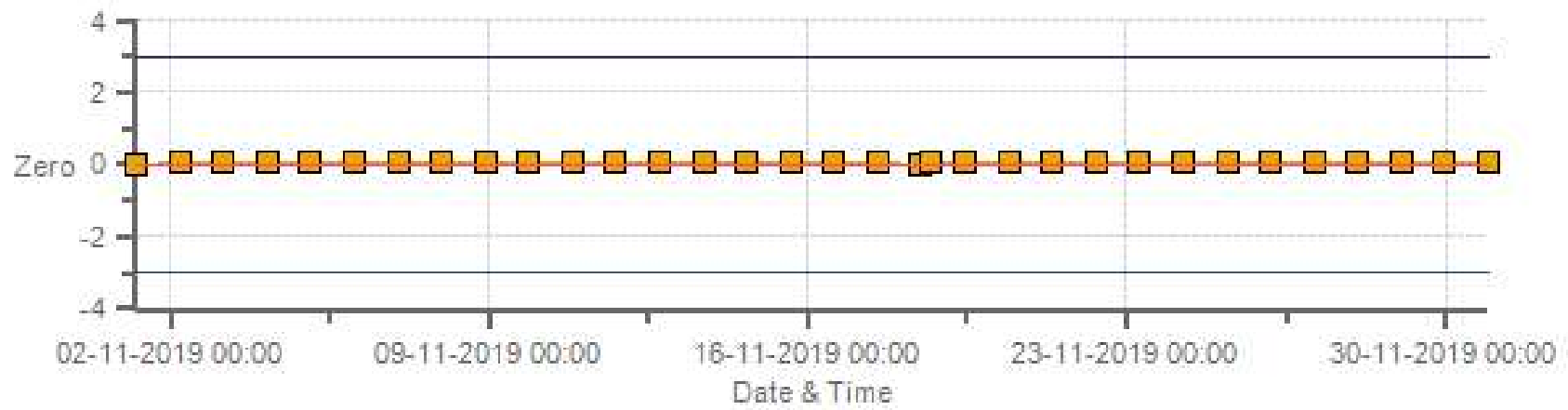
Zero Zero Ref Zero Low Zero High

THC [ppm] Calibration: LICA St. Lina Monthly: 11-2019 Type: Span



Span SpanRef Span Low Span High

CH4 [ppm] Calibration: LICA St. Lina Monthly: 11-2019 Type: Zero



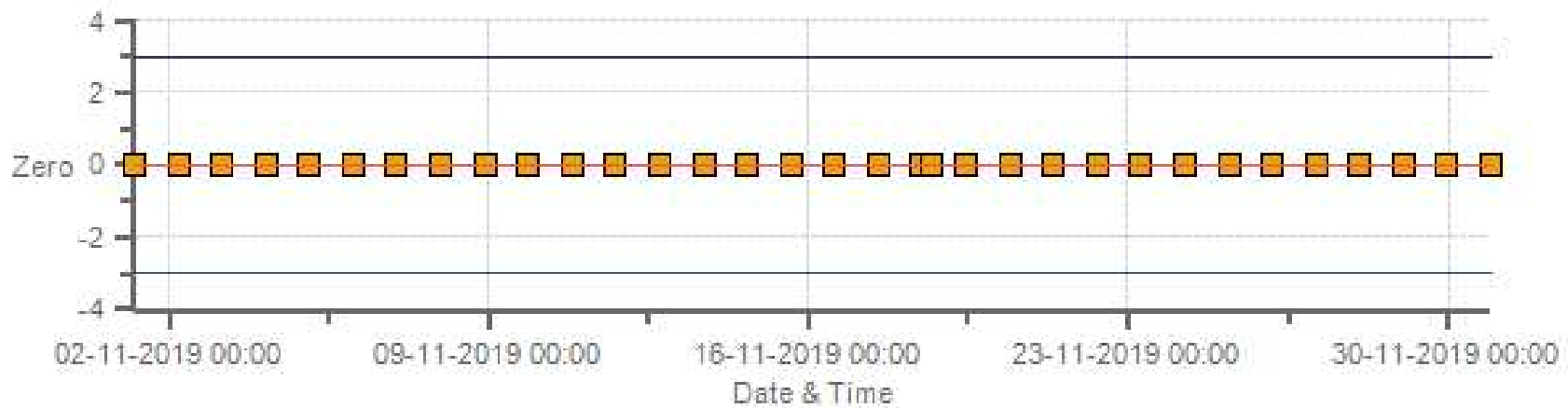
Zero Zero Ref Zero Low Zero High

CH4 [ppm] Calibration: LICA St. Lina Monthly: 11-2019 Type: Span



Span SpanRef Span Low Span High

NMHC [ppm] Calibration: LICA St. Lina Monthly: 11-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

NMHC [ppm] Calibration: LICA St. Lina Monthly: 11-2019 Type: Span



Span SpanRef Span Low Span High

MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



DATE:	19-Nov-2019	PREVIOUS CALIBRATION DATE:	08-Oct-2019
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	916
PURPOSE:	Routine	START TIME (MST):	10:00
PERFORMED BY:	Alex Yakupov	END TIME (MST):	13:57

ANALYZER:

MAKE/MODEL	Thermo 43I-TLE	RANGE	1000 ppb
SERIAL #	1180930030	FLOW (mL/min)	431
INITIAL		FINAL	
BKG/OFFSET	3.72	BKG/OFFSET	3.98
COEF/SLOPE	1.12	COEF/SLOPE	1.131
Expected (reference) Value	399	Expected (reference) Value	400

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	API	MAKE:	Teledyne
MODEL:	700	MODEL:	T701
ID:	690	ID:	132
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 107918	HIGH ID	n/a
CONC (ppm):	49.50	EXPIRY DATE	n/a
CYLINDER (psi):	800	LOW ID	n/a
EXPIRY DATE	20-Aug-2026	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	780	380	190
RANGE	600 - 800	300 - 400	100 - 200

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	n/a	SO2 Conc (ppb)	n/a
END TIME:	n/a	Analyzer Response (ppb)	n/a

CALIBRATION:

FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	77.80	5000	0.00	0	0	1.009	1.000
4922	77.80	5000	770.22	763	770	1.009	1.000
4962	37.90	5000	375.21	n/a	375	n/a	1.001
4981	18.90	5000	187.11	n/a	186	n/a	1.006

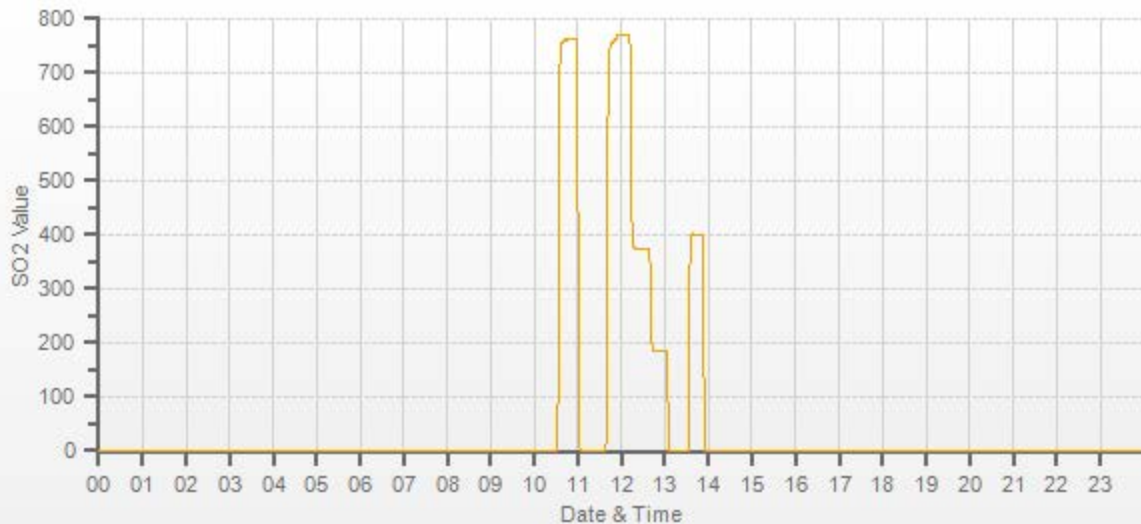
LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	0.0%

COMMENTS:

Sample filter was changed.

SO2[ppb] Station: St. Lina Daily: 19-11-2019 Type: AVG 1 Min. [1 Min.]



CAL-LICA-201911-01250

H2S Analyzer Calibration by Dilution



DATE:	18-Nov-2019	PREVIOUS CALIBRATION DATE:	07-Oct-2019
PARAMETER:	H2S	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	912
PURPOSE:	Routine	START TIME (MST):	12:35
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:59

ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	CM 18010058	FLOW (mL/min)	815
INITIAL		FINAL	
BKG/OFFSET	48.8	BKG/OFFSET	48.2
COEF/SLOPE	0.871	COEF/SLOPE	0.851
Expected (reference) Value	80.2	Expected (reference) Value	83.4

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 19174	HIGH ID	n/a
CONC (ppm):	10.00	EXPIRY DATE	n/a
CYLINDER (psi):	1900	LOW ID	n/a
EXPIRY DATE	16-Jul-2022	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	78	38	19
RANGE	60 - 80	30 - 40	10 - 20

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	12:41	SO2 Conc (ppb)	780
END TIME:	12:56	Analyzer Response (ppb)	0.0

CALIBRATION:

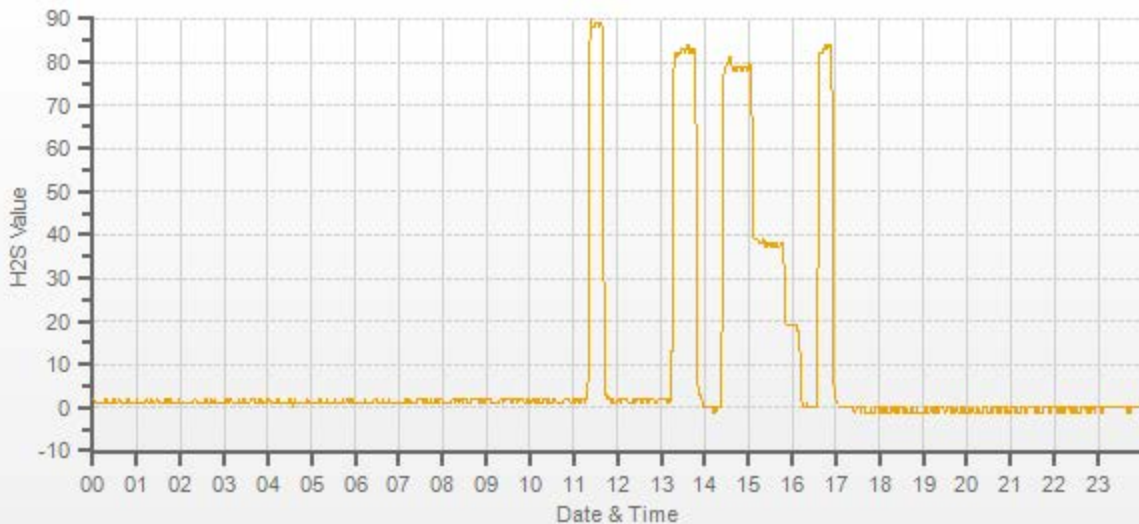
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	58.50	7500	0.00	1.8	0	0.973	1.000
7442	58.50	7500	78.00	82	78	0.973	1.000
7472	28.50	7500	38.00	n/a	38	n/a	1.000
7486	14.20	7500	18.93	n/a	18.7	n/a	1.012

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.001	-0.1%

COMMENTS:

Sample inlet filter was changed.



Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	18-Nov-2019	PREVIOUS CALIBRATION DATE:	08-Oct-2019	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1180930025	1210
LOCATION:	St. Lina	BAROMETRIC (mBar):	912	PARAMETER:	CH4	NMHC	THC
PURPOSE	Routine	START TIME (MST):	12:35	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:14	PREVIOUS CF:	1.000	1.000	1.000

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	API	MAKE:	Teledyne	CYLINDER ID:	LL 29687	HIGH ID:	n/a
MODEL:	700	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	598.0 198.0	HIGH EXPIRY:	n/a
ID:	690	ID:	132	CYLINDER (psi):	800	LOW ID:	n/a
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	115	EXPIRY DATE	01-Aug-2026	LOW EXPIRY:	n/a

CALIBRATION PARAMETERS:

POINT (CH ₄ /NMHC)	HIGH	MID	LOW	CH ₄ EQUIVILANCE		
TARGET	14	7	3.5	C ₃ H ₈ as CH ₄		544.5
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄		1142.5

EXPECTED (REFERENCE) VALUE:

INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	10.60	10.74	21.34		10.68	10.73	21.41

CALIBRATION:

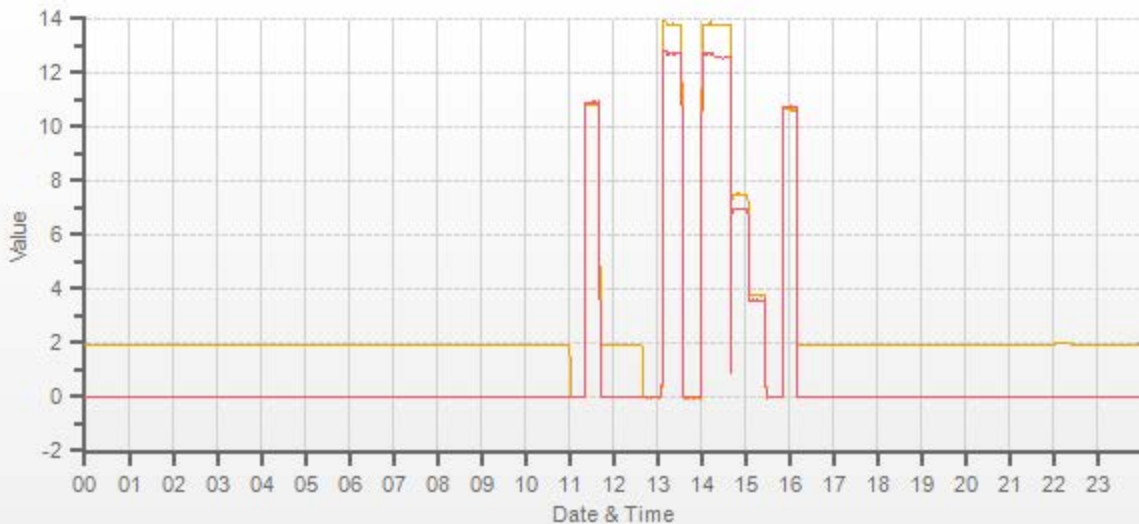
FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC
3025	X	3025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	X	X	X	X	X	X
2955	70.00	3025	13.84	12.60	26.44	13.82	12.71	26.54	13.84	12.60	26.44	1.001	0.991	0.996	1.000	1.000	1.000
2987	38.00	3025	7.51	6.84	14.35	n/a	n/a	n/a	7.56	6.92	14.49	n/a	n/a	n/a	0.994	0.988	0.990
3006	19.00	3025	3.76	3.42	7.18	n/a	n/a	n/a	3.79	3.54	7.33	n/a	n/a	n/a	0.991	0.966	0.979

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
CH ₄	1.000	1.000	0.1%
NMHC	1.000	1.000	0.3%
THC	1.000	0.999	0.2%

COMMENTS:

Sample inlet filter was changed.



CAL-LICA-201911-01250

Page 17 of 27
CH4 [ppm] NMHC [ppm]

NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	19-Nov-2019	PREVIOUS CALIBRATION DATE:	08-Oct-2019	MAKE/MODEL:	Thermo 42i	PREVIOUS CF.	
CLIENT:	LICA	TEMPERATURE (°C):	22.0	SERIAL #:	1180930029	NOx	1.000
LOCATION:	St. Lina	BAROMETRIC (mBar):	916.00	FLOW (mL/min)	510	NO	0.999
PURPOSE:	Routine	START TIME (MST):	10:00	RANGE (ppb)	1000	NO2	1.000
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:29	GPT FOR O3?		No	

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	API	MAKE:	Teledyne	CYLINDER ID:	LL 107918	HIGH ID:	n/a
MODEL:	700	MODEL:	T701	NO/NOx (PPM):	50.1 50.1	HIGH EXPIRY:	n/a
ID:	690	ID:	132	CYLINDER (psi):	800	LOW ID:	n/a
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a	EXPIRY DATE	20-Aug-2026	LOW EXPIRY:	n/a

CALIBRATION SETTINGS:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
BKG/OFFSET:	6	6	n/a	BKG/OFFSET:	6	6	n/a
SLOPE/COEF/CE:	1	1	1.0	SLOPE/COEF/CE:	1	1	1.0

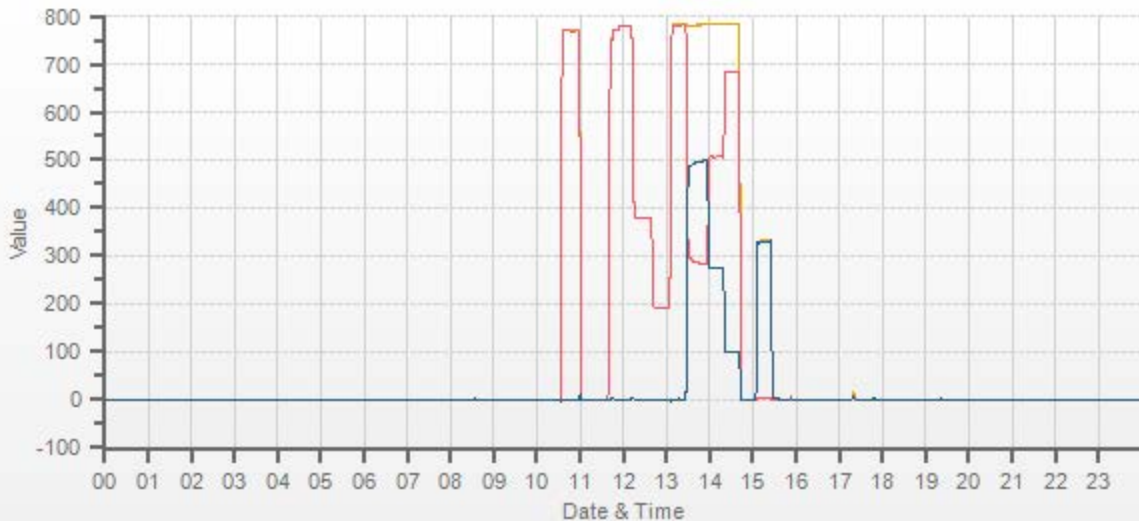
EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	336	4	332.0		334	3	331.0

POINT	NO TARGET (PPB)	NO2 TARGET (PPB)	NO2 RANGE	O3 POINT
HIGH	780	500	470-540	n/a
MID	380	275	235-310	n/a
LOW	190	90	80-115	n/a
EXTRA 1	n/a	n/a	n/a	n/a

FLOW RATE			CONCENTRATION (ppb)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2
5000	77.80	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.015	1.014	0.999	0.998	0.997	0.997
4922	77.80	5000	779.6	779.6	0.0	768.0	769.0	1.0	780.0	781.0	1.0	1.015	1.014	0.999	0.998	0.997	0.997
4962	37.90	5000	379.8	379.8	0.0	n/a	n/a	n/a	380.0	381.0	1.0	n/a	n/a	0.999	0.997	0.997	0.997
4981	18.90	5000	189.4	189.4	0.0	n/a	n/a	n/a	190.0	190.0	0.0	n/a	n/a	0.997	0.997	0.997	0.997

Point	CALIBRATOR			INDICATED (ppb)			NO DROP / O3 Conc (ppb)	NO2 GAIN (ppb)	NO2 Corr. FACTOR	CONV. EFFICIENCY
	GAS	TOTAL	O3 SETPOINT	NO	NOx	NO2				
REFERENCE	77.80	5000	0	782.0	783.0	1.0	497	497	1.000	100.00%
AS-FOUND HIGH	77.80	5000	500	285.0	783.0	498.0	497	497	1.000	100.00%
ADJUSTED HIGH	77.80	5000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MID	77.80	5000	275	507.0	783.0	276.0	275	275	1.000	100.00%
LOW	77.80	5000	100	683.0	783.0	100.0	99	99	1.000	100.00%
NO2 adjustment not required.									AVERAGE:	100.00%

LINEAR REGRESSION ANALYSIS:				COMMENTS:
	CORRELATION	SLOPE	INTERCEPT	
NO	1.000	1.000	0.02%	
NOx	1.000	1.000	0.02%	
NO2	1.000	1.000	0.00%	



CAL-LICA-201911-01250

Ozone Calibration by Direct GPT



DATE:	05-Nov-2019	PREVIOUS CALIBRATION DATE:	30-Oct-2019
PARAMETER:	Ozone	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	932
PURPOSE	Removal/Shut-down	START TIME (MST):	13:43
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:28

ANALYZER:

MAKE/MODEL	Thermo 49i	RANGE	500 ppb
SERIAL #	1002240371	FLOW (mL/min)	1494
INITIAL		FINAL	
BKG/OFFSET	-0.7	BKG/OFFSET	n/a
COEF/SLOPE	1.036	COEF/SLOPE	n/a
Expected (reference) Value	380	Expected (reference) Value	n/a

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a
CALIBRATION METHOD:		DIRECT GPT	
GPT DATE:	n/a	GPT END TIME:	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
RANGE	300 - 400	150 - 200	50 - 100

CALIBRATION:

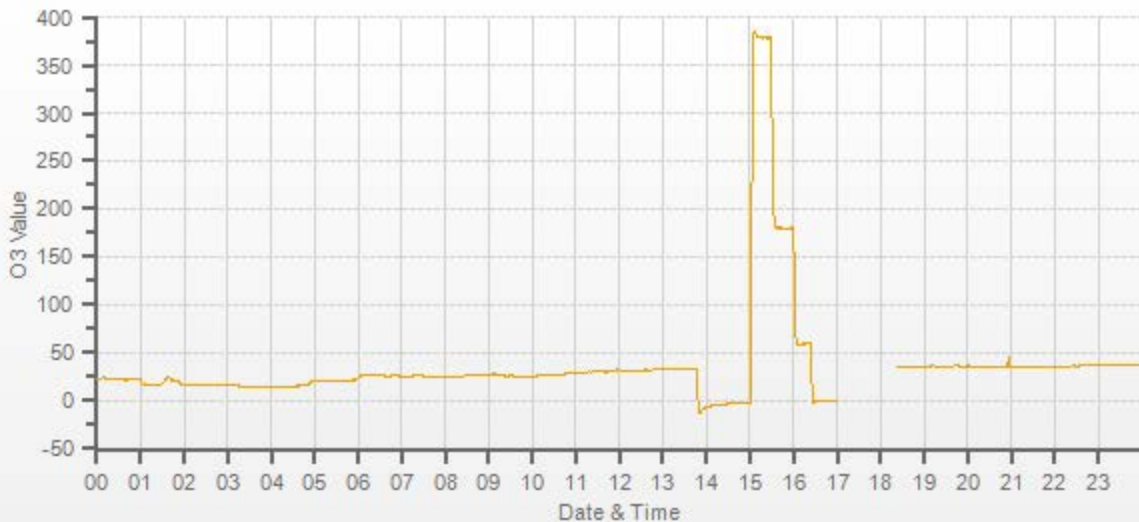
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	XXXX	5000	0.0	0.0	n/a	XXXX	XXXX
5000	XXXX	5000	380.0	380.0	n/a	1.000	n/a
5000	XXXX	5000	180.0	180.0	n/a	1.000	n/a
5000	XXXX	5000	60.0	60.0	n/a	1.000	n/a

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	0.0%

COMMENTS:

Shutdown calibration was completed to remove the analyzer for repair. Faulty sample valve suspected. ZS check failed periodically.



