



**Lakeland Industry & Community Association**

**DECEMBER 2019**

**Monthly Ambient Air Quality Monitoring Report**

**LICA-201912**

**Operation and Maintenance:**

Bureau Veritas Canada

**Data Validation and Report:**

Lakeland Industry & Community Association

January 13, 2020

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**January 13, 2020**

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**RE: LICA – December 2019 Monthly Ambient Air Quality Monitoring Report**

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Enclosed is the December 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

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

## TABLE OF CONTECTS

<b>LIST OF ACRONYMS</b> .....	5
<b>NETWORK STATION SUMMARY</b> .....	6
<b>Listing of Continuous Monitoring Stations and Integrated Sampling Stations</b> .....	6
<b>List of Contractors who performed the air monitoring activities</b> .....	7
<b>Monitoring Notes during the Month of December 2019</b> .....	7
<b>Cold Lake South</b> .....	7
<b>Maskwa</b> .....	8
<b>St. Lina Station</b> .....	8
<b>Bonnyville East Station</b> .....	9
<b>Integrated Sampling</b> .....	9
<b>Revisions to Alberta’s Ambient Air Quality Data Warehouse</b> .....	11
<b>Deviations from Authorized Monitoring Methods</b> .....	11
<b>Disclaimer</b> .....	11
<b>Certification</b> .....	12
<b>Map of LICA Continuous Monitoring Network</b> .....	13
<b>CONTINUOUS NETWORK EQUIPMENT AND MONITORING RESULTS SUMMARY</b> .....	14
<b>Cold Lake South Station</b> .....	14
<b>Maskwa Station</b> .....	16
<b>St. Lina Station</b> .....	20
<b>Bonnyville - East Station</b> .....	23
<b>TABLES, CHARTS, WIND ROSES AND EQUIPMENT CALIBRATION RECORDS</b> .....	26
<b>COLD LAKE SOUTH STATION</b> .....	27
<b>MASKWA STATION</b> .....	92
<b>ST. LINA STATION</b> .....	151
<b>BONNYVILLE -EAST STATION</b> .....	220
<b>REFERENCE DOCUMENTS</b> .....	281
<b>HOURLY INSTANTANEOUS DATA</b> .....	282
<b>COLD LAKE SOUTH STATION</b> .....	283
<b>MASKWA STATION</b> .....	304
<b>ST. LINA STATION</b> .....	323
<b>BONNYVILLE -EAST STATION</b> .....	344
<b>END OF REPORT</b> .....	365

## 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 <sub>4</sub>	Methane
EPEA	Environmental Protection and Enhancement Act
H <sub>2</sub> S	Hydrogen Sulphide
kph	kilometers per hour
LICA	Lakeland Industry & Community Association
mb	millibar
mm	millimeter
NMHC	Non-Methane Hydrocarbons
NO	Nitric Oxide
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Oxide of Nitrogen
PAC	Polycyclic Aromatic Compounds
ppb	parts per billion
ppm	parts per million
RH	Relative Humidity
SO <sub>2</sub>	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 December 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 (87.5%). AEP reference #: 362344.
- **THC/CH4/NMHC:**
  - Due to poor sample injections that occurred on December 2, the Thermo 55i analyzer, s/n: 1236656107, was removed. A successful shut-down calibration was not able to achieve. The Thermo 55i analyzer, s/n: 1180030034, was installed. Column conditioning was run overnight. A successful installation calibration was performed on December 3. Data were invalidated back to the last valid zero-span check, which was December 1 hour 17. The N2 purifier was replaced and relocated and the carrier gas cylinder was replaced after the calibration was completed. Forty-two hours of data were discarded due to this event.

- Poor sample injection issues were observed again on December 9 hour 9. A repeat calibration was performed on December 9 to correct the issue. Five hours of downtime were recorded due to this event.
- The zero air supply failed on December 23 and was replaced on December 24. A post-repair calibration was performed on December 24. Data were invalidated back to the last valid zero-span check, which was December 22 hour 19. Forty-six hours of data were discarded 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 except THC/CH<sub>4</sub>/NMHC (88.6%). AEP reference #: 362277.
- **SO<sub>2</sub>/H<sub>2</sub>S:** Both analyzers failed the daily zero-span check on December 7 due to high shelter temperature. The thermostat was adjusted on December 8 and a repeat zero-span check was initiated. The analyzers passed the check requirements. One hour of downtime was recorded due to additional zero-span check.
- **THC/CH<sub>4</sub>/NMHC:**
  - Poor sample injection issues started appearing on December 13, and the analyzer completely malfunctioned on December 15 hour 12. The Thermo 55i analyzer, s/n: 1180930026, was removed. A successful shut-down calibration was not able to achieve. The Thermo 55i analyzer, s/n: 1236656188, was installed. Column conditioning was run overnight. A successful installation calibration was performed on December 3. Eighty hours of data were discarded due to this event.
  - Poor sample injection issues were observed again on December 22. Maintenance was performed on December 22 hour 8, including zero calibration and span calibration with span gas remotely. A completed repeat calibration was performed on December 23. A total of 5 hours of downtime was recorded due to this maintenance event.
- **RH:** Three hours of data were invalidated as the hourly readings were recorded overrange.

## 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.
- **THC/CH<sub>4</sub>/NMHC:** The span gas was replaced following a zero-span check on December 13 hour 15. One hour of downtime was recorded due to this maintenance activity.
- **O<sub>3</sub>:**
  - A monthly calibration attempted on December 11, but it was aborted due to issues from the calibration system, specific issue with the Teledyne T701 zero-air generator (ZAG). Five hours of downtime were recorded due to this event.



- On Dec 13, the Maxxam -supplied API 400A analyzer, s/n: 446, was removed, and the LICA-owned Thermo 49i analyzer, s/n: 1002240371, was installed. The Thermo 49i analyzer was removed in November 2019 for offsite repair.
- The analyzer failed the daily zero-span check on December 15. A repeat zero-span check was initiated on December 15 hour 20. The results failed the check requirements. It was determined the pump for the zero-span pump had failed. The pump was replaced following a repeat multi-point calibration on December 20. As the issue was isolated to the zero-span system, data quality was not affected. No data were discarded due to this issue. However, four hours of downtime were recorded due to additional calibration checks.

### **Bonnyville East Station**

- Measured parameters were below Alberta Ambient Air Quality Objectives (AAQOs) 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 scheduled daily zero-span check did not execute properly on December 19. A repeat zero-span check was initiated. The results met the check requirements. One hour of downtime was recorded due to this event.
- **THC/CH4/NMHC:** Both span gas cylinder and carrier gas cylinder were replaced following a zero-span check on December 27. One hour of downtime was recorded due to the additional zero-span check.
- **NOx/NO/NO2:** The analyzer failed the daily zero-span check on December 8. A repeat zero-span check were initiated on December 8 hour 19 and 20. The check results showed the analyzer could not reach the 20-minutes span point stability requirements. As 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. Data quality were not affected by this issue. Two hours of downtime were recorded due to additional zero-span checks.

### **Integrated Sampling**

All the integrated sampling analytical results are included in the December 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 December 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 December 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: December 5, 11, 17, 23 and 29.
- **Passive Sampling System:**
  - The passive sample filters were installed at the stations between December 2 and December 3, and were removed between December 31, 2019 and January 2, 2020.
  - A total of 9 duplicate samples were collected: 2 for H<sub>2</sub>S, 3 for SO<sub>2</sub>, 2 for NO<sub>2</sub> and 2 for O<sub>3</sub>.
- **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 December 10 at 16:20, at concentration of 0.36ppm.
- **PAC Sampling System:**
  - The PAC sampling program began in November 2019, and is designed to collect a 2-month integrated sample.
  - Sampling media for the sampling period November – December 2019 were deployed at 6 sites between October 21 and October 22, and were removed between December 31, 2019 and January 2, 2020.
  - Sampling media for the sampling period January - February 2020 were deployed between December 31, 2019 and January 2, 2020, and will be collected for analysis at the end of February 2020.

## **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).

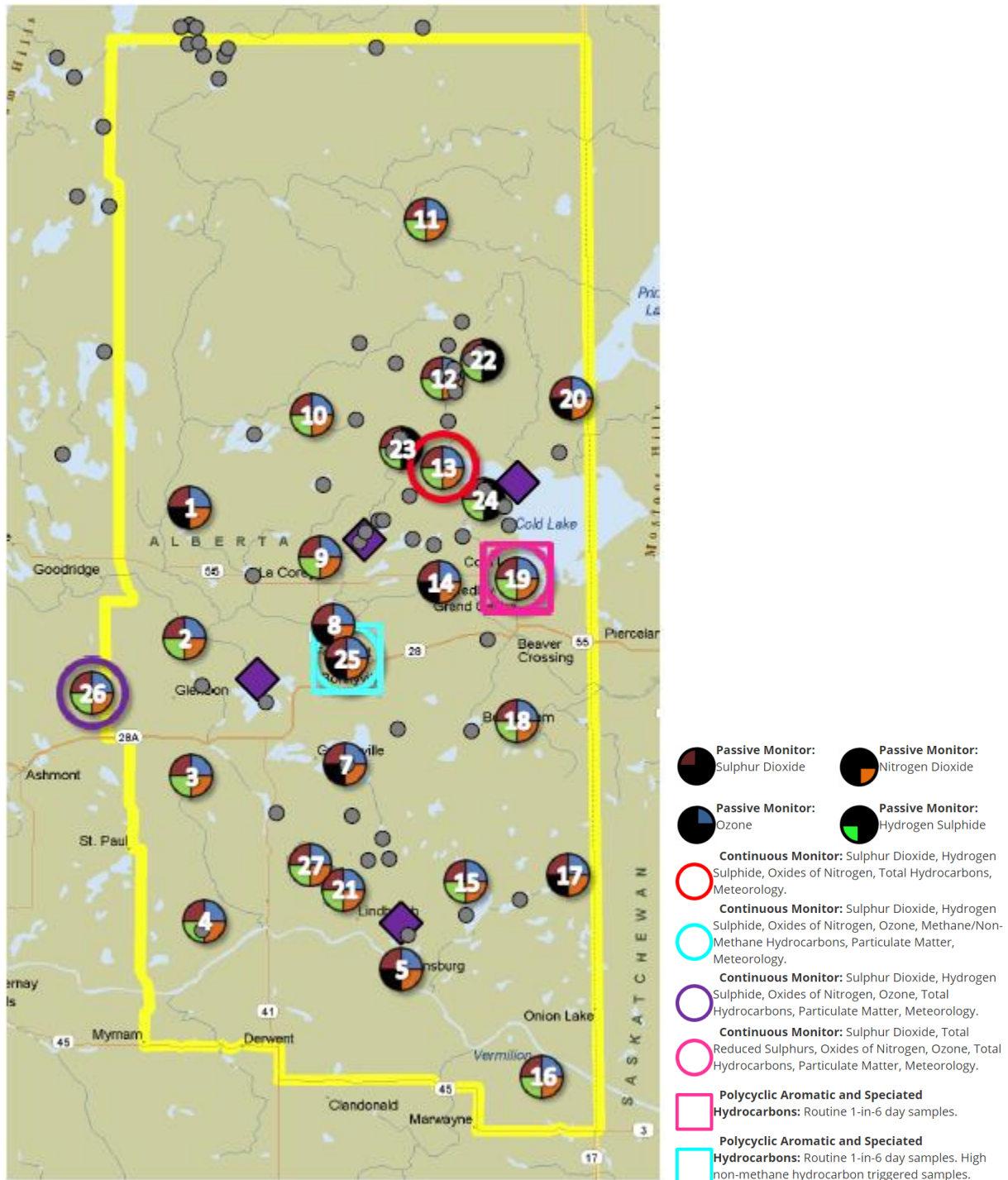
I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. I also certify that at the time of this report's submission, all 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 December 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

January 13, 2020

# 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
<b>Sulphur Dioxide (SO<sub>2</sub>)</b>	<b>Thermo / 43i-TLE</b>	<b>1180026018</b>	<b>December 12, 2019</b>
<ul style="list-style-type: none"> <li>No issues were identified this month.</li> </ul>			
<b>Total Reduced Sulphur (TRS)</b>	<b>Thermo / 450i</b>	<b>812728560</b>	<b>December 12, 2019</b>
<ul style="list-style-type: none"> <li>No issues were identified this month.</li> </ul>			
<b>Oxide of Nitrogen / Nitric Oxide/ Nitrogen Dioxide (NO<sub>x</sub>/NO/NO<sub>2</sub>)</b>	<b>Thermo / 42i</b>	<b>1505664393</b>	<b>December 12, 2019</b>
<ul style="list-style-type: none"> <li>No issues were identified this month.</li> </ul>			
<b>Ozone (O<sub>3</sub>)</b>	<b>Thermo / 49i</b>	<b>700419951</b>	<b>December 16, 2019</b>
<ul style="list-style-type: none"> <li>No issues were identified this month.</li> </ul>			
<b>Total Hydrocarbons / Methane/ Non-methane Hydrocarbons (THC/CH<sub>4</sub>/NMHC)</b>	<b>Thermo / 55i</b>	<b>11800300034</b>	<b>December 24, 2019</b>
<ul style="list-style-type: none"> <li>Due to poor sample injections that occurred on December 2, the Thermo 55i analyzer, s/n: 1236656107, was removed. A successful shut-down calibration was not able to achieve. The Thermo 55i analyzer, s/n: 1180030034, was installed. Column conditioning was run overnight. A successful installation calibration was performed on December 3. Data were invalidated back to the last valid zero-span check, which was December 1 hour 17. The N<sub>2</sub> purifier was replaced and relocated and the carrier gas cylinder was replaced after the calibration was completed. Forty-two hours of data were discarded due to this event.</li> <li>Poor sample injection issues were observed again on December 9 hour 9. A repeat calibration was performed on December 9 to correct the issue. Five hours of downtime were recorded due tot his event.</li> <li>The H<sub>2</sub> gas cylinder was replaced on December 20. (Continued on next page)</li> </ul>			

Parameter	Make / Model	Serial Number	Calibration Date
<b>Total Hydrocarbons / Methane/ Non-methane Hydrocarbons (THC/CH4/NMHC)</b>	<b>Thermo / 55i</b>	<b>11800300034</b>	<b>December 24, 2019</b>
<ul style="list-style-type: none"> <li>The zero air supply failed on December 23 and was replaced on December 24. A post-repair calibration was performed on December 24. Data were invalidated back to the last valid zero-span check, which was December 22 hour 19. Forty-six hours of data were discarded due to this event.</li> </ul>			
<b>Particulate Matter 2.5 (PM2.5)</b>	<b>Thermo / Sharp 5030</b>	<b>CM-2209</b>	<b>December 27, 2019</b>
<ul style="list-style-type: none"> <li>No issues were identified this month.</li> </ul>			
<b>Relative Humidity (RH)</b>	<b>Rotronic / Hydroclip-S3</b>	<b>PFD919-121406 / Part 50.5PS</b>	<b>January 26, 2018</b>
<ul style="list-style-type: none"> <li>No issues were identified this month.</li> </ul>			
<b>Ambient Temperature (AT)</b>	<b>Rotronic / Hydroclip-S3</b>	<b>PFD919-121406 / Part 50.5PS</b>	<b>January 26, 2018</b>
<ul style="list-style-type: none"> <li>No issues were identified this month.</li> </ul>			
<b>Station Temperature (ST)</b>	<b>Maxxam-supplied</b>	<b>n/a</b>	<b>n/a</b>
<ul style="list-style-type: none"> <li>No issues were identified this month.</li> </ul>			
<b>Wind Speed (WS) / Wind Direction (WD)/ Stand Deviation Wind Direction (STDWD)</b>	<b>RM Young /05305VK</b>	<b>161466</b>	<b>October 9, 2019</b>
<ul style="list-style-type: none"> <li>Wind direction data contained in this report represents where the wind is coming from.</li> <li>No issues were identified this month.</li> </ul>			

## Monitored Data Summary for December 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	0.2	0	2	December 2 at hour 22	8.3	WSW	0.7	December 5	100.0	95.0
TRS (ppb)	10	3	-	-	-	-	0.0	0	1	December 22 at hour 19	3.9	WSW	0.2	December 22	100.0	95.0
Nox (ppb)	-	-	-	-	-	-	7.8	0	52	December 9 at hour 7	10.4	N	24.9	December 30	100.0	94.7
NO (ppb)	-	-	-	-	-	-	1.5	0	39	December 9 at hour 7	10.4	N	10.7	December 30	100.0	94.7
NO2 (ppb)	159	-	-	0	-	-	6.2	0	26	December 18 at hour 17	2.5	ENE	14.3	December 30	100.0	94.7
O3 (ppb)	76	-	-	0	-	-	21.0	0	37	December 3 at hour 15	11.1	W	33.1	December 3	100.0	95.3
THC (ppm)	-	-	-	-	-	-	2.18	1.94	2.95	December 7 at hour 4	0.4	SW	2.62	December 30	87.5	83.0
CH4 (ppm)	-	-	-	-	-	-	2.16	1.94	2.82	December 7 at hour 4	0.4	SW	2.52	December 30	87.5	83.0
NMHC (ppm)	-	-	-	-	-	-	0.02	0.00	0.55	December 18 at hour 17	2.5	ENE	0.10	December 30	87.5	83.0
PM2.5 (µg/m3)	80	30	-	0	0	-	5.6	0	30	December 20 at hour 9	4.6	E	13.4	December 20	100.0	99.6
RH (%)	-	-	-	-	-	-	77.8	50	96	December 22 at hour 12	9.5	WSW	93.3	December 22	100.0	100.0
Ext. Temp. (°C)	-	-	-	-	-	-	-11.9	-30.0	4.5	December 3 at hour 13	12.1	W	-0.3	December 3	100.0	100.0
Stn. Temp. (°C)	-	-	-	-	-	-	21.0	14.7	22.4	December 3 at hour 8	8.1	WSW	22.0	December 3	100.0	100.0
WSV (km/hr)	-	-	-	-	-	-	0.7	0.0	16.3	December 18 at hour 7	16.3	NNW	8.5	December 3	100.0	100.0
WDV (sector)	-	-	-	-	-	-	223 (SW)	-	-	-	-	-	-	-	100.0	100.0

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.



## Maskwa Station

### Equipment Operation Summary

Parameter	Make / Model	Serial Number	Calibration Date
<b>Sulphur Dioxide (SO2)</b>	<b>Thermo / 43i-TLE</b>	<b>1180930031</b>	<b>December 19, 2019</b>
<ul style="list-style-type: none"> <li>The analyzer failed the daily zero-span check on December 7 due to high shelter temperature. The thermostat was adjusted on December 8 and a repeat zero-span check was initiated. The analyzer passed the check requirements. One hour of downtime was recorded due to additional zero-span check. The root cause for the analyzer malfunction was due to sudden low ambient temperature, which caused the AC unit to switch on the heating mode frequency and for longer time periods, and eventually overheated the station.</li> </ul>			
<b>Hydrogen Sulphide (H2S)</b>	<b>Thermo / 450i</b>	<b>CM17360005</b>	<b>December 18, 2019</b>
<ul style="list-style-type: none"> <li>The analyzer failed the daily zero-span check on December 7 due to high shelter temperature. The thermostat was adjusted on December 8 and a repeat zero-span check was initiated. The analyzer passed the check requirements. One hour of downtime was recorded due to additional zero-span check. The root cause for the analyzer malfunction was due to sudden low ambient temperature, which caused the AC unit to switch on the heating mode frequency and for longer time periods, and eventually overheated the station.</li> </ul>			
<b>Oxide of Nitrogen / Nitric Oxide/ Nitrogen Dioxide (NOx/NO/NO2)</b>	<b>Thermo / 42i</b>	<b>1180930028</b>	<b>December 19, 2019</b>
<ul style="list-style-type: none"> <li>No issues were identified this month.</li> </ul>			
<b>Total Hydrocarbons / Methane/ Non-methane Hydrocarbons (THC/CH4/NMHC)</b>	<b>Thermo / 55i</b>	<b>1180930026 / 1236656188</b>	<b>December 23, 2019</b>
<ul style="list-style-type: none"> <li>Poor sample injection issues started appearing on December 13, and the analyzer completely malfunctioned on December 15 hour 12. The Thermo 55i analyzer, s/n: 1180930026, was removed. A successful shut-down calibration was not able to achieve. The Thermo 55i analyzer, s/n: 1236656188, was installed. Column conditioning was run overnight. A successful installation calibration was performed on December 3. Eighty hours of data were discarded due to this event.</li> <li>Poor sample injection issues were observed again on December 22. Maintenance were performed on December 22 hour 8, including zero calibration and span calibration with span gas remotely. A completed repeat calibration was performed on December 23. A total of 5 hours of downtime was recorded due to this maintenance event.</li> </ul>			

<b>Parameter</b>	<b>Make / Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>
<b>Relative Humidity (RH)</b>	<b>Campbell Scientific 070 / HC2A-S3</b>	<b>20257103</b>	<b>November 29, 2019</b>
<ul style="list-style-type: none"> <li>• Three hours of data were invalidated as the hourly readings were recorded overrange.</li> </ul>			
<b>Ambient Temperature (AT)</b>	<b>Campbell Scientific 070 / HC2A-S3</b>	<b>20257103</b>	<b>November 29, 2019</b>
<ul style="list-style-type: none"> <li>• No issues were identified this month.</li> </ul>			
<b>Barometric Pressure (BP)</b>	<b>Met One / Part 090D</b>	<b>F4997</b>	<b>February 15, 2019</b>
<ul style="list-style-type: none"> <li>• No issues were identified this month.</li> </ul>			
<b>Station Temperature (ST)</b>	<b>Maxxam-supplied</b>	<b>n/a</b>	<b>n/a</b>
<ul style="list-style-type: none"> <li>• No issues were identified this month.</li> </ul>			
<b>Precipitation (PRECIP)</b>	<b>Met One / Part 387-Heated Rain Gauge</b>	<b>F4481</b>	<b>November 29, 2019</b>
<ul style="list-style-type: none"> <li>• No issues were identified this month.</li> </ul>			
<b>Wind Speed (WS) / Wind Direction (WD)/ Stand Deviation Wind Direction (STDWD)</b>	<b>RM Young / 05305VK</b>	<b>161465</b>	<b>September 19, 2019</b>
<ul style="list-style-type: none"> <li>• Wind direction data contained in this report represents where the wind is coming from.</li> <li>• No issues were identified this month.</li> </ul>			

## Monitored Data Summary for December 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	0.7	0	9	December 16 at hour 7	6.6	NW	1.7	December 27	99.9	95.0
H2S (ppb)	10	3	-	0	0	-	0.0	0	1	December 5 at hour 20	6.2	SSW	0.3	December 30	99.9	94.7
Nox (ppb)	-	-	-	-	-	-	5.9	0	25	December 6 at hour 7	3.9	SW	16.0	December 6	100.0	94.9
NO (ppb)	-	-	-	-	-	-	0.5	0	8	December 6 at hour 10	3.3	SSW	2.3	December 6	100.0	94.9
NO2 (ppb)	159	-	-	0	-	-	5.4	0	20	December 2 at hour 2	4.8	SSW	13.7	December 6	100.0	94.9
THC (ppm)	-	-	-	-	-	-	2.17	1.90	2.72	December 31 at hour 9	4.7	SSW	2.43	December 31	88.6	84.1
CH4 (ppm)	-	-	-	-	-	-	2.17	1.90	2.72	December 31 at hour 9	4.7	SSW	2.43	December 31	88.6	84.1
NMHC (ppm)	-	-	-	-	-	-	0.00	0.00	0.07	December 10 at hour 3	1.1	SE	0.00	December 10	88.6	84.1
RH (%)	-	-	-	-	-	-	85.2	55	100	December 22 at hour 9	3.3	SW	98.7	December 24	99.6	99.6
BP (millibar)	-	-	-	-	-	-	931	911	944	December 10 at hour 16	3.3	ENE	942	December 10	100.0	100.0
Ext. Temp. (°C)	-	-	-	-	-	-	-11.9	-30.6	3.8	December 3 at hour 13	10.5	WNW	-0.3	December 3	100.0	100.0
Stn. Temp. (°C)	-	-	-	-	-	-	20.6	19.5	30.5	December 7 at hour 23	1.2	NNE	24.1	December 8	100.0	100.0
Precipitation (mm)*	-	-	-	-	-	-	0.2	0.0	0.1	December 12 at hour 0	4.5	ESE	0.2	December 12	100.0	100.0
WSV (km/hr)	-	-	-	-	-	-	1.0	0.0	11.2	December 7 at hour 10	11.2	NNE	5.7	December 3	100.0	100.0
WDV (sector)	-	-	-	-	-	-	206 (SSW)	-	-	-	-	-	-	-	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.

## St. Lina Station

### Equipment Operation Summary

Parameter	Make / Model	Serial Number	Calibration Date
<b>Sulphur Dioxide (SO<sub>2</sub>)</b>	<b>Thermo / 43i-TLE</b>	<b>1180930030</b>	<b>December 10, 2019</b>
<ul style="list-style-type: none"> <li>No issues were identified this month.</li> </ul>			
<b>Hydrogen Sulphide (H<sub>2</sub>S)</b>	<b>Thermo / 450i</b>	<b>CM18010058</b>	<b>December 10, 2019</b>
<ul style="list-style-type: none"> <li>No issues were identified this month.</li> </ul>			
<b>Oxide of Nitrogen / Nitric Oxide/ Nitrogen Dioxide (NO<sub>x</sub>/NO/NO<sub>2</sub>)</b>	<b>Thermo / 42i</b>	<b>1180930029</b>	<b>December 10, 2019</b>
<ul style="list-style-type: none"> <li>No issues were identified this month.</li> </ul>			
<b>Ozone (O<sub>3</sub>)</b>	<b>API / 400A, Thermo / 49i</b>	<b>446 / 1002240371</b>	<b>December 20, 2019</b>
<ul style="list-style-type: none"> <li>A monthly calibration attempted on December 11, but it was aborted due to issues from the calibration system, specific issue with the Teledyne T701 zero-air generator (ZAG). Five hours of downtime were recorded due to this event. The Dec 11 calibration failed as the analyzer was responding too slowly to changes in concentration (drift in both the as-found zero and as-found high can be seen in the data). Following data review and conclusions from the field operators, the 'failure' was determined to be caused by the calibration system (specifically the Teledyne T701 zero-air generator (ZAG)) rather than any specific issue with the API400 analyzer. O<sub>3</sub> analyzers are known to be sensitive to changing humidity in the sample and this problem was exacerbated by low ambient temperatures combined with the very dry output of a Teledyne ZAG.</li> <li>On Dec 13, the Maxxam -supplied API 400A analyzer, s/n: 446, was removed, and the LICA-owned Thermo 49i analyzer, s/n: 1002240371, was installed. The Thermo 49i analyzer was removed in November 2019 for offsite repair.</li> <li>The analyzer failed the daily zero-span check on December 15. A repeat zero-span check was initiated on December 15 hour 20. The results failed the check requirements. It was determined that the pump for the zero-span pump had failed. The pump was replaced following a repeat multi-point calibration on December 20. As the issue was isolated to the zero-span system, data quality was not affected. No data were discarded due to this issue. However, four hours of downtime were recorded due to additional calibration checks.</li> </ul>			

Parameter	Make / Model	Serial Number	Calibration Date
<b>Total Hydrocarbons / Methane/ Non-methane Hydrocarbons (THC/CH4/NMHC)</b>	<b>Thermo / 55i</b>	<b>1180930025</b>	<b>December 11, 2019</b>
<ul style="list-style-type: none"> <li>• During the monthly calibration on December 11, zero chromatogram was completed.</li> <li>• The span gas was replaced following a zero-span check on December 13 hour 15. One hour of downtime was recorded due to this maintenance activity.</li> </ul>			
<b>Particulate Matter 2.5 (PM2.5)</b>	<b>Thermo / Sharp 5030i</b>	<b>CM17091001</b>	<b>December 11, 2019</b>
<ul style="list-style-type: none"> <li>• No issues were identified this month.</li> </ul>			
<b>Relative Humidity (RH)</b>	<b>Vaisala Oyj. Finland / HMP155</b>	<b>R2640785</b>	<b>June 28, 2019</b>
<ul style="list-style-type: none"> <li>• No issues were identified this month.</li> </ul>			
<b>Ambient Temperature (AT)</b>	<b>Vaisala Oyj. Finland / HMP155</b>	<b>R2640785</b>	<b>June 28, 2019</b>
<ul style="list-style-type: none"> <li>• No issues were identified this month.</li> </ul>			
<b>Barometric Pressure (BP)</b>	<b>Met One / Part 090D</b>	<b>F4998</b>	<b>February 21, 2019</b>
<ul style="list-style-type: none"> <li>• No issues were identified this month.</li> </ul>			
<b>Station Temperature (ST)</b>	<b>Maxxam-supplied</b>	<b>n/a</b>	<b>n/a</b>
<ul style="list-style-type: none"> <li>• No issues were identified this month.</li> </ul>			
<b>Precipitation (PRECIP)</b>	<b>Met One / Part 387-Heated Rain Gauge</b>	<b>n/a</b>	<b>November 18, 2019</b>
<ul style="list-style-type: none"> <li>• No issues were identified this month.</li> </ul>			
<b>Wind Speed (WS) / Wind Direction (WD)/ Stand Deviation Wind Direction (STDWD)</b>	<b>RM Young / 05305VK</b>	<b>65521</b>	<b>May 17, 2019</b>
<ul style="list-style-type: none"> <li>• Wind direction data contained in this report represents where the wind is coming from</li> <li>• No issues were identified this month.</li> </ul>			

## Monitored Data Summary for December 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	0.4	0	5	December 26 at hour 17	11.9	SW	1.2	December 5	100.0	95.1
H2S (ppb)	10	3	-	0	0	-	0.0	0	1	December 22 at hour 12	11.9	WSW	0.3	December 22	100.0	95.1
Nox (ppb)	-	-	-	-	-	-	5.0	0	33	December 6 at hour 8	8.8	SW	15.3	December 6	100.0	94.9
NO (ppb)	-	-	-	-	-	-	0.4	0	11	December 6 at hour 9	9.8	SW	2.0	December 6	100.0	94.9
NO2 (ppb)	159	-	-	0	-	-	4.6	0	29	December 6 at hour 7	9.4	SW	13.2	December 6	100.0	94.9
O3 (ppb)	76	-	-	0	-	-	26.9	0	41	December 16 at hour 18	6.2	ESE	38.6	December 3	98.8	93.7
THC (ppm)	-	-	-	-	-	-	2.09	1.91	2.50	December 14 at hour 4	9.8	S	2.30	December 23	99.9	95.0
CH4 (ppm)	-	-	-	-	-	-	2.09	1.91	2.50	December 14 at hour 4	9.8	S	2.30	December 23	99.9	95.0
NMHC (ppm)	-	-	-	-	-	-	0.00	0.00	0.04	December 24 at hour 23	2.4	SE	0.00	December 24	99.9	95.0
PM2.5 (µg/m3)	80	30	-	0	0	-	6.9	0	30	December 30 at hour 8	12.1	SSW	13.8	December 30	100.0	99.9
RH (%)	-	-	-	-	-	-	81.3	47	96	December 23 at hour 19	3.2	SW	92.4	December 23	100.0	100.0
BP (millibar)	-	-	-	-	-	-	914	896	925	December 9 at hour 10	8.8	N	923	December 10	100.0	100.0
Ext. Temp. (°C)	-	-	-	-	-	-	-10.8	-26.2	4.2	December 3 at hour 13	20	WNW	0.4	December 3	100.0	100.0
Stn. Temp. (°C)	-	-	-	-	-	-	21.6	18.9	23.2	December 3 at hour 16	14.4	WNW	22.3	December 3	100.0	100.0
Precipitation (mm)*	-	-	-	-	-	-	4.4	0.0	1.3	December 31 at hour 14	16.9	W	2.8	December 31	100.0	100.0
WSV (km/hr)	-	-	-	-	-	-	3.8	0.0	24.0	December 3 at hour 0	24	WSW	16.9	December 3	100.0	100.0
WDV (sector)	-	-	-	-	-	-	229 (SW)	-	-	-	-	-	-	-	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 (AAQOs) Exceedances

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

## Bonnyville - East Station

### Equipment Operation Summary

Parameter	Make / Model	Serial Number	Calibration Date
<b>Sulphur Dioxide (SO2)</b>	<b>Thermo / 43i-TLE</b>	<b>1180320043</b>	<b>December 5, 2019</b>
<ul style="list-style-type: none"> <li>No issues were identified this month.</li> </ul>			
<b>Hydrogen Sulphide (H2S)</b>	<b>Thermo / 450i</b>	<b>CM17360002</b>	<b>December 5, 2019</b>
<ul style="list-style-type: none"> <li>The scheduled daily zero-span check did not execute properly on December 19. Reason for the root cause cannot be determined. A repeat zero-span check was initiated. The results met the check requirements. One hour of downtime was recorded due to this event.</li> </ul>			
<b>Oxide of Nitrogen / Nitric Oxide/ Nitrogen Dioxide (NOx/NO/NO2)</b>	<b>Thermo / 42i</b>	<b>1180930027</b>	<b>December 5, 2019</b>
<ul style="list-style-type: none"> <li>The analyzer failed the daily zero-span check on December 8. A repeat zero-span check were initiated on December 8 hour 19 and 20. The check results showed the analyzer could not reach the 20-minutes span point stability requirements. As 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. Data quality were not affected by this issue. Two hours of downtime were recorded due to additional zero-span checks.</li> </ul>			
<b>Ozone (O3)</b>	<b>Thermo / 49i</b>	<b>1002240372</b>	<b>December 6, 2019</b>
<ul style="list-style-type: none"> <li>No issues were identified this month.</li> </ul>			
<b>Total Hydrocarbons / Methane/ Non-methane Hydrocarbons (THC/CH4/NMHC)</b>	<b>Thermo / 55i</b>	<b>1180320044</b>	<b>December 6, 2019</b>
<ul style="list-style-type: none"> <li>Both span gas cylinder and carrier gas cylinder were replaced following a zero-span check on December 27. One hour of downtime was recorded due to the additional zero-span check.</li> </ul>			

<b>Parameter</b>	<b>Make / Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>
<b>Particulate Matter 2.5 (PM2.5)</b>	<b>Thermo / Sharp 5030i</b>	<b>CM17071016</b>	<b>December 23, 2019</b>
<ul style="list-style-type: none"> <li>• A power outage occurred on December 8 between hour 11 and hour 15. Five hours of data were invalidated.</li> </ul>			
<b>Station Temperature (ST)</b>	<b>Maxxam-supplied</b>	<b>n/a</b>	<b>n/a</b>
<ul style="list-style-type: none"> <li>• A power outage occurred on December 8 between hour 11 and hour 15. Five hours of data were invalidated.</li> </ul>			
<b>Wind Speed (WS) / Wind Direction (WD)/ Stand Deviation Wind Direction (STDWD)</b>	<b>RM Young / 05305VK</b>	<b>56778</b>	<b>October 25, 2019</b>
<ul style="list-style-type: none"> <li>• Wind direction data contained in this report represents where the wind is coming from.</li> <li>• A power outage occurred on December 8 between hour 11 and hour 15. Five hours of data were invalidated.</li> </ul>			



## Monitored Data Summary for December 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	0.5	0	3	December 14 at hour 13	12.8	SW	1.5	December 17	100.0	95.0
H2S (ppb)	10	3	-	0	0	-	0.3	0	5	December 1 at hour 23	4.5	WSW	1.3	December 30	99.9	94.7
Nox (ppb)	-	-	-	-	-	-	6.3	1	100	December 10 at hour 11	6.7	NNE	15.2	December 13	99.7	94.5
NO (ppb)	-	-	-	-	-	-	0.8	0	68	December 10 at hour 11	6.7	NNE	6.4	December 10	99.7	94.5
NO2 (ppb)	159	-	-	0	-	-	5.4	0	33	December 10 at hour 11	6.7	NNE	12.4	December 13	99.7	94.5
O3 (ppb)	76	-	-	0	-	-	23.5	1	39	December 3 at hour 16	18.2	W	35.8	December 3	100.0	95.0
THC (ppm)	-	-	-	-	-	-	2.25	1.97	4.89	December 30 at hour 9	2.4	E	3.04	December 30	99.7	94.7
CH4 (ppm)	-	-	-	-	-	-	2.25	1.97	4.89	December 30 at hour 9	2.4	E	3.04	December 30	99.7	94.7
NMHC (ppm)	-	-	-	-	-	-	0.00	0.00	0.07	December 10 at hour 16	5.2	E	0.00	December 10	99.7	94.7
PM2.5 (µg/m3)	80	30	-	0	0	-	7.4	0	24	December 7 at hour 0	5.3	S	16.8	December 20	100.0	99.7
Stn. Temp. (°C)	-	-	-	-	-	-	23.8	20.6	25.3	December 13 at hour 8	5.3	WSW	24.4	December 13	100.0	100.0
WSV (km/hr)	-	-	-	-	-	-	1.9	0.0	26.8	December 19 at hour 2	26.8	ENE	16.6	December 3	100.0	100.0
WDV (sector)	-	-	-	-	-	-	236 (SW)	-	-	-	-	-	-	-	100.0	100.0

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

### Alberta Ambient Air Quality Objectives (AAAQOs) Exceedances

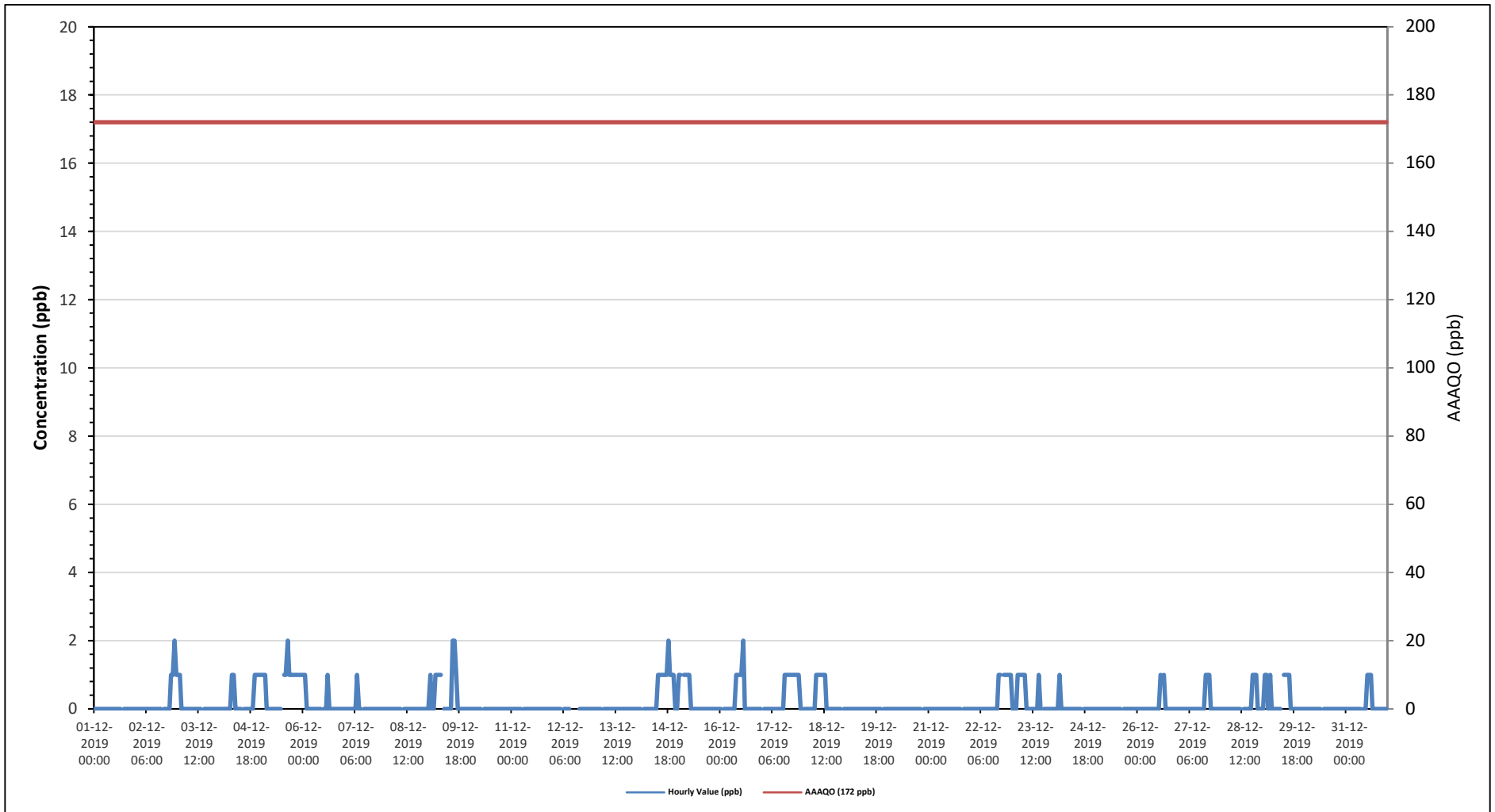
The measured ambient air quality was within the AAAQOs for all monitored parameters.

TABLES, CHARTS, WIND ROSES AND EQUIPMENT CALIBRATION RECORDS

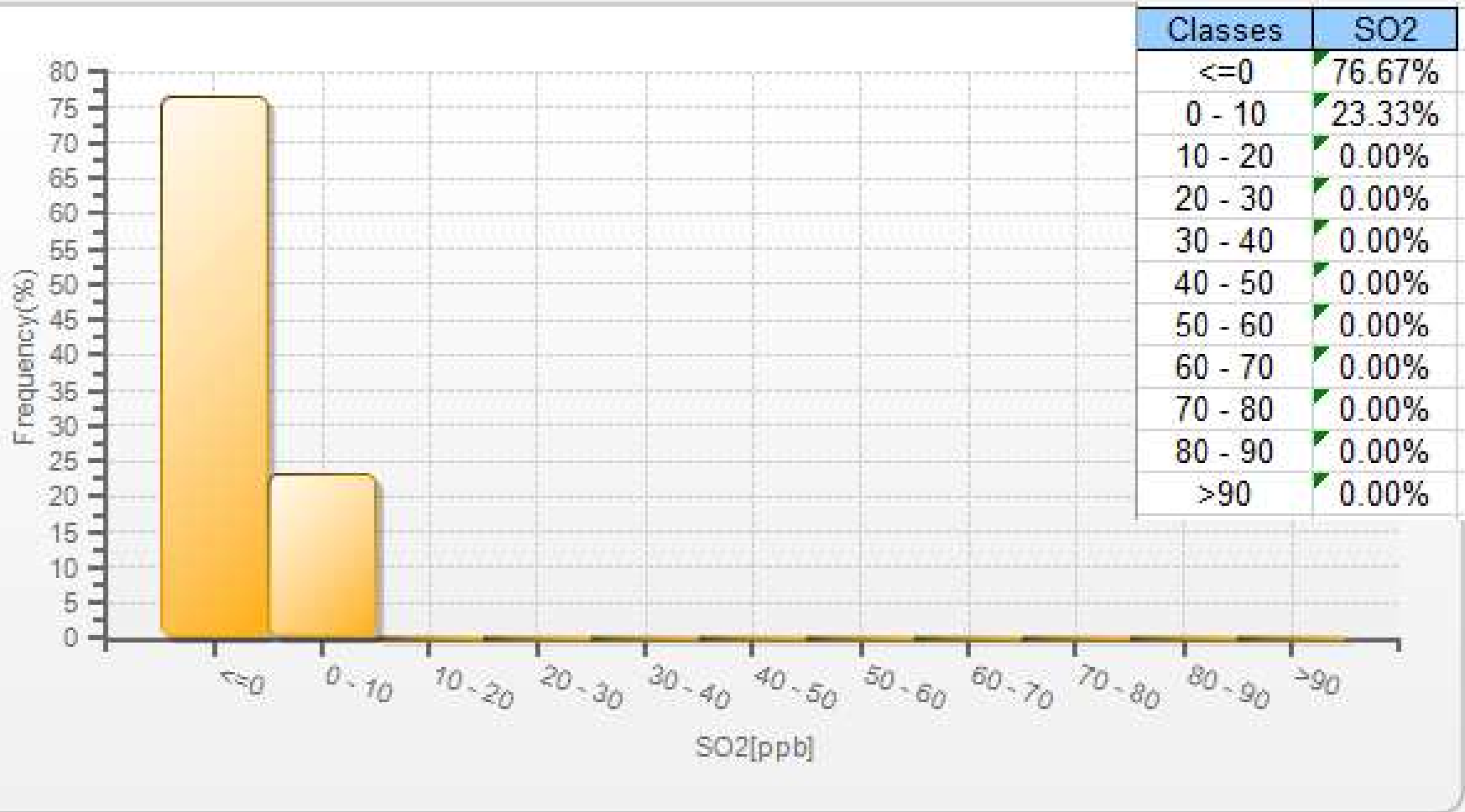
**COLD LAKE SOUTH STATION**



**Timeseries Chart of Hourly Average for SO<sub>2</sub> - Cold Lake South Station**

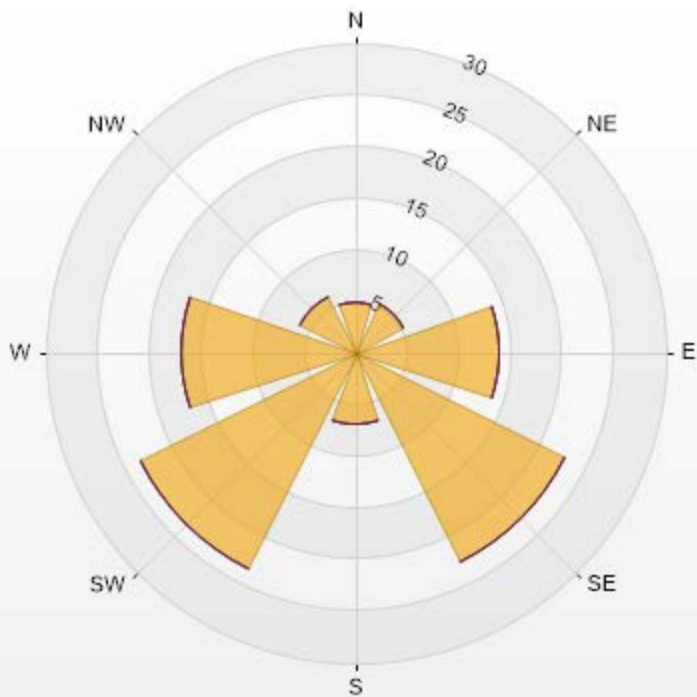


SO2[ppb] Histogram: Cold Lake South Monthly: 12-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-SO2[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00 [ppb]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	4.84	0	0	0	0	4.84
NE	5.26	0	0	0	0	5.26
E	13.94	0	0	0	0	13.94
SE	22.62	0	0	0	0	22.62
S	6.97	0	0	0	0	6.97
SW	23.33	0	0	0	0	23.33
W	16.93	0	0	0	0	16.93
NW	6.12	0	0	0	0	6.12
Summary	100	0	0	0	0	100

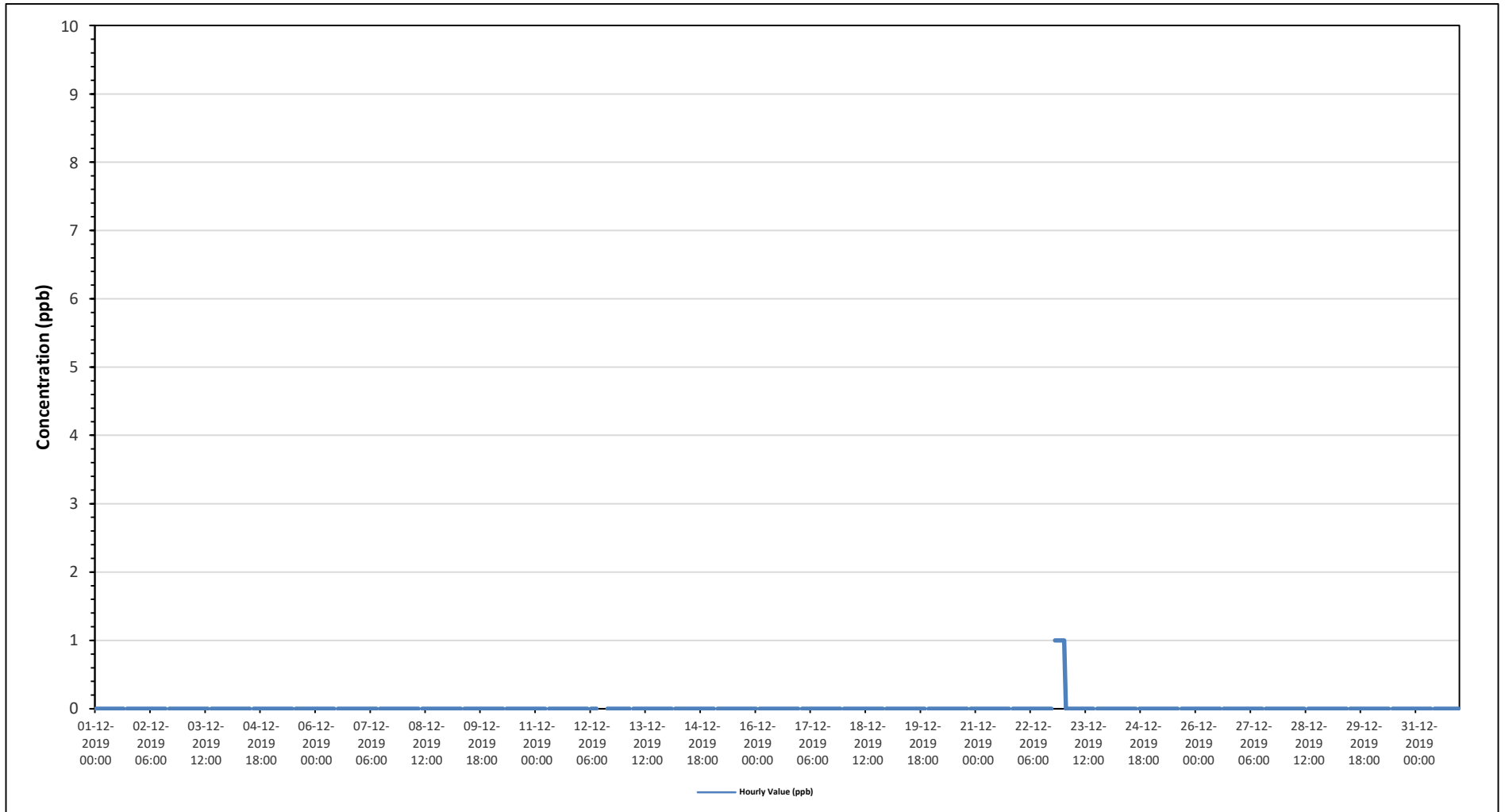


LICA-201912-Revision 1

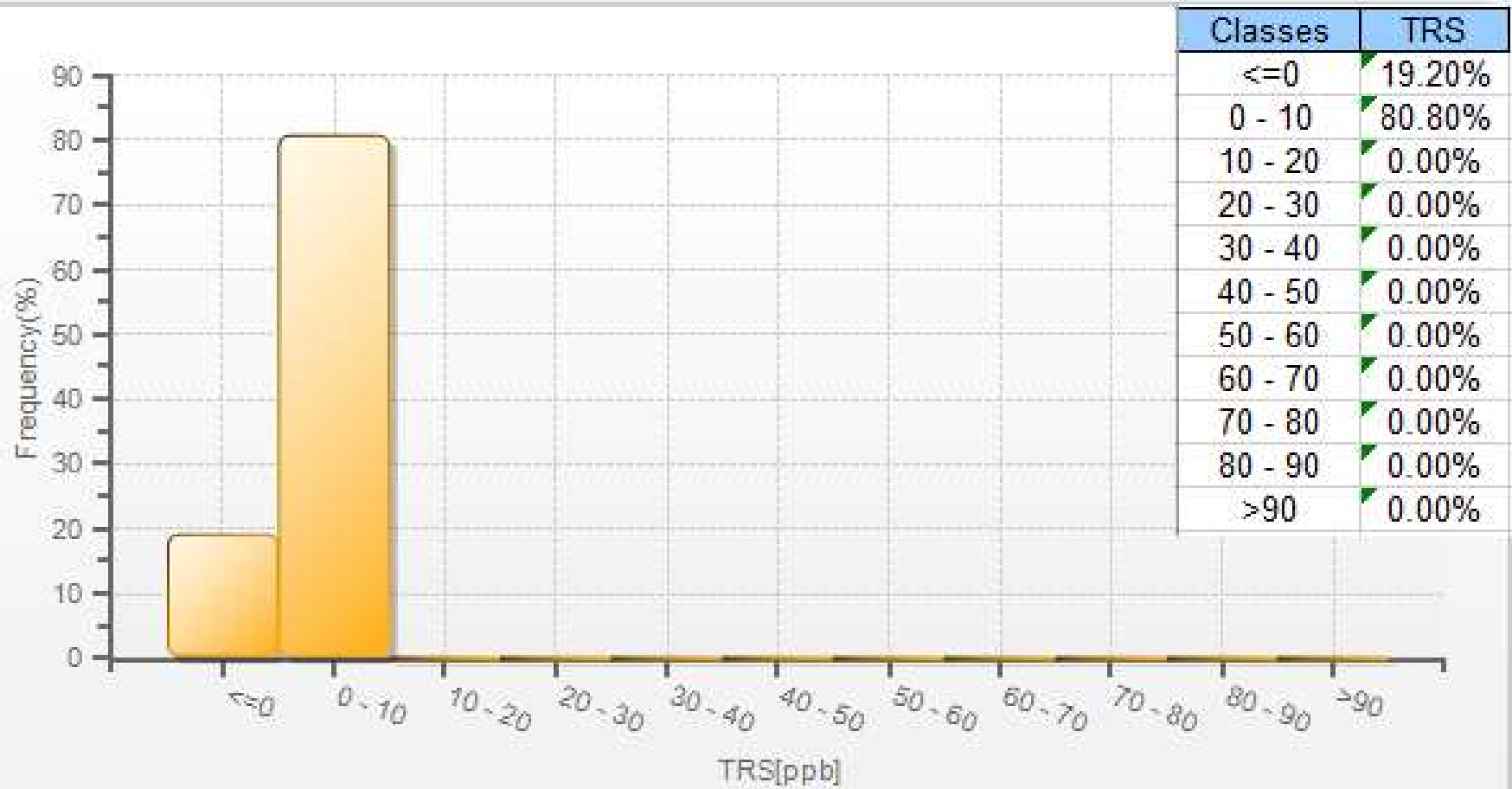




**Timeseries Chart of Hourly Average for TRS - Cold Lake South Station**

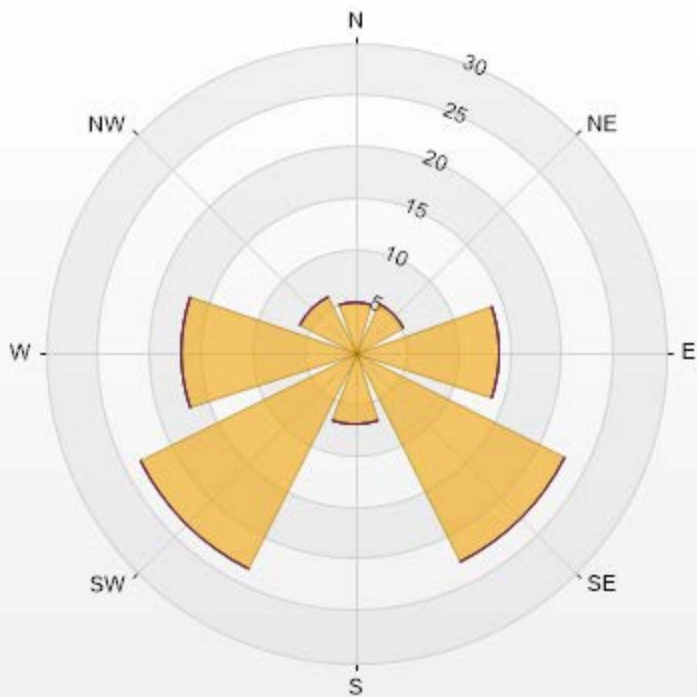


TRS[ppb] Histogram: Cold Lake South Monthly: 12-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-TRS[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00 [ppb]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	4.84	0	0	0	0	4.84
NE	5.26	0	0	0	0	5.26
E	13.94	0	0	0	0	13.94
SE	22.62	0	0	0	0	22.62
S	6.97	0	0	0	0	6.97
SW	23.33	0	0	0	0	23.33
W	16.93	0	0	0	0	16.93
NW	6.12	0	0	0	0	6.12
Summary	100	0	0	0	0	100



LICA-201912-Revision 1



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2019

Summary of Hourly Averages

OXIDES OF NITROGEN (NOx) in ppb

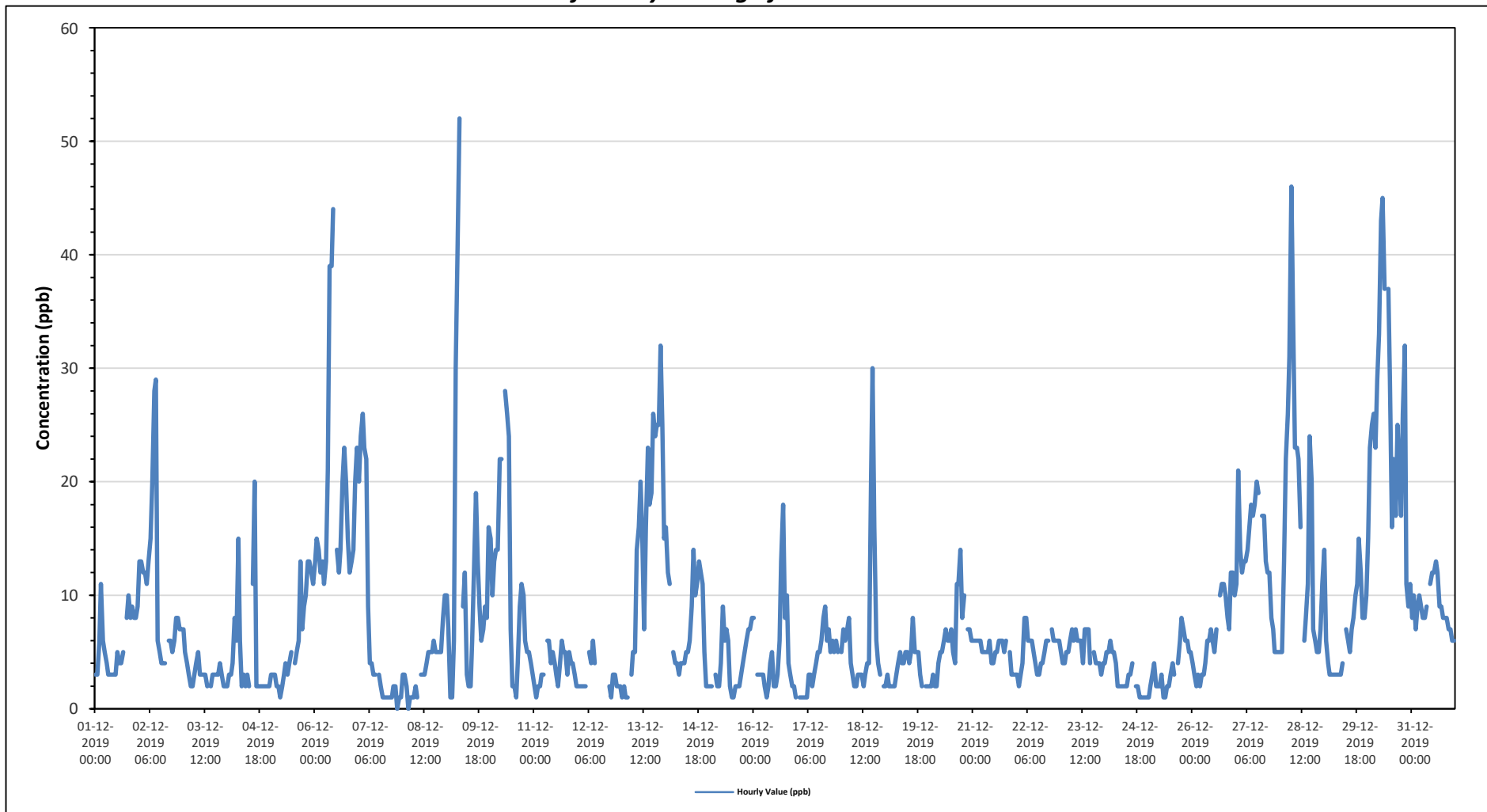
Maximum Hourly Value:	52 ppb on December 9 at hour 7	Hours in Service:	744
Maximum Daily Value:	24.9 ppb on December 30	Hours of Data:	705
Minimum Hourly Value:	0 ppb on December 7 at hour 21	Hours of Missing Data:	0
Minimum Daily Value:	2.8 ppb on December 24	Hours of Calibration:	39
Monthly Average:	7.8 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	
Dec 1	3	3	6	11	6	5	4	3	3	3	3	3	5	4	4	5	S	8	10	8	9	8	8	9	3	11	5.7	
Dec 2	13	13	12	12	11	13	15	20	28	29	6	5	4	4	4	S	6	6	5	6	8	8	7	7	4	29	10.5	
Dec 3	7	5	4	3	2	2	3	4	5	3	3	3	3	2	S	2	3	3	3	4	3	2	2	2	2	7	3.2	
Dec 4	2	3	3	4	8	6	15	6	2	3	2	3	2	S	11	20	2	2	2	2	2	2	2	2	2	20	4.6	
Dec 5	3	3	3	2	2	1	2	3	4	3	4	5	S	4	5	6	13	7	9	10	13	13	12	11	1	13	6.0	
Dec 6	13	15	14	12	13	11	13	21	39	39	44	S	14	12	14	20	23	20	15	12	13	14	20	23	11	44	18.9	
Dec 7	20	24	26	23	22	9	4	4	3	3	S	3	2	1	1	1	1	1	1	2	2	0	1	1	0	26	6.7	
Dec 8	3	3	2	0	1	1	1	2	1	S	3	3	3	4	5	5	5	6	5	5	5	5	8	10	0	10	3.7	
Dec 9	10	7	1	1	6	30	40	S	9	12	3	2	2	6	12	19	13	9	6	7	9	8	16	1	52	12.2		
Dec 10	15	10	13	14	14	22	22	S	28	26	24	7	2	2	1	4	9	11	10	6	5	5	4	3	1	28	11.2	
Dec 11	2	1	2	2	3	3	S	6	6	4	5	4	3	2	4	6	5	5	3	5	4	4	3	2	1	6	3.7	
Dec 12	2	2	2	2	2	S	5	4	6	4	C	C	C	C	C	C	C	2	1	3	3	2	2	2	1	6	-	
Dec 13	1	2	1	1	S	3	5	5	14	16	20	16	7	16	23	18	19	26	24	25	32	25	15	1	32	14.7		
Dec 14	16	12	11	S	5	4	4	3	4	4	4	5	5	6	9	14	10	11	13	12	11	5	2	2	2	16	7.5	
Dec 15	2	2	S	3	2	2	4	9	6	7	6	2	1	1	2	2	2	3	4	5	6	7	7	8	1	9	4.0	
Dec 16	8	S	3	3	3	3	2	1	2	4	5	2	2	3	6	13	18	8	10	4	3	2	2	1	1	18	4.7	
Dec 17	S	1	1	1	1	1	3	2	3	4	5	5	6	8	9	6	7	5	6	5	6	5	S	S	1	9	4.2	
Dec 18	5	7	6	7	8	4	3	2	2	3	3	2	3	4	4	20	30	16	6	4	3	S	S	2	2	30	6.4	
Dec 19	2	3	2	2	2	2	3	4	5	4	4	5	5	4	5	8	5	5	5	3	2	S	S	2	2	2	8	3.7
Dec 20	2	2	3	2	2	4	5	5	6	7	6	6	7	5	4	11	11	14	8	10	S	7	7	6	2	14	6.1	
Dec 21	6	6	6	6	6	5	5	5	6	4	4	5	5	6	6	6	5	6	S	5	3	3	3	3	3	6	5.1	
Dec 22	3	2	3	4	8	8	6	6	6	5	4	3	3	4	4	5	6	6	S	7	6	6	6	6	2	8	5.1	
Dec 23	5	4	4	5	5	6	7	6	7	6	6	6	4	7	7	4	S	5	4	4	4	4	3	4	3	7	5.2	
Dec 24	4	5	5	6	5	5	4	2	2	2	2	2	3	3	4	S	4	2	2	1	1	1	1	1	1	6	2.8	
Dec 25	1	2	3	4	2	2	2	3	1	1	2	2	3	4	3	S	4	6	8	7	6	6	5	5	1	8	3.6	
Dec 26	4	3	2	3	2	3	3	4	6	6	7	6	5	7	S	10	11	11	10	8	7	12	12	10	2	12	6.6	
Dec 27	11	21	14	12	13	13	14	16	18	17	18	20	19	S	17	17	13	12	12	8	7	5	5	5	5	21	13.3	
Dec 28	5	5	13	22	26	31	46	34	23	23	22	16	S	7	6	8	11	24	20	7	6	5	5	7	11	5	46	16.3
Dec 29	14	6	4	3	3	3	3	3	3	3	4	S	7	6	5	7	8	10	11	15	12	8	8	10	3	15	6.8	
Dec 30	15	23	25	26	23	29	33	43	45	37	S	37	29	16	22	17	25	21	17	26	32	11	9	11	9	45	24.9	
Dec 31	8	10	7	9	10	9	8	8	9	S	11	12	12	13	12	9	9	8	8	8	7	7	6	6	6	13	9.0	
Diurnal Maximum	20	24	26	26	26	31	46	52	45	39	44	37	29	16	23	20	25	30	24	26	32	32	25	23				
Diurnal Average	6.8	6.8	6.7	6.8	7.2	8.0	9.5	9.6	9.7	9.7	8.5	6.8	5.8	5.4	7.3	9.0	10.3	9.6	8.1	7.6	7.4	6.8	6.4	6.5				

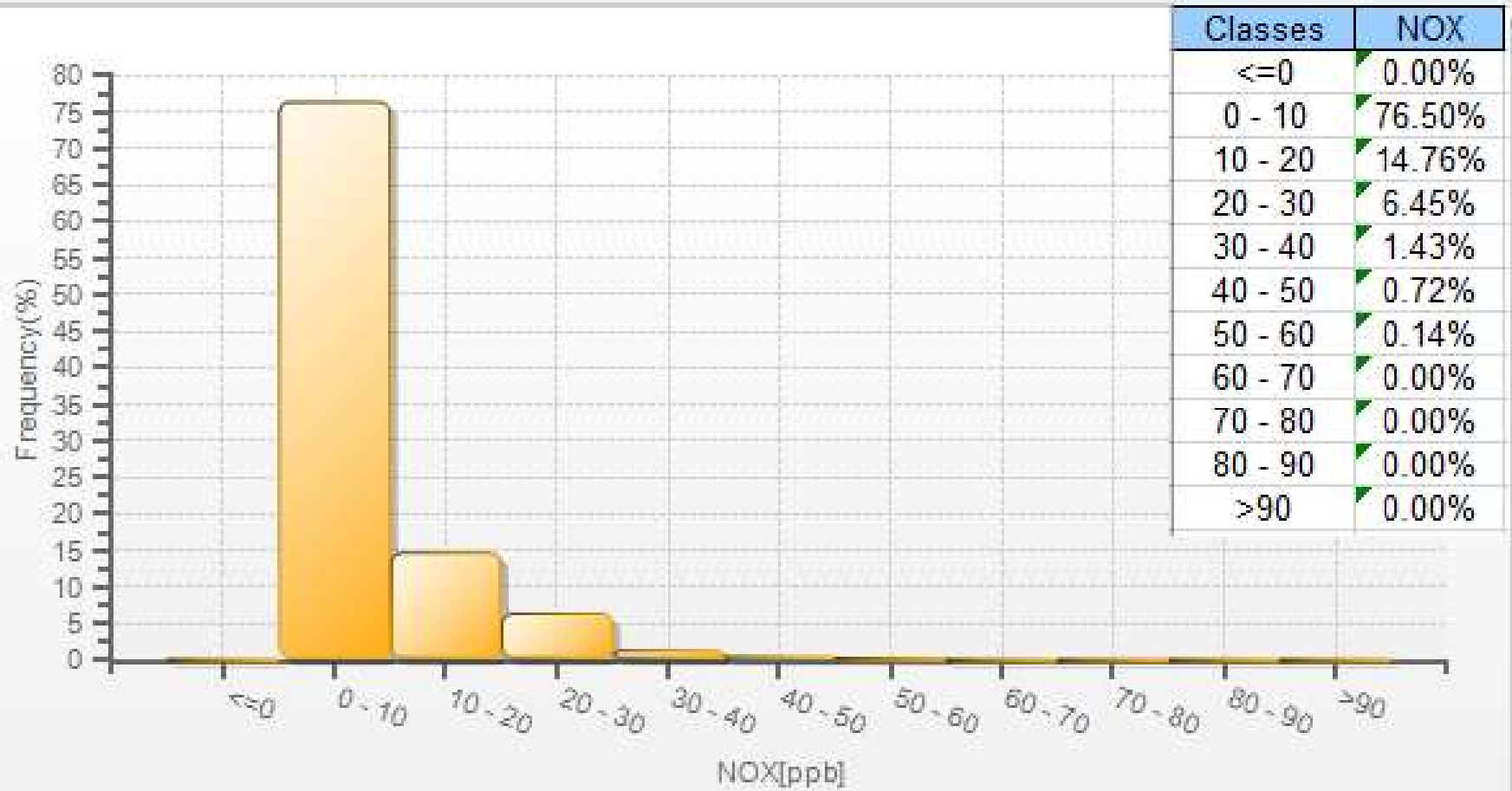
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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 - Cold Lake South Station*



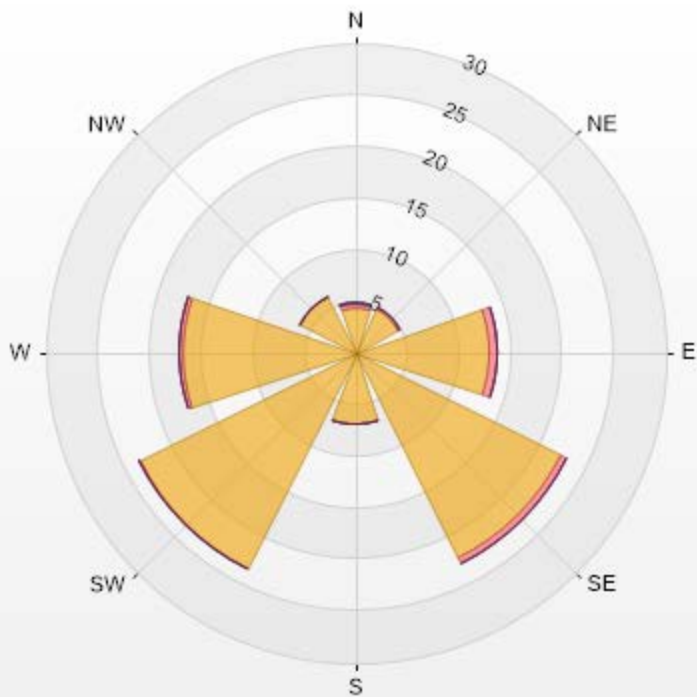
NOX[ppb] Histogram: Cold Lake South Monthly: 12-2019 1 Hr.





Wind: Cold Lake South Poll.: Cold Lake South-NOX[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 93.82% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	4.44	0.29	0.14	0	0	4.87
NE	4.73	0.14	0	0	0	4.87
E	13.04	0.72	0	0	0	13.76
SE	22.35	0.43	0	0	0	22.78
S	7.02	0	0	0	0	7.02
SW	23.35	0.14	0	0	0	23.49
W	16.76	0.29	0	0	0	17.05
NW	6.02	0.14	0	0	0	6.16
Summary	97.71	2.15	0.14	0	0	100



LICA-201912-Revision 1

% Icon Classes (ppb)	98	0-30	2	36-50	0	50-82	0	82-159	0	>159.0
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## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2019

### Summary of Hourly Averages

#### NITRIC OXIDE (NO) in ppb

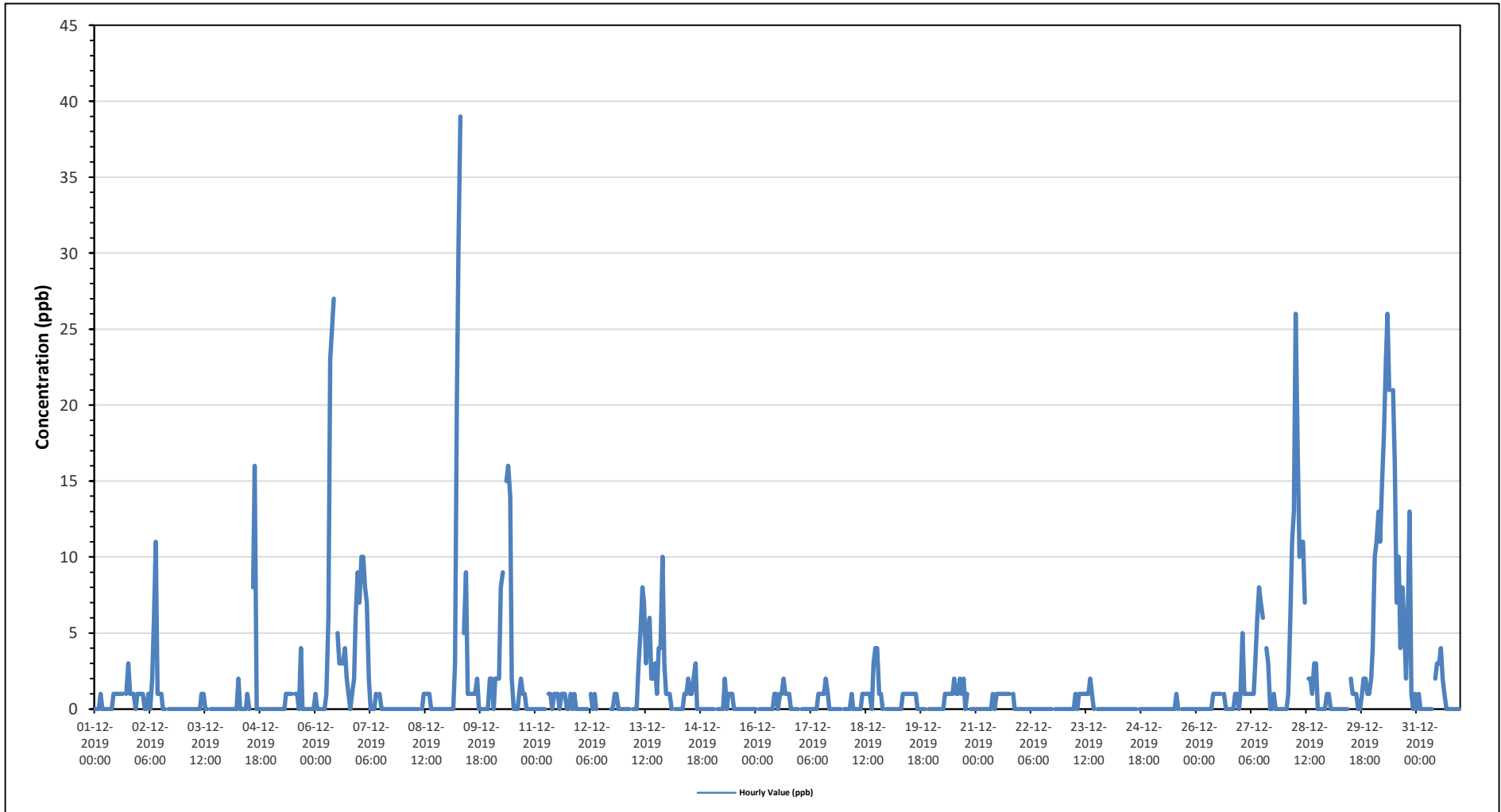
Maximum Hourly Value:	39 ppb on December 9 at hour 7	Hours in Service:	744
Maximum Daily Value:	10.7 ppb on December 30	Hours of Data:	705
Minimum Hourly Value:	0 ppb on December 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on December 22	Hours of Calibration:	39
Monthly Average:	1.5 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	
Dec 1	0	0	0	1	0	0	0	0	0	0	1	1	1	1	1	1	S	1	3	1	1	1	0	1	0	3	0.7	
Dec 2	1	1	1	0	0	1	0	2	6	11	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	11	1.1
Dec 3	0	0	0	0	0	0	0	0	0	0	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Dec 4	0	0	0	0	0	0	2	0	0	0	0	1	0	S	8	16	0	0	0	0	0	0	0	0	0	0	16	1.2
Dec 5	0	0	0	0	0	0	0	0	1	1	1	S	1	1	0	4	0	0	0	0	0	0	0	0	0	0	4	0.4
Dec 6	1	0	0	0	0	0	1	6	23	25	27	S	5	3	3	4	2	1	0	1	2	6	9	0	27	5.3		
Dec 7	7	10	10	8	7	2	0	0	0	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	10	2.0	
Dec 8	0	0	0	0	0	0	0	0	0	S	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0.2	
Dec 9	0	0	0	0	3	20	31	39	S	5	9	1	1	1	1	1	2	0	0	0	0	0	0	2	0	39	5.0	
Dec 10	2	0	2	2	2	8	9	S	15	16	14	2	0	0	0	1	2	1	1	0	0	0	0	0	0	16	3.3	
Dec 11	0	0	0	0	0	0	S	1	1	0	1	1	1	0	1	1	1	0	0	1	0	1	0	0	0	1	0.4	
Dec 12	0	0	0	0	0	S	1	0	1	0	C	C	C	C	C	C	C	0	0	1	1	0	0	0	0	1	-	
Dec 13	0	0	0	0	S	0	0	0	3	5	8	7	3	5	6	2	2	3	1	4	4	10	3	1	0	10	2.9	
Dec 14	1	1	0	S	0	0	0	0	0	1	1	2	1	1	2	3	0	0	0	0	0	0	0	0	0	3	0.6	
Dec 15	0	0	S	0	0	0	0	2	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.2	
Dec 16	0	S	0	0	0	0	0	0	0	0	1	1	0	1	1	2	1	1	1	0	0	0	0	0	0	2	0.4	
Dec 17	S	0	0	0	0	0	0	0	0	0	1	1	1	1	2	1	0	0	0	0	0	0	0	0	0	2	0.3	
Dec 18	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1	0	3	4	4	1	1	0	S	0	0	4	0.8	
Dec 19	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	S	0	0	0	1	0.3	
Dec 20	0	0	0	0	0	0	0	1	1	1	1	2	1	1	2	1	2	0	1	2	S	0	0	0	0	2	0.7	
Dec 21	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	S	1	0	0	0	1	0.4	
Dec 22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0.0	
Dec 23	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	1	0	S	0	0	0	0	0	0	0	2	0.4	
Dec 24	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	
Dec 25	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	1	0.0	
Dec 26	0	0	0	0	0	0	0	0	0	1	1	1	1	1	S	1	0	0	0	0	0	0	0	1	1	0	0.3	
Dec 27	1	5	1	1	1	1	1	1	3	6	8	7	6	S	4	3	0	0	1	0	0	0	0	0	0	8	2.2	
Dec 28	0	0	1	6	11	13	26	17	10	11	11	7	S	2	2	1	3	3	0	0	0	0	0	1	0	26	5.4	
Dec 29	1	0	0	0	0	0	0	0	0	0	0	S	2	1	1	1	0	0	1	2	2	1	1	2	0	2	0.7	
Dec 30	4	10	11	13	11	15	18	23	26	21	S	21	16	7	10	4	8	6	2	6	13	1	0	1	0	26	10.7	
Dec 31	0	1	0	0	0	0	0	0	0	S	2	3	3	4	2	1	0	0	0	0	0	0	0	0	0	4	0.7	
Diurnal Maximum	7	10	11	13	11	20	31	39	26	25	27	21	16	7	10	16	8	6	4	6	13	10	6	9				
Diurnal Average	0.6	0.9	0.9	1.0	1.2	2.0	3.0	3.1	3.1	3.8	3.3	2.4	1.8	1.3	1.9	1.7	1.1	0.8	0.5	0.6	0.8	0.6	0.4	0.6				

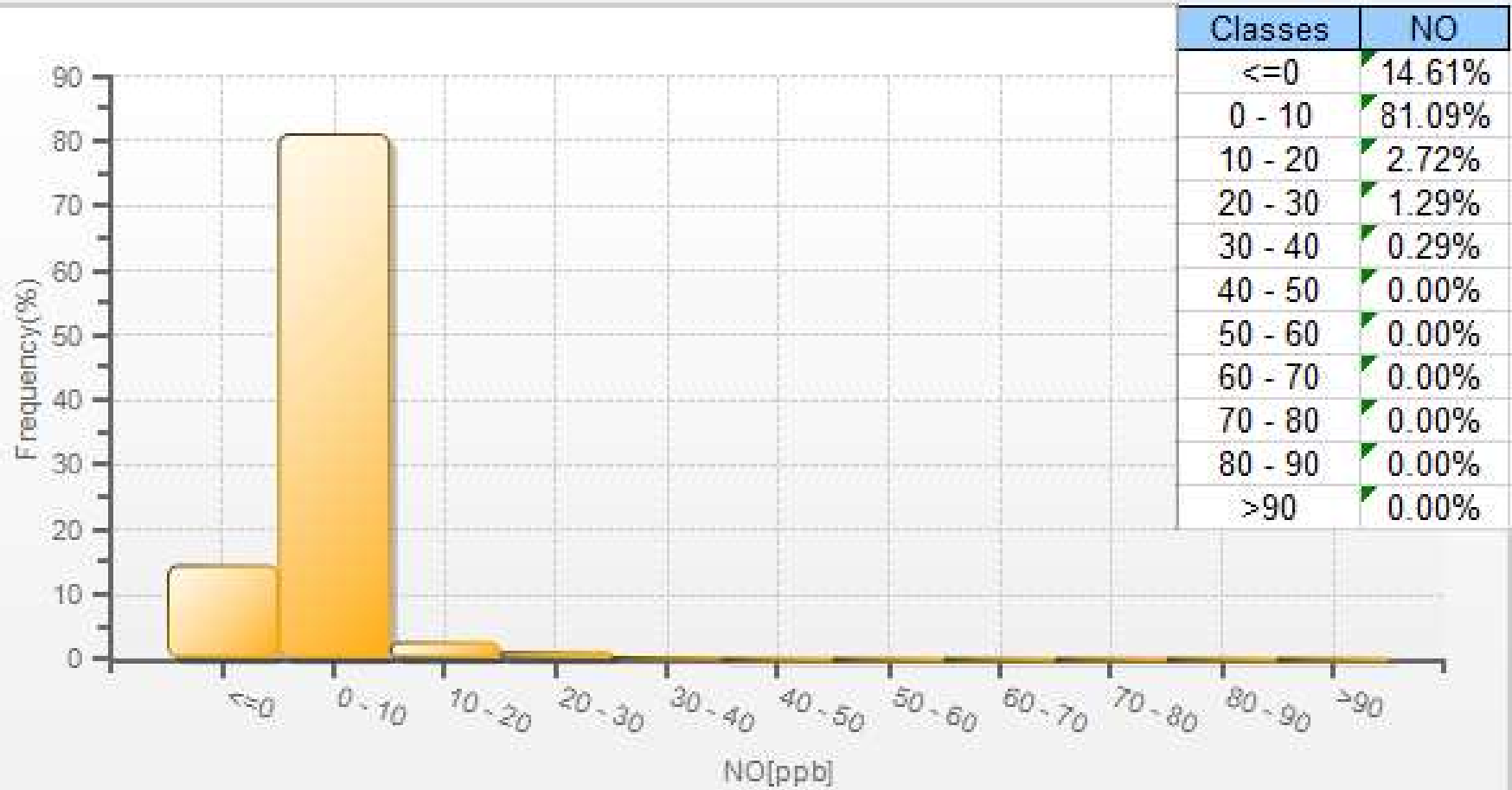
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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 NO - Cold Lake South Station**

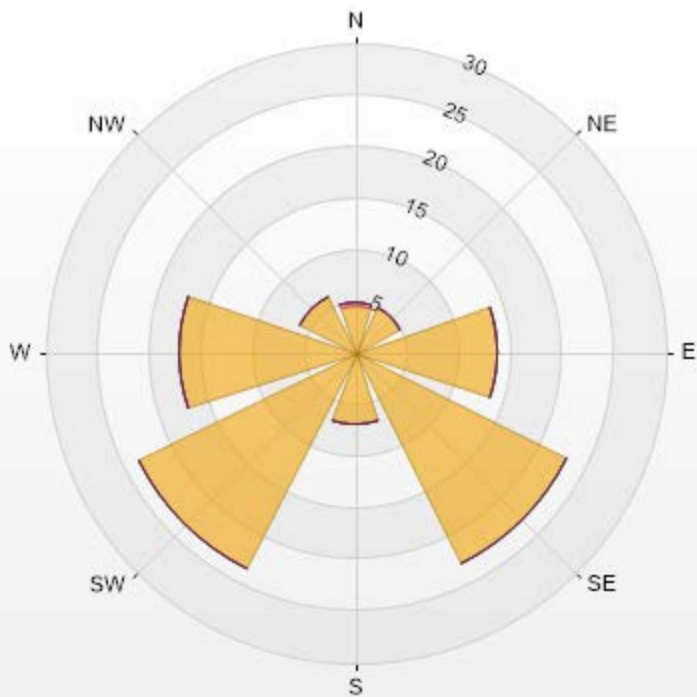


NO[ppb] Histogram: Cold Lake South Monthly: 12-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-NO[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 93.82% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	4.58	0.29	0	0	0	4.87
NE	4.87	0	0	0	0	4.87
E	13.75	0	0	0	0	13.75
SE	22.78	0	0	0	0	22.78
S	7.02	0	0	0	0	7.02
SW	23.5	0	0	0	0	23.5
W	17.05	0	0	0	0	17.05
NW	6.16	0	0	0	0	6.16
Summary	100	0.29	0	0	0	100



LICA-201912-Revision 1



# LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2019

Summary of Hourly Averages

NITROGEN DIOXIDE (NO<sub>2</sub>) in ppb

## Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb

Number of 1-Hour Exceedences: 0

Maximum Hourly Value:	26 ppb on December 18 at hour 17	Hours in Service:	744
Maximum Daily Value:	14.3 ppb on December 30	Hours of Data:	705
Minimum Hourly Value:	0 ppb on December 7 at hour 21	Hours of Missing Data:	0
Minimum Daily Value:	2.7 ppb on December 24	Hours of Calibration:	39
Monthly Average:	6.2 ppb	Operational Uptime:	100.0

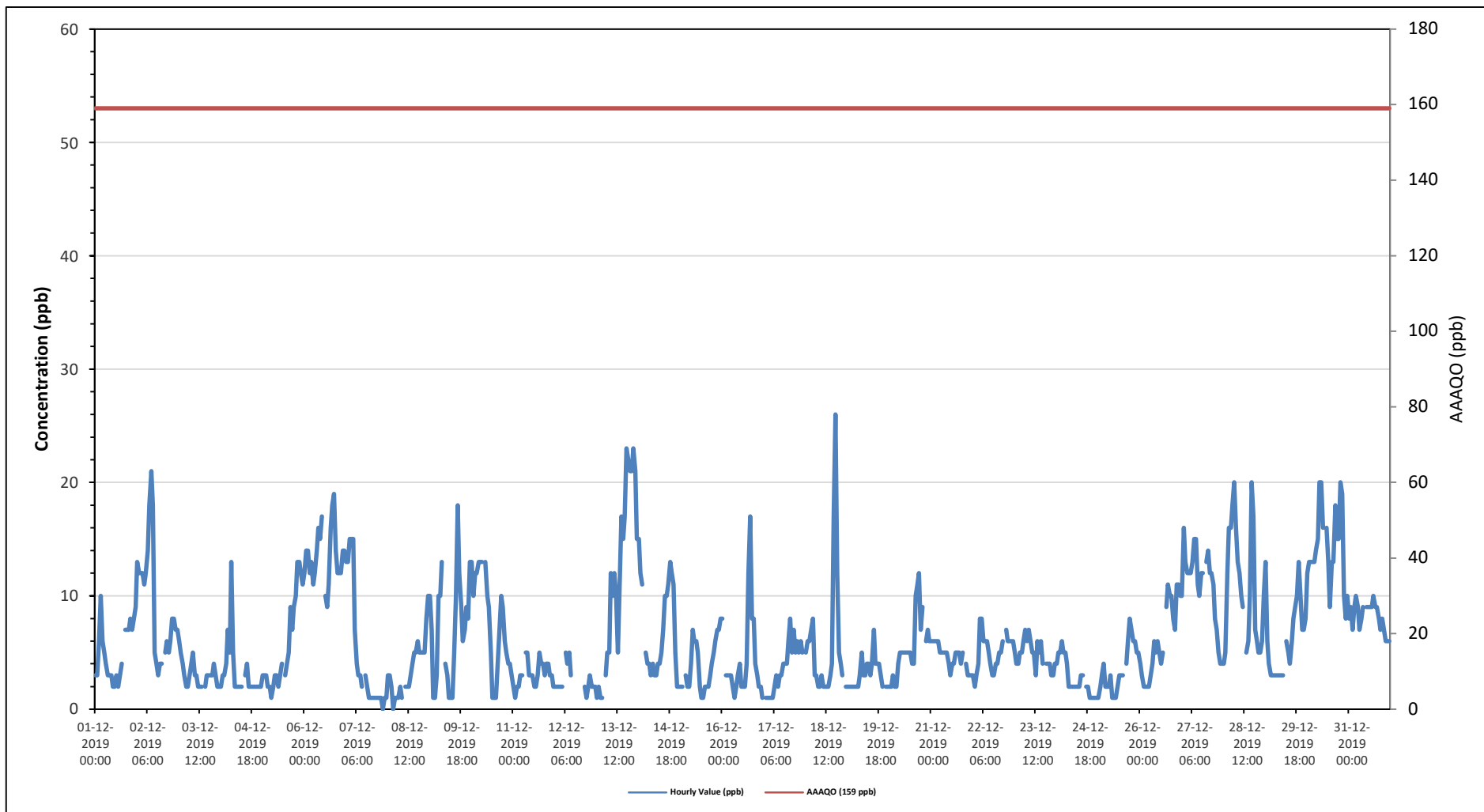
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Dec 1	3	3	6	10	6	5	4	3	3	3	2	2	3	2	3	4	S	7	7	7	8	7	8	9	2	10	5.0
Dec 2	13	12	12	12	11	12	14	18	21	18	5	4	3	4	4	S	5	6	5	6	8	8	7	7	3	21	9.3
Dec 3	6	5	4	3	2	2	3	4	5	3	3	2	2	2	S	2	3	3	3	4	3	2	2	2	2	6	3.1
Dec 4	2	3	3	4	7	5	13	5	2	2	2	2	2	S	3	4	2	2	2	2	2	2	2	2	2	13	3.3
Dec 5	3	3	3	2	2	1	2	3	3	2	3	4	S	3	4	5	9	7	9	10	13	13	12	11	1	13	5.5
Dec 6	12	14	14	12	13	11	12	14	16	15	17	S	10	9	11	16	18	19	14	12	12	14	14	14	9	19	13.5
Dec 7	13	13	15	15	15	7	4	3	3	2	S	3	2	1	1	1	1	1	1	1	1	0	1	1	0	15	4.6
Dec 8	3	3	2	0	1	1	1	2	1	S	2	2	2	3	4	5	5	6	5	5	5	5	8	10	0	10	3.5
Dec 9	10	7	1	1	3	10	10	13	S	4	3	1	1	1	5	10	18	12	9	6	7	9	8	13	1	18	7.0
Dec 10	13	10	12	12	13	13	S	13	10	9	5	1	1	1	4	7	10	9	6	5	4	4	3	1	13	7.7	7.7
Dec 11	2	1	2	2	3	3	S	5	5	3	3	3	2	2	3	5	4	4	3	4	4	3	3	2	1	5	3.1
Dec 12	2	2	2	2	2	S	5	4	5	3	C	C	C	C	C	C	C	2	1	2	3	2	2	2	1	5	-
Dec 13	1	2	1	1	S	3	5	5	12	10	12	10	5	11	17	15	17	23	22	21	21	23	21	15	1	23	11.9
Dec 14	15	12	11	S	5	4	4	3	4	3	3	4	4	5	7	10	10	11	13	12	11	5	2	2	2	15	7.0
Dec 15	2	2	S	3	2	2	4	7	6	6	5	2	1	1	2	2	2	3	4	5	6	7	7	8	1	8	3.9
Dec 16	8	S	3	3	3	3	2	1	2	3	4	2	2	2	4	12	17	8	8	4	3	2	2	1	1	17	4.3
Dec 17	S	1	1	1	1	1	2	3	2	3	3	4	4	4	6	8	5	7	5	6	5	6	5	S	1	8	3.8
Dec 18	5	6	6	7	8	3	3	2	2	3	2	2	2	2	3	4	17	26	12	5	4	3	S	2	2	26	5.6
Dec 19	2	2	2	2	2	2	2	3	5	3	3	4	4	3	4	7	4	4	4	3	2	S	2	2	2	7	3.1
Dec 20	2	2	3	2	2	4	5	5	5	5	5	5	4	4	4	10	11	12	7	9	S	6	7	6	2	12	5.5
Dec 21	6	6	6	6	6	5	5	5	5	5	4	3	4	4	5	5	4	5	4	5	S	4	3	3	3	6	4.7
Dec 22	3	2	3	4	8	8	6	6	6	5	4	3	3	4	4	5	5	6	S	7	6	6	6	6	2	8	5.0
Dec 23	5	4	4	5	5	6	7	6	7	6	5	5	3	6	5	6	4	S	4	4	4	3	3	4	3	7	4.8
Dec 24	4	5	5	6	5	5	4	2	2	2	2	2	2	2	3	S	2	2	1	1	1	1	1	1	1	6	2.7
Dec 25	1	2	3	4	2	2	2	3	1	1	1	2	3	3	3	S	4	6	8	7	6	6	5	5	1	8	3.5
Dec 26	4	3	2	2	2	2	3	4	6	5	6	5	4	5	S	9	11	10	10	8	7	11	11	10	2	11	6.1
Dec 27	10	16	13	12	12	12	13	15	15	11	10	12	12	S	13	14	12	12	11	8	7	5	4	4	4	16	11.0
Dec 28	4	5	12	16	16	18	20	16	13	12	10	9	S	5	6	10	20	17	7	6	5	5	6	10	4	20	10.8
Dec 29	13	6	4	3	3	3	3	3	3	3	3	S	5	4	6	8	9	10	13	10	7	7	8	3	13	6.1	
Dec 30	12	13	13	13	13	14	15	20	20	16	S	16	13	9	13	13	18	15	15	20	19	10	8	10	8	20	14.3
Dec 31	8	9	7	9	10	9	7	8	9	S	9	9	9	9	10	9	9	8	7	8	7	6	6	6	6	10	8.2
Diurnal Maximum	15	16	15	16	16	18	20	20	21	18	17	16	13	11	17	16	20	26	22	21	21	23	21	15			
Daiurnal Average	6.2	5.8	5.8	5.8	6.1	5.9	6.4	6.4	6.7	5.8	5.0	4.5	4.1	4.0	5.4	7.3	9.0	8.7	7.4	7.0	6.7	6.1	5.9	6.0			

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

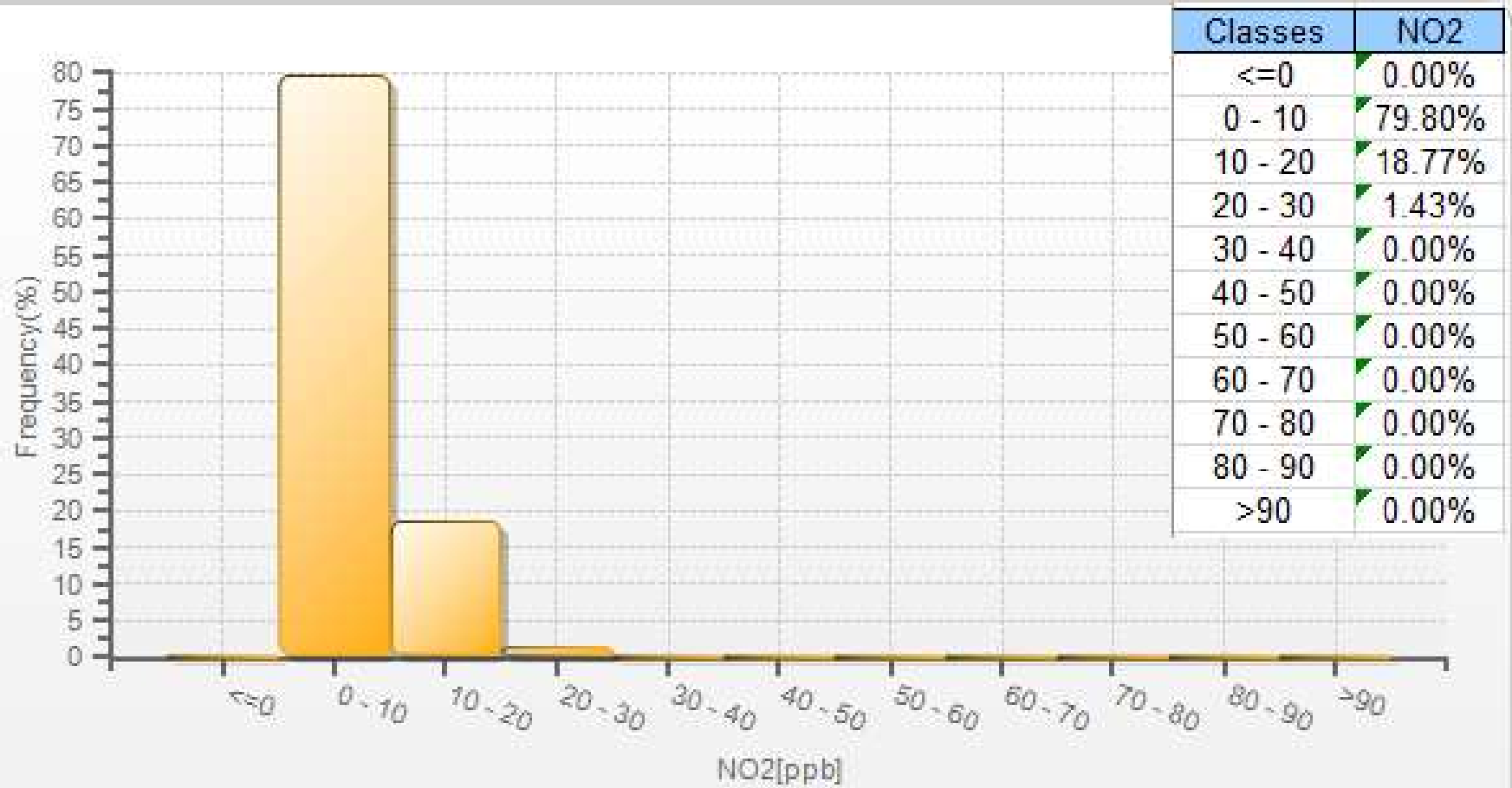
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.  
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



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

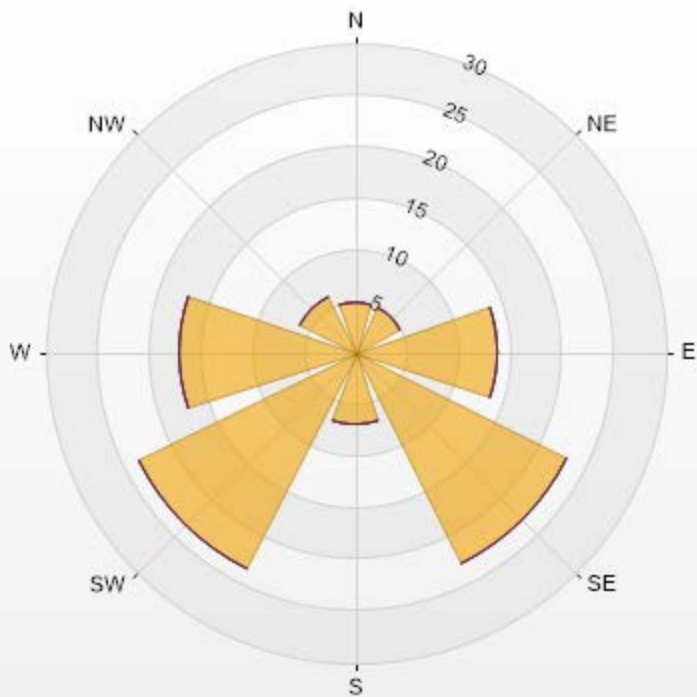


NO2[ppb] Histogram: Cold Lake South Monthly: 12-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-NO2[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 93.82% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	4.87	0	0	0	0	4.87
NE	4.87	0	0	0	0	4.87
E	13.75	0	0	0	0	13.75
SE	22.78	0	0	0	0	22.78
S	7.02	0	0	0	0	7.02
SW	23.5	0	0	0	0	23.5
W	17.05	0	0	0	0	17.05
NW	6.16	0	0	0	0	6.16
Summary	100	0	0	0	0	100



LICA-201912-Revision 1



# LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2019

Summary of Hourly Averages

OZONE (O<sub>3</sub>) in ppb

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

Number of 1-Hour Exceedences: 0

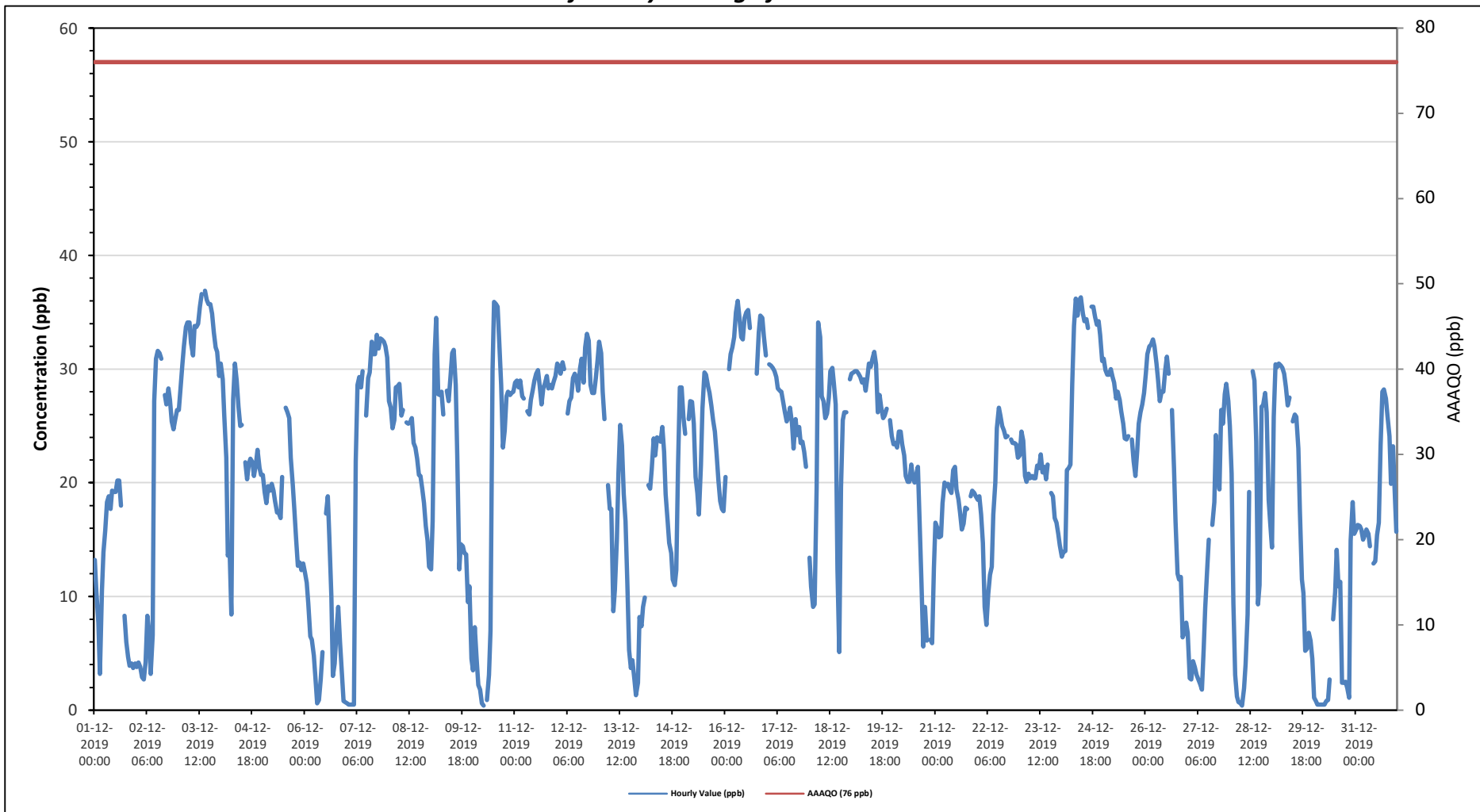
Maximum Hourly Value:	36.9 ppb on December 3 at hour 15	Hours in Service:	744
Maximum Daily Value:	33.1 ppb on December 3	Hours of Data:	709
Minimum Hourly Value:	0.4 ppb on December 10 at hour 6	Hours of Missing Data:	0
Minimum Daily Value:	5.3 ppb on December 30	Hours of Calibration:	35
Monthly Average:	21.0 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	
Dec 1	13.2	10.4	7.7	3.2	10.5	13.9	15.8	18.3	18.8	17.7	19.3	19.2	19.2	20.2	20.2	18	S	8.3	6	4.7	3.9	4.1	3.7	4.1	3.2	20.2	12.2	
Dec 2	3.8	4.2	3.8	2.9	2.7	4.2	8.3	6.8	3.2	6.6	27.2	30.9	31.6	31.4	30.9	S	36.9	27.7	26.9	28.3	27.3	25.4	24.7	25.6	26.4	2.7	31.6	17.9
Dec 3	26.4	28.4	30.4	32	33.7	34.1	34.1	32.3	31.2	33.8	33.7	34	35.5	36.6	S	36.9	36.1	35.7	35.7	34.9	33.2	31.9	31.5	29.4	26.4	36.9	33.1	
Dec 4	30.5	29.1	25.9	22.2	13.6	14.2	8.4	27.3	30.5	29	26.7	25	25.1	S	21.8	20.3	21.7	22.1	21.8	20.6	21.7	22.9	21.3	20.7	8.4	30.5	22.7	
Dec 5	20.7	19.2	18.2	19.7	19.3	19.9	19.3	18.4	17.4	17.4	16.9	20.5	S	26.6	26.2	25.7	22.2	19.8	17.7	15.1	12.7	13	12.3	12.9	12.3	26.6	18.7	
Dec 6	12.1	11.2	9.4	6.5	6.2	4.8	2.9	0.6	0.9	2.7	5.1	S	17.3	18.8	15.2	10	3	4.1	6.9	9.1	6	3.8	0.8	0.7	0.6	18.8	6.9	
Dec 7	0.6	0.5	0.5	0.5	0.5	21.9	28.6	29.3	28.4	29.8	S	25.9	29.2	29.7	32.4	31.3	31.3	33	31.8	32.7	32.6	32.4	32	31	0.5	33.0	23.7	
Dec 8	27.2	26.6	24.8	25.5	28.4	28.5	28.7	25.9	26.4	S	25.3	25.2	25.3	25.7	23.5	23.1	22.1	20.7	20.6	19.5	18.2	16.2	14.9	12.6	12.6	28.7	23.3	
Dec 9	12.4	16.6	31.3	34.5	27.8	27.7	28	26	S	28.1	27.2	29.2	31.4	31.7	28.6	22.4	12.4	14.6	14.4	13.8	13.7	9.5	10.9	4.5	4.5	34.5	21.6	
Dec 10	3.5	7.3	4.6	2.2	1.8	0.6	0.4	S	0.9	3.1	7	29.8	35.9	35.7	35.5	32.1	28.6	23.1	24.6	27.6	28	27.7	27.9	28	0.4	35.9	18.1	
Dec 11	28.8	29	28.4	29	27.6	27.4	S	26.3	26	27.3	28.1	29	29.6	29.9	28.5	26.9	28.3	28.7	29.4	28.3	28.6	28.3	28.9	29.4	26.0	29.9	28.3	
Dec 12	30.5	30.2	29.6	30.6	30	S	26.1	27.2	27.5	29.2	29.6	29.2	28.1	30.1	30.9	28.8	31.9	33.1	32.5	28.6	27.9	27.9	29.2	30.8	26.1	33.1	29.5	
Dec 13	32.4	31.4	28	25.6	S	19.8	17.7	17.7	8.7	10.6	15.1	20.8	25.1	23.3	19	16.6	11.3	5.3	3.7	4.4	2.7	1.3	2.4	8.2	1.3	32.4	15.3	
Dec 14	7.4	9.1	9.9	S	19.8	19.5	21.1	23.9	22.4	24	23.9	23.6	24.9	22.7	19	16.6	14.7	13.8	11.5	11	12.3	21.6	28.4	28.4	7.4	28.4	18.7	
Dec 15	25.8	24.3	S	25.6	27.2	27.1	25.2	20.5	19.1	17.2	21.5	26.5	29.7	29.5	28.5	27.9	26.8	25.5	24.5	22.5	20.2	18.4	17.7	17.5	17.2	29.7	23.9	
Dec 16	20.5	S	30	31.3	31.9	32.8	35	36	34.7	32.8	32.6	34.5	35	35.2	33.6	C	C	C	29.6	33.2	34.7	34.5	32.9	31.2	20.5	36.0	32.6	
Dec 17	S	30.4	30.3	30.1	29.8	29.3	28.3	28.1	28	27.1	26.2	25.4	25.8	26.6	25.2	23	25.6	24.2	24.9	23.5	23.6	22.7	21.4	S	21.4	30.4	26.3	
Dec 18	13.4	10.9	9.1	9.3	19.6	34.1	32.8	27.6	27.2	25.7	26.1	27.5	29.8	30.1	28.7	26.9	12.4	5.1	19.6	25.5	26.2	26.2	S	29.1	5.1	34.1	22.7	
Dec 19	29.6	29.7	29.8	29.8	29.6	29.3	28.8	29.1	28.1	29.3	30.5	30.2	30.9	31.5	30.4	26.2	27.7	26.7	25.7	25.9	26.5	S	25.5	24.1	24.1	31.5	28.5	
Dec 20	23.4	23.5	23.1	24.5	24.5	23.4	22.4	20.6	20.1	20.1	21.6	20.4	20	20.8	21.4	15.6	11.2	5.6	9.1	6.1	S	6.2	5.9	12.5	5.6	24.5	17.5	
Dec 21	16.5	16	15.2	15.3	18.2	20	19.7	19.9	19.4	19.1	21.1	21.4	19.4	18.5	17.4	15.9	16.4	17.8	17.7	S	18.8	19.3	19.1	18.8	15.2	21.4	18.3	
Dec 22	18.5	18.8	17.2	14.7	9.1	7.5	10.2	11.9	12.6	17.2	20	24.8	26.6	25.9	25	24.6	24	24.1	S	23.8	23.5	23.5	23.4	22.2	7.5	26.6	19.5	
Dec 23	22.4	24.5	23.7	20.6	20.1	20.8	20.4	20.6	20.4	20.4	21.5	21.3	22.5	20.9	21.4	20.3	21.6	S	19.1	18.8	16.9	16.5	15.5	14.5	14.5	24.5	20.2	
Dec 24	13.5	13.9	14	21.1	21.3	21.6	28.7	33.8	36.2	34.7	36.1	36.3	34.9	34.2	34.4	33.6	S	35.5	35.5	34.6	33.9	34.2	33	30.7	13.5	36.3	29.8	
Dec 25	30.9	29.9	29.5	29.5	30	29.3	28.8	27.4	28	27.3	26.3	25.2	23.9	23.8	24.1	S	23.8	21.9	20.6	22.8	25.2	26.2	26.9	27.9	20.6	30.9	26.5	
Dec 26	29.6	31.3	32	32.1	32.6	32	30.5	29.1	27.2	28	28	29.8	31.1	29.6	S	26.4	21.3	16.6	12	11.5	11.7	6.4	6.8	7.7	6.4	32.6	23.6	
Dec 27	6.8	2.8	2.7	4.3	3.8	3.1	2.7	2.3	1.8	5.4	9	12.5	15	S	16.3	18.3	24.2	21	19.4	26.4	25.2	27.8	28.7	27.2	1.8	28.7	13.3	
Dec 28	25	20.8	9.4	3.1	1.2	0.7	0.6	0.4	1.9	4	8.4	19.2	S	29.8	29	23.6	9.3	11	26.7	26.8	27.9	26.2	18.5	16.5	0.4	29.8	14.8	
Dec 29	14.3	25.8	30.4	30.2	30.5	30.3	29.6	28.4	26.8	27.5	S	25.4	26	25.8	23	17.5	11.5	10.3	5.2	5.4	6.8	6.1	4.5	4.5	4.5	30.5	20.5	
Dec 30	1.1	0.8	0.5	0.5	0.5	0.5	0.5	0.8	0.9	2.7	S	8	10.4	14.1	10.9	11.3	2.4	2.4	2.5	1.9	1.1	14.9	18.3	15.5	0.5	18.3	5.3	
Dec 31	15.9	16.3	16.2	15.9	15	15.4	15.9	15.5	14.4	S	12.9	13.1	15.4	16.5	23.3	28	28.2	27.4	25.9	24.1	19.9	23.2	19.6	15.7	12.9	28.2	18.9	
Diurnal Maximum	32	31	32	35	34	34	35	36	36	36	36	36	36	37	36	37	36	36	36	35	35	35	33	31				
Daiurnal Average	18.6	19.1	18.9	19.1	18.9	19.8	20.0	21.1	19.7	20.5	22.6	24.8	26.0	26.7	25.1	23.3	20.8	19.5	20.3	20.3	20.3	19.9	19.6	19.4				

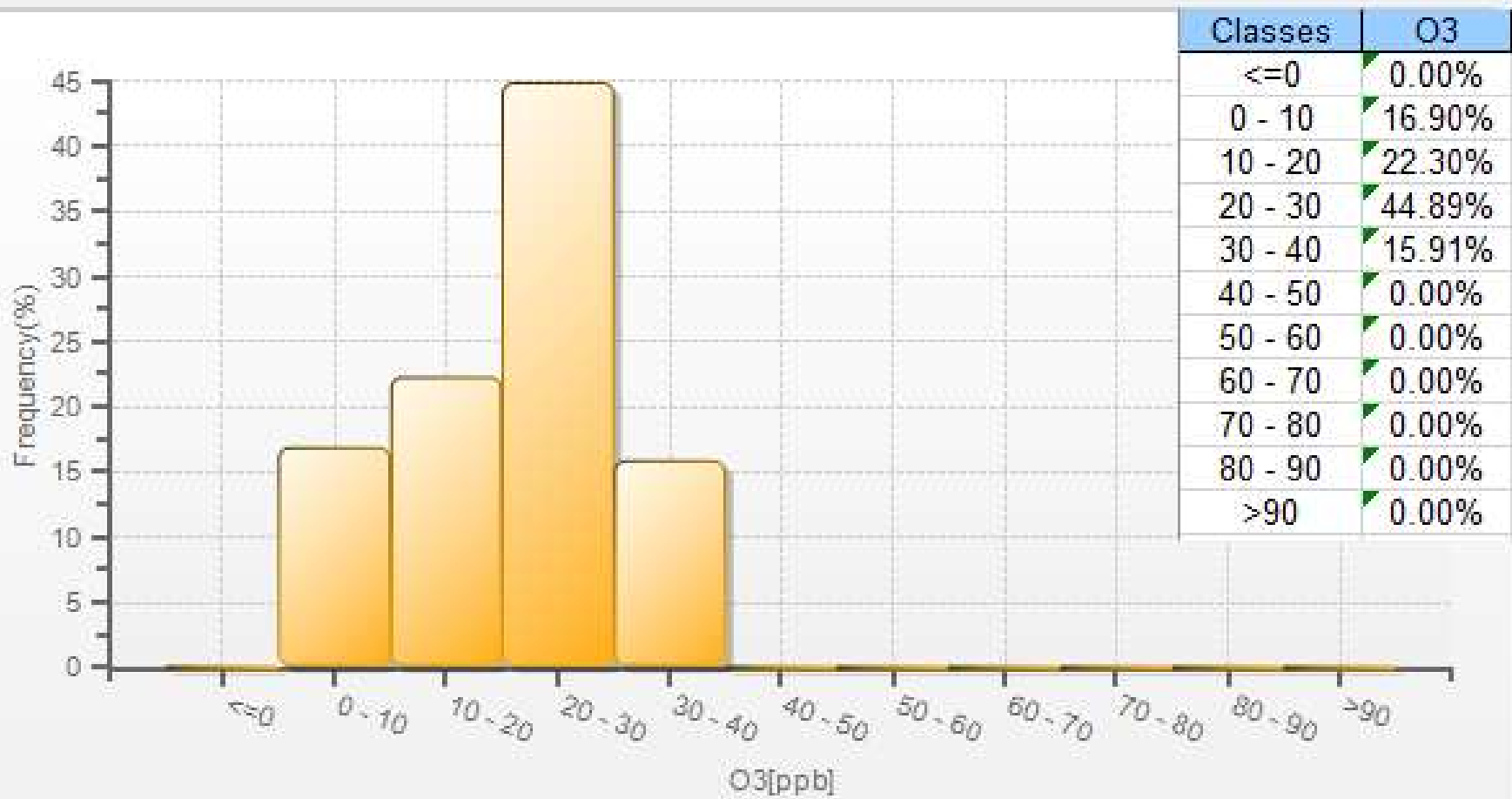
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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 O3 - Cold Lake South Station**



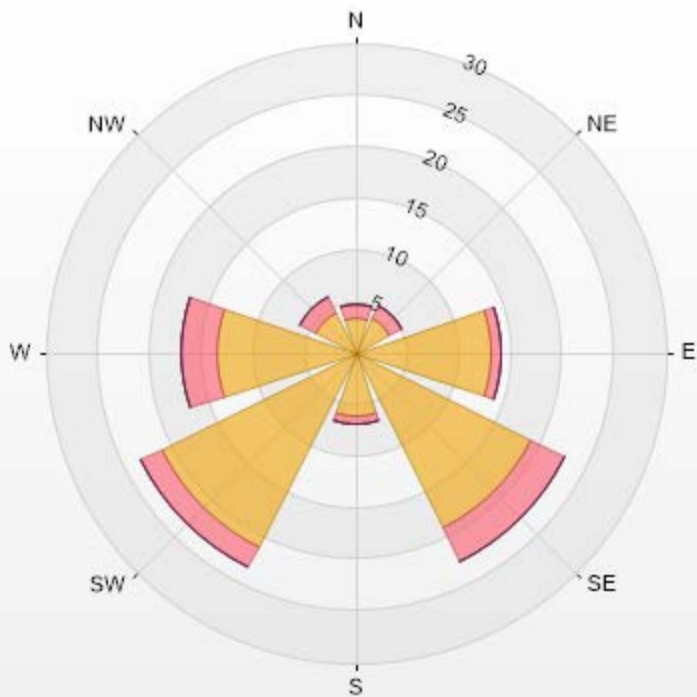
O3[ppb] Histogram: Cold Lake South Monthly: 12-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-O3[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.62% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	3.41	1.42	0	0	0	4.83
NE	3.69	1.42	0	0	0	5.11
E	13.07	0.99	0	0	0	14.06
SE	18.89	3.84	0	0	0	22.73
S	6.11	0.85	0	0	0	6.96
SW	21.02	2.27	0	0	0	23.29
W	13.49	3.41	0	0	0	16.9
NW	4.4	1.7	0	0	0	6.1
Summary	84.08	15.9	0	0	0	100





LICA-201912-Revision 1

%	Icon	Classes (ppb)	84	16	0	0
84		0-30	16			
16		30-50	0			
0		50-82	0			
0		82-159	0			
0		>159.0	0			



# LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

## Cold Lake South Station - December 2019

### Summary of Hourly Averages

#### TOTAL HYDROCARBONS (THC) in ppm

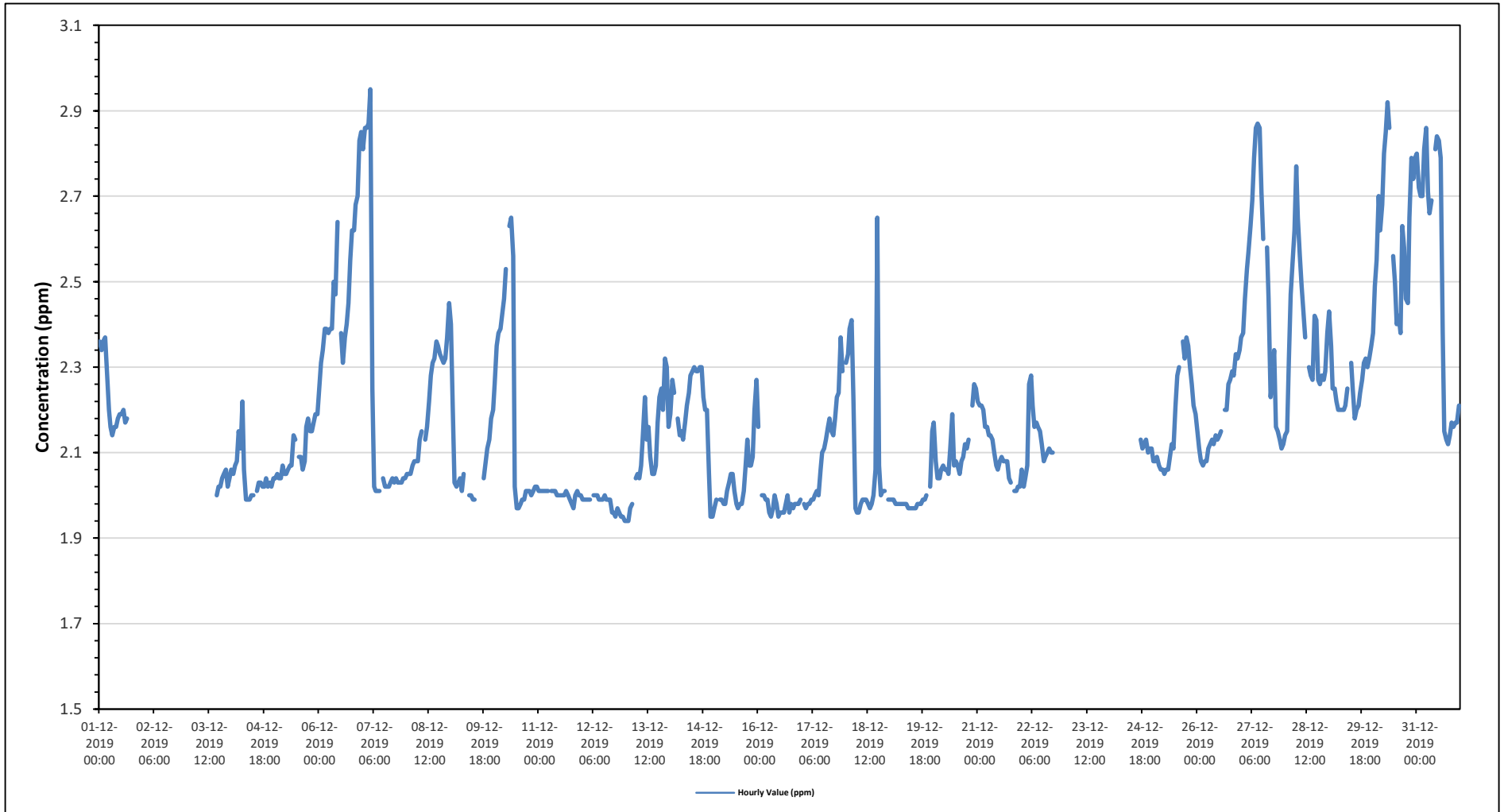
Maximum Hourly Value:	2.95 ppm on December 7 at hour 4	Hours in Service:	744
Maximum Daily Value:	2.62 ppm on December 30	Hours of Data:	618
Minimum Hourly Value:	1.94 ppm on December 12 at hour 23	Hours of Missing Data:	93
Minimum Daily Value:	1.98 ppm on December 12	Hours of Calibration:	33
Monthly Average:	2.18 ppm	Operational Uptime:	87.5

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
Dec 1	2.36	2.34	2.36	2.37	2.29	2.20	2.16	2.14	2.16	2.16	2.18	2.19	2.19	2.20	2.17	2.18	S	X	X	X	X	X	X	2.14	2.37	-	
Dec 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.00	2.06	-	
Dec 3	X	X	X	X	X	X	X	C	C	C	C	Y	Y	Y	S	Y											
Dec 4	2.06	2.05	2.07	2.08	2.15	2.11	2.22	2.06	1.99	1.99	1.99	2.00	2.00	S	2.01	2.03	2.03	2.02	2.02	2.04	2.02	2.03	2.02	2.04	1.99	2.22	2.04
Dec 5	2.04	2.05	2.04	2.04	2.07	2.05	2.05	2.06	2.07	2.07	2.14	2.13	S	2.09	2.09	2.06	2.08	2.16	2.18	2.15	2.15	2.17	2.19	2.19	2.04	2.19	2.10
Dec 6	2.25	2.31	2.34	2.39	2.39	2.38	2.39	2.39	2.50	2.47	2.64	S	2.38	2.31	2.37	2.40	2.45	2.55	2.62	2.62	2.68	2.70	2.83	2.85	2.25	2.85	2.49
Dec 7	2.81	2.86	2.86	2.87	2.95	2.25	2.02	2.01	2.01	2.01	S	2.04	2.02	2.02	2.02	2.03	2.04	2.03	2.04	2.03	2.03	2.03	2.04	2.04	2.01	2.95	2.22
Dec 8	2.05	2.05	2.05	2.07	2.08	2.08	2.08	2.13	2.15	S	2.13	2.16	2.22	2.28	2.31	2.32	2.36	2.35	2.33	2.32	2.31	2.32	2.37	2.45	2.05	2.45	2.22
Dec 9	2.40	2.21	2.03	2.02	2.03	2.04	2.01	2.05	S	X	2.00	2.00	1.99	1.99	C1	C1	C1	C1	2.04	2.08	2.11	2.13	2.18	2.20	1.99	2.40	2.08
Dec 10	2.26	2.35	2.38	2.39	2.42	2.46	2.53	S	2.63	2.65	2.56	2.02	1.97	1.97	1.98	1.99	1.99	2.01	2.01	2.01	2.00	2.01	2.02	2.02	1.97	2.65	2.20
Dec 11	2.01	2.01	2.01	2.01	2.01	2.01	S	2.01	2.01	2.01	2.00	2.00	2.00	2.00	2.01	2.00	1.99	1.98	1.97	2.00	2.01	2.00	2.00	1.97	2.01	2.00	2.00
Dec 12	1.99	1.99	1.99	1.99	1.99	S	2.00	2.00	2.00	1.99	1.99	1.99	2.00	1.99	1.99	1.96	1.96	1.95	1.97	1.96	1.95	1.95	1.94	1.94	2.00	1.98	1.98
Dec 13	1.94	1.94	1.97	1.98	S	2.04	2.05	2.04	2.07	2.14	2.23	2.13	2.16	2.09	2.05	2.05	2.07	2.17	2.23	2.25	2.20	2.32	2.30	2.16	1.94	2.32	2.11
Dec 14	2.19	2.27	2.24	S	2.18	2.14	2.15	2.13	2.17	2.21	2.24	2.28	2.29	2.30	2.29	2.29	2.30	2.23	2.20	2.20	2.05	1.95	1.95	1.95	1.95	2.30	2.20
Dec 15	1.97	1.99	S	1.99	1.99	1.98	1.98	2.01	2.03	2.05	2.05	2.01	1.98	1.97	1.98	1.98	2.01	2.06	2.13	2.07	2.07	2.09	2.20	2.27	1.97	2.27	2.04
Dec 16	2.16	S	2.00	2.00	1.99	1.99	1.96	1.95	1.97	2.00	1.98	1.95	1.96	1.96	1.98	2.00	1.96	1.98	1.97	1.98	1.98	1.98	1.98	1.99	1.95	2.16	1.98
Dec 17	S	1.98	1.97	1.98	1.98	1.99	1.99	2.00	2.01	2.00	2.06	2.10	2.11	2.13	2.16	2.18	2.15	2.14	2.18	2.23	2.24	2.37	2.29	S	1.97	2.37	2.10
Dec 18	2.31	2.33	2.39	2.41	2.23	1.97	1.96	1.96	1.98	1.99	1.99	1.99	1.98	1.97	1.98	2.00	2.06	2.65	2.07	2.00	2.01	2.01	S	1.99	1.96	2.65	2.10
Dec 19	1.99	1.99	1.99	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.97	1.97	1.97	1.97	1.98	1.98	1.98	1.98	1.99	1.99	2.00	S	2.02	2.15	1.97	2.15	1.99
Dec 20	2.17	2.08	2.04	2.04	2.06	2.07	2.06	2.06	2.05	2.11	2.19	2.07	2.08	2.07	2.05	2.08	2.09	2.12	2.11	2.13	S	2.21	2.26	2.25	2.04	2.26	2.11
Dec 21	2.22	2.21	2.21	2.20	2.16	2.16	2.14	2.14	2.13	2.10	2.07	2.06	2.08	2.09	2.08	2.08	2.08	2.04	2.03	S	2.01	2.01	2.02	2.02	2.01	2.22	2.10
Dec 22	2.06	2.02	2.04	2.07	2.26	2.28	2.21	2.16	2.17	2.16	2.15	2.12	2.08	2.09	2.10	2.11	2.10	2.10	S	X	X	X	X	X	2.02	2.28	2.13
Dec 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	2.10	2.13	-
Dec 24	X	X	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	2.13	2.11	2.12	2.13	2.10	2.11	2.11	2.10	2.13	-
Dec 25	2.08	2.08	2.09	2.07	2.06	2.06	2.05	2.06	2.06	2.09	2.12	2.11	2.21	2.28	2.30	S	2.36	2.32	2.37	2.35	2.30	2.26	2.21	2.19	2.05	2.37	2.18
Dec 26	2.15	2.11	2.08	2.07	2.08	2.08	2.11	2.12	2.13	2.12	2.14	2.13	2.14	2.15	S	2.20	2.20	2.26	2.27	2.29	2.28	2.33	2.32	2.34	2.07	2.34	2.18
Dec 27	2.37	2.38	2.46	2.53	2.57	2.63	2.69	2.79	2.86	2.87	2.86	2.71	2.60	S	2.58	2.46	2.23	2.28	2.34	2.16	2.15	2.13	2.11	2.12	2.11	2.87	2.47
Dec 28	2.14	2.15	2.32	2.47	2.54	2.62	2.77	2.65	2.56	2.49	2.43	2.37	S	2.30	2.28	2.27	2.42	2.41	2.27	2.26	2.28	2.27	2.29	2.38	2.14	2.77	2.39
Dec 29	2.43	2.35	2.25	2.25	2.22	2.20	2.20	2.20	2.20	2.21	2.25	S	2.31	2.25	2.18	2.20	2.21	2.24	2.27	2.31	2.32	2.30	2.32	2.35	2.18	2.43	2.26
Dec 30	2.38	2.49	2.55	2.70	2.62	2.68	2.80	2.85	2.92	2.86	S	2.56	2.50	2.40	2.42	2.38	2.63	2.58	2.46	2.45	2.65	2.79	2.74	2.79	2.38	2.92	2.62
Dec 31	2.80	2.72	2.70	2.70	2.81	2.86	2.71	2.66	2.69	S	2.81	2.84	2.83	2.79	2.38	2.15	2.13	2.12	2.14	2.17	2.16	2.17	2.17	2.21	2.12	2.86	2.51
Diurnal Maximum	2.81	2.86	2.86	2.87	2.95	2.86	2.80	2.85	2.92	2.87	2.86	2.84	2.83	2.79	2.58	2.46	2.63	2.65	2.62	2.62	2.68	2.79	2.83	2.85			
Diurnal Average	2.22	2.20	2.21	2.22	2.24	2.20	2.20	2.18	2.21	2.20	2.21	2.16	2.16	2.15	2.15	2.14	2.15	2.18	2.16	2.16	2.17	2.18	2.19	2.19			

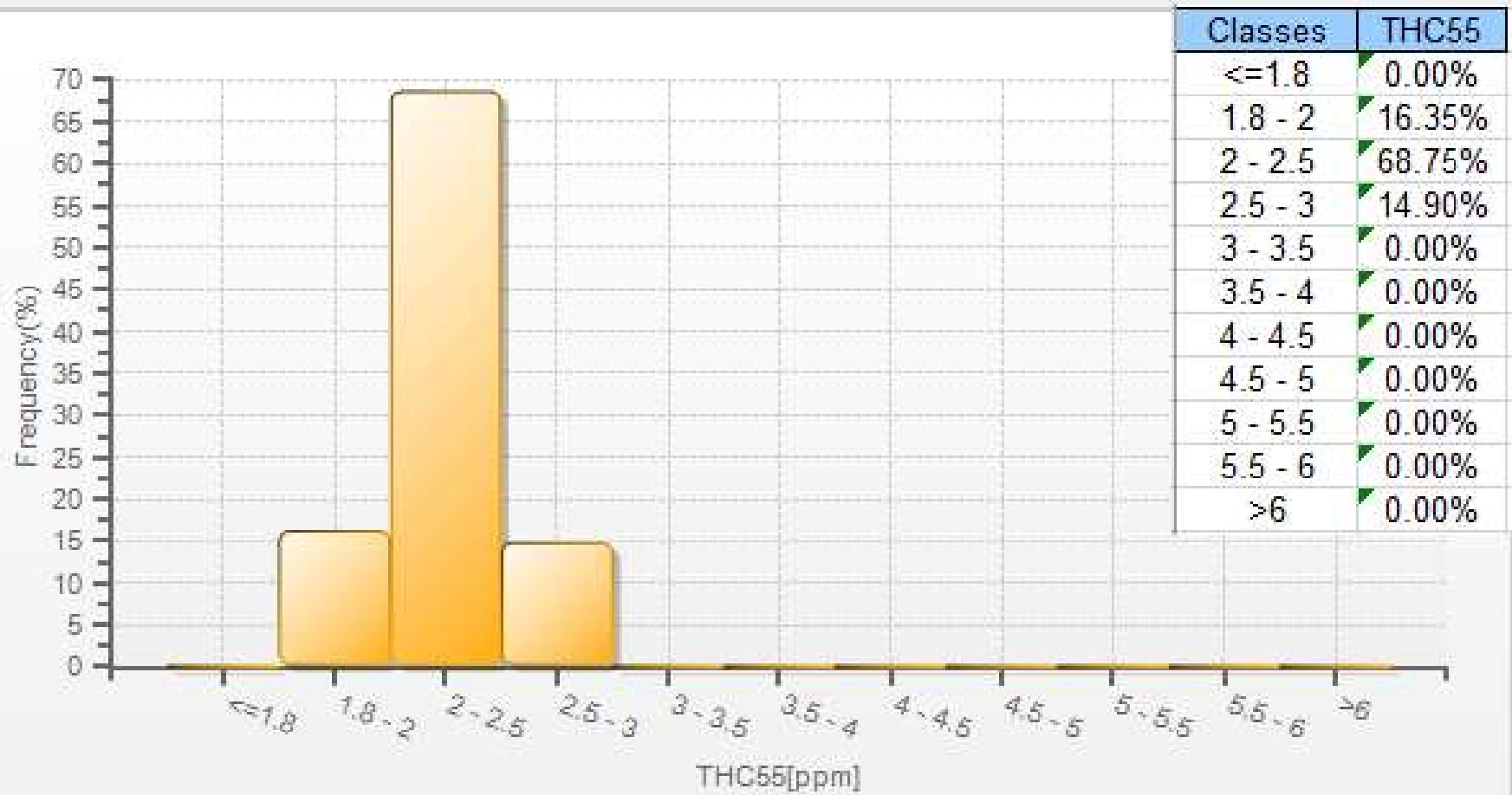
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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 Average for THC - Cold Lake South Station**

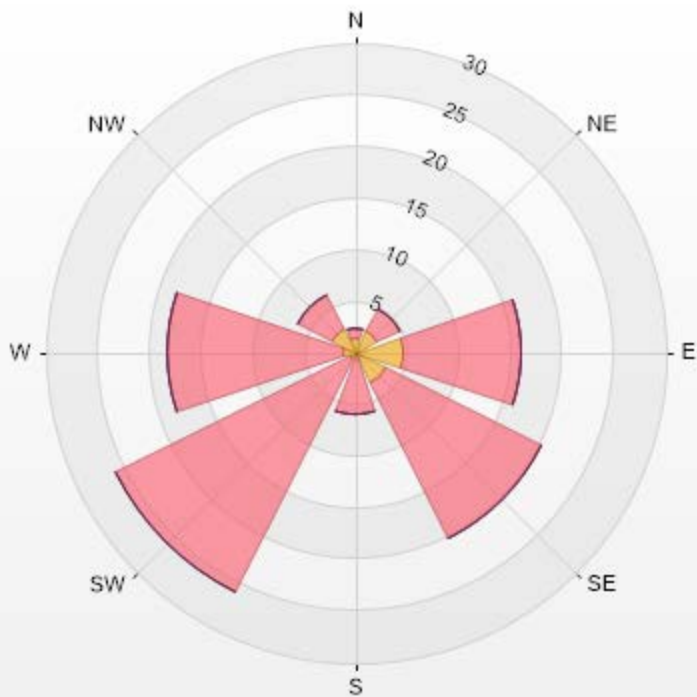


THC55[ppm] Histogram: Cold Lake South Monthly: 12-2019 1 Hr.








Wind: Cold Lake South Poll.: Cold Lake South-THC55[ppm] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 55.91% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	1.44	0.96	0	0	0	2.4
NE	2.4	2.4	0	0	0	4.8
E	4.57	11.54	0	0	0	16.11
SE	3.37	16.83	0	0	0	20.2
S	0	6.01	0	0	0	6.01
SW	0.72	25.24	0	0	0	25.96
W	1.2	17.07	0	0	0	18.27
NW	2.64	3.61	0	0	0	6.25
Summary	16.34	83.66	0	0	0	100



LICA-201912-Revision 1

% Icon	Classes (ppm)	16	84	0	0
	0-2	16	84	0	0
	2-5	0	84	0	0
	5-10	0	0	0	0
	10-40	0	0	0	0
	>40.0	0	0	0	0



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2019

Summary of Hourly Averages

METHANE (CH4) in ppm

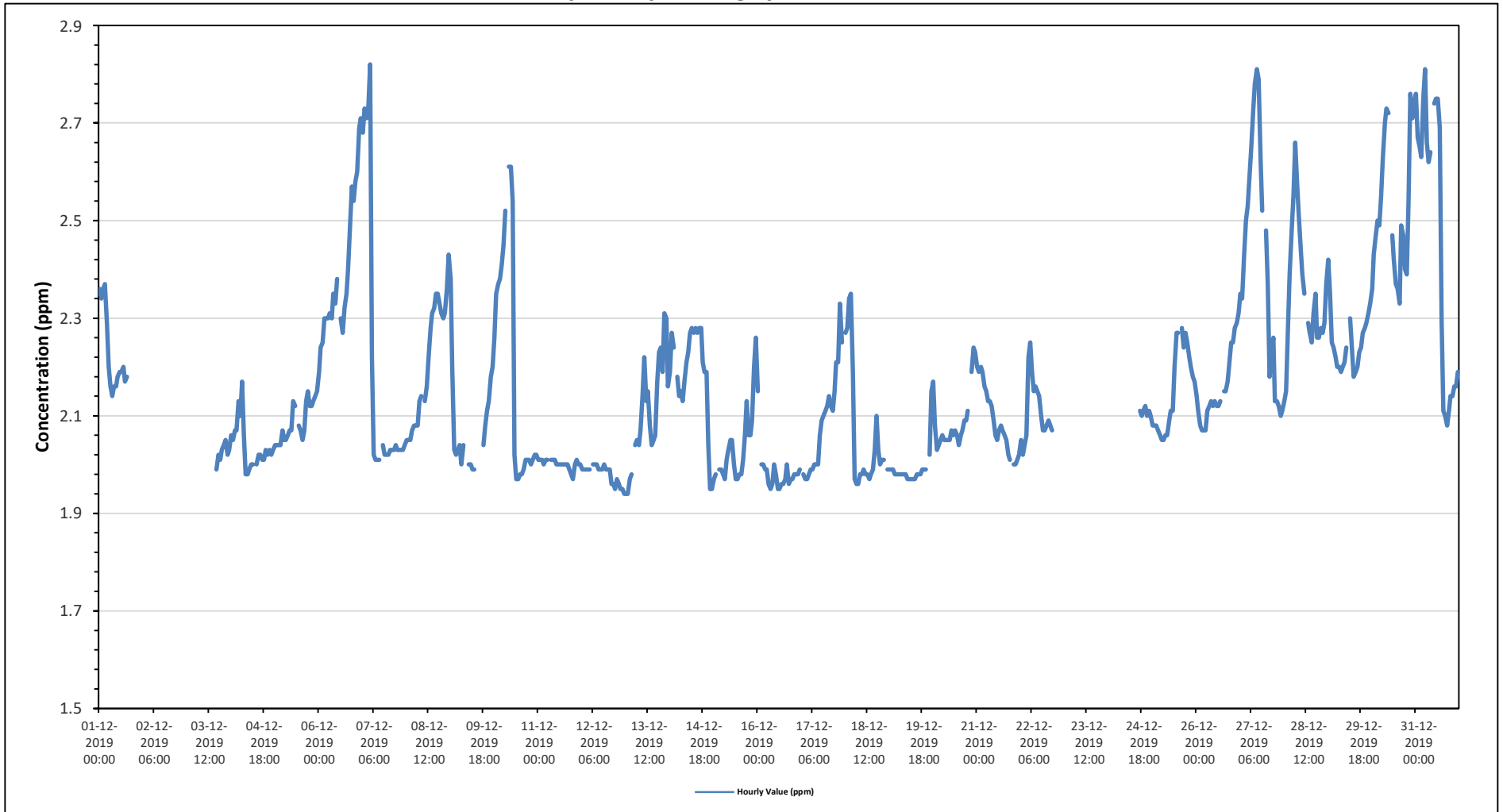
Maximum Hourly Value:	2.82 ppm on December 7 at hour 4	Hours in Service:	744
Maximum Daily Value:	2.52 ppm on December 30	Hours of Data:	618
Minimum Hourly Value:	1.94 ppm on December 12 at hour 23	Hours of Missing Data:	93
Minimum Daily Value:	1.98 ppm on December 12	Hours of Calibration:	33
Monthly Average:	2.16 ppm	Operational Uptime:	87.5

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	
Dec 1	2.36	2.34	2.36	2.37	2.29	2.20	2.16	2.14	2.16	2.16	2.18	2.19	2.19	2.20	2.17	2.18	S	X	X	X	X	X	X	2.14	2.37	-		
Dec 2	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	-	
Dec 3	X	X	X	X	X	X	X	C	C	C	C	Y	Y	Y	S	Y	X	X	X	2.01	2.03	2.04	2.05	2.02	2.03	1.99	2.05	-
Dec 4	2.06	2.05	2.07	2.07	2.13	2.10	2.17	2.06	1.98	1.98	1.99	2.00	2.00	S	2.00	2.02	2.02	2.01	2.01	2.03	2.02	2.03	2.02	2.03	1.98	2.17	2.04	
Dec 5	2.04	2.04	2.04	2.04	2.07	2.05	2.05	2.06	2.07	2.07	2.13	2.12	S	2.08	2.07	2.05	2.07	2.13	2.15	2.12	2.12	2.13	2.14	2.15	2.04	2.15	2.09	
Dec 6	2.19	2.24	2.25	2.30	2.30	2.30	2.31	2.30	2.35	2.33	2.38	S	2.30	2.27	2.32	2.35	2.40	2.49	2.57	2.54	2.58	2.60	2.69	2.71	2.19	2.71	2.39	
Dec 7	2.68	2.73	2.71	2.72	2.82	2.22	2.02	2.01	2.01	2.01	S	2.04	2.02	2.02	2.02	2.03	2.03	2.03	2.04	2.03	2.03	2.03	2.03	2.04	2.01	2.82	2.19	
Dec 8	2.05	2.05	2.05	2.07	2.08	2.08	2.08	2.13	2.14	S	2.13	2.16	2.22	2.28	2.31	2.32	2.35	2.35	2.33	2.31	2.30	2.31	2.36	2.43	2.05	2.43	2.21	
Dec 9	2.38	2.20	2.03	2.02	2.03	2.04	2.00	2.04	S	X	2.00	2.00	1.99	1.99	C1	C1	C1	C1	2.04	2.08	2.11	2.13	2.18	2.20	1.99	2.38	2.08	
Dec 10	2.26	2.35	2.37	2.38	2.41	2.45	2.52	S	2.61	2.61	2.54	2.02	1.97	1.97	1.98	1.98	1.99	2.01	2.01	2.01	2.00	2.01	2.02	2.02	1.97	2.61	2.20	
Dec 11	2.01	2.01	2.01	2.00	2.01	2.01	S	2.01	2.01	2.01	2.00	2.00	2.00	2.00	2.00	2.00	1.99	1.98	1.97	2.00	2.01	2.00	2.00	1.97	2.01	2.00	2.00	
Dec 12	1.99	1.99	1.99	1.99	1.99	S	2.00	2.00	2.00	1.99	1.99	1.99	2.00	1.99	1.99	1.99	1.96	1.96	1.95	1.97	1.96	1.95	1.95	1.94	1.94	2.00	1.98	
Dec 13	1.94	1.94	1.97	1.98	S	2.04	2.05	2.04	2.07	2.14	2.22	2.13	2.15	2.08	2.04	2.05	2.06	2.17	2.23	2.24	2.19	2.31	2.30	2.16	1.94	2.31	2.11	
Dec 14	2.19	2.27	2.24	S	2.18	2.14	2.15	2.13	2.17	2.21	2.23	2.27	2.28	2.27	2.28	2.27	2.28	2.28	2.21	2.19	2.19	2.04	1.95	1.95	1.95	2.28	2.19	
Dec 15	1.97	1.98	S	1.99	1.99	1.98	1.97	2.01	2.03	2.05	2.05	2.00	1.97	1.97	1.98	1.98	2.01	2.06	2.13	2.06	2.06	2.09	2.20	2.26	1.97	2.26	2.03	
Dec 16	2.15	S	2.00	2.00	1.99	1.99	1.96	1.95	1.96	2.00	1.98	1.95	1.95	1.96	1.96	1.97	2.00	1.96	1.97	1.97	1.98	1.98	1.98	1.99	1.95	2.15	1.98	
Dec 17	S	1.98	1.97	1.97	1.98	1.99	1.99	2.00	2.00	2.00	2.06	2.09	2.10	2.11	2.12	2.14	2.12	2.11	2.15	2.21	2.21	2.33	2.25	S	1.97	2.33	2.09	
Dec 18	2.27	2.28	2.34	2.35	2.19	1.97	1.96	1.96	1.98	1.98	1.99	1.98	1.98	1.97	1.98	1.99	2.03	2.10	2.03	2.00	2.01	2.01	S	1.99	1.96	2.35	2.06	
Dec 19	1.99	1.99	1.99	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.97	1.97	1.97	1.97	1.98	1.98	1.98	1.98	1.99	1.99	1.99	S	2.02	2.15	1.97	2.15	1.99	
Dec 20	2.17	2.08	2.03	2.04	2.05	2.06	2.05	2.05	2.05	2.05	2.07	2.06	2.07	2.06	2.04	2.06	2.07	2.09	2.09	2.11	S	2.19	2.24	2.23	2.03	2.24	2.09	
Dec 21	2.20	2.19	2.20	2.19	2.16	2.15	2.13	2.13	2.12	2.09	2.06	2.05	2.07	2.08	2.07	2.06	2.05	2.02	2.01	S	2.00	2.00	2.01	2.02	2.00	2.20	2.09	
Dec 22	2.05	2.02	2.04	2.06	2.22	2.25	2.19	2.15	2.16	2.15	2.14	2.10	2.07	2.07	2.08	2.09	2.08	2.07	S	X	X	X	X	X	2.02	2.25	2.11	
Dec 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
Dec 24	X	X	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	2.11	2.10	2.11	2.12	2.10	2.11	2.10	2.10	2.12	-
Dec 25	2.08	2.08	2.08	2.07	2.06	2.05	2.05	2.06	2.06	2.09	2.11	2.11	2.20	2.27	2.27	S	2.28	2.24	2.27	2.25	2.22	2.20	2.18	2.17	2.05	2.28	2.15	
Dec 26	2.14	2.11	2.08	2.07	2.07	2.07	2.11	2.12	2.13	2.12	2.13	2.12	2.12	2.13	S	2.15	2.15	2.17	2.21	2.25	2.25	2.28	2.29	2.31	2.07	2.31	2.16	
Dec 27	2.35	2.34	2.43	2.50	2.53	2.59	2.65	2.73	2.78	2.81	2.79	2.62	2.52	S	2.48	2.37	2.18	2.23	2.26	2.13	2.13	2.12	2.10	2.11	2.10	2.81	2.42	
Dec 28	2.13	2.15	2.29	2.39	2.48	2.55	2.66	2.58	2.51	2.44	2.39	2.35	S	2.29	2.27	2.25	2.31	2.35	2.26	2.26	2.28	2.27	2.29	2.37	2.13	2.66	2.35	
Dec 29	2.42	2.35	2.25	2.24	2.22	2.20	2.20	2.19	2.20	2.21	2.24	S	2.30	2.24	2.18	2.19	2.20	2.23	2.24	2.27	2.28	2.29	2.31	2.33	2.18	2.42	2.25	
Dec 30	2.36	2.43	2.47	2.50	2.49	2.55	2.63	2.70	2.73	2.72	S	2.47	2.42	2.37	2.36	2.33	2.49	2.47	2.40	2.39	2.54	2.76	2.71	2.74	2.33	2.76	2.52	
Dec 31	2.76	2.67	2.65	2.63	2.75	2.81	2.66	2.62	2.64	S	2.74	2.75	2.75	2.69	2.30	2.11	2.10	2.08	2.11	2.14	2.14	2.16	2.16	2.19	2.08	2.81	2.46	
Diurnal Maximum	2.76	2.73	2.71	2.72	2.82	2.81	2.66	2.73	2.78	2.81	2.79	2.75	2.69	2.48	2.37	2.49	2.49	2.57	2.54	2.58	2.76	2.71	2.74					
Diurnal Average	2.20	2.19	2.19	2.19	2.21	2.19	2.18	2.16	2.19	2.18	2.18	2.14	2.14	2.13	2.13	2.12	2.12	2.14	2.14	2.14	2.14	2.17	2.17	2.18				

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

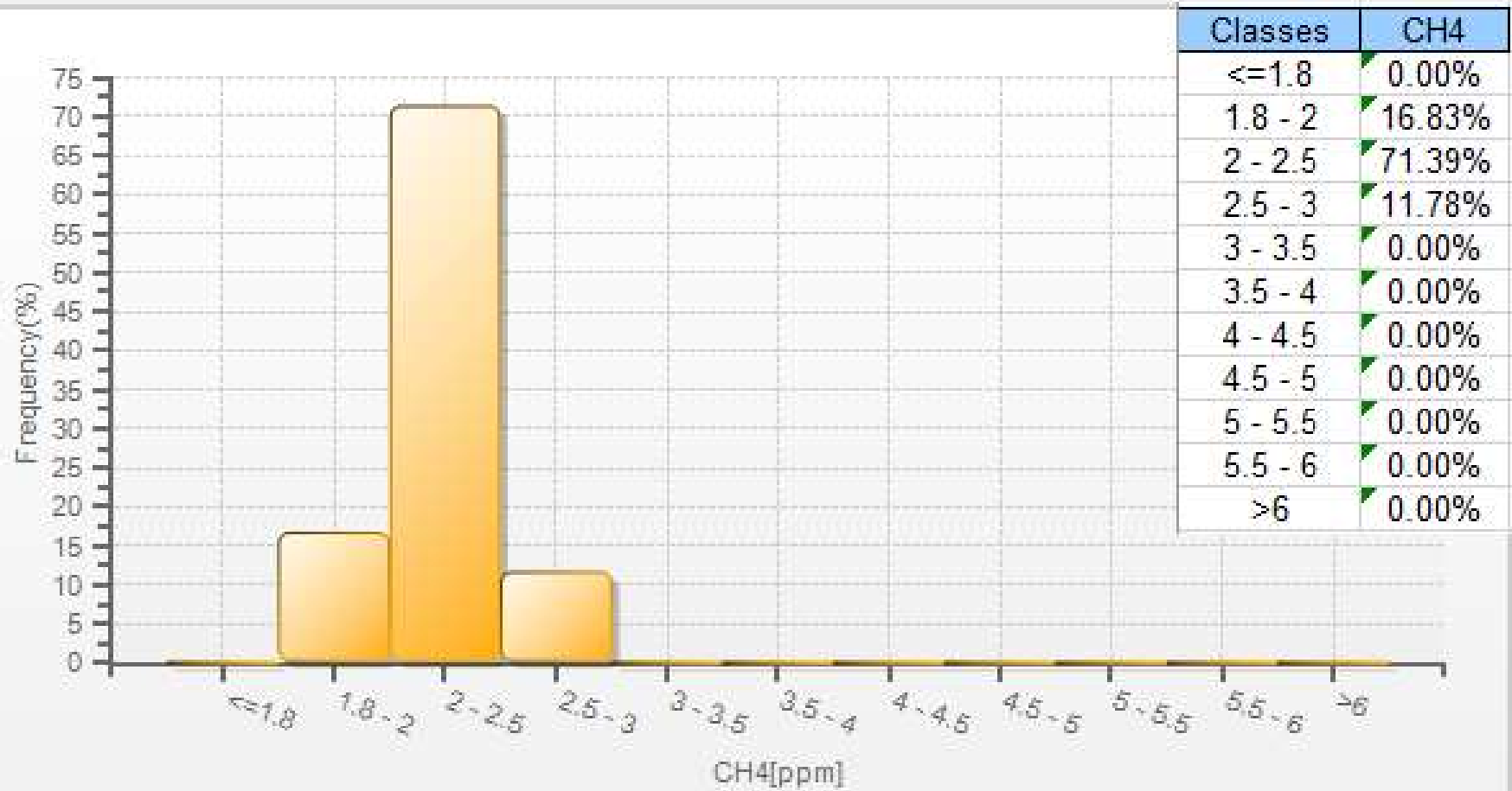
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.  
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

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



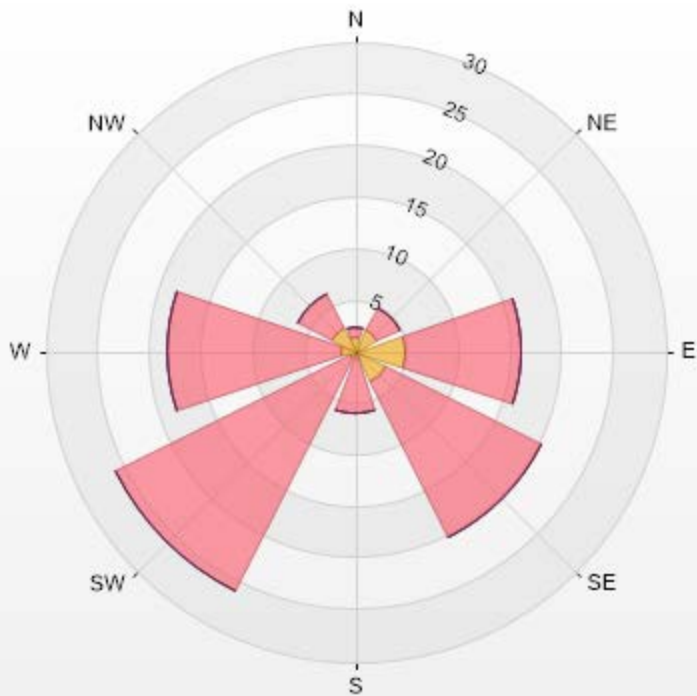


CH4[ppm] Histogram: Cold Lake South Monthly: 12-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-CH4[ppm] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 55.91% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	1.44	0.96	0	0	0	2.4
NE	2.4	2.4	0	0	0	4.8
E	4.81	11.3	0	0	0	16.11
SE	3.37	16.83	0	0	0	20.2
S	0	6.01	0	0	0	6.01
SW	0.72	25.24	0	0	0	25.96
W	1.44	16.83	0	0	0	18.27
NW	2.64	3.61	0	0	0	6.25
Summary	16.82	83.18	0	0	0	100



LICA-201912-Revision 1

% Icon Classes (ppm)	17	83	0	0
0-2	17	83	0	0
2-5	0	0	0	0
5-10	0	0	0	0
10-20	0	0	0	0
>20.0	0	0	0	0



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

*Cold Lake South Station - December 2019*

### Summary of Hourly Averages

#### NON-METHANE HYDROCARBONS (NMHC) in ppm

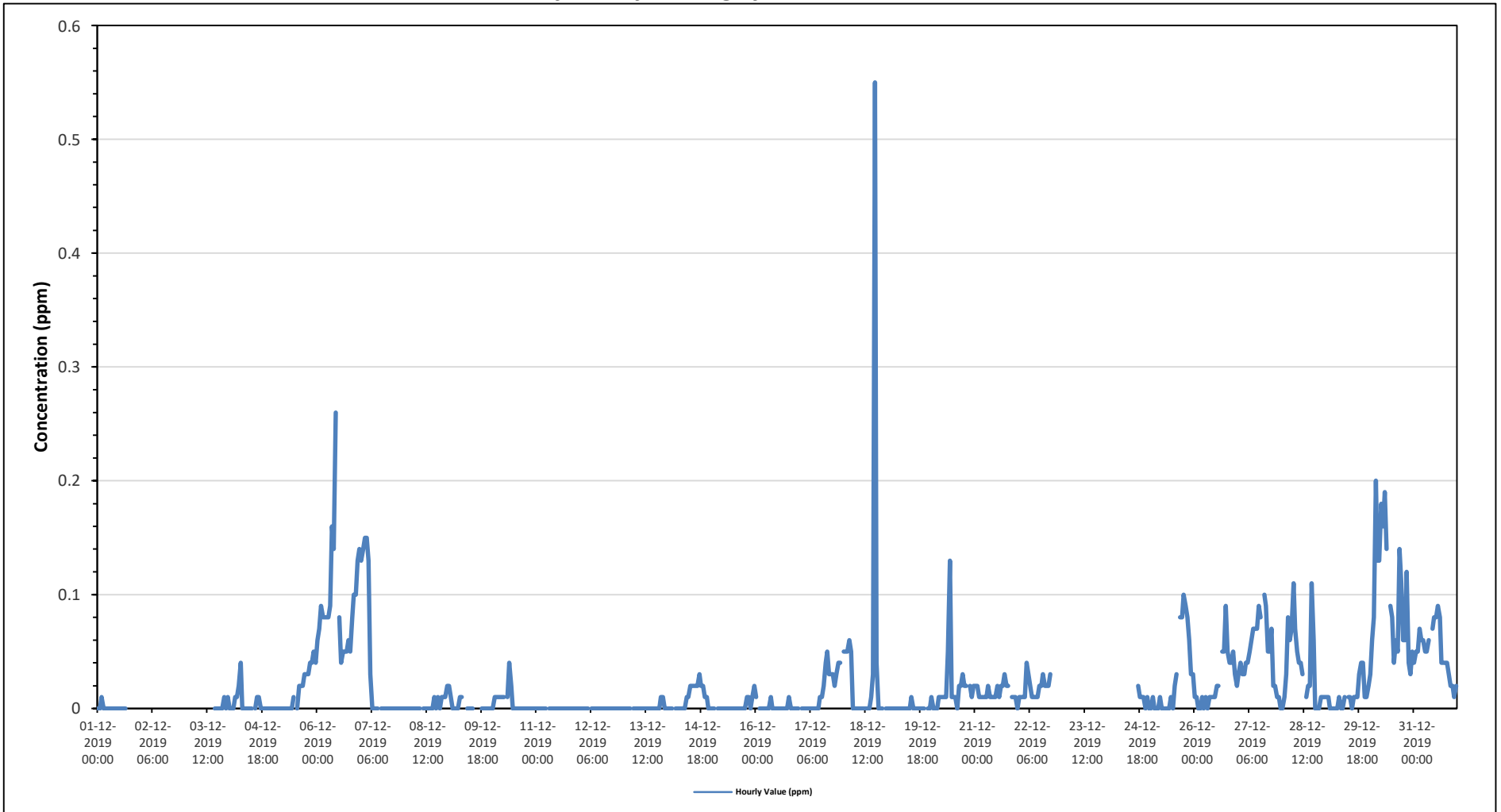
Maximum Hourly Value: 0.55 ppm on December 18 at hour 17	Hours in Service: 744
Maximum Daily Value: 0.10 ppm on December 30	Hours of Data: 618
Minimum Hourly Value: 0.00 ppm on December 1 at hour 0	Hours of Missing Data: 93
Minimum Daily Value: 0.00 ppm on December 11	Hours of Calibration: 33
Monthly Average: 0.02 ppm	Operational Uptime: 87.5

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
Dec 1	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	X	X	X	X	X	X	0.00	0.01	-	
Dec 2	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	0.01	-
Dec 3	X	X	X	X	X	X	X	C	C	C	C	Y	Y	Y	S	Y	X	X	X	X	X	X	X	0.00	0.01	-	
Dec 4	0.00	0.00	0.00	0.01	0.01	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00
Dec 5	0.00	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	0.02	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.05	0.04	0.00	0.05	0.01
Dec 6	0.06	0.07	0.09	0.08	0.08	0.08	0.08	0.09	0.16	0.14	0.26	S	0.08	0.04	0.05	0.05	0.05	0.06	0.05	0.08	0.10	0.10	0.13	0.14	0.04	0.26	0.09
Dec 7	0.13	0.14	0.15	0.15	0.13	0.03	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	0.15	0.03
Dec 8	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	0.01	0.00	0.01	0.01	0.01	0.01	0.02	0.00	0.02	0.00
Dec 9	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.01	S	X	0.00	0.00	0.00	0.00	C1	C1	C1	C1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Dec 10	0.00	0.01	0.01	0.01	0.01	0.01	0.01	S	0.01	0.04	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	0.04	0.01
Dec 11	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 12	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 13	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	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00
Dec 14	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.01	0.00	0.00	0.00	0.03	0.01
Dec 15	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.02	0.00	0.02	0.00
Dec 16	0.01	S	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Dec 17	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.04	0.05	0.03	0.03	0.03	0.02	0.03	0.04	0.04	S	0.00	0.00	0.05	0.02
Dec 18	0.05	0.05	0.05	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.55	0.04	0.00	0.00	0.00	S	0.00	0.00	0.55	0.04	
Dec 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	0.00	0.00
Dec 20	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.05	0.13	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.02	0.02	S	0.02	S	0.02	0.01	0.02	0.00
Dec 21	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.03	0.02	0.02	S	0.01	0.01	0.01	0.01	0.00	0.00	0.03
Dec 22	0.01	0.01	0.01	0.01	0.04	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.02	0.02	0.02	0.03	S	X	X	X	X	X	0.01	0.04
Dec 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	0.00	0.02
Dec 24	X	X	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	0.02	0.01	0.01	0.01	0.00	0.01	0.00	-	0.00
Dec 25	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.03	S	0.08	0.08	0.10	0.09	0.08	0.06	0.03	0.03	0.00	0.10	0.03
Dec 26	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.02	0.02	S	0.05	0.05	0.09	0.05	0.04	0.04	0.05	0.03	0.02	0.00	0.09	0.02
Dec 27	0.03	0.04	0.03	0.03	0.04	0.04	0.05	0.06	0.07	0.07	0.07	0.09	0.08	S	0.10	0.09	0.05	0.05	0.07	0.02	0.02	0.01	0.01	0.00	0.00	0.10	0.05
Dec 28	0.00	0.01	0.03	0.08	0.06	0.07	0.11	0.07	0.05	0.04	0.04	0.03	S	0.01	0.02	0.02	0.11	0.06	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.11	0.04
Dec 29	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	S	0.01	0.01	0.00	0.01	0.01	0.01	0.03	0.04	0.04	0.01	0.01	0.02	0.00	0.04	0.01
Dec 30	0.03	0.06	0.08	0.20	0.13	0.13	0.18	0.16	0.19	0.14	S	0.09	0.08	0.04	0.06	0.05	0.14	0.11	0.06	0.06	0.12	0.04	0.03	0.05	0.03	0.20	0.10
Dec 31	0.04	0.05	0.05	0.07	0.06	0.06	0.05	0.05	0.06	S	0.07	0.08	0.08	0.09	0.08	0.04	0.04	0.04	0.04	0.03	0.02	0.02	0.01	0.02	0.01	0.09	0.05
Diurnal Maximum	0.13	0.14	0.15	0.20	0.13	0.13	0.18	0.16	0.19	0.14	0.26	0.09	0.08	0.09	0.10	0.09	0.14	0.55	0.10	0.09	0.12	0.10	0.13	0.14	0.01	0.09	0.05
Diurnal Average	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.02	0.02	0.03	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.09	0.05

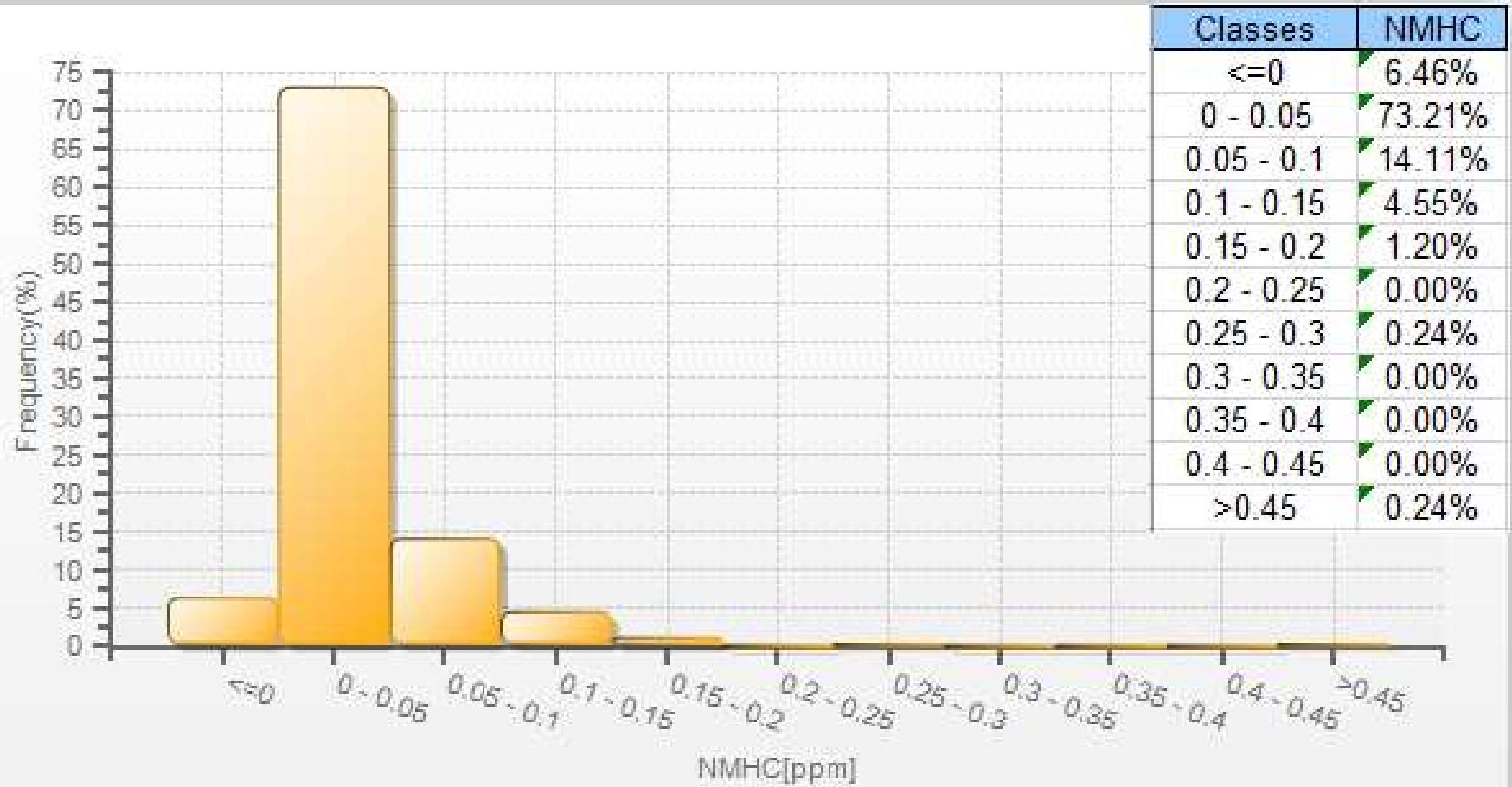
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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 - Cold Lake South Station*

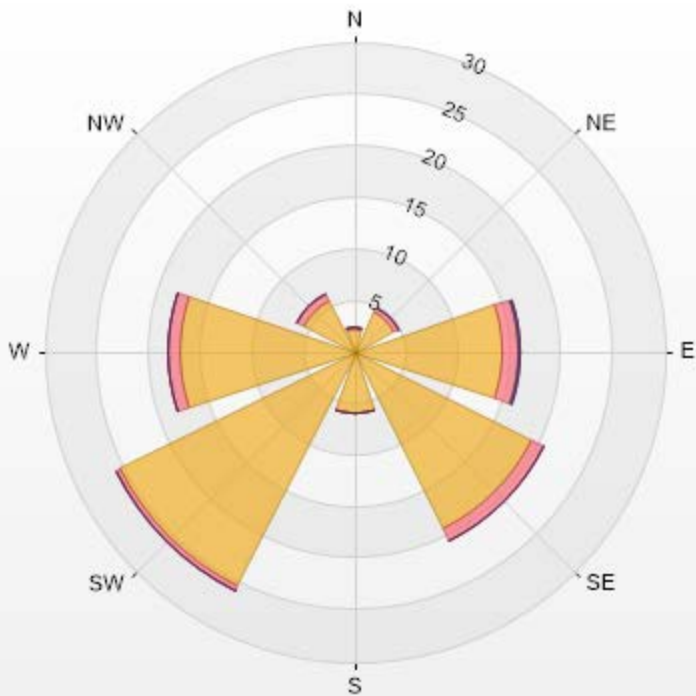


NMHC[ppm] Histogram: Cold Lake South Monthly: 12-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-NMHC[ppm] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 56.18% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-0.9	0.9-2	>2.0	Total
N	2.15	0.24	0	0	0	2.39
NE	4.31	0.48	0	0	0	4.79
E	14.35	1.44	0.24	0	0	16.03
SE	19.14	1.44	0	0	0	20.58
S	5.98	0	0	0	0	5.98
SW	25.36	0.48	0	0	0	25.84
W	16.99	1.2	0	0	0	18.19
NW	5.5	0.72	0	0	0	6.22
Summary	93.78	6	0.24	0	0	100



LICA-201912-Revision 1

% Icon Classes (ppm)	94	0-0.1	6	0.1-0.3	0	0.3-0.9	0	0.9-2.0	0	>2.0
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## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2019

Summary of Hourly Averages

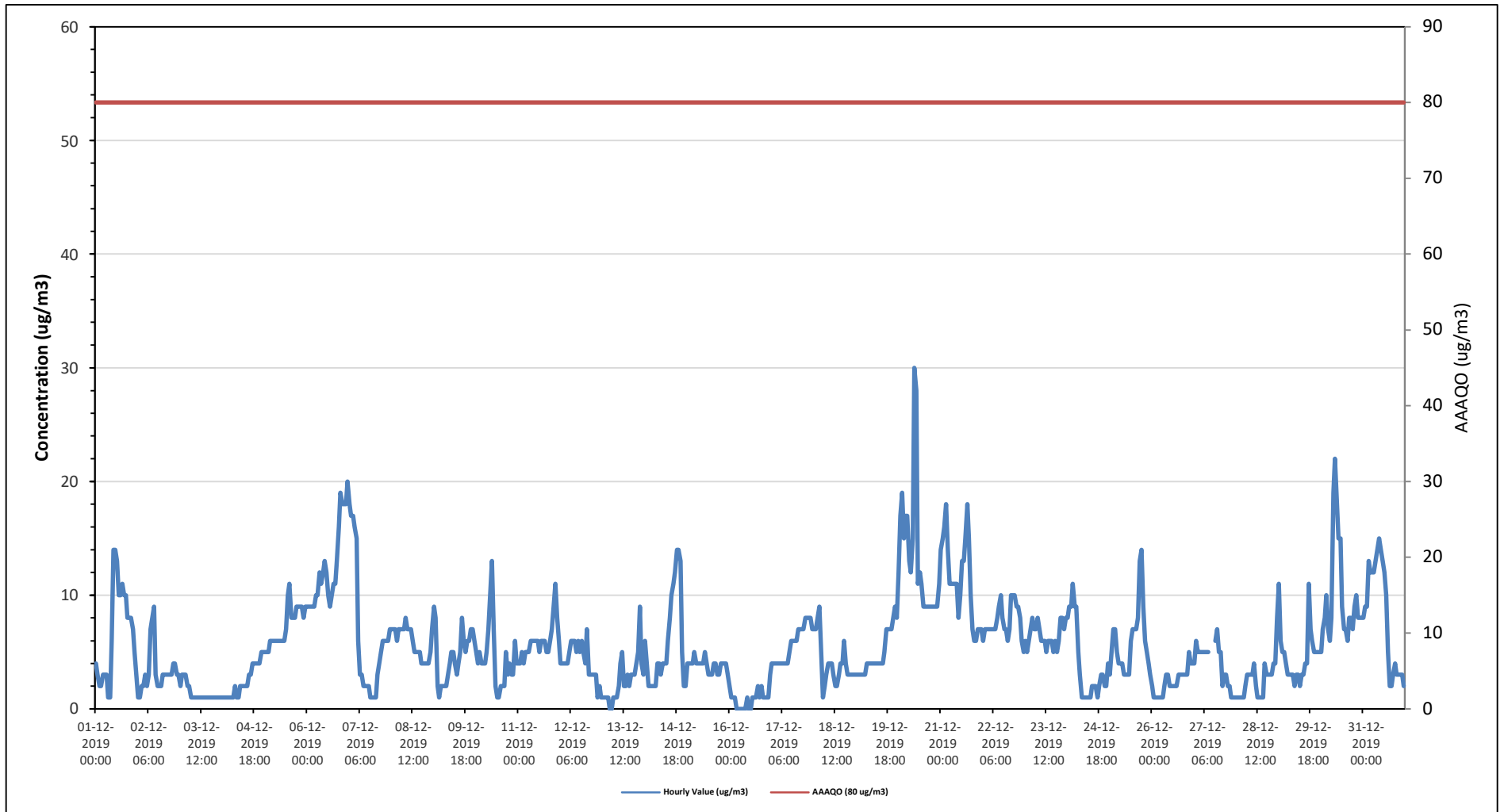
PARTICULATE MATTER 2.5 (PM<sub>2.5</sub>) in µg/m<sup>3</sup>

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 80 µg/m <sup>3</sup> , 24-Hour 29 µg/m <sup>3</sup>																												
Number of 1-Hour Exceedences: 0													Number of 24-Hour Exceedences: 0															
Maximum Hourly Value: 30 µg/m <sup>3</sup> on December 20 at hour 9													Hours in Service: 744															
Maximum Daily Value: 13.4 µg/m <sup>3</sup> on December 20													Hours of Data: 741															
Minimum Hourly Value: 0 µg/m <sup>3</sup> on December 13 at hour 4													Hours of Missing Data: 0															
Minimum Daily Value: 1 µg/m <sup>3</sup> on December 16													Hours of Calibration: 3															
Monthly Average: 5.6 µg/m <sup>3</sup>													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	
Dec 1	4	3	2	2	3	3	3	1	1	6	14	14	13	10	10	11	10	10	8	8	8	7	5	3	1	14	6.6	
Dec 2	1	1	2	2	3	2	3	7	8	9	3	2	2	2	3	3	3	3	3	3	4	4	3	3	1	9	3.3	
Dec 3	2	3	3	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1.4	
Dec 4	1	1	1	1	1	1	1	2	1	1	2	2	2	2	2	3	3	4	4	4	4	4	5	5	1	5	2.4	
Dec 5	5	5	5	6	6	6	6	6	6	6	6	6	7	10	11	8	8	8	9	9	9	9	8	9	5	11	7.3	
Dec 6	9	9	9	9	9	10	10	12	11	12	13	12	10	9	10	11	11	13	16	19	18	18	18	20	9	20	12.4	
Dec 7	18	17	17	16	15	6	3	3	2	2	2	1	1	1	1	3	4	5	6	6	6	6	7	1	18	6.3		
Dec 8	7	7	7	6	7	7	7	7	8	7	7	7	6	5	5	5	5	4	4	4	4	4	5	7	4	8	5.9	
Dec 9	9	8	2	1	2	2	2	2	3	4	5	5	4	3	4	5	8	6	5	6	6	7	7	6	1	9	4.7	
Dec 10	5	4	5	4	4	4	5	7	10	13	7	2	1	1	2	2	2	5	3	4	3	6	4	1	13	4.4		
Dec 11	4	4	5	4	5	5	5	6	6	6	6	6	5	6	6	6	5	5	6	7	9	11	8	6	4	11	5.9	
Dec 12	4	4	4	4	4	5	6	6	6	5	6	5	6	5	4	7	3	3	3	3	3	1	2	1	1	7	4.2	
Dec 13	1	1	1	1	0	0	1	1	1	2	4	5	2	2	3	2	3	3	3	4	5	9	4	3	0	9	2.5	
Dec 14	6	4	2	2	2	2	2	4	4	3	4	4	4	6	8	10	11	12	14	14	13	5	2	2	2	14	5.8	
Dec 15	4	4	4	4	5	4	4	4	4	4	5	4	3	3	3	4	4	3	3	4	4	4	4	3	3	5	3.8	
Dec 16	2	1	1	1	0	0	0	0	0	0	1	0	0	1	1	1	2	1	2	1	1	1	1	3	0	3	0.9	
Dec 17	4	4	4	4	4	4	4	4	4	4	5	6	6	6	6	7	7	7	7	8	8	8	8	7	4	8	5.7	
Dec 18	7	7	8	9	5	1	2	3	4	4	4	4	3	2	4	4	4	6	4	3	3	3	3	3	1	9	4.0	
Dec 19	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	5	7	7	7	7	8	9	8	3	9	4.8		
Dec 20	12	17	19	15	17	17	13	12	15	30	28	11	12	11	9	9	9	9	9	9	9	9	9	11	9	30	13.4	
Dec 21	14	15	16	18	14	11	11	11	11	8	10	13	13	15	18	15	10	7	6	6	7	7	7	7	6	18	11.4	
Dec 22	6	7	7	7	7	7	7	7	8	9	10	8	7	7	6	7	10	10	10	9	9	8	6	5	5	10	7.7	
Dec 23	6	5	6	7	8	7	7	8	7	6	6	6	5	6	6	6	5	6	5	6	8	8	7	8	5	8	6.5	
Dec 24	8	9	9	11	9	9	5	3	1	1	1	1	1	1	2	2	2	1	2	3	3	2	2	4	1	11	3.8	
Dec 25	3	5	7	7	5	4	4	4	3	3	3	3	6	7	7	8	13	14	9	6	5	4	3	3	14	5.8		
Dec 26	2	1	1	1	1	1	1	2	3	3	2	2	2	2	2	3	3	3	3	3	5	4	4	1	5	2.4		
Dec 27	4	6	5	5	5	5	5	5	5	C	C	C	6	7	5	5	2	3	3	2	2	1	1	1	1	7	4.0	
Dec 28	1	1	1	1	1	2	3	3	3	3	4	2	1	1	1	1	4	3	3	3	3	4	4	8	1	8	2.5	
Dec 29	11	6	5	5	4	3	3	3	3	2	3	3	2	3	3	4	4	11	7	6	5	5	5	2	11	4.6		
Dec 30	5	7	8	10	7	6	8	19	22	18	15	15	9	7	7	6	8	8	7	9	10	8	8	8	5	22	9.8	
Dec 31	8	9	9	13	12	12	12	13	14	15	14	13	12	10	5	2	2	3	4	3	3	3	3	2	2	15	8.2	
Diurnal Maximum	18	17	19	18	17	17	13	19	22	30	28	15	13	13	15	18	15	13	16	19	18	18	20					
Diurnal Average	5.7	5.7	5.7	5.9	5.5	4.9	4.8	5.5	5.8	6.5	6.4	5.5	5.0	5.0	5.0	5.3	5.5	6.0	5.8	5.9	5.9	5.7	5.3	5.4				
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							

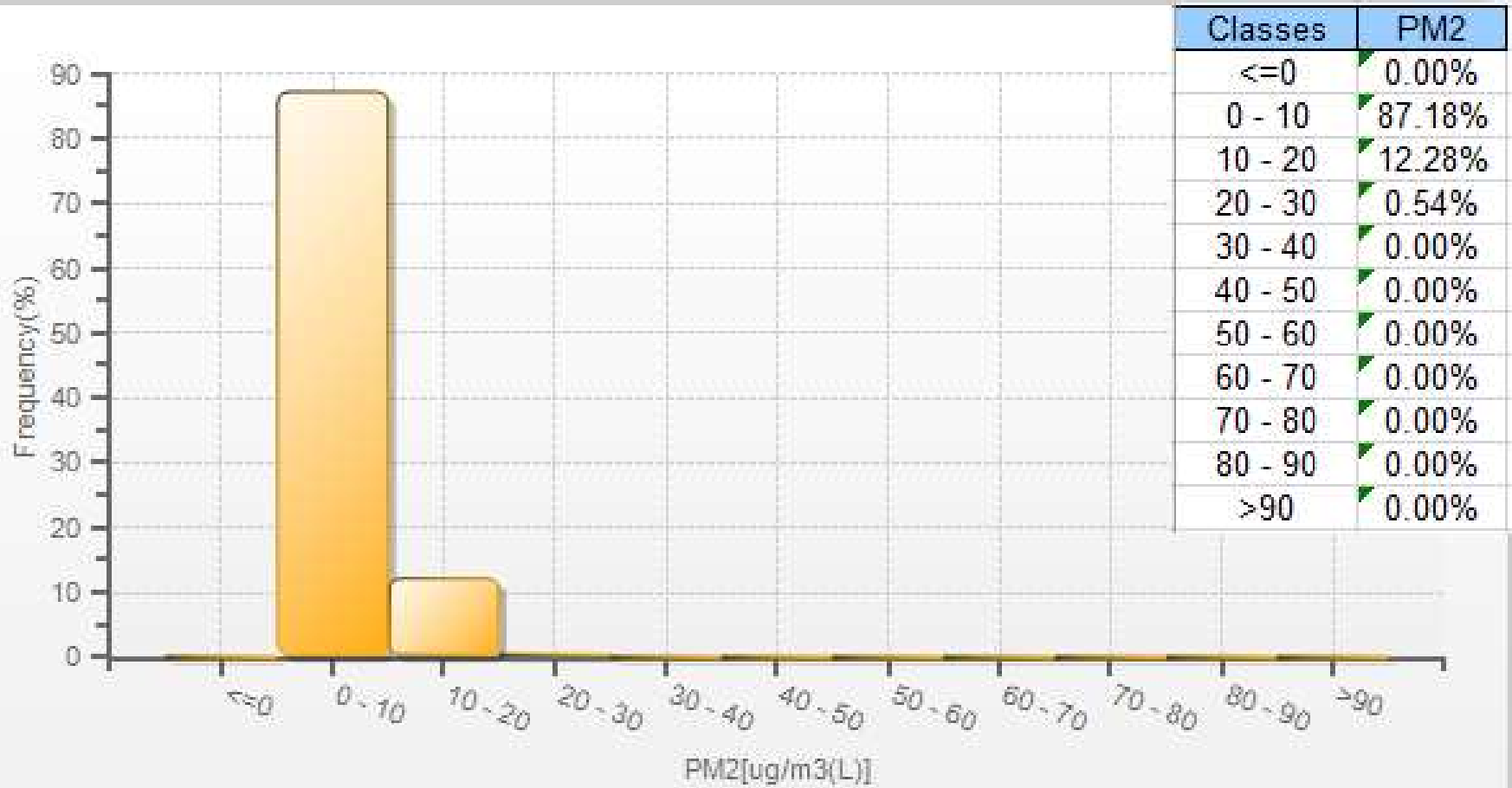
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

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

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

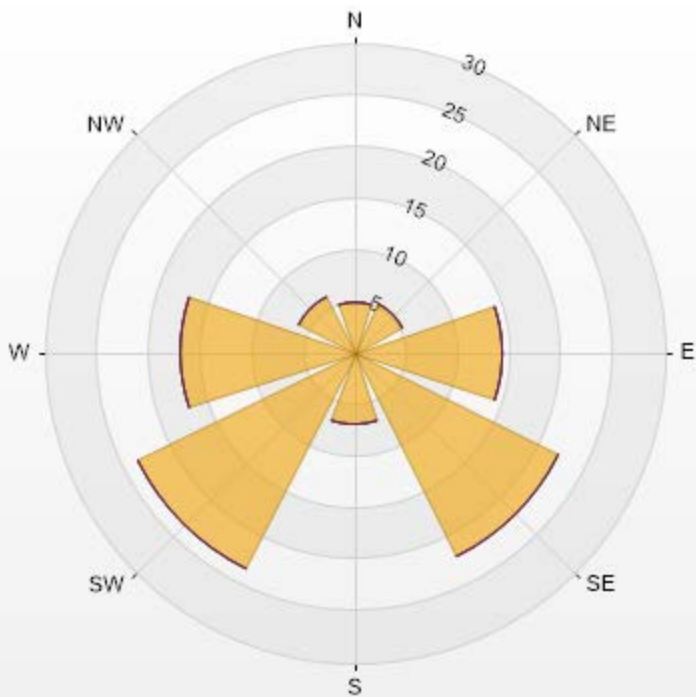


PM2[ug/m3(L)] Histogram: Cold Lake South Monthly: 12-2019 1 Hr.