Ozone Calibration by Direct GPT



DATE:	06-Nov-2019	PREVIOUS CALIBRATION DATE:	n/a
PARAMETER:	Ozone	PREVIOUS CORRECTION FACTOR:	n/a
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	934
PURPOSE:	Install/Post-Repair	START TIME (MST):	09:24
PERFORMED BY:	Alex Yakupov	END TIME (MST):	12:51

ANALYZER:

MAKE/MODEL	API 400A	RANGE	500 ppb
SERIAL #	446	FLOW (mL/min)	819
INITIAL		FINAL	
BKG/OFFSET	n/a	BKG/OFFSET	-6.6
COEF/SLOPE	n/a	COEF/SLOPE	0.997
Expected (reference) Value	n/a	Expected (reference) Value	316

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a
CALIBRATION METHOD:		DIRECT GPT	
GPT DATE:	n/a	GPT END TIME:	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
RANGE	300 - 400	150 - 200	50 - 100

CALIBRATION:

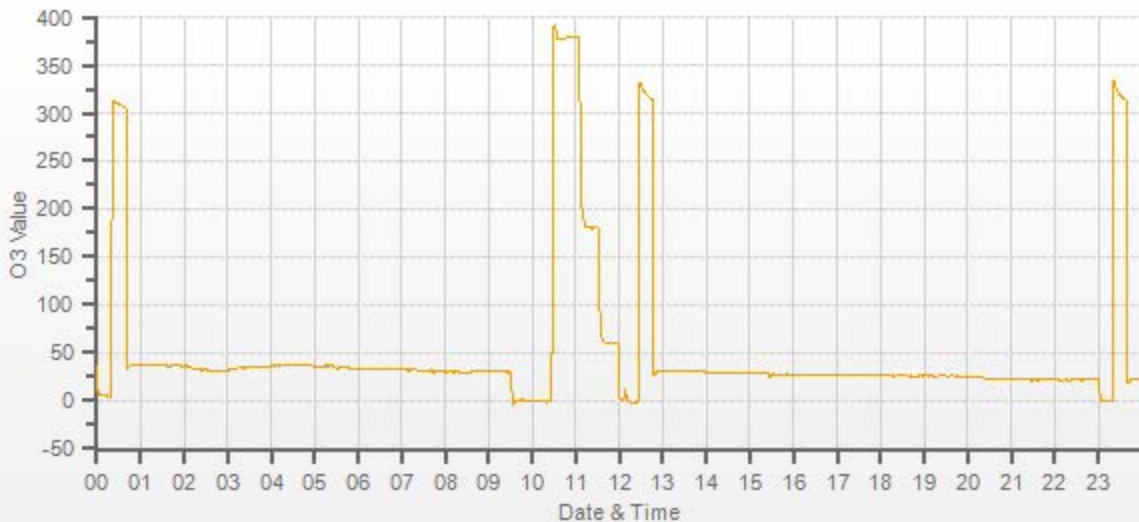
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	5000	5000	0.0	0.0	0.0	n/a	n/a
5000	5000	5000	380.0	n/a	380.0	n/a	1.000
5000	5000	5000	180.0	n/a	181.0	n/a	0.994
5000	5000	5000	60.0	n/a	61.0	n/a	0.984

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.999	0.1%

COMMENTS:

Installation calibration of BV analyzer after faulty LICA analyzer was removed for repair.



Thermo 5030i SHARP Monitor Calibration

Date: November 28, 2019	Performed By/Reviewer: Alex Yakupov Chris Wesson
Company: LICA	Start Time (mst): 10:39
Station Name/Location: St. Lina	End Time (mst): 12:28
Previous Audit Date: October 25, 2019	Calibration Purpose: Quarterly
Parameter: PM 2.5	Weather Conditions: Mix of sun and clouds

SHARP 5030i Information and Status:		
Serial Number: CM 17091001	Filter Tape Counter	216

Reference Standards:						
Air Flow						
	Manometer	Orifice	Pressure:		Temp / RH:	
Make:	Dwyer	Chinook	Fisher Scientific		Fisher Scientific	11745843
Model:	475 Mk. III	CHN0901	FB61291		11-661-7A	
Serial Number:	#3	#4	130168457		160348895	
Expiry Date:	January 17, 2020	January 31, 2020	January 17, 2020		June 19, 2020	

Ambient Temperature (°C)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	-11.90	-11.8	-0.1	-11.90	-11.9	0.0
#2	-12.10	-11.9	-0.2	-11.90	-11.9	0.0
#3	-12.10	-11.9	-0.2	-11.90	-11.9	0.0
Average	-12.0	-11.9	-0.2	-11.9	-11.9	0.0
<i>Temp Limit: ± 2°C</i>						

Ambient Relative Humidity (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Offset (ZERO)	Reference	SHARP	Offset (ZERO)
#1	74.10	74.5	-0.4	74.50	74.5	0.0
#2	74.30	74.6	-0.3	74.50	74.5	0.0
#3	74.20	74.4	-0.2	74.50	74.7	-0.2
Average	74.2	74.5	-0.3	74.5	74.6	-0.1
<i>RH Limit: ± 2 %RH</i>						

Flow Temperature (°C)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	20.30	19.6	0.7	20.30	19.6	0.7
#2	20.40	19.8	0.6	20.40	19.8	0.6
#3	20.40	19.8	0.6	20.40	19.8	0.6
Average	20.4	19.7	0.6	20.4	19.7	0.6
<i>Temp Limit: ± 2°C</i>						

Barometric Pressure (mmHg)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	696.0	697.0	-1.0	696.0	696.0	0.0
<i>BP Limit: ± 2 mmHg</i>						

Nephelometer Relative Humidity (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	15.20	15.0	0.2	15.20	15.0	0.2
<i>RH Limit: ± 2 %RH</i>						

Nephelometer Temperature (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	20.10	20.1	0.0	20.10	20.1	0.0
<i>Temp Limit: ± 2°C</i>						

Nephelometer Source Level						
As Found:			As Left: (same as found if acceptable)			
	Variable	Value		Variable	Value	
	IRE D	65		IRE D	65	
	SRC LEVEL	47		SRC LEVEL	47	
<i>IRE D Limit (as found): 60-70 mA Adjusted IRE D Limit (as left): 65 mA</i>						

Detector Calibration (Auto)						
As Found:			As Left:			
Detector Auto Calibration Completed: YES			Variable	Value		
			HIGH VOLT	n/a		
			BETA REF TH	n/a		
			ALPHA TH	n/a		
			DIFF HV	n/a		

Mass Coefficient (Auto)						
Zero			Span			
	Variable	Value		Variable	Value	
	MASS COEF	6979.9		MASS COEF	7191.0	
	FOIL VALUE	0		FOIL VALUE	1045	
	Beta Avg	8910		Beta Avg	7705	
	difference	Foil set # 4804		difference	3.0	
Foil Set: CM1597						

Flow Calibration (L/min)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	16.65	16.66	-0.01	16.65	16.66	-0.01
#2	16.65	16.67	-0.02	16.65	16.67	-0.02
#3	16.66	16.68	-0.02	16.66	16.68	-0.02
Average	16.65	16.67	-0.02	16.65	16.67	-0.02
<i>Flow Limit: 16.67 ± 0.33 L/min</i>						

Leak Check (L/min)						
Without Leak Check Adapter			With leak Check Adapter			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	16.66	16.67	-0.01	16.63	16.64	-0.01
<i>Leak Limit: 0.08 L/min</i>						
LEAK RATE: 0.00						

Meteorological System Checklist



Date:	November 18, 2019		
Technician:	Alex Yakupov		
Reviewer:	Wunmi Adekanmbi		
Station:	St. Lina		
Unit:	Make:	Model:	Serial #:
Precipitation Sampler:	Met One - Heated Rain Gauge	Part 387	n/a
PRECIPITATION SENSOR CHECK			
Checklist:	Reply:	Comments:	
Previous check date:	August 15, 2019	n/a	
Is the sensor Level?	yes	n/a	
Is the heater operating properly?	yes	n/a	
Are the bucket drain holes clean?	yes	n/a	
Is the screen on the housing? (screen should be on between July and September)	no	Removed for Winter	
Is the housing clean?	yes	n/a	
Is the area around the housing clean and free from obstacles?	yes	n/a	
TIP TEST - Slowly pour water until 10 tip are heard. (10 tips = 1 ml)			
# of Tips	Data Logger Response (ml):	Manual Specification = +/- 0.1 ml	
10	1.00		



Meteorological Sensor Audit/Calibration

Location Information

Company:	N/A	Performed By:	Chris Wesson
Audit Location:	Edm Shop	Reviewed By:	Rob Fisher
Audit Date:	May 17, 2019	Start/End Time (mst):	08:10 / 08:51
Calibration Purpose:	shut down	Weather Conditions:	Mainly sunny

Wind Sensor Information

Sensor ID Data:		Sensor Outputs:	
Sensor Make:	RM Young	Velocity Voltage Output Range:	0-1V
Sensor Model:	05305VK	Velocity Unit Output Range:	0-200 kph
Serial #:	65521	Direction Voltage Output Range:	0-1V
Previous Cal/Audit Date:	March 20, 2018	Direction Unit Output Range:	0-360 DEG

Wind Calibrator Information

Calibrator I.D. and Expiry Date: RM Young 18802 id# CA03309 expires October 3, 2019

Wind Speed Audit Data ****+/- 2% of the average correction factor is the limit****

RPM	Wind Speed Generated kph	Clockwise Wind Speed kph	Counter Clockwise Wind Speed kph	Correction Factor
0	0	0.1	0.1	-
1000	18.4	18.4	18.4	1.002
2000	36.9	36.8	36.9	1.000
3000	55.3	55.2	55.2	1.002
4000	73.7	73.6	73.6	1.002
5000	92.2	92.0	92.0	1.002
6000	110.6	110.4	110.4	1.002
7000	129.0	128.8	128.7	1.002
8000	147.4	147.2	147.2	1.002
9000	165.9	165.5	165.6	1.002
10000	184.3	183.9	183.9	1.002
The audit meets AMD requirements.			Average Correction Factor=	1.002

Wind Direction Audit Data ****+/- 3° of the absolute average degrees difference for all points is the limit****

Generated Wind Direction 0-360 (Up)	Generated Wind Direction 360-0 (Down)	Indicated Wind Direction 0-360 (Up)	Indicated Wind Direction 360-0 (Down)	Degrees Difference 0-360 (Up)	Degrees Difference 360-0 (Down)	Average Absolute Degrees Difference
0	355	355	353	5.0	2.1	3.6
30	330	27	328	2.6	1.8	2.2
60	300	58	299	2.2	1.1	1.7
90	270	88	270	1.9	0.3	1.1
120	240	119	240	1.4	0.1	0.8
150	210	149	210	0.6	0.2	0.4
180	180	180	179	0.4	0.6	0.5
210	150	210	149	-0.2	0.9	0.5
240	120	240	119	0.0	1.3	0.6
270	90	271	88	-0.6	1.8	1.2
300	60	300	58	0.3	1.8	1.1
330	30	328	27	2.1	2.6	2.4
355	0	353	355	2.4	4.7	3.5
The audit meets AMD requirements.				Average Absolute Degrees Difference=		1.5

Comments:

Physical inspection completed. No issues. Completed at Edm shop.

End of Report



Lakeland Industry & Community Association

NOVEMBER 2019
Ambient Air Monitoring Calibration Report
- BONNYVILLE EAST STATION-
CAL-LICA-201911-01608

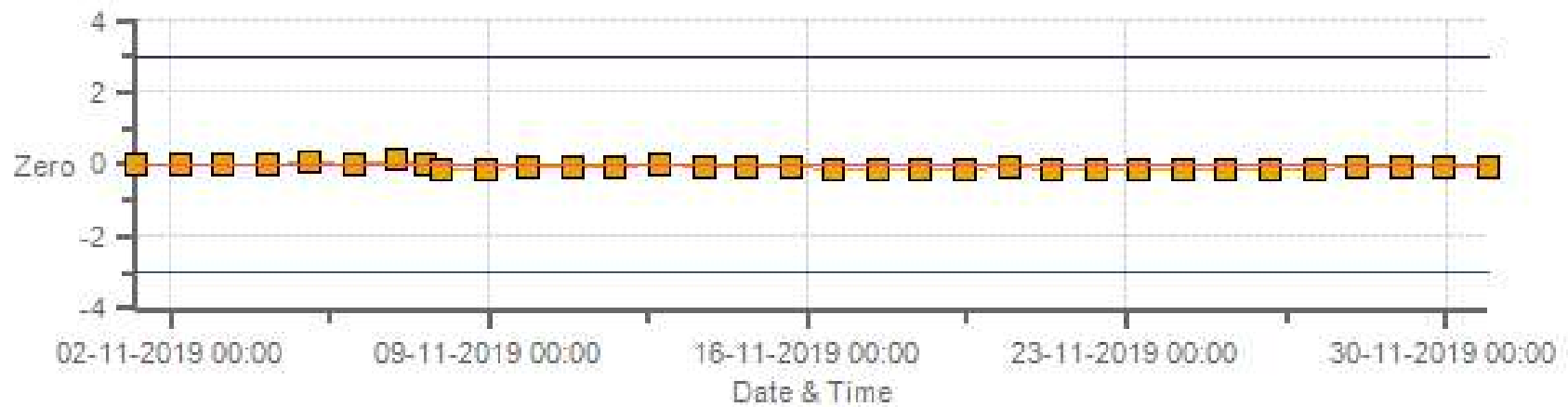
Station Operation and Maintenance:
Bureau Veritas Canada

Data Validation and Report:
Bureau Veritas Canada

December 17, 2019

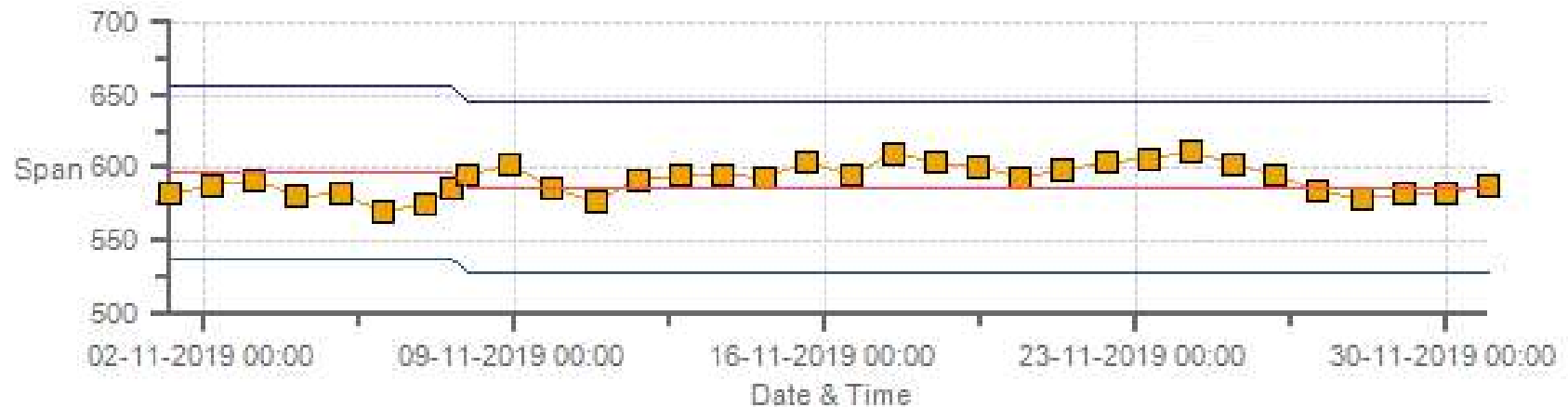
DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2 [ppb] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Zero