Wind: Cold Lake South Poll.: Cold Lake South-PM2[ug/m3(L)] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 99.60% Calm Avg: 0.00 [ug/m3(L)]

Direction	0-50	50-80	80-120	120-240	>240.0	Total
N	4.99	0	0	0	0	4.99
NE	5.26	0	0	0	0	5.26
E	14.3	0	0	0	0	14.3
SE	22	0	0	0	0	22
S	7.02	0	0	0	0	7.02
SW	23.48	0	0	0	0	23.48
W	16.87	0	0	0	0	16.87
NW	6.07	0	0	0	0	6.07
Summary	100	0	0	0	0	100



LICA-201912-Revision 1



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2019

### Summary of Hourly Averages

#### RELATIVE HUMIDITY (RH) in %

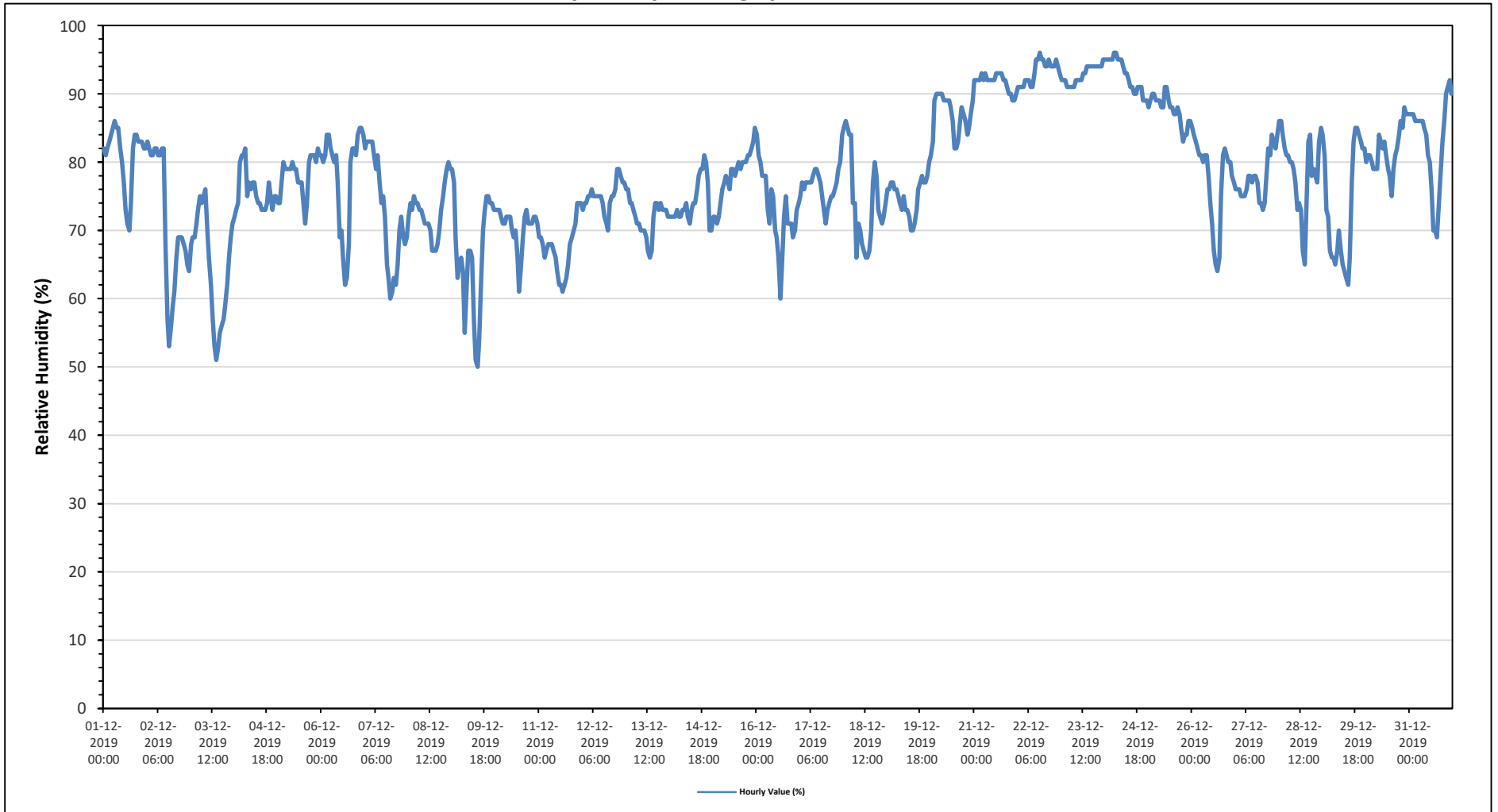
Maximum Hourly Value:	96 %	on December 22 at hour 12	Hours in Service:	744
Maximum Daily Value:	93.3 %	on December 22	Hours of Data:	744
Minimum Hourly Value:	50 %	on December 9 at hour 14	Hours of Missing Data:	0
Minimum Daily Value:	64.9 %	on December 3	Hours of Calibration:	0
Monthly Average:	77.8 %		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
Dec 1	82	81	82	83	84	85	86	85	85	82	80	77	73	71	70	74	82	84	84	83	83	83	82	82	70	86	81.0
Dec 2	83	82	81	81	82	82	81	81	82	82	68	57	53	56	59	61	66	69	69	69	68	67	65	64	53	83	71.2
Dec 3	68	69	69	71	73	75	74	75	76	70	66	62	57	53	51	53	55	56	57	59	62	66	69	71	51	76	64.9
Dec 4	72	73	74	80	81	81	82	75	77	76	77	77	75	74	74	73	73	73	74	77	75	73	75	75	72	82	75.7
Dec 5	74	74	77	80	79	79	79	79	80	79	79	77	77	77	74	71	74	80	81	81	81	80	82	81	71	82	78.1
Dec 6	81	80	81	84	84	82	81	80	81	77	69	70	66	62	63	68	80	82	82	81	84	85	85	84	62	85	78.0
Dec 7	82	83	83	83	83	81	79	81	77	74	75	72	65	63	60	61	63	62	65	70	72	69	68	69	60	83	72.5
Dec 8	72	74	73	75	74	74	73	73	72	71	71	71	70	67	67	67	68	70	73	75	77	79	80	79	67	80	72.7
Dec 9	79	77	69	63	65	66	64	55	62	67	67	66	57	51	50	54	63	70	73	75	75	74	74	73	50	79	66.2
Dec 10	73	73	73	72	71	71	72	72	72	70	69	70	66	61	65	69	72	73	71	71	71	72	72	71	61	73	70.5
Dec 11	69	69	68	66	67	68	68	68	67	66	64	62	62	61	62	63	65	68	69	70	71	74	74	74	61	74	67.3
Dec 12	73	74	74	75	75	76	75	75	75	75	75	74	72	71	70	74	75	75	76	79	79	78	77	77	70	79	75.0
Dec 13	76	76	74	74	73	72	71	71	70	70	70	69	67	66	67	72	74	74	73	74	73	73	73	72	66	76	71.8
Dec 14	72	72	72	72	73	72	72	73	73	74	72	71	73	74	74	76	78	79	79	81	80	77	70	70	70	81	74.1
Dec 15	72	72	71	72	74	76	77	78	77	76	79	79	78	79	80	79	80	80	80	81	81	82	83	85	71	85	78.0
Dec 16	84	81	80	78	78	78	73	71	76	75	70	69	66	60	65	72	75	71	71	71	69	70	73	74	60	84	72.9
Dec 17	75	77	76	77	77	77	77	78	79	79	78	77	75	73	71	73	74	75	75	76	77	79	80	84	71	84	76.6
Dec 18	85	86	85	84	84	74	74	66	71	70	68	67	66	66	67	70	77	80	78	73	72	71	72	74	66	86	74.2
Dec 19	76	76	77	77	76	76	75	74	73	75	73	73	72	70	70	71	73	76	77	78	77	77	78	80	70	80	75.0
Dec 20	81	83	89	90	90	90	90	89	89	89	89	88	82	82	83	86	88	87	86	84	85	87	89	89	81	90	86.8
Dec 21	92	92	92	92	93	92	93	92	92	92	92	92	92	93	93	93	92	92	91	90	90	89	89	90	89	93	91.7
Dec 22	91	91	91	91	92	92	92	91	91	93	95	95	96	95	95	94	94	95	94	94	94	95	94	93	91	96	93.3
Dec 23	92	92	92	91	91	91	91	91	92	92	92	92	93	93	93	94	94	94	94	94	94	94	94	95	91	95	92.8
Dec 24	95	95	95	95	95	96	96	95	95	95	94	93	93	92	91	91	90	90	91	91	91	89	89	89	89	96	92.8
Dec 25	88	89	90	90	89	89	89	88	88	91	91	89	88	88	87	87	88	87	85	83	84	84	86	86	83	91	87.7
Dec 26	85	84	83	82	81	81	80	81	81	78	74	71	67	65	64	66	75	81	82	81	80	80	78	77	64	85	77.4
Dec 27	76	76	76	75	75	75	76	78	78	77	78	77	74	74	74	73	74	78	82	81	84	83	82	84	73	84	77.7
Dec 28	86	86	84	82	81	81	80	80	79	77	73	74	73	67	65	73	83	84	78	79	78	77	83	85	65	86	78.7
Dec 29	84	81	73	72	67	66	66	65	67	70	67	65	64	63	62	66	77	83	85	85	84	83	82	82	62	85	73.3
Dec 30	80	81	81	80	79	79	79	84	83	82	83	81	79	78	75	79	81	82	84	86	85	88	87	87	75	88	81.8
Dec 31	87	87	87	86	86	86	86	86	85	84	81	80	76	70	69	74	78	83	86	90	91	92	90	69	92	82.9	
Diurnal Maximum	95	95	95	95	95	96	96	95	95	95	95	95	96	95	95	94	94	95	94	94	94	95	94	95	94	95	95
Diurnal Average	80.2	80.2	79.7	79.8	79.7	79.5	79.1	78.4	78.9	78.3	76.7	75.4	73.4	71.5	71.3	73.2	76.6	78.4	78.8	79.4	79.5	79.6	79.8	80.2			

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 RH - Cold Lake South Station**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

### Cold Lake South Station - December 2019

#### Summary of Hourly Averages

#### AMBIENT TEMPERATURE (AT) in Degree Celsius

Maximum Hourly Value:	4.5 °C	on December 3 at hour 13	Hours in Service:	744
Maximum Daily Value:	-0.3 °C	on December 3	Hours of Data:	744
Minimum Hourly Value:	-30.0 °C	on December 13 at hour 8	Hours of Missing Data:	0
Minimum Daily Value:	-25.4 °C	on December 13	Hours of Calibration:	0
Monthly Average:	-11.9 °C		Operational Uptime:	100.0

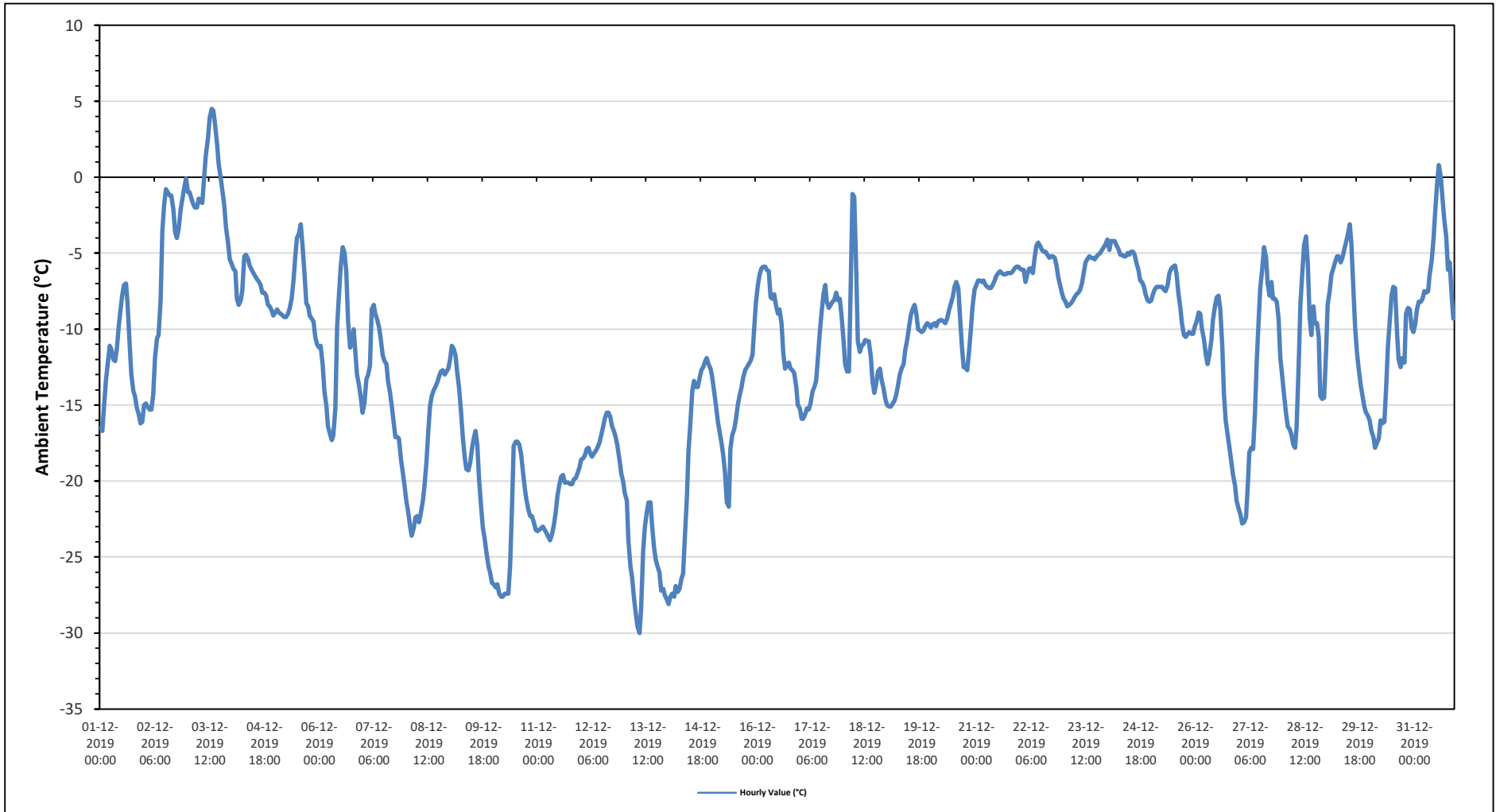
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Dec 1	-16.5	-16.7	-15.2	-13.4	-12.3	-11.1	-11.3	-12.0	-12.1	-11.3	-9.9	-8.8	-7.8	-7.1	-7.0	-8.3	-10.9	-13.0	-14.1	-14.4	-15.2	-15.6	-16.2	-16.1	-16.7	-7.0	-12.3
Dec 2	-15.0	-14.9	-15.1	-15.3	-15.3	-14.3	-11.9	-10.6	-10.4	-8.1	-3.5	-1.8	-0.8	-1.0	-1.2	-2.1	-3.6	-4.0	-3.4	-2.1	-1.5	-0.7	-0.1	-0.1	-15.3	-0.1	-6.6
Dec 3	-1.0	-1.0	-1.4	-1.8	-2.0	-2.0	-1.4	-1.6	-1.7	0.2	1.5	2.5	3.9	4.5	4.4	3.5	2.2	0.9	0.0	-0.9	-1.8	-3.3	-4.3	-5.4	-5.4	4.5	-0.3
Dec 4	-5.7	-6.0	-6.2	-8.0	-8.4	-8.1	-7.5	-5.2	-5.1	-5.4	-5.8	-6.1	-6.3	-6.5	-6.7	-6.9	-7.1	-7.6	-7.6	-7.8	-8.4	-8.5	-8.8	-9.1	-9.1	-5.1	-7.0
Dec 5	-8.9	-8.7	-8.9	-9.0	-9.1	-9.2	-9.2	-9.0	-8.6	-8.0	-6.9	-5.1	-4.0	-3.7	-3.1	-4.5	-6.2	-8.3	-8.5	-9.1	-9.3	-9.5	-10.5	-11.0	-11.0	-3.1	-7.8
Dec 6	-11.2	-11.1	-12.3	-14.1	-15.1	-16.4	-16.9	-17.3	-17.0	-15.2	-9.8	-7.8	-5.9	-4.6	-5.0	-6.2	-9.5	-11.2	-11.0	-10.0	-11.6	-13.0	-13.7	-14.5	-17.3	-4.6	-11.7
Dec 7	-15.5	-14.9	-13.3	-13.0	-12.4	-8.7	-8.4	-9.0	-9.4	-9.9	-10.6	-11.7	-12.1	-12.3	-13.4	-14.2	-15.1	-16.1	-17.1	-17.1	-17.2	-18.6	-19.4	-20.3	-20.3	-8.4	-13.7
Dec 8	-21.3	-22.0	-23.0	-23.6	-23.1	-22.4	-22.3	-22.7	-22.0	-21.3	-20.2	-18.8	-16.8	-15.1	-14.4	-14.0	-13.8	-13.5	-13.1	-12.8	-12.7	-13.0	-12.8	-12.6	-23.6	-12.6	-17.8
Dec 9	-12.0	-11.1	-11.3	-11.7	-13.0	-13.8	-15.4	-17.1	-18.5	-19.2	-19.3	-18.8	-17.9	-17.2	-16.7	-17.6	-19.9	-21.7	-23.1	-23.8	-24.7	-25.6	-26.0	-26.7	-26.7	-11.1	-18.4
Dec 10	-26.8	-27.0	-26.8	-27.4	-27.6	-27.6	-27.4	-27.4	-27.4	-25.6	-21.4	-17.7	-17.4	-17.4	-17.6	-18.2	-19.3	-20.5	-21.2	-21.9	-22.3	-22.3	-22.7	-23.2	-27.6	-17.4	-23.1
Dec 11	-23.3	-23.2	-23.1	-23.0	-23.2	-23.4	-23.7	-23.9	-23.5	-22.9	-22.1	-21.0	-20.2	-19.7	-19.6	-20.1	-20.1	-20.1	-20.2	-20.2	-19.9	-19.8	-19.5	-19.1	-23.9	-19.1	-21.5
Dec 12	-18.6	-18.5	-18.3	-17.9	-17.8	-18.2	-18.4	-18.2	-18.0	-17.8	-17.5	-17.0	-16.4	-15.9	-15.5	-15.8	-16.4	-16.7	-17.1	-17.7	-18.6	-19.5	-20.0	-20.0	-20.0	-15.5	-17.6
Dec 13	-20.8	-21.3	-23.9	-25.6	-26.4	-27.7	-28.7	-29.6	-30.0	-28.4	-24.6	-23.0	-22.1	-21.4	-21.4	-22.9	-24.4	-25.2	-25.7	-26.0	-27.2	-27.1	-27.5	-27.8	-30.0	-20.8	-25.4
Dec 14	-28.1	-27.6	-27.4	-27.6	-26.9	-27.3	-27.1	-26.4	-26.1	-23.7	-21.1	-18.1	-16.1	-14.1	-13.4	-13.8	-13.8	-13.2	-12.7	-12.5	-12.1	-11.9	-12.3	-12.6	-28.1	-11.9	-19.4
Dec 15	-13.1	-14.1	-15.0	-16.1	-16.7	-17.5	-18.3	-19.5	-21.4	-21.7	-17.9	-17.0	-16.6	-15.9	-15.0	-14.4	-13.8	-13.2	-12.7	-12.5	-12.3	-12.1	-11.7	-10.1	-21.7	-10.1	-15.4
Dec 16	-8.3	-7.1	-6.4	-6.0	-5.9	-5.9	-6.1	-6.2	-7.9	-8.0	-7.7	-8.5	-9.0	-8.7	-9.6	-11.6	-12.6	-12.3	-12.2	-12.6	-12.7	-12.9	-13.8	-15.0	-15.0	-5.9	-9.5
Dec 17	-15.2	-15.9	-15.9	-15.6	-15.2	-15.3	-14.9	-14.1	-13.8	-13.4	-11.9	-10.1	-9.0	-7.7	-7.1	-8.2	-8.6	-8.4	-8.2	-8.1	-7.6	-8.1	-8.0	-9.1	-15.9	-7.1	-11.2
Dec 18	-10.8	-12.3	-12.8	-12.8	-8.0	-1.1	-1.3	-6.3	-10.8	-11.5	-11.1	-11.0	-10.7	-10.8	-10.8	-11.8	-13.5	-14.2	-13.6	-12.8	-12.6	-13.3	-13.9	-14.6	-14.6	-1.1	-10.9
Dec 19	-15.0	-15.1	-15.1	-14.9	-14.7	-14.3	-13.7	-13.0	-12.6	-12.3	-11.4	-10.7	-9.9	-9.1	-8.7	-8.4	-9.0	-10.0	-10.1	-10.2	-10.1	-9.8	-9.6	-9.7	-15.1	-8.4	-11.6
Dec 20	-9.9	-9.7	-9.6	-9.8	-9.5	-9.4	-9.4	-9.5	-9.6	-9.3	-8.8	-8.3	-7.9	-7.2	-6.9	-7.3	-9.0	-11.1	-12.5	-12.5	-12.7	-11.5	-9.9	-8.5	-12.7	-6.9	-9.6
Dec 21	-7.4	-7.1	-6.8	-6.8	-6.9	-6.8	-7.1	-7.2	-7.3	-7.3	-7.1	-6.8	-6.5	-6.3	-6.2	-6.3	-6.4	-6.4	-6.3	-6.3	-6.3	-6.2	-6.0	-5.9	-7.4	-5.9	-6.7
Dec 22	-5.9	-6.0	-6.1	-6.1	-6.9	-6.4	-6.0	-6.0	-6.3	-5.3	-4.5	-4.3	-4.5	-4.8	-4.9	-4.9	-5.1	-5.3	-5.2	-5.2	-5.3	-5.8	-6.6	-7.1	-7.1	-4.3	-5.6
Dec 23	-7.6	-8.0	-8.2	-8.5	-8.4	-8.3	-8.1	-7.9	-7.7	-7.6	-7.4	-7.0	-6.3	-5.6	-5.4	-5.2	-5.3	-5.3	-5.4	-5.2	-5.1	-5.0	-4.8	-4.6	-8.5	-4.6	-6.6
Dec 24	-4.4	-4.1	-4.8	-4.2	-4.2	-4.2	-4.5	-4.7	-5.1	-5.1	-5.2	-5.0	-5.1	-4.9	-4.9	-5.1	-5.7	-6.1	-6.8	-6.9	-7.2	-7.7	-8.1	-8.1	-8.1	-4.1	-5.4
Dec 25	-8.2	-8.1	-7.7	-7.4	-7.2	-7.2	-7.2	-7.2	-7.4	-7.5	-7.1	-6.3	-6.0	-5.9	-5.8	-6.4	-7.6	-8.6	-9.6	-10.4	-10.5	-10.3	-10.2	-10.3	-10.5	-5.8	-7.9
Dec 26	-10.3	-9.8	-9.5	-8.9	-9.0	-10.0	-10.7	-11.7	-12.3	-11.7	-10.7	-9.4	-8.5	-7.9	-7.8	-8.7	-11.2	-14.2	-16.0	-17.0	-17.8	-18.7	-19.6	-20.3	-20.3	-7.8	-12.2
Dec 27	-21.3	-21.8	-22.2	-22.8	-22.7	-22.4	-20.3	-18.1	-17.8	-17.9	-15.6	-12.2	-9.3	-7.3	-6.0	-4.6	-5.3	-7.0	-7.8	-6.9	-8.0	-8.0	-8.2	-9.3	-22.8	-4.6	-13.5
Dec 28	-11.9	-13.2	-14.4	-15.5	-16.4	-16.6	-16.9	-17.6	-17.8	-16.4	-12.4	-8.3	-6.4	-4.5	-3.9	-5.7	-9.2	-10.4	-8.5	-9.6	-9.6	-10.5	-14.4	-14.6	-17.8	-3.9	-11.9
Dec 29	-14.5	-11.4	-8.4	-7.5	-6.4	-6.0	-5.6	-5.2	-5.2	-5.6	-5.3	-4.8	-4.3	-3.8	-3.1	-4.3	-7.3	-9.9	-11.5	-12.6	-13.7	-14.4	-15.1	-15.5	-15.5	-3.1	-8.4
Dec 30	-15.7	-16.0	-16.7	-17.1	-17.8	-17.5	-17.2	-16.0	-16.2	-16.1	-13.8	-11.1	-9.5	-7.8	-7.2	-7.3	-10.3	-12.0	-12.5	-11.9	-12.2	-9.0	-8.6	-8.7	-17.8	-7.2	-12.8
Dec 31	-9.9	-10.2	-9.7	-8.7	-8.2	-8.2	-8.0	-7.5	-7.6	-7.5	-6.4	-5.5	-4.1	-2.2	-0.5	0.8	0.0	-1.3	-2.9	-3.9	-6.1	-5.6	-7.9	-9.3	-10.2	0.8	-5.9
Diurnal Maximum	-1.0	-1.0	-1.4	-1.8	-2.0	-1.1	-1.3	-1.6	-1.7	0.2	1.5	2.5	3.9	4.5	4.4	3.5	2.2	0.9	0.0	-0.9	-1.8	-1.5	-0.7	-0.1			
Diurnal Average	-13.4	-13.4	-13.4	-13.6	-13.4	-13.1	-13.1	-13.2	-13.4	-12.9	-11.5	-10.3	-9.5	-8.8	-8.5	-9.0	-10.2	-11.1	-11.5	-11.7	-12.0	-12.2	-12.6	-12.9			

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 AT - Cold Lake South Station**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2019

Summary of Hourly Averages

### STATION TEMPERATURE (ST) in Degree Celsius

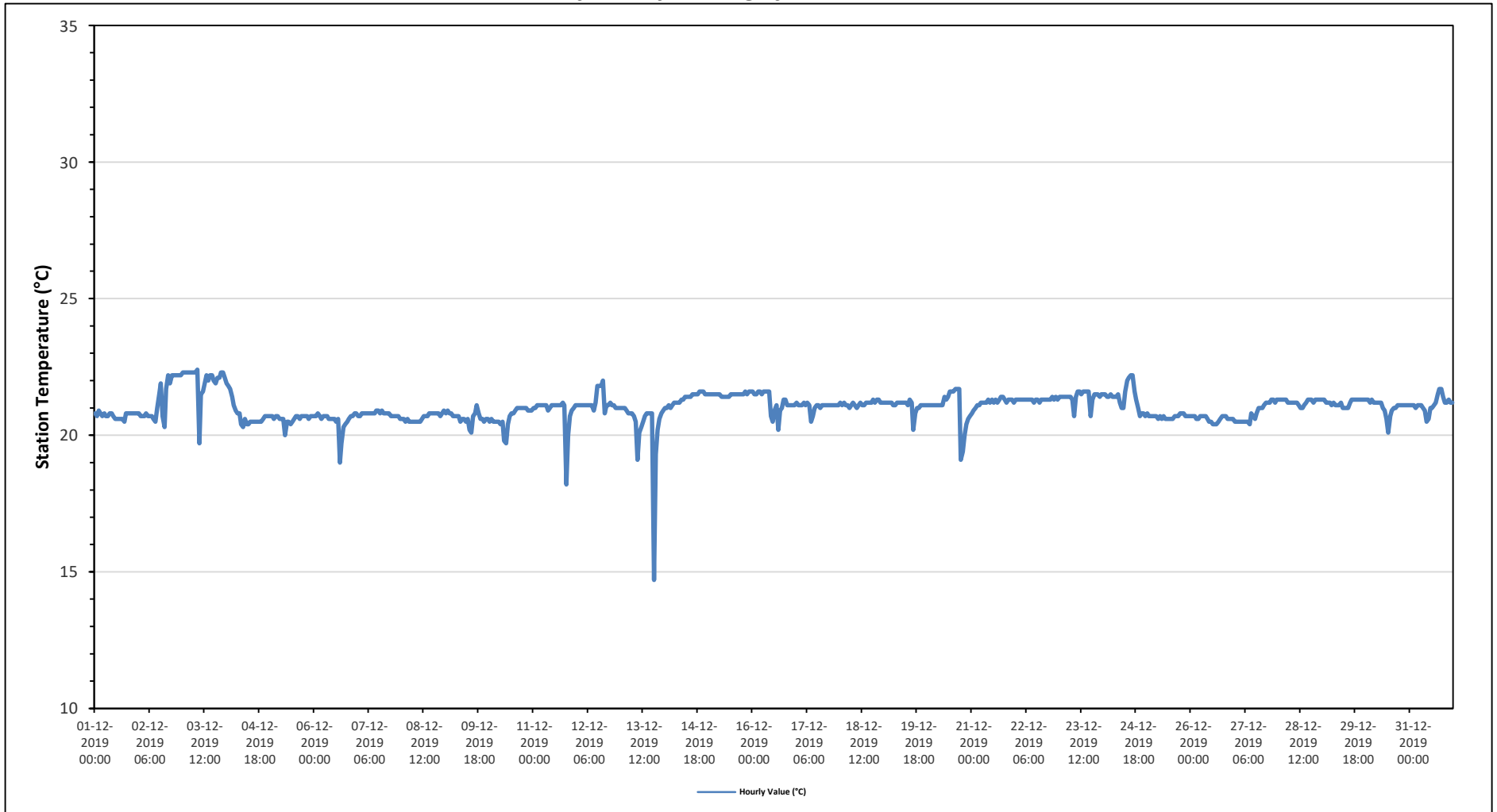
Maximum Hourly Value:	22.4 °C	on December 3 at hour 8	Hours in Service:	744
Maximum Daily Value:	22.0 °C	on December 3	Hours of Data:	744
Minimum Hourly Value:	14.7 °C	on December 13 at hour 18	Hours of Missing Data:	0
Minimum Daily Value:	20.3 °C	on December 13	Hours of Calibration:	0
Monthly Average:	21.0 °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	
Dec 1	20.8	20.7	20.9	20.8	20.7	20.8	20.7	20.7	20.8	20.8	20.7	20.6	20.6	20.6	20.6	20.6	20.5	20.8	20.8	20.8	20.8	20.8	20.8	20.5	20.9	20.7		
Dec 2	20.8	20.7	20.7	20.7	20.8	20.7	20.7	20.7	20.6	20.5	21.0	21.5	21.9	20.7	20.3	21.7	22.2	21.9	22.2	22.2	22.2	22.2	22.2	22.2	22.2	20.3	22.2	21.3
Dec 3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.4	19.7	21.5	21.6	21.9	22.2	22.0	22.2	22.2	22.0	21.9	22.1	22.1	22.1	22.3	22.3	19.7	22.4	22.0
Dec 4	21.9	21.8	21.7	21.4	21.1	20.9	20.8	20.8	20.4	20.3	20.6	20.4	20.4	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.6	20.7	20.7	20.3	21.9	20.8	
Dec 5	20.7	20.7	20.6	20.7	20.7	20.6	20.6	20.6	20.6	20.5	20.5	20.4	20.5	20.6	20.7	20.7	20.6	20.7	20.7	20.7	20.7	20.6	20.7	20.7	20.0	20.7	20.6	
Dec 6	20.7	20.7	20.8	20.7	20.6	20.7	20.7	20.7	20.6	20.6	20.6	20.6	20.5	20.6	19.0	19.7	20.3	20.4	20.5	20.6	20.7	20.7	20.8	20.8	19.0	20.8	20.5	
Dec 7	20.7	20.7	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.9	20.9	20.8	20.9	20.8	20.8	20.8	20.8	20.8	20.7	20.7	20.7	20.7	20.6	20.6	20.9	20.8	
Dec 8	20.6	20.6	20.5	20.6	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.6	20.7	20.7	20.7	20.8	20.8	20.8	20.8	20.8	20.8	20.7	20.8	20.9	20.5	20.9	20.7	
Dec 9	20.8	20.9	20.8	20.8	20.7	20.7	20.7	20.7	20.5	20.6	20.6	20.5	20.6	20.2	20.1	20.7	20.8	21.1	20.8	20.6	20.6	20.5	20.6	20.6	20.1	21.1	20.6	
Dec 10	20.5	20.6	20.5	20.5	20.5	20.5	20.4	20.5	19.8	19.7	20.4	20.7	20.8	20.8	20.9	21.0	21.0	21.0	21.0	21.0	20.9	20.9	20.9	19.7	20.9	21.0	20.7	
Dec 11	21.0	21.0	21.1	21.1	21.1	21.1	21.1	21.1	20.9	21.0	21.1	21.1	21.1	21.1	21.1	21.1	21.2	21.1	18.2	20.0	20.7	20.9	21.0	21.1	18.2	21.2	20.9	
Dec 12	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	20.9	21.2	21.8	21.8	21.8	22.0	20.8	21.1	21.1	21.2	21.1	21.1	21.0	21.0	20.8	20.8	22.0	21.2	
Dec 13	21.0	21.0	21.0	20.9	20.8	20.8	20.8	20.7	20.5	19.1	20.1	20.3	20.5	20.7	20.8	20.8	20.8	20.8	14.7	19.3	20.2	20.6	20.8	20.9	14.7	21.0	20.3	
Dec 14	21.0	21.0	21.1	21.0	21.1	21.2	21.2	21.2	21.2	21.3	21.3	21.4	21.4	21.4	21.4	21.5	21.5	21.5	21.5	21.5	21.6	21.6	21.6	21.5	21.0	21.6	21.3	
Dec 15	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.4	21.4	21.4	21.4	21.4	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.6	21.5	21.6	21.4	21.6	21.5	
Dec 16	21.6	21.5	21.5	21.6	21.6	21.5	21.6	21.6	21.6	21.6	20.7	20.5	20.9	21.1	20.2	20.9	21.0	21.3	21.3	21.1	21.1	21.1	21.1	21.1	20.2	21.6	21.2	
Dec 17	21.2	21.1	21.1	21.1	21.2	21.1	21.2	21.1	20.5	20.7	21.0	21.1	21.1	21.0	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	20.5	21.2	21.1	
Dec 18	21.2	21.1	21.2	21.1	21.1	21.0	21.1	21.2	21.1	21.0	21.1	21.2	21.1	21.1	21.2	21.2	21.2	21.2	21.3	21.2	21.3	21.3	21.2	21.2	21.0	21.3	21.2	
Dec 19	21.2	21.2	21.2	21.2	21.2	21.1	21.1	21.2	21.2	21.2	21.2	21.2	21.2	21.1	21.3	21.2	20.2	20.8	21.0	21.0	21.1	21.1	21.1	21.1	20.2	21.3	21.1	
Dec 20	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.4	21.3	21.4	21.6	21.6	21.6	21.7	21.7	21.7	19.1	19.4	20.0	20.4	20.6	20.7	19.1	21.7	21.0	
Dec 21	20.8	20.9	21.0	21.1	21.1	21.2	21.2	21.2	21.2	21.3	21.2	21.3	21.2	21.3	21.2	21.3	21.4	21.4	21.3	21.2	21.3	21.3	21.3	21.2	20.8	21.4	21.2	
Dec 22	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.2	21.3	21.3	21.2	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.4	21.3	21.2	21.4	21.3	
Dec 23	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.3	20.7	21.4	21.6	21.6	21.5	21.6	21.6	21.6	21.6	20.7	21.3	21.5	21.5	21.5	21.4	21.5	20.7	21.6	21.4	
Dec 24	21.5	21.5	21.4	21.4	21.5	21.4	21.4	21.4	21.5	21.2	21.0	21.0	21.6	22.0	22.1	22.2	22.2	21.6	21.3	21.0	20.7	20.8	20.8	20.7	20.7	22.2	21.4	
Dec 25	20.8	20.7	20.7	20.7	20.7	20.7	20.6	20.7	20.6	20.7	20.6	20.6	20.6	20.6	20.6	20.7	20.7	20.7	20.8	20.8	20.8	20.8	20.7	20.7	20.6	20.8	20.7	
Dec 26	20.7	20.7	20.7	20.6	20.6	20.7	20.7	20.7	20.7	20.6	20.5	20.5	20.4	20.4	20.4	20.5	20.6	20.7	20.7	20.7	20.7	20.6	20.6	20.6	20.4	20.7	20.6	
Dec 27	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.4	20.8	20.7	20.6	20.8	21.0	21.0	21.0	21.1	21.2	21.2	21.2	21.2	21.3	21.2	21.3	20.4	21.3	20.8	
Dec 28	21.3	21.3	21.3	21.3	21.3	21.2	21.2	21.2	21.2	21.2	21.2	21.1	21.0	21.0	21.1	21.2	21.3	21.3	21.3	21.2	21.2	21.3	21.3	21.3	21.0	21.3	21.2	
Dec 29	21.3	21.3	21.2	21.2	21.2	21.1	21.2	21.1	21.1	21.1	21.2	21.0	21.0	21.0	21.0	21.2	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.0	21.3	21.2	
Dec 30	21.3	21.3	21.2	21.3	21.2	21.2	21.2	21.2	21.2	21.0	20.9	20.6	20.1	20.7	20.9	21.0	21.0	21.1	21.1	21.1	21.1	21.1	21.1	21.1	20.1	21.3	21.0	
Dec 31	21.1	21.1	21.1	21.0	21.1	21.1	21.1	21.0	20.9	20.5	20.6	21.0	21.0	21.1	21.2	21.5	21.7	21.7	21.4	21.2	21.2	21.3	21.2	21.2	20.5	21.7	21.1	
Diurnal Maximum	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.4	21.6	21.6	21.8	21.9	22.2	22.1	22.2	22.2	22.0	22.2	22.2	22.2	22.3	22.3	22.2				
Diurnal Average	21.1	21.1	21.1	21.1	21.0	21.0	21.0	21.0	20.9	20.8	20.9	21.0	21.0	21.0	21.0	21.1	21.1	21.1	20.8	21.0	21.0	21.1	21.1	21.1				

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 ST - Cold Lake South Station*





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2019

Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr

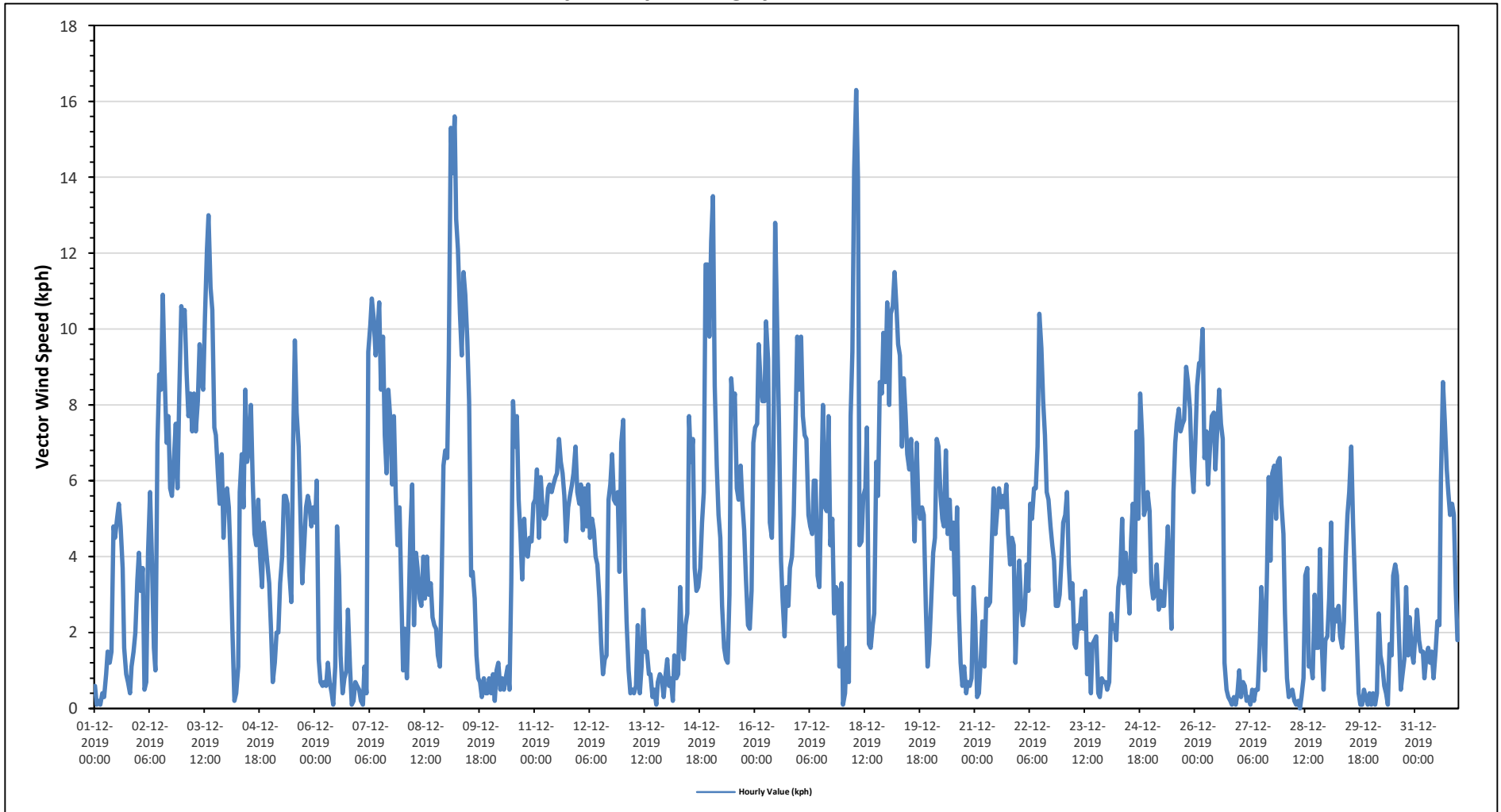
Maximum Hourly Value:	16.3 kph	on December 18 at hour 7	Hours in Service:	744
Maximum Daily Value:	8.5 kph	on December 3	Hours of Data:	744
Minimum Hourly Value:	0.0 kph	on December 28 at hour 9	Hours of Missing Data:	0
Minimum Daily Value:	1.3 kph	on December 13	Hours of Calibration:	0
Monthly Average:	0.7 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	
Dec 1	0.6	0.1	0.2	0.1	0.4	0.3	0.9	1.5	1.2	1.5	4.8	4.5	5	5.4	4.8	3.7	1.6	0.9	0.7	0.4	1.1	1.5	2	3.4	0.1	5.4	1.9	
Dec 2	4.1	3.1	3.7	0.5	0.7	4.1	5.7	4	1.6	1	7	8.8	8.4	10.9	8.9	7	7.7	5.8	5.6	6.6	7.5	5.8	8.3	10.6	0.5	10.9	5.7	
Dec 3	10.2	10.5	8.8	7.7	8.3	7.3	8.3	7.3	8.1	9.6	8.6	8.4	10.3	12.1	13	11.1	10.5	7.4	7.2	6.2	5.4	6.7	4.5	5.4	4.5	13.0	8.5	
Dec 4	5.8	5.3	3.7	2.1	0.2	0.4	1.1	5.7	6.7	5.3	8.4	6.5	6.8	8	6	4.6	4.3	5.5	4	3.2	4.9	4.3	3.8	3.3	0.2	8.4	4.6	
Dec 5	2.1	0.7	1.2	2	2	3.3	4	5.6	5.6	5.4	3.6	2.8	6.9	9.7	7.8	6.9	5.1	3.3	4.2	5.3	5.6	5.4	4.8	5.3	0.7	9.7	4.5	
Dec 6	4.9	6	1.3	0.7	0.6	0.7	0.6	1.2	0.7	0.4	0.1	1.1	4.8	3.5	1.4	0.4	0.8	1	2.6	1.1	0.1	0.2	0.7	0.6	0.1	6.0	1.5	
Dec 7	0.5	0.2	0.1	1.1	0.4	9.4	10.1	10.8	10.3	9.3	9.9	10.7	8.4	9.8	7.2	6.2	8.4	7.6	5.9	7.7	5.7	4.3	5.3	3.1	0.1	10.8	6.4	
Dec 8	1	2.1	0.8	2.5	4.7	5.9	2.2	4.1	3.7	2.9	2.7	4	2.9	4	3	3.3	2.4	2.2	2.1	1.4	1.1	3	6.4	6.8	0.8	6.8	3.1	
Dec 9	6.6	9.2	15.3	14.1	15.6	12.9	12.1	10.4	9.3	11.5	10.9	9.7	8.1	3.5	3.6	2.9	1.4	0.8	0.7	0.3	0.8	0.4	0.4	0.8	0.3	15.6	6.7	
Dec 10	0.4	0.9	0.2	1	1.2	0.5	0.8	0.5	0.8	1.1	0.5	3.3	8.1	6.9	7.7	5.5	4.6	3.4	5	4.1	4	4.5	4.4	5.4	0.2	8.1	3.1	
Dec 11	5.5	6.3	4.5	6.1	5.4	5	5.1	5.8	5.9	5.7	5.9	6.1	6.2	7.1	6.5	6.2	5.6	4.4	5.3	5.6	5.9	6.2	6.9	5.7	4.4	7.1	5.8	
Dec 12	5.4	5.9	4.7	5.8	4.8	5.9	4.5	5	4.7	4	3.8	2.9	1.7	0.9	1.3	1.4	5.5	5.9	6.7	5.5	5.4	5.7	3.6	7	0.9	7.0	4.5	
Dec 13	7.6	3.7	2.3	1	0.4	0.5	0.4	0.6	2.2	0.4	1.1	2.6	1.5	1.5	0.9	0.9	0.3	0.5	0.1	0.7	0.9	0.8	0.3	0.8	0.1	7.6	1.3	
Dec 14	1.3	0.6	0.8	0.2	1.4	0.8	0.9	3.2	1.8	1.3	2.2	2.5	7.7	6.5	7.1	3.7	3.1	3.2	3.7	4.9	5.7	11.7	11.7	9.8	0.2	11.7	4.0	
Dec 15	12.3	13.5	8.5	6.4	5.1	4.5	2.7	1.6	1.3	1.2	3	8.7	7.9	8.3	5.8	5.5	6.4	5.4	4.7	3.4	2.2	2.1	3.1	7	1.2	13.5	5.4	
Dec 16	7.4	7.5	9.6	8.5	8.1	8.1	10.2	9.2	4.9	4.5	6.6	12.8	10	7.5	3.9	2.9	1.9	3.2	2.7	3.7	4	5.1	7.4	9.8	1.9	12.8	6.6	
Dec 17	8.4	9.8	7.7	7.2	7.1	5.1	4.8	4.6	6	6	3.5	3.2	5.5	8	5.3	5.2	7.7	4.3	5	2.5	3.2	3.1	1.1	3.3	1.1	9.8	5.3	
Dec 18	0.1	0.4	1.6	0.7	7.7	9.4	14.2	16.3	13.9	4.3	4.4	5.6	5.8	7.4	1.7	1.6	2.2	2.5	6.5	5.6	8.6	8.3	9.9	8.6	0.1	16.3	6.1	
Dec 19	10.7	8	10.4	10.6	11.5	10.5	9.6	9.3	6.9	8.7	7.8	6.7	6.3	7.1	5.8	4.4	7	5.3	5	5.3	5.1	2.7	1.1	1.7	1.1	11.5	7.0	
Dec 20	2.8	4.1	4.5	7.1	6.9	5.6	5	4.8	6.8	4.6	5.5	4.2	4.9	3	5.3	2.6	1.2	0.6	1.1	0.4	0.7	0.6	0.8	3.2	0.4	7.1	3.6	
Dec 21	2.4	0.3	0.4	1.4	2.3	1.1	2.9	2.7	2.8	4.2	5.8	4.6	5.3	5.8	5.3	5.6	5.3	5.9	4.6	3.8	4.5	4.3	1.2	2.9	0.3	5.9	3.6	
Dec 22	3.9	2.6	2.2	2.6	3.8	3.1	5.4	5	5.8	5.8	6.9	10.4	9.5	8.1	7.2	5.7	5.5	4.8	4.3	3.9	2.7	2.7	3	3.9	2.2	10.4	5.0	
Dec 23	4.9	5.1	5.7	3.8	2.9	3.3	1.7	1.6	2.2	2.1	2.9	2.1	3.1	0.9	1.7	0.4	1.7	1.8	1.9	0.4	0.3	0.8	0.7	0.7	0.3	5.7	2.2	
Dec 24	0.5	0.7	2.5	2.1	2.2	1.8	3.2	3.5	5	3.3	4.1	3.4	2.5	4.4	5.4	3.6	7.3	5	8.3	7.1	5.1	5.3	5.7	5.2	0.5	8.3	4.1	
Dec 25	3.3	2.9	3	3.8	2.6	3.1	2.7	2.7	3.8	4.8	3.5	2.1	5.7	7	7.5	7.9	7.3	7.5	7.6	9	8.6	7.9	6.4	5.7	2.1	9.0	5.3	
Dec 26	7	8.5	9.1	9.1	10	6.6	7.3	5.9	6.9	7.7	7.8	6.3	7.3	8.4	7.5	7.1	1.2	0.5	0.3	0.2	0.1	0.3	0.1	0.4	0.1	10.0	5.2	
Dec 27	1	0.3	0.7	0.6	0.2	0.3	0.1	0.5	0.2	0.5	0.5	1.6	3.2	2.3	1	3.5	6.1	3.9	6.2	6.4	5	6.5	6.6	5.4	0.1	6.6	2.6	
Dec 28	4.6	2.5	0.8	0.3	0.4	0.5	0.2	0.1	0.2	0	0.3	0.8	3.5	3.7	1.1	1.2	0.8	3	1.6	1.6	4.2	1.7	0.5	1.8	0.0	4.6	1.5	
Dec 29	1.9	2.9	4.9	1.8	2.6	2.3	2.7	1.9	1.6	2.3	4	5.1	5.7	6.9	4.9	3.4	2	0.4	0.1	0.1	0.5	0.3	0.1	0.4	0.1	6.9	2.5	
Dec 30	0.1	0.4	0.1	0.4	2.5	1.4	1.1	0.6	0.4	0.1	1.7	1.4	3.5	3.8	3.5	1.9	0.5	0.9	1.3	3.2	1.4	2.4	1.5	1.2	0.1	3.8	1.5	
Dec 31	2	2.6	1.8	1.5	1.5	0.8	1.4	1.6	1.2	1.5	0.8	1.5	2.3	2.2	6	8.6	7.6	6.3	5.7	5.1	5.4	5.1	3.2	1.8	0.8	8.6	3.2	
Diurnal Maximum	12	14	15	14	16	13	14	16	14	12	11	13	10	12	13	11	11	8	8	9	9	12	12	11				
Diurnal Average	4.2	4.1	3.9	3.6	4.0	4.0	4.3	4.4	4.3	3.9	4.5	5.0	5.8	6.0	5.1	4.4	4.3	3.7	3.9	3.7	3.7	3.9	3.7	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.

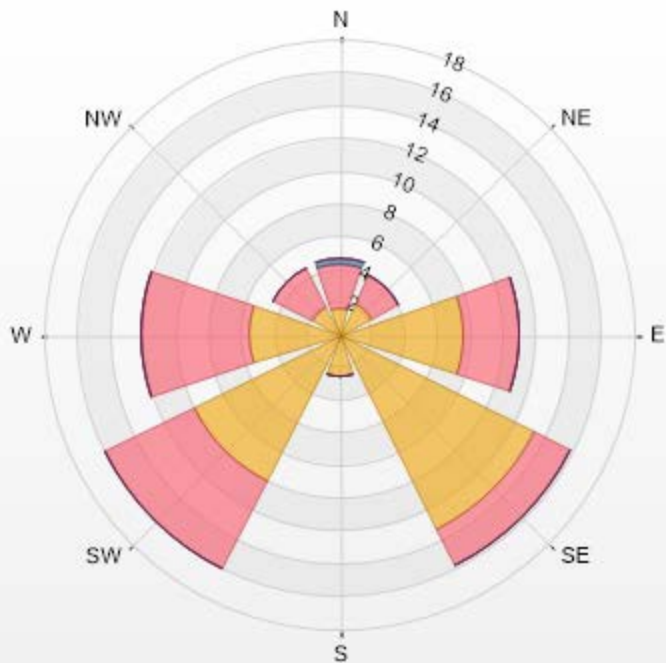
**Timeseries Chart of Hourly Average for VWS - Cold Lake South Station**



Wind: Cold Lake South Poll.: Cold Lake South-WDS[kph] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 29.30% Valid Data: 100.00% Calm Avg: 0.82 [kph]

Direction	0-6	6-15	15-29	29-39	>39.0	Total
N	1.61	2.69	0.4	0	0	4.7
NE	2.15	1.88	0	0	0	4.03
E	7.53	3.49	0	0	0	11.02
SE	13.31	2.42	0	0	0	15.73
S	2.55	0	0	0	0	2.55
SW	9.95	6.05	0	0	0	16
W	5.51	6.59	0	0	0	12.1
NW	1.88	2.69	0	0	0	4.57
Summary	44.49	25.81	0.4	0	0	70.7

Cold Lake South Poll.: Cold Lake South-WDS[kph] 01-12-2019 00:00 - 31-12-2019 23:00 Calm: 29.30% Calm  
 Poll Avg: 0.82[kph]



LICA-201912-Revision 1

% Icon Classes (kph)	44	0-6	26	7-15	0	15-29	0	29-39	0	>39.0
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## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2019

Summary of Hourly Averages

WIND DIRECTION (VWD) in sector

Monthly Average:	223 (SW) degree	Hours in Service:	744
		Hours of Data:	744
		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
Dec 1	W	SE	SE	NNW	SSE	S	S	SSW	S	SSW	SW	WSW	WSW	SW	SW	SW	SSW	S	WSW	SW	SW	WSW	WSW	WSW	229	SW
Dec 2	WSW	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	SW	WSW	W	W	WSW	WSW	WSW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	249	WSW
Dec 3	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	WSW	W	WSW	WSW	W	W	W	W	W	W	W	WSW	WSW	WSW	WSW	WSW	258	WSW
Dec 4	SW	WSW	SW	W	SE	W	N	N	NNE	NE	NE	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	345	NNW
Dec 5	NW	SW	S	SE	SSE	SSE	SE	SE	SE	SE	SSE	SSW	SW	SW	SW	SW	WSW	WSW	SW	SW	WSW	WSW	SW	212	SSW	
Dec 6	WSW	SW	SW	S	SSW	WSW	WSW	W	E	W	E	W	SSW	S	SSW	SSE	SSE	SW	WSW	W	NNE	SE	SE	225	SW	
Dec 7	NNW	SE	SW	W	SW	NE	NE	NNE	NE	NNE	N	NNE	N	NNW	NNW	NNW	NNW	NNW	N	NE	NE	SE	ESE	20	NNE	
Dec 8	ESE	SE	SSE	SE	SE	SE	S	SE	SE	SSE	SSE	SE	SSE	S	SSE	SSE	S	S	S	SW	WSW	WSW	W	W	174	S
Dec 9	WNW	NW	NNW	NNW	NNW	NNW	NNW	N	NNW	NNW	NNW	NW	NNW	NW	WSW	W	SW	SW	SSE	WSW	WSW	SSW	WSW	333	NNW	
Dec 10	S	SW	E	WSW	WSW	W	WSW	SSW	WSW	WSW	SW	E	NNE	NNE	N	NE	ENE	ESE	E	ESE	ESE	ESE	ESE	SE	76	ENE
Dec 11	ESE	SE	ESE	SE	E	ESE	E	E	E	ESE	E	E	ESE	SE	E	E	E	ESE	ESE	E	E	E	E	E	107	ESE
Dec 12	ESE	ESE	ESE	ESE	ESE	E	E	E	ESE	E	E	ESE	ESE	E	NNE	ENE	NNW	NNW	NNW	NNE	NE	NE	NNE	NE	70	ENE
Dec 13	NE	NE	W	WSW	W	S	SW	WSW	WSW	WSW	W	WSW	W	WSW	W	WSW	W	WSW	W	WSW	W	WSW	W	WSW	17	NNE
Dec 14	E	NNE	SE	SSE	SSE	SSW	SSE	SE	SE	SSE	SSW	SSW	SW	SW	WSW	WSW	SW	WSW	WSW	WSW	WSW	W	W	266	W	
Dec 15	NW	NW	NW	NW	WNW	W	W	WSW	SW	WSW	W	WSW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	272	W
Dec 16	W	W	W	W	W	W	WNW	NW	NW	NW	NNW	NNW	NNW	NNW	NE	ENE	E	E	SE	ESE	ESE	SE	SE	SE	307	NW
Dec 17	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	SE	SE	ESE	ESE	SE	ESE	SE	SE	SE	SE	S	WSW	133	SE
Dec 18	ENE	WSW	WSW	SSE	WSW	W	NW	NNW	NNW	N	NNE	NE	NE	NE	NNE	W	ENE	ENE	ENE	ENE	E	ESE	E	ESE	21	NNE
Dec 19	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	ESE	ESE	ESE	SE	SE	SSE	SE	SSE	100	E
Dec 20	SE	SE	ESE	SE	SE	ESE	E	E	E	E	E	E	E	NE	NE	E	SSW	SW	W	SW	SW	SW	SW	SW	109	ESE
Dec 21	SW	SSE	S	SW	SW	SSW	SSE	SE	SE	ESE	SE	ESE	E	E	ENE	ENE	E	E	ENE	ENE	ENE	NE	NNW	95	E	
Dec 22	NW	WNW	WNW	WSW	WSW	SW	WSW	SW	WSW	WSW	SW	WSW	WSW	WSW	WSW	WSW	SW	WSW	WSW	WSW	SW	S	SSE	SSE	243	WSW
Dec 23	SE	SE	SE	SE	SE	ESE	ENE	SE	ESE	SE	SE	ESE	SE	ESE	ESE	SE	SE	SE	SE	WNW	SSE	SSE	SSE	SE	135	SE
Dec 24	SSE	SSW	SW	SW	SSE	S	SSW	SSW	SW	SSW	SSW	SSW	S	SE	SE	ESE	SE	SE	SE	SE	SE	SSE	SSE	SE	163	SSE
Dec 25	SE	ESE	E	E	ESE	SE	SE	SE	SE	SE	SE	SE	SE	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	220	SW
Dec 26	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	S	S	ESE	SE	SE	S	241	WSW
Dec 27	WSW	NW	SE	WSW	SSE	WSW	WSW	WNW	S	SW	W	WSW	WSW	WSW	WNW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	252	WSW
Dec 28	WSW	WSW	WSW	W	WNW	SE	ESE	WSW	SE	W	WNW	WNW	W	WSW	WNW	ESE	E	SE	SSE	SSE	SE	SSE	W	SE	206	SSW
Dec 29	SE	SSE	SSE	SSE	S	S	S	SSW	SSW	SSW	SW	SW	WSW	WSW	WSW	WSW	WSW	W	S	SE	SSW	SW	SSW	SE	211	SSW
Dec 30	E	ESE	ESE	ESE	WSW	E	W	ESE	NNW	NW	ENE	E	ENE	E	E	ESE	NE	NW	SE	SE	ESE	SE	ESE	103	ESE	
Dec 31	SE	SE	WSW	ESE	SE	SW	SW	S	SSE	SSW	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	240	WSW

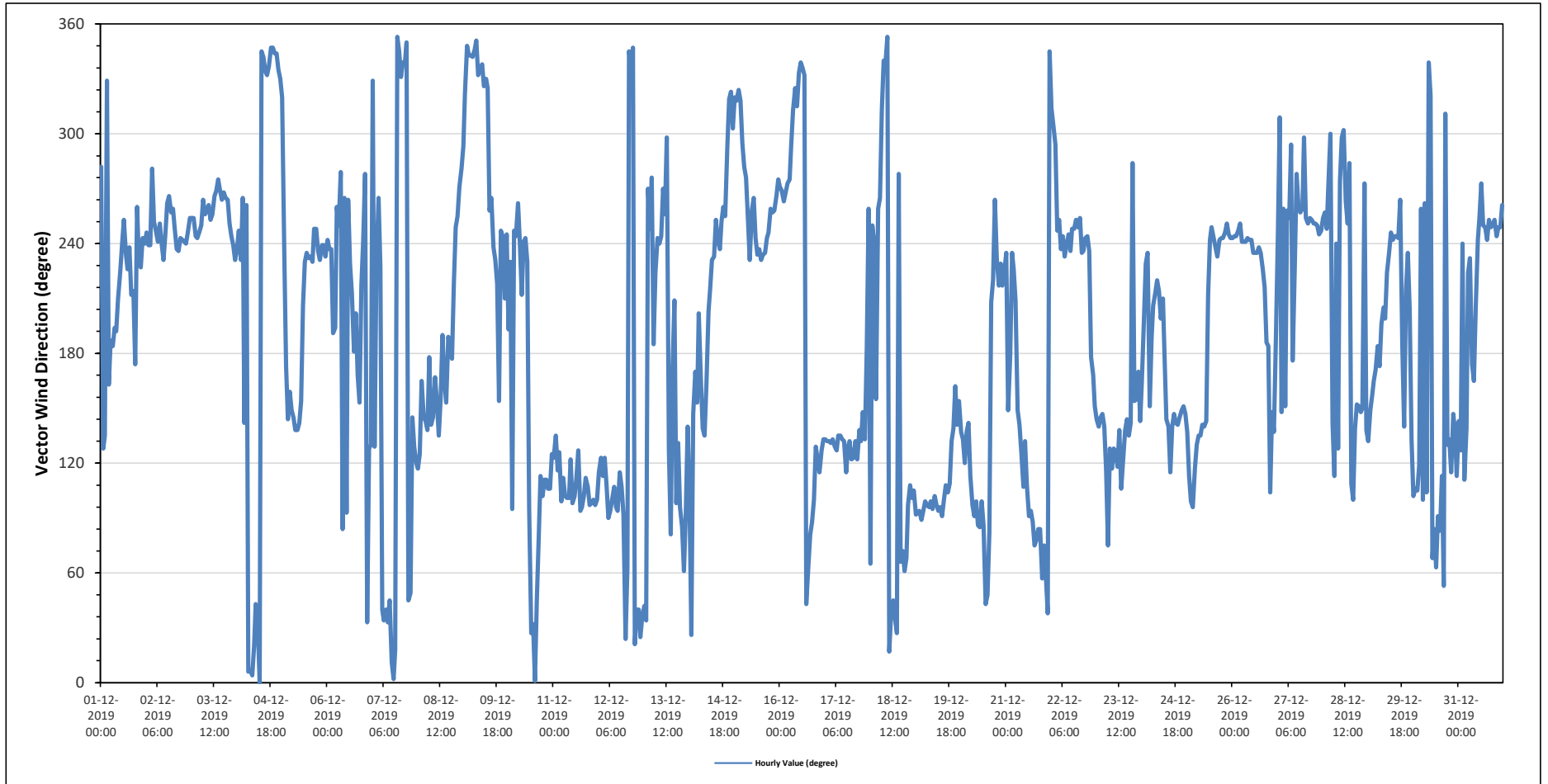
Diurnal Maximum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Diurnal Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/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 VWD - Cold Lake South Station**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2019

Summary of Hour Standard Deviations

### STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

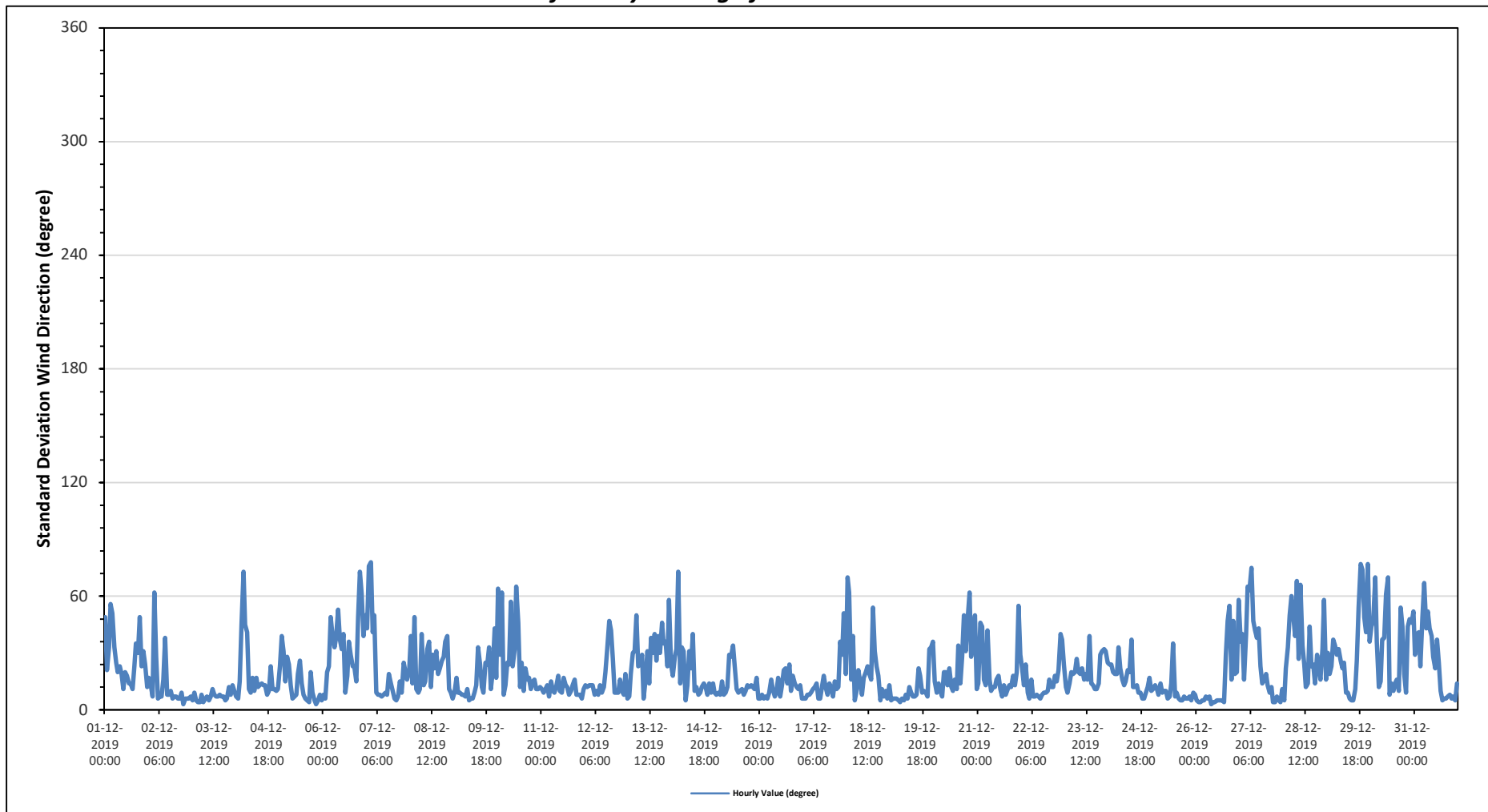
Maximum Hourly Value:	78 degree on December 7 at hour 2	Hours in Service:	744
Minimum Hourly Value:	3 degree on December 2 at hour 19	Hours of Data:	744
		Hours of Missing Data:	0
		Hours of Calibration:	0
		Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							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
Dec 1	49	21	33	56	51	33	25	20	23	19	11	20	18	14	14	11	23	35	30	49	23	31	24	12	11	56
Dec 2	17	14	7	62	28	6	7	7	16	38	8	8	10	6	7	7	6	9	3	6	6	6	7	7	3	62
Dec 3	5	9	5	4	4	8	4	6	7	5	7	11	8	7	7	8	7	5	6	12	8	13	10	4	13	
Dec 4	7	6	15	45	73	45	41	11	9	17	10	17	12	13	14	13	13	8	10	23	11	11	10	11	6	73
Dec 5	23	39	31	15	28	24	13	6	7	8	19	26	14	8	6	5	4	20	9	5	3	5	8	5	3	39
Dec 6	8	6	20	23	49	38	33	38	53	37	32	40	9	18	36	29	23	23	15	49	73	61	39	50	6	73
Dec 7	43	76	78	41	50	9	8	8	7	8	9	8	19	14	10	6	5	7	15	9	25	20	16	20	5	78
Dec 8	39	14	49	11	9	11	40	13	15	32	36	12	29	22	31	19	22	26	28	36	39	11	9	6	6	49
Dec 9	9	17	9	9	8	8	7	11	5	6	9	13	33	24	12	9	25	24	33	11	20	43	17	5	43	
Dec 10	64	29	62	8	13	25	24	57	23	32	65	46	12	25	10	22	16	17	11	15	16	11	11	12	8	65
Dec 11	11	9	11	13	7	15	10	9	13	18	10	9	17	13	12	8	10	13	16	8	8	8	6	11	6	18
Dec 12	13	12	13	13	13	8	10	8	13	9	12	20	32	47	42	27	9	9	9	16	10	8	19	6	6	47
Dec 13	7	19	30	31	50	23	24	29	6	15	31	14	38	30	40	26	39	30	46	35	36	23	58	24	6	58
Dec 14	18	28	32	73	14	33	31	5	13	31	22	40	10	12	8	9	12	14	12	8	14	9	14	9	5	73
Dec 15	8	9	8	15	8	9	12	29	28	34	24	11	9	10	11	8	10	13	12	13	12	11	17	6	6	34
Dec 16	6	8	6	7	6	9	16	11	7	10	17	7	13	21	22	14	24	10	18	14	12	11	13	6	6	24
Dec 17	6	6	8	8	9	11	12	14	6	6	13	18	12	8	14	12	7	15	11	12	36	29	51	19	6	51
Dec 18	70	62	16	39	5	10	21	14	8	17	20	23	19	16	54	31	23	18	5	11	7	10	6	13	5	70
Dec 19	5	6	6	6	5	4	6	5	8	6	12	9	7	7	8	22	18	9	10	9	7	32	33	36	4	36
Dec 20	15	9	14	10	7	20	20	13	22	12	10	16	11	34	14	28	50	31	47	62	28	37	50	11	7	62
Dec 21	14	46	44	16	13	42	16	10	12	12	16	18	11	7	13	8	11	13	12	18	13	20	55	29	7	55
Dec 22	22	13	24	9	6	16	7	7	8	7	6	8	9	9	10	16	12	12	18	15	21	40	37	24	6	40
Dec 23	12	9	14	20	19	20	27	20	19	22	16	19	16	39	14	13	11	11	14	29	31	32	31	25	9	39
Dec 24	24	24	20	19	19	33	22	16	13	15	21	20	37	12	12	13	9	9	6	6	9	12	17	10	6	37
Dec 25	11	13	11	8	14	9	10	10	6	7	14	35	7	9	6	5	5	7	6	6	7	5	9	8	5	35
Dec 26	5	4	4	5	5	7	6	7	3	4	4	5	5	5	5	4	29	47	55	16	47	19	20	58	3	58
Dec 27	36	40	16	40	65	63	75	47	42	38	43	23	14	16	19	13	9	12	4	4	7	5	4	11	4	75
Dec 28	5	22	33	50	60	50	39	68	27	66	34	24	12	14	44	23	24	14	29	24	16	32	58	16	5	68
Dec 29	30	19	23	37	34	29	32	26	22	25	9	9	6	5	5	11	26	54	77	74	49	41	77	36	5	77
Dec 30	44	47	70	36	12	15	37	38	61	70	8	14	10	14	16	10	54	44	19	9	44	48	46	52	8	70
Dec 31	29	40	41	23	49	67	43	52	43	39	28	22	37	25	10	5	6	6	7	8	6	7	5	14	5	67
Diurnal Minimum	5	4	4	4	4	4	4	5	3	4	4	5	5	5	5	4	4	6	4	3	3	5	4	5		
Diurnal Maximum	70	76	78	73	73	67	75	68	61	70	65	46	38	47	54	31	54	54	77	74	73	61	77	58		

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 - December 2019

Summary of Hourly Averages

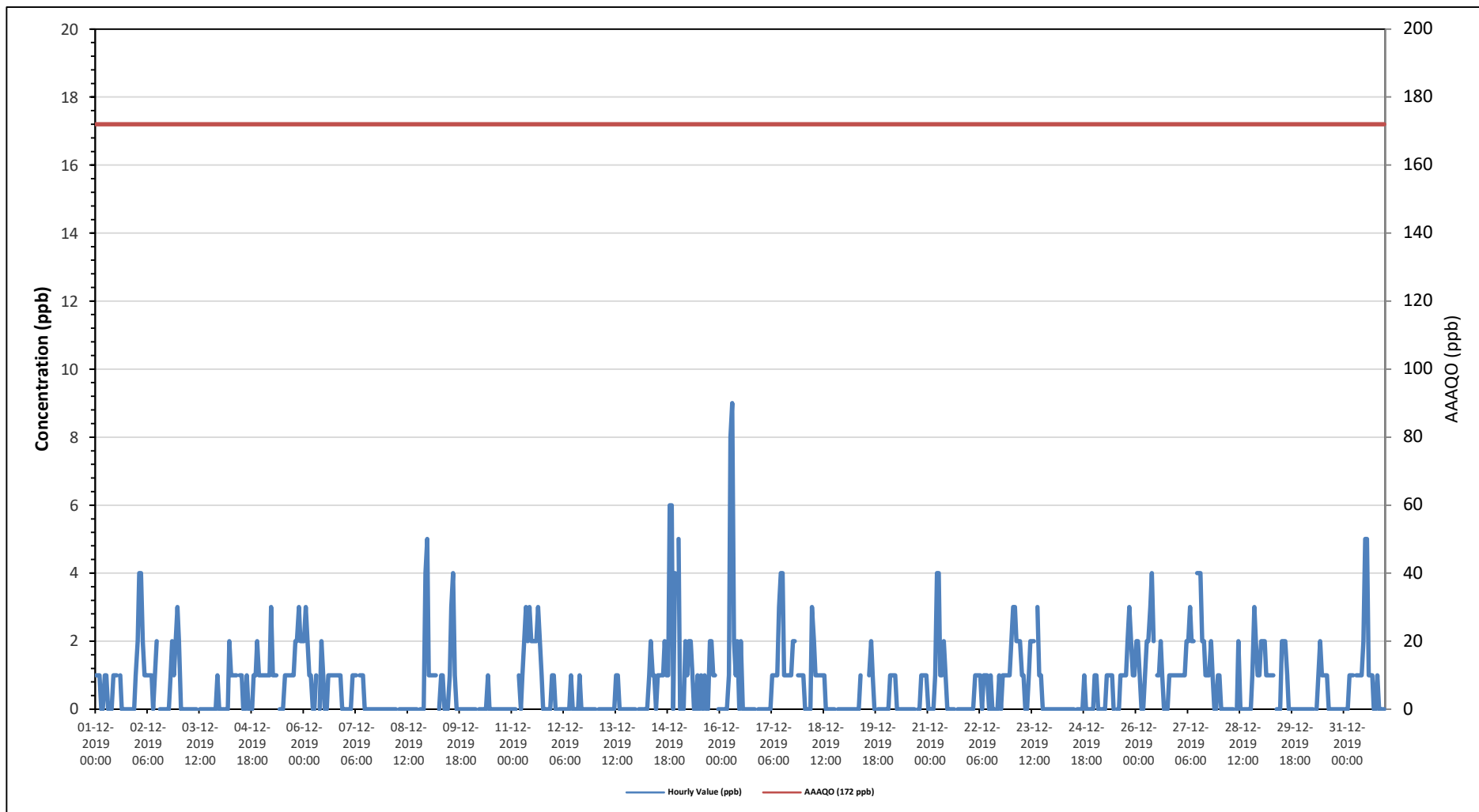
SULPHUR DIOXIDE (SO<sub>2</sub>) in ppb

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:													9 ppb on December 16 at hour 7													Hours in Service:						744							
Maximum Daily Value:													1.7 ppb on December 27													Hours of Data:						707							
Minimum Hourly Value:													0 ppb on December 1 at hour 3													Hours of Missing Data:						1							
Minimum Daily Value:													0.0 ppb on December 10													Hours of Calibration:						36							
Monthly Average:													0.7 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															
Dec 1	1	1	1	0	0	1	1	0	0	0	1	1	1	S	1	0	0	0	0	0	0	0	0	1	0	1	0	1	0.4										
Dec 2	2	4	4	2	1	1	1	1	1	0	1	2	S	0	0	0	0	0	0	1	2	1	2	3	0	4	1.3												
Dec 3	2	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0.1												
Dec 4	0	0	0	0	0	2	1	1	1	1	S	1	1	0	0	1	0	0	0	1	1	2	1	1	0	2	0.7												
Dec 5	1	1	1	1	1	3	1	1	1	S	0	0	0	1	1	1	1	1	1	2	2	3	2	2	0	3	1.2												
Dec 6	2	3	2	1	1	0	0	1	S	0	2	1	0	0	1	1	1	1	1	1	1	1	0	0	0	3	0.9												
Dec 7	0	0	0	0	1	1	1	S	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3												
Dec 8	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	S1	0	0	0	4	5	0	5	0.4												
Dec 9	1	1	1	1	1	S	0	1	1	0	0	0	1	3	4	1	0	0	0	0	0	0	0	0	0	4	0.7												
Dec 10	0	0	0	0	S	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0												
Dec 11	0	0	0	S	1	0	1	2	3	2	3	2	2	2	2	3	2	1	0	0	0	0	0	1	0	3	1.2												
Dec 12	1	0	S	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0.1												
Dec 13	0	S	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0.1												
Dec 14	S	0	0	0	0	0	0	1	2	1	1	0	1	1	1	1	2	1	1	6	6	0	4	S	0	6	1.3												
Dec 15	5	0	0	0	2	1	2	2	1	0	0	1	0	1	0	1	0	0	2	2	1	1	S	0	0	5	1.0												
Dec 16	0	0	0	0	0	1	8	9	2	1	2	0	2	0	0	0	0	0	0	0	0	S	0	0	0	9	1.1												
Dec 17	0	0	0	0	0	0	1	1	1	1	3	4	4	1	1	1	1	1	2	2	S	1	1	1	0	4	1.2												
Dec 18	1	0	0	0	0	3	2	1	1	1	1	1	1	0	0	0	0	0	0	S	0	0	0	0	0	3	0.5												
Dec 19	0	0	0	0	0	0	0	0	0	1	C	C	C	C	1	2	1	0	S	0	0	0	0	0	0	2	0.3												
Dec 20	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	1	1	1	0	1	0.3												
Dec 21	0	0	0	0	1	4	4	1	1	2	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	4	0.6												
Dec 22	0	0	0	1	1	1	1	0	1	1	1	0	1	0	0	S	0	1	0	1	1	1	1	1	0	1	0.6												
Dec 23	2	3	3	2	2	2	1	1	0	0	1	2	2	2	S	3	1	1	0	0	0	0	0	0	0	3	1.2												
Dec 24	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	0	0	0	0	0	1	0.0												
Dec 25	1	1	0	0	0	0	0	0	1	1	1	1	0	S	0	0	1	1	1	2	3	2	1	1	0	3	0.8												
Dec 26	2	2	1	0	0	1	2	2	3	4	2	S	1	1	2	1	0	0	1	1	1	1	1	1	0	4	1.3												
Dec 27	1	1	1	1	1	2	2	3	2	2	S	4	4	4	2	2	1	1	1	2	1	0	0	1	0	4	1.7												
Dec 28	1	0	0	0	0	0	0	0	0	S	0	2	0	0	0	0	0	0	0	1	3	2	1	1	0	3	0.5												
Dec 29	2	2	2	1	1	1	1	1	S	0	0	0	2	2	2	1	0	0	0	0	0	0	0	0	0	2	0.8												
Dec 30	0	0	0	0	0	0	0	S	0	1	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	2	0.3												
Dec 31	0	0	0	1	1	1	S	1	1	1	1	2	5	5	1	1	1	0	0	1	0	0	0	0	0	5	1.0												
Diurnal Maximum	5	4	4	2	2	4	8	9	3	4	3	4	5	5	4	3	2	1	2	6	6	3	4	5															
Daiurnal Average	0.8	0.6	0.6	0.4	0.5	0.9	1.0	1.1	0.8	0.7	0.9	0.9	1.1	0.9	0.7	0.7	0.4	0.3	0.3	0.8	0.8	0.5	0.7	0.7															
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																		

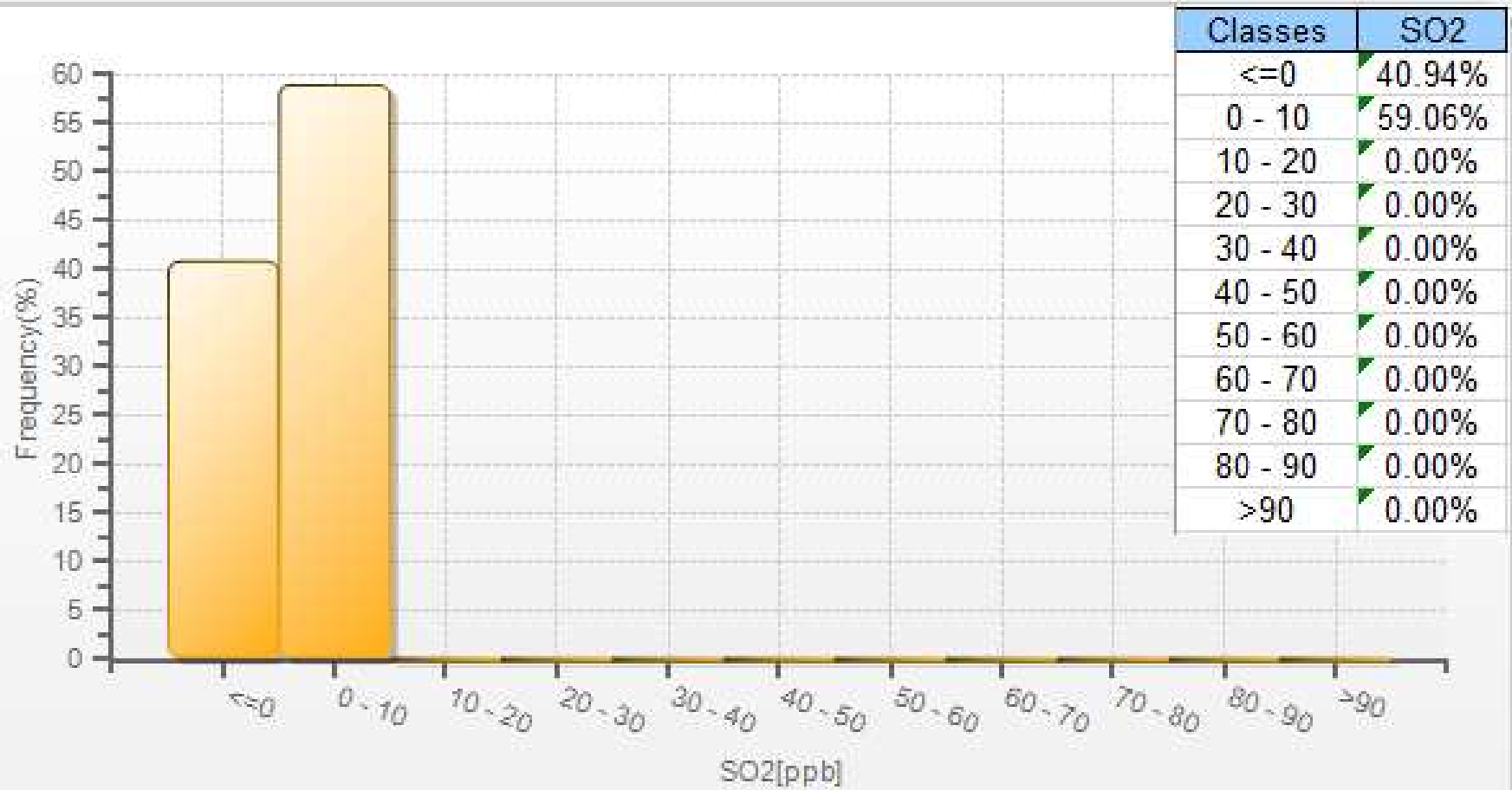
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

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

**Timeseries Chart of Hourly Average for SO2 - Maskwa Site**



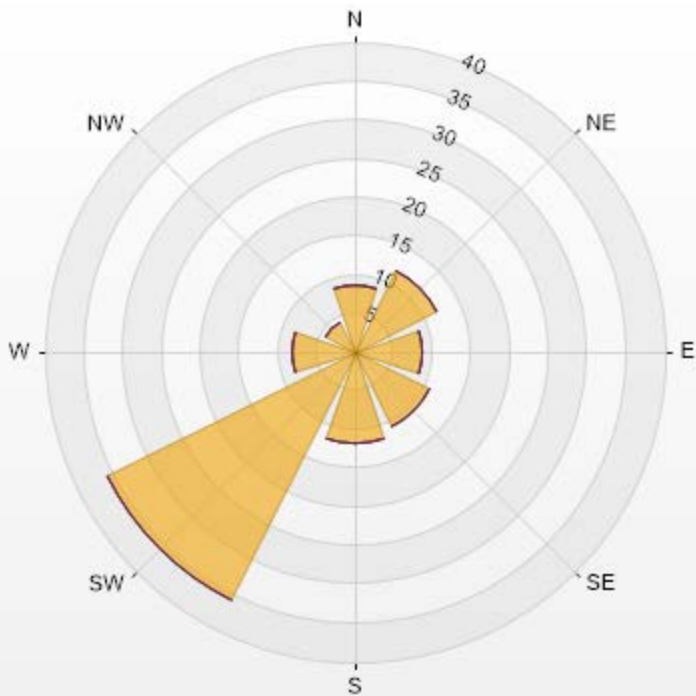
SO2[ppb] Histogram: Maskwa Monthly: 12-2019 1 Hr.



Wind: Maskwa Poll.: Maskwa-SO2[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.22% Calm Avg: 0.00 [ppb]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	8.7	0	0	0	0	8.7
NE	11.84	0	0	0	0	11.84
E	8.7	0	0	0	0	8.7
SE	10.84	0	0	0	0	10.84
S	11.84	0	0	0	0	11.84
SW	35.81	0	0	0	0	35.81
W	8.13	0	0	0	0	8.13
NW	4.14	0	0	0	0	4.14
Summary	100	0	0	0	0	100





LICA-201912-Revision 1

% Icon Classes (ppb)

100

0-10

0

50-100

0

100-172

0

>172.0

0

0



**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**

*Maskwa Site - December 2019*

**Summary of Hourly Averages**

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

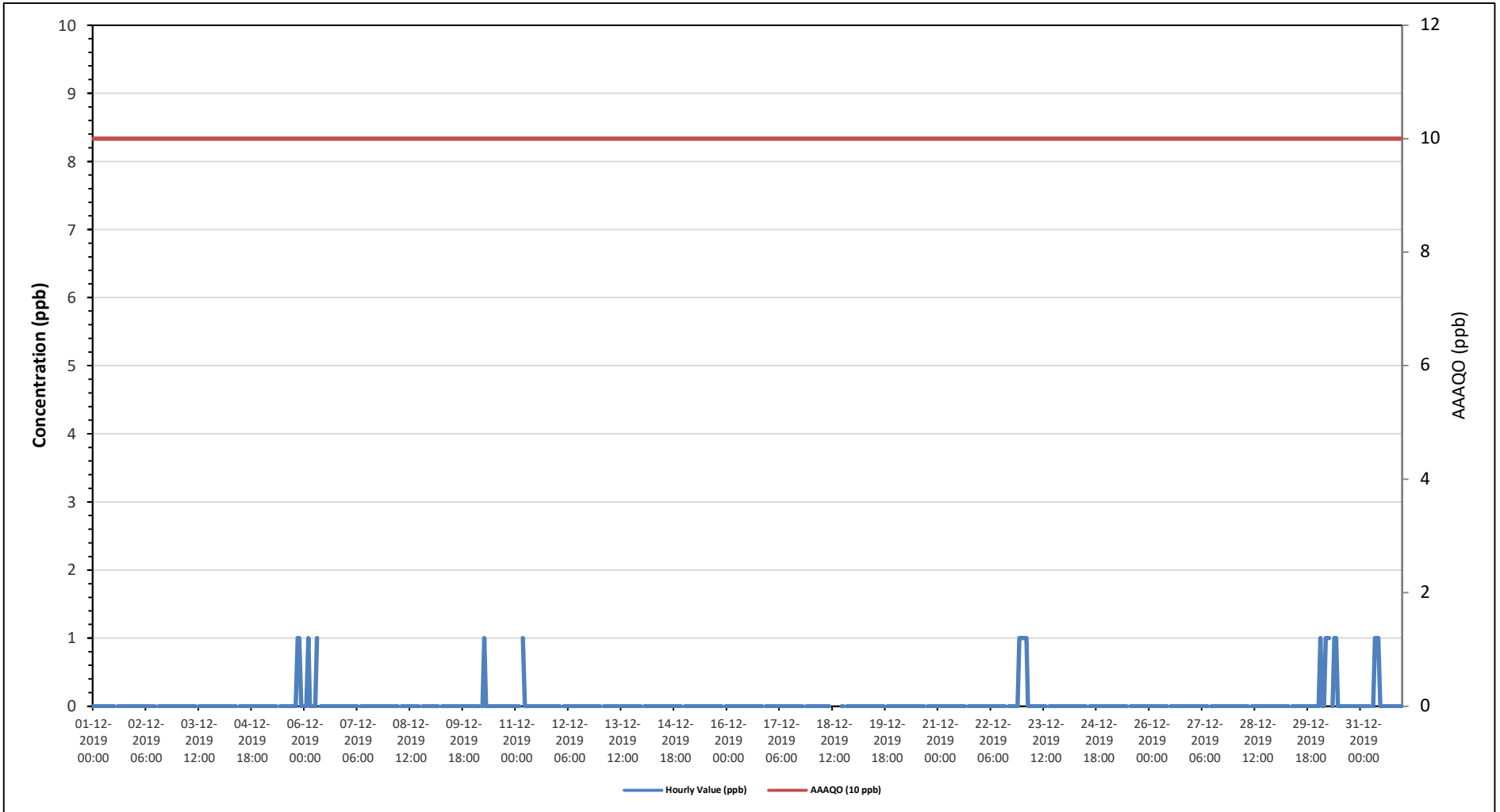
Maximum Hourly Value:	1 ppb on December 5 at hour 20	Hours in Service:	744
Maximum Daily Value:	0.3 ppb on December 30	Hours of Data:	705
Minimum Hourly Value:	0 ppb on December 1 at hour 0	Hours of Missing Data:	1
Minimum Daily Value:	0.0 ppb on December 1	Hours of Calibration:	38
Monthly Average:	0.0 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				
Dec 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	0	0	0	0
Dec 2	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
Dec 3	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dec 4	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
Dec 5	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	1	0
Dec 6	0	0	1	0	0	0	0	0	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dec 7	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
Dec 8	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	S1	0	0	0	0	0	0	0	0
Dec 9	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
Dec 10	0	0	0	0	S	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dec 11	0	0	0	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
Dec 12	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
Dec 13	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
Dec 14	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	S	S
Dec 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	S	0
Dec 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0
Dec 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	S	0
Dec 18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	0	0	S	0	0	0	0	0
Dec 19	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
Dec 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
Dec 21	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
Dec 22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	1
Dec 23	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dec 24	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
Dec 25	0	0	0	0	0	0	0	0	0	0	0	0	S	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dec 26	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
Dec 27	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
Dec 28	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
Dec 29	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
Dec 30	0	1	0	0	1	1	1	S	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dec 31	0	0	0	0	0	0	0	S	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diurnal Maximum	1	1	1	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
Diurnal Average	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

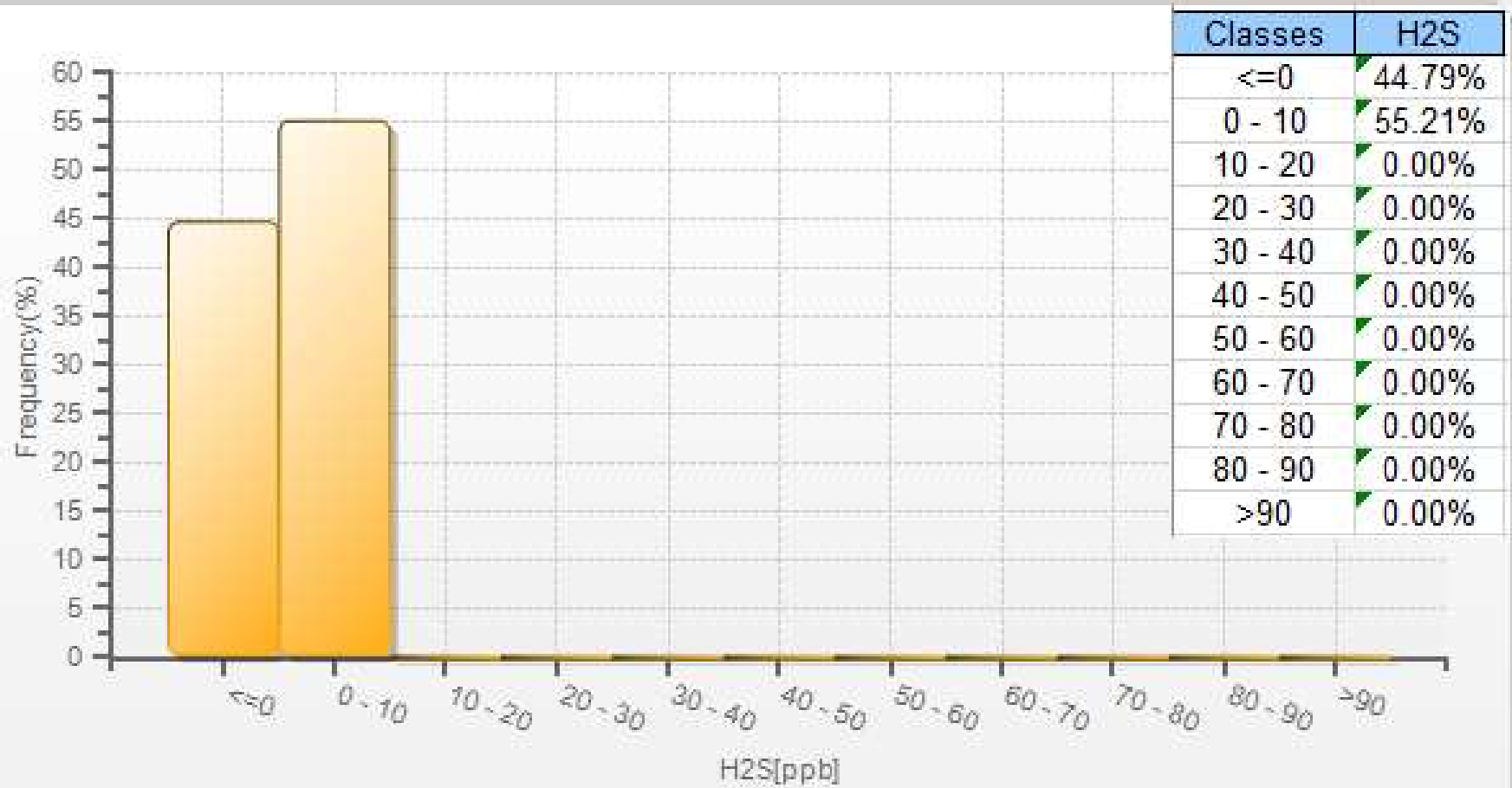
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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*

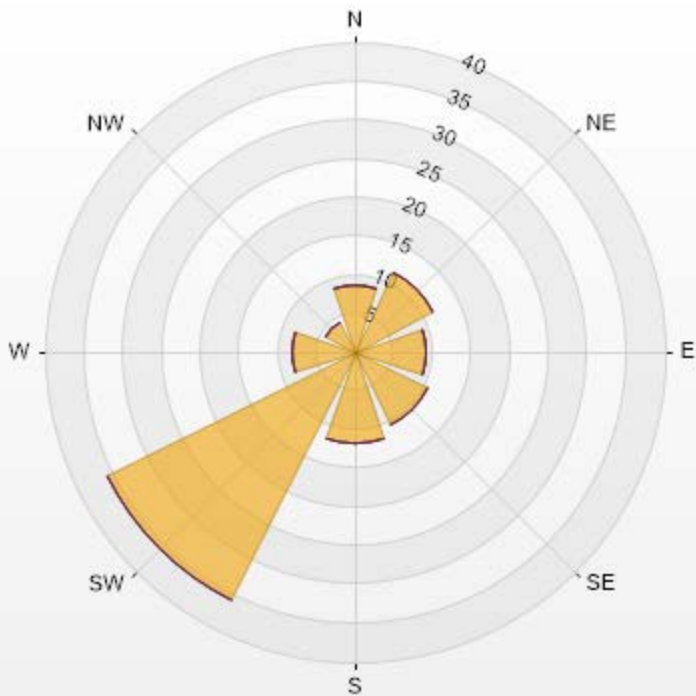


H2S[ppb] Histogram: Maskwa Monthly: 12-2019 1 Hr.



Wind: Maskwa Poll.: Maskwa-H2S[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.22% Calm Avg: 0.00 [ppb]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	8.7	0	0	0	0	8.7
NE	11.41	0	0	0	0	11.41
E	9.27	0	0	0	0	9.27
SE	10.7	0	0	0	0	10.7
S	11.84	0	0	0	0	11.84
SW	35.81	0	0	0	0	35.81
W	8.13	0	0	0	0	8.13
NW	4.14	0	0	0	0	4.14
Summary	100	0	0	0	0	100



LICA-201912-Revision 1

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



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**Maskwa Site - December 2019**

**Summary of Hourly Averages**

**OXIDES OF NITROGEN (NOx) in ppb**

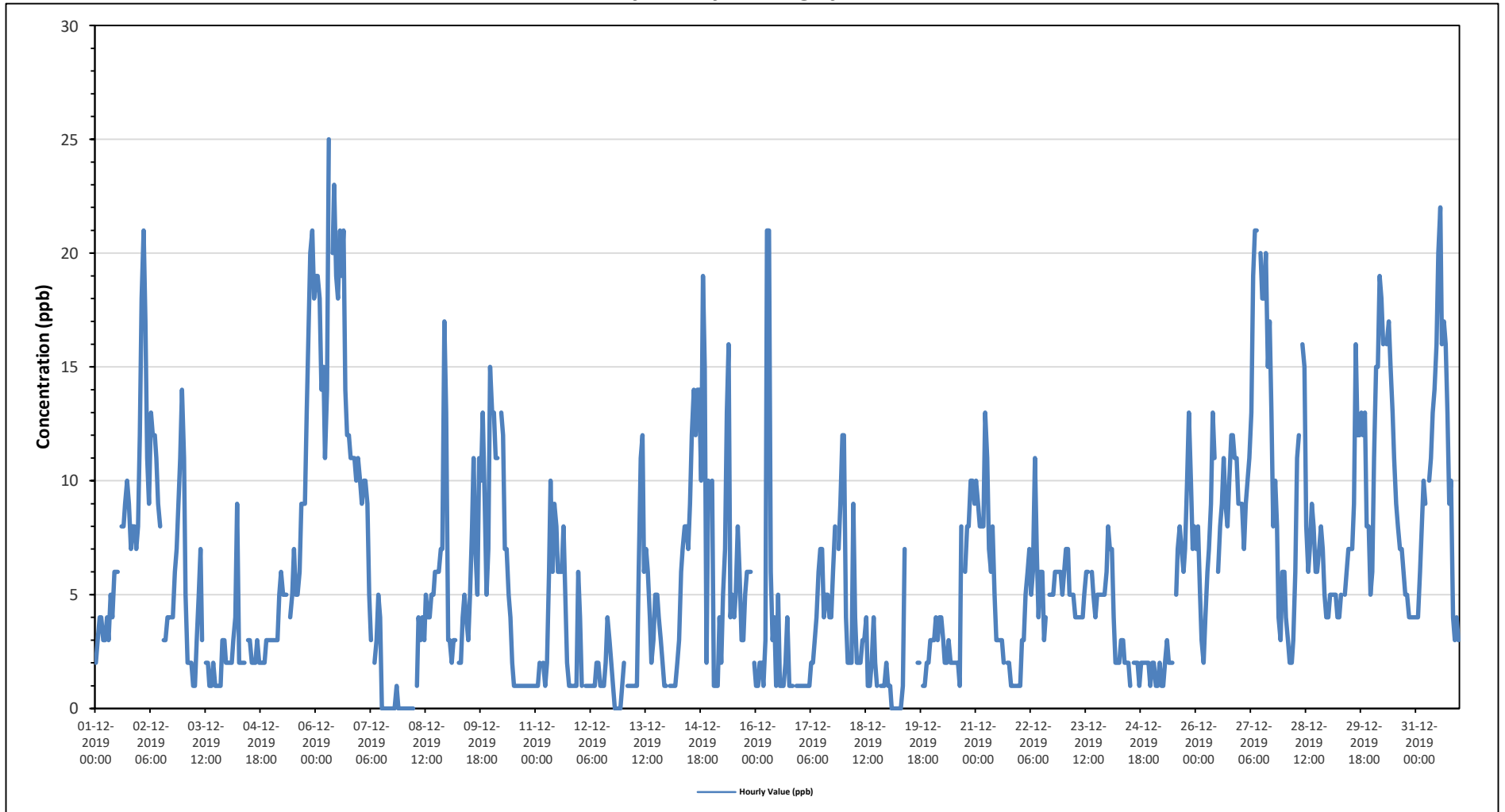
Maximum Hourly Value: 25 ppb on December 6 at hour 7	Hours in Service: 744
Maximum Daily Value: 16.0 ppb on December 6	Hours of Data: 706
Minimum Hourly Value: 0 ppb on December 7 at hour 12	Hours of Missing Data: 0
Minimum Daily Value: 1.3 ppb on December 12	Hours of Calibration: 38
Monthly Average: 5.9 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	
Dec 1	2	3	4	4	3	3	4	3	5	4	6	6	6	S	8	8	9	10	9	7	8	8	7	8	2	10	5.9	
Dec 2	12	18	21	17	11	9	13	12	12	11	9	8	S	3	3	4	4	4	4	6	7	9	11	14	3	21	9.7	
Dec 3	11	5	2	2	2	1	1	3	5	7	3	S	2	2	1	2	1	1	1	1	1	3	3	2	1	11	2.7	
Dec 4	2	2	2	3	4	9	2	2	2	2	S	3	3	2	2	2	3	2	2	2	2	3	3	3	2	9	2.7	
Dec 5	3	3	3	3	5	6	5	5	S	4	5	7	5	5	6	9	9	9	9	13	17	20	21	18	3	21	8.1	
Dec 6	19	19	18	14	15	11	14	25	S	20	23	19	18	21	19	21	14	12	12	11	11	11	10	11	10	25	16.0	
Dec 7	10	9	10	10	9	5	3	S	2	3	5	4	0	0	0	0	0	0	0	0	1	0	0	0	0	10	3.1	
Dec 8	0	0	0	0	0	0	S	1	4	3	4	3	5	4	4	5	5	6	6	6	7	7	17	13	0	17	4.3	
Dec 9	3	3	2	3	3	S	2	2	4	5	4	3	5	8	11	7	5	11	10	13	9	5	7	15	2	15	6.1	
Dec 10	13	13	11	11	S	13	12	7	7	5	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13	4.8
Dec 11	1	1	2	S	2	1	2	6	10	6	9	8	6	6	6	8	5	2	1	1	1	1	1	6	1	10	4.0	
Dec 12	4	1	S	1	1	1	1	1	1	2	2	1	1	1	2	4	3	2	1	0	0	0	0	1	0	4	1.3	
Dec 13	2	S	1	1	1	1	1	1	6	11	12	6	7	6	4	2	3	5	5	4	3	2	1	1	1	12	3.7	
Dec 14	S	1	1	1	1	2	3	6	7	8	8	7	9	12	14	12	14	14	10	19	15	2	10	S	1	19	8.0	
Dec 15	10	1	1	1	4	2	5	7	13	16	4	5	4	5	8	6	3	3	5	6	6	6	S	2	1	16	5.3	
Dec 16	1	1	2	2	1	3	21	21	6	3	4	1	5	1	1	2	4	1	1	1	1	S	1	1	1	21	3.7	
Dec 17	1	1	1	1	1	1	2	2	3	4	6	7	7	4	5	5	4	4	6	8	S	7	9	12	1	12	4.4	
Dec 18	12	4	2	2	2	9	4	2	2	2	3	3	4	1	1	2	4	2	1	S	1	1	1	2	1	12	2.9	
Dec 19	1	1	0	0	0	0	0	0	1	7	C	C	C	C	C	C	2	2	S	1	1	2	2	3	0	7	-	
Dec 20	3	3	4	3	4	4	3	2	2	3	2	2	2	2	2	1	8	S	6	8	8	10	10	9	1	10	4.4	
Dec 21	10	9	8	8	8	13	11	7	6	8	5	3	3	3	2	S	2	2	2	1	1	1	1	1	1	13	5.0	
Dec 22	1	3	3	5	6	7	5	6	11	7	4	6	6	3	4	S	5	5	5	6	6	6	6	5	1	11	5.3	
Dec 23	6	7	7	5	5	5	4	4	4	4	4	5	6	6	S	6	5	4	5	5	5	5	6	4	7	5.1		
Dec 24	8	7	7	4	2	2	2	3	3	2	2	2	1	S	2	2	2	1	2	2	2	2	2	1	1	8	2.7	
Dec 25	2	2	1	1	2	1	1	2	3	2	2	2	S	5	7	8	7	6	7	10	13	10	7	8	1	13	4.7	
Dec 26	7	8	5	3	2	4	6	7	9	13	11	S	6	8	9	11	9	8	10	12	12	11	11	9	2	13	8.3	
Dec 27	9	9	7	9	10	11	13	19	21	21	S	20	18	18	20	15	17	13	8	10	8	4	3	6	3	21	12.6	
Dec 28	6	4	3	2	2	3	6	11	12	S	16	15	8	6	7	9	8	6	6	7	8	7	5	4	2	16	7.0	
Dec 29	4	5	5	5	5	4	4	5	S	5	6	7	7	7	9	16	12	12	13	12	13	8	8	5	4	16	7.7	
Dec 30	6	11	15	15	19	18	16	S	16	17	15	13	11	9	8	7	7	6	5	5	4	4	4	4	4	19	10.2	
Dec 31	4	4	6	8	10	9	S	10	11	13	14	16	20	22	16	17	16	13	9	10	4	3	4	3	3	22	10.5	
Diurnal Maximum	19	19	21	17	19	18	21	25	21	21	23	20	20	22	20	21	17	14	13	19	17	20	21	18				
Diurnal Average	5.8	5.3	5.1	4.8	4.7	5.3	5.7	6.3	6.7	7.4	6.8	6.5	6.4	6.1	6.3	6.5	6.3	5.7	5.4	6.3	5.9	5.3	5.7	5.8				

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

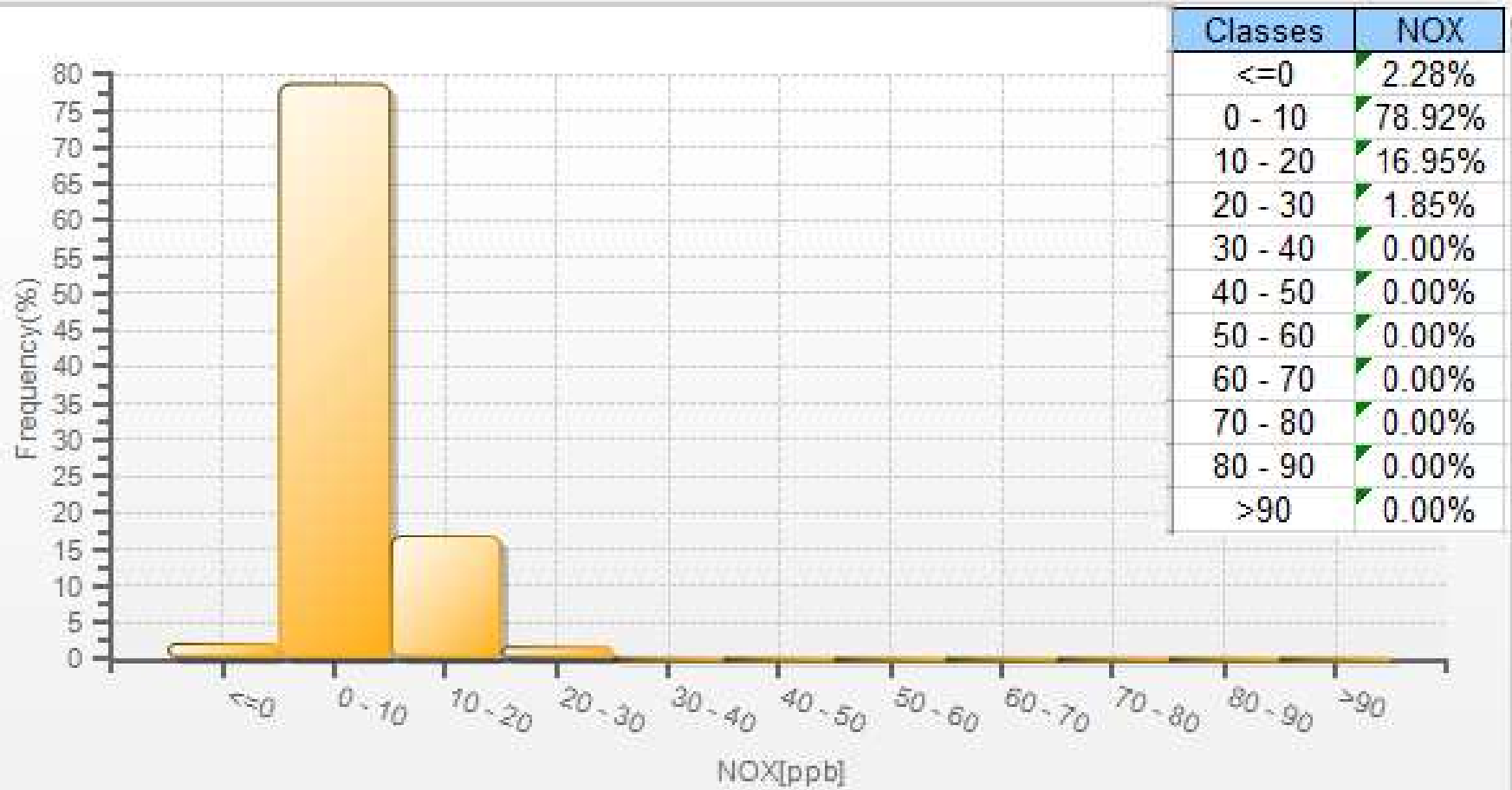
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.  
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

*Timeseries Chart of Hourly Average for NOx - Maskwa Site*





NOX[ppb] Histogram: Maskwa Monthly: 12-2019 1 Hr.



Wind: Maskwa Poll.: Maskwa-NOX[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.35% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	8.69	0	0	0	0	8.69
NE	11.82	0	0	0	0	11.82
E	8.69	0	0	0	0	8.69
SE	10.83	0	0	0	0	10.83
S	11.82	0	0	0	0	11.82
SW	35.9	0	0	0	0	35.9
W	8.12	0	0	0	0	8.12
NW	4.13	0	0	0	0	4.13
Summary	100	0	0	0	0	100





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

### Maskwa Site - December 2019 Summary of Hourly Averages

#### NITRIC OXIDE (NO) in ppb

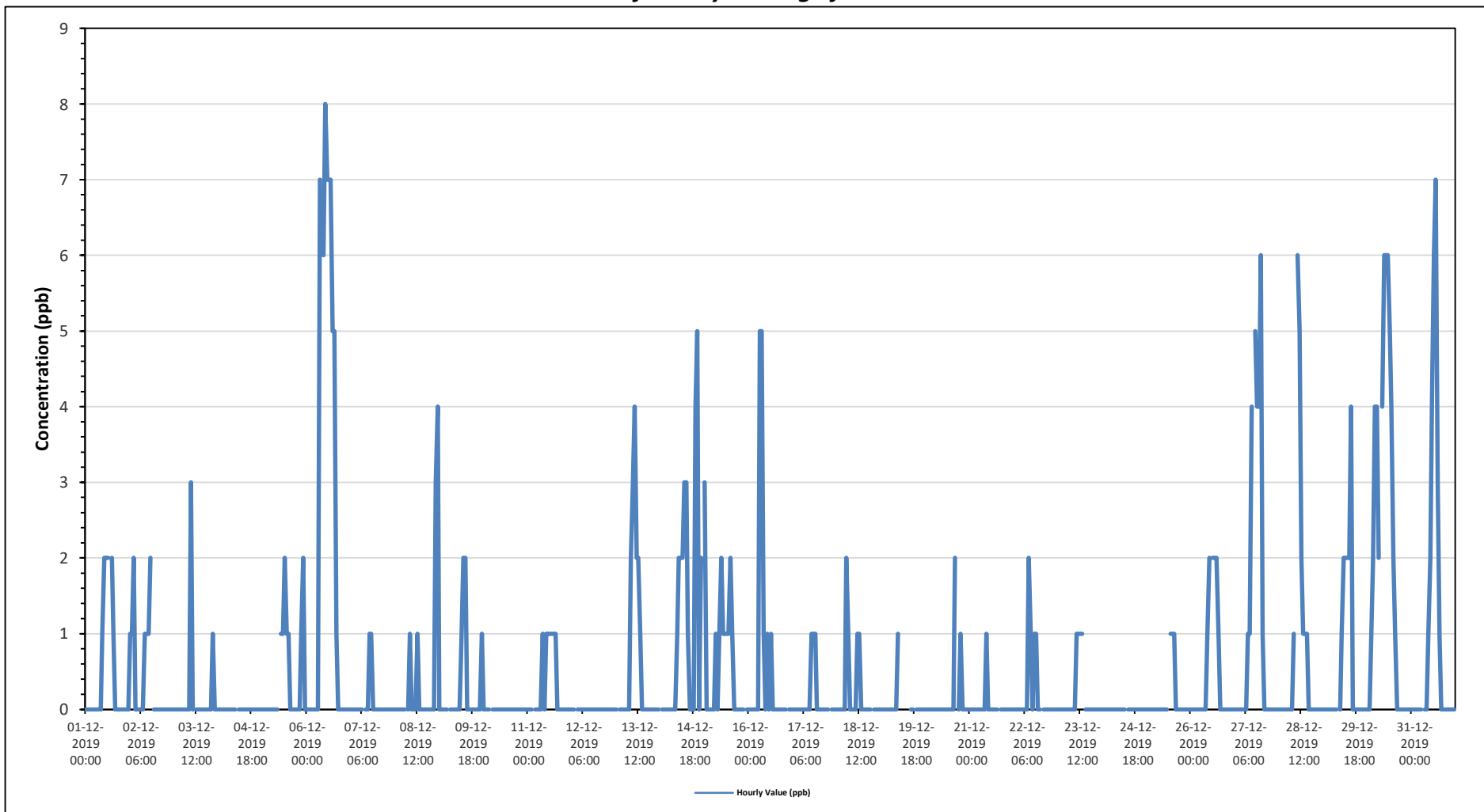
Maximum Hourly Value:	8 ppb on December 6 at hour 10	Hours in Service:	744
Maximum Daily Value:	2.3 ppb on December 6	Hours of Data:	706
Minimum Hourly Value:	0 ppb on December 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on December 4	Hours of Calibration:	38
Monthly Average:	0.5 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	
Dec 1	0	0	0	0	0	0	0	0	0	1	2	2	2	S	2	1	0	0	0	0	0	0	0	0	0	0	2	0.4
Dec 2	1	1	2	0	0	0	0	0	1	1	1	2	S	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.4
Dec 3	0	0	0	0	0	0	0	0	0	3	0	S	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0.2
Dec 4	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
Dec 5	0	0	0	0	0	0	0	0	0	S	1	1	2	1	1	0	0	0	0	0	0	1	2	0	0	0	2	0.4
Dec 6	0	0	0	0	0	0	0	7	S	6	8	7	7	7	5	5	1	0	0	0	0	0	0	0	0	0	8	2.3
Dec 7	0	0	0	0	0	0	0	S	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Dec 8	0	0	0	0	0	0	0	S	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	3	4	0	4	0.4
Dec 9	0	0	0	0	0	0	0	S	0	0	0	0	0	1	2	2	0	0	0	0	0	0	0	0	1	0	2	0.3
Dec 10	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
Dec 11	0	0	0	0	0	0	0	S	0	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0.3
Dec 12	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 13	0	0	0	0	0	0	0	S	0	2	3	4	2	2	1	0	0	0	0	0	0	0	0	0	0	0	4	0.6
Dec 14	S	0	0	0	0	0	0	0	0	0	1	2	2	2	3	3	1	0	0	0	4	5	0	2	S	0	5	1.1
Dec 15	3	0	0	0	0	0	1	0	1	2	1	1	1	1	2	1	0	0	0	0	0	0	0	0	0	S	0	0.6
Dec 16	0	0	0	0	0	0	5	5	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0.6
Dec 17	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0.1
Dec 18	0	0	0	0	0	2	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0.2
Dec 19	0	0	0	0	0	0	0	0	0	1	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	1	-
Dec 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	S	0	1	0	0	0	0	0	0	2	0.1
Dec 21	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0.0
Dec 22	0	0	0	0	0	0	0	0	2	1	0	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	2	0.2
Dec 23	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	1	0.2
Dec 24	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
Dec 25	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	0	0	0	0	0	0	0	0	0	0	1	0.1
Dec 26	0	0	0	0	0	0	0	0	0	1	2	S	2	2	2	1	0	0	0	0	0	0	0	0	0	0	2	0.4
Dec 27	0	0	0	0	0	0	1	1	4	S	5	4	4	6	1	0	0	0	0	0	0	0	0	0	0	0	6	1.1
Dec 28	0	0	0	0	0	0	0	1	S	6	5	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	6	0.7
Dec 29	0	0	0	0	0	0	0	0	S	0	1	2	2	2	2	4	0	0	0	0	0	0	0	0	0	0	4	0.6
Dec 30	0	0	1	2	4	4	2	S	4	6	6	6	5	4	2	1	0	0	0	0	0	0	0	0	0	0	6	2.0
Dec 31	0	0	0	0	0	0	0	S	0	0	1	2	4	6	7	3	1	0	0	0	0	0	0	0	0	0	7	1.0
Diurnal Maximum	3	1	2	2	4	4	5	7	4	6	8	7	7	7	6	5	2	0	0	4	5	1	3	4				
Diurnal Average	0.1	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.5	1.1	1.5	1.6	1.6	1.4	1.1	0.7	0.1	0.0	0.0	0.2	0.2	0.1	0.2	0.2				

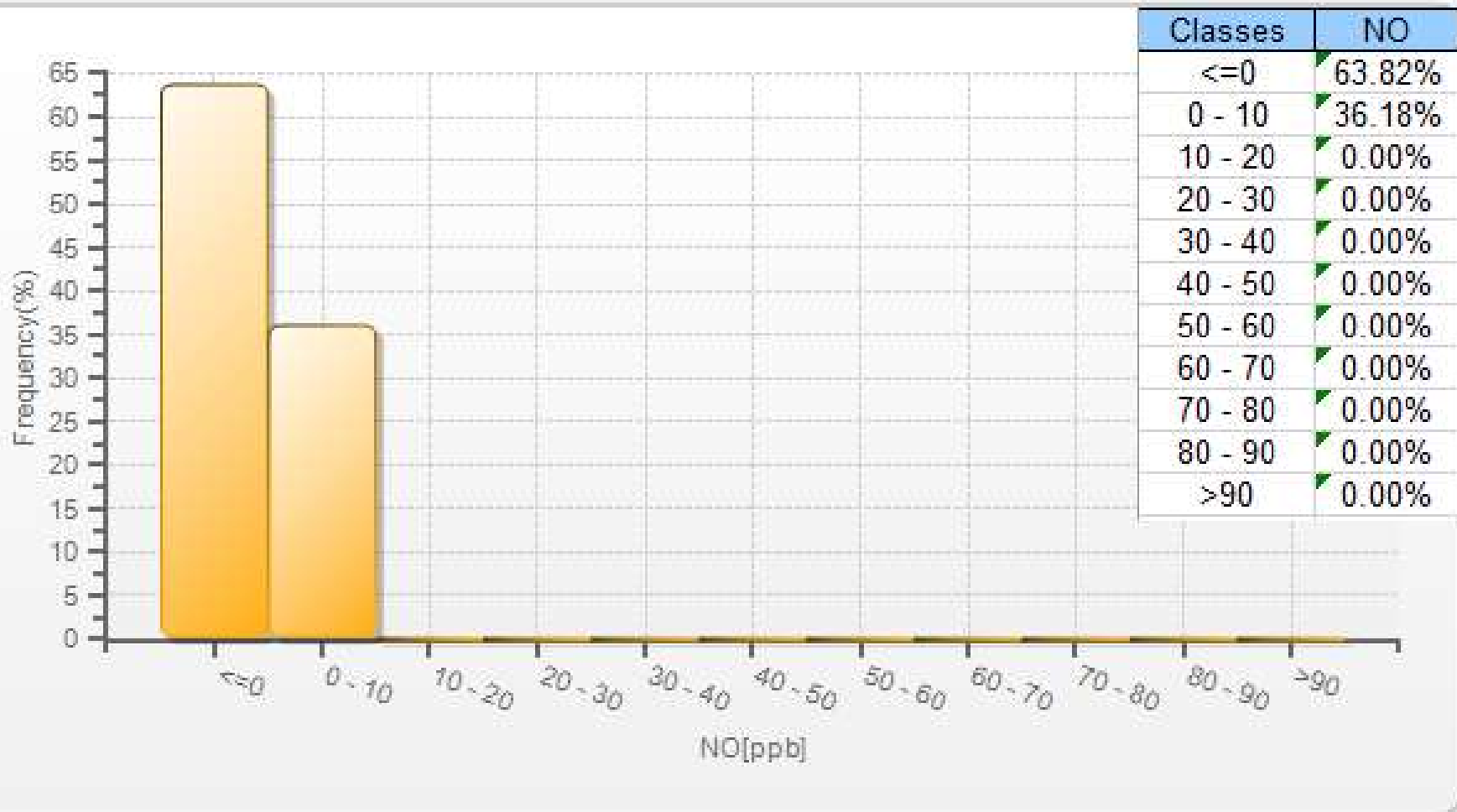
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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 Average for NO - Maskwa Site

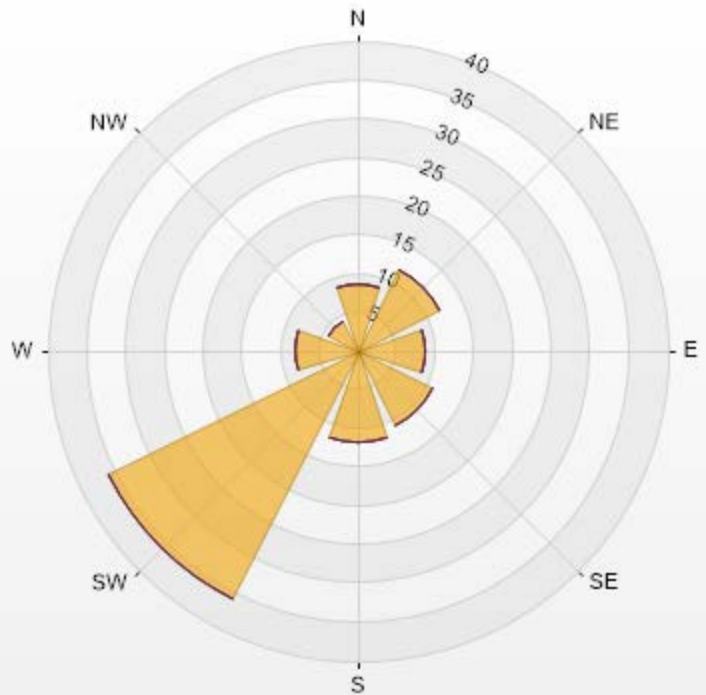


NO[ppb] Histogram: Maskwa Monthly: 12-2019 1 Hr.



Wind: Maskwa Poll.: Maskwa-NO[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.35% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	8.69	0	0	0	0	8.69
NE	11.82	0	0	0	0	11.82
E	8.69	0	0	0	0	8.69
SE	10.83	0	0	0	0	10.83
S	11.82	0	0	0	0	11.82
SW	35.9	0	0	0	0	35.9
W	8.12	0	0	0	0	8.12
NW	4.13	0	0	0	0	4.13
Summary	100	0	0	0	0	100



LICA-201912-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 - December 2019

Summary of Hourly Averages

NITROGEN DIOXIDE (NO<sub>2</sub>) in ppb

## Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb

Number of 1-Hour Exceedences: 0

Maximum Hourly Value: 20 ppb on December 2 at hour 2

Hours in Service: 744

Maximum Daily Value: 13.7 ppb on December 6

Hours of Data: 706

Minimum Hourly Value: 0 ppb on December 7 at hour 12

Hours of Missing Data: 0

Minimum Daily Value: 1.3 ppb on December 12

Hours of Calibration: 38

Monthly Average: 5.4 ppb

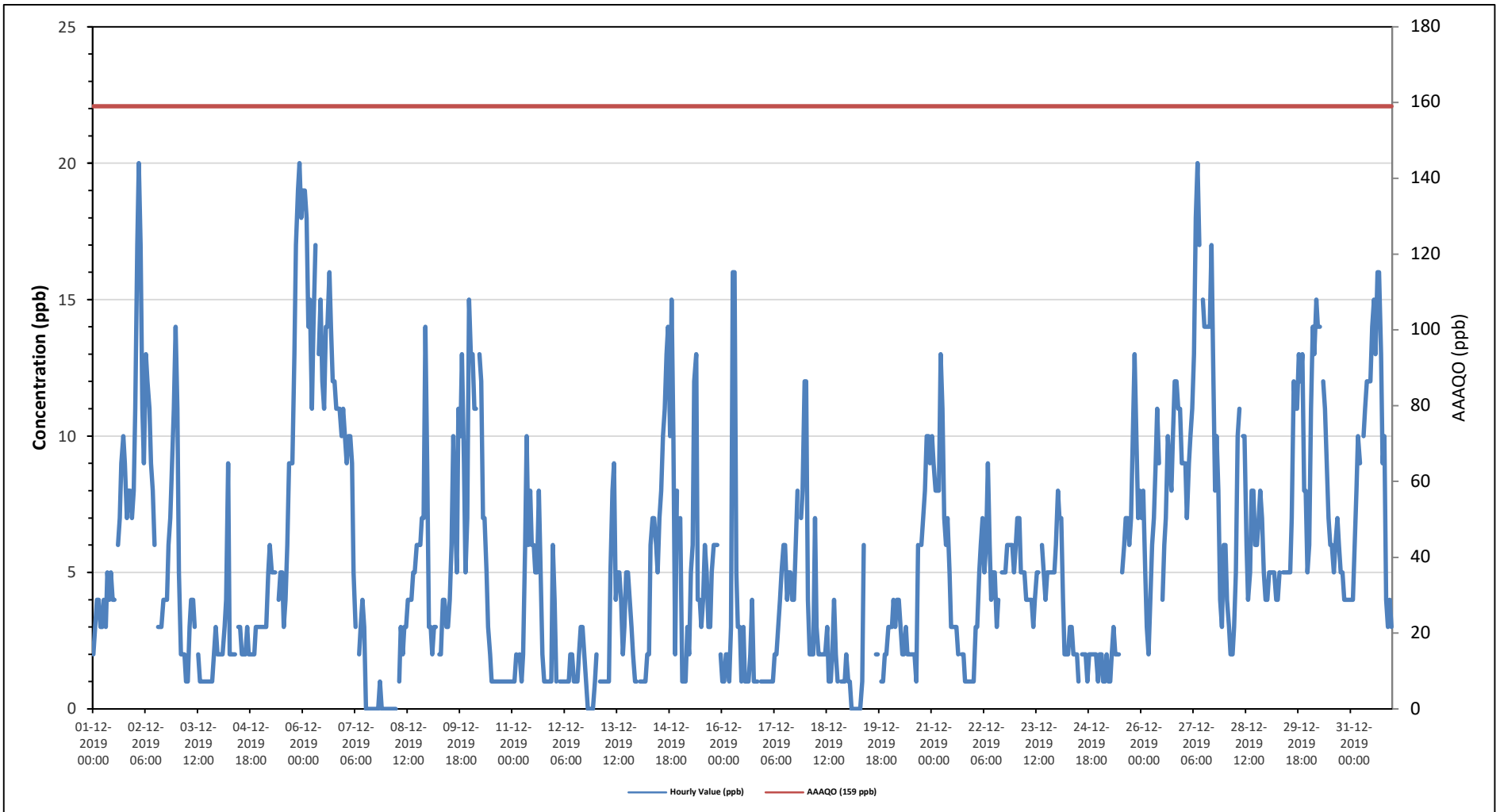
Operational Uptime: 100.0

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	
Dec 1	2	3	4	4	3	3	4	3	5	4	5	4	4	S	6	7	9	10	9	7	8	8	7	8	2	10	5.5	
Dec 2	11	17	20	17	11	9	13	12	11	9	8	6	S	3	3	3	4	4	4	6	7	9	11	14	3	20	9.2	
Dec 3	11	5	2	2	2	1	1	3	4	4	3	4	S	2	1	1	1	1	1	1	2	3	2	1	11	2.4		
Dec 4	2	2	2	3	4	9	2	2	2	2	S	3	3	2	2	2	3	2	2	2	2	3	3	3	2	9	2.7	
Dec 5	3	3	3	3	5	6	5	5	5	S	4	5	5	3	4	6	9	9	9	13	17	19	20	18	3	20	7.8	
Dec 6	19	19	18	14	15	11	14	17	S	13	15	12	11	14	14	16	14	12	12	11	11	11	10	11	10	19	13.7	
Dec 7	10	9	10	10	9	5	3	S	2	3	4	3	0	0	0	0	0	0	0	0	1	0	0	0	0	10	3.0	
Dec 8	0	0	0	0	0	0	S	1	3	2	3	3	4	4	4	5	5	6	6	6	7	7	14	9	0	14	3.9	
Dec 9	3	3	2	3	3	S	2	2	4	4	3	3	4	6	10	7	5	11	10	13	9	5	7	15	2	15	5.8	
Dec 10	13	13	11	11	S	13	12	7	7	5	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13	4.7
Dec 11	1	1	2	S	2	1	2	6	10	6	8	6	6	5	5	8	5	2	1	1	1	1	1	6	1	10	3.8	
Dec 12	4	1	S	1	1	1	1	1	1	2	2	1	1	1	2	3	3	2	1	0	0	0	0	1	0	4	1.3	
Dec 13	2	S	1	1	1	1	1	1	5	8	9	4	5	5	4	2	3	5	5	4	3	2	1	1	1	9	3.2	
Dec 14	S	1	1	1	1	2	2	6	7	7	6	5	7	8	10	11	13	14	10	15	10	2	8	S	1	15	6.7	
Dec 15	7	1	1	1	3	2	5	6	12	13	4	4	3	4	6	5	3	3	5	6	6	6	S	2	1	13	4.7	
Dec 16	1	1	2	2	1	3	16	16	5	3	3	1	3	1	1	1	2	4	1	1	1	S	1	1	1	16	3.1	
Dec 17	1	1	1	1	1	1	2	2	3	4	5	6	6	4	5	5	4	4	6	8	S	7	8	12	1	12	4.2	
Dec 18	12	4	2	2	2	7	3	2	2	2	2	2	3	1	1	2	4	2	1	S	1	1	1	2	1	12	2.7	
Dec 19	1	1	0	0	0	0	0	0	1	6	C	C	C	C	C	C	2	2	S	1	1	2	2	3	0	6	-	
Dec 20	3	3	4	3	4	4	3	2	2	3	2	2	2	2	2	1	6	S	6	7	8	10	10	9	1	10	4.3	
Dec 21	10	9	8	8	8	13	11	7	6	7	5	3	3	3	3	2	S	5	2	2	1	1	1	1	1	13	5.0	
Dec 22	1	3	3	5	6	7	5	6	9	6	4	5	5	3	4	S	5	5	5	6	6	6	6	5	1	9	5.0	
Dec 23	6	7	7	5	5	5	4	4	4	4	3	4	5	5	S	6	5	4	5	5	5	5	5	6	3	7	5.0	
Dec 24	8	7	7	4	2	2	2	3	3	2	2	2	2	1	S	2	2	2	1	2	2	2	2	1	1	8	2.7	
Dec 25	2	2	1	1	2	1	1	2	3	2	2	2	2	S	5	6	7	7	6	7	10	13	10	7	8	1	13	4.7
Dec 26	7	8	5	3	2	4	6	7	9	11	9	S	4	6	7	10	9	8	10	12	12	11	11	9	2	12	7.8	
Dec 27	9	9	7	9	10	11	13	18	20	17	S	15	14	14	14	14	17	13	8	10	8	4	3	6	3	20	11.4	
Dec 28	6	4	3	2	2	3	5	10	11	S	10	10	6	4	5	8	8	6	6	7	8	7	5	4	2	11	6.1	
Dec 29	4	5	5	5	5	4	5	S	5	5	5	5	5	5	7	12	11	11	13	12	13	8	8	5	4	13	7.0	
Dec 30	6	11	14	13	15	14	14	S	12	11	9	7	6	6	5	6	7	6	5	5	4	4	4	4	4	4	15	8.2
Dec 31	4	4	6	8	10	9	S	10	11	12	12	12	14	15	13	16	16	13	9	10	4	3	4	3	3	16	9.5	
Diurnal Maximum	19	19	20	17	15	14	16	18	20	17	15	15	14	15	14	16	17	14	13	15	17	19	20	18				
Daiurnal Average	5.6	5.2	5.1	4.7	4.5	5.1	5.4	5.7	6.2	6.1	5.4	4.9	4.8	4.7	5.1	5.8	6.1	5.6	5.4	6.1	5.7	5.2	5.5	5.7				

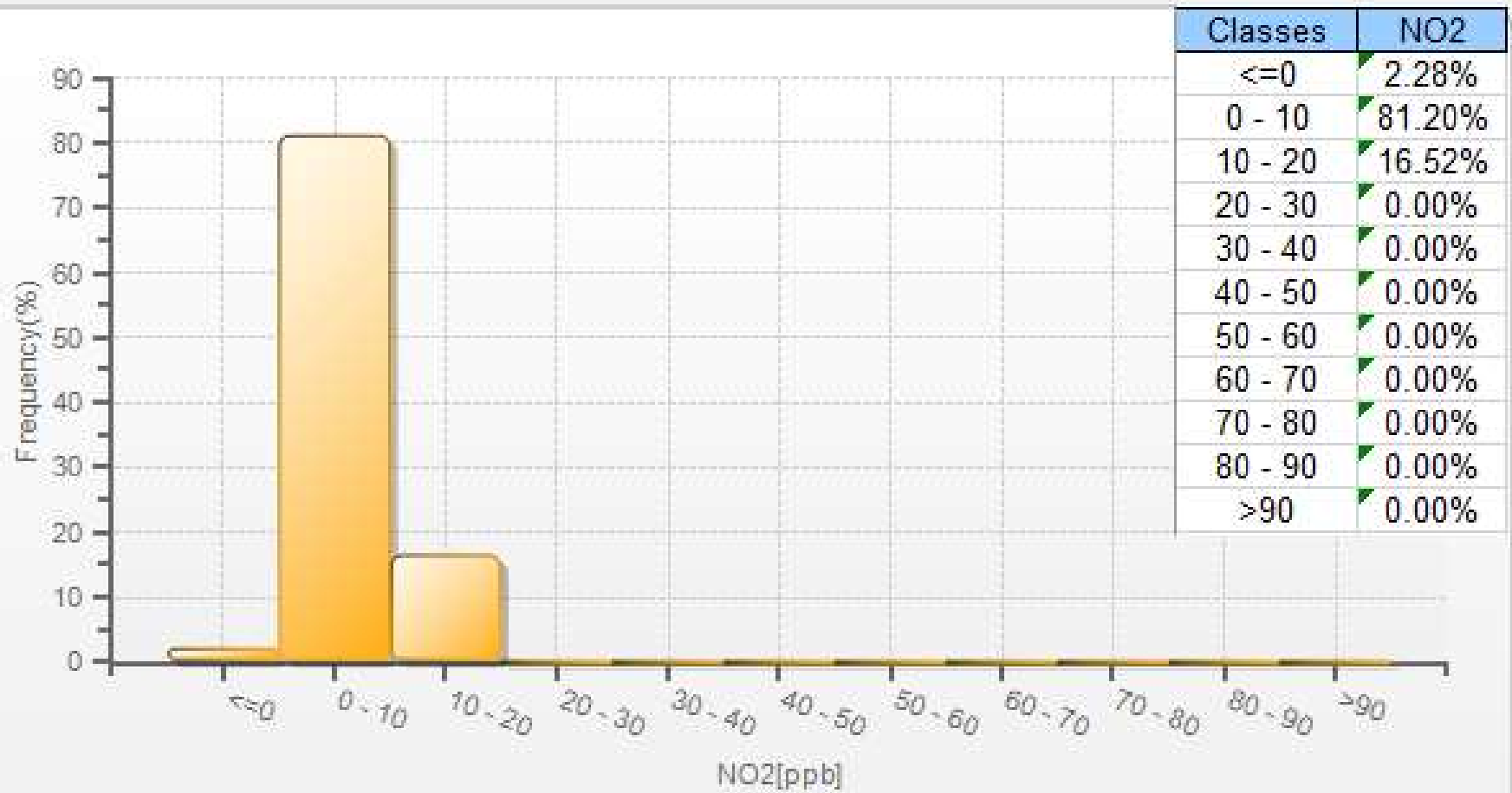
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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 NO2 - Maskwa Site

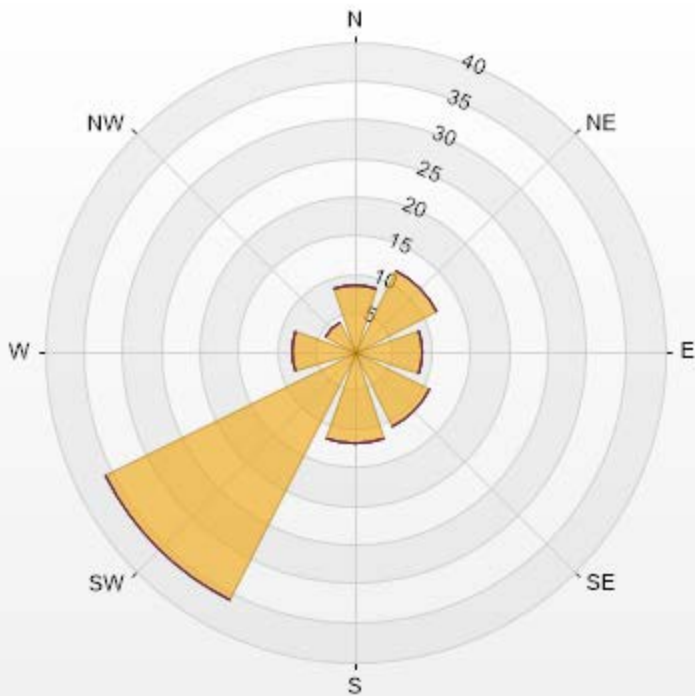


NO2[ppb] Histogram: Maskwa Monthly: 12-2019 1 Hr.



Wind: Maskwa Poll.: Maskwa-NO2[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.35% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	8.69	0	0	0	0	8.69
NE	11.82	0	0	0	0	11.82
E	8.69	0	0	0	0	8.69
SE	10.83	0	0	0	0	10.83
S	11.82	0	0	0	0	11.82
SW	35.9	0	0	0	0	35.9
W	8.12	0	0	0	0	8.12
NW	4.13	0	0	0	0	4.13
Summary	100	0	0	0	0	100



LICA-201912-Revision 1



# LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - December 2019

Summary of Hourly Averages

## TOTAL HYDROCARBONS (THC) in ppm

Maximum Hourly Value:	2.72 ppm on December 31 at hour 9	Hours in Service:	744
Maximum Daily Value:	2.43 ppm on December 31	Hours of Data:	626
Minimum Hourly Value:	1.90 ppm on December 19 at hour 4	Hours of Missing Data:	85
Minimum Daily Value:	2.01 ppm on December 19	Hours of Calibration:	33
Monthly Average:	2.17 ppm	Operational Uptime:	88.6

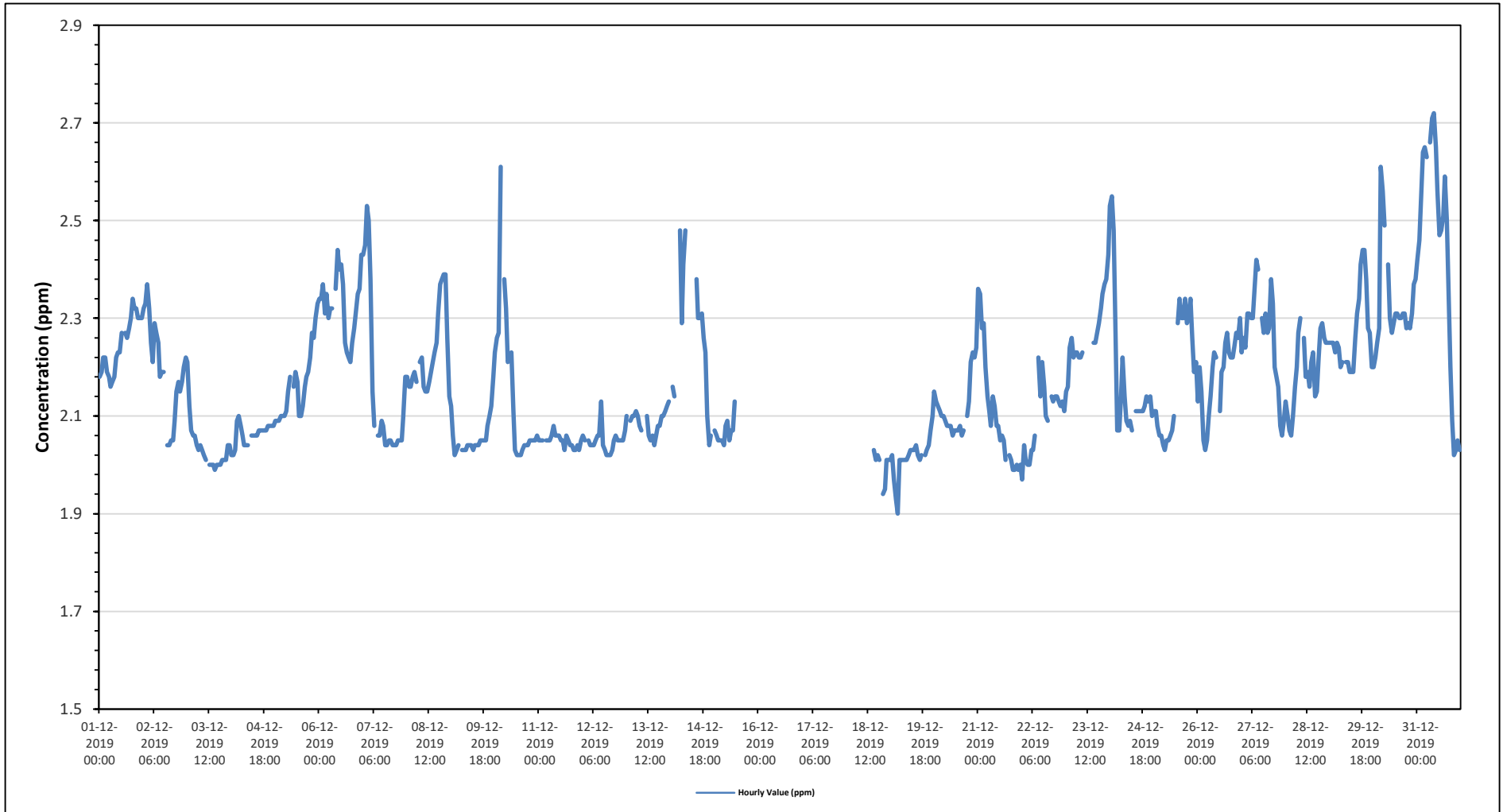
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Dec 1	2.18	2.19	2.22	2.22	2.19	2.18	2.16	2.17	2.18	2.22	2.23	2.23	2.27	S	2.27	2.26	2.28	2.30	2.34	2.32	2.32	2.30	2.30	2.16	2.34	2.24		
Dec 2	2.32	2.33	2.37	2.32	2.25	2.21	2.29	2.27	2.25	2.18	2.19	2.19	S	2.04	2.04	2.05	2.05	2.09	2.15	2.17	2.15	2.20	2.22	2.04	2.37	2.20		
Dec 3	2.21	2.12	2.07	2.06	2.06	2.04	2.03	2.04	2.03	2.02	2.01	S	2.00	2.00	1.99	2.00	2.00	2.00	2.01	2.01	2.01	2.04	2.04	1.99	2.21	2.03		
Dec 4	2.02	2.02	2.03	2.09	2.10	2.08	2.06	2.04	2.04	2.04	S	2.06	2.06	2.06	2.06	2.07	2.07	2.07	2.07	2.07	2.08	2.08	2.08	2.02	2.10	2.06		
Dec 5	2.09	2.09	2.09	2.10	2.10	2.10	2.11	2.15	2.18	S	2.16	2.19	2.17	2.10	2.10	2.12	2.16	2.18	2.19	2.22	2.27	2.26	2.30	2.09	2.33	2.16		
Dec 6	2.34	2.34	2.37	2.31	2.35	2.30	2.32	2.32	S	2.36	2.44	2.40	2.41	2.37	2.25	2.23	2.22	2.21	2.25	2.28	2.31	2.35	2.36	2.21	2.44	2.33		
Dec 7	2.43	2.45	2.53	2.50	2.38	2.15	2.08	S	2.06	2.06	2.09	2.08	2.04	2.04	2.05	2.05	2.04	2.04	2.04	2.05	2.05	2.10	2.18	2.04	2.53	2.15		
Dec 8	2.18	2.16	2.16	2.18	2.19	2.17	S	2.21	2.22	2.16	2.15	2.15	2.17	2.19	2.21	2.23	2.25	2.31	2.37	2.38	2.39	2.39	2.26	2.14	2.14	2.39	2.23	
Dec 9	2.12	2.06	2.02	2.03	2.04	S	2.03	2.03	2.03	2.04	2.04	2.03	2.04	2.04	2.04	2.05	2.05	2.05	2.05	2.05	2.08	2.10	2.12	2.02	2.18	2.06		
Dec 10	2.23	2.26	2.27	2.61	S	2.38	2.32	2.21	2.22	2.23	2.11	2.03	2.02	2.02	2.02	2.03	2.04	2.04	2.04	2.05	2.05	2.05	2.06	2.02	2.61	2.15		
Dec 11	2.05	2.05	2.05	S	2.05	2.05	2.05	2.06	2.08	2.06	2.06	2.06	2.05	2.05	2.03	2.06	2.05	2.04	2.04	2.03	2.03	2.04	2.03	2.03	2.08	2.05		
Dec 12	2.06	2.05	S	2.05	2.04	2.04	2.04	2.05	2.06	2.06	2.13	2.04	2.03	2.02	2.02	2.02	2.03	2.05	2.06	2.05	2.05	2.05	2.07	2.02	2.13	2.05		
Dec 13	2.10	S	2.09	2.10	2.10	2.11	2.10	2.08	2.07	X	X	2.10	2.06	2.05	2.06	2.04	2.06	2.08	2.08	2.10	2.10	2.11	2.12	2.13	2.04	2.13	2.09	
Dec 14	S	2.16	2.14	X	X	2.48	2.29	2.41	2.48	X	X	X	X	X	2.38	2.30	2.30	2.31	2.26	2.23	2.10	2.04	2.06	S	2.04	2.48	-	
Dec 15	2.07	2.06	2.05	2.05	2.05	2.04	2.08	2.09	2.05	2.07	2.07	2.13	X	X	X	X	X	X	X	X	X	X	X	X	2.04	2.13	-	
Dec 16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Dec 17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Dec 18	X	X	X	X	X	X	X	X	X	X	X	X	C	C	C	C	2.03	2.01	2.02	2.01	S	1.94	1.95	2.01	2.01	1.94	2.03	-
Dec 19	2.01	2.02	1.97	1.93	1.90	2.01	2.01	2.01	2.01	2.01	2.02	2.03	2.03	2.03	2.04	2.02	2.01	2.02	S	2.02	2.03	2.04	2.07	2.10	1.90	2.10	2.01	
Dec 20	2.15	2.13	2.12	2.11	2.10	2.10	2.09	2.08	2.08	2.08	2.06	2.07	2.07	2.07	2.08	2.06	2.07	S	2.10	2.13	2.21	2.23	2.22	2.24	2.06	2.24	2.12	
Dec 21	2.36	2.35	2.28	2.29	2.20	2.14	2.11	2.08	2.14	2.12	2.08	2.08	2.05	2.06	2.05	2.01	S	2.02	2.01	1.99	1.99	2.00	1.99	2.00	1.99	2.36	2.10	
Dec 22	1.97	2.04	2.01	2.00	2.00	2.03	2.03	2.06	Y	2.22	2.14	2.21	2.16	2.10	2.09	S	2.14	2.13	2.14	2.14	2.13	2.12	2.13	2.11	1.97	2.22	2.10	
Dec 23	2.15	2.16	2.24	2.26	2.22	2.23	2.23	2.22	2.22	2.23	C1	C1	C1	C1	S	2.25	2.25	2.27	2.29	2.32	2.35	2.37	2.38	2.43	2.15	2.43	2.27	
Dec 24	2.53	2.55	2.48	2.28	2.07	2.14	2.22	2.14	2.09	2.08	2.09	2.07	S	2.29	2.11	2.11	2.11	2.11	2.12	2.14	2.13	2.14	2.10	2.07	2.55	2.17		
Dec 25	2.11	2.11	2.08	2.06	2.06	2.04	2.03	2.05	2.05	2.06	2.07	2.10	S	2.29	2.34	2.30	2.30	2.34	2.29	2.30	2.34	2.26	2.19	2.21	2.03	2.34	2.17	
Dec 26	2.13	2.20	2.15	2.05	2.03	2.05	2.10	2.14	2.20	2.23	2.22	S	2.11	2.19	2.20	2.25	2.27	2.23	2.22	2.22	2.24	2.27	2.26	2.30	2.03	2.30	2.19	
Dec 27	2.23	2.26	2.24	2.31	2.31	2.30	2.30	2.36	2.42	2.40	S	2.30	2.27	2.31	2.27	2.28	2.38	2.33	2.20	2.18	2.16	2.08	2.06	2.09	2.06	2.42	2.26	
Dec 28	2.13	2.10	2.07	2.06	2.10	2.16	2.20	2.27	2.30	S	2.26	2.18	2.19	2.16	2.21	2.23	2.14	2.15	2.22	2.28	2.29	2.26	2.25	2.25	2.06	2.30	2.19	
Dec 29	2.25	2.25	2.25	2.23	2.25	2.24	2.20	2.21	S	2.21	2.21	2.19	2.19	2.19	2.26	2.31	2.34	2.41	2.44	2.44	2.38	2.28	2.27	2.20	2.19	2.44	2.27	
Dec 30	2.20	2.22	2.25	2.28	2.61	2.56	2.49	S	2.41	2.30	2.27	2.29	2.31	2.31	2.30	2.30	2.31	2.31	2.28	2.29	2.28	2.31	2.37	2.38	2.20	2.61	2.33	
Dec 31	2.42	2.46	2.55	2.64	2.65	2.63	S	2.66	2.71	2.72	2.65	2.56	2.47	2.48	2.51	2.59	2.50	2.35	2.20	2.09	2.02	2.03	2.05	2.03	2.02	2.72	2.43	
Diurnal Maximum	2.53	2.55	2.55	2.64	2.65	2.63	2.49	2.66	2.71	2.72	2.65	2.56	2.47	2.48	2.51	2.59	2.50	2.41	2.44	2.44	2.39	2.39	2.38	2.43				
Diurnal Average	2.19	2.19	2.19	2.20	2.17	2.18	2.15	2.17	2.19	2.17	2.16	2.16	2.14	2.14	2.15	2.16	2.16	2.17	2.16	2.17	2.16	2.15	2.16	2.17				

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

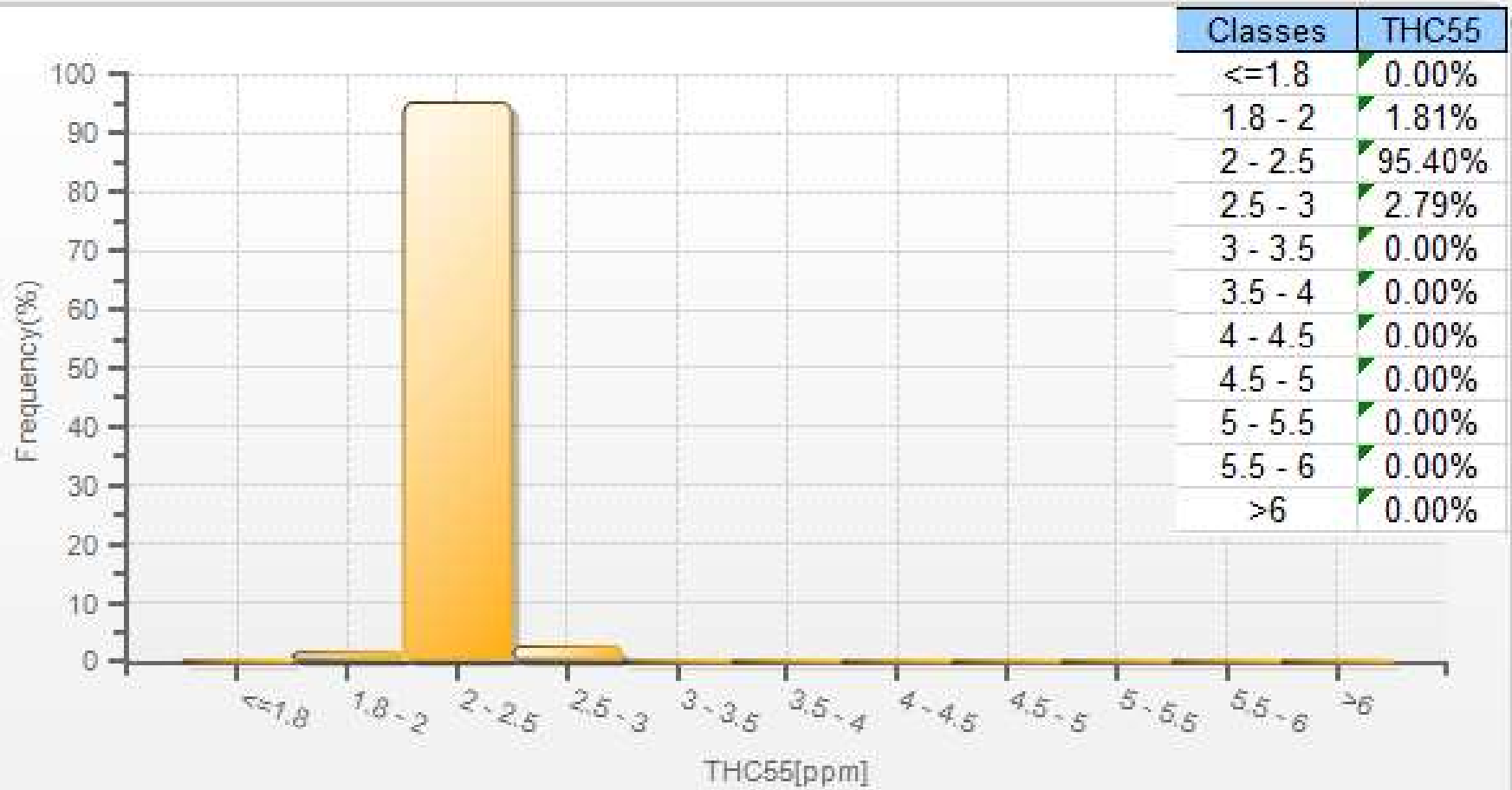
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

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 - Maskwa Site*



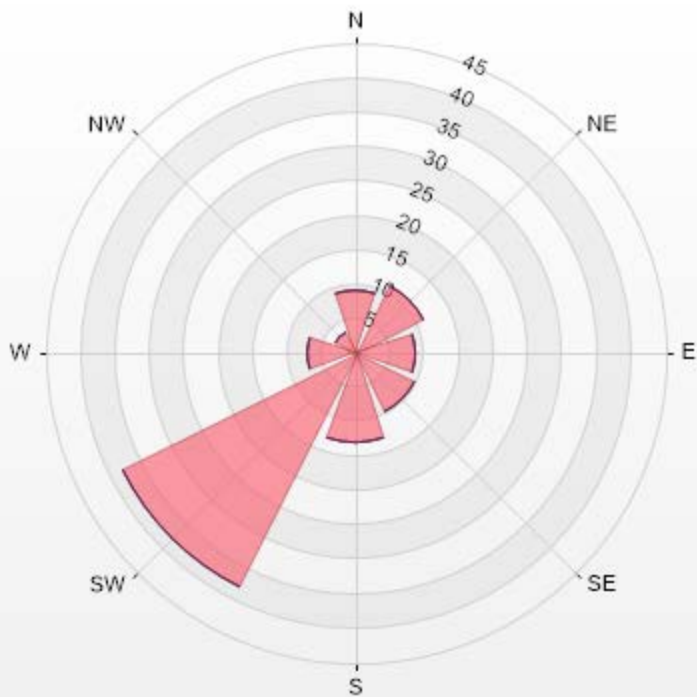
THC55[ppm] Histogram: Maskwa Monthly: 12-2019 1 Hr.