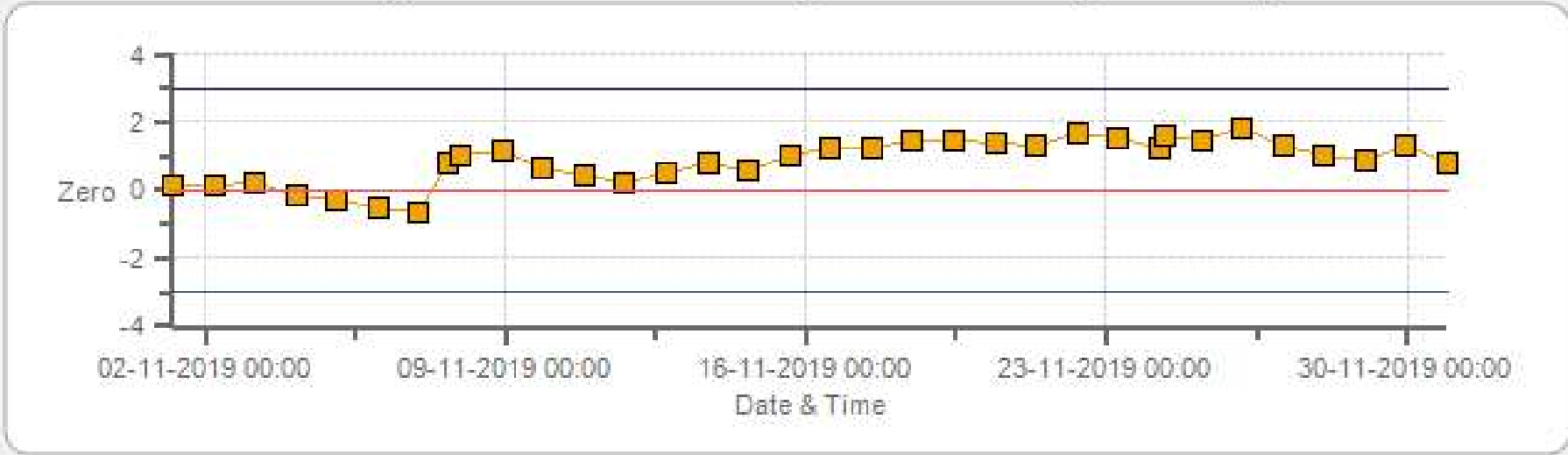
Zero Zero Ref Zero Low Zero High

SO2 [ppb] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Span



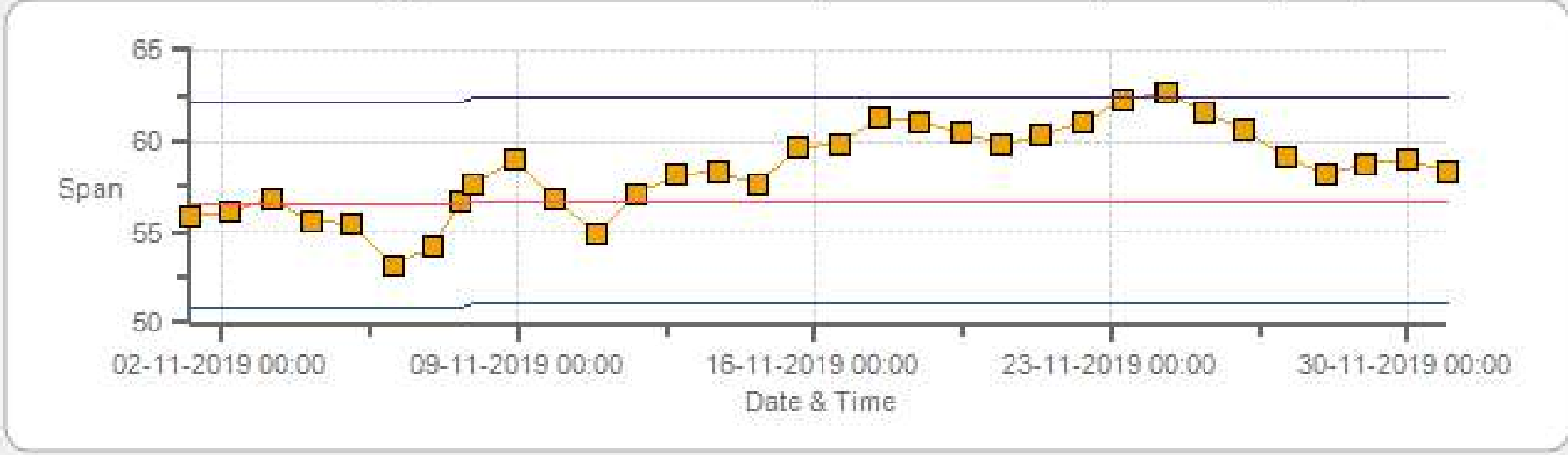
Span SpanRef Span Low Span High

H2S [ppb] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Zero



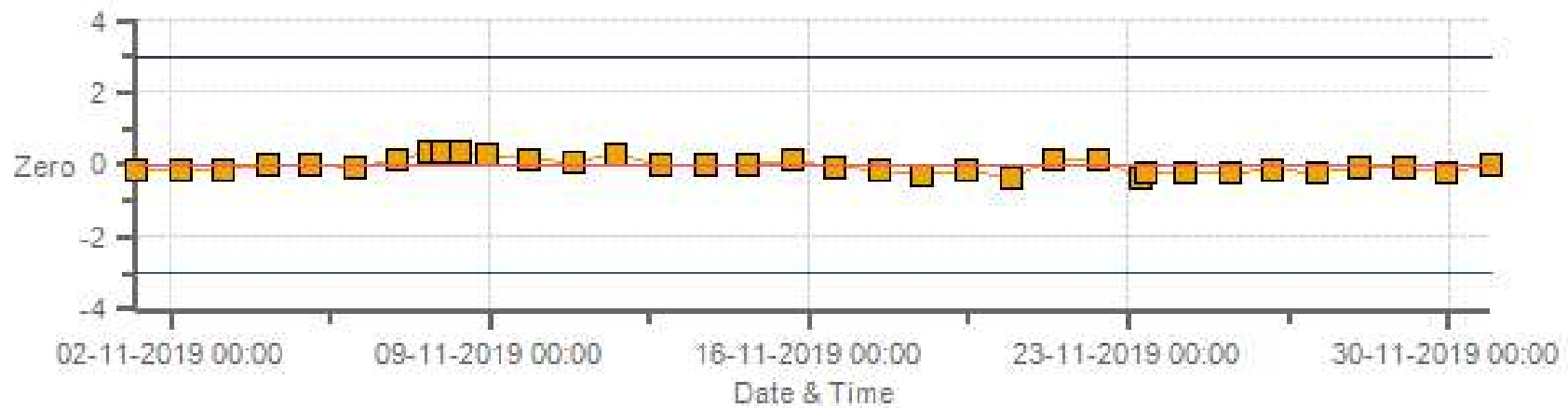
Zero Zero Ref Zero Low Zero High

H2S [ppb] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Span



Span SpanRef Span Low Span High

NOx [ppb] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Zero



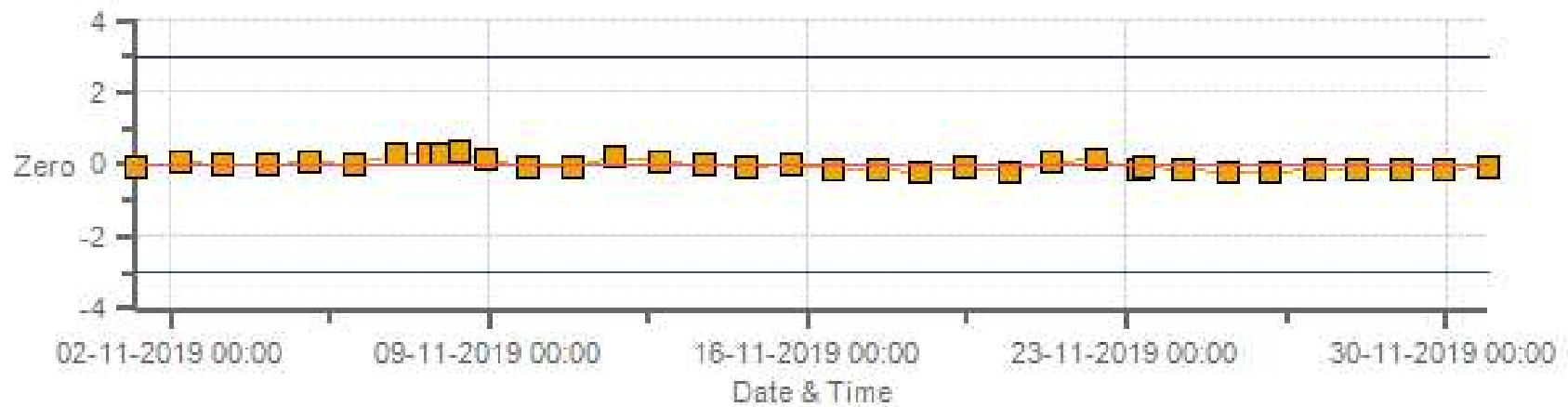
Zero Zero Ref Zero Low Zero High

NOx [ppb] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Span



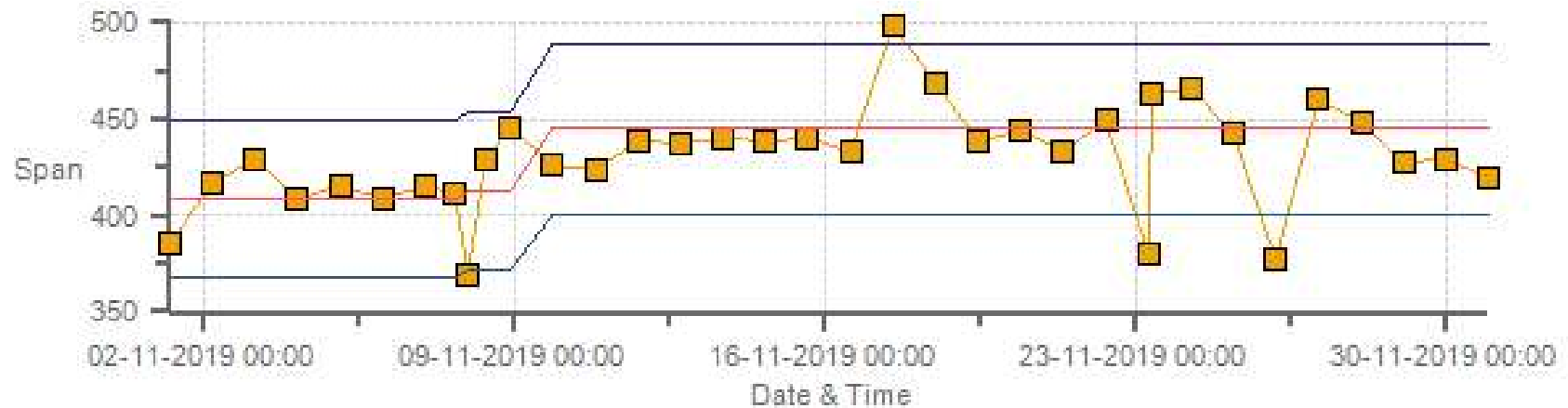
Span SpanRef Span Low Span High

NO2 [ppb] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Zero



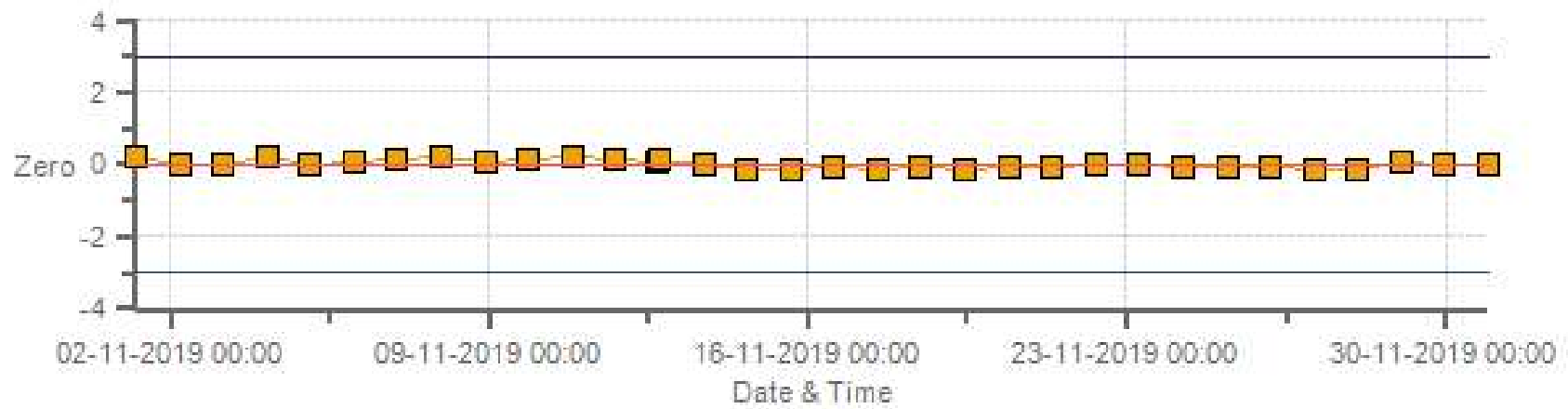
Zero Zero Ref Zero Low Zero High

NO2 [ppb] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Span



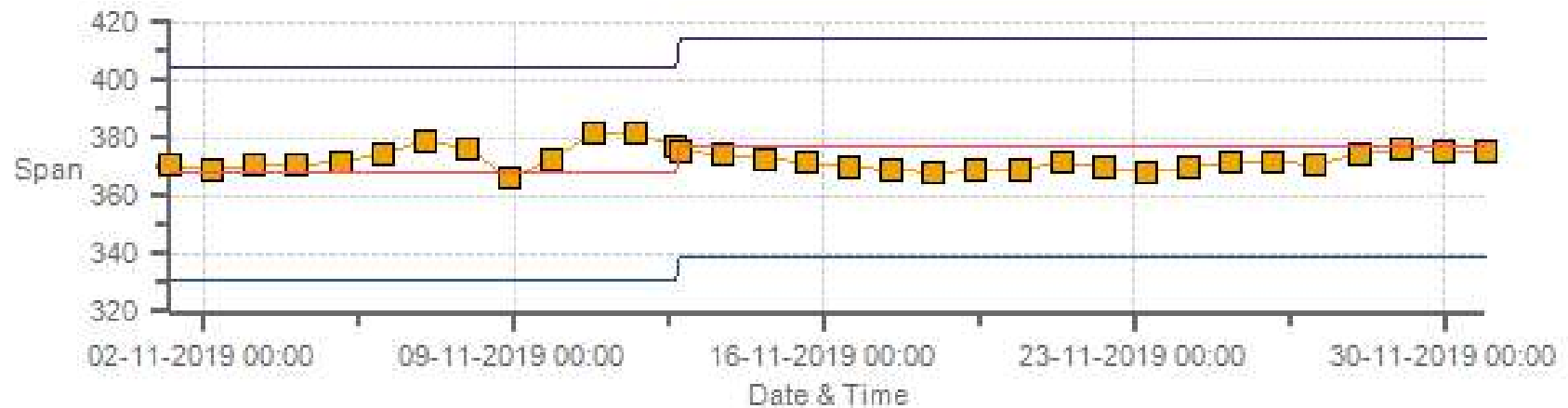
Span SpanRef Span Low Span High

O3 [ppb] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Zero



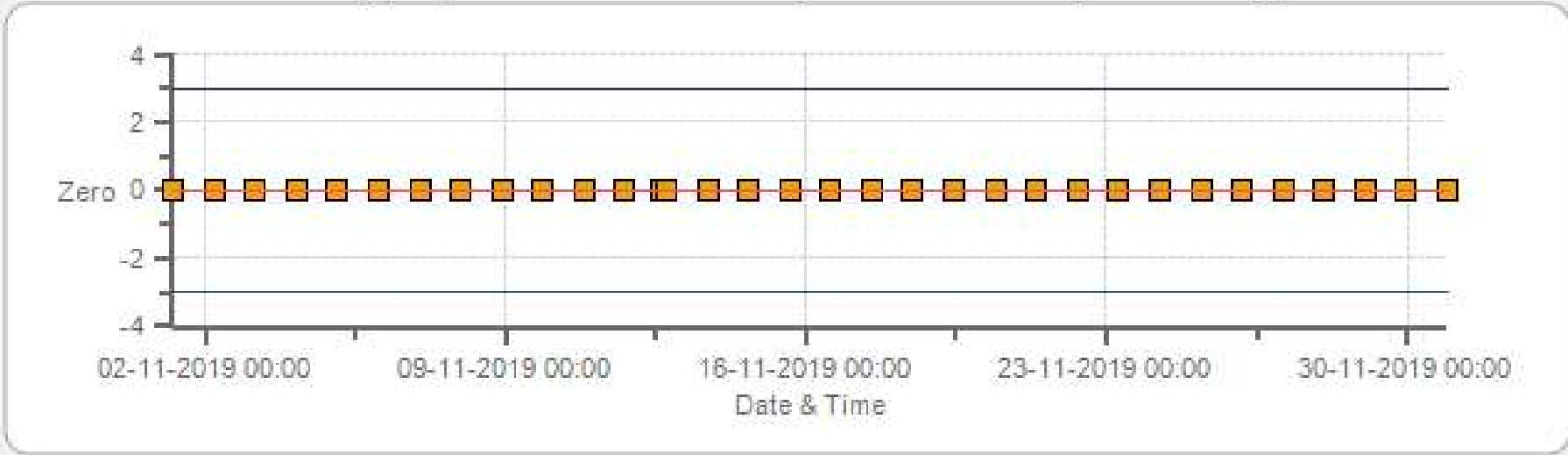
Zero Zero Ref Zero Low Zero High

O3 [ppb] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Span



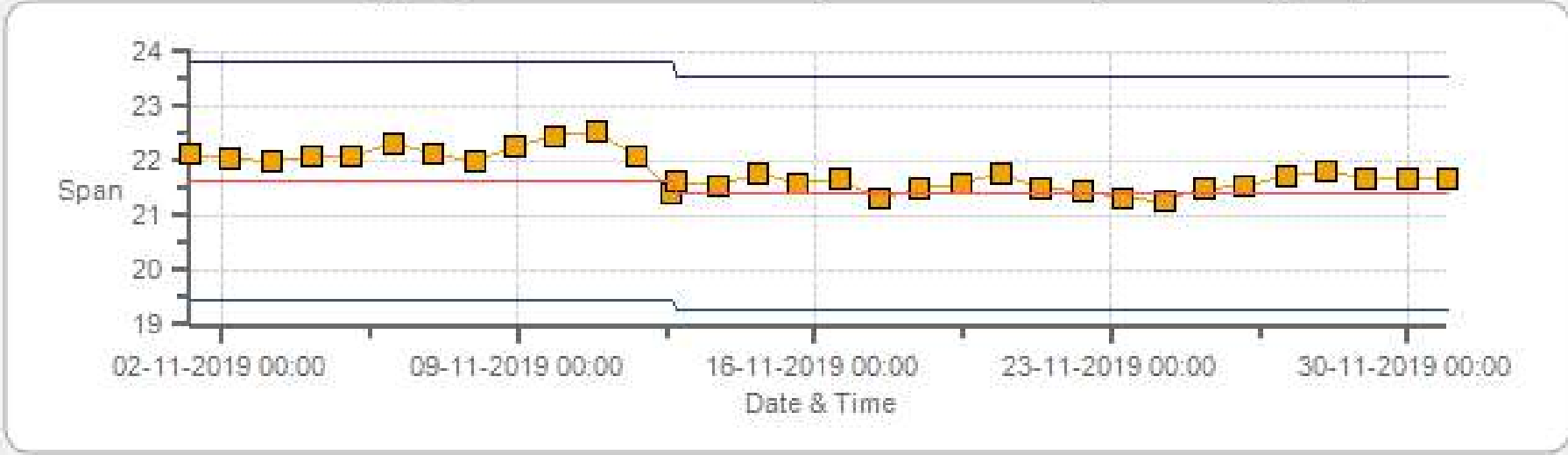
Span Span Ref Span Low Span High

THC [ppm] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Zero



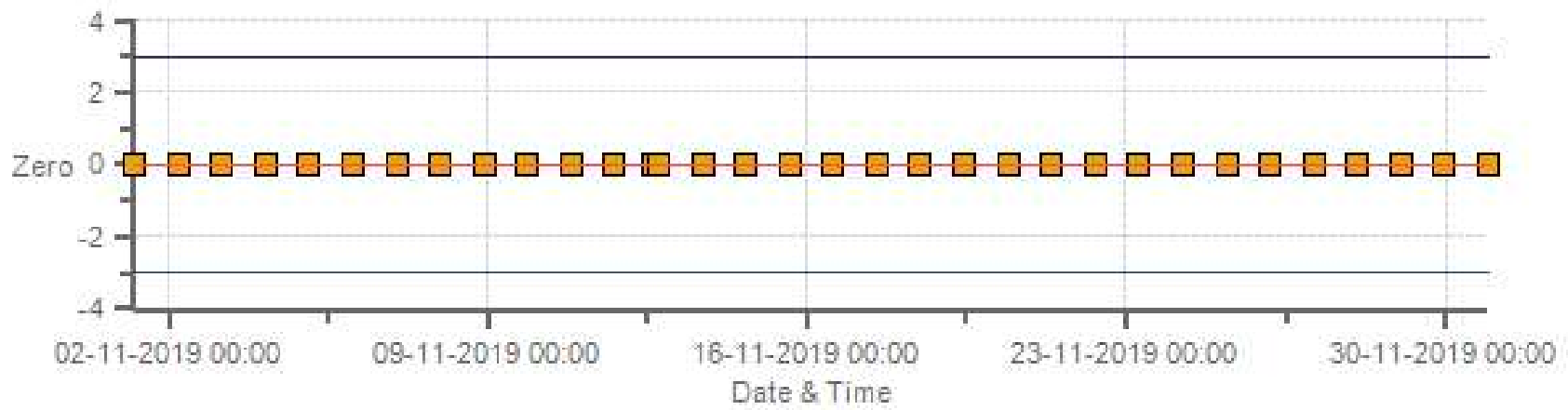
Zero Zero Ref Zero Low Zero High

THC [ppm] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Span



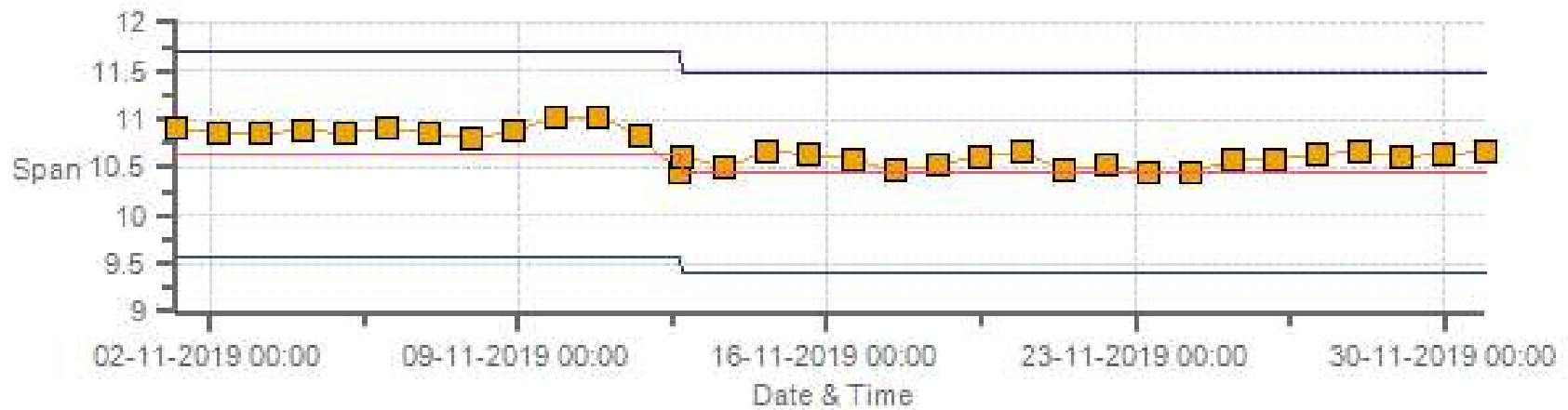
Span SpanRef Span Low Span High

CH4 [ppm] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Zero



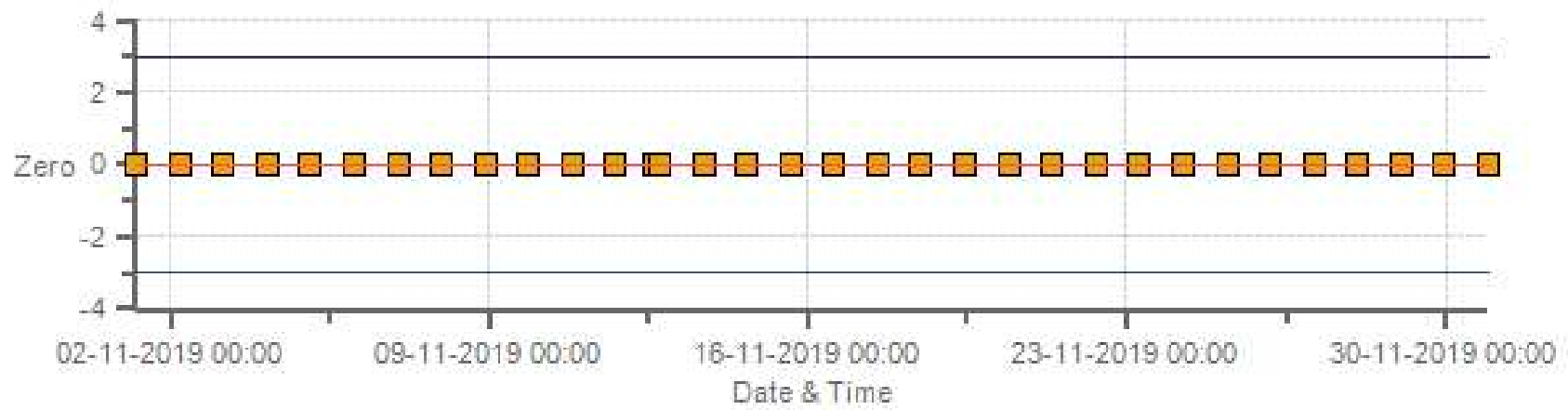
Zero Zero Ref Zero Low Zero High

CH4 [ppm] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Span



Span SpanRef Span Low Span High

NMHC [ppm] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

NMHC [ppm] Calibration: LICA Bonnyville-East Monthly: 11-2019 Type: Span



Span SpanRef Span Low Span High

MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



DATE:	07-Nov-2019	PREVIOUS CALIBRATION DATE:	15-Oct-2019
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	24.0
LOCATION:	Bonnyville - East	BAROMETRIC (mBar):	937
PURPOSE:	Routine	START TIME (MST):	10:22
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:16

ANALYZER:

MAKE/MODEL	Thermo 43I-TLE	RANGE	1000 ppb
SERIAL #	1180320043	FLOW (mL/min)	459
INITIAL		FINAL	
BKG/OFFSET	4.92	BKG/OFFSET	5.15
COEF/SLOPE	0.962	COEF/SLOPE	0.975
Expected (reference) Value	596	Expected (reference) Value	586

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	API	MAKE:	Teledyne
MODEL:	700	MODEL:	T701
ID:	690	ID:	132
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 107918	HIGH ID	n/a
CONC (ppm):	49.50	EXPIRY DATE	n/a
CYLINDER (psi):	800	LOW ID	n/a
EXPIRY DATE	20-Aug-2026	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	780	380	190
RANGE	600 - 800	300 - 400	100 - 200

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	n/a	SO2 Conc (ppb)	n/a
END TIME:	n/a	Analyzer Response (ppb)	n/a

CALIBRATION:

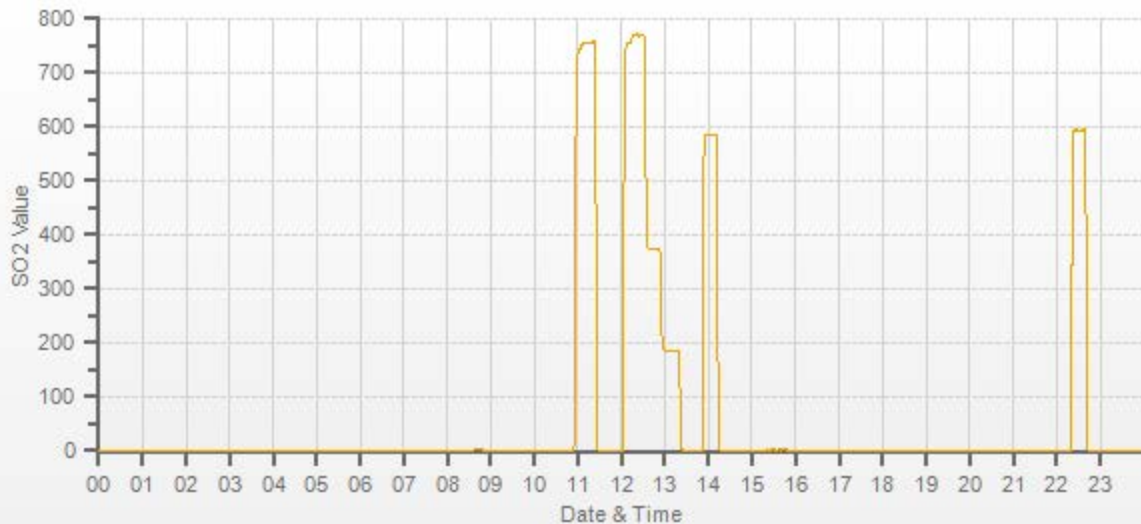
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	77.80	5000	0.00	0	0	1.015	1.000
4922	77.80	5000	770.22	759	770	1.015	1.000
4962	37.90	5000	375.21	n/a	375	n/a	1.001
4981	18.90	5000	187.11	n/a	187	n/a	1.001

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	0.0%

COMMENTS:

Sample inlet filter was changed.



H2S Analyzer Calibration by Dilution



DATE:	07-Nov-2019	PREVIOUS CALIBRATION DATE:	15-Oct-2019
PARAMETER:	H2S	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	24.0
LOCATION:	Bonnyville - East	BAROMETRIC (mBar):	937
PURPOSE:	Routine	START TIME (MST):	10:22
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:04

ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	CM 17360002	FLOW (mL/min)	957
INITIAL		FINAL	
BKG/OFFSET	31.4	BKG/OFFSET	31
COEF/SLOPE	1.194	COEF/SLOPE	1.216
Expected (reference) Value	56.5	Expected (reference) Value	56.7

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	EY 0001003	HIGH ID	n/a
CONC (ppm):	10.00	EXPIRY DATE	n/a
CYLINDER (psi):	1900	LOW ID	n/a
EXPIRY DATE	16-Jul-2022	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	78	38	19
RANGE	60 - 80	30 - 40	10 - 20

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	10:29	SO2 Conc (ppb)	780
END TIME:	10:44	Analyzer Response (ppb)	0.0

CALIBRATION:

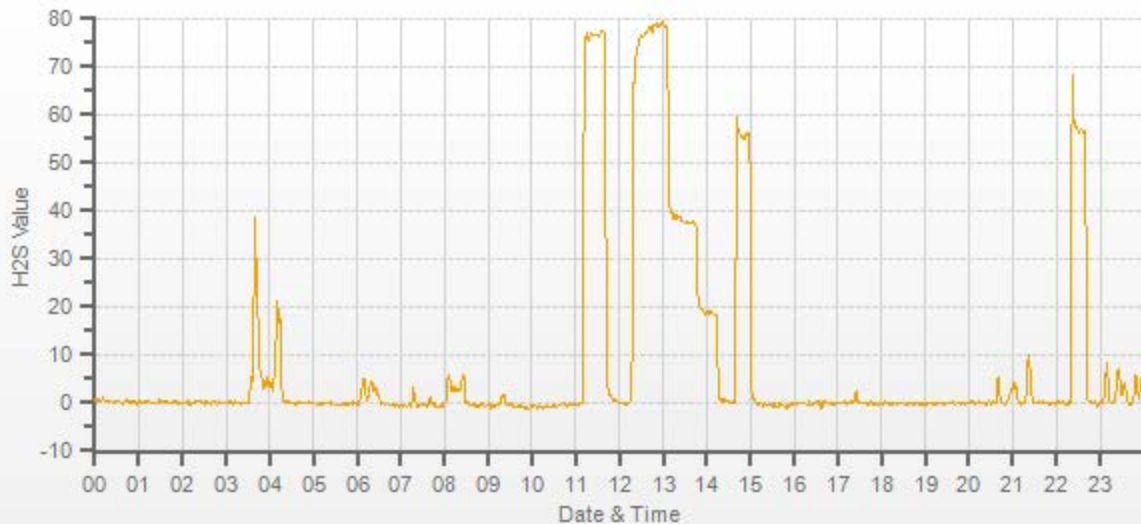
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	58.50	7500	0.00	0	0	1.005	1.000
7441	58.50	7499	78.01	77.6	78	1.005	1.000
7470	28.50	7498	38.01	n/a	38	n/a	1.000
7486	14.20	7500	18.93	n/a	19	n/a	0.996

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	0.0%

COMMENTS:

Sample inlet filter was changed.