Wind: Maskwa Poll.: Maskwa-THC55[ppm] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 81.85% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	0.33	8.7	0	0	0	9.03
NE	0	11	0	0	0	11
E	0.33	8.37	0	0	0	8.7
SE	0	9.69	0	0	0	9.69
S	0	13.14	0	0	0	13.14
SW	0	37.93	0	0	0	37.93
W	0.99	6.24	0	0	0	7.23
NW	0	3.28	0	0	0	3.28
Summary	1.65	98.35	0	0	0	100



LICA-201912-Revision 1



# LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - December 2019

Summary of Hourly Averages

METHANE (CH4) in ppm

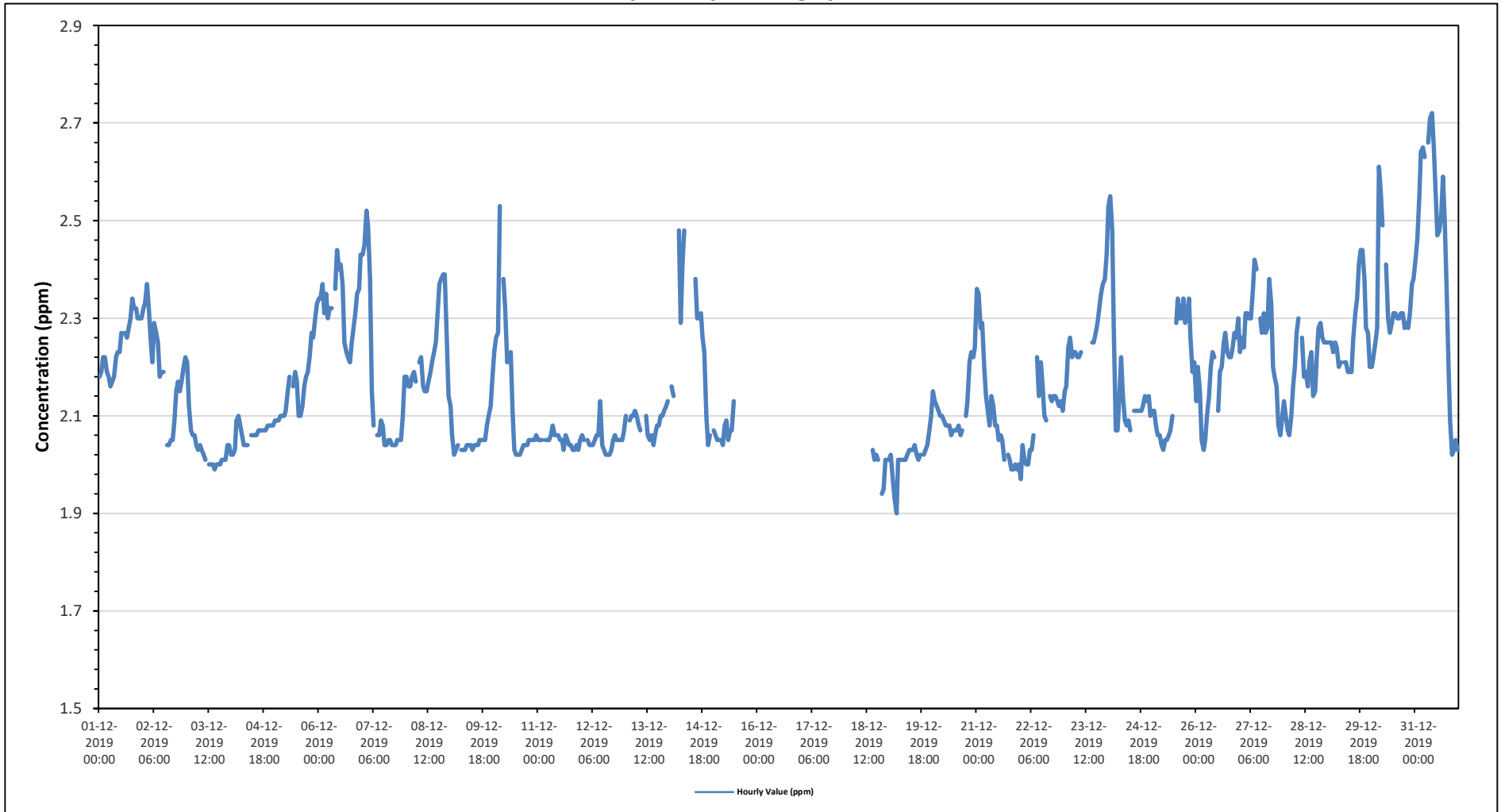
Maximum Hourly Value:	2.72 ppm on December 31 at hour 9	Hours in Service:	744
Maximum Daily Value:	2.43 ppm on December 31	Hours of Data:	626
Minimum Hourly Value:	1.90 ppm on December 19 at hour 4	Hours of Missing Data:	85
Minimum Daily Value:	2.01 ppm on December 19	Hours of Calibration:	33
Monthly Average:	2.17 ppm	Operational Uptime:	88.6

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	
Dec 1	2.18	2.19	2.22	2.22	2.19	2.18	2.16	2.17	2.18	2.22	2.23	2.23	2.27	S	2.27	2.26	2.28	2.30	2.34	2.32	2.32	2.30	2.30	2.30	2.16	2.34	2.24	
Dec 2	2.32	2.33	2.37	2.32	2.25	2.21	2.29	2.27	2.25	2.18	2.19	2.19	S	S	2.04	2.04	2.05	2.05	2.09	2.15	2.17	2.15	2.20	2.22	2.04	2.37	2.20	
Dec 3	2.21	2.12	2.07	2.06	2.06	2.04	2.03	2.04	2.03	2.02	2.01	S	S	2.00	2.00	1.99	2.00	2.00	2.00	2.01	2.01	2.01	2.04	2.04	1.99	2.21	2.03	
Dec 4	2.02	2.02	2.03	2.09	2.10	2.08	2.06	2.04	2.04	2.04	S	S	2.06	2.06	2.06	2.06	2.07	2.07	2.07	2.07	2.08	2.08	2.08	2.08	2.02	2.10	2.06	
Dec 5	2.09	2.09	2.09	2.10	2.10	2.10	2.11	2.15	2.18	S	S	2.16	2.19	2.17	2.10	2.10	2.12	2.16	2.18	2.19	2.22	2.27	2.26	2.30	2.09	2.33	2.16	
Dec 6	2.34	2.34	2.37	2.31	2.35	2.30	2.32	S	S	2.36	2.44	2.40	2.41	2.37	2.25	2.23	2.22	2.21	2.25	2.28	2.31	2.35	2.36	2.43	2.21	2.44	2.33	
Dec 7	2.43	2.45	2.52	2.49	2.38	2.15	2.08	S	S	2.06	2.06	2.09	2.08	2.04	2.04	2.05	2.05	2.04	2.04	2.04	2.05	2.05	2.05	2.10	2.18	2.04	2.52	2.15
Dec 8	2.18	2.16	2.16	2.18	2.19	2.17	S	S	2.21	2.22	2.16	2.15	2.15	2.17	2.19	2.21	2.23	2.25	2.31	2.37	2.38	2.39	2.39	2.26	2.14	2.14	2.39	2.23
Dec 9	2.12	2.06	2.02	2.03	2.04	S	S	2.03	2.03	2.03	2.04	2.04	2.03	2.04	2.04	2.05	2.05	2.05	2.05	2.05	2.08	2.10	2.12	2.18	2.02	2.18	2.06	
Dec 10	2.23	2.26	2.27	2.53	S	S	2.38	2.32	2.21	2.22	2.23	2.11	2.03	2.02	2.02	2.02	2.03	2.04	2.04	2.04	2.05	2.05	2.05	2.06	2.02	2.05	2.14	
Dec 11	2.05	2.05	2.05	S	S	2.05	2.05	2.06	2.08	2.06	2.06	2.06	2.05	2.05	2.03	2.06	2.05	2.04	2.04	2.03	2.03	2.04	2.03	2.05	2.03	2.08	2.05	
Dec 12	2.06	2.05	S	S	2.05	2.04	2.04	2.04	2.05	2.06	2.06	2.13	2.04	2.03	2.02	2.02	2.02	2.03	2.05	2.06	2.05	2.05	2.05	2.07	2.02	2.13	2.05	
Dec 13	2.10	S	S	2.09	2.10	2.10	2.11	2.10	2.08	2.07	X	X	2.10	2.06	2.05	2.06	2.04	2.06	2.08	2.08	2.10	2.10	2.11	2.12	2.13	2.04	2.13	2.09
Dec 14	S	2.16	2.14	X	X	2.48	2.29	2.41	2.48	X	X	X	X	X	2.38	2.30	2.30	2.31	2.26	2.23	2.10	2.04	2.06	S	2.04	2.48	-	
Dec 15	2.07	2.06	2.05	2.05	2.05	2.04	2.08	2.09	2.05	2.07	2.07	2.13	X	X	X	X	X	X	X	X	X	X	X	X	2.04	2.13	-	
Dec 16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dec 17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dec 18	X	X	X	X	X	X	X	X	X	X	X	C	C	C	C	2.03	2.01	2.02	2.01	S	1.94	1.95	2.01	2.01	1.94	2.03	-	
Dec 19	2.01	2.02	1.97	1.93	1.90	2.01	2.01	2.01	2.01	2.01	2.02	2.03	2.03	2.03	2.04	2.02	2.01	2.02	S	2.02	2.03	2.04	2.07	2.10	1.90	2.10	2.01	
Dec 20	2.15	2.13	2.12	2.11	2.10	2.10	2.09	2.08	2.08	2.08	2.06	2.07	2.07	2.07	2.08	2.06	2.07	S	2.10	2.13	2.21	2.23	2.22	2.24	2.06	2.24	2.12	
Dec 21	2.36	2.35	2.28	2.29	2.20	2.14	2.11	2.08	2.14	2.12	2.08	2.08	2.05	2.06	2.05	2.01	S	2.02	2.01	1.99	1.99	2.00	1.99	2.00	1.99	2.36	2.10	
Dec 22	1.97	2.04	2.01	2.00	2.00	2.03	2.03	2.06	Y	2.22	2.14	2.21	2.16	2.10	2.09	S	2.14	2.13	2.14	2.14	2.13	2.12	2.13	2.11	1.97	2.22	2.10	
Dec 23	2.15	2.16	2.24	2.26	2.22	2.23	2.23	2.22	2.22	2.23	C1	C1	C1	C1	S	2.25	2.25	2.27	2.29	2.32	2.35	2.37	2.38	2.43	2.15	2.43	2.27	
Dec 24	2.53	2.55	2.48	2.28	2.07	2.14	2.22	2.14	2.09	2.08	2.09	2.07	S	S	2.11	2.11	2.11	2.11	2.11	2.12	2.14	2.13	2.14	2.10	2.07	2.55	2.17	
Dec 25	2.11	2.11	2.08	2.06	2.06	2.04	2.03	2.05	2.05	2.06	2.07	2.10	S	S	2.29	2.34	2.30	2.30	2.34	2.29	2.30	2.34	2.26	2.19	2.21	2.03	2.34	2.17
Dec 26	2.13	2.20	2.15	2.05	2.03	2.05	2.10	2.14	2.20	2.23	2.22	S	S	2.11	2.19	2.20	2.25	2.27	2.23	2.22	2.22	2.24	2.27	2.26	2.30	2.03	2.30	2.19
Dec 27	2.23	2.26	2.24	2.31	2.31	2.30	2.30	2.36	2.42	2.40	S	S	2.30	2.27	2.31	2.27	2.28	2.38	2.33	2.20	2.18	2.16	2.08	2.06	2.09	2.06	2.42	2.26
Dec 28	2.13	2.10	2.07	2.06	2.10	2.16	2.20	2.27	2.30	S	S	2.26	2.18	2.19	2.16	2.21	2.23	2.14	2.15	2.22	2.28	2.29	2.26	2.25	2.25	2.06	2.30	2.19
Dec 29	2.25	2.25	2.25	2.23	2.25	2.24	2.20	2.21	S	S	2.21	2.21	2.19	2.19	2.19	2.26	2.31	2.34	2.41	2.44	2.44	2.38	2.28	2.27	2.20	2.19	2.44	2.27
Dec 30	2.20	2.22	2.25	2.28	2.61	2.56	2.49	S	S	2.41	2.30	2.27	2.29	2.31	2.31	2.30	2.30	2.31	2.31	2.28	2.29	2.28	2.31	2.37	2.28	2.20	2.61	2.33
Dec 31	2.42	2.46	2.55	2.64	2.65	2.63	S	S	2.66	2.71	2.72	2.65	2.56	2.47	2.48	2.51	2.59	2.50	2.35	2.20	2.09	2.02	2.03	2.05	2.03	2.02	2.72	2.43
Diurnal Maximum	2.53	2.55	2.55	2.64	2.65	2.63	2.49	2.66	2.71	2.72	2.65	2.56	2.47	2.48	2.51	2.59	2.50	2.41	2.44	2.44	2.39	2.39	2.38	2.43				
Diurnal Average	2.19	2.19	2.19	2.19	2.17	2.18	2.15	2.17	2.19	2.17	2.16	2.16	2.14	2.14	2.15	2.16	2.16	2.17	2.16	2.17	2.16	2.17	2.16	2.17				

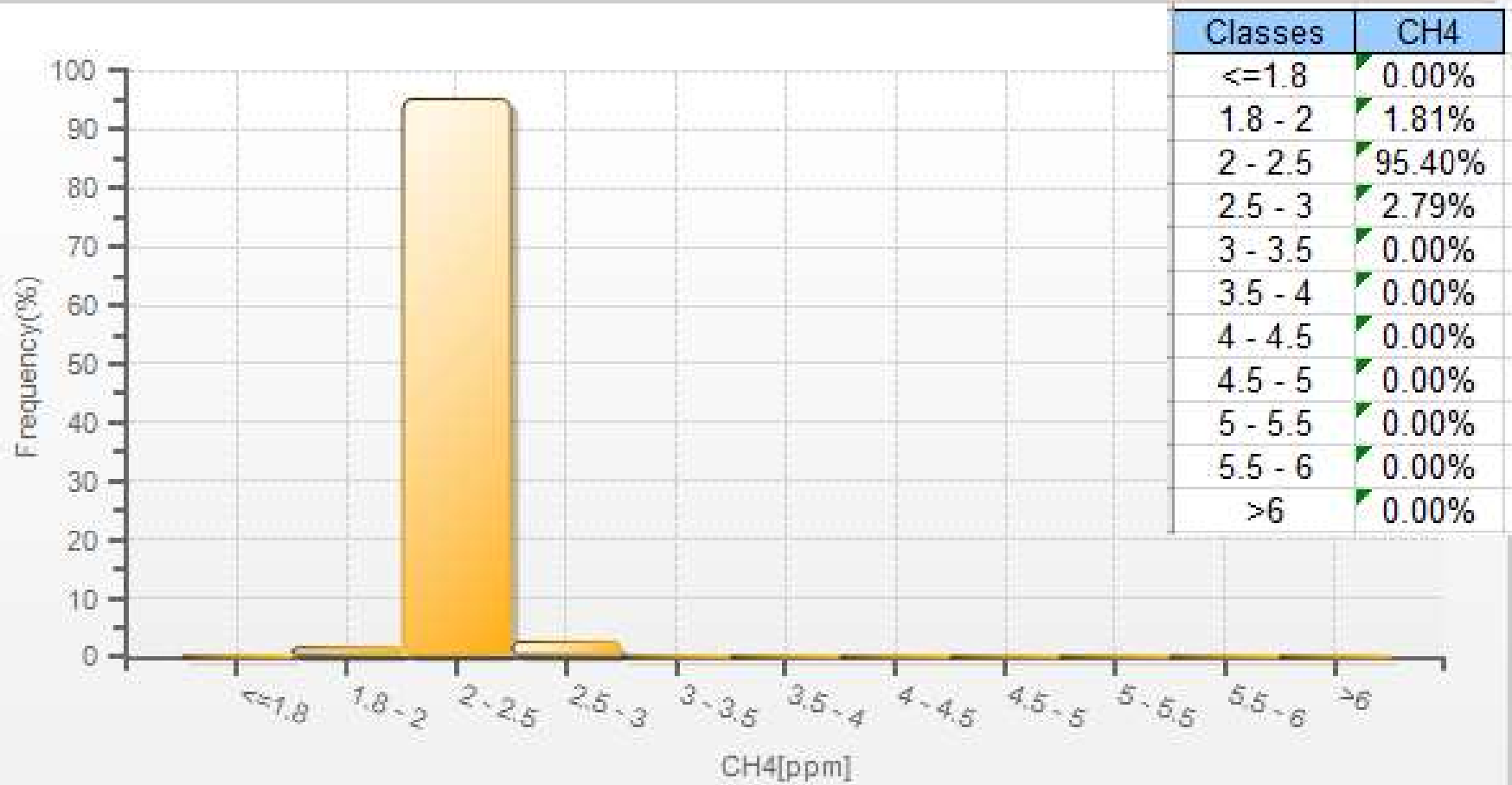
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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 - Maskwa Site*

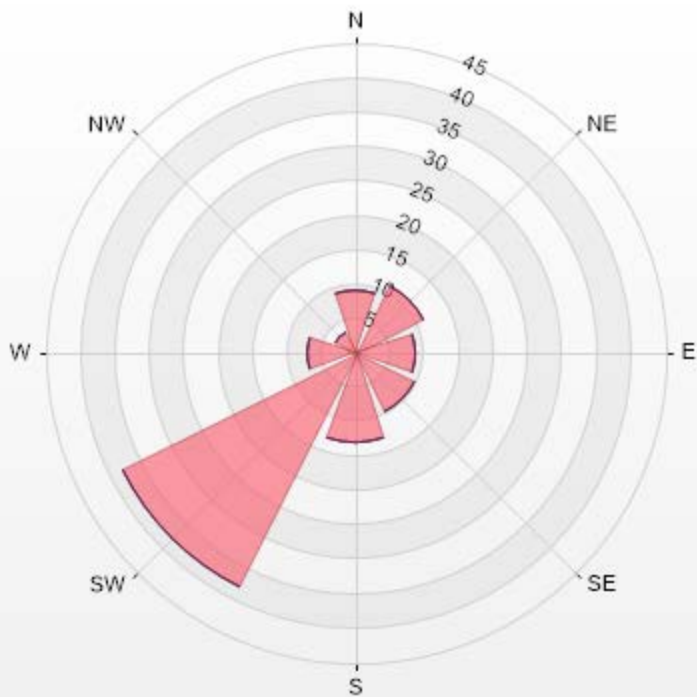


CH4[ppm] Histogram: Maskwa Monthly: 12-2019 1 Hr.



Wind: Maskwa Poll.: Maskwa-CH4[ppm] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 81.85% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	0.33	8.7	0	0	0	9.03
NE	0	11	0	0	0	11
E	0.33	8.37	0	0	0	8.7
SE	0	9.69	0	0	0	9.69
S	0	13.14	0	0	0	13.14
SW	0	37.93	0	0	0	37.93
W	0.99	6.24	0	0	0	7.23
NW	0	3.28	0	0	0	3.28
Summary	1.65	98.35	0	0	0	100



LICA-201912-Revision 1



**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**

**Maskwa Site - December 2019  
Summary of Hourly Averages**

**NON-METHANE HYDROCARBONS (NMHC) in ppm**

Maximum Hourly Value:	0.07 ppm on December 10 at hour 3	Hours in Service:	744
Maximum Daily Value:	0.00 ppm on December 10	Hours of Data:	626
Minimum Hourly Value:	0.00 ppm on December 1 at hour 0	Hours of Missing Data:	85
Minimum Daily Value:	0.00 ppm on December 1	Hours of Calibration:	33
Monthly Average:	0.00 ppm	Operational Uptime:	88.6

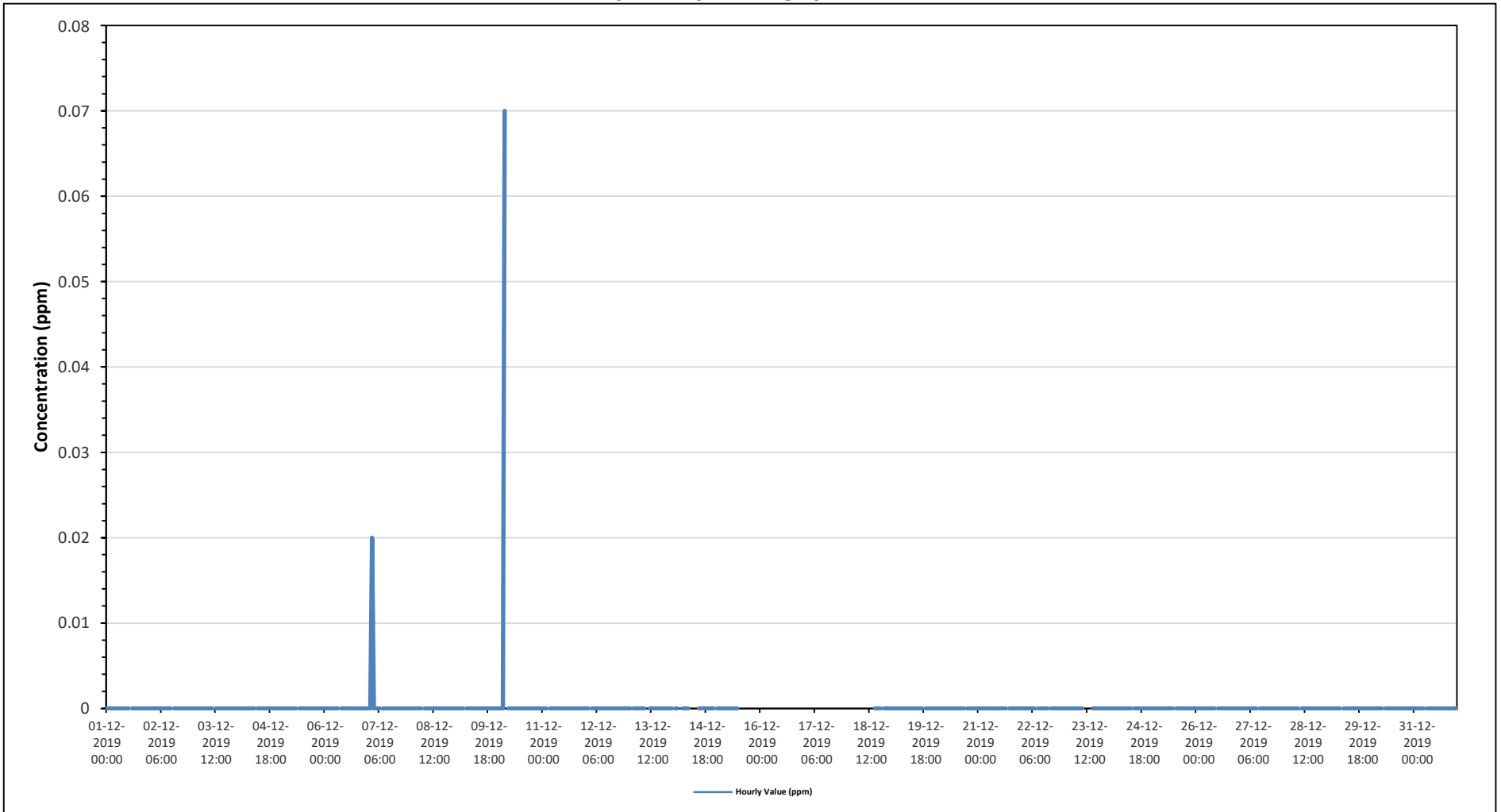
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average									
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23								
Dec 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Dec 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	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		
Dec 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	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		
Dec 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	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		
Dec 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Dec 6	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	0.00	0.00	0.00	0.00	0.00		
Dec 7	0.00	0.00	0.02	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	0.00	0.00		
Dec 8	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	0.00	0.00	0.00	0.00	0.00		
Dec 9	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	0.00	0.00	0.00	0.00	0.00		
Dec 10	0.00	0.00	0.00	0.07	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	0.00	0.00		
Dec 11	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	0.00	0.00	0.00	0.00	0.00		
Dec 12	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	0.00	0.00	0.00	0.00	0.00		
Dec 13	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	X	X	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Dec 14	S	0.00	0.00	X	X	0.00	0.00	0.00	0.00	0.00	X	X	X	X	X	0.00	0.00	0.00	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		
Dec 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	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.00	0.00	
Dec 16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.00	0.00
Dec 17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.00	0.00
Dec 18	X	X	X	X	X	X	X	X	X	X	X	X	C	C	C	C	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	
Dec 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	
Dec 20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	
Dec 21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	
Dec 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	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	
Dec 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	C1	C1	C1	C1	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	
Dec 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	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	
Dec 25	0.00	0.00	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	0.00	0.00	0.00	0.00	
Dec 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	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	
Dec 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	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	
Dec 28	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	0.00	0.00	0.00	0.00	0.00	0.00	
Dec 29	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	0.00	0.00	0.00	0.00	0.00	0.00	
Dec 30	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	0.00	0.00	0.00	0.00	0.00	0.00	
Dec 31	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	0.00	0.00	0.00	0.00	0.00	0.00	
Diurnal Maximum	0.00	0.00	0.02	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	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	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

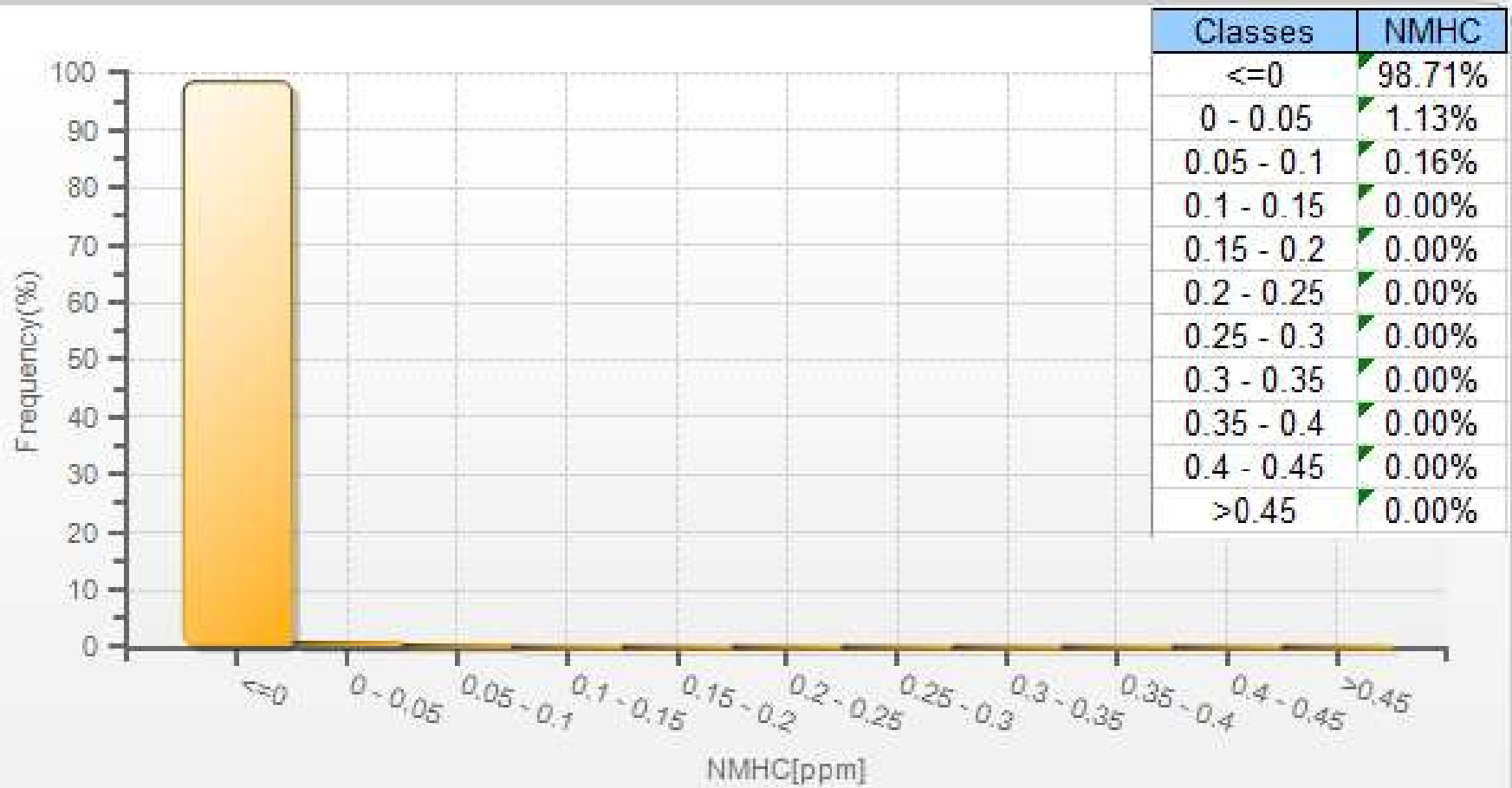
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.  
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



**Timeseries Chart of Hourly Average for NMHC - Maskwa Site**

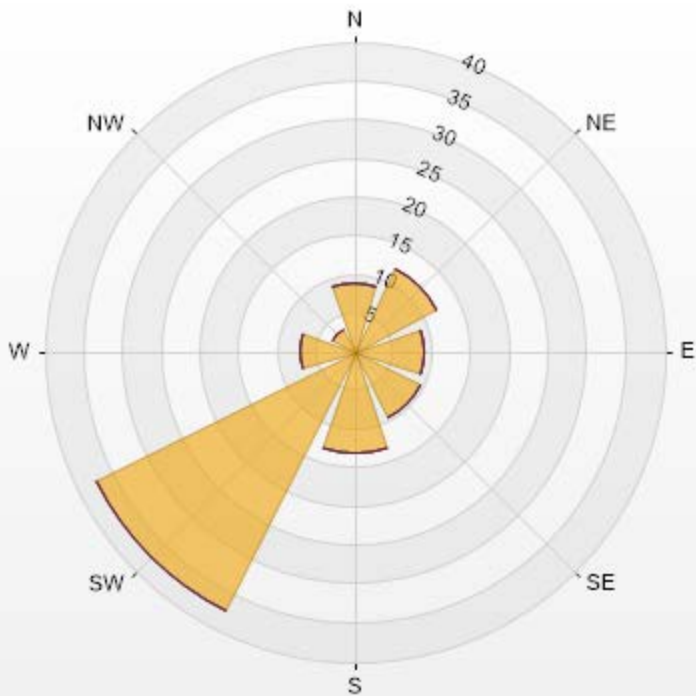


NMHC[ppm] Histogram: Maskwa Monthly: 12-2019 1 Hr.



Wind: Maskwa Poll.: Maskwa-NMHC[ppm] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 83.47% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-0.9	0.9-2	>2.0	Total
N	8.86	0	0	0	0	8.86
NE	11.92	0	0	0	0	11.92
E	9.02	0	0	0	0	9.02
SE	9.5	0	0	0	0	9.5
S	13.04	0	0	0	0	13.04
SW	37.36	0	0	0	0	37.36
W	7.09	0	0	0	0	7.09
NW	3.22	0	0	0	0	3.22
Summary	100	0	0	0	0	100



LICA-201912-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 - December 2019

Summary of Hourly Averages

RELATIVE HUMIDITY (RH) in %

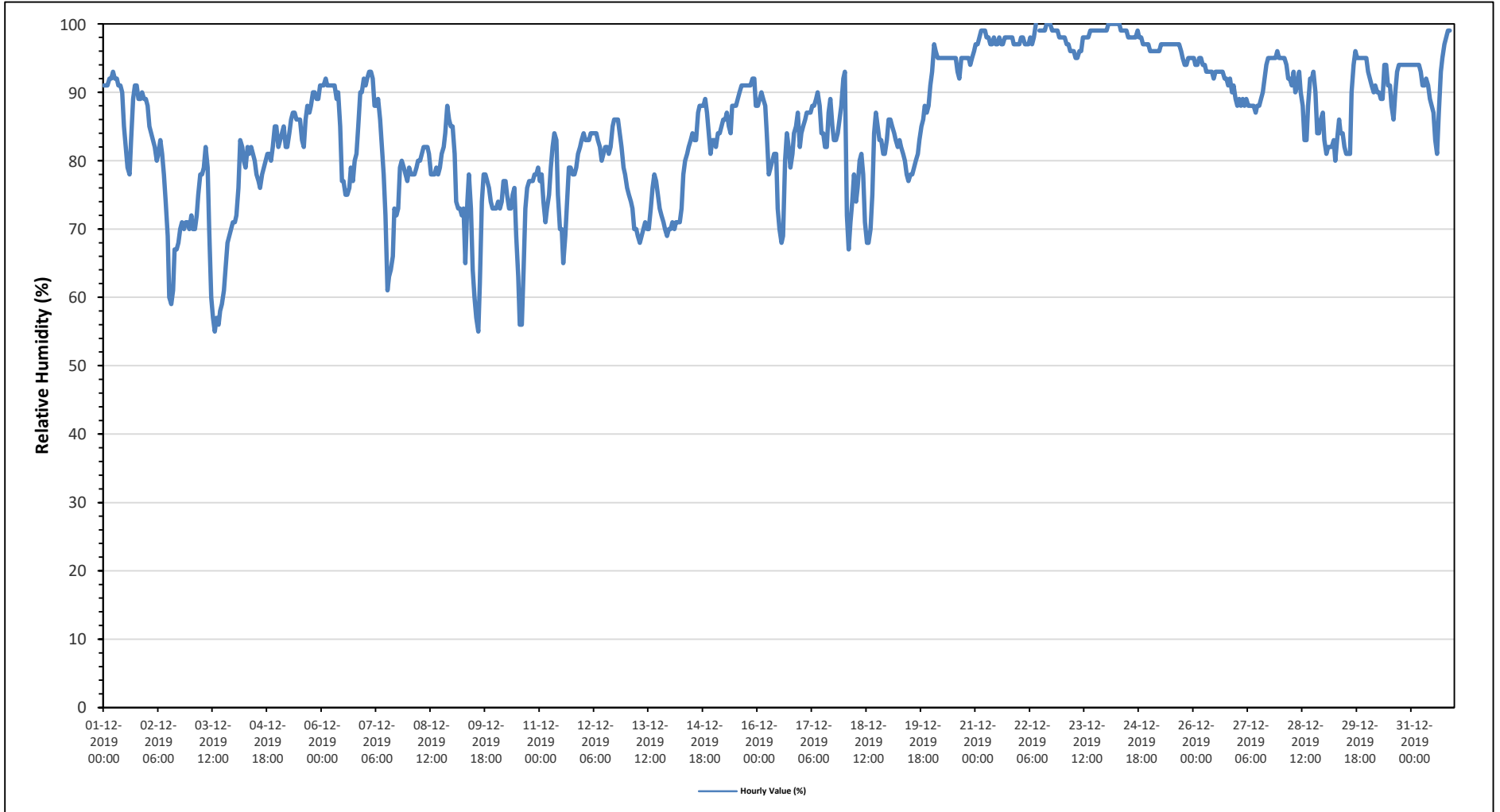
Maximum Hourly Value:	100 %	on December 22 at hour 9	Hours in Service:	744
Maximum Daily Value:	98.7 %	on December 24	Hours of Data:	741
Minimum Hourly Value:	55 %	on December 3 at hour 13	Hours of Missing Data:	3
Minimum Daily Value:	67.9 %	on December 3	Hours of Calibration:	0
Monthly Average:	85.2 %		Operational Uptime:	99.6

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
Dec 1	91	91	91	92	92	93	92	92	91	91	90	85	82	79	78	83	89	91	91	89	89	90	89	89	78	93	88.8
Dec 2	88	85	84	83	82	80	81	83	81	78	74	69	60	59	61	67	67	68	70	71	70	71	71	70	59	88	73.9
Dec 3	72	70	70	72	75	78	78	79	82	79	70	60	57	55	57	56	58	59	61	64	68	69	70	71	55	82	67.9
Dec 4	71	72	76	83	82	80	79	82	81	82	81	80	78	77	76	78	79	80	81	81	80	82	85	85	71	85	79.6
Dec 5	82	83	84	85	82	82	84	86	87	87	86	86	86	83	82	86	88	87	88	90	90	89	89	91	82	91	86.0
Dec 6	91	91	92	91	91	91	91	91	89	90	85	77	77	75	75	76	79	77	80	81	85	90	90	92	75	92	85.3
Dec 7	91	92	93	93	92	88	88	89	86	82	78	72	61	63	64	66	73	72	73	79	80	79	78	77	61	93	79.5
Dec 8	79	78	78	78	79	80	80	81	82	82	82	81	78	78	79	78	79	81	82	84	88	86	85	78	88	80.7	
Dec 9	85	81	74	73	73	72	73	65	74	78	73	64	60	57	55	62	74	78	78	77	76	74	73	73	55	85	71.8
Dec 10	73	74	73	74	77	77	75	73	73	75	76	69	63	56	56	64	73	76	77	77	77	78	78	79	56	79	72.6
Dec 11	77	78	74	71	73	75	79	82	84	83	75	70	70	65	69	74	79	79	78	78	79	81	82	83	65	84	76.6
Dec 12	84	83	83	83	84	84	84	84	83	82	80	81	82	82	81	82	85	86	86	86	84	82	79	78	78	86	82.8
Dec 13	76	75	74	73	70	70	69	68	69	70	71	70	70	73	76	78	77	75	73	72	71	70	69	70	68	78	72.0
Dec 14	70	71	70	71	71	71	73	78	80	81	82	83	84	83	83	87	88	88	88	89	87	84	81	83	70	89	80.3
Dec 15	83	82	84	84	85	86	86	87	85	84	88	88	88	89	90	91	91	91	91	91	91	92	92	88	82	92	87.8
Dec 16	88	89	90	89	88	84	78	79	80	81	81	73	70	68	69	80	84	82	79	81	84	85	87	82	68	90	81.3
Dec 17	84	85	86	87	87	87	88	88	89	90	88	84	84	82	82	87	89	85	83	83	84	86	88	92	82	92	86.2
Dec 18	93	72	67	71	74	78	74	76	80	81	78	71	68	68	70	75	84	87	85	83	83	81	81	83	67	93	77.6
Dec 19	86	86	85	84	83	82	83	82	81	80	78	77	78	78	79	80	81	83	85	86	88	87	88	91	77	91	83.0
Dec 20	93	97	96	95	95	95	95	95	95	95	95	95	95	95	93	92	95	95	95	95	95	94	95	96	92	97	94.8
Dec 21	97	97	98	99	99	99	98	98	97	97	98	97	97	98	97	97	98	98	98	98	98	97	97	97	97	97	97.7
Dec 22	97	98	98	97	97	97	98	97	98	100	X	99	99	99	99	100	100	100	99	99	99	99	98	98	97	100	98.5
Dec 23	98	98	97	97	96	96	96	95	95	96	96	98	98	98	98	99	99	99	99	99	99	99	99	99	95	99	97.6
Dec 24	99	100	100	100	100	100	100	100	99	99	99	99	98	98	98	98	98	98	98	98	97	97	97	97	97	100	98.7
Dec 25	96	96	96	96	96	96	97	97	97	97	97	97	97	97	97	97	96	95	94	94	95	95	95	94	94	97	96.1
Dec 26	95	94	94	95	95	94	94	93	93	93	93	92	93	93	93	93	93	92	92	91	92	90	91	89	89	95	92.8
Dec 27	88	89	88	89	88	89	88	88	88	88	87	88	88	89	90	92	94	95	95	95	95	95	96	95	87	96	90.7
Dec 28	95	95	95	94	92	92	91	93	90	91	93	90	88	83	83	88	92	92	93	90	84	84	86	87	83	95	90.0
Dec 29	83	81	82	82	82	83	80	83	86	84	84	82	81	81	81	90	94	96	95	95	95	95	95	95	80	96	86.9
Dec 30	93	92	91	90	91	90	90	89	89	94	94	91	91	88	86	90	93	94	94	94	94	94	94	94	86	94	91.7
Dec 31	94	94	94	94	94	93	91	92	91	89	88	87	83	81	87	93	95	97	98	99	99	X	X	81	99	92.0	
Diurnal Maximum	99	100	100	100	100	100	100	100	99	100	99	99	99	99	99	100	100	100	99	99	99	99	99	99	99	99	99
Diurnal Average	86.8	86.1	85.7	86.0	86.0	85.9	85.6	85.9	86.3	86.5	84.7	82.5	80.9	79.7	79.9	83.0	85.9	86.3	86.4	86.6	86.8	87.0	86.6	86.8	81	99	86.8

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 RH - Maskwa Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**Maskwa Site - December 2019**

**Summary of Hourly Averages**

### BAROMETRIC PRESSURE (BP) in millibar

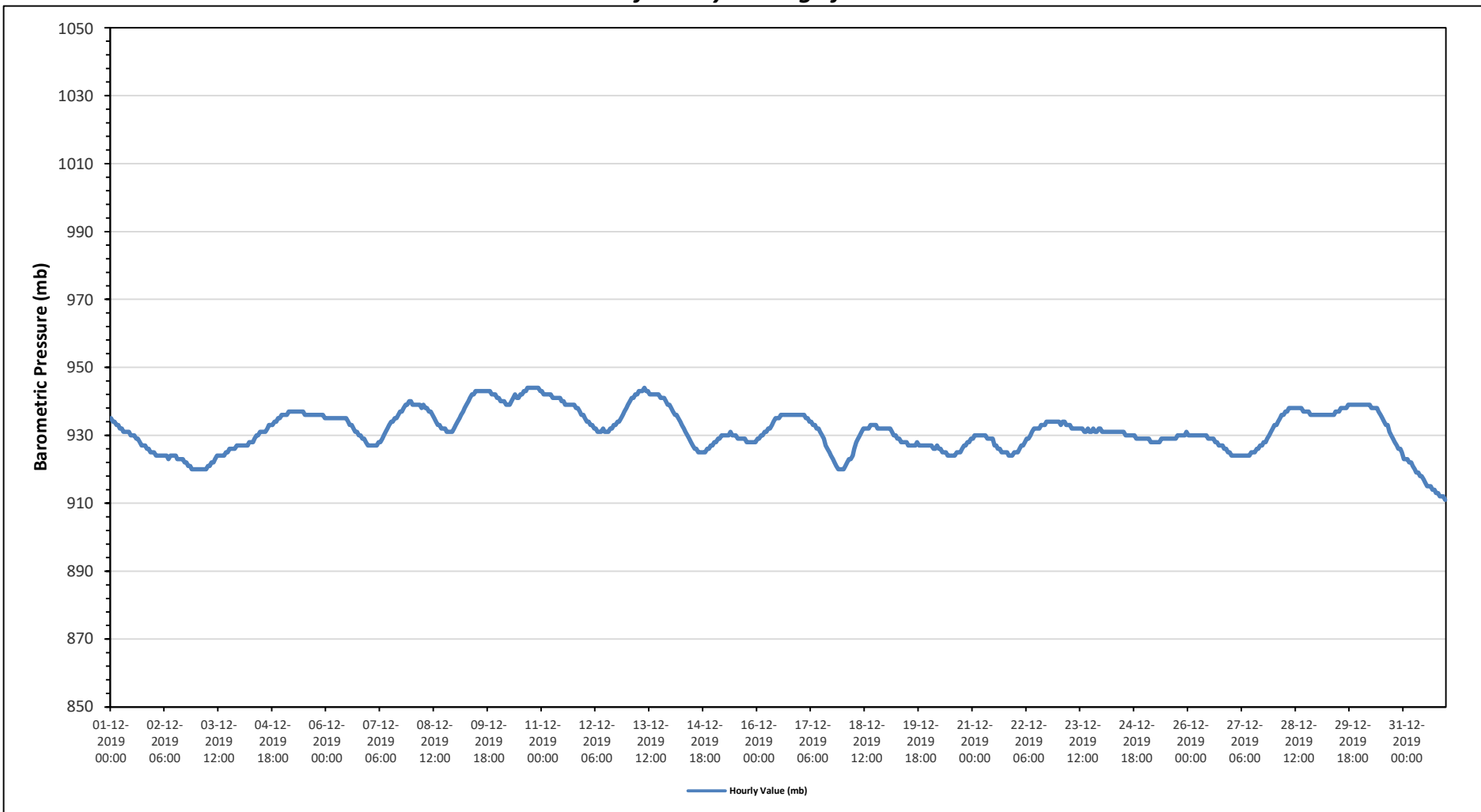
Maximum Hourly Value:	944 mb on December 10 at hour 16	Hours in Service:	744
Maximum Daily Value:	942 mb on December 10	Hours of Data:	744
Minimum Hourly Value:	911 mb on December 31 at hour 23	Hours of Missing Data:	0
Minimum Daily Value:	917 mb on December 31	Hours of Calibration:	0
Monthly Average:	931 mb	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
Dec 1	935	934	934	933	933	932	932	931	931	931	931	930	930	930	929	929	928	927	927	927	926	926	925	925	925	925	930
Dec 2	925	924	924	924	924	924	924	924	923	924	924	924	923	923	923	923	922	922	921	921	920	920	920	920	920	920	923
Dec 3	920	920	920	920	920	920	921	921	922	922	923	924	924	924	924	924	925	925	926	926	926	926	927	927	927	927	923
Dec 4	927	927	927	927	927	928	928	928	929	930	930	931	931	931	931	932	933	933	933	933	934	934	935	935	936	936	931
Dec 5	936	936	936	937	937	937	937	937	937	937	937	936	936	936	936	936	936	936	936	936	936	936	936	936	935	936	936
Dec 6	935	935	935	935	935	935	935	935	935	935	935	935	935	934	933	933	932	931	931	930	930	929	929	928	927	933	933
Dec 7	927	927	927	927	927	928	928	929	930	931	932	933	934	934	935	935	936	937	937	938	939	939	940	940	940	940	933
Dec 8	939	939	939	939	939	938	939	938	938	937	937	936	935	934	933	933	932	932	931	931	931	931	931	932	931	931	935
Dec 9	933	934	935	936	937	938	939	940	941	942	942	943	943	943	943	943	943	943	943	943	942	942	942	941	941	940	940
Dec 10	941	940	940	940	939	939	939	940	941	942	941	941	942	942	943	943	944	944	944	944	944	944	944	943	943	943	942
Dec 11	943	942	942	942	942	942	941	941	941	941	941	940	940	939	939	939	939	939	939	938	938	937	936	936	936	936	940
Dec 12	935	934	934	933	933	932	932	931	931	931	932	931	931	931	932	932	933	933	934	934	935	936	937	938	938	938	933
Dec 13	939	940	941	941	942	942	943	943	943	944	943	943	942	942	942	942	941	941	941	940	939	939	939	939	939	939	942
Dec 14	938	937	936	936	935	934	933	932	931	930	929	928	927	926	926	925	925	925	925	925	926	926	927	927	927	927	930
Dec 15	928	928	929	929	930	930	930	930	930	931	930	930	930	929	929	929	929	929	928	928	928	928	928	928	928	928	929
Dec 16	929	929	930	930	931	931	932	932	933	934	935	935	935	936	936	936	936	936	936	936	936	936	936	936	936	936	934
Dec 17	936	936	936	935	935	934	934	933	933	932	931	930	929	927	926	925	924	923	922	921	920	920	920	920	920	920	929
Dec 18	920	921	922	923	923	924	926	928	929	930	931	932	932	932	932	933	933	933	933	932	932	932	932	932	932	932	929
Dec 19	932	932	932	931	930	930	929	929	928	928	928	928	927	927	927	927	928	927	927	927	927	927	927	927	927	927	930
Dec 20	927	927	926	926	927	926	926	925	925	925	924	924	924	924	925	925	925	925	926	927	927	928	928	929	929	929	926
Dec 21	929	930	930	930	930	930	930	930	929	929	929	927	927	926	926	925	925	925	925	925	924	924	924	925	924	924	927
Dec 22	925	925	926	927	927	928	929	929	930	931	932	932	932	932	933	933	933	934	934	934	934	934	934	934	934	934	931
Dec 23	934	933	934	934	933	933	933	932	932	932	932	932	932	932	931	931	932	931	931	932	931	931	932	932	932	932	932
Dec 24	931	931	931	931	931	931	931	931	931	931	931	930	930	930	930	930	930	930	929	929	929	929	929	929	929	929	930
Dec 25	929	929	929	928	928	928	928	928	928	929	929	929	929	929	929	929	929	930	930	930	930	930	931	931	931	931	929
Dec 26	930	930	930	930	930	930	930	930	930	930	930	929	929	929	929	928	928	927	927	927	926	926	925	925	925	925	929
Dec 27	924	924	924	924	924	924	924	924	924	924	924	925	925	925	926	926	927	927	928	928	929	930	931	932	932	932	926
Dec 28	933	933	934	935	936	936	937	937	938	938	938	938	938	938	938	937	937	937	937	937	936	936	936	936	936	936	937
Dec 29	936	936	936	936	936	936	936	936	936	936	936	937	937	937	938	938	938	938	939	939	939	939	939	939	939	939	937
Dec 30	939	939	939	939	939	939	938	938	938	938	937	936	935	934	933	933	931	930	929	928	927	926	926	925	925	925	937
Dec 31	923	923	923	922	922	921	920	919	919	918	918	917	916	915	915	915	914	913	913	912	912	912	911	911	911	911	929
Diurnal Maximum	943	942	942	942	942	942	943	943	943	944	943	943	943	943	943	944	944	944	944	944	944	944	944	944	943	943	943
Diurnal Average	932	931	932	932	932	932	932	932	932	932	932	932	932	931	931	931	931	931	931	931	931	931	931	931	931	931	931

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 - December 2019

Summary of Hourly Averages

### AMBIENT TEMPERATURE (AT) in Degree Celsius

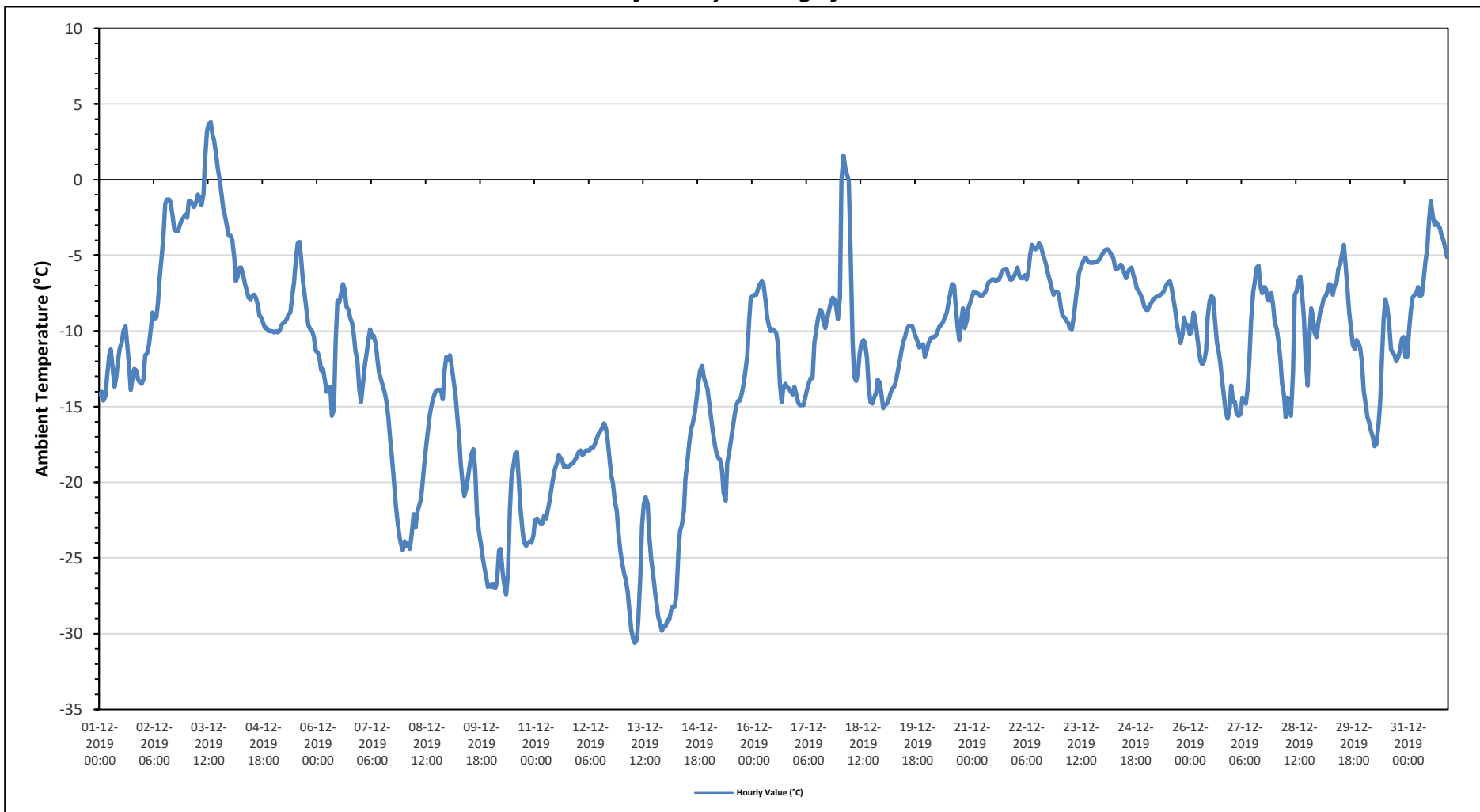
Maximum Hourly Value:	3.8 °C	on December 3 at hour 13	Hours in Service:	744
Maximum Daily Value:	-0.3 °C	on December 3	Hours of Data:	744
Minimum Hourly Value:	-30.6 °C	on December 13 at hour 7	Hours of Missing Data:	0
Minimum Daily Value:	-26.8 °C	on December 13	Hours of Calibration:	0
Monthly Average:	-11.9 °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
Dec 1	-14.2	-14.0	-14.6	-14.3	-12.9	-11.6	-11.2	-12.5	-13.7	-13.0	-11.9	-11.1	-10.8	-10.0	-9.7	-10.7	-12.2	-13.9	-13.0	-12.5	-12.6	-13.2	-13.4	-13.5	-14.6	-9.7	-12.5
Dec 2	-13.2	-11.6	-11.5	-10.9	-9.9	-8.8	-9.2	-9.1	-8.2	-6.3	-5.1	-3.7	-1.6	-1.3	-1.3	-1.5	-2.4	-3.3	-3.4	-3.4	-3.0	-2.7	-2.5	-2.3	-13.2	-1.3	-5.7
Dec 3	-2.5	-1.4	-1.4	-1.6	-1.8	-1.5	-1.0	-1.2	-1.7	-1.0	1.3	3.2	3.7	3.8	3.0	2.6	1.7	0.8	0.0	-0.9	-1.9	-2.4	-3.1	-3.7	-3.7	3.8	-0.3
Dec 4	-3.7	-4.0	-5.2	-6.7	-6.4	-5.8	-5.8	-6.3	-6.9	-7.4	-7.8	-7.9	-7.7	-7.6	-7.8	-8.3	-9.0	-9.1	-9.5	-9.8	-9.8	-10.0	-10.0	-10.0	-10.0	-3.7	-7.6
Dec 5	-10.1	-10.0	-10.1	-10.0	-9.6	-9.5	-9.4	-9.2	-8.9	-8.8	-7.8	-6.7	-5.5	-4.2	-4.1	-5.3	-6.7	-7.8	-8.8	-9.6	-9.9	-10.0	-10.4	-11.3	-11.3	-4.1	-8.5
Dec 6	-11.4	-11.7	-12.6	-12.5	-13.3	-14.0	-13.9	-13.7	-15.6	-15.2	-10.7	-8.0	-8.1	-7.5	-6.9	-7.3	-8.4	-8.6	-9.1	-9.5	-10.3	-11.3	-12.0	-13.8	-15.6	-6.9	-11.1
Dec 7	-14.7	-13.6	-12.3	-11.5	-10.6	-9.9	-10.4	-10.3	-10.8	-11.9	-12.7	-13.2	-13.6	-14.1	-14.6	-15.7	-17.1	-18.3	-19.7	-21.4	-22.4	-23.5	-24.1	-24.5	-24.5	-9.9	-15.5
Dec 8	-23.9	-24.2	-24.0	-24.4	-23.3	-22.1	-23.0	-22.0	-21.5	-21.1	-19.9	-18.6	-17.5	-16.5	-15.5	-14.8	-14.4	-14.0	-13.9	-13.9	-13.9	-14.5	-12.6	-11.7	-24.4	-11.7	-18.4
Dec 9	-11.9	-11.6	-12.3	-13.2	-14.2	-15.4	-16.9	-18.8	-20.2	-20.9	-20.4	-19.6	-18.8	-18.1	-17.8	-19.2	-22.1	-23.3	-24.0	-24.9	-25.6	-26.3	-26.9	-26.8	-26.9	-11.6	-19.6
Dec 10	-26.9	-26.7	-27.0	-26.6	-24.5	-24.4	-25.9	-26.8	-27.4	-26.1	-21.8	-19.7	-18.9	-18.1	-18.0	-19.9	-21.8	-23.2	-24.0	-24.2	-24.0	-23.9	-24.0	-23.5	-27.4	-18.0	-23.6
Dec 11	-22.5	-22.4	-22.6	-22.7	-22.7	-22.2	-22.4	-21.9	-21.2	-20.4	-19.7	-19.1	-18.7	-18.2	-18.4	-18.6	-19.0	-18.9	-19.0	-18.9	-18.8	-18.7	-18.5	-18.3	-22.7	-18.2	-20.2
Dec 12	-18.0	-17.9	-18.2	-18.1	-17.9	-17.9	-17.9	-17.7	-17.7	-17.5	-17.1	-16.8	-16.6	-16.4	-16.1	-16.4	-17.2	-18.4	-19.5	-20.1	-21.2	-21.9	-23.4	-24.5	-24.5	-16.1	-18.5
Dec 13	-25.3	-26.0	-26.4	-27.2	-28.5	-29.7	-30.3	-30.6	-30.4	-29.1	-26.2	-22.8	-21.4	-21.0	-21.4	-23.5	-25.1	-26.0	-27.2	-28.0	-28.9	-29.4	-29.8	-29.5	-30.6	-21.0	-26.8
Dec 14	-29.5	-29.1	-29.1	-28.4	-28.2	-28.2	-27.3	-24.4	-23.2	-22.8	-21.9	-19.8	-18.6	-17.4	-16.5	-16.1	-15.4	-14.5	-13.4	-12.6	-12.3	-13.0	-13.4	-13.8	-29.5	-12.3	-20.4
Dec 15	-14.6	-15.7	-16.6	-17.5	-18.0	-18.4	-18.5	-19.1	-20.7	-21.2	-18.7	-18.1	-17.2	-16.4	-15.6	-14.9	-14.6	-14.6	-14.1	-13.5	-12.6	-11.7	-9.2	-7.8	-21.2	-7.8	-15.8
Dec 16	-7.7	-7.6	-7.6	-7.2	-6.9	-6.7	-6.9	-7.9	-9.1	-9.7	-10.0	-9.9	-10.0	-10.1	-10.9	-13.5	-14.7	-13.7	-13.5	-13.7	-13.8	-14.0	-14.2	-13.7	-14.7	-6.7	-10.5
Dec 17	-14.2	-14.7	-14.9	-14.9	-14.9	-14.4	-13.9	-13.4	-13.1	-13.1	-10.8	-9.9	-9.2	-8.6	-8.7	-9.3	-9.8	-9.2	-8.7	-8.2	-7.8	-7.9	-8.4	-9.2	-14.9	-7.8	-11.1
Dec 18	-7.8	-0.1	1.6	0.8	0.4	0.1	-4.7	-10.6	-13.0	-13.3	-12.8	-11.5	-10.8	-10.6	-10.8	-11.8	-13.8	-14.7	-14.8	-14.4	-14.1	-13.2	-13.4	-14.2	-14.8	1.6	-9.5
Dec 19	-15.1	-14.9	-14.8	-14.5	-14.1	-13.8	-13.7	-13.3	-12.7	-12.0	-11.4	-10.7	-10.4	-9.9	-9.7	-9.7	-10.1	-10.4	-10.7	-11.1	-10.9	-10.9	-11.7	-15.1	-9.7	-11.9	
Dec 20	-11.3	-10.8	-10.5	-10.4	-10.4	-10.3	-10.0	-9.7	-9.6	-9.4	-9.1	-8.8	-8.1	-7.5	-6.9	-7.0	-8.3	-9.8	-10.6	-9.3	-8.5	-9.8	-9.3	-8.5	-11.3	-6.9	-9.3
Dec 21	-8.1	-7.7	-7.4	-7.5	-7.5	-7.6	-7.7	-7.6	-7.5	-7.2	-6.8	-6.7	-6.6	-6.6	-6.7	-6.6	-6.6	-6.2	-6.0	-5.9	-5.9	-6.3	-6.6	-6.6	-8.1	-5.9	-6.9
Dec 22	-6.4	-6.2	-5.8	-6.3	-6.5	-6.5	-6.3	-6.6	-6.1	-5.0	-4.3	-4.5	-4.6	-4.5	-4.2	-4.4	-4.9	-5.3	-5.7	-6.3	-6.7	-7.2	-7.6	-7.4	-7.6	-4.2	-5.8
Dec 23	-7.4	-7.6	-8.5	-9.0	-9.1	-9.3	-9.5	-9.8	-9.9	-9.1	-8.1	-7.1	-6.2	-5.8	-5.5	-5.2	-5.2	-5.4	-5.5	-5.5	-5.5	-5.4	-5.4	-5.3	-9.9	-5.2	-7.1
Dec 24	-5.1	-4.9	-4.7	-4.6	-4.6	-4.8	-5.0	-5.2	-5.9	-5.9	-5.8	-5.6	-5.8	-6.2	-6.5	-6.1	-5.9	-5.8	-6.3	-6.7	-7.2	-7.4	-7.6	-7.9	-7.9	-4.6	-5.9
Dec 25	-8.4	-8.6	-8.6	-8.3	-8.1	-7.9	-7.8	-7.7	-7.7	-7.6	-7.5	-7.3	-7.0	-6.8	-6.7	-7.1	-7.8	-8.6	-9.5	-10.2	-10.8	-10.2	-9.1	-9.6	-10.8	-6.7	-8.3
Dec 26	-9.6	-10.2	-10.1	-8.8	-9.1	-10.1	-11.2	-12.0	-12.2	-12.0	-11.3	-9.1	-8.0	-7.7	-7.8	-9.3	-10.8	-11.3	-12.1	-13.4	-14.4	-15.4	-15.8	-15.1	-15.8	-7.7	-11.1
Dec 27	-13.6	-14.7	-14.7	-15.5	-15.6	-15.5	-14.4	-14.6	-14.8	-13.8	-11.8	-9.2	-7.4	-6.8	-5.8	-5.7	-7.1	-7.5	-7.1	-7.2	-7.9	-8.0	-7.5	-8.2	-15.6	-5.7	-10.6
Dec 28	-9.4	-9.9	-10.7	-11.8	-13.5	-14.3	-15.7	-14.4	-14.6	-15.6	-12.8	-7.6	-7.4	-6.7	-6.4	-7.6	-9.1	-11.9	-13.6	-10.6	-8.5	-9.1	-10.1	-10.4	-15.7	-6.4	-10.9
Dec 29	-9.5	-8.7	-8.4	-7.8	-7.7	-7.4	-6.9	-7.0	-7.6	-7.0	-6.8	-5.9	-5.6	-5.0	-4.3	-5.5	-7.2	-8.8	-9.8	-10.9	-11.2	-10.6	-10.8	-11.1	-11.2	-4.3	-8.0
Dec 30	-12.0	-13.9	-14.7	-15.7	-16.0	-16.6	-17.0	-17.6	-17.5	-16.3	-14.8	-11.9	-9.2	-7.9	-8.4	-9.4	-11.2	-11.4	-11.6	-12.0	-11.7	-11.3	-10.5	-10.4	-17.6	-7.9	-12.9
Dec 31	-11.7	-11.7	-10.0	-8.7	-7.8	-7.6	-7.5	-7.1	-7.7	-7.6	-6.7	-5.4	-4.6	-2.7	-1.4	-2.3	-3.0	-2.8	-3.0	-3.2	-3.7	-4.0	-4.6	-5.1	-11.7	-1.4	-5.8
Diurnal Maximum	-2.5	-0.1	1.6	0.8	0.4	-0.1	-1.0	-1.2	-1.7	-1.0	1.3	3.2	3.7	3.8	3.0	2.6	1.7	0.8	0.0	-0.9	-1.9	-2.4	-2.5	-2.3			
Diurnal Average	-12.9	-12.6	-12.7	-12.8	-12.7	-12.7	-12.9	-13.2	-13.5	-13.1	-12.0	-10.7	-10.1	-9.6	-9.4	-10.0	-10.9	-11.5	-11.8	-12.0	-12.1	-12.4	-12.4	-12.6			

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 AT - Maskwa Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - December 2019

Summary of Hourly Averages

### STATION TEMPERATURE (ST) in Degree Celsius

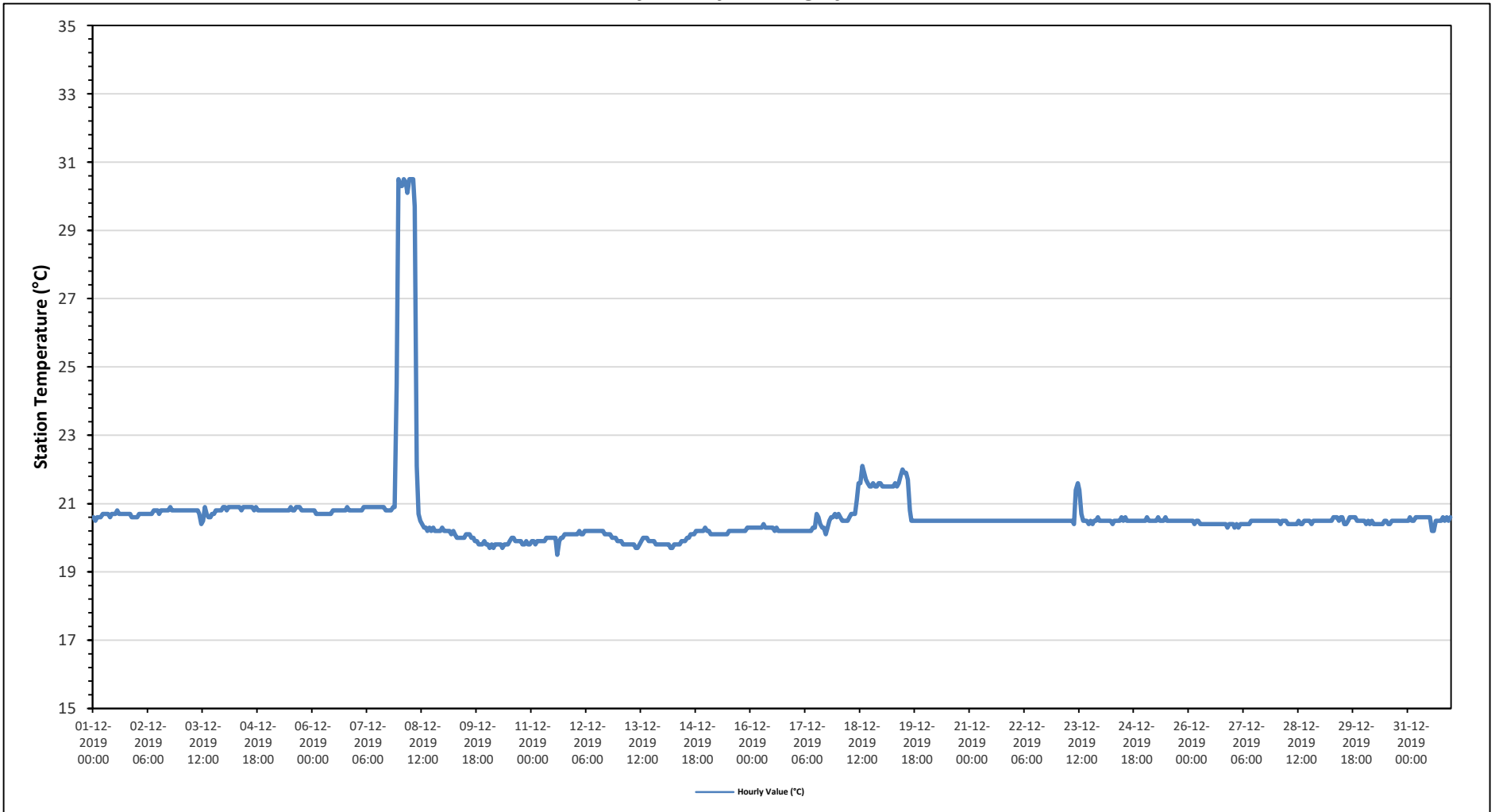
Maximum Hourly Value:	30.5 °C	on December 7 at hour 23	Hours in Service:	744
Maximum Daily Value:	24.1 °C	on December 8	Hours of Data:	744
Minimum Hourly Value:	19.5 °C	on December 11 at hour 14	Hours of Missing Data:	0
Minimum Daily Value:	19.8 °C	on December 10	Hours of Calibration:	0
Monthly Average:	20.6 °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	
Dec 1	20.6	20.5	20.6	20.6	20.6	20.7	20.7	20.7	20.7	20.6	20.7	20.7	20.7	20.8	20.7	20.7	20.7	20.7	20.7	20.7	20.6	20.6	20.6	20.5	20.8	20.7		
Dec 2	20.6	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.8	20.8	20.8	20.7	20.8	20.8	20.8	20.8	20.8	20.9	20.8	20.8	20.8	20.8	20.8	20.6	20.9	20.8	
Dec 3	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.7	20.4	20.5	20.9	20.7	20.6	20.6	20.7	20.7	20.8	20.8	20.8	20.8	20.9	20.7	20.8	
Dec 4	20.9	20.8	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.8	20.9	20.9	20.9	20.9	20.9	20.9	20.8	20.9	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.9	20.9	
Dec 5	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	20.9	20.8	20.8	20.8	20.9	20.9	20.8	20.8	20.8	20.8	20.8	20.8	20.9	20.8	
Dec 6	20.8	20.8	20.7	20.7	20.7	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	20.9	20.8	20.8	20.8	20.7	20.9	20.8	
Dec 7	20.8	20.8	20.8	20.8	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.8	20.8	20.8	20.8	20.9	20.9	24.5	30.5	20.8	30.5	21.4	
Dec 8	30.3	30.3	30.5	30.4	30.1	30.5	30.5	30.5	29.7	22.1	20.7	20.5	20.4	20.3	20.3	20.2	20.3	20.2	20.3	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	
Dec 9	20.2	20.2	20.2	20.2	20.1	20.2	20.1	20.0	20.0	20.0	20.0	20.0	20.1	20.1	20.1	20.1	20.0	20.0	19.9	19.9	19.9	19.8	19.8	19.9	19.8	19.8	20.0	
Dec 10	19.8	19.7	19.8	19.7	19.8	19.8	19.8	19.8	19.7	19.8	19.8	19.8	19.8	19.9	20.0	20.0	19.9	19.9	19.9	19.9	19.8	19.8	19.8	19.9	19.8	19.8	19.8	
Dec 11	19.9	19.9	19.8	19.9	19.9	19.9	19.9	19.9	20.0	20.0	20.0	20.0	20.0	20.0	19.5	19.9	20.0	20.0	20.1	20.1	20.1	20.1	20.1	20.1	19.5	20.1	20.0	
Dec 12	20.1	20.1	20.2	20.1	20.1	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.1	20.1	20.1	20.1	20.1	20.0	20.0	19.9	19.9	20.2	20.1	
Dec 13	19.9	19.9	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.7	19.7	19.8	19.9	20.0	20.0	20.0	19.9	19.9	19.9	19.9	19.8	19.8	19.8	19.8	19.8	19.7	20.0	19.8
Dec 14	19.8	19.8	19.8	19.8	19.7	19.7	19.8	19.8	19.8	19.8	19.8	19.9	19.9	19.9	20.0	20.0	20.1	20.1	20.1	20.2	20.2	20.2	20.2	20.2	20.3	19.7	20.3	20.0
Dec 15	20.2	20.2	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.3	20.3	20.2	
Dec 16	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.4	20.3	20.3	20.3	20.3	20.3	20.3	20.2	20.3	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.4	20.3
Dec 17	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.3	20.3	20.3	20.7	20.6	20.4	20.3	20.3	20.1	20.3	20.5	20.6	20.6	20.7	20.6	20.1	20.7	20.3
Dec 18	20.7	20.6	20.5	20.5	20.5	20.5	20.6	20.7	20.7	20.7	21.1	21.6	21.6	22.1	21.9	21.7	21.6	21.5	21.5	21.6	21.5	21.5	21.6	21.6	20.5	22.1	21.2	
Dec 19	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.6	21.5	21.6	21.8	22.0	21.9	21.9	21.7	20.8	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	22.0	21.2
Dec 20	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
Dec 21	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
Dec 22	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
Dec 23	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.4	21.4	21.6	21.4	20.7	20.5	20.5	20.5	20.4	20.5	20.4	20.5	20.5	20.6	20.5	20.4	21.6	20.6	
Dec 24	20.5	20.5	20.5	20.5	20.5	20.5	20.4	20.5	20.5	20.5	20.5	20.6	20.5	20.6	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.4	20.6	20.5
Dec 25	20.5	20.6	20.5	20.5	20.5	20.5	20.5	20.6	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.6	20.5
Dec 26	20.5	20.5	20.5	20.4	20.5	20.5	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.3	20.4	20.4	20.4
Dec 27	20.4	20.3	20.4	20.3	20.4	20.4	20.4	20.4	20.4	20.4	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.3	20.5	20.5	20.5
Dec 28	20.5	20.5	20.4	20.5	20.5	20.5	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.5	20.4	20.4	20.5	20.5	20.5	20.5	20.5	20.4	20.5	20.5	20.5	20.4	20.5	20.5
Dec 29	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.6	20.6	20.6	20.6	20.5	20.6	20.6	20.4	20.4	20.5	20.6	20.6	20.6	20.6	20.6	20.6	20.5	20.5	20.5	20.5	20.5
Dec 30	20.5	20.4	20.5	20.4	20.5	20.4	20.4	20.4	20.4	20.4	20.4	20.5	20.5	20.4	20.4	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.4	20.5	20.5	20.5
Dec 31	20.5	20.6	20.5	20.5	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.2	20.2	20.5	20.5	20.5	20.5	20.5	20.6	20.5	20.6	20.5	20.6	20.2	20.6	20.5
Diurnal Maximum	30.3	30.3	30.5	30.4	30.1	30.5	30.5	30.5	29.7	22.1	21.8	22.0	21.9	22.1	21.9	21.7	21.6	21.5	21.5	21.6	21.5	21.5	24.5	30.5				
Diurnal Average	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.5	20.5	20.6	20.6	20.6	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.6	20.8				

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 - Maskwa Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - December 2019

Summary of Hourly Averages

### PRECIPITATION in mm

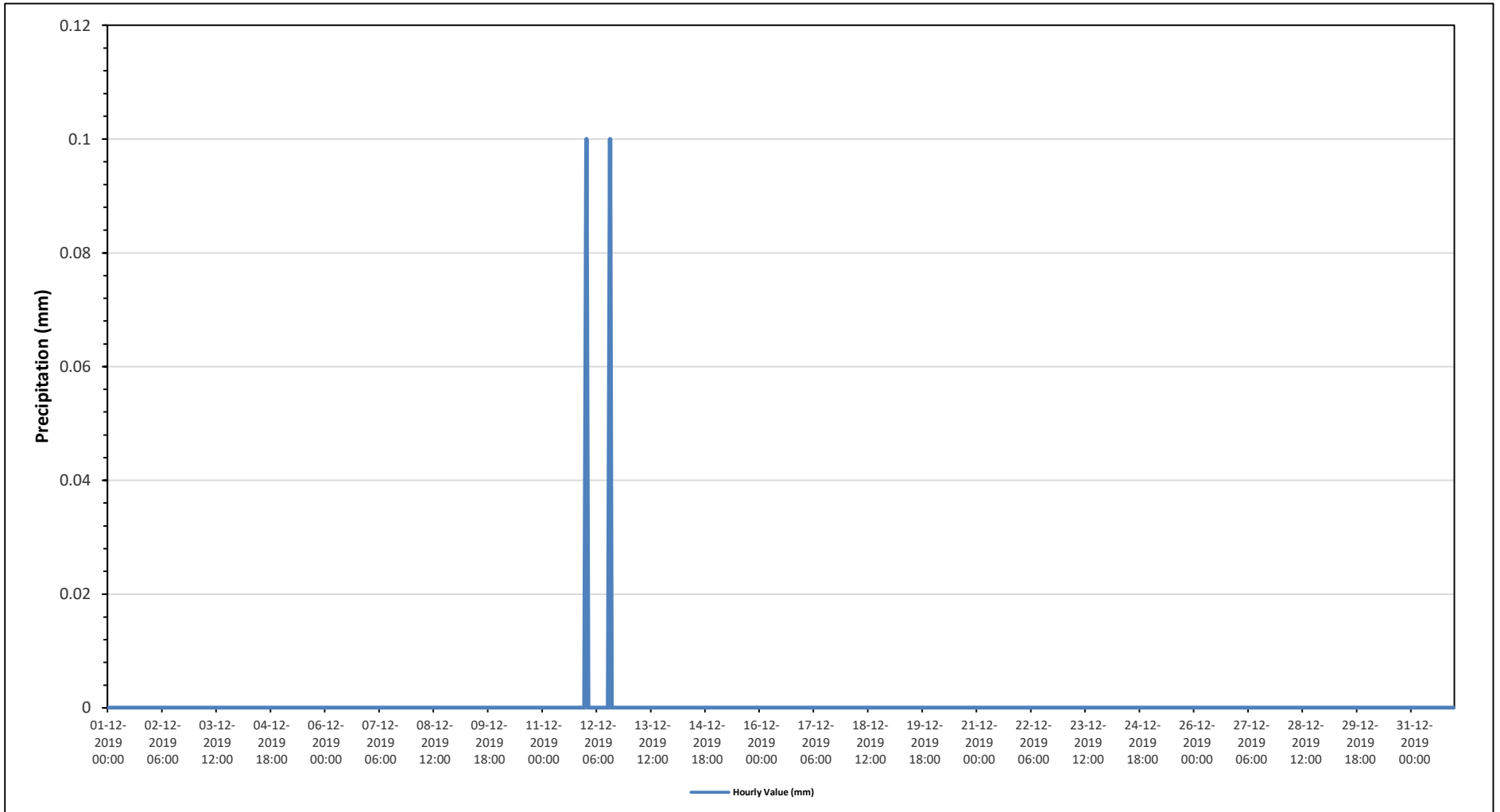
Maximum Hourly Value:	0.1 mm on December 12 at hour 0	Hours in Service:	744
Maximum Daily Value:	0.2 mm on December 12	Hours of Data:	744
Minimum Hourly Value:	0.0 mm on December 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0 mm on December 1	Hours of Calibration:	0
Monthly Total:	0.2 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							
Dec 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	0.0	0.0
Dec 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Dec 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	
Dec 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	
Dec 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Dec 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	
Dec 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	
Dec 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Dec 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	
Dec 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	
Dec 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	
Dec 12	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Dec 13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Dec 14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Dec 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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Dec 16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Dec 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	
Dec 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	
Dec 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	
Dec 20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Dec 21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Dec 22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Dec 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	
Dec 24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Dec 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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Dec 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	
Dec 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	
Dec 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	
Dec 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	
Dec 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	
Dec 31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Diurnal Average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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 Precipitation - Maskwa Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - December 2019

Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr

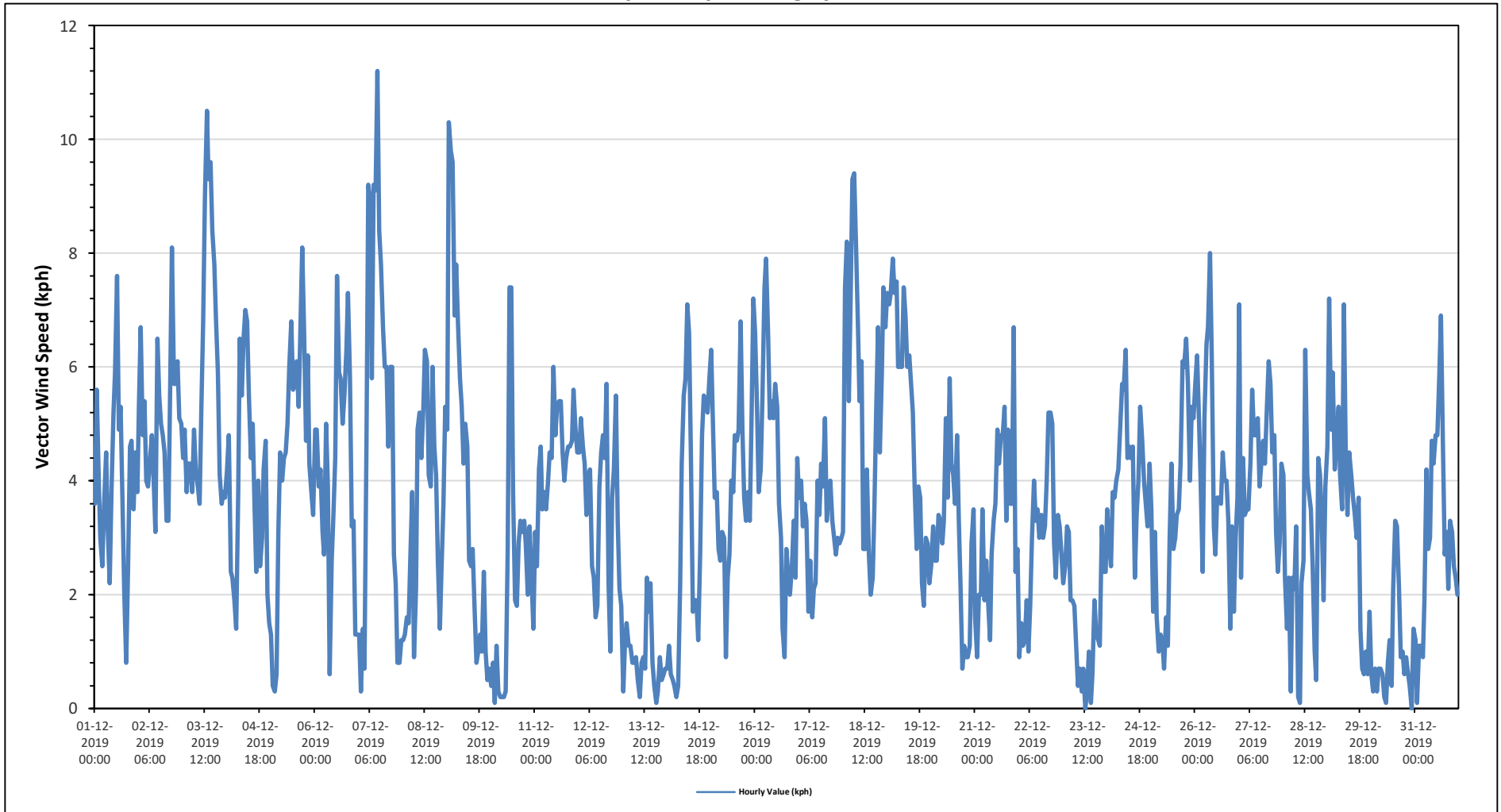
Maximum Hourly Value:	11.2 kph	on December 7 at hour 10	Hours in Service:	744
Maximum Daily Value:	5.7 kph	on December 3	Hours of Data:	744
Minimum Hourly Value:	0.0 kph	on December 23 at hour 12	Hours of Missing Data:	0
Minimum Daily Value:	0.9 kph	on December 13	Hours of Calibration:	0
Monthly Average:	1.0 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
Dec 1	3.6	5.6	4	3	2.5	3.6	4.5	3.2	2.2	3.8	5.2	5.9	7.6	4.9	5.3	3.5	2.1	0.8	2.4	4.6	4.7	3.5	4.5	3.8	0.8	7.6	4.0
Dec 2	5.3	6.7	4.8	5.4	4	3.9	4.4	4.8	3.9	3.1	6.5	5.5	5	4.8	4.5	3.3	3.3	5.6	8.1	5.7	5.7	6.1	5.1	5	3.1	8.1	5.0
Dec 3	4.4	4.9	3.8	4.3	4.3	3.8	4.9	4.2	3.9	3.6	5.3	6.8	9	10.5	9.3	9.6	8.4	7.8	6.9	5.9	4.1	3.6	3.8	3.7	3.6	10.5	5.7
Dec 4	4.2	4.8	2.4	2.3	1.9	1.4	3.8	6.5	5.5	6.5	7	6.8	5.5	4.4	5	3.6	2.4	4	2.5	3	4.2	4.7	2	1.5	1.4	7.0	4.0
Dec 5	1.3	0.4	0.3	0.6	3.1	4.5	4	4.4	4.5	5	6	6.8	5.6	5.7	6.1	5.3	6.7	8.1	6.7	4.7	6.2	4.3	3.8	3.4	0.3	8.1	4.5
Dec 6	4.9	4.9	3.9	4.2	3.1	2.7	5	3.9	0.6	2.6	3.3	4.4	7.6	5.9	5.8	5	5.5	6.3	7.3	5.8	3.2	3.3	1.3	1.3	0.6	7.6	4.2
Dec 7	1.3	0.3	1.4	0.7	4.7	9.2	8.9	5.8	9.2	9.1	11.2	8.4	7.8	6.7	6	6	4.6	6	6	2.7	2.2	0.8	0.8	1.2	0.3	11.2	5.0
Dec 8	1.2	1.3	1.6	1.5	2.7	3.8	0.9	2.1	4.9	5.2	4.4	5.3	6.3	6.1	4.1	3.9	6	4.6	4.1	2.6	1.4	2.4	3.6	5.3	0.9	6.3	3.6
Dec 9	4.9	10.3	9.8	9.6	6.9	7.8	6.8	5.8	5.3	4.3	5	4.6	2.6	2.5	2.8	1.7	0.8	1	1.3	1	2.4	1	0.5	0.7	0.5	10.3	4.1
Dec 10	0.4	0.8	0.1	1.1	0.3	0.2	0.2	0.2	0.3	2.8	7.4	7.4	3.8	1.9	1.8	2.9	3.3	3.1	3.3	2.9	2	3.2	2.3	1.4	0.1	7.4	2.2
Dec 11	3.1	2.5	4.2	4.6	3.5	3.8	3.5	4	4.5	4.4	6	4.8	5.3	5.4	5.4	4.5	4	4.4	4.6	4.6	4.7	5.6	4.9	4.5	2.5	6.0	4.5
Dec 12	4.5	5.1	4.6	4.3	3.4	4.1	4.2	2.5	2.3	1.6	1.8	3.9	4.5	4.8	4.4	5.7	2.2	1	3.7	4.2	5.5	3.3	2.1	1.8	1.0	5.7	3.6
Dec 13	0.3	1.2	1.5	1.1	1.1	0.8	0.8	0.9	0.5	0.2	0.8	0.9	0.7	2.3	1.7	2.2	0.8	0.4	0.1	0.3	0.9	0.5	0.6	0.7	0.1	2.3	0.9
Dec 14	0.7	1.1	0.6	0.5	0.4	0.2	0.4	2.2	4.3	5.5	5.8	7.1	6.6	4.5	1.7	1.9	1.9	1.2	2.8	4.8	5.5	5.3	5.2	5.8	0.2	7.1	3.2
Dec 15	6.3	5	3.7	3.8	2.8	2.6	3.1	3	0.9	2.3	2.7	4	3.8	4.8	4.7	4.9	6.8	4.9	3.7	3.3	3.8	3.3	5.1	7.2	0.9	7.2	4.0
Dec 16	6.6	5.2	3.8	4.2	5.5	7.4	7.9	6.6	5.1	5.4	5.1	5.7	5.3	3.6	3	1.4	0.9	2.8	2.3	2	2.5	3.3	2.3	4.4	0.9	7.9	4.3
Dec 17	3.7	4	3.2	3.6	3.3	1.7	2.6	1.6	2.1	2.2	4	3.4	4.3	3.9	5.1	3.3	3.8	4	3.3	3	2.7	3	2.9	3	1.6	5.1	3.2
Dec 18	3.1	7.4	8.2	5.4	7.2	9.3	9.4	8	6.7	5.4	6.1	2.8	2.8	4.2	2.7	2	2.3	3.4	5.3	6.7	4.5	5.9	7.4	6.7	2.0	9.4	5.5
Dec 19	7.3	7.1	7.3	7.9	7.3	7.5	6	6	6	7.4	6.9	6	6.2	5.7	5.2	3.9	2.8	3.9	3.7	2.2	1.8	3	2.9	2.2	1.8	7.9	5.3
Dec 20	2.5	3.2	2.6	2.6	3.4	3.3	2.9	3.3	5.1	3.7	5.8	4.3	4.1	3.6	4.8	3.3	2.1	0.7	1.1	0.9	0.9	1.1	2.9	3.5	0.7	5.8	3.0
Dec 21	1.6	0.9	2	2	3.5	1.9	2.6	1.9	1.2	2.7	3.3	3.6	4.9	4.3	4.8	4.8	5.3	3.3	4.9	3.6	3.6	6.7	2.4	2.8	0.9	6.7	3.3
Dec 22	0.9	1.5	1.1	1.2	1.9	1	1.8	3	4	3.3	3.5	3	3.4	3	3.2	4	5.2	5.2	5	2.9	2.3	3.4	3.2	2.7	0.9	5.2	2.9
Dec 23	2.2	2.5	3.2	3.1	1.9	1.9	1.8	1.2	0.4	0.7	0.3	0.7	0	0.3	1	0.1	0.6	1.9	1.3	1.2	1.1	3.2	2.4	2.4	0.0	3.2	1.5
Dec 24	3.5	2.9	2.5	3.8	3.7	4	4.2	4.9	5.7	5.6	6.3	4.4	4.6	4.4	4.6	2.3	3.4	4	5.3	4.7	4	3.6	3.2	4.3	2.3	6.3	4.2
Dec 25	3.5	1.7	3.1	1.6	1	1.3	1.2	0.7	1.6	1.1	3	4.3	2.8	3	3.4	3.5	4.3	6.1	6	6.5	5.7	4	5.3	5.1	0.7	6.5	3.3
Dec 26	5.7	6.2	5	4	2.4	5.1	6.4	6.7	8	6.1	3.2	2.7	3.7	3.7	3.6	4.5	4	4	3.3	1.4	3.2	1.7	3	3.7	1.4	8.0	4.2
Dec 27	7.1	2.3	4.4	3.4	3.5	3.5	4.3	5.6	4.8	4.8	5.1	3.9	4.3	4.7	4.3	5.3	6.1	5.7	4.5	4.8	3.1	2.4	2.9	4.3	2.3	7.1	4.4
Dec 28	4.1	2.3	1.4	2.3	0.3	2.3	2.1	3.2	0.2	0.1	2.2	2.6	6.3	4.1	3.8	3.5	2.5	1	0.5	4.4	4.1	3.3	1.9	3.9	0.1	6.3	2.6
Dec 29	4.6	7.2	4.9	5.9	4.2	4.7	5.3	4.1	3.5	7.1	4.6	3.4	4.5	4.1	3.7	3.4	3	3.7	1.4	0.7	0.6	1	0.6	1.7	0.6	7.2	3.7
Dec 30	0.6	0.3	0.7	0.3	0.7	0.7	0.6	0.2	0.1	0.8	1.2	0.4	2.1	3.3	3.2	2.1	0.9	1	0.6	0.9	0.6	0.4	0	1.4	0.0	3.3	1.0
Dec 31	1.2	0.1	1.1	1.1	0.9	1.9	4.2	2.8	3	4.7	4.3	4.8	4.8	5.9	6.9	4.6	2.7	3.1	2.1	3.3	3.1	2.5	2.3	2	0.1	6.9	3.1
Diurnal Maximum	7	10	10	10	7	9	9	8	9	9	11	8	9	11	9	10	8	8	8	7	6	7	7	7			
Diurnal Average	3.4	3.5	3.3	3.2	3.1	3.5	3.8	3.7	3.6	3.9	4.6	4.5	4.7	4.4	4.3	3.7	3.5	3.6	3.7	3.4	3.2	3.2	2.9	3.3			

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 VWS - Maskwa Site**

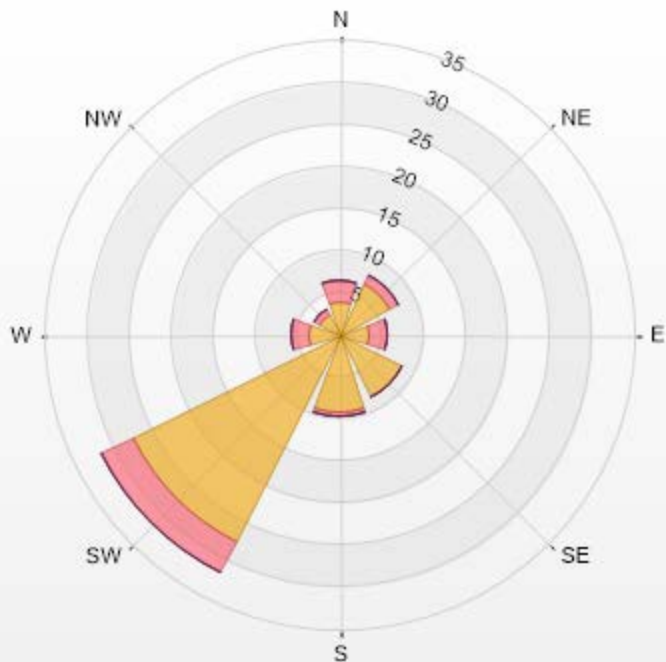




Wind: Maskwa Poll.: Maskwa-WDS[kph] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 21.10% Valid Data: 100.00% Calm Avg: 0.90 [kph]

Direction	0-6	6-15	15-29	29-39	>39.0	Total
N	4.03	2.42	0	0	0	6.45
NE	6.72	1.21	0	0	0	7.93
E	3.49	2.28	0	0	0	5.77
SE	8.2	0	0	0	0	8.2
S	9.27	0.54	0	0	0	9.81
SW	27.42	4.17	0	0	0	31.59
W	3.76	2.02	0	0	0	5.78
NW	2.82	0.54	0	0	0	3.36
Summary	65.71	13.18	0	0	0	78.89

Maskwa Poll.: Maskwa-WDS[kph] 01-12-2019 00:00 - 31-12-2019 23:00 Calm: 21.10% Calm Poll Avg: 0.90 [kph]



LICA-201912-Revision 1

% Icon Classes (kph)	66	0-6	13	15-29	0	29-39	0	>39.0
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## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - December 2019

Summary of Hourly Averages

WIND DIRECTION (VWD) in sector

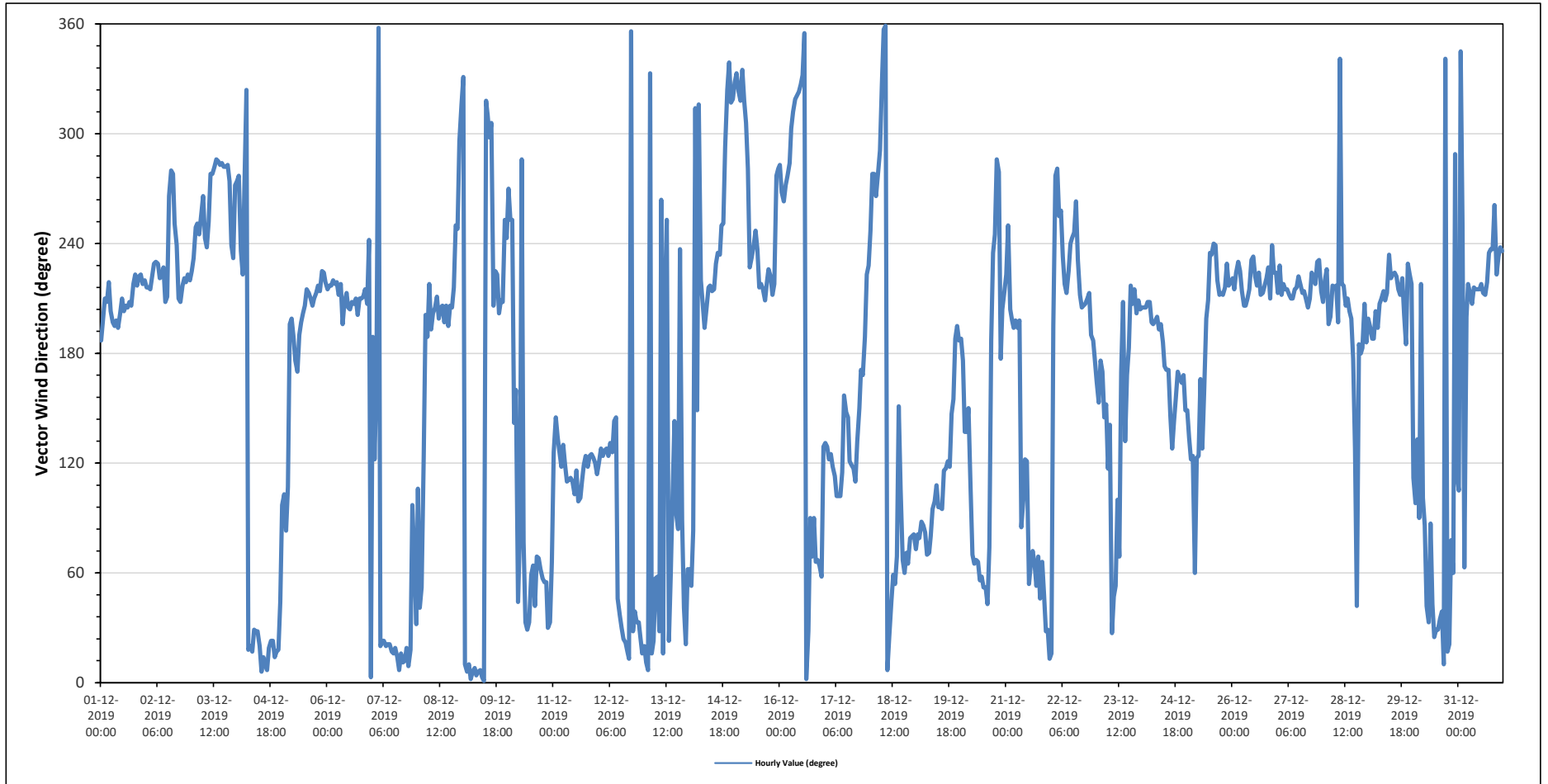
Monthly Average:	206 (SSW) degree	Hours in Service:	744
		Hours of Data:	744
		Hours of Missing Data:	0
		Hours of Calibration:	0
		Operational Uptime:	100.0

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	
Dec 1	S	SSW	SSW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	207	SSW	
Dec 2	SW	SW	SSW	SW	SW	SW	SW	SW	SW	SW	SSW	SSW	W	W	W	WSW	WSW	SSW	SSW	SW	SW	SW	SW	SW	225	SW	
Dec 3	SW	SW	WSW	WSW	WSW	WSW	W	WSW	SW	WSW	W	W	W	WNW	WNW	W	WNW	W	W	W	W	WSW	SW	W	268	W	
Dec 4	W	W	SW	SW	W	NW	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NE	9	N	
Dec 5	E	ESE	E	ESE	SSW	SSW	S	S	SSE	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	204	SSW	
Dec 6	SSW	SW	SW	SW	SW	SW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	212	SSW	
Dec 7	S	ESE	SSE	N	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	E	ENE	19	NNE	
Dec 8	ESE	NE	NE	ESE	SSW	S	SW	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	209	SSW	
Dec 9	NNW	N	N	N	N	N	N	N	N	N	N	N	NW	NW	WNW	NW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	355	N	
Dec 10	W	WSW	WSW	SE	SSE	NE	E	WNW	ENE	NNE	NNE	ENE	ENE	NE	ENE	ENE	ENE	ENE	ENE	NE	NE	NNE	NNE	ENE	48	NE	
Dec 11	SE	SE	SE	SE	ESE	SE	ESE	ESE	ESE	ESE	ESE	ESE	E	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	117	ESE	
Dec 12	ESE	SE	ESE	SE	SE	ESE	SE	SE	SE	SE	NE	NE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	68	ENE	
Dec 13	NNE	NNE	N	NNW	NNE	NNE	ENE	ENE	NNE	W	NNE	SSW	SSW	ENE	ESE	SE	E	SW	E	NE	NNE	ENE	ENE	ENE	41	NE	
Dec 14	ENE	NE	E	NW	SSE	NW	SW	SSW	SSW	SSW	SW	SW	SSW	SSW	SW	SW	SW	WSW	WSW	WNW	NW	NNW	NW	NW	250	WSW	
Dec 15	NNW	NNW	NW	NW	NNW	NW	NW	W	SW	SW	WSW	WSW	SW	SW	SW	SSW	SSW	SW	SW	SW	SSW	SW	W	W	257	WSW	
Dec 16	W	W	W	W	W	WNW	WNW	NW	NW	NW	NW	NW	NNW	N	N	NNE	E	ENE	E	ENE	ENE	ENE	ENE	SE	318	NW	
Dec 17	SE	SE	ESE	SE	ESE	ESE	E	E	E	ESE	SSE	SE	SE	ESE	ESE	ESE	ESE	SE	SSE	S	SSE	S	SW	SW	137	SE	
Dec 18	WSW	W	W	W	W	WNW	NW	N	N	NNE	NE	ENE	NE	ENE	ENE	ESE	ESE	ENE	ENE	ENE	ENE	ENE	E	E	10	N	
Dec 19	ENE	E	ENE	E	E	ENE	ENE	E	E	ESE	E	ESE	E	E	ESE	ESE	ESE	ESE	ESE	SE	SSE	S	SSW	S	96	E	
Dec 20	S	S	SE	SE	SSE	ESE	ENE	ENE	ENE	ENE	NE	ENE	NE	NE	ENE	S	SW	WSW	WNW	W	S	SSW	SSW	93	E		
Dec 21	SW	WSW	SSW	SSW	SSW	SSW	SSW	SSW	E	ESE	ESE	NE	ENE	ENE	ENE	NE	ENE	NE	ENE	NE	NNE	NNE	NNE	NNE	74	ENE	
Dec 22	NNE	SSW	W	W	WSW	WSW	SW	SW	SSW	SW	WSW	WSW	W	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	S	S	220	SW	
Dec 23	SSE	SSE	S	SSE	SE	SSE	ESE	SE	NNE	NE	NE	E	ENE	SSE	SSW	SE	SSE	S	SW	SSW	SSW	SSW	SSW	SSW	174	S	
Dec 24	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSW	S	S	S	S	SE	SE	SE	SSE	SSE	SSE	SSE	SSE	SSE	180	S	
Dec 25	SSE	SE	ESE	ESE	ENE	ESE	ESE	SSE	SE	SSE	SSW	SSW	SW	SW	WSW	WSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	205	SSW	
Dec 26	SW	SSW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SW	SSW	SSW	SW	SW	SW	SSW	WSW	SW	218	SW
Dec 27	SSW	SW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	215	SSW	
Dec 28	SSW	SW	SW	SSW	SSW	SSW	SW	SW	SSW	NNW	SW	SW	SSW	SSW	SSW	S	SE	NE	S	S	S	SSW	S	201	SSW		
Dec 29	SSW	SSW	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SSW	SSW	SW	SSW	S	SW	SW	SW	208	SSW	
Dec 30	ESE	E	SE	E	SW	E	E	NE	NNE	E	NE	NNE	NNE	NE	NE	N	NNW	NNE	NNE	ENE	ENE	WNW	ESE	46	NE		
Dec 31	ESE	NNW	WSW	ENE	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	221	SW	
Diurnal Maximum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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 Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/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 VWD - Maskwa Site*





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - December 2019

### Summary of Hour Standard Deviations

#### STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

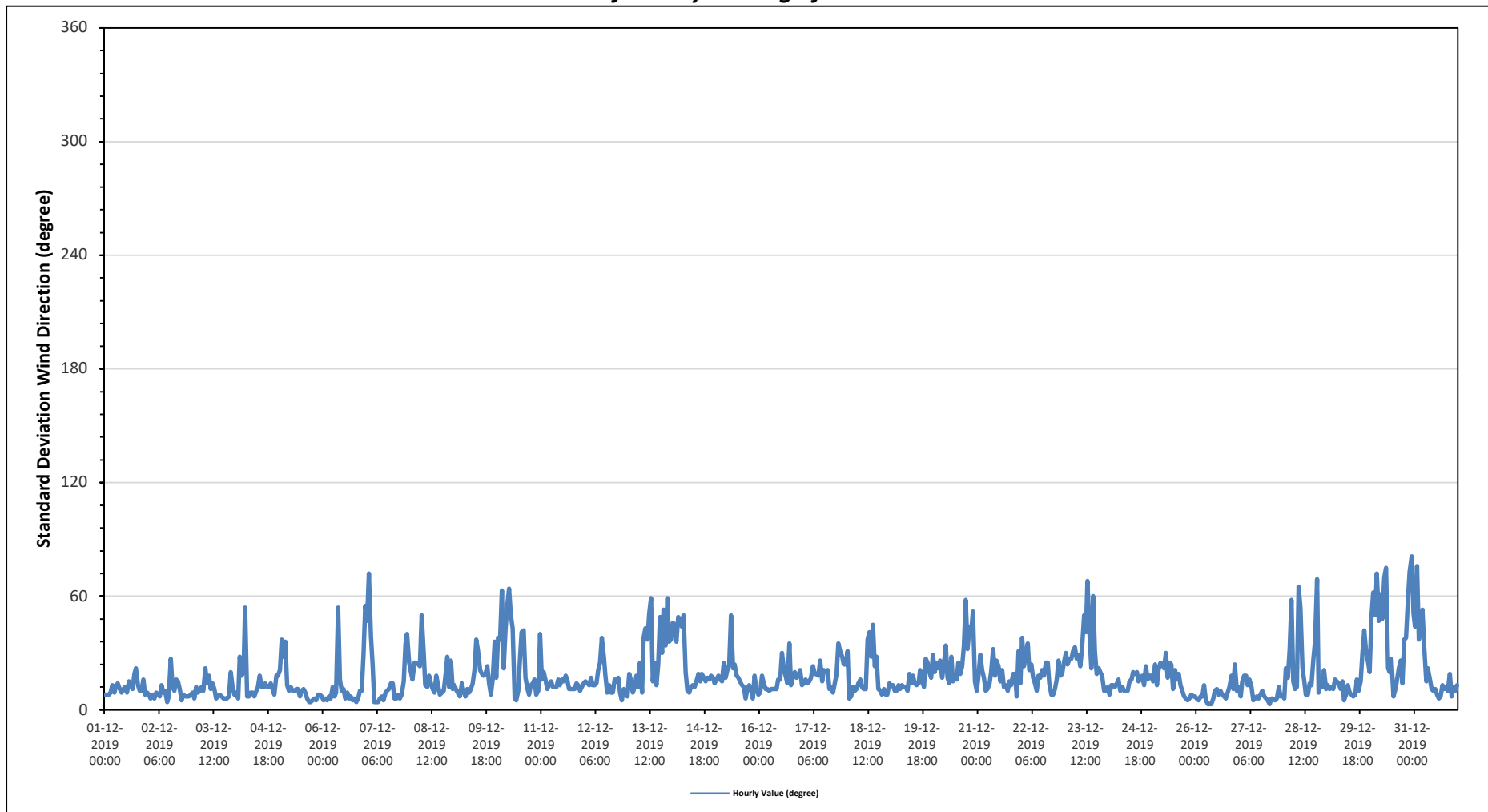
Maximum Hourly Value:	81 degree on December 30 at hour 22	Hours in Service:	744
Minimum Hourly Value:	3 degree on December 26 at hour 6	Hours of Data:	744
		Hours of Missing Data:	0
		Hours of Calibration:	0
		Operational Uptime:	100.0

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
Dec 1	8	8	8	9	13	9	13	14	11	9	11	12	9	15	13	11	19	22	13	10	10	16	8	9	8	22
Dec 2	8	6	8	6	9	8	7	13	9	10	4	7	27	12	10	16	15	11	5	8	7	7	7	8	4	27
Dec 3	9	6	12	9	10	12	10	22	14	18	11	14	11	6	7	8	7	6	6	6	7	20	12	8	6	22
Dec 4	9	6	28	18	20	54	7	7	9	9	7	10	12	18	12	12	14	12	12	14	11	8	18	18	6	54
Dec 5	21	37	28	36	13	10	12	10	10	11	11	7	10	11	9	6	4	4	5	6	5	8	8	7	4	37
Dec 6	5	6	5	7	6	12	7	9	54	16	10	11	6	9	6	7	5	6	4	6	10	10	29	55	4	55
Dec 7	47	72	39	23	4	4	4	6	7	5	9	10	11	14	14	6	6	8	6	8	15	35	40	25	4	72
Dec 8	20	16	25	25	24	23	50	30	13	12	18	14	11	9	18	13	8	9	10	17	28	12	26	11	8	50
Dec 9	13	10	10	7	14	10	7	11	9	11	14	21	37	31	21	19	18	19	23	14	8	16	36	17	7	37
Dec 10	38	37	63	22	42	55	64	50	43	6	5	10	28	41	42	17	11	8	13	14	16	8	10	40	5	64
Dec 11	16	20	16	11	13	15	12	12	12	16	13	16	15	18	16	11	11	11	11	14	13	10	12	14	10	20
Dec 12	15	14	13	17	13	13	14	21	25	38	28	18	9	13	9	9	16	15	17	9	5	11	8	7	5	38
Dec 13	19	16	9	12	18	12	25	9	38	43	37	51	59	15	25	13	24	49	30	53	34	59	36	37	9	59
Dec 14	46	45	36	49	48	44	50	20	10	9	12	13	12	15	19	15	19	17	15	17	16	18	17	14	9	50
Dec 15	16	18	16	15	25	17	21	24	50	22	24	18	17	15	13	12	6	11	13	10	6	18	10	8	6	50
Dec 16	9	18	14	11	11	10	11	11	11	11	16	16	30	22	18	14	35	13	17	20	17	18	21	13	9	35
Dec 17	14	16	14	15	17	23	19	19	18	26	15	21	20	21	11	12	9	14	19	35	31	28	24	24	9	35
Dec 18	31	6	7	12	10	11	14	16	12	11	11	37	41	28	45	23	28	11	10	8	11	8	8	14	6	45
Dec 19	13	13	10	10	13	11	13	12	12	10	19	14	18	14	13	14	21	15	12	27	25	20	17	29	10	29
Dec 20	20	25	22	26	17	24	34	17	14	28	15	18	16	25	19	23	34	58	32	44	40	52	15	10	10	58
Dec 21	17	29	21	17	10	11	14	20	32	18	26	23	15	21	12	13	10	15	13	19	19	7	31	14	7	32
Dec 22	38	23	29	35	21	24	17	14	10	18	17	21	18	25	25	14	8	8	11	16	26	18	19	25	8	38
Dec 23	30	24	27	27	31	33	27	29	23	33	50	41	68	40	22	60	31	19	22	20	18	10	10	12	10	68
Dec 24	8	13	13	12	14	16	10	12	10	10	10	15	16	20	19	20	15	16	18	13	23	16	18	18	8	23
Dec 25	15	24	13	21	25	24	22	30	17	25	24	11	21	16	19	13	10	7	6	5	6	8	7	7	5	30
Dec 26	6	5	7	7	13	5	3	3	3	6	10	11	8	10	8	7	6	9	12	18	11	24	10	12	3	24
Dec 27	7	15	18	18	13	16	12	5	6	7	6	8	10	7	6	5	3	6	6	5	6	12	7	8	3	18
Dec 28	6	22	17	32	58	15	11	12	65	54	22	15	8	8	14	13	26	36	69	9	13	12	21	11	6	69
Dec 29	13	11	12	11	16	15	14	11	15	5	8	13	9	8	7	8	16	10	15	30	42	31	26	20	5	42
Dec 30	49	62	50	72	47	61	48	70	75	22	20	27	7	10	15	22	26	14	37	38	57	73	81	51	7	81
Dec 31	44	76	37	45	53	33	15	22	17	11	10	11	8	6	7	13	11	12	10	19	7	12	10	13	6	76
Diurnal Minimum	5	5	5	6	4	4	3	3	3	5	4	7	6	6	6	5	3	4	4	5	5	7	7	7		
Diurnal Maximum	49	76	63	72	58	61	64	70	75	54	50	51	68	41	45	60	35	58	69	53	57	73	81	55		

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 - Maskwa Site**



**ST. LINA STATION**



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

Summary of Hourly Averages

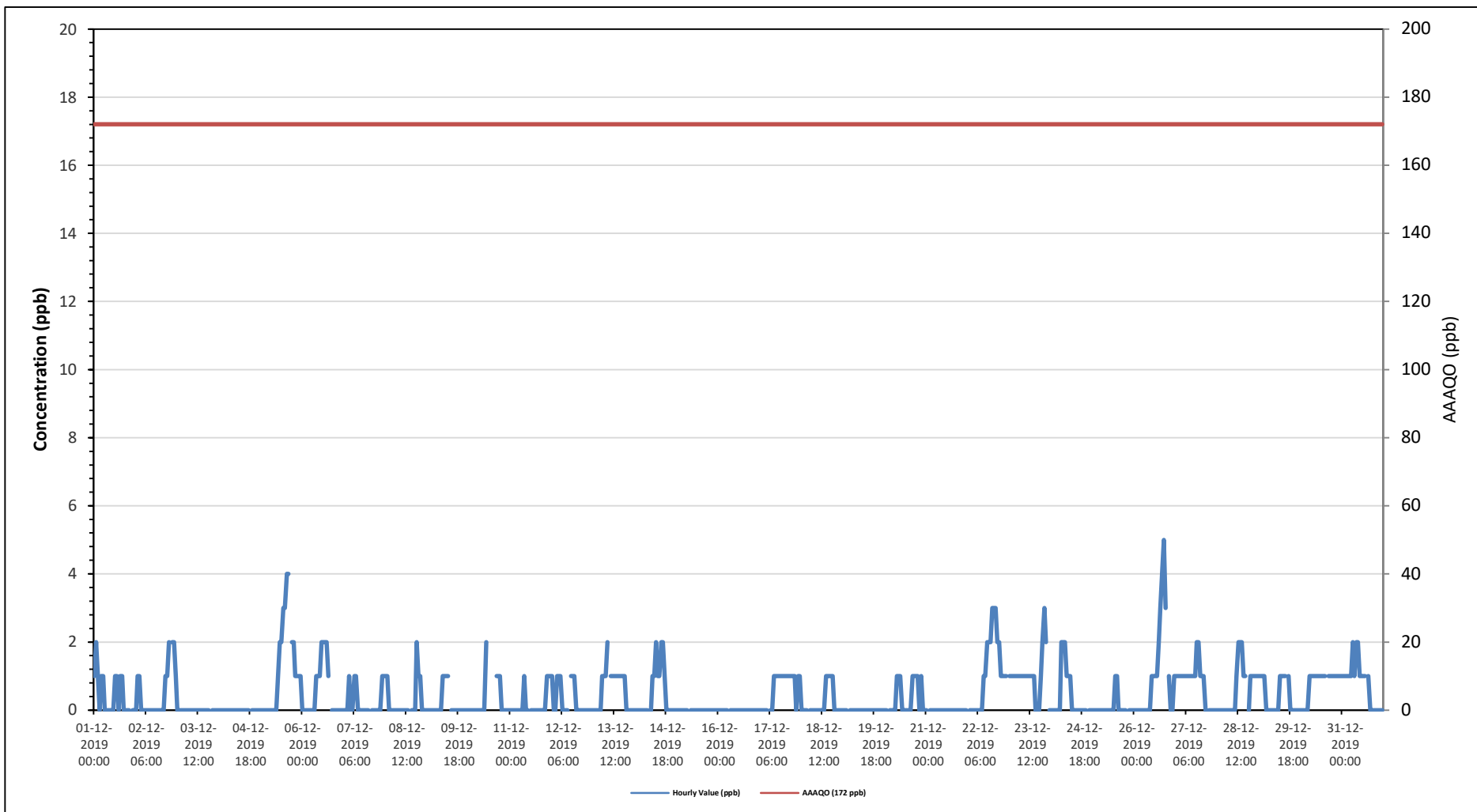
SULPHUR DIOXIDE (SO<sub>2</sub>) in ppb

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: 5 ppb on December 26 at hour 17										Hours in Service: 744																		
Maximum Daily Value: 1.2 ppb on December 5										Hours of Data: 708																		
Minimum Hourly Value: 0 ppb on December 1 at hour 3										Hours of Missing Data: 0																		
Minimum Daily Value: 0.0 ppb on December 3										Hours of Calibration: 36																		
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	
Dec 1	1	2	1	0	1	1	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	S	0	0	0	2	0.4	
Dec 2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	S	2	2	1	0	2	0.5	
Dec 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0.0	
Dec 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0.0	
Dec 5	0	0	0	0	0	0	0	0	0	0	1	2	2	3	3	4	4	S	2	2	1	1	1	1	0	4	1.2	
Dec 6	0	0	0	0	0	0	0	0	1	1	1	2	2	2	2	1	S	0	0	0	0	0	0	0	0	2	0.5	
Dec 7	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	1	0	1	0.2
Dec 8	1	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	2	1	1	0	0	0	0	2	0.3	
Dec 9	0	0	0	0	0	0	0	0	0	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	
Dec 10	0	0	0	0	0	0	0	0	0	2	C	C	C	C	C	1	1	1	1	0	0	0	0	0	0	2	0.3	
Dec 11	0	0	0	0	0	0	0	0	1	0	0	S	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0.2	
Dec 12	1	0	0	1	1	1	0	0	0	0	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0.3	
Dec 13	0	0	0	0	0	1	1	1	2	S	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	2	0.6	
Dec 14	0	0	0	0	0	0	0	0	0	S	0	1	1	2	1	1	2	2	1	0	0	0	0	0	0	0	2	0.5
Dec 15	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
Dec 16	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
Dec 17	0	0	0	0	0	S	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0.7	
Dec 18	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	1	0.2
Dec 19	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 20	0	0	S	S	0	0	0	0	1	1	1	0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	1	0.3
Dec 21	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 22	S	0	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	2	2	1	1	1	1	S	0	3	1.1	
Dec 23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	2	3	2	S	0	0	3	1.0	
Dec 24	0	0	0	0	0	0	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0	S	0	0	0	2	0.4	
Dec 25	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	S	0	0	0	1	0.1	
Dec 26	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	3	4	S	3	S	1	0	0	1	0	5	1.0	
Dec 27	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	0	S	0	0	0	0	0	0	2	0.8	
Dec 28	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	1	1	S	0	1	1	1	1	1	0	2	0.6	
Dec 29	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1	S	1	0	0	0	0	0	0	0	1	0.4	
Dec 30	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	0.8	
Dec 31	1	1	1	1	1	1	2	1	2	2	1	1	1	1	S	1	0	0	0	0	0	0	0	0	0	2	0.8	
Diurnal Maximum	1	2	1	1	1	1	2	2	2	2	2	2	3	3	3	4	4	5	3	2	3	2	2	1				
Daiurnal Average	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.8	0.8	0.8	0.6	0.6	0.4	0.3	0.3	0.3	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							

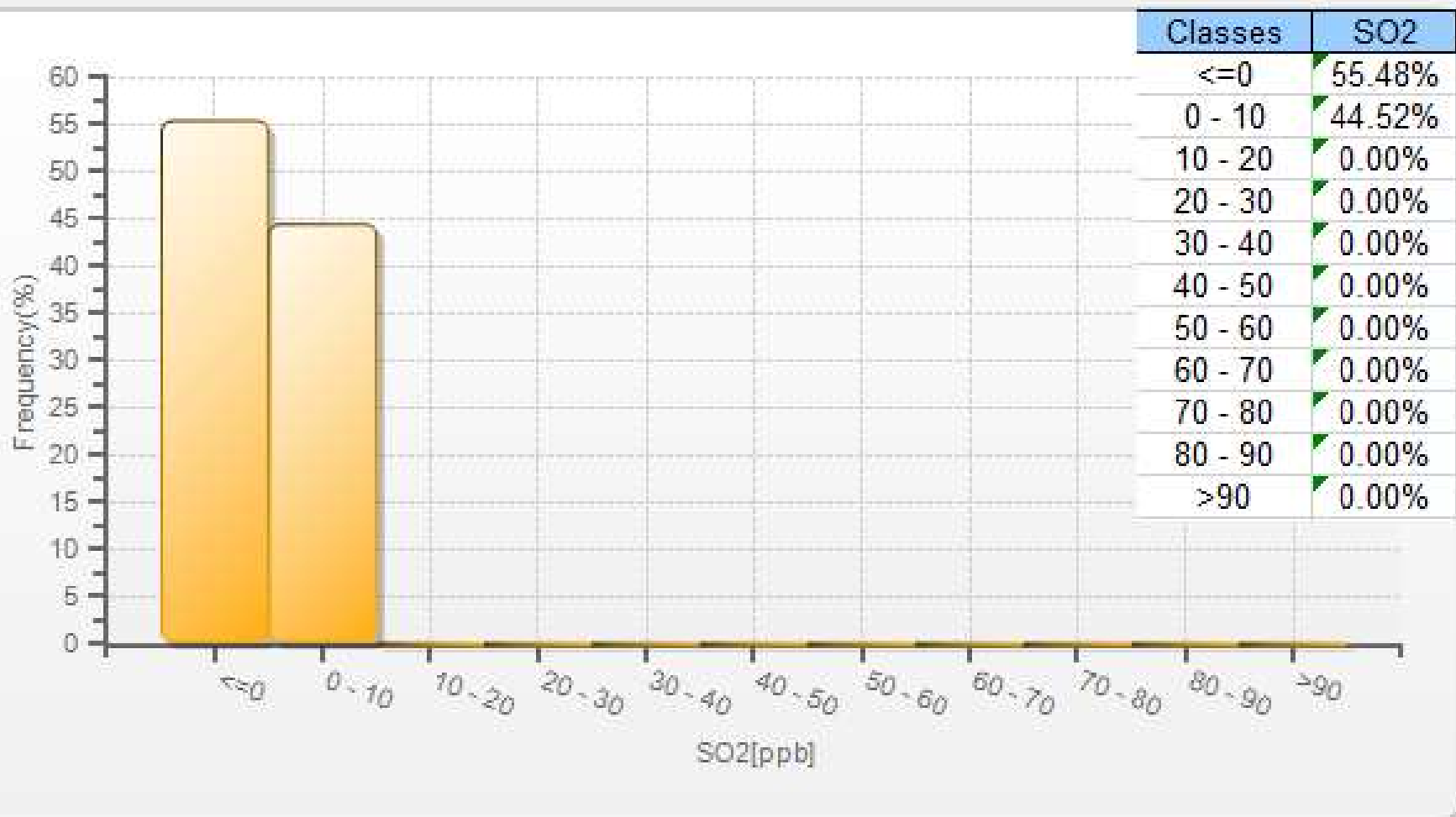
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.  
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



**Timeseries Chart of Hourly Average for SO<sub>2</sub> - St. Lina Site**

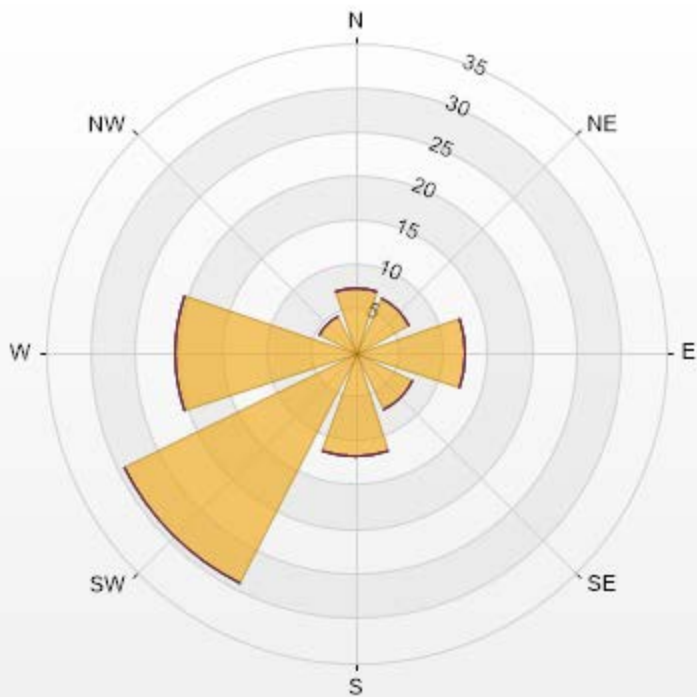


SO2[ppb] Histogram: St. Lina Monthly: 12-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-SO2[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00 [ppb]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	7.4	0	0	0	0	7.4
NE	6.83	0	0	0	0	6.83
E	12.38	0	0	0	0	12.38
SE	7.25	0	0	0	0	7.25
S	11.81	0	0	0	0	11.81
SW	29.16	0	0	0	0	29.16
W	20.48	0	0	0	0	20.48
NW	4.69	0	0	0	0	4.69
Summary	100	0	0	0	0	100



LICA-201912-Revision 1

% Icon Classes (ppb)

100 0-10

0 10-50

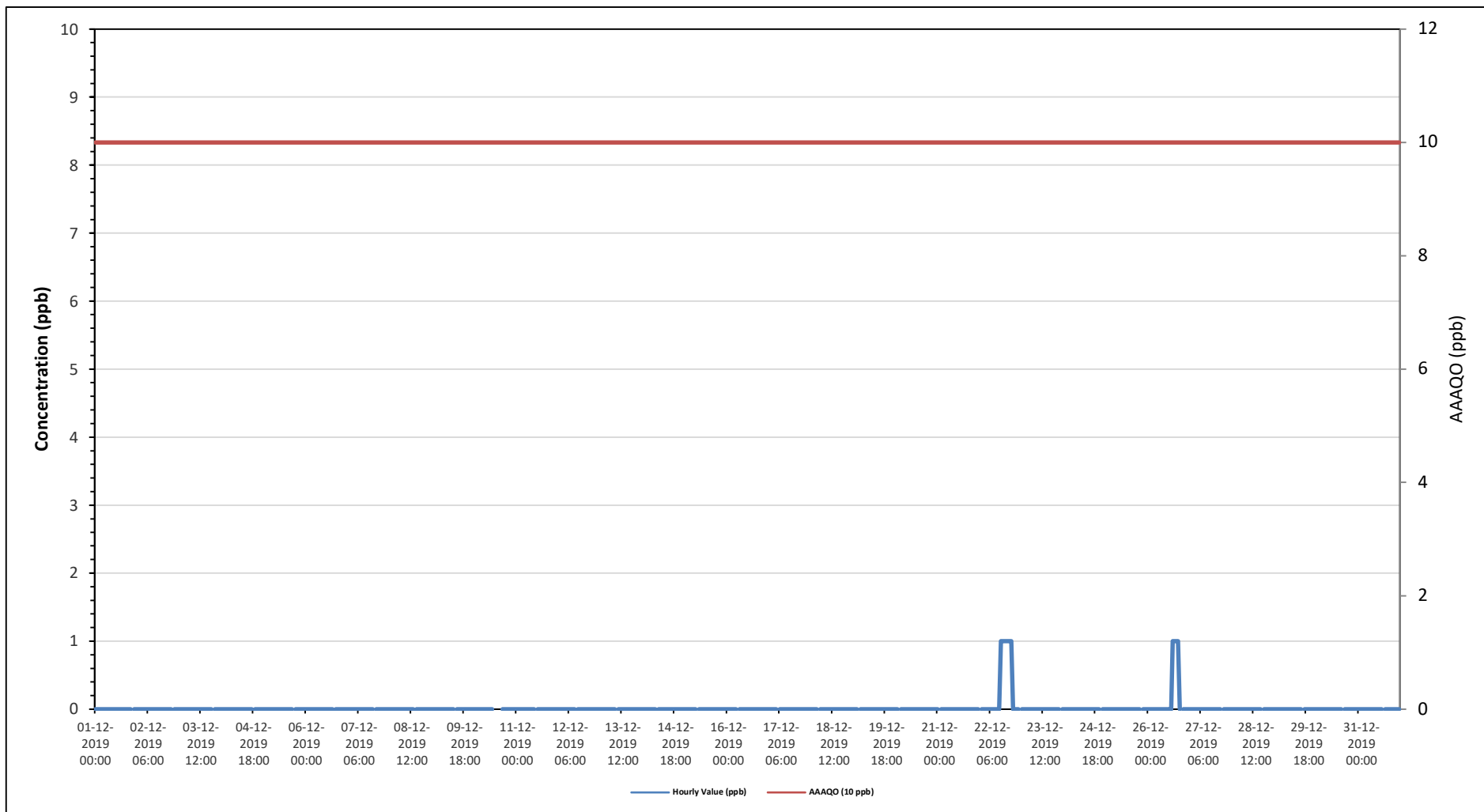
0 50-100

0 100-172

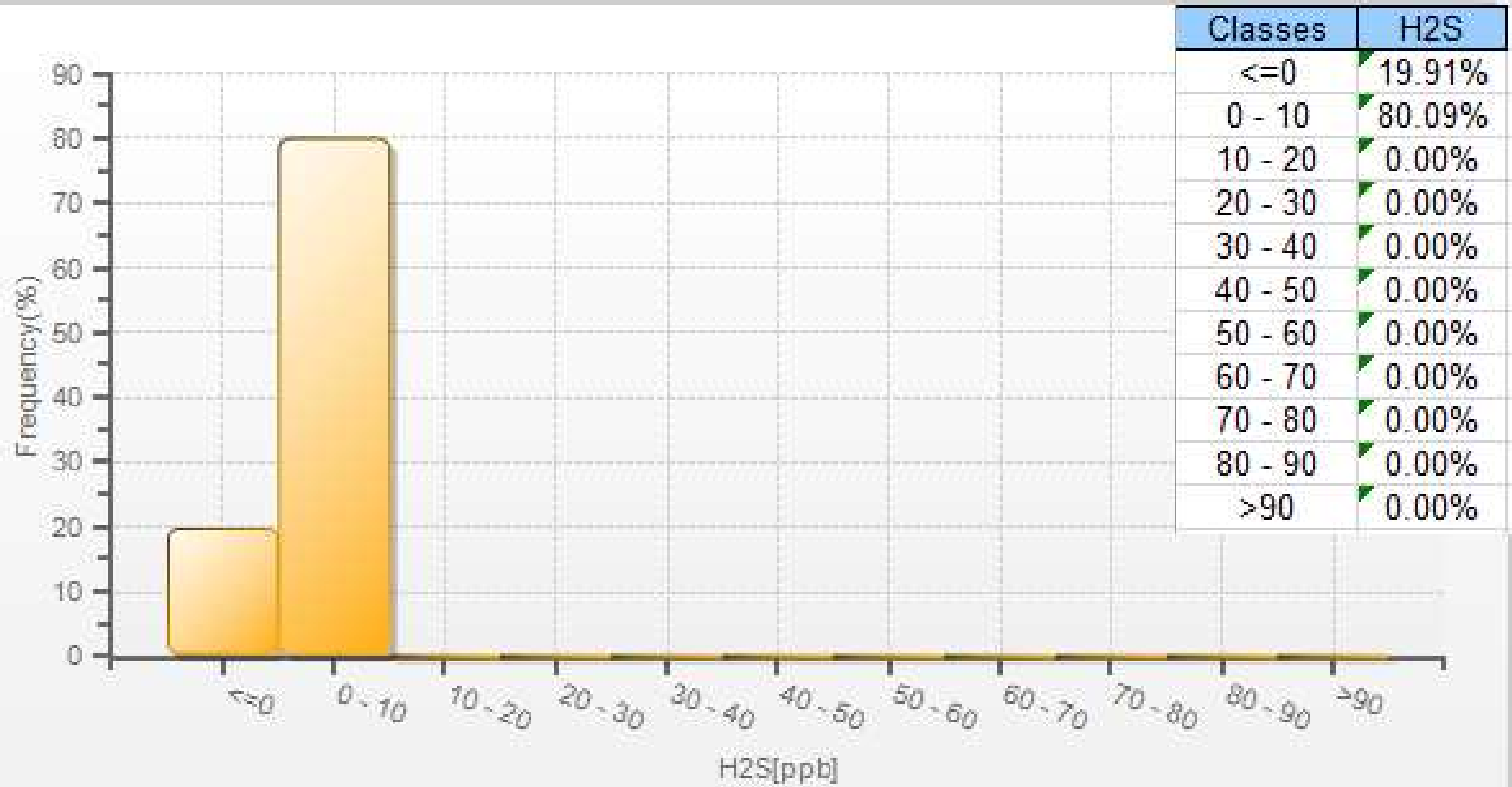
0 >172.0



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



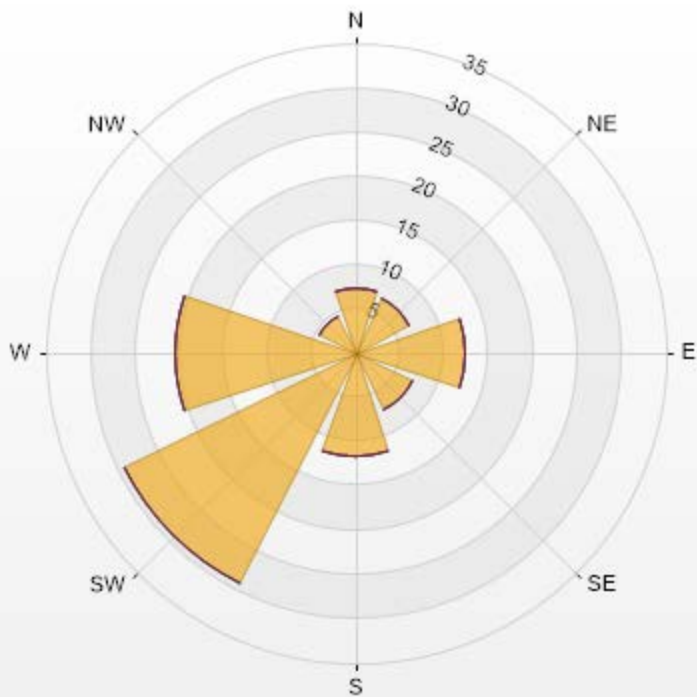
H2S[ppb] Histogram: St. Lina Monthly: 12-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-H2S[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00 [ppb]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	7.4	0	0	0	0	7.4
NE	6.83	0	0	0	0	6.83
E	12.38	0	0	0	0	12.38
SE	7.25	0	0	0	0	7.25
S	11.81	0	0	0	0	11.81
SW	29.16	0	0	0	0	29.16
W	20.48	0	0	0	0	20.48
NW	4.69	0	0	0	0	4.69
Summary	100	0	0	0	0	100





LICA-201912-Revision 1



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

Summary of Hourly Averages

### OXIDES OF NITROGEN (NOx) in ppb

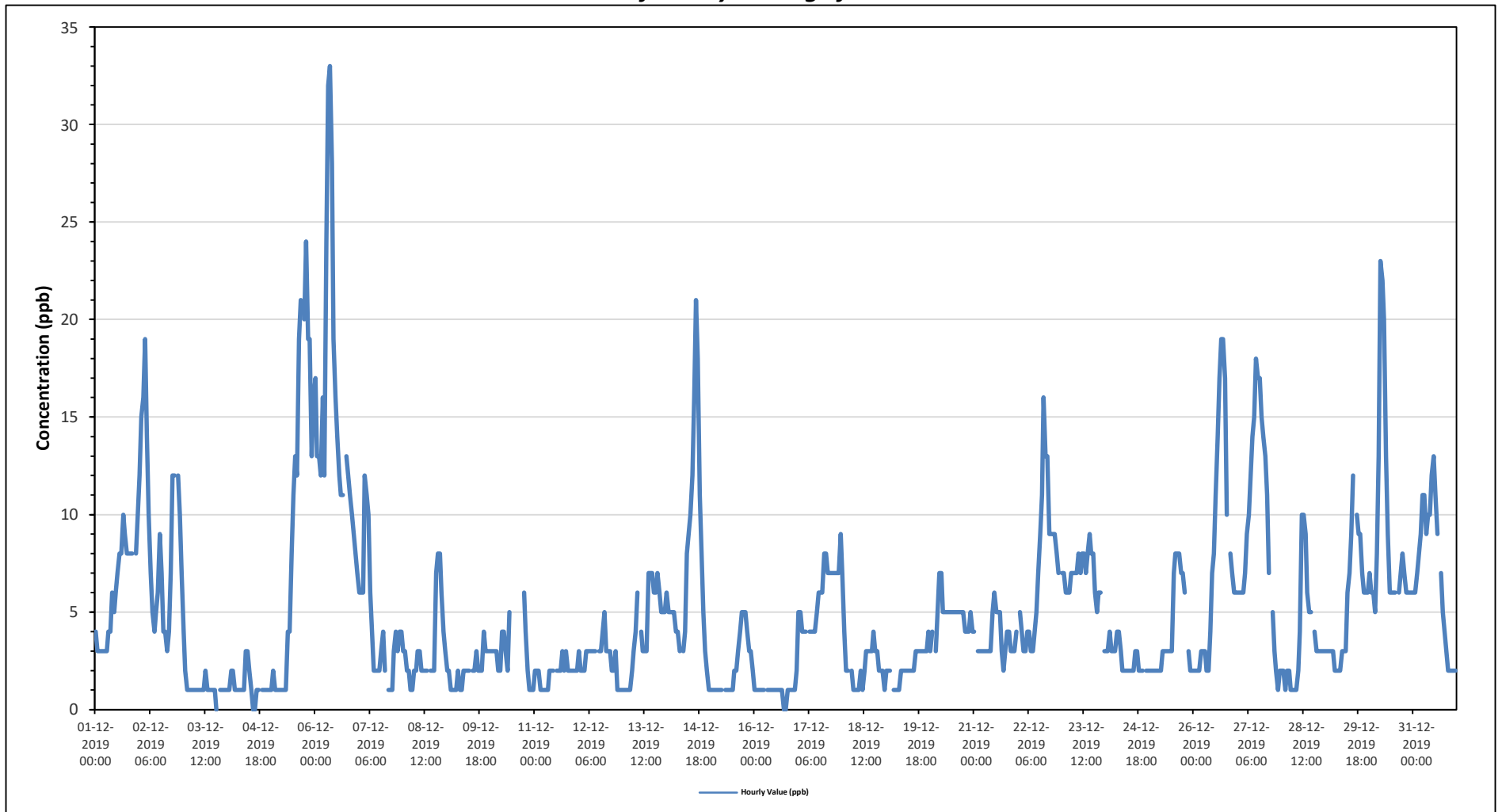
Maximum Hourly Value:	33 ppb	on December 6 at hour 8	Hours in Service:	744
Maximum Daily Value:	15.3 ppb	on December 6	Hours of Data:	706
Minimum Hourly Value:	0 ppb	on December 3 at hour 18	Hours of Missing Data:	0
Minimum Daily Value:	1.0 ppb	on December 16	Hours of Calibration:	38
Monthly Average:	5.0 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
Dec 1	4	3	3	3	3	3	3	4	4	6	5	6	7	8	8	10	9	8	8	8	8	S	8	10	3	10	6.0
Dec 2	12	15	16	19	14	10	7	5	4	5	6	9	7	4	4	3	4	7	12	12	S	12	10	7	3	19	8.9
Dec 3	4	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	0	S	1	1	1	1	0	4	1.2
Dec 4	1	1	2	2	1	1	1	1	1	1	3	3	2	1	0	0	1	1	S	1	1	1	1	1	0	3	1.2
Dec 5	1	2	1	1	1	1	1	1	1	4	4	8	11	13	12	19	21	S	20	24	19	19	13	16	1	24	9.3
Dec 6	17	13	13	12	16	12	24	32	33	28	19	16	14	12	11	11	S	13	12	11	10	9	8	7	7	33	15.3
Dec 7	6	6	6	12	11	10	6	4	2	2	2	2	3	4	2	S	1	1	1	3	4	3	4	4	1	12	4.3
Dec 8	3	3	2	2	1	1	2	2	3	3	2	2	2	2	S	2	2	2	7	8	8	6	4	3	1	8	3.1
Dec 9	2	2	1	1	1	1	2	1	1	2	2	2	2	S	2	2	C	C	C	2	2	4	3	3	1	4	2.0
Dec 10	3	3	3	3	2	2	4	4	3	2	5	C	C	C	C	C	C	C	C	6	4	2	1	1	1	6	-
Dec 11	2	2	2	1	1	1	1	1	2	2	2	S	2	2	2	3	2	3	2	2	2	2	2	2	1	3	1.9
Dec 12	3	2	2	2	3	3	3	3	3	3	S	3	3	4	5	3	3	3	2	2	3	1	1	1	1	5	2.7
Dec 13	1	1	1	1	1	2	3	4	6	S	4	3	3	3	7	7	7	6	6	7	6	5	5	5	1	7	4.1
Dec 14	6	5	5	5	5	4	4	3	S	3	4	8	9	10	12	16	21	18	11	8	5	3	2	1	1	21	7.3
Dec 15	1	1	1	1	1	1	1	S	1	1	1	1	1	2	2	3	4	5	5	5	4	3	3	2	1	5	2.2
Dec 16	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	2	0	2	1.0
Dec 17	5	5	4	4	4	S	4	4	4	4	5	6	6	6	8	8	7	7	7	7	7	7	7	9	4	9	5.9
Dec 18	7	4	2	2	S	2	1	1	1	1	2	1	2	3	3	3	3	4	3	3	2	2	2	1	1	7	2.4
Dec 19	2	2	2	S	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4	1	4	2.2
Dec 20	3	4	S	3	5	7	7	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	5	4	3	7	4.8
Dec 21	4	S	3	3	3	3	3	3	3	3	5	6	5	5	5	3	2	3	4	4	3	3	3	4	2	6	3.6
Dec 22	S	5	4	3	3	4	4	3	3	4	5	7	9	11	16	13	13	9	9	9	9	8	7	S	3	16	7.2
Dec 23	7	7	6	6	6	7	7	7	7	8	7	8	8	7	8	9	8	8	6	5	6	6	S	3	3	9	6.8
Dec 24	3	3	4	3	3	3	4	4	3	2	2	2	2	2	2	3	3	2	2	2	2	S	2	2	2	4	2.6
Dec 25	2	2	2	2	2	2	2	3	3	3	3	3	3	3	7	8	8	8	7	7	6	S	3	2	2	8	3.9
Dec 26	2	2	2	2	3	3	3	2	2	4	7	8	11	14	17	19	19	17	10	S	8	7	6	6	2	19	7.6
Dec 27	6	6	6	6	7	9	10	12	14	15	18	17	17	15	14	13	11	7	S	5	3	2	1	2	1	18	9.4
Dec 28	2	2	1	2	2	1	1	1	1	2	4	10	10	9	6	5	5	S	4	3	3	3	3	3	1	10	3.6
Dec 29	3	3	3	3	3	2	2	2	2	3	3	3	6	7	9	12	S	10	9	9	7	6	6	6	2	12	5.2
Dec 30	7	6	6	5	8	13	23	22	20	13	9	6	6	6	6	S	6	7	8	7	6	6	6	6	5	23	9.0
Dec 31	6	6	7	8	9	11	11	9	10	10	12	13	11	9	S	7	5	4	3	2	2	2	2	2	2	13	7.0
Diurnal Maximum	17	15	16	19	16	13	24	32	33	28	19	17	17	15	17	19	21	18	20	24	19	19	13	16			
Diurnal Average	4.2	4.0	3.7	4.0	4.1	4.1	4.9	4.9	4.9	4.8	5.0	5.6	5.7	6.0	6.4	6.8	6.3	5.9	6.0	5.8	4.9	4.6	4.1	4.0			

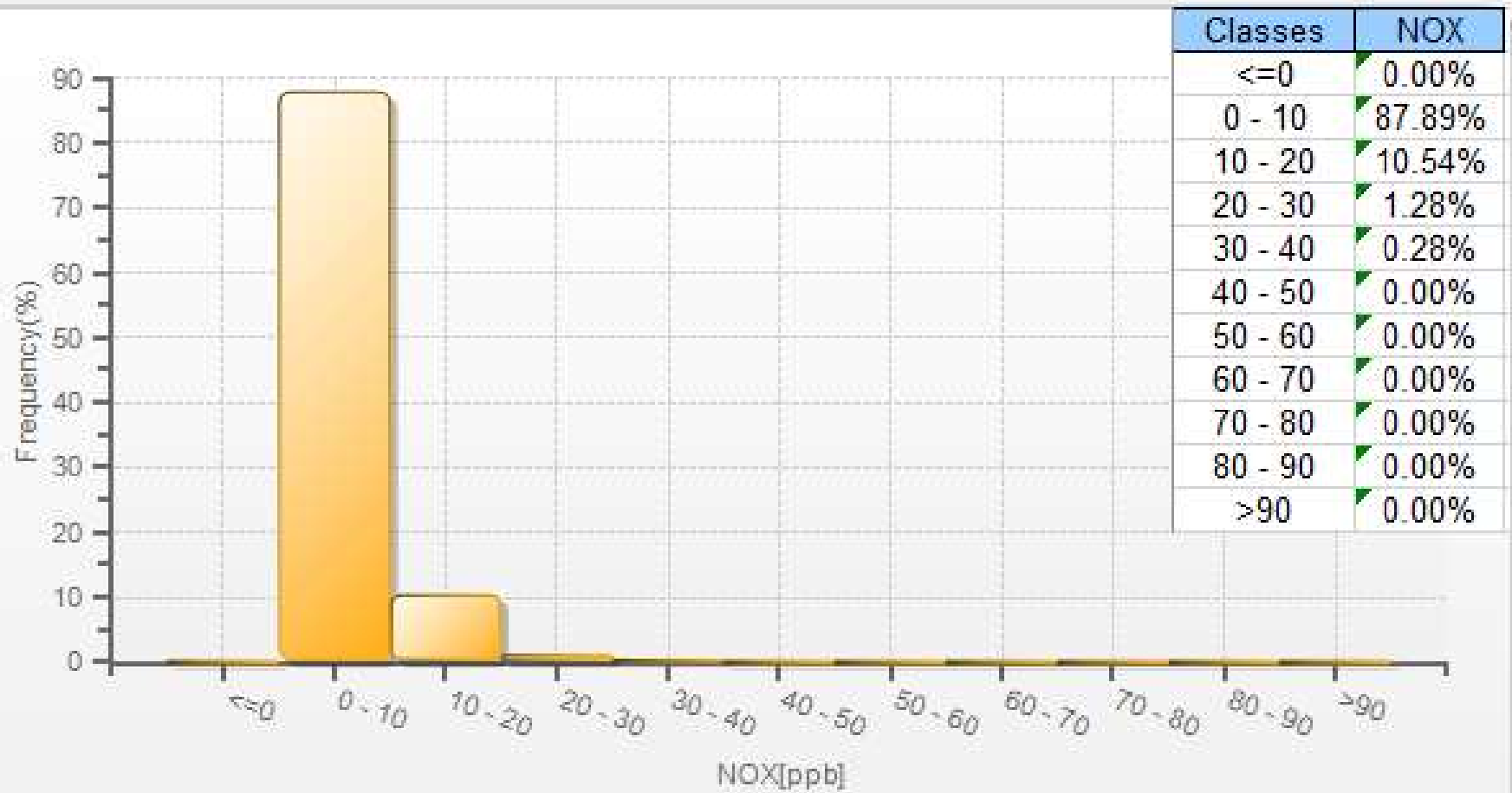
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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 NOx - St. Lina Site*

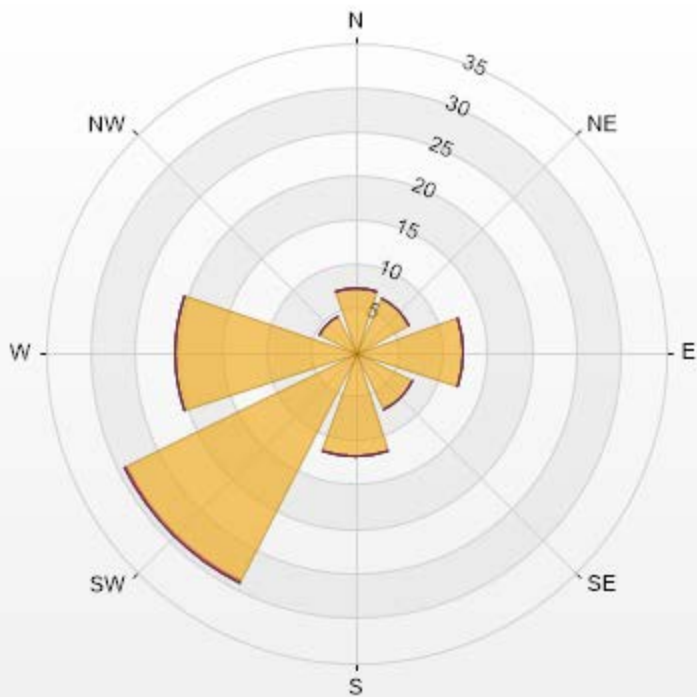


NOX[ppb] Histogram: St. Lina Monthly: 12-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-NOX[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.35% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	7.41	0	0	0	0	7.41
NE	6.84	0	0	0	0	6.84
E	12.25	0	0	0	0	12.25
SE	7.26	0	0	0	0	7.26
S	11.82	0	0	0	0	11.82
SW	28.92	0.28	0	0	0	29.2
W	20.51	0	0	0	0	20.51
NW	4.7	0	0	0	0	4.7
Summary	100	0.28	0	0	0	100



LICA-201912-Revision 1



**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**

**St. Lina Site - December 2019**

**Summary of Hourly Averages**

**NITRIC OXIDE (NO) in ppb**

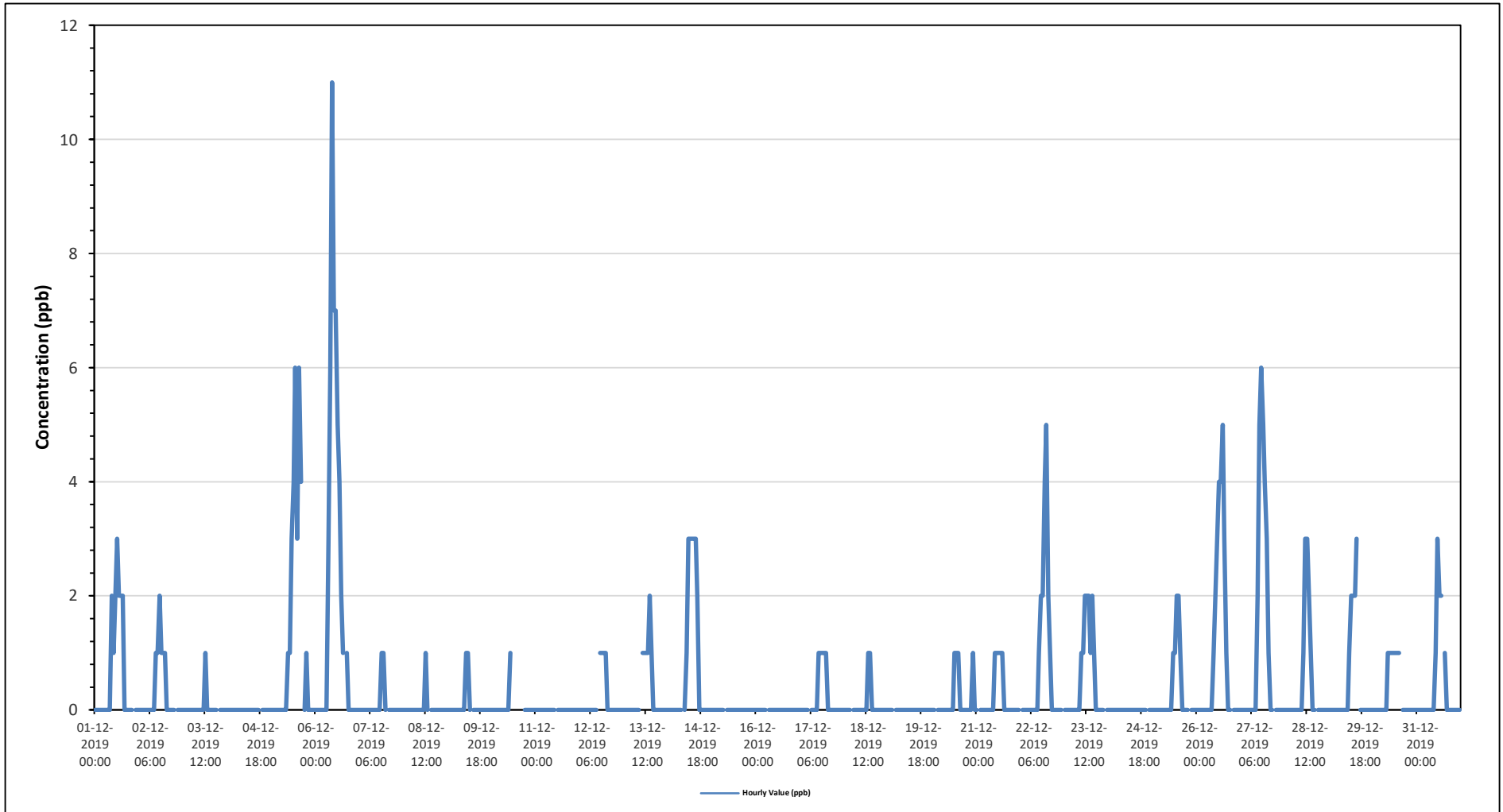
Maximum Hourly Value:	11 ppb on December 6 at hour 9	Hours in Service:	744
Maximum Daily Value:	2.0 ppb on December 6	Hours of Data:	706
Minimum Hourly Value:	0 ppb on December 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on December 4	Hours of Calibration:	38
Monthly Average:	0.4 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	
Dec 1	0	0	0	0	0	0	0	0	0	2	1	2	3	2	2	2	0	0	0	0	0	S	0	0	0	0	3	0.6
Dec 2	0	0	0	0	0	0	0	0	1	1	2	1	1	1	0	0	0	0	0	0	S	0	0	0	0	0	2	0.3
Dec 3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0.0
Dec 4	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
Dec 5	0	0	0	0	0	0	0	0	1	1	3	4	6	3	6	4	S	0	1	0	0	0	0	0	0	0	6	1.3
Dec 6	0	0	0	0	0	0	3	6	11	7	7	5	4	2	1	S	1	0	0	0	0	0	0	0	0	0	11	2.0
Dec 7	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	0	1	0.1
Dec 8	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	1	0.0
Dec 9	0	0	0	0	0	0	0	0	0	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Dec 10	0	0	0	0	0	0	0	0	0	1	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	1	-
Dec 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
Dec 12	0	0	0	0	0	0	0	0	0	S	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0.2
Dec 13	0	0	0	0	0	0	0	0	S	1	1	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0	2	0.3
Dec 14	0	0	0	0	0	0	0	S	0	1	3	3	3	3	3	2	0	0	0	0	0	0	0	0	0	0	3	0.8
Dec 15	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
Dec 16	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	0.0
Dec 17	0	0	0	0	S	S	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0.2
Dec 18	0	0	0	S	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Dec 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
Dec 20	0	0	S	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0.2
Dec 21	0	S	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0.2
Dec 22	S	0	0	0	0	0	0	0	0	1	2	2	4	5	2	1	0	0	0	0	0	0	0	0	0	S	0	0.8
Dec 23	0	0	0	0	0	0	0	0	1	1	2	2	2	1	2	1	0	0	0	0	0	0	0	0	S	0	2	0.5
Dec 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0.0
Dec 25	0	0	0	0	0	0	0	0	0	0	1	1	2	2	1	0	0	0	0	0	0	S	0	0	0	0	2	0.3
Dec 26	0	0	0	0	0	0	0	0	1	2	3	4	4	5	3	1	0	0	0	S	0	0	0	0	0	0	5	1.0
Dec 27	0	0	0	0	0	0	0	0	2	5	6	5	4	3	1	0	0	0	S	0	0	0	0	0	0	0	6	1.1
Dec 28	0	0	0	0	0	0	0	0	0	1	3	3	2	1	0	0	0	S	0	0	0	0	0	0	0	0	3	0.4
Dec 29	0	0	0	0	0	0	0	0	0	0	1	2	2	2	3	S	0	0	0	0	0	0	0	0	0	0	3	0.4
Dec 30	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	0	1	0.3
Dec 31	0	0	0	0	0	0	0	0	1	3	2	2	S	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0.4
Diurnal Maximum	0	0	0	0	0	0	3	6	11	7	7	5	6	5	6	4	1	0	1	0	0	1	0	0	1	0		
Diurnal Average	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.7	0.9	1.5	1.5	1.6	1.4	0.9	0.3	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

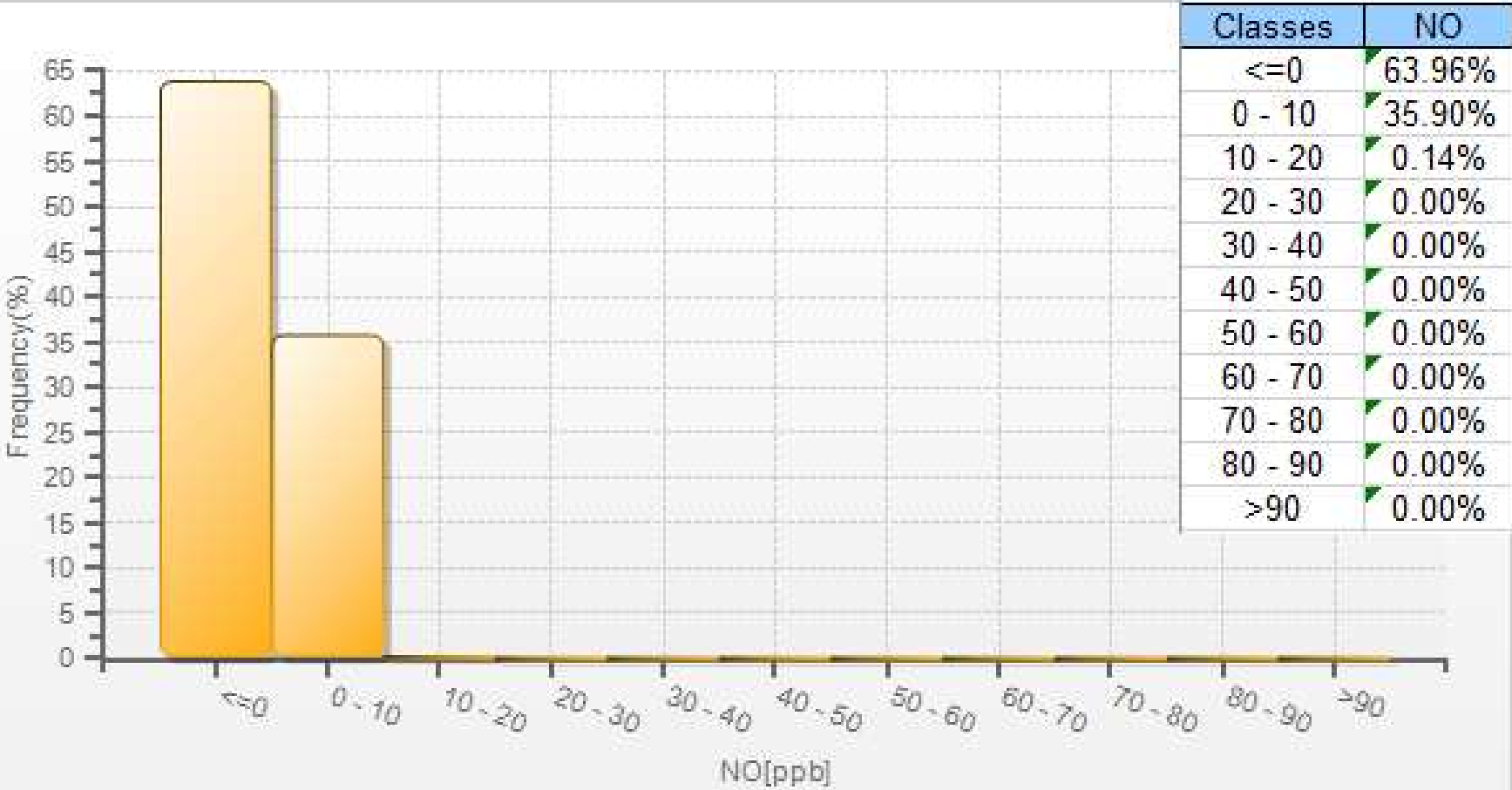
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.  
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

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



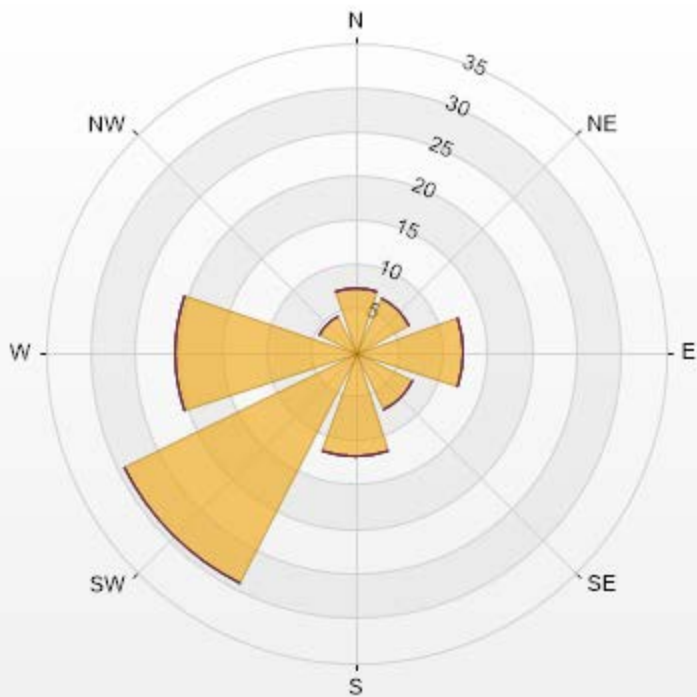


NO[ppb] Histogram: St. Lina Monthly: 12-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-NO[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.35% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	7.41	0	0	0	0	7.41
NE	6.84	0	0	0	0	6.84
E	12.25	0	0	0	0	12.25
SE	7.26	0	0	0	0	7.26
S	11.82	0	0	0	0	11.82
SW	29.2	0	0	0	0	29.2
W	20.51	0	0	0	0	20.51
NW	4.7	0	0	0	0	4.7
Summary	100	0	0	0	0	100



LICA-201912-Revision 1

% Icon Classes (ppb)	100	0-30	0	Page 171 of 365	50-82	0	82-159	0	>159.0



# LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

Summary of Hourly Averages

NITROGEN DIOXIDE (NO<sub>2</sub>) in ppb

## Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb

Number of 1-Hour Exceedences: 0

Maximum Hourly Value: 29 ppb on December 6 at hour 7

Hours in Service: 744

Maximum Daily Value: 13.2 ppb on December 6

Hours of Data: 706

Minimum Hourly Value: 0 ppb on December 3 at hour 18

Hours of Missing Data: 0

Minimum Daily Value: 1.0 ppb on December 16

Hours of Calibration: 38

Monthly Average: 4.6 ppb

Operational Uptime: 100.0

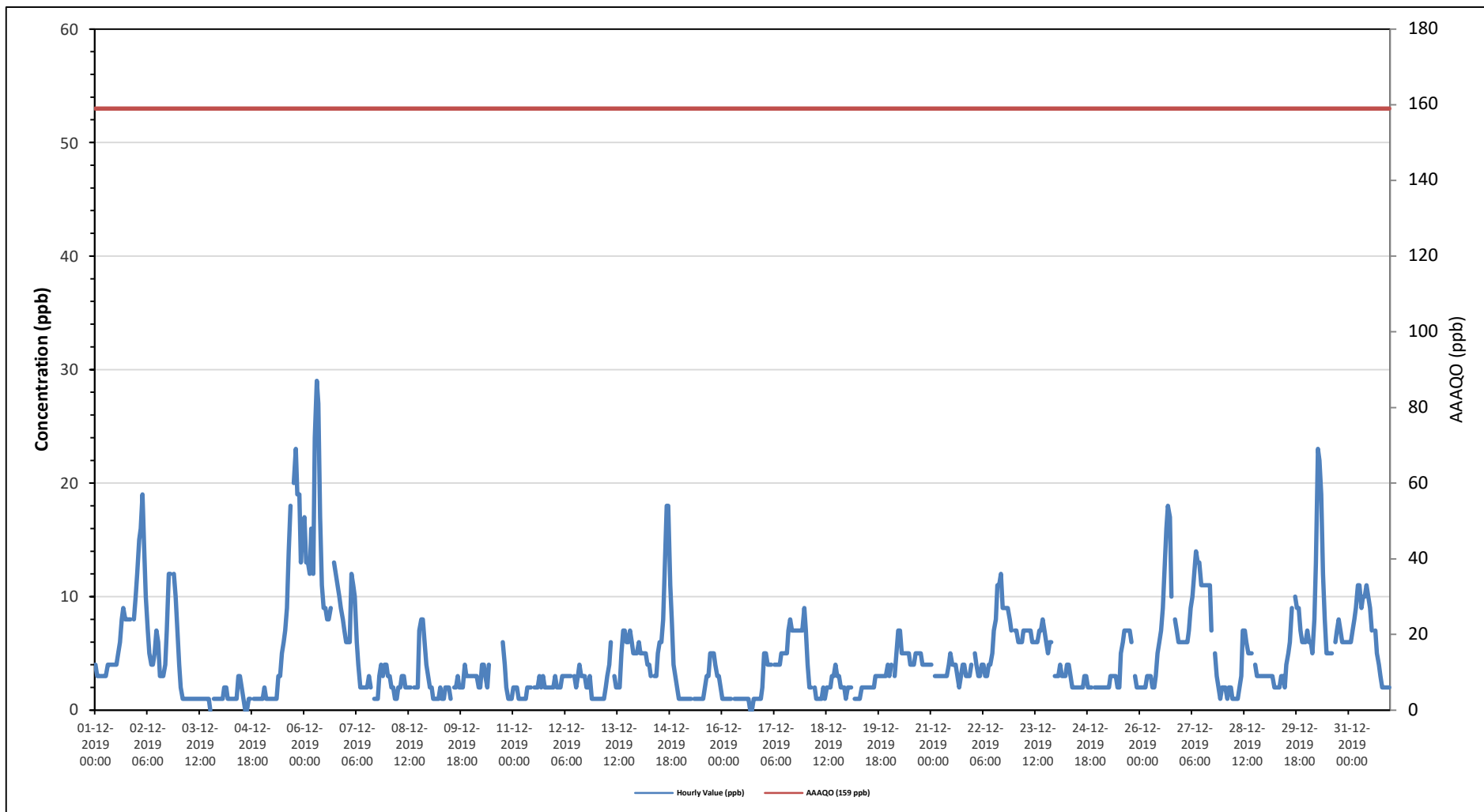
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Dec 1	4	3	3	3	3	3	3	4	4	4	4	4	4	5	6	8	9	8	8	8	8	S	8	10	3	10	5.4	
Dec 2	12	15	16	19	14	10	7	5	4	4	5	7	6	3	3	3	4	7	12	12	S	12	10	7	3	19	8.6	
Dec 3	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	S	1	1	1	0	4	1.1
Dec 4	1	1	2	2	1	1	1	1	1	1	3	3	2	1	0	0	1	1	S	1	1	1	1	1	1	0	3	1.2
Dec 5	1	2	1	1	1	1	1	1	1	3	3	5	6	7	9	14	18	S	20	23	19	19	13	16	1	23	8.0	
Dec 6	17	13	13	12	16	12	24	29	27	17	11	9	9	8	8	9	S	13	12	11	10	9	8	7	7	29	13.2	
Dec 7	6	6	6	12	11	10	6	4	2	2	2	2	2	3	2	S	1	1	1	3	4	3	4	4	1	12	4.2	
Dec 8	3	3	2	2	1	1	2	2	3	3	2	2	2	2	S	2	2	2	7	8	8	6	4	3	1	8	3.1	
Dec 9	2	2	1	1	1	1	2	1	1	2	2	2	2	1	S	2	2	3	2	2	2	4	3	3	1	4	2.0	
Dec 10	3	3	3	3	2	2	4	4	3	2	4	C	C	C	C	C	C	C	6	4	2	1	1	1	1	6	-	
Dec 11	2	2	2	1	1	1	1	1	2	2	2	S	2	2	2	2	3	2	3	2	2	2	2	2	1	3	1.9	
Dec 12	3	2	2	2	3	3	3	3	3	3	S	3	2	3	4	3	3	3	2	2	3	1	1	1	1	4	2.5	
Dec 13	1	1	1	1	1	2	3	4	6	S	3	2	2	2	5	7	7	6	6	7	6	5	5	5	1	7	3.8	
Dec 14	6	5	5	5	5	4	4	3	S	3	3	5	6	6	8	13	18	18	11	8	4	3	2	1	1	18	6.3	
Dec 15	1	1	1	1	1	1	1	S	1	1	1	1	1	1	2	3	3	5	5	5	4	3	3	2	1	5	2.1	
Dec 16	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	2	0	2	1.0	
Dec 17	5	5	4	4	4	S	4	4	4	4	5	5	5	5	7	8	7	7	7	7	7	7	7	9	4	9	5.7	
Dec 18	7	4	2	2	S	2	1	1	1	1	2	1	2	2	2	2	3	4	3	3	2	2	2	1	1	7	2.3	
Dec 19	2	2	2	S	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	4	1	4	2.2	
Dec 20	3	4	S	3	3	5	7	7	5	5	5	5	4	4	4	5	5	5	5	4	4	4	4	3	7	7	4.6	
Dec 21	4	S	3	3	3	3	3	3	3	3	4	4	5	4	4	3	2	3	4	4	3	3	3	4	2	5	3.4	
Dec 22	S	5	4	3	3	4	4	3	3	4	4	5	7	8	11	11	12	9	9	9	9	8	7	S	3	12	6.5	
Dec 23	7	7	6	6	6	7	7	7	7	7	6	6	6	6	6	7	8	7	6	5	6	6	S	3	3	8	6.3	
Dec 24	3	3	4	3	3	3	4	4	3	2	2	2	2	2	2	2	3	3	2	2	2	S	2	2	2	4	2.6	
Dec 25	2	2	2	2	2	2	2	3	3	3	3	2	2	2	5	6	7	7	7	7	6	S	3	2	2	7	3.6	
Dec 26	2	2	2	2	3	3	3	2	2	3	5	6	7	9	12	16	18	17	10	S	8	7	6	6	2	18	6.6	
Dec 27	6	6	6	6	7	9	10	12	14	13	13	11	11	11	11	11	11	7	S	5	3	2	1	2	1	14	8.2	
Dec 28	2	2	1	2	2	1	1	1	2	3	7	7	6	5	5	5	S	10	4	3	3	3	3	3	1	7	3.1	
Dec 29	3	3	3	3	3	2	2	2	2	3	3	2	4	5	6	9	S	10	9	9	7	6	6	6	2	10	4.7	
Dec 30	7	6	6	5	8	13	23	22	19	12	8	5	5	5	5	S	6	7	8	7	6	6	6	6	5	23	8.7	
Dec 31	6	6	7	8	9	11	11	9	10	10	11	10	9	7	S	7	5	4	3	2	2	2	2	2	2	11	6.7	
Diurnal Maximum	17	15	16	19	16	13	24	29	27	17	13	11	11	11	12	16	18	18	20	23	19	19	13	16				
Daiurnal Average	4.2	4.0	3.7	4.0	4.1	4.1	4.9	4.8	4.6	4.1	4.1	4.2	4.1	4.3	4.9	5.9	6.0	5.8	6.0	5.7	4.9	4.6	4.0	4.0				

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

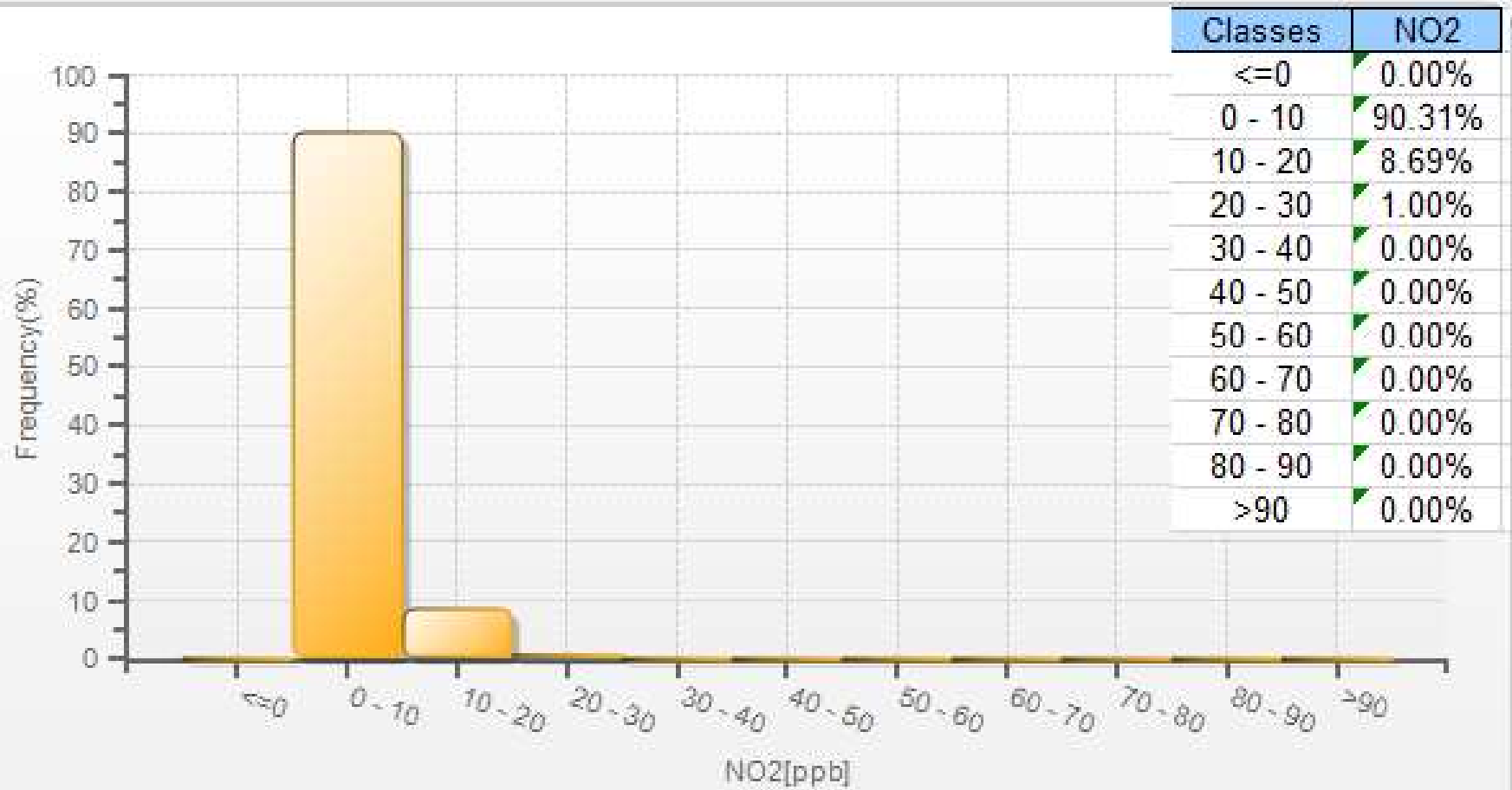
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

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

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

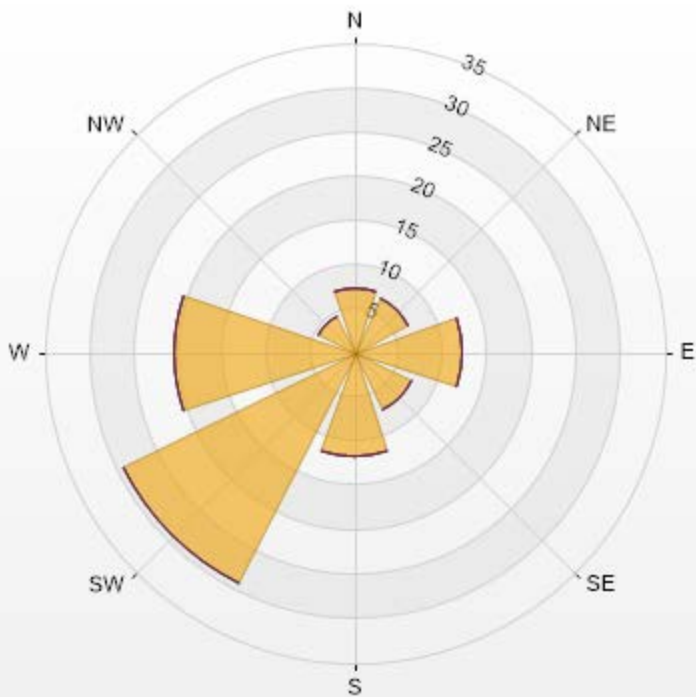


NO2[ppb] Histogram: St. Lina Monthly: 12-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-NO2[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.35% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	7.41	0	0	0	0	7.41
NE	6.84	0	0	0	0	6.84
E	12.25	0	0	0	0	12.25
SE	7.26	0	0	0	0	7.26
S	11.82	0	0	0	0	11.82
SW	29.2	0	0	0	0	29.2
W	20.51	0	0	0	0	20.51
NW	4.7	0	0	0	0	4.7
Summary	100	0	0	0	0	100



LICA-201912-Revision 1





# LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

Summary of Hourly Averages

OZONE (O<sub>3</sub>) in ppb

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

Number of 1-Hour Exceedences: 0

Maximum Hourly Value:	40.9 ppb	on December 16 at hour 18	Hours in Service:	744
Maximum Daily Value:	38.6 ppb	on December 3	Hours of Data:	697
Minimum Hourly Value:	0.3 ppb	on December 6 at hour 7	Hours of Missing Data:	9
Minimum Daily Value:	13.9 ppb	on December 6	Hours of Calibration:	38
Monthly Average:	26.9 ppb		Operational Uptime:	98.8

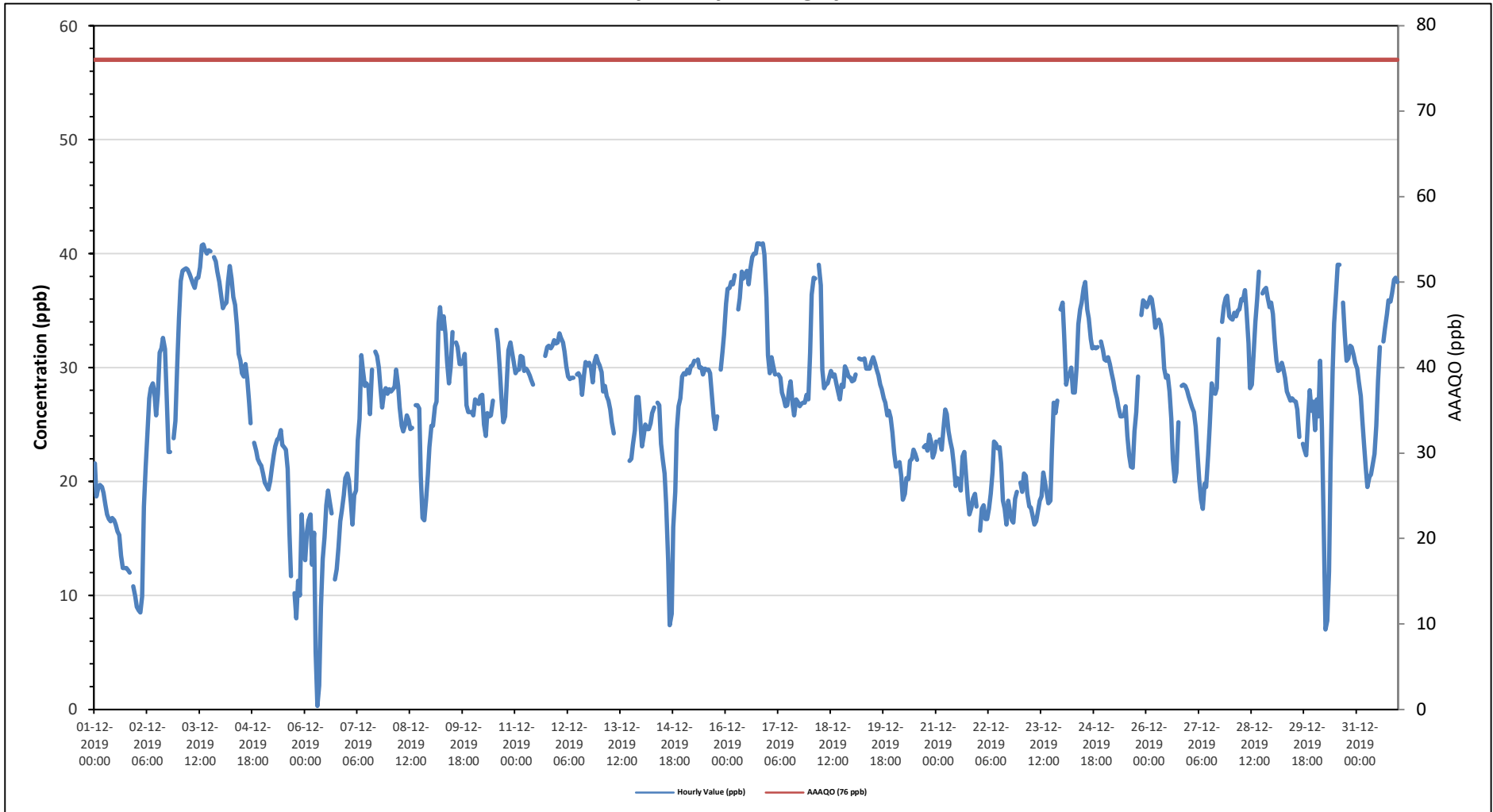
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Dec 1	21.6	18.7	19.5	19.7	19.5	19	18	17.1	16.7	16.5	16.8	16.6	16.2	15.6	15.3	13.5	12.4	12.4	12.4	12.2	12	S	10.8	9.9	9.9	21.6	15.8
Dec 2	9	8.7	8.5	9.9	17.8	21.3	24.3	27.3	28.2	28.6	27.9	25.8	27.7	31.3	31.7	32.6	31.6	27.9	22.6	22.6	S	23.8	25.3	30.1	8.5	32.6	23.7
Dec 3	34.3	37.6	38.5	38.6	38.7	38.6	38.2	37.8	37.3	37	37.8	37.9	38.8	40.7	40.8	40.3	40	40.3	40.2	S	39.7	39.3	38.4	37.5	34.3	40.8	38.6
Dec 4	36.5	35.2	35.5	35.7	37.5	38.9	37.8	36.2	35.5	33.7	31.2	30.6	29.5	29.2	30.3	29	27	25.1	S	23.4	22.7	22	21.6	21.4	21.4	38.9	30.7
Dec 5	20.7	19.9	19.6	19.3	20	21.2	22.3	23.1	23.7	23.8	24.5	23.2	23	22.8	21.1	15.5	11.7	S	10.2	8	11.3	10	17.1	13.9	8.0	24.5	18.5
Dec 6	13.1	15.6	16.6	17.1	12.7	15.5	5.1	0.3	2.1	9	13.2	15.1	17.9	19.2	18.3	17.2	S	11.4	12.3	14.2	16.5	17.4	18.8	20.3	0.3	20.3	13.9
Dec 7	20.7	20.1	18.1	16.2	18.8	19.2	23.6	25.5	31.1	29.8	28.4	28.6	28.3	25.9	29.8	S	31.4	31	30	28	26.5	27.9	28.2	27.7	16.2	31.4	25.9
Dec 8	28.1	27.9	28.1	28.3	29.8	28.4	26.5	24.9	24.4	25	25.8	25.4	24.6	24.7	S	26.7	26.7	26.4	20.5	16.8	16.6	18.4	20.6	23	16.6	29.8	24.7
Dec 9	24.9	24.9	26.6	27	33.9	35.3	33.4	34.5	33	30.4	28.6	30.1	33.1	S	32.2	31.8	30.3	30.3	30.6	31.2	26.7	26.1	26.1	26.1	24.9	35.3	29.9
Dec 10	25.8	27.2	27	26.8	27.5	27.6	25	24	26	25.7	25.8	27.1	S	33.3	32.2	29.9	27.2	25.2	25.7	28.9	31.5	32.2	31.4	30.5	24.0	33.3	28.0
Dec 11	29.5	29.8	29.8	31	30.9	29.7	29.9	29.7	29.3	28.9	28.5	S	X	X	X	X	X	31	31.8	31.9	31.7	31.9	32.4	32.1	28.5	32.4	30.5
Dec 12	32.2	33	32.6	32.2	31.4	30.1	29.2	29	29.1	29.1	S	29.4	29.5	29.1	27.6	29.4	30.5	30.2	30.4	30	28.7	30.5	31	30.5	27.6	33.0	30.2
Dec 13	30.2	29.6	27.9	28.4	27.5	27.1	26.3	25.2	24.2	S	29.7	C	C	C	C	C	C	21.8	22	23.2	24.5	27.4	27.4	25.8	21.8	30.2	-
Dec 14	23.1	23.9	25	24.6	24.6	25.1	26	26.5	S	26.9	26.7	23.3	21.9	20.7	18.1	13.1	7.4	8.4	16	19.1	24.5	26.6	27.3	29.2	7.4	29.2	22.1
Dec 15	29.5	29.4	29.8	29.5	30.1	30.2	30.6	S	30.7	30	30	29.4	29.9	29.8	29.8	29.5	27.6	25.7	24.6	25.7	S1	29.8	31.4	32.9	24.6	32.9	29.4
Dec 16	35.6	36.9	37	37.5	37.3	38.1	S	35.1	36.1	38.4	37.8	38.1	38.5	37.3	38.7	39.7	40	40	40.9	40.9	40.8	40.9	39.9	36.1	35.1	40.9	38.3
Dec 17	31.1	29.5	30.9	30.1	29.4	S	29.4	29.1	27.8	27.3	26.6	26.7	28.1	28.8	26.8	25.8	27.2	27	26.6	26.8	26.9	26.9	27.6	27.2	25.8	31.1	28.0
Dec 18	31.3	36.4	37.9	37.8	S	39	37.2	29.8	28.2	28.5	28.6	29.2	29.7	29.2	29.4	28.6	27.9	27.2	28.5	28.3	30.1	29.7	29.2	29.1	27.2	29.0	30.9
Dec 19	28.8	28.9	29.4	S	30.8	30.7	30.7	30.8	29.9	29.9	29.9	30.5	30.9	30.4	29.8	29.3	28.5	28.1	27.3	26.9	25.8	26.2	25.6	24.3	24.3	30.9	28.8
Dec 20	22.5	21.3	S	21.7	20.4	18.4	18.9	20.3	20.2	21.8	22	22.8	22.4	21.9	C1	C1	C1	23	23.2	22.7	24.1	23.5	22.1	22.6	18.4	24.1	21.8
Dec 21	23.5	S	23.7	22.8	24.4	26.3	25.9	24.4	23.5	22.8	21.4	19.6	20.3	20.1	19.2	22.2	22.6	20.5	18.4	17.1	17.7	18.5	18.9	17.8	17.1	26.3	21.4
Dec 22	S	15.7	17.6	17.9	16.7	16.7	17.6	18.9	20.8	23.5	23.3	22.9	23	21.6	18.3	17.6	16.2	18.3	17.5	16.6	16.4	18.5	19.1	S	15.7	23.5	18.9
Dec 23	19.9	19.1	20.7	20.5	18.9	17.8	17.7	16.9	16.2	16.5	17.4	18.3	18.7	20.8	19.9	18.9	18.1	18.3	22.8	26.9	26	27.1	S	35.1	16.2	35.1	20.5
Dec 24	35.7	32.9	28.5	29.2	29.4	30	27.8	27.8	30	33.8	35.1	35.7	37	37.5	35.1	34.3	32.5	31.7	31.8	31.7	31.8	S	32.3	31.5	27.8	37.5	32.3
Dec 25	30.7	30.6	30.9	30.3	29.5	28.8	28	27.3	26.5	25.7	25.8	26.6	24	22.3	21.3	21.2	24.4	26.1	29.2	S	34.6	35.9	35.7	21.2	35.9	27.9	
Dec 26	35.3	35.6	36.2	36	34.8	33.5	34.1	34.2	33.8	32.5	29.9	29.1	29.3	27.9	25.5	22	20	20.8	25.2	S	28.4	28.5	28.4	28	20.0	36.2	30.0
Dec 27	27.5	26.9	26.5	26.1	24.8	22.5	20.1	18.4	17.6	19.8	19.5	22.3	24.8	28.6	27.8	27.7	28.2	32.5	S	34	35.4	36.1	36.3	34.5	17.6	36.3	26.9
Dec 28	34.3	34.2	34.8	34.5	35	35.1	36	35.9	36.8	35	32.1	28.2	28.5	31.2	34	36	38.4	S	36.5	36.8	37	36.2	35.3	35.7	28.2	38.4	34.7
Dec 29	34.7	32.4	30.6	29.7	29.8	30.4	29.9	29.1	27.9	27.5	27.1	27.3	27.1	27	26.3	23.9	S	23.3	22.8	22.3	25.3	28	26.2	27	22.3	34.7	27.6
Dec 30	24.5	27.2	25.7	30.6	24.7	16.1	7	7.8	12.1	21.6	29.6	33.9	36.7	39	39	S	35.7	32.9	30.6	30.8	31.9	31.8	31.1	30.4	7.0	39.0	27.4
Dec 31	29.9	28.8	27.5	25.4	23.2	21.1	19.5	20.4	20.6	21.5	22.4	24.9	28.9	31.8	S	32.3	33.4	34.7	35.9	35.8	36.5	37.7	37.9	37.5	19.5	37.9	29.0
Diurnal Maximum	37	38	39	39	39	38	38	37	38	38	38	38	39	41	41	40	40	40	41	41	41	41	40	38			
Daiurnal Average	27.5	27.3	27.4	27.1	27.0	27.1	25.9	25.6	26.0	26.7	26.8	26.8	27.5	27.8	27.7	26.5	26.7	25.9	25.6	26.7	27.8	27.8	28.1				

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

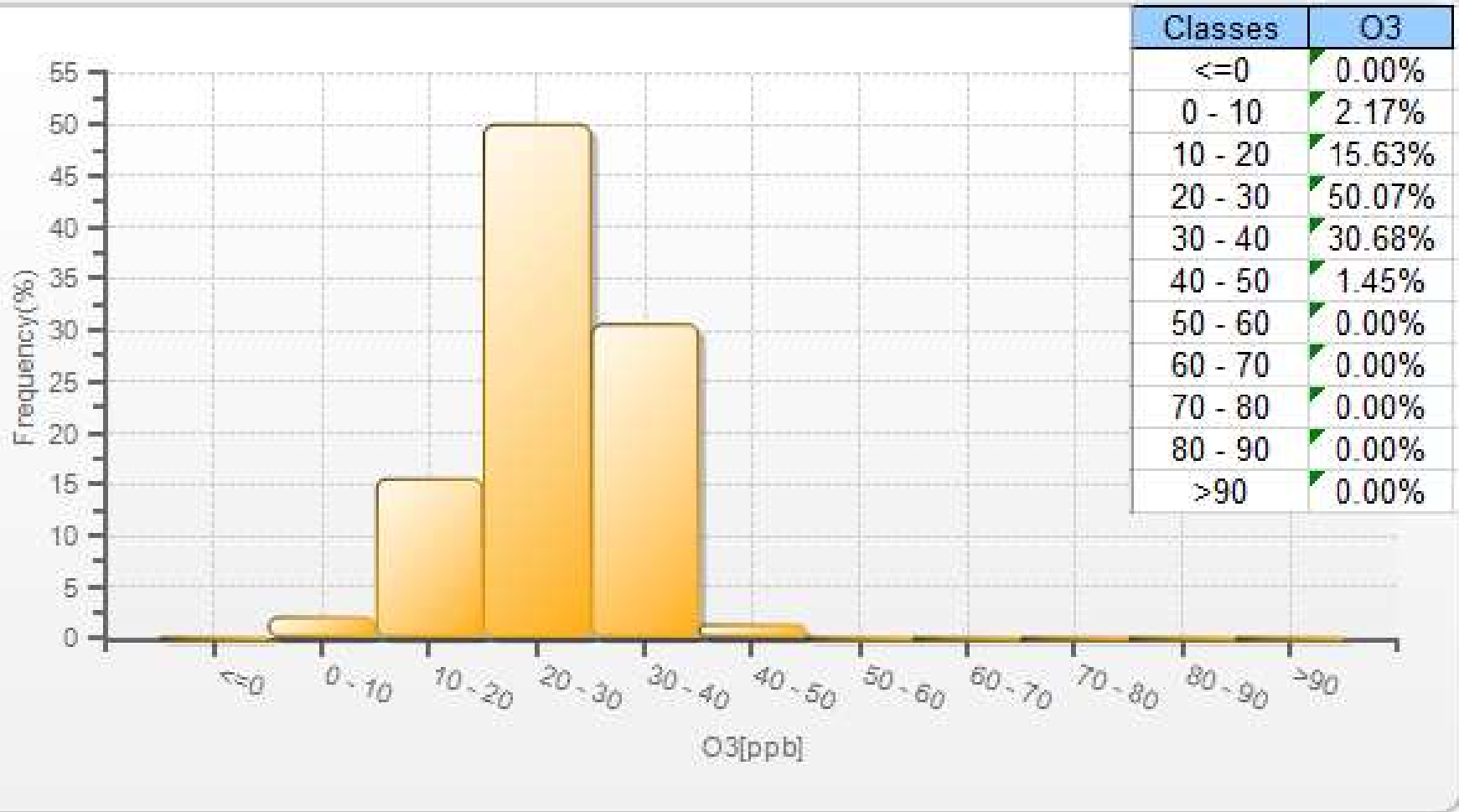
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

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

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

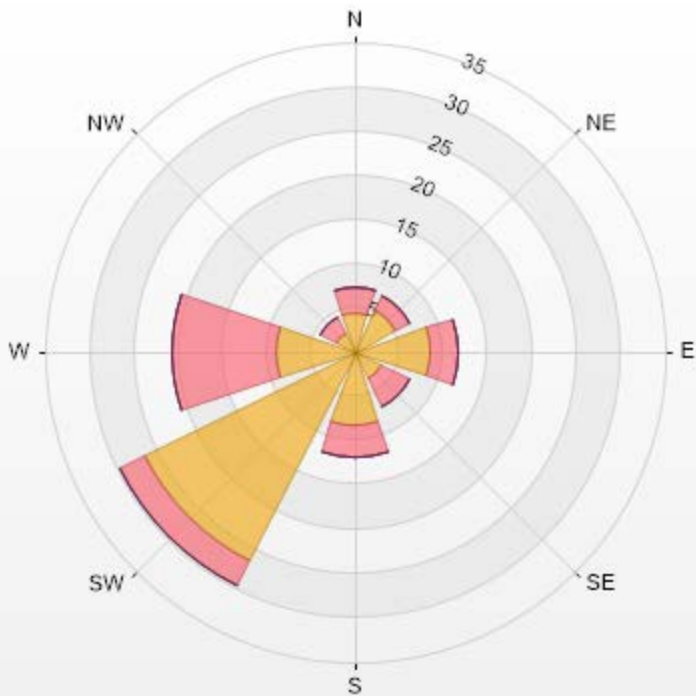


O3[ppb] Histogram: St. Lina Monthly: 12-2019 1 Hr.




Wind: St. Lina Poll.: St. Lina-O3[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 92.88% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	4.34	3.04	0	0	0	7.38
NE	5.21	1.88	0	0	0	7.09
E	8.68	3.04	0	0	0	11.72
SE	3.33	3.76	0	0	0	7.09
S	8.39	3.47	0	0	0	11.86
SW	26.48	3.18	0	0	0	29.66
W	8.97	11.72	0	0	0	20.69
NW	2.46	2.03	0	0	0	4.49
Summary	67.86	32.12	0	0	0	100



LICA-201912-Revision 1

%	Icon	Classes (ppb)	68		0-30	32		30-50		50-82	0		82-159	0		>159.0
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## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**St. Lina Site - December 2019**

**Summary of Hourly Averages**

### TOTAL HYDROCARBONS (THC) in ppm

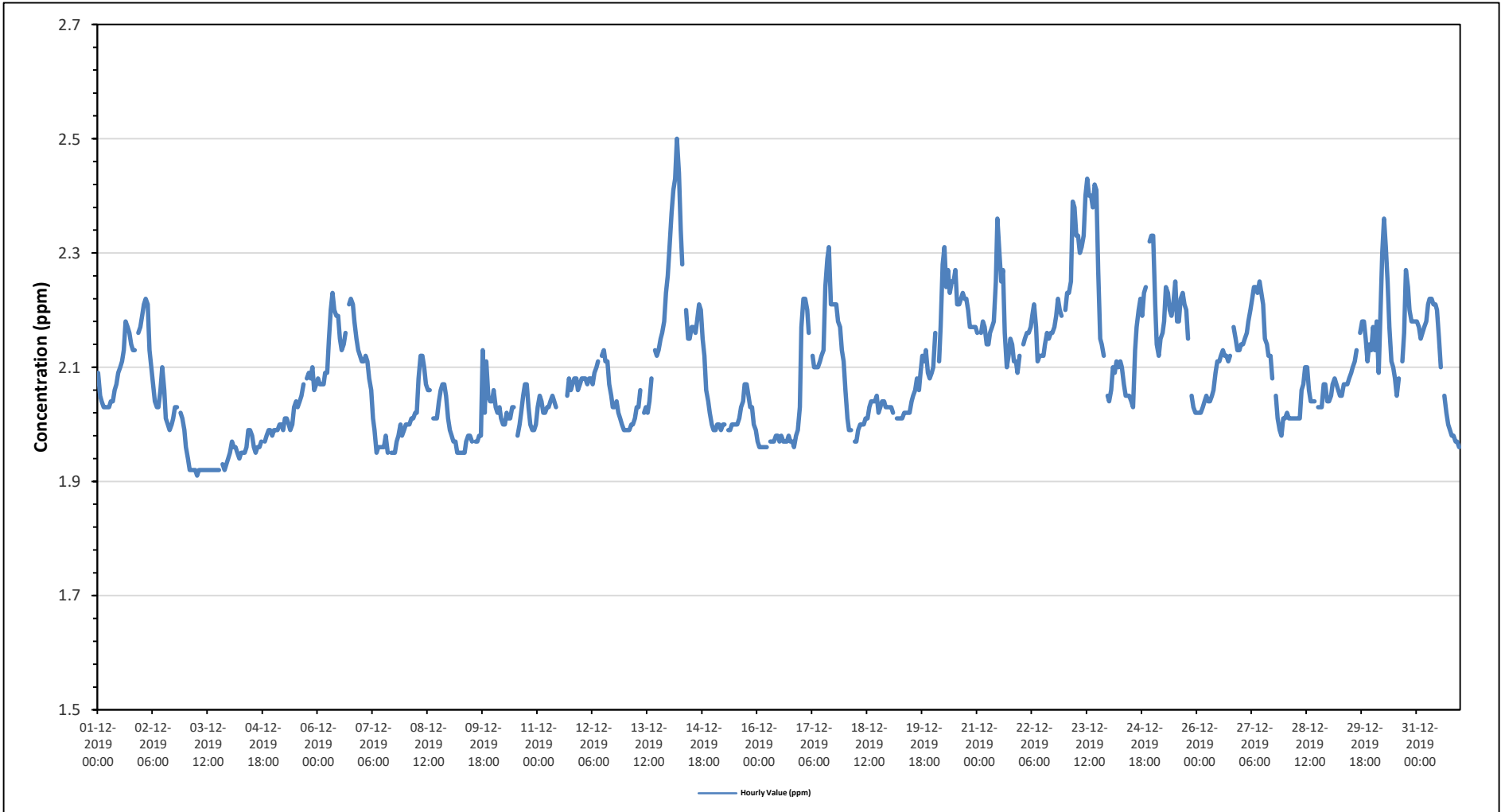
Maximum Hourly Value: 2.50 ppm on December 14 at hour 4	Hours in Service: 744
Maximum Daily Value: 2.30 ppm on December 23	Hours of Data: 707
Minimum Hourly Value: 1.91 ppm on December 3 at hour 6	Hours of Missing Data: 1
Minimum Daily Value: 1.92 ppm on December 3	Hours of Calibration: 36
Monthly Average: 2.09 ppm	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	
Dec 1	2.09	2.05	2.04	2.03	2.03	2.03	2.03	2.04	2.04	2.06	2.07	2.09	2.10	2.11	2.13	2.18	2.17	2.16	2.14	2.13	2.13	S	2.16	2.17	2.03	2.18	2.09	
Dec 2	2.19	2.21	2.22	2.21	2.13	2.10	2.07	2.04	2.03	2.03	2.06	2.10	2.06	2.01	2.00	1.99	2.00	2.01	2.03	2.03	S	2.02	2.01	1.99	1.99	2.22	2.07	
Dec 3	1.96	1.94	1.92	1.92	1.92	1.92	1.92	1.91	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	S	1.92	1.93	1.94	1.91	1.96	1.92	
Dec 4	1.95	1.97	1.96	1.96	1.95	1.94	1.95	1.95	1.95	1.96	1.99	1.99	1.98	1.96	1.95	1.96	1.96	1.97	S	1.97	1.98	1.99	1.99	1.98	1.94	1.99	1.97	
Dec 5	1.99	1.99	1.99	2.00	2.00	1.99	2.01	2.01	2.00	1.99	2.00	2.03	2.04	2.03	2.04	2.05	2.07	S	2.08	2.09	2.08	2.10	2.06	2.07	1.99	2.10	2.03	
Dec 6	2.08	2.08	2.07	2.07	2.09	2.09	2.15	2.20	2.23	2.20	2.19	2.19	2.15	2.13	2.14	2.16	S	2.21	2.22	2.21	2.18	2.15	2.13	2.12	2.07	2.23	2.15	
Dec 7	2.11	2.11	2.12	2.11	2.08	2.06	2.01	1.99	1.95	1.96	1.96	1.96	1.96	1.98	1.95	S	1.95	1.95	1.95	1.97	1.98	2.00	1.98	1.99	1.95	2.12	2.00	
Dec 8	2.00	2.00	2.00	2.01	2.01	2.02	2.02	2.08	2.12	2.12	2.10	2.07	2.06	2.06	S	2.01	2.01	2.01	2.04	2.06	2.07	2.07	2.05	2.01	2.00	2.12	2.04	
Dec 9	1.99	1.98	1.97	1.97	1.95	1.95	1.95	1.95	1.95	1.97	1.98	1.98	1.97	S	1.97	1.97	1.98	1.98	2.13	2.02	2.11	2.05	2.04	2.04	1.95	2.13	1.99	
Dec 10	2.06	2.03	2.02	2.03	2.01	2.00	2.00	2.02	2.01	2.01	2.03	2.03	S	1.98	2.00	2.02	2.05	2.07	2.07	2.03	2.00	1.99	1.99	2.00	1.98	2.07	2.02	
Dec 11	2.03	2.05	2.04	2.02	2.02	2.03	2.03	2.04	2.05	2.04	2.03	S	C	C	C	C	2.05	2.08	2.06	2.07	2.08	2.08	2.06	2.07	2.02	2.08	2.05	
Dec 12	2.08	2.08	2.08	2.07	2.08	2.08	2.07	2.09	2.10	2.11	S	2.12	2.13	2.11	2.11	2.07	2.05	2.03	2.03	2.04	2.02	2.01	2.00	1.99	1.99	2.13	2.07	
Dec 13	1.99	1.99	1.99	2.00	2.00	2.01	2.03	2.03	2.06	S	2.02	2.03	2.02	2.04	2.08	S1	2.13	2.12	2.13	2.15	2.16	2.18	2.23	2.26	1.99	2.26	2.08	
Dec 14	2.31	2.37	2.41	2.43	2.50	2.44	2.34	2.28	S	2.20	2.15	2.15	2.17	2.17	2.16	2.18	2.21	2.20	2.15	2.12	2.06	2.04	2.02	2.00	2.00	2.50	2.22	
Dec 15	1.99	1.99	2.00	2.00	1.99	2.00	2.00	S	1.99	1.99	2.00	2.00	2.00	2.00	2.01	2.03	2.04	2.07	2.07	2.05	2.03	2.03	2.00	1.99	1.99	2.07	2.01	
Dec 16	1.97	1.96	1.96	1.96	1.96	1.96	S	1.97	1.97	1.97	1.98	1.98	1.97	1.98	1.97	1.97	1.98	1.97	1.98	1.97	1.96	1.98	1.99	2.03	1.96	2.03	1.97	
Dec 17	2.17	2.22	2.22	2.20	2.16	S	2.12	2.10	2.10	2.10	2.11	2.12	2.13	2.24	2.29	2.31	2.21	2.21	2.21	2.21	2.18	2.17	2.13	2.11	2.10	2.31	2.17	
Dec 18	2.06	2.01	1.99	1.99	S	1.97	1.97	1.99	2.00	2.00	2.00	2.01	2.01	2.03	2.04	2.04	2.04	2.05	2.02	2.03	2.04	2.04	2.03	2.03	1.97	2.06	2.02	
Dec 19	2.03	2.03	2.02	S	2.01	2.01	2.01	2.01	2.02	2.02	2.02	2.02	2.02	2.04	2.05	2.06	2.08	2.06	2.09	2.12	2.11	2.13	2.09	2.08	2.09	2.01	2.13	2.05
Dec 20	2.10	2.16	S	2.11	2.17	2.28	2.31	2.24	2.27	2.23	2.25	2.25	2.27	2.21	2.21	2.22	2.23	2.22	2.22	2.20	2.17	2.17	2.17	2.17	2.10	2.31	2.21	
Dec 21	2.16	S	2.16	2.18	2.17	2.14	2.14	2.16	2.17	2.18	2.25	2.36	2.30	2.25	2.27	2.16	2.10	2.12	2.15	2.14	2.11	2.11	2.09	2.12	2.09	2.36	2.17	
Dec 22	S	2.14	2.15	2.16	2.16	2.17	2.19	2.21	2.17	2.11	2.12	2.12	2.12	2.14	2.16	2.15	2.16	2.16	2.17	2.19	2.22	2.20	2.19	S	2.11	2.22	2.16	
Dec 23	2.20	2.23	2.23	2.25	2.39	2.38	2.33	2.33	2.30	2.31	2.33	2.40	2.43	2.40	2.40	2.38	2.42	2.41	2.27	2.15	2.14	2.12	S	2.05	2.05	2.43	2.30	
Dec 24	2.04	2.06	2.10	2.09	2.11	2.10	2.11	2.10	2.07	2.05	2.05	2.04	2.03	2.13	2.17	2.20	2.22	2.19	2.23	2.24	S	2.32	2.33	2.03	2.33	2.13		
Dec 25	2.33	2.21	2.14	2.12	2.15	2.16	2.18	2.24	2.23	2.20	2.19	2.21	2.25	2.18	2.18	2.22	2.23	2.21	2.20	2.15	S	2.05	2.03	2.02	2.02	2.33	2.18	
Dec 26	2.02	2.02	2.02	2.03	2.04	2.05	2.04	2.04	2.05	2.06	2.09	2.11	2.11	2.12	2.13	2.12	2.12	2.11	2.12	S	2.17	2.15	2.13	2.13	2.02	2.17	2.09	
Dec 27	2.14	2.14	2.15	2.16	2.18	2.20	2.22	2.24	2.24	2.23	2.25	2.23	2.21	2.15	2.14	2.12	2.12	2.08	S	2.05	2.01	1.99	1.98	2.01	1.98	2.25	2.14	
Dec 28	2.01	2.02	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.06	2.07	2.10	2.10	2.06	2.04	2.04	S	2.03	2.03	2.03	2.07	2.07	2.04	2.01	2.10	2.04	2.04	
Dec 29	2.04	2.05	2.07	2.08	2.07	2.06	2.05	2.05	2.07	2.07	2.07	2.08	2.09	2.10	2.11	2.13	S	2.16	2.18	2.18	2.15	2.11	2.14	2.13	2.04	2.18	2.10	
Dec 30	2.17	2.13	2.18	2.09	2.18	2.30	2.36	2.31	2.25	2.17	2.11	2.10	2.08	2.05	2.08	S	2.11	2.16	2.27	2.24	2.20	2.18	2.18	2.18	2.05	2.36	2.18	
Dec 31	2.18	2.17	2.15	2.16	2.17	2.18	2.21	2.22	2.22	2.21	2.21	2.20	2.15	2.10	S	2.05	2.02	2.00	1.99	1.98	1.98	1.97	1.97	1.96	1.96	2.22	2.11	
Diurnal Maximum	2.33	2.37	2.41	2.43	2.50	2.44	2.36	2.33	2.30	2.31	2.33	2.40	2.43	2.40	2.40	2.38	2.42	2.41	2.27	2.24	2.24	2.20	2.32	2.33				
Diurnal Average	2.08	2.08	2.08	2.08	2.09	2.09	2.09	2.10	2.08	2.08	2.09	2.10	2.10	2.09	2.10	2.10	2.09	2.10	2.11	2.10	2.09	2.07	2.07	2.07				

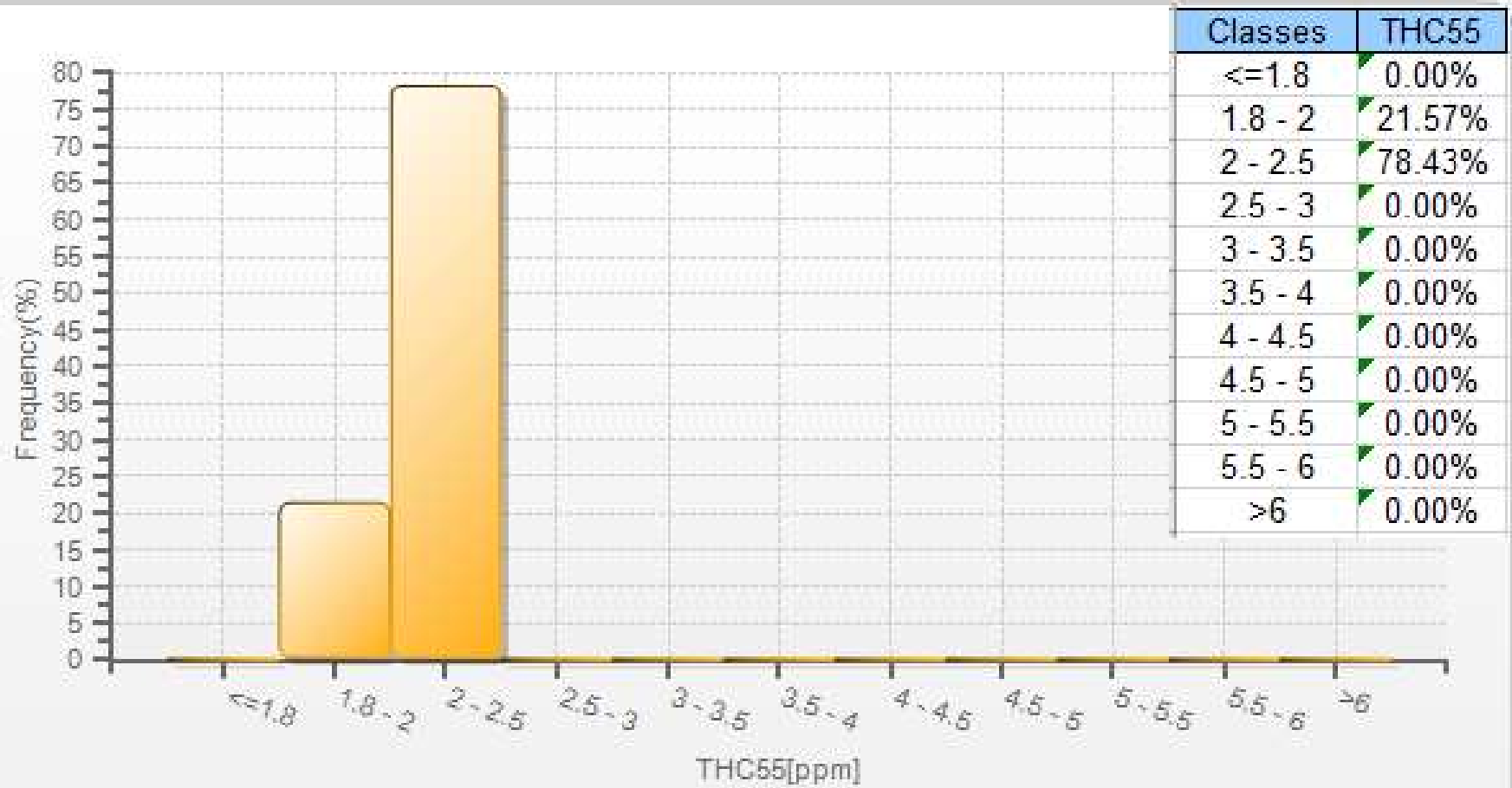
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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 THC - St. Lina Site**



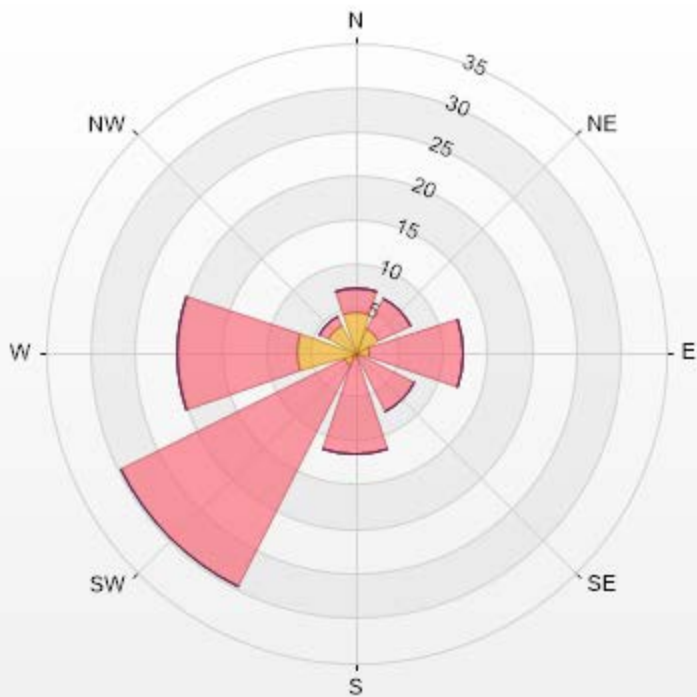
THC55[ppm] Histogram: St. Lina Monthly: 12-2019 1 Hr.





Wind: St. Lina Poll.: St. Lina-THC55[ppm] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 90.99% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	4.73	2.66	0	0	0	7.39
NE	2.95	3.99	0	0	0	6.94
E	1.62	10.49	0	0	0	12.11
SE	0.44	6.94	0	0	0	7.38
S	0.3	11.23	0	0	0	11.53
SW	1.48	28.21	0	0	0	29.69
W	6.65	13.59	0	0	0	20.24
NW	3.4	1.33	0	0	0	4.73
Summary	21.57	78.44	0	0	0	100



LICA-201912-Revision 1

% Icon Classes (ppm)	22	76	0	0
0-2	22	76	0	0
5-10				
10-40				
>40.0				



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**St. Lina Site - December 2019**

**Summary of Hourly Averages**

**METHANE (CH4) in ppm**

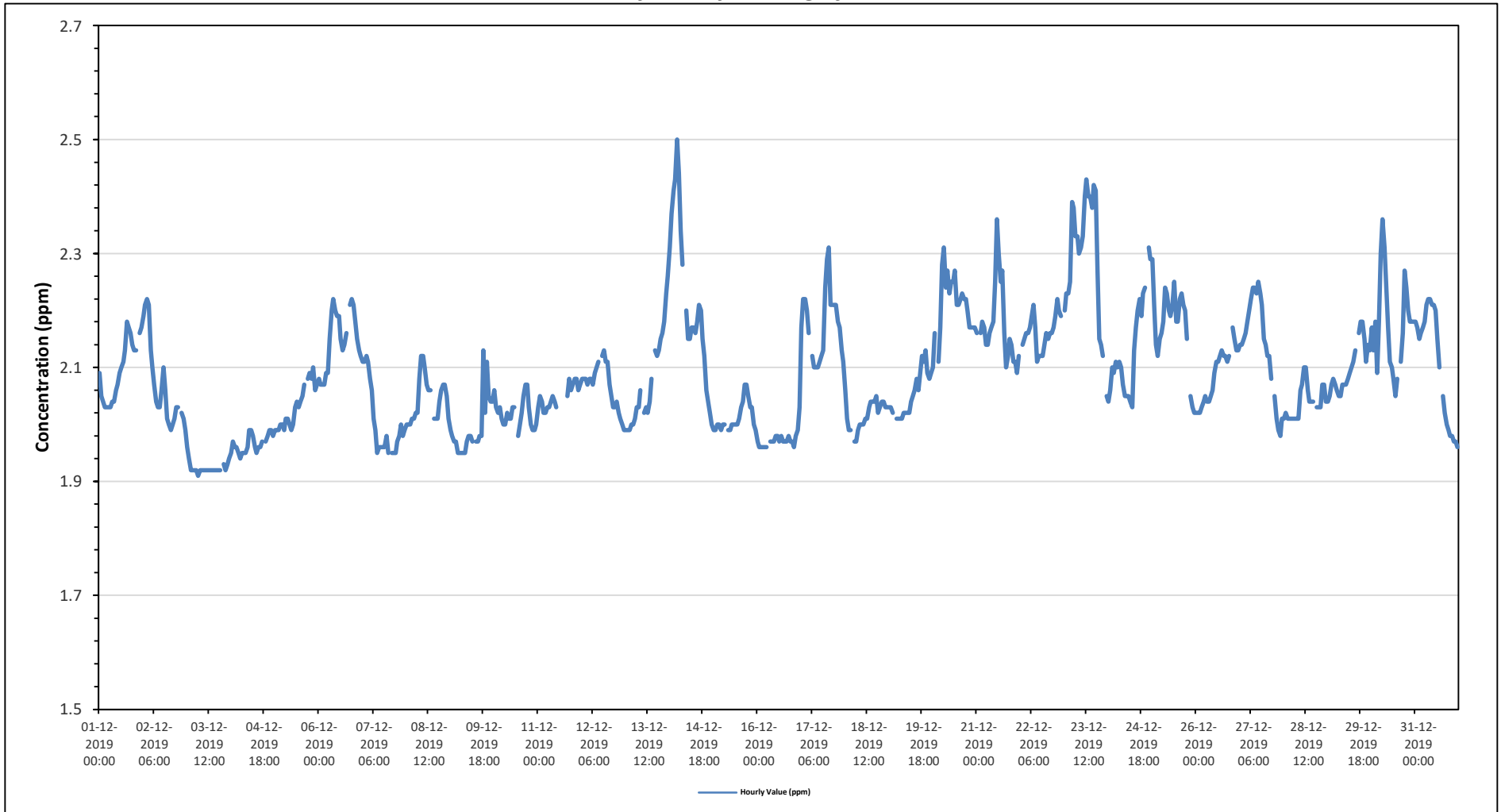
Maximum Hourly Value: 2.50 ppm on December 14 at hour 4	Hours in Service: 744
Maximum Daily Value: 2.30 ppm on December 23	Hours of Data: 707
Minimum Hourly Value: 1.91 ppm on December 3 at hour 6	Hours of Missing Data: 1
Minimum Daily Value: 1.92 ppm on December 3	Hours of Calibration: 36
Monthly Average: 2.09 ppm	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	
Dec 1	2.09	2.05	2.04	2.03	2.03	2.03	2.03	2.04	2.04	2.06	2.07	2.09	2.10	2.11	2.13	2.18	2.17	2.16	2.14	2.13	2.13	S	2.16	2.17	2.03	2.18	2.09	
Dec 2	2.19	2.21	2.22	2.21	2.13	2.10	2.07	2.04	2.03	2.03	2.06	2.10	2.06	2.01	2.00	1.99	2.00	2.01	2.03	2.03	S	2.02	2.01	1.99	1.99	2.22	2.07	
Dec 3	1.96	1.94	1.92	1.92	1.92	1.92	1.92	1.91	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	S	1.92	1.93	1.94	1.91	1.96	1.92	
Dec 4	1.95	1.97	1.96	1.96	1.95	1.94	1.95	1.95	1.95	1.96	1.99	1.99	1.98	1.96	1.95	1.96	1.96	1.97	S	1.97	1.98	1.99	1.99	1.98	1.94	1.99	1.97	
Dec 5	1.99	1.99	1.99	2.00	2.00	1.99	2.01	2.01	2.00	1.99	2.00	2.03	2.04	2.03	2.04	2.05	2.07	S	2.08	2.09	2.08	2.10	2.06	2.07	1.99	2.10	2.03	
Dec 6	2.08	2.08	2.07	2.07	2.09	2.09	2.15	2.20	2.22	2.20	2.19	2.19	2.15	2.13	2.14	2.16	S	2.21	2.22	2.21	2.18	2.15	2.13	2.12	2.07	2.22	2.15	
Dec 7	2.11	2.11	2.12	2.11	2.08	2.06	2.01	1.99	1.95	1.96	1.96	1.96	1.96	1.98	1.95	S	1.95	1.95	1.95	1.97	1.98	2.00	1.98	1.99	1.95	2.12	2.00	
Dec 8	2.00	2.00	2.00	2.01	2.01	2.02	2.02	2.08	2.12	2.12	2.10	2.07	2.06	2.06	S	2.01	2.01	2.01	2.04	2.06	2.07	2.07	2.05	2.01	2.00	2.12	2.04	
Dec 9	1.99	1.98	1.97	1.97	1.95	1.95	1.95	1.95	1.95	1.97	1.98	1.98	1.97	S	1.97	1.97	1.98	1.98	2.13	2.02	2.11	2.05	2.04	2.04	1.95	2.13	1.99	
Dec 10	2.06	2.03	2.02	2.03	2.01	2.00	2.00	2.02	2.01	2.01	2.03	2.03	S	1.98	2.00	2.02	2.05	2.07	2.07	2.03	2.00	1.99	1.99	2.00	1.98	2.07	2.02	
Dec 11	2.03	2.05	2.04	2.02	2.02	2.03	2.03	2.04	2.05	2.04	2.03	S	C	C	C	C	2.05	2.08	2.06	2.07	2.08	2.08	2.06	2.07	2.02	2.08	2.05	
Dec 12	2.08	2.08	2.08	2.07	2.08	2.08	2.07	2.09	2.10	2.11	S	2.12	2.13	2.11	2.11	2.07	2.05	2.03	2.03	2.04	2.02	2.01	2.00	1.99	1.99	2.13	2.07	
Dec 13	1.99	1.99	1.99	2.00	2.00	2.01	2.03	2.03	2.06	S	2.02	2.03	2.02	2.04	2.08	S1	2.13	2.12	2.13	2.15	2.16	2.18	2.23	2.26	1.99	2.26	2.08	
Dec 14	2.31	2.37	2.41	2.43	2.50	2.44	2.34	2.28	S	2.20	2.15	2.15	2.17	2.17	2.16	2.18	2.21	2.20	2.15	2.12	2.06	2.04	2.02	2.00	2.00	2.50	2.22	
Dec 15	1.99	1.99	2.00	2.00	1.99	2.00	2.00	S	1.99	1.99	2.00	2.00	2.00	2.00	2.01	2.03	2.04	2.07	2.07	2.05	2.03	2.03	2.00	1.99	1.99	2.07	2.01	
Dec 16	1.97	1.96	1.96	1.96	1.96	1.96	S	1.97	1.97	1.97	1.98	1.98	1.97	1.98	1.97	1.97	1.98	1.97	1.98	1.97	1.96	1.98	1.99	2.03	1.96	2.03	1.97	
Dec 17	2.17	2.22	2.22	2.20	2.16	S	2.12	2.10	2.10	2.10	2.11	2.12	2.13	2.24	2.29	2.31	2.21	2.21	2.21	2.21	2.18	2.17	2.13	2.11	2.10	2.31	2.17	
Dec 18	2.06	2.01	1.99	1.99	S	1.97	1.97	1.99	2.00	2.00	2.00	2.01	2.01	2.03	2.04	2.04	2.04	2.05	2.02	2.03	2.04	2.04	2.03	2.03	1.97	2.06	2.02	
Dec 19	2.03	2.03	2.02	S	2.01	2.01	2.01	2.01	2.02	2.02	2.02	2.02	2.02	2.04	2.05	2.06	2.08	2.06	2.09	2.12	2.11	2.13	2.09	2.08	2.09	2.01	2.13	2.05
Dec 20	2.10	2.16	S	2.11	2.17	2.28	2.31	2.24	2.27	2.23	2.25	2.25	2.27	2.21	2.21	2.22	2.23	2.22	2.22	2.20	2.17	2.17	2.17	2.17	2.10	2.31	2.21	
Dec 21	2.16	S	2.16	2.18	2.17	2.14	2.14	2.16	2.17	2.18	2.25	2.36	2.30	2.25	2.27	2.16	2.10	2.12	2.15	2.14	2.11	2.11	2.09	2.12	2.09	2.36	2.17	
Dec 22	S	2.14	2.15	2.16	2.16	2.17	2.19	2.21	2.17	2.11	2.12	2.12	2.12	2.14	2.16	2.15	2.16	2.16	2.17	2.19	2.22	2.20	2.19	S	2.11	2.22	2.16	
Dec 23	2.20	2.23	2.23	2.25	2.39	2.38	2.33	2.33	2.30	2.31	2.33	2.40	2.43	2.40	2.40	2.38	2.42	2.41	2.27	2.15	2.14	2.12	S	2.05	2.05	2.43	2.30	
Dec 24	2.04	2.06	2.10	2.09	2.11	2.10	2.11	2.10	2.07	2.05	2.05	2.04	2.03	2.13	2.17	2.20	2.22	2.19	2.23	2.24	S	2.31	2.29	2.03	2.31	2.13	2.13	
Dec 25	2.29	2.21	2.14	2.12	2.15	2.16	2.18	2.24	2.23	2.20	2.19	2.21	2.25	2.18	2.18	2.22	2.23	2.21	2.20	2.15	S	2.05	2.03	2.02	2.02	2.29	2.18	
Dec 26	2.02	2.02	2.02	2.03	2.04	2.05	2.04	2.04	2.05	2.06	2.09	2.11	2.11	2.12	2.13	2.12	2.12	2.11	2.12	S	2.17	2.15	2.13	2.13	2.02	2.17	2.09	
Dec 27	2.14	2.14	2.15	2.16	2.18	2.20	2.22	2.24	2.24	2.23	2.25	2.23	2.21	2.15	2.14	2.12	2.12	2.08	S	2.05	2.01	1.99	1.98	2.01	1.98	2.25	2.14	
Dec 28	2.01	2.02	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.06	2.07	2.10	2.10	2.06	2.04	2.04	S	2.03	2.03	2.03	2.07	2.07	2.04	2.01	2.10	2.04	2.04	
Dec 29	2.04	2.05	2.07	2.08	2.07	2.06	2.05	2.05	2.07	2.07	2.07	2.08	2.09	2.10	2.11	2.13	S	2.16	2.18	2.18	2.15	2.11	2.14	2.13	2.04	2.18	2.10	
Dec 30	2.17	2.13	2.18	2.09	2.18	2.30	2.36	2.31	2.25	2.17	2.11	2.10	2.08	2.05	2.08	S	2.11	2.16	2.27	2.24	2.20	2.18	2.18	2.18	2.05	2.36	2.18	
Dec 31	2.18	2.17	2.15	2.16	2.17	2.18	2.21	2.22	2.22	2.21	2.21	2.20	2.15	2.10	S	2.05	2.02	2.00	1.99	1.98	1.98	1.97	1.97	1.96	1.96	2.22	2.11	
Diurnal Maximum	2.31	2.37	2.41	2.43	2.50	2.44	2.36	2.33	2.30	2.31	2.33	2.40	2.43	2.40	2.40	2.38	2.42	2.41	2.27	2.24	2.24	2.20	2.31	2.29				
Diurnal Average	2.08	2.08	2.08	2.08	2.09	2.09	2.09	2.10	2.08	2.08	2.09	2.10	2.10	2.09	2.10	2.10	2.09	2.10	2.11	2.10	2.09	2.07	2.07	2.07				

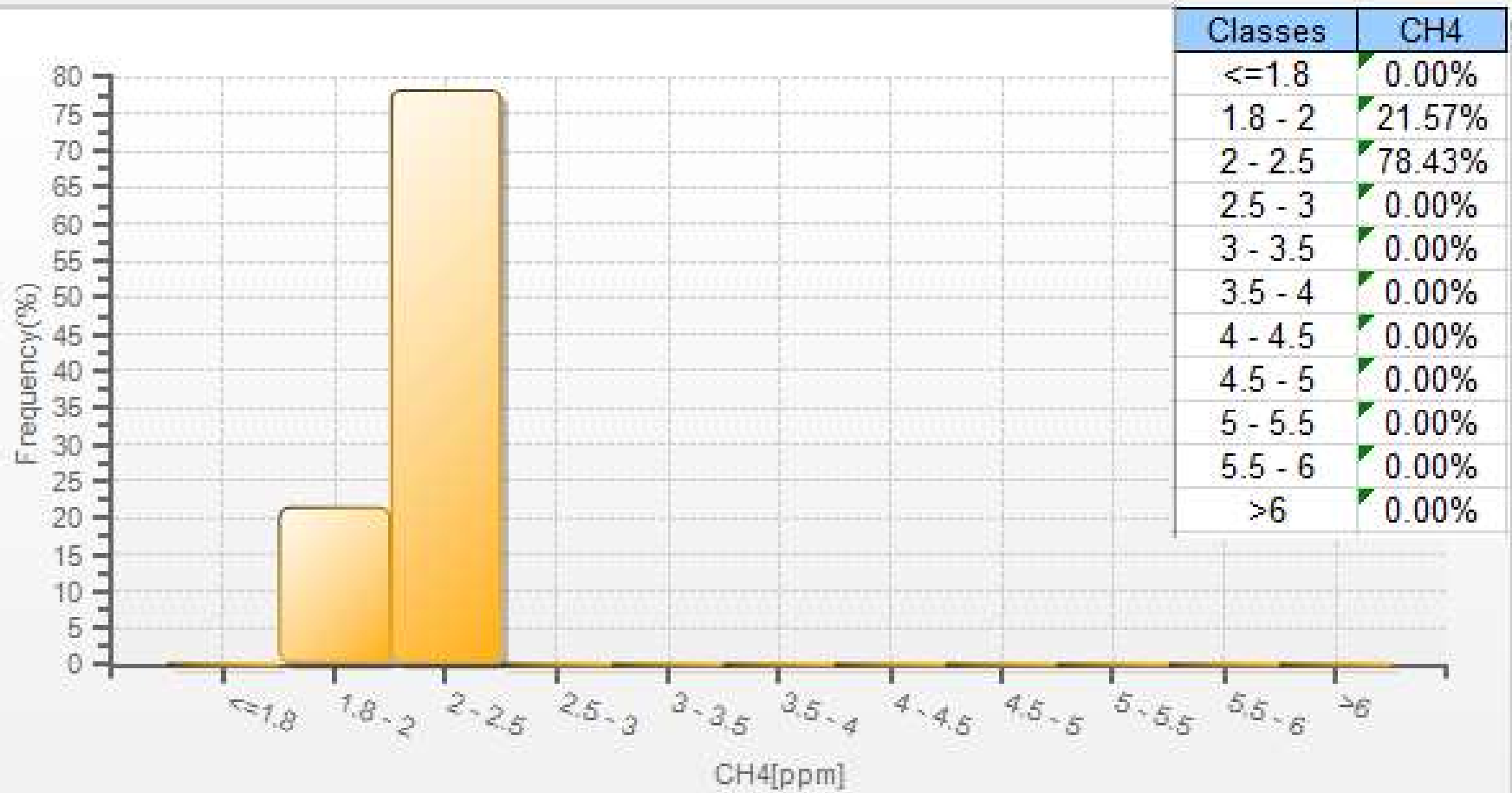
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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 CH4 - St. Lina Site**

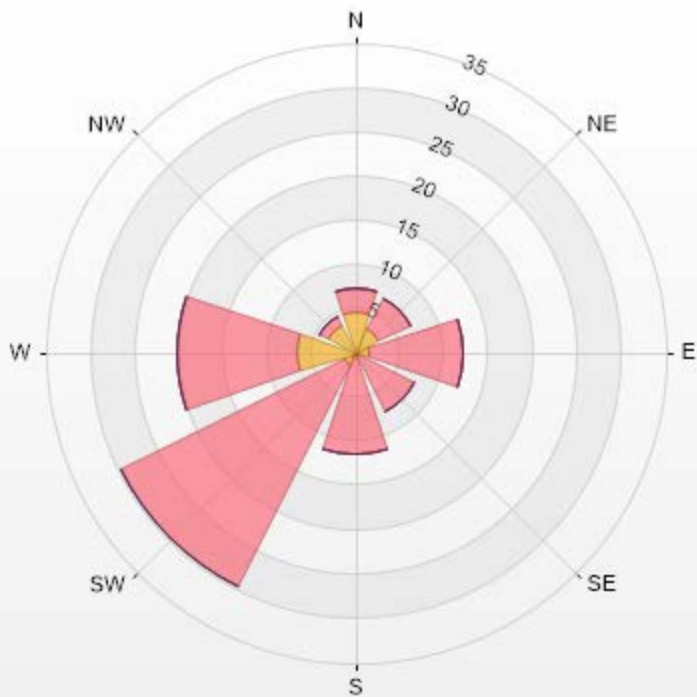


CH4[ppm] Histogram: St. Lina Monthly: 12-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-CH4[ppm] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 90.99% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	4.73	2.66	0	0	0	7.39
NE	2.95	3.99	0	0	0	6.94
E	1.62	10.49	0	0	0	12.11
SE	0.44	6.94	0	0	0	7.38
S	0.3	11.23	0	0	0	11.53
SW	1.48	28.21	0	0	0	29.69
W	6.65	13.59	0	0	0	20.24
NW	3.4	1.33	0	0	0	4.73
Summary	21.57	78.44	0	0	0	100



LICA-201912-Revision 1

% Icon	Classes (ppm)	22	0-2	76	1-5	365	5-10	0	10-20	0	>20.0



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**St. Lina Site - December 2019**

**Summary of Hourly Averages**

### NON-METHANE HYDROCARBONS (NMHC) in ppm

Maximum Hourly Value:	0.04 ppm on December 24 at hour 23	Hours in Service:	744
Maximum Daily Value:	0.00 ppm on December 24	Hours of Data:	707
Minimum Hourly Value:	0.00 ppm on December 1 at hour 0	Hours of Missing Data:	1
Minimum Daily Value:	0.00 ppm on December 1	Hours of Calibration:	36
Monthly Average:	0.00 ppm	Operational Uptime:	99.9

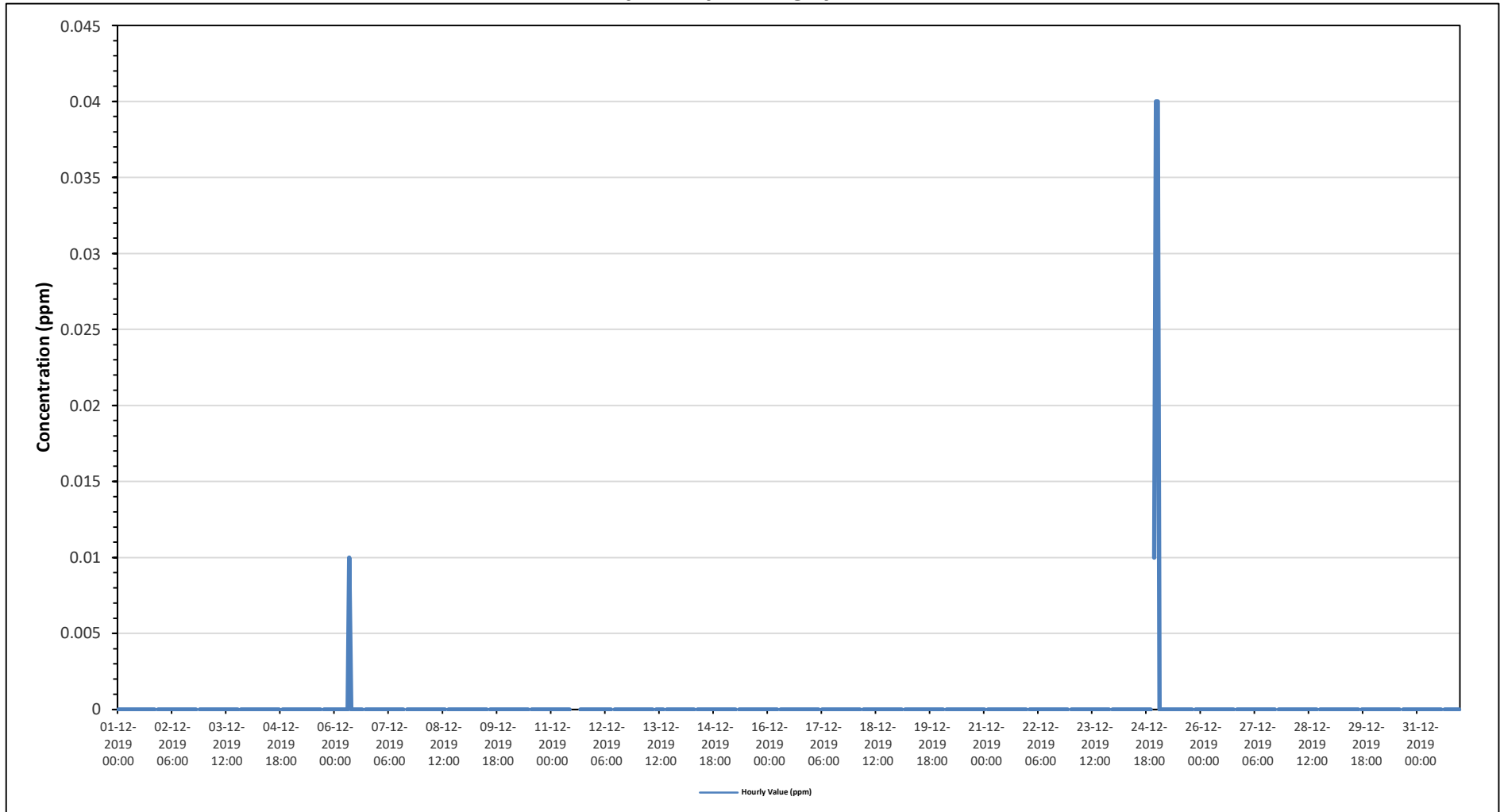
Day	Hourly Period Starting at (MST)																							Daily	Daily	Daily		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Minimum	Maximum	Average	
Dec 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	0.00	S	S	0.00	0.00	0.00	0.00	0.00
Dec 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	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00
Dec 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	0.00	S	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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
Dec 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
Dec 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	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
Dec 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	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
Dec 11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	C	C	C	C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 12	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
Dec 13	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	S1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 14	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
Dec 15	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
Dec 16	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
Dec 17	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
Dec 18	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
Dec 19	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
Dec 20	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
Dec 21	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
Dec 22	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
Dec 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
Dec 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	0.00	S	0.01	0.04	0.00	0.04	0.00	0.00
Dec 25	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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
Dec 31	0.00	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	0.04	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	0.00	0.00	0.00	0.00	0.01	0.04	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

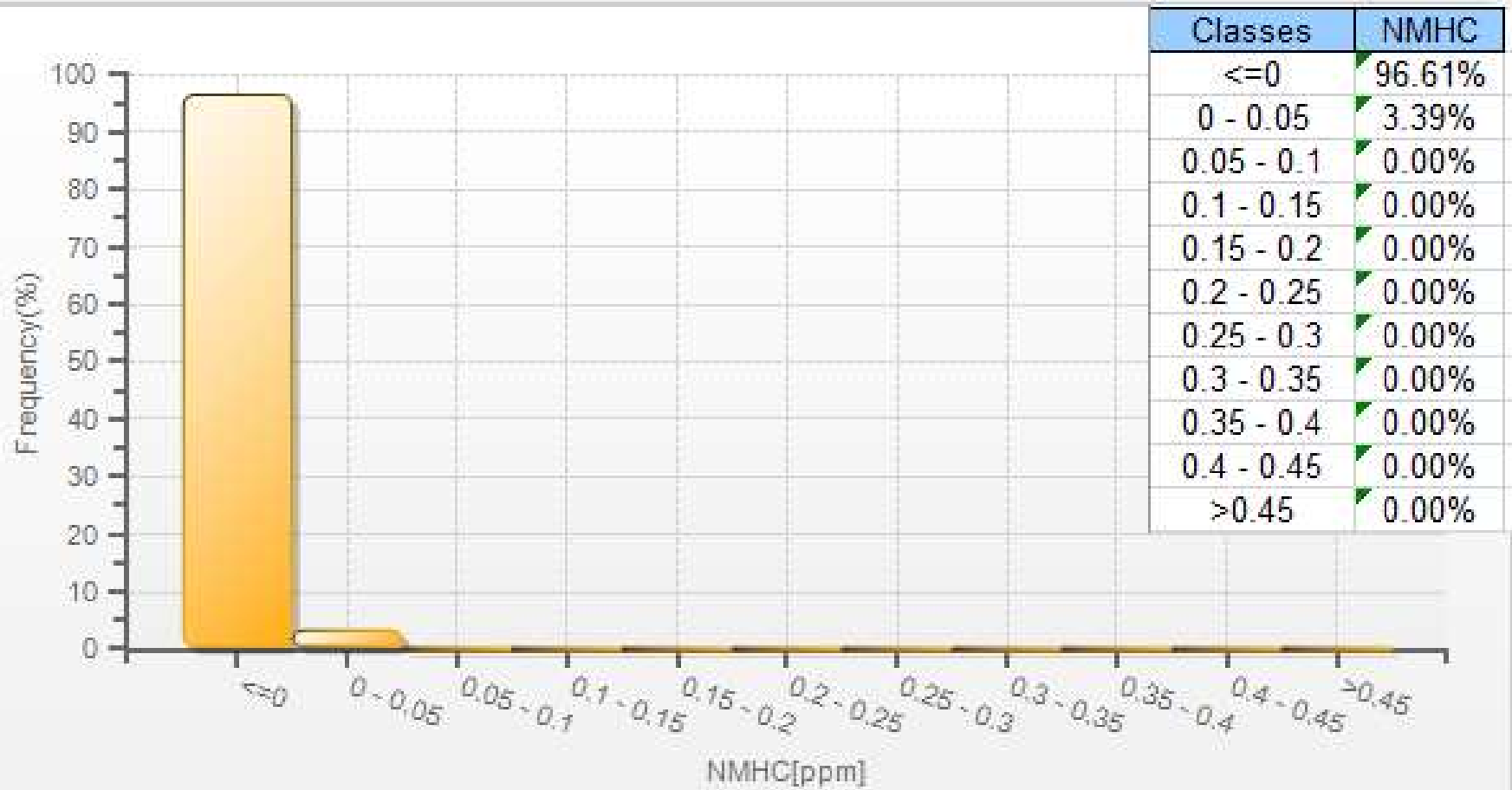
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.  
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



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

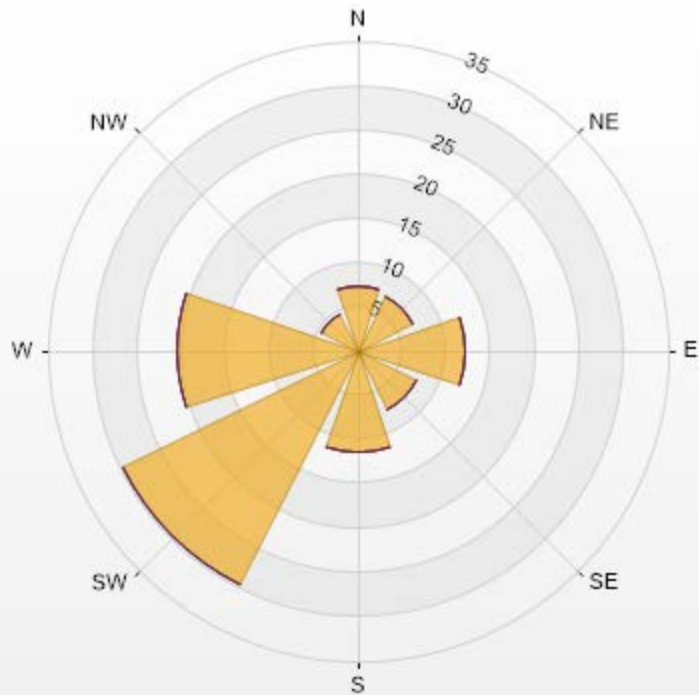


NMHC[ppm] Histogram: St. Lina Monthly: 12-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-NMHC[ppm] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 91.13% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-0.9	0.9-2	>2.0	Total
N	7.37	0	0	0	0	7.37
NE	6.93	0	0	0	0	6.93
E	12.09	0	0	0	0	12.09
SE	7.37	0	0	0	0	7.37
S	11.5	0	0	0	0	11.5
SW	29.65	0	0	0	0	29.65
W	20.35	0	0	0	0	20.35
NW	4.72	0	0	0	0	4.72
Summary	100	0	0	0	0	100



LICA-201912-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

St. Lina Site - December 2019

Summary of Hourly Averages

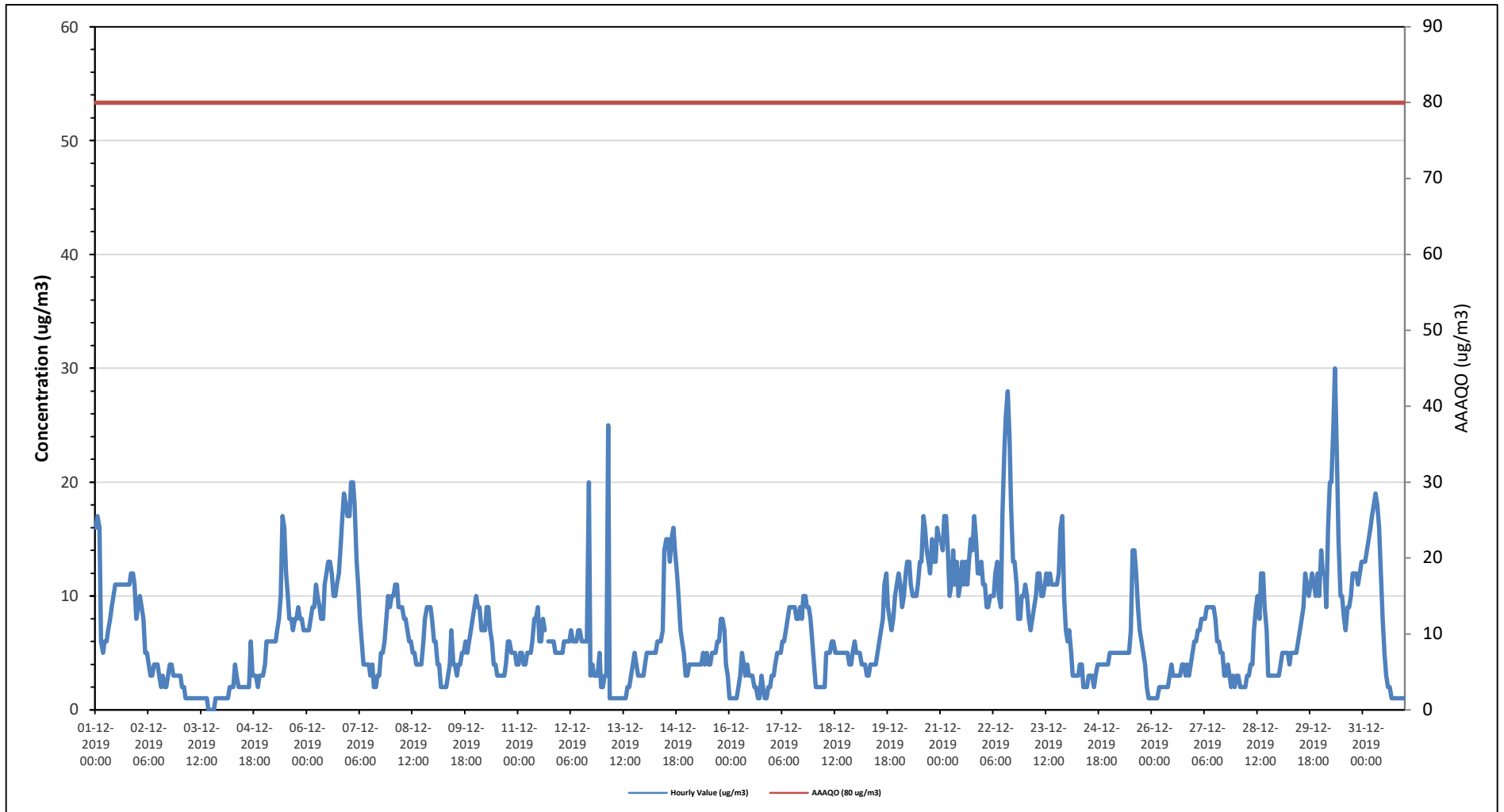
### PARTICULATE MATTER 2.5 (PM<sub>2.5</sub>) in µg/m<sup>3</sup>

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 80 µg/m <sup>3</sup> , 24-Hour 29 µg/m <sup>3</sup>																											
Number of 1-Hour Exceedences: 0					Number of 24-Hour Exceedences: 0																						
Maximum Hourly Value: 30 µg/m <sup>3</sup> on December 30 at hour 8					Hours in Service: 744																						
Maximum Daily Value: 13.8 µg/m <sup>3</sup> on December 30					Hours of Data: 743																						
Minimum Hourly Value: 0 µg/m <sup>3</sup> on December 3 at hour 16					Hours of Missing Data: 0																						
Minimum Daily Value: 1 µg/m <sup>3</sup> on December 3					Hours of Calibration: 1																						
Monthly Average: 6.9 µg/m <sup>3</sup>					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			
Dec 1	16	17	16	6	5	6	6	7	8	9	10	11	11	11	11	11	11	11	11	11	12	12	11	8	5	17	10.3
Dec 2	9	10	9	8	5	5	4	3	3	4	4	4	3	2	3	2	2	3	4	4	3	3	3	3	2	10	4.3
Dec 3	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	0	3	1.0
Dec 4	1	1	1	1	2	2	2	4	3	2	2	2	2	2	2	2	6	3	3	3	2	3	3	3	1	6	2.4
Dec 5	4	6	6	6	6	6	6	7	8	10	17	16	12	10	8	8	7	8	8	9	8	8	7	7	4	17	8.3
Dec 6	7	7	8	9	9	11	10	9	8	8	11	12	13	13	12	10	10	11	12	14	17	19	18	17	7	19	11.5
Dec 7	17	20	20	18	13	11	8	6	4	4	4	4	3	4	2	2	3	3	5	5	6	8	10	9	2	20	7.9
Dec 8	10	10	11	11	9	9	9	8	8	7	6	6	5	5	4	4	4	4	6	8	9	9	9	8	4	11	7.5
Dec 9	6	6	4	4	2	2	2	2	3	4	7	4	4	3	4	4	5	5	6	5	6	7	8	9	2	9	4.7
Dec 10	10	9	9	7	7	7	9	9	7	6	4	4	3	3	3	3	3	4	6	6	5	5	5	4	3	10	5.8
Dec 11	4	5	5	4	4	5	5	5	6	8	8	9	6	6	8	7	C	6	6	6	6	5	5	5	4	9	5.8
Dec 12	5	5	6	6	6	6	7	6	6	6	7	7	6	6	6	6	20	3	4	3	3	3	5	2	2	20	5.8
Dec 13	2	3	3	25	1	1	1	1	1	1	1	1	1	1	2	2	3	4	5	4	3	3	3	3	1	25	3.1
Dec 14	4	5	5	5	5	5	5	6	6	6	7	14	15	15	13	15	16	14	12	10	7	6	5	3	3	16	8.5
Dec 15	3	4	4	4	4	4	4	4	4	5	4	5	4	4	5	5	5	6	6	8	8	7	4	3	3	8	4.8
Dec 16	1	1	1	1	1	2	3	5	4	3	4	3	3	3	2	2	1	1	3	2	1	1	2	2	1	5	2.2
Dec 17	3	3	4	5	5	5	6	6	7	8	9	9	9	8	8	9	8	10	10	9	9	8	6	3	10	7.2	
Dec 18	4	2	2	2	2	2	2	5	5	5	6	6	5	5	5	5	5	5	5	4	4	5	6	2	6	4.3	
Dec 19	5	5	5	4	4	4	3	3	4	4	4	4	5	6	7	8	11	12	9	8	7	8	10	11	3	12	6.3
Dec 20	12	11	9	10	12	13	13	11	10	10	10	11	13	13	17	16	14	13	12	15	13	13	16	15	9	17	12.6
Dec 21	15	14	17	17	14	10	11	14	11	13	10	11	13	11	13	11	13	15	14	17	15	12	12	13	10	17	13.2
Dec 22	11	11	9	9	10	10	10	12	13	10	9	17	23	26	28	24	18	13	13	11	8	8	10	10	8	28	13.5
Dec 23	11	10	8	7	8	9	10	12	12	10	10	11	12	11	12	11	11	11	11	12	16	17	10	7	7	17	10.8
Dec 24	6	7	5	3	3	3	3	4	4	2	2	2	3	3	3	2	3	4	4	4	4	4	4	4	2	7	3.6
Dec 25	5	5	5	5	5	5	5	5	5	5	5	5	7	14	14	12	9	7	6	5	4	2	1	1	1	14	5.9
Dec 26	1	1	1	1	2	2	2	2	2	2	3	4	3	3	3	3	3	4	4	3	4	3	4	5	1	5	2.7
Dec 27	6	6	7	7	8	8	8	9	9	9	9	9	8	6	6	5	5	3	3	4	3	2	3	2	2	9	6.0
Dec 28	3	3	2	2	2	2	3	3	4	4	7	9	10	8	12	12	9	7	3	3	3	3	3	3	2	12	5.0
Dec 29	3	4	5	5	5	5	4	5	5	5	5	6	7	8	9	12	11	10	11	12	11	10	12	10	3	12	7.5
Dec 30	14	12	12	9	16	20	20	25	30	22	15	10	10	8	7	9	9	10	12	12	12	11	12	13	7	30	13.8
Dec 31	13	13	14	15	16	17	18	19	18	16	12	8	5	3	2	2	1	1	1	1	1	1	1	1	1	19	8.3
Diurnal Maximum	17	20	20	25	16	20	20	25	30	22	17	17	23	26	28	24	20	15	14	17	17	19	18	17			
Diurnal Average	6.9	7.0	6.9	7.0	6.2	6.4	6.5	7.0	7.1	6.7	6.9	7.3	7.3	7.2	7.5	7.2	7.6	6.7	6.9	7.1	6.8	6.7	6.8	6.3			
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						

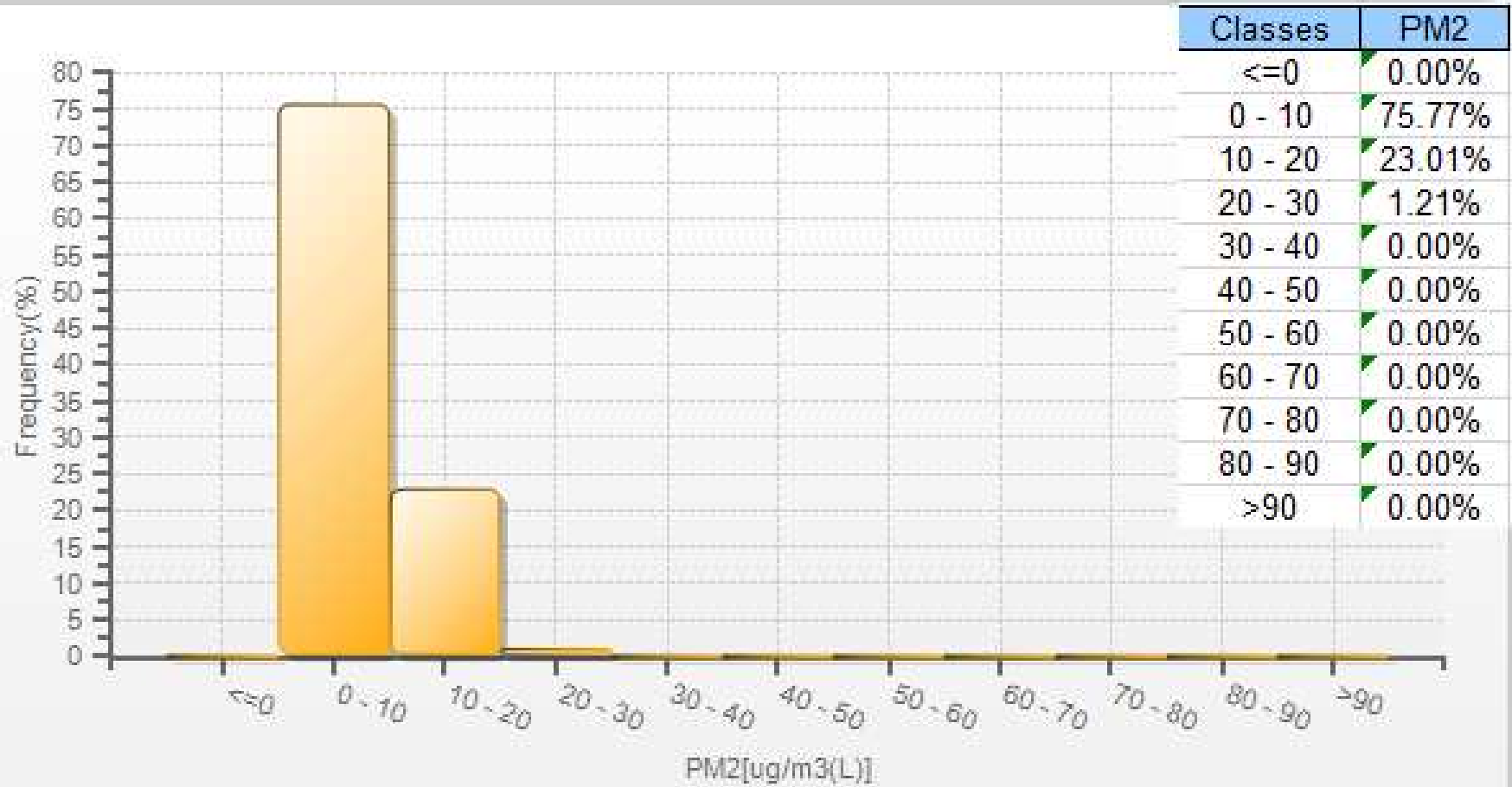
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

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

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



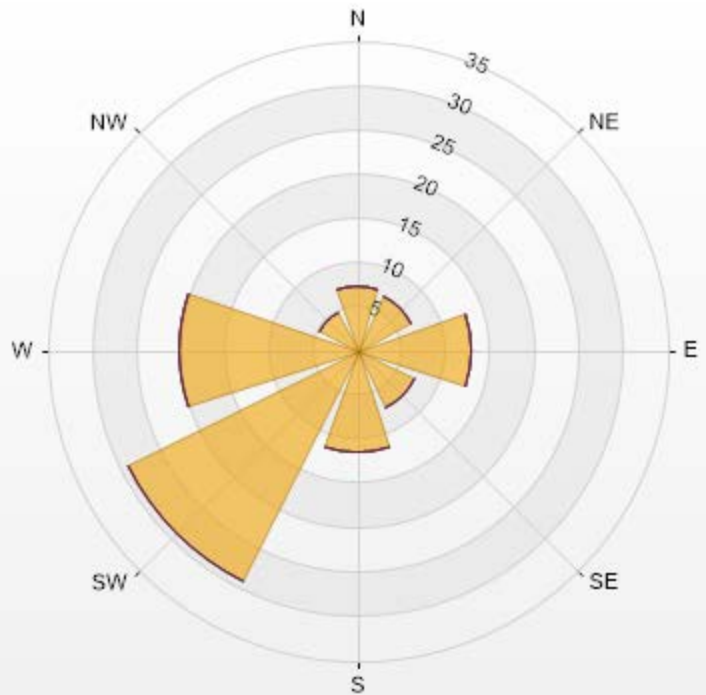
PM2[ug/m3(L)] Histogram: St. Lina Monthly: 12-2019 1 Hr.



Wind: St. Lina Poll.: St. Lina-PM2[ug/m3(L)] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 99.87% Calm Avg: 0.00 [ug/m3(L)]

Direction	0-50	50-80	80-120	120-240	>240.0	Total
N	7.27	0	0	0	0	7.27
NE	6.86	0	0	0	0	6.86
E	12.92	0	0	0	0	12.92
SE	7.27	0	0	0	0	7.27
S	11.57	0	0	0	0	11.57
SW	29.07	0	0	0	0	29.07
W	20.19	0	0	0	0	20.19
NW	4.85	0	0	0	0	4.85
Summary	100	0	0	0	0	100





LICA-201912-Revision 1

% Icon Classes (ug/m3(L))	100	0-50	0	80-120	0	120-240	0	>240.0
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## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019  
Summary of Hourly Averages

### RELATIVE HUMIDITY (RH) in %

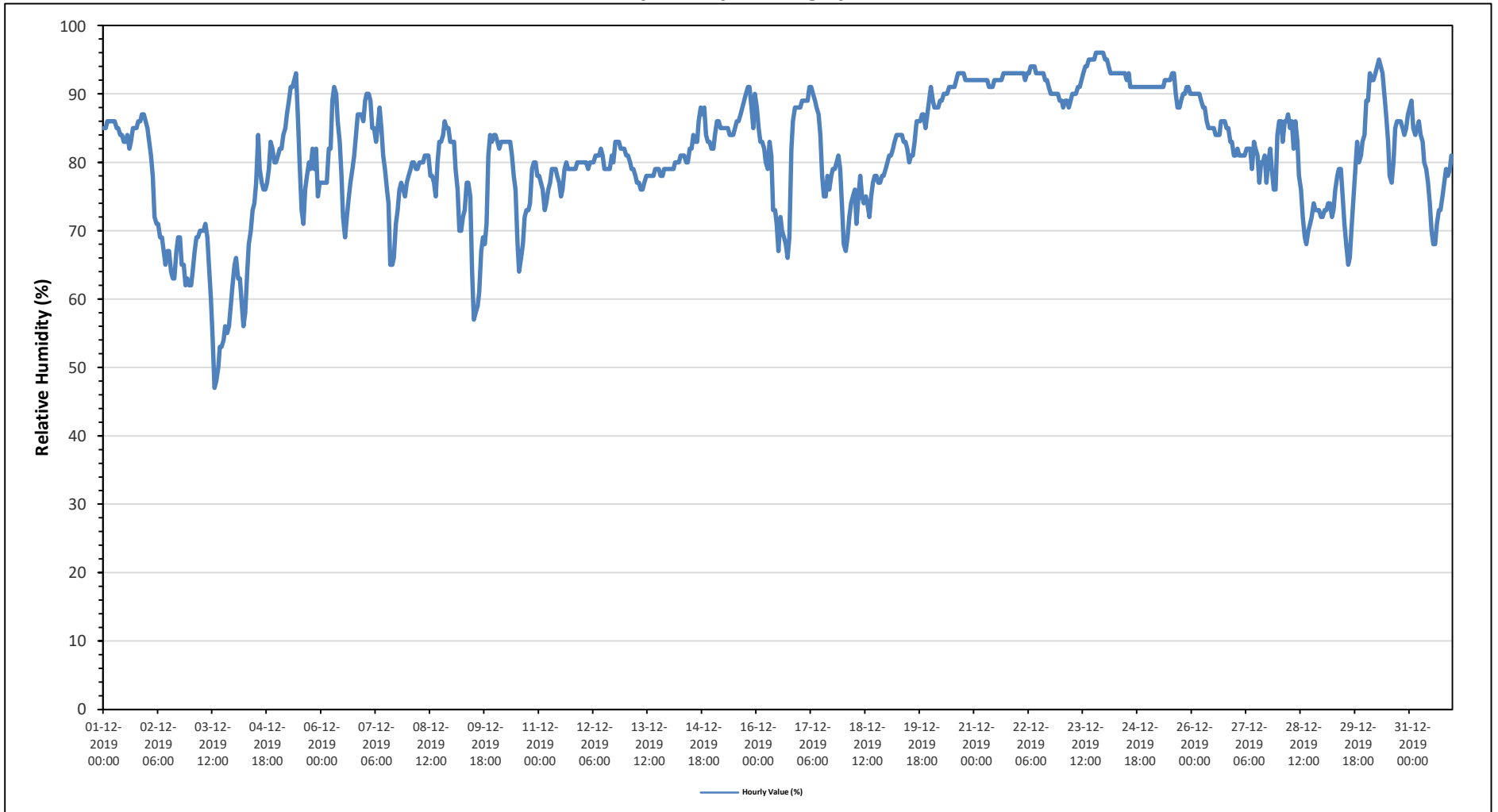
Maximum Hourly Value:	96 %	on December 23 at hour 19	Hours in Service:	744
Maximum Daily Value:	92.4 %	on December 23	Hours of Data:	744
Minimum Hourly Value:	47 %	on December 3 at hour 13	Hours of Missing Data:	0
Minimum Daily Value:	60.5 %	on December 3	Hours of Calibration:	0
Monthly Average:	81.3 %		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	
Dec 1	85	85	86	86	86	86	86	85	85	84	84	83	83	84	82	83	85	85	85	86	86	87	87	86	82	87	85.0	
Dec 2	85	83	81	78	72	71	71	69	69	67	65	67	67	64	63	63	67	69	69	65	65	62	63	62	62	85	69.0	
Dec 3	62	64	67	69	69	70	70	70	71	69	65	60	54	47	48	50	53	53	54	56	55	56	59	62	47	71	60.5	
Dec 4	65	66	63	63	59	56	58	64	68	70	73	74	77	84	79	77	76	76	77	79	83	82	80	80	56	84	72.0	
Dec 5	81	82	82	84	85	87	89	91	91	92	93	86	80	73	71	76	78	80	79	82	79	82	75	77	71	93	82.3	
Dec 6	77	77	77	77	82	82	89	91	90	86	83	78	72	69	72	75	77	79	81	84	87	87	87	86	69	91	81.0	
Dec 7	89	90	90	89	85	85	83	85	88	85	81	79	76	74	65	65	66	71	73	76	77	76	75	77	65	90	79.2	
Dec 8	78	79	80	80	79	79	80	80	80	81	81	81	78	78	77	75	80	83	83	84	86	85	85	83	75	86	80.6	
Dec 9	83	83	79	76	70	70	72	73	77	77	75	64	57	58	59	61	67	69	68	71	81	84	83	84	57	84	72.5	
Dec 10	84	83	82	83	83	83	83	83	83	81	78	76	68	64	66	68	72	73	73	74	79	80	80	78	64	84	77.4	
Dec 11	78	77	76	73	74	76	77	79	79	79	78	77	75	76	79	80	79	79	79	79	79	80	80	80	73	80	77.8	
Dec 12	80	80	80	79	80	80	80	81	81	81	82	81	79	79	79	79	81	80	83	83	83	82	82	82	79	83	80.7	
Dec 13	81	81	80	79	79	78	77	77	76	76	77	78	78	78	78	78	79	79	79	78	78	79	79	79	76	81	78.4	
Dec 14	79	79	79	80	80	80	81	81	81	80	80	82	82	84	83	83	86	88	87	88	84	83	83	82	79	88	82.3	
Dec 15	82	84	86	86	85	85	85	85	85	84	84	84	85	86	86	87	88	89	90	91	91	88	85	90	82	91	86.3	
Dec 16	88	85	83	83	82	80	79	83	81	73	73	71	67	72	70	69	68	66	69	82	86	88	88	88	66	88	78.1	
Dec 17	88	89	89	89	89	91	91	90	89	88	87	84	78	75	75	78	76	78	79	79	80	81	79	73	73	91	83.1	
Dec 18	68	67	69	72	74	75	76	71	75	78	75	74	75	74	72	75	77	78	78	77	77	78	78	79	67	79	74.7	
Dec 19	80	81	81	82	83	84	84	84	84	83	83	82	80	81	81	83	86	86	86	87	87	85	87	89	80	89	83.7	
Dec 20	91	89	88	88	88	89	89	90	90	90	91	91	91	91	92	93	93	93	93	92	92	92	92	92	88	93	90.8	
Dec 21	92	92	92	92	92	92	92	92	91	91	91	92	92	92	92	92	93	93	93	93	93	93	93	93	91	93	92.2	
Dec 22	93	93	93	93	92	93	93	94	94	94	93	93	93	93	93	92	92	91	90	90	90	90	89	89	89	94	92.1	
Dec 23	89	88	89	89	88	89	90	90	90	91	91	92	93	94	94	95	95	95	95	96	96	96	96	96	88	96	92.4	
Dec 24	95	95	94	93	93	93	93	93	93	93	93	92	93	91	91	91	91	91	91	91	91	91	91	91	91	95	92.3	
Dec 25	91	91	91	91	91	91	91	91	91	92	92	92	92	93	93	90	88	88	89	90	90	91	91	90	88	93	90.8	
Dec 26	90	90	90	90	90	89	88	88	86	85	85	85	85	84	84	84	86	86	86	86	85	85	83	83	81	81	90	86.2
Dec 27	81	82	81	81	81	81	82	82	82	79	83	82	81	77	80	80	81	77	80	82	79	76	76	84	76	84	80.4	
Dec 28	86	86	83	86	86	87	85	86	82	86	83	78	76	72	69	68	70	71	72	74	73	73	72	72	68	87	78.2	
Dec 29	72	73	73	74	74	72	73	76	78	79	79	75	71	68	65	66	71	75	79	83	80	81	83	84	65	84	75.2	
Dec 30	89	89	93	92	92	93	94	95	94	93	90	87	83	78	77	80	85	86	86	86	85	84	85	87	77	95	87.6	
Dec 31	88	89	85	84	85	86	84	83	80	79	77	74	70	68	68	71	73	73	75	77	79	78	79	81	68	89	78.6	
Diurnal Maximum	95	95	94	93	93	93	94	95	94	94	93	93	93	94	94	95	95	95	95	96	96	96	96	96				
Diurnal Average	82.9	83.0	82.6	82.6	82.2	82.4	82.7	83.3	83.4	82.8	82.1	80.5	78.4	77.5	76.9	77.6	79.3	80.0	80.7	81.9	82.5	82.4	82.2	82.5				

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 RH - St. Lina Site*





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**St. Lina Site - December 2019**

**Summary of Hourly Averages**

### BAROMETRIC PRESSURE (BP) in millibar

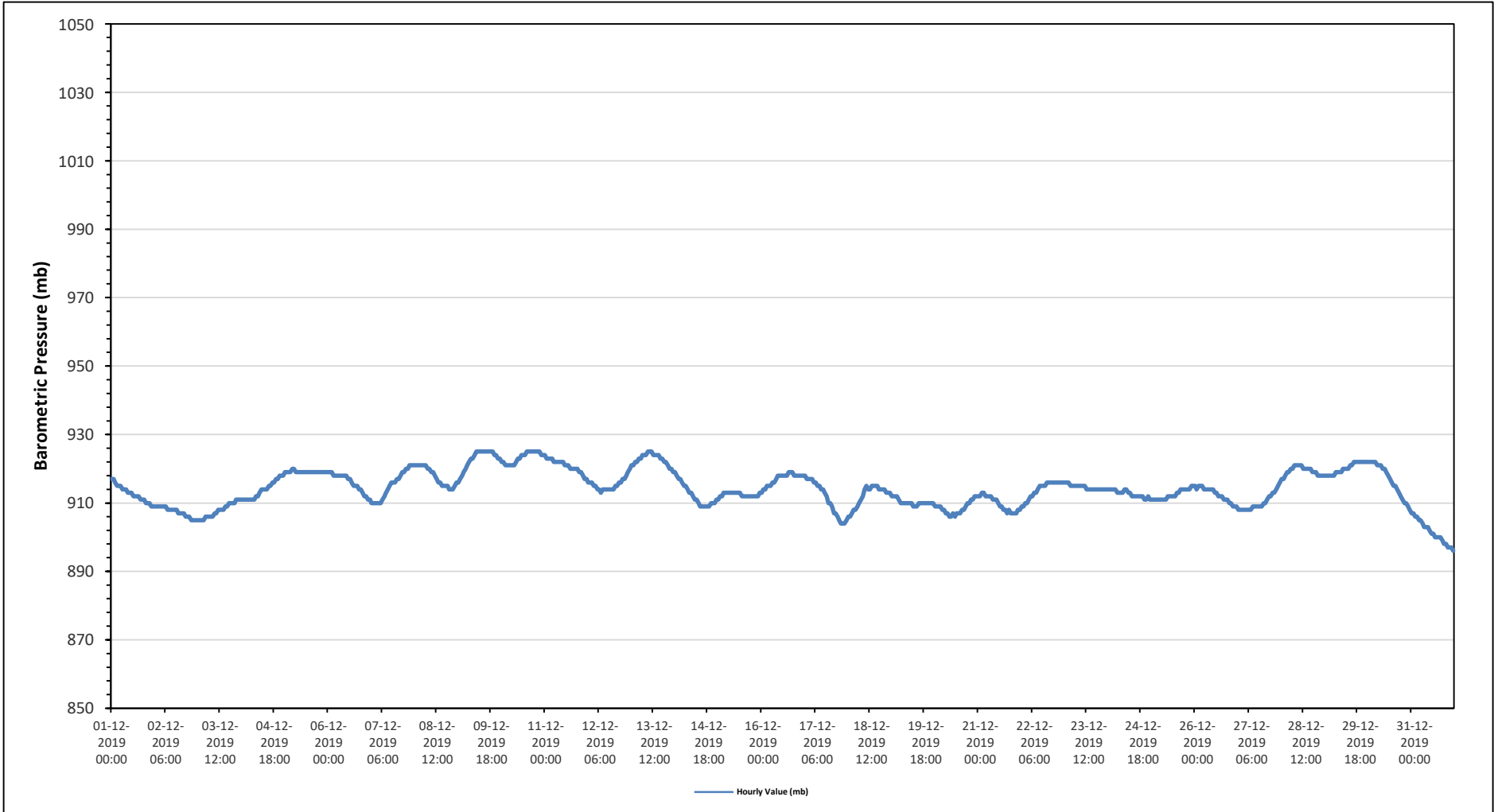
Maximum Hourly Value:	925	mb	on December 9 at hour 10	Hours in Service:	744
Maximum Daily Value:	923	mb	on December 10	Hours of Data:	744
Minimum Hourly Value:	896	mb	on December 31 at hour 23	Hours of Missing Data:	0
Minimum Daily Value:	901	mb	on December 31	Hours of Calibration:	0
Monthly Average:	914	mb		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			
Dec 1	917	917	916	915	915	915	914	914	914	913	913	913	912	912	912	912	911	911	911	910	910	909	909	909	917	913
Dec 2	909	909	909	909	909	909	909	908	908	908	908	908	907	907	907	907	906	906	906	905	905	905	905	905	909	907
Dec 3	905	905	905	905	906	906	906	906	906	907	907	908	908	908	908	909	909	910	910	910	911	911	911	911	911	908
Dec 4	911	911	911	911	911	911	911	911	912	912	913	914	914	914	914	915	915	916	916	917	917	918	918	918	918	914
Dec 5	919	919	919	919	920	920	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919
Dec 6	919	919	919	918	918	918	918	918	918	918	918	917	917	916	915	915	915	914	914	913	912	912	911	911	911	916
Dec 7	910	910	910	910	910	910	911	912	913	914	915	916	916	916	917	917	918	919	919	920	920	921	921	921	921	915
Dec 8	921	921	921	921	921	921	921	920	920	919	919	918	917	916	916	915	915	915	915	914	914	914	915	916	916	918
Dec 9	916	917	918	919	920	921	922	923	923	924	925	925	925	925	925	925	925	925	925	925	925	924	924	923	923	923
Dec 10	922	922	921	921	921	921	921	921	922	923	923	924	924	924	925	925	925	925	925	925	925	925	925	924	924	923
Dec 11	924	923	923	923	923	922	922	922	922	922	922	921	921	921	920	920	920	920	920	919	919	918	917	917	917	921
Dec 12	916	916	916	915	915	914	914	913	914	914	914	914	914	914	915	915	916	916	916	917	917	918	919	920	915	915
Dec 13	921	921	922	922	923	923	924	924	924	925	925	925	924	924	924	923	923	922	922	921	920	920	919	919	919	923
Dec 14	919	918	917	917	916	915	915	914	913	913	912	911	911	910	909	909	909	909	909	909	910	910	910	911	911	912
Dec 15	911	912	912	913	913	913	913	913	913	913	913	913	913	912	912	912	912	912	912	912	912	912	912	913	913	912
Dec 16	913	914	914	915	915	915	916	916	917	918	918	918	918	918	918	919	919	919	918	918	918	918	918	918	918	917
Dec 17	918	917	917	917	917	916	916	915	915	914	914	913	912	910	910	909	907	907	906	905	904	904	904	905	904	911
Dec 18	906	906	907	908	908	909	910	911	912	914	915	914	914	915	915	915	914	914	914	914	913	913	913	913	913	912
Dec 19	912	912	912	912	911	910	910	910	910	910	910	909	909	909	909	910	910	910	910	910	910	910	910	910	910	910
Dec 20	909	909	909	909	908	908	907	907	906	906	907	906	907	907	907	908	908	909	910	910	911	911	912	912	912	908
Dec 21	912	912	913	913	912	912	912	912	911	911	911	910	909	909	908	908	907	908	907	907	907	907	908	908	908	910
Dec 22	909	909	910	910	911	912	912	913	913	914	915	915	915	915	916	916	916	916	916	916	916	916	916	916	916	914
Dec 23	916	916	916	915	915	915	915	915	915	915	915	915	914	914	914	914	914	914	914	914	914	914	914	914	914	915
Dec 24	914	914	914	914	914	913	913	913	913	913	914	914	913	912	912	912	912	912	912	912	911	911	912	911	913	913
Dec 25	911	911	911	911	911	911	911	911	911	911	912	912	912	912	912	913	913	914	914	914	914	914	914	915	915	912
Dec 26	915	914	915	915	915	914	914	914	914	914	914	913	913	912	912	912	911	911	911	910	910	909	909	909	913	913
Dec 27	908	908	908	908	908	908	908	908	909	909	909	909	909	909	910	910	911	912	912	913	913	914	915	916	916	910
Dec 28	917	917	918	919	919	920	920	921	921	921	921	921	920	920	920	920	919	919	919	919	918	918	918	918	918	919
Dec 29	918	918	918	918	918	918	919	919	919	919	919	920	920	920	920	921	921	922	922	922	922	922	922	922	922	920
Dec 30	922	922	922	922	922	921	921	921	920	920	919	918	917	916	915	915	914	913	912	911	910	910	909	908	908	917
Dec 31	907	907	906	906	905	905	904	903	903	903	902	901	901	900	900	900	899	898	898	897	897	897	897	896	896	901
Diurnal Maximum	924	923	923	923	923	923	924	924	924	925	925	925	925	925	925	925	925	925	925	925	925	924	924	924	924	924
Diurnal Average	914	914	914	915	915	914	914	914	915	915	915	915	914	914	914	914	914	914	914	914	914	914	914	914	914	914

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 - St. Lina Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

Summary of Hourly Averages

### AMBIENT TEMPERATURE (AT) in Degree Celsius

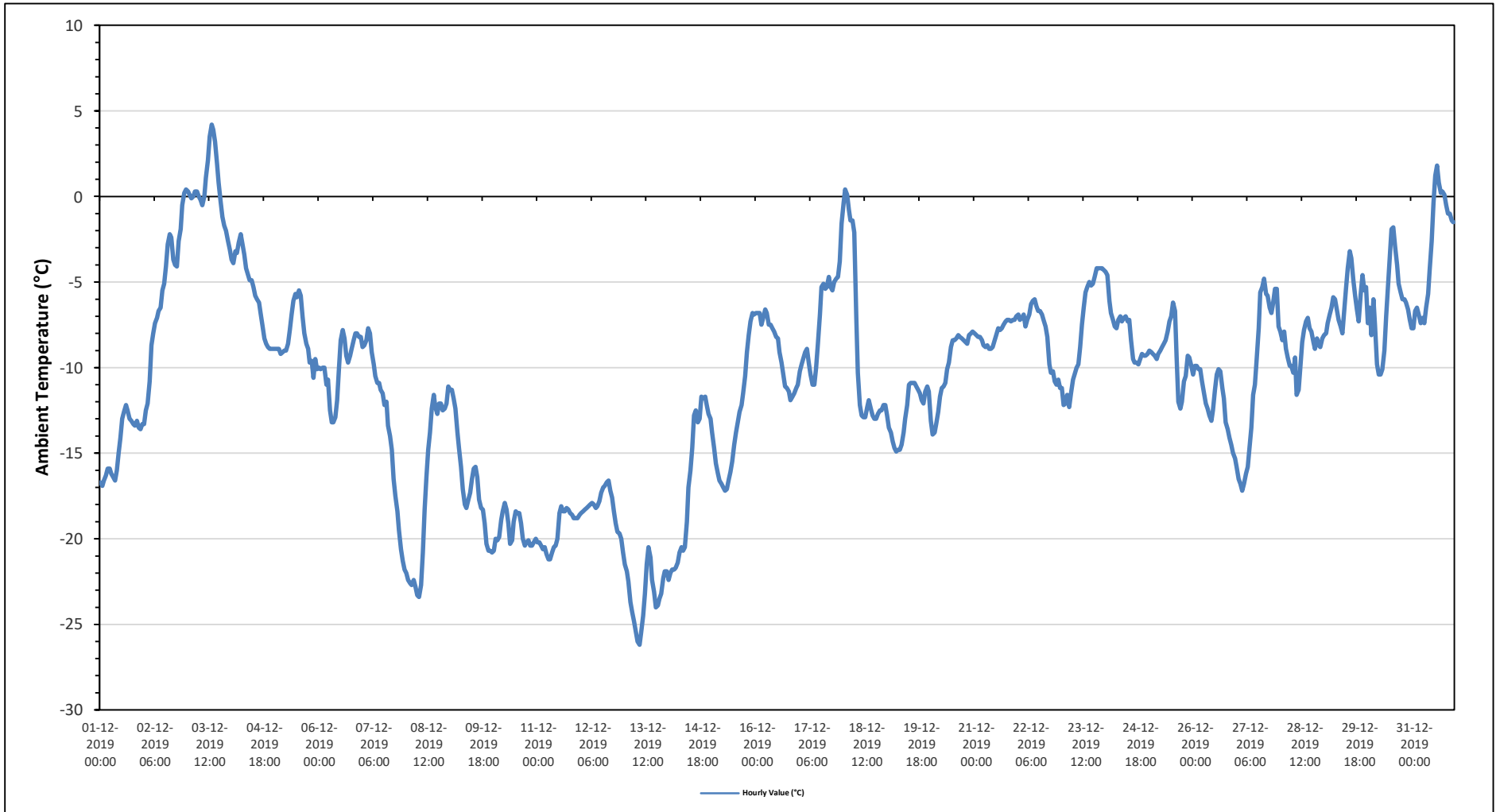
Maximum Hourly Value:	4.2 °C	on December 3 at hour 13	Hours in Service:	744
Maximum Daily Value:	0.4 °C	on December 3	Hours of Data:	744
Minimum Hourly Value:	-26.2 °C	on December 13 at hour 8	Hours of Missing Data:	0
Minimum Daily Value:	-23.3 °C	on December 13	Hours of Calibration:	0
Monthly Average:	-10.8 °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
Dec 1	-16.7	-16.9	-16.6	-16.3	-15.9	-15.9	-16.2	-16.4	-16.6	-16.0	-15.0	-14.1	-13.0	-12.6	-12.2	-12.5	-13.0	-13.1	-13.3	-13.4	-13.1	-13.5	-13.6	-13.3	-16.9	-12.2	-14.6
Dec 2	-13.3	-12.5	-12.1	-10.8	-8.7	-8.0	-7.4	-7.1	-6.7	-6.5	-5.5	-5.1	-4.1	-2.8	-2.2	-2.4	-3.7	-4.0	-4.1	-2.6	-1.9	-0.5	0.2	0.4	-13.3	0.4	-5.5
Dec 3	0.3	0.1	-0.1	0.0	0.3	0.3	0.0	-0.2	-0.5	0.0	1.1	2.1	3.5	4.2	3.9	3.2	1.9	0.8	-0.3	-1.2	-1.7	-2.0	-2.6	-3.1	-3.1	4.2	0.4
Dec 4	-3.7	-3.9	-3.2	-3.3	-2.7	-2.2	-2.7	-3.4	-4.2	-4.6	-4.9	-4.9	-5.3	-5.8	-6.0	-6.2	-6.8	-7.5	-8.3	-8.6	-8.8	-8.9	-8.9	-8.9	-8.9	-2.2	-5.6
Dec 5	-8.9	-8.9	-8.9	-9.2	-9.1	-9.0	-9.0	-8.6	-7.8	-6.9	-6.1	-5.7	-5.9	-5.5	-5.8	-7.0	-8.0	-8.6	-8.9	-9.7	-9.6	-10.6	-9.5	-10.1	-10.6	-5.5	-8.2
Dec 6	-10.0	-10.1	-10.0	-10.0	-11.0	-10.7	-12.5	-13.2	-13.2	-12.9	-11.9	-10.1	-8.4	-7.8	-8.3	-9.3	-9.7	-9.3	-8.9	-8.4	-8.0	-8.2	-8.2	-8.2	-13.2	-7.8	-9.9
Dec 7	-8.8	-8.7	-8.4	-7.7	-8.0	-9.1	-9.8	-10.5	-10.9	-10.9	-11.3	-11.5	-12.2	-12.0	-13.4	-14.0	-14.8	-16.5	-17.5	-18.4	-19.5	-20.6	-21.3	-21.8	-21.8	-7.7	-13.2
Dec 8	-22.0	-22.4	-22.6	-22.7	-22.4	-22.8	-23.3	-23.4	-22.7	-20.8	-18.3	-16.4	-14.8	-13.8	-12.4	-11.6	-12.3	-12.7	-12.1	-12.1	-12.5	-12.4	-12.1	-11.1	-23.4	-11.1	-17.1
Dec 9	-11.3	-11.3	-11.8	-12.4	-13.8	-14.7	-15.8	-17.1	-18.0	-18.2	-17.7	-17.3	-16.5	-15.9	-15.8	-16.4	-17.7	-18.2	-18.3	-19.1	-20.3	-20.7	-20.8	-20.8	-20.8	-11.3	-16.7
Dec 10	-20.7	-20.0	-20.1	-19.9	-18.9	-18.4	-17.9	-18.3	-19.1	-20.3	-20.1	-19.0	-18.4	-18.5	-18.5	-19.1	-20.0	-20.4	-20.2	-20.1	-20.4	-20.4	-20.2	-20.0	-20.7	-17.9	-19.5
Dec 11	-20.2	-20.2	-20.4	-20.6	-20.5	-20.9	-21.2	-21.2	-20.8	-20.5	-20.4	-20.0	-18.5	-18.1	-18.4	-18.4	-18.2	-18.3	-18.5	-18.6	-18.8	-18.8	-18.8	-18.6	-21.2	-18.1	-19.5
Dec 12	-18.5	-18.4	-18.3	-18.2	-18.1	-18.0	-17.9	-18.0	-18.2	-18.1	-17.8	-17.3	-17.0	-16.9	-16.7	-16.6	-17.2	-17.6	-18.4	-19.1	-19.6	-19.7	-20.0	-20.8	-20.8	-16.6	-18.2
Dec 13	-21.5	-21.9	-22.5	-23.7	-24.3	-24.8	-25.4	-26.0	-26.2	-25.5	-24.5	-23.2	-21.5	-20.5	-21.1	-22.4	-23.1	-24.0	-23.9	-23.5	-23.2	-22.3	-21.9	-21.9	-26.2	-20.5	-23.3
Dec 14	-22.4	-22.0	-21.8	-21.8	-21.7	-21.4	-20.8	-20.5	-20.7	-20.5	-19.0	-17.0	-16.0	-14.7	-12.8	-12.5	-13.2	-13.0	-11.7	-11.8	-11.7	-12.2	-12.7	-13.0	-22.4	-11.7	-16.9
Dec 15	-13.8	-14.7	-15.6	-16.2	-16.6	-16.8	-17.0	-17.2	-17.1	-16.5	-16.1	-15.5	-14.5	-13.8	-13.2	-12.6	-12.2	-11.5	-10.5	-9.1	-8.1	-7.3	-6.8	-6.9	-17.2	-6.8	-13.3
Dec 16	-6.8	-6.8	-6.8	-7.5	-7.1	-6.6	-6.8	-7.5	-7.5	-7.7	-7.9	-8.2	-8.3	-9.1	-9.7	-10.4	-11.1	-11.2	-11.4	-11.9	-11.7	-11.5	-11.2	-11.0	-11.9	-6.6	-9.0
Dec 17	-10.2	-9.8	-9.5	-9.1	-8.9	-9.7	-10.4	-11.0	-11.0	-10.0	-8.6	-6.9	-5.3	-5.1	-5.4	-5.3	-4.7	-5.3	-5.5	-5.0	-4.8	-4.7	-3.8	-1.6	-11.0	-1.6	-7.2
Dec 18	-0.4	0.4	0.1	-0.8	-1.4	-1.4	-2.1	-7.1	-10.3	-12.2	-12.8	-12.9	-12.9	-12.3	-11.9	-12.4	-12.8	-13.0	-13.0	-12.7	-12.5	-12.5	-12.2	-12.2	-13.0	0.4	-8.8
Dec 19	-12.8	-13.5	-13.8	-14.3	-14.7	-14.9	-14.8	-14.8	-14.5	-13.8	-13.0	-12.2	-11.0	-10.9	-10.9	-10.9	-11.1	-11.3	-11.5	-11.9	-12.1	-11.4	-11.1	-11.4	-14.9	-10.9	-12.6
Dec 20	-13.1	-13.9	-13.8	-13.3	-12.6	-11.7	-11.2	-11.1	-10.9	-10.1	-9.7	-8.8	-8.4	-8.4	-8.3	-8.1	-8.2	-8.3	-8.4	-8.5	-8.6	-8.1	-8.0	-7.9	-13.9	-7.9	-10.0
Dec 21	-8.0	-8.1	-8.2	-8.2	-8.4	-8.7	-8.8	-8.7	-8.9	-8.9	-8.8	-8.4	-8.1	-7.7	-7.8	-7.7	-7.5	-7.3	-7.2	-7.2	-7.3	-7.2	-7.2	-7.0	-8.9	-7.0	-8.0
Dec 22	-6.9	-7.2	-7.1	-6.9	-7.6	-7.2	-6.9	-6.3	-6.1	-6.0	-6.4	-6.7	-6.7	-6.9	-7.2	-7.6	-8.2	-9.8	-10.3	-10.2	-10.8	-11.0	-10.7	-11.2	-11.2	-6.0	-8.0
Dec 23	-11.2	-12.2	-12.1	-11.6	-12.3	-11.5	-10.7	-10.4	-10.0	-9.8	-8.8	-7.5	-6.5	-5.6	-5.3	-5.0	-5.2	-5.1	-4.7	-4.2	-4.2	-4.2	-4.3	-4.3	-12.3	-4.2	-7.8
Dec 24	-4.4	-4.6	-6.1	-6.8	-7.2	-7.6	-7.7	-7.2	-7.0	-7.3	-7.1	-7.0	-7.3	-7.2	-8.4	-9.5	-9.7	-9.7	-9.8	-9.5	-9.2	-9.3	-9.2	-9.2	-9.8	-4.4	-7.8
Dec 25	-9.0	-9.1	-9.2	-9.3	-9.5	-9.2	-9.0	-8.8	-8.6	-8.4	-7.9	-7.3	-7.0	-6.2	-6.7	-9.3	-12.0	-12.4	-12.0	-10.8	-10.5	-9.3	-9.4	-9.9	-12.4	-6.2	-9.2
Dec 26	-10.4	-9.9	-9.9	-10.1	-10.1	-10.8	-11.5	-12.1	-12.4	-12.8	-13.1	-12.5	-11.3	-10.4	-10.1	-10.2	-11.2	-11.8	-13.2	-13.6	-14.1	-14.5	-15.0	-15.3	-15.3	-9.9	-11.9
Dec 27	-15.8	-16.5	-16.8	-17.2	-16.8	-16.2	-15.8	-14.8	-13.5	-11.6	-11.0	-9.5	-7.7	-5.6	-5.3	-4.8	-5.7	-5.8	-6.5	-6.8	-6.3	-5.4	-5.4	-7.6	-17.2	-4.8	-10.4
Dec 28	-7.9	-8.4	-7.9	-8.9	-9.4	-9.9	-9.9	-10.3	-9.4	-11.6	-11.3	-9.9	-8.5	-7.8	-7.3	-7.1	-7.7	-7.9	-8.5	-8.9	-8.3	-8.7	-8.8	-8.3	-11.6	-7.1	-8.9
Dec 29	-8.1	-8.0	-7.4	-6.9	-6.5	-5.9	-6.0	-6.7	-7.2	-7.6	-8.0	-6.7	-5.4	-4.2	-3.2	-3.6	-4.9	-5.8	-6.6	-7.3	-5.7	-4.6	-5.5	-5.3	-8.1	-3.2	-6.1
Dec 30	-7.4	-6.5	-8.1	-6.0	-7.5	-9.8	-10.4	-10.4	-10.1	-9.0	-7.0	-5.3	-3.6	-1.9	-1.8	-2.9	-4.0	-5.1	-5.6	-6.0	-6.0	-6.2	-6.6	-7.2	-10.4	-1.8	-6.4
Dec 31	-7.7	-7.7	-6.7	-6.5	-6.9	-7.4	-7.1	-7.4	-6.5	-5.7	-4.3	-2.6	-0.4	1.2	1.8	0.8	0.2	0.3	0.1	-0.5	-1.0	-1.4	-1.5	-7.7	1.8	-3.2	
Diurnal Maximum	0.3	0.4	0.1	0.0	0.3	0.3	0.0	-0.2	-0.5	0.0	1.1	2.1	3.5	4.2	3.9	3.2	1.9	0.8	0.1	-0.5	-1.0	-0.5	0.2	0.4			
Diurnal Average	-11.3	-11.4	-11.5	-11.5	-11.6	-11.6	-11.8	-12.1	-12.1	-12.0	-11.4	-10.6	-9.7	-9.1	-9.0	-9.4	-10.1	-10.4	-10.6	-10.7	-10.7	-10.6	-10.5	-10.6			

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 AT - St. Lina Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019  
Summary of Hourly Averages

### STATION TEMPERATURE (ST) in Degree Celsius

Maximum Hourly Value:	23.2 °C	on December 3 at hour 16	Hours in Service:	744
Maximum Daily Value:	22.3 °C	on December 3	Hours of Data:	744
Minimum Hourly Value:	18.9 °C	on December 13 at hour 16	Hours of Missing Data:	0
Minimum Daily Value:	21.0 °C	on December 14	Hours of Calibration:	0
Monthly Average:	21.6 °C		Operational Uptime:	100.0

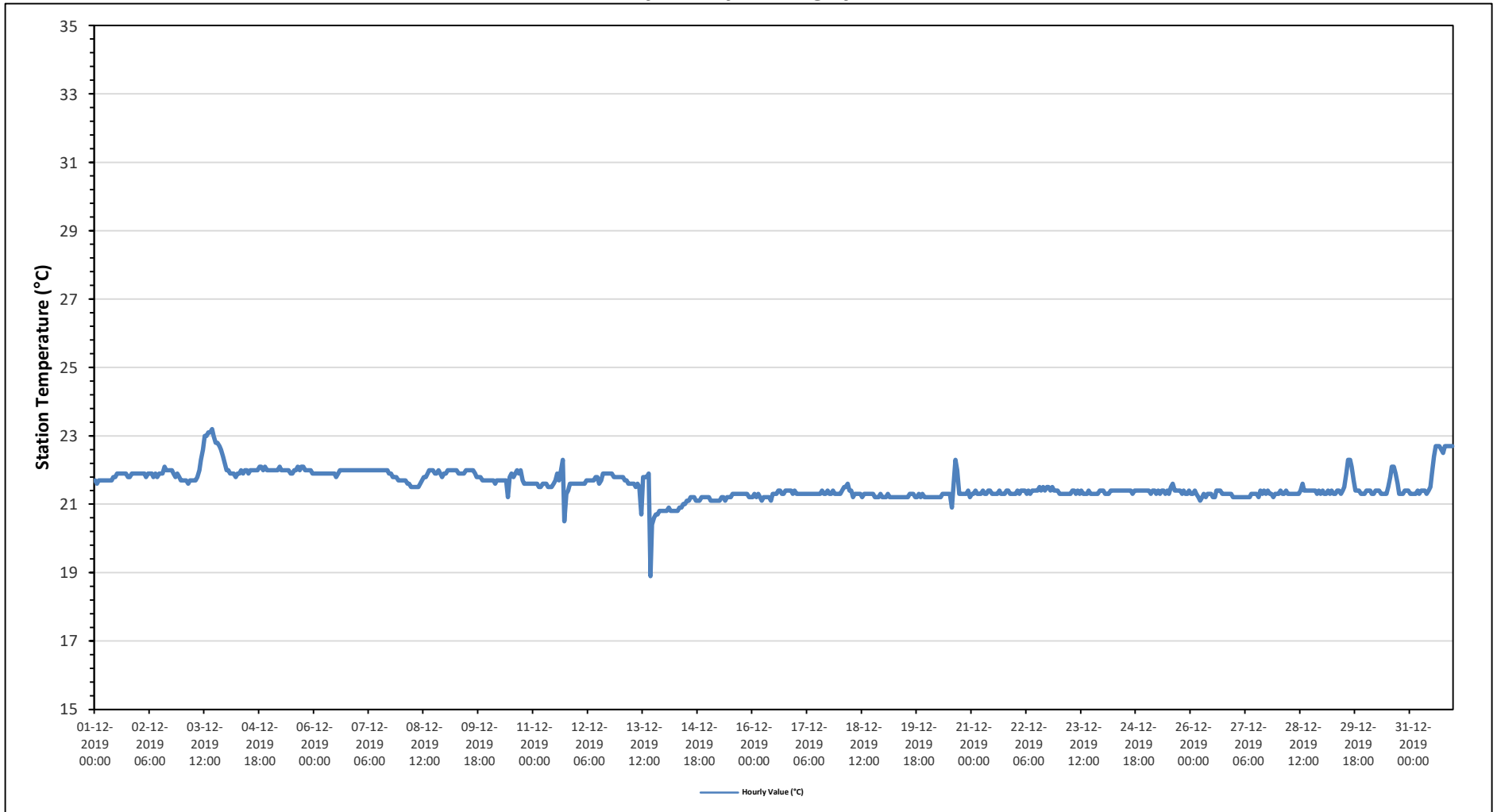
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Dec 1	21.7	21.6	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.8	21.8	21.9	21.9	21.9	21.9	21.9	21.9	21.8	21.8	21.9	21.9	21.9	21.9	21.6	21.9	21.8
Dec 2	21.9	21.9	21.9	21.9	21.8	21.9	21.9	21.9	21.8	21.9	21.8	21.9	21.9	21.9	22.1	22.0	22.0	22.0	21.9	21.8	21.9	21.8	21.7	21.7	21.7	22.1	21.9
Dec 3	21.7	21.7	21.7	21.6	21.7	21.7	21.7	21.7	21.8	22.0	22.3	22.6	23.0	23.1	23.1	23.2	23.0	22.8	22.8	22.7	22.6	22.4	22.2	21.6	23.2	22.3	
Dec 4	22.0	22.0	21.9	21.9	21.9	21.8	21.9	21.9	22.0	21.9	22.0	22.0	21.9	22.0	22.0	22.0	22.0	22.1	22.1	22.1	22.0	22.1	22.0	21.8	22.1	22.0	
Dec 5	22.0	22.0	22.0	22.0	22.0	22.1	22.0	22.0	22.0	22.0	22.0	21.9	21.9	22.0	22.0	22.1	22.0	22.1	22.1	22.0	22.0	22.0	21.9	21.9	22.1	22.0	
Dec 6	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.8	21.9	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	21.8	22.0	21.9	
Dec 7	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	21.9	21.9	21.8	21.8	21.8	21.7	21.7	22.0	21.9	
Dec 8	21.7	21.7	21.7	21.6	21.6	21.5	21.5	21.5	21.5	21.5	21.6	21.7	21.8	21.8	21.9	22.0	22.0	21.9	21.9	22.0	21.9	21.8	21.9	21.5	22.0	21.8	
Dec 9	21.9	22.0	22.0	22.0	22.0	22.0	22.0	21.9	21.9	21.9	22.0	22.0	22.0	22.0	22.0	22.0	21.9	21.8	21.8	21.7	21.7	21.7	21.7	21.7	22.0	21.9	
Dec 10	21.7	21.7	21.7	21.6	21.7	21.7	21.7	21.7	21.7	21.7	21.2	21.8	21.9	21.8	21.9	22.0	21.9	22.0	21.7	21.6	21.6	21.6	21.6	21.2	22.0	21.7	
Dec 11	21.6	21.6	21.6	21.5	21.5	21.6	21.6	21.6	21.5	21.5	21.5	21.6	21.7	21.9	21.7	22.0	22.3	20.5	21.3	21.4	21.6	21.6	21.6	20.5	22.3	21.6	
Dec 12	21.6	21.6	21.6	21.6	21.6	21.7	21.7	21.7	21.7	21.7	21.8	21.8	21.6	21.7	21.9	21.9	21.9	21.9	21.9	21.8	21.8	21.8	21.8	21.6	21.9	21.8	
Dec 13	21.8	21.8	21.7	21.7	21.6	21.6	21.6	21.6	21.5	21.6	21.5	20.7	21.8	21.8	21.8	21.9	18.9	20.4	20.6	20.7	20.7	20.8	20.8	18.9	21.9	21.2	
Dec 14	20.8	20.8	20.9	20.8	20.8	20.8	20.8	20.8	20.9	20.9	21.0	21.0	21.1	21.1	21.2	21.2	21.1	21.1	21.1	21.2	21.2	21.2	21.2	20.8	21.2	21.0	
Dec 15	21.2	21.1	21.1	21.1	21.1	21.1	21.1	21.2	21.2	21.1	21.2	21.2	21.2	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.2	21.2	21.1	21.3	
Dec 16	21.2	21.3	21.2	21.3	21.2	21.1	21.2	21.2	21.2	21.1	21.3	21.3	21.3	21.3	21.4	21.4	21.3	21.3	21.4	21.4	21.4	21.4	21.3	21.1	21.4	21.3	
Dec 17	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.4	21.3	21.3	21.3	21.4	21.3	21.3	21.3	21.3	21.3	21.3	21.4	
Dec 18	21.3	21.4	21.5	21.5	21.6	21.4	21.4	21.2	21.3	21.3	21.3	21.3	21.2	21.3	21.3	21.3	21.3	21.3	21.3	21.2	21.2	21.2	21.2	21.2	21.6	21.3	
Dec 19	21.2	21.2	21.3	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.3	21.3	21.2	21.2	21.2	21.3	21.2	21.3	21.2	21.2	21.2	21.3	
Dec 20	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.3	21.3	21.3	21.3	20.9	21.5	22.3	22.0	21.3	21.3	21.3	21.3	21.3	21.3	21.4	21.2	20.9	22.3	
Dec 21	21.3	21.3	21.4	21.3	21.3	21.3	21.4	21.3	21.3	21.4	21.4	21.3	21.3	21.3	21.4	21.3	21.4	21.3	21.3	21.4	21.4	21.3	21.3	21.3	21.3	21.4	
Dec 22	21.3	21.4	21.3	21.4	21.4	21.4	21.3	21.4	21.3	21.4	21.4	21.4	21.4	21.4	21.5	21.4	21.5	21.4	21.5	21.5	21.4	21.5	21.4	21.3	21.5	21.4	
Dec 23	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.4	21.4	21.3	21.4	21.3	21.4	21.3	21.3	21.3	21.4	21.3	21.3	21.3	21.3	21.3	21.4	21.3	21.3	21.4	
Dec 24	21.4	21.3	21.3	21.3	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.3	21.4	21.3	21.4	21.4	21.4	21.4	21.4	21.3	21.4	21.4	
Dec 25	21.4	21.4	21.3	21.4	21.4	21.3	21.4	21.3	21.4	21.4	21.3	21.4	21.3	21.5	21.6	21.4	21.4	21.4	21.4	21.3	21.4	21.3	21.3	21.3	21.3	21.6	
Dec 26	21.3	21.3	21.4	21.3	21.2	21.1	21.2	21.3	21.2	21.3	21.3	21.3	21.2	21.2	21.4	21.4	21.4	21.3	21.3	21.3	21.3	21.3	21.3	21.1	21.4	21.3	
Dec 27	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.3	21.3	21.3	21.3	21.2	21.4	21.3	21.4	21.3	21.4	21.3	21.3	21.2	21.2	21.2	21.4	21.3	
Dec 28	21.3	21.4	21.3	21.3	21.4	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.4	21.6	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.3	21.3	21.3	21.6	
Dec 29	21.4	21.3	21.3	21.4	21.3	21.4	21.3	21.3	21.4	21.4	21.3	21.4	21.5	21.9	22.3	22.3	22.1	21.7	21.4	21.4	21.4	21.3	21.3	21.3	22.3	21.5	
Dec 30	21.4	21.4	21.4	21.3	21.3	21.4	21.4	21.4	21.3	21.3	21.3	21.3	21.5	21.8	22.1	22.1	21.9	21.6	21.3	21.3	21.3	21.3	21.4	21.4	21.3	22.1	
Dec 31	21.3	21.3	21.3	21.3	21.4	21.3	21.4	21.4	21.4	21.3	21.4	21.5	21.9	22.4	22.7	22.7	22.7	22.6	22.5	22.7	22.7	22.7	22.7	21.3	22.7	22.0	
Diurnal Maximum	22.0	22.0	22.0	22.0	22.0	22.1	22.0	22.0	22.0	22.0	22.3	22.6	23.0	23.0	23.1	23.1	23.2	23.0	22.8	22.8	22.7	22.7	22.7	22.7	22.7	22.7	
Diurnal Average	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.6	21.7	21.7	21.8	21.7	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.5	

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.

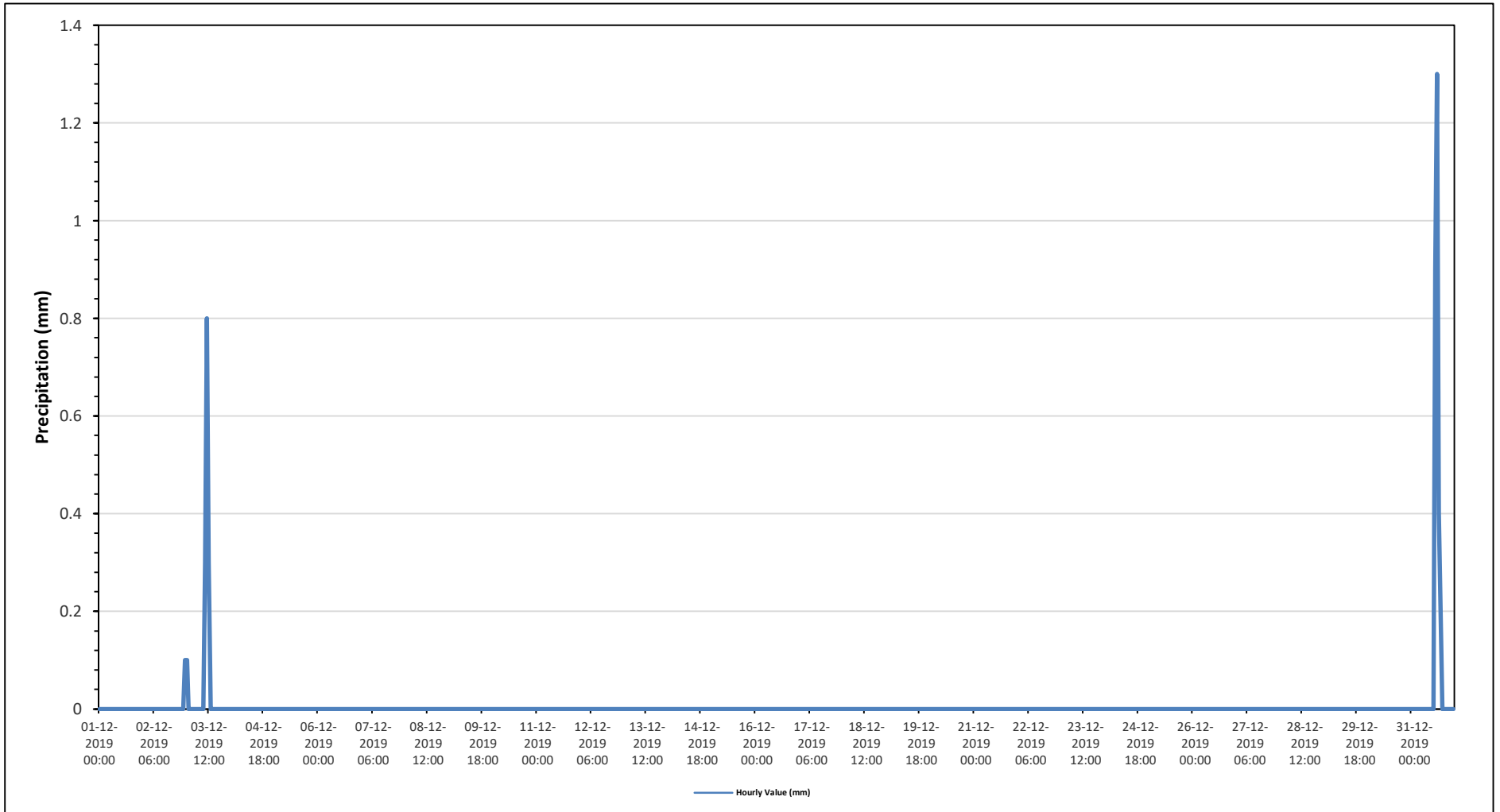


**Timeseries Chart of Hourly Average for ST - St. Lina Site**





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





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr

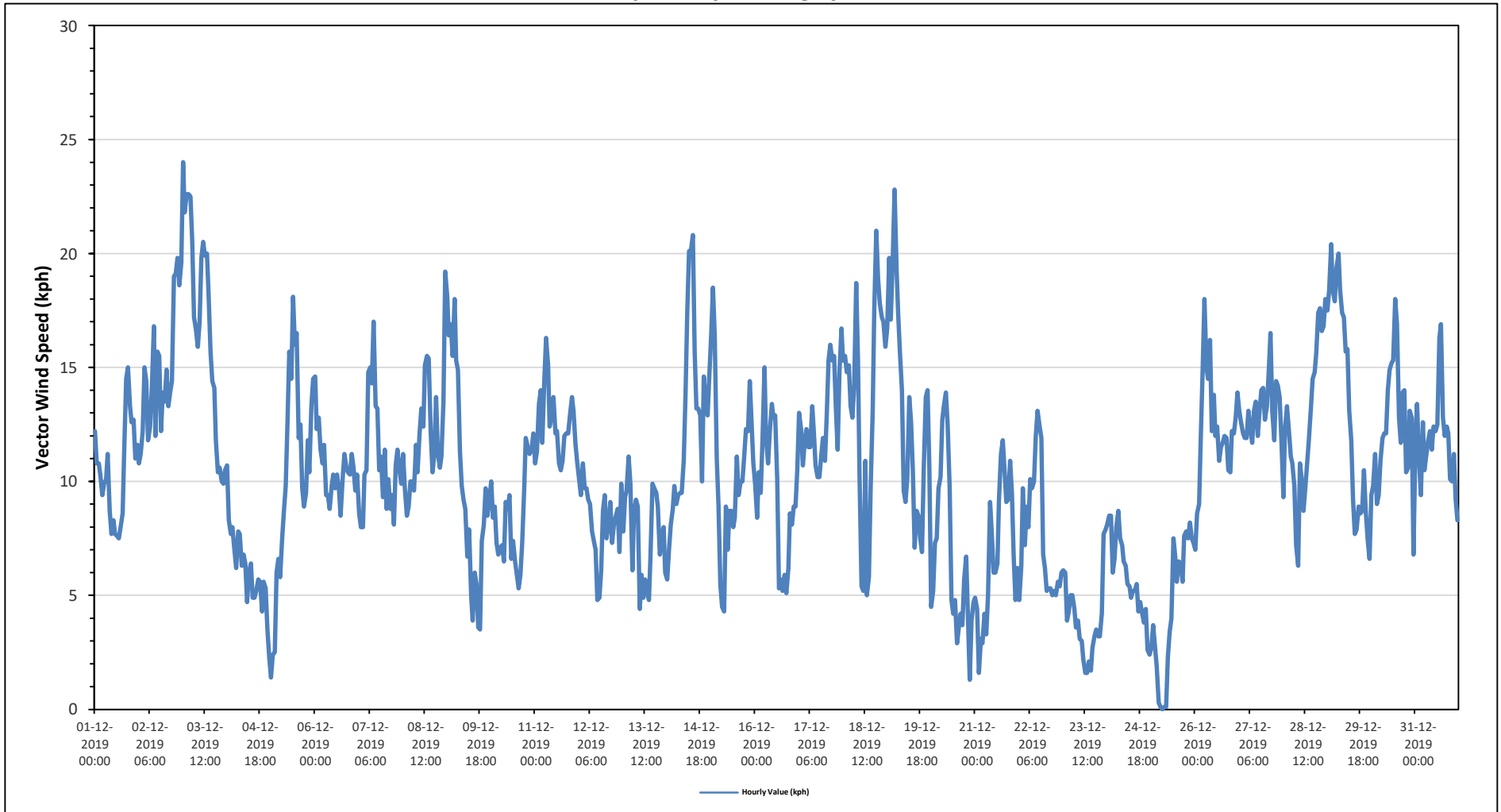
Maximum Hourly Value:	24.0 kph	on December 3 at hour 0	Hours in Service:	744
Maximum Daily Value:	16.9 kph	on December 3	Hours of Data:	744
Minimum Hourly Value:	0.0 kph	on December 25 at hour 6	Hours of Missing Data:	0
Minimum Daily Value:	3.9 kph	on December 23	Hours of Calibration:	0
Monthly Average:	3.8 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
Dec 1	12.2	10.8	10.8	10.3	9.4	9.9	10.1	11.2	8.7	7.7	8.3	7.7	7.6	7.5	8	8.6	11.3	14.5	15	13.3	12.6	12.7	11	11.6	7.5	15.0	10.5
Dec 2	10.8	11.2	12.2	15	14.4	11.8	12.4	14.1	16.8	12	15.7	15.5	12.2	13.9	13.5	14.9	13.3	13.9	14.4	19	19.1	19.8	18.6	19.6	10.8	19.8	14.8
Dec 3	24	21.8	22.6	22.6	22.5	20.5	17.2	16.7	15.9	17	19.8	20.5	19.9	20	18.3	15.7	14.4	14.1	11.8	10.4	10.6	10	9.9	10.5	9.9	24.0	16.9
Dec 4	10.7	8.3	7.7	8	7	6.2	7.8	7.7	6.3	6.8	6.4	4.7	6	6.4	4.9	4.9	5.2	5.7	5.6	4.3	5.6	5.3	3.5	2.3	2.3	10.7	6.1
Dec 5	1.4	2.4	2.5	6	6.6	5.8	7.5	8.7	9.8	12.6	15.7	14.5	18.1	16	16.5	11.9	12.5	9.7	8.9	9.5	11.8	10.4	13.3	14.5	1.4	18.1	10.3
Dec 6	14.6	12.3	12.8	11.4	10.8	11.6	9.4	9.4	8.8	9.8	10.3	9.7	10.3	9.6	8.5	10.1	11.2	10.6	10.4	10.3	11.2	10.6	9.6	10.3	8.5	14.6	10.6
Dec 7	8.6	8	8	10.3	10.5	14.8	15	14.3	17	13.3	13.2	10.5	11.1	9.3	11.4	8.8	10.1	8.8	9.4	8.1	10.7	11.4	10.5	9.9	8.0	17.0	11.0
Dec 8	11.2	9.7	8.5	8.9	10	10	9.6	11.6	10.4	12.1	13.2	12.4	15.1	15.5	15.4	12.1	10.4	11.2	13.7	11.2	10.6	11.1	13.5	19.2	8.5	19.2	11.9
Dec 9	18.1	16.4	16.9	15.5	18	15.3	14.9	11.3	9.8	9.2	8.8	6.7	7.9	5	3.9	6	5.5	3.6	3.5	7.4	8.1	9.7	8.5	9.1	3.5	18.1	10.0
Dec 10	10	8.4	8.9	7.3	6.8	7.1	7.2	6.5	9.1	8.8	9.4	6.6	7.4	6.5	5.9	5.3	5.9	7.3	9.7	11.9	11.5	11.2	11.4	12.1	5.3	12.1	8.4
Dec 11	10.8	11.3	13.4	14	11.7	14.4	16.3	15.1	12.4	12.9	13.7	12.1	12.2	10.8	10.5	10.9	12	12.1	12.1	12.9	13.7	13.1	11.6	10.8	10.5	16.3	12.5
Dec 12	10	9.4	10.8	9.7	9.7	9.2	9	7.8	7.4	7	4.8	4.9	6.1	8.7	9.4	7.5	8.1	9.1	7.3	8.1	8.5	8.8	6.9	9.9	4.8	10.8	8.3
Dec 13	7.8	9.3	9.6	11.1	9.9	6.1	8.6	9.2	8.9	4.4	5.9	4.9	5.7	5.2	4.8	6.7	9.9	9.7	9.5	8.9	6.8	7.6	8	6	4.4	11.1	7.7
Dec 14	5.7	7	8.1	8.8	9.8	9	9.4	9.5	9.5	10.9	13.8	17.5	20.1	20.1	20.8	15.7	13.2	13.2	12.9	10	14.6	13.6	12.9	14.7	5.7	20.8	12.5
Dec 15	16.4	18.5	16.4	11	8.9	5.5	4.5	4.3	8.9	7	8.7	8.7	8	8.4	11.1	9.4	10	10	11.1	12.3	12.2	14.4	12.6	10.8	4.3	18.5	10.4
Dec 16	9.9	8.4	10.4	9.5	11.8	15	11.9	10.8	12.2	13.4	12.8	12.9	10.1	5.3	5.7	5.2	5.9	5.1	6.2	8.6	8.1	8.9	8.9	10.5	5.1	15.0	9.5
Dec 17	13	12.3	10.7	11.7	12.3	11.5	11.5	13.3	12.2	10.7	10.2	10.2	11.1	11.9	10.9	12.9	15.3	16	15.3	15.5	13.2	11.4	14.8	16.7	10.2	16.7	12.7
Dec 18	15.3	15.5	14.8	15.1	13.3	12.8	14.2	18.7	15.3	10.3	5.4	5.2	10.9	5	5.8	9.8	13.1	17.5	21	18.9	17.8	17.2	17	15.9	5.0	21.0	13.6
Dec 19	16.7	19.8	17.1	19.8	22.8	19.3	17.4	15.7	14	9.6	9.1	10.1	13.7	12.6	10.5	7.1	8.7	8.5	7.5	6.9	10.6	13.7	14	10.6	6.9	22.8	13.2
Dec 20	4.5	5.2	7.3	7.5	9.7	10.2	12.7	13.3	13.9	12.5	9.7	4.8	4.2	4.8	2.9	3.6	4.2	3.7	5.7	6.7	4.4	1.3	3.9	4.7	1.3	13.9	6.7
Dec 21	4.9	4.4	1.6	3.1	2.9	4.2	3.3	5	9.1	7.9	6	6	6.4	9.2	11.2	11.8	10.5	9.1	9.2	10.9	9.5	6.7	4.8	6.2	1.6	11.8	6.8
Dec 22	4.8	6.3	9.7	7.2	8.9	8	10.1	9.7	10	12	13.1	12.5	11.9	6.8	6.2	5.2	5.3	5.3	5	5.2	5	5.6	5.4	6	4.8	13.1	7.7
Dec 23	6.1	6	3.9	4.3	5	5	4.4	3.6	3.9	3.1	3	2.2	1.6	1.6	2.1	1.7	2.7	3.2	3.5	3.2	3.2	4.2	7.7	7.9	1.6	7.9	3.9
Dec 24	8.1	8.5	8.5	6	6.6	8	8.7	7.5	7.2	6.5	6.3	5.5	5.4	4.9	5.2	5.2	5.5	4.3	4.7	4.2	3.8	4.4	2.6	2.4	2.4	8.7	5.8
Dec 25	2.7	3.7	2.8	1.9	0.3	0.1	0	0.1	0.1	2.3	3.4	4	7.5	6.7	5.6	6.5	6.4	5.6	7.6	7.8	7.5	8.2	7.5	7.3	0.0	8.2	4.4
Dec 26	7	8.6	9	11.7	14.9	18	15	14.5	16.2	12.2	13.8	12	12.4	10.9	11.5	11.7	12	11.9	10.5	10.4	12.2	12.1	12.8	13.9	7.0	18.0	12.3
Dec 27	13.1	12.6	12.1	11.9	11.9	13.1	12.3	11.7	13.1	13.5	12	13.1	14	14.1	12.7	13.3	14.8	16.5	13.1	11.8	14.4	14.2	13.7	11.8	11.7	16.5	13.1
Dec 28	9.3	12.3	13.3	12.3	11.1	10.8	9.8	7.2	6.3	10.8	10.2	8.7	9.7	10.9	11.8	13.2	14.5	14.8	15.6	17.4	17.6	16.6	16.8	18	6.3	18.0	12.5
Dec 29	17.5	18.4	20.4	18.4	17.9	19.4	20	18.4	17.4	17.2	15.7	15.8	13.1	11.8	9.2	7.7	7.9	8.9	8.6	8.7	10.5	8.7	7.4	6.6	6.6	20.4	13.6
Dec 30	9.4	9.8	11.2	9	9.4	10.9	11.9	12.1	12.1	14	14.9	15.2	15.3	18	16.9	12.8	11.7	13.9	14	10.4	10.6	13.1	12.8	6.8	6.8	18.0	12.3
Dec 31	12	13.4	10.9	9.4	12.6	10.5	11.2	11.8	12.2	11.4	12.4	12.2	12.5	16.3	16.9	12.8	12	12.4	12.1	10.1	10	11.2	9.2	8.3	8.3	16.9	11.8
Diurnal Maximum	24	22	23	23	23	21	20	19	17	17	20	21	20	20	21	16	15	18	21	19	19	20	19	20			
Diurnal Average	10.5	10.6	10.7	10.6	10.9	10.8	10.8	10.7	10.8	10.3	10.5	9.9	10.6	10.1	9.9	9.3	9.8	10.0	10.2	10.1	10.5	10.6	10.4	10.5			

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

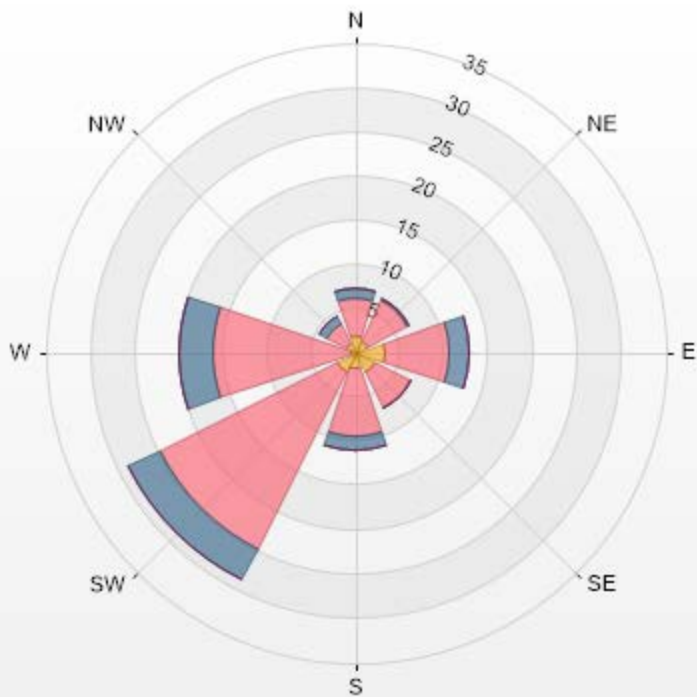
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.  
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

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



Wind: St. Lina Poll.: St. Lina-WDS[kph] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 1.48% Valid Data: 100.00% Calm Avg: 0.88 [kph]

Direction	0-6	6-15	15-29	29-39	>39.0	Total
N	2.02	4.17	1.08	0	0	7.27
NE	1.48	5.11	0.27	0	0	6.86
E	3.36	7.26	2.28	0	0	12.9
SE	2.42	4.57	0	0	0	6.99
S	1.88	7.66	1.61	0	0	11.15
SW	2.42	22.31	4.03	0	0	28.76
W	0.67	15.46	3.9	0	0	20.03
NW	1.21	2.55	0.81	0	0	4.57
Summary	15.46	69.09	13.98	0	0	98.53



LICA-201912-Revision 1



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

Summary of Hourly Averages

### WIND DIRECTION (VWD) in sector

Monthly Average:	229 (SW) degree	Hours in Service:	744
		Hours of Data:	744
		Hours of Missing Data:	0
		Hours of Calibration:	0
		Operational Uptime:	100.0

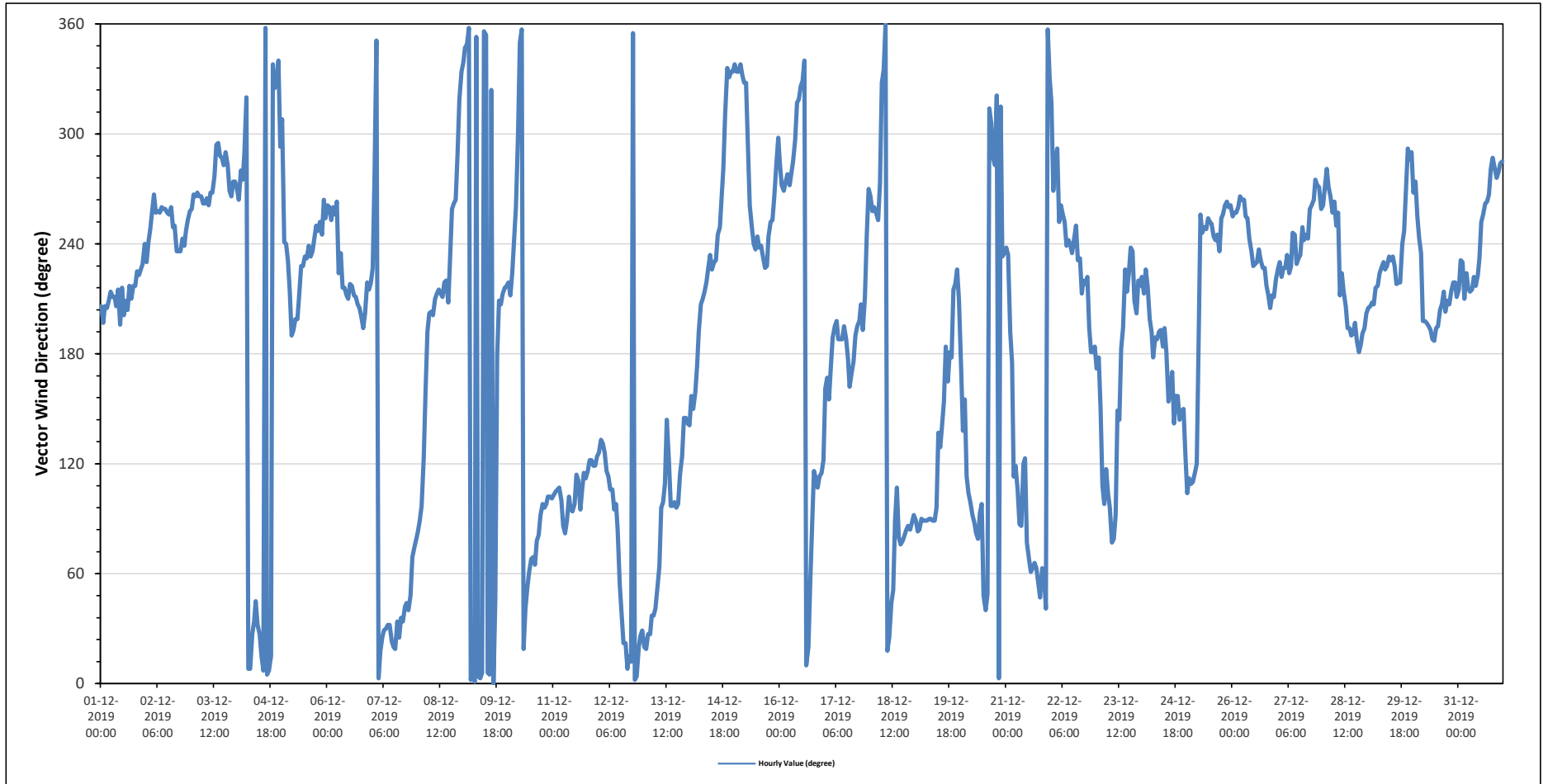
Day	Hourly Period Starting at (MST)																							Daily Average			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Degree	Quadrant	
Dec 1	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	214	SSW	
Dec 2	SW	WSW	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	251	WSW	
Dec 3	WSW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	272	W	
Dec 4	W	W	W	W	WNW	NW	N	N	NNE	NE	NE	NNE	NNE	N	N	N	N	N	NNE	NNW	NW	NW	NNW	WNW	341	NNW	
Dec 5	NW	WSW	WSW	SW	SSW	S	S	SSW	SSW	SSW	SW	SW	SW	SW	WSW	SW	SW	WSW	WSW	WSW	WSW	WSW	W	WSW	233	SW	
Dec 6	W	WSW	WSW	WSW	WSW	W	SW	SW	SW	SW	SSW	SSW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	226	SW	
Dec 7	SW	W	N	N	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NE	NNE	NE	NE	NE	NE	NE	ENE	ENE	ENE	ENE	31	NNE	
Dec 8	E	E	E	ESE	SSE	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SSW	SW	WSW	W	W	WNW	NW	NNW	221	SW
Dec 9	NNW	NNW	NNW	N	N	N	N	N	N	N	N	N	N	N	N	NW	N	NE	S	SSW	SSW	SSW	SSW	SSW	347	NNW	
Dec 10	SW	SSW	SW	WSW	WSW	WNW	N	N	NNE	NE	NE	ENE	ENE	ENE	ENE	E	E	E	E	E	E	E	E	E	81	E	
Dec 11	ESE	ESE	ESE	ESE	E	E	E	E	E	E	E	E	ESE	ESE	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	105	ESE	
Dec 12	SE	SE	SE	SE	ESE	ESE	ESE	ESE	E	E	E	NE	NE	NNE	NNE	N	NNE	NNE	N	N	NNE	NNE	NNE	NNE	63	ENE	
Dec 13	NNE	NNE	NNE	NNE	NE	NE	NE	NE	ENE	E	ESE	SE	ESE	E	E	E	E	E	ESE	ESE	SE	SE	SE	SE	80	E	
Dec 14	SE	SSE	SSE	SSE	S	S	SSW	SSW	SSW	SW	SW	SW	SW	SW	SW	WSW	WSW	W	W	NW	NNW	NNW	NNW	NNW	241	WSW	
Dec 15	NNW	NNW	NNW	NNW	NNW	NNW	NNW	WNW	W	WSW	WSW	SW	WSW	SW	WSW	SW	SW	WSW	WSW	WSW	W	WNW	WNW	WNW	277	W	
Dec 16	WNW	W	W	W	W	W	W	WNW	WNW	NW	NW	NW	NNW	NNW	N	NNE	NE	E	ESE	ESE	ESE	ESE	ESE	ESE	306	NW	
Dec 17	SSE	SSE	SSE	S	S	SSW	SSW	S	S	SSW	S	S	SSE	SSE	S	S	SSW	SSW	SSW	S	SSW	WSW	W	192	S		
Dec 18	W	WSW	WSW	WSW	WSW	W	NNW	NNW	N	NNE	NNE	NE	NE	E	ESE	E	ENE	ENE	E	E	E	E	E	E	46	NE	
Dec 19	E	E	E	E	E	E	E	E	E	E	E	E	SE	SE	SE	SSE	S	SSE	S	S	SSW	SW	SSW	SSW	117	ESE	
Dec 20	S	SE	SSE	ESE	ESE	E	E	E	E	ENE	E	E	NE	NE	NE	NW	NW	WNW	W	NW	N	NW	SW	SW	88	E	
Dec 21	SW	SW	S	S	ESE	ESE	E	E	ESE	ESE	ENE	ENE	ENE	ENE	ENE	ENE	NE	NE	ENE	ENE	NE	N	NNW	71	ENE		
Dec 22	NW	W	WNW	WNW	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SSW	S	S	241	WSW	
Dec 23	S	S	SSE	ESE	E	ESE	ESE	E	ENE	ENE	E	SSE	SE	S	SSW	SW	SSW	SW	SW	SW	SSW	SSW	SW	SW	167	SSE	
Dec 24	SW	SSW	SW	SW	SSW	S	S	S	S	S	S	S	SSW	S	SSE	SSE	SSE	SE	SSE	SSE	SE	SSE	SSE	SE	185	S	
Dec 25	ESE	ESE	ESE	ESE	ESE	ESE	S	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	WSW	248	WSW	
Dec 26	WSW	WSW	WSW	WSW	W	W	W	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SW	238	SW	
Dec 27	SW	SW	SW	SW	SW	SW	SW	WSW	WSW	WSW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	W	W	W	W	W	WSW	244	WSW	
Dec 28	W	W	W	W	W	WSW	W	WSW	WSW	SSW	SW	SSW	SSW	SSW	S	S	SSW	S	S	S	S	S	SSW	SSW	216	SW	
Dec 29	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	WSW	WSW	W	WNW	WNW	NNW	NNW	227	SW	
Dec 30	W	W	WSW	WSW	SW	SSW	SSW	SSW	SSW	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	210	SSW	
Dec 31	SSW	SW	SW	SSW	SW	SW	SSW	SSW	SSW	SW	SW	SW	WSW	WSW	W	W	W	W	WNW	W	W	WNW	WNW	WNW	246	WSW	
Diurnal Maximum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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 Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/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 VWD - St. Lina Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

### Summary of Hour Standard Deviations

#### STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

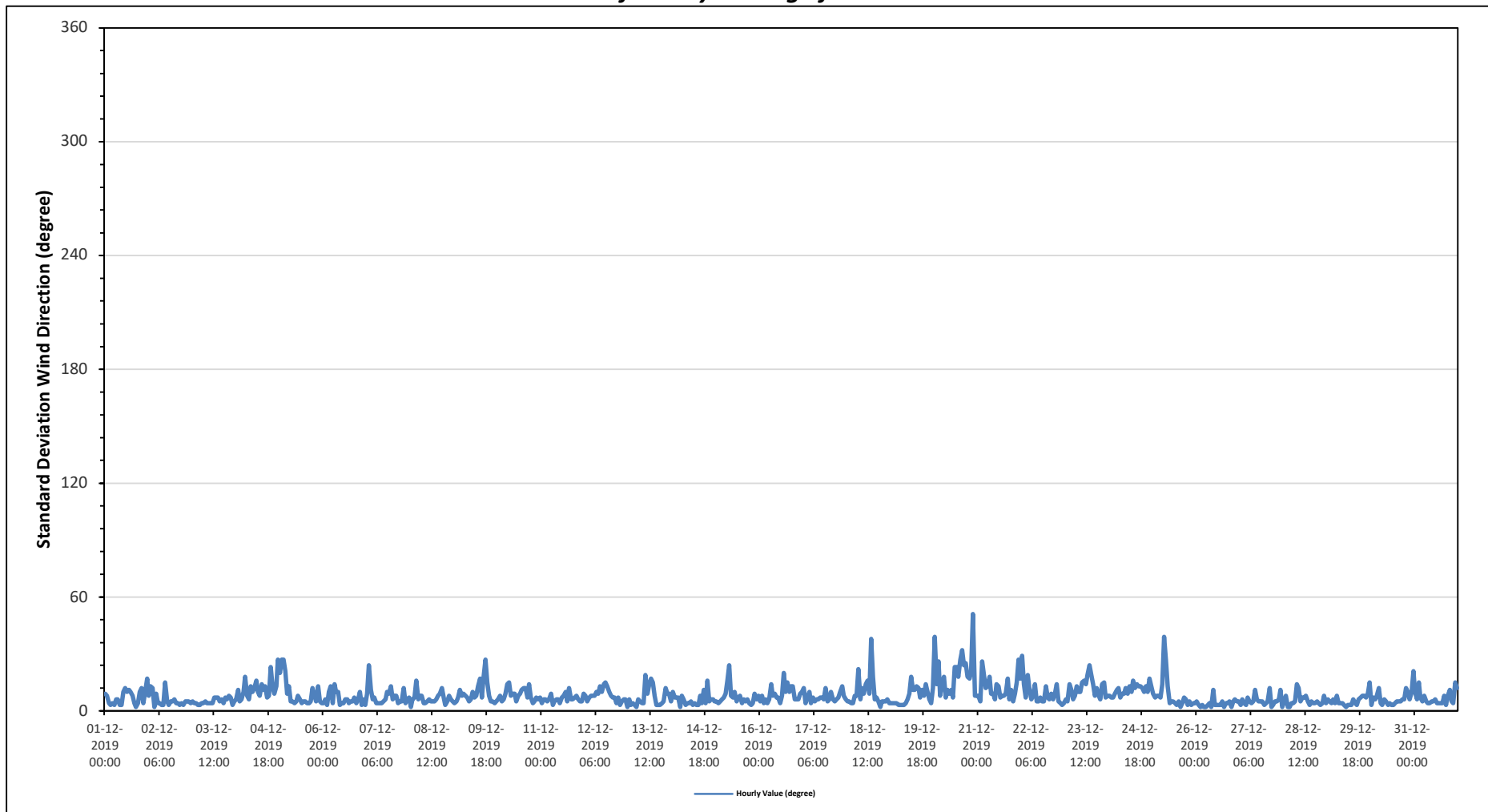
Maximum Hourly Value:	51 degree on December 20 at hour 21	Hours in Service:	744
Minimum Hourly Value:	2 degree on December 1 at hour 17	Hours of Data:	744
		Hours of Missing Data:	0
		Hours of Calibration:	0
		Operational Uptime:	100.0

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
Dec 1	9	8	4	3	4	3	6	6	3	3	10	12	10	11	10	8	4	2	4	10	12	4	10	17	2	17
Dec 2	8	13	12	2	9	4	4	3	3	15	5	3	5	5	6	4	4	3	4	3	5	5	5	4	2	15
Dec 3	5	4	4	3	3	4	4	4	5	4	4	4	7	7	7	5	6	4	7	6	8	7	3	5	3	8
Dec 4	6	11	5	6	10	18	8	6	13	10	12	16	10	8	14	11	13	7	8	23	13	9	13	27	5	27
Dec 5	20	27	27	21	9	13	5	5	4	5	8	6	4	5	5	4	4	5	12	8	5	13	5	4	4	27
Dec 6	4	6	3	10	13	4	14	10	10	3	4	4	6	6	4	5	5	7	4	6	10	3	6	3	3	14
Dec 7	9	24	11	6	7	4	4	4	4	5	6	10	9	13	6	8	8	4	5	5	12	4	6	7	4	24
Dec 8	2	6	7	16	6	8	8	4	4	5	6	5	5	5	6	8	9	12	7	3	5	8	6	5	2	16
Dec 9	4	5	7	11	8	9	8	7	5	6	10	7	8	13	17	7	17	27	15	8	5	5	4	5	4	27
Dec 10	6	8	5	6	9	14	15	8	9	9	5	8	9	11	12	12	7	14	7	4	5	7	6	7	4	15
Dec 11	4	6	6	5	6	9	3	5	6	6	4	7	8	10	5	12	6	6	7	8	6	5	5	9	3	12
Dec 12	8	5	7	8	8	8	10	9	13	10	14	15	13	10	8	7	7	4	7	3	5	6	6	2	2	15
Dec 13	6	3	4	3	2	6	5	4	4	19	9	14	17	15	8	3	3	3	4	5	12	9	9	5	2	19
Dec 14	10	7	7	7	2	8	6	3	4	4	5	3	4	3	3	8	4	11	4	16	5	6	6	5	2	16
Dec 15	5	4	5	6	7	9	16	24	8	7	10	5	7	8	4	6	5	6	4	3	4	9	6	8	3	24
Dec 16	5	8	4	6	4	6	14	8	9	7	7	4	8	20	10	15	10	13	13	6	6	6	9	10	4	20
Dec 17	12	4	7	10	4	7	5	6	6	7	7	6	12	5	6	10	6	5	6	7	10	13	8	6	4	13
Dec 18	5	5	4	4	8	8	22	6	12	9	14	16	9	38	18	6	7	5	2	5	5	5	6	4	2	38
Dec 19	4	4	4	4	3	3	3	3	4	6	9	18	11	11	13	12	7	11	8	14	10	6	4	12	3	18
Dec 20	39	14	26	8	15	18	7	11	9	11	7	23	23	18	27	32	24	25	18	17	21	51	8	8	7	51
Dec 21	8	5	26	19	12	13	18	9	9	6	14	13	7	8	8	9	17	6	11	5	9	15	27	17	5	27
Dec 22	29	14	7	19	12	6	8	14	5	5	7	5	5	13	7	6	9	6	9	14	5	4	3	4	3	29
Dec 23	6	5	14	11	6	8	13	10	10	15	16	14	19	24	19	14	8	12	8	6	14	15	7	8	5	24
Dec 24	8	7	7	9	11	12	7	9	9	12	9	13	10	16	12	14	13	13	12	10	13	10	17	13	7	17
Dec 25	9	7	8	8	7	14	39	27	13	4	5	5	4	3	5	2	4	7	6	3	5	3	4	4	2	39
Dec 26	5	3	2	3	2	2	3	4	2	11	3	3	3	3	5	2	4	4	5	2	5	6	5	5	2	11
Dec 27	3	6	4	3	7	5	4	5	11	6	5	5	5	3	4	5	12	2	3	5	5	6	11	2	2	12
Dec 28	5	8	2	2	4	4	5	14	12	5	7	7	8	5	3	5	4	4	5	4	3	4	8	4	2	14
Dec 29	6	5	4	6	4	8	4	4	4	3	2	3	3	3	6	4	3	6	7	8	8	7	9	15	2	15
Dec 30	3	7	6	8	12	4	3	6	5	3	4	3	3	4	5	5	5	6	6	12	10	6	10	21	3	21
Dec 31	10	6	15	7	5	8	5	4	4	5	5	6	4	4	4	4	8	3	8	11	5	4	15	12	3	15
Diurnal Minimum	2	3	2	2	2	2	3	3	2	3	2	3	3	3	3	2	3	2	2	2	3	3	3	2		
Diurnal Maximum	39	27	27	21	15	18	39	27	13	19	16	23	23	38	27	32	24	27	18	23	21	51	27	27		

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 STDWD - St. Lina Site**



**BONNYVILLE -EAST STATION**



**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**

**Bonnyville - East Site - December 2019**

**Summary of Hourly Averages**

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

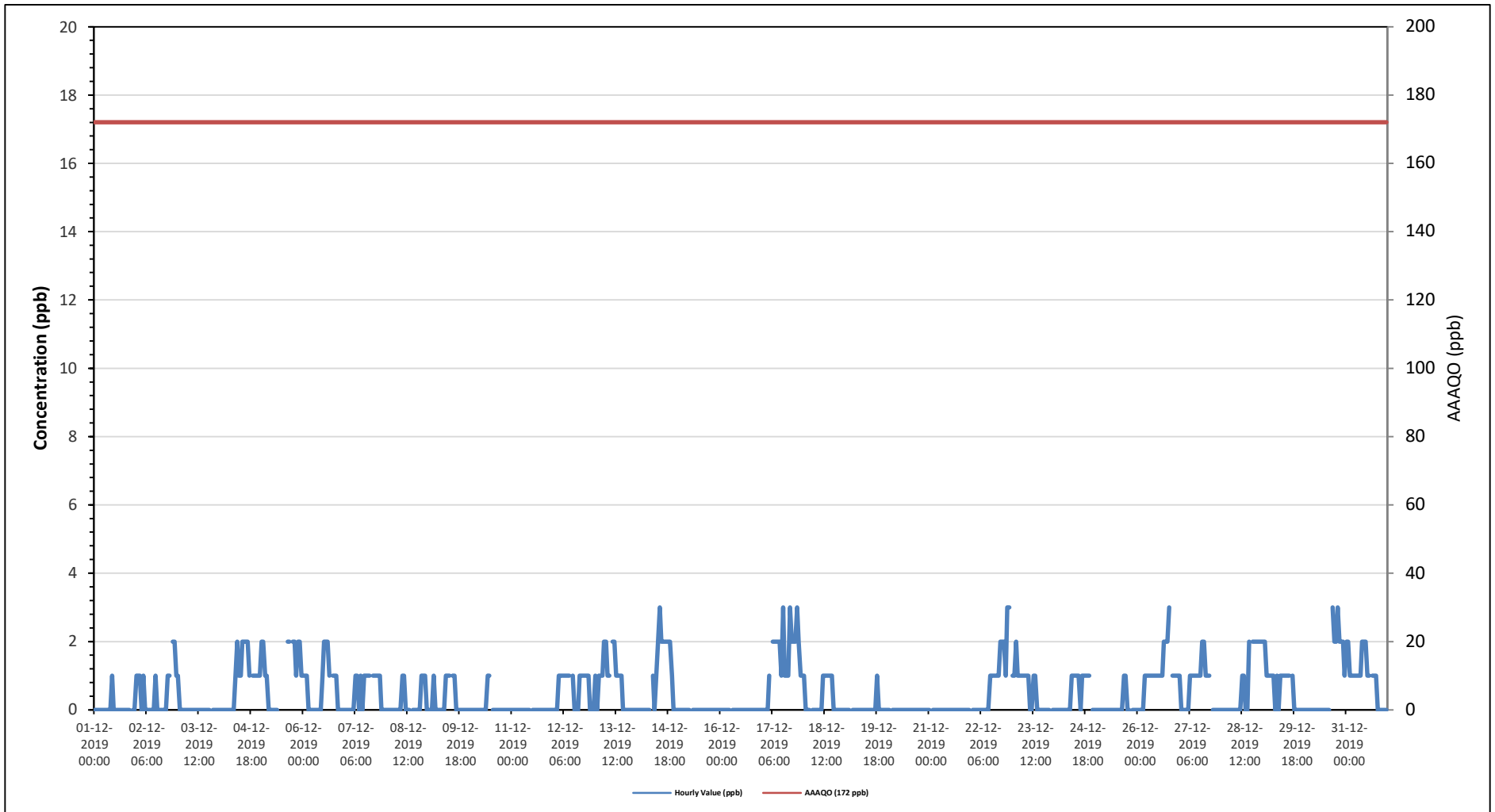
Maximum Hourly Value:	3 ppb on December 14 at hour 13	Hours in Service:	744
Maximum Daily Value:	1.5 ppb on December 17	Hours of Data:	707
Minimum Hourly Value:	0 ppb on December 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on December 11	Hours of Calibration:	37
Monthly Average:	0.5 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
Dec 1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0.0
Dec 2	1	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	S	2	2	1	0	2	0.5
Dec 3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0.0
Dec 4	0	0	0	0	0	0	0	0	0	1	2	1	1	2	2	2	2	1	S	1	1	1	1	1	1	0	0.8
Dec 5	2	2	1	1	0	0	0	0	0	0	C	C	C	C	C	2	2	S	2	2	1	2	2	1	0	1.1	
Dec 6	1	1	1	0	0	0	0	0	0	0	0	1	2	2	2	1	S	1	1	1	0	0	0	0	0	0.6	
Dec 7	0	0	0	0	0	0	1	1	0	1	0	1	1	1	1	S	1	1	1	1	1	0	0	0	0	0.5	
Dec 8	0	0	0	0	0	0	0	0	0	1	1	0	0	0	S	0	0	0	0	0	0	1	1	1	0	0.2	
Dec 9	0	0	0	1	0	0	0	0	0	0	1	1	1	S	1	1	0	0	0	0	0	0	0	0	0	0.3	
Dec 10	0	0	0	0	0	0	0	0	0	0	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0.1	
Dec 11	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Dec 12	0	0	0	1	1	1	1	1	1	1	S	1	0	0	0	1	1	1	1	1	1	1	0	0	0	0.6	
Dec 13	1	0	1	1	1	2	2	1	1	S	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0.8	
Dec 14	0	0	0	0	0	0	0	0	S	1	0	1	2	2	3	2	2	2	2	2	2	1	0	0	0	0.9	
Dec 15	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Dec 16	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Dec 17	0	0	0	0	1	S	2	2	2	2	2	1	3	1	1	1	3	2	2	2	3	2	1	1	0	1.5	
Dec 18	1	0	0	0	S	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0.3	
Dec 19	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.0	
Dec 20	0	0	S	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Dec 21	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Dec 22	S	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	2	2	2	1	3	3	S	0	0.9	
Dec 23	1	1	2	1	1	1	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	S	0	0.6	
Dec 24	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	1	1	1	1	S	0	0	0	0.4	
Dec 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	S	0	0	0	0	0.1	
Dec 26	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	S	1	1	1	1	0	1.0	
Dec 27	1	0	0	0	0	0	1	1	1	1	1	1	1	2	2	1	1	1	S	0	0	0	0	0	0	0.7	
Dec 28	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	2	S	2	2	2	2	2	2	0	0.7	
Dec 29	2	2	1	1	1	1	1	0	1	0	1	1	1	1	1	1	S	1	0	0	0	0	0	0	0	0.7	
Dec 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	3	2	2	3	2	2	2	1	0	0.7	
Dec 31	2	2	1	1	1	1	1	1	1	2	2	2	1	1	S	1	1	1	0	0	0	0	0	0	0	0.0	
Diurnal Maximum	2	2	2	1	1	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	3	3	3	3	2		
Daiurnal Average	0.4	0.3	0.3	0.2	0.3	0.2	0.4	0.3	0.3	0.4	0.6	0.7	0.7	0.7	0.6	0.6	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.3		