H2S Analyzer Calibration by Dilution



DATE:	20-Nov-2019	PREVIOUS CALIBRATION DATE:	07-Nov-2019
PARAMETER:	H2S	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	24.0
LOCATION:	Bonnyville - East	BAROMETRIC (mBar):	919
PURPOSE:	As-Found	START TIME (MST):	13:20
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:35

ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	CM 17360002	FLOW (mL/min)	955
INITIAL		FINAL	
BKG/OFFSET	31.4	BKG/OFFSET	31.4
COEF/SLOPE	1.194	COEF/SLOPE	1.194
Expected (reference) Value	56.5	Expected (reference) Value	56.5

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	EY 0001003	HIGH ID	n/a
CONC (ppm):	10.00	EXPIRY DATE	n/a
CYLINDER (psi):	1900	LOW ID	n/a
EXPIRY DATE	16-Jul-2022	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	78	38	19
RANGE	60 - 80	30 - 40	10 - 20

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	n/a	SO2 Conc (ppb)	n/a
END TIME:	n/a	Analyzer Response (ppb)	n/a

CALIBRATION:

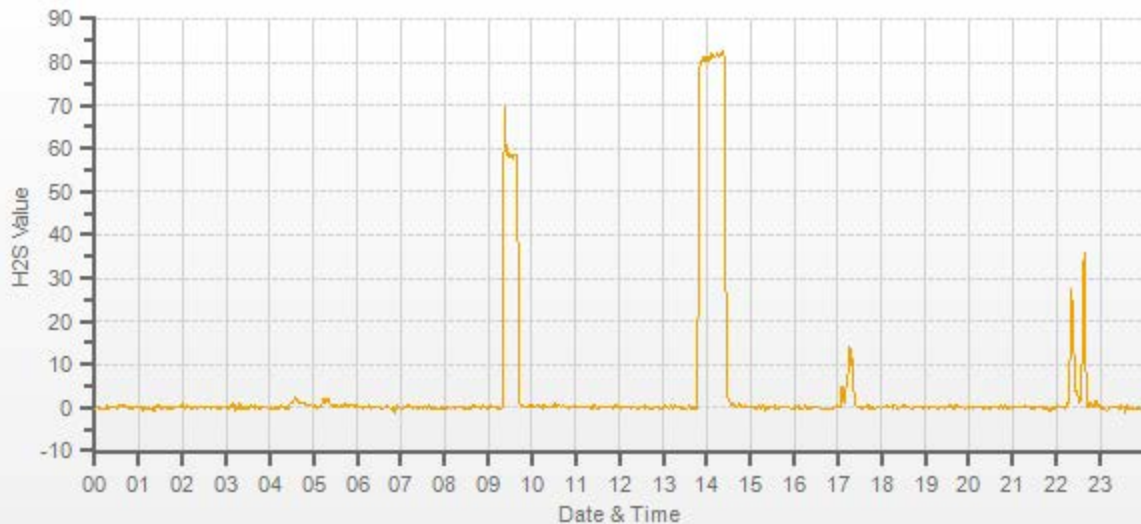
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	58.50	7500	0.00	1.4	n/a	0.961	n/a
7442	58.50	7500	78.00	82.6	n/a	0.961	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	n/a	n/a	n/a

COMMENTS:

As Found calibration was completed to check drift of the analyzer as daily SPAN checks reported a drift of over 7%.



Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	12-Nov-2019	PREVIOUS CALIBRATION DATE:	16-Oct-2019	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	23.0		Thermo 55i	1180320044	1050
LOCATION:	Bonnyville - East	BAROMETRIC (mBar):	931	PARAMETER:	CH4	NMHC	THC
PURPOSE	Routine	START TIME (MST):	11:52	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:04	PREVIOUS CF:	1.000	1.000	1.000

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	API	MAKE:	Teledyne	CYLINDER ID:	LL 29687	HIGH ID:	n/a
MODEL:	700	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	598.0 198.0	HIGH EXPIRY:	n/a
ID:	690	ID:	132	CYLINDER (psi):	800	LOW ID:	n/a
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	115	EXPIRY DATE	01-Aug-2026	LOW EXPIRY:	n/a

CALIBRATION PARAMETERS:

POINT (CH ₄ /NMHC)	HIGH	MID	LOW	CH ₄ EQUIVILANCE		
TARGET	14	7	3.5	C ₃ H ₈ as CH ₄		544.5
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄		1142.5

EXPECTED (REFERENCE) VALUE:

INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	10.63	11.01	21.64		10.44	10.97	21.41

CALIBRATION:

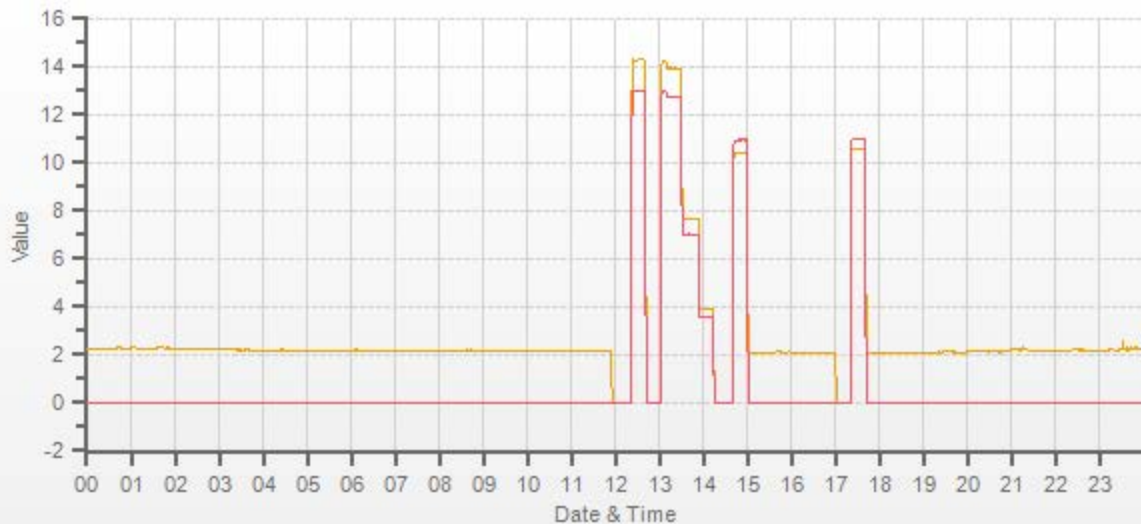
FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC
3000	X	3000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	X	X	X	X	X	X
2930	70.00	3000	13.95	12.71	26.66	14.27	13.02	27.29	13.95	12.71	26.66	0.978	0.976	0.977	1.000	1.000	1.000
2962	38.00	3000	7.57	6.90	14.47	n/a	n/a	n/a	7.67	6.99	14.66	n/a	n/a	n/a	0.988	0.987	0.987
2981	19.00	3000	3.79	3.45	7.24	n/a	n/a	n/a	3.88	3.55	7.44	n/a	n/a	n/a	0.976	0.971	0.973

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
CH ₄	1.000	0.999	0.3%
NMHC	1.000	0.999	0.3%
THC	1.000	0.999	0.3%

COMMENTS:

Sample inlet filter was changed



CAL-LICA-201911-01608

Page 19 of 27
CH4 [ppm] NMHC [ppm]

NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	07-Nov-2019	PREVIOUS CALIBRATION DATE:	15-Oct-2019	MAKE/MODEL:	Thermo 42i	PREVIOUS CF.	
CLIENT:	LICA	TEMPERATURE (°C):	24.0	SERIAL #:	1180930027	NOx	1.000
LOCATION:	Bonnyville - East	BAROMETRIC (mBar):	937.00	FLOW (mL/min)	677	NO	0.999
PURPOSE:	Routine	START TIME (MST):	10:22	RANGE (ppb)	1000	NO2	1.000
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:47	GPT FOR O3?		No	

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	API	MAKE:	Teledyne	CYLINDER ID:	LL107918	HIGH ID:	n/a
MODEL:	700	MODEL:	700	NO/NOx (PPM):	50.1 50.2	HIGH EXPIRY:	n/a
ID:	690	ID:	132	CYLINDER (psi):	800	LOW ID:	n/a
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a	EXPIRY DATE	20-Aug-2026	LOW EXPIRY:	n/a

CALIBRATION SETTINGS:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
BKG/OFFSET:	8	8	n/a	BKG/OFFSET:	8	8	n/a
SLOPE/COEF/CE:	1	1	1.0	SLOPE/COEF/CE:	1	1	1.0

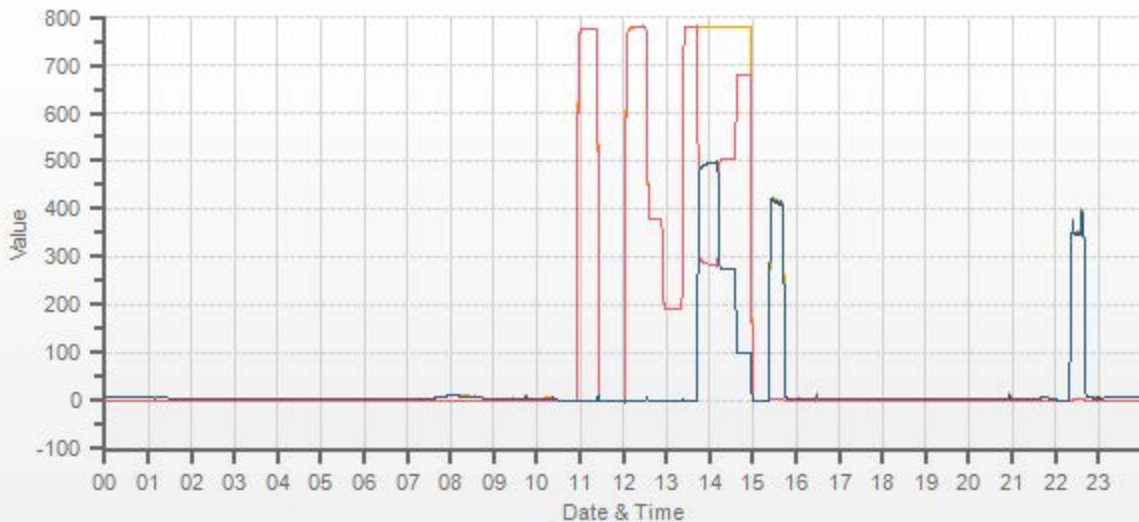
EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	413	4	409.0		416	3	413.0

POINT	NO TARGET (PPB)	NO2 TARGET (PPB)	NO2 RANGE	O3 POINT
HIGH	780	500	470-540	n/a
MID	380	275	235-310	n/a
LOW	190	90	80-115	n/a
EXTRA 1	n/a	n/a	n/a	n/a