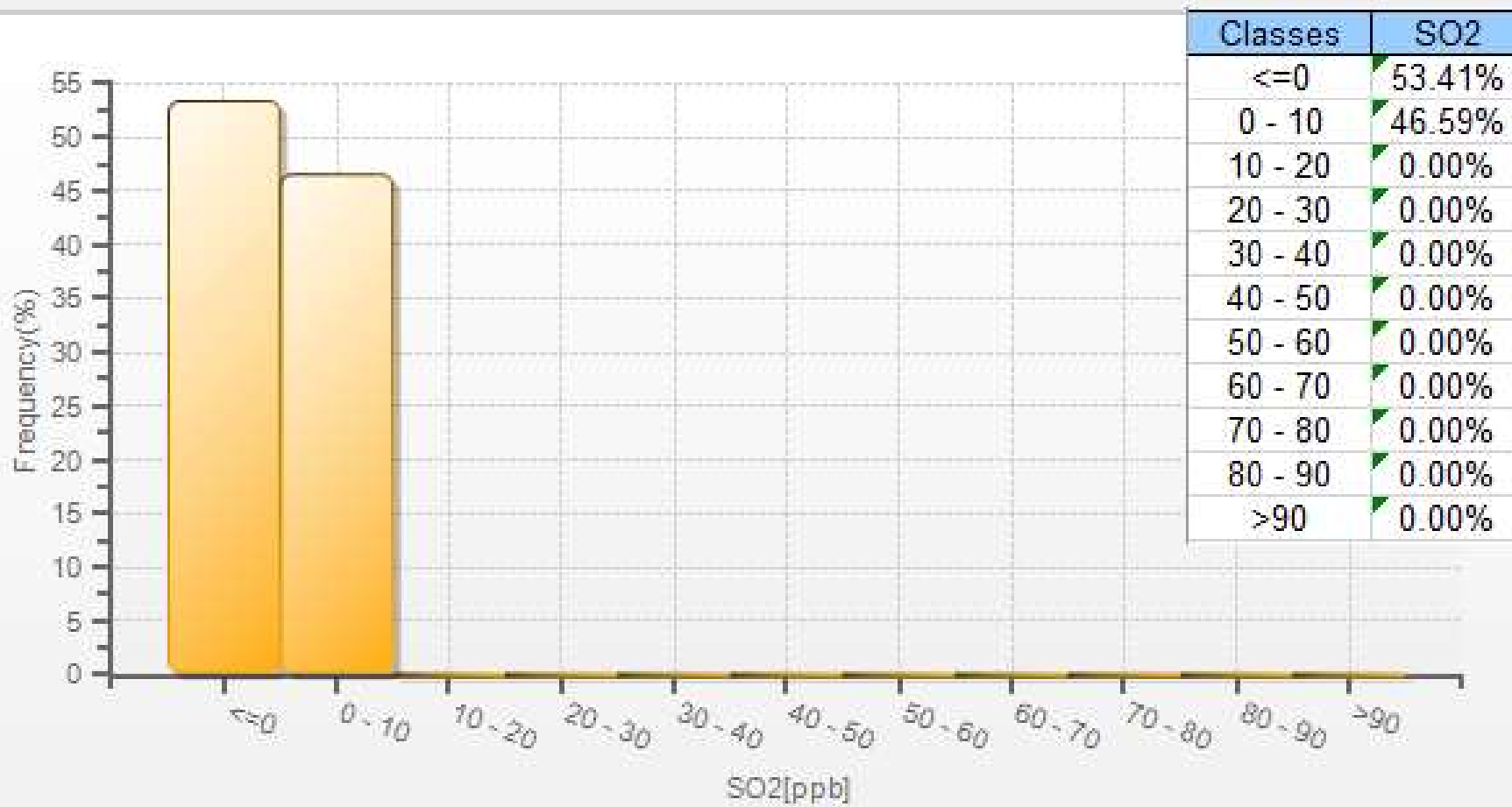
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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 SO2 - Bonnyville - East Site**



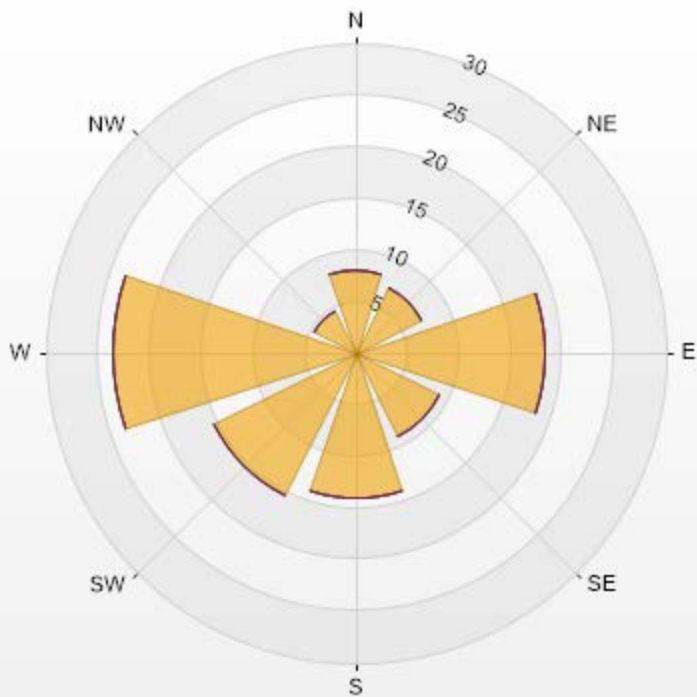
SO2[ppb] Histogram: Bonnyville East Monthly: 12-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-SO2[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.62% Calm Avg: 0.00 [ppb]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	7.95	0	0	0	0	7.95
NE	7.1	0	0	0	0	7.1
E	18.32	0	0	0	0	18.32
SE	9.09	0	0	0	0	9.09
S	14.06	0	0	0	0	14.06
SW	15.48	0	0	0	0	15.48
W	23.44	0	0	0	0	23.44
NW	4.55	0	0	0	0	4.55
Summary	100	0	0	0	0	100





LICA-201912-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 - December 2019

Summary of Hourly Averages

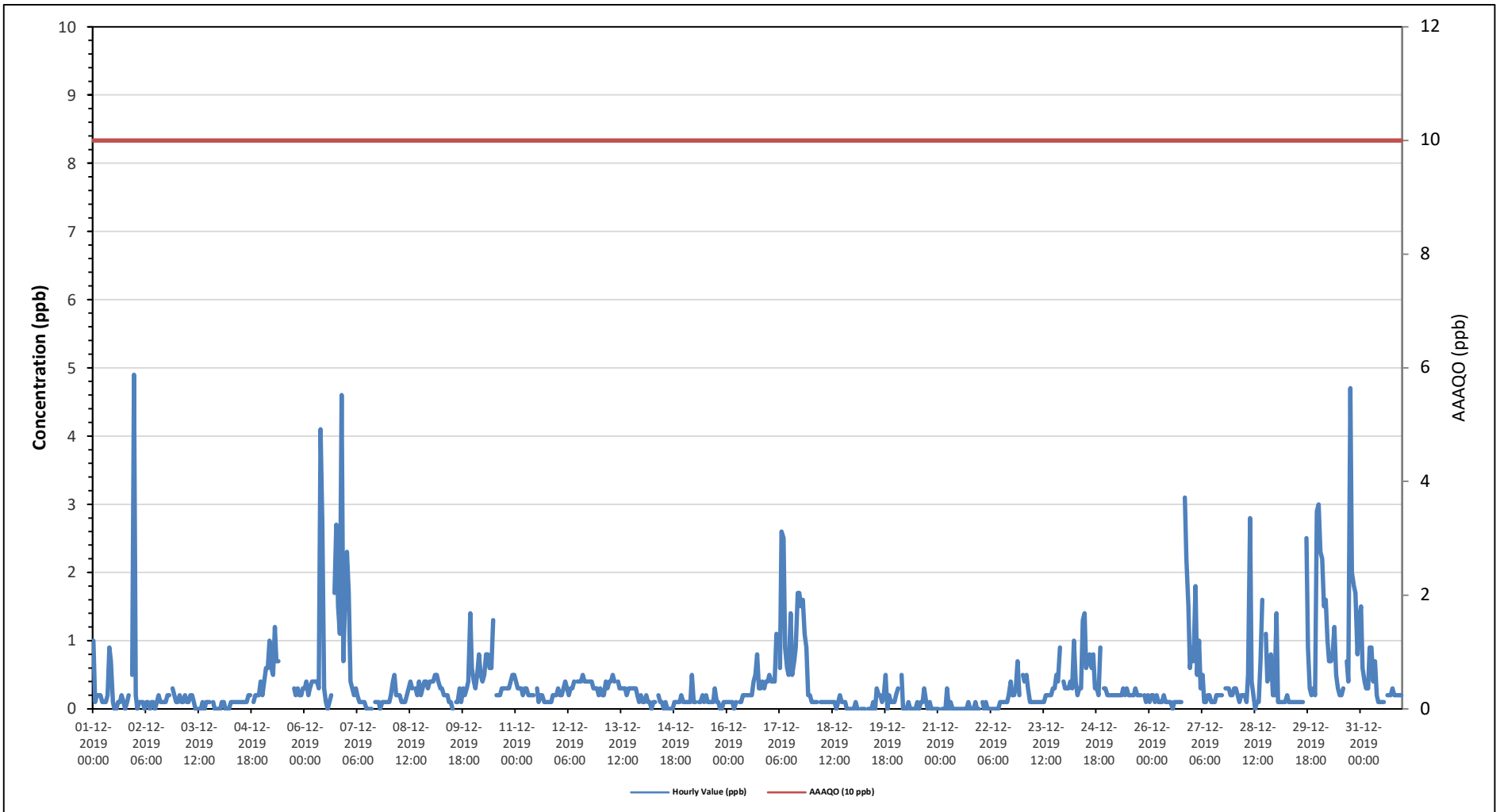
HYDROGEN SULPHIDE (H<sub>2</sub>S) in ppb

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: 5 ppb on December 1 at hour 23													Hours in Service: 744														
Maximum Daily Value: 1.3 ppb on December 30													Hours of Data: 705														
Minimum Hourly Value: 0 ppb on December 1 at hour 12													Hours of Missing Data: 1														
Minimum Daily Value: 0.0 ppb on December 21													Hours of Calibration: 38														
Monthly Average: 0.3 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
Dec 1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	S	1	5	0	5	0.4
Dec 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	0.1
Dec 3	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	0.1
Dec 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0.1
Dec 5	0	0	1	1	1	1	1	1	1	C	C	C	C	C	C	0	S	0	0	0	0	0	0	0	0	1	-
Dec 6	0	0	0	0	0	0	0	0	0	4	3	0	0	0	0	0	S	2	3	2	1	5	1	2	0	5	1.1
Dec 7	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	2	0.3
Dec 8	0	0	0	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0.3
Dec 9	0	0	1	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	1	0	1	0.3
Dec 10	0	0	1	1	1	0	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	1	1	0	1	0.5
Dec 11	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2
Dec 12	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.3
Dec 13	0	0	0	0	0	0	0	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3
Dec 14	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
Dec 15	0	0	0	0	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
Dec 16	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0.2
Dec 17	1	0	0	0	1	S	1	3	3	1	1	1	1	1	1	2	2	2	2	1	1	0	0	0	0	3	1.0
Dec 18	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
Dec 19	0	0	0	S	0	0	0	S1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.1
Dec 20	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
Dec 21	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 22	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	S	0	0.1	
Dec 23	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	S	0	0	0	0.3
Dec 24	0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	0	0	0	1	S	0	0	0	0	0	0.5
Dec 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	0.2
Dec 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	3	2	2	1	0	0	3	0.4
Dec 27	1	1	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0.4
Dec 28	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	1	2	S	1	0	1	1	0	0	0	3	0.5
Dec 29	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	3	1	0	0	0	0	3	0	3	0.4	
Dec 30	3	2	2	2	2	1	1	1	1	1	1	0	0	0	S	1	0	5	2	2	2	1	1	0	5	1.3	
Dec 31	2	1	0	0	0	1	1	0	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	2	0.4
Diurnal Maximum	3	2	2	2	2	1	1	3	3	4	3	1	1	1	1	1	2	3	5	2	3	5	2	5			
Diurnal Average	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.5	0.6	0.3	0.6			
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						

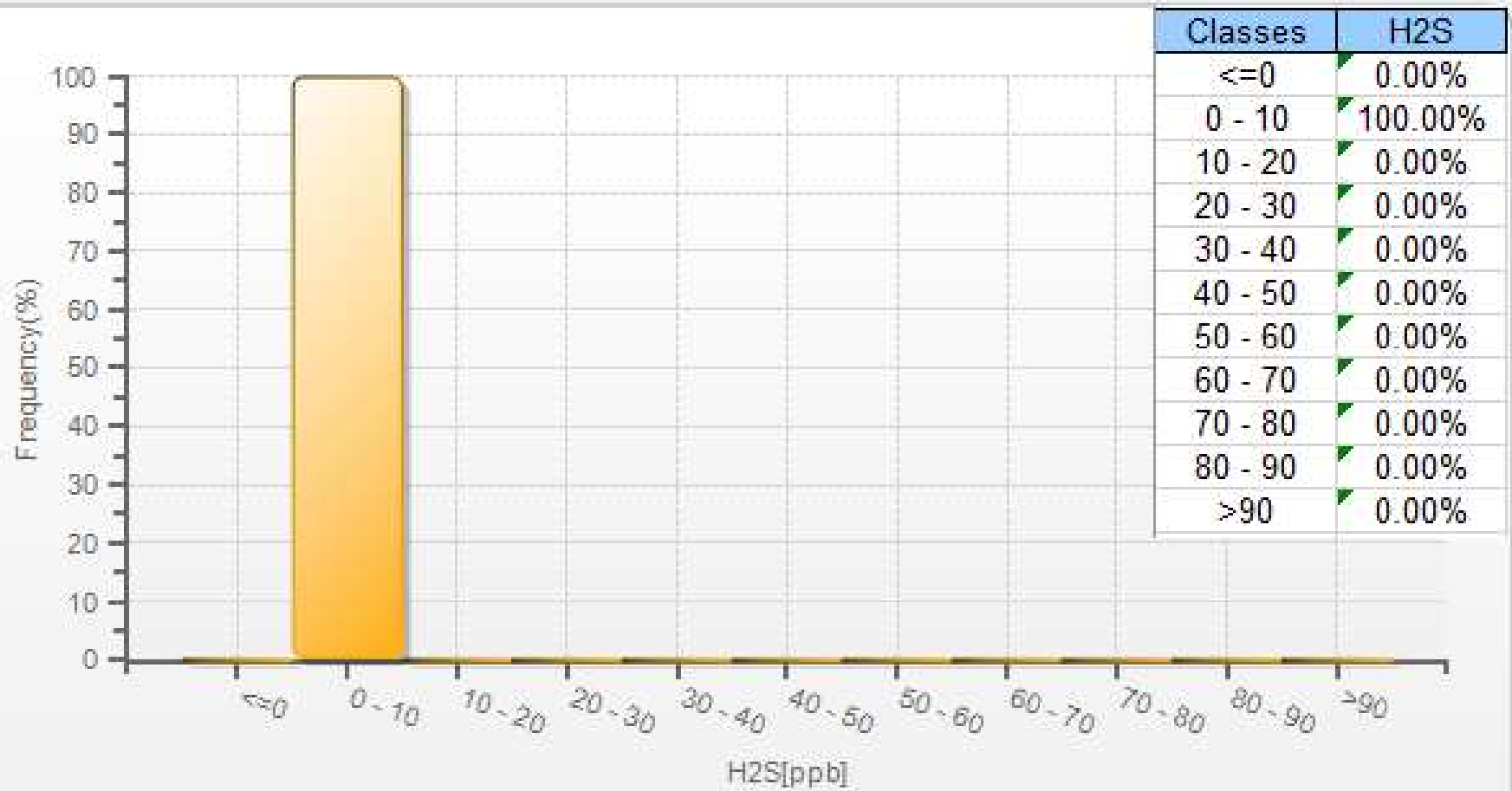
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

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

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

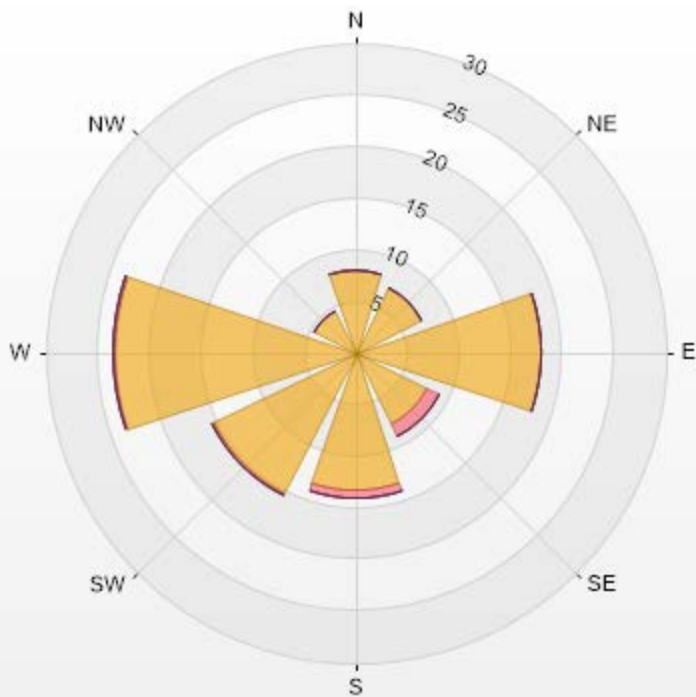


H2S[ppb] Histogram: Bonnyville East Monthly: 12-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-H2S[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.35% Calm Avg: 0.00 [ppb]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	7.98	0	0	0	0	7.98
NE	7.12	0	0	0	0	7.12
E	18.09	0	0	0	0	18.09
SE	7.69	1.42	0	0	0	9.11
S	13.39	0.71	0	0	0	14.1
SW	15.38	0.14	0	0	0	15.52
W	23.36	0.14	0	0	0	23.5
NW	4.56	0	0	0	0	4.56
Summary	97.57	2.41	0	0	0	100



LICA-201912-Revision 1



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**Bonnyville - East Site - December 2019**

### Summary of Hourly Averages

#### OXIDES OF NITROGEN (NOx) in ppb

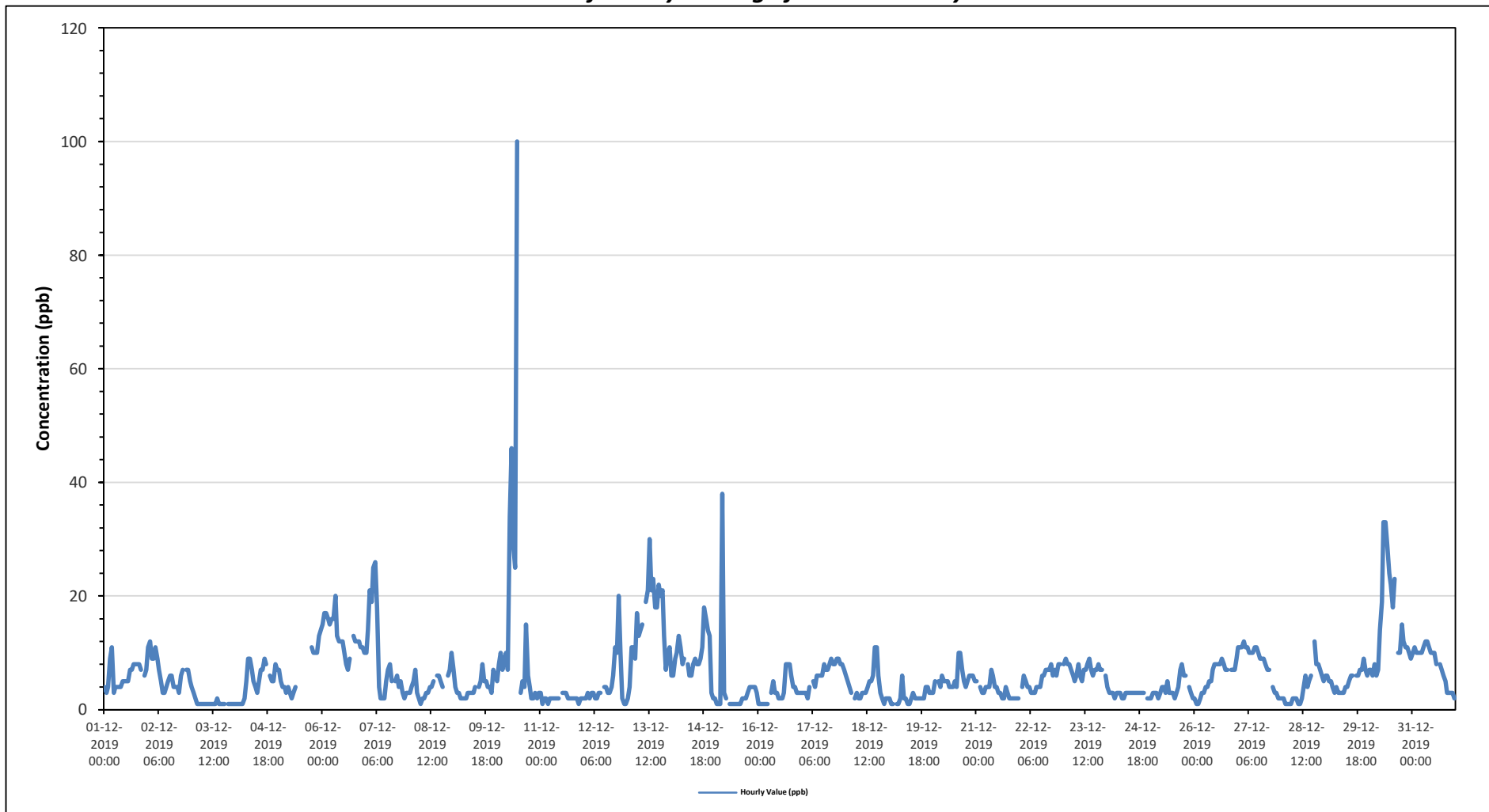
Maximum Hourly Value:	100 ppb on December 10 at hour 11	Hours in Service:	744
Maximum Daily Value:	15.2 ppb on December 13	Hours of Data:	703
Minimum Hourly Value:	1 ppb on December 3 at hour 3	Hours of Missing Data:	2
Minimum Daily Value:	1.3 ppb on December 3	Hours of Calibration:	39
Monthly Average:	6.3 ppb	Operational Uptime:	99.7

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	
Dec 1	4	3	4	9	11	3	4	4	4	4	5	5	5	5	7	7	8	8	8	8	7	S	6	7	3	11	5.9	
Dec 2	11	12	9	9	11	9	7	5	3	3	4	5	6	6	4	4	3	6	7	S	7	7	7	5	3	12	6.4	
Dec 3	4	3	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	S	1	1	1	1	1	4	1.3	
Dec 4	1	1	1	1	1	2	5	9	9	7	5	4	3	5	7	7	9	8	S	6	5	5	8	7	1	9	5.0	
Dec 5	7	5	4	4	3	4	3	2	3	4	C	C	C	C	C	C	C	C	C	11	10	10	10	13	14	2	14	-
Dec 6	15	17	17	16	15	16	16	20	13	12	12	12	10	8	7	9	S	13	12	12	12	11	11	10	7	20	12.9	
Dec 7	10	14	21	19	25	26	18	4	2	2	2	5	7	8	5	S	5	6	4	5	3	2	3	3	2	26	8.7	
Dec 8	3	4	5	7	3	2	1	2	2	3	3	4	4	5	S	6	6	5	4	S1	S1	6	7	10	1	10	4.4	
Dec 9	7	4	3	3	2	2	2	2	3	3	3	4	S	4	5	8	5	5	4	4	3	7	6	2	8	4.0		
Dec 10	5	8	10	7	9	10	7	34	46	29	25	100	S	3	5	4	15	6	4	2	2	3	2	3	2	100	14.7	
Dec 11	3	1	2	2	1	2	2	2	2	2	2	S	3	3	3	2	2	2	2	2	2	1	2	2	1	3	2.0	
Dec 12	2	2	3	2	3	3	2	2	3	3	S	4	4	3	3	4	6	11	10	20	10	2	1	1	1	20	4.5	
Dec 13	2	4	11	11	9	17	13	14	15	S	19	21	30	21	23	18	18	22	20	21	13	7	10	11	2	30	15.2	
Dec 14	6	6	9	10	13	11	8	9	S	8	6	6	8	9	8	8	9	11	18	16	14	13	3	2	2	18	9.2	
Dec 15	2	1	1	1	38	3	2	S	1	1	1	1	1	1	2	2	2	3	4	4	4	4	3	1	38	3.6		
Dec 16	1	1	1	1	1	S	3	5	3	3	2	2	2	3	8	8	8	6	4	4	3	3	3	1	8	3.3		
Dec 17	3	3	3	2	4	S	5	4	6	6	6	6	8	7	7	8	9	8	8	9	9	8	8	7	2	9	6.3	
Dec 18	6	5	4	3	S	2	3	2	2	3	3	3	4	5	5	6	11	11	6	3	2	1	2	2	1	11	4.1	
Dec 19	2	1	1	S	1	1	2	6	2	2	1	1	2	3	2	2	2	2	2	2	4	4	3	3	1	6	2.2	
Dec 20	3	5	S	5	4	6	5	5	5	4	4	4	5	4	10	10	7	5	4	5	6	6	6	5	3	10	5.3	
Dec 21	5	S	4	3	3	4	4	4	7	6	4	4	3	3	2	2	4	3	2	2	2	2	2	2	2	7	3.3	
Dec 22	S	4	6	5	4	4	3	3	3	4	4	4	6	6	7	7	7	8	6	7	6	8	8	S	3	8	5.5	
Dec 23	8	9	8	8	7	6	5	6	8	6	5	7	7	8	9	7	6	7	7	8	7	S	6	5	9	7.0		
Dec 24	4	3	3	3	2	3	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	S	2	2	2	4	2.8	
Dec 25	2	3	3	3	2	3	4	4	3	5	3	3	3	2	3	4	7	8	6	6	S	4	3	2	2	8	3.7	
Dec 26	2	1	1	2	3	3	4	4	5	5	7	8	8	8	8	9	8	7	7	S	7	7	7	9	1	9	5.7	
Dec 27	11	11	11	12	11	11	10	10	10	11	11	10	9	9	9	8	7	7	S	4	3	3	2	2	2	12	8.3	
Dec 28	2	2	1	1	1	2	2	2	2	1	1	2	4	6	4	5	6	S	12	8	8	7	6	5	1	12	3.9	
Dec 29	6	6	5	5	4	3	4	3	3	3	3	4	4	5	6	6	S	6	6	7	7	9	7	6	3	9	5.1	
Dec 30	7	7	6	8	6	7	14	19	33	33	29	24	22	18	23	S	10	10	15	12	11	11	10	9	6	33	15.0	
Dec 31	10	11	10	10	10	10	11	12	12	11	10	10	10	8	S	8	7	6	5	3	3	3	3	2	2	12	8.0	
Diurnal Maximum	15	17	21	19	38	26	18	34	46	33	29	100	30	21	23	18	18	22	20	21	14	13	13	14				
Diurnal Average	5.1	5.2	5.6	5.8	6.9	5.9	5.7	6.7	7.2	6.2	6.4	9.2	6.4	6.0	6.4	6.1	7.0	7.0	7.0	7.1	6.0	5.4	5.2	5.0				

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

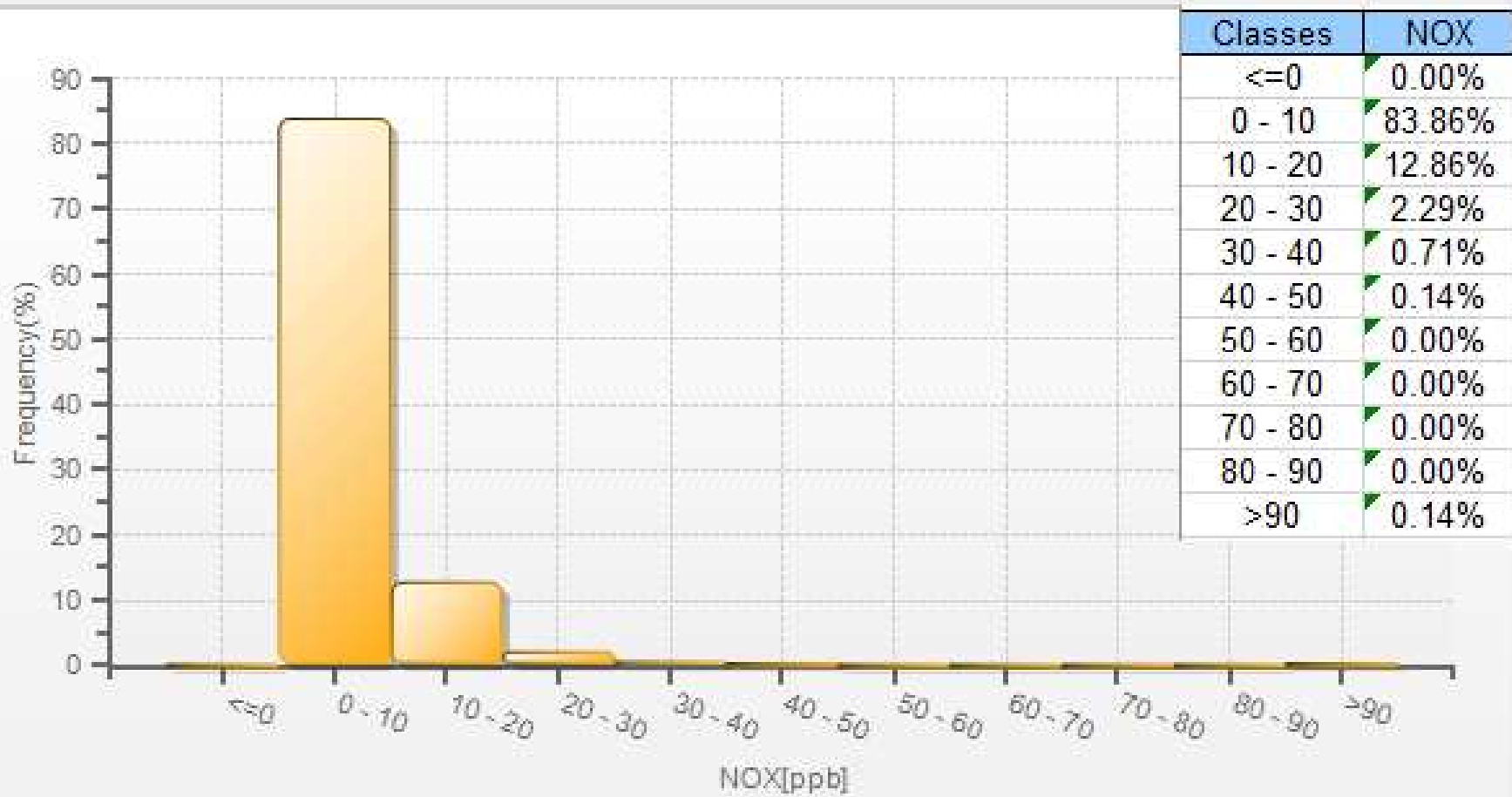
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.  
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

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



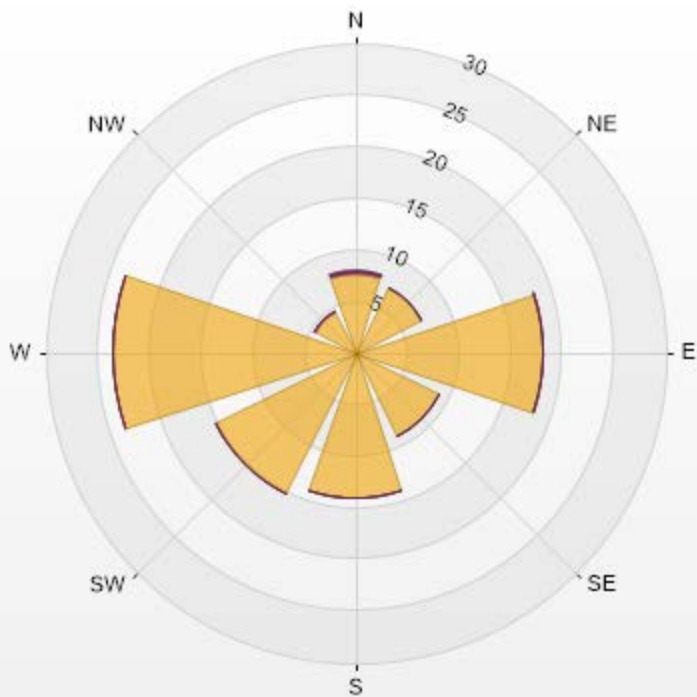


NOX[ppb] Histogram: Bonnyville East Monthly: 12-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-NOX[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.09% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	7.57	0.29	0	0.14	0	8
NE	7.14	0	0	0	0	7.14
E	18	0.29	0	0	0	18.29
SE	9.14	0	0	0	0	9.14
S	14.14	0	0	0	0	14.14
SW	15.29	0	0	0	0	15.29
W	23.43	0	0	0	0	23.43
NW	4.29	0.29	0	0	0	4.58
Summary	99	0.87	0	0.14	0	100



LICA-201912-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 - December 2019

### Summary of Hourly Averages

#### NITRIC OXIDE (NO) in ppb

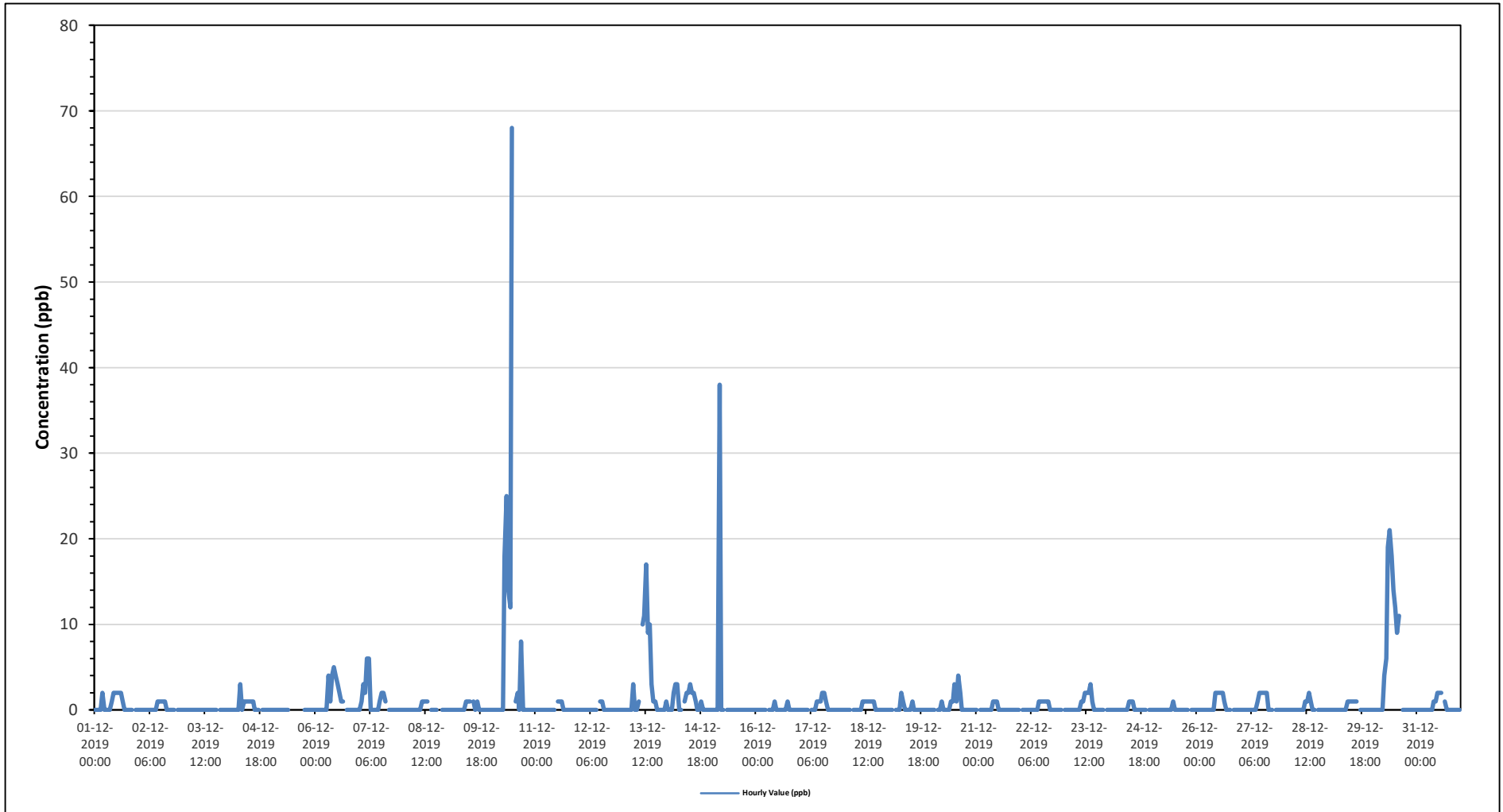
Maximum Hourly Value:	68 ppb on December 10 at hour 11	Hours in Service:	744
Maximum Daily Value:	6.4 ppb on December 10	Hours of Data:	703
Minimum Hourly Value:	0 ppb on December 1 at hour 0	Hours of Missing Data:	2
Minimum Daily Value:	0.0 ppb on December 3	Hours of Calibration:	39
Monthly Average:	0.8 ppb	Operational Uptime:	99.7

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
Dec 1	0	0	0	0	2	0	0	0	0	1	2	2	2	2	2	1	0	0	0	0	0	S	0	0	0	2	0.6
Dec 2	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	S	0	0	0	1	0.2
Dec 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0.0
Dec 4	0	0	0	0	0	0	0	3	0	1	1	1	1	1	1	0	0	0	0	S	0	0	0	0	0	3	0.4
Dec 5	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	-
Dec 6	0	0	0	0	0	0	0	4	1	4	5	4	3	2	1	S	0	0	0	0	0	0	0	0	0	5	1.1
Dec 7	0	1	3	2	6	6	0	0	0	0	0	1	2	2	1	S	0	0	0	0	0	0	0	0	0	6	1.0
Dec 8	0	0	0	0	0	0	0	0	0	0	1	1	1	1	S	0	0	0	0	0	S1	S1	0	0	0	1	0.2
Dec 9	0	0	0	0	0	0	0	0	0	0	1	1	1	S	1	0	1	0	0	0	0	0	0	0	0	1	0.2
Dec 10	0	0	0	0	0	0	0	18	25	14	12	68	S	1	2	0	8	0	0	0	0	0	0	0	0	68	6.4
Dec 11	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0.1
Dec 12	0	0	0	0	0	0	0	0	0	0	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Dec 13	0	0	0	0	0	3	0	0	1	S	10	11	17	9	10	3	1	1	0	0	0	0	0	1	0	17	2.9
Dec 14	0	0	0	2	3	3	0	0	S	1	2	2	3	2	2	1	0	0	1	0	0	0	0	0	0	3	1.0
Dec 15	0	0	0	0	38	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	1.7
Dec 16	0	0	0	0	0	0	S	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0.1
Dec 17	0	0	0	0	0	S	0	0	0	1	1	1	2	2	1	0	0	0	0	0	0	0	0	0	0	2	0.3
Dec 18	0	0	0	0	S	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0.3
Dec 19	0	0	0	S	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0.2
Dec 20	0	0	S	0	0	1	0	0	0	0	1	1	3	1	4	2	0	0	0	0	0	0	0	0	0	4	0.6
Dec 21	0	S	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Dec 22	S	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0.3
Dec 23	0	0	0	0	0	0	0	0	0	1	1	2	2	2	3	1	0	0	0	0	0	0	0	0	0	3	0.5
Dec 24	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	0.1
Dec 25	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0.0
Dec 26	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	1	0	0	0	0	S	0	0	0	0	2	0.5
Dec 27	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	0	0	0	0	S	0	0	0	0	0	2	0.5
Dec 28	0	0	0	0	0	0	0	0	0	0	0	1	1	2	1	0	0	0	0	S	0	0	0	0	0	2	0.2
Dec 29	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	1	0.3
Dec 30	0	0	0	0	0	0	4	6	19	21	18	14	12	9	11	S	0	0	0	0	0	0	0	0	0	21	5.0
Dec 31	0	0	0	0	0	0	0	0	0	1	1	2	2	2	S	1	0	0	0	0	0	0	0	0	0	2	0.4
Diurnal Maximum	0	1	3	2	38	6	4	18	25	21	18	68	17	9	11	3	8	1	1	0	0	0	0	0	1		
Diurnal Average	0.0	0.0	0.1	0.1	1.6	0.4	0.1	1.1	1.6	1.6	2.3	4.3	2.2	1.7	1.8	0.5	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

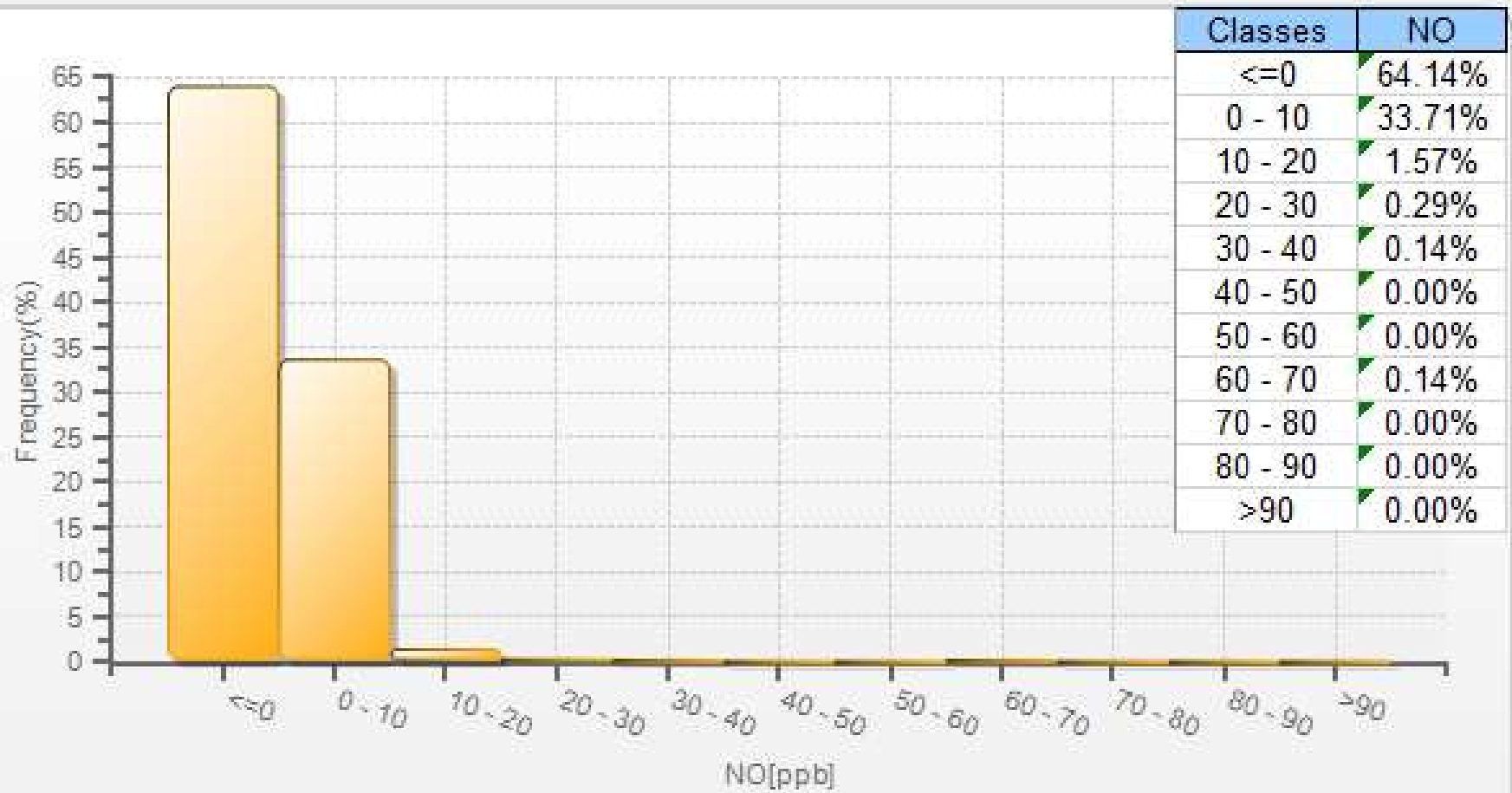
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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*

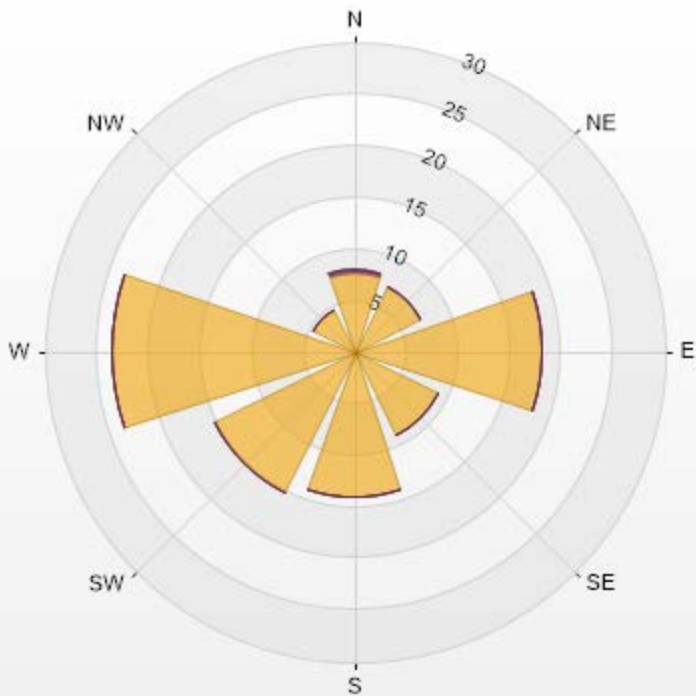


NO[ppb] Histogram: Bonnyville East Monthly: 12-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-NO[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.09% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	7.71	0.14	0.14	0	0	7.99
NE	7.14	0	0	0	0	7.14
E	18.29	0	0	0	0	18.29
SE	9.14	0	0	0	0	9.14
S	14.14	0	0	0	0	14.14
SW	15.29	0	0	0	0	15.29
W	23.43	0	0	0	0	23.43
NW	4.57	0	0	0	0	4.57
Summary	100	0.14	0.14	0	0	100



LICA-201912-Revision 1





# LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - December 2019

Summary of Hourly Averages

NITROGEN DIOXIDE (NO<sub>2</sub>) in ppb

## Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb

Number of 1-Hour Exceedences: 0

Maximum Hourly Value: 33 ppb on December 10 at hour 11  
 Maximum Daily Value: 12.4 ppb on December 13  
 Minimum Hourly Value: 0 ppb on December 15 at hour 4  
 Minimum Daily Value: 1.3 ppb on December 3  
 Monthly Average: 5.4 ppb

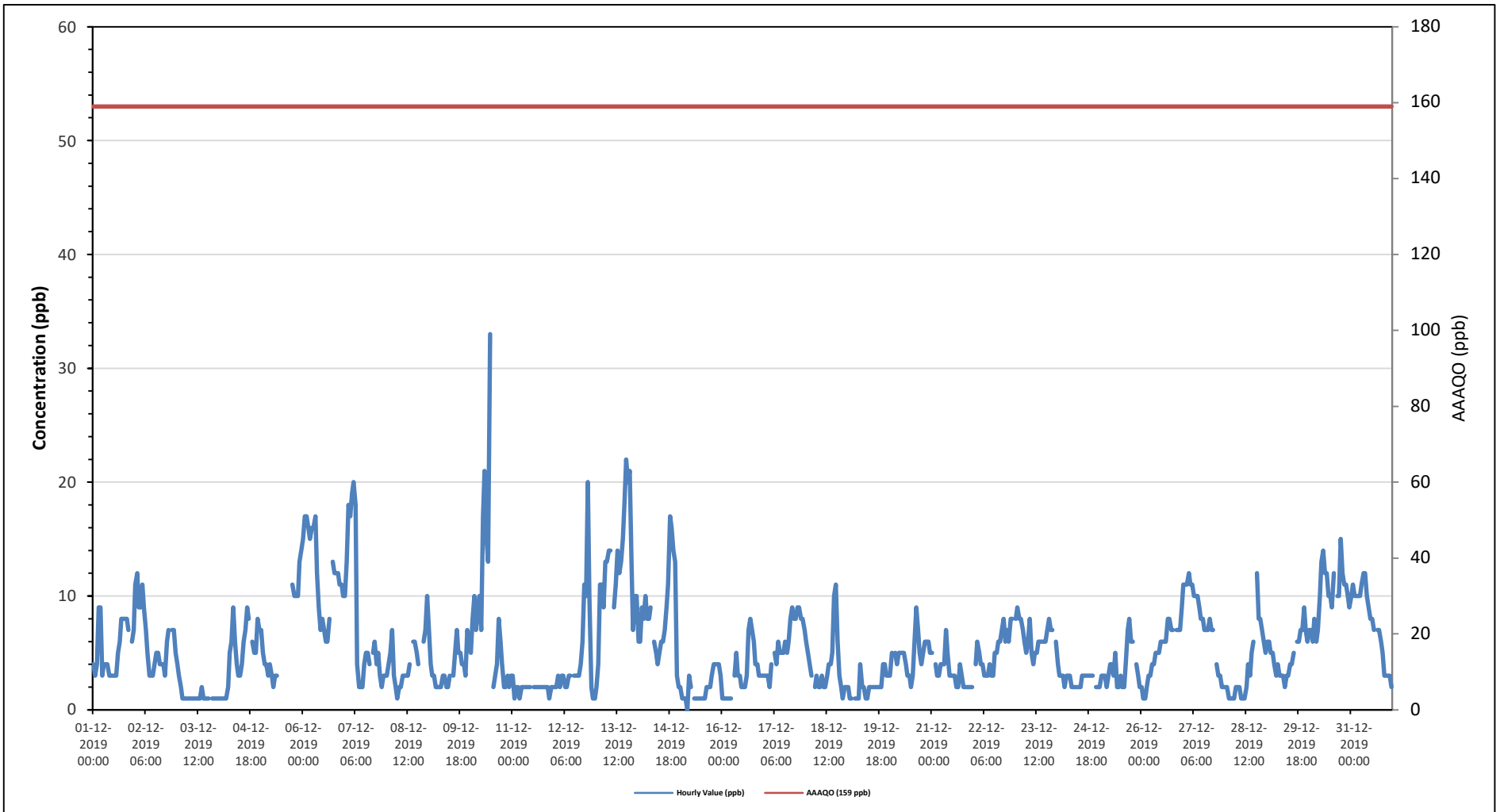
Hours in Service: 744  
 Hours of Data: 703  
 Hours of Missing Data: 2  
 Hours of Calibration: 39  
 Operational Uptime: 99.7

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	
Dec 1	4	3	4	9	9	3	4	4	4	3	3	3	3	3	5	6	8	8	8	8	7	S	6	7	3	9	5.3	
Dec 2	11	12	9	9	11	9	7	5	3	3	3	4	5	5	4	4	4	3	6	7	S	7	7	5	3	12	6.2	
Dec 3	4	3	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	S	1	1	1	1	4	1.3	
Dec 4	1	1	1	1	1	2	5	6	9	6	4	3	3	4	6	7	9	8	S	6	5	5	8	7	1	9	4.7	
Dec 5	7	5	4	4	3	4	3	2	3	3	C	C	C	C	C	C	C	C	C	11	10	10	10	13	14	2	14	-
Dec 6	15	17	17	16	15	16	16	17	12	9	7	8	7	6	6	8	S	S	13	12	12	12	11	11	10	6	17	11.9
Dec 7	10	13	18	17	19	20	18	4	2	2	2	4	5	5	4	S	5	6	4	5	3	2	3	3	2	20	7.6	
Dec 8	3	4	5	7	3	2	1	2	2	3	3	3	3	4	S	6	6	5	4	S1	S1	6	7	10	1	10	4.2	
Dec 9	7	4	3	3	2	2	2	2	3	3	2	2	3	S	3	5	7	5	5	4	4	3	7	6	2	7	3.8	
Dec 10	5	8	10	7	9	10	7	17	21	15	13	S	S	2	3	4	8	6	4	2	2	3	2	3	2	33	8.4	
Dec 11	3	1	2	2	1	2	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	1	2	2	1	3	1.9	
Dec 12	2	2	3	2	3	3	2	2	3	3	S	3	3	3	3	4	6	11	10	20	10	2	1	1	1	20	4.4	
Dec 13	2	4	11	11	9	13	13	14	14	S	9	11	14	12	13	15	18	22	20	21	13	7	10	10	2	22	12.4	
Dec 14	6	6	9	8	10	8	8	9	S	6	5	4	5	6	6	7	9	11	17	16	14	13	3	2	2	17	8.2	
Dec 15	2	1	1	1	0	3	2	S	1	1	1	1	1	1	1	2	2	2	3	4	4	4	4	3	0	4	2.0	
Dec 16	1	1	1	1	1	1	S	3	5	3	3	2	2	2	3	7	8	7	6	4	4	3	3	3	1	8	3.2	
Dec 17	3	3	3	2	4	S	5	4	6	5	5	5	6	5	6	8	9	8	8	9	9	8	8	7	2	9	5.9	
Dec 18	6	5	4	3	S	2	3	2	2	3	2	2	3	4	4	5	10	11	6	3	2	1	2	2	1	11	3.8	
Dec 19	2	1	1	S	1	1	1	4	2	2	1	1	2	2	2	2	2	2	2	2	4	4	3	3	1	4	2.0	
Dec 20	3	5	S	5	4	5	5	5	5	4	3	3	2	3	6	9	7	5	4	5	6	6	5	2	9	4.8		
Dec 21	5	S	4	3	3	4	4	4	7	5	3	3	3	3	2	2	4	3	2	2	2	2	2	2	2	7	3.2	
Dec 22	S	4	6	5	4	4	3	3	4	3	3	5	5	6	6	7	8	6	7	6	8	8	S	3	8	5.2		
Dec 23	8	9	8	8	7	6	5	6	8	5	4	5	5	6	6	6	6	6	7	8	7	S	6	4	9	6.5		
Dec 24	4	3	3	3	2	3	3	3	2	2	2	2	2	2	3	3	3	3	3	3	3	S	2	2	2	4	2.7	
Dec 25	2	3	3	3	2	3	4	4	3	5	2	2	3	2	2	4	7	8	6	6	S	4	3	2	2	8	3.6	
Dec 26	2	1	1	2	3	3	4	4	5	5	5	6	6	6	8	8	7	7	S	7	7	7	7	9	1	9	5.2	
Dec 27	11	11	11	12	11	11	10	10	10	9	8	8	7	7	7	8	7	7	S	4	3	3	2	2	2	12	7.8	
Dec 28	2	2	1	1	1	1	2	2	2	1	1	1	2	4	3	5	6	S	12	8	8	7	6	5	1	12	3.6	
Dec 29	6	6	5	5	4	3	4	3	3	3	2	3	3	4	4	5	S	6	6	7	7	9	7	6	2	9	4.8	
Dec 30	7	7	6	8	6	7	10	13	14	12	12	10	10	9	12	S	10	10	15	12	11	11	10	9	6	15	10.0	
Dec 31	10	11	10	10	10	10	11	12	12	10	9	8	8	7	S	7	7	6	5	3	3	3	3	2	2	12	7.7	
Diurnal Maximum	15	17	18	17	19	20	18	17	21	15	13	33	14	12	13	15	18	22	20	21	14	13	13	14				
Daiurnal Average	5.1	5.2	5.5	5.6	5.3	5.4	5.5	5.6	5.6	4.6	4.1	5.0	4.3	4.3	4.6	5.6	6.6	6.9	7.0	7.1	6.0	5.4	5.2	5.0				

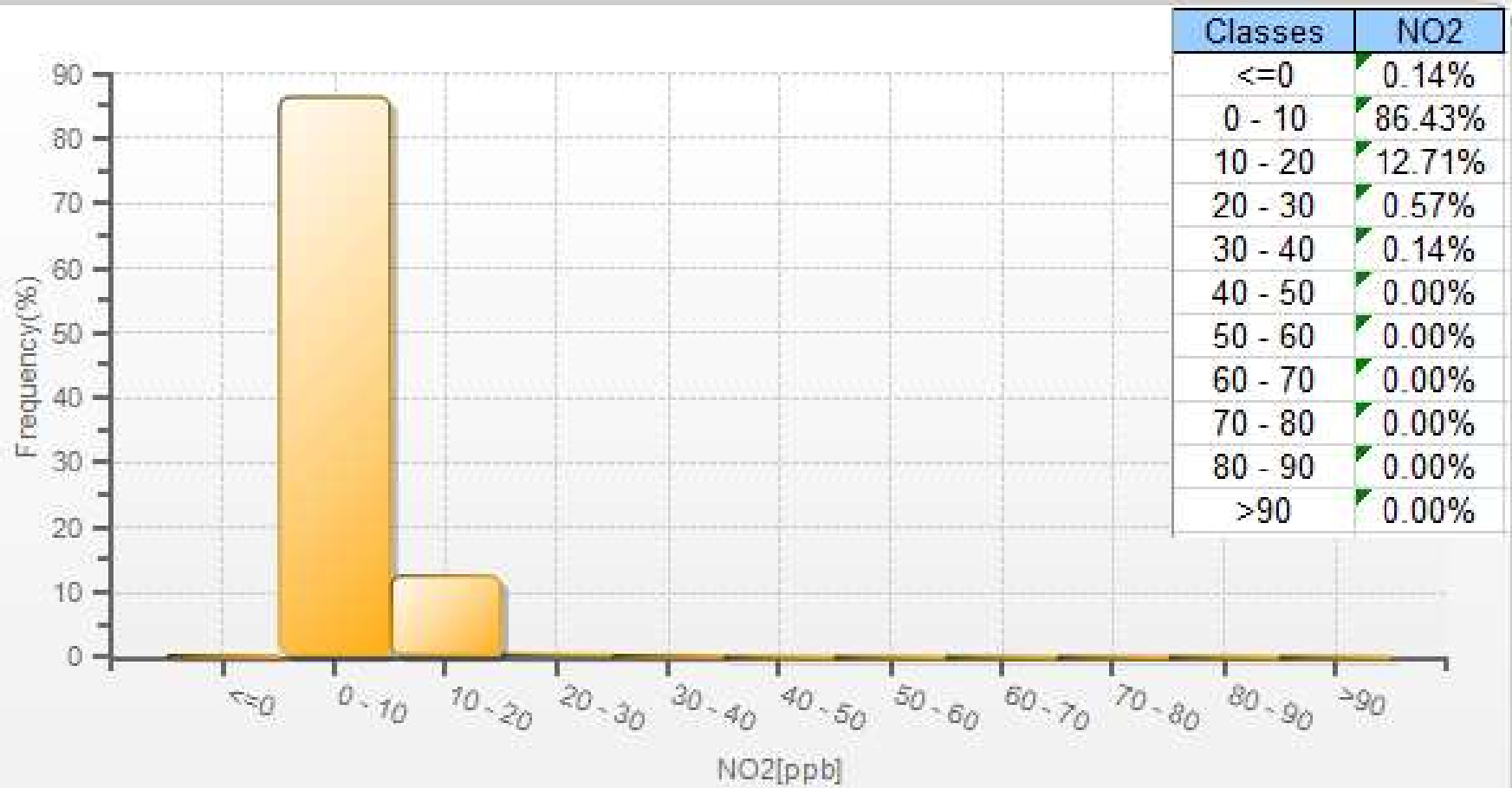
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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 NO2 - Bonnyville - East Site**

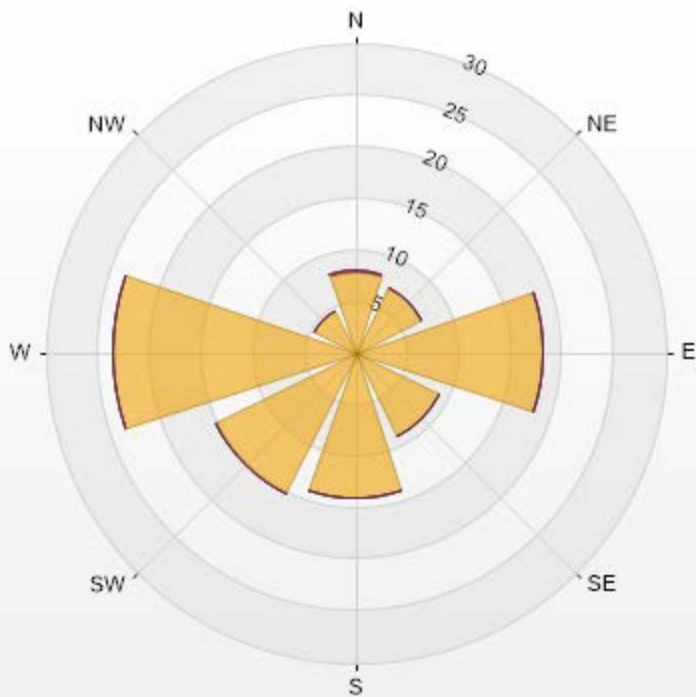


NO2[ppb] Histogram: Bonnyville East Monthly: 12-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-NO2[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.09% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	7.86	0.14	0	0	0	8
NE	7.14	0	0	0	0	7.14
E	18.29	0	0	0	0	18.29
SE	9.14	0	0	0	0	9.14
S	14.14	0	0	0	0	14.14
SW	15.29	0	0	0	0	15.29
W	23.43	0	0	0	0	23.43
NW	4.57	0	0	0	0	4.57
Summary	100	0.14	0	0	0	100



LICA-201912-Revision 1



# LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - December 2019

Summary of Hourly Averages

OZONE (O<sub>3</sub>) in ppb

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

Number of 1-Hour Exceedences: 0

Maximum Hourly Value:	38.7 ppb on December 3 at hour 16	Hours in Service:	744
Maximum Daily Value:	35.8 ppb on December 3	Hours of Data:	707
Minimum Hourly Value:	0.8 ppb on December 7 at hour 4	Hours of Missing Data:	0
Minimum Daily Value:	12.7 ppb on December 30	Hours of Calibration:	37
Monthly Average:	23.5 ppb	Operational Uptime:	100.0

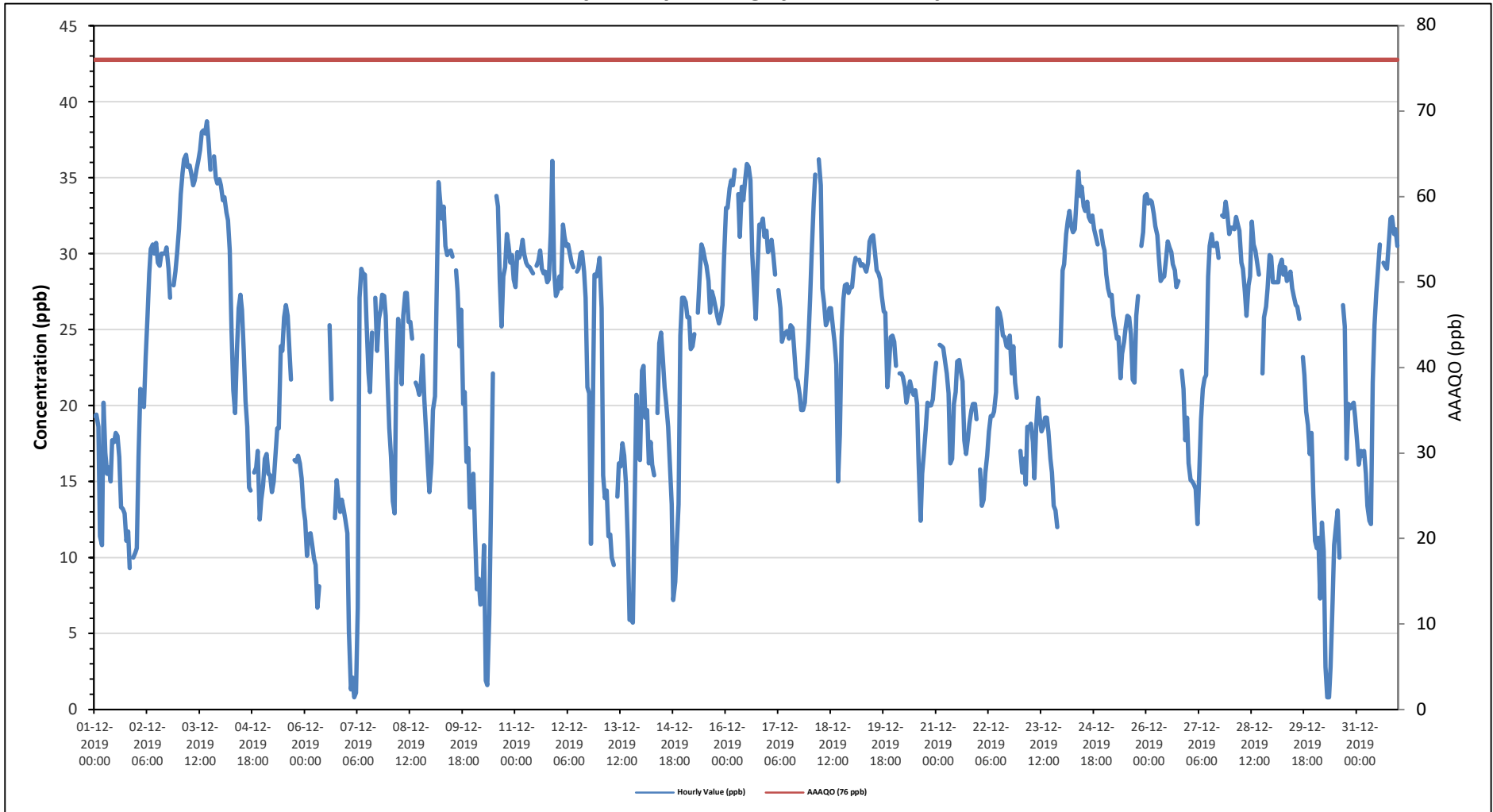
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Dec 1	19.3	19.4	18.6	11.4	10.8	20.2	16.9	15.5	15.9	15	17.7	17.6	18.2	18	16.6	13.3	13.2	12.9	11.1	11.7	9.3	S	10	10.3	9.3	20.2	14.9
Dec 2	10.6	16.7	21.1	20.3	19.9	23.2	25.8	28.7	30.3	30.6	30	30.7	29.4	29.2	30	30	30	30.4	29	27.1	S	27.9	28.8	30.1	10.6	30.7	26.5
Dec 3	31.6	33.9	35.3	36.2	36.5	35.7	35.8	35.3	34.5	34.8	35.5	36.1	36.8	38	38.1	37.9	38.7	37.3	35.5	S	36.4	35	34.6	34.9	31.6	38.7	35.8
Dec 4	34.5	33.5	33.7	32.7	32.2	30.2	24.9	21	19.5	23.5	26.4	27.3	26.3	23.6	20.3	18.6	14.6	14.4	S	15.6	15.9	17	12.5	13.8	12.5	34.5	23.1
Dec 5	14.7	16.5	16.8	15.5	15.4	14.3	15	16.5	18.5	18.5	23.9	23.6	25.8	26.6	25.9	23.6	21.7	S	16.4	16.3	16.7	16.2	15.2	13.3	13.3	26.6	18.6
Dec 6	12.4	10.1	11.5	11.6	10.9	9.9	9.5	6.7	8.1	C	C	C	C	C	25.3	20.4	S	12.6	15.1	13.9	13	13.8	13.1	12.5	6.7	25.3	12.8
Dec 7	11.6	5.2	1.3	2.1	0.8	1.1	6.7	27.1	29	28.7	28.6	25.7	22.2	20.9	24.8	S	27.1	23.6	25.7	26.3	27.3	27.2	25.9	21.8	0.8	29.0	19.2
Dec 8	18.5	16.6	13.7	12.9	21.5	25.7	24.3	21.4	25.9	27.4	27.4	25.5	25.5	24.4	S	21.5	21.2	20.7	21.3	23.3	20.4	18.3	16	14.3	12.9	27.4	21.2
Dec 9	16.2	19.7	20.6	26.8	34.7	33.5	32.3	33.1	30.5	29.9	30.1	30.2	29.8	S	28.9	27.5	23.9	26.3	20.1	20.9	16.3	17.2	13.3	13.3	13.3	34.7	25.0
Dec 10	15.5	11.5	7.9	8.6	6.9	7	10.8	1.9	1.6	6.3	12.8	22.1	S	33.8	33.1	28.3	25.2	28.5	29.1	31.3	30.6	29.4	29.9	28.3	1.6	33.8	19.1
Dec 11	27.8	30.1	29.7	30	30.9	30	29.4	29.2	29.1	28.9	28.7	S	29.2	29.5	30.2	29	28.7	28.8	28.1	28.3	31.4	36.1	28.9	27.2	27.2	36.1	29.5
Dec 12	27.5	28.5	27.7	31.9	31.1	30.5	30.6	30	29.4	29.1	S	28.8	29	30	30.1	28.8	27.1	21.2	20.8	10.9	19.2	28.6	28.5	29	10.9	31.9	27.3
Dec 13	29.7	26.4	15.4	13.9	14.4	11.4	11.5	10	9.5	S	14	16.2	16	17.5	16.7	14.8	11.1	5.9	5.9	7.2	14.5	20.7	17	16.4	5.7	29.7	14.5
Dec 14	22.3	22.6	19.2	19.7	16.2	17.6	16.1	15.4	S	19.5	24.1	24.8	23.1	21.2	20.2	18.6	16.4	13.5	7.2	8.4	10.9	13.5	24.6	27.1	7.2	27.1	18.4
Dec 15	27.1	26.8	25.8	25.8	23.7	23.9	24.7	S	26.1	28.2	30.6	30.3	29.6	29.2	28.2	26.1	27.5	27.1	26.5	25.9	25.4	25.9	26.6	29.7	23.7	30.6	27.0
Dec 16	33	33	34.3	34.8	34.5	35.5	S	33.9	31.1	34.4	33.5	34.8	35.9	35.7	34.8	30	27.7	25.7	28.6	31.9	31.8	32.3	31.1	31.5	25.7	35.9	32.6
Dec 17	30.1	30.3	30.9	29.9	28.6	S	27.6	26.4	24.2	24.6	24.8	24.9	24.4	25.3	25.1	23.7	21.8	21.6	20.7	19.7	19.7	20.2	22.1	24.2	19.7	30.9	24.8
Dec 18	27.1	30	33.3	35.2	S	36.2	34.5	27.7	26.7	25.3	25.6	26.4	26.4	25.1	24.2	22.7	15	18.1	24.5	27	27.9	28	27.4	27.8	15.0	36.2	27.0
Dec 19	27.8	29.2	29.7	S	29.6	29.2	29.3	29.1	28.8	29.4	30.8	31.1	31.2	30.1	28.9	28.7	28.3	27.2	26.2	26.1	21.2	22.5	24.5	24.6	21.2	31.2	28.0
Dec 20	24.2	22.6	S	22.1	22.1	21.9	21.2	20.2	20.9	21.6	21	20.7	21	20.1	16.3	12.4	15.5	16.9	18.4	20.2	20	20	20.4	21.9	12.4	24.2	20.1
Dec 21	22.8	S	24	23.9	23.8	22.8	22.1	20.8	16.2	16.5	20.1	20.9	22.9	23	22.3	21.6	17.7	16.8	17.8	18.8	19.7	20.1	20.1	19.1	16.2	24.0	20.6
Dec 22	S	15.8	13.4	13.8	15.6	16.7	18.3	19.3	19.3	19.6	20.9	26.4	26.1	25.6	24.6	24.5	23.9	23.8	24.6	22.1	23.9	21.5	20.5	S	13.4	26.4	20.9
Dec 23	17	15.6	16.5	14.8	18.6	18.6	18.8	17.6	15.2	18.6	20.5	19.2	18.3	18.6	19.2	19.2	18.3	16.5	15.6	13.4	13.1	12	S	23.9	12.0	23.9	17.4
Dec 24	28.9	29.3	31.3	32.1	32.8	31.8	31.4	31.6	33.6	35.4	33.8	34.4	33.1	32.8	33.4	32.4	32.1	32.5	31.6	31.1	30.6	S	31.5	30.6	28.9	35.4	32.1
Dec 25	30.2	28.6	27.7	27.2	27.3	25.9	25.3	24.4	24.5	21.8	23.4	24.2	25.1	25.9	25.8	24.7	21.7	21.5	25.9	27.2	S	30.5	31.4	33.8	21.5	33.8	26.3
Dec 26	33.9	33.3	33.5	33.4	32.6	31.8	31.2	29.7	28.2	28.4	28.5	29.6	30.8	30.4	30.1	29.3	28.9	27.8	28.2	S	22.3	21.1	17.7	19.2	17.7	33.9	28.7
Dec 27	16.2	15.1	15	14.8	14.5	12.2	15.5	19.1	21.1	21.8	22	28.5	30.5	31.3	30.5	30.5	30.7	29.7	S	32.5	32.4	33.4	32.7	31.3	12.2	33.4	24.4
Dec 28	31.7	31.7	31.6	32.4	31.9	31.5	29.4	29	27.4	25.9	27.9	28.5	32.1	30.6	30.2	29.4	28.6	S	22.1	25.8	26.5	27.7	29.9	29.8	22.1	32.4	29.2
Dec 29	28.1	28.1	28.1	28.1	29.2	29.6	28.6	29.1	28.2	28.4	28.8	27.7	27.2	26.6	26.5	25.7	S	23.2	22	19.6	18.7	16.8	18.2	14.2	14.2	29.6	25.2
Dec 30	11.1	10.6	11.3	7.3	12.3	10.4	2.8	0.8	0.8	2.8	7.1	10.8	12.2	13.1	10	S	26.6	25.2	16.5	20.1	19.8	20	20.2	19.2	0.8	26.6	12.7
Dec 31	17.5	16.1	17	16.7	17	15.5	13.4	12.4	12.2	21.5	25.3	27.4	29	30.6	S	29.4	29.2	29	30.4	32.3	32.4	31.3	31.6	30.5	12.2	32.4	23.8
Diurnal Maximum	35	34	35	36	37	36	36	35	35	35	36	36	37	38	38	38	39	37	36	33	36	36	35	35			
Daiurnal Average	23.3	22.9	22.5	22.2	22.5	22.8	22.1	22.1	22.2	24.0	25.0	26.0	26.5	26.4	25.9	24.9	23.9	22.7	22.2	21.8	22.3	23.6	23.5	23.5			

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

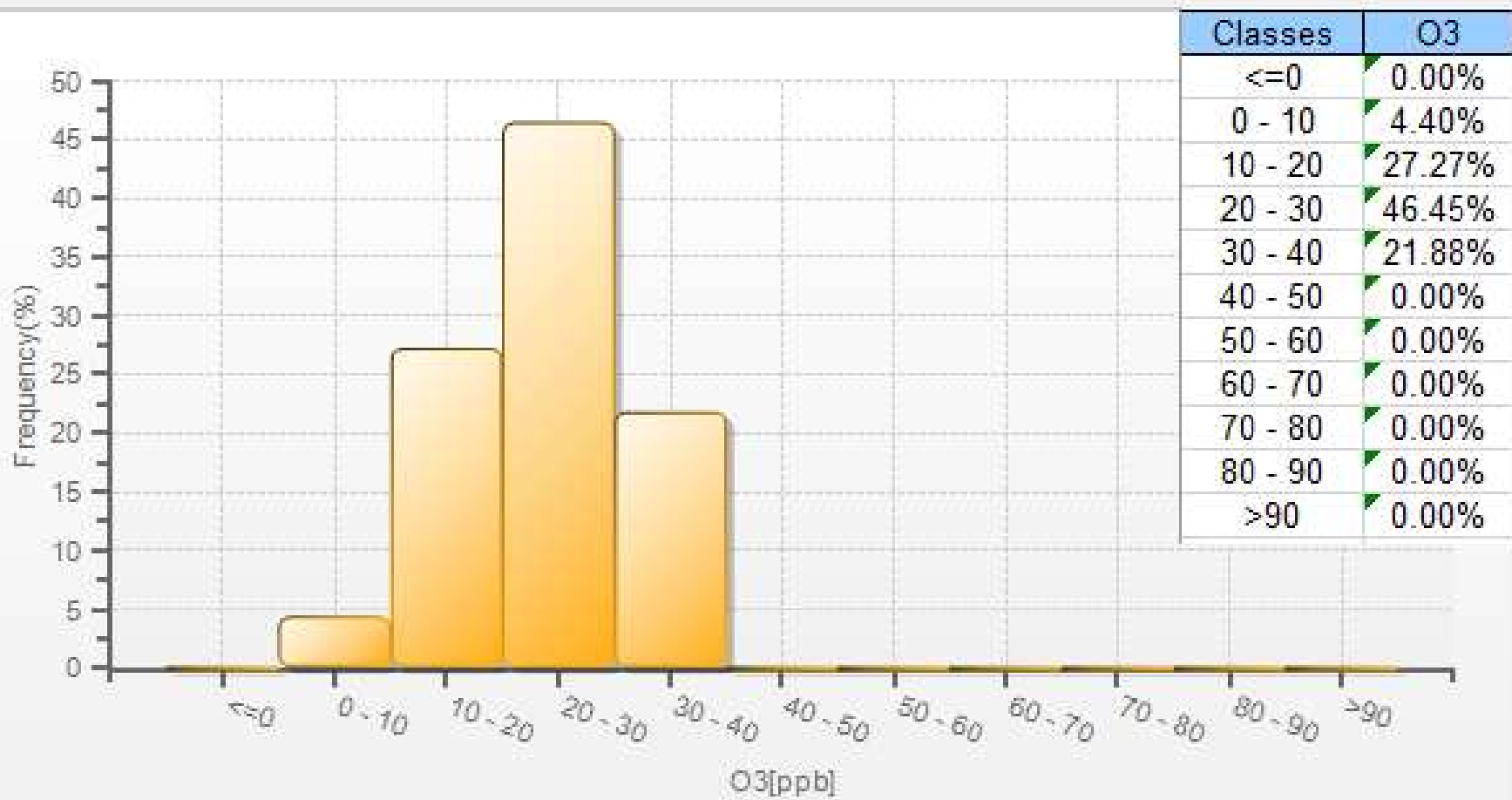
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

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

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



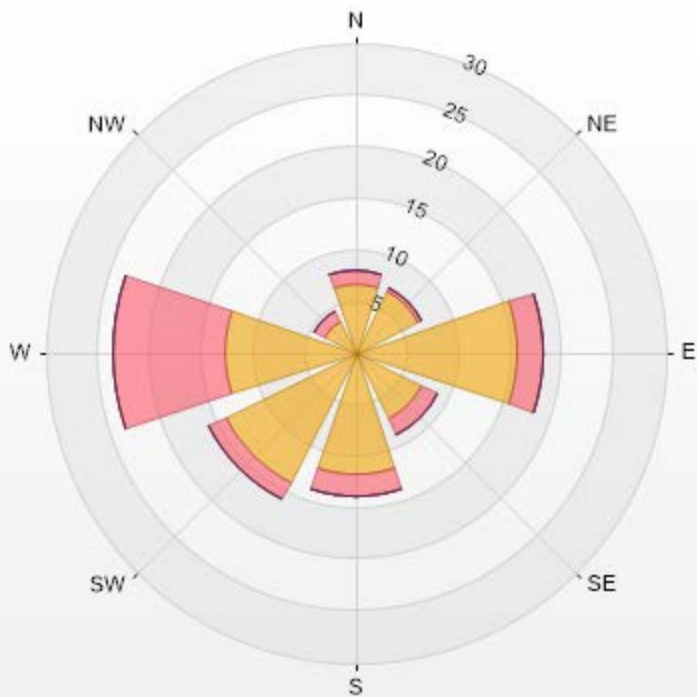
O3[ppb] Histogram: Bonnyville East Monthly: 12-2019 1 Hr.





Wind: Bonnyville East Poll.: Bonnyville East-O3[ppb] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.62% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-82	82-159	>159.0	Total
N	6.68	1.28	0	0	0	7.96
NE	6.68	0.43	0	0	0	7.11
E	15.77	2.41	0	0	0	18.18
SE	7.1	1.85	0	0	0	8.95
S	11.79	2.13	0	0	0	13.92
SW	14.06	1.85	0	0	0	15.91
W	12.64	10.8	0	0	0	23.44
NW	3.41	1.14	0	0	0	4.55
Summary	78.13	21.89	0	0	0	100



LICA-201912-Revision 1

%	Icon	Classes (ppb)	78	22	0	0
78		0-30	22		30-50	0
22		>159.0	0		50-82	0
0		82-159	0		159-300	0



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**Bonnyville - East Site - December 2019**

**Summary of Hourly Averages**

**TOTAL HYDROCARBONS (THC) in ppm**

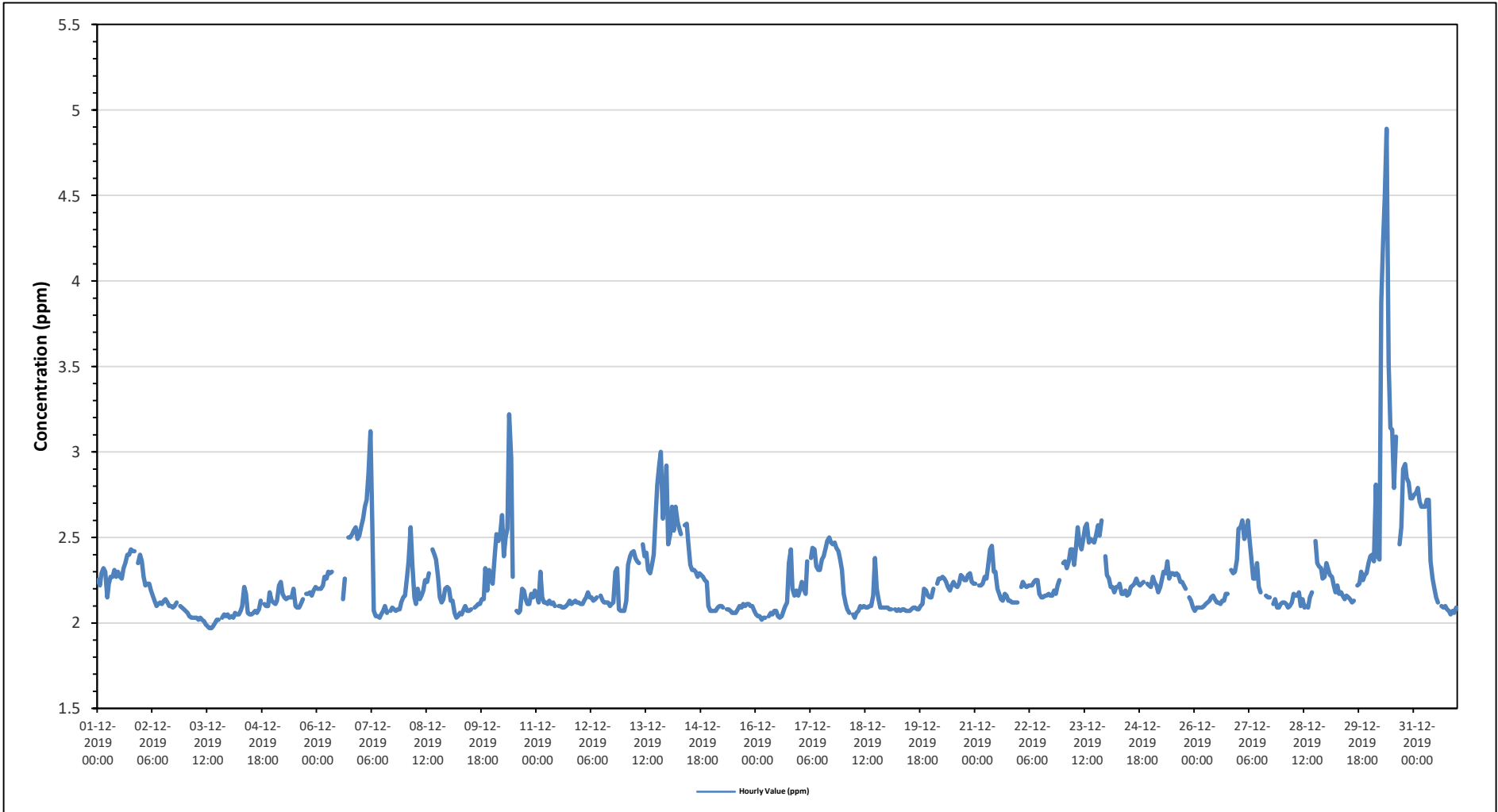
Maximum Hourly Value:	4.89 ppm on December 30 at hour 9	Hours in Service:	744
Maximum Daily Value:	3.04 ppm on December 30	Hours of Data:	705
Minimum Hourly Value:	1.97 ppm on December 3 at hour 13	Hours of Missing Data:	2
Minimum Daily Value:	2.02 ppm on December 3	Hours of Calibration:	37
Monthly Average:	2.25 ppm	Operational Uptime:	99.7

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
Dec 1	2.25	2.22	2.29	2.32	2.30	2.15	2.23	2.27	2.27	2.31	2.27	2.30	2.27	2.26	2.32	2.35	2.40	2.40	2.43	2.42	2.42	S	2.35	2.40	2.15	2.43	2.31
Dec 2	2.36	2.27	2.22	2.23	2.23	2.19	2.16	2.13	2.10	2.11	2.12	2.11	2.13	2.14	2.12	2.10	2.10	2.09	2.10	2.12	S	2.10	2.09	2.08	2.08	2.36	2.15
Dec 3	2.07	2.06	2.04	2.03	2.03	2.03	2.03	2.02	2.03	2.02	2.01	1.99	1.98	1.97	1.97	1.98	2.00	2.02	2.02	S	2.03	2.05	2.04	2.05	1.97	2.07	2.02
Dec 4	2.03	2.04	2.03	2.06	2.05	2.05	2.07	2.10	2.21	2.17	2.06	2.05	2.05	2.06	2.07	2.06	2.08	2.13	S	2.11	2.10	2.10	2.18	2.13	2.03	2.21	2.09
Dec 5	2.12	2.11	2.13	2.22	2.24	2.17	2.15	2.14	2.15	2.15	2.15	2.20	2.10	2.09	2.09	2.11	2.14	S	2.17	2.17	2.18	2.16	2.19	2.21	2.09	2.24	2.15
Dec 6	2.20	2.20	2.20	2.22	2.27	2.26	2.30	2.29	2.30	C	C	C	C	C	2.14	2.26	S	2.50	2.52	2.54	2.56	2.49	2.51	2.14	2.56	2.35	
Dec 7	2.56	2.61	2.68	2.72	2.87	3.12	2.59	2.07	2.04	2.04	2.03	2.05	2.07	2.10	2.06	S	2.07	2.09	2.08	2.07	2.08	2.08	2.12	2.15	2.03	3.12	2.28
Dec 8	2.16	2.27	2.36	2.56	2.34	2.15	2.11	2.20	2.14	2.16	2.19	2.25	2.24	2.29	S	2.43	2.40	2.37	2.27	2.15	2.12	2.14	2.20	2.21	2.11	2.56	2.25
Dec 9	2.20	2.13	2.13	2.06	2.03	2.04	2.06	2.05	2.08	2.10	2.07	2.07	2.08	S	2.09	2.10	2.11	2.11	2.14	2.14	2.32	2.19	2.31	2.26	2.03	2.32	2.12
Dec 10	2.23	2.39	2.52	2.48	2.51	2.63	2.39	2.50	2.55	3.22	2.96	2.27	S	2.07	2.06	2.07	2.20	2.19	2.14	2.11	2.11	2.17	2.15	2.19	2.06	3.22	2.35
Dec 11	2.17	2.12	2.30	2.15	2.12	2.12	2.11	2.13	2.11	2.12	2.10	S	2.10	2.10	2.09	2.09	2.10	2.11	2.13	2.11	2.12	2.13	2.12	2.12	2.09	2.30	2.12
Dec 12	2.11	2.11	2.13	2.15	2.18	2.15	2.15	2.13	2.14	2.15	S	2.16	2.13	2.12	2.12	2.12	2.10	2.11	2.12	2.30	2.32	2.08	2.07	2.07	2.07	2.32	2.14
Dec 13	2.07	2.13	2.34	2.39	2.41	2.42	2.38	2.36	2.35	S	2.46	2.39	2.41	2.31	2.29	2.34	2.40	2.61	2.81	2.93	3.00	2.61	2.72	2.92	2.07	3.00	2.48
Dec 14	2.46	2.52	2.68	2.54	2.68	2.59	2.55	2.52	S	2.57	2.58	2.47	2.34	2.31	2.31	2.30	2.27	2.29	2.28	2.27	2.25	2.24	2.10	2.07	2.07	2.68	2.40
Dec 15	2.07	2.07	2.07	2.09	2.10	2.10	2.09	S	2.08	2.08	2.07	2.06	2.06	2.06	2.08	2.10	2.09	2.11	2.10	2.11	2.11	2.10	2.10	2.07	2.06	2.11	2.09
Dec 16	2.05	2.04	2.04	2.02	2.03	2.03	S	2.04	2.06	2.05	2.07	2.07	2.04	2.03	2.04	2.07	2.10	2.12	2.35	2.43	2.20	2.16	2.19	2.16	2.02	2.43	2.10
Dec 17	2.19	2.24	2.20	2.17	2.36	S	2.38	2.44	2.43	2.33	2.31	2.31	2.37	2.39	2.44	2.48	2.50	2.47	2.46	2.47	2.44	2.42	2.37	2.31	2.17	2.50	2.37
Dec 18	2.17	2.11	2.08	2.06	S	2.05	2.03	2.06	2.07	2.10	2.09	2.10	2.09	2.09	2.10	2.10	2.16	2.38	2.20	2.14	2.09	2.09	2.09	2.09	2.03	2.38	2.11
Dec 19	2.09	2.08	2.08	S	2.08	2.07	2.08	2.07	2.08	2.08	2.07	2.07	2.07	2.08	2.09	2.09	2.08	2.08	2.10	2.11	2.20	2.19	2.16	2.15	2.07	2.20	2.10
Dec 20	2.15	2.20	S	2.23	2.26	2.26	2.27	2.26	2.24	2.21	2.19	2.22	2.24	2.22	2.21	2.23	2.28	2.27	2.25	2.25	2.28	2.29	2.24	2.23	2.15	2.29	2.24
Dec 21	2.23	S	2.22	2.22	2.23	2.27	2.26	2.33	2.43	2.45	2.30	2.30	2.20	2.17	2.14	2.13	2.17	2.16	2.13	2.13	2.12	2.12	2.12	2.12	2.12	2.12	2.22
Dec 22	S	2.21	2.24	2.22	2.21	2.22	2.22	2.22	2.24	2.25	2.25	2.17	2.15	2.15	2.16	2.16	2.17	2.16	2.16	2.19	2.17	2.22	2.25	S	2.15	2.25	2.20
Dec 23	2.35	2.36	2.32	2.36	2.43	2.43	2.34	2.44	2.56	2.47	2.43	2.49	2.56	2.58	2.47	2.49	2.48	2.47	2.51	2.57	2.51	2.60	S	2.39	2.32	2.60	2.46
Dec 24	2.28	2.26	2.21	2.21	2.18	2.21	2.21	2.23	2.17	2.17	2.19	2.16	2.17	2.21	2.22	2.23	2.26	2.23	2.22	2.23	2.24	S	2.23	2.22	2.16	2.28	2.21
Dec 25	2.21	2.27	2.24	2.22	2.18	2.21	2.25	2.30	2.29	2.36	2.26	2.29	2.29	2.28	2.29	2.28	2.24	2.24	2.22	2.20	S	2.15	2.13	2.09	2.09	2.36	2.24
Dec 26	2.07	2.09	2.09	2.09	2.09	2.10	2.11	2.12	2.13	2.15	2.16	2.14	2.12	2.12	2.11	2.13	2.13	2.17	2.17	S	2.31	2.29	2.30	2.37	2.07	2.37	2.15
Dec 27	2.55	2.56	2.60	2.49	2.52	2.60	2.48	2.37	2.26	2.26	2.35	2.21	2.18	S1	S1	2.16	2.15	2.15	S	2.11	2.14	2.09	2.09	2.11	2.09	2.60	2.31
Dec 28	2.12	2.12	2.11	2.09	2.10	2.12	2.17	2.16	2.16	2.18	2.10	2.14	2.09	2.10	2.09	2.15	2.18	S	2.48	2.35	2.33	2.32	2.26	2.27	2.09	2.48	2.18
Dec 29	2.35	2.31	2.28	2.27	2.22	2.18	2.22	2.17	2.18	2.16	2.14	2.16	2.15	2.14	2.12	2.13	S	2.22	2.23	2.30	2.25	2.28	2.29	2.35	2.12	2.35	2.22
Dec 30	2.39	2.40	2.36	2.81	2.39	2.37	3.88	4.22	4.50	4.89	3.52	3.14	3.13	2.79	3.09	S	2.46	2.56	2.90	2.93	2.85	2.82	2.73	2.73	2.36	4.89	3.04
Dec 31	2.75	2.76	2.79	2.71	2.68	2.68	2.68	2.72	2.72	2.36	2.26	2.21	2.15	2.12	S	2.10	2.09	2.10	2.08	2.07	2.05	2.07	2.06	2.09	2.05	2.79	2.36
Diurnal Maximum	2.75	2.76	2.79	2.81	2.87	3.12	3.88	4.22	4.50	4.89	3.52	3.14	3.13	2.79	3.09	2.49	2.50	2.61	2.90	2.93	3.00	2.82	2.73	2.92			
Diurnal Average	2.23	2.24	2.27	2.28	2.28	2.27	2.30	2.30	2.30	2.33	2.27	2.23	2.21	2.19	2.19	2.18	2.20	2.24	2.27	2.28	2.27	2.24	2.22	2.24			

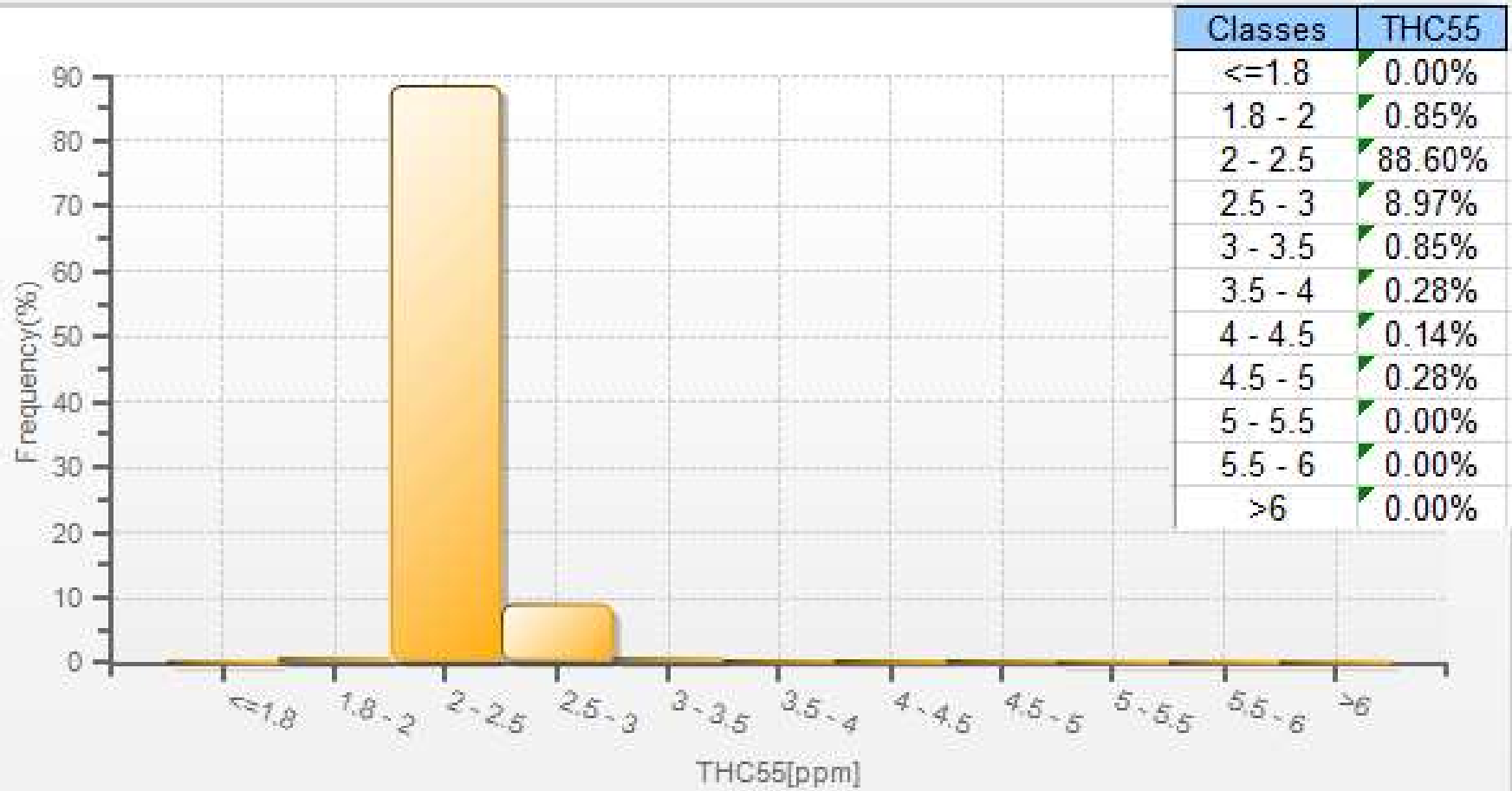
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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**

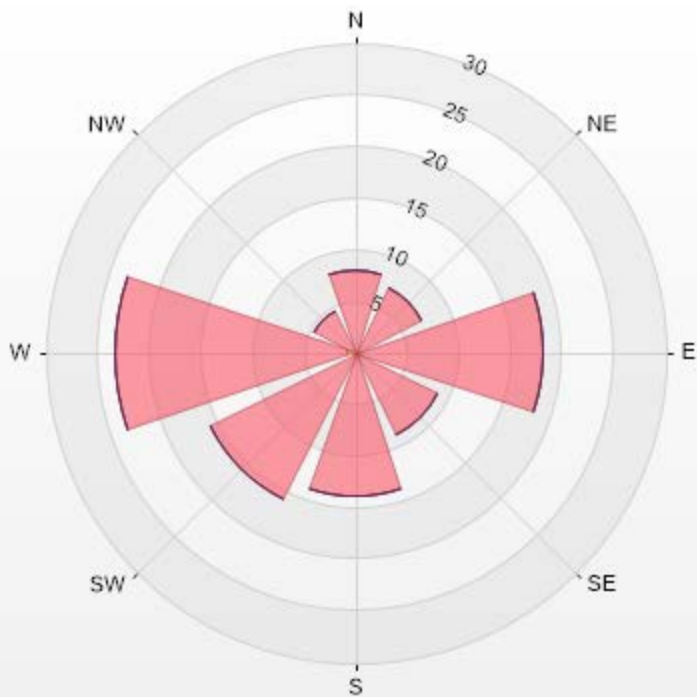


THC55[ppm] Histogram: Bonnyville East Monthly: 12-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-THC55[ppm] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.35% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	0	7.98	0	0	0	7.98
NE	0	7.12	0	0	0	7.12
E	0	18.23	0	0	0	18.23
SE	0	8.97	0	0	0	8.97
S	0	13.96	0	0	0	13.96
SW	0	15.81	0	0	0	15.81
W	0.85	22.51	0	0	0	23.36
NW	0	4.56	0	0	0	4.56
Summary	0.85	99.14	0	0	0	100



LICA-201912-Revision 1



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - December 2019

### Summary of Hourly Averages

#### METHANE (CH4) in ppm

Maximum Hourly Value:	4.89 ppm on December 30 at hour 9	Hours in Service:	744
Maximum Daily Value:	3.04 ppm on December 30	Hours of Data:	705
Minimum Hourly Value:	1.97 ppm on December 3 at hour 13	Hours of Missing Data:	2
Minimum Daily Value:	2.02 ppm on December 3	Hours of Calibration:	37
Monthly Average:	2.25 ppm	Operational Uptime:	99.7

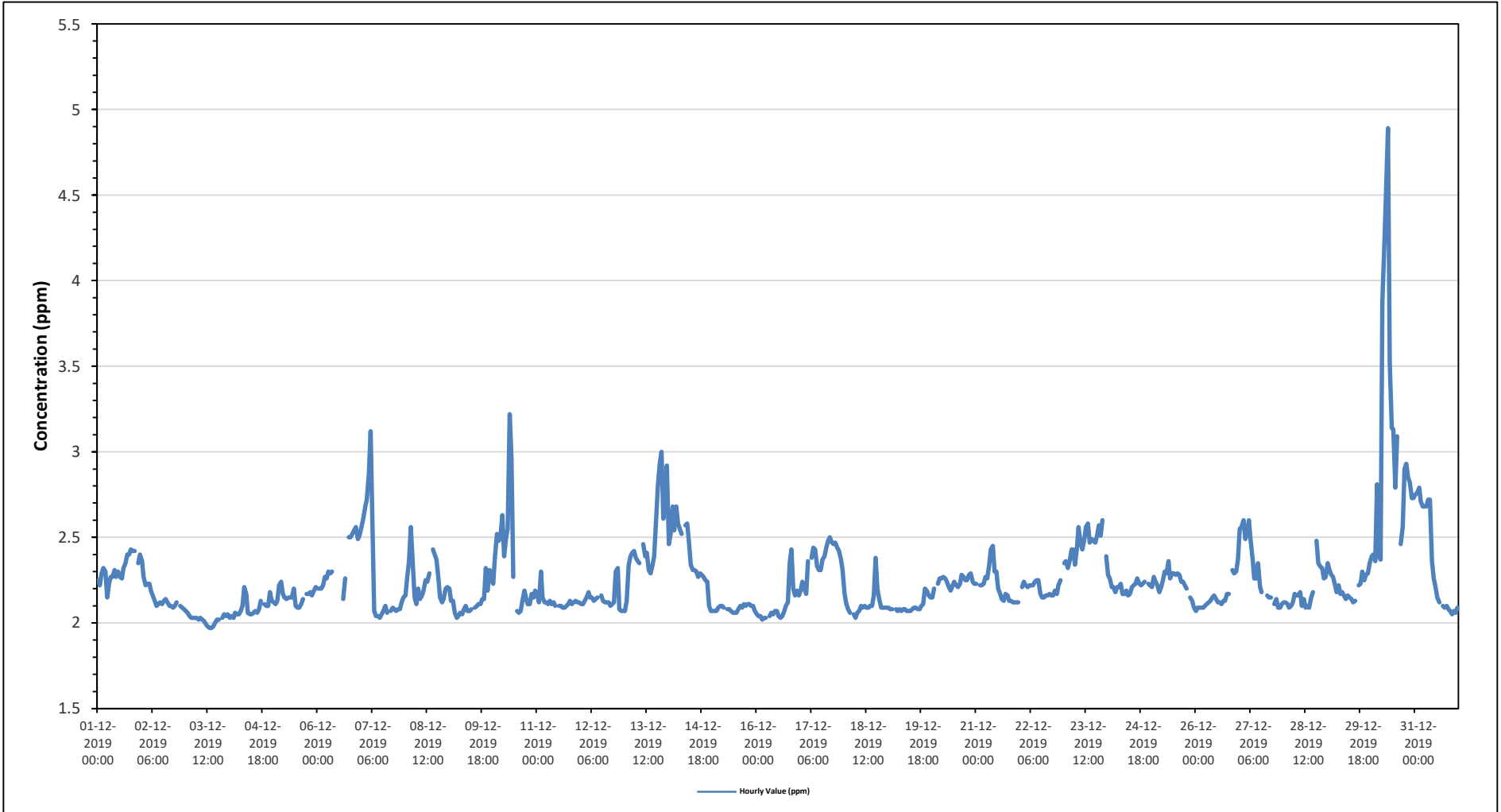
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Dec 1	2.25	2.22	2.29	2.32	2.30	2.15	2.23	2.27	2.27	2.31	2.27	2.30	2.27	2.26	2.32	2.35	2.40	2.40	2.43	2.42	2.42	S	2.35	2.40	2.15	2.43	2.31	
Dec 2	2.36	2.27	2.22	2.23	2.23	2.19	2.16	2.13	2.10	2.11	2.12	2.11	2.13	2.14	2.12	2.10	2.10	2.09	2.10	2.12	S	2.10	2.09	2.08	2.08	2.36	2.15	
Dec 3	2.07	2.06	2.04	2.03	2.03	2.03	2.03	2.02	2.03	2.02	2.01	1.99	1.98	1.97	1.97	1.98	2.00	2.02	2.02	S	2.03	2.05	2.04	2.05	1.97	2.07	2.02	
Dec 4	2.03	2.04	2.03	2.06	2.05	2.05	2.07	2.10	2.21	2.17	2.06	2.05	2.05	2.06	2.07	2.06	2.08	2.13	S	2.11	2.10	2.10	2.18	2.13	2.03	2.21	2.09	
Dec 5	2.12	2.11	2.13	2.22	2.24	2.17	2.15	2.14	2.15	2.15	2.15	2.20	2.10	2.09	2.09	2.11	2.14	S	2.17	2.17	2.18	2.16	2.19	2.21	2.09	2.24	2.15	
Dec 6	2.20	2.20	2.20	2.22	2.27	2.26	2.30	2.29	2.30	C	C	C	C	C	2.14	2.26	S	2.50	2.52	2.54	2.56	2.49	2.51	2.14	2.56	2.35		
Dec 7	2.56	2.61	2.68	2.72	2.87	3.12	2.59	2.07	2.04	2.04	2.03	2.05	2.07	2.10	2.06	S	2.07	2.09	2.08	2.07	2.08	2.08	2.12	2.15	2.03	3.12	2.28	
Dec 8	2.16	2.27	2.36	2.56	2.34	2.15	2.11	2.20	2.14	2.16	2.19	2.25	2.24	2.29	S	2.43	2.40	2.37	2.27	2.15	2.12	2.14	2.20	2.21	2.11	2.56	2.25	
Dec 9	2.20	2.13	2.13	2.06	2.03	2.04	2.06	2.05	2.08	2.10	2.07	2.07	2.08	S	2.09	2.10	2.11	2.11	2.14	2.14	2.32	2.19	2.31	2.26	2.03	2.32	2.12	
Dec 10	2.23	2.39	2.52	2.48	2.51	2.63	2.39	2.50	2.55	3.22	2.96	2.27	S	2.07	2.06	2.07	2.13	2.19	2.14	2.11	2.11	2.17	2.15	2.19	2.06	3.22	2.35	
Dec 11	2.17	2.12	2.30	2.15	2.12	2.12	2.11	2.13	2.11	2.12	2.10	S	2.10	2.10	2.09	2.09	2.10	2.11	2.13	2.11	2.12	2.13	2.12	2.12	2.09	2.30	2.12	
Dec 12	2.11	2.11	2.13	2.15	2.18	2.15	2.15	2.13	2.14	2.15	S	2.16	2.13	2.12	2.12	2.12	2.10	2.11	2.12	2.30	2.32	2.08	2.07	2.07	2.07	2.32	2.14	
Dec 13	2.07	2.13	2.34	2.39	2.41	2.42	2.38	2.36	2.35	S	2.46	2.39	2.41	2.31	2.29	2.34	2.39	2.61	2.81	2.93	3.00	2.61	2.72	2.92	2.07	3.00	2.48	
Dec 14	2.46	2.52	2.68	2.54	2.68	2.58	2.55	2.52	S	2.57	2.58	2.47	2.34	2.31	2.31	2.30	2.27	2.29	2.28	2.27	2.25	2.24	2.10	2.07	2.07	2.68	2.40	
Dec 15	2.07	2.07	2.07	2.09	2.10	2.10	2.09	S	2.08	2.08	2.07	2.06	2.06	2.06	2.08	2.10	2.09	2.11	2.10	2.11	2.11	2.10	2.10	2.07	2.06	2.11	2.09	
Dec 16	2.05	2.04	2.04	2.02	2.03	2.03	S	2.04	2.06	2.05	2.07	2.07	2.04	2.03	2.04	2.07	2.10	2.12	2.35	2.43	2.20	2.16	2.19	2.16	2.02	2.43	2.10	
Dec 17	2.19	2.24	2.20	2.17	2.36	S	2.38	2.44	2.43	2.33	2.31	2.31	2.37	2.39	2.44	2.48	2.50	2.47	2.46	2.47	2.44	2.42	2.37	2.31	2.17	2.50	2.37	
Dec 18	2.17	2.11	2.08	2.06	S	2.05	2.03	2.06	2.07	2.10	2.09	2.10	2.09	2.09	2.10	2.10	2.16	2.38	2.20	2.14	2.09	2.09	2.09	2.09	2.03	2.38	2.11	
Dec 19	2.09	2.08	2.08	S	2.08	2.07	2.08	2.07	2.08	2.08	2.07	2.07	2.07	2.07	2.08	2.09	2.09	2.08	2.08	2.10	2.11	2.20	2.19	2.16	2.15	2.07	2.20	2.10
Dec 20	2.15	2.20	S	2.23	2.26	2.26	2.27	2.26	2.24	2.21	2.19	2.22	2.24	2.22	2.21	2.23	2.28	2.27	2.25	2.25	2.28	2.29	2.24	2.23	2.15	2.29	2.24	
Dec 21	2.23	S	2.22	2.22	2.23	2.27	2.26	2.33	2.43	2.45	2.30	2.30	2.20	2.17	2.14	2.13	2.17	2.16	2.13	2.13	2.12	2.12	2.12	2.12	2.12	2.45	2.22	
Dec 22	S	2.21	2.24	2.22	2.21	2.22	2.22	2.22	2.24	2.25	2.25	2.17	2.15	2.15	2.16	2.16	2.17	2.16	2.16	2.19	2.17	2.22	2.25	S	2.15	2.25	2.20	
Dec 23	2.35	2.36	2.32	2.36	2.43	2.43	2.34	2.44	2.56	2.47	2.43	2.49	2.56	2.58	2.47	2.49	2.48	2.47	2.51	2.57	2.51	2.60	S	2.39	2.32	2.60	2.46	
Dec 24	2.28	2.26	2.21	2.21	2.18	2.21	2.21	2.23	2.17	2.17	2.19	2.16	2.17	2.21	2.22	2.23	2.26	2.23	2.22	2.23	2.24	S	2.23	2.22	2.16	2.28	2.21	
Dec 25	2.21	2.27	2.24	2.22	2.18	2.21	2.25	2.30	2.29	2.36	2.26	2.29	2.29	2.28	2.29	2.28	2.24	2.24	2.22	2.20	S	2.15	2.13	2.09	2.09	2.36	2.24	
Dec 26	2.07	2.09	2.09	2.09	2.09	2.10	2.11	2.12	2.13	2.15	2.16	2.14	2.12	2.12	2.11	2.13	2.13	2.17	2.17	S	2.31	2.29	2.30	2.37	2.07	2.37	2.15	
Dec 27	2.55	2.56	2.60	2.49	2.52	2.60	2.48	2.37	2.26	2.26	2.35	2.21	2.18	S1	S1	2.16	2.15	2.15	S	2.11	2.14	2.09	2.09	2.11	2.09	2.60	2.31	
Dec 28	2.12	2.12	2.11	2.09	2.10	2.12	2.17	2.16	2.16	2.18	2.10	2.14	2.09	2.10	2.09	2.15	2.18	S	2.48	2.35	2.33	2.32	2.26	2.27	2.09	2.48	2.18	
Dec 29	2.35	2.31	2.28	2.27	2.22	2.18	2.22	2.17	2.18	2.16	2.14	2.16	2.15	2.14	2.12	2.13	S	2.22	2.23	2.30	2.25	2.28	2.29	2.35	2.12	2.35	2.22	
Dec 30	2.39	2.40	2.36	2.81	2.39	2.37	3.88	4.22	4.50	4.89	3.52	3.14	3.13	2.79	3.09	S	2.46	2.56	2.90	2.93	2.85	2.82	2.73	2.73	2.36	4.89	3.04	
Dec 31	2.75	2.76	2.79	2.71	2.68	2.68	2.68	2.72	2.72	2.36	2.26	2.21	2.15	2.12	S	2.10	2.09	2.10	2.08	2.07	2.05	2.07	2.06	2.09	2.05	2.79	2.36	
Diurnal Maximum	2.75	2.76	2.79	2.81	2.87	3.12	3.88	4.22	4.50	4.89	3.52	3.14	3.13	2.79	3.09	2.49	2.50	2.61	2.90	2.93	3.00	2.82	2.73	2.92				
Diurnal Average	2.23	2.24	2.27	2.28	2.28	2.27	2.30	2.30	2.30	2.33	2.27	2.23	2.21	2.19	2.19	2.18	2.20	2.24	2.27	2.28	2.27	2.24	2.22	2.24				

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

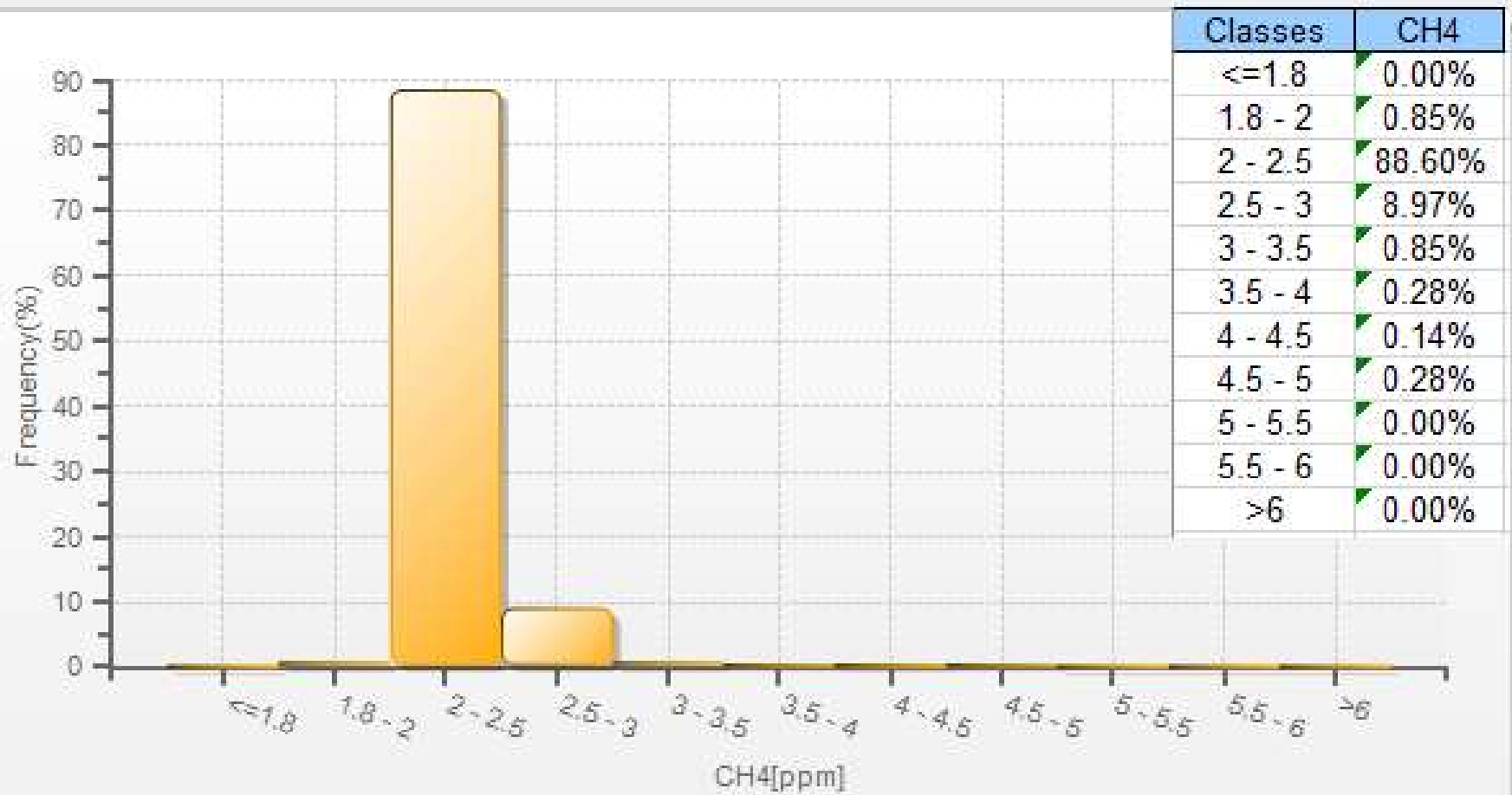
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.  
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



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

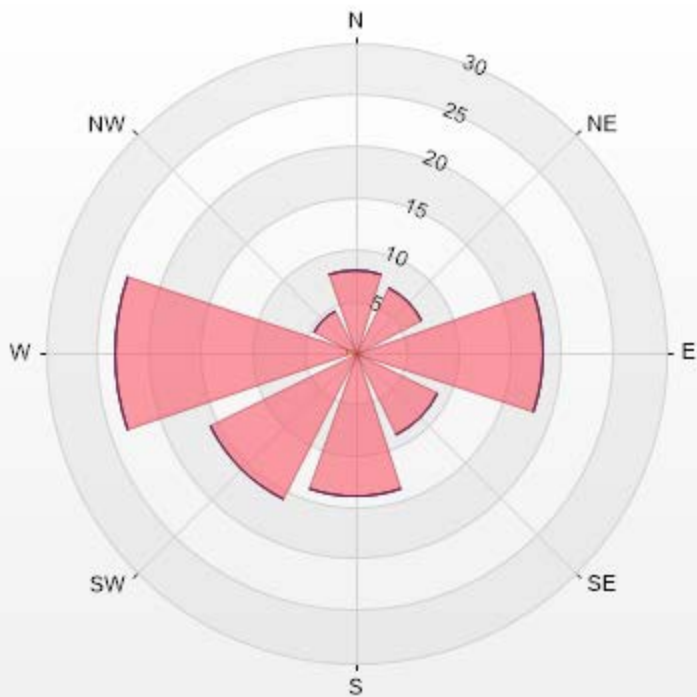


CH4[ppm] Histogram: Bonnyville East Monthly: 12-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-CH4[ppm] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.35% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	0	7.98	0	0	0	7.98
NE	0	7.12	0	0	0	7.12
E	0	18.23	0	0	0	18.23
SE	0	8.97	0	0	0	8.97
S	0	13.96	0	0	0	13.96
SW	0	15.81	0	0	0	15.81
W	0.85	22.51	0	0	0	23.36
NW	0	4.56	0	0	0	4.56
Summary	0.85	99.14	0	0	0	100



LICA-201912-Revision 1



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**Bonnyville - East Site - December 2019**

### Summary of Hourly Averages

#### NON-METHANE HYDROCARBONS (NMHC) in ppm

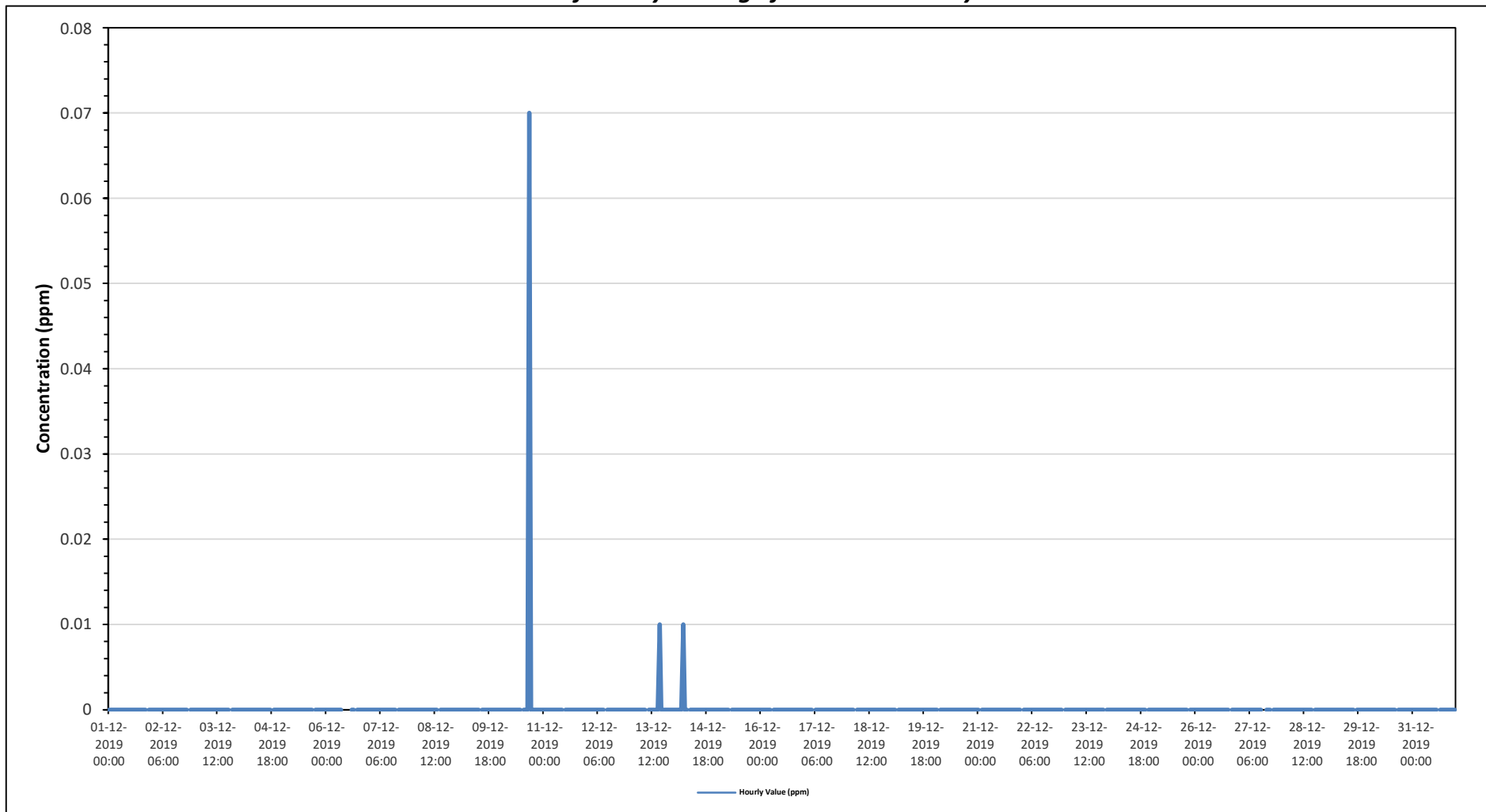
Maximum Hourly Value: 0.07 ppm on December 10 at hour 16	Hours in Service: 744
Maximum Daily Value: 0.00 ppm on December 10	Hours of Data: 705
Minimum Hourly Value: 0.00 ppm on December 1 at hour 0	Hours of Missing Data: 2
Minimum Daily Value: 0.00 ppm on December 1	Hours of Calibration: 37
Monthly Average: 0.00 ppm	Operational Uptime: 99.7

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	
Dec 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	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	0.00	S	S	0.00	0.00	0.00	0.00	0.00
Dec 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	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00
Dec 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 6	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	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	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
Dec 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
Dec 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	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
Dec 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	S	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
Dec 11	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
Dec 12	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
Dec 13	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	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 14	0.00	0.00	0.00	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 15	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
Dec 16	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
Dec 17	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
Dec 18	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
Dec 19	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
Dec 20	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
Dec 21	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
Dec 22	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
Dec 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	S	0.00	0.00	0.00	0.00
Dec 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	0.00	0.00	S	S	0.00	0.00	0.00	0.00
Dec 25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
Dec 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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	S1	S1	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
Dec 28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	0.00
Dec 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	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
Dec 31	0.00	0.00	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	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	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

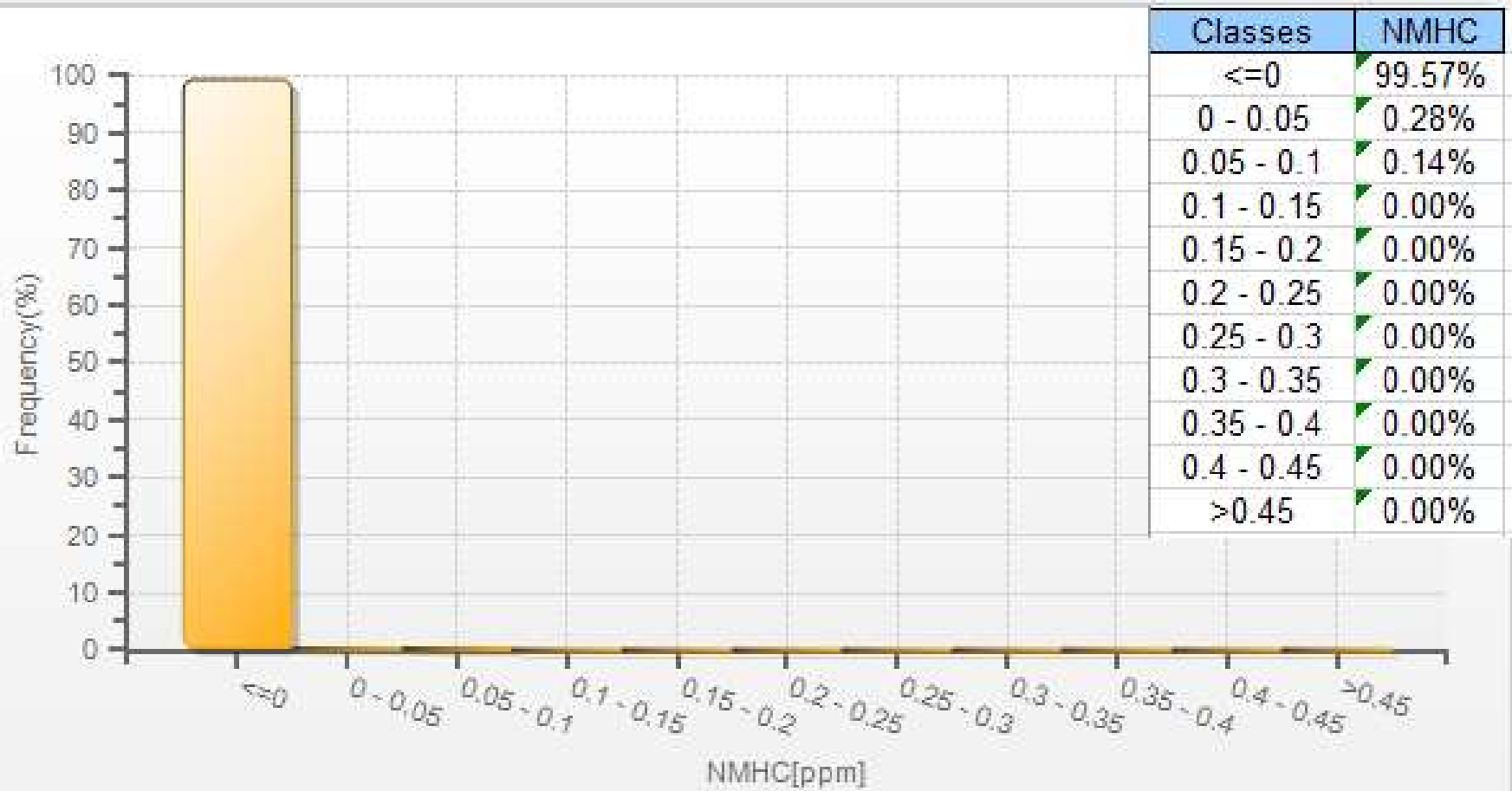
C	Calibration	S	Daily Zero/Span	Q	Quality Assurance	C1	Repeat Calibration	S1	Repeat Daily Zero/Span
G	Out for Repair	K	Collection Error	N	Not in Service	O	Operator Error	P	Power Failure
R	Recovery	X	Machine Malfunction	Y	Maintenance	T	Exceeds Temperature Limits	N	Not in Service

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**



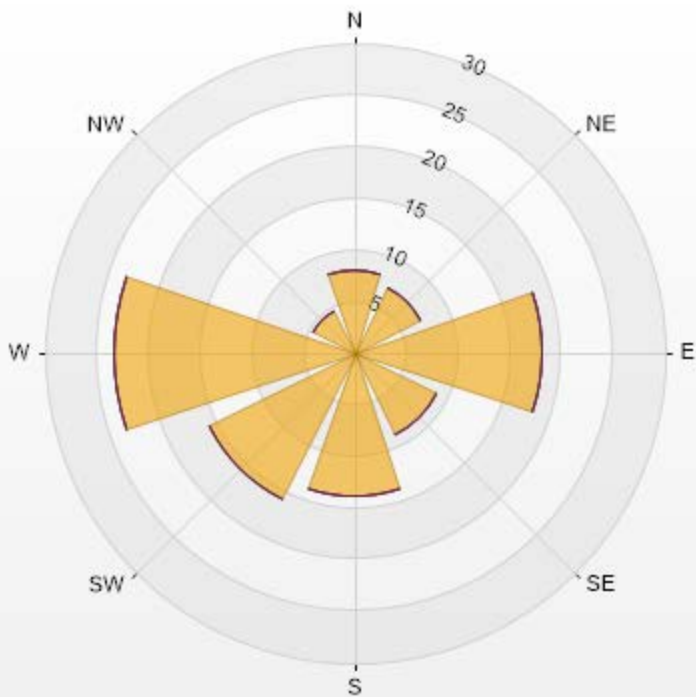
NMHC[ppm] Histogram: Bonnyville East Monthly: 12-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-NMHC[ppm] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 94.35% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-0.9	0.9-2	>2.0	Total
N	7.98	0	0	0	0	7.98
NE	7.12	0	0	0	0	7.12
E	18.23	0	0	0	0	18.23
SE	8.97	0	0	0	0	8.97
S	13.96	0	0	0	0	13.96
SW	15.81	0	0	0	0	15.81
W	23.36	0	0	0	0	23.36
NW	4.56	0	0	0	0	4.56
Summary	100	0	0	0	0	100





LICA-201912-Revision 1

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



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - December 2019

### Summary of Hourly Averages

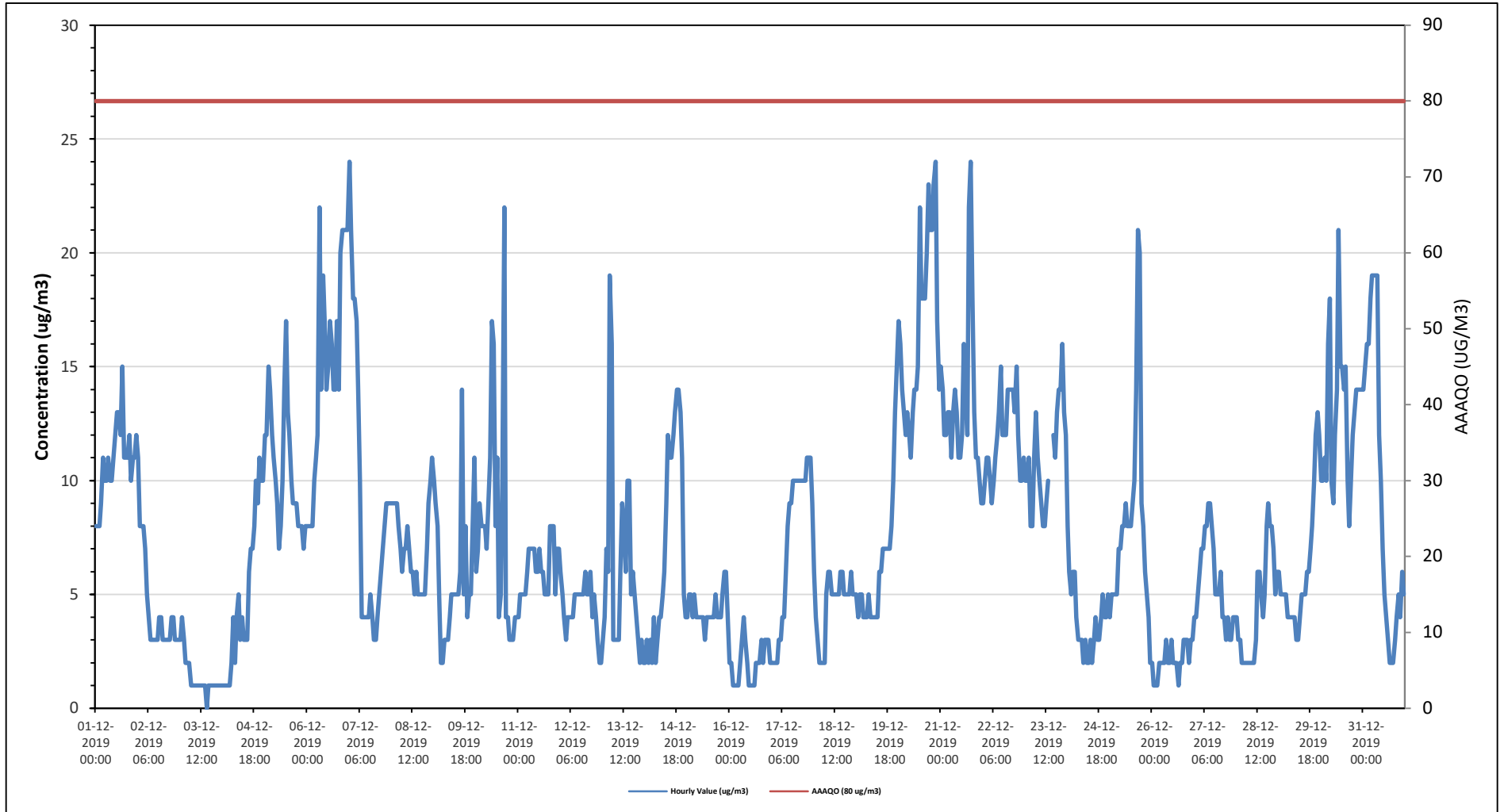
#### PARTICULATE MATTER 2.5 (PM<sub>2.5</sub>) in µg/m<sup>3</sup>

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 80 µg/m <sup>3</sup> , 24-Hour 29 µg/m <sup>3</sup>																											
Number of 1-Hour Exceedences: 0					Number of 24-Hour Exceedences: 0																						
Maximum Hourly Value: 24 µg/m <sup>3</sup> on December 7 at hour 0					Hours in Service: 744																						
Maximum Daily Value: 16.8 µg/m <sup>3</sup> on December 20					Hours of Data: 742																						
Minimum Hourly Value: 0 µg/m <sup>3</sup> on December 3 at hour 15					Hours of Missing Data: 0																						
Minimum Daily Value: 1 µg/m <sup>3</sup> on December 3					Hours of Calibration: 2																						
Monthly Average: 7.4 µg/m <sup>3</sup>					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
Dec 1	8	8	8	9	11	10	10	11	10	10	11	12	13	13	12	15	11	11	11	12	10	11	11	12	8	15	10.8
Dec 2	11	8	8	8	7	5	4	3	3	3	3	3	4	4	3	3	3	3	3	4	4	3	3	3	3	11	4.4
Dec 3	3	4	3	2	2	2	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	4	1.4
Dec 4	1	1	1	1	1	2	4	2	4	5	3	4	3	3	3	6	7	7	8	10	9	11	10	10	1	11	4.8
Dec 5	12	12	15	14	12	11	10	9	7	8	10	14	17	13	12	10	9	9	9	8	8	8	7	8	7	17	10.5
Dec 6	8	8	8	8	10	11	12	22	14	19	17	14	15	17	16	14	14	17	14	20	21	21	21	21	8	22	15.1
Dec 7	24	21	18	18	17	14	10	4	4	4	4	4	5	4	3	3	4	5	6	7	8	9	9	9	3	24	8.9
Dec 8	9	9	9	9	8	7	6	7	7	8	7	6	6	5	6	5	5	5	5	5	7	9	10	11	5	11	7.1
Dec 9	10	9	8	5	2	2	3	3	3	4	5	5	5	5	5	6	14	5	8	4	5	5	8	11	2	14	5.8
Dec 10	6	7	9	8	8	8	7	9	11	17	16	8	11	4	5	10	22	4	4	3	3	4	4	3	22	8.0	
Dec 11	4	5	5	5	5	6	7	7	7	7	6	6	7	6	6	5	5	5	8	8	8	5	7	7	4	8	6.1
Dec 12	6	5	4	3	4	4	4	4	5	5	5	5	5	5	6	5	5	6	4	5	4	3	2	2	2	6	4.4
Dec 13	3	4	7	6	19	16	3	3	3	3	6	9	8	6	10	10	5	6	5	4	3	2	3	2	2	19	6.1
Dec 14	2	3	2	3	2	4	2	3	4	4	5	6	9	12	11	11	12	13	14	14	13	11	5	4	2	14	7.0
Dec 15	4	5	5	4	5	4	4	4	4	4	3	4	4	4	4	4	5	4	4	4	5	6	6	4	3	6	4.3
Dec 16	2	2	1	1	1	1	2	3	4	3	2	1	1	1	1	2	2	2	3	2	3	3	3	2	1	4	2.0
Dec 17	2	2	2	2	3	3	4	4	6	8	9	9	10	10	10	10	10	10	10	10	11	11	11	9	2	11	7.3
Dec 18	6	4	3	2	2	2	2	5	6	6	5	5	5	5	5	6	6	5	5	5	5	6	5	5	2	6	4.6
Dec 19	5	4	5	5	4	4	4	5	4	4	4	4	4	6	6	7	7	7	7	7	8	10	13	15	4	15	6.2
Dec 20	17	16	14	13	12	13	12	11	13	14	14	15	22	18	18	18	20	23	21	21	23	24	17	14	11	24	16.8
Dec 21	15	14	12	12	13	13	11	13	14	13	11	11	12	16	14	12	22	24	18	13	11	11	10	9	9	24	13.5
Dec 22	9	10	11	11	10	9	10	11	12	13	15	12	12	12	14	14	14	14	13	15	12	10	10	11	9	15	11.8
Dec 23	10	10	11	8	8	11	13	11	10	9	8	8	9	10	C	C	12	11	13	14	14	16	13	12	8	16	11.0
Dec 24	8	6	5	6	6	4	3	3	3	2	3	2	2	3	2	3	4	3	3	4	5	4	4	5	2	8	3.9
Dec 25	4	5	5	5	5	7	7	8	8	9	8	8	9	10	14	21	20	9	8	6	5	4	2	2	21	8.1	
Dec 26	2	1	1	1	2	2	2	2	3	2	2	3	2	2	2	1	2	2	3	3	3	2	3	3	1	3	2.1
Dec 27	4	4	5	6	7	7	8	8	9	9	8	7	5	5	5	6	4	4	3	4	3	3	4	4	3	9	5.5
Dec 28	4	3	3	2	2	2	2	2	2	2	2	3	6	6	5	4	5	8	9	8	8	7	5	6	2	9	4.4
Dec 29	6	5	5	5	4	4	4	4	4	3	3	4	5	5	5	6	6	7	8	10	12	13	12	3	13	6.0	
Dec 30	10	10	11	10	16	18	10	9	12	14	21	15	15	14	15	10	8	10	12	13	14	14	14	14	8	21	12.9
Dec 31	14	15	16	16	18	19	19	19	19	12	10	7	5	4	3	2	2	2	3	4	5	4	6	5	2	19	9.5
Diurnal Maximum	24	21	18	18	19	19	19	22	19	19	21	15	22	18	18	18	22	24	21	21	23	24	21	21			
Daiurnal Average	7.4	7.1	7.1	6.7	7.3	7.3	6.5	6.8	7.0	7.3	7.3	6.9	7.6	7.4	7.3	7.4	8.6	8.1	7.8	8.0	8.1	8.1	7.8	7.6			
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						

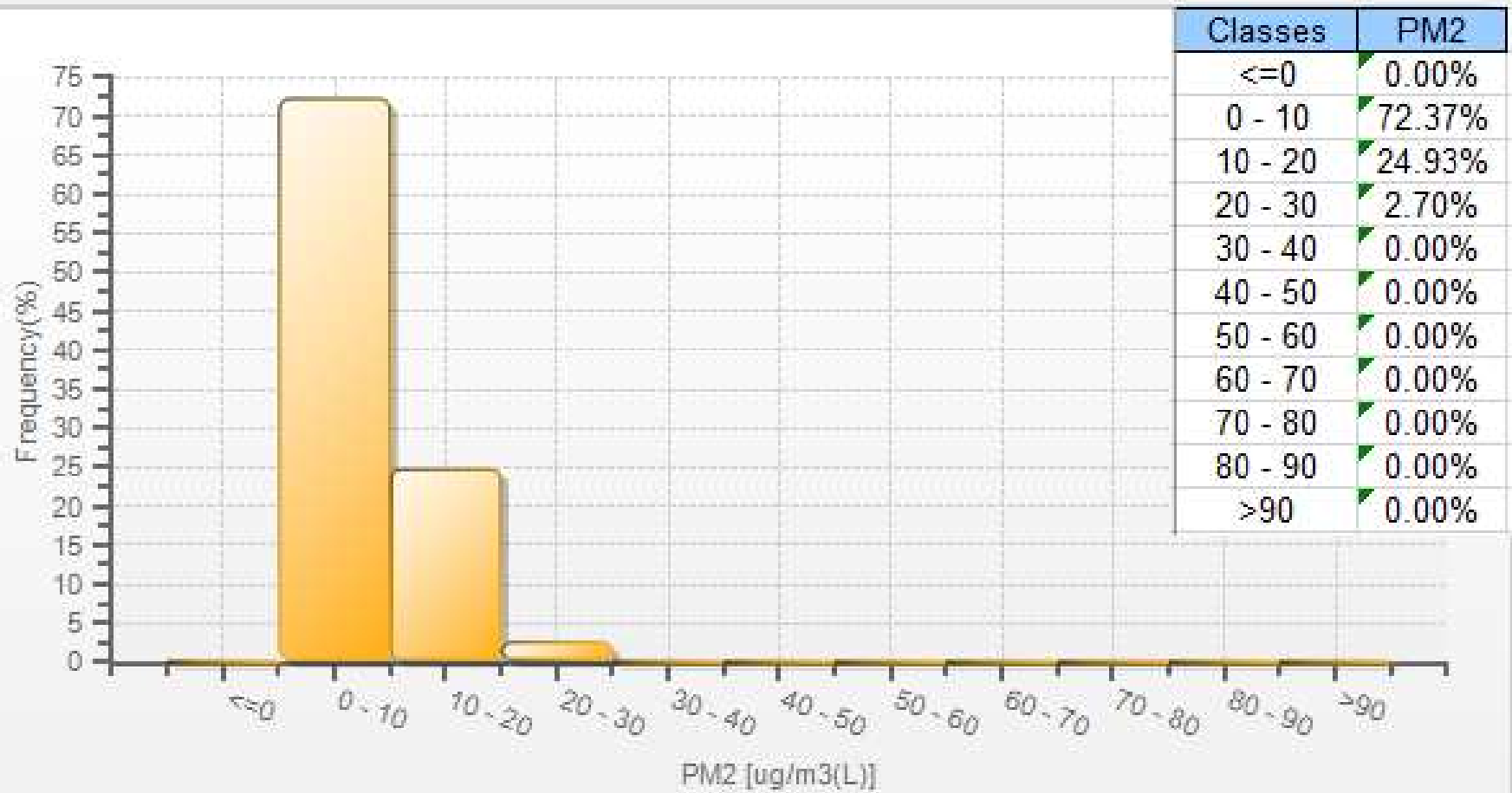
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

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 - Bonnyville - East Site**

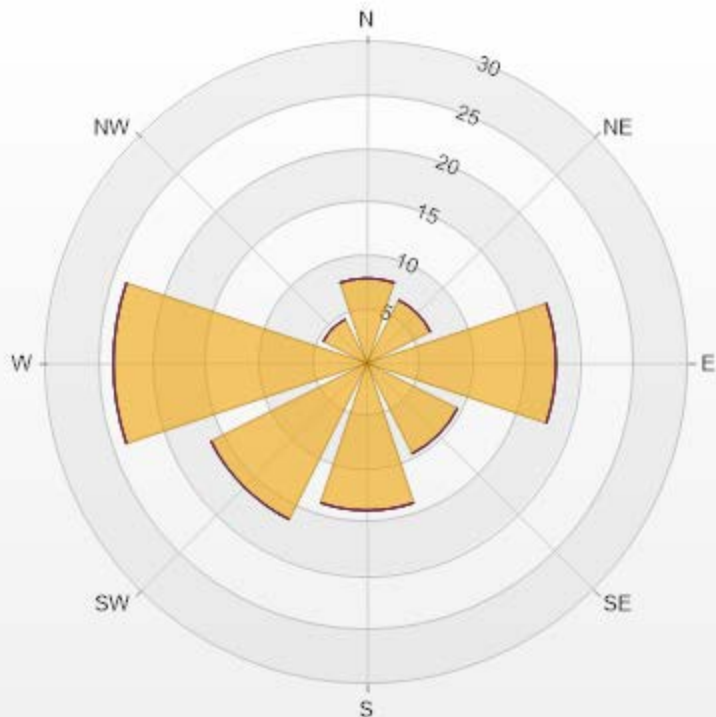


PM2[ug/m3(L)] Histogram: Bonnyville East Monthly: 12-2019 1 Hr.



Wind: Bonnyville East Poll.: Bonnyville East-PM2[ug/m3(L)] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 0.00% Valid Data: 99.73% Calm Avg: 0.00 [ug/m3(L)]

Direction	0-50	50-80	80-120	120-240	>240.0	Total
N	7.95	0	0	0	0	7.95
NE	6.6	0	0	0	0	6.6
E	17.65	0	0	0	0	17.65
SE	9.43	0	0	0	0	9.43
S	13.75	0	0	0	0	13.75
SW	16.31	0	0	0	0	16.31
W	23.72	0	0	0	0	23.72
NW	4.58	0	0	0	0	4.58
Summary	100	0	0	0	0	100




LICA-201912-Revision 1

% Icon Classes ( $\mu\text{g}/\text{m}^3$ (L))

100  0-50

0  50-80

0  80-120

0  120-240

0  >240.0



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - December 2019

Summary of Hourly Averages

### STATION TEMPERATURE (ST) in Degree Celsius

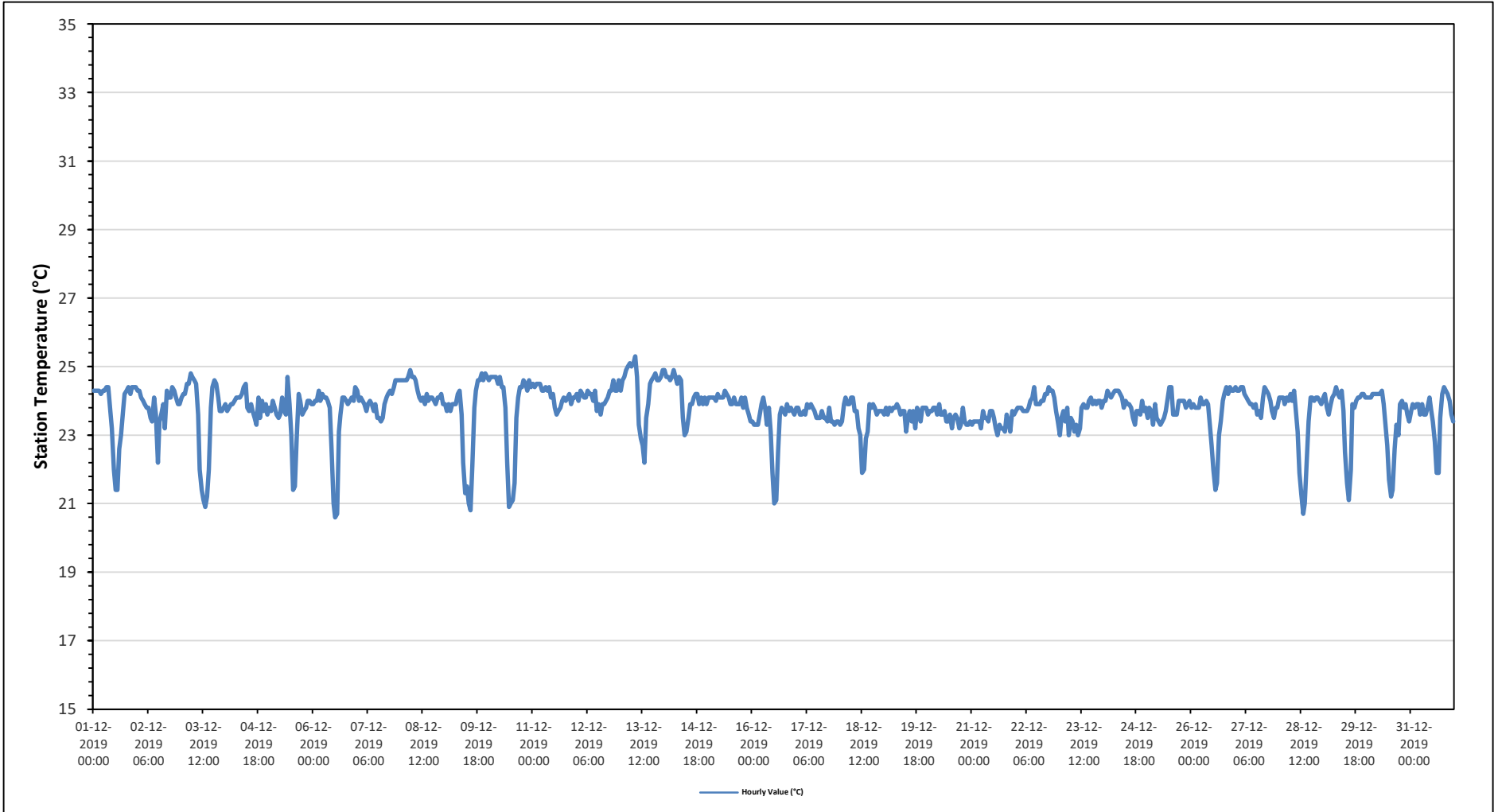
Maximum Hourly Value:	25.3 °C	on December 13 at hour 8	Hours in Service:	744
Maximum Daily Value:	24.4 °C	on December 13	Hours of Data:	744
Minimum Hourly Value:	20.6 °C	on December 6 at hour 12	Hours of Missing Data:	0
Minimum Daily Value:	23.3 °C	on December 16	Hours of Calibration:	0
Monthly Average:	23.8 °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
Dec 1	24.3	24.3	24.3	24.3	24.2	24.3	24.3	24.4	24.4	23.7	23.2	22.0	21.4	21.4	22.6	23.0	23.7	24.2	24.3	24.4	24.2	24.4	24.4	21.4	24.4	23.8	
Dec 2	24.3	24.3	24.1	24.0	23.9	23.8	23.8	23.5	23.4	24.1	23.6	22.2	23.4	23.6	23.9	23.2	24.3	24.1	24.1	24.4	24.3	24.1	23.9	23.9	22.2	24.4	23.8
Dec 3	24.1	24.2	24.2	24.5	24.5	24.8	24.7	24.6	24.5	23.6	22.0	21.4	21.1	20.9	21.2	22.0	23.8	24.4	24.6	24.5	24.1	23.7	23.7	23.8	20.9	24.8	23.5
Dec 4	23.9	23.7	23.8	23.9	23.9	24.0	24.1	24.1	24.1	24.2	24.4	24.5	23.8	23.7	23.9	23.7	23.5	23.3	24.1	23.5	24.0	23.7	23.9	23.6	23.3	24.5	23.9
Dec 5	23.8	23.7	24.0	23.8	23.6	23.5	23.6	24.1	23.7	23.6	24.7	23.9	23.0	21.4	21.5	22.9	24.2	24.0	23.6	23.7	23.8	24.0	24.0	23.9	21.4	24.7	23.6
Dec 6	23.9	24.0	24.0	24.3	24.0	24.2	24.1	24.1	24.0	23.8	22.6	21.0	20.6	20.7	23.1	23.6	24.1	24.1	24.0	23.9	24.0	24.1	24.0	24.4	20.6	24.4	23.5
Dec 7	24.3	24.0	24.1	24.0	23.9	23.7	23.9	24.0	23.9	23.7	23.9	23.5	23.5	23.4	23.5	23.9	24.1	24.2	24.3	24.2	24.4	24.6	24.6	24.6	23.4	24.6	24.0
Dec 8	24.6	24.6	24.6	24.6	24.7	24.9	24.7	24.7	24.6	24.3	24.1	24.0	24.1	23.9	24.2	24.0	24.1	24.1	24.0	23.9	24.1	24.1	24.2	23.9	23.9	24.9	24.3
Dec 9	23.9	23.7	23.9	23.7	23.9	23.9	24.2	24.3	23.6	22.2	21.3	21.5	21.0	20.8	22.1	23.8	24.3	24.6	24.6	24.8	24.6	24.8	24.7	20.8	24.8	23.5	
Dec 10	24.6	24.7	24.7	24.7	24.7	24.5	24.7	24.4	24.4	23.8	22.2	20.9	21.0	21.1	21.6	23.5	24.1	24.4	24.4	24.6	24.5	24.3	24.6	24.4	20.9	24.7	23.8
Dec 11	24.5	24.4	24.5	24.5	24.5	24.3	24.3	24.4	24.3	24.4	24.1	24.2	23.8	23.6	23.7	23.8	24.0	24.1	24.0	24.1	24.2	23.9	24.1	24.1	23.6	24.5	24.2
Dec 12	24.2	24.0	24.3	24.2	24.1	24.1	24.3	24.2	24.2	24.0	24.3	23.7	23.9	23.6	23.9	23.9	24.0	24.1	24.3	24.3	24.6	24.3	24.6	23.6	24.6	24.1	24.1
Dec 13	24.3	24.6	24.7	24.9	25.0	25.1	25.0	25.1	25.3	24.7	23.3	22.9	22.7	22.2	23.5	23.9	24.5	24.6	24.7	24.8	24.6	24.6	24.7	24.9	22.2	25.3	24.4
Dec 14	24.9	24.7	24.7	24.6	24.7	24.9	24.7	24.5	24.7	24.6	23.5	23.0	23.1	23.5	23.9	23.9	24.1	24.2	24.2	23.9	24.1	23.9	24.1	23.9	23.0	24.9	24.2
Dec 15	24.1	24.1	24.1	24.1	24.0	24.2	24.1	24.1	24.1	24.3	24.2	24.1	23.9	23.9	24.1	23.9	23.9	23.9	24.1	23.8	24.1	23.8	23.6	23.4	23.4	24.3	24.0
Dec 16	23.4	23.3	23.3	23.3	23.6	23.9	24.1	23.8	23.3	23.8	23.1	21.9	21.0	21.1	22.5	23.6	23.8	23.7	23.6	23.9	23.7	23.8	23.7	23.6	21.0	24.1	23.3
Dec 17	23.8	23.8	23.6	23.6	23.7	23.6	23.9	23.8	23.9	23.8	23.7	23.5	23.5	23.5	23.7	23.5	23.5	23.4	23.8	23.4	23.4	23.3	23.4	23.4	23.3	23.9	23.6
Dec 18	23.3	23.4	23.9	24.1	23.9	23.9	24.1	24.1	23.7	23.7	23.2	23.0	21.9	22.0	22.9	23.1	23.9	23.8	23.9	23.8	23.6	23.7	23.7	23.7	21.9	24.1	23.5
Dec 19	23.6	23.8	23.6	23.8	23.7	23.8	23.8	23.9	23.8	23.6	23.7	23.7	23.1	23.5	23.7	23.4	23.7	23.2	23.8	23.7	23.4	23.8	23.8	23.8	23.1	23.9	23.7
Dec 20	23.6	23.7	23.7	23.8	23.8	23.6	23.9	23.6	23.7	23.4	23.4	23.6	23.2	23.5	23.6	23.5	23.2	23.3	23.8	23.4	23.3	23.3	23.4	23.2	23.2	23.9	23.5
Dec 21	23.3	23.4	23.4	23.4	23.4	23.2	23.7	23.5	23.5	23.4	23.7	23.7	23.5	23.2	23.0	23.3	23.2	23.2	23.1	23.6	23.4	23.1	23.7	23.6	23.0	23.7	23.4
Dec 22	23.7	23.8	23.8	23.8	23.7	23.7	23.7	23.8	24.0	24.1	24.4	23.9	23.9	23.9	24.0	24.0	24.2	24.2	24.4	24.3	24.3	24.1	23.7	23.4	23.4	24.4	24.0
Dec 23	23.0	23.5	23.7	23.4	23.8	23.0	23.5	23.4	23.1	23.3	23.0	23.2	23.8	23.9	23.8	23.8	24.0	24.1	23.9	24.0	23.9	24.0	24.0	23.8	23.0	24.1	23.6
Dec 24	24.0	24.0	24.3	24.2	24.1	24.2	24.3	24.3	24.3	24.2	24.1	23.8	24.0	23.9	23.9	23.8	23.5	23.3	23.7	23.7	23.6	24.0	23.7	23.8	23.3	24.3	23.9
Dec 25	23.5	23.8	23.7	23.3	23.9	23.5	23.4	23.3	23.4	23.5	23.7	24.1	24.4	24.4	23.6	23.6	23.6	24.0	24.0	24.0	24.0	23.8	23.9	24.0	23.3	24.4	23.8
Dec 26	23.8	23.9	23.8	23.8	23.8	24.1	23.9	23.9	24.0	23.9	23.4	22.7	22.0	21.4	21.6	23.0	23.4	24.0	24.2	24.4	24.2	24.4	24.3	24.3	21.4	24.4	23.6
Dec 27	24.4	24.3	24.3	24.4	24.4	24.2	24.1	24.0	23.9	23.9	23.8	23.9	23.6	23.7	23.5	24.1	24.4	24.3	24.2	24.0	23.7	23.5	23.8	23.8	23.5	24.4	24.0
Dec 28	24.1	24.1	24.1	23.9	24.1	24.0	24.2	24.0	24.3	23.7	23.1	21.9	21.3	20.7	21.0	22.3	23.4	24.1	24.1	24.0	24.1	24.1	24.0	23.9	20.7	24.3	23.4
Dec 29	24.1	24.2	23.8	23.6	23.9	24.1	24.2	24.4	24.2	24.1	24.3	23.7	22.5	21.6	21.1	22.0	23.9	23.8	24.0	24.1	24.1	24.2	24.2	24.1	21.1	24.4	23.7
Dec 30	24.1	24.1	24.1	24.2	24.2	24.2	24.2	24.2	24.3	23.9	23.3	22.7	21.7	21.2	21.4	22.6	23.3	23.0	23.9	24.0	23.8	23.9	23.6	23.4	21.2	24.3	23.5
Dec 31	23.7	23.9	23.8	23.9	23.9	23.6	23.9	23.6	23.8	24.1	23.7	23.4	22.8	21.9	21.9	23.5	24.2	24.4	24.3	24.2	24.0	23.6	23.4	21.9	24.4	23.6	
Diurnal Maximum	24.9	24.7	24.7	24.9	25.0	25.1	25.0	25.1	25.3	24.7	24.7	24.5	24.4	24.4	24.2	24.1	24.5	24.6	24.7	24.8	24.8	24.6	24.8	24.9			
Diurnal Average	24.0	24.0	24.0	24.0	24.0	24.0	24.1	24.1	24.0	23.9	23.6	23.1	22.8	22.6	22.9	23.3	23.8	23.9	24.1	24.1	24.0	24.0	23.9				

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 ST - Bonnyville - East Site**







## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - December 2019

Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr

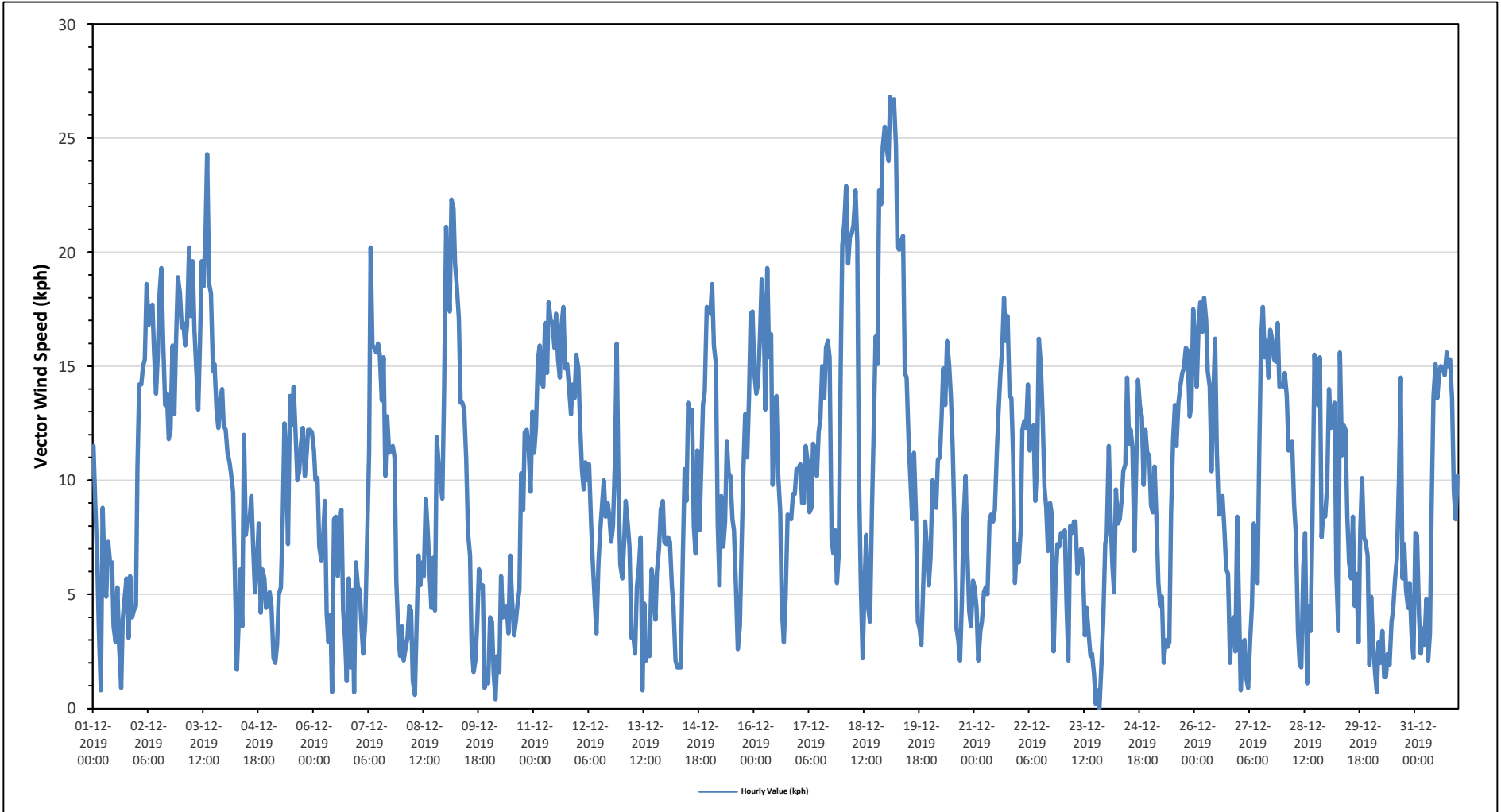
Maximum Hourly Value:	26.8 kph	on December 19 at hour 2	Hours in Service:	744
Maximum Daily Value:	16.6 kph	on December 3	Hours of Data:	744
Minimum Hourly Value:	0.0 kph	on December 23 at hour 20	Hours of Missing Data:	0
Minimum Daily Value:	4.3 kph	on December 30	Hours of Calibration:	0
Monthly Average:	1.9 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
Dec 1	11.5	9	6.4	3.5	0.8	8.8	5.7	4.9	7.3	6.4	6.4	3.6	2.9	5.3	2.7	0.9	3.9	4.9	5.7	3.1	5.8	4	4.3	4.5	0.8	11.5	5.1
Dec 2	10.6	14.2	14.2	15	15.3	18.6	16.8	17.6	17.7	15.7	13.8	15.5	18.2	19.3	16.1	13.3	13.8	11.8	12.2	15.9	12.9	16.2	18.9	18.2	10.6	19.3	15.5
Dec 3	16.7	16.9	15.9	16.8	20.2	17.2	19.6	16.6	14.7	13.1	16.1	19.6	18.5	21	24.3	18.6	18.2	14.8	15.1	13.1	12.3	13.6	14	12.4	12.3	24.3	16.6
Dec 4	12.2	11.2	10.8	10.3	9.5	6	1.7	3.5	6.1	3.6	12	7.6	8.3	8.3	9.3	7.1	5.1	6.4	8.1	4.2	6.1	5.7	4.4	4.7	1.7	12.2	7.2
Dec 5	5.1	4.5	2.2	2	2.8	5	5.3	8.2	12.5	10.9	7.2	13.7	12.4	14.1	12.3	10	10.4	11.6	12.3	10.2	11.1	12.2	12.2	12.1	2.0	14.1	9.2
Dec 6	11.3	10	10.1	7.1	6.5	7.2	9.1	4.2	2.9	4.1	0.7	8.3	8.4	5.8	8	8.7	4.3	2.9	1.2	5.7	1.8	5.2	0.7	6.4	0.7	11.3	5.9
Dec 7	5.3	5.2	3.4	2.4	3.8	7.3	11.2	20.2	15.9	15.8	15.6	16	15.5	13.5	15.4	10.2	12.8	11.2	11.3	11.5	11	5.6	3.2	2.3	2.3	20.2	10.2
Dec 8	3.6	2.1	2.7	3.1	4.5	4.3	1.2	0.6	3.3	6.7	5.4	6.4	5.8	9.2	7.9	5.9	4.4	6.6	4.3	11.9	10.6	10	9.2	13.9	0.6	13.9	6.0
Dec 9	21.1	18.8	17.4	22.3	21.9	19.5	18.5	17.1	13.4	13.4	13.1	10.9	7.7	6.7	2.8	1.6	2.1	3.7	6.1	5.3	0.9	1.7	1.1	0.9	0.9	22.3	10.5
Dec 10	4	3.8	1.5	0.4	2.3	1.6	5.8	4	4.3	4.5	3.3	6.7	4.8	3.2	3.8	4.6	5.2	10.3	8.7	12.1	12.2	11.5	9.5	13	0.4	13.0	5.9
Dec 11	11.2	12.3	15.3	15.9	14.3	14.1	16.9	14.7	17.8	17	16.9	15.8	17.3	15.3	14.5	16.8	17.6	14.9	15.1	14.1	12.9	14.2	13.6	15.5	11.2	17.8	15.2
Dec 12	14.9	12.7	10.5	9.6	10.8	10	10.7	8.1	6.3	4.8	3.3	6.4	7.8	8.9	10	8.4	9	8.4	7.3	8	10.9	16	9.5	6.3	3.3	16.0	9.1
Dec 13	5.7	7.3	9.1	8.1	7.1	3.1	3.3	2.4	5.3	6.2	7.5	0.8	4.6	2.1	2.6	2.3	6.1	5.4	3.9	6	7	8.7	9.1	7.3	0.8	9.1	5.5
Dec 14	7.2	7.5	7.3	5.3	4.5	2.1	1.8	1.8	1.8	6.8	10.5	9.1	13.4	12.8	13.1	8	6.8	11.3	7.8	10.4	13.3	13.9	17.6	17.5	1.8	17.6	8.8
Dec 15	17.3	18.6	15.9	15.1	8.1	5.4	9.3	7.1	8.2	11.7	10.3	10.2	8.3	7.8	5.2	2.6	3.6	7.1	10.5	12.9	11	13.6	17.3	17.4	2.6	18.6	10.6
Dec 16	14.7	13.8	14.2	16.2	18.8	17.2	13.1	19.3	15.4	16.4	9.8	12.2	13.7	10.2	8.6	4.4	2.9	4.9	8.5	8.4	8.3	9.4	9.4	10.5	2.9	19.3	11.7
Dec 17	10.5	10.7	9	9	11.5	10.8	8.6	8.8	11.6	11.4	10.2	12.1	12.7	15	13.6	15.8	16.1	15.4	7.4	6.8	7.8	5.5	6.8	15.2	5.5	16.1	10.9
Dec 18	20.3	21.3	22.9	19.5	20.7	20.8	21.2	22.7	20.4	10.6	5.3	2.2	5.6	7.6	4.4	3.8	8.9	11.9	16.3	15.1	22.7	22.1	24.6	25.5	2.2	25.5	15.7
Dec 19	24.6	24	26.8	26.5	26.7	24.7	20.2	20.1	20.5	20.7	14.7	14.5	11.7	10	8.3	11.2	8.4	3.8	3.5	2.8	5.3	8.2	7	5.4	2.8	26.8	14.6
Dec 20	6.6	10	9	8.8	10.9	11	12.9	14.9	13.3	16.1	15.1	13.7	11.5	8.3	3.5	3	2.1	4.6	8.3	10.2	7.1	4.3	3.6	5.6	2.1	16.1	8.9
Dec 21	5.3	4.4	2.1	3.4	3.8	5.1	5.3	5	8.2	8.5	8.2	8.7	11.3	12.9	14.7	15.8	18	16.1	17.2	13.7	13.6	11	5.5	7.2	2.1	18.0	9.4
Dec 22	6.4	7.9	12.2	12.6	12.3	14.2	11.3	12.1	12.4	9.1	10.6	16.2	15	12.8	9.7	8.8	6.9	9	8.5	2.5	5.4	7.2	7.1	7.7	2.5	16.2	9.9
Dec 23	7.5	7.8	4.5	2.1	8	7.7	8.2	8.2	5.9	6.7	7	6.4	3.2	4.4	3.4	2.3	2.4	1.5	0.2	0.8	0	1.9	3.8	7.2	0.0	8.2	4.6
Dec 24	7.6	11.5	8.4	6.3	5.1	9.6	8.1	8.3	9.2	10.4	10.7	14.5	11.6	12.2	11.4	6.9	10.7	14.4	13.3	12.8	9.8	12.2	11.2	11.1	5.1	14.5	10.3
Dec 25	8.9	8.6	10.6	8.5	5.5	4.5	4.9	2	3	2.7	2.9	8.6	11.8	13.3	11.5	13.4	14.1	14.7	14.9	15.8	15.7	12.8	13.3	17.5	2.0	17.5	10.0
Dec 26	16.1	14.1	17.1	17.8	16.5	18	17	14.8	14.1	10.4	14	16.2	11.2	8.5	9.2	9.3	8	6.1	5.9	2	3.6	4	2.5	8.4	2.0	18.0	11.0
Dec 27	4.5	0.8	2.9	3	1.3	0.9	3	4.5	8.1	6.8	5.5	11.4	16.2	17.6	15.4	16.1	14.5	16.6	16.2	15.3	15.2	16.9	14.1	14.2	0.8	17.6	10.0
Dec 28	14.1	14.7	13.7	11.3	11.6	11.7	8.9	7.6	3.4	1.9	1.8	6.2	7.7	1.1	4.5	3.4	8.3	15.5	13.5	13.3	15.4	7.5	8.7	8.4	1.1	15.5	8.9
Dec 29	9.8	14	12.3	12.6	13.4	5.9	3.4	15.6	11.1	12.4	12.2	8.4	6.4	5.7	8.4	4.5	5.9	2.9	7.8	10.1	7.5	7.3	6.7	1.9	1.9	15.6	8.6
Dec 30	4.9	3	1.6	0.7	2.9	2	3.4	1.4	1.4	2.4	1.9	3.8	4.3	5.7	6.6	10	14.5	5.7	7.2	5.2	4.4	5.5	3.2	2.2	0.7	14.5	4.3
Dec 31	7.7	7.6	4.1	2.4	3.5	2.8	4.8	2.1	3.3	9	13.7	15.1	13.6	14.8	15	14.9	14.6	15.6	15	15.3	13.6	9.5	8.3	10.2	2.1	15.6	9.9
Diurnal Maximum	25	24	27	27	27	25	21	23	21	21	17	20	19	21	24	19	18	17	17	16	23	22	25	26			
Diurnal Average	10.6	10.6	10.1	9.6	9.8	9.6	9.4	9.6	9.6	9.6	9.2	10.3	10.4	10.1	9.6	8.5	9.0	9.4	9.5	9.5	9.7	9.6	9.1	10.0			

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.

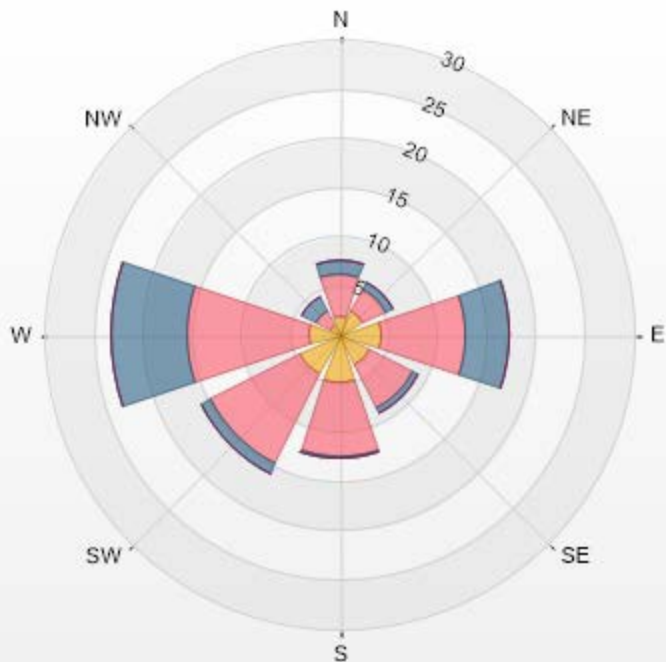
*Timeseries Chart of Hourly Average for VWS - Bonnyville - East Site*



Wind: Bonnyville East Poll.: Bonnyville East-WDS[kph] Monthly: 12-2019 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.  
 Calm: 4.03% Valid Data: 100.00% Calm Avg: 1.09 [kph]

Direction	0-6	6-15	15-29	29-39	>39.0	Total
N	2.02	4.17	1.48	0	0	7.67
NE	2.69	2.55	0.81	0	0	6.05
E	4.17	8.6	4.57	0	0	17.34
SE	3.49	4.84	0.54	0	0	8.87
S	4.97	7.39	0.27	0	0	12.63
SW	4.57	10.08	1.21	0	0	15.86
W	3.09	12.37	7.8	0	0	23.26
NW	1.08	1.61	1.61	0	0	4.3
Summary	26.08	51.61	18.29	0	0	95.98

Bonnyville East Poll.: Bonnyville East-WDS[kph] 01-12-2019 00:00 - 31-12-2019 23:00 Calm: 4.03% Calm Poll  
 Avg: 1.09[kph]



LICA-201912-Revision 1

% Icon Classes (kph)	26	52	19	0	0
	0-6	7-14	15-29	29-39	>39.0



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - December 2019

Summary of Hourly Averages

WIND DIRECTION (VWD) in sector

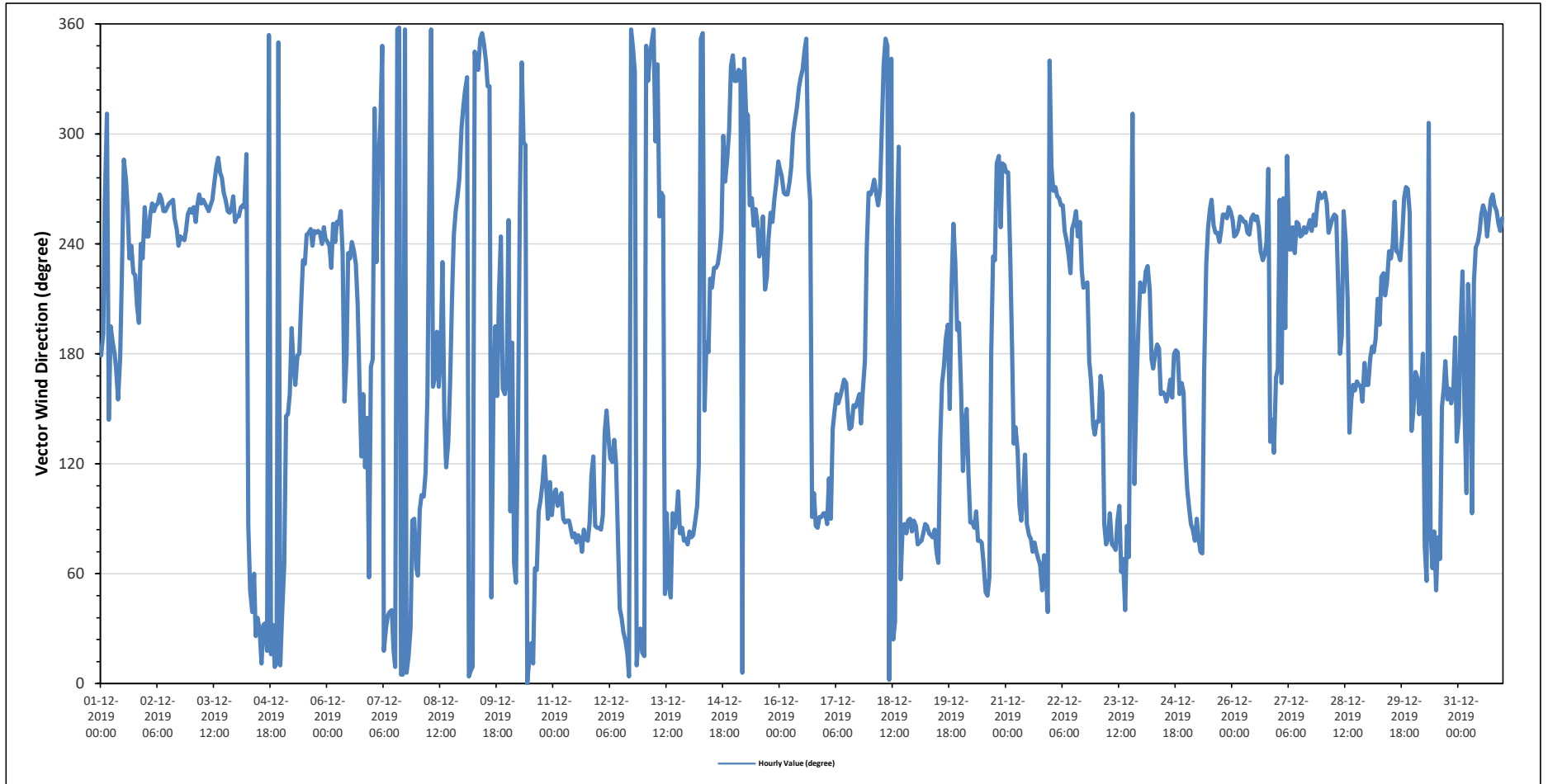
Monthly Average:	236 (SW) degree	Hours in Service:	744
		Hours of Data:	744
		Hours of Missing Data:	0
		Hours of Calibration:	0
		Operational Uptime:	100.0

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		
Dec 1	S	S	W	NW	SE	SSW	S	S	S	SSE	S	SW	WNW	W	WSW	SW	WSW	SW	SW	SSW	SSW	WSW	SW	WSW	210	SSW		
Dec 2	WSW	WSW	WSW	W	WSW	W	W	W	W	WSW	WSW	W	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	256	WSW		
Dec 3	WSW	WSW	WSW	W	W	W	W	W	WSW	WSW	W	W	W	WNW	W	W	W	W	WSW	WSW	WSW	W	WSW	266	W			
Dec 4	WSW	WSW	WSW	W	WSW	WNW	E	NE	NE	ENE	NNE	NE	NNE	NNE	NNE	NNE	N	NNE	NNE	N	NNE	N	N	350	N			
Dec 5	NE	ENE	SE	SE	SSE	SSW	S	SSE	S	S	SSW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	227	SW			
Dec 6	WSW	WSW	SW	WSW	WSW	WSW	WSW	WSW	SW	SSE	S	SW	SW	WSW	SW	SW	SSW	SSE	ESE	SSE	ESE	SE	ENE	S	225	SW		
Dec 7	S	NW	SW	WNW	NW	NNW	NNE	NNE	NE	NE	NNE	N	N	N	N	N	N	N	NNE	NNE	E	E	ENE	16	NNE			
Dec 8	ENE	E	ESE	E	ESE	SSE	W	N	SSE	SSE	S	SSE	S	SW	SE	ESE	SE	SSE	SSW	WSW	WSW	W	W	WNW	205	SSW		
Dec 9	NW	NW	NNW	N	N	N	NNW	NNW	NNW	N	N	NNW	NNW	NW	NW	NE	SSE	SSW	SSE	SSW	WSW	SSE	SSE	SSE	342	NNW		
Dec 10	WSW	E	S	ENE	NE	SE	W	NNW	WNW	WNW	N	NNE	NNE	ENE	ENE	E	E	ESE	ESE	ESE	E	ESE	E	E	86	E		
Dec 11	ESE	ESE	E	E	ESE	E	E	E	E	E	E	E	ENE	E	ENE	ENE	E	ENE	ENE	E	ESE	ESE	E	E	89	E		
Dec 12	E	E	E	SE	SSE	SE	ESE	ESE	SE	ESE	E	NE	NE	NNE	NNE	NNE	N	N	NNW	NNW	N	NNE	NNE	NNE	59	ENE		
Dec 13	NNE	NNW	NNW	NNW	N	N	WNW	NNW	WSW	W	W	NE	E	NE	NE	E	E	ESE	E	E	ENE	ENE	ENE	ENE	33	NNE		
Dec 14	E	E	E	E	E	ESE	N	N	SSE	S	S	SW	SW	SW	SW	SW	SW	WSW	WNW	W	WNW	WNW	NNW	NNW	260	WSW		
Dec 15	NNW	NNW	NNW	NNW	N	NNW	NW	NW	W	W	WSW	WSW	WSW	SW	SW	WSW	SSW	SW	WSW	WSW	WSW	W	W	WNW	284	WNW		
Dec 16	W	W	W	W	W	W	W	WNW	NW	NW	NNW	NNW	NNW	N	W	W	E	ESE	E	E	E	E	E	E	306	NW		
Dec 17	E	E	ESE	E	SE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SE	SE	SE	SSE	SSE	SSE	SSE	SE	SSE	S	SW	W	149	SSE		
Dec 18	W	W	W	W	W	W	WNW	NNW	N	NNW	N	NNW	NNE	NE	WSW	WNW	ENE	E	E	E	E	E	E	E	352	N		
Dec 19	E	ENE	ENE	ENE	E	E	E	E	E	E	ENE	ENE	SE	SSE	S	S	SSW	SSE	SW	WSW	SW	S	SSW	94	E			
Dec 20	SSE	ESE	SE	SSE	ESE	E	E	E	E	ENE	ENE	ENE	ENE	NE	NE	ENE	S	SW	SW	WNW	WNW	WSW	WNW	W	95	E		
Dec 21	W	W	SW	S	SE	SE	SE	E	E	ESE	SE	E	E	ENE	ENE	ENE	ENE	ENE	NE	ENE	ENE	NE	NNW	76	ENE			
Dec 22	W	W	W	W	W	W	W	WSW	WSW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	S	SSE	SE	SE	242	WSW		
Dec 23	SE	SE	SSE	SSE	E	ENE	ENE	E	ENE	ENE	ENE	E	E	ENE	ENE	NE	E	ENE	SSW	NW	ESE	SSE	SSW	SW	101	E		
Dec 24	SSW	SSW	SW	SW	SSW	S	S	S	S	SSE	SSE	SSE	SSE	SSE	SSE	SSE	S	S	S	SSE	SSE	SSE	SE	SE	174	S		
Dec 25	ESE	E	E	E	ENE	E	ENE	ENE	ENE	SSE	SW	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	245	WSW		
Dec 26	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	WSW	W	SE	SE	SE	SSE	245	WSW		
Dec 27	S	W	SSE	W	SSW	WNW	SW	SW	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	W	249	WSW		
Dec 28	W	W	W	WSW	WSW	WSW	WSW	WSW	SW	S	WSW	WSW	SSW	SE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	S	SSE	S	211	SSW		
Dec 29	SSE	S	S	S	S	SSW	SSW	SW	SW	SSW	SW	SW	WSW	W	SW	SW	SW	WSW	W	W	W	W	WSW	SE	218	SW		
Dec 30	SSE	SSE	SSE	SE	SSE	S	ENE	NE	NW	E	ENE	E	NE	E	ENE	SSE	SSE	S	SSE	SSE	SSE	S	SE	SE	138	SE		
Dec 31	SE	SSW	SW	SSE	ESE	SW	S	E	SW	SW	WSW	WSW	W	WSW	WSW	WSW	W	W	W	WSW	WSW	WSW	WSW	WSW	246	WSW		
Diurnal Maximum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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 Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/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 VWD - Bonnyville - East Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**Bonnyville - East Site - December 2019**

**Summary of Hour Standard Deviations**

### STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

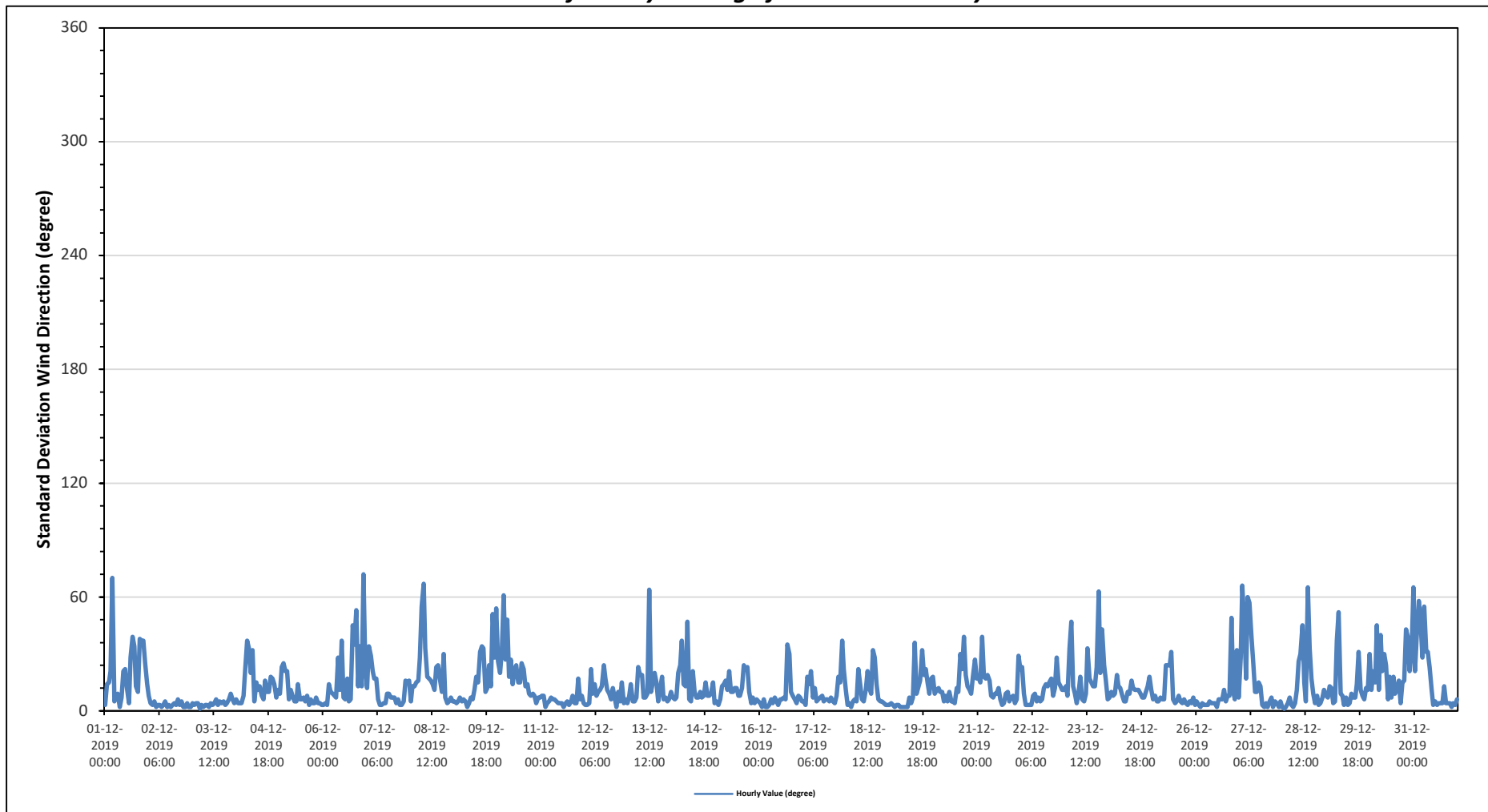
Maximum Hourly Value: 72 degree on December 6 at hour 22	Hours in Service: 744
	Hours of Data: 744
Minimum Hourly Value: 1 degree on December 3 at hour 4	Hours of Missing Data: 0
	Hours of Calibration: 0
	Operational Uptime: 100.0

Day	Hourly Period Starting at (MST)																							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	
Dec 1	3	14	15	21	70	5	8	9	2	7	21	22	12	4	28	39	34	13	10	38	37	37	25	14	2	70	
Dec 2	8	4	3	5	2	3	3	2	3	5	2	3	2	3	4	3	6	3	5	2	2	4	2	2	2	8	
Dec 3	4	3	4	4	1	3	2	3	3	2	4	3	4	6	3	5	4	5	3	4	6	9	6	4	1	9	
Dec 4	6	4	4	4	8	21	37	33	20	32	5	15	11	13	8	6	16	10	10	18	17	14	7	11	4	37	
Dec 5	9	23	25	21	21	6	11	8	5	5	14	6	6	7	5	8	3	6	4	4	7	4	4	3	3	25	
Dec 6	3	4	3	14	10	9	8	7	28	11	37	7	6	17	5	6	45	35	53	13	34	13	72	23	3	72	
Dec 7	12	34	29	21	17	17	6	3	3	4	4	9	9	7	7	7	4	6	3	3	5	16	15	16	3	34	
Dec 8	5	13	13	15	16	28	55	67	33	18	17	16	14	11	23	24	17	10	30	7	4	5	7	5	4	67	
Dec 9	5	4	5	7	5	6	5	2	4	7	6	11	18	15	31	34	33	10	12	24	13	51	28	54	2	54	
Dec 10	26	20	32	61	27	48	18	27	14	22	24	15	15	25	22	13	14	9	8	9	8	4	7	7	4	61	
Dec 11	8	8	2	4	5	7	6	6	5	4	4	4	2	4	5	3	5	8	4	4	17	6	8	4	2	17	
Dec 12	3	3	4	22	9	14	8	10	11	13	24	17	11	9	6	12	7	2	10	5	15	4	6	4	2	24	
Dec 13	8	14	5	5	7	23	19	19	7	7	9	64	10	15	20	15	5	11	18	6	7	5	6	10	5	64	
Dec 14	7	6	7	20	24	37	14	13	47	6	5	21	10	7	7	10	7	8	15	8	8	9	15	4	4	47	
Dec 15	5	3	6	13	14	16	11	21	10	10	12	12	8	8	12	24	22	23	10	4	7	4	6	5	3	24	
Dec 16	4	2	6	2	2	3	6	4	7	5	3	6	6	7	6	35	30	10	8	6	4	8	7	5	2	35	
Dec 17	5	3	18	14	21	7	12	5	6	7	8	5	6	6	5	7	5	4	8	18	15	37	22	11	3	37	
Dec 18	3	4	2	5	6	5	22	13	6	5	11	21	12	9	32	28	14	6	5	5	4	3	3	3	2	32	
Dec 19	4	3	2	3	3	2	2	2	2	2	7	4	7	36	9	13	16	32	19	22	15	9	17	18	2	36	
Dec 20	9	11	12	10	10	5	8	5	10	5	4	12	10	30	22	39	19	13	11	9	18	27	17	4	4	39	
Dec 21	18	15	39	18	17	19	16	8	7	9	9	12	6	3	4	9	10	5	7	8	4	6	29	22	3	39	
Dec 22	23	9	3	3	3	3	8	9	5	7	5	6	12	14	13	15	17	8	12	28	15	13	11	11	3	28	
Dec 23	13	8	33	47	13	9	4	9	18	6	5	9	33	17	15	13	13	23	63	20	43	24	17	6	4	63	
Dec 24	7	10	8	9	19	13	12	8	5	5	10	9	16	12	11	11	11	9	7	7	10	13	18	11	5	19	
Dec 25	6	8	5	5	7	6	6	24	24	24	31	6	4	5	8	5	4	6	4	3	5	4	7	3	3	31	
Dec 26	5	3	2	4	3	3	3	5	4	4	4	2	6	6	6	11	5	8	8	49	10	6	32	7	2	49	
Dec 27	28	66	48	17	60	57	39	25	10	10	15	13	3	2	4	2	5	7	2	5	4	2	5	2	2	66	
Dec 28	1	2	4	7	3	2	4	11	26	30	45	15	5	65	33	17	9	4	8	3	4	7	11	8	1	65	
Dec 29	7	13	12	4	5	37	52	9	8	3	7	3	4	9	7	7	14	31	11	8	6	12	11	30	3	52	
Dec 30	11	21	15	45	11	40	21	30	24	6	18	7	18	9	11	16	4	15	16	43	39	21	32	65	4	65	
Dec 31	21	43	58	49	28	55	31	31	23	11	3	5	3	4	4	4	13	4	4	4	2	4	3	6	2	58	
Diurnal Minimum	1	2	2	2	1	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2
Diurnal Maximum	28	66	58	61	70	57	55	67	47	32	45	64	33	65	33	39	45	35	63	49	43	51	72	65			

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 STDWD - Bonnyville - East Site**





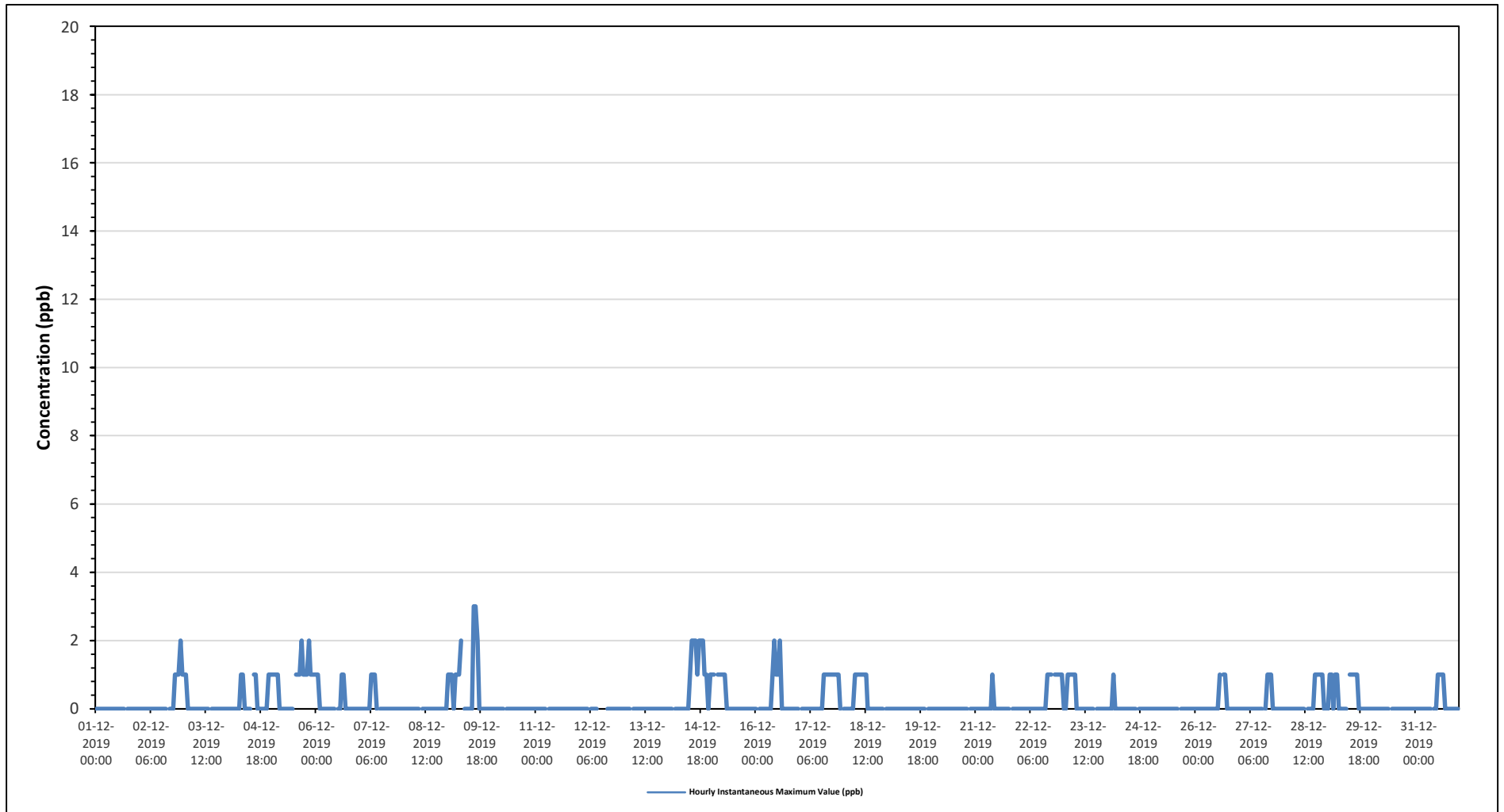
## REFERENCE DOCUMENTS

**HOURLY INSTANTANEOUS DATA**

COLD LAKE SOUTH STATION



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





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

### Cold Lake South Station - December 2019 Summary of Hourly Instantaneous Maximums

#### TOTAL REDUCED SULPHUR (TRS) in ppb

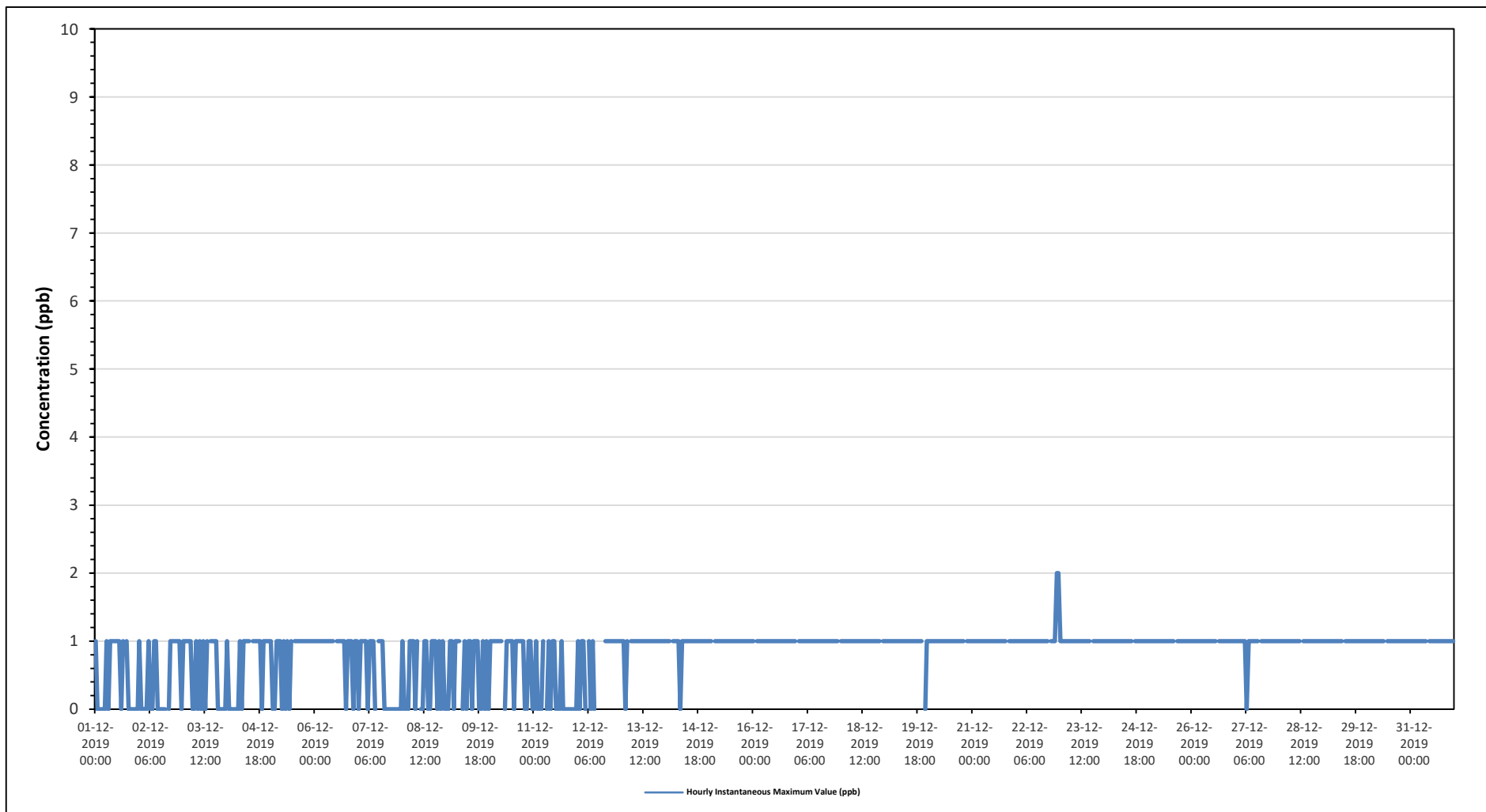
Maximum Hourly Value:	2 ppb on December 22 at hour 22	Hours in Service:	744
Maximum Daily Value:	1.1 ppb on December 22	Hours of Data:	707
Minimum Hourly Value:	0 ppb on December 1 at hour 1	Hours of Missing Data:	0
Minimum Daily Value:	0 ppb on December 11	Hours of Calibration:	37
Monthly Average:	0.8 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					
Dec 1	1	0	0	0	0	0	1	0	1	1	1	1	1	1	0	1	S	1	0	0	0	0	0	0	0	0	0	0	1	0.4		
Dec 2	1	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	S	0	1	1	1	1	1	1	1	0	0	1	0.4			
Dec 3	1	1	1	1	1	0	0	1	0	1	0	1	0	1	S	1	1	1	1	0	0	0	0	0	0	0	0	1	0.6			
Dec 4	1	0	0	0	0	0	0	1	0	1	1	1	1	S	1	1	1	1	1	0	1	1	1	1	1	1	0	1	0.7			
Dec 5	1	0	0	1	1	1	0	1	0	1	0	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0.8			
Dec 6	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	0	1	1	1	0	1	1	1	0	1	0.9			
Dec 7	0	1	1	1	1	0	1	1	1	0	S	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4			
Dec 8	1	0	0	0	1	1	1	0	1	S	0	0	1	1	0	0	1	1	1	0	1	0	1	0	1	0	0	1	0.5			
Dec 9	0	0	1	1	0	1	1	1	S	0	1	0	1	0	1	0	1	1	1	0	0	1	0	1	0	1	0	0	1	0.6		
Dec 10	1	1	1	1	1	1	1	S	0	1	1	1	1	0	1	1	1	1	1	1	0	0	1	1	0	0	0	1	0.8			
Dec 11	0	1	0	0	0	1	S	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3		
Dec 12	1	0	1	1	0	S	1	0	1	0	C	C	C	C	C	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0.8		
Dec 13	1	1	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	0	1	1.0		
Dec 14	1	1	1	S	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1.0		
Dec 15	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	1.0		
Dec 16	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	1.0		
Dec 17	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	S	1	1.0	
Dec 18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1.0	
Dec 19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	0	1	0	1	0	1	1.0	
Dec 20	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	1	1	1	1.0	
Dec 21	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	1	1	1	1.0	
Dec 22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	2	2	1	2	1.1
Dec 23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1.0	
Dec 24	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	1	1	1	1.0	
Dec 25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	
Dec 26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	
Dec 27	1	1	1	1	1	1	0	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1.0	
Dec 28	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	
Dec 29	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	
Dec 30	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	
Dec 31	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	
Diurnal Maximum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Diurnal Average	0.90	0.77	0.77	0.83	0.80	0.87	0.83	0.83	0.83	0.83	0.86	0.86	0.89	0.89	0.89	0.79	0.93	0.90	0.90	0.87	0.73	0.83	0.77	0.87	0.77							

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 - December 2019 Summary of Hourly Instantaneous Maximums

#### OXIDES OF NITROGEN (NOx) in ppb

Maximum Hourly Value:	135 ppb on December 4 at hour 15	Hours in Service:	744
Maximum Daily Value:	37.0 ppb on December 30	Hours of Data:	705
Minimum Hourly Value:	1 ppb on December 7 at hour 14	Hours of Missing Data:	0
Minimum Daily Value:	4.3 ppb on December 24	Hours of Calibration:	39
Monthly Average:	13.2 ppb	Operational Uptime:	100.0

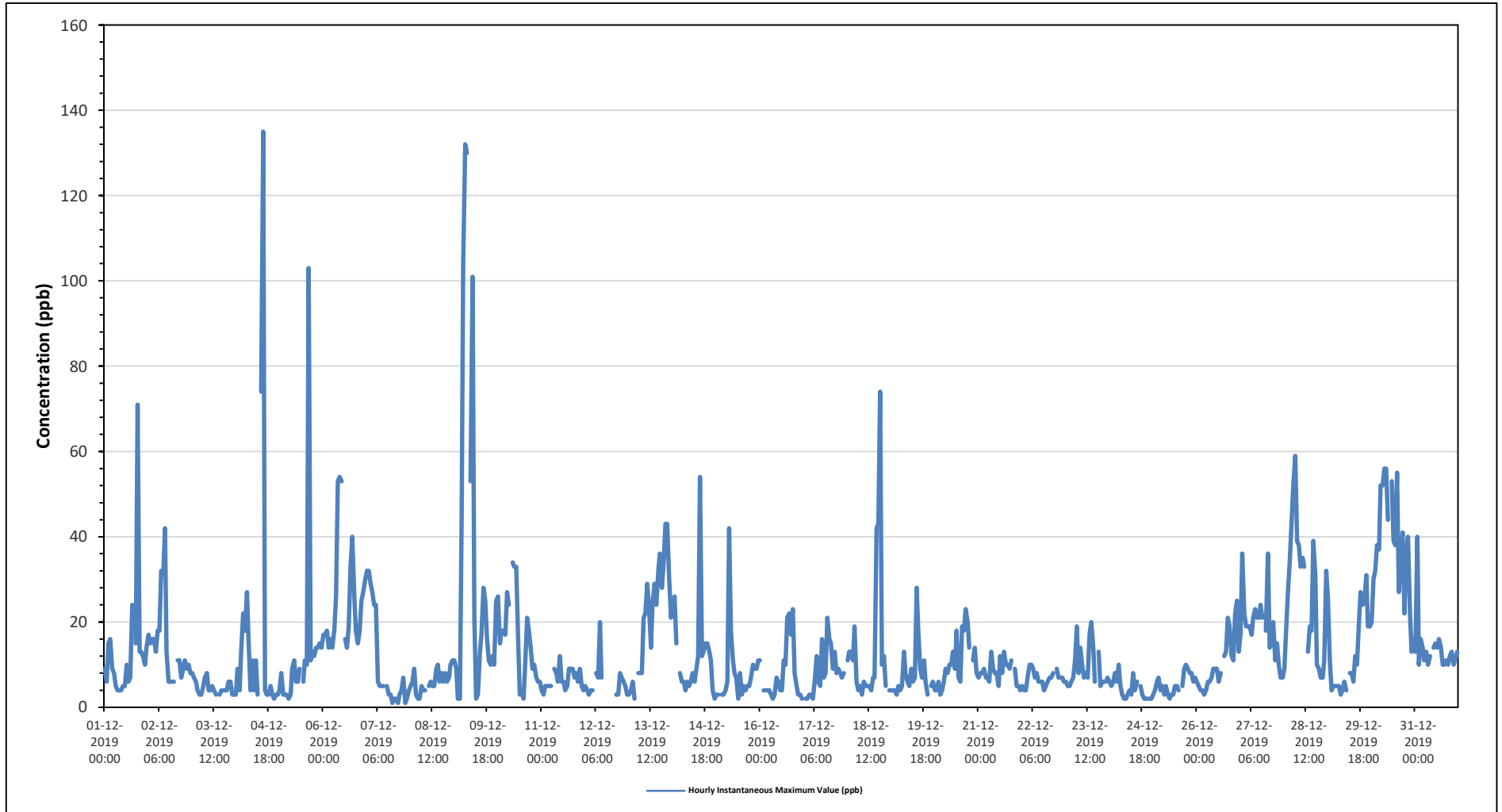
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Dec 1	9	6	15	16	9	8	5	4	4	4	5	5	10	6	7	24	S	15	71	13	13	12	10	14	4	71	12.4
Dec 2	17	15	16	16	13	18	18	32	31	42	13	6	6	6	6	S	11	11	7	9	11	9	10	8	6	42	14.4
Dec 3	8	7	6	4	3	3	5	7	8	4	4	5	4	3	S	3	4	4	4	6	6	3	3	3	3	8	4.7
Dec 4	3	9	4	13	22	18	27	16	4	11	4	11	3	S	74	135	4	3	3	5	3	2	3	3	2	135	16.5
Dec 5	4	8	3	3	3	2	3	9	11	6	6	9	S	6	11	10	103	11	13	12	14	14	15	14	2	103	12.6
Dec 6	17	17	18	14	16	14	18	26	53	54	S	16	14	19	33	40	26	18	15	18	25	27	30	14	54	25.3	
Dec 7	32	32	29	27	24	24	6	5	5	5	S	5	3	3	1	2	2	1	3	4	7	1	2	4	1	32	9.9
Dec 8	5	6	9	3	2	2	5	4	4	S	5	6	5	5	9	10	6	8	6	8	6	7	10	11	2	11	6.2
Dec 9	11	9	2	2	45	104	132	130	S	53	101	21	2	3	13	17	28	25	16	11	10	12	10	25	2	132	34.0
Dec 10	26	15	18	18	17	27	24	S	34	33	33	17	3	4	2	11	21	18	14	9	10	7	6	6	2	34	16.2
Dec 11	4	3	5	5	5	5	S	9	8	6	12	6	6	4	5	9	9	9	7	8	6	9	5	4	3	12	6.5
Dec 12	5	4	3	4	4	S	8	7	20	7	C	C	C	C	C	C	C	3	3	8	7	6	5	3	3	20	-
Dec 13	3	4	6	2	S	8	8	8	21	22	29	24	14	24	29	24	32	36	28	34	43	43	31	21	2	43	21.5
Dec 14	24	26	15	S	8	6	6	4	6	5	6	8	6	9	12	54	12	13	15	15	13	11	4	2	2	54	12.2
Dec 15	3	3	S	3	3	4	6	42	18	11	8	7	2	8	3	5	4	5	5	7	10	9	9	11	2	42	8.1
Dec 16	11	S	4	4	4	4	3	2	3	7	6	4	4	11	10	21	22	17	23	8	5	3	3	2	2	23	7.9
Dec 17	S	2	2	3	3	2	6	12	6	5	16	7	8	21	16	15	9	13	8	9	8	7	8	S	2	21	8.5
Dec 18	11	13	13	11	19	6	4	5	3	6	5	5	4	7	7	42	43	74	10	12	5	S	4	3	3	74	13.7
Dec 19	4	4	4	3	5	4	5	13	8	6	5	9	6	7	28	17	9	7	11	6	3	S	5	6	3	28	7.6
Dec 20	4	4	6	3	4	6	9	8	10	10	13	9	18	7	6	19	18	23	20	14	S	11	14	8	3	23	10.6
Dec 21	7	8	8	9	7	7	6	13	9	8	8	5	12	8	13	10	10	9	11	S	9	5	5	4	4	13	8.3
Dec 22	5	4	4	7	10	10	9	7	8	6	6	6	4	5	6	7	7	8	S	9	7	7	7	6	4	10	6.7
Dec 23	6	5	5	6	7	11	19	8	14	10	7	8	7	17	20	14	6	S	13	5	6	6	6	7	5	20	9.3
Dec 24	6	5	6	8	6	10	5	3	2	3	4	3	8	4	6	S	5	3	2	2	2	2	2	2	2	10	4.3
Dec 25	3	4	6	7	4	5	3	5	3	2	3	3	5	5	4	S	5	9	10	9	8	8	6	7	2	10	5.4
Dec 26	6	5	4	4	3	4	6	6	7	9	9	9	6	8	S	12	13	21	19	12	11	22	25	13	3	25	10.2
Dec 27	17	36	22	19	19	19	17	21	23	21	21	24	21	S	18	36	14	15	20	11	15	10	7	7	7	36	18.8
Dec 28	9	17	27	34	43	52	59	39	38	33	35	33	S	13	19	18	39	31	10	9	7	7	11	32	7	59	26.7
Dec 29	25	11	4	5	5	5	3	4	6	4	S	8	8	6	12	10	20	27	24	25	31	19	19	3	31	12.4	
Dec 30	20	30	32	38	37	52	52	56	56	44	S	53	39	38	55	27	33	41	22	36	40	22	13	16	13	56	37.0
Dec 31	13	40	10	16	14	11	13	10	12	S	14	15	14	16	14	10	10	11	10	12	13	10	11	13	10	40	13.6
Diurnal Maximum	32	40	32	38	45	104	132	130	56	54	101	53	39	38	74	135	103	43	74	36	43	43	31	32			
Diurnal Average	10.6	11.7	10.2	10.2	12.1	15.0	16.4	17.1	14.4	15.1	15.5	11.6	8.6	9.7	14.9	20.3	18.7	15.4	16.5	11.3	11.6	11.0	9.7	10.2			

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 NOx - Cold Lake South Station**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2019

Summary of Hourly Instantaneous Maximums

NITRIC OXIDE (NO) in ppb

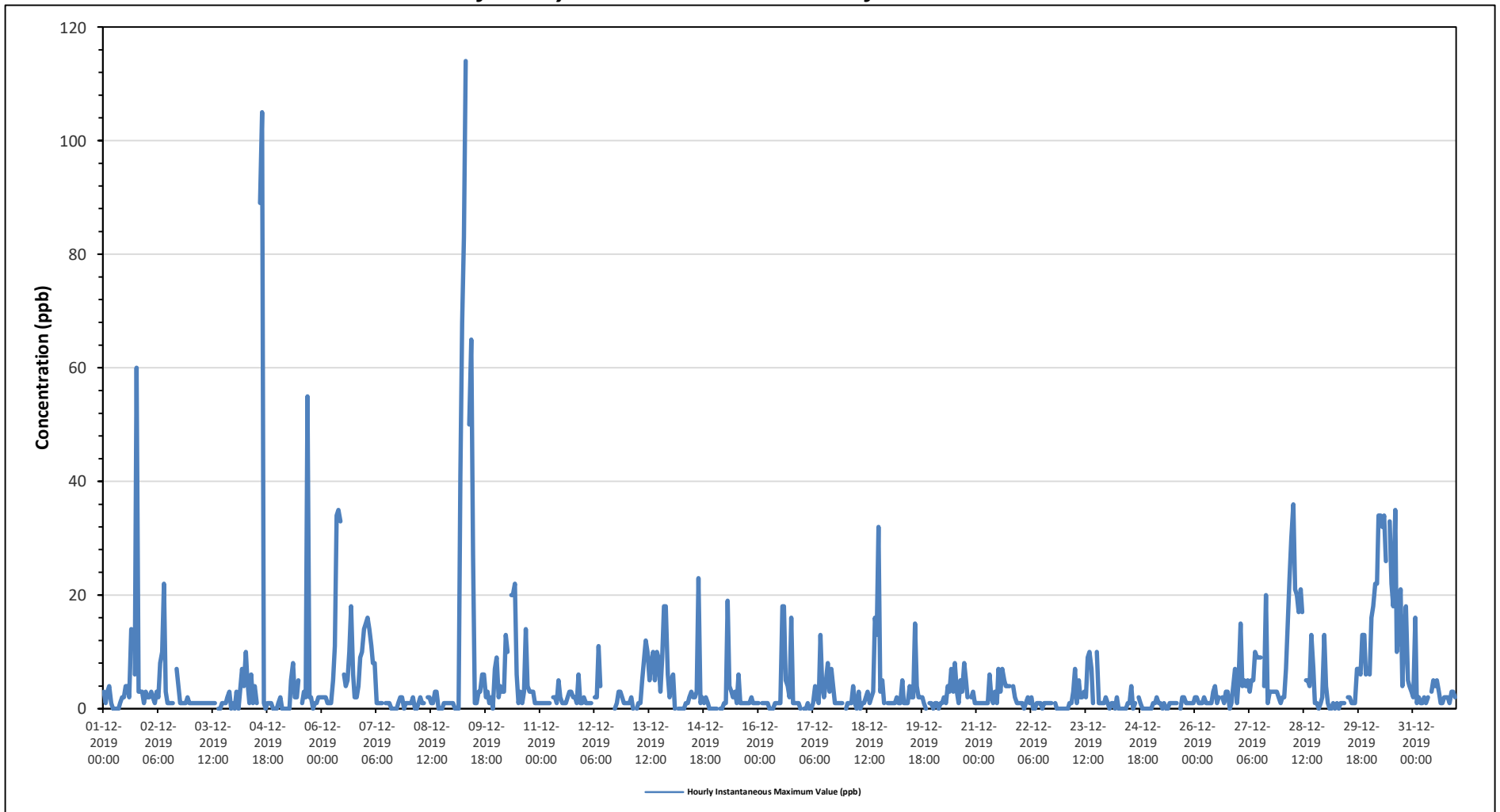
Maximum Hourly Value:	114 ppb	on December 9 at hour 7	Hours in Service:	744
Maximum Daily Value:	21.0 ppb	on December 9	Hours of Data:	705
Minimum Hourly Value:	0 ppb	on December 1 at hour 5	Hours of Missing Data:	0
Minimum Daily Value:	0.7 ppb	on December 24	Hours of Calibration:	39
Monthly Average:	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
Dec 1	3	1	3	4	1	0	0	0	0	1	2	2	4	4	2	14	S	6	60	3	3	3	1	3	0	60	5.2
Dec 2	2	2	3	2	1	3	2	8	10	22	3	1	1	1	1	S	7	4	1	1	1	1	2	1	1	22	3.5
Dec 3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	0	0	1	1	1	2	3	0	1	0	3	1.0
Dec 4	0	3	0	3	7	4	10	5	1	6	1	4	1	S	89	105	1	0	1	1	1	0	0	0	0	105	10.6
Dec 5	1	2	0	0	0	0	0	5	8	2	2	S	1	3	2	55	2	2	0	1	1	2	2	0	55	4.2	
Dec 6	2	2	2	1	1	1	5	11	34	35	33	S	6	4	5	10	18	6	2	2	4	9	10	14	1	35	9.4
Dec 7	15	16	14	11	8	8	1	1	1	1	S	1	1	1	0	0	0	0	1	2	2	0	1	1	0	16	3.7
Dec 8	1	1	2	0	0	1	2	1	1	S	2	2	1	1	3	3	0	0	0	1	1	1	1	1	0	3	1.1
Dec 9	1	0	0	0	41	68	83	114	S	50	65	27	1	1	3	3	6	6	2	3	1	2	0	7	0	114	21.0
Dec 10	9	2	4	3	3	13	10	S	20	20	22	6	1	3	1	3	14	4	3	3	3	1	1	1	1	22	6.5
Dec 11	1	1	1	1	1	1	S	2	2	1	5	2	1	1	1	2	3	3	2	2	1	6	1	1	1	6	1.8
Dec 12	2	1	1	1	1	S	2	2	11	4	C	C	C	C	C	C	C	0	1	3	3	2	1	1	0	11	-
Dec 13	1	1	2	0	S	0	0	1	1	5	9	12	10	5	8	10	5	10	9	3	9	18	18	6	2	18	6.3
Dec 14	5	6	0	S	0	0	0	0	1	1	2	3	2	2	3	23	1	2	1	2	1	0	0	0	0	23	2.4
Dec 15	0	0	S	0	0	1	1	19	4	3	2	3	1	6	1	1	1	1	1	1	2	1	1	1	0	19	2.2
Dec 16	1	S	1	1	1	1	0	0	0	1	1	1	1	18	18	5	4	2	16	1	1	1	1	0	0	18	3.3
Dec 17	S	0	0	0	1	0	0	1	4	2	1	13	4	2	5	8	3	7	4	1	1	1	1	1	0	13	2.7
Dec 18	0	1	1	1	4	1	0	3	0	1	1	2	3	1	2	3	16	13	32	3	5	1	S	1	0	32	4.1
Dec 19	1	1	1	1	2	1	1	5	1	1	1	4	2	2	15	4	2	2	2	1	0	S	1	1	0	15	2.3
Dec 20	0	1	1	0	1	1	2	1	4	3	7	3	8	3	1	5	3	8	5	2	S	2	3	1	0	8	2.8
Dec 21	1	1	1	1	1	1	1	6	2	1	3	1	7	3	7	5	4	4	4	S	4	2	1	1	1	7	2.7
Dec 22	1	1	0	1	2	1	2	0	0	1	1	1	0	1	1	1	1	1	S	1	0	0	0	0	0	2	0.7
Dec 23	0	0	0	1	1	3	7	1	5	2	2	3	2	9	10	7	1	S	10	1	1	1	1	2	0	10	3.0
Dec 24	1	0	1	1	0	2	0	0	0	0	0	1	4	0	1	S	2	1	0	0	0	0	0	0	0	4	0.7
Dec 25	0	1	1	2	1	1	0	1	0	0	1	1	1	1	1	S	0	2	2	1	1	1	1	1	0	2	0.9
Dec 26	2	2	1	1	1	2	1	1	1	1	3	4	1	2	S	2	1	3	3	0	1	4	7	1	0	7	2.0
Dec 27	5	15	4	5	4	5	3	5	5	10	9	9	S	4	20	1	3	3	3	3	3	2	1	1	20	5.7	
Dec 28	2	2	7	15	23	30	36	21	20	17	21	17	S	5	5	4	13	7	1	1	0	1	2	13	0	36	11.4
Dec 29	4	1	0	0	1	0	1	0	1	1	1	S	2	2	1	1	1	7	7	6	13	13	6	7	0	13	3.3
Dec 30	6	16	18	22	22	34	34	32	34	26	S	33	22	18	35	10	14	21	4	13	18	5	4	3	3	35	19.3
Dec 31	2	16	1	2	1	1	2	1	2	S	3	5	4	5	3	1	1	2	2	2	1	3	3	2	1	16	2.8
Diurnal Maximum	15	16	18	22	41	68	83	114	34	50	65	33	22	18	89	105	55	21	60	13	18	18	10	14			
Diurnal Average	2.3	3.2	2.4	2.7	4.3	6.2	7.0	8.4	5.9	7.7	7.8	5.6	3.3	4.0	8.3	8.7	6.6	4.2	5.8	2.3	3.1	2.9	2.0	2.3			

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 - Cold Lake South Station*





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

### Cold Lake South Station - December 2019 Summary of Hourly Instantaneous Maximums

#### NITROGEN DIOXIDE (NO<sub>2</sub>) in ppb

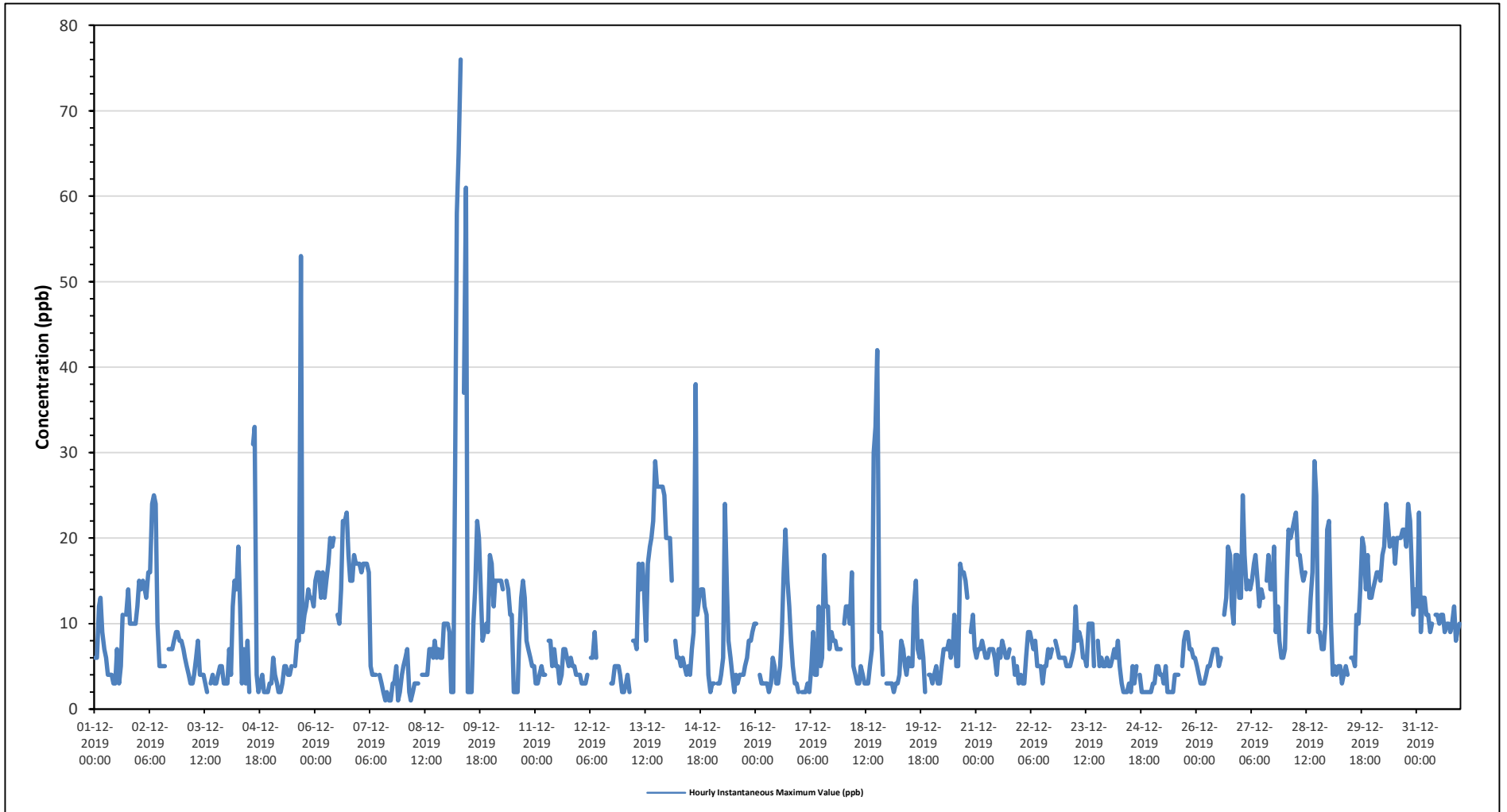
Maximum Hourly Value:	76 ppb on December 9 at hour 7	Hours in Service:	744
Maximum Daily Value:	21.2 ppb on December 9	Hours of Data:	705
Minimum Hourly Value:	1 ppb on December 7 at hour 14	Hours of Missing Data:	0
Minimum Daily Value:	3.7 ppb on December 24	Hours of Calibration:	39
Monthly Average:	9.3 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
Dec 1	6	6	12	13	9	7	6	4	4	4	3	3	7	3	5	11	S	11	14	10	10	10	12	3	14	7.8	
Dec 2	15	14	15	14	13	16	16	24	25	24	10	5	5	5	S	7	7	7	8	9	9	8	8	5	25	11.7	
Dec 3	7	6	5	4	3	3	4	6	8	4	4	4	3	2	S	3	4	3	3	4	5	5	3	2	8	4.2	
Dec 4	3	7	4	12	15	14	19	12	3	7	3	8	2	S	31	33	4	2	3	4	2	2	2	3	2	33	8.5
Dec 5	3	6	4	3	2	2	3	5	5	4	4	5	S	5	8	8	53	9	11	12	14	13	13	2	53	8.9	
Dec 6	15	16	16	13	16	13	15	17	20	19	20	S	11	10	14	22	22	23	18	15	15	18	17	17	10	23	16.6
Dec 7	17	16	17	17	17	16	5	4	4	4	S	4	3	2	1	2	1	1	3	3	5	1	2	4	1	17	6.5
Dec 8	5	6	7	2	1	2	3	3	3	S	4	4	4	4	7	7	6	8	6	7	6	6	10	10	1	10	5.3
Dec 9	10	9	2	2	27	58	65	76	S	37	61	2	2	2	10	14	22	20	14	8	9	10	9	18	2	76	21.2
Dec 10	17	12	15	15	15	14	S	15	14	15	11	11	2	2	2	8	13	15	13	8	7	6	5	5	2	17	10.4
Dec 11	3	3	4	5	4	4	S	8	8	5	7	5	5	3	4	7	7	6	5	6	5	5	4	4	3	8	5.1
Dec 12	4	3	3	3	4	S	6	6	9	6	C	C	C	C	C	C	C	3	3	5	5	5	4	2	2	9	-
Dec 13	2	3	4	2	S	8	8	7	17	14	17	14	8	17	19	20	22	29	26	26	26	25	20	2	29	15.7	
Dec 14	20	20	15	S	8	6	6	5	6	5	4	5	4	7	9	38	11	13	14	14	12	11	4	2	2	38	10.4
Dec 15	3	3	S	3	3	4	6	24	14	8	6	4	2	4	3	4	4	4	5	6	8	8	9	10	2	24	6.3
Dec 16	10	S	4	3	3	3	3	2	3	6	5	3	3	5	9	16	21	15	12	8	5	3	3	2	2	21	6.4
Dec 17	S	2	2	2	3	2	5	9	4	4	12	5	6	18	12	12	7	9	8	8	7	7	7	S	2	18	6.9
Dec 18	10	12	12	10	16	5	4	3	3	5	4	3	3	3	5	7	30	33	42	9	9	4	S	3	3	42	10.2
Dec 19	3	3	3	2	3	3	4	8	7	5	4	6	5	5	12	15	7	6	8	6	2	S	4	4	2	15	5.4
Dec 20	3	4	5	3	3	5	7	7	7	8	6	7	11	5	5	17	16	16	15	13	S	9	11	7	3	17	8.3
Dec 21	6	7	7	8	7	6	6	7	7	7	6	4	7	6	8	7	6	6	7	S	6	4	5	3	3	8	6.2
Dec 22	4	3	3	6	9	9	8	7	8	5	5	5	3	5	5	7	6	7	S	8	7	6	6	6	3	9	6.0
Dec 23	6	5	5	5	6	7	12	8	9	8	6	6	5	10	10	10	5	S	8	5	6	5	5	6	5	12	6.9
Dec 24	5	5	6	7	6	8	5	3	2	2	2	3	2	5	3	5	S	4	2	2	2	2	2	2	2	8	3.7
Dec 25	3	3	5	5	4	4	3	5	2	2	2	2	4	4	4	S	5	8	9	9	7	7	6	6	2	9	4.7
Dec 26	5	4	3	3	3	4	5	5	6	7	7	7	5	6	S	11	13	19	18	12	10	18	18	13	3	19	8.8
Dec 27	13	25	18	14	15	14	15	17	18	15	12	14	13	S	15	18	14	14	19	9	12	8	6	6	6	25	14.1
Dec 28	7	15	21	20	21	22	23	18	18	16	15	16	S	9	13	16	29	25	9	9	7	7	10	21	7	29	16.0
Dec 29	22	10	4	5	4	5	5	3	4	5	4	S	6	6	5	11	10	14	20	19	14	18	13	13	3	22	9.6
Dec 30	14	15	16	16	15	18	19	24	22	19	S	20	17	20	20	20	21	21	19	24	22	17	11	14	11	24	18.4
Dec 31	12	23	9	13	13	11	11	9	10	S	11	11	10	11	11	9	10	10	9	10	12	8	9	10	8	23	11.0
Diurnal Maximum	22	25	21	20	27	58	65	76	25	37	61	20	17	20	31	38	53	33	42	26	26	26	25	21			
Diurnal Average	8.4	8.9	8.2	7.7	8.9	9.8	10.4	11.2	9.0	9.3	9.1	6.6	5.6	6.6	9.1	12.8	13.4	12.0	11.7	9.6	8.9	8.6	8.0	8.2			

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 NO2 - Cold Lake South Station**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

### Cold Lake South Station - December 2019 Summary of Hourly Instantaneous Maximums

#### OZONE (O<sub>3</sub>) in ppb

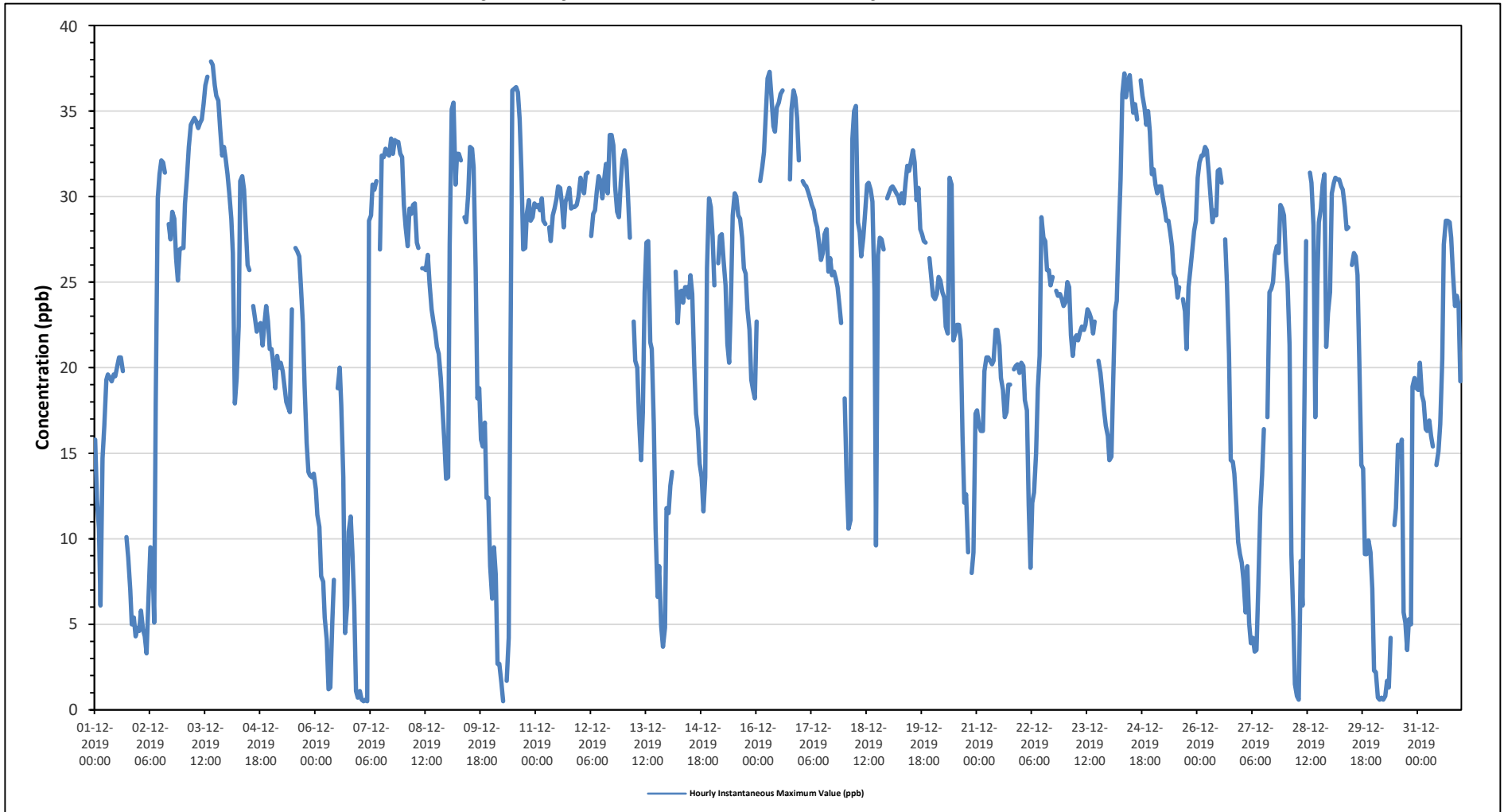
Maximum Hourly Value:	37.9 ppb	on December 3 at hour 15	Hours in Service:	744
Maximum Daily Value:	34.1 ppb	on December 3	Hours of Data:	709
Minimum Hourly Value:	0.5 ppb	on December 7 at hour 2	Hours of Missing Data:	0
Minimum Daily Value:	7.2 ppb	on December 30	Hours of Calibration:	35
Monthly Average:	22.8 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
Dec 1	15.8	12.3	10.6	6.1	14.7	16.6	19.3	19.6	19.4	19.2	19.6	19.5	20.1	20.6	20.6	19.8	S	10.1	8.9	7	5	5.4	4.3	4.8	4.3	20.6	13.9
Dec 2	4.6	5.8	4.7	4.3	3.3	6.3	9.5	9.4	5.1	17.9	29.9	31.3	32.1	32	31.4	S	28.4	27.5	29.1	28.7	26.4	25.1	26.9	27	3.3	32.1	19.4
Dec 3	27	29.6	31.2	32.9	34.2	34.4	34.6	34.4	34	34.3	34.5	35.4	36.5	37	S	37.9	37.7	36.5	35.9	35.6	34	32.4	32.9	32.3	27.0	37.9	34.1
Dec 4	31.3	30.2	28.7	26.7	17.9	19.4	22.4	30.9	31.2	30.4	28.2	26	25.7	S	23.6	22.9	22.1	22.5	22.6	21.3	22.4	23.6	22.7	21.1	17.9	31.3	24.9
Dec 5	21.1	21.2	18.8	20.7	20	20.3	19.8	18.9	18	17.7	17.4	23.4	S	27	26.8	26.5	24.6	22.6	18.9	15.6	13.9	13.7	13.6	13.8	13.6	27.0	19.7
Dec 6	12.9	11.4	10.7	7.8	7.5	5.4	4.1	1.2	1.3	5.2	7.6	S	18.8	20	17.8	13.6	4.5	6.1	10.4	11.3	9.1	6.1	1.1	0.7	0.7	20.0	8.5
Dec 7	1.1	0.6	0.5	0.6	0.5	28.6	28.9	30.7	30.4	30.9	S	26.9	32.4	32.3	32.8	32.5	32.4	33.4	32.5	33.3	33.2	33.2	32.5	32.3	0.5	33.4	24.9
Dec 8	29.5	28.2	27.1	29.3	29	29.5	29.6	27.3	27	S	25.8	25.8	25.7	26.6	24.9	23.4	22.7	22.1	21.2	20.8	19.4	17.8	15.7	13.5	13.5	29.6	24.4
Dec 9	13.6	27.2	35.1	35.5	30.7	32.5	32.5	32.1	S	28.8	28.5	30.2	32.9	32.8	31.7	25.8	18.2	18.8	15.8	15.4	16.8	12.4	12.4	8.4	8.4	35.5	24.7
Dec 10	6.5	9.5	7.9	2.7	2.7	1.6	0.5	S	1.7	4.2	21.1	36.2	36.3	36.4	36.1	34.5	31.4	26.9	27	29	29.8	28.6	28.8	29.6	0.5	36.4	20.4
Dec 11	29.4	29.5	29.2	29.9	28.6	28.4	S	28.2	27.4	28.9	29.3	29.9	30.6	30.5	29.6	28.2	29.7	30	30.5	29.3	29.4	29.4	29.5	30	27.4	30.6	29.4
Dec 12	31.1	30.7	30.2	31.3	31.4	S	27.7	29	29.2	30.3	31.2	30.9	29.9	31	31.9	30.2	33.6	33.6	33	30.6	29.1	28.8	30.8	32.2	27.7	33.6	30.8
Dec 13	32.7	32.1	30.2	27.6	S	22.7	20.4	20	17	14.6	17.4	24.4	27.3	27.4	21.5	21.1	16.7	10.6	6.6	8.4	4.9	3.7	4.8	11.8	3.7	32.7	18.4
Dec 14	11.5	13.1	13.9	S	25.6	22.6	24.4	24.5	23.8	24.7	24.7	24.1	25.4	24.3	20.1	17.3	16.4	14.4	13.6	11.6	13.6	25.8	29.9	29.4	11.5	29.9	20.6
Dec 15	27.7	24.8	S	26.1	27.7	27.8	26.3	24.8	21.4	20.3	23.9	28.9	30.2	30	28.9	28.7	27.6	25.8	25.5	23.4	22.2	19.3	18.7	18.2	18.2	30.2	25.1
Dec 16	22.7	S	30.9	31.7	32.6	35.1	36.9	37.3	35.9	34.1	33.8	35.2	35.5	36	36.2	C	C	C	31	35.1	36.2	35.8	34.6	32.1	22.7	37.3	33.9
Dec 17	S	30.9	30.7	30.6	30.3	29.9	29.5	29.2	28.6	28.2	27.2	26.3	26.7	27.8	28.1	25.6	26.4	25.4	25.6	25.2	24.7	23.7	22.6	S	22.6	30.9	27.4
Dec 18	18.2	13.3	10.6	11.1	33.3	35	35.3	28.5	27.9	26.5	27.6	29	30.7	30.8	30.4	29.7	24.5	9.6	26.6	27.6	27.5	26.9	S	29.9	9.6	35.3	25.7
Dec 19	30.2	30.5	30.6	30.4	30.2	30	29.6	30.2	29.6	30.8	31.8	31.5	32.1	32.7	32	29.8	30.5	28.1	27.8	27.4	27.3	S	26.4	25.3	25.3	32.7	29.8
Dec 20	24.2	24	24.3	25.3	25.1	24.4	24.1	22.4	22	31.1	30.7	21.6	22	22.5	22.5	21.6	16	12.1	12.6	9.2	S	8	9.2	17.3	8.0	31.1	20.5
Dec 21	17.5	16.6	16.3	16.3	19.8	20.6	20.6	20.4	20.2	20.4	22.2	22.2	21.3	19.4	18.7	17.1	17.4	19	19	S	19.9	20.1	20.2	19.7	16.3	22.2	19.3
Dec 22	20.3	20.1	18.1	17.5	12	8.3	12.1	12.7	15	18.8	20.7	28.8	27.6	27.4	25.7	25.7	24.8	25.3	S	24.5	24.2	24.3	24	23.6	8.3	28.8	20.9
Dec 23	23.8	25	24.7	21.9	20.7	21.7	21.9	21.6	22.1	22.4	22.2	22.5	23.4	23.2	22.9	22	22.7	S	20.4	19.7	18.8	17.5	16.6	16	16.0	25.0	21.5
Dec 24	14.6	14.8	19.2	23.3	23.9	27.5	31	36	37.2	35.8	36.7	37.1	35.8	34.9	35.4	34.5	S	36.8	35.9	35.2	34.2	35	33.8	31.3	14.6	37.2	31.3
Dec 25	31.6	30.7	30.2	30.6	30.6	29.9	29.3	28.6	28.6	27.9	27.1	25.5	25.2	24.1	24.7	S	24	23.3	21.1	24.7	25.7	26.9	28	28.6	21.1	31.6	27.3
Dec 26	31.1	32	32.4	32.4	32.9	32.7	31.3	30.1	28.5	29.2	28.9	31.5	31.6	30.8	S	27.5	24.9	20.8	14.6	14.5	13.8	11.9	9.8	9.1	9.1	32.9	25.3
Dec 27	8.6	7.6	5.7	8.4	5.1	3.9	4.2	3.4	3.5	7.1	11.7	13.7	16.4	S	17.1	24.4	24.6	25	26.6	27.1	26.7	29.5	29.3	28.9	3.4	29.5	15.6
Dec 28	26.2	25	21.3	9.2	5.2	1.5	0.8	0.6	8.7	6.1	15.9	27.4	S	31.4	30.8	28.3	17.1	24.9	28.5	29.3	30.7	31.3	21.2	23.2	0.6	31.4	19.3
Dec 29	24.4	30.2	30.8	31.1	31	31	30.6	30.4	29.4	28.1	28.2	S	26	26.7	26.5	25.4	20.4	14.3	14.1	9.1	9.1	9.9	9.2	7.1	7.1	31.1	22.7
Dec 30	2.3	2.2	0.7	0.6	0.7	0.6	0.8	1.7	1.3	4.2	S	10.8	11.8	15.5	14.8	15.8	5.7	5.1	3.5	5.3	5	18.9	19.4	18.8	0.6	19.4	7.2
Dec 31	18.7	20.3	18.4	18	16.4	16.3	16.9	16	15.4	S	14.3	15.1	16.7	20.5	27.2	28.6	28.6	28.5	27.6	25.5	23.6	24.2	23.7	19.2	14.3	28.6	20.9
Diurnal Maximum	33	32	35	36	34	35	37	37	37	36	37	37	37	37	36	38	38	37	36	36	36	36	35	32			
Diurnal Average	20.3	20.9	20.8	20.7	20.8	21.5	21.8	22.7	21.4	22.7	24.8	26.6	27.1	28.0	26.6	25.7	23.3	22.0	22.2	22.0	21.9	21.6	21.1	21.2			

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 O3 - Cold Lake South Station*





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

### Cold Lake South Station - December 2019 Summary of Hourly Instantaneous Maximums

#### TOTAL HYDROCARBONS (THC) in ppm

Maximum Hourly Value:	3.70 ppm on December 18 at hour 17	Hours in Service:	744
Maximum Daily Value:	2.83 ppm on December 30	Hours of Data:	618
Minimum Hourly Value:	1.95 ppm on December 13 at hour 1	Hours of Missing Data:	93
Minimum Daily Value:	2.01 ppm on December 12	Hours of Calibration:	33
Monthly Average:	2.29 ppm	Operational Uptime:	87.5

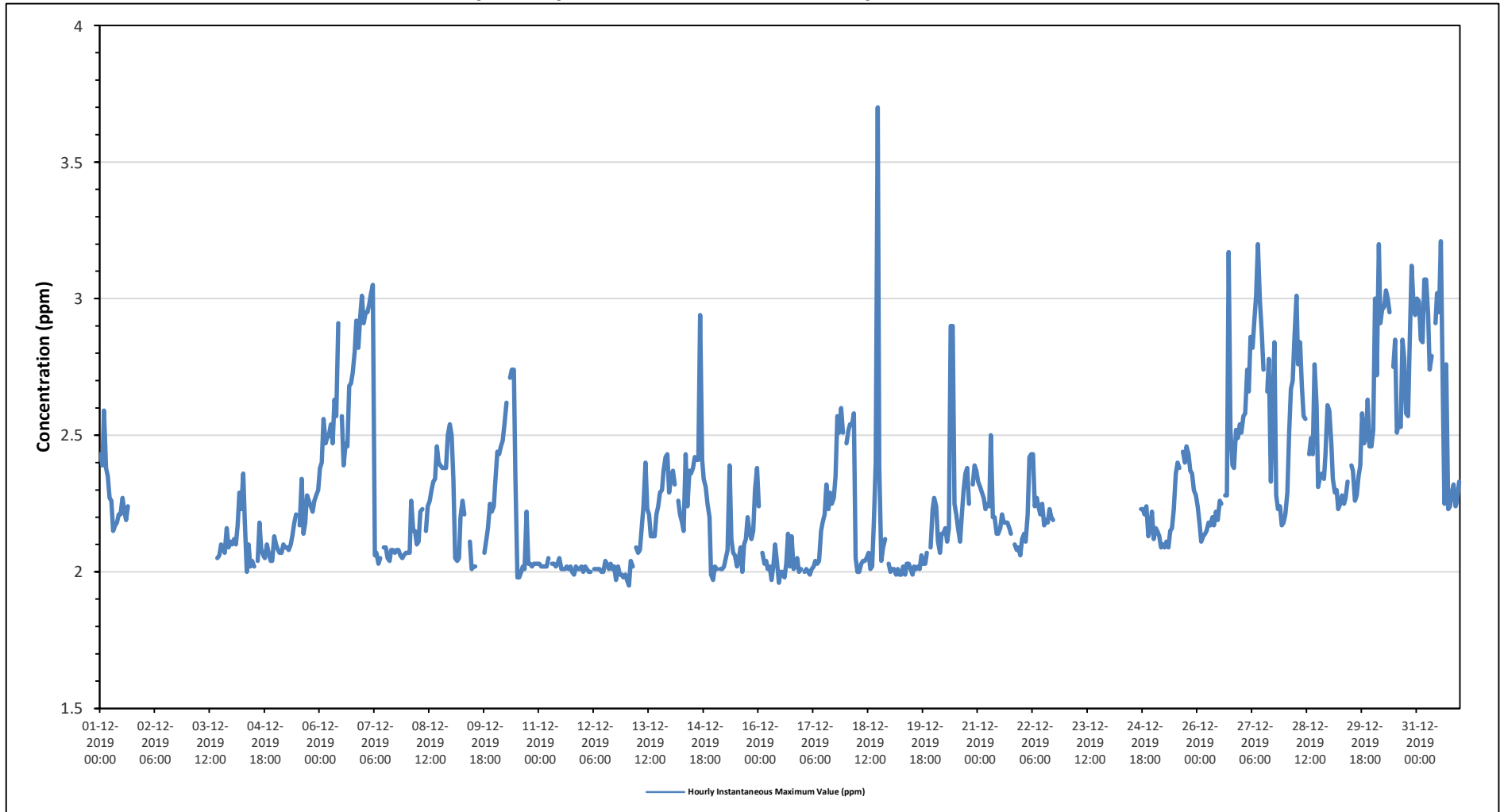
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Dec 1	2.43	2.39	2.59	2.38	2.35	2.27	2.26	2.15	2.17	2.18	2.21	2.21	2.27	2.22	2.19	2.24	S	X	X	X	X	X	X	X	2.15	2.59	-	
Dec 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.05	2.16	-	
Dec 3	X	X	X	X	X	X	X	C	C	C	C	Y	Y	Y	S	Y	X	X	X	X	X	X	X	2.00	2.36	2.11		
Dec 4	2.10	2.12	2.10	2.17	2.29	2.23	2.36	2.19	2.00	2.10	2.02	2.04	2.02	S	2.04	2.18	2.08	2.06	2.05	2.10	2.07	2.04	2.04	2.13	2.00	2.36	2.11	
Dec 5	2.10	2.08	2.07	2.07	2.10	2.09	2.09	2.08	2.10	2.13	2.18	2.21	S	2.17	2.34	2.14	2.18	2.28	2.26	2.24	2.22	2.26	2.28	2.30	2.07	2.34	2.17	
Dec 6	2.38	2.40	2.56	2.47	2.49	2.50	2.54	2.47	2.63	2.57	2.91	S	2.57	2.39	2.47	2.46	2.68	2.69	2.73	2.81	2.92	2.82	2.93	3.01	2.38	3.01	2.63	
Dec 7	2.91	2.95	2.95	2.98	3.02	3.05	2.06	2.07	2.03	2.05	S	2.09	2.09	2.05	2.04	2.08	2.08	2.07	2.08	2.08	2.06	2.05	2.06	2.07	2.03	3.05	2.30	
Dec 8	2.07	2.07	2.26	2.15	2.15	2.10	2.11	2.22	2.23	S	2.15	2.24	2.26	2.30	2.33	2.34	2.46	2.40	2.39	2.38	2.38	2.38	2.50	2.54	2.07	2.54	2.28	
Dec 9	2.50	2.34	2.05	2.04	2.05	2.20	2.26	2.21	S	X	2.11	2.01	2.02	2.02	C1	C1	C1	C1	2.07	2.12	2.16	2.25	2.22	2.24	2.01	2.50	2.16	
Dec 10	2.33	2.44	2.43	2.46	2.48	2.54	2.62	S	2.71	2.74	2.74	2.35	1.98	1.98	2.00	2.02	2.01	2.22	2.03	2.03	2.02	2.03	2.03	2.03	1.98	2.74	2.27	
Dec 11	2.03	2.02	2.02	2.02	2.02	2.05	S	2.03	2.03	2.02	2.03	2.05	2.01	2.01	2.01	2.02	2.01	2.02	2.00	1.99	2.02	2.01	2.01	2.02	1.99	2.05	2.02	
Dec 12	2.00	2.02	2.01	2.00	2.00	S	2.01	2.01	2.01	2.01	2.00	2.00	2.04	2.03	2.01	2.03	2.01	2.02	1.97	2.02	1.99	1.99	1.98	1.99	1.97	2.04	2.01	
Dec 13	1.97	1.95	2.04	2.02	S	2.09	2.07	2.08	2.16	2.24	2.40	2.23	2.21	2.13	2.13	2.13	2.21	2.24	2.29	2.30	2.37	2.42	2.43	2.29	1.95	2.43	2.19	
Dec 14	2.34	2.37	2.32	S	2.26	2.21	2.18	2.15	2.43	2.24	2.37	2.36	2.38	2.42	2.13	2.41	2.41	2.94	2.41	2.34	2.31	2.25	2.20	1.99	1.97	2.94	2.32	
Dec 15	2.02	2.01	S	2.01	2.01	2.02	2.05	2.08	2.39	2.12	2.07	2.06	2.02	2.04	2.09	2.00	2.10	2.12	2.20	2.14	2.12	2.15	2.30	2.38	2.00	2.39	2.11	
Dec 16	2.24	S	2.07	2.03	2.04	2.01	2.02	1.97	2.03	2.10	2.03	1.96	2.00	2.00	1.98	2.03	2.14	2.02	2.13	2.01	2.02	2.05	2.00	2.01	1.96	2.24	2.04	
Dec 17	S	2.00	2.01	2.00	1.99	2.01	2.02	2.04	2.03	2.04	2.15	2.18	2.21	2.32	2.23	2.29	2.25	2.27	2.35	2.57	2.51	2.60	2.51	S	1.99	2.60	2.21	
Dec 18	2.47	2.52	2.54	2.54	2.58	2.05	2.00	2.00	2.03	2.04	2.04	2.05	2.07	2.01	2.02	2.19	2.40	3.70	2.38	2.04	2.09	2.12	S	2.03	2.00	3.70	2.26	
Dec 19	2.00	2.01	2.01	1.99	2.01	1.99	1.99	2.02	1.99	2.03	2.03	2.01	1.99	2.02	2.01	2.02	2.01	2.06	2.03	2.03	2.07	S	2.09	2.23	1.99	2.23	2.03	
Dec 20	2.27	2.24	2.11	2.07	2.14	2.14	2.16	2.11	2.16	2.90	2.90	2.25	2.21	2.16	2.11	2.21	2.30	2.36	2.38	2.25	S	2.32	2.39	2.37	2.07	2.90	2.28	
Dec 21	2.33	2.31	2.29	2.27	2.23	2.25	2.24	2.50	2.20	2.20	2.14	2.14	2.16	2.21	2.18	2.18	2.18	2.16	2.14	S	2.10	2.08	2.09	2.06	2.06	2.50	2.20	
Dec 22	2.12	2.14	2.11	2.21	2.42	2.43	2.43	2.24	2.27	2.24	2.21	2.25	2.17	2.19	2.18	2.23	2.20	2.19	S	X	X	X	X	X	2.11	2.43	2.24	
Dec 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	2.13	2.24	-	
Dec 24	X	X	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	2.23	2.23	2.21	2.24	2.13	2.16	2.22	2.09	2.46	2.25
Dec 25	2.12	2.16	2.15	2.13	2.09	2.10	2.09	2.11	2.09	2.15	2.16	2.23	2.36	2.40	2.38	S	2.44	2.40	2.46	2.43	2.37	2.36	2.30	2.28	2.11	3.17	2.31	
Dec 26	2.24	2.18	2.11	2.13	2.14	2.15	2.18	2.17	2.20	2.17	2.22	2.19	2.26	2.25	S	2.28	2.28	3.17	2.52	2.39	2.38	2.52	2.49	2.54	2.11	3.17	2.31	
Dec 27	2.51	2.57	2.58	2.74	2.66	2.86	2.82	2.92	3.01	3.20	2.99	2.88	2.74	S	2.66	2.78	2.33	2.60	2.84	2.28	2.23	2.24	2.17	2.18	2.17	3.20	2.64	
Dec 28	2.21	2.29	2.51	2.67	2.70	2.86	3.01	2.76	2.84	2.68	2.57	2.56	S	2.43	2.49	2.43	2.76	2.61	2.31	2.35	2.36	2.34	2.43	2.61	2.21	3.01	2.56	
Dec 29	2.59	2.47	2.34	2.29	2.30	2.23	2.25	2.28	2.25	2.27	2.33	S	2.39	2.37	2.26	2.28	2.35	2.39	2.58	2.47	2.49	2.63	2.46	2.46	2.23	2.63	2.38	
Dec 30	2.52	3.00	2.72	3.20	2.91	2.96	2.97	3.03	3.00	2.95	S	2.75	2.85	2.51	2.55	2.53	2.85	2.78	2.58	2.57	2.82	3.12	2.99	2.94	2.51	3.20	2.83	
Dec 31	3.00	2.99	2.85	2.84	3.07	3.07	2.94	2.74	2.79	S	2.91	3.02	2.95	3.21	2.64	2.25	2.76	2.23	2.24	2.29	2.32	2.24	2.26	2.33	2.23	3.21	2.69	
Diurnal Maximum	3.00	3.00	2.95	3.20	3.07	3.07	3.01	3.03	3.01	3.20	2.99	3.02	2.95	3.21	2.66	2.78	2.94	3.70	2.84	2.81	2.92	3.12	2.99	3.01				
Diurnal Average	2.30	2.31	2.30	2.30	2.33	2.33	2.30	2.26	2.30	2.31	2.31	2.25	2.25	2.23	2.23	2.23	2.31	2.36	2.28	2.25	2.26	2.29	2.28	2.28				

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 - December 2019 Summary of Hourly Instantaneous Maximums

### METHANE (CH4) in ppm

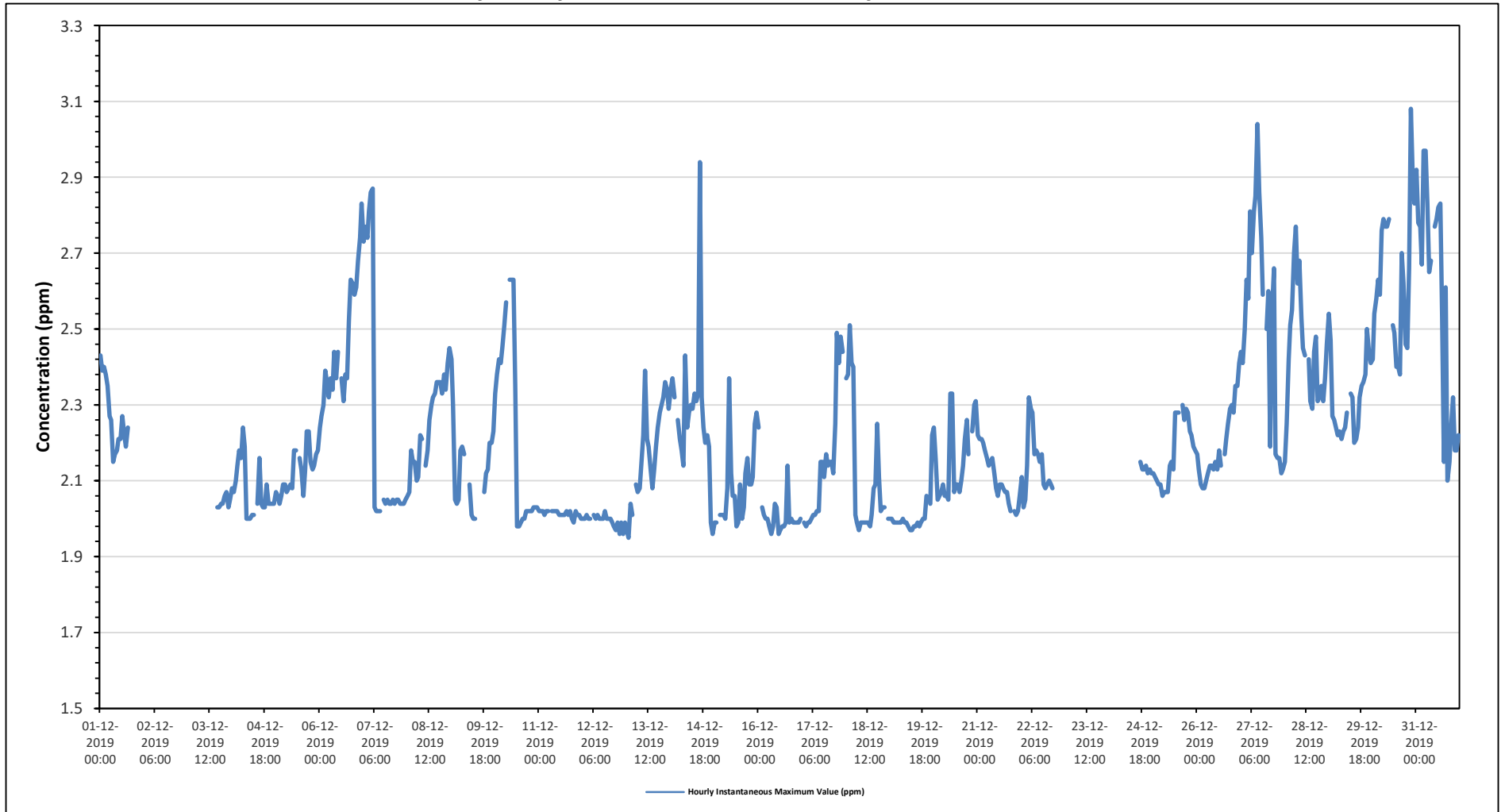
Maximum Hourly Value:	3.08 ppm on December 30 at hour 21	Hours in Service:	744
Maximum Daily Value:	2.63 ppm on December 30	Hours of Data:	618
Minimum Hourly Value:	1.95 ppm on December 13 at hour 1	Hours of Missing Data:	93
Minimum Daily Value:	1.99 ppm on December 12	Hours of Calibration:	33
Monthly Average:	2.21 ppm	Operational Uptime:	87.5

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	
Dec 1	2.43	2.39	2.40	2.38	2.35	2.27	2.26	2.15	2.17	2.18	2.21	2.21	2.27	2.22	2.19	2.24	S	X	X	X	X	X	X	2.15	2.43	-		
Dec 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.03	2.07	-		
Dec 3	X	X	X	X	X	X	X	C	C	C	C	Y	Y	Y	S	Y												
Dec 4	2.08	2.07	2.10	2.14	2.18	2.16	2.24	2.19	2.00	2.00	2.00	2.01	2.01	S	2.04	2.16	2.04	2.03	2.03	2.09	2.04	2.04	2.04	2.04	2.00	2.24	2.08	
Dec 5	2.07	2.06	2.04	2.06	2.09	2.09	2.07	2.08	2.09	2.08	2.18	2.18	S	2.16	2.13	2.06	2.13	2.23	2.23	2.15	2.13	2.14	2.17	2.18	2.04	2.23	2.12	
Dec 6	2.24	2.27	2.30	2.39	2.36	2.32	2.37	2.34	2.44	2.37	2.44	S	2.37	2.31	2.38	2.37	2.52	2.63	2.62	2.59	2.61	2.68	2.74	2.83	2.24	2.83	2.46	
Dec 7	2.73	2.77	2.74	2.81	2.86	2.87	2.03	2.02	2.02	2.02	S	2.05	2.04	2.05	2.04	2.05	2.04	2.05	2.05	2.04	2.04	2.04	2.04	2.05	2.02	2.87	2.24	
Dec 8	2.06	2.07	2.18	2.15	2.15	2.10	2.11	2.22	2.21	S	2.14	2.18	2.26	2.30	2.32	2.33	2.36	2.36	2.36	2.33	2.38	2.34	2.41	2.45	2.06	2.45	2.25	
Dec 9	2.42	2.30	2.05	2.04	2.05	2.18	2.19	2.17	S	X	2.09	2.01	2.00	2.00	C1	C1	C1	C1	2.07	2.12	2.13	2.20	2.20	2.23	2.00	2.42	2.14	
Dec 10	2.33	2.38	2.42	2.41	2.45	2.51	2.57	S	2.63	2.63	2.63	2.35	1.98	1.98	1.99	2.00	2.00	2.02	2.02	2.02	2.03	2.03	2.03	2.03	1.98	2.62	2.24	
Dec 11	2.02	2.02	2.02	2.01	2.02	2.02	S	2.02	2.02	2.02	2.02	2.01	2.01	2.01	2.01	2.02	2.01	2.02	2.00	1.99	2.02	2.01	2.01	2.00	1.99	2.02	2.01	
Dec 12	2.00	2.00	2.01	2.00	2.00	S	2.01	2.00	2.01	2.00	2.00	2.00	2.02	2.00	2.00	2.00	1.99	1.98	1.97	1.99	1.96	1.99	1.96	1.99	1.96	2.02	1.99	
Dec 13	1.97	1.95	2.04	2.01	S	2.09	2.07	2.08	2.14	2.22	2.39	2.21	2.19	2.13	2.08	2.13	2.19	2.24	2.28	2.30	2.32	2.36	2.34	2.29	1.95	2.39	2.17	
Dec 14	2.34	2.37	2.32	S	2.26	2.21	2.18	2.14	2.43	2.24	2.28	2.30	2.29	2.33	2.31	2.33	2.94	2.32	2.24	2.20	2.22	2.19	1.99	1.96	1.96	2.94	2.28	
Dec 15	1.99	1.99	S	2.01	2.01	2.01	2.00	2.08	2.37	2.12	2.06	2.06	1.98	1.99	2.09	2.00	2.03	2.12	2.16	2.09	2.09	2.11	2.25	2.28	1.98	2.37	2.08	
Dec 16	2.24	S	2.03	2.01	2.00	2.00	1.98	1.96	1.98	2.04	2.03	1.96	1.97	1.98	1.99	2.14	1.99	2.00	1.99	1.99	1.99	1.99	1.99	2.00	1.96	2.24	2.01	
Dec 17	S	1.99	1.98	1.99	1.99	2.00	2.01	2.01	2.02	2.02	2.15	2.15	2.11	2.17	2.14	2.15	2.15	2.12	2.25	2.49	2.41	2.48	2.44	S	1.98	2.49	2.15	
Dec 18	2.37	2.38	2.51	2.41	2.40	2.01	1.99	1.97	1.99	1.99	1.99	1.99	1.99	1.98	2.01	2.08	2.09	2.25	2.11	2.02	2.03	2.03	S	2.00	1.97	2.51	2.11	
Dec 19	2.00	2.00	1.99	1.99	1.99	1.99	1.99	2.00	1.99	1.99	1.98	1.97	1.97	1.98	1.98	1.99	1.98	1.99	2.00	2.00	2.06	S	2.04	2.22	1.97	2.22	2.00	
Dec 20	2.24	2.16	2.05	2.06	2.07	2.09	2.06	2.06	2.05	2.33	2.33	2.07	2.09	2.09	2.07	2.10	2.14	2.21	2.26	2.17	S	2.23	2.30	2.31	2.05	2.33	2.15	
Dec 21	2.22	2.21	2.21	2.20	2.18	2.16	2.14	2.15	2.16	2.12	2.08	2.06	2.09	2.09	2.08	2.07	2.04	2.02	S	2.02	2.01	2.02	2.06	2.06	2.01	2.22	2.11	
Dec 22	2.11	2.03	2.05	2.14	2.32	2.29	2.28	2.17	2.18	2.17	2.15	2.17	2.09	2.08	2.09	2.10	2.09	2.08	S	X	X	X	X	X	2.03	2.32	2.14	
Dec 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	2.12	2.15	-
Dec 24	X	X	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1											
Dec 25	2.12	2.11	2.10	2.09	2.09	2.06	2.07	2.07	2.07	2.14	2.15	2.13	2.28	2.28	2.28	S	2.30	2.26	2.29	2.28	2.23	2.22	2.19	2.18	2.06	2.30	2.17	
Dec 26	2.17	2.13	2.09	2.08	2.08	2.10	2.12	2.14	2.14	2.13	2.15	2.13	2.18	2.14	S	2.17	2.21	2.25	2.29	2.30	2.28	2.35	2.35	2.41	2.08	2.41	2.19	
Dec 27	2.44	2.41	2.50	2.63	2.58	2.81	2.70	2.81	2.85	3.04	2.86	2.74	2.59	S	2.50	2.60	2.19	2.54	2.66	2.17	2.16	2.16	2.12	2.13	2.12	3.04	2.53	
Dec 28	2.15	2.25	2.42	2.51	2.55	2.70	2.77	2.62	2.68	2.53	2.45	2.43	S	2.42	2.31	2.29	2.44	2.48	2.31	2.32	2.35	2.31	2.37	2.46	2.15	2.77	2.44	
Dec 29	2.54	2.47	2.27	2.26	2.24	2.22	2.23	2.21	2.23	2.24	2.28	S	2.33	2.32	2.20	2.21	2.24	2.32	2.35	2.36	2.38	2.50	2.44	2.41	2.20	2.54	2.32	
Dec 30	2.42	2.54	2.58	2.63	2.59	2.76	2.79	2.77	2.77	2.79	S	2.51	2.49	2.40	2.40	2.38	2.70	2.62	2.46	2.45	2.66	3.08	2.88	2.83	2.38	3.08	2.63	
Dec 31	2.92	2.78	2.77	2.67	2.97	2.97	2.83	2.65	2.68	S	2.77	2.79	2.82	2.83	2.53	2.15	2.61	2.10	2.15	2.24	2.32	2.18	2.18	2.22	2.10	2.97	2.57	
Diurnal Maximum	2.92	2.78	2.77	2.81	2.97	2.97	2.83	2.81	2.85	3.04	2.86	2.79	2.82	2.83	2.53	2.60	2.94	2.63	2.66	2.59	2.66	3.08	2.88	2.83				
Diurnal Average	2.25	2.23	2.24	2.23	2.26	2.27	2.23	2.20	2.24	2.23	2.23	2.19	2.18	2.17	2.17	2.16	2.22	2.20	2.20	2.19	2.19	2.23	2.22	2.22				

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 - December 2019*

### Summary of Hourly Instantaneous Maximums

#### NON-METHANE HYDROCARBONS (NMHC) in ppm

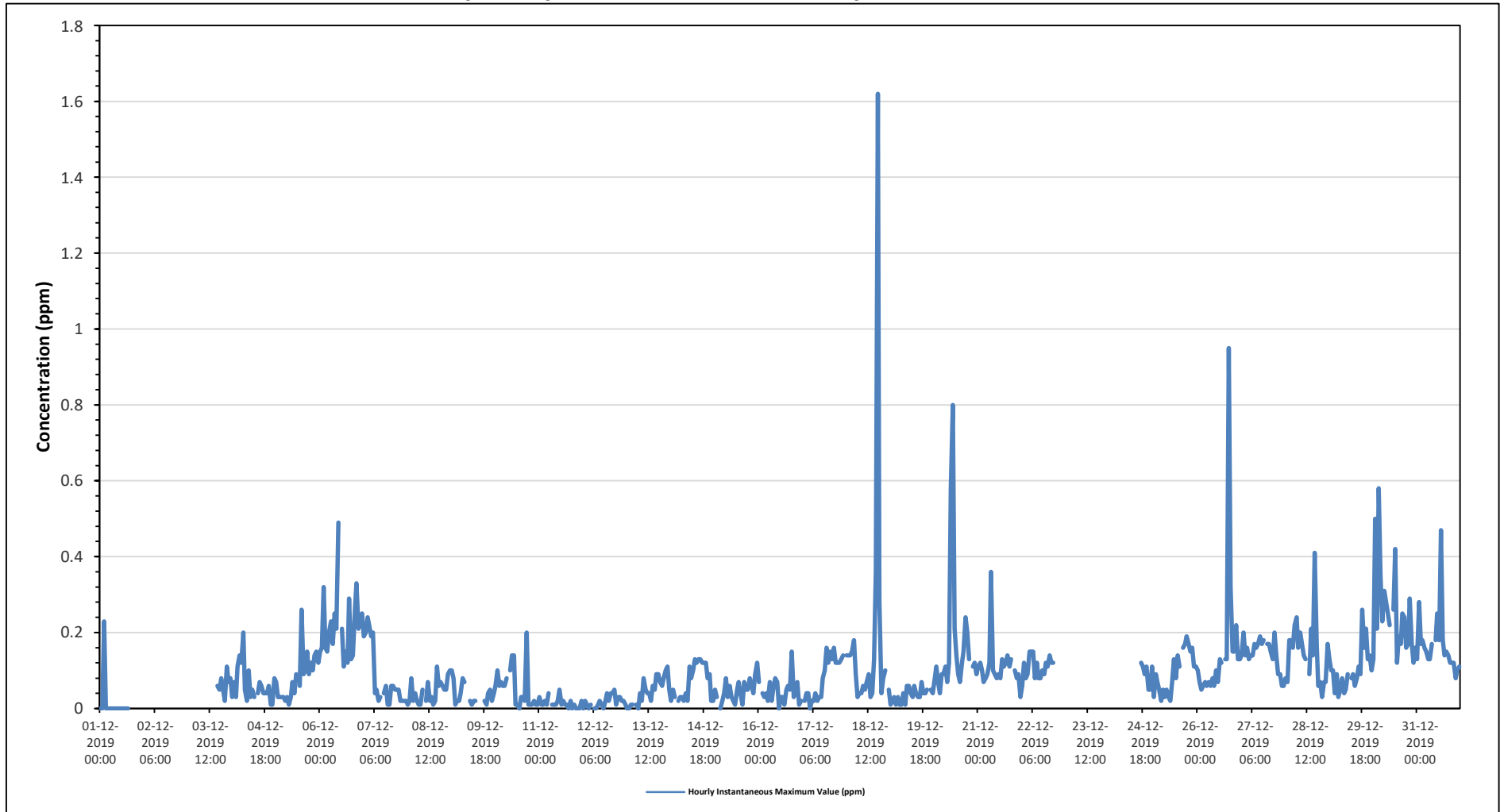
Maximum Hourly Value: 1.62 ppm on December 18 at hour 17	Hours in Service: 744
Maximum Daily Value: 0.25 ppm on December 30	Hours of Data: 618
Minimum Hourly Value: 0.00 ppm on December 1 at hour 0	Hours of Missing Data: 93
Minimum Daily Value: 0.01 ppm on December 11	Hours of Calibration: 33
Monthly Average: 0.10 ppm	Operational Uptime: 87.5

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	
Dec 1	0.00	0.00	0.23	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	S	X	X	X	X	X	X	0.00	0.23	-	
Dec 2	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	0.02	0.11	-
Dec 3	X	X	X	X	X	X	X	C	C	C	C	Y	Y	Y	S	Y	X	0.05	0.08	0.05	0.02	0.11	0.07	0.08	0.01	0.11	0.04	
Dec 4	0.03	0.07	0.03	0.11	0.14	0.12	0.20	0.05	0.02	0.10	0.03	0.05	0.03	S	0.04	0.07	0.06	0.04	0.04	0.04	0.06	0.01	0.01	0.08	0.01	0.20	0.06	
Dec 5	0.07	0.03	0.03	0.03	0.03	0.02	0.03	0.01	0.03	0.07	0.04	0.09	S	0.06	0.26	0.09	0.10	0.15	0.09	0.12	0.10	0.14	0.15	0.12	0.01	0.26	0.08	
Dec 6	0.15	0.16	0.32	0.16	0.15	0.20	0.23	0.17	0.25	0.21	0.49	S	0.21	0.11	0.15	0.12	0.29	0.13	0.14	0.26	0.33	0.21	0.24	0.25	0.11	0.49	0.21	
Dec 7	0.19	0.20	0.24	0.22	0.19	0.20	0.04	0.05	0.02	0.03	S	0.04	0.06	0.01	0.01	0.06	0.06	0.05	0.05	0.05	0.02	0.02	0.02	0.02	0.01	0.24	0.08	
Dec 8	0.01	0.02	0.08	0.02	0.04	0.02	0.01	0.01	0.05	S	0.02	0.07	0.02	0.03	0.01	0.02	0.11	0.06	0.07	0.06	0.05	0.05	0.09	0.10	0.01	0.11	0.04	
Dec 9	0.10	0.08	0.01	0.02	0.02	0.04	0.08	0.07	S	X	0.02	0.01	0.02	0.02	C1	C1	C1	C1	0.02	0.01	0.04	0.05	0.02	0.04	0.01	0.10	0.04	
Dec 10	0.06	0.10	0.06	0.07	0.06	0.06	0.08	S	0.10	0.14	0.14	0.01	0.01	0.00	0.03	0.03	0.02	0.20	0.01	0.01	0.01	0.02	0.01	0.01	0.00	0.20	0.05	
Dec 11	0.03	0.01	0.01	0.02	0.01	0.04	S	0.01	0.01	0.01	0.02	0.05	0.01	0.02	0.01	0.01	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.05	0.01	
Dec 12	0.00	0.02	0.01	0.00	0.01	S	0.00	0.00	0.01	0.02	0.01	0.00	0.02	0.04	0.02	0.04	0.04	0.05	0.01	0.03	0.03	0.02	0.02	0.01	0.00	0.05	0.02	
Dec 13	0.00	0.00	0.01	0.01	S	0.01	0.00	0.04	0.02	0.08	0.05	0.04	0.04	0.02	0.06	0.05	0.09	0.09	0.07	0.06	0.08	0.10	0.11	0.05	0.00	0.11	0.05	
Dec 14	0.02	0.05	0.03	S	0.02	0.03	0.03	0.02	0.04	0.02	0.11	0.08	0.10	0.13	0.12	0.13	0.13	0.12	0.12	0.08	0.09	0.02	0.02	0.02	0.02	0.13	0.07	
Dec 15	0.05	0.03	S	0.00	0.02	0.04	0.08	0.03	0.06	0.03	0.02	0.01	0.05	0.07	0.04	0.01	0.07	0.05	0.05	0.08	0.06	0.04	0.09	0.12	0.00	0.12	0.05	
Dec 16	0.07	S	0.04	0.03	0.04	0.02	0.07	0.02	0.06	0.08	0.07	0.00	0.03	0.03	0.01	0.05	0.06	0.05	0.15	0.03	0.05	0.07	0.01	0.02	0.00	0.15	0.05	
Dec 17	S	0.02	0.04	0.04	0.00	0.02	0.02	0.02	0.04	0.02	0.03	0.03	0.08	0.10	0.16	0.12	0.15	0.13	0.16	0.12	0.12	0.12	0.13	0.14	S	0.00	0.16	0.08
Dec 18	0.14	0.14	0.14	0.15	0.18	0.09	0.03	0.04	0.04	0.06	0.05	0.07	0.09	0.03	0.04	0.13	0.36	1.62	0.28	0.04	0.08	0.10	S	0.05	0.03	1.62	0.17	
Dec 19	0.01	0.02	0.03	0.01	0.03	0.01	0.01	0.04	0.01	0.06	0.06	0.04	0.03	0.06	0.04	0.03	0.03	0.07	0.04	0.04	0.05	S	0.05	0.04	0.01	0.07	0.04	
Dec 20	0.07	0.11	0.07	0.04	0.09	0.09	0.11	0.07	0.12	0.58	0.80	0.21	0.14	0.09	0.07	0.12	0.15	0.24	0.20	0.13	S	0.11	0.12	0.09	0.04	0.80	0.17	
Dec 21	0.11	0.12	0.10	0.07	0.08	0.09	0.12	0.36	0.10	0.09	0.08	0.09	0.08	0.13	0.11	0.12	0.14	0.11	0.13	S	0.10	0.08	0.09	0.03	0.03	0.36	0.11	
Dec 22	0.06	0.12	0.08	0.09	0.15	0.15	0.15	0.08	0.12	0.08	0.08	0.10	0.09	0.12	0.11	0.14	0.12	0.12	S	X	X	X	X	X	0.06	0.15	0.11	
Dec 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	0.05	0.12	-
Dec 24	X	X	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	0.12	0.11	0.09	0.11	0.05	0.05	0.11	0.02	0.19	0.10
Dec 25	0.03	0.09	0.07	0.05	0.02	0.05	0.03	0.05	0.03	0.02	0.07	0.13	0.08	0.14	0.11	S	0.16	0.17	0.19	0.17	0.15	0.16	0.11	0.11	0.02	0.19	0.10	
Dec 26	0.10	0.07	0.05	0.06	0.07	0.06	0.07	0.06	0.08	0.06	0.10	0.07	0.13	0.12	S	0.13	0.13	0.95	0.32	0.15	0.15	0.22	0.13	0.13	0.05	0.95	0.15	
Dec 27	0.14	0.20	0.14	0.16	0.13	0.14	0.14	0.17	0.16	0.17	0.19	0.17	0.18	S	0.17	0.17	0.15	0.13	0.20	0.14	0.09	0.09	0.06	0.06	0.06	0.20	0.15	
Dec 28	0.08	0.07	0.18	0.18	0.16	0.22	0.24	0.16	0.20	0.17	0.14	0.13	S	0.09	0.21	0.14	0.41	0.17	0.06	0.07	0.03	0.07	0.07	0.17	0.03	0.41	0.15	
Dec 29	0.13	0.10	0.10	0.04	0.09	0.03	0.05	0.08	0.04	0.05	0.09	S	0.08	0.09	0.06	0.08	0.11	0.09	0.26	0.16	0.21	0.13	0.14	0.10	0.03	0.26	0.10	
Dec 30	0.13	0.50	0.21	0.58	0.35	0.23	0.31	0.28	0.25	0.22	S	0.26	0.42	0.12	0.19	0.17	0.25	0.24	0.16	0.17	0.29	0.17	0.12	0.16	0.12	0.58	0.25	
Dec 31	0.13	0.28	0.17	0.18	0.16	0.15	0.13	0.13	0.17	S	0.18	0.25	0.18	0.47	0.18	0.14	0.15	0.14	0.12	0.12	0.12	0.08	0.10	0.11	0.08	0.47	0.17	
Diurnal Maximum	0.19	0.50	0.32	0.58	0.35	0.23	0.31	0.36	0.25	0.58	0.80	0.26	0.42	0.47	0.26	0.17	0.41	1.62	0.32	0.26	0.33	0.22	0.24	0.25				
Diurnal Average	0.07	0.10	0.10	0.09	0.09	0.08	0.09	0.08	0.08	0.10	0.12	0.08	0.09	0.09	0.09	0.09	0.13	0.20	0.11	0.09	0.09	0.09	0.08	0.08				

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 - December 2019 Summary of Hourly Instantaneous Maximums

#### WIND SPEED (WS) in km/hr

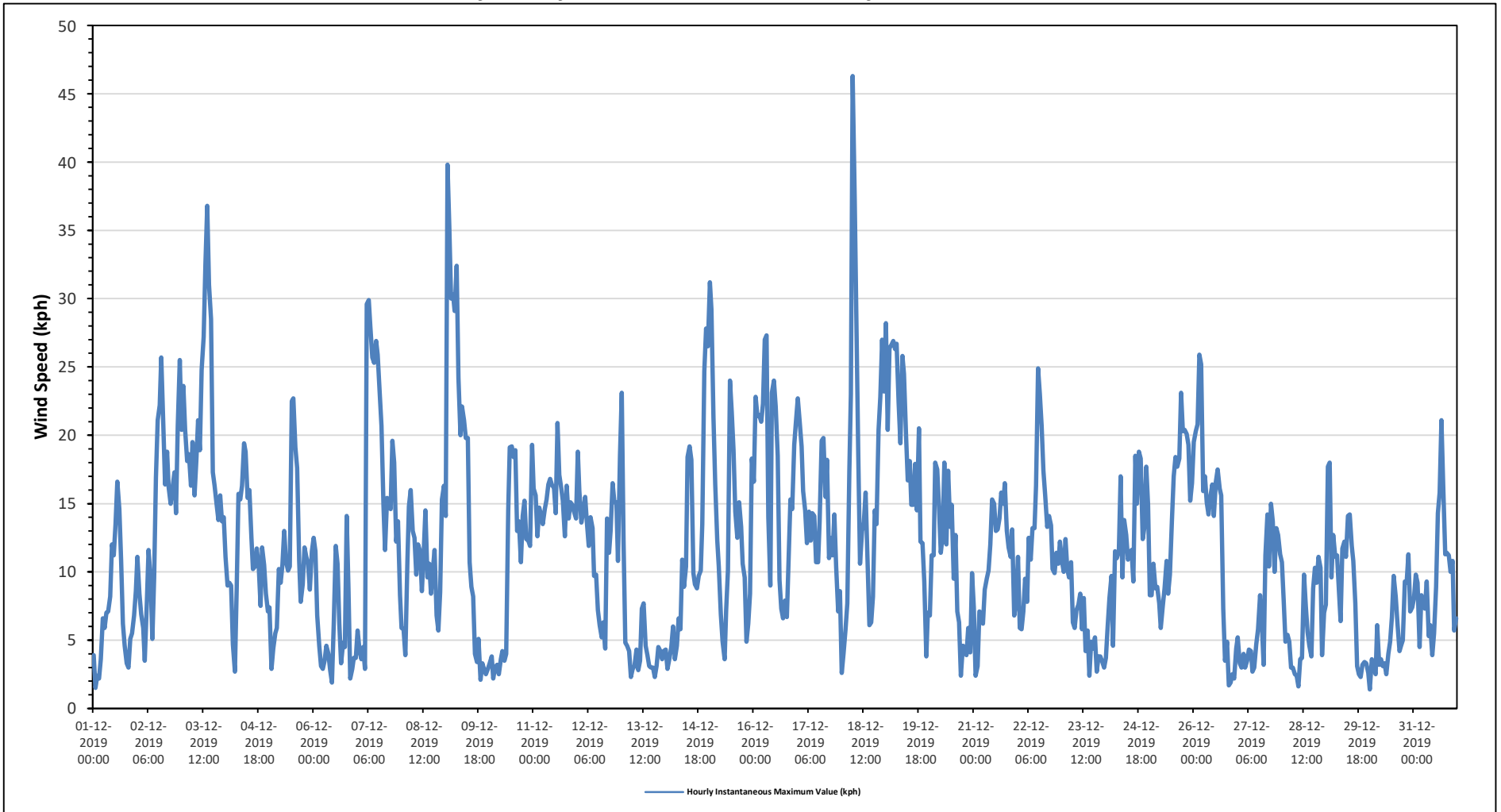
Maximum Hourly Value:	46.3 kph	on December 18 at hour 6	Hours in Service:	744
Maximum Daily Value:	20.7 kph	on December 3	Hours of Data:	744
Minimum Hourly Value:	1.4 kph	on December 30 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	5.1 kph	on December 13	Hours of Calibration:	0
Monthly Average:	11.8 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
Dec 1	3.9	1.5	2.4	2.2	3.6	6.6	5.9	7.0	7.1	8.2	12.0	11.2	13.5	16.6	14.6	10.8	6.2	4.6	3.3	3.0	5.1	5.5	6.8	8.6	1.5	16.6	7.1
Dec 2	11.1	8.4	6.9	5.9	3.5	7.6	11.6	9.5	5.1	9.6	16.9	21.1	22.2	25.7	20.8	16.4	18.8	16.2	15.0	16.1	17.3	14.3	20.7	25.5	3.5	25.7	14.4
Dec 3	20.4	23.6	20.4	18.1	18.6	16.3	19.5	15.6	18.1	21.1	18.9	24.8	27.2	32.6	36.8	31.0	28.5	17.3	16.3	15.1	13.8	15.6	13.7	14.0	13.7	36.8	20.7
Dec 4	11.1	9.0	9.2	9.0	4.7	2.7	8.8	15.7	15.3	16.3	19.4	18.8	15.4	16.0	12.5	10.2	10.4	11.7	10.3	7.5	11.8	10.5	8.4	7.1	2.7	19.4	11.3
Dec 5	7.4	2.9	4.4	5.5	5.9	10.2	9.2	10.5	13.0	10.8	10.1	10.4	22.5	22.7	19.1	17.6	10.8	7.8	9.1	11.8	11.1	10.6	8.7	11.5	2.9	22.7	11.0
Dec 6	12.5	11.5	6.8	4.6	3.1	2.9	3.5	4.6	4.0	2.8	1.9	6.1	11.9	10.6	6.2	3.3	4.8	4.5	14.1	8.8	2.2	2.9	3.7	3.7	1.9	14.1	5.9
Dec 7	5.7	4.2	3.6	4.5	2.9	29.6	29.9	28.0	25.7	25.3	26.9	25.9	23.1	20.7	14.8	11.6	15.4	15.0	14.6	19.6	18.0	12.2	13.7	8.3	2.9	29.9	16.6
Dec 8	5.9	5.8	3.9	10.7	14.8	16.0	13.0	12.5	9.8	12.0	11.5	8.6	11.3	14.5	9.6	10.6	8.4	10.1	11.6	6.8	5.7	8.5	15.3	16.3	3.9	16.3	10.6
Dec 9	14.1	39.8	35.3	30.0	30.3	29.1	32.4	24.2	20.0	22.1	21.1	19.8	19.8	10.7	8.9	8.2	4.0	3.4	5.1	2.1	3.3	2.8	2.5	2.9	2.1	39.8	16.3
Dec 10	3.3	3.8	2.2	3.0	3.2	2.5	3.6	4.2	3.5	4.0	14.5	19.1	19.2	18.4	18.9	13.0	13.7	10.7	14.1	15.2	12.4	12.3	11.9	19.3	2.2	19.3	10.3
Dec 11	16.1	15.6	12.6	14.7	14.2	13.5	14.6	15.3	16.4	16.8	16.3	16.2	14.3	20.9	17.1	16.1	15.2	12.6	16.3	13.9	15.1	14.9	14.4	13.9	12.6	20.9	15.3
Dec 12	18.8	15.9	13.6	14.4	15.5	13.8	11.9	14.0	13.2	9.7	9.8	7.2	6.1	5.2	6.3	4.4	13.9	11.4	13.0	16.5	15.1	15.1	10.8	18.5	4.4	18.8	12.3
Dec 13	23.1	12.3	4.8	4.6	4.2	2.3	2.9	3.1	4.3	2.8	3.5	7.3	7.7	4.6	3.9	3.1	3.0	3.0	2.3	3.1	4.5	4.2	3.6	4.2	2.3	23.1	5.1
Dec 14	4.3	2.9	3.7	4.5	6.0	3.6	4.6	6.6	5.8	10.9	8.9	10.4	18.4	19.2	18.2	9.9	9.1	8.8	9.7	10.1	13.5	24.7	27.8	26.5	2.9	27.8	11.2
Dec 15	31.2	29.2	21.3	16.4	12.3	10.4	6.9	4.9	3.6	7.2	10.1	24.0	21.7	18.9	14.4	12.5	15.1	13.3	10.6	9.6	4.9	6.2	8.4	18.3	3.6	31.2	13.8
Dec 16	16.6	22.8	21.4	21.5	21.0	22.3	27.0	27.3	14.0	9.0	23.1	24.0	22.1	18.5	9.4	7.3	6.6	7.9	6.7	11.0	15.3	14.6	19.3	20.8	6.6	27.3	17.1
Dec 17	22.7	21.1	19.2	15.9	14.5	12.1	14.4	12.3	14.3	14.1	10.7	13.7	19.6	19.8	15.5	18.2	11.0	12.5	11.2	14.2	10.4	7.1	8.6	7.1	7.1	22.7	14.3
Dec 18	2.6	4.0	5.8	7.7	17.4	23.0	46.3	37.4	28.0	18.7	10.6	13.0	13.6	15.8	11.2	6.1	6.3	8.2	14.5	13.5	20.4	22.8	27.0	23.2	2.6	46.3	16.5
Dec 19	28.2	20.4	26.4	26.6	26.9	26.3	26.7	22.4	19.4	25.8	24.5	20.1	16.7	18.1	14.9	14.9	17.9	14.5	20.5	12.2	12.1	9.3	3.8	7.0	3.8	28.2	19.0
Dec 20	6.8	11.2	11.2	18.0	17.5	14.7	11.4	12.6	18.0	12.0	17.4	13.3	14.9	9.5	12.7	7.1	6.3	2.4	4.6	4.5	3.9	5.9	4.1	9.9	2.4	18.0	10.4
Dec 21	7.4	2.4	3.1	7.1	7.0	6.2	8.7	9.5	10.1	12.0	15.3	15.0	13.0	13.1	13.9	15.8	15.0	16.5	13.0	11.8	11.1	13.1	6.8	7.7	2.4	16.5	10.6
Dec 22	11.1	5.9	5.8	7.1	9.5	7.8	12.5	10.9	13.2	13.2	16.3	24.9	23.0	20.7	17.4	15.6	13.3	14.1	13.4	10.2	9.9	11.4	10.6	12.2	5.8	24.9	12.9
Dec 23	10.8	10.0	12.4	10.2	9.6	10.7	6.3	5.9	7.2	7.6	8.4	5.8	8.1	4.2	5.7	2.4	4.9	4.4	5.2	2.7	3.8	3.8	3.4	3.0	2.4	12.4	6.5
Dec 24	3.7	6.0	8.1	9.7	4.6	11.5	11.0	11.5	17.0	9.6	13.8	12.7	10.9	11.3	11.6	9.3	18.5	15.0	18.8	18.3	12.4	13.2	17.7	14.9	3.7	18.8	12.1
Dec 25	8.3	8.3	10.6	8.8	8.9	7.7	5.9	7.5	8.8	10.8	8.4	9.8	13.8	17.0	18.4	17.7	18.3	23.1	20.3	20.4	20.1	19.3	15.2	16.5	5.9	23.1	13.5
Dec 26	19.5	20.3	20.8	25.9	25.2	15.9	17.0	15.1	14.2	15.6	16.4	14.1	16.6	17.5	16.1	15.6	7.3	3.5	4.9	1.7	1.9	2.5	2.2	4.4	1.7	25.9	13.1
Dec 27	5.2	3.3	3.0	4.0	3.0	3.5	4.3	4.2	2.7	3.0	4.7	5.8	8.3	6.6	3.2	11.2	14.2	10.4	15.0	13.7	10.0	13.2	12.7	11.3	2.7	15.0	7.4
Dec 28	10.7	7.9	4.9	5.4	4.9	3.0	3.0	2.5	2.4	1.6	3.6	3.7	9.8	7.5	5.6	4.6	3.8	8.8	10.3	9.2	11.1	10.3	3.9	7.0	1.6	11.1	6.1
Dec 29	7.6	17.7	18.0	9.6	12.7	11.1	11.2	8.8	6.4	11.7	12.2	11.1	14.1	14.2	11.9	10.8	7.7	3.1	2.5	2.3	3.2	3.4	3.3	2.6	2.3	18.0	9.1
Dec 30	1.4	3.6	3.0	2.5	6.1	3.2	3.6	3.1	3.3	2.5	4.0	4.9	6.7	9.7	8.2	6.2	4.2	4.6	5.0	9.3	9.2	11.3	7.1	7.4	1.4	11.3	5.4
Dec 31	8.1	9.8	9.2	4.5	8.3	7.6	7.3	9.3	5.3	6.1	3.9	5.5	8.9	14.3	15.8	21.1	16.3	11.3	11.4	11.2	10.0	10.8	5.7	6.6	3.9	21.1	9.5
Diurnal Maximum	31.2	39.8	35.3	30.0	30.3	29.6	46.3	37.4	28.0	25.8	26.9	25.9	27.2	32.6	36.8	31.0	28.5	23.1	20.5	20.4	20.4	24.7	27.8	26.5			
Diurnal Average	11.6	11.6	10.8	10.7	11.0	11.4	12.7	12.1	11.3	11.4	12.7	13.7	15.1	15.3	13.5	11.6	11.5	10.0	11.1	10.4	10.4	10.8	10.3	11.7			

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 Instantaneous Maximum for WS - Cold Lake South Station*



MASKWA STATION





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

*Maskwa Site - December 2019*

### Summary of Hourly Instantaneous Maximums

#### SULPHUR DIOXIDE (SO<sub>2</sub>) in ppb

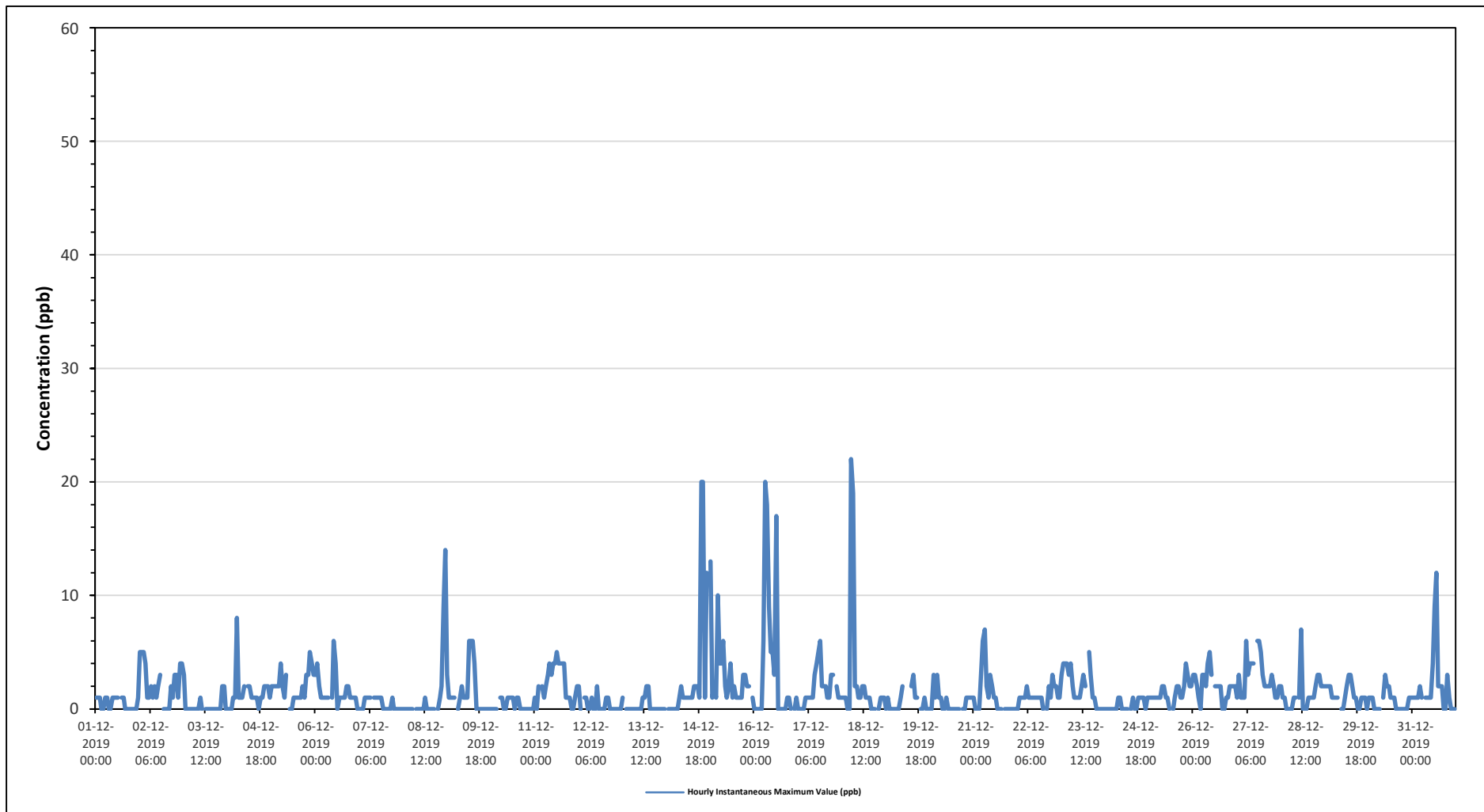
Maximum Hourly Value:	22 ppb on December 18 at hour 5	Hours in Service:	744
Maximum Daily Value:	3.7 ppb on December 16	Hours of Data:	707
Minimum Hourly Value:	0 ppb on December 1 at hour 3	Hours of Missing Data:	1
Minimum Daily Value:	0.3 ppb on December 13	Hours of Calibration:	36
Monthly Average:	1.5 ppb	Operational Uptime:	99.9

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	
Dec 1	1	1	1	0	0	1	1	0	0	1	1	1	1	S	1	1	0	0	0	0	0	0	0	1	0	1	0.5	
Dec 2	5	5	5	4	1	1	2	1	2	1	2	3	S	0	0	0	0	2	1	3	3	1	4	4	0	5	2.2	
Dec 3	3	0	0	0	0	0	0	0	0	1	0	S	0	0	0	0	0	0	0	0	0	2	2	0	0	3	0.3	
Dec 4	0	0	0	1	1	8	1	1	1	2	S	2	2	1	1	1	1	0	1	1	2	2	2	1	0	8	1.4	
Dec 5	2	2	2	2	2	4	2	1	3	S	0	0	1	1	1	1	1	2	1	3	3	5	4	3	0	5	2.0	
Dec 6	3	4	2	1	1	1	1	1	S	1	6	4	0	1	1	1	1	2	2	1	1	1	1	0	0	6	1.6	
Dec 7	0	0	0	1	1	1	1	S	1	1	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0.4	
Dec 8	0	0	0	0	0	0	S	0	0	0	0	0	1	0	0	0	0	0	S1	0	1	2	9	14	0	14	1.2	
Dec 9	3	1	1	1	1	S	0	1	2	1	1	1	6	6	4	0	0	0	0	0	0	0	0	0	0	6	1.5	
Dec 10	0	0	0	0	S	1	1	0	0	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	1	0.3	
Dec 11	1	0	2	S	2	1	2	3	4	3	4	4	5	4	4	4	4	1	1	1	0	0	1	2	0	5	2.3	
Dec 12	2	0	S	1	1	0	0	1	0	0	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	0.4	
Dec 13	1	S	0	0	0	0	0	0	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	0	0	2	0.3	
Dec 14	S	0	0	0	0	0	0	1	2	1	1	1	1	1	1	2	2	2	1	20	20	1	12	S	0	20	3.1	
Dec 15	13	1	2	1	10	4	4	6	2	1	2	4	1	2	1	1	1	1	3	3	2	2	S	1	1	13	3.0	
Dec 16	0	0	0	0	0	6	20	18	9	5	5	3	17	0	0	0	0	0	1	1	0	S	0	1	0	20	3.7	
Dec 17	0	0	0	0	1	1	1	1	1	3	4	5	6	2	2	2	1	1	3	3	S	2	1	1	0	6	1.8	
Dec 18	1	1	1	0	0	22	19	2	2	1	1	2	2	1	1	1	0	0	0	S	0	1	1	1	0	22	2.6	
Dec 19	0	1	0	0	0	0	0	0	1	2	C	C	C	C	2	3	1	1	S	0	0	1	0	0	0	3	0.6	
Dec 20	0	0	3	1	3	1	1	0	0	1	0	0	0	0	0	0	0	S	0	0	0	1	1	1	1	0	0.6	
Dec 21	1	0	0	0	3	6	7	2	1	3	2	1	1	0	0	0	S	0	0	0	0	0	0	0	0	7	1.2	
Dec 22	0	1	1	1	1	2	1	1	1	1	1	1	1	1	0	S	0	2	1	3	2	2	1	1	0	3	1.1	
Dec 23	3	4	4	4	3	4	2	1	1	1	1	2	3	2	S	5	3	1	1	0	0	0	0	0	0	5	2.0	
Dec 24	0	0	0	0	0	0	0	1	1	0	0	0	0	S	0	1	0	0	1	1	1	1	0	1	0	1	0.3	
Dec 25	1	1	1	1	1	1	1	2	2	1	1	0	S	0	1	2	2	1	1	2	4	3	2	2	0	4	1.4	
Dec 26	3	3	2	1	0	3	3	2	4	5	3	S	2	2	2	2	0	0	1	1	2	2	2	2	0	5	2.0	
Dec 27	1	3	1	1	1	6	3	4	4	4	S	6	6	5	3	2	2	2	2	3	2	1	1	2	1	6	2.8	
Dec 28	2	1	1	0	0	0	0	1	1	S	1	7	0	0	0	0	1	1	1	1	2	3	3	2	2	0	7	1.3
Dec 29	2	2	2	2	1	1	1	1	S	0	0	1	2	3	3	2	1	1	0	0	1	1	1	0	0	3	1.2	
Dec 30	1	1	1	0	0	0	0	S	1	3	2	2	1	1	1	0	0	0	0	0	0	0	1	1	0	3	0.7	
Dec 31	1	1	1	1	2	1	S	1	1	1	1	4	9	12	2	2	2	0	0	3	1	0	0	0	0	12	2.0	
Diurnal Maximum	13	5	5	4	10	22	20	18	9	5	6	7	17	12	6	5	4	2	3	20	20	5	12	14				
Diurnal Average	1.7	1.1	1.1	0.8	1.2	2.5	2.6	1.8	1.6	1.6	1.5	2.0	2.5	1.7	1.2	1.3	0.8	0.7	0.8	1.7	1.6	1.1	1.6	1.4				

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 SO2 - Maskwa Site**





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - December 2019  
 Summary of Hourly Instantaneous Maximums  
 HYDROGEN SULPHIDE (H<sub>2</sub>S) in ppb

Maximum Hourly Value:	3 ppb on December 18 at hour 16	Hours in Service:	744
Maximum Daily Value:	1.0 ppb on December 6	Hours of Data:	706
Minimum Hourly Value:	0 ppb on December 1 at hour 0	Hours of Missing Data:	1
Minimum Daily Value:	0.0 ppb on December 12	Hours of Calibration:	37
Monthly Average:	0.6 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					
Dec 1	0	0	0	0	0	1	1	0	0	0	0	0	1	S	0	1	0	1	1	0	0	0	1	0	0	1	0	0	1	0.3		
Dec 2	0	1	0	1	1	0	0	1	1	0	0	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3		
Dec 3	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0.1		
Dec 4	1	1	0	0	1	0	1	0	1	1	S	1	0	1	0	0	0	1	1	1	1	0	0	1	0	0	1	0	1	0.6		
Dec 5	0	0	1	1	0	1	1	0	0	S	0	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0.6	
Dec 6	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	
Dec 7	0	1	1	1	1	1	1	S	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0.5	
Dec 8	1	0	0	0	0	0	S	1	1	0	0	0	0	0	0	0	0	0	0	0	S1	0	0	0	0	0	0	0	0	0	0.1	
Dec 9	0	0	1	1	0	S	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	
Dec 10	0	0	0	1	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	
Dec 11	0	0	0	S	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	
Dec 12	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	
Dec 13	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	
Dec 14	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	S	0	0	0	0.0	
Dec 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
Dec 16	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	1	0	1	0	0	S	0	1	0	1	0	1	0	1	0.3	
Dec 17	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	1	S	1	1	1	0	1	0	1	0	0.4	
Dec 18	1	0	1	0	0	1	1	1	0	1	1	C	C	C	C	C	3	1	1	S	1	1	1	0	0	0	0	3	0	0	0.8	
Dec 19	1	0	0	0	1	1	0	1	0	0	0	0	0	0	1	0	1	1	S	1	0	1	0	1	0	1	0	1	0	1	0.4	
Dec 20	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	0	0.9	
Dec 21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	0	1	1	1	1	0	0	1	0	1	0	0.9	
Dec 22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	
Dec 23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	1.0	
Dec 24	1	1	1	1	0	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1.0
Dec 25	1	1	1	1	1	1	1	1	1	0	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1.0
Dec 26	0	1	1	0	1	0	1	0	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0.8	
Dec 27	1	1	0	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	0	1	1.0	
Dec 28	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0
Dec 29	1	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	1	1	1.0
Dec 30	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1.0
Dec 31	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	1.0
Diurnal Maximum	1	1	1	1	1	1	1	1	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	0.5	0.5	0.5	0.6	0.5	0.6	0.7	0.6	0.5	0.5	0.4	0.5	0.6	0.5	0.6	0.5	0.7	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.6	

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.





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

*Maskwa Site - December 2019*

### Summary of Hourly Instantaneous Maximums

#### OXIDES OF NITROGEN (NOx) in ppb

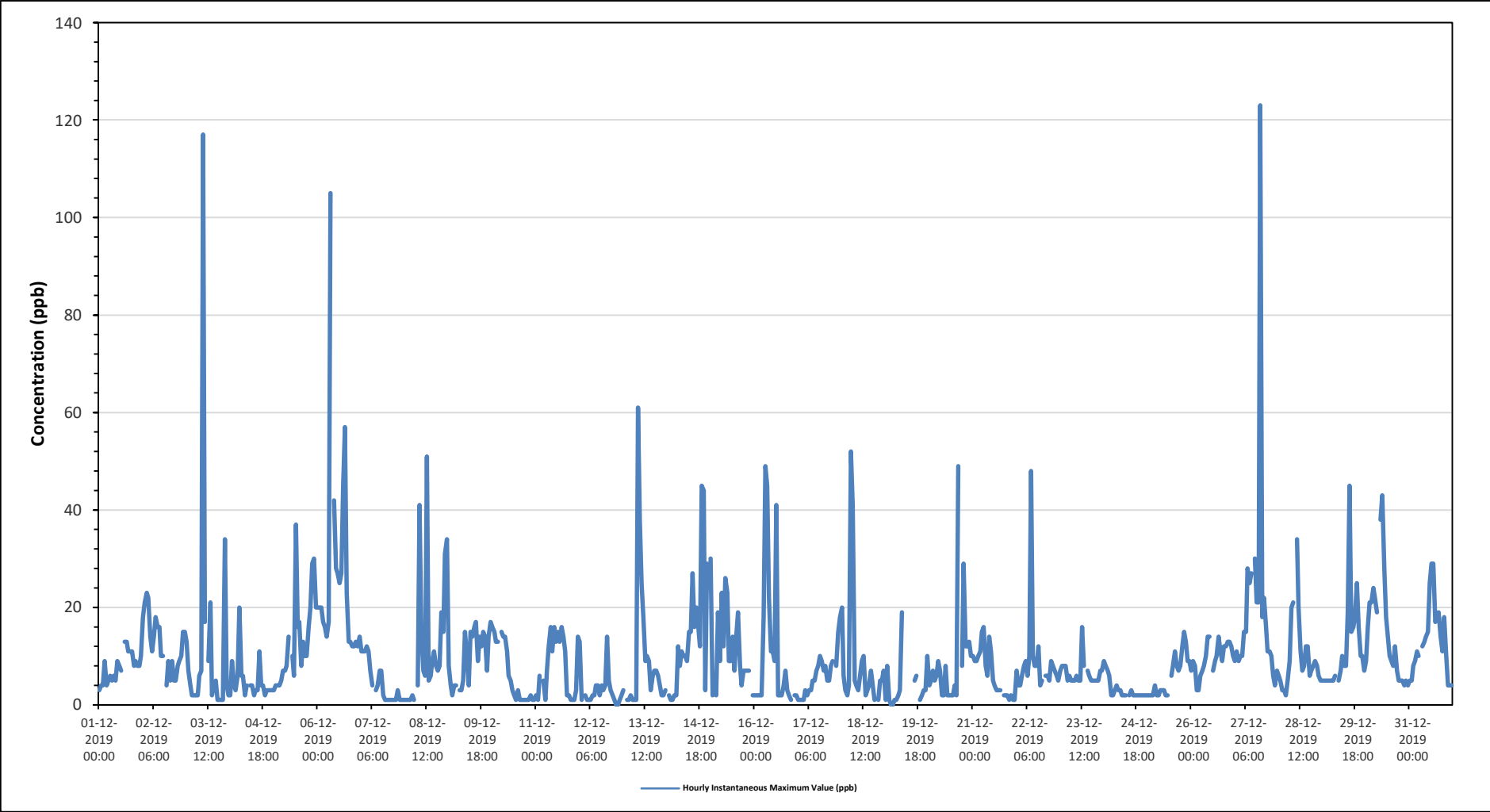
Maximum Hourly Value:	123 ppb on December 27 at hour 14	Hours in Service:	744
Maximum Daily Value:	25.7 ppb on December 6	Hours of Data:	706
Minimum Hourly Value:	0 ppb on December 12 at hour 20	Hours of Missing Data:	0
Minimum Daily Value:	3.1 ppb on December 12	Hours of Calibration:	38
Monthly Average:	9.8 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
Dec 1	3	4	4	9	4	5	6	5	6	5	9	8	7	S	13	13	11	11	11	8	9	8	8	10	3	13	7.7
Dec 2	18	21	23	22	14	11	14	18	16	16	10	10	S	4	9	5	9	5	5	8	9	10	15	15	4	23	12.5
Dec 3	13	7	4	2	2	2	2	6	7	117	17	S	9	21	2	4	5	1	1	1	1	34	4	2	1	117	11.5
Dec 4	2	9	4	3	6	20	6	6	2	4	S	4	4	2	3	3	11	4	4	2	3	3	3	3	2	20	4.8
Dec 5	3	4	4	4	5	7	7	8	14	S	10	6	37	16	17	8	13	10	10	16	20	29	30	20	3	37	13.0
Dec 6	20	20	20	17	16	14	17	105	S	42	28	27	25	27	45	57	23	13	13	12	12	13	12	14	12	105	25.7
Dec 7	11	11	11	12	11	7	4	S	3	4	7	7	2	1	1	1	1	1	1	1	3	1	1	1	1	12	4.5
Dec 8	1	1	1	1	2	1	S	4	41	15	7	6	51	5	6	9	11	8	7	8	19	15	31	34	1	51	12.3
Dec 9	8	4	2	4	4	S	3	3	5	15	10	4	15	14	16	17	9	14	12	15	14	7	14	17	2	17	9.8
Dec 10	16	15	13	13	S	15	14	14	11	6	5	3	2	1	3	1	1	1	1	1	1	2	1	1	1	16	6.1
Dec 11	2	1	6	S	5	1	7	12	16	11	16	13	15	13	16	14	11	2	2	1	1	1	3	14	1	16	8.0
Dec 12	13	1	S	2	1	1	1	2	2	4	4	2	4	3	4	14	5	3	2	1	0	0	1	2	0	14	3.1
Dec 13	3	S	1	1	1	2	1	1	61	38	25	18	9	10	9	3	6	7	7	6	4	2	2	3	1	61	9.6
Dec 14	S	2	1	1	2	2	12	8	11	10	10	9	15	15	27	16	20	17	12	45	44	3	29	S	1	45	14.1
Dec 15	30	2	4	2	19	9	23	12	26	23	9	9	14	7	14	19	8	4	7	7	7	7	S	2	2	30	11.5
Dec 16	2	2	2	2	2	18	49	45	22	11	11	9	41	2	2	4	7	3	2	1	S	2	2	2	1	49	10.6
Dec 17	1	1	1	1	3	2	3	3	5	5	7	8	10	9	7	8	5	5	8	9	S	8	15	18	1	18	6.2
Dec 18	20	6	3	2	4	52	41	5	4	3	6	9	10	2	3	4	7	4	1	S	1	5	5	7	1	52	8.9
Dec 19	1	8	1	0	0	1	1	2	3	19	C	C	C	C	C	C	5	6	S	1	2	3	3	10	0	19	-
Dec 20	4	5	7	5	6	9	7	2	2	8	2	2	2	2	4	2	49	S	8	29	12	12	13	10	2	49	8.8
Dec 21	10	9	9	10	11	15	16	8	6	14	11	5	4	3	3	3	S	2	2	2	1	2	1	1	1	16	6.4
Dec 22	7	4	4	6	8	9	6	10	48	10	8	8	12	4	5	S	6	6	5	9	8	7	6	5	4	48	8.7
Dec 23	7	8	8	8	5	6	5	5	5	6	5	5	16	8	S	7	6	5	5	5	5	5	7	7	5	16	6.5
Dec 24	9	8	7	6	2	3	4	3	3	2	2	2	2	S	2	3	2	2	2	2	2	2	2	2	2	9	3.2
Dec 25	2	2	2	2	4	2	2	3	3	3	2	2	S	6	8	11	8	7	8	12	15	13	9	9	2	15	5.9
Dec 26	7	9	8	3	3	6	7	8	10	14	14	S	7	9	10	14	11	9	12	12	13	13	12	10	3	14	9.6
Dec 27	9	11	9	10	10	15	15	28	25	27	S	30	21	21	123	18	22	16	11	11	10	6	4	7	4	123	20.0
Dec 28	6	5	3	3	2	5	9	20	21	S	34	20	11	7	8	12	12	6	7	8	9	8	6	5	2	34	9.9
Dec 29	5	5	5	5	5	5	5	6	S	5	7	10	8	8	8	19	45	15	16	18	25	16	10	7	5	45	11.3
Dec 30	9	16	21	21	24	22	19	S	38	43	28	18	14	10	9	8	12	7	5	5	5	4	5	4	4	43	15.1
Dec 31	5	5	8	9	11	10	S	12	13	14	15	25	29	29	17	18	19	14	11	18	11	4	4	4	4	29	13.3
Diurnal Maximum	30	21	23	22	24	52	49	105	61	117	34	30	51	29	123	57	49	17	18	45	44	34	31	34			
Diurnal Average	8.2	6.9	6.5	6.2	6.4	9.2	10.5	12.6	14.8	17.1	11.4	10.0	14.1	9.3	14.0	11.7	10.9	7.1	6.7	9.4	8.6	7.9	8.6	8.2			

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 NOx - Maskwa Site*





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - December 2019

### Summary of Hourly Instantaneous Maximums

#### NITRIC OXIDE (NO) in ppb

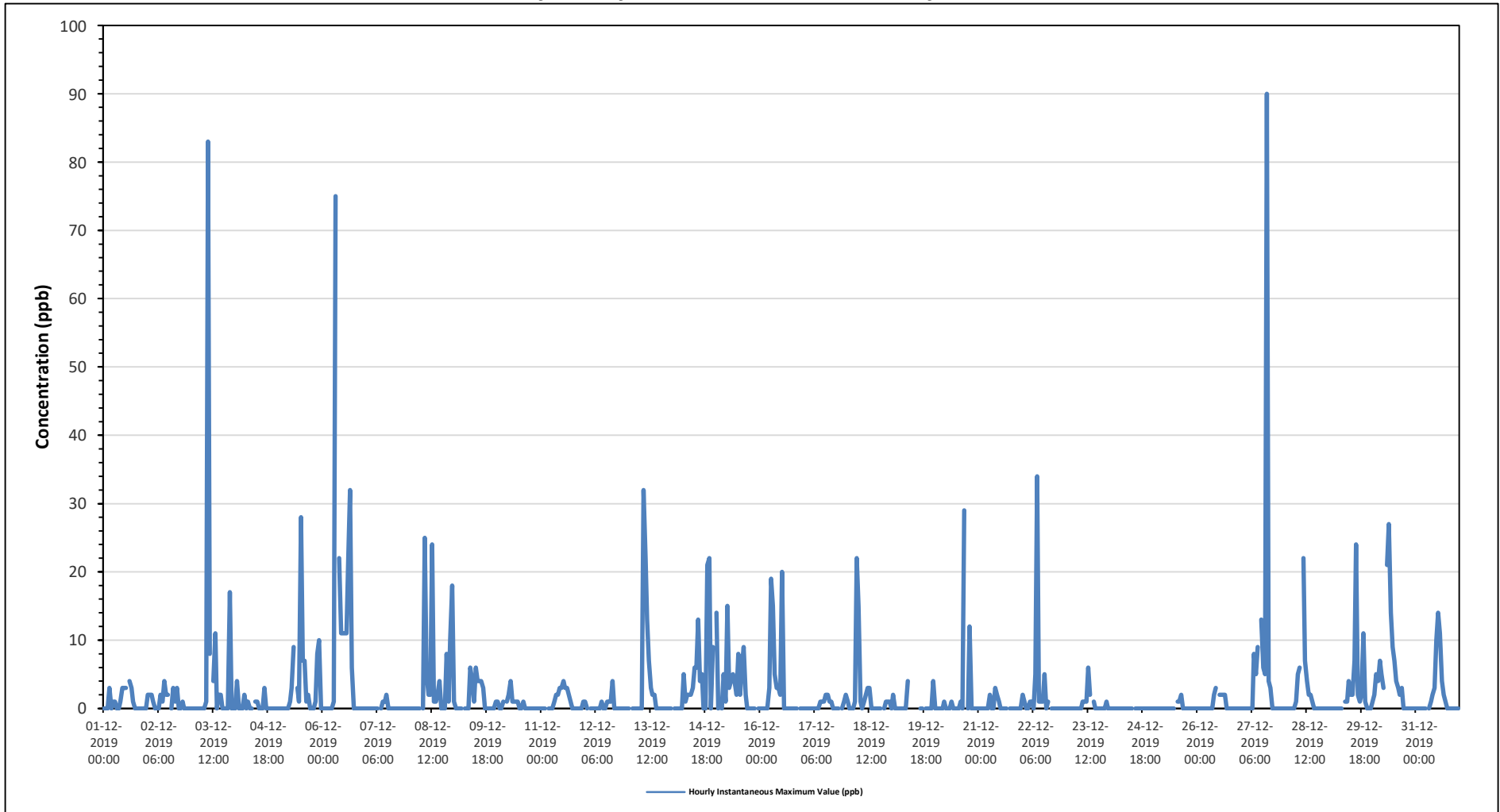
Maximum Hourly Value:	90 ppb on December 27 at hour 14	Hours in Service:	744
Maximum Daily Value:	8.8 ppb on December 6	Hours of Data:	706
Minimum Hourly Value:	0 ppb on December 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on December 24	Hours of Calibration:	38
Monthly Average:	2.3 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					
Dec 1	0	0	0	3	0	1	1	0	0	1	3	3	S	4	3	1	0	0	0	0	0	0	0	0	0	0	0	4	1.0
Dec 2	2	2	2	1	0	0	0	2	1	4	2	2	S	0	3	1	3	0	0	1	0	0	0	0	0	0	0	4	1.1
Dec 3	0	0	0	0	0	0	0	0	1	83	8	S	4	11	0	2	2	0	0	0	0	17	0	0	0	0	83	5.6	
Dec 4	0	4	0	0	0	2	0	1	0	0	S	1	1	0	0	0	3	0	0	0	0	0	0	0	0	0	4	0.5	
Dec 5	0	0	0	0	0	0	1	3	9	S	3	1	28	7	7	1	2	0	0	0	1	8	10	0	0	0	28	3.5	
Dec 6	0	0	0	0	0	0	1	75	S	22	11	11	11	11	22	32	6	0	0	0	0	0	0	0	0	0	75	8.8	
Dec 7	0	0	0	0	0	0	0	S	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.2	
Dec 8	0	0	0	0	0	0	S	0	25	5	2	2	24	1	1	2	4	0	0	0	8	1	10	18	0	25	4.5		
Dec 9	1	0	0	0	0	S	0	0	0	6	4	1	6	4	4	4	3	0	0	0	0	0	0	0	1	0	6	1.5	
Dec 10	1	0	0	1	S	1	2	4	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0.6	
Dec 11	0	0	0	S	0	0	0	1	2	2	3	3	4	3	3	2	1	0	0	0	0	0	0	0	1	0	4	1.1	
Dec 12	1	0	S	0	0	0	0	0	0	1	0	0	1	1	1	4	0	0	0	0	0	0	0	0	0	0	4	0.4	
Dec 13	0	S	0	0	0	0	0	0	32	22	13	7	3	2	2	0	0	0	0	0	0	0	0	0	0	0	32	3.5	
Dec 14	S	0	0	0	0	0	5	1	2	2	2	3	6	6	13	4	5	0	0	21	22	0	9	S	0	22	4.6		
Dec 15	14	0	1	0	5	1	15	3	4	5	4	2	8	2	6	9	2	0	0	0	0	0	0	S	0	0	15	3.5	
Dec 16	0	0	0	0	0	3	19	15	5	3	3	2	20	0	0	0	0	0	0	0	0	0	S	0	0	0	20	3.0	
Dec 17	0	0	0	0	0	0	0	0	0	1	1	1	2	2	1	1	0	0	0	0	0	S	0	1	2	0	2	0.5	
Dec 18	1	0	0	0	1	22	15	1	0	1	2	3	3	0	0	0	0	0	0	S	0	1	1	1	1	0	22	2.3	
Dec 19	0	2	0	0	0	0	0	0	0	4	C	C	C	C	C	C	0	0	S	0	0	0	0	0	4	0	4	-	
Dec 20	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	29	S	0	12	0	0	0	0	0	0	29	1.9	
Dec 21	0	0	0	0	0	0	2	0	0	3	2	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	3	0.3	
Dec 22	2	1	0	0	1	1	0	5	34	1	1	1	5	0	1	S	0	0	0	0	0	0	0	0	0	0	34	2.3	
Dec 23	0	0	0	0	0	0	0	0	0	1	1	1	6	2	S	1	0	0	0	0	0	0	0	1	0	0	6	0.6	
Dec 24	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	
Dec 25	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	2	0	0	0	0	0	0	0	0	0	2	0.2	
Dec 26	0	0	0	0	0	0	0	0	0	2	3	S	2	2	2	2	0	0	0	0	0	0	0	0	0	0	3	0.6	
Dec 27	0	0	0	0	0	0	8	5	9	S	13	6	5	90	4	3	0	0	0	0	0	0	0	0	0	0	90	6.2	
Dec 28	0	0	0	0	0	1	5	6	S	22	7	4	2	2	2	1	0	0	0	0	0	0	0	0	0	0	22	2.2	
Dec 29	0	0	0	0	0	0	0	0	S	1	1	4	2	2	7	24	2	1	2	11	1	0	0	0	0	0	24	2.5	
Dec 30	1	2	5	4	7	5	3	S	21	27	14	9	7	4	3	2	3	0	0	0	0	0	0	0	0	0	27	5.1	
Dec 31	0	0	0	0	0	0	S	0	1	2	3	10	14	11	4	2	1	0	0	0	0	0	0	0	0	0	14	2.1	
Diurnal Maximum	14	4	5	4	7	22	19	75	34	83	22	13	28	11	90	32	29	1	2	21	22	17	10	18					
Diurnal Average	0.8	0.4	0.3	0.3	0.5	1.2	2.2	4.3	5.1	7.3	3.9	3.3	6.1	2.8	6.2	3.6	2.3	0.0	0.1	1.5	1.1	0.9	1.1	0.9					

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 NO - Maskwa Site*







## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - December 2019

### Summary of Hourly Instantaneous Maximums

#### NITROGEN DIOXIDE (NO<sub>2</sub>) in ppb

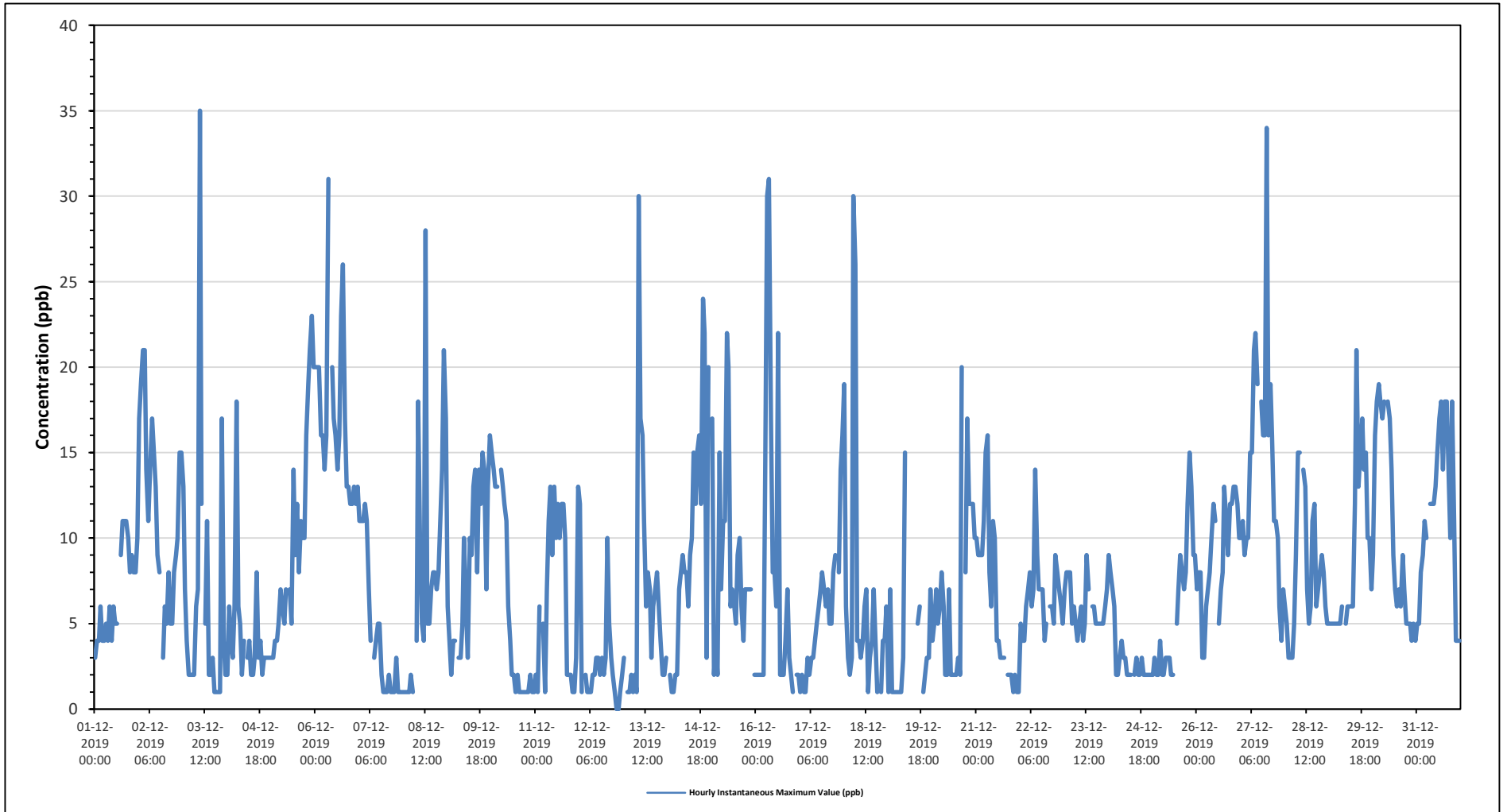
Maximum Hourly Value:	35 ppb on December 3 at hour 9	Hours in Service:	744
Maximum Daily Value:	17.0 ppb on December 6	Hours of Data:	706
Minimum Hourly Value:	0 ppb on December 12 at hour 20	Hours of Missing Data:	0
Minimum Daily Value:	2.7 ppb on December 12	Hours of Calibration:	38
Monthly Average:	7.7 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	
Dec 1	3	4	4	6	4	4	5	4	6	4	6	5	5	S	9	11	11	11	10	8	9	8	8	10	3	11	6.7	
Dec 2	17	19	21	21	14	11	14	17	15	13	9	8	S	3	6	5	8	5	5	8	9	10	15	15	3	21	11.7	
Dec 3	13	7	4	2	2	2	2	6	7	35	12	S	5	11	2	2	3	1	1	1	1	17	4	2	1	35	6.2	
Dec 4	2	6	4	3	6	18	6	5	2	4	S	3	4	2	2	3	8	3	4	2	3	3	3	3	2	18	4.3	
Dec 5	3	3	4	4	5	7	6	5	7	S	7	5	14	9	12	8	11	10	10	16	19	21	23	20	3	23	10.0	
Dec 6	20	20	20	16	16	14	16	31	S	20	17	16	14	16	23	26	17	13	13	12	12	13	12	13	12	31	17.0	
Dec 7	11	11	11	12	11	7	4	S	3	4	5	5	2	1	1	1	2	1	1	1	3	1	1	1	1	12	4.3	
Dec 8	1	1	1	1	2	1	S	4	18	10	5	4	28	5	5	7	8	8	7	8	11	14	21	17	1	28	8.1	
Dec 9	6	4	2	4	4	S	3	3	5	10	6	3	10	9	13	14	8	14	12	15	14	7	13	16	2	16	8.5	
Dec 10	15	14	13	13	S	14	13	12	11	6	4	2	2	1	2	1	1	1	1	1	2	1	1	1	1	1	15	5.7
Dec 11	2	1	6	S	5	1	7	11	13	9	13	10	12	10	12	12	10	2	2	2	1	1	3	13	1	13	6.9	
Dec 12	12	1	S	2	1	1	1	2	2	3	3	2	3	2	3	10	5	3	2	1	0	0	1	2	0	12	2.7	
Dec 13	3	S	1	1	2	1	2	1	30	17	16	11	6	8	7	3	6	7	8	6	4	2	2	3	1	30	6.4	
Dec 14	S	2	1	1	2	2	7	8	9	8	8	6	9	10	15	12	15	16	12	24	22	3	20	S	1	24	9.6	
Dec 15	17	2	4	2	15	7	11	11	22	20	6	7	6	5	9	10	6	4	7	7	7	7	S	2	2	22	8.4	
Dec 16	2	2	2	2	2	15	30	31	17	8	8	6	22	2	2	4	7	3	2	1	S	2	2	2	1	31	7.6	
Dec 17	1	2	1	1	3	2	3	3	4	5	6	7	8	7	6	7	5	5	8	9	S	8	14	16	1	16	5.7	
Dec 18	19	6	3	2	3	30	26	4	4	3	4	6	7	1	3	4	7	4	1	S	1	4	4	6	1	30	6.6	
Dec 19	1	7	1	1	1	1	1	1	3	15	C	C	C	C	C	C	5	6	S	1	2	3	3	7	1	15	-	
Dec 20	4	5	7	5	6	8	6	2	2	7	2	2	2	3	2	20	S	8	17	12	12	12	10	2	20	6.8		
Dec 21	10	9	9	9	11	15	16	8	6	11	10	4	4	3	3	S	2	2	2	1	2	1	1	1	1	16	6.2	
Dec 22	5	4	4	6	7	8	6	7	14	9	7	7	7	4	5	S	6	6	5	9	8	7	6	5	4	14	6.6	
Dec 23	7	8	8	8	5	6	5	4	5	6	4	5	9	7	S	6	6	5	5	5	5	5	6	7	4	9	6.0	
Dec 24	9	8	7	6	2	3	4	3	3	2	2	2	S	5	2	3	2	2	3	2	2	2	2	2	2	9	3.3	
Dec 25	2	3	2	2	4	2	2	3	3	3	2	2	S	5	7	9	8	7	8	12	15	13	9	9	2	15	5.7	
Dec 26	7	8	8	3	3	6	7	8	10	12	11	S	5	7	8	13	11	9	12	12	13	13	12	10	3	13	9.0	
Dec 27	10	11	9	10	10	15	15	21	22	19	S	18	16	16	34	16	19	16	11	11	10	6	4	7	4	34	14.2	
Dec 28	6	5	3	3	3	5	9	15	15	S	14	13	7	5	6	11	12	6	7	8	9	8	6	5	3	15	7.9	
Dec 29	5	5	5	5	5	5	5	6	S	5	6	6	6	6	12	21	13	15	17	14	15	10	10	7	5	21	8.9	
Dec 30	9	16	18	19	18	17	18	S	18	17	14	9	7	6	7	6	9	7	5	5	5	4	5	4	4	19	10.6	
Dec 31	5	5	8	9	11	10	S	12	12	12	13	15	17	18	14	18	18	14	10	18	11	4	4	4	4	18	11.4	
Diurnal Maximum	20	20	21	21	18	30	30	31	30	35	17	18	28	18	34	26	20	16	17	24	22	21	23	20				
Diurnal Average	7.6	6.6	6.4	6.0	6.1	7.9	8.6	8.6	9.9	10.3	7.9	6.8	8.5	6.5	8.0	8.5	8.8	7.0	6.7	8.0	7.5	7.0	7.6	7.3				

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 NO2 - Maskwa Site*





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**Maskwa Site - December 2019**

### Summary of Hourly Instantaneous Maximums

#### TOTAL HYDROCARBONS (THC) in ppm

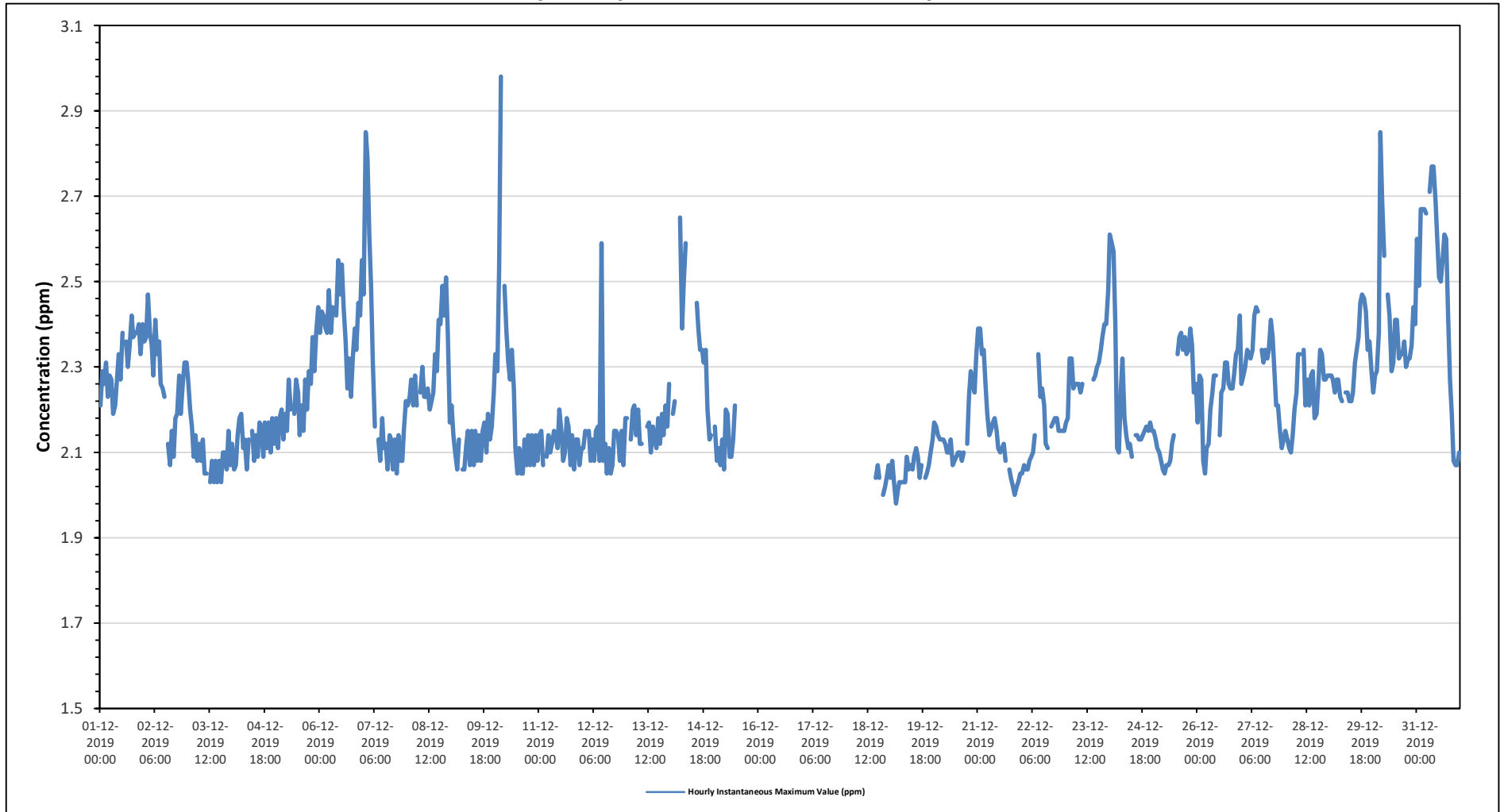
Maximum Hourly Value: 2.98 ppm on December 10 at hour 3	Hours in Service: 744
Maximum Daily Value: 2.49 ppm on December 31	Hours of Data: 625
Minimum Hourly Value: 1.98 ppm on December 19 at hour 3	Hours of Missing Data: 85
Minimum Daily Value: 2.06 ppm on December 19	Hours of Calibration: 34
Monthly Average: 2.23 ppm	Operational Uptime: 88.6

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	
Dec 1	2.21	2.29	2.26	2.31	2.23	2.28	2.27	2.19	2.21	2.27	2.33	2.27	2.38	S	2.36	2.30	2.35	2.42	2.37	2.38	2.38	2.40	2.33	2.40	2.19	2.42	2.31	
Dec 2	2.36	2.37	2.47	2.38	2.35	2.28	2.41	2.33	2.36	2.26	2.25	2.23	S	2.12	2.07	2.15	2.09	2.18	2.19	2.28	2.19	2.26	2.31	2.31	2.07	2.47	2.27	
Dec 3	2.27	2.20	2.16	2.09	2.14	2.08	2.12	2.08	2.13	2.05	2.05	S	2.03	2.08	2.03	2.08	2.03	2.08	2.03	2.10	2.10	2.06	2.15	2.07	2.03	2.27	2.10	
Dec 4	2.12	2.06	2.07	2.14	2.18	2.19	2.11	2.13	2.06	2.13	S	2.15	2.08	2.14	2.09	2.17	2.16	2.09	2.17	2.11	2.17	2.10	2.18	2.12	2.06	2.19	2.13	
Dec 5	2.18	2.11	2.18	2.20	2.13	2.19	2.15	2.27	2.20	S	2.19	2.27	2.24	2.14	2.21	2.15	2.27	2.20	2.29	2.26	2.37	2.29	2.38	2.44	2.11	2.44	2.23	
Dec 6	2.38	2.43	2.42	2.39	2.38	2.48	2.38	2.44	S	2.42	2.55	2.47	2.54	2.44	2.36	2.25	2.32	2.23	2.32	2.39	2.34	2.45	2.42	2.55	2.23	2.55	2.41	
Dec 7	2.47	2.85	2.79	2.61	2.49	2.31	2.16	S	2.13	2.08	2.18	2.11	2.12	2.06	2.14	2.13	2.06	2.13	2.05	2.14	2.08	2.15	2.22	2.05	2.85	2.24	2.05	
Dec 8	2.21	2.23	2.27	2.21	2.28	2.21	S	2.24	2.30	2.23	2.23	2.25	2.20	2.22	2.24	2.33	2.29	2.41	2.40	2.49	2.42	2.51	2.38	2.17	2.17	2.51	2.29	
Dec 9	2.21	2.14	2.10	2.06	2.13	S	2.06	2.06	2.12	2.15	2.07	2.15	2.07	2.15	2.08	2.14	2.08	2.15	2.17	2.10	2.19	2.13	2.16	2.24	2.06	2.24	2.13	
Dec 10	2.33	2.29	2.53	2.98	S	2.49	2.38	2.31	2.27	2.34	2.25	2.11	2.05	2.11	2.05	2.11	2.05	2.13	2.07	2.14	2.07	2.14	2.08	2.08	2.05	2.98	2.23	
Dec 11	2.14	2.15	2.07	S	2.09	2.14	2.10	2.12	2.15	2.14	2.11	2.20	2.15	2.08	2.10	2.18	2.16	2.07	2.14	2.06	2.13	2.13	2.07	2.11	2.06	2.20	2.12	
Dec 12	2.11	2.15	S	2.15	2.08	2.13	2.08	2.15	2.16	2.08	2.59	2.08	2.12	2.05	2.11	2.05	2.07	2.15	2.15	2.14	2.08	2.15	2.07	2.18	2.05	2.59	2.13	
Dec 13	2.18	S	2.13	2.20	2.21	2.14	2.20	2.12	2.12	X	X	X	X	2.17	2.10	2.16	2.13	2.11	2.18	2.12	2.19	2.14	2.21	2.16	2.26	2.10	2.26	
Dec 14	S	2.19	2.22	X	X	2.65	2.39	2.49	2.59	X	X	X	X	X	2.45	2.39	2.34	2.34	2.31	2.34	2.20	2.13	2.14	S	2.13	2.65	-	
Dec 15	2.16	2.08	2.11	2.07	2.13	2.06	2.20	2.19	2.09	2.09	2.13	2.21	X	X	X	X	X	X	X	X	X	X	X	X	2.06	2.21	-	
Dec 16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dec 17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dec 18	X	X	X	X	X	X	X	X	X	X	X	C	C	C	C	C	2.04	2.07	2.04	S	2.00	2.02	2.04	2.07	2.00	2.07	-	
Dec 19	2.04	2.08	2.03	1.98	2.01	2.03	2.03	2.03	2.03	2.09	2.06	2.07	2.06	2.09	2.11	2.09	2.04	2.07	S	2.04	2.05	2.07	2.10	2.13	1.98	2.13	2.06	
Dec 20	2.17	2.16	2.14	2.13	2.13	2.12	2.10	2.10	2.13	2.07	2.08	2.09	2.10	2.10	2.10	2.08	2.10	S	2.12	2.23	2.29	2.26	2.24	2.33	2.07	2.33	2.15	
Dec 21	2.39	2.39	2.33	2.34	2.26	2.19	2.14	2.15	2.17	2.18	2.15	2.11	2.10	2.11	2.12	2.08	S	2.06	2.04	2.02	2.00	2.02	2.03	2.05	2.00	2.39	2.15	
Dec 22	2.05	2.07	2.06	2.06	2.08	2.09	2.10	2.14	Y	2.33	2.23	2.25	2.21	2.12	2.11	S	2.16	2.17	2.18	2.18	2.15	2.15	2.15	2.15	2.05	2.33	2.15	
Dec 23	2.17	2.18	2.32	2.32	2.25	2.26	2.26	2.26	2.24	2.26	C1	C1	C1	C1	S	2.27	2.28	2.30	2.31	2.34	2.37	2.40	2.40	2.48	2.17	2.48	2.30	
Dec 24	2.61	2.59	2.57	2.40	2.11	2.10	2.25	2.32	2.18	2.14	2.11	2.12	2.09	S	2.14	2.14	2.13	2.13	2.14	2.15	2.16	2.15	2.17	2.15	2.09	2.61	2.22	
Dec 25	2.15	2.13	2.11	2.10	2.08	2.06	2.05	2.07	2.07	2.08	2.12	2.14	S	2.33	2.37	2.38	2.34	2.37	2.33	2.34	2.39	2.35	2.24	2.26	2.05	2.39	2.21	
Dec 26	2.17	2.28	2.27	2.08	2.05	2.11	2.12	2.20	2.24	2.28	2.28	S	2.14	2.24	2.25	2.31	2.31	2.26	2.25	2.25	2.28	2.33	2.34	2.42	2.05	2.42	2.24	
Dec 27	2.26	2.28	2.30	2.34	2.33	2.32	2.34	2.42	2.44	2.43	S	2.34	2.31	2.34	2.32	2.34	2.41	2.37	2.29	2.21	2.21	2.15	2.11	2.13	2.11	2.44	2.30	
Dec 28	2.15	2.13	2.11	2.10	2.14	2.20	2.24	2.33	2.33	S	2.34	2.21	2.27	2.21	2.28	2.29	2.18	2.19	2.25	2.34	2.33	2.27	2.27	2.28	2.10	2.34	2.24	
Dec 29	2.28	2.28	2.27	2.24	2.27	2.27	2.23	2.22	S	2.24	2.24	2.22	2.22	2.24	2.31	2.34	2.37	2.45	2.47	2.46	2.43	2.34	2.36	2.29	2.22	2.47	2.31	
Dec 30	2.24	2.28	2.29	2.38	2.85	2.69	2.56	S	2.47	2.42	2.29	2.31	2.41	2.41	2.32	2.33	2.33	2.36	2.30	2.32	2.32	2.35	2.44	2.40	2.24	2.85	2.39	
Dec 31	2.60	2.49	2.67	2.67	2.67	2.66	S	2.71	2.77	2.77	2.69	2.61	2.51	2.50	2.56	2.61	2.60	2.41	2.27	2.19	2.08	2.07	2.10	2.07	2.07	2.77	2.49	
Diurnal Maximum	2.61	2.85	2.79	2.98	2.85	2.69	2.56	2.71	2.77	2.77	2.69	2.61	2.54	2.50	2.56	2.61	2.60	2.45	2.47	2.49	2.43	2.51	2.44	2.55				
Diurnal Average	2.24	2.25	2.27	2.27	2.23	2.25	2.21	2.23	2.24	2.23	2.24	2.21	2.20	2.19	2.21	2.22	2.21	2.22	2.22	2.22	2.23	2.21	2.21	2.21	2.24			