FLOW RATE			CONCENTRATION (ppb)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2
5000	77.80	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.006	1.007	0.999	1.000	0.999	0.999
4922	77.80	5000	779.6	781.1	1.6	775.0	776.0	1.0	780.0	781.0	1.0	1.006	1.007	0.999	1.000	0.999	0.999
4962	37.90	5000	379.8	380.5	0.8	n/a	n/a	n/a	380.0	381.0	0.0	n/a	n/a	0.999	0.999	0.999	0.999
4981	18.90	5000	189.4	189.8	0.4	n/a	n/a	n/a	190.0	191.0	1.0	n/a	n/a	0.997	0.993	0.993	0.993

GPT CALIBRATION:										
Point	CALIBRATOR			INDICATED (ppb)			NO DROP / O3 Conc (ppb)	NO2 GAIN (ppb)	NO2 Corr. FACTOR	CONV. EFFICIENCY
	GAS	TOTAL	O3 SETPOINT	NO	NOx	NO2				
REFERENCE	77.80	5000	0	780.0	780.0	0.0	495	495	1.000	100.00%
AS-FOUND HIGH	77.80	5000	500	285.0	781.0	495.0	495	495	1.000	100.00%
ADJUSTED HIGH	77.80	5000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MID	77.80	5000	275	504.0	780.0	276.0	276	276	1.000	100.00%
LOW	77.80	5000	100	680.0	780.0	100.0	100	100	1.000	100.00%
NO2 adjustment not required.									AVERAGE:	100.00%

LINEAR REGRESSION ANALYSIS:				COMMENTS:
	CORRELATION	SLOPE	INTERCEPT	
NO	1.000	1.000	0.02%	
NOx	1.000	1.000	0.06%	
NO2	1.000	1.000	0.00%	



CAL-LICA-201911-01608

NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	26-Nov-2019	PREVIOUS CALIBRATION DATE:	07-Nov-2019	MAKE/MODEL:	Thermo 42i	PREVIOUS CF.	
CLIENT:	LICA	TEMPERATURE (°C):	24.0	SERIAL #:	1180930027	NOx	1.000
LOCATION:	Bonnyville - East	BAROMETRIC (mBar):	945.00	FLOW (mL/min)	633	NO	0.999
PURPOSE:	As-Found	START TIME (MST):	10:16	RANGE (ppb)	1000	NO2	1.000
PERFORMED BY:	Alex Yakupov	END TIME (MST):	11:39	GPT FOR O3?		No	

CALIBRATION SYSTEM:							
CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	API	MAKE:	Teledyne	CYLINDER ID:	LL107918	HIGH ID:	n/a
MODEL:	700	MODEL:	700	NO/NOx (PPM):	50.1 50.2	HIGH EXPIRY:	n/a
ID:	690	ID:	132	CYLINDER (psi):	700	LOW ID:	n/a
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a	EXPIRY DATE	20-Aug-2026	LOW EXPIRY:	n/a

CALIBRATION SETTINGS:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
BKG/OFFSET:	8	8	n/a	BKG/OFFSET:	8	8	n/a
SLOPE/COEF/CE:	1	1	1.0	SLOPE/COEF/CE:	1	1	1.0

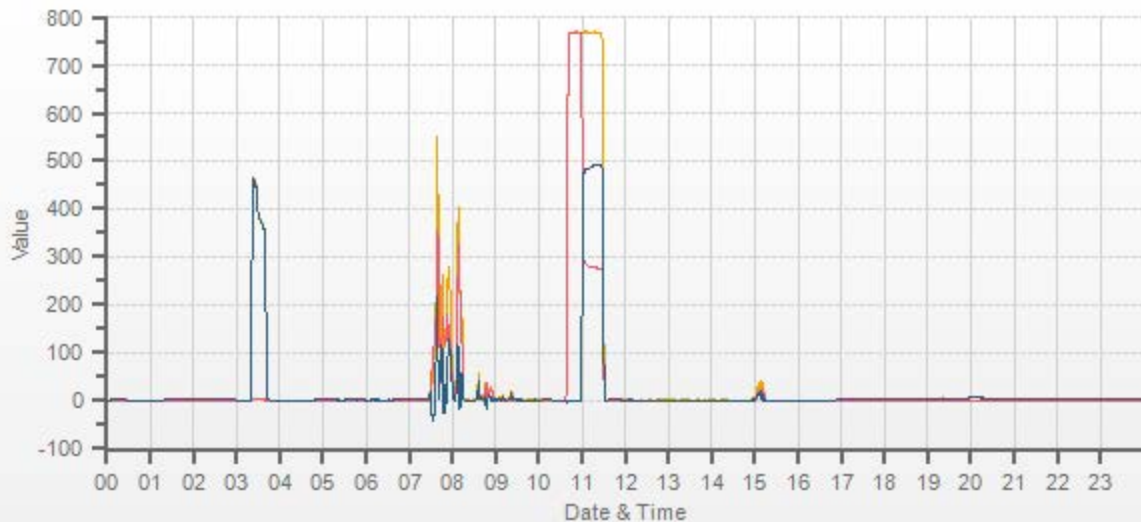
EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	449	4	444.9		449	4	444.9

CALIBRATION PARAMETERS:				
POINT	NO TARGET (PPB)	NO2 TARGET (PPB)	NO2 RANGE	O3 POINT
HIGH	780	500	470-540	n/a
MID	380	275	235-310	n/a
LOW	190	90	80-115	n/a
EXTRA 1	n/a	n/a	n/a	n/a

NO/NOx CALIBRATION:																	
FLOW RATE			CONCENTRATION (ppb)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2
5000	5000	5000	0.0	0.0	0.0	0.0	0.0	0.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4922	77.80	5000	779.6	781.1	1.6	767.0	769.0	2.0	n/a	n/a	n/a	1.016	1.016	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

GPT CALIBRATION:										
Point	CALIBRATOR			INDICATED (ppb)			NO DROP / O3 Conc (ppb)	NO2 GAIN (ppb)	NO2 Corr. FACTOR	CONV. EFFICIENCY
	GAS	TOTAL	O3 SETPOINT	NO	NOx	NO2				
REFERENCE	77.80	5000	0	767.0	769.0	2.0	n/a	n/a	n/a	n/a
AS-FOUND HIGH	77.80	5000	500	279.0	768.0	490.0	488	488	1.000	100.00%
ADJUSTED HIGH	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MID	n/a	n/a	275	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOW	n/a	n/a	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NO2 adjustment not required.									AVERAGE:	n/a

LINEAR REGRESSION ANALYSIS:				COMMENTS:
	CORRELATION	SLOPE	INTERCEPT	
NO	n/a	n/a	n/a	
NOx	n/a	n/a	n/a	
NO2	n/a	n/a	n/a	



CAL-LICA-201911-01608

Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	12-Nov-2019	PREVIOUS CALIBRATION DATE:	16-Oct-2019
PARAMETER:	Ozone	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	23.0
LOCATION:	Bonnyville - East	BAROMETRIC (mBar):	931
PURPOSE:	Routine	START TIME (MST):	11:52
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:52

ANALYZER:

MAKE/MODEL	Thermo 49i	RANGE	500 ppb
SERIAL #	10022440372	FLOW (mL/min)	1513
INITIAL		FINAL	
BKG/OFFSET	-0.2	BKG/OFFSET	0
COEF/SLOPE	1.024	COEF/SLOPE	1.024
Expected (reference) Value	368	Expected (reference) Value	377

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	03-Oct-2019	OXIDIZER ID:	n/a
CALIBRATION METHOD:		Photometer (Varying UV Lamp)	
GPT DATE:	n/a	GPT END TIME:	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
RANGE	300 - 400	150 - 200	50 - 100

CALIBRATION:

FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	 	5000	0.0	0.0	0.0	 	
5000	 	5000	380.0	380.0	380.0	1.000	1.000
5000	 	5000	180.0	n/a	180.0	n/a	1.000
5000	 	5000	60.0	n/a	60.0	n/a	1.000

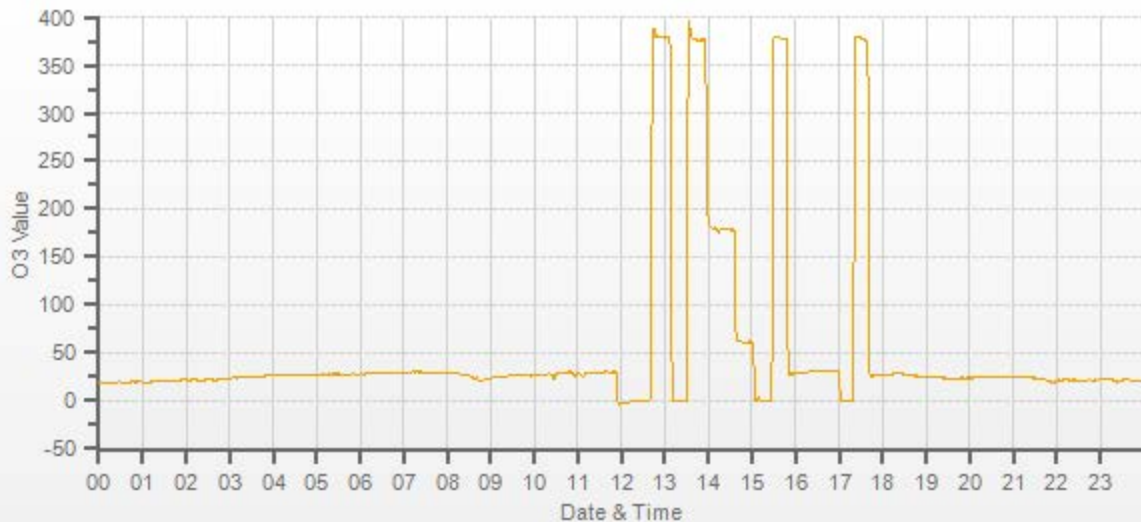
LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	0.0%

COMMENTS:

Sample inlet filter was changed.

O3[ppb] Station: Bonnyville East Daily: 12-11-2019 Type: AVG 1 Min. [1 Min.]



CAL-LICA-201911-01608

Thermo 5030i SHARP Monitor Monthly Check



Date: November 26, 2019
Company: LICA
Station Name/Location: Bonnyville - East
Previous Audit Date: October 25, 2019
Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Wunmi Adekanmbi
Start Time (mst): 12:42
End Time (mst): 13:25
Calibration Purpose: routine monthly
Weather Conditions: Light snow

SHARP 5030i Information and Status:

Serial Number: CM 17071016 **Filter Tape Counter:** 274

Reference Standards:

Air Flow

	Manometer	Orifice	Pressure:		Temp / RH:
Make:	Dwyer	chinook	Fisher Scientific	Jan 17, 2020	Fisher Scientific
Model:	475 Mk. III	CHN0901	FB61291		11745843
Serial Number:	#3	#2	130168457		160348895
Calibration Expiration Date:	January 17, 2020	January 31, 2020	January 17, 2020		June 19, 2020

Ambient Temperature (°C)

	Reference	SHARP	Difference	Range	Action
				< ± 2°C	OK
				2-3 °C	Recalibrate
				> 3°C	Fail
#1	-9.10	-9.2	0.1		

Ambient Relative Humidity (%RH)

	Reference	SHARP	Difference	Range	Action
As Found:				< ± 2 %RH	OK
				2-5 %RH	Recalibrate
				> 5 %RH	Fail
#1	72.00	71.2	0.8		

Barometric Pressure (mmHg)

	Reference	SHARP	Difference	Range	Action
As Found:				< ± 10 mmHg	OK
				10-12 mmHg	Recalibrate
				> 12 mmHg	Fail
#1	710.0	710.0	0.0		

Flow Audit (L/min)

	Reference	SHARP		Range	Action
As Found:				< ± 4%	OK
				4-5%	Recalibrate
				>5%	Fail
#1	16.65	16.66	% Difference 0.040008002		
#2	16.67	16.68			
#3	16.67	16.67			
Average	16.66	16.67			

Leak Check (L/min)

	Without Leak Check Adapter			With leak Check Adapter			
	Reference	SHARP	Difference	Reference	SHARP	Difference	
#1	16.67	16.67	0.00	16.62	16.64	-0.02	<i>Leak Limit: 0.80 L/min</i>
						LEAK RATE:	-0.02

End of Report