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 - December 2019

## Summary of Hourly Instantaneous Maximums

### METHANE (CH4) in ppm

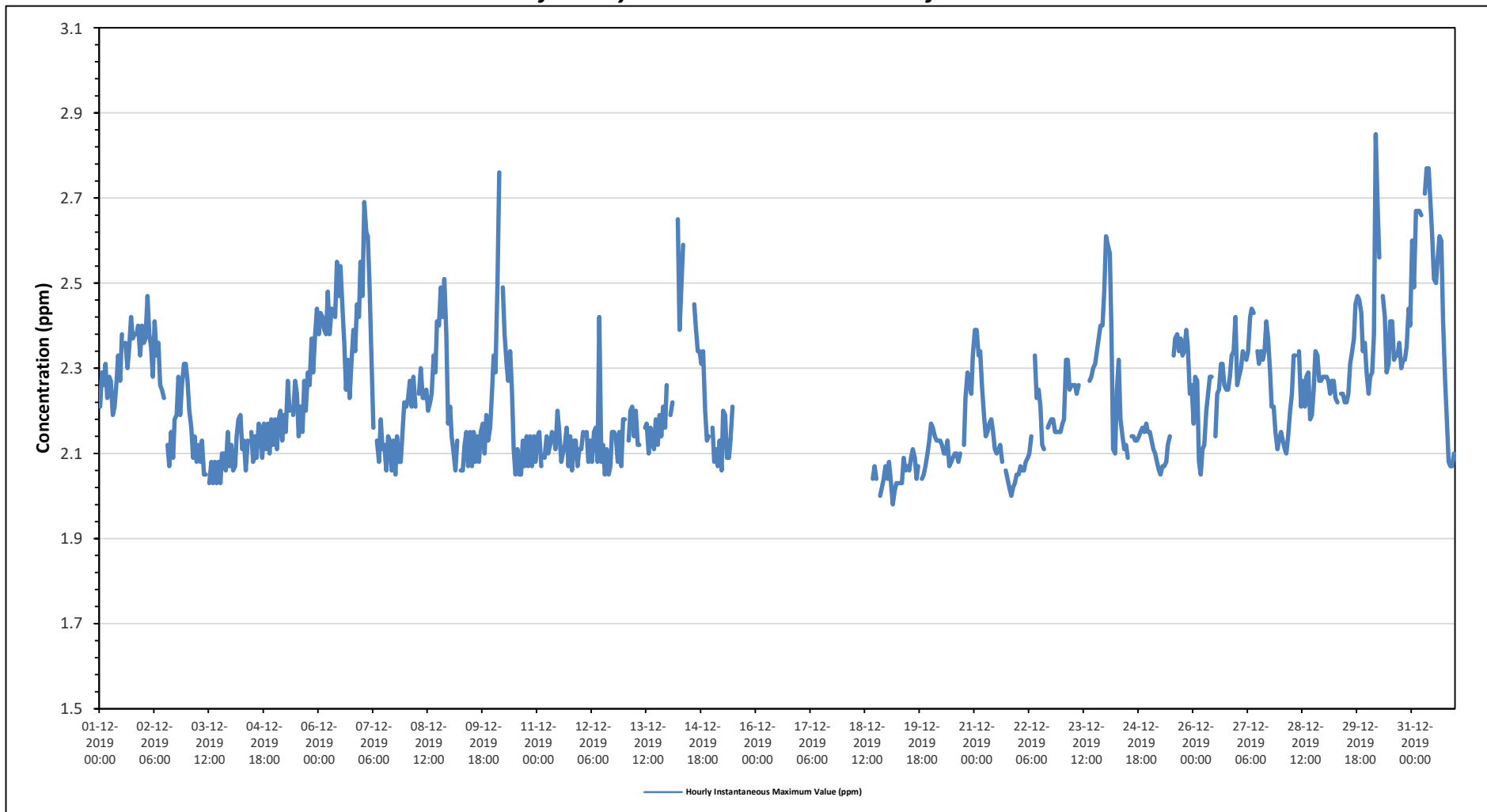
Maximum Hourly Value:	2.85 ppm on December 30 at hour 4	Hours in Service:	744
Maximum Daily Value:	2.49 ppm on December 31	Hours of Data:	625
Minimum Hourly Value:	1.98 ppm on December 19 at hour 3	Hours of Missing Data:	85
Minimum Daily Value:	2.06 ppm on December 19	Hours of Calibration:	34
Monthly Average:	2.23 ppm	Operational Uptime:	88.6

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	
Dec 1	2.21	2.29	2.26	2.31	2.23	2.28	2.27	2.19	2.21	2.27	2.33	2.27	2.38	S	2.36	2.30	2.35	2.42	2.37	2.38	2.38	2.40	2.33	2.40	2.19	2.42	2.31	
Dec 2	2.36	2.37	2.47	2.38	2.35	2.28	2.41	2.33	2.36	2.26	2.25	2.23	S	2.12	2.07	2.15	2.09	2.18	2.19	2.28	2.19	2.26	2.31	2.31	2.07	2.47	2.27	
Dec 3	2.27	2.20	2.16	2.09	2.14	2.08	2.12	2.08	2.13	2.05	2.05	S	2.03	2.08	2.03	2.08	2.03	2.08	2.03	2.10	2.10	2.06	2.15	2.07	2.03	2.27	2.10	
Dec 4	2.12	2.06	2.07	2.14	2.18	2.19	2.11	2.13	2.06	2.13	S	2.15	2.08	2.14	2.09	2.17	2.16	2.09	2.17	2.11	2.17	2.10	2.18	2.12	2.06	2.19	2.13	
Dec 5	2.18	2.11	2.18	2.20	2.13	2.19	2.15	2.27	2.20	S	2.19	2.27	2.24	2.14	2.21	2.15	2.27	2.20	2.29	2.26	2.37	2.29	2.38	2.44	2.11	2.44	2.23	
Dec 6	2.38	2.43	2.42	2.39	2.38	2.48	2.38	2.44	S	2.42	2.55	2.47	2.54	2.44	2.36	2.25	2.32	2.23	2.32	2.39	2.34	2.45	2.42	2.55	2.23	2.55	2.41	
Dec 7	2.47	2.69	2.62	2.61	2.49	2.31	2.16	S	2.13	2.08	2.18	2.11	2.12	2.06	2.14	2.13	2.06	2.13	2.05	2.14	2.08	2.15	2.22	2.05	2.69	2.23	2.05	
Dec 8	2.21	2.23	2.27	2.21	2.28	2.21	S	2.24	2.30	2.23	2.23	2.25	2.20	2.22	2.24	2.33	2.29	2.41	2.40	2.49	2.42	2.51	2.38	2.17	2.17	2.51	2.29	
Dec 9	2.21	2.14	2.10	2.06	2.13	S	2.06	2.06	2.12	2.15	2.07	2.15	2.07	2.15	2.08	2.14	2.08	2.15	2.17	2.10	2.19	2.13	2.16	2.24	2.06	2.24	2.13	
Dec 10	2.33	2.29	2.50	2.76	S	2.49	2.38	2.31	2.27	2.34	2.25	2.11	2.05	2.11	2.05	2.13	2.07	2.14	2.07	2.14	2.07	2.14	2.08	2.08	2.05	2.76	2.22	
Dec 11	2.14	2.15	2.07	S	2.09	2.14	2.10	2.12	2.15	2.14	2.11	2.20	2.15	2.08	2.10	2.12	2.16	2.07	2.14	2.06	2.13	2.13	2.07	2.11	2.06	2.20	2.12	
Dec 12	2.11	2.15	S	2.15	2.08	2.13	2.08	2.15	2.16	2.08	2.42	2.08	2.12	2.05	2.11	2.05	2.07	2.15	2.15	2.14	2.08	2.15	2.07	2.18	2.05	2.42	2.13	
Dec 13	2.18	S	2.13	2.20	2.21	2.14	2.20	2.12	2.12	X	X	X	X	2.17	2.10	2.16	2.13	2.11	2.18	2.12	2.19	2.14	2.21	2.16	2.26	2.10	2.26	2.16
Dec 14	S	2.19	2.22	X	X	2.65	2.39	2.49	2.59	X	X	X	X	X	2.45	2.39	2.34	2.34	2.31	2.34	2.20	2.13	2.14	S	2.13	2.65	-	
Dec 15	2.16	2.08	2.11	2.07	2.13	2.06	2.20	2.19	2.09	2.09	2.13	2.21	X	X	X	X	X	X	X	X	X	X	X	X	2.06	2.21	-	
Dec 16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dec 17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dec 18	X	X	X	X	X	X	X	X	X	X	X	C	C	C	C	C	2.04	2.07	2.04	S	2.00	2.02	2.04	2.07	2.00	2.07	-	
Dec 19	2.04	2.08	2.03	1.98	2.01	2.03	2.03	2.03	2.03	2.09	2.06	2.07	2.06	2.09	2.11	2.09	2.04	2.07	S	2.04	2.05	2.07	2.10	2.13	1.98	2.13	2.06	
Dec 20	2.17	2.16	2.14	2.13	2.13	2.12	2.10	2.10	2.13	2.07	2.08	2.09	2.10	2.10	2.10	2.08	2.10	S	2.12	2.23	2.29	2.26	2.24	2.33	2.07	2.33	2.15	
Dec 21	2.39	2.39	2.33	2.34	2.26	2.19	2.14	2.15	2.17	2.18	2.15	2.11	2.10	2.11	2.12	2.08	S	2.06	2.04	2.02	2.00	2.02	2.03	2.05	2.00	2.39	2.15	
Dec 22	2.05	2.07	2.06	2.06	2.08	2.09	2.10	2.14	Y	2.33	2.23	2.25	2.21	2.12	2.11	S	2.16	2.17	2.18	2.18	2.15	2.15	2.15	2.15	2.05	2.33	2.15	
Dec 23	2.17	2.18	2.32	2.32	2.25	2.26	2.26	2.26	2.24	2.26	C1	C1	C1	C1	S	2.27	2.28	2.30	2.31	2.34	2.37	2.40	2.40	2.48	2.17	2.48	2.30	
Dec 24	2.61	2.59	2.57	2.40	2.11	2.10	2.25	2.32	2.18	2.14	2.11	2.12	2.09	S	2.14	2.14	2.13	2.13	2.14	2.15	2.16	2.15	2.17	2.15	2.09	2.61	2.22	
Dec 25	2.15	2.13	2.11	2.10	2.08	2.06	2.05	2.07	2.07	2.08	2.12	2.14	S	2.33	2.37	2.38	2.34	2.37	2.33	2.34	2.39	2.35	2.24	2.26	2.05	2.39	2.21	
Dec 26	2.17	2.28	2.27	2.08	2.05	2.11	2.12	2.20	2.24	2.28	2.28	S	2.14	2.24	2.25	2.31	2.31	2.26	2.25	2.25	2.28	2.33	2.34	2.42	2.05	2.42	2.24	
Dec 27	2.26	2.28	2.30	2.34	2.33	2.32	2.34	2.42	2.44	2.43	S	2.34	2.31	2.34	2.32	2.34	2.41	2.37	2.29	2.21	2.21	2.15	2.11	2.13	2.11	2.44	2.30	
Dec 28	2.15	2.13	2.11	2.10	2.14	2.20	2.24	2.33	2.33	S	2.34	2.21	2.27	2.21	2.28	2.29	2.18	2.19	2.25	2.34	2.33	2.27	2.27	2.28	2.10	2.34	2.24	
Dec 29	2.28	2.28	2.27	2.24	2.27	2.27	2.23	2.22	S	2.24	2.24	2.22	2.22	2.24	2.31	2.34	2.37	2.45	2.47	2.46	2.43	2.34	2.36	2.29	2.22	2.47	2.31	
Dec 30	2.24	2.28	2.29	2.38	2.85	2.69	2.56	S	2.47	2.42	2.29	2.31	2.41	2.41	2.32	2.33	2.33	2.36	2.30	2.32	2.32	2.35	2.44	2.40	2.24	2.85	2.39	
Dec 31	2.60	2.49	2.67	2.67	2.67	2.66	S	2.71	2.77	2.77	2.69	2.61	2.51	2.50	2.56	2.61	2.60	2.41	2.27	2.19	2.08	2.07	2.10	2.07	2.07	2.77	2.49	
Diurnal Maximum	2.61	2.69	2.67	2.76	2.85	2.69	2.56	2.71	2.77	2.77	2.69	2.61	2.54	2.50	2.56	2.61	2.60	2.45	2.47	2.49	2.43	2.51	2.44	2.55				
Diurnal Average	2.24	2.25	2.26	2.26	2.23	2.25	2.21	2.23	2.24	2.23	2.23	2.21	2.20	2.19	2.21	2.22	2.21	2.22	2.22	2.22	2.23	2.21	2.21	2.21	2.24			

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 - December 2019

### Summary of Hourly Instantaneous Maximums

#### NON-METHANE HYDROCARBONS (NMHC) in ppm

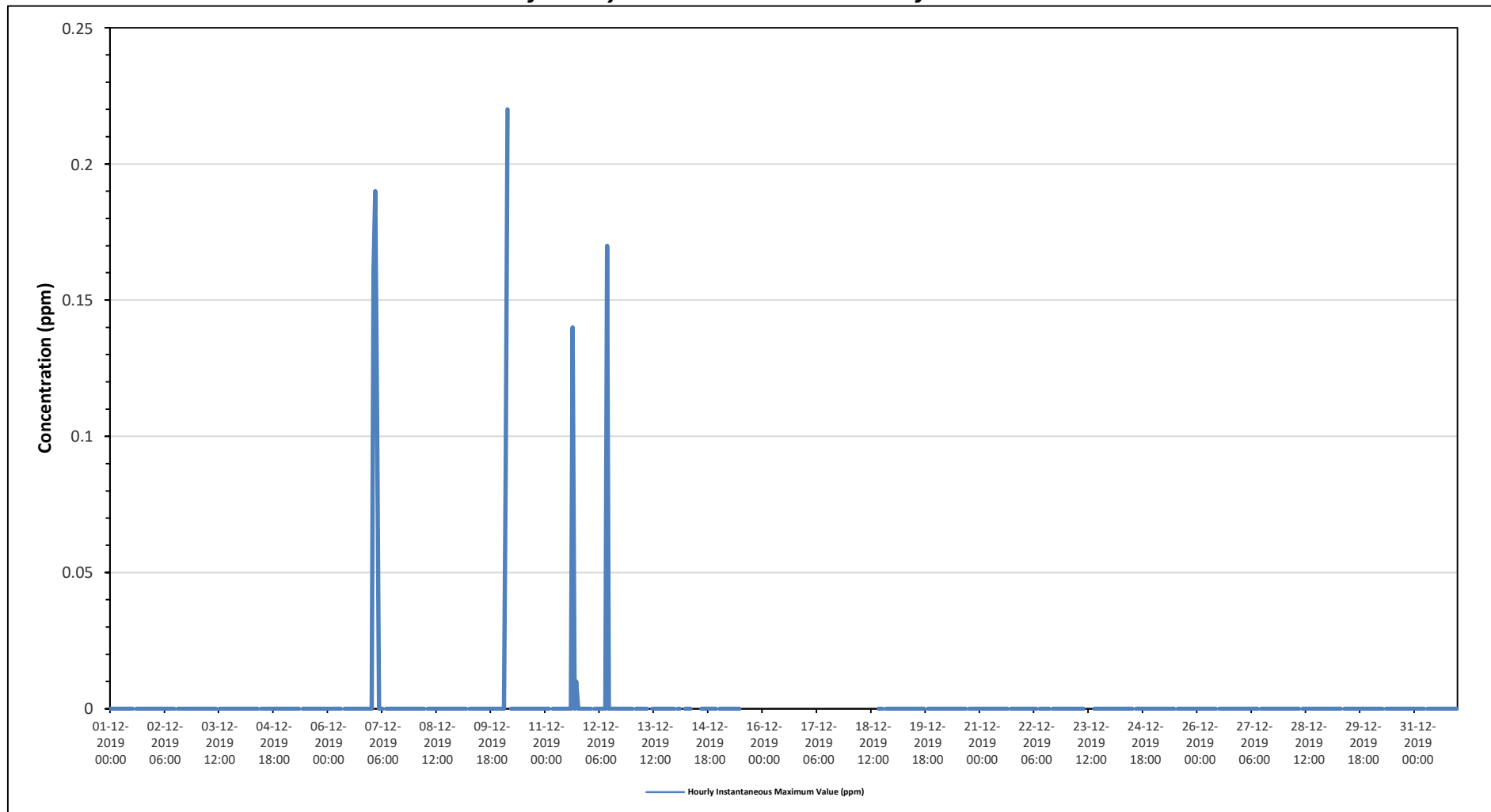
Maximum Hourly Value:	0.22 ppm on December 10 at hour 3	Hours in Service:	744
Maximum Daily Value:	0.02 ppm on December 7	Hours of Data:	625
Minimum Hourly Value:	0.00 ppm on December 1 at hour 0	Hours of Missing Data:	85
Minimum Daily Value:	0.00 ppm on December 1	Hours of Calibration:	34
Monthly Average:	0.00 ppm	Operational Uptime:	88.6

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						
Dec 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	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
Dec 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	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	
Dec 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	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	
Dec 4	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	0.00	0.00	0.00	0.00	
Dec 5	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	0.00	0.00	0.00	0.00	
Dec 6	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	0.00	0.00	0.00	0.00	
Dec 7	0.00	0.16	0.19	0.11	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	0.19	0.02	0.00	
Dec 8	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	0.00	0.00	0.00	0.00	0.00
Dec 9	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	0.00	0.00	0.00	0.00	0.00
Dec 10	0.00	0.00	0.09	0.22	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	0.22	0.01	0.00	
Dec 11	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	0.14	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	0.14	0.01	0.00	
Dec 12	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.01	0.00	
Dec 13	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	X	X	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Dec 14	S	0.00	0.00	X	X	0.00	0.00	0.00	0.00	0.00	X	X	X	X	X	0.00	0.00	0.00	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	
Dec 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	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.00	
Dec 16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.00
Dec 17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.00
Dec 18	X	X	X	X	X	X	X	X	X	X	X	C	C	C	C	C	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
Dec 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
Dec 20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
Dec 21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
Dec 22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Y	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
Dec 23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C1	C1	C1	C1	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
Dec 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	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
Dec 25	0.00	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	0.00	0.00	0.00	0.00
Dec 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	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
Dec 27	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	0.00	0.00	0.00	0.00	0.00
Dec 28	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	0.00	0.00	0.00	0.00	0.00
Dec 29	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	0.00	0.00	0.00	0.00	0.00
Dec 30	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	0.00	0.00	0.00	0.00	0.00
Dec 31	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	0.00	0.00	0.00	0.00	0.00
Diurnal Maximum	0.00	0.16	0.19	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.14	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
Diurnal Average	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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 - December 2019

### Summary of Hourly Instantaneous Maximums

#### WIND SPEED (WS) in km/hr

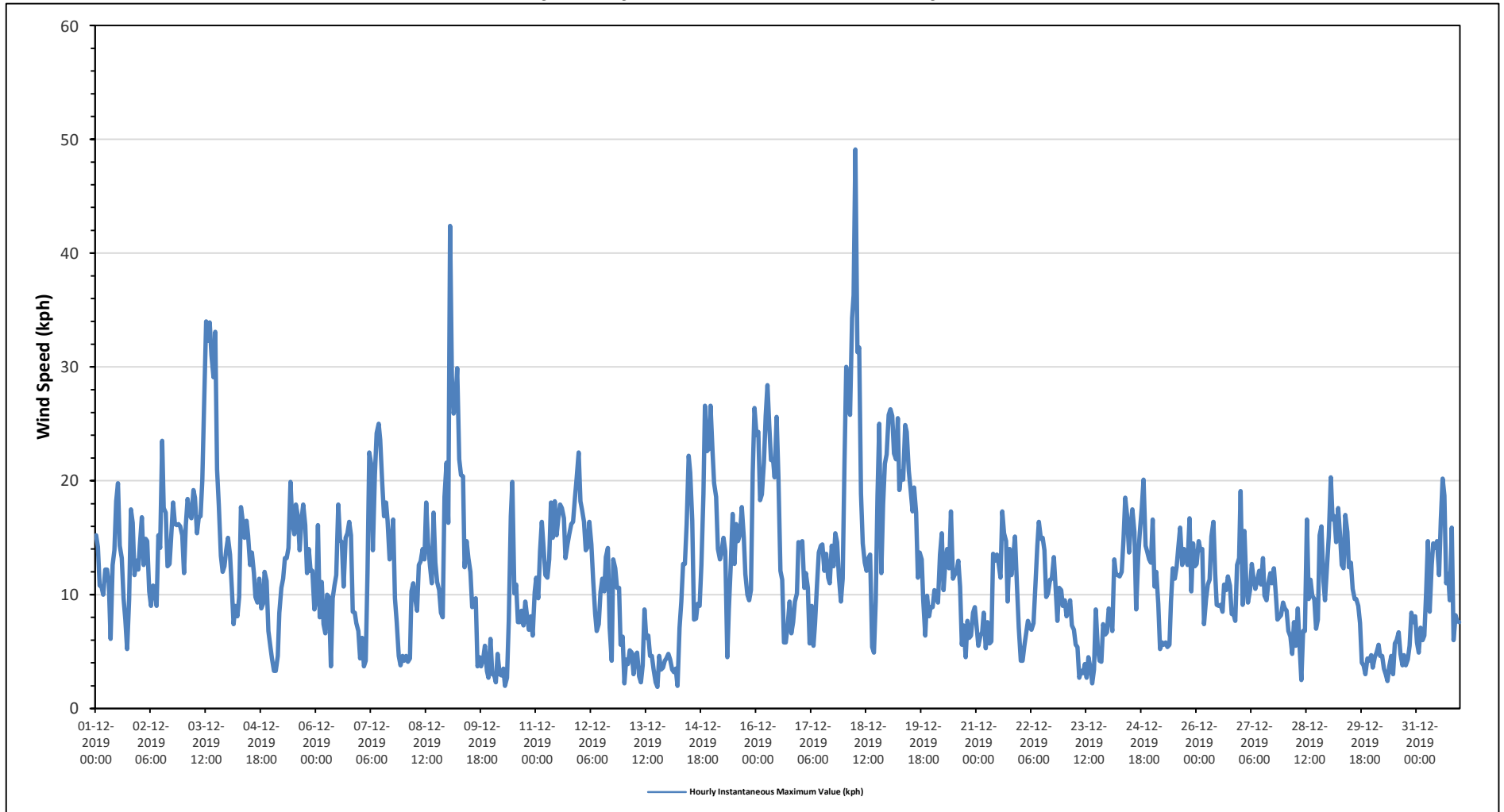
Maximum Hourly Value:	49.1 kph	on December 18 at hour 6	Hours in Service:	744
Maximum Daily Value:	21.2 kph	on December 18	Hours of Data:	744
Minimum Hourly Value:	1.9 kph	on December 13 at hour 18	Hours of Missing Data:	0
Minimum Daily Value:	4.2 kph	on December 13	Hours of Calibration:	0
Monthly Average:	12.1 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
Dec 1	15.2	14.2	10.8	10.7	10.0	12.2	12.2	11.0	6.1	12.6	13.9	18.2	19.8	14.3	13.2	9.7	7.8	5.2	9.6	17.5	16.3	11.7	13.0	12.2	5.2	19.8	12.4
Dec 2	14.3	16.8	12.6	14.9	14.7	10.3	9.0	10.8	10.5	9.0	15.2	14.1	23.5	17.6	17.2	12.5	12.7	14.9	18.1	16.2	16.1	16.2	16.0	15.2	9.0	23.5	14.5
Dec 3	11.9	16.1	18.4	17.0	16.7	19.2	18.5	15.4	16.8	16.9	20.1	26.7	34.0	32.3	33.9	31.0	29.1	33.1	21.0	17.8	13.4	12.0	12.5	13.9	11.9	34.0	20.7
Dec 4	15.0	13.5	10.6	7.4	9.0	8.1	9.8	17.7	16.5	15.0	16.5	15.2	12.6	13.7	11.9	9.8	9.3	11.4	8.8	9.2	12.0	11.2	6.8	5.4	5.4	17.7	11.5
Dec 5	4.4	3.3	3.3	4.6	8.4	10.6	11.4	13.2	13.2	14.1	19.9	16.3	15.3	17.9	16.9	13.9	16.7	17.9	16.1	11.9	14.0	12.1	12.1	8.7	3.3	19.9	12.3
Dec 6	9.5	16.1	8.0	11.1	7.4	6.6	10.0	9.8	3.7	9.7	10.8	11.7	17.9	14.8	14.6	10.7	15.0	15.4	16.4	15.2	8.5	8.4	7.5	6.8	3.7	17.9	11.1
Dec 7	4.4	6.2	3.7	4.2	11.9	22.5	21.4	13.9	20.5	24.2	25.0	23.6	19.8	16.9	18.1	16.5	13.1	14.5	16.6	9.7	7.6	4.6	3.8	4.6	3.7	25.0	13.6
Dec 8	4.2	4.6	4.1	4.4	10.3	11.0	9.6	8.6	12.6	12.9	14.0	13.1	18.1	14.6	12.5	11.0	17.2	12.8	11.1	10.4	8.4	8.0	18.6	21.6	4.1	21.6	11.4
Dec 9	16.3	42.4	29.2	25.9	27.1	29.9	21.9	20.5	20.4	12.4	14.7	13.2	12.0	8.9	9.5	9.7	3.7	4.5	3.7	4.3	5.5	3.3	2.7	6.1	2.7	42.4	14.5
Dec 10	3.0	2.9	2.3	4.8	3.0	2.9	3.5	2.0	2.7	7.7	16.9	19.9	10.1	10.9	7.6	7.6	8.6	7.3	9.4	8.1	6.9	8.1	6.4	10.2	2.0	19.9	7.2
Dec 11	11.5	9.7	13.8	16.4	14.1	11.7	11.5	13.1	18.1	15.0	18.2	15.2	16.7	17.9	17.6	16.7	13.2	14.4	15.3	16.2	16.4	18.4	20.2	22.5	9.7	22.5	15.6
Dec 12	18.2	17.5	16.4	13.9	14.2	16.4	14.4	11.3	8.3	6.8	7.4	10.2	11.4	10.3	13.3	14.1	7.1	4.2	13.1	12.3	10.6	10.6	5.6	6.3	4.2	18.2	11.4
Dec 13	2.2	4.3	3.9	5.1	4.9	3.0	4.7	4.9	2.8	2.3	3.8	8.7	6.2	6.4	4.6	4.6	3.4	2.3	1.9	4.6	3.4	3.6	4.2	4.4	1.9	8.7	4.2
Dec 14	4.8	4.3	3.4	3.2	3.5	2.0	7.1	9.4	12.7	12.7	16.2	22.2	20.7	16.5	7.8	7.9	9.2	9.0	12.6	18.8	26.6	22.6	22.8	26.6	2.0	26.6	12.6
Dec 15	22.5	19.8	18.6	14.0	13.1	13.7	15.0	13.8	4.5	8.7	12.3	17.1	12.7	16.2	14.7	15.3	17.7	15.0	11.8	10.0	9.5	10.4	20.7	26.4	4.5	26.4	14.7
Dec 16	24.0	24.3	18.3	18.8	21.6	25.7	28.4	24.9	21.8	21.9	20.3	25.6	20.4	12.1	11.3	5.8	5.8	7.4	9.4	6.6	7.6	9.4	10.1	14.6	5.8	28.4	16.5
Dec 17	14.5	14.7	10.6	11.9	10.6	5.7	9.0	5.5	7.4	10.9	13.7	14.3	14.4	12.1	13.6	11.5	11.0	14.3	12.5	15.4	14.6	11.6	9.4	11.4	5.5	15.4	11.7
Dec 18	21.4	30.0	27.2	25.8	34.3	36.3	49.1	31.3	31.7	18.9	14.5	12.8	12.1	13.2	13.5	5.4	4.9	9.4	18.7	25.0	11.9	17.9	21.5	22.3	4.9	49.1	21.2
Dec 19	25.8	26.3	25.7	22.4	21.9	25.5	19.2	20.8	20.1	24.9	24.3	20.9	19.3	17.3	19.4	17.2	11.5	13.7	13.1	9.5	6.4	9.9	8.1	8.9	6.4	26.3	18.0
Dec 20	8.9	10.4	10.0	9.3	13.5	15.4	10.4	12.8	14.0	12.3	17.3	11.4	11.7	12.0	13.0	10.7	5.6	7.3	4.5	7.7	6.2	6.4	8.4	8.9	4.5	17.3	10.3
Dec 21	7.2	5.5	6.4	6.7	8.4	5.3	7.6	5.7	5.9	13.6	13.0	13.5	12.7	11.5	17.3	15.4	14.7	9.4	14.0	11.7	13.5	15.1	10.7	7.1	5.3	17.3	10.5
Dec 22	4.2	4.2	5.5	6.6	7.7	7.1	6.9	7.5	10.6	14.3	16.4	14.9	15.0	13.9	9.8	10.1	11.3	11.4	13.3	11.0	7.7	10.6	10.4	9.0	4.2	16.4	10.0
Dec 23	9.5	8.1	8.7	9.5	7.3	6.9	5.6	5.4	2.7	3.3	3.1	3.9	2.7	4.5	3.6	2.2	3.4	8.7	5.3	4.2	4.1	7.4	6.5	6.7	2.2	9.5	5.6
Dec 24	8.8	8.2	6.8	13.1	11.8	11.7	11.6	12.0	14.8	18.5	17.0	13.7	16.2	17.5	15.5	8.7	13.3	15.4	17.6	20.1	14.3	13.8	13.1	12.8	6.8	20.1	13.6
Dec 25	16.6	10.7	12.0	9.2	5.2	5.8	5.6	5.8	5.4	5.6	9.4	12.3	11.4	12.4	14.2	15.9	12.6	14.0	13.6	12.6	16.7	10.3	14.5	12.5	5.2	16.7	11.0
Dec 26	12.7	14.7	13.9	14.0	7.4	9.6	10.9	11.3	15.1	16.4	11.8	9.1	9.0	9.1	8.5	10.9	10.4	11.6	10.8	8.3	8.3	7.7	12.6	13.2	7.4	16.4	11.1
Dec 27	19.1	9.1	15.6	10.6	9.3	10.4	12.7	11.2	10.5	11.2	12.1	10.9	13.2	9.9	9.5	11.0	11.9	11.0	12.3	10.2	7.8	8.0	8.2	9.3	7.8	19.1	11.0
Dec 28	8.8	8.6	6.8	6.3	4.8	7.6	5.5	8.8	5.5	2.5	6.8	6.8	16.6	9.6	11.3	9.9	9.6	7.0	7.8	15.2	16.0	11.2	9.5	12.5	2.5	16.6	9.0
Dec 29	15.1	20.3	16.6	16.9	14.6	17.6	15.3	12.6	12.3	17.0	15.5	12.4	12.8	10.5	9.6	9.6	9.0	7.5	4.0	3.8	3.0	4.4	4.2	4.7	3.0	20.3	11.2
Dec 30	3.6	4.5	4.9	5.6	4.6	4.6	3.5	3.0	2.4	3.7	4.6	3.0	5.7	6.0	6.7	4.8	3.8	4.7	3.8	4.3	5.5	8.4	7.6	8.1	2.4	8.4	4.9
Dec 31	5.8	4.9	7.1	6.0	6.4	10.1	14.7	8.5	12.6	14.5	14.1	14.7	11.7	16.6	20.2	18.7	11.0	11.8	9.5	15.9	6.0	8.2	7.7	7.6	4.9	20.2	11.0
Diurnal Maximum	25.8	42.4	29.2	25.9	34.3	36.3	49.1	31.3	31.7	24.9	25.0	26.7	34.0	32.3	33.9	31.0	29.1	33.1	21.0	25.0	26.6	22.6	22.8	26.6			
Diurnal Average	11.7	12.8	11.5	11.3	11.5	12.4	12.8	11.7	11.7	12.6	14.2	14.4	14.7	13.5	13.2	11.6	10.8	11.2	11.5	11.7	10.5	10.4	10.8	11.6			

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 WS - Maskwa Site**



ST. LINA STATION



## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

### Summary of Hourly Instantaneous Maximums

#### SULPHUR DIOXIDE (SO<sub>2</sub>) in ppb

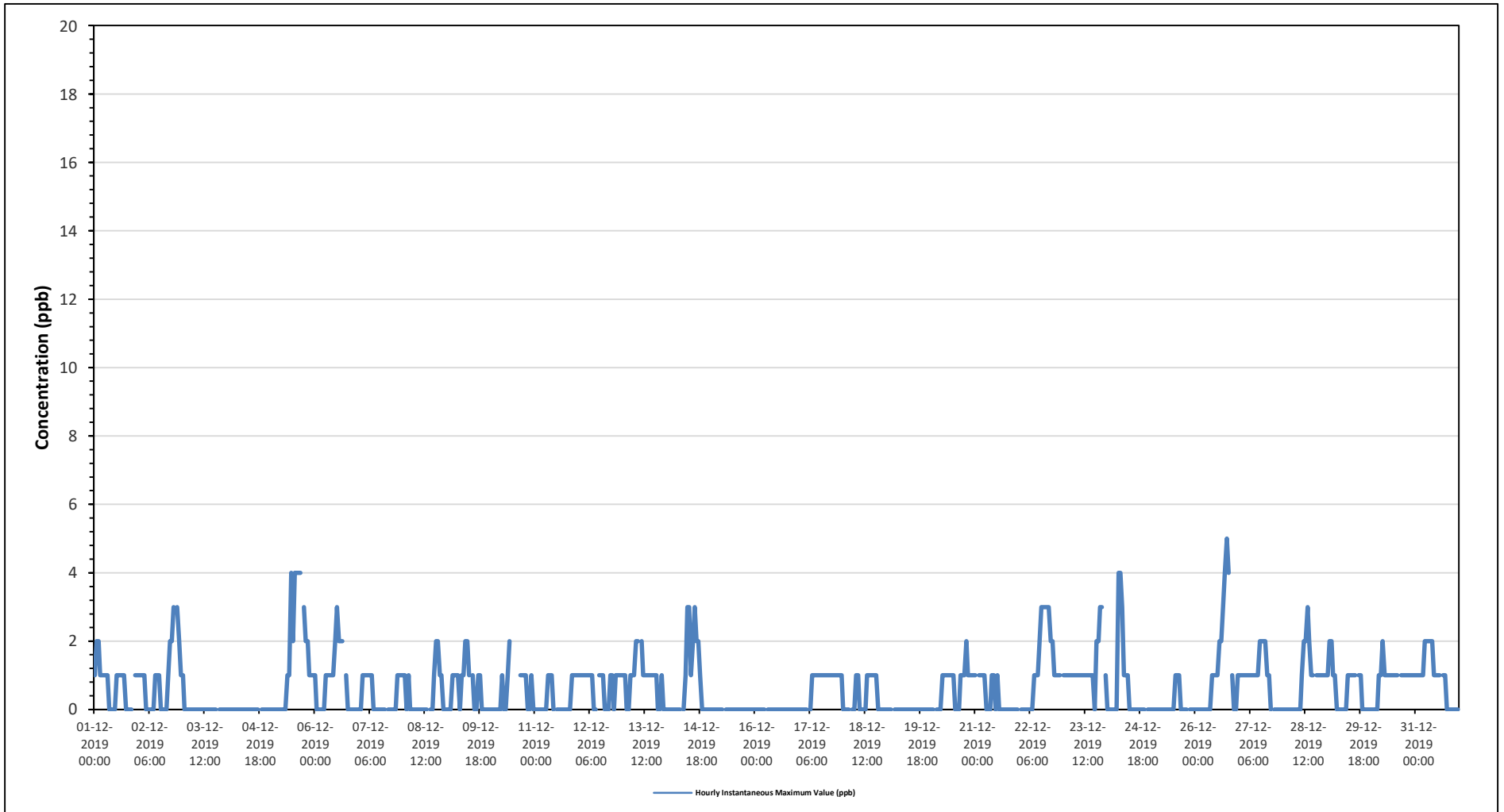
Maximum Hourly Value:	5 ppb on December 26 at hour 17	Hours in Service:	744
Maximum Daily Value:	1.5 ppb on December 5	Hours of Data:	708
Minimum Hourly Value:	0 ppb on December 1 at hour 8	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on December 4	Hours of Calibration:	36
Monthly Average:	0.6 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
Dec 1	1	2	2	1	1	1	1	1	0	0	0	0	1	1	1	1	1	0	0	0	0	S	1	1	0	2	0.7
Dec 2	1	1	1	1	0	0	0	0	0	1	1	1	0	0	0	0	1	2	2	3	S	3	2	1	0	3	0.9
Dec 3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0.0
Dec 4	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
Dec 5	0	0	0	0	0	0	0	0	0	1	1	4	2	4	4	4	4	S	3	2	2	1	1	1	0	4	1.5
Dec 6	1	0	0	0	0	0	1	1	1	1	1	2	3	2	2	2	S	1	0	0	0	0	0	0	0	3	0.8
Dec 7	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	1	1	0	1	0.4
Dec 8	1	1	0	1	0	0	0	0	0	0	0	0	0	0	S	0	0	1	2	2	1	1	0	0	0	2	0.4
Dec 9	0	0	0	1	1	1	0	1	1	2	2	1	S	1	0	0	1	1	1	0	0	0	0	0	0	2	0.6
Dec 10	0	0	0	0	0	0	1	0	0	1	2	C	C	C	C	C	1	1	1	1	0	0	1	0	0	2	0.5
Dec 11	0	0	0	0	0	0	0	1	1	1	0	S	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0.3
Dec 12	1	1	1	1	1	1	1	1	0	0	S	1	1	1	0	0	0	1	1	0	1	1	1	1	0	1	0.7
Dec 13	1	1	0	0	1	1	1	2	2	S	2	1	1	1	1	1	1	1	1	0	0	1	0	0	0	2	0.9
Dec 14	0	0	0	0	0	0	0	0	S	0	1	3	3	1	2	3	2	2	1	0	0	0	0	0	0	3	0.8
Dec 15	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 16	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 17	0	0	0	0	0	S	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0.7
Dec 18	0	0	0	0	S	0	0	1	1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	1	0.3
Dec 19	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 20	0	0	S	0	0	0	1	1	1	1	1	1	1	0	0	0	1	1	1	2	1	1	1	1	0	2	0.7
Dec 21	1	S	1	1	1	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3
Dec 22	S	0	0	0	0	0	0	0	1	1	1	2	3	3	3	3	3	2	2	1	1	1	1	1	S	3	1.3
Dec 23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	2	2	3	3	S	1	0	3	1.2	
Dec 24	0	0	0	0	0	0	4	4	3	1	1	0	0	0	0	0	0	0	0	0	0	S	0	0	4	0.6	
Dec 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	S	0	0	1	0.1	
Dec 26	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	3	4	5	4	S	1	0	0	1	5	1.1	
Dec 27	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	0	S	0	0	0	0	2	0.9	
Dec 28	0	0	0	0	0	0	0	0	0	0	1	2	2	3	2	1	1	S	1	1	1	1	1	1	0	3	0.8
Dec 29	1	2	2	1	1	0	0	0	0	0	0	1	1	1	1	1	S	1	1	0	0	0	0	0	2	0.6	
Dec 30	0	0	0	0	1	1	2	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	0	2	0.9
Dec 31	1	1	1	1	1	2	2	2	2	1	1	1	S	1	1	0	0	0	0	0	0	0	0	0	2	0.9	
Diurnal Maximum	1	2	2	1	1	2	4	4	3	2	2	4	3	4	4	4	4	5	4	3	3	3	3	2	1		
Daily Average	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.6	0.7	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.6	0.5	0.6	0.4	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

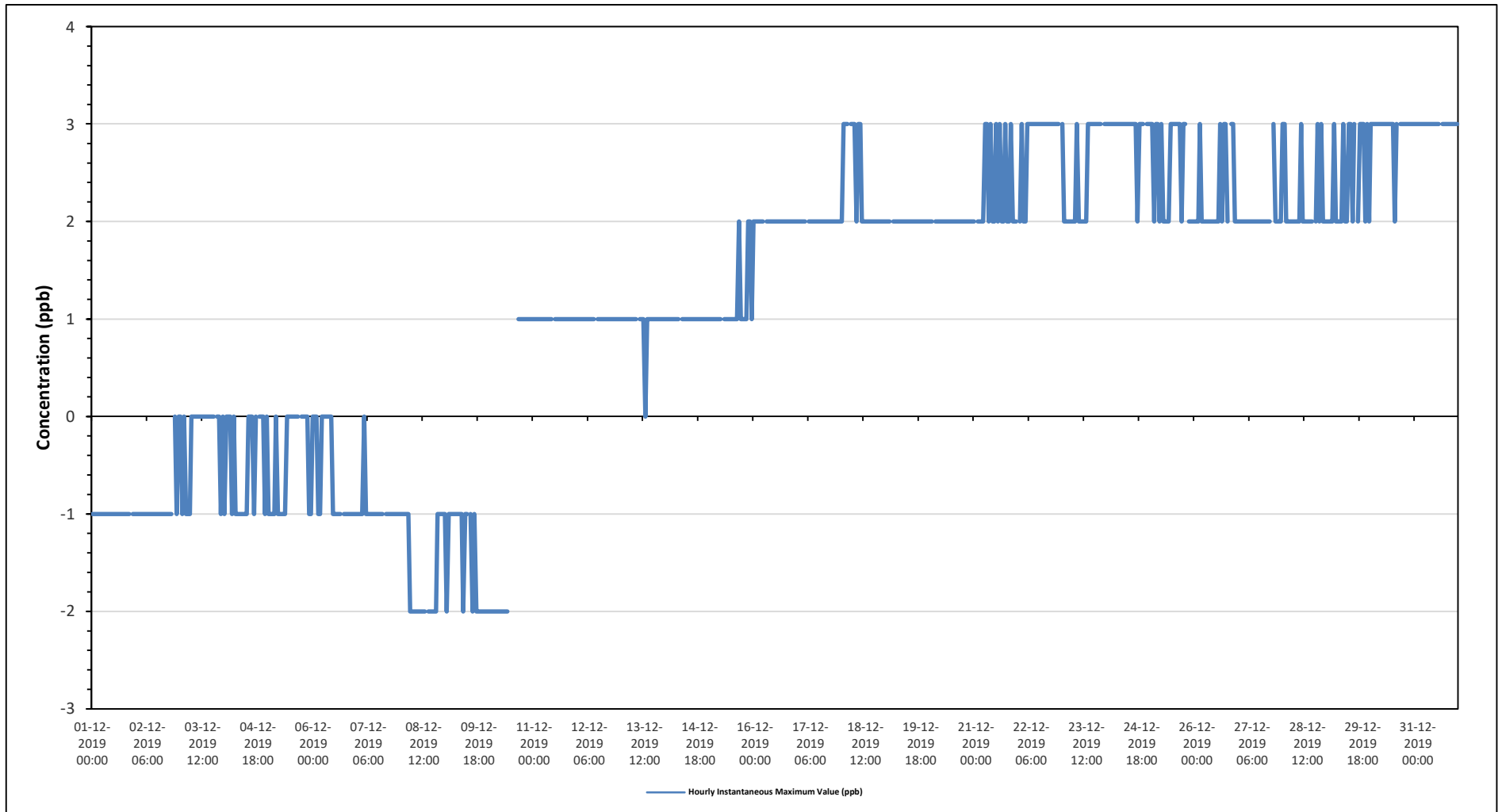
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.  
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

**Timeseries Chart of Hourly Instantaneous Maximum for SO<sub>2</sub> - St. Lina Site**





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





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

### Summary of Hourly Instantaneous Maximums

#### OXIDES OF NITROGEN (NOx) in ppb

Maximum Hourly Value:	60 ppb on December 6 at hour 9	Hours in Service:	744
Maximum Daily Value:	22.5 ppb on December 6	Hours of Data:	706
Minimum Hourly Value:	1 ppb on December 3 at hour 2	Hours of Missing Data:	0
Minimum Daily Value:	1.7 ppb on December 16	Hours of Calibration:	38
Monthly Average:	7.4 ppb	Operational Uptime:	100.0

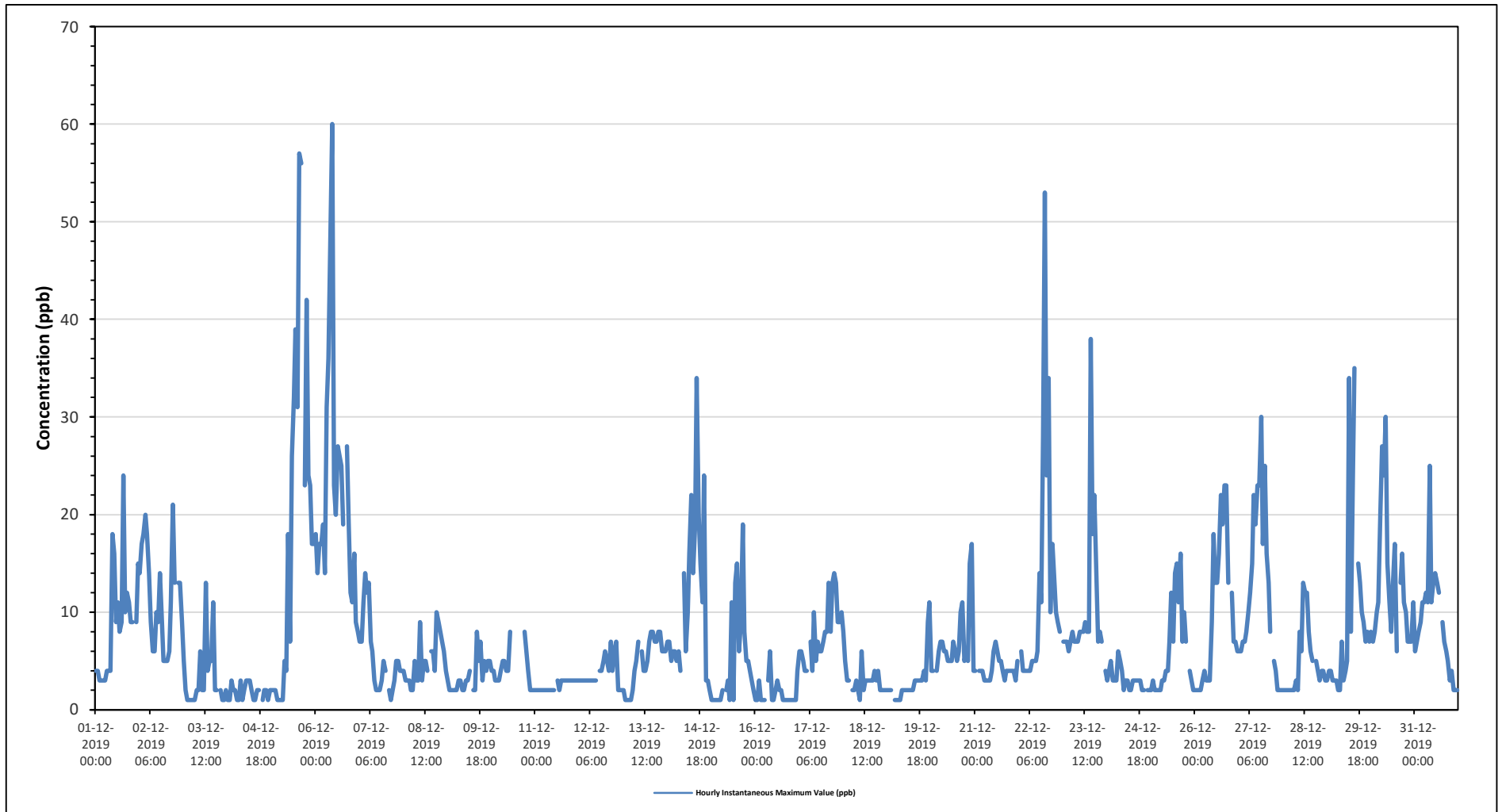
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Dec 1	4	4	3	3	3	3	4	4	4	18	16	9	11	8	9	24	10	12	11	9	9	S	9	15	3	24	8.8
Dec 2	14	17	18	20	18	14	9	6	6	10	9	14	9	5	5	6	11	21	13	S	13	13	9	5	21	11.5	
Dec 3	5	2	1	1	1	1	1	2	2	6	2	2	13	4	5	5	11	2	2	S	2	1	1	2	1	13	3.2
Dec 4	1	1	3	2	2	1	1	3	1	2	3	3	3	2	1	1	2	2	S	1	2	2	1	2	1	3	1.8
Dec 5	2	2	2	1	1	1	1	5	4	18	7	26	32	39	31	57	56	S	23	42	24	23	17	17	1	57	18.7
Dec 6	18	14	17	17	19	14	31	36	49	60	23	20	27	26	25	19	S	27	19	12	11	16	9	8	8	60	22.5
Dec 7	7	7	11	14	12	13	7	6	3	2	2	2	3	5	4	S	2	1	2	3	5	5	4	4	1	14	5.4
Dec 8	4	3	3	3	2	2	5	3	3	9	3	5	5	4	S	6	6	4	10	9	8	7	6	4	2	10	5.0
Dec 9	3	2	2	2	2	2	3	3	2	2	3	3	4	S	2	2	8	5	7	3	5	4	5	5	2	8	3.4
Dec 10	4	4	3	3	3	4	5	5	4	4	8	C	C	C	C	C	C	C	8	6	4	2	2	2	2	8	-
Dec 11	2	2	2	2	2	2	2	2	2	2	2	S	3	2	3	3	3	3	3	3	3	3	3	3	2	3	2.5
Dec 12	3	3	3	3	3	3	3	3	3	3	S	4	4	5	6	5	4	7	4	6	7	2	2	2	2	7	3.8
Dec 13	2	1	1	1	1	2	4	5	7	S	6	4	4	5	7	8	8	7	7	8	8	6	6	6	1	8	5.0
Dec 14	7	7	5	6	6	5	6	4	S	14	6	10	16	22	14	19	34	20	15	11	24	3	3	2	2	34	11.3
Dec 15	1	1	1	1	1	1	2	S	2	3	1	11	1	13	15	6	9	19	8	5	5	4	3	2	1	19	5.0
Dec 16	1	1	3	1	1	1	S	3	6	1	1	2	3	2	2	1	1	1	1	1	1	1	1	4	1	6	1.7
Dec 17	6	6	5	4	4	S	7	4	10	5	7	6	6	7	8	8	13	8	13	14	13	9	9	10	4	14	7.9
Dec 18	8	5	3	3	S	2	2	3	2	1	6	2	3	3	3	3	4	3	4	2	2	2	2	2	1	8	3.1
Dec 19	2	2	2	S	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	4	3	9	11	1	11	2.9
Dec 20	4	4	S	4	6	7	7	6	6	5	5	5	7	6	5	6	10	11	5	6	5	15	17	4	4	17	6.8
Dec 21	4	S	4	4	4	3	3	3	3	4	6	7	6	5	5	4	3	4	4	4	4	4	3	5	3	7	4.2
Dec 22	S	6	4	4	4	4	4	5	5	5	6	14	11	28	53	24	34	10	17	14	10	9	8	S	4	53	12.7
Dec 23	7	7	7	6	7	8	7	7	7	8	8	8	8	9	8	8	38	18	22	14	7	8	7	S	4	38	10.0
Dec 24	3	4	5	3	3	3	6	5	4	2	3	3	2	2	3	3	3	3	2	2	S	2	2	2	2	6	3.1
Dec 25	2	3	2	2	2	2	3	3	4	4	7	12	7	14	15	11	16	7	10	7	S	4	3	2	2	16	6.2
Dec 26	2	2	2	2	3	4	3	3	3	9	18	13	13	16	22	19	23	23	13	S	12	7	7	6	2	23	9.8
Dec 27	6	6	7	7	8	10	12	15	22	19	23	23	30	17	25	16	13	8	S	5	4	2	2	2	2	30	12.3
Dec 28	2	2	2	2	2	2	2	3	2	8	6	13	12	12	8	6	5	S	5	4	3	4	4	3	2	13	4.9
Dec 29	3	4	4	3	3	3	2	2	7	3	4	5	34	8	24	35	S	15	13	10	9	7	8	7	2	35	9.3
Dec 30	8	7	8	10	11	20	27	24	30	15	11	8	13	17	6	S	13	16	11	10	7	7	7	11	6	30	12.9
Dec 31	6	7	8	9	11	11	12	11	25	11	13	14	13	12	S	9	7	6	5	3	4	2	2	2	2	25	8.8
Diurnal Maximum	18	17	18	20	19	20	31	36	49	60	23	26	34	39	53	57	56	27	23	42	24	23	17	17			
Diurnal Average	4.7	4.5	4.7	4.8	4.9	5.0	6.1	6.2	7.7	8.5	7.2	8.6	10.2	10.3	11.3	12.4	11.6	9.3	9.0	7.8	7.1	6.0	5.6	5.3			

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 NOx - St. Lina Site*





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

### Summary of Hourly Instantaneous Maximums

#### NITRIC OXIDE (NO) in ppb

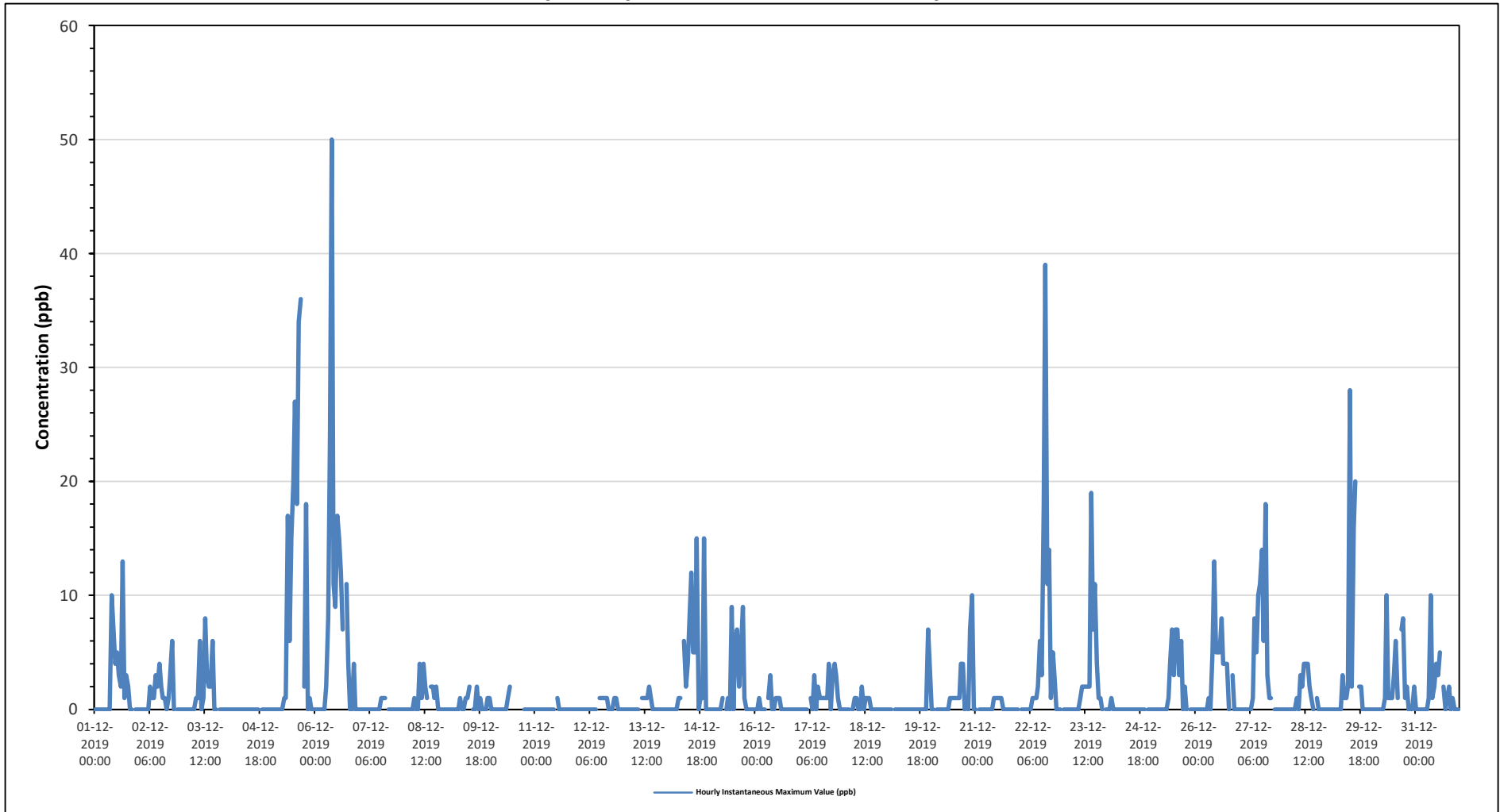
Maximum Hourly Value:	50 ppb on December 6 at hour 9	Hours in Service:	744
Maximum Daily Value:	8.5 ppb on December 5	Hours of Data:	706
Minimum Hourly Value:	0 ppb on December 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on December 4	Hours of Calibration:	38
Monthly Average:	1.8 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
Dec 1	0	0	0	0	0	0	0	0	0	10	7	4	5	3	2	13	1	3	2	0	0	S	0	0	0	13	2.2
Dec 2	0	0	0	0	0	0	2	1	1	3	2	4	2	1	1	0	1	3	6	0	S	0	0	0	0	6	1.2
Dec 3	0	0	0	0	0	0	0	1	1	6	0	1	8	3	2	2	6	0	0	S	0	0	0	0	0	8	1.3
Dec 4	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
Dec 5	0	0	0	0	0	0	0	1	1	17	6	15	20	27	18	34	36	S	2	18	0	1	0	0	0	36	8.5
Dec 6	0	0	0	0	0	0	2	8	24	50	11	9	17	15	12	7	S	11	4	0	0	4	0	0	0	50	7.6
Dec 7	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	S	0	0	0	0	0	0	0	0	0	1	0.1
Dec 8	0	0	0	0	0	0	1	0	0	4	1	4	2	1	S	2	2	1	2	0	0	0	0	0	0	4	0.9
Dec 9	0	0	0	0	0	0	0	1	0	0	1	2	S	0	0	2	0	1	0	0	0	0	1	1	0	2	0.4
Dec 10	0	0	0	0	0	0	0	0	0	1	2	C	C	C	C	C	C	C	0	0	0	0	0	0	0	2	-
Dec 11	0	0	0	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0
Dec 12	0	0	0	0	0	0	0	0	0	0	S	1	1	1	1	1	1	0	0	0	1	1	0	0	0	1	0.3
Dec 13	0	0	0	0	0	0	0	0	0	S	1	1	1	1	2	1	0	0	0	0	0	0	0	0	0	2	0.3
Dec 14	0	0	0	0	0	0	1	1	S	6	2	4	8	12	5	5	15	0	1	1	15	0	0	0	0	15	3.3
Dec 15	0	0	0	0	0	0	1	S	0	1	0	9	0	6	7	2	5	9	1	0	0	0	0	0	0	9	1.8
Dec 16	0	0	1	0	0	0	S	1	3	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	3	0.3
Dec 17	0	0	0	0	0	S	1	0	3	0	2	1	1	1	1	1	4	0	3	4	3	1	0	0	0	4	1.1
Dec 18	0	0	0	0	S	0	1	1	0	0	2	0	1	1	1	0	0	0	0	0	0	0	0	0	0	2	0.3
Dec 19	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	4	7	0.5
Dec 20	0	0	S	0	0	0	0	0	0	0	1	1	1	1	1	1	4	4	0	1	0	7	10	0	10	1.4	
Dec 21	0	S	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0.2
Dec 22	S	0	0	0	0	0	0	1	1	1	2	6	3	18	39	11	14	1	5	3	0	0	0	S	0	39	4.8
Dec 23	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	19	7	11	4	1	1	0	S	0	0	19	2.3
Dec 24	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0.0
Dec 25	0	0	0	0	0	0	0	0	0	1	4	7	3	7	7	3	6	0	2	0	S	0	0	0	0	7	1.7
Dec 26	0	0	0	0	0	0	0	1	0	5	13	5	5	5	8	4	4	4	0	S	3	0	0	0	0	13	2.5
Dec 27	0	0	0	0	0	0	0	1	8	5	10	11	14	6	18	3	1	1	S	0	0	0	0	0	0	18	3.4
Dec 28	0	0	0	0	0	0	0	1	0	3	2	4	4	4	2	1	0	S	1	0	0	0	0	0	0	4	1.0
Dec 29	0	0	0	0	0	0	0	0	3	1	1	2	28	2	16	20	S	2	2	0	0	0	0	0	0	28	3.3
Dec 30	0	0	0	0	0	0	0	1	10	1	1	1	3	6	1	S	7	8	1	2	0	0	0	2	0	10	1.9
Dec 31	0	0	0	0	0	0	0	1	10	1	2	4	3	5	S	2	0	1	2	0	0	0	0	0	0	10	1.4
Diurnal Maximum	0	0	1	0	0	0	2	8	24	50	13	15	28	27	39	34	36	11	6	18	15	7	10	4			
Diurnal Average	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.7	2.2	3.9	2.5	3.4	4.6	4.5	5.3	4.7	4.1	2.1	1.3	1.1	0.8	0.4	0.6	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 NO - St. Lina Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**St. Lina Site - December 2019**

### Summary of Hourly Instantaneous Maximums

#### NITROGEN DIOXIDE (NO<sub>2</sub>) in ppb

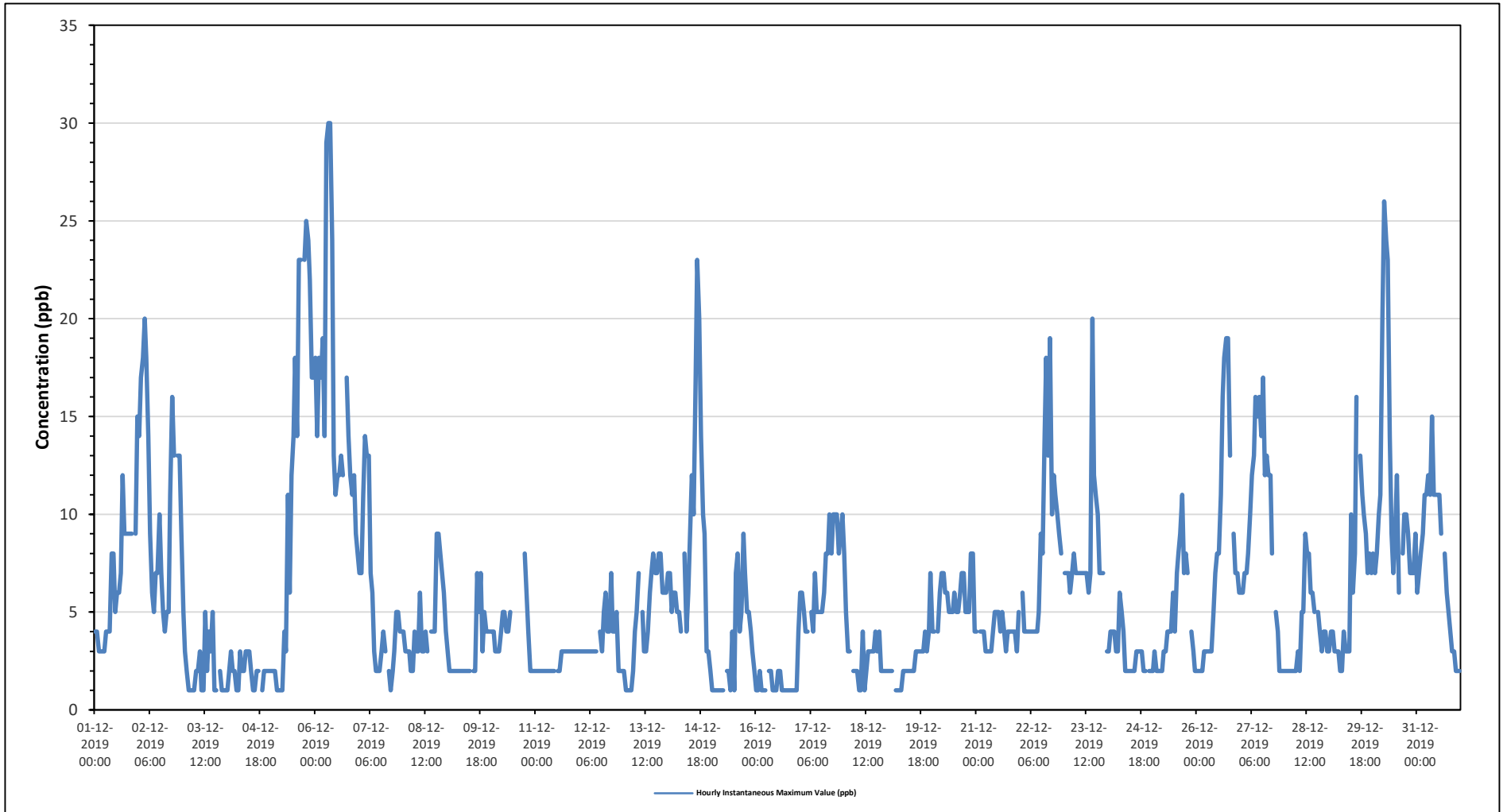
Maximum Hourly Value:	30 ppb on December 6 at hour 7	Hours in Service:	744
Maximum Daily Value:	16.0 ppb on December 6	Hours of Data:	706
Minimum Hourly Value:	1 ppb on December 3 at hour 3	Hours of Missing Data:	0
Minimum Daily Value:	1.3 ppb on December 16	Hours of Calibration:	38
Monthly Average:	5.9 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	
Dec 1	4	4	3	3	3	3	4	4	4	8	8	5	6	6	7	12	9	9	9	9	9	S	9	15	3	15	6.7	
Dec 2	14	17	18	20	18	14	9	6	5	7	7	10	7	5	4	5	5	11	16	13	S	13	13	9	4	20	10.7	
Dec 3	5	3	2	1	1	1	1	2	2	3	1	1	5	2	4	3	5	1	1	S	2	1	1	1	1	1	5	2.1
Dec 4	1	2	3	2	2	1	1	3	2	2	3	3	3	2	1	1	2	2	S	1	2	2	2	2	2	1	3	2.0
Dec 5	2	2	2	1	1	1	1	4	3	11	6	12	14	18	14	23	23	S	23	25	24	22	17	17	1	25	11.6	
Dec 6	18	14	18	17	19	14	29	30	30	24	13	11	12	18	13	12	S	17	14	12	11	12	9	8	8	30	16.0	
Dec 7	7	7	11	14	13	13	7	6	3	2	2	2	3	4	3	S	2	1	2	3	5	5	4	4	1	14	5.3	
Dec 8	4	3	3	3	2	2	4	3	3	6	3	3	4	3	S	4	4	4	9	9	8	7	6	4	2	9	4.4	
Dec 9	3	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	7	5	7	3	5	4	4	7	3.0	
Dec 10	4	4	3	3	3	4	5	5	4	4	5	C	C	C	C	C	C	C	C	8	6	4	2	2	2	8	-	
Dec 11	2	2	2	2	2	2	2	2	2	2	2	S	2	2	3	3	3	3	3	3	3	3	3	3	2	3	2.4	
Dec 12	3	3	3	3	3	3	3	3	3	3	S	4	3	5	6	4	4	7	4	4	5	2	2	2	2	7	3.6	
Dec 13	2	1	1	1	1	2	4	5	7	S	5	3	3	4	6	7	8	7	7	8	8	6	6	6	1	8	4.7	
Dec 14	7	7	5	6	6	5	5	4	S	8	4	6	9	12	10	17	23	20	14	10	9	3	3	2	2	23	8.5	
Dec 15	1	1	1	1	1	1	1	S	2	2	1	4	1	7	8	4	5	9	7	5	5	4	3	2	1	9	3.3	
Dec 16	1	1	2	1	1	1	S	2	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	4	1	4	1.3	
Dec 17	6	6	5	4	4	S	5	4	7	5	5	5	6	8	8	10	8	10	10	10	8	9	10	4	10	6.9		
Dec 18	8	5	3	3	S	2	2	2	1	1	4	1	2	3	3	3	4	3	4	2	2	2	2	2	1	8	2.8	
Dec 19	2	2	2	S	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	4	3	4	7	1	7	2.5	
Dec 20	4	4	S	4	6	7	7	6	6	5	5	5	5	6	5	6	7	7	5	5	5	8	8	4	8	8	5.7	
Dec 21	4	S	4	4	4	3	3	3	4	5	5	5	4	5	4	5	4	3	4	4	4	4	3	5	3	5	4.0	
Dec 22	S	6	4	4	4	4	4	4	4	4	5	9	8	14	18	13	19	10	12	11	10	9	8	S	4	19	8.4	
Dec 23	7	7	7	6	7	8	7	7	7	7	7	7	7	6	7	20	12	11	10	7	7	7	S	3	3	20	7.9	
Dec 24	3	4	4	4	3	3	6	5	4	2	2	2	2	2	2	3	3	3	2	2	S	2	2	2	2	6	3.0	
Dec 25	2	3	2	2	2	2	3	3	4	4	4	6	4	7	8	9	11	7	8	7	S	4	3	2	2	11	4.7	
Dec 26	2	2	2	2	3	3	3	3	3	5	7	8	8	11	16	18	19	19	13	S	9	7	7	6	2	19	7.7	
Dec 27	6	6	7	7	8	10	12	13	16	15	16	14	17	12	13	12	12	8	S	5	4	2	2	2	2	17	9.5	
Dec 28	2	2	2	2	2	2	2	3	2	5	5	9	8	8	6	6	5	S	5	4	3	4	4	3	2	9	4.1	
Dec 29	3	4	4	3	3	3	2	2	4	3	3	3	10	6	8	16	S	13	11	10	9	7	8	7	2	16	6.2	
Dec 30	8	7	8	10	11	20	26	24	23	14	9	7	9	12	6	S	8	10	10	9	7	7	7	9	6	26	11.3	
Dec 31	6	7	8	9	11	11	12	11	15	11	11	11	9	S	8	6	5	4	3	3	3	2	2	2	2	15	7.7	
Diurnal Maximum	18	17	18	20	19	20	29	30	30	24	16	14	17	18	18	23	23	20	23	25	24	22	17	17				
Diurnal Average	4.7	4.6	4.7	4.8	4.9	4.9	5.8	5.7	5.8	5.7	5.1	5.6	6.0	6.6	6.8	8.1	7.9	7.5	7.8	6.8	6.2	5.6	5.1	5.0				

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 NO2 - St. Lina Site*





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

### Summary of Hourly Instantaneous Maximums

#### OZONE (O<sub>3</sub>) in ppb

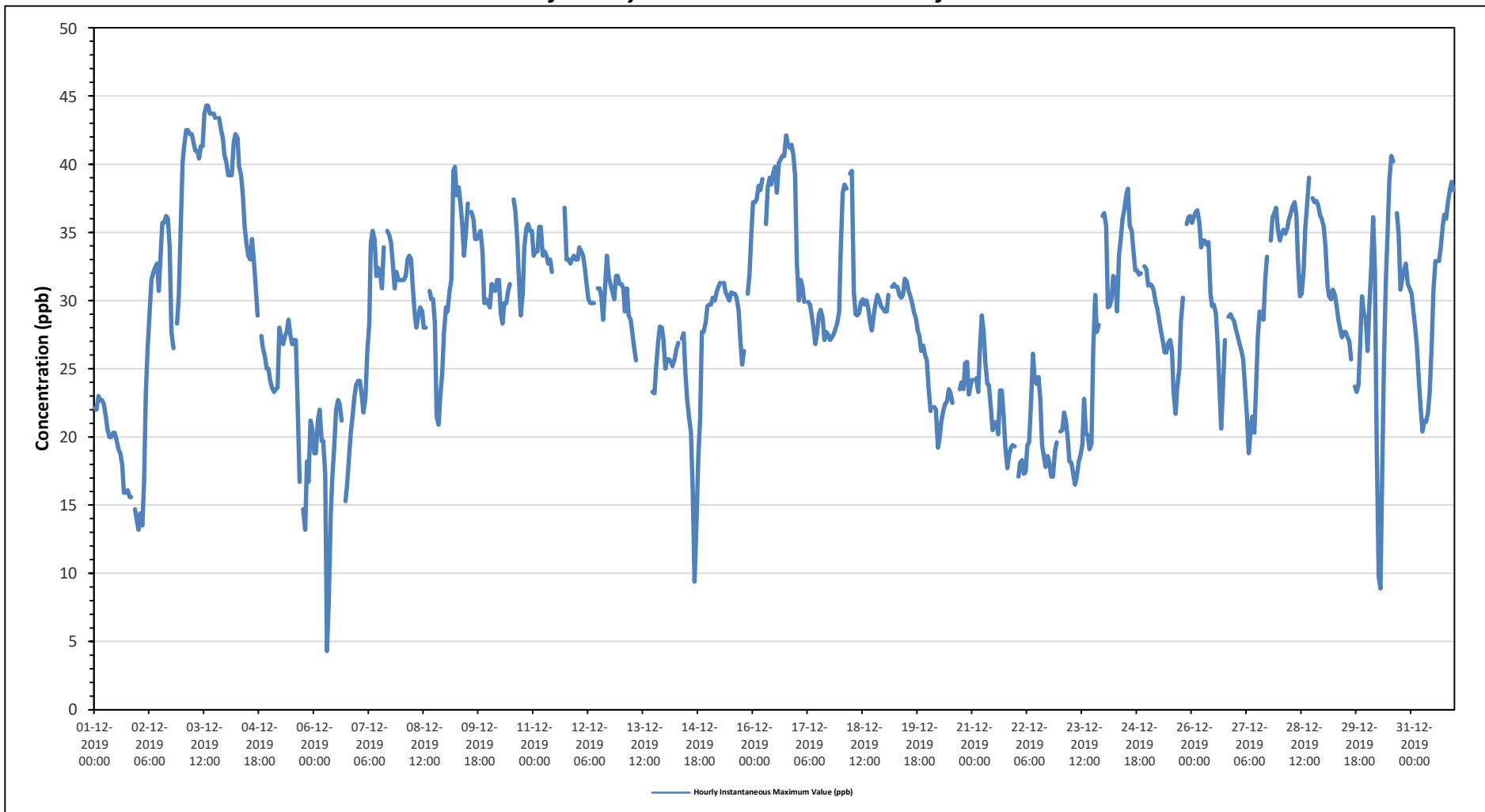
Maximum Hourly Value:	44.3 ppb	on December 3 at hour 13	Hours in Service:	744
Maximum Daily Value:	42.3 ppb	on December 3	Hours of Data:	697
Minimum Hourly Value:	4.3 ppb	on December 6 at hour 7	Hours of Missing Data:	9
Minimum Daily Value:	18.6 ppb	on December 6	Hours of Calibration:	38
Monthly Average:	29.0 ppb		Operational Uptime:	98.8

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	
Dec 1	22.1	22	23	22.7	22.7	22.4	21.5	20.6	20	20	20.3	20.3	19.7	19.1	18.8	17.9	15.9	15.9	16.1	15.6	15.6	S	14.7	13.8	13.8	23.0	19.2	
Dec 2	13.2	14.4	13.5	16.7	23.3	26.5	29.2	31.5	32.1	32.4	32.7	30.7	33.3	35.7	35.7	36.2	36	33.9	27.7	26.5	S	28.3	30.3	35.6	13.2	36.2	28.5	
Dec 3	40.1	41.3	42.5	42.5	42.2	42.2	41.6	41	41	40.4	41.3	41.3	43.7	44.3	44.3	43.7	43.7	43.7	43.4	S	43.4	42.5	41.9	40.7	40.1	44.3	42.3	
Dec 4	40.1	39.2	39.2	39.2	41.6	42.2	41.9	39.8	39.2	37.7	35.4	34.2	33.3	33	34.5	33	31.2	28.9	S	27.4	26.5	25.9	25	25	25.0	42.2	34.5	
Dec 5	24.1	23.6	23.3	23.5	23.6	28	27.1	26.8	27.4	27.7	28.6	27.4	26.8	27.1	21.8	21.8	16.7	S	14.7	13.2	18.2	16.7	21.2	20.6	13.2	28.6	23.3	
Dec 6	18.8	18.8	21.2	22	19.7	19.7	17.3	4.3	7.9	14.4	17	19.4	22	22.7	22.4	21.2	S	15.3	16.4	18.5	20.3	21.5	22.9	23.8	4.3	23.8	18.6	
Dec 7	24.1	24.1	22.9	21.8	22.9	26.2	28.3	34.2	35.1	34.5	31.8	32.4	32.1	30.9	33.9	S	35.1	34.8	34.2	32.7	30.9	32.1	31.5	31.5	21.8	35.1	30.3	
Dec 8	31.5	31.5	31.8	33	33.3	33	30.9	28.9	28	28.9	29.5	29.2	28	28	S	30.7	30.1	30.1	28.3	21.5	20.9	22.9	24.7	27.7	20.9	33.3	28.8	
Dec 9	29.5	29.2	30.7	31.5	39.5	39.8	37.7	38.3	37.1	35.6	33.3	35.1	37.1	S	36.5	36	34.5	34.5	34.8	35.1	33.6	29.8	30.1	29.8	29.2	39.8	34.3	
Dec 10	29.5	31.2	30.9	30.7	31.5	31.5	29.1	28.3	29.8	29.8	30.7	31.2	S	37.4	36.5	34.5	31.5	28.9	30.6	33.9	35.3	35.6	35.1	35.1	28.3	37.4	32.1	
Dec 11	33.3	33.6	33.6	35.4	35.4	33.3	33.6	33.3	32.7	33	32.1	S	X	X	X	X	X	X	36.8	33	33	32.7	33	33.3	33	32.1	36.8	33.6
Dec 12	33	33.9	33.6	33.3	32.4	31.2	30.1	29.8	29.8	29.8	S	30.9	30.9	30.3	28.6	30.7	33.3	31.8	31.2	30.7	30.1	31.8	31.8	31.2	28.6	33.9	31.3	
Dec 13	31.2	30.9	29.2	30.9	28.9	28.6	27.7	26.5	25.6	S	32.4	C	C	C	C	C	C	23.3	23.2	25	26.9	28.1	28	27.2	23.2	32.4	-	
Dec 14	25	25.7	25.7	25.5	25.2	25.7	26.4	26.9	S	27.2	27.6	24.7	22.7	21.5	20.3	16	9.4	13.2	18.6	21.3	27.7	27.7	28.4	29.6	9.4	29.6	23.6	
Dec 15	29.7	29.7	30.2	30	30.6	31	31.3	S	31.3	30.6	30.3	30	30.6	30.5	30.5	30.2	29.3	27.1	25.3	26.3	S1	30.5	31.9	34.8	25.3	34.8	30.1	
Dec 16	37.2	37.2	37.4	38.4	38.1	38.9	S	35.6	38.3	39	38.5	39.3	39.8	37.9	40.1	40.3	40.6	40.6	42.1	41.5	41.2	41.4	40.7	39.2	35.6	42.1	39.3	
Dec 17	32.7	30	31.5	31	29.9	S	29.9	29.7	29	28.1	26.8	27.6	29	29.3	28.7	27.1	27.7	27.5	27.1	27.3	27.5	27.9	28.3	29.2	26.8	32.7	28.8	
Dec 18	33.6	37.9	38.5	38.2	S	39.3	39.5	30.6	29	28.9	29.1	29.9	30.1	29.7	30	29.4	28.3	27.8	29	29.8	30.4	30	29.6	29.4	27.8	39.5	31.7	
Dec 19	29.2	29.2	30.4	S	31	31.2	31	31	30.4	30.2	30.4	31.6	31.4	30.7	30.3	29.8	29.1	28.7	27.8	27.4	26.3	26.7	26	25.6	25.6	31.6	29.4	
Dec 20	23.6	21.9	S	22.2	22	19.2	20	21.1	21.9	22.4	22.6	23.5	23.2	22.5	C1	C1	C1	23.5	24	23.5	25.4	25.5	23.1	23.9	19.2	25.5	22.8	
Dec 21	24.2	S	24.3	23.3	26.2	28.9	27.8	25.5	23.9	23.8	22.1	20.5	21	21.1	20.2	23.4	23.4	21.6	19.3	17.7	18.7	19.2	19.4	19.3	17.7	28.9	22.4	
Dec 22	S	17.1	18.1	18.3	17.3	17.4	19.4	19.6	22.8	26.1	24.2	23.9	24.4	22.8	19.4	18.6	17.8	18.6	18.1	17.1	17.1	19	19.6	S	17.1	26.1	19.9	
Dec 23	20.4	20.5	21.8	21.2	20	18.2	18.1	17.4	16.5	17.1	18.2	18.6	19.4	22.8	20.3	20.1	19.1	19.5	26.4	30.4	27.7	28.2	S	36.2	16.5	36.2	21.7	
Dec 24	36.4	35.5	29.5	29.6	30.1	31.8	31.6	29.2	33.4	34.4	36	36.7	37.8	38.2	35.5	35.1	33.6	32.2	32.2	31.9	32	S	32.5	32.3	29.2	38.2	33.4	
Dec 25	31.1	31.2	31.1	30.8	29.9	29.4	28.6	27.8	27	26.2	26.2	26.9	27.1	26.3	23.3	21.7	23.7	25	28.4	30.2	S	35.6	36.1	36.2	21.7	36.2	28.7	
Dec 26	35.7	36.1	36.5	36.6	35.7	33.9	34.4	34.4	34.1	34.3	30.5	29.6	29.7	29.1	26.9	23.8	20.6	24	27.1	S	28.8	29	28.7	28.5	20.6	36.6	30.8	
Dec 27	27.9	27.4	26.8	26.3	25.7	23.7	21.5	18.8	20.4	21.5	20.3	23.7	27.4	29.2	28.8	28.6	31.5	33.2	S	34.4	36.1	36.4	36.8	35.2	18.8	36.8	27.9	
Dec 28	34.4	34.9	35.2	34.9	35.3	35.9	36.4	36.9	37.2	36.3	33	30.3	30.5	32.3	35.3	37.2	39	S	37.5	37.2	37.3	37	36.3	36	30.3	39.0	35.5	
Dec 29	35.4	33.9	31.1	30.3	30.1	30.8	30.4	29.7	28.6	27.9	27.3	27.7	27.7	27.3	27	25.7	S	23.7	23.3	23.8	26.8	30.3	29	28.7	23.3	35.4	28.5	
Dec 30	26.3	29.6	32.6	36.1	32.2	19.6	9.8	8.9	17.6	25.8	31.3	35.5	38.8	40.6	40.2	S	36.4	34.8	30.8	31.6	32.3	32.7	31.2	30.9	8.9	40.6	29.8	
Dec 31	30.5	29.4	28	26.6	24	22.3	20.4	21.2	21.1	21.7	23.2	26.6	30.7	32.9	S	32.9	33.9	35.5	36.3	36	37.3	38.1	38.7	38.1	20.4	38.7	29.8	
Diurnal Maximum	40	41	43	43	42	42	42	41	41	40	41	41	44	44	44	44	44	44	44	43	42	43	43	42	41			
Diurnal Average	29.5	29.4	29.5	29.4	29.3	29.4	28.4	27.6	28.3	28.9	28.8	28.9	29.6	29.8	29.8	28.7	28.9	28.1	27.8	27.6	28.8	29.8	29.6	30.3				

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 O3 - St. Lina Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

### Summary of Hourly Instantaneous Maximums

#### TOTAL HYDROCARBONS (THC) in ppm

Maximum Hourly Value: 2.52 ppm on December 14 at hour 4	Hours in Service: 744
Maximum Daily Value: 2.34 ppm on December 23	Hours of Data: 707
Minimum Hourly Value: 1.98 ppm on December 3 at hour 8	Hours of Missing Data: 1
Minimum Daily Value: 2.00 ppm on December 3	Hours of Calibration: 36
Monthly Average: 2.14 ppm	Operational Uptime: 99.9

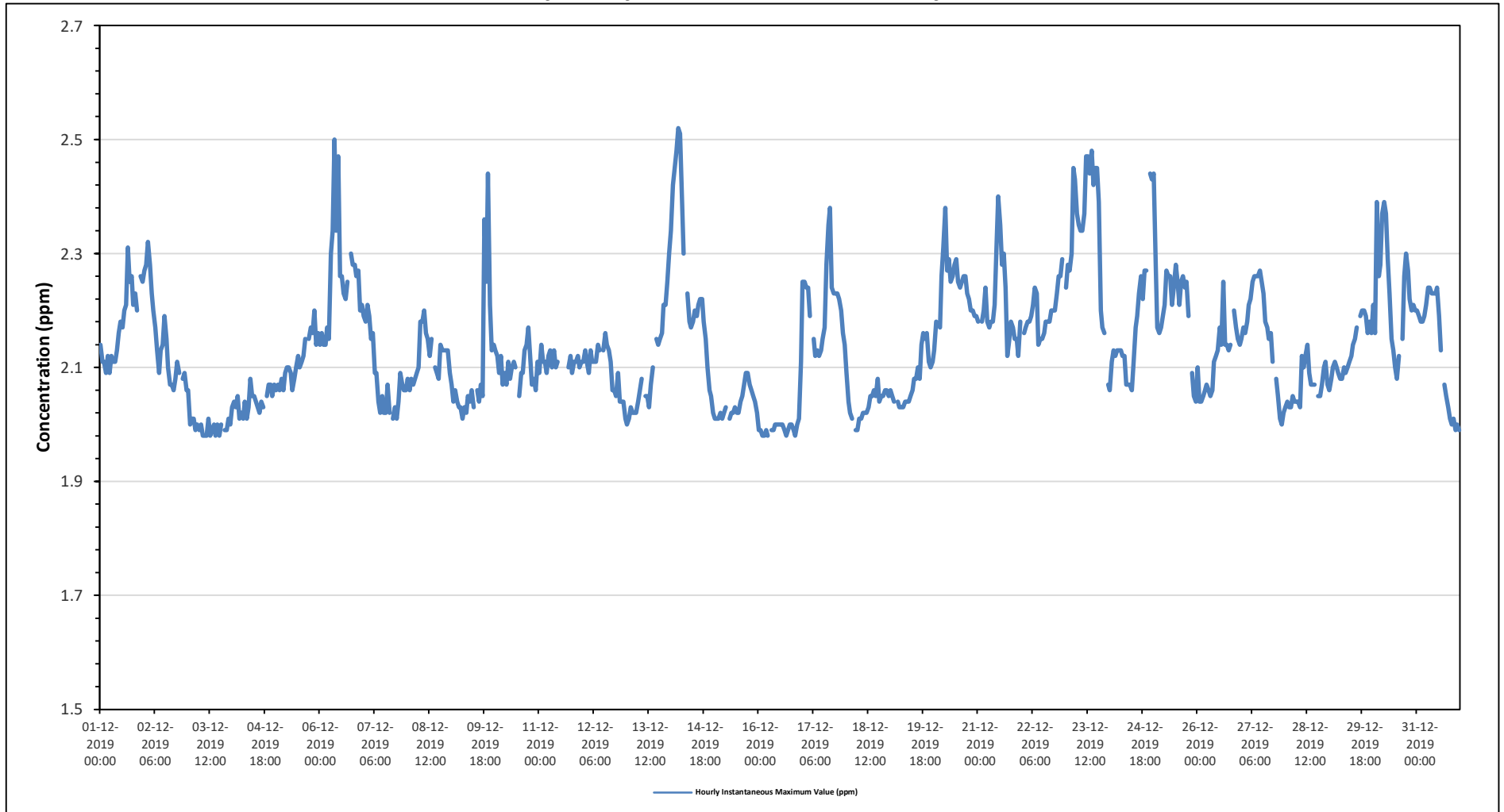
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Dec 1	2.14	2.11	2.11	2.09	2.12	2.09	2.12	2.11	2.11	2.13	2.16	2.18	2.17	2.20	2.21	2.31	2.25	2.26	2.21	2.23	2.20	S	2.26	2.25	2.09	2.31	2.17
Dec 2	2.27	2.28	2.32	2.28	2.23	2.20	2.17	2.13	2.09	2.13	2.14	2.19	2.15	2.10	2.07	2.07	2.06	2.08	2.11	2.09	S	2.08	2.09	2.06	2.06	2.32	2.15
Dec 3	2.06	2.00	2.01	2.01	1.99	2.00	1.99	2.00	1.98	1.98	1.98	2.01	1.98	1.99	2.00	1.98	2.00	1.98	2.00	S	1.99	2.01	2.00	1.98	2.06	2.00	
Dec 4	2.03	2.04	2.03	2.05	2.01	2.02	2.01	2.04	2.01	2.03	2.08	2.05	2.05	2.04	2.03	2.02	2.04	2.03	S	2.05	2.07	2.07	2.05	2.07	2.01	2.08	2.04
Dec 5	2.06	2.07	2.06	2.08	2.06	2.09	2.10	2.10	2.09	2.06	2.08	2.10	2.12	2.10	2.11	2.12	2.15	S	2.15	2.17	2.16	2.20	2.14	2.16	2.06	2.20	2.11
Dec 6	2.14	2.16	2.14	2.14	2.17	2.15	2.30	2.34	2.50	2.34	2.47	2.26	2.26	2.23	2.22	2.25	S	2.30	2.28	2.28	2.26	2.27	2.20	2.21	2.14	2.50	2.26
Dec 7	2.19	2.18	2.21	2.19	2.15	2.16	2.09	2.09	2.04	2.02	2.05	2.02	2.02	2.07	2.02	S	2.01	2.03	2.01	2.04	2.09	2.07	2.06	2.06	2.01	2.21	2.08
Dec 8	2.08	2.06	2.08	2.07	2.08	2.09	2.10	2.18	2.18	2.20	2.16	2.15	2.12	2.15	S	2.10	2.09	2.08	2.14	2.13	2.13	2.13	2.09	2.06	2.20	2.12	
Dec 9	2.07	2.04	2.06	2.04	2.03	2.03	2.01	2.03	2.02	2.05	2.04	2.06	2.03	S	2.06	2.04	2.07	2.05	2.36	2.25	2.44	2.21	2.13	2.14	2.01	2.44	2.10
Dec 10	2.13	2.12	2.09	2.12	2.07	2.09	2.07	2.11	2.08	2.10	2.11	2.10	S	2.05	2.09	2.09	2.13	2.14	2.17	2.12	2.07	2.08	2.06	2.11	2.05	2.17	2.10
Dec 11	2.09	2.14	2.11	2.11	2.09	2.12	2.13	2.10	2.13	2.10	2.11	S	C	C	C	C	2.10	2.12	2.09	2.11	2.11	2.12	2.10	2.11	2.09	2.14	2.11
Dec 12	2.11	2.13	2.11	2.09	2.13	2.11	2.11	2.11	2.14	2.13	S	2.13	2.16	2.14	2.13	2.11	2.06	2.05	2.09	2.04	2.04	2.04	2.01	2.01	2.16	2.10	2.10
Dec 13	2.00	2.01	2.03	2.02	2.02	2.02	2.04	2.06	2.08	S	2.05	2.05	2.03	2.07	2.10	S1	2.15	2.14	2.15	2.16	2.21	2.21	2.25	2.30	2.00	2.30	2.10
Dec 14	2.34	2.42	2.45	2.48	2.52	2.51	2.39	2.30	S	2.23	2.18	2.17	2.18	2.20	2.19	2.21	2.22	2.22	2.18	2.15	2.10	2.06	2.05	2.02	2.02	2.52	2.25
Dec 15	2.01	2.01	2.01	2.02	2.01	2.02	2.03	S	2.01	2.02	2.02	2.03	2.02	2.02	2.04	2.05	2.07	2.09	2.09	2.07	2.06	2.05	2.04	2.02	2.01	2.09	2.04
Dec 16	1.99	1.99	1.98	1.98	1.99	1.98	S	1.99	1.99	2.00	2.00	2.00	2.00	1.99	1.98	1.99	2.00	2.00	1.99	1.98	2.00	2.01	2.11	1.98	2.11	2.00	
Dec 17	2.25	2.25	2.24	2.24	2.19	S	2.15	2.12	2.13	2.12	2.13	2.15	2.17	2.28	2.35	2.38	2.24	2.23	2.23	2.23	2.22	2.20	2.16	2.14	2.12	2.38	2.21
Dec 18	2.09	2.04	2.02	2.01	S	1.99	1.99	2.01	2.01	2.02	2.02	2.02	2.03	2.05	2.05	2.06	2.05	2.08	2.04	2.05	2.05	2.06	2.05	1.99	2.09	2.04	
Dec 19	2.06	2.05	2.04	S	2.04	2.03	2.03	2.03	2.04	2.04	2.04	2.05	2.06	2.08	2.08	2.10	2.08	2.14	2.16	2.15	2.16	2.11	2.10	2.11	2.03	2.16	2.08
Dec 20	2.13	2.18	S	2.17	2.26	2.31	2.38	2.27	2.29	2.25	2.26	2.28	2.29	2.25	2.24	2.25	2.26	2.26	2.23	2.22	2.20	2.19	2.19	2.13	2.38	2.24	
Dec 21	2.18	S	2.18	2.20	2.24	2.18	2.17	2.18	2.18	2.21	2.32	2.40	2.35	2.28	2.30	2.24	2.12	2.15	2.18	2.17	2.15	2.15	2.12	2.18	2.12	2.40	2.21
Dec 22	S	2.16	2.17	2.18	2.18	2.19	2.21	2.24	2.23	2.14	2.15	2.15	2.16	2.18	2.18	2.18	2.20	2.20	2.20	2.23	2.26	2.26	2.29	S	2.14	2.29	2.20
Dec 23	2.24	2.28	2.27	2.30	2.45	2.43	2.37	2.35	2.34	2.34	2.37	2.47	2.47	2.44	2.48	2.42	2.45	2.45	2.39	2.20	2.17	2.16	S	2.07	2.07	2.48	2.17
Dec 24	2.06	2.11	2.13	2.12	2.13	2.13	2.13	2.12	2.07	2.07	2.06	2.11	2.17	2.19	2.23	2.26	2.22	2.27	2.27	S	2.44	2.43	2.06	2.44	2.17	2.17	
Dec 25	2.44	2.28	2.17	2.16	2.17	2.19	2.21	2.27	2.26	2.26	2.21	2.24	2.28	2.25	2.21	2.25	2.26	2.24	2.25	2.19	S	2.09	2.05	2.04	2.04	2.44	2.22
Dec 26	2.10	2.04	2.04	2.05	2.06	2.07	2.06	2.05	2.06	2.11	2.12	2.13	2.17	2.14	2.25	2.14	2.14	2.13	2.14	S	2.20	2.17	2.15	2.14	2.04	2.25	2.12
Dec 27	2.15	2.17	2.16	2.18	2.21	2.22	2.25	2.26	2.26	2.26	2.27	2.25	2.23	2.18	2.17	2.15	2.16	2.11	S	2.08	2.05	2.01	2.00	2.02	2.00	2.27	2.17
Dec 28	2.03	2.04	2.03	2.03	2.05	2.04	2.04	2.04	2.03	2.12	2.10	2.12	2.14	2.09	2.07	2.07	S	2.05	2.05	2.07	2.10	2.11	2.07	2.03	2.14	2.07	
Dec 29	2.06	2.08	2.10	2.11	2.10	2.09	2.08	2.08	2.10	2.09	2.10	2.11	2.12	2.14	2.15	2.17	S	2.19	2.20	2.20	2.19	2.16	2.18	2.16	2.06	2.20	2.13
Dec 30	2.21	2.16	2.39	2.26	2.28	2.37	2.39	2.37	2.29	2.23	2.15	2.13	2.10	2.08	2.12	S	2.15	2.26	2.30	2.27	2.22	2.20	2.21	2.20	2.08	2.39	2.23
Dec 31	2.20	2.19	2.18	2.18	2.19	2.21	2.24	2.24	2.23	2.23	2.23	2.24	2.19	2.13	S	2.07	2.05	2.03	2.01	2.00	2.01	1.99	2.00	1.99	1.99	2.24	2.13
Diurnal Maximum	2.44	2.42	2.45	2.48	2.52	2.51	2.39	2.37	2.50	2.34	2.47	2.47	2.44	2.48	2.42	2.45	2.45	2.39	2.28	2.44	2.27	2.44	2.43				
Diurnal Average	2.13	2.13	2.13	2.13	2.14	2.14	2.15	2.14	2.13	2.13	2.14	2.14	2.14	2.14	2.15	2.15	2.13	2.15	2.16	2.15	2.14	2.12	2.12	2.12			

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 - St. Lina Site**





# LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

## Summary of Hourly Instantaneous Maximums

### METHANE (CH4) in ppm

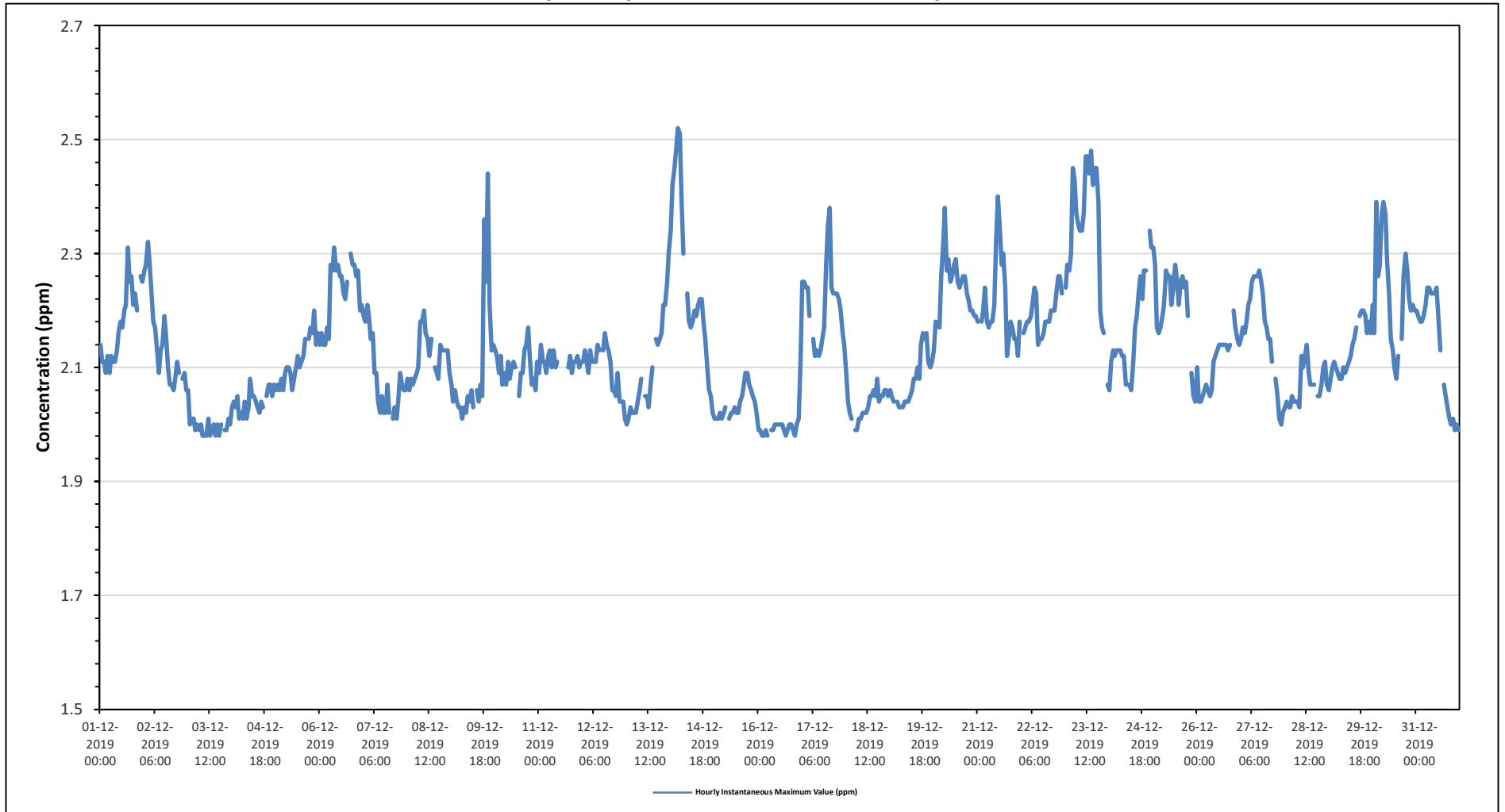
Maximum Hourly Value:	2.52 ppm on December 14 at hour 4	Hours in Service:	744
Maximum Daily Value:	2.34 ppm on December 23	Hours of Data:	707
Minimum Hourly Value:	1.98 ppm on December 3 at hour 8	Hours of Missing Data:	1
Minimum Daily Value:	2.00 ppm on December 3	Hours of Calibration:	36
Monthly Average:	2.14 ppm	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
Dec 1	2.14	2.11	2.11	2.09	2.12	2.09	2.12	2.11	2.11	2.13	2.16	2.18	2.17	2.20	2.21	2.31	2.25	2.26	2.21	2.23	2.20	S	2.26	2.25	2.09	2.31	2.17
Dec 2	2.27	2.28	2.32	2.28	2.23	2.18	2.17	2.13	2.09	2.13	2.14	2.19	2.15	2.10	2.07	2.07	2.06	2.08	2.11	2.09	S	2.08	2.09	2.06	2.06	2.32	2.15
Dec 3	2.06	2.00	2.01	2.01	1.99	2.00	1.99	2.00	1.98	1.98	1.98	2.01	1.98	1.99	2.00	1.98	2.00	1.98	2.00	S	1.99	2.01	2.00	1.98	2.06	2.00	
Dec 4	2.03	2.04	2.03	2.05	2.01	2.02	2.01	2.04	2.01	2.03	2.08	2.05	2.05	2.04	2.03	2.02	2.04	2.03	S	2.05	2.07	2.07	2.05	2.07	2.01	2.08	2.04
Dec 5	2.06	2.07	2.06	2.08	2.06	2.09	2.10	2.10	2.09	2.06	2.08	2.10	2.12	2.10	2.11	2.12	2.15	S	2.15	2.17	2.16	2.20	2.14	2.16	2.06	2.20	2.11
Dec 6	2.14	2.16	2.14	2.14	2.17	2.15	2.28	2.27	2.31	2.27	2.28	2.26	2.26	2.23	2.22	2.25	S	2.30	2.28	2.28	2.26	2.27	2.20	2.21	2.14	2.31	2.23
Dec 7	2.19	2.18	2.21	2.19	2.15	2.16	2.09	2.09	2.04	2.02	2.05	2.02	2.02	2.07	2.02	S	2.01	2.03	2.01	2.04	2.09	2.07	2.06	2.06	2.01	2.21	2.08
Dec 8	2.08	2.06	2.08	2.07	2.08	2.09	2.10	2.18	2.18	2.20	2.16	2.15	2.12	2.15	S	2.10	2.09	2.08	2.14	2.13	2.13	2.13	2.09	2.06	2.20	2.12	
Dec 9	2.07	2.04	2.06	2.04	2.03	2.03	2.01	2.03	2.02	2.05	2.04	2.06	2.03	S	2.06	2.04	2.07	2.05	2.36	2.25	2.44	2.21	2.13	2.14	2.01	2.44	2.10
Dec 10	2.13	2.12	2.09	2.12	2.07	2.09	2.07	2.11	2.08	2.10	2.11	2.10	S	2.05	2.09	2.09	2.13	2.14	2.17	2.12	2.07	2.08	2.06	2.11	2.05	2.17	2.10
Dec 11	2.09	2.14	2.11	2.11	2.09	2.12	2.13	2.10	2.13	2.10	2.11	S	C	C	C	C	2.10	2.12	2.09	2.11	2.11	2.12	2.10	2.11	2.09	2.14	2.11
Dec 12	2.11	2.13	2.11	2.09	2.13	2.11	2.11	2.11	2.14	2.13	S	2.13	2.16	2.14	2.13	2.11	2.06	2.05	2.09	2.04	2.04	2.04	2.01	2.01	2.16	2.10	2.10
Dec 13	2.00	2.01	2.03	2.02	2.02	2.02	2.04	2.06	2.08	S	2.05	2.05	2.03	2.07	2.10	S1	2.15	2.14	2.15	2.16	2.21	2.21	2.25	2.30	2.00	2.30	2.10
Dec 14	2.34	2.42	2.45	2.48	2.52	2.51	2.39	2.30	S	2.23	2.18	2.17	2.18	2.20	2.19	2.21	2.22	2.22	2.18	2.15	2.10	2.06	2.05	2.02	2.02	2.52	2.25
Dec 15	2.01	2.01	2.01	2.02	2.01	2.02	2.03	S	2.01	2.02	2.02	2.03	2.02	2.02	2.04	2.05	2.07	2.09	2.09	2.07	2.06	2.05	2.04	2.02	2.01	2.09	2.04
Dec 16	1.99	1.99	1.98	1.98	1.99	1.98	S	1.99	1.99	2.00	2.00	2.00	2.00	2.00	1.99	1.98	1.99	2.00	2.00	1.99	1.98	2.00	2.01	2.11	1.98	2.11	2.00
Dec 17	2.25	2.25	2.24	2.24	2.19	S	2.15	2.12	2.13	2.12	2.13	2.15	2.17	2.28	2.35	2.38	2.24	2.23	2.23	2.23	2.22	2.20	2.16	2.14	2.12	2.38	2.21
Dec 18	2.09	2.04	2.02	2.01	S	1.99	1.99	2.01	2.01	2.02	2.02	2.02	2.03	2.05	2.05	2.06	2.05	2.08	2.04	2.05	2.05	2.06	2.05	2.05	1.99	2.09	2.04
Dec 19	2.06	2.05	2.04	S	2.04	2.03	2.03	2.03	2.04	2.04	2.04	2.05	2.06	2.08	2.08	2.10	2.08	2.14	2.16	2.15	2.16	2.11	2.10	2.11	2.03	2.16	2.08
Dec 20	2.13	2.18	S	2.17	2.26	2.31	2.38	2.27	2.29	2.25	2.26	2.28	2.29	2.25	2.24	2.25	2.26	2.26	2.23	2.22	2.20	2.19	2.19	2.19	2.13	2.38	2.24
Dec 21	2.18	S	2.18	2.20	2.24	2.18	2.17	2.18	2.18	2.21	2.32	2.40	2.35	2.28	2.30	2.24	2.12	2.15	2.18	2.17	2.15	2.15	2.12	2.18	2.12	2.40	2.21
Dec 22	S	2.16	2.17	2.18	2.18	2.19	2.21	2.24	2.23	2.14	2.15	2.15	2.16	2.18	2.18	2.18	2.20	2.20	2.20	2.23	2.26	2.26	2.23	S	2.14	2.26	2.19
Dec 23	2.24	2.28	2.27	2.30	2.45	2.43	2.37	2.35	2.34	2.34	2.37	2.47	2.47	2.44	2.48	2.42	2.45	2.45	2.39	2.20	2.17	2.16	S	2.07	2.07	2.48	2.34
Dec 24	2.06	2.11	2.13	2.12	2.13	2.13	2.13	2.12	2.12	2.07	2.07	2.07	2.06	2.11	2.17	2.19	2.23	2.26	2.22	2.27	2.27	S	2.34	2.31	2.06	2.34	2.16
Dec 25	2.31	2.28	2.17	2.16	2.17	2.19	2.21	2.27	2.26	2.26	2.21	2.24	2.28	2.25	2.21	2.25	2.26	2.24	2.25	2.19	S	2.09	2.05	2.04	2.04	2.31	2.21
Dec 26	2.10	2.04	2.04	2.05	2.06	2.07	2.06	2.05	2.06	2.11	2.12	2.13	2.14	2.14	2.14	2.14	2.14	2.13	2.14	S	2.20	2.17	2.15	2.14	2.04	2.20	2.11
Dec 27	2.15	2.17	2.16	2.18	2.21	2.22	2.25	2.26	2.26	2.26	2.27	2.25	2.23	2.18	2.17	2.15	2.15	2.11	S	2.08	2.05	2.01	2.00	2.02	2.00	2.27	2.16
Dec 28	2.03	2.04	2.03	2.03	2.05	2.04	2.04	2.04	2.03	2.12	2.10	2.12	2.14	2.09	2.07	2.07	S	S	2.05	2.05	2.07	2.10	2.11	2.07	2.03	2.14	2.07
Dec 29	2.06	2.08	2.10	2.11	2.10	2.09	2.08	2.08	2.10	2.09	2.10	2.11	2.12	2.14	2.15	2.17	S	2.19	2.20	2.20	2.19	2.16	2.18	2.16	2.06	2.20	2.13
Dec 30	2.21	2.16	2.39	2.26	2.28	2.37	2.39	2.37	2.29	2.23	2.15	2.13	2.10	2.08	2.12	S	2.15	2.26	2.30	2.27	2.22	2.20	2.21	2.20	2.08	2.39	2.23
Dec 31	2.20	2.19	2.18	2.18	2.19	2.21	2.24	2.24	2.23	2.23	2.23	2.24	2.19	2.13	S	2.07	2.05	2.03	2.01	2.00	2.01	1.99	2.00	1.99	1.99	2.24	2.13
Diurnal Maximum	2.34	2.42	2.45	2.48	2.52	2.51	2.39	2.37	2.34	2.34	2.37	2.47	2.47	2.44	2.48	2.42	2.45	2.45	2.39	2.28	2.44	2.27	2.34	2.31			
Diurnal Average	2.13	2.13	2.13	2.13	2.14	2.14	2.14	2.14	2.13	2.13	2.13	2.14	2.14	2.14	2.14	2.15	2.13	2.15	2.16	2.15	2.14	2.12	2.12	2.11			

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 - St. Lina Site*





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**St. Lina Site - December 2019**

### Summary of Hourly Instantaneous Maximums

#### NON-METHANE HYDROCARBONS (NMHC) in ppm

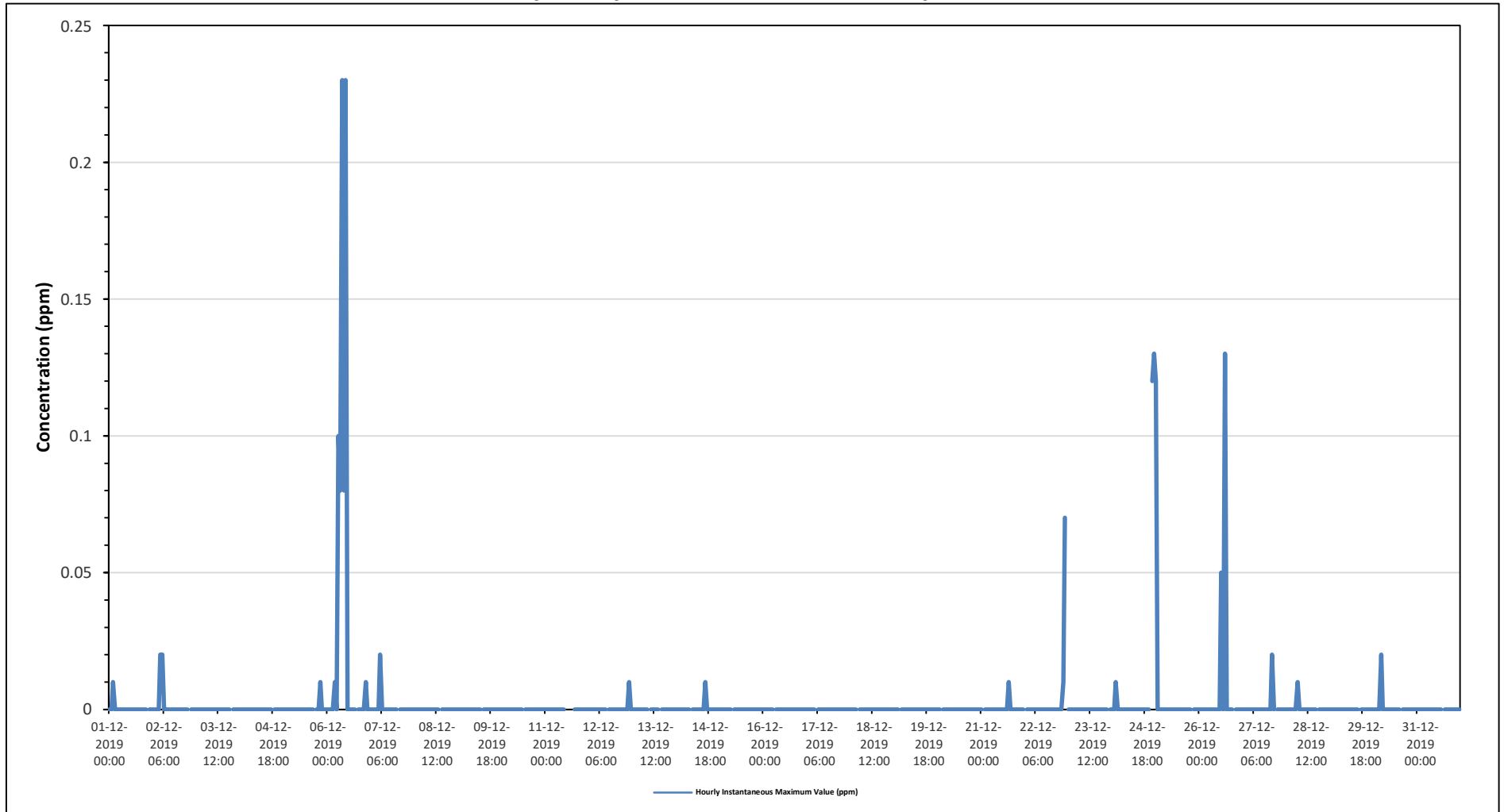
Maximum Hourly Value: 0.23 ppm on December 6 at hour 8	Hours in Service: 744
Maximum Daily Value: 0.03 ppm on December 6	Hours of Data: 707
Minimum Hourly Value: 0.00 ppm on December 1 at hour 0	Hours of Missing Data: 1
Minimum Daily Value: 0.00 ppm on December 3	Hours of Calibration: 36
Monthly Average: 0.00 ppm	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	
Dec 1	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	0.00	
Dec 2	0.00	0.00	0.00	0.00	0.02	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	S	S	0.00	0.00	0.00	0.00	0.02	0.00
Dec 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	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	0.00	S	S	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Dec 6	0.00	0.00	0.00	0.00	0.01	0.00	0.10	0.08	0.23	0.08	0.23	0.00	0.00	0.00	0.00	0.00	S	S	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Dec 7	0.00	0.00	0.00	0.00	0.00	0.02	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
Dec 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
Dec 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	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
Dec 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	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
Dec 11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	C	C	C	C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 12	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	0.01	0.00	0.00	0.00
Dec 13	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	S1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 14	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	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 15	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
Dec 16	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
Dec 17	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
Dec 18	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
Dec 19	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
Dec 20	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
Dec 21	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	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 22	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	0.01	0.07	S	0.00	0.07	0.00	
Dec 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
Dec 24	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.12	0.13	0.00	0.13	0.01	
Dec 25	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
Dec 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	0.05	0.00	0.13	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
Dec 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	0.02	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 28	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	S	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	0.00
Dec 30	0.00	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	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
Dec 31	0.00	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	0.12	0.00	0.01	0.00	0.02	0.02	0.10	0.08	0.23	0.08	0.23	0.00	0.05	0.00	0.13	0.01	0.02	0.00	0.00	0.00	0.00	0.01	0.01	0.12	0.13	0.00	0.00	0.00
Diurnal Average	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	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	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 - St. Lina Site*





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2019

### Summary of Hourly Instantaneous Maximums

WIND SPEED (WS) in km/hr

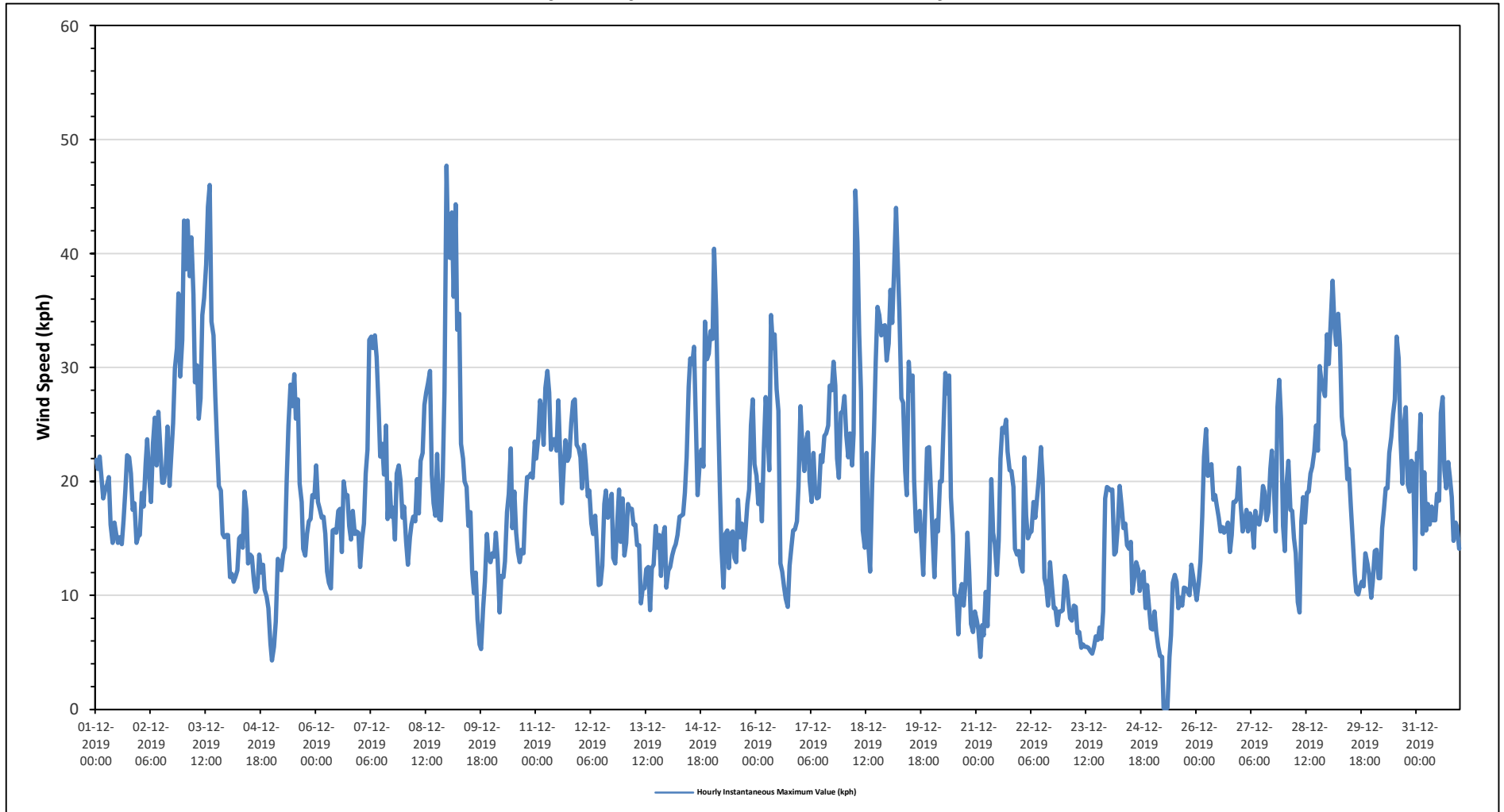
Maximum Hourly Value:	47.7 kph	on December 8 at hour 23	Hours in Service:	744
Maximum Daily Value:	31.4 kph	on December 3	Hours of Data:	744
Minimum Hourly Value:	0.1 kph	on December 25 at hour 6	Hours of Missing Data:	0
Minimum Daily Value:	7.8 kph	on December 25	Hours of Calibration:	0
Monthly Average:	18.8 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
Dec 1	21.9	21.1	22.2	20.4	18.5	19.3	19.7	20.4	16.2	14.6	16.4	15.4	14.6	15.1	14.5	16.6	19.2	22.3	22.1	20.7	17.5	18.1	14.6	15.2	14.5	22.3	18.2
Dec 2	15.3	19.0	17.8	21.6	23.7	20.4	18.2	23.4	25.6	21.4	26.1	23.2	19.9	19.9	21.2	24.8	19.6	22.0	25.1	29.9	31.7	36.5	29.2	32.4	15.3	36.5	23.7
Dec 3	42.9	38.6	42.9	38.0	41.4	36.4	28.7	30.2	25.5	27.3	34.6	36.1	39.0	44.1	46.0	34.0	32.8	27.5	23.4	19.6	19.2	15.4	15.1	15.3	15.1	46.0	31.4
Dec 4	15.3	11.6	11.9	11.2	11.6	12.2	15.0	15.2	14.2	19.1	17.4	12.8	13.6	13.4	11.3	10.3	10.7	13.6	12.0	12.7	10.5	9.9	8.9	5.8	5.8	19.1	12.5
Dec 5	4.3	5.5	7.7	13.2	12.9	12.2	13.6	14.2	20.1	24.9	28.5	26.6	29.4	25.5	27.2	19.8	18.2	14.1	13.5	15.4	16.5	16.7	18.8	18.6	4.3	29.4	17.4
Dec 6	21.4	18.2	17.6	16.8	16.9	15.4	12.1	11.1	10.6	15.7	15.8	15.5	17.4	17.6	13.8	20.0	18.7	18.8	16.1	14.9	17.4	15.4	15.6	15.5	10.6	21.4	16.2
Dec 7	12.5	15.0	16.3	20.7	22.8	32.4	32.7	31.7	32.8	30.9	26.3	22.2	23.3	20.6	24.9	16.7	19.9	16.9	17.7	14.9	20.7	21.4	20.1	16.8	12.5	32.8	22.1
Dec 8	17.8	14.7	12.7	15.1	16.2	16.9	16.5	20.2	17.2	21.8	22.5	26.7	27.8	28.6	29.7	20.6	18.1	17.0	22.4	16.7	16.6	20.4	27.9	47.7	12.7	47.7	21.3
Dec 9	39.7	39.6	43.6	36.2	44.3	33.3	34.7	23.3	22.0	19.5	16.1	17.3	12.1	10.2	12.0	7.9	5.7	5.3	8.9	11.2	15.4	13.4	12.9	5.3	44.3	21.0	
Dec 10	13.7	13.4	15.5	13.2	8.5	11.7	11.6	13.0	17.3	18.9	22.9	15.9	19.1	15.5	13.8	12.9	14.0	13.7	17.8	20.4	20.4	20.7	20.3	23.5	8.5	23.5	16.2
Dec 11	22.0	23.9	27.1	26.2	23.2	28.2	29.7	27.8	22.8	23.7	23.7	22.7	27.1	22.4	18.1	21.5	23.6	21.8	22.2	25.2	27.0	27.2	23.2	22.9	18.1	29.7	24.3
Dec 12	22.1	19.4	23.2	21.5	18.7	19.2	16.3	15.4	17.0	14.6	10.9	11.0	12.6	18.0	19.2	16.8	17.8	18.9	13.3	12.8	16.0	19.3	14.7	18.5	10.9	23.2	17.0
Dec 13	13.5	14.6	18.0	17.6	17.6	16.2	16.2	14.4	14.4	9.3	10.6	10.6	12.3	12.5	8.7	12.4	12.7	16.1	14.2	15.3	11.7	15.2	16.0	10.7	8.7	18.0	13.8
Dec 14	12.2	12.5	13.5	14.1	14.5	15.3	16.9	17.0	17.1	19.0	22.1	28.3	30.8	30.3	31.8	24.5	18.8	21.5	22.8	21.3	34.0	30.7	31.2	33.2	12.2	34.0	22.2
Dec 15	32.5	40.4	35.1	26.9	19.1	14.1	10.7	15.4	15.7	12.4	15.4	15.6	13.3	12.9	18.4	15.1	16.3	14.0	15.5	18.0	19.3	24.9	27.2	21.5	10.7	40.4	19.6
Dec 16	20.5	18.0	19.7	16.5	23.0	27.4	24.7	21.0	34.6	31.7	32.9	28.1	26.2	12.8	12.1	10.8	9.7	9.0	12.6	14.2	15.7	15.8	16.5	19.5	9.0	34.6	19.7
Dec 17	26.6	23.3	20.9	23.5	24.3	20.1	18.2	22.5	19.4	18.5	18.6	22.3	21.7	24.0	24.2	24.9	28.4	28.0	30.5	28.4	22.0	20.3	26.0	26.1	18.2	30.5	23.4
Dec 18	27.5	24.1	22.1	24.2	21.4	24.2	45.5	41.0	32.9	27.9	15.7	14.2	22.5	14.4	12.1	19.7	24.2	30.5	35.3	34.6	32.8	33.6	33.7	30.6	12.1	45.5	26.9
Dec 19	32.1	36.8	33.9	38.3	44.0	39.1	35.0	27.3	26.9	20.9	18.8	30.5	28.0	29.3	20.2	15.6	16.9	17.4	14.3	11.8	17.7	22.9	23.0	19.8	11.8	44.0	25.9
Dec 20	15.2	11.6	16.6	15.6	20.0	20.0	24.9	29.5	27.7	29.3	18.6	15.3	10.1	9.9	6.6	10.2	11.0	9.1	11.3	15.5	12.0	7.5	6.8	8.6	6.6	29.5	15.1
Dec 21	7.9	7.0	4.6	7.4	6.5	10.3	7.3	12.8	20.2	15.5	14.5	11.8	14.8	22.0	24.7	24.3	25.4	22.6	21.0	20.9	19.5	14.1	13.6	13.9	4.6	25.4	15.1
Dec 22	12.7	12.1	22.1	17.0	15.0	15.5	15.6	18.2	16.8	18.8	20.3	23.0	20.2	11.5	10.8	9.1	12.9	10.9	8.9	8.9	7.4	8.6	8.6	8.7	7.4	23.0	13.9
Dec 23	11.7	11.2	9.5	8.0	7.8	9.1	9.0	6.7	6.8	5.4	5.7	5.5	5.5	5.4	5.1	4.9	5.5	6.4	6.1	7.2	6.2	8.6	18.5	19.5	4.9	19.5	8.1
Dec 24	19.4	19.2	19.3	13.6	13.8	16.2	19.6	17.8	15.9	16.3	14.4	14.1	14.7	10.2	11.6	12.9	12.3	10.4	11.6	12.1	8.9	10.9	8.9	7.1	7.1	19.6	13.8
Dec 25	7.0	8.6	6.8	5.5	4.7	4.6	0.1	0.1	0.1	4.6	6.5	11.1	11.8	11.2	8.9	9.8	9.1	10.7	10.6	10.3	10.0	12.7	11.7	10.6	0.1	12.7	7.8
Dec 26	9.6	11.1	13.0	16.9	22.2	24.6	20.5	20.6	21.5	18.4	18.8	17.9	16.8	15.6	16.0	15.5	15.8	16.4	13.8	15.3	18.2	18.2	18.5	21.2	9.6	24.6	17.4
Dec 27	18.1	15.6	16.3	17.5	15.6	17.2	16.7	14.2	17.4	16.4	16.2	17.1	19.6	19.1	16.6	17.3	21.1	22.7	19.4	15.6	26.5	28.9	25.5	16.1	14.2	28.9	18.6
Dec 28	13.9	19.8	21.8	17.5	17.4	15.0	13.7	9.4	8.5	16.5	18.6	16.4	19.0	19.1	20.7	21.3	22.6	24.9	22.7	30.1	28.8	28.0	27.5	32.9	8.5	32.9	20.3
Dec 29	30.3	34.2	37.6	33.8	32.0	34.7	32.0	25.7	24.1	23.5	20.2	21.1	17.7	15.0	11.9	10.3	10.1	10.8	11.2	10.8	13.7	12.8	11.8	9.8	9.8	37.6	20.6
Dec 30	11.2	13.9	14.0	11.5	11.5	15.9	17.5	19.4	19.4	22.5	23.9	25.9	27.2	32.7	30.8	23.9	19.8	25.0	26.5	19.7	19.1	21.8	21.5	12.3	11.2	32.7	20.3
Dec 31	22.5	22.2	25.9	15.4	20.8	15.7	18.0	16.2	17.8	16.6	16.6	18.9	18.3	26.0	27.4	21.0	19.4	21.7	20.5	18.6	14.8	16.4	16.0	14.1	14.1	27.4	19.2
Diurnal Maximum	42.9	40.4	43.6	38.3	44.3	39.1	45.5	41.0	34.6	31.7	34.6	36.1	39.0	44.1	46.0	34.0	32.8	30.5	35.3	34.6	34.0	36.5	33.7	47.7			
Diurnal Average	19.1	19.2	20.3	19.2	19.7	19.8	19.7	19.2	19.3	19.2	19.1	19.1	19.7	18.9	18.3	17.1	17.2	17.4	17.4	17.4	18.2	19.0	18.8	18.8			

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 WS - St. Lina Site**



BONNYVILLE -EAST STATION





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - December 2019

### Summary of Hourly Instantaneous Maximums

#### SULPHUR DIOXIDE (SO<sub>2</sub>) in ppb

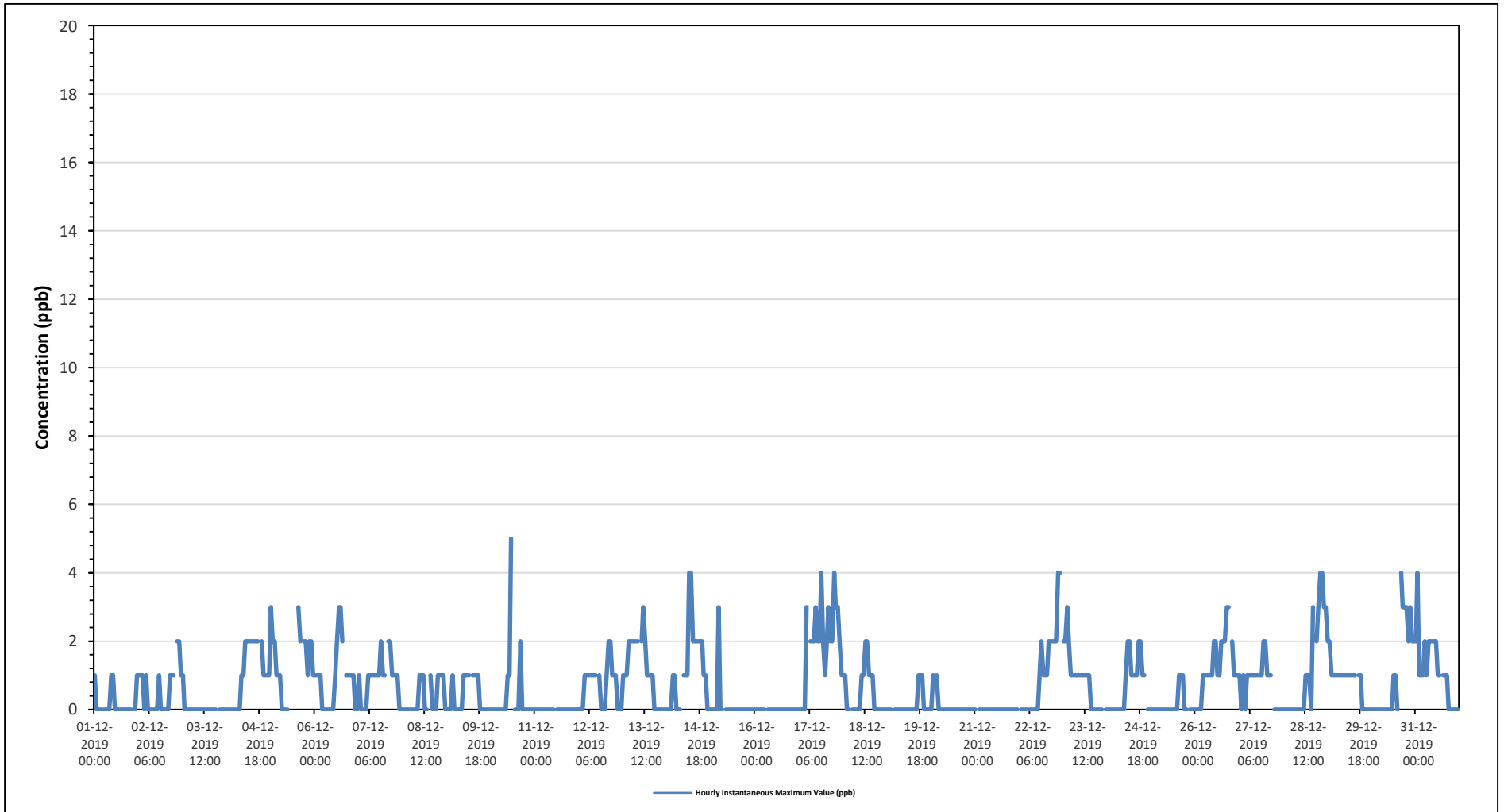
Maximum Hourly Value:	5 ppb on December 10 at hour 11	Hours in Service:	744
Maximum Daily Value:	2.0 ppb on December 17	Hours of Data:	707
Minimum Hourly Value:	0 ppb on December 1 at hour 1	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on December 11	Hours of Calibration:	37
Monthly Average:	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				
Dec 1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	S	0	1	0	1	0.2	
Dec 2	1	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	S	2	2	1	0	2	0.6
Dec 3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	S	0	0	0	0	0	1	0.0
Dec 4	0	0	0	0	0	0	0	0	1	1	2	2	2	2	2	2	2	2	2	S	2	1	1	1	1	0	2	1.0
Dec 5	3	2	2	1	1	1	0	0	0	0	C	C	C	C	C	3	2	S	2	2	1	2	2	1	0	3	1.4	
Dec 6	1	1	1	1	0	0	0	0	0	0	0	1	2	3	3	2	S	1	1	1	1	1	0	0	0	3	0.9	
Dec 7	1	0	0	0	0	1	1	1	1	1	1	1	2	1	1	S	2	2	1	1	1	1	0	0	0	2	0.9	
Dec 8	0	0	0	0	0	0	0	0	0	1	1	1	0	0	S	1	0	0	0	1	1	1	1	0	0	1	0.3	
Dec 9	0	0	0	1	0	0	0	0	0	1	1	1	1	S	1	1	1	1	0	0	0	0	0	0	0	0	1	0.4
Dec 10	0	0	0	0	0	0	0	0	0	1	1	S	S	0	0	0	2	0	0	0	0	0	0	0	0	5	0.4	
Dec 11	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 12	0	0	0	1	1	1	1	1	1	1	S	1	0	0	0	1	2	2	1	1	1	0	0	0	0	2	0.7	
Dec 13	1	1	1	2	2	2	2	2	2	S	2	3	2	1	1	1	0	0	0	0	0	0	0	0	0	3	1.1	
Dec 14	0	0	0	1	1	0	0	0	S	1	1	1	4	4	2	2	2	2	2	2	1	1	0	0	0	4	1.2	
Dec 15	0	0	0	0	3	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.1	
Dec 16	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 17	0	0	0	0	3	S	2	2	2	3	2	2	4	2	1	2	3	2	2	4	3	3	2	1	0	4	2.0	
Dec 18	1	1	0	0	S	0	0	0	0	0	1	1	2	2	1	1	1	0	0	0	0	0	0	0	0	2	0.5	
Dec 19	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0.1	
Dec 20	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	1	0.1	
Dec 21	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 22	S	0	0	0	0	0	0	0	0	0	0	1	2	1	1	1	2	2	2	2	2	4	4	S	0	4	1.1	
Dec 23	2	2	3	2	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	S	0	0	3	0.9	
Dec 24	0	0	0	0	0	0	0	0	0	0	1	2	2	1	1	1	1	2	2	1	1	S	0	0	0	2	0.7	
Dec 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	S	0	0	0	0	1	0.1	
Dec 26	0	0	0	0	1	1	1	1	1	1	2	2	1	1	2	2	2	3	3	S	2	1	1	1	0	3	1.3	
Dec 27	1	0	1	0	1	1	1	1	1	1	1	1	2	2	1	1	1	S	0	0	0	0	0	0	0	2	0.8	
Dec 28	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	3	S	2	3	4	4	3	3	0	4	1.1	
Dec 29	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	0	0	0	0	0	0	0	2	0.9	
Dec 30	0	0	0	0	0	0	0	0	0	0	0	1	1	0	S	4	3	3	3	2	3	2	2	2	0	4	1.0	
Dec 31	2	4	1	1	2	1	2	2	2	2	2	1	1	S	1	1	1	0	0	0	0	0	0	0	0	4	1.2	
Diurnal Maximum	3	4	3	2	3	2	2	2	2	3	2	5	4	4	3	3	4	3	3	4	4	4	4	3	3	3	3	
Diurnal Average	0.6	0.5	0.4	0.4	0.6	0.4	0.4	0.4	0.4	0.6	0.7	1.0	1.0	0.9	0.8	0.8	1.1	1.0	0.8	0.9	0.7	0.8	0.6	0.4	0.4	0.4	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 Instantaneous Maximum for SO2 - Bonnyville - East Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - December 2019  
 Summary of Hourly Instantaneous Maximums

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

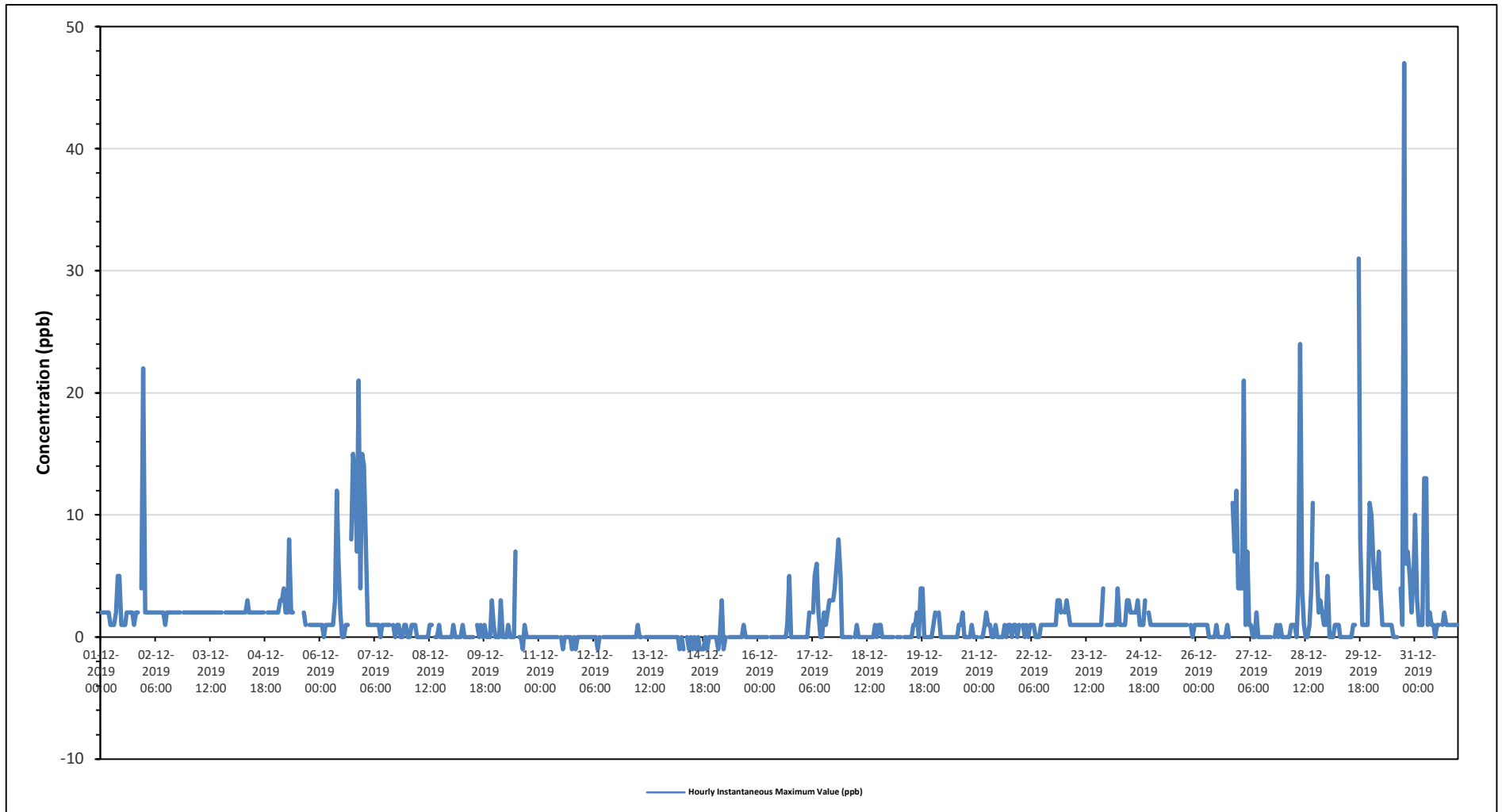
Maximum Hourly Value:	47 ppb on December 30 at hour 18	Hours in Service:	744
Maximum Daily Value:	5.1 ppb on December 30	Hours of Data:	706
Minimum Hourly Value:	-1 ppb on December 10 at hour 15	Hours of Missing Data:	1
Minimum Daily Value:	-0.4 ppb on December 14	Hours of Calibration:	37
Monthly Average:	1.4 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
Dec 1	2	2	2	2	2	1	1	1	2	5	5	1	1	1	2	2	2	2	1	2	2	S	4	22	1	22	2.9
Dec 2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	S	2	2	2	1	2	2.0
Dec 3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2.0
Dec 4	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	3	2.0
Dec 5	2	2	3	3	4	2	2	8	2	2	S	S	S	S	1	2	1	S	2	2	2	2	2	1	1	2.2	
Dec 6	1	1	0	1	1	1	1	1	3	12	6	2	0	0	1	1	S	8	15	13	7	21	4	15	0	21	5.0
Dec 7	14	8	1	1	1	1	1	1	1	0	1	1	1	1	1	S	1	0	1	1	0	0	1	1	0	14	1.7
Dec 8	0	0	1	1	1	0	0	0	0	0	0	0	1	1	S	0	0	1	0	0	0	0	0	0	0	1	0.3
Dec 9	0	1	0	0	0	0	1	0	0	0	0	0	0	S	1	0	1	0	1	0	0	0	0	3	1	0	0.4
Dec 10	0	0	0	3	0	0	0	1	0	0	0	0	0	7	S	0	0	-1	1	0	0	0	0	0	0	-1	0.5
Dec 11	0	0	0	0	0	0	0	0	0	0	0	S	0	-1	0	0	0	0	0	-1	0	-1	0	0	0	-1	-0.1
Dec 12	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
Dec 13	0	0	0	0	0	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 14	0	0	0	0	0	-1	0	-1	S	0	-1	0	-1	0	-1	0	-1	-1	-1	0	-1	0	0	0	0	-1	-0.4
Dec 15	0	0	-1	0	3	-1	0	S	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	-1	0.1
Dec 16	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0.3
Dec 17	0	0	0	0	2	S	2	5	6	2	0	0	2	1	2	3	3	3	4	6	8	5	0	0	0	8	2.3
Dec 18	0	0	0	0	S	0	1	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	1	0.2
Dec 19	0	0	0	S	0	0	0	S1	0	0	0	0	0	1	1	2	0	4	4	0	0	0	0	0	0	4	0.5
Dec 20	1	2	S	2	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	1	0	0	0	2	0.4
Dec 21	0	S	0	0	1	2	1	1	0	0	1	0	0	0	1	0	1	0	1	1	0	1	0	1	0	2	0.5
Dec 22	S	1	0	1	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	3	3	2	S	0	3	1.0
Dec 23	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	S	1	1	4	1.3
Dec 24	1	1	1	1	1	4	1	1	1	1	3	3	2	2	2	2	3	1	1	1	3	S	2	1	1	4	1.7
Dec 25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	0	1	0	1	1.0
Dec 26	1	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0	1	0	0	S	11	7	12	4	0	12	1.9
Dec 27	4	4	21	1	7	1	1	0	0	2	0	0	0	0	0	0	0	0	0	S	0	1	0	1	0	21	1.9
Dec 28	0	0	0	0	1	1	1	0	4	24	4	1	0	0	1	4	11	S	6	2	3	2	1	1	0	24	2.9
Dec 29	5	0	0	0	1	1	1	0	0	0	0	0	0	0	1	1	S	31	8	1	1	1	1	11	0	31	2.8
Dec 30	10	6	4	4	7	4	1	1	1	1	1	1	0	0	S	4	1	47	6	7	5	2	5	0	47	5.1	
Dec 31	10	3	1	1	1	13	13	1	2	1	1	0	1	1	S	1	2	1	1	1	1	1	1	0	13	2.6	
Diurnal Maximum	14	8	21	4	7	13	13	8	6	24	6	7	2	2	2	4	11	31	47	13	11	21	12	22			
Diurnal Average	2.0	1.4	1.4	1.0	1.4	1.3	1.3	1.0	1.0	1.9	1.0	0.9	0.6	0.6	0.8	1.0	1.4	2.3	3.3	1.4	1.8	2.0	1.4	2.4			

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 H2S - Bonnyville - East Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - December 2019  
 Summary of Hourly Instantaneous Maximums

### OXIDES OF NITROGEN (NOx) in ppb

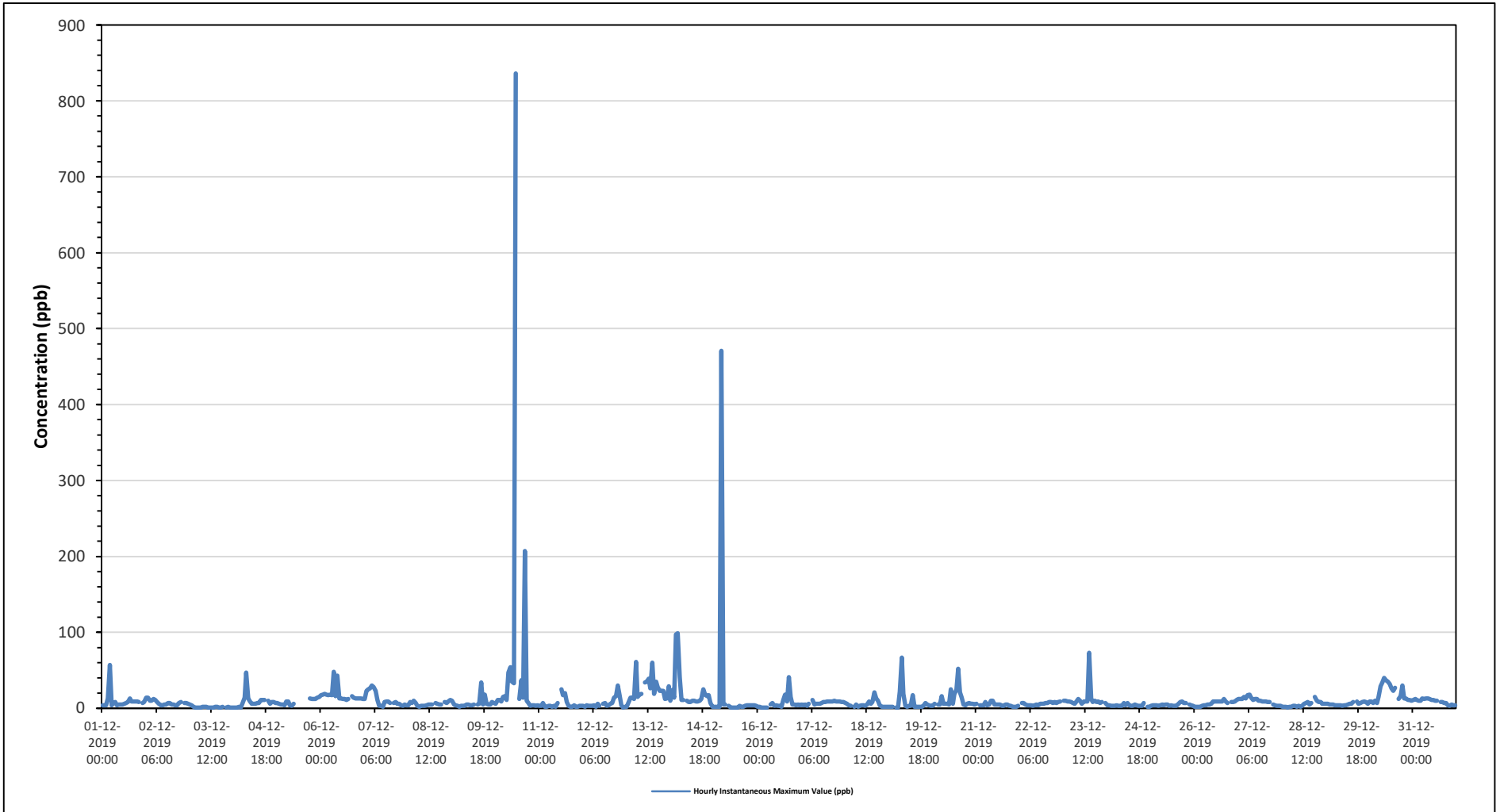
Maximum Hourly Value:	836 ppb on December 10 at hour 11	Hours in Service:	744
Maximum Daily Value:	60.4 ppb on December 10	Hours of Data:	703
Minimum Hourly Value:	1 ppb on December 3 at hour 3	Hours of Missing Data:	2
Minimum Daily Value:	1.7 ppb on December 3	Hours of Calibration:	39
Monthly Average:	11.1 ppb	Operational Uptime:	99.7

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	
Dec 1	4	4	4	13	57	4	7	8	4	5	5	6	7	8	13	9	9	9	9	8	S	7	8	4	57	9.3		
Dec 2	14	14	10	10	12	11	8	6	4	4	5	5	7	7	5	5	4	4	7	8	S	7	7	6	4	14	7.4	
Dec 3	5	4	2	1	1	1	1	2	2	2	1	1	1	1	2	2	1	1	2	S	1	2	1	1	1	5	1.7	
Dec 4	1	1	1	2	1	7	14	47	13	9	6	6	6	7	7	11	11	11	S	10	6	8	8	7	1	47	8.7	
Dec 5	7	6	5	5	4	9	9	4	3	6	C	C	C	C	C	C	C	C	C	C	13	12	12	14	15	3	15	-
Dec 6	17	18	19	18	17	18	17	48	16	43	13	13	12	12	12	12	S	16	14	13	13	13	13	12	11	48	17.3	
Dec 7	12	23	25	26	30	28	23	11	3	3	2	8	9	9	7	S	7	8	6	6	4	3	5	4	2	30	11.4	
Dec 8	4	8	7	10	7	3	2	3	3	3	4	5	5	5	S	7	6	5	5	S1	S1	7	9	11	2	11	5.7	
Dec 9	10	5	4	3	2	3	3	3	5	5	4	4	5	S	5	6	34	5	18	6	5	5	8	7	2	34	6.7	
Dec 10	6	11	11	9	15	16	11	47	54	35	33	836	S	12	37	14	207	10	7	3	4	4	3	4	3	836	60.4	
Dec 11	3	3	7	2	2	3	3	2	3	2	7	S	25	17	20	8	3	2	2	4	2	2	3	3	2	25	5.6	
Dec 12	3	2	4	3	3	3	4	2	6	3	S	6	7	3	4	6	7	14	16	30	17	4	1	2	1	30	6.5	
Dec 13	2	8	14	14	12	61	15	18	19	S	34	35	39	26	60	19	35	28	23	23	23	12	13	29	2	61	24.4	
Dec 14	10	24	14	97	99	41	11	11	S	10	8	8	10	10	9	9	10	12	25	18	16	17	7	2	2	99	20.8	
Dec 15	2	2	2	2	471	5	5	S	3	1	1	1	1	1	3	2	2	3	4	4	4	4	4	3	1	471	23.0	
Dec 16	2	2	1	1	1	1	S	5	7	3	4	3	3	2	11	18	9	41	15	5	5	4	5	4	1	41	6.6	
Dec 17	5	4	5	3	6	S	11	5	6	6	6	7	8	8	9	9	9	10	9	9	9	8	8	3	3	11	7.3	
Dec 18	7	6	4	3	S	2	5	2	3	4	4	3	5	9	6	8	21	13	10	4	2	2	2	2	2	21	5.5	
Dec 19	2	2	2	S	1	1	22	67	19	3	2	3	3	17	2	2	2	2	2	3	7	5	4	3	1	67	7.7	
Dec 20	3	6	S	5	5	16	6	6	6	5	25	6	19	24	52	21	14	5	4	6	7	6	6	5	3	52	11.2	
Dec 21	6	S	4	4	4	8	4	5	10	10	5	5	5	3	3	5	5	3	3	2	2	2	3	2	2	10	4.6	
Dec 22	S	7	7	5	4	4	4	3	4	5	4	6	6	6	7	7	8	8	7	8	7	8	9	S	3	9	6.1	
Dec 23	10	10	9	9	8	7	6	9	12	10	6	9	9	9	73	12	8	10	8	9	7	8	S	7	6	73	11.5	
Dec 24	4	4	3	3	3	4	3	3	7	4	7	4	3	3	5	4	3	3	3	3	7	S	2	2	2	7	3.8	
Dec 25	3	4	4	4	3	4	5	4	5	5	3	4	3	3	3	6	8	9	7	7	S	5	4	3	3	9	4.6	
Dec 26	2	2	2	2	3	4	4	5	5	6	9	9	9	9	9	9	12	9	7	S	8	8	9	11	2	12	6.7	
Dec 27	12	12	12	15	13	17	18	14	11	12	12	10	10	9	9	9	8	8	S	5	4	3	3	3	3	18	10.0	
Dec 28	2	2	2	1	2	2	3	3	2	3	2	3	6	7	8	5	7	S	15	10	8	8	6	6	1	15	4.9	
Dec 29	6	6	5	5	5	4	4	4	4	3	4	4	5	6	6	8	S	9	6	7	8	9	8	6	3	9	5.7	
Dec 30	9	9	7	10	7	15	29	34	40	37	35	32	26	23	27	S	12	16	30	13	13	11	11	10	7	40	19.8	
Dec 31	11	12	11	10	10	13	12	13	13	12	11	10	10	S	8	8	7	7	4	3	5	4	4	4	3	13	9.1	
Diurnal Maximum	17	24	25	97	471	61	29	67	54	43	35	836	39	26	73	21	207	41	30	30	23	17	14	29				
Diurnal Average	6.1	7.4	6.9	9.8	26.9	10.5	9.0	13.1	9.6	8.7	8.9	36.4	9.1	9.2	14.5	8.7	16.8	9.7	9.8	8.6	7.6	6.7	6.2	6.4				

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 NOx - Bonnyville - East Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - December 2019

### Summary of Hourly Instantaneous Maximums

#### NITRIC OXIDE (NO) in ppb

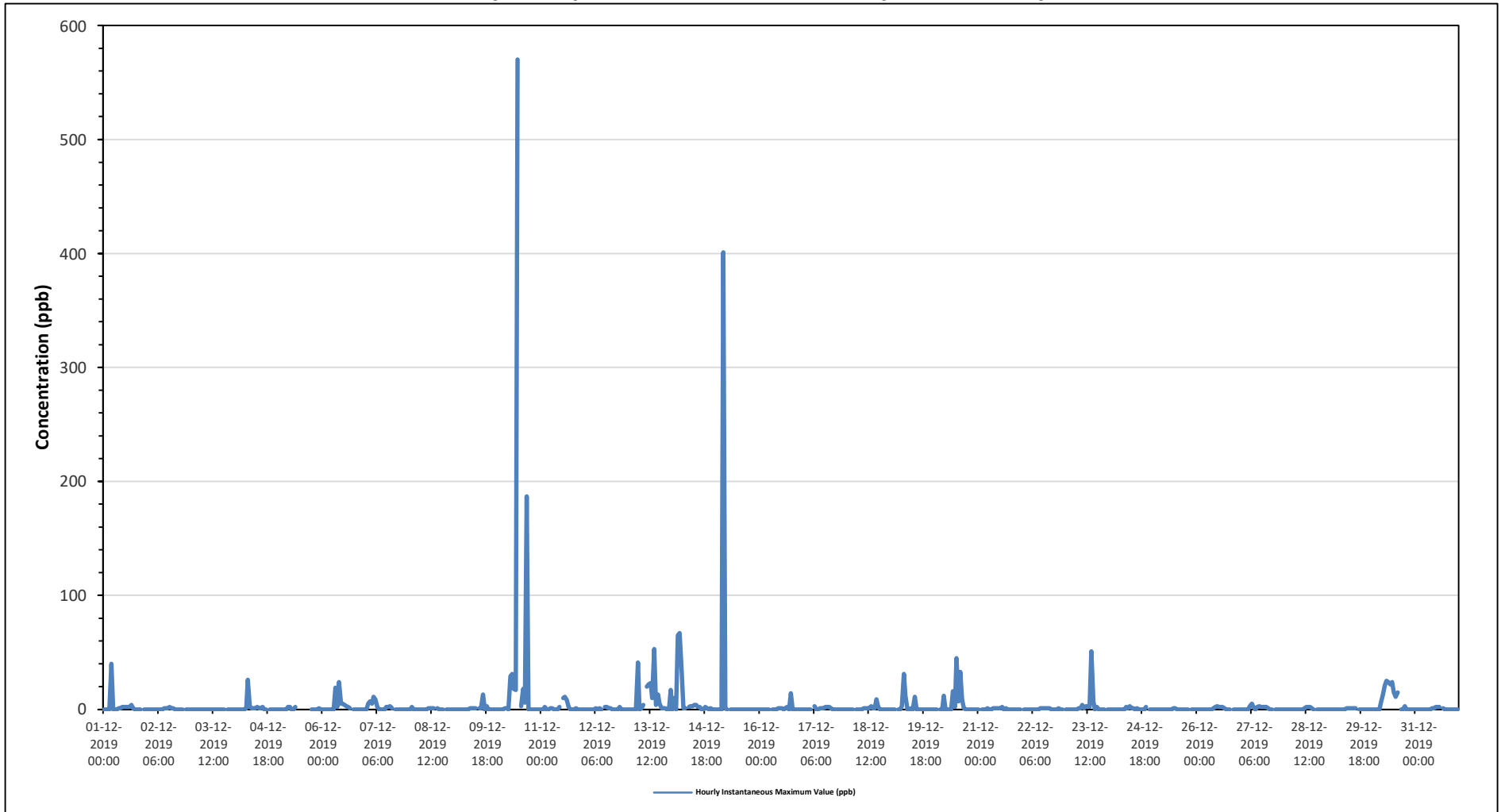
Maximum Hourly Value:	570 ppb on December 10 at hour 11	Hours in Service:	744
Maximum Daily Value:	38.3 ppb on December 10	Hours of Data:	703
Minimum Hourly Value:	0 ppb on December 1 at hour 0	Hours of Missing Data:	2
Minimum Daily Value:	0.0 ppb on December 3	Hours of Calibration:	39
Monthly Average:	3.7 ppb	Operational Uptime:	99.7

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	
Dec 1	0	0	0	0	40	0	0	0	1	1	2	2	2	2	2	4	1	0	0	0	0	S	0	0	0	0	40	2.5
Dec 2	0	0	0	0	0	0	0	0	0	1	1	1	2	1	1	0	0	0	0	0	S	0	0	0	0	0	2	0.3
Dec 3	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
Dec 4	0	0	0	0	0	0	1	26	2	1	1	1	2	1	1	2	0	0	S	0	0	0	0	0	0	0	26	1.7
Dec 5	0	0	0	0	0	2	2	0	0	2	C	C	C	C	C	C	C	C	0	0	0	0	0	1	0	2	-	
Dec 6	0	0	0	0	0	0	0	19	2	24	5	5	4	3	2	1	S	0	0	0	0	0	0	0	0	24	2.8	
Dec 7	0	5	7	5	11	9	2	0	0	0	0	2	2	3	1	S	0	0	0	0	0	0	0	0	0	11	2.0	
Dec 8	0	2	0	0	0	0	0	0	0	0	1	1	1	1	S	1	0	0	0	S1	S1	0	0	0	0	2	0.3	
Dec 9	0	0	0	0	0	0	0	0	1	1	1	1	S	1	1	13	0	3	0	0	0	0	0	0	0	13	1.0	
Dec 10	0	0	0	0	1	1	0	29	31	18	17	570	S	3	18	6	187	0	0	0	0	0	0	0	0	570	38.3	
Dec 11	0	0	2	0	0	1	1	0	0	0	2	S	10	11	8	2	0	0	0	1	0	0	0	0	0	11	1.7	
Dec 12	0	0	0	0	0	0	1	0	1	0	S	2	2	1	1	0	0	0	0	2	0	0	0	0	0	2	0.4	
Dec 13	0	0	0	0	0	41	0	1	4	S	20	22	23	10	53	4	13	5	1	1	1	0	0	17	53	9.4		
Dec 14	0	10	0	65	67	34	1	1	S	2	3	3	4	4	2	2	0	0	2	1	0	1	0	0	0	67	8.8	
Dec 15	0	0	0	0	401	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	401	17.5	
Dec 16	0	0	0	0	0	0	S	0	0	0	1	1	1	1	0	1	2	0	14	0	0	0	0	0	0	14	0.9	
Dec 17	0	0	0	0	0	S	3	0	0	1	1	1	2	2	2	1	0	0	0	0	0	0	0	0	0	3	0.6	
Dec 18	0	0	0	0	S	0	0	0	0	1	1	1	1	3	1	1	9	2	0	0	0	0	0	0	0	9	0.9	
Dec 19	0	0	0	S	0	0	3	31	12	0	0	1	0	11	0	0	0	0	0	0	0	0	0	0	0	31	2.5	
Dec 20	0	0	S	0	0	12	0	0	0	0	16	2	45	7	33	9	1	0	0	0	0	0	0	0	0	45	5.4	
Dec 21	0	S	0	0	0	1	0	0	1	1	1	1	1	2	0	1	0	0	0	0	0	0	0	0	0	2	0.4	
Dec 22	S	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	S	0	1	0.3	
Dec 23	0	0	0	0	0	0	0	1	1	4	1	3	3	2	51	7	0	2	0	0	0	0	0	0	0	51	3.3	
Dec 24	0	0	0	0	0	0	0	0	0	2	1	3	1	1	0	1	0	0	0	0	2	S	0	0	0	3	0.5	
Dec 25	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	S	0	0	0	0	1	0.1	
Dec 26	0	0	0	0	0	0	0	0	0	1	2	3	2	2	2	1	0	0	0	0	S	0	0	0	0	3	0.6	
Dec 27	0	0	0	0	0	3	5	2	0	2	3	2	2	2	2	1	0	0	0	S	0	0	0	0	0	5	1.0	
Dec 28	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	1	0	0	0	S	0	0	0	0	0	2	0.3	
Dec 29	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	1	0.3	
Dec 30	0	0	0	0	0	6	13	21	25	24	22	24	15	11	15	S	0	0	3	0	0	0	0	0	0	25	7.8	
Dec 31	0	0	0	0	0	0	0	0	0	1	1	2	2	2	S	1	0	0	0	0	0	0	0	0	0	2	0.4	
Diurnal Maximum	0	10	7	65	401	41	13	31	31	24	22	570	45	11	53	9	187	14	3	2	2	1	1	17				
Diurnal Average	0.0	0.6	0.3	2.3	17.3	3.7	1.1	4.4	2.7	2.9	3.6	22.7	4.6	3.1	7.2	1.8	8.0	0.8	0.3	0.2	0.1	0.0	0.0	0.6				

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 NO - Bonnyville - East Site**







## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Bonnyville - East Site - December 2019

### Summary of Hourly Instantaneous Maximums

#### NITROGEN DIOXIDE (NO<sub>2</sub>) in ppb

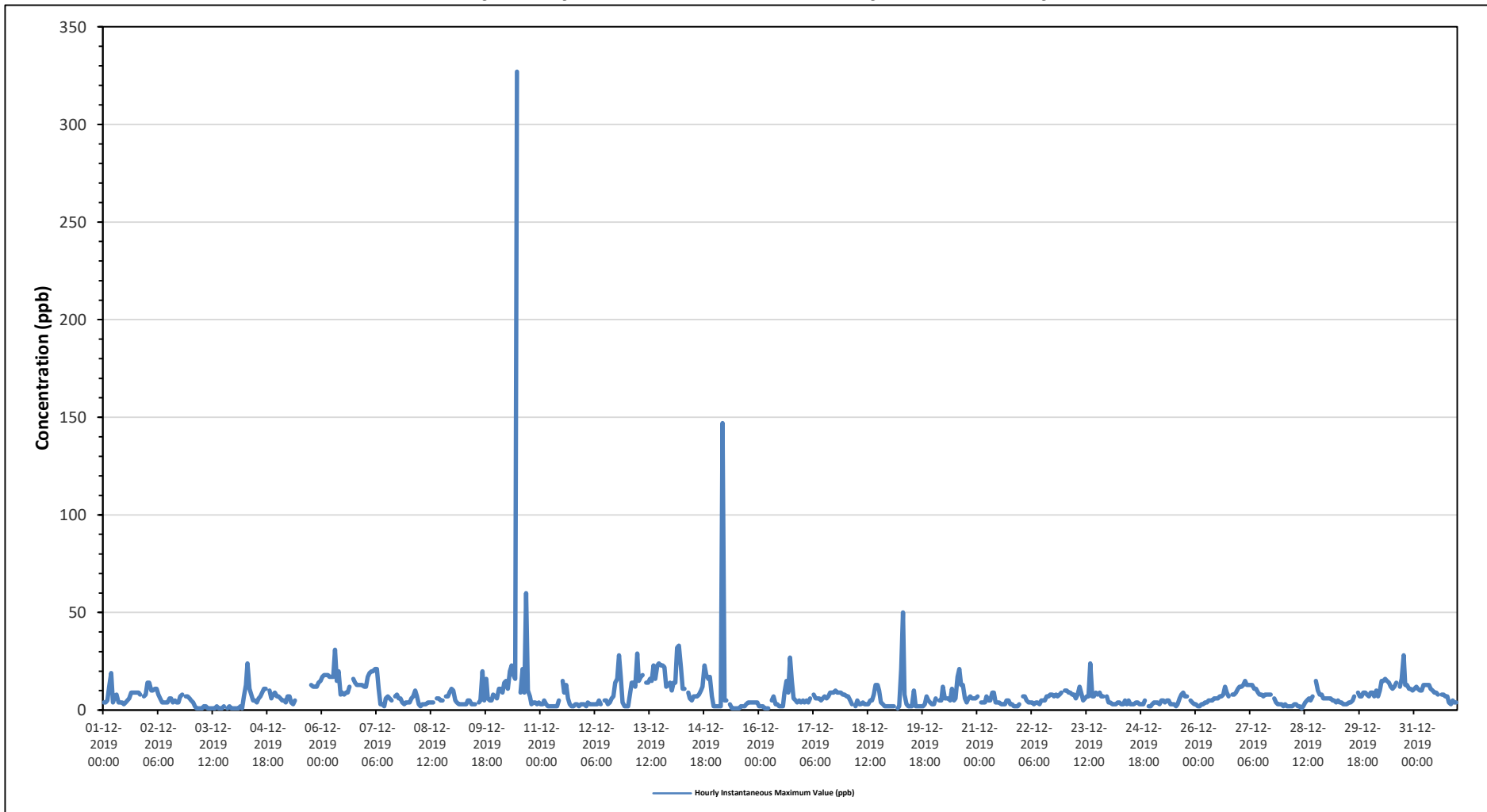
Maximum Hourly Value:	327 ppb	on December 10 at hour 11	Hours in Service:	744
Maximum Daily Value:	26.7 ppb	on December 10	Hours of Data:	703
Minimum Hourly Value:	1 ppb	on December 3 at hour 3	Hours of Missing Data:	2
Minimum Daily Value:	1.6 ppb	on December 3	Hours of Calibration:	39
Monthly Average:	8.0 ppb		Operational Uptime:	99.7

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	
Dec 1	4	4	5	12	19	4	7	8	4	4	4	3	4	5	6	9	9	9	9	9	8	S	7	8	3	19	7.0	
Dec 2	14	14	10	10	11	11	8	6	4	4	4	4	6	6	4	5	4	4	7	8	S	7	7	6	4	14	7.1	
Dec 3	5	4	2	1	1	1	1	2	2	1	1	1	1	1	2	1	1	1	2	2	S	1	2	1	1	1	5	1.6
Dec 4	1	1	1	2	1	7	13	24	11	8	5	5	4	6	7	9	11	11	S	10	6	8	9	7	1	24	7.3	
Dec 5	7	6	5	5	4	7	7	4	3	5	C	C	C	C	C	C	C	C	C	13	12	12	12	14	15	3	15	-
Dec 6	17	18	18	18	17	17	17	31	15	20	8	9	8	9	12	S	16	14	13	13	13	13	12	12	8	31	14.7	
Dec 7	12	17	19	20	20	21	21	11	3	3	2	6	7	6	5	S	7	8	6	6	4	3	4	4	2	21	9.3	
Dec 8	4	6	7	10	7	3	2	3	3	3	4	4	4	4	S	6	6	5	5	S1	S1	7	9	11	2	11	5.4	
Dec 9	10	5	4	3	3	3	3	3	5	5	3	3	3	S	4	5	20	5	16	6	5	5	8	7	3	20	5.8	
Dec 10	6	11	11	9	14	15	11	20	23	18	16	S	327	S	9	21	9	60	10	7	3	4	4	3	4	3	327	26.7
Dec 11	3	3	5	3	2	2	2	2	2	2	5	S	15	9	13	6	3	2	2	3	3	2	3	3	2	15	4.1	
Dec 12	3	2	4	3	3	3	3	3	5	3	S	5	5	3	4	6	7	14	16	28	17	4	2	2	2	28	6.3	
Dec 13	2	8	14	14	12	29	15	17	18	S	14	14	16	15	23	16	23	24	23	23	22	12	13	14	2	29	16.6	
Dec 14	10	14	14	32	33	22	11	11	S	9	6	5	7	7	7	8	10	12	23	18	16	17	7	2	2	33	13.1	
Dec 15	2	2	2	2	147	5	5	S	3	1	1	1	1	1	2	2	2	3	4	4	4	4	4	4	4	1	147	9.0
Dec 16	2	2	2	1	1	1	S	5	7	3	3	2	2	2	9	15	9	27	15	6	5	4	5	4	1	27	5.7	
Dec 17	5	4	5	4	6	S	8	6	6	6	5	6	7	6	7	9	9	9	10	9	9	9	8	8	4	10	7.0	
Dec 18	7	7	5	3	S	2	5	3	3	4	3	3	3	5	5	8	13	13	10	4	3	2	2	2	2	13	5.0	
Dec 19	2	2	2	S	1	2	21	50	8	3	2	2	2	10	2	2	2	2	2	3	7	5	4	3	1	50	6.0	
Dec 20	3	6	S	5	5	12	6	6	6	5	11	5	6	17	21	13	13	6	4	6	7	6	6	6	3	21	7.9	
Dec 21	7	S	4	4	4	7	5	5	9	9	4	4	4	3	3	3	5	5	3	3	2	2	2	3	2	9	4.3	
Dec 22	S	7	7	5	4	4	4	3	4	4	3	5	5	5	7	7	8	8	7	8	7	8	9	S	3	9	5.9	
Dec 23	10	10	9	9	8	8	6	8	12	9	5	6	7	7	24	7	7	9	8	9	7	7	S	7	5	24	8.7	
Dec 24	4	4	3	3	3	4	4	3	3	5	3	5	3	3	4	4	3	3	3	3	5	S	2	2	2	5	3.4	
Dec 25	3	4	4	4	3	5	5	4	5	5	3	3	3	2	3	6	8	9	7	7	S	5	4	3	2	9	4.6	
Dec 26	3	2	2	3	3	4	4	5	5	5	6	6	6	7	7	8	12	9	7	S	8	8	9	11	2	12	6.1	
Dec 27	12	12	13	15	13	13	13	13	11	11	9	8	8	7	8	8	8	8	S	6	4	3	3	3	3	15	9.1	
Dec 28	2	3	2	2	2	2	3	3	2	2	1	2	4	5	6	5	7	S	15	10	8	8	6	6	1	15	4.6	
Dec 29	6	6	6	5	5	4	5	4	4	3	3	3	4	4	5	7	S	9	7	7	9	9	8	7	3	9	5.7	
Dec 30	9	9	7	10	7	10	15	15	16	15	14	12	11	12	14	S	12	16	28	13	13	11	11	10	7	28	12.6	
Dec 31	11	12	11	10	10	13	13	13	11	10	9	9	8	S	8	8	7	7	4	3	5	4	4	4	3	13	8.8	
Diurnal Maximum	17	18	19	32	147	29	21	50	23	20	16	327	16	17	24	16	60	27	28	28	22	17	14	15				
Diurnal Average	6.2	6.8	6.8	7.6	12.3	8.0	8.1	9.7	7.2	6.2	5.4	16.1	5.7	6.3	8.3	7.3	10.3	9.1	9.7	8.6	7.6	6.6	6.2	6.0				

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 NO2 - Bonnyville - East Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**Bonnyville - East Site - December 2019**

### Summary of Hourly Instantaneous Maximums

#### OZONE (O<sub>3</sub>) in ppb

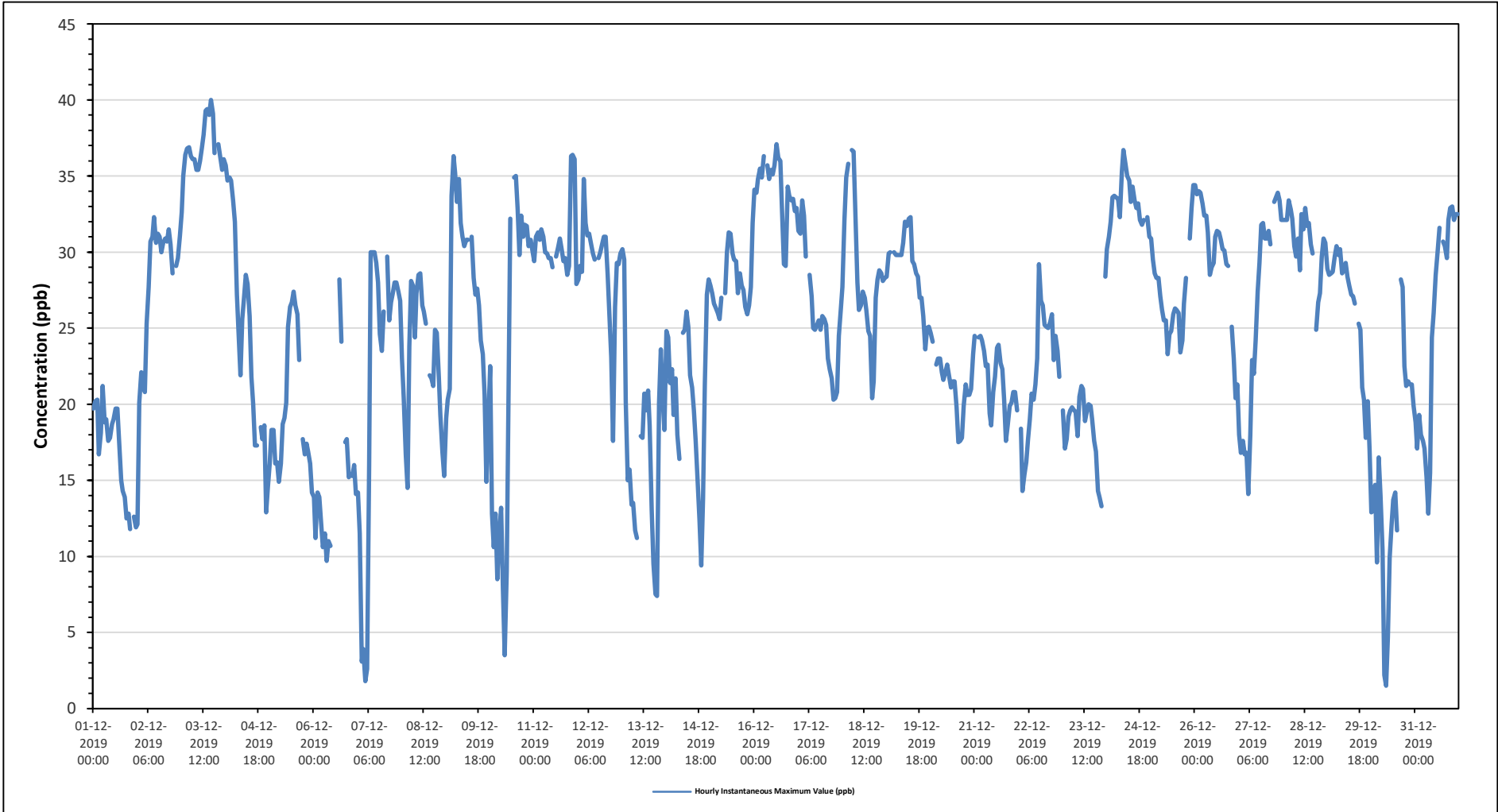
Maximum Hourly Value: 40.0 ppb on December 3 at hour 16	Hours in Service: 744
Maximum Daily Value: 36.8 ppb on December 3	Hours of Data: 708
Minimum Hourly Value: 1.5 ppb on December 30 at hour 8	Hours of Missing Data: 0
Minimum Daily Value: 14.9 ppb on December 6	Hours of Calibration: 36
Monthly Average: 25.1 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	
Dec 1	19.7	20.2	20.3	16.7	18.1	21.2	18.8	19	17.6	17.8	18.7	19	19.7	19.7	17.5	15	14.3	13.9	12.5	12.8	11.8	S	12.6	11.9	11.8	21.2	16.9	
Dec 2	12.1	20.1	22.1	21.6	20.8	25.3	27.7	30.7	31	32.3	30.6	31.2	31	30	30.6	30.9	30.7	31.5	30.5	28.6	S	29.1	29.6	31.1	12.1	32.3	27.8	
Dec 3	32.6	35	36.4	36.8	36.9	36.3	36.1	36.1	35.4	35.4	36	36.8	37.7	39.3	39.4	39	40	39.1	36.5	S	37.1	36.2	35.4	36.1	32.6	40.0	36.8	
Dec 4	35.7	34.7	34.9	34.7	33.4	32	27.2	24.9	21.9	25.6	27	28.5	27.9	25.8	21.8	20	17.3	17.3	S	18.5	17.7	18.6	12.9	14.6	12.9	35.7	24.9	
Dec 5	16.1	18.3	18.3	16.1	16.2	14.9	16.1	18.7	19.1	20.1	25.1	26.4	26.7	27.4	26.5	25.9	22.9	S	17.7	16.7	17.4	16.9	16.1	14.2	14.2	27.4	19.7	
Dec 6	13.9	11.2	14.2	13.9	12	10.6	11.5	9.7	11	10.7	C	C	C	C	28.2	24.1	S	17.5	17.7	15.2	15.4	15.3	16	14.1	9.7	28.2	14.9	
Dec 7	14.2	11.5	3.1	3.9	1.8	2.6	16	30	30	30	29.3	28	24.6	23.5	26.1	S	29.7	25.5	26.7	27.3	28	28	27.4	26.8	1.8	30.0	21.5	
Dec 8	23	20.4	16.7	14.5	23.8	28.1	27.8	24.4	27.3	28.5	28.6	26.5	26.1	25.3	S	21.9	21.7	21.2	24.9	24.7	21.8	19.3	16.9	15.3	14.5	28.6	23.0	
Dec 9	19.1	20.3	21	33.7	36.3	35.2	33.3	34.8	31.9	31	30.4	30.8	30.8	S	31	28.3	27.2	27.6	26.5	24.2	23.3	20.6	14.9	18.6	14.9	36.3	27.4	
Dec 10	22.5	12.8	10.6	12.8	8.5	11.6	13.2	7.9	3.5	9	20.5	32.2	S	34.9	35	32.8	29.8	32.4	31	31.8	31.7	30.4	30.8	30.1	3.5	35.0	22.4	
Dec 11	29.4	31	31.3	30.8	31.5	31	30	29.9	29.6	29.6	29	S	29.7	30.3	30.9	30.2	29.4	29.6	28.5	29.1	36.3	36.4	36.1	27.9	27.9	36.4	30.8	
Dec 12	28.2	29.1	28.7	34.8	31.9	31.1	31.2	30.5	29.9	29.5	S	29.6	30	30.5	31	31	28.5	25.8	23.1	17.6	26.4	29.3	29.2	29.9	17.6	34.8	29.0	
Dec 13	30.2	29.5	20.2	15	15.7	13.4	13.5	11.7	11.2	S	17.9	17.8	20.7	19.6	20.9	18.6	13.1	9.5	7.5	7.4	20.1	23.6	20.1	18.3	7.4	30.2	17.2	
Dec 14	24.8	24.4	21.4	22.3	19.3	21.7	18	16.4	S	24.7	24.9	26.1	25.1	21.9	21.1	19.6	17.6	15.2	12.4	9.4	13.8	21.3	27.2	28.2	9.4	28.2	20.7	
Dec 15	27.8	27.3	26.6	26.3	26	25.6	27	S	27.3	30	31.3	31.2	29.9	29.5	29.4	27.3	28.6	27.8	27.5	26.4	25.9	26.5	27.7	31.9	25.6	31.9	28.0	
Dec 16	34.1	33.9	34.8	35.5	34.9	36.3	S	35.7	34.8	35.4	35.1	35.7	37.1	36.2	36	33	29.2	29.1	34.3	33.7	33.4	33.5	32.7	32.9	29.1	37.1	34.2	
Dec 17	31.4	31.2	33.4	32.4	29.7	S	28.5	27.1	25	24.9	25.2	25.5	24.9	25.8	25.6	25.2	23	22.3	21.7	20.3	20.4	20.8	24.5	26.3	20.3	33.4	25.9	
Dec 18	27.7	32.1	34.9	35.8	S	36.7	36.6	32	28	26.2	26.5	27.4	27	26.2	24.8	24.5	20.4	21.5	27	28.2	28.8	28.6	28.1	28.3	20.4	36.7	28.6	
Dec 19	28.4	29.9	30	S	30	29.8	29.8	29.8	29.8	30.6	32	31.7	32.2	32.3	29.4	29.2	28.6	28.4	27	27	25.8	23.6	25	25.1	23.6	32.3	28.9	
Dec 20	24.7	24.1	S	22.6	23	23	22.1	21.6	22.1	22.6	21.8	21.1	21.5	21.5	19.8	17.5	17.6	17.8	19.9	21.3	20.6	20.6	21	23.3	17.5	24.7	21.4	
Dec 21	24.5	S	24.4	24.5	24.2	23.5	22.5	22.6	19.4	18.6	20.8	21.8	23.7	23.9	22.7	22.3	20.3	17.6	18.6	19.9	20.1	20.8	20.8	19.6	17.6	24.5	21.6	
Dec 22	S	18.4	14.3	15.4	16.2	17.7	19	20.7	20.3	21.3	23	29.2	26.8	26.5	25.2	25.1	25	25.4	25.9	22.9	24.5	23.5	21.8	S	14.3	29.2	22.2	
Dec 23	19.6	17.1	17.7	19.2	19.6	19.8	19.6	19.5	17.9	20.5	21.2	21	18.9	19.5	20	19.9	19	17.6	16.9	14.3	13.9	13.3	S	28.4	13.3	28.4	18.9	
Dec 24	30.2	31	32	33.6	33.7	33.6	33.5	32.3	35.3	36.7	35.8	35	34.7	33.3	34.3	33.4	32.9	33.2	32.1	31.8	32.1	S	32.3	31	30.2	36.7	33.2	
Dec 25	30.9	29.5	28.6	28.3	28.3	27.1	26.2	25.5	25.5	23.3	24.6	24.8	25.9	26.3	26.2	26	23.4	24.2	26.6	28.3	S	30.9	32.9	34.4	23.3	34.4	27.3	
Dec 26	34.4	33.8	34	33.9	33.2	32.4	32.4	31.3	28.5	29	29.3	31	31.4	31.3	30.8	30.2	30.1	29.2	29.1	S	25.1	23	20.4	21.3	20.4	34.4	29.8	
Dec 27	18	16.8	17.6	16.7	16.8	14.1	18	22.9	22	24.2	27.4	29.3	31.8	31.9	30.9	30.9	31.4	30.5	S	33.3	33.6	33.9	33.4	32.1	14.1	33.9	26.0	
Dec 28	32.1	32.1	32.1	33.4	32.8	32.2	30.4	29.7	30.9	28.8	32.5	31.5	32.9	31.7	31.9	30.5	29.9	S	24.9	26.7	27.3	29.7	30.9	30.6	24.9	33.4	30.7	
Dec 29	28.9	28.5	28.6	28.7	29.7	30.4	29.8	30.2	28.6	28.8	29.3	28.4	27.8	27.2	27.1	26.6	S	25.3	24.9	21.1	20.3	17.8	20.2	17	17.0	30.4	26.3	
Dec 30	12.9	13	14.7	9.6	16.5	14	10.4	2.2	1.5	4.7	9.9	12.2	13.7	14.2	11.7	S	28.2	27.7	22.5	21.2	21.5	21.3	21.3	19.9	1.5	28.2	15.0	
Dec 31	18.8	17.1	19.3	18	17.6	17.1	15.2	12.8	15.5	24.4	26	28.5	29.9	31.6	S	30.7	30.4	29.6	32.1	32.9	33	32.1	32.5	32.5	12.8	33.0	25.1	
Diurnal Maximum	36	35	36	37	37	37	37	36	35	37	36	37	38	39	39	39	39	35	39	37	34	37	36	36	36			
Diurnal Average	24.9	24.5	24.1	24.1	23.9	24.3	24.0	24.0	23.7	25.1	26.5	27.5	27.6	27.5	27.1	26.5	25.5	24.6	24.4	23.2	24.4	25.0	25.0	25.1				

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 O3 - Bonnyville - East Site**





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

**Bonnyville - East Site - December 2019**

**Summary of Hourly Instantaneous Maximums**

**TOTAL HYDROCARBONS (THC) in ppm**

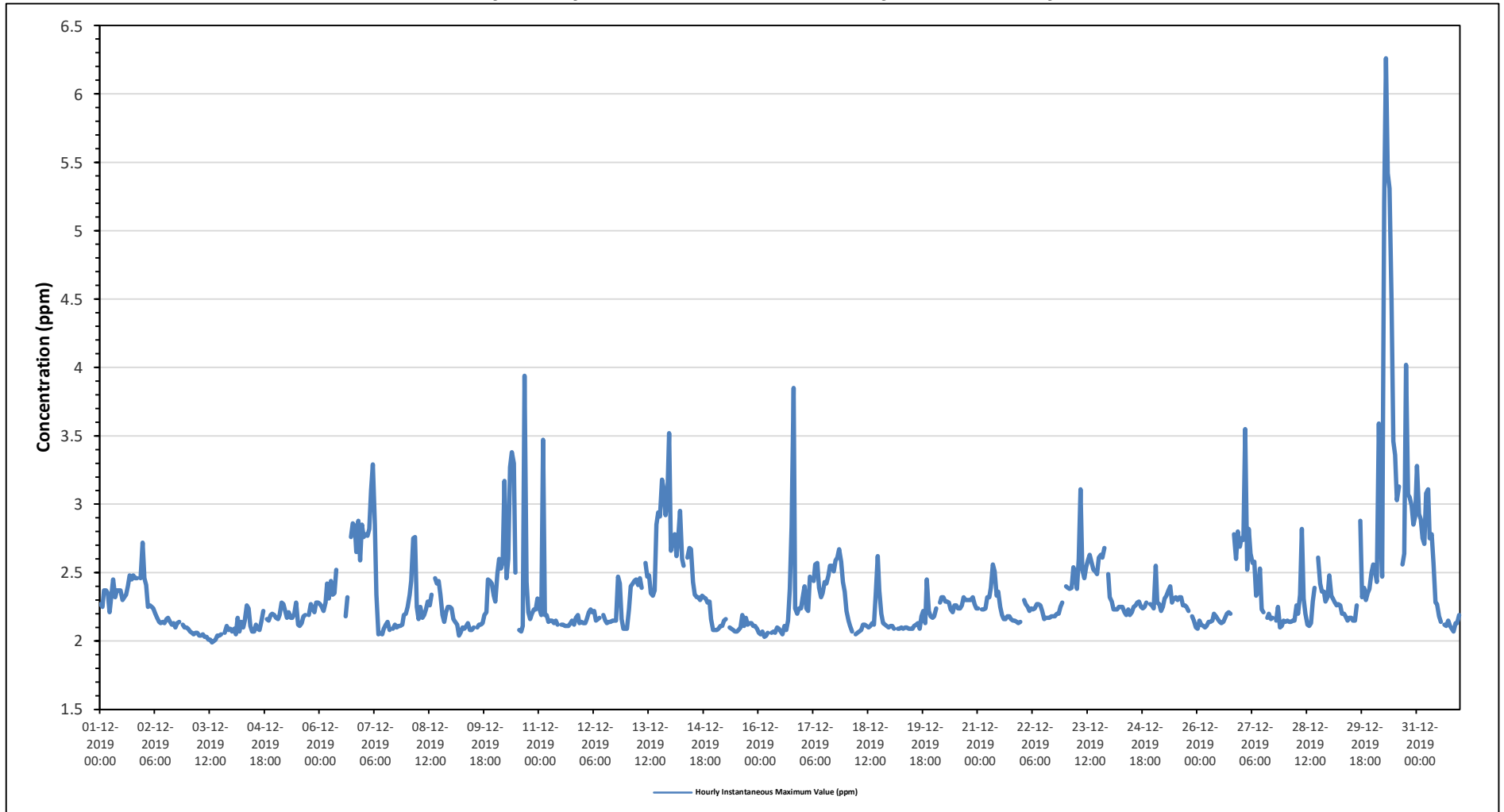
Maximum Hourly Value: 6.26 ppm on December 30 at hour 7	Hours in Service: 744
Maximum Daily Value: 3.48 ppm on December 30	Hours of Data: 706
Minimum Hourly Value: 1.99 ppm on December 3 at hour 13	Hours of Missing Data: 2
Minimum Daily Value: 2.05 ppm on December 3	Hours of Calibration: 36
Monthly Average: 2.34 ppm	Operational Uptime: 99.7

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	
Dec 1	2.27	2.25	2.37	2.37	2.35	2.21	2.33	2.45	2.32	2.37	2.37	2.37	2.30	2.32	2.34	2.40	2.48	2.45	2.48	2.46	2.46	S	2.46	2.72	2.21	2.72	2.39	
Dec 2	2.46	2.41	2.25	2.26	2.25	2.24	2.20	2.17	2.14	2.13	2.14	2.13	2.16	2.17	2.14	2.12	2.13	2.10	2.13	2.14	S	2.12	2.10	2.10	2.10	2.46	2.18	
Dec 3	2.09	2.07	2.06	2.05	2.06	2.06	2.04	2.04	2.05	2.03	2.03	2.01	2.01	1.99	2.00	2.01	2.04	2.04	2.05	S	2.06	2.11	2.08	2.09	1.99	2.11	2.05	
Dec 4	2.07	2.09	2.05	2.17	2.07	2.14	2.10	2.15	2.26	2.24	2.11	2.07	2.07	2.12	2.09	2.08	2.14	2.22	S	2.16	2.15	2.19	2.20	2.19	2.05	2.26	2.14	
Dec 5	2.17	2.16	2.19	2.28	2.27	2.22	2.17	2.21	2.17	2.17	2.17	2.17	2.10	2.13	2.18	2.19	S	2.19	S	2.19	2.27	2.24	2.21	2.28	2.28	2.11	2.28	2.20
Dec 6	2.27	2.25	2.22	2.28	2.42	2.31	2.44	2.34	2.35	2.52	C	C	C	C	2.18	2.32	S	2.76	2.86	2.84	2.65	2.88	2.59	2.85	2.18	2.88	2.49	
Dec 7	2.76	2.78	2.77	2.82	3.10	3.29	2.85	2.34	2.05	2.06	2.05	2.09	2.12	2.14	2.08	S	2.09	2.12	2.10	2.11	2.11	2.12	2.19	2.20	2.05	3.29	2.36	
Dec 8	2.25	2.34	2.44	2.75	2.76	2.25	2.16	2.25	2.17	2.19	2.23	2.29	2.26	2.34	S	2.46	2.42	2.44	2.34	2.19	2.14	2.21	2.25	2.25	2.14	2.76	2.32	
Dec 9	2.24	2.16	2.14	2.12	2.04	2.06	2.10	2.09	2.11	2.13	2.08	2.08	2.10	S	2.10	2.12	2.12	2.13	2.19	2.21	2.45	2.44	2.42	2.33	2.04	2.45	2.17	
Dec 10	2.29	2.49	2.60	2.53	2.58	3.17	2.46	2.60	3.27	3.38	3.30	2.50	S	2.08	2.07	2.11	3.94	2.43	2.21	2.16	2.20	2.23	2.23	2.31	2.07	3.94	2.57	
Dec 11	2.24	2.19	3.47	2.19	2.19	2.14	2.15	2.15	2.13	2.15	2.12	S	2.12	2.12	2.11	2.11	2.11	2.13	2.15	2.12	2.17	2.19	2.13	2.14	2.11	3.47	2.21	
Dec 12	2.13	2.13	2.16	2.21	2.23	2.21	2.22	2.15	2.16	2.17	S	2.19	2.15	2.13	2.14	2.14	2.15	2.15	2.15	2.47	2.42	2.16	2.09	2.09	2.09	2.47	2.18	
Dec 13	2.09	2.23	2.40	2.42	2.44	2.45	2.41	2.46	2.39	S	2.57	2.47	2.48	2.35	2.33	2.37	2.85	2.94	2.91	3.18	3.12	2.92	3.04	3.52	2.09	3.52	2.62	
Dec 14	2.66	2.75	2.78	2.62	2.76	2.95	2.60	2.55	S	2.61	2.68	2.67	2.43	2.34	2.32	2.32	2.30	2.33	2.32	2.31	2.28	2.29	2.16	2.08	2.08	2.95	2.48	
Dec 15	2.08	2.08	2.09	2.11	2.11	2.15	2.16	S	2.10	2.09	2.08	2.07	2.07	2.08	2.10	2.19	2.11	2.17	2.12	2.13	2.13	2.11	2.11	2.09	2.07	2.19	2.11	
Dec 16	2.06	2.05	2.07	2.03	2.04	2.06	S	2.06	2.07	2.06	2.10	2.09	2.07	2.05	2.11	2.08	2.15	2.38	2.84	3.85	2.24	2.20	2.24	2.24	2.03	3.85	2.22	
Dec 17	2.31	2.40	2.24	2.22	2.47	S	2.44	2.56	2.57	2.39	2.32	2.35	2.43	2.42	2.48	2.55	2.55	2.51	2.59	2.61	2.67	2.58	2.43	2.36	2.22	2.67	2.45	
Dec 18	2.22	2.15	2.11	2.07	S	2.05	2.06	2.07	2.08	2.12	2.12	2.11	2.10	2.11	2.13	2.12	2.34	2.62	2.37	2.20	2.13	2.12	2.11	2.10	2.05	2.62	2.16	
Dec 19	2.11	2.11	2.09	S	2.09	2.09	2.10	2.09	2.10	2.10	2.09	2.09	2.09	2.11	2.12	2.13	2.09	2.18	2.22	2.13	2.45	2.22	2.18	2.17	2.09	2.45	2.14	
Dec 20	2.18	2.24	S	2.28	2.32	2.32	2.29	2.29	2.28	2.23	2.21	2.26	2.24	2.24	2.26	2.32	2.30	2.30	2.30	2.30	2.32	2.27	2.24	2.18	2.32	2.27	2.27	
Dec 21	2.24	S	2.23	2.23	2.24	2.32	2.32	2.39	2.56	2.51	2.33	2.36	2.25	2.19	2.16	2.18	2.18	2.16	2.15	2.15	2.14	2.13	2.14	2.13	2.13	2.56	2.25	
Dec 22	S	2.30	2.27	2.25	2.22	2.24	2.23	2.24	2.27	2.27	2.26	2.22	2.16	2.17	2.17	2.18	2.18	2.18	2.20	2.20	2.25	2.28	S	2.16	2.30	2.22		
Dec 23	2.40	2.39	2.38	2.39	2.54	2.49	2.38	2.60	3.11	2.52	2.46	2.54	2.59	2.63	2.57	2.52	2.51	2.49	2.61	2.63	2.61	2.68	S	2.49	2.38	3.11	2.54	
Dec 24	2.32	2.29	2.23	2.23	2.23	2.25	2.25	2.25	2.21	2.19	2.23	2.19	2.21	2.25	2.26	2.28	2.29	2.25	2.24	2.25	2.28	S	2.27	2.26	2.19	2.32	2.25	
Dec 25	2.24	2.55	2.28	2.27	2.22	2.25	2.31	2.33	2.37	2.40	2.28	2.31	2.32	2.30	2.32	2.32	2.26	2.26	2.25	2.22	S	2.18	2.15	2.10	2.10	2.55	2.28	
Dec 26	2.09	2.15	2.12	2.11	2.10	2.11	2.14	2.14	2.15	2.20	2.18	2.16	2.14	2.13	2.14	2.17	2.20	2.21	2.20	S	2.78	2.60	2.80	2.69	2.09	2.80	2.25	
Dec 27	2.75	2.74	3.55	2.52	2.82	2.64	2.57	2.58	2.33	2.36	2.53	2.23	2.21	S1	S1	2.20	2.16	2.17	S	2.15	2.25	2.10	2.11	2.15	2.10	3.55	2.43	
Dec 28	2.14	2.15	2.14	2.14	2.15	2.15	2.26	2.20	2.34	2.82	2.31	2.20	2.12	2.11	2.13	2.29	2.39	S	2.61	2.42	2.36	2.36	2.29	2.32	2.11	2.82	2.28	
Dec 29	2.48	2.33	2.31	2.28	2.26	2.27	2.26	2.20	2.20	2.18	2.15	2.17	2.17	2.15	2.15	2.26	S	2.88	2.32	2.39	2.30	2.35	2.38	2.50	2.15	2.88	2.30	
Dec 30	2.56	2.51	2.43	3.59	2.81	2.47	5.20	6.26	5.42	5.31	4.48	3.46	3.36	3.03	3.13	S	2.56	2.64	4.02	3.07	3.05	2.99	2.85	2.91	2.43	6.26	3.48	
Dec 31	3.28	2.93	2.89	2.75	2.71	3.08	3.11	2.75	2.78	2.57	2.28	2.27	2.18	2.14	S	2.12	2.11	2.15	2.11	2.09	2.07	2.13	2.19	2.07	3.28	2.47		
Diurnal Maximum	3.28	2.93	3.55	3.59	3.10	3.29	5.20	6.26	5.42	5.31	4.48	3.46	3.36	3.03	3.13	2.55	3.94	2.94	4.02	3.85	3.12	2.99	3.04	3.52				
Diurnal Average	2.32	2.32	2.38	2.35	2.36	2.35	2.41	2.43	2.42	2.42	2.35	2.28	2.24	2.23	2.22	2.23	2.32	2.34	2.39	2.39	2.36	2.32	2.30	2.34				

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 - December 2019

## Summary of Hourly Instantaneous Maximums

### METHANE (CH4) in ppm

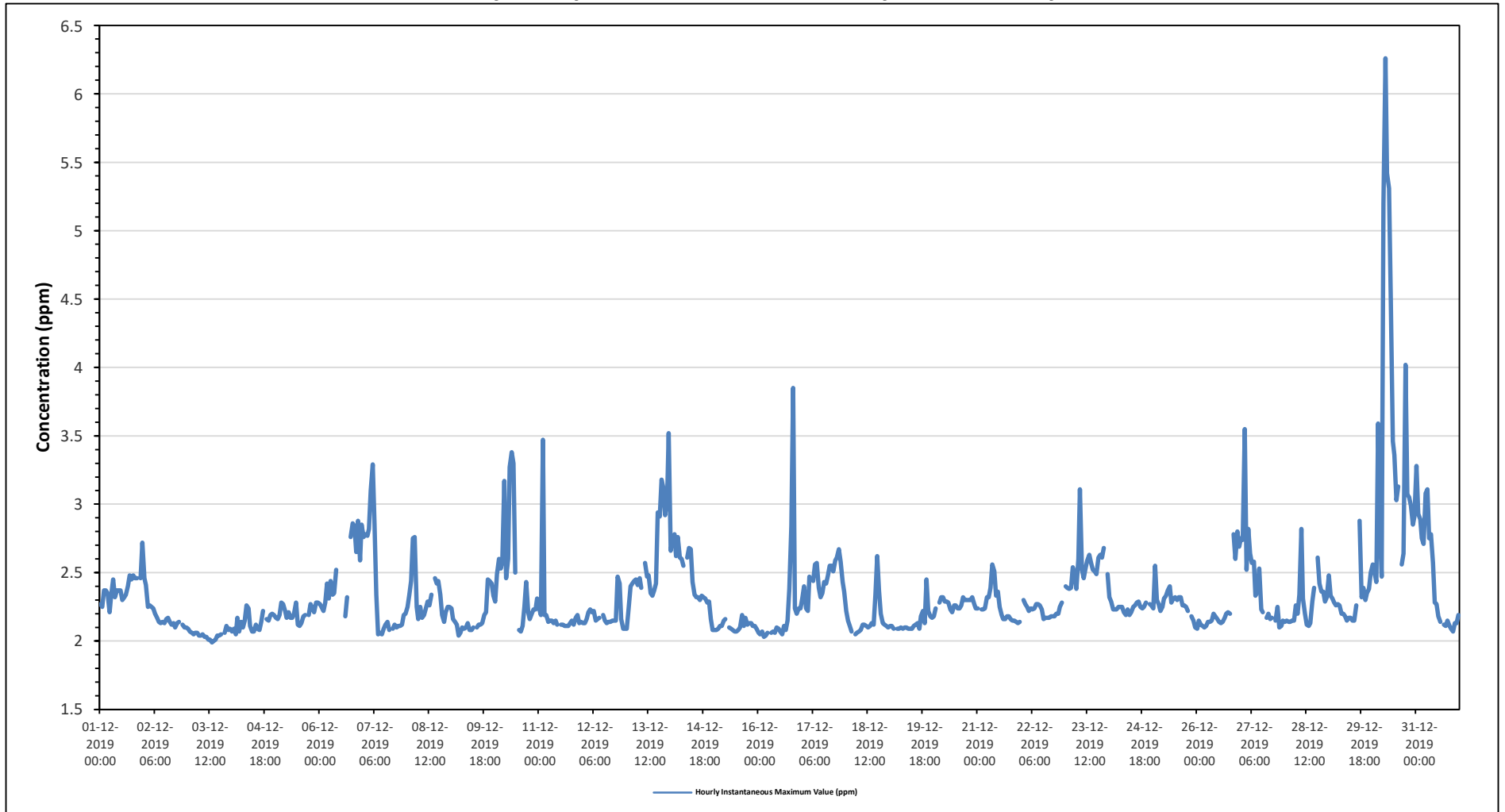
Maximum Hourly Value:	6.26 ppm on December 30 at hour 7	Hours in Service:	744
Maximum Daily Value:	3.48 ppm on December 30	Hours of Data:	706
Minimum Hourly Value:	1.99 ppm on December 3 at hour 13	Hours of Missing Data:	2
Minimum Daily Value:	2.05 ppm on December 3	Hours of Calibration:	36
Monthly Average:	2.33 ppm	Operational Uptime:	99.7

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	
Dec 1	2.27	2.25	2.37	2.37	2.35	2.21	2.33	2.45	2.32	2.37	2.37	2.37	2.30	2.32	2.34	2.40	2.48	2.45	2.48	2.46	2.46	S	2.46	2.72	2.21	2.72	2.39	
Dec 2	2.46	2.41	2.25	2.26	2.25	2.24	2.20	2.17	2.14	2.13	2.14	2.13	2.16	2.17	2.14	2.12	2.13	2.10	2.13	2.14	S	2.12	2.10	2.10	2.10	2.46	2.18	
Dec 3	2.09	2.07	2.06	2.05	2.06	2.06	2.04	2.04	2.05	2.03	2.03	2.01	2.01	1.99	2.00	2.01	2.04	2.04	2.05	S	2.06	2.11	2.08	2.09	1.99	2.11	2.05	
Dec 4	2.07	2.09	2.05	2.17	2.07	2.14	2.10	2.15	2.26	2.24	2.11	2.07	2.07	2.12	2.09	2.08	2.14	2.22	S	2.16	2.15	2.19	2.20	2.19	2.05	2.26	2.14	
Dec 5	2.17	2.16	2.19	2.28	2.27	2.22	2.17	2.21	2.17	2.17	2.17	2.17	2.17	2.13	2.18	2.18	2.19	S	2.19	2.27	2.24	2.21	2.28	2.28	2.11	2.28	2.20	
Dec 6	2.27	2.25	2.22	2.28	2.42	2.31	2.44	2.34	2.35	2.52	C	C	C	C	2.18	2.32	S	2.76	2.86	2.84	2.65	2.88	2.59	2.85	2.18	2.88	2.49	
Dec 7	2.76	2.78	2.77	2.82	3.10	3.29	2.85	2.34	2.05	2.06	2.05	2.09	2.12	2.14	2.08	S	2.09	2.12	2.10	2.11	2.11	2.12	2.19	2.20	2.05	3.29	2.36	
Dec 8	2.25	2.34	2.44	2.75	2.76	2.25	2.16	2.25	2.17	2.19	2.23	2.29	2.26	2.34	S	2.46	2.42	2.44	2.34	2.19	2.14	2.21	2.25	2.25	2.14	2.76	2.32	
Dec 9	2.24	2.16	2.14	2.12	2.04	2.06	2.10	2.09	2.10	2.13	2.08	2.08	2.10	S	2.10	2.12	2.12	2.13	2.19	2.21	2.45	2.44	2.42	2.33	2.04	2.45	2.17	
Dec 10	2.29	2.49	2.60	2.53	2.58	3.17	2.46	2.60	3.27	3.38	3.30	2.50	S	2.08	2.07	2.11	2.25	2.43	2.21	2.16	2.20	2.23	2.23	2.31	2.07	3.38	2.50	
Dec 11	2.24	2.19	3.47	2.19	2.19	2.14	2.15	2.15	2.13	2.15	2.12	S	2.12	2.12	2.11	2.11	2.11	2.13	2.15	2.12	2.17	2.19	2.13	2.14	2.11	3.47	2.21	
Dec 12	2.13	2.13	2.16	2.21	2.23	2.21	2.22	2.15	2.16	2.17	S	2.19	2.15	2.13	2.14	2.14	2.15	2.15	2.15	2.47	2.42	2.16	2.09	2.09	2.09	2.47	2.18	
Dec 13	2.09	2.23	2.40	2.42	2.44	2.45	2.41	2.46	2.39	S	2.57	2.47	2.48	2.35	2.33	2.37	2.42	2.94	2.91	3.18	3.12	2.92	3.04	3.52	2.09	3.52	2.60	
Dec 14	2.66	2.75	2.78	2.62	2.76	2.61	2.60	2.55	S	2.61	2.68	2.67	2.43	2.34	2.32	2.32	2.30	2.33	2.32	2.31	2.28	2.29	2.16	2.08	2.08	2.78	2.47	
Dec 15	2.08	2.08	2.09	2.11	2.11	2.15	2.16	S	2.10	2.09	2.08	2.07	2.07	2.08	2.10	2.19	2.11	2.17	2.12	2.13	2.13	2.11	2.11	2.09	2.07	2.19	2.11	
Dec 16	2.06	2.05	2.07	2.03	2.04	2.06	S	2.06	2.07	2.06	2.10	2.09	2.07	2.05	2.11	2.08	2.15	2.38	2.84	3.85	2.24	2.20	2.24	2.24	2.03	3.85	2.22	
Dec 17	2.31	2.40	2.24	2.22	2.47	S	2.44	2.56	2.57	2.39	2.32	2.35	2.43	2.42	2.48	2.55	2.55	2.51	2.59	2.61	2.67	2.58	2.43	2.36	2.22	2.67	2.45	
Dec 18	2.22	2.15	2.11	2.07	S	2.05	2.06	2.07	2.08	2.12	2.12	2.11	2.10	2.11	2.13	2.12	2.34	2.62	2.37	2.20	2.13	2.12	2.11	2.10	2.05	2.62	2.16	
Dec 19	2.11	2.11	2.09	S	2.09	2.09	2.10	2.09	2.10	2.10	2.09	2.09	2.09	2.11	2.12	2.13	2.09	2.18	2.22	2.13	2.45	2.22	2.18	2.17	2.09	2.45	2.14	
Dec 20	2.18	2.24	S	2.28	2.32	2.32	2.29	2.29	2.28	2.23	2.21	2.26	2.24	2.24	2.26	2.32	2.30	2.30	2.30	2.30	2.32	2.27	2.24	2.18	2.32	2.27	2.27	
Dec 21	2.24	S	2.23	2.23	2.24	2.32	2.32	2.39	2.56	2.51	2.33	2.36	2.25	2.19	2.16	2.18	2.18	2.16	2.15	2.15	2.14	2.13	2.14	2.13	2.13	2.56	2.25	
Dec 22	S	2.30	2.27	2.25	2.22	2.24	2.23	2.24	2.27	2.27	2.26	2.23	2.16	2.17	2.17	2.17	2.18	2.18	2.18	2.20	2.20	2.25	2.28	S	2.16	2.30	2.22	
Dec 23	2.40	2.39	2.38	2.39	2.54	2.49	2.38	2.60	3.11	2.52	2.46	2.54	2.59	2.63	2.57	2.52	2.51	2.49	2.61	2.63	2.61	2.68	S	2.49	2.38	3.11	2.54	
Dec 24	2.32	2.29	2.23	2.23	2.23	2.25	2.25	2.25	2.21	2.19	2.23	2.19	2.21	2.25	2.26	2.28	2.29	2.25	2.24	2.25	2.28	S	2.27	2.26	2.19	2.32	2.25	
Dec 25	2.24	2.55	2.30	2.27	2.22	2.25	2.31	2.33	2.37	2.40	2.28	2.31	2.32	2.30	2.32	2.32	2.26	2.26	2.25	2.22	S	2.18	2.15	2.10	2.10	2.55	2.28	
Dec 26	2.09	2.15	2.12	2.11	2.10	2.11	2.14	2.14	2.15	2.20	2.18	2.16	2.14	2.13	2.14	2.17	2.20	2.21	2.20	S	2.78	2.60	2.80	2.69	2.09	2.80	2.25	
Dec 27	2.75	2.74	3.55	2.52	2.82	2.64	2.57	2.58	2.33	2.36	2.53	2.23	2.21	S1	S1	2.20	2.16	2.17	S	2.15	2.25	2.10	2.11	2.15	2.10	3.55	2.43	
Dec 28	2.14	2.15	2.14	2.14	2.15	2.15	2.26	2.20	2.34	2.82	2.31	2.20	2.12	2.11	2.13	2.29	2.39	S	2.88	2.61	2.42	2.36	2.36	2.29	2.32	2.11	2.82	2.28
Dec 29	2.48	2.33	2.31	2.28	2.26	2.27	2.26	2.20	2.20	2.18	2.15	2.17	2.17	2.15	2.15	2.26	S	2.88	2.32	2.39	2.30	2.35	2.38	2.50	2.15	2.88	2.30	
Dec 30	2.56	2.51	2.43	3.59	2.81	2.47	5.20	6.26	5.42	5.31	4.48	3.46	3.36	3.03	3.13	S	2.56	2.64	4.02	3.07	3.05	2.99	2.85	2.91	2.43	6.26	3.48	
Dec 31	3.28	2.93	2.89	2.75	2.71	3.08	3.11	2.75	2.78	2.57	2.28	2.27	2.18	2.14	S	2.12	2.11	2.15	2.11	2.09	2.07	2.13	2.13	2.19	2.07	3.28	2.47	
Diurnal Maximum	3.28	2.93	3.55	3.59	3.10	3.29	5.20	6.26	5.42	5.31	4.48	3.46	3.36	3.03	3.13	2.55	2.56	2.94	4.02	3.85	3.12	2.99	3.04	3.52				
Diurnal Average	2.32	2.32	2.38	2.35	2.36	2.34	2.41	2.43	2.42	2.42	2.35	2.28	2.24	2.23	2.22	2.23	2.25	2.34	2.39	2.39	2.36	2.32	2.30	2.34				

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 - Bonnyville - East Site**







## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

*Bonnyville - East Site - December 2019*

### Summary of Hourly Instantaneous Maximums

#### NON-METHANE HYDROCARBONS (NMHC) in ppm

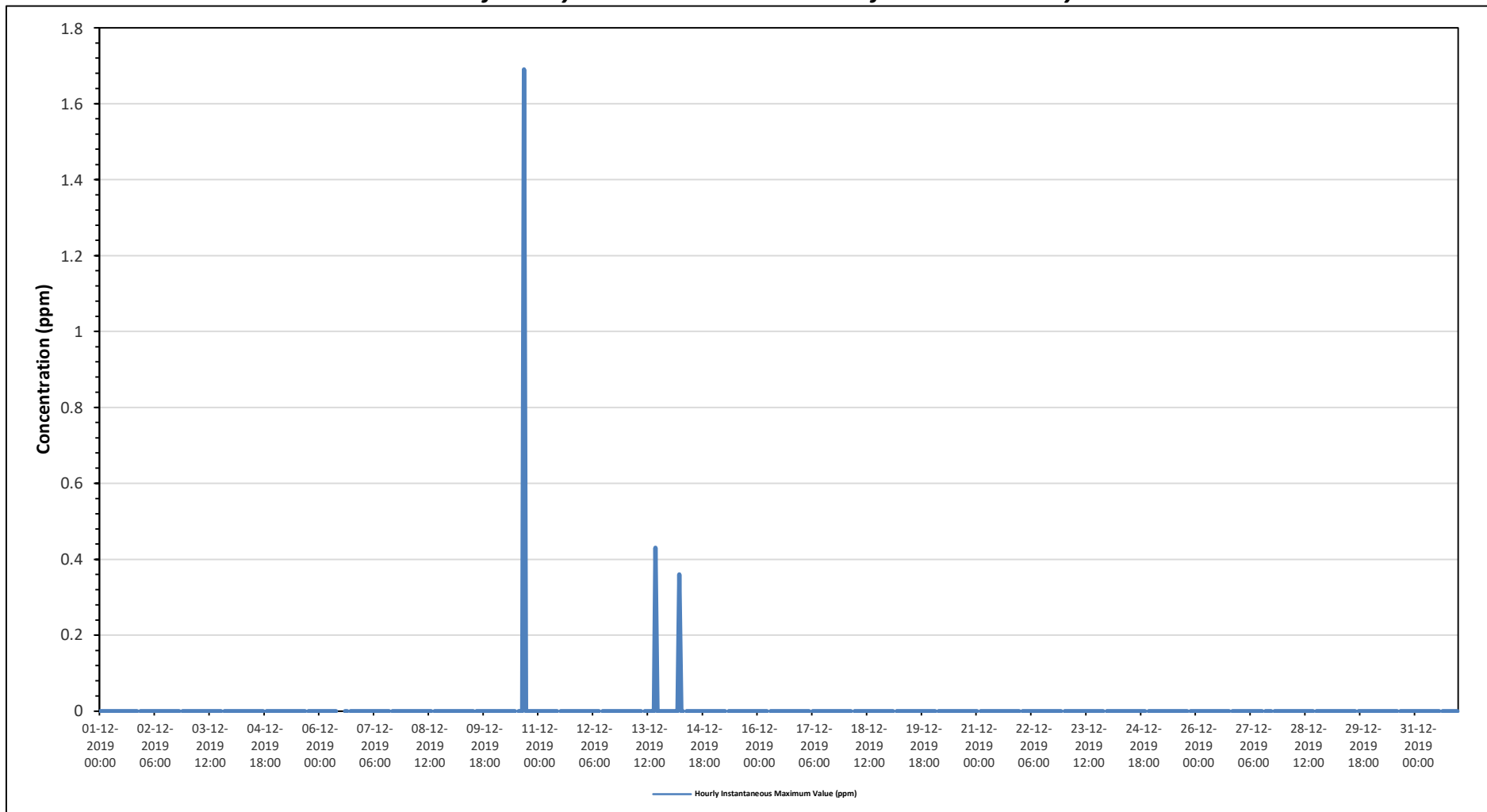
Maximum Hourly Value:	1.69 ppm on December 10 at hour 16	Hours in Service:	744
Maximum Daily Value:	0.07 ppm on December 10	Hours of Data:	706
Minimum Hourly Value:	0.00 ppm on December 1 at hour 0	Hours of Missing Data:	2
Minimum Daily Value:	0.00 ppm on December 1	Hours of Calibration:	36
Monthly Average:	0.00 ppm	Operational Uptime:	99.7

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	
Dec 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	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	0.00	S	S	0.00	0.00	0.00	0.00	0.00
Dec 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	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00
Dec 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C	C	C	C	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
Dec 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
Dec 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
Dec 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	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
Dec 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	S	0.00	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 11	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
Dec 12	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
Dec 13	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	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 14	0.00	0.00	0.00	0.00	0.00	0.36	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
Dec 15	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
Dec 16	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
Dec 17	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
Dec 18	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
Dec 19	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
Dec 20	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
Dec 21	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
Dec 22	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
Dec 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
Dec 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	0.00	S	S	0.00	0.00	0.00	0.00	0.00
Dec 25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
Dec 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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	S1	S1	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
Dec 28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec 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	0.00
Dec 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	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
Dec 31	0.00	0.00	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	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.69	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	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	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 Instantaneous Maximum for NMHC - Bonnyville - East Site





## LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

*Bonnyville - East Site - December 2019*

### Summary of Hourly Instantaneous Maximums

#### WIND SPEED (WS) in km/hr

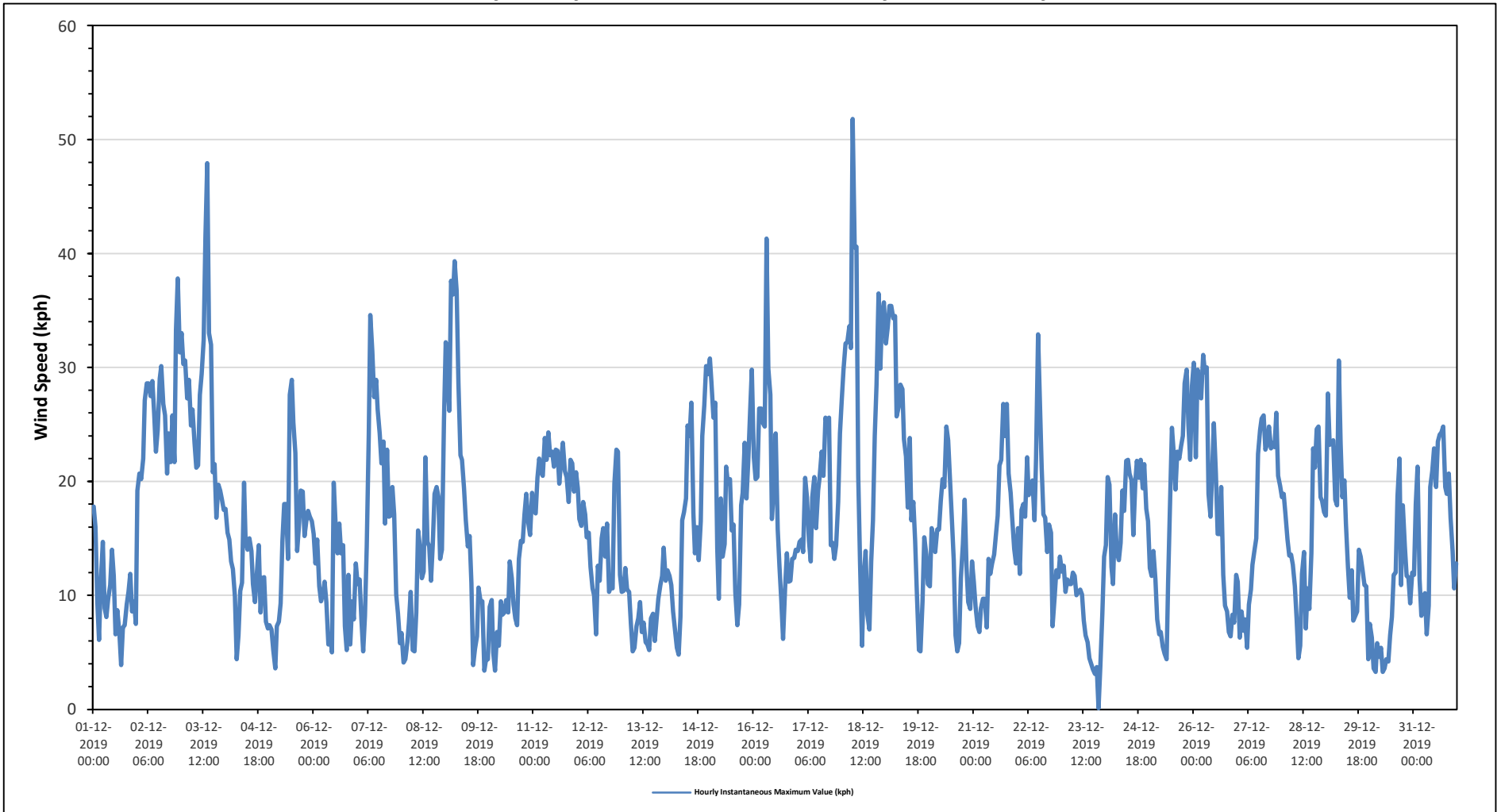
Maximum Hourly Value:	51.8 kph	on December 18 at hour 6	Hours in Service:	744
Maximum Daily Value:	26.9 kph	on December 3	Hours of Data:	744
Minimum Hourly Value:	0.1 kph	on December 23 at hour 20	Hours of Missing Data:	0
Minimum Daily Value:	8.2 kph	on December 23	Hours of Calibration:	0
Monthly Average:	16.4 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
Dec 1	17.8	16.0	9.6	6.1	11.2	14.7	8.9	8.1	9.7	10.9	14.0	11.7	6.6	8.7	6.8	3.9	7.2	7.4	9.2	10.3	11.9	8.6	9.5	7.5	3.9	17.8	9.8
Dec 2	19.2	20.7	20.2	22.0	27.1	28.6	28.6	27.5	28.8	26.0	22.6	24.5	29.0	30.1	26.8	25.8	20.7	24.2	21.7	25.8	21.7	33.3	37.8	31.3	19.2	37.8	26.0
Dec 3	33.0	30.3	30.6	27.3	28.9	24.9	26.3	23.4	21.2	21.4	27.6	29.4	32.4	41.5	47.9	33.0	32.0	20.8	21.5	16.8	19.7	19.2	18.4	17.5	16.8	47.9	26.9
Dec 4	17.6	15.5	14.9	13.0	12.3	9.9	4.4	6.5	10.4	11.1	19.9	14.8	14.0	15.0	13.9	11.0	9.4	11.8	14.4	8.5	11.5	11.6	7.7	7.1	4.4	19.9	11.9
Dec 5	7.4	7.0	5.2	3.6	7.3	7.7	9.3	14.8	18.0	18.0	13.2	27.6	28.9	25.2	22.5	13.9	16.4	19.2	19.1	15.2	16.5	17.4	16.9	16.5	3.6	28.9	15.3
Dec 6	15.4	12.8	14.9	10.8	9.5	10.1	11.2	9.4	5.7	6.6	5.0	19.9	15.9	13.7	16.3	13.7	14.4	7.3	5.2	11.8	5.7	9.5	7.9	12.8	5.0	19.9	11.1
Dec 7	11.0	11.4	7.9	5.1	8.2	14.3	24.1	34.6	31.4	27.4	28.9	26.3	24.2	21.6	23.5	16.3	22.8	16.9	17.0	19.5	17.1	10.1	8.4	5.8	5.1	34.6	18.1
Dec 8	6.7	4.1	4.4	5.9	7.6	10.3	5.2	5.1	8.5	15.7	14.2	11.5	12.1	22.1	14.7	14.3	11.3	14.5	18.9	19.5	18.7	13.2	14.0	25.3	4.1	25.3	12.4
Dec 9	32.2	28.8	26.2	37.6	36.4	39.3	36.7	28.6	22.3	21.9	19.4	16.6	14.3	15.2	11.1	3.9	5.3	6.4	10.7	9.5	9.5	3.4	4.3	4.4	3.4	39.3	18.5
Dec 10	9.0	9.6	5.0	3.4	6.8	5.6	9.5	8.3	8.5	9.6	8.5	13.0	11.5	9.2	8.0	7.4	13.2	14.8	14.7	17.1	18.9	16.4	15.3	19.0	3.4	19.0	10.9
Dec 11	17.5	17.2	20.3	22.0	20.8	20.5	23.8	21.9	24.3	22.3	22.6	21.3	22.8	22.7	19.8	22.0	23.4	20.9	20.4	18.2	21.9	21.6	19.1	20.8	17.2	24.3	21.2
Dec 12	19.4	16.7	16.1	18.2	17.1	15.1	15.5	12.5	10.6	10.0	6.6	12.6	11.3	15.0	15.9	13.4	16.3	10.3	10.7	10.6	19.8	22.8	22.6	11.8	6.6	22.8	14.6
Dec 13	10.3	10.4	12.4	10.5	10.3	7.5	5.1	5.4	7.3	8.0	9.4	6.8	7.6	5.9	5.7	5.2	8.0	8.4	6.0	7.9	9.7	10.9	11.7	14.2	5.1	14.2	8.5
Dec 14	11.3	12.2	11.7	10.9	8.6	7.1	5.4	4.8	8.1	16.6	17.3	18.5	24.9	24.0	26.9	17.2	13.7	16.0	13.1	16.5	24.0	26.7	30.1	29.4	4.8	30.1	16.5
Dec 15	30.8	28.7	25.6	26.9	14.1	9.7	18.5	13.4	14.5	21.3	19.8	20.2	15.7	16.2	10.3	7.4	9.2	17.9	19.0	23.4	18.5	21.8	25.9	29.8	7.4	30.8	19.1
Dec 16	22.1	20.2	20.4	26.4	26.4	25.1	24.8	41.3	29.9	27.6	16.7	19.5	24.2	15.8	12.5	9.6	6.2	10.6	13.7	11.2	11.3	13.2	13.3	14.0	6.2	41.3	19.0
Dec 17	13.9	14.7	14.9	13.8	20.3	18.6	14.8	13.0	18.6	20.4	15.9	19.2	20.4	22.6	20.5	25.6	25.0	25.6	14.4	14.6	13.2	14.4	18.2	24.2	13.0	25.6	18.2
Dec 18	27.1	29.8	32.1	32.2	33.6	31.7	51.8	40.5	40.6	20.5	13.0	5.6	11.8	13.9	8.3	7.0	13.0	16.6	24.0	28.5	36.5	29.9	34.8	35.7	5.6	51.8	25.8
Dec 19	32.1	33.5	35.4	35.4	34.3	34.5	25.7	26.5	28.5	28.1	23.7	22.2	17.7	23.8	16.6	18.2	14.8	10.1	5.2	5.1	9.4	15.1	13.6	11.0	5.1	35.4	21.7
Dec 20	10.8	15.9	15.0	13.8	15.8	15.8	18.3	20.2	19.5	24.8	23.6	19.8	17.0	13.1	6.5	5.1	5.8	11.5	14.5	18.4	12.6	9.4	8.8	13.0	5.1	24.8	14.5
Dec 21	11.2	9.0	7.3	6.8	8.9	9.7	9.7	7.2	13.2	11.9	12.8	13.6	15.3	17.0	21.4	21.9	26.8	24.0	26.8	20.7	19.0	16.8	14.1	12.8	6.8	26.8	14.9
Dec 22	15.9	11.9	17.5	18.0	16.9	22.1	18.8	19.2	20.1	16.6	22.0	32.9	27.1	21.3	17.1	16.8	13.8	16.2	15.5	7.3	9.8	12.2	11.6	13.4	7.3	32.9	17.3
Dec 23	12.1	12.6	10.3	11.4	11.0	11.0	12.0	11.7	10.0	10.3	10.5	10.1	7.8	6.5	5.9	4.5	4.0	3.5	3.1	3.7	0.1	3.7	8.4	13.4	0.1	13.4	8.2
Dec 24	14.4	20.4	19.7	12.5	11.0	17.1	13.8	13.1	14.6	19.2	17.4	21.8	21.9	20.7	20.1	15.3	20.0	21.8	20.3	21.9	19.4	21.5	17.6	16.5	11.0	21.9	18.0
Dec 25	12.4	11.7	13.9	11.4	7.9	6.6	6.8	5.5	4.9	4.4	11.2	17.6	24.7	22.5	19.3	22.6	22.0	23.1	24.0	28.6	29.8	24.9	21.9	28.4	4.4	29.8	16.9
Dec 26	30.4	22.1	29.8	28.4	27.3	31.1	29.6	30.0	18.9	16.9	21.3	25.1	20.7	15.4	15.4	19.5	11.8	9.1	8.6	6.8	6.4	8.3	7.6	11.8	6.4	31.1	18.8
Dec 27	11.2	6.3	8.6	6.9	7.9	5.4	9.2	10.5	12.7	13.8	15.0	22.4	24.5	25.5	25.8	22.8	23.4	24.8	22.9	23.4	23.0	26.0	20.5	19.6	5.4	26.0	17.2
Dec 28	18.6	18.9	17.1	14.9	13.5	13.6	12.7	10.8	7.9	4.5	5.6	11.9	13.8	7.1	10.6	8.8	13.7	22.9	21.2	24.6	24.8	18.6	18.3	17.3	4.5	24.8	14.7
Dec 29	17.0	27.7	23.2	23.4	23.6	18.4	17.9	30.6	23.4	18.6	20.1	16.3	12.5	9.8	12.2	7.8	8.2	8.6	14.0	13.4	12.3	10.9	10.8	4.4	4.4	30.6	16.0
Dec 30	7.5	6.3	3.6	3.3	5.8	4.6	5.4	3.3	3.6	4.4	4.2	6.5	8.1	11.8	12.0	18.7	22.0	10.9	17.9	14.3	11.7	11.6	9.3	12.0	3.3	22.0	9.1
Dec 31	11.8	18.0	21.3	11.4	8.2	9.8	10.2	6.6	9.1	19.5	20.9	22.9	19.5	23.5	24.1	24.3	24.8	19.5	18.9	20.7	16.8	13.9	10.6	12.8	6.6	24.8	16.6
Diurnal Maximum	33.0	33.5	35.4	37.6	36.4	39.3	51.8	41.3	40.6	28.1	28.9	32.9	32.4	41.5	47.9	33.0	32.0	25.6	26.8	28.6	36.5	33.3	37.8	35.7			
Diurnal Average	17.0	16.8	16.6	15.9	16.1	16.1	16.6	16.6	16.3	16.4	16.2	18.1	18.0	17.9	16.7	14.7	15.4	15.3	15.7	15.9	16.2	16.0	15.8	16.6			

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 WS - Bonnyville - East Site**



END OF REPORT

This report, 365 of 365, ends the December 2019 Monthly Ambient Air Quality Monitoring Report.



**Lakeland Industry & Community Association**

**DECEMBER 2019**

**Ambient Air Monitoring Calibration Report**

**- COLD LAKE SOUTH STATION-**

**CAL-LICA-201912-01174**

**Station Operation and Maintenance:**

Bureau Veritas Canada

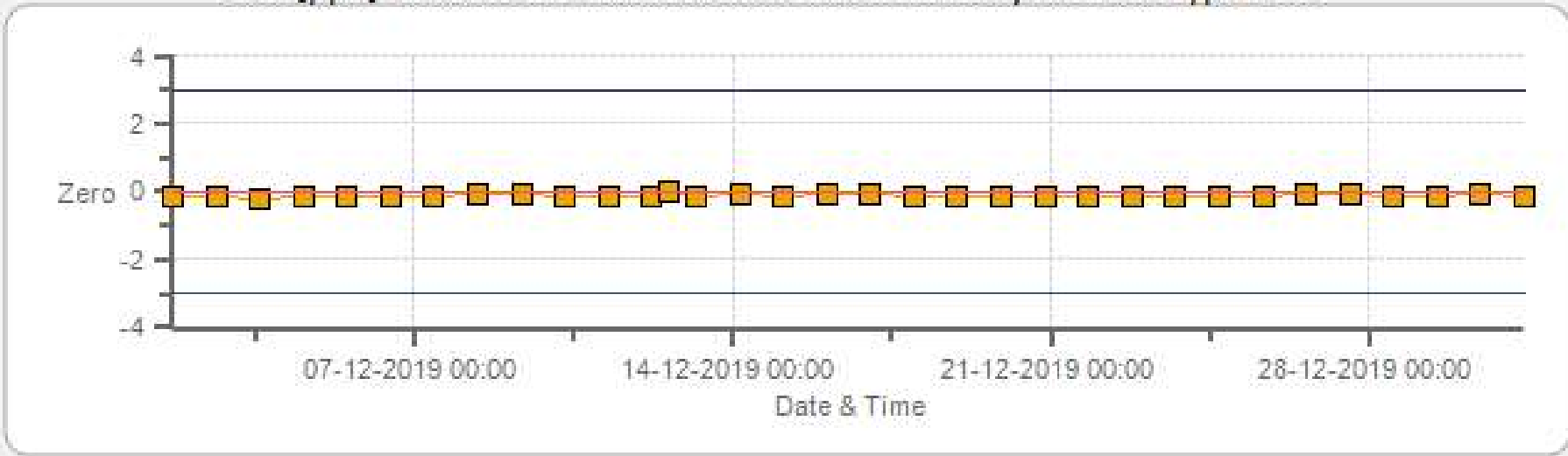
**Data Validation and Report:**

Bureau Veritas Canada

January 13, 2020

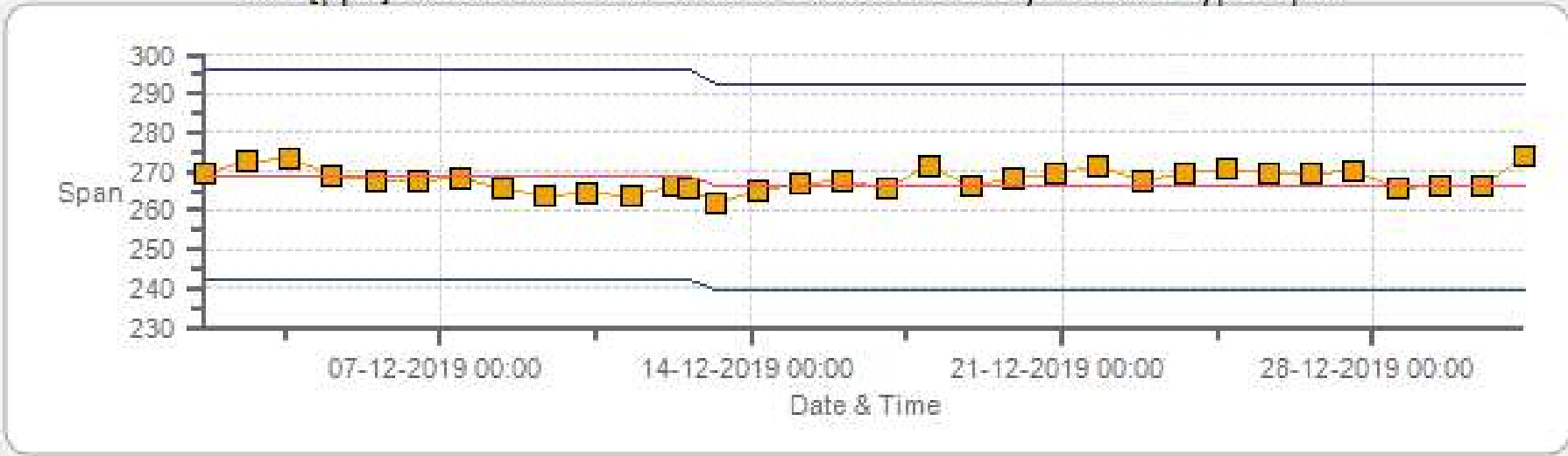
# DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2 [ppb] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

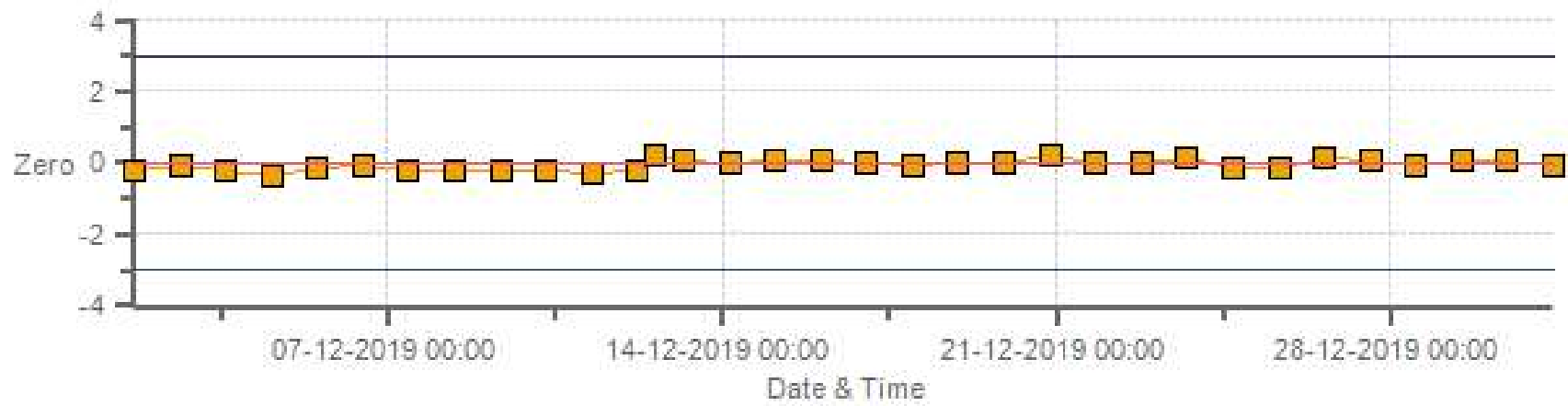
SO2 [ppb] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Span



Span SpanRef Span Low Span High

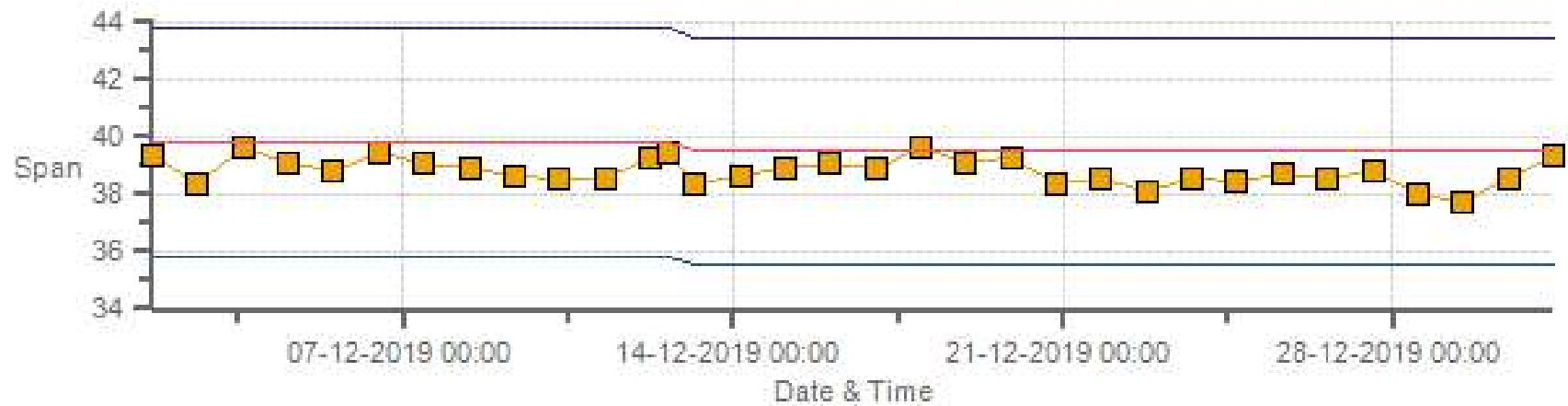


TRS [ppb] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Zero



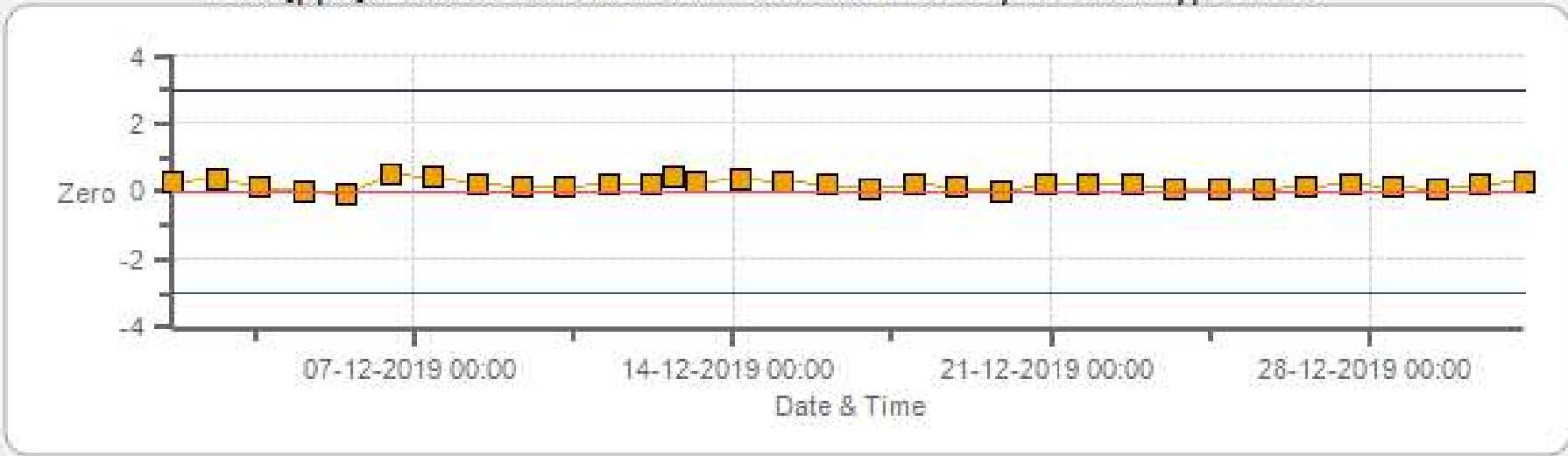
Zero Zero Ref Zero Low Zero High

TRS [ppb] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Span



Span SpanRef Span Low Span High

NOx [ppb] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Zero



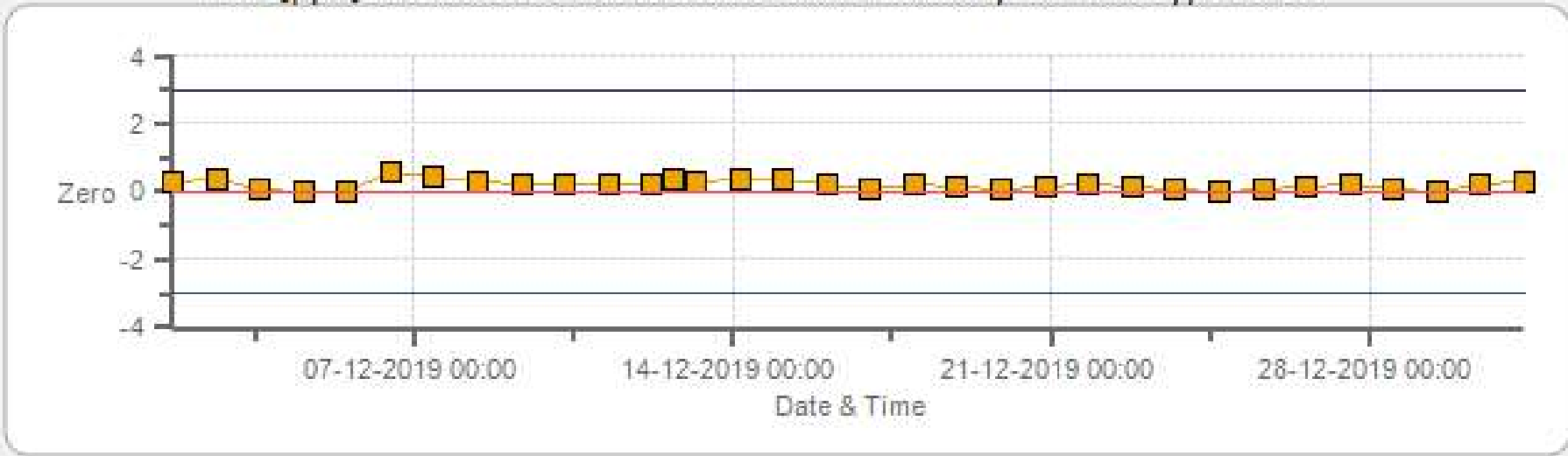
Zero Zero Ref Zero Low Zero High

NOx [ppb] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Span



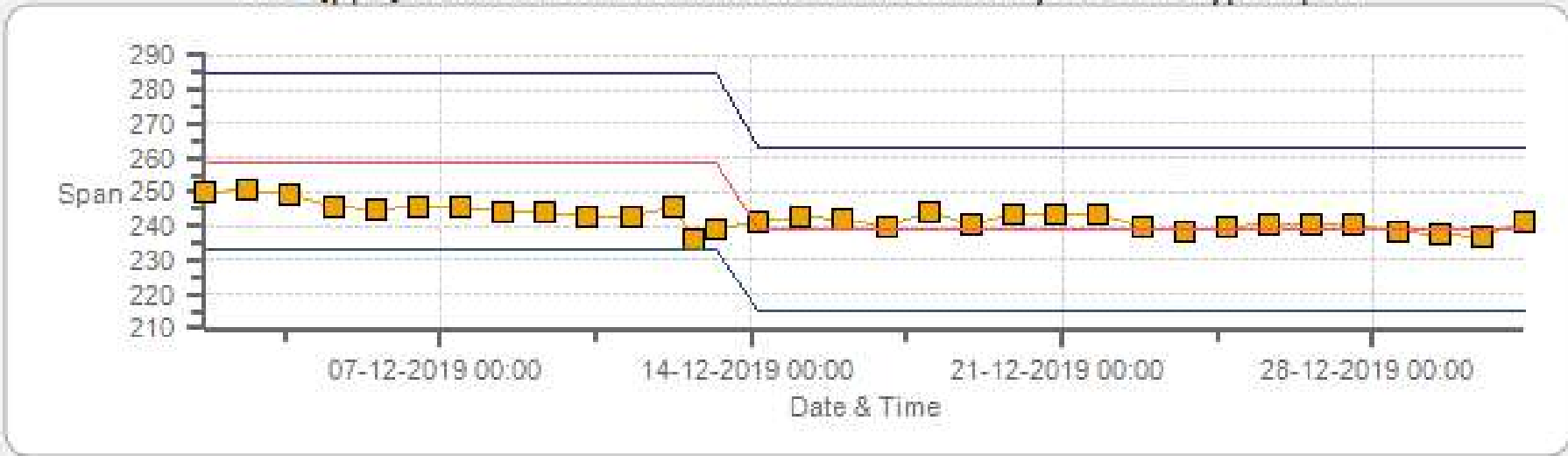
Span SpanRef Span Low Span High

NO2 [ppb] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Zero



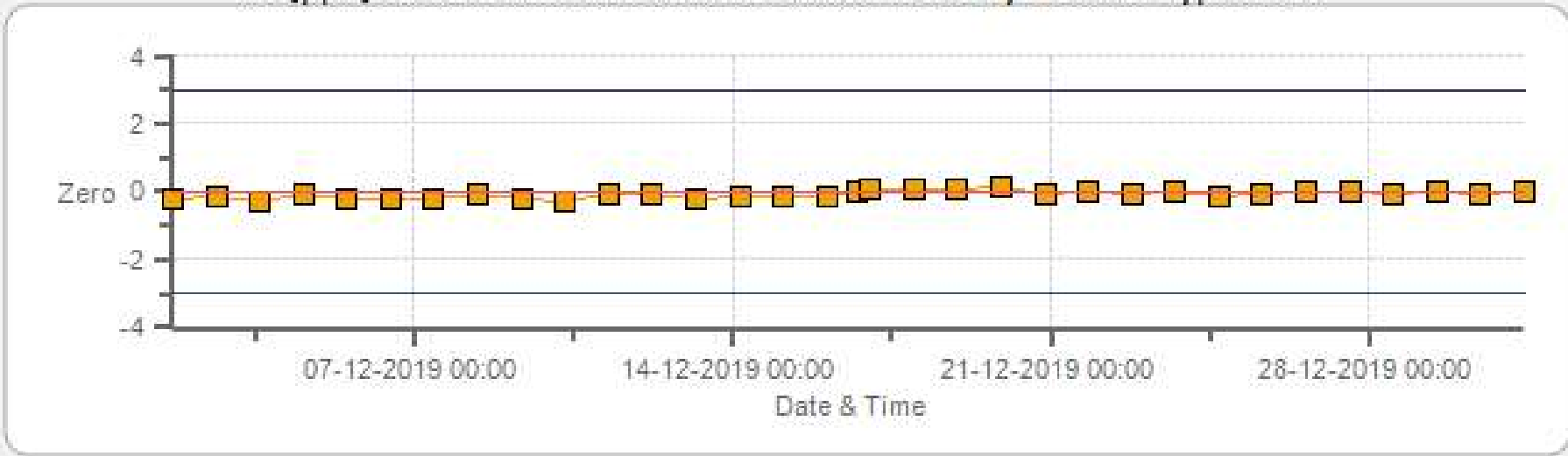
Zero Zero Ref Zero Low Zero High

NO2 [ppb] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Span



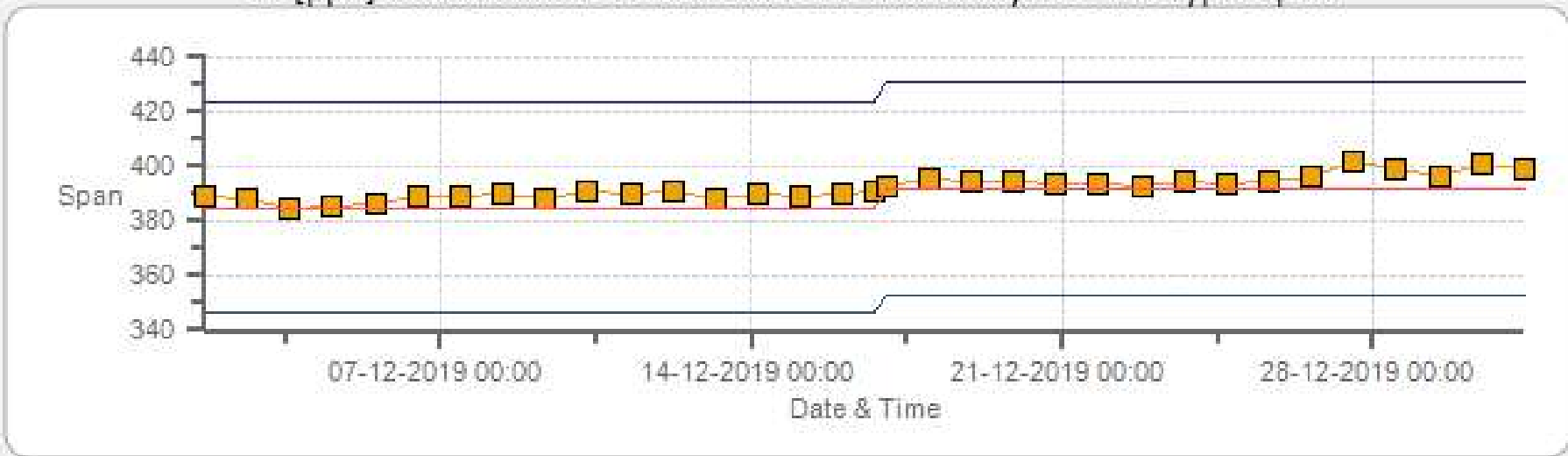
Span SpanRef Span Low Span High

O3 [ppb] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Zero



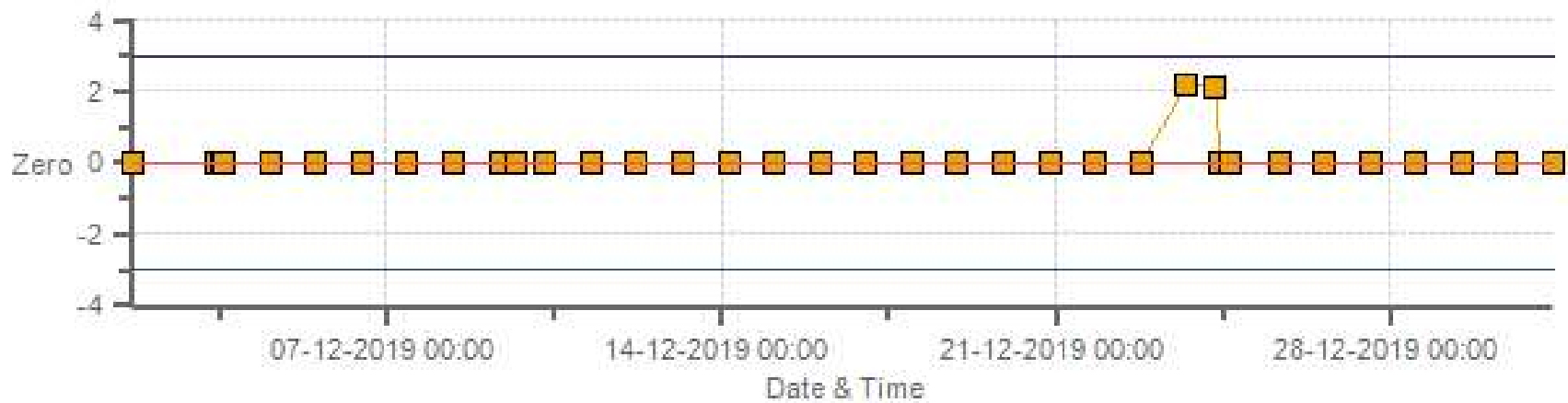
Zero Zero Ref Zero Low Zero High

O3 [ppb] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Span



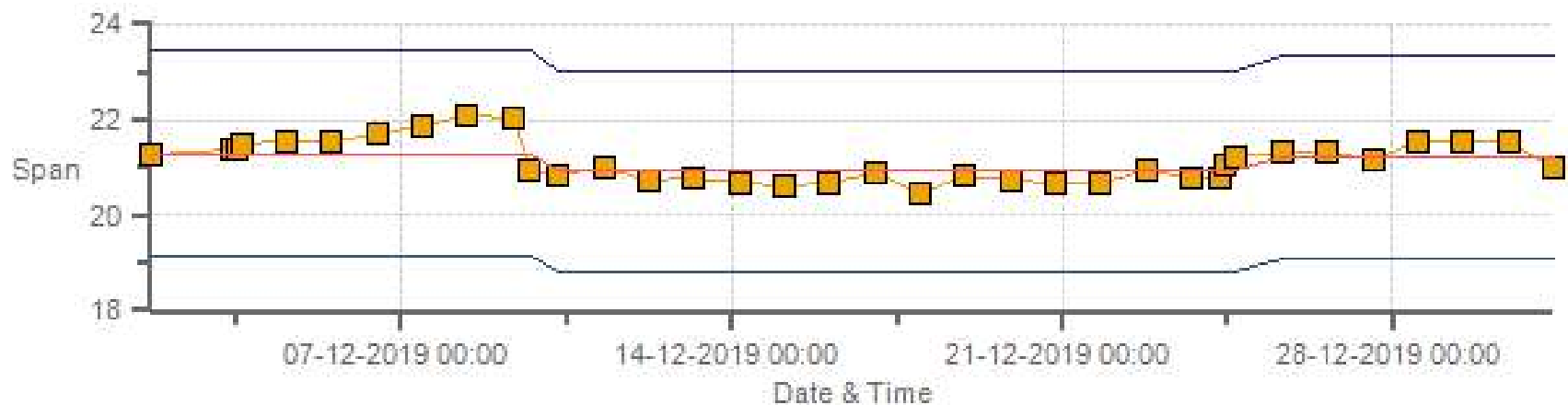
Span SpanRef Span Low Span High

THC [ppm] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Zero



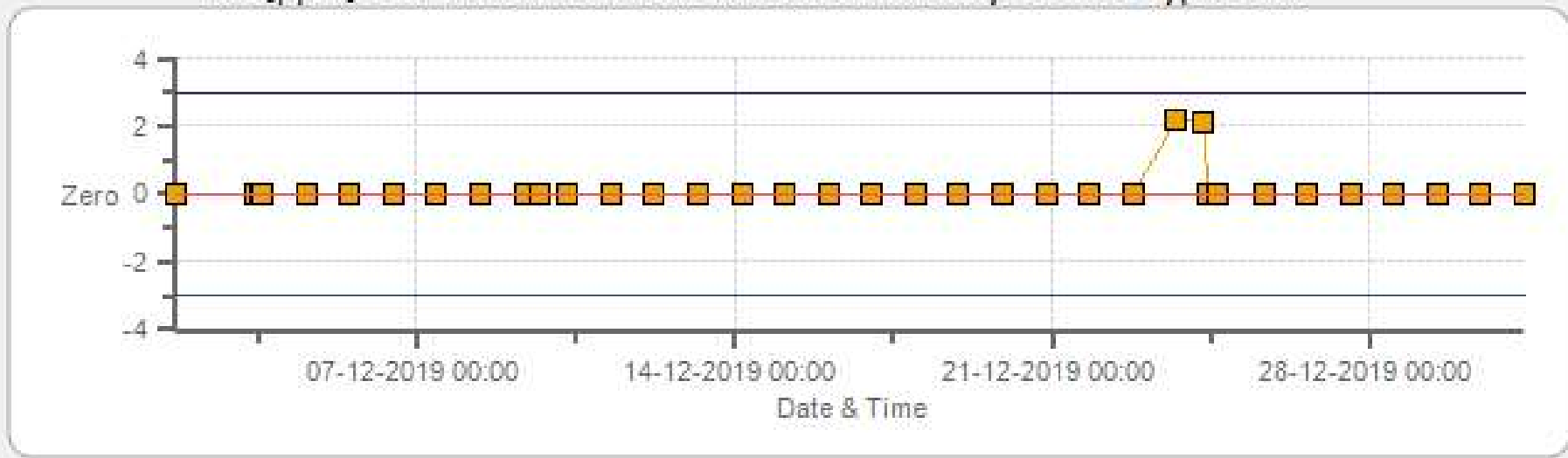
Zero Zero Ref Zero Low Zero High

THC [ppm] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Span



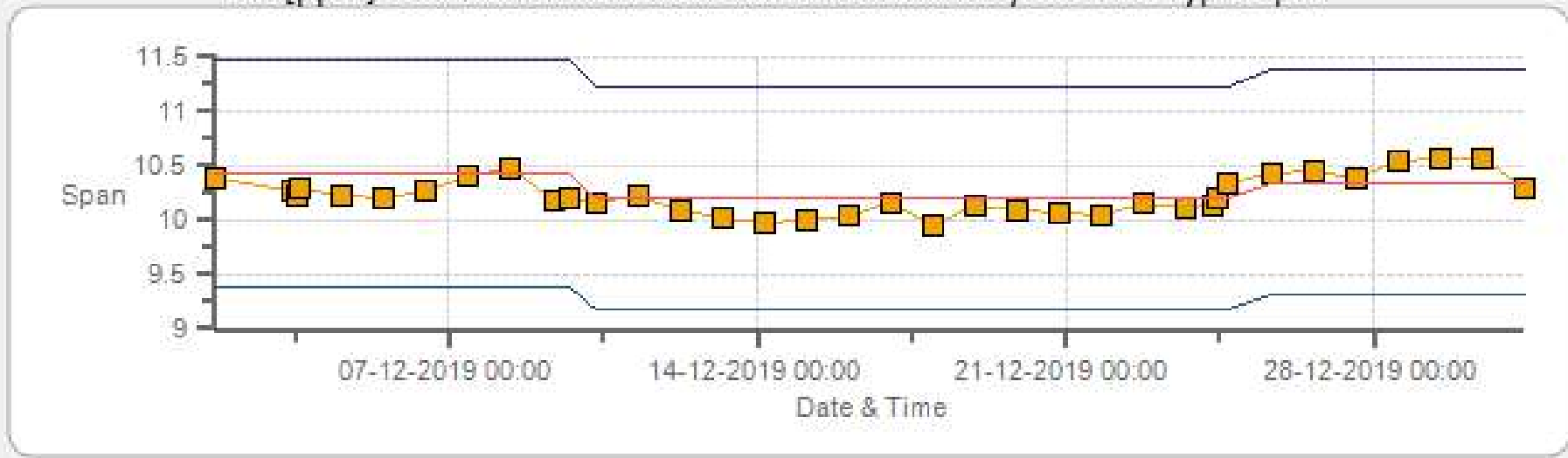
Span SpanRef Span Low Span High

CH4 [ppm] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Zero



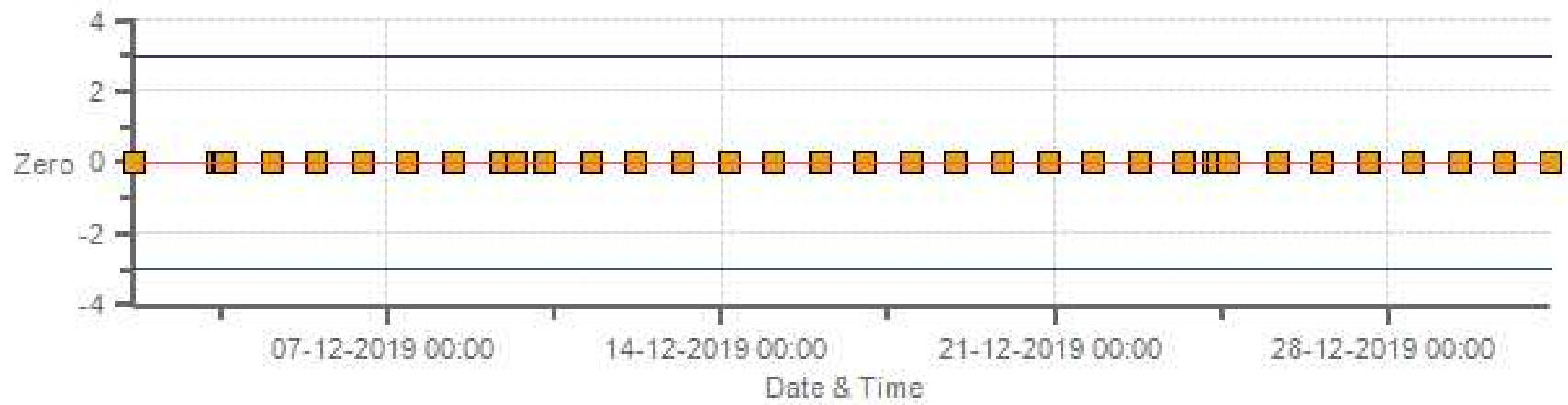
Zero Zero Ref Zero Low Zero High

CH4 [ppm] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Span



Span SpanRef Span Low Span High

NMHC [ppm] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

NMHC [ppm] Calibration: LICA Cold Lake South Monthly: 12-2019 Type: Span



Span SpanRef Span Low Span High

# MULTI-POINT CALIBRATION RECORDS



# SO2 Analyzer Calibration by Dilution



DATE:	12-Dec-2019	PREVIOUS CALIBRATION DATE:	21-Nov-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):	10:22
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:27

## ANALYZER:

MAKE/MODEL	Thermo 43I-TLE	RANGE	500 ppb
SERIAL #	1180026018	FLOW (mL/min)	448
INITIAL		FINAL	
BKG/OFFSET	2.05	BKG/OFFSET	2.04
COEF/SLOPE	1.006	COEF/SLOPE	1.003
Expected (reference) Value	269	Expected (reference) Value	266

## 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:

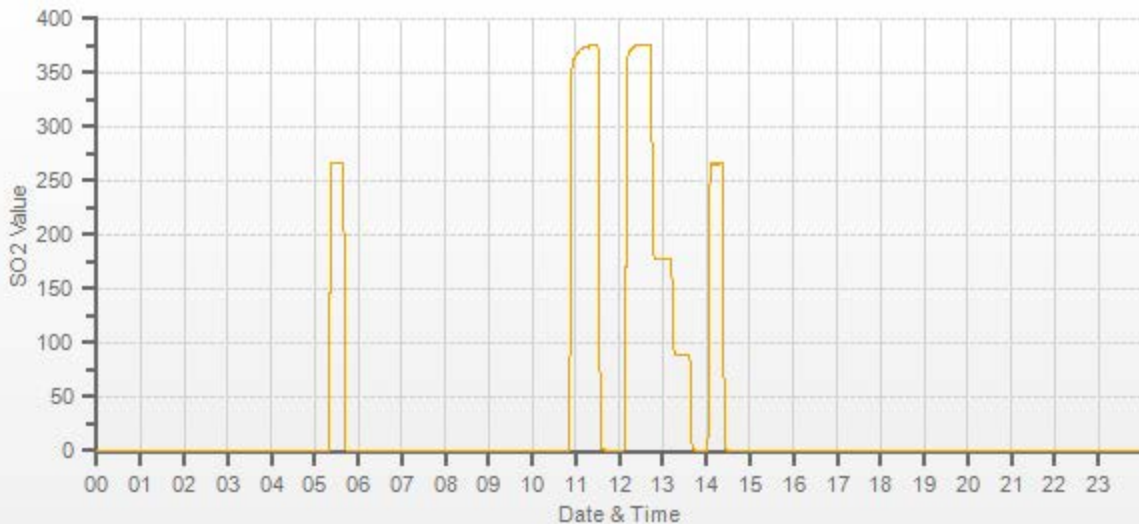
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	<del>37.90</del>	5000	0.00	0	0	<del>1.001</del>	<del>1.001</del>
4962	37.90	5000	375.21	375	375	1.001	1.001
4982	18.00	5000	178.20	n/a	178	n/a	1.001
4991	8.90	5000	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:	12-Dec-2019	PREVIOUS CALIBRATION DATE:	21-Nov-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):	10:22
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:40

## ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	812728560	FLOW (mL/min)	483
INITIAL		FINAL	
BKG/OFFSET	17.4	BKG/OFFSET	17
COEF/SLOPE	0.951	COEF/SLOPE	0.943
Expected (reference) Value	39.8	Expected (reference) Value	39.5

## 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):	1700	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:	10:28	SO2 Conc (ppb)	380
END TIME:	10:43	Analyzer Response (ppb)	0.0

## CALIBRATION:

FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	<del>58.50</del>	7500	0.00	0	0	<del>1.000</del>	<del>1.000</del>
7442	58.50	7500	78.00	78	78	1.000	1.000
7472	28.50	7500	38.00	n/a	38	n/a	1.000
7486	14.20	7500	18.93	n/a	18.9	n/a	1.002

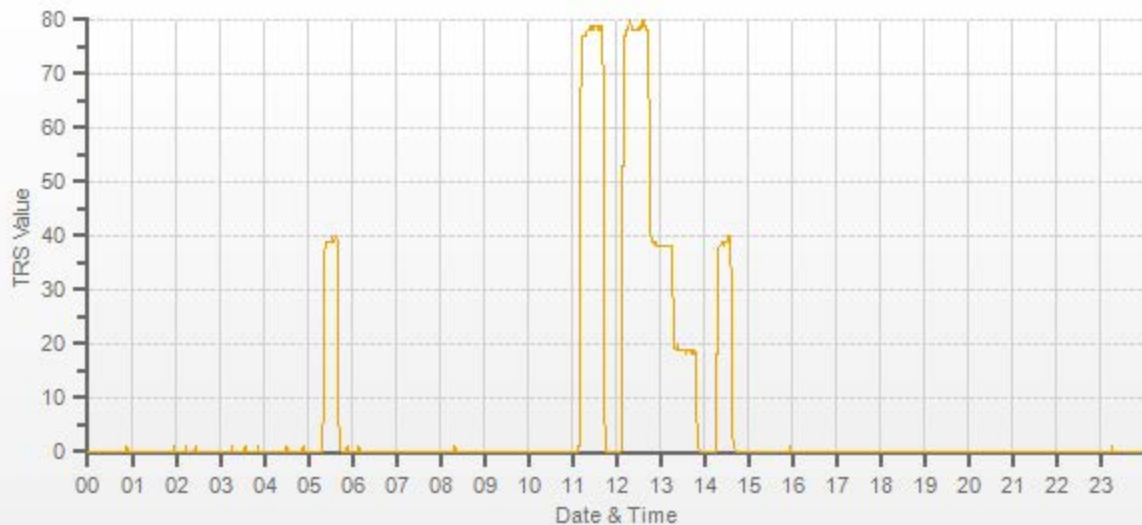
## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	0.0%

## COMMENTS:

Sample inlet filter was changed.

TRS[ppb] Station: Cold Lake South Daily: 12-12-2019 Type: AVG 1 Min. [1 Min.]



CAL-LICA-201912-01174

# NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	12-Dec-2019	PREVIOUS CALIBRATION DATE:	21-Nov-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)	769	NO	0.999
PURPOSE:	Routine	START TIME (MST):	10:22	RANGE (ppb)	500	NO2	1.000
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:32	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	4	n/a
SLOPE/COEF/CE:	1	1	1.0	SLOPE/COEF/CE:	1	1	1.0

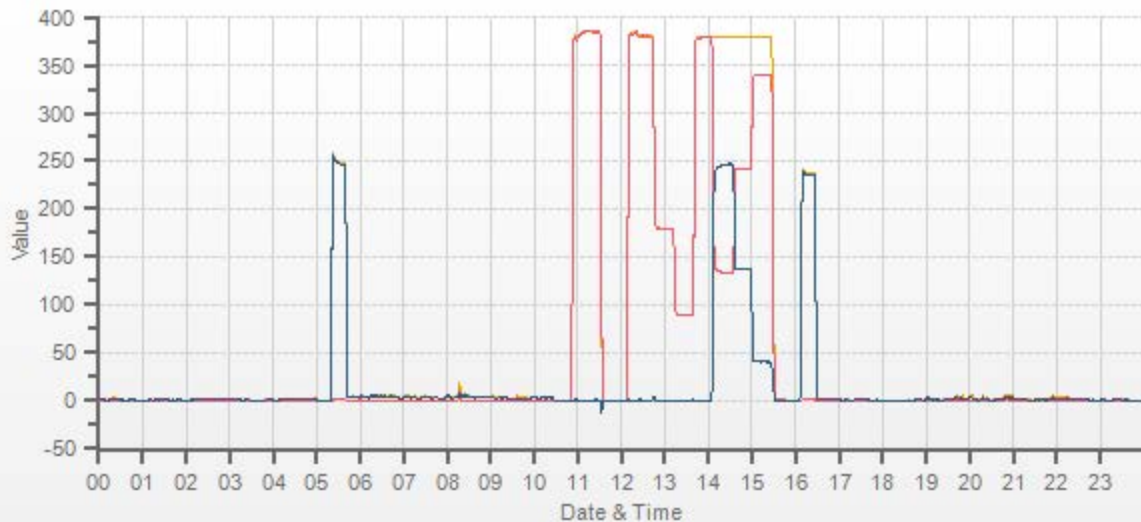
EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	261	2	259.0		241	2	239.0

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	<del>37.90</del>	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<del>0.986</del>	<del>0.986</del>	<del>1.002</del>	<del>0.999</del>	<del>0.999</del>	<del>1.004</del>
4962	37.90	5000	379.8	380.5	0.8	385.0	386.0	2.0	380.0	381.0	1.0	0.986	0.986	1.002	0.999	0.999	1.004
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		
4991	8.90	5000	89.2	89.4	0.2	n/a	n/a	n/a	89.0	89.0	0.0	n/a	n/a	1.002	1.004		

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	380.0	0.0	<del>245</del>	<del>245</del>	<del>1.000</del>	<del>100.00%</del>
AS-FOUND HIGH	37.90	5000	245	135.0	380.0	245.0	245	245	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	242.0	380.0	138.0	138	138	1.000	100.00%
LOW	37.90	5000	45	335.0	380.0	45.0	45	45	1.000	100.00%
NO2 adjustment not required.									AVERAGE:	100.00%

LINEAR REGRESSION ANALYSIS:				COMMENTS:
	CORRELATION	SLOPE	INTERCEPT	
NO	1.000	1.001	-0.04%	
NOx	1.000	1.000	-0.04%	
NO2	1.000	1.000	0.00%	



CAL-LICA-201912-01174

# Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	16-Dec-2019	PREVIOUS CALIBRATION DATE:	21-Nov-2019
PARAMETER:	Ozone	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	20.0
LOCATION:	Cold Lake South	BAROMETRIC (mBar):	949
PURPOSE:	Routine	START TIME (MST):	14:46
PERFORMED BY:	Alex Yakupov	END TIME (MST):	18:10

## ANALYZER:

MAKE/MODEL	Thermo 49i	RANGE	500 ppb
SERIAL #	700419951	FLOW (mL/min)	1455
INITIAL		FINAL	
BKG/OFFSET	0	BKG/OFFSET	-0.1
COEF/SLOPE	1.034	COEF/SLOPE	1.044
Expected (reference) Value	385	Expected (reference) Value	392

## CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Thermo Electron
MODEL:	2010 D	MODEL:	Model 111
ID:	11900613	ID:	204
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	<del>          </del>	5000	0.0	0.0	0.0	<del>          </del>	<del>          </del>
5000	<del>          </del>	5000	378.0	374.0	378.0	1.011	1.000
5000	<del>          </del>	5000	180.0	n/a	180.0	n/a	1.000
5000	<del>          </del>	5000	61.0	n/a	63.0	n/a	0.968

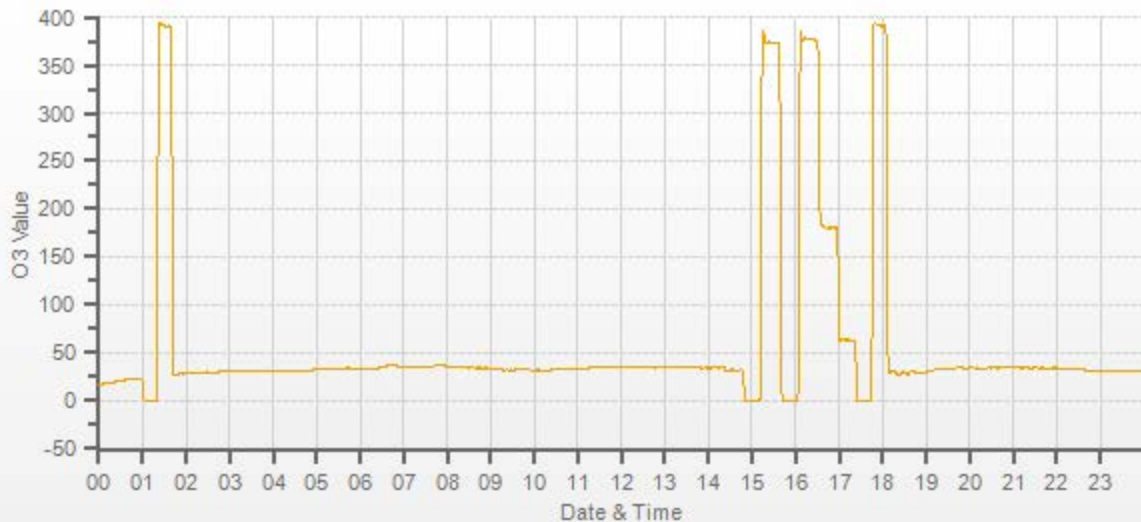
## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.998	0.2%

## COMMENTS:

Sample inlet filter was changed.

O3[ppb] Station: Cold Lake South Daily: 16-12-2019 Type: AVG 1 Min. [1 Min.]



CAL-LICA-201912-01174



# Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	03-Dec-2019	PREVIOUS CALIBRATION DATE:	n/a	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.9		Thermo 55i	1180030034	1056
LOCATION:	Cold Lake South	BAROMETRIC (mBar):	936	PARAMETER:	CH4	NMHC	THC
PURPOSE:	Install/Post-Repair	START TIME (MST):	7:30	RANGE (ppm):	20	20	40
PERFORMED BY:	Chris Wesson	END TIME (MST):	10:05	PREVIOUS CF:	n/a	n/a	n/a

## CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	EnviroNics	MAKE:	Teledyne	CYLINDER ID:	LL107207	HIGH ID:	n/a
MODEL:	2000	MODEL:	T701	CH <sub>4</sub> /C <sub>3</sub> H <sub>8</sub> (ppm):	600.0   207.0	HIGH EXPIRY:	n/a
ID:	1991	ID:	134	CYLINDER (psi):	850	LOW ID:	n/a
MFC CALIBRATION DATE:	19-Nov-2019	OXIDIZER ID:	Internal	EXPIRY DATE:	18-Oct-2025	LOW EXPIRY:	n/a

## CALIBRATION PARAMETERS:

POINT (CH <sub>4</sub> /NMHC)	HIGH	MID	LOW	CH <sub>4</sub> EQUIVILANCE		
TARGET	14	7	3.5	C <sub>3</sub> H <sub>8</sub> as CH <sub>4</sub>		569.3
RANGE	12 - 16	6 - 8	2 - 4	THC as CH <sub>4</sub>		1169.3

## EXPECTED (REFERENCE) VALUE:

INITIAL	CH <sub>4</sub>	NMHC	THC	FINAL	CH <sub>4</sub>	NMHC	THC
	n/a	n/a	n/a		n/a	10.48	10.93

## CALIBRATION:

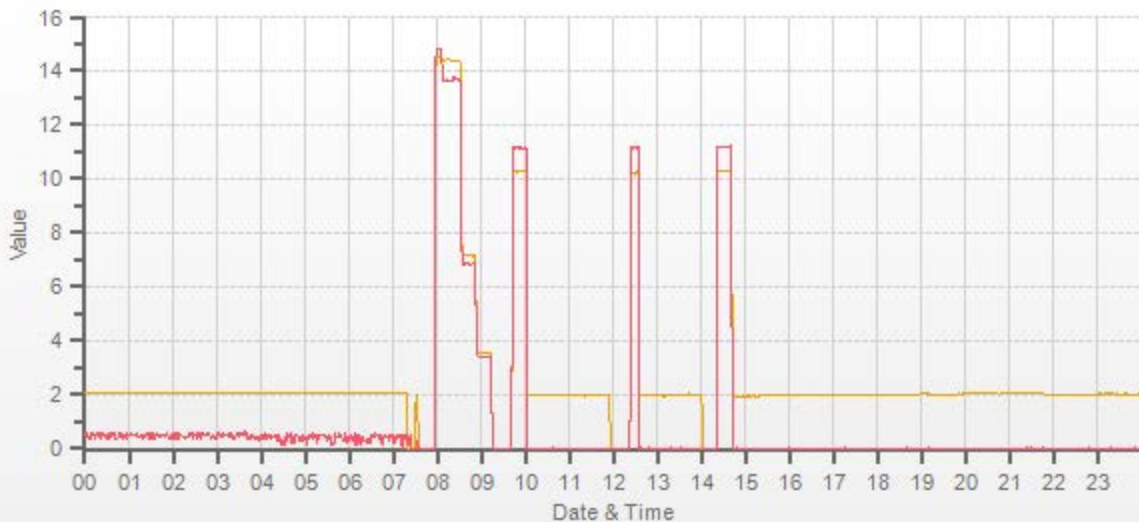
FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC
3003	<del>X</del>	3003	0.00	0.00	0.00	n/a	n/a	n/a	0.00	0.00	0.00	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>
2928	71.82	3000	14.36	13.63	27.99	n/a	n/a	n/a	14.38	13.67	28.05	n/a	n/a	n/a	0.999	0.997	0.998
2966	35.92	3002	7.18	6.81	13.99	n/a	n/a	n/a	7.14	6.83	13.98	n/a	n/a	n/a	1.006	0.997	1.001
2983	17.96	3001	3.59	3.41	7.00	n/a	n/a	n/a	3.56	3.40	6.97	n/a	n/a	n/a	1.009	1.002	1.004

## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
CH <sub>4</sub>	1.000	1.002	-0.001184303
NMHC	1.000	1.004	-0.000384933
THC	1.000	1.002	-0.000634607

## COMMENTS:

Zero chromatogram active and adjusted



CAL-LICA-201912-01174

# Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	09-Dec-2019	PREVIOUS CALIBRATION DATE:	03-Dec-2019	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	20.0		Thermo 55i	1180030034	1056
LOCATION:	Cold Lake South	BAROMETRIC (mBar):	956	PARAMETER:	CH4	NMHC	THC
PURPOSE	Repeat	START TIME (MST):	14:25	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	17:32	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 <sub>4</sub> /C <sub>3</sub> H <sub>8</sub> (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 <sub>4</sub> /NMHC)	HIGH	MID	LOW	CH <sub>4</sub> EQUIVILANCE		
TARGET	14	7	3.5	C <sub>3</sub> H <sub>8</sub> as CH <sub>4</sub>		544.5
RANGE	12 - 16	6 - 8	2 - 4	THC as CH <sub>4</sub>		1142.5

## EXPECTED (REFERENCE) VALUE:

INITIAL	CH <sub>4</sub>	NMHC	THC	FINAL	CH <sub>4</sub>	NMHC	THC
	10.44	10.83	21.30		10.21	10.72	20.93

## CALIBRATION:

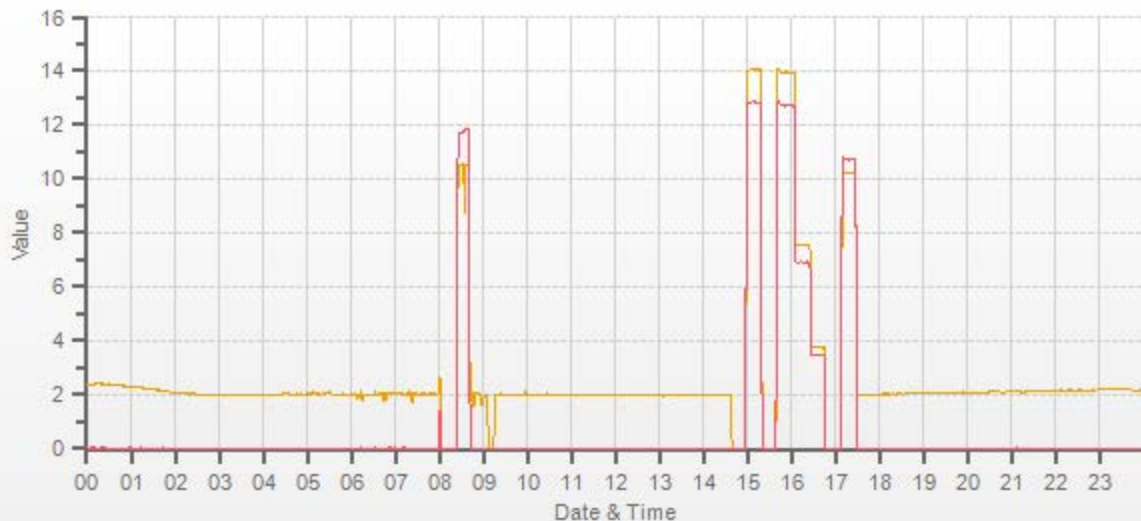
FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC
3000	<del>X</del>	3000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>
2930	70.00	3000	13.95	12.71	26.66	14.03	12.85	26.89	13.95	12.71	26.66	0.995	0.989	0.991	1.000	1.000	1.000
2962	38.00	3000	7.57	6.90	14.47	n/a	n/a	n/a	7.57	6.93	14.51	n/a	n/a	n/a	1.001	0.995	0.997
2981	19.00	3000	3.79	3.45	7.24	n/a	n/a	n/a	3.79	3.45	7.24	n/a	n/a	n/a	0.999	1.000	0.999

## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
CH <sub>4</sub>	1.000	1.000	0.0%
NMHC	1.000	1.000	0.0%
THC	1.000	1.000	0.0%

## COMMENTS:

Sample inlet filter was changed.



CAL-LICA-201912-01174

Page 23 of 28  
CH4 [ppm] NMHC [ppm]

# Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	24-Dec-2019	PREVIOUS CALIBRATION DATE:	09-Dec-2019	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	20.0		Thermo 55i	1180030034	1056
LOCATION:	Cold Lake South	BAROMETRIC (mBar):	945	PARAMETER:	CH4	NMHC	THC
PURPOSE	Install/Post-Repair	START TIME (MST):	12:00	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:03	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 <sub>4</sub> /C <sub>3</sub> H <sub>8</sub> (ppm):	598.0   198.0	HIGH EXPIRY:	n/a
ID:	690	ID:	132	CYLINDER (psi):	400	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 <sub>4</sub> /NMHC)	HIGH	MID	LOW	CH <sub>4</sub> EQUIVILANCE		
TARGET	14	7	3.5	C <sub>3</sub> H <sub>8</sub> as CH <sub>4</sub>		544.5
RANGE	12 - 16	6 - 8	2 - 4	THC as CH <sub>4</sub>		1142.5

## EXPECTED (REFERENCE) VALUE:

INITIAL	CH <sub>4</sub>	NMHC	THC	FINAL	CH <sub>4</sub>	NMHC	THC
	10.21	10.72	20.93		10.35	10.86	21.21

## CALIBRATION:

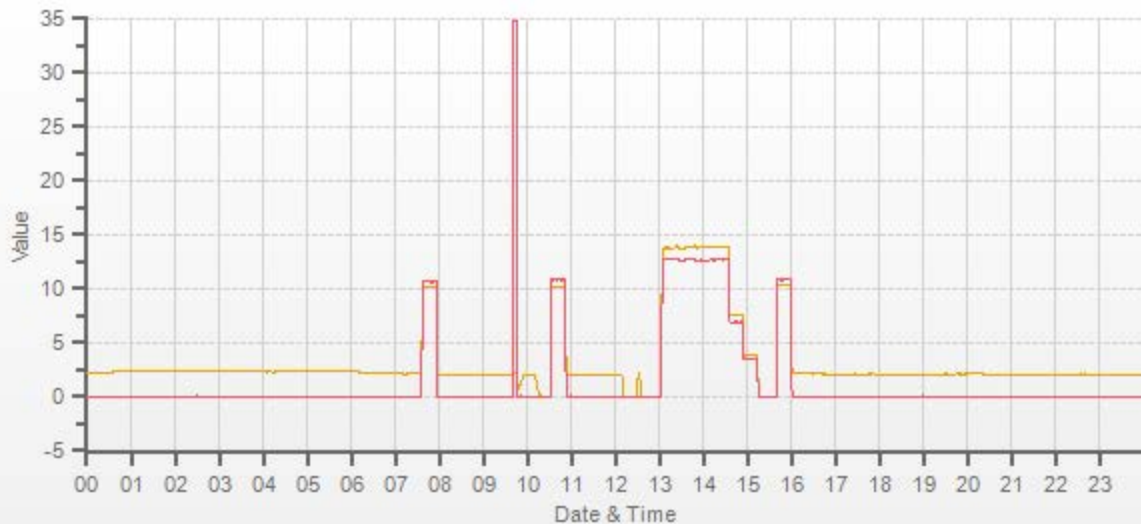
FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC
3000	<del>X</del>	3000	0.00	0.00	0.00	n/a	n/a	n/a	0.00	0.00	0.00	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>
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	7.59	6.89	14.49	n/a	n/a	n/a	0.998	1.001	0.999
2981	19.00	3000	3.79	3.45	7.24	n/a	n/a	n/a	3.80	3.44	7.24	n/a	n/a	n/a	0.997	1.002	0.999

## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
CH <sub>4</sub>	1.000	1.000	0.0%
NMHC	1.000	1.000	0.0%
THC	1.000	1.000	0.0%

## COMMENTS:

Post-repair calibration was completed because a Zero Air generator failed and was replaced with LICA Zero Air that came back after repair in Edmonton. (The failed Zero Air generator belongs to BV and was temporarily installed while LICA generator was sent for repair). Zero Chromatogram was completed during this calibration.



CAL-LICA-201912-01174

Page 25 of 28  
CH4 [ppm] NMHC [ppm]



# Thermo 5030 SHARP Monitor Calibration

Date:	December 27, 2019	Performed By/Reviewer:	Alex Yakupov	Wunmi Adekanmbi
Company:	LICA	Start Time (mst):	9:04	
Station Name/Location:	Cold Lake South	End Time (mst):	11:47	
Previous Audit Date:	November 25, 2019	Calibration Purpose:	quarterly	
Parameter:	PM 2.5	Weather Conditions:	A few clouds	

<b>SHARP Information and Status:</b>				
Serial Number/Owner:	CM - 2209	LICA	Status Code	0
Approx. % Tape Reaming	1/10		Error Code	0

<b>Reference Standards/I.D./Cert. Date:</b>	
High Flow:	Airmetrics/Chinook High, expires Jan 31, 2020.
Digital Manometer:	Dwyer 475 Mark III, expires January 17, 2020.
Temperature:	F.S. 160348895 expires June 19, 2020
Pressure:	F.S. 05544 expires January 16, 2020

<b>As Found Temperatures, Pressure, Humidity:</b>						
	T1 (°C)	T2 (°C)	T3 (°C)	T4 (°C)	P3 (hPa)	RH (%)
SHARP:	-17	21	21	21	939	15
Reference:	-17.2	20.9	20.9	20.9	939.0	15.0
Difference:	0.2	0.1	0.1	0.1	0.0	0.0
	Temp Limit: ± 4 °C					
	Pressure Limit: ± 13.33 hPa					
	RH Limit: ± 2%					

<b>As Left Temperature and Pressure (same as above if as found adequate):</b>						
	T1 (°C)	T2 (°C)	T3 (°C)	T4 (°C)	P3 (hPa)	RH (%)
SHARP:	-17	21	21	21	939	15
Reference:	-17.2	20.9	20.9	20.9	939.0	15.0
Difference:	0.2	0.1	0.1	0.1	0.0	0.0%
	Temp Limit: ± 4 °C					
	Pressure Limit: ± 13.33 hPa					
	RH Limit: ± 2%					

<b>Mass Foil Calibration:</b>					
	Mass Foil:	ZERO:	Span Sensitivity		
Mass Foil ID:	9015	QLF:	15	OLD:	7026
Spanfoil Value (µg):	1294	CONFID:	7	NEW:	7026

<b>Nephelometer Zero:</b>						
	As Found			As Left		
Analog	161.00			161.00		
NEPH	0.30			0.00		
C14	146.20			136.40		
Conc	1.60			0.00		

<b>Flow rate:</b>						
	As Found			As Left		
SHARP AirFlow l/hr	1000			1000		
Reference AirFlow (l/min)	16.65			16.65		
Reference AirFlow (l/hr)	999			999		
% Difference:	0.1%			0.1%		
	Tolerance +/- 5%					

<b>Inlet Assembly:</b>		
	Yes/No?	If no, explain:
PM10 Inlet Cleaned	yes	
PM2.5 Cyclone Cleaned	yes	

<b>Pump Assembly:</b>		
	Yes/No?	If no, explain:
Pump Inspected / Cleaned	yes	
Pump Vanes Replaced	no	Not required

**Comments:**

Leak check: Without adapter = 16.65 vs with adapter = 16.60, difference = 0.05, less than 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=	<b>0.997</b>

### 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=		<b>1.2</b>

## 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



**Lakeland Industry & Community Association**

**DECEMBER 2019**

**Ambient Air Monitoring Calibration Report**

**- MASKWA STATION-**

**CAL-LICA-201912-01248**

**Station Operation and Maintenance:**

Bureau Veritas Canada

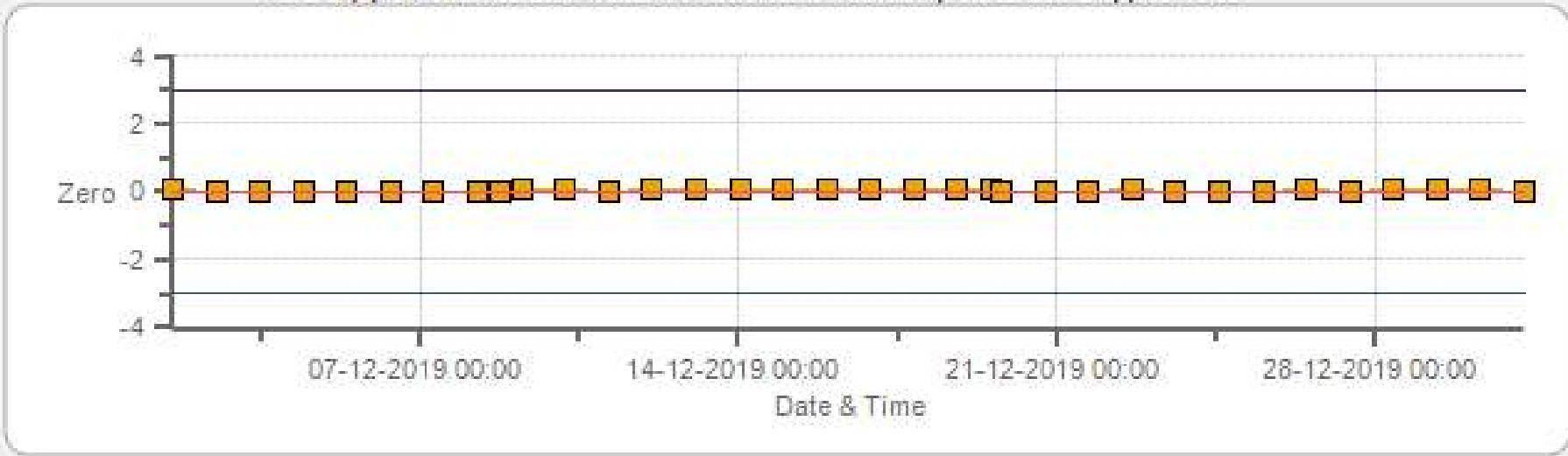
**Data Validation and Report:**

Bureau Veritas Canada

January 13, 2020

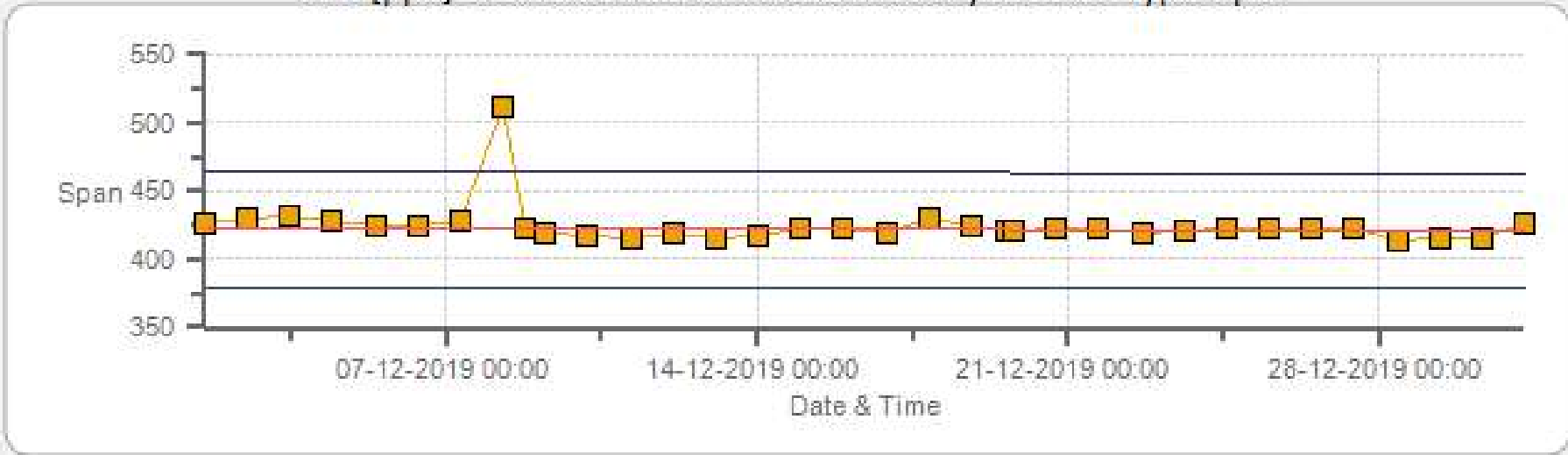
# DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2 [ppb] Calibration: LICA Maskwa Monthly: 12-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

SO2 [ppb] Calibration: LICA Maskwa Monthly: 12-2019 Type: Span



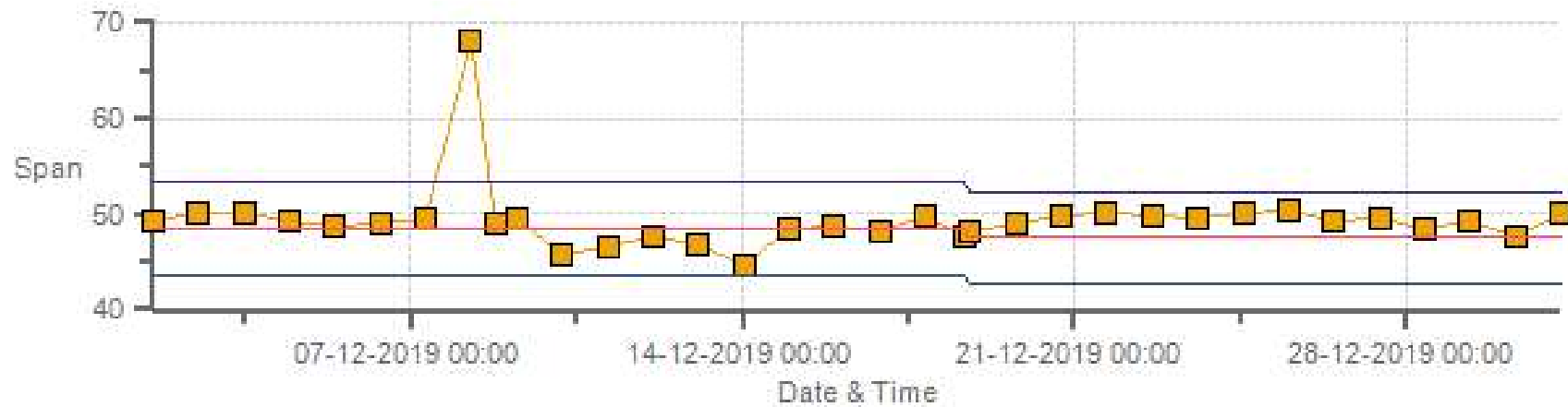
Span SpanRef Span Low Span High

H2S [ppb] Calibration: LICA Maskwa Monthly: 12-2019 Type: Zero



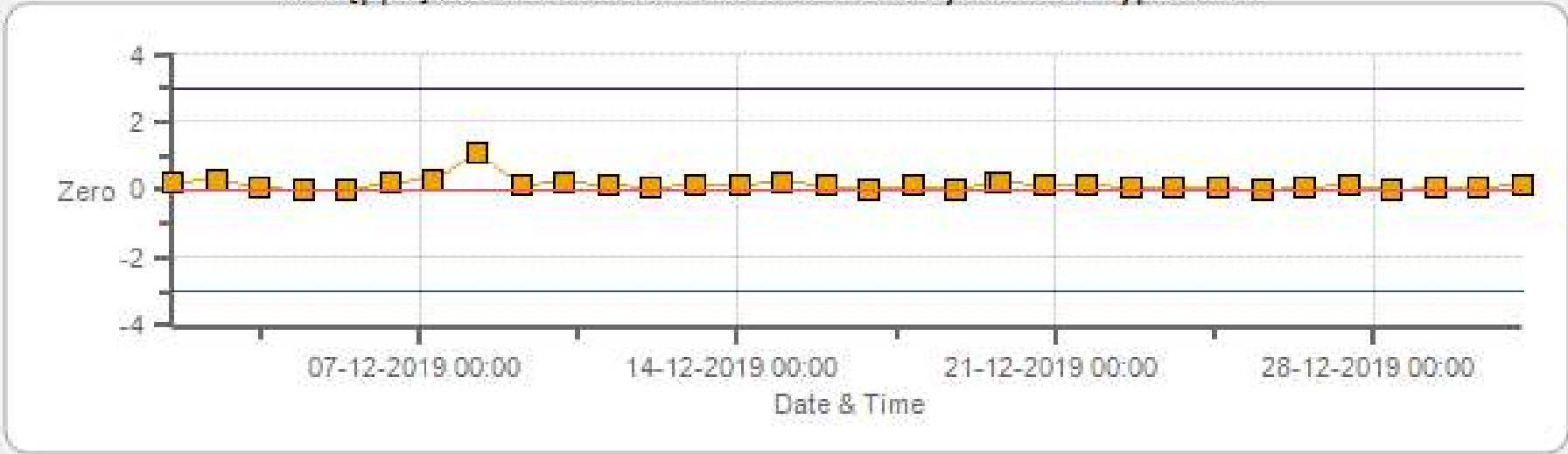
Zero Zero Ref Zero Low Zero High

H2S [ppb] Calibration: LICA Maskwa Monthly: 12-2019 Type: Span



Span SpanRef Span Low Span High

NOx [ppb] Calibration: LICA Maskwa Monthly: 12-2019 Type: Zero



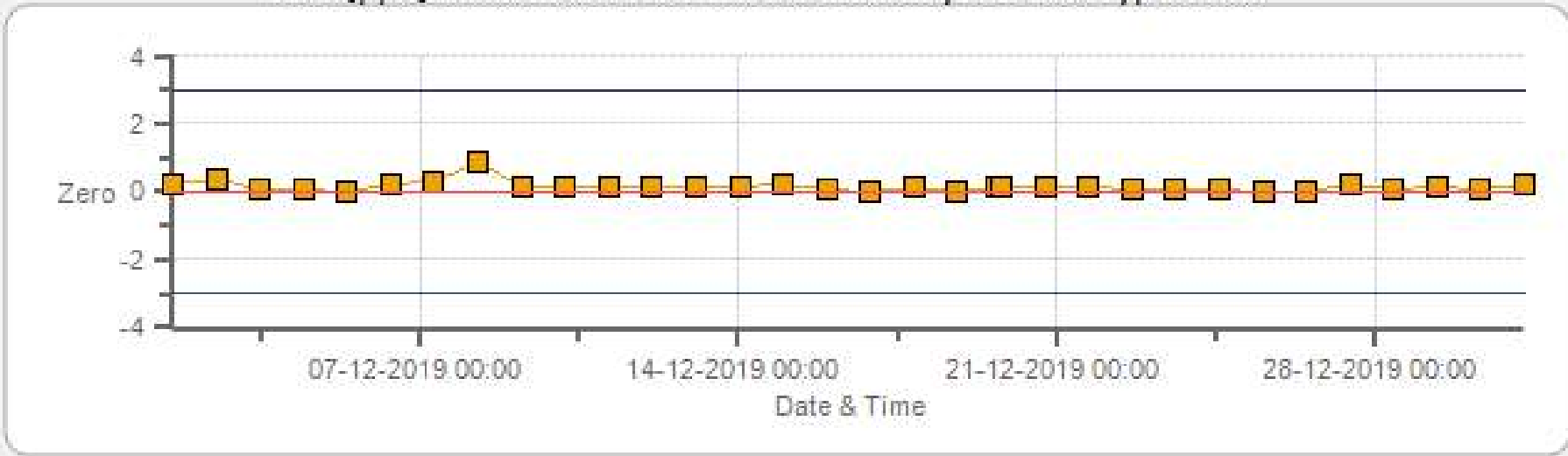
Zero Zero Ref Zero Low Zero High

NOx [ppb] Calibration: LICA Maskwa Monthly: 12-2019 Type: Span



Span Span Ref Span Low Span High

NO2 [ppb] Calibration: LICA Maskwa Monthly: 12-2019 Type: Zero



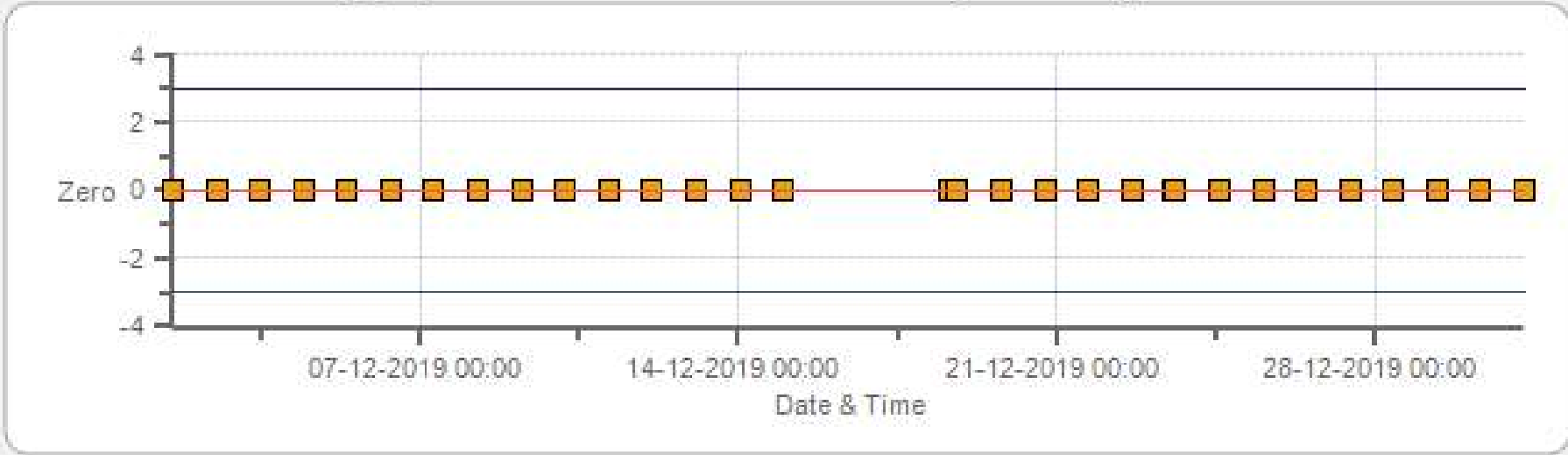
Zero Zero Ref Zero Low Zero High

NO2 [ppb] Calibration: LICA Maskwa Monthly: 12-2019 Type: Span



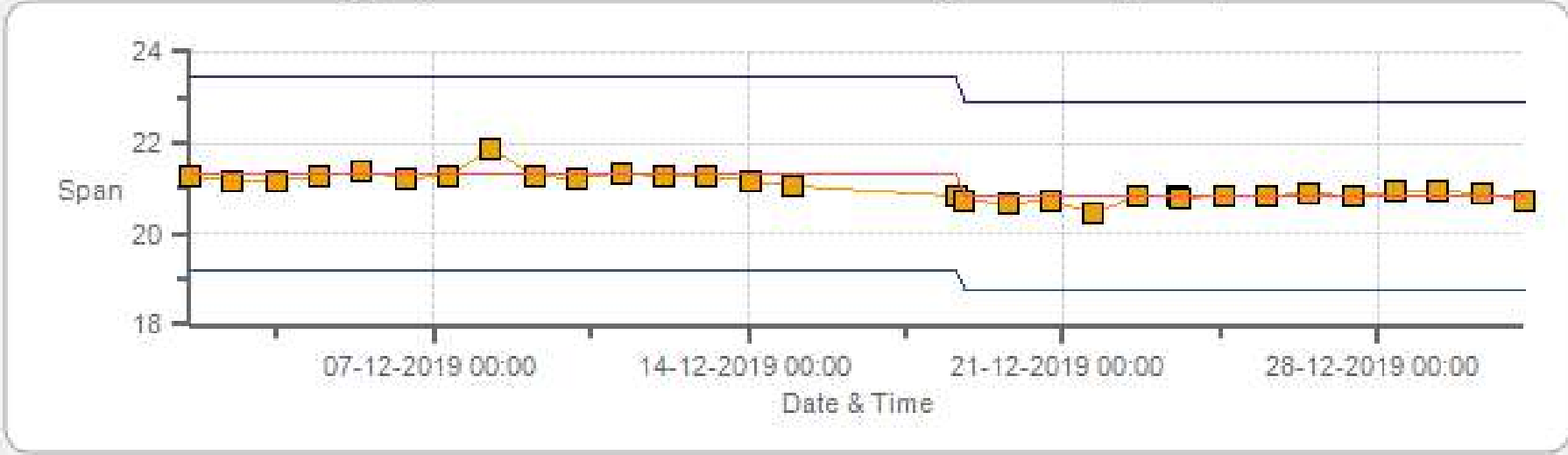
Span SpanRef Span Low Span High

THC [ppm] Calibration: LICA Maskwa Monthly: 12-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

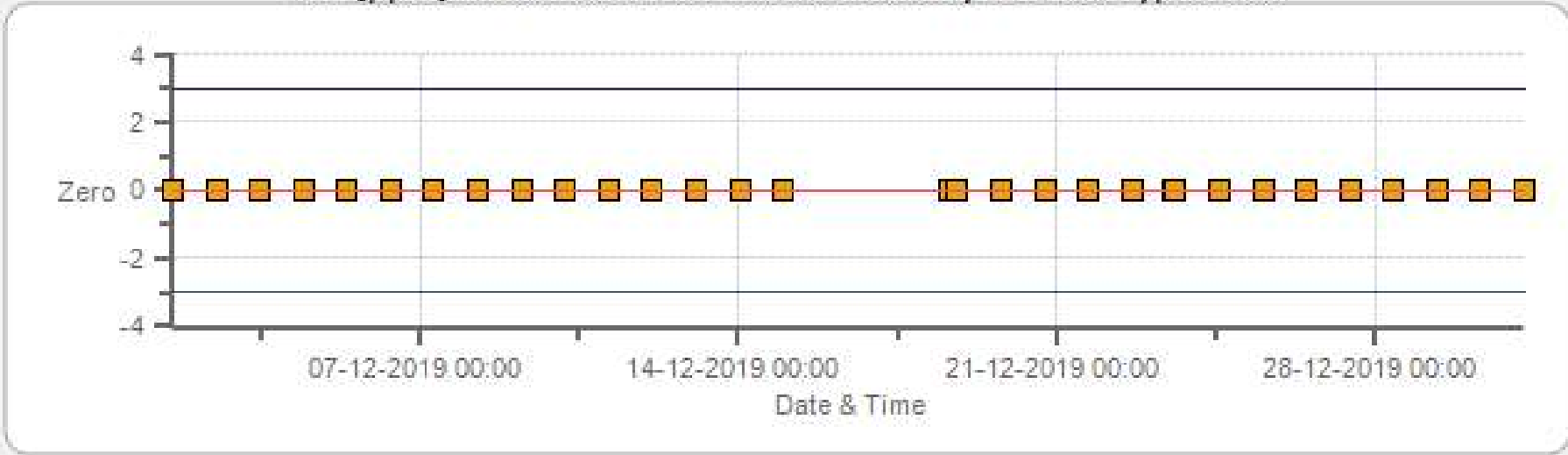
THC [ppm] Calibration: LICA Maskwa Monthly: 12-2019 Type: Span



Span SpanRef Span Low Span High



CH4 [ppm] Calibration: LICA Maskwa Monthly: 12-2019 Type: Zero



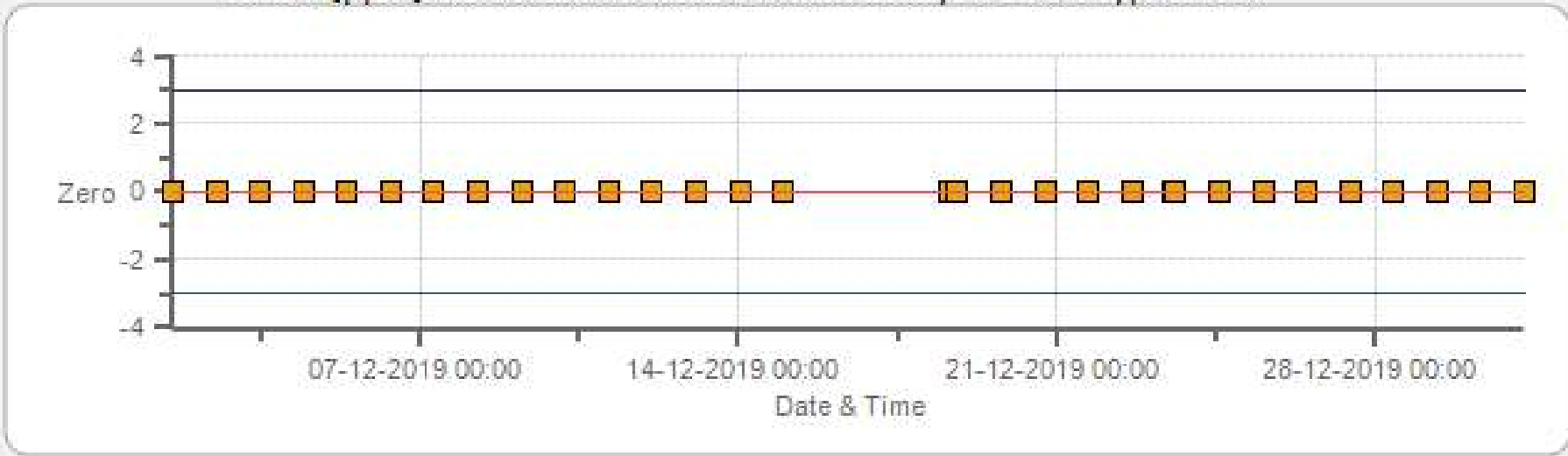
Zero Zero Ref Zero Low Zero High

CH4 [ppm] Calibration: LICA Maskwa Monthly: 12-2019 Type: Span



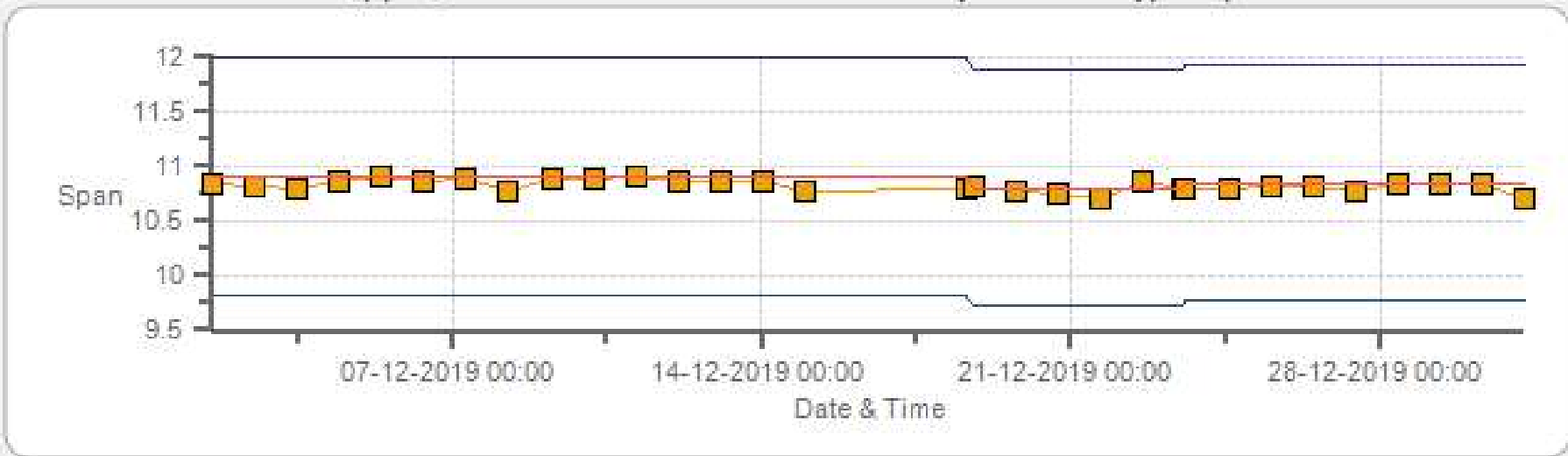
Span SpanRef Span Low Span High

NMHC [ppm] Calibration: LICA Maskwa Monthly: 12-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

NMHC [ppm] Calibration: LICA Maskwa Monthly: 12-2019 Type: Span



Span SpanRef Span Low Span High

# MULTI-POINT CALIBRATION RECORDS

# SO2 Analyzer Calibration by Dilution



DATE:	19-Dec-2019	PREVIOUS CALIBRATION DATE:	13-Nov-2019
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	Maskwa	BAROMETRIC (mBar):	928
PURPOSE:	Routine	START TIME (MST):	10:22
PERFORMED BY:	Alex Yakupov	END TIME (MST):	13:15

## ANALYZER:

MAKE/MODEL	Thermo 43I-TLE	RANGE	1000 ppb
SERIAL #	1180930031	FLOW (mL/min)	451
INITIAL		FINAL	
BKG/OFFSET	2.28	BKG/OFFSET	2.26
COEF/SLOPE	0.982	COEF/SLOPE	0.967
Expected (reference) Value	422	Expected (reference) Value	421

## 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	<del>77.80</del>	5000	0.00	0	0	<del>0.987</del>	<del>1.000</del>
4922	77.80	5000	770.22	780	770	0.987	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

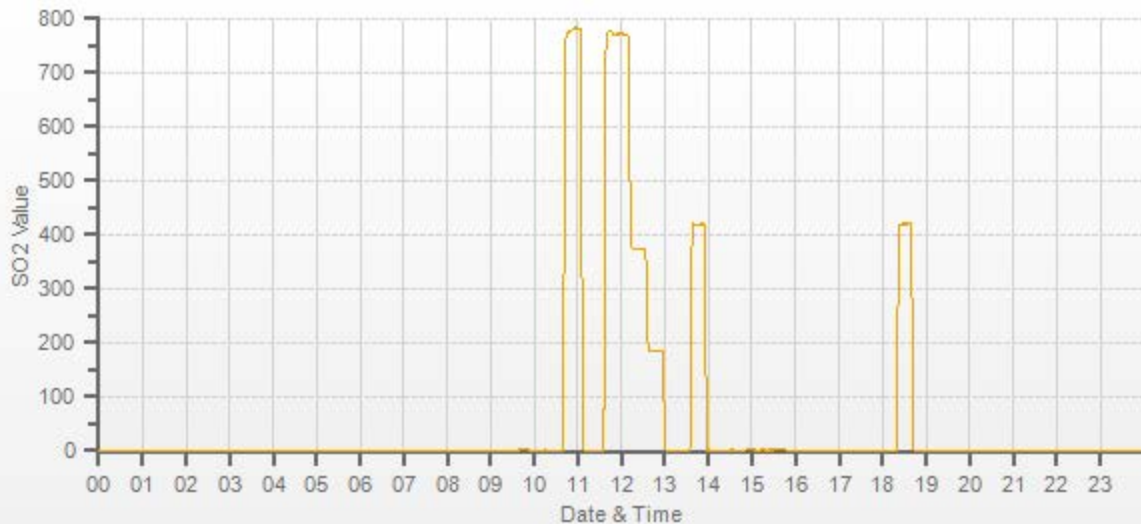
## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	0.0%

## COMMENTS:

Sample inlet filter was changed.

SO2[ppb] Station: Maskwa Periodically: 19-12-2019 00:00-19-12-2019 23:59 Type: AVG 1 Min. [1 Min.]



CAL-LICA-201912-01248

# H2S Analyzer Calibration by Dilution



DATE:	18-Dec-2019	PREVIOUS CALIBRATION DATE:	13-Nov-2019
PARAMETER:	H2S	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	Maskwa	BAROMETRIC (mBar):	932
PURPOSE:	Routine	START TIME (MST):	11:39
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:00

## ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	CM 17360005	FLOW (mL/min)	906
INITIAL		FINAL	
BKG/OFFSET	24.2	BKG/OFFSET	23.9
COEF/SLOPE	0.835	COEF/SLOPE	0.827
Expected (reference) Value	48.5	Expected (reference) Value	47.6

## 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):	1800	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:	11:46	SO2 Conc (ppb)	780
END TIME:	12:01	Analyzer Response (ppb)	0.0

## CALIBRATION:

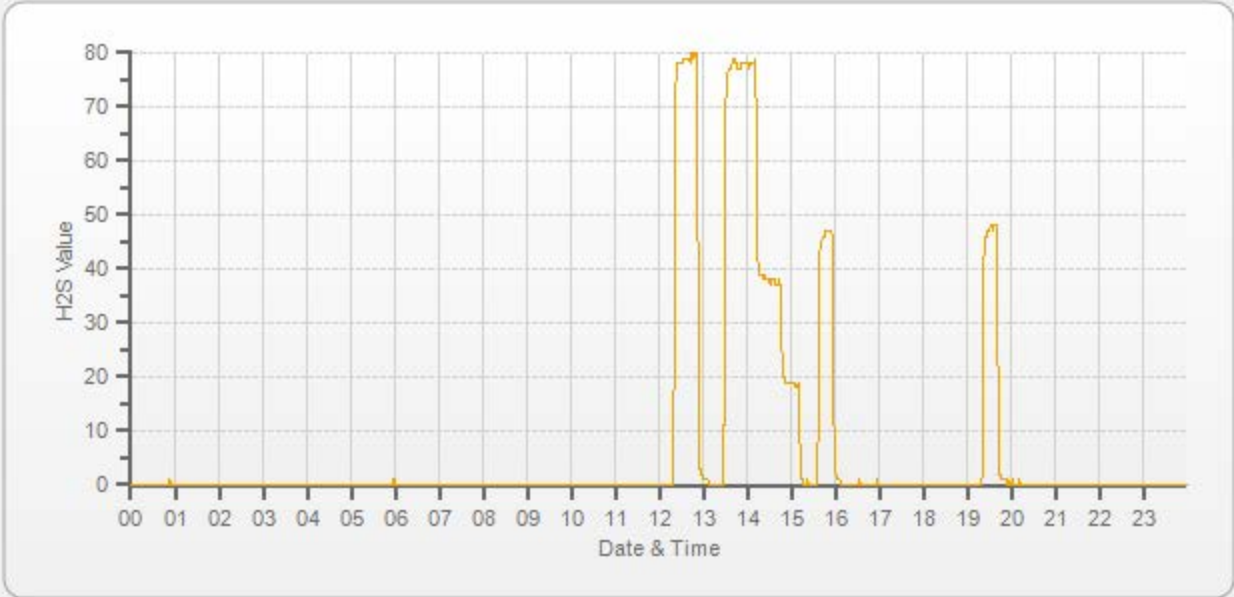
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	<del>58.50</del>	7500	0.00	0	0	<del>0.987</del>	<del>1.000</del>
7441	58.50	7499	78.01	79	78	0.987	1.000
7470	28.50	7498	38.01	n/a	38	n/a	1.000
7486	14.20	7500	18.93	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.



# NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	19-Dec-2019	PREVIOUS CALIBRATION DATE:	13-Nov-2019	MAKE/MODEL:	Thermo 42i	PREVIOUS CF.	
CLIENT:	LICA	TEMPERATURE (°C):	22.0	SERIAL #:	1180930028	NOx	1.000
LOCATION:	Maskwa	BAROMETRIC (mBar):	928.00	FLOW (mL/min)	526	NO	0.999
PURPOSE:	Routine	START TIME (MST):	10:22	RANGE (ppb)	1000	NO2	1.000
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:27	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
	386	4	382.0		393	3	390.0

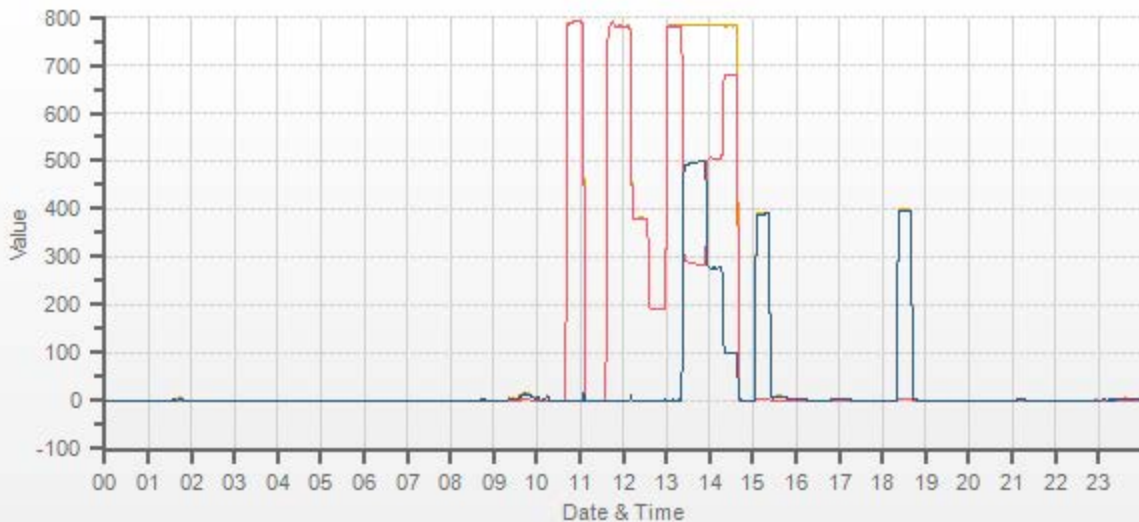
CALIBRATION PARAMETERS:				
POINT	NO TARGET (PPB)	NO2 TARGET (PPB)	NO2 RANGE	O3 POINT
HIGH	780	500	470-540	n/a
MID	380	275	235-310	n/a
LOW	190	90	80-115	n/a
EXTRA 1	n/a	n/a	n/a	n/a

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	<del>77.80</del>	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<del>0.987</del>	<del>0.987</del>	<del>0.999</del>	<del>1.000</del>	<del>0.999</del>	<del>0.999</del>
4922	77.80	5000	779.6	781.1	1.6	790.0	791.0	1.0	780.0	781.0	1.0	0.987	0.987	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	1.0	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	191.0	191.0	0.0	n/a	n/a	0.992	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	782.0	2.0	<del>495</del>	<del>495</del>	<del>1.000</del>	<del>100.00%</del>
AS-FOUND HIGH	77.80	5000	500	285.0	782.0	497.0	495	495	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	505.0	782.0	277.0	275	275	1.000	100.00%
LOW	77.80	5000	100	680.0	782.0	102.0	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	0.06%	
NO2	1.000	1.000	0.00%	





CAL-LICA-201912-01248

# Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	18-Dec-2019	PREVIOUS CALIBRATION DATE:	14-Nov-2019	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1236656188	1110
LOCATION:	Maskwa	BAROMETRIC (mBar):	932	PARAMETER:	CH4	NMHC	THC
PURPOSE:	Install/Post-Repair	START TIME (MST):	11:39	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:54	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 <sub>4</sub> /C <sub>3</sub> H <sub>8</sub> (ppm):	598.0   198.0	HIGH EXPIRY:	n/a
ID:	690	ID:	132	CYLINDER (psi):	500	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 <sub>4</sub> /NMHC)	HIGH	MID	LOW	CH <sub>4</sub> EQUIVILANCE		
TARGET	14	7	3.5	C <sub>3</sub> H <sub>8</sub> as CH <sub>4</sub>		544.5
RANGE	12 - 16	6 - 8	2 - 4	THC as CH <sub>4</sub>		1142.5

## EXPECTED (REFERENCE) VALUE:

INITIAL	CH <sub>4</sub>	NMHC	THC	FINAL	CH <sub>4</sub>	NMHC	THC
	n/a	n/a	n/a		n/a	10.04	10.80

## CALIBRATION:

FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC
3000	<del>X</del>	3000	0.00	0.00	0.00	n/a	n/a	n/a	0.00	0.00	0.00	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>
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	7.68	6.79	14.49	n/a	n/a	n/a	0.986	1.016	0.999
2981	19.00	3000	3.79	3.45	7.24	n/a	n/a	n/a	3.90	3.44	7.34	n/a	n/a	n/a	0.971	1.002	0.986

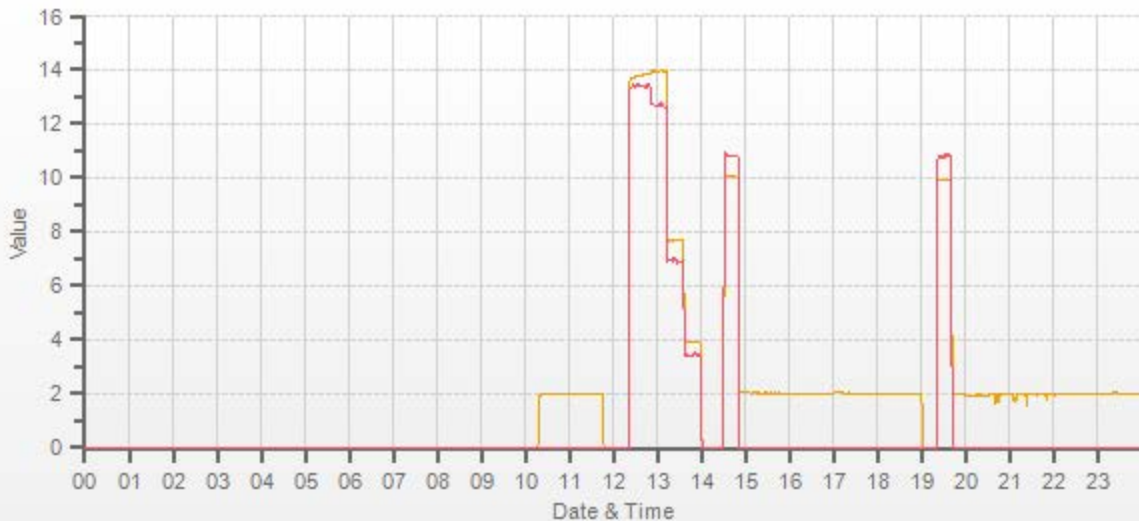
## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
CH <sub>4</sub>	1.000	0.998	0.3%
NMHC	1.000	1.000	-0.1%
THC	1.000	0.999	0.1%

## COMMENTS:

Sample inlet filter was changed.

Station: Maskwa Periodically: 18-12-2019 00:00-18-12-2019 23:59 Type: AVG 1 Min. [1 Min.]



CAL-LICA-201912-01248

Page 18 of 22  
CH4 [ppm] NMHC [ppm]

# Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	23-Dec-2019	PREVIOUS CALIBRATION DATE:	18-Dec-2019	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1236656188	1110
LOCATION:	Maskwa	BAROMETRIC (mBar):	932	PARAMETER:	CH4	NMHC	THC
PURPOSE	Repeat	START TIME (MST):	10:26	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	13:13	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 <sub>4</sub> /C <sub>3</sub> H <sub>8</sub> (ppm):	598.0   198.0	HIGH EXPIRY:	n/a
ID:	690	ID:	132	CYLINDER (psi):	400	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 <sub>4</sub> /NMHC)	HIGH	MID	LOW	CH <sub>4</sub> EQUIVILANCE		
TARGET	14	7	3.5	C <sub>3</sub> H <sub>8</sub> as CH <sub>4</sub>		544.5
RANGE	12 - 16	6 - 8	2 - 4	THC as CH <sub>4</sub>		1142.5

## EXPECTED (REFERENCE) VALUE:

INITIAL	CH <sub>4</sub>	NMHC	THC	FINAL	CH <sub>4</sub>	NMHC	THC
	10.04	10.80	20.84		9.99	10.85	20.85

## CALIBRATION:

FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC
3000	<del>X</del>	3000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>
2930	70.00	3000	13.95	12.71	26.66	13.93	12.70	26.64	13.95	12.71	26.66	1.002	1.000	1.001	1.000	1.000	1.000
2962	38.00	3000	7.57	6.90	14.47	n/a	n/a	n/a	7.64	6.93	14.57	n/a	n/a	n/a	0.991	0.995	0.993
2981	19.00	3000	3.79	3.45	7.24	n/a	n/a	n/a	3.85	3.37	7.23	n/a	n/a	n/a	0.984	1.023	1.001

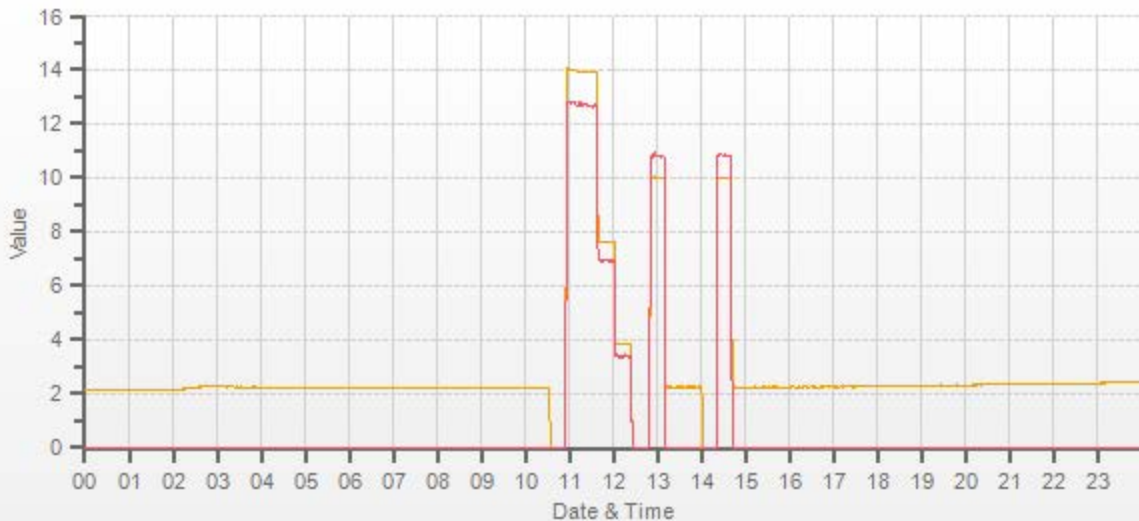
## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
CH <sub>4</sub>	1.000	0.999	0.2%
NMHC	1.000	1.000	-0.1%
THC	1.000	1.001	0.0%

## COMMENTS:

Repeat calibration was required after the poor injection issue was fixed remotely.  
Filter was changed during a monthly calibration 5 days ago (on Dec 18, 2019).

Station: Maskwa Periodically: 23-12-2019 00:00-23-12-2019 23:59 Type: AVG 1 Min. [1 Min.]



CAL-LICA-201912-01248

Page 20 of 22  
CH4 [ppm] NMHC [ppm]



# Meteorological Sensor Audit/Calibration

## Location Information

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

## Wind Sensor Information

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

## 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
<b>The audit meets AMD requirements.</b>			<b>Average Correction Factor=</b>	<b>0.997</b>

### 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
<b>The audit meets AMD requirements.</b>				<b>Average Absolute Degrees Difference=</b>		<b>0.8</b>

## 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**

**DECEMBER 2019**

**Ambient Air Monitoring Calibration Report**

**- ST. LINA STATION-**

**CAL-LICA-201912-01250**

**Station Operation and Maintenance:**

Bureau Veritas Canada

**Data Validation and Report:**

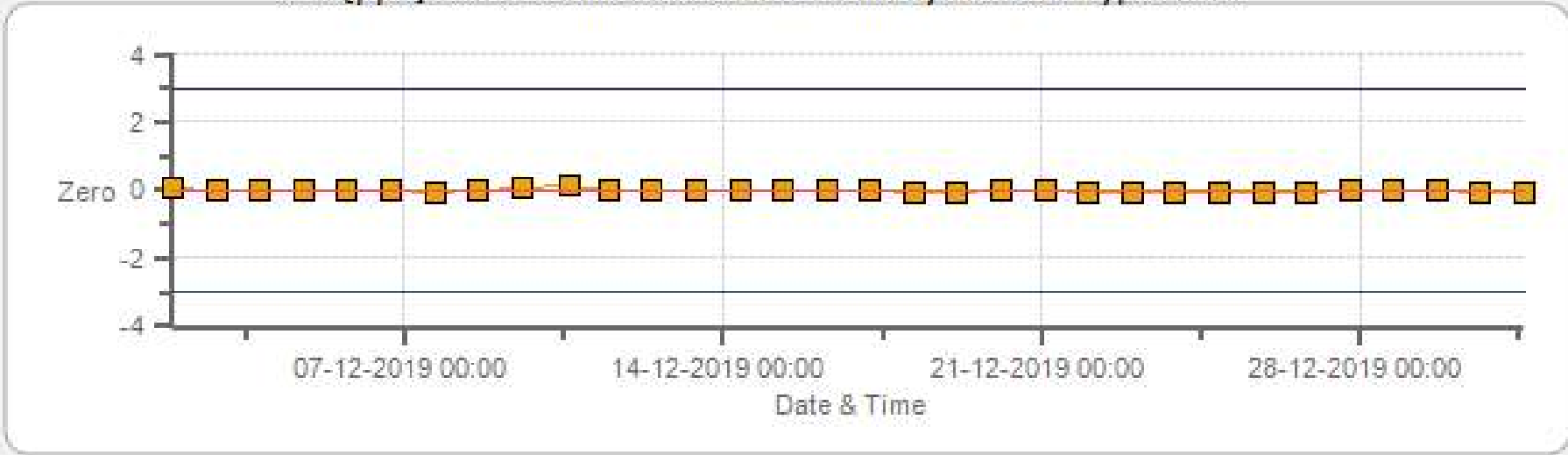
Bureau Veritas Canada

January 13, 2020



# DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2 [ppb] Calibration: LICA St. Lina Monthly: 12-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

SO2 [ppb] Calibration: LICA St. Lina Monthly: 12-2019 Type: Span



Span Span Ref Span Low Span High

H2S [ppb] Calibration: LICA St. Lina Monthly: 12-2019 Type: Zero



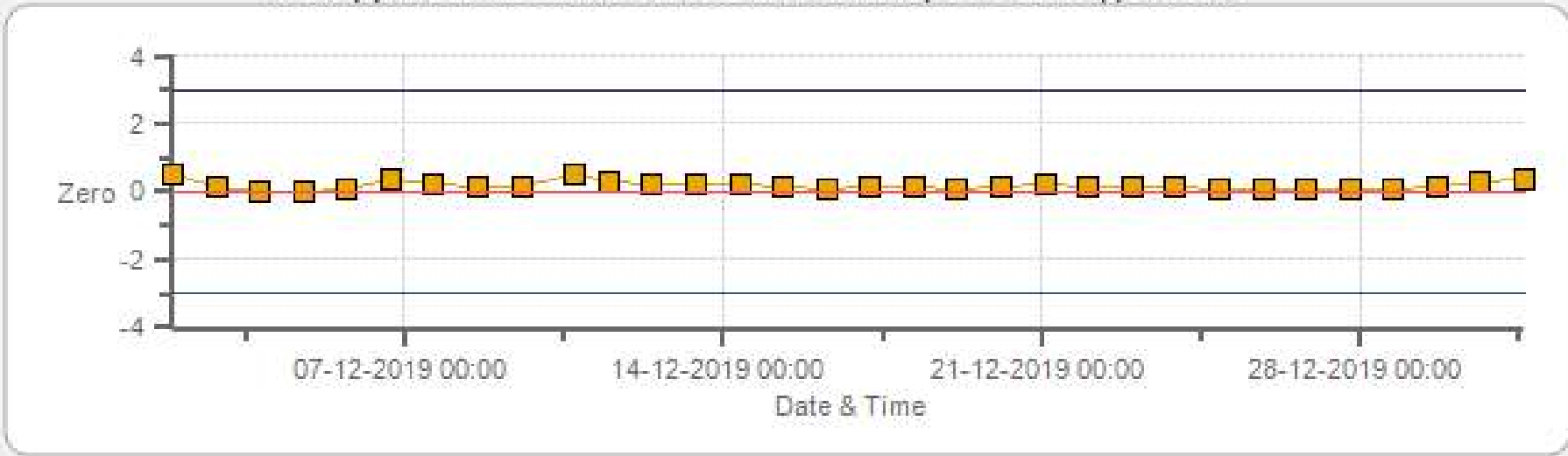
■ Zero    
 — Zero Ref    
 — Zero Low    
 — Zero High

H2S [ppb] Calibration: LICA St. Lina Monthly: 12-2019 Type: Span



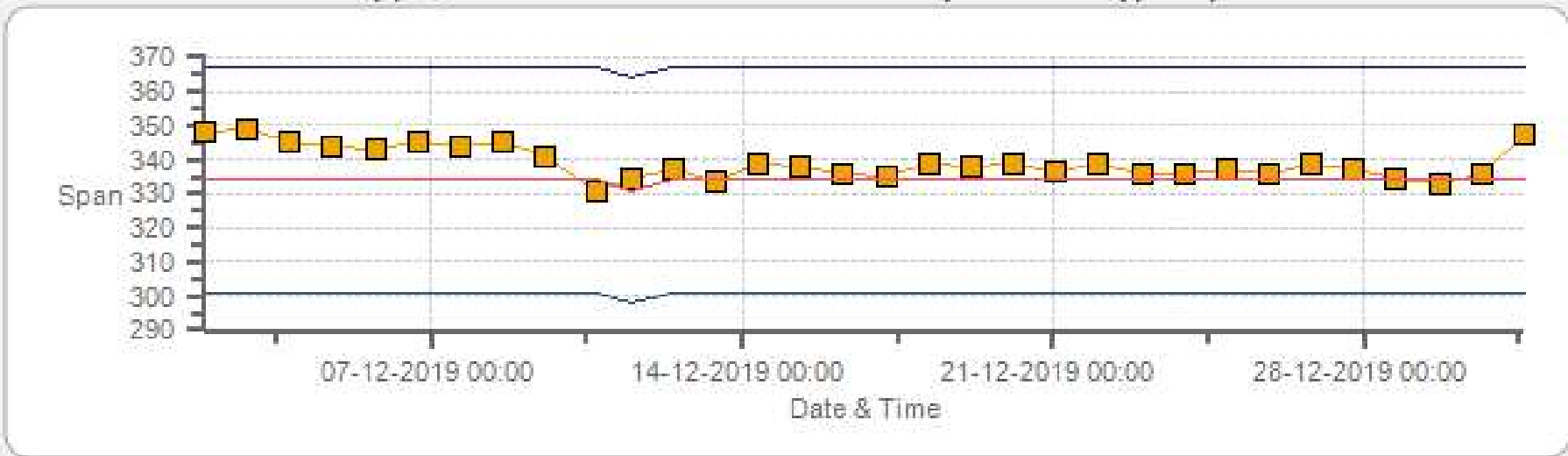
■ Span    
 — SpanRef    
 — Span Low    
 — Span High

NOx [ppb] Calibration: LICA St. Lina Monthly: 12-2019 Type: Zero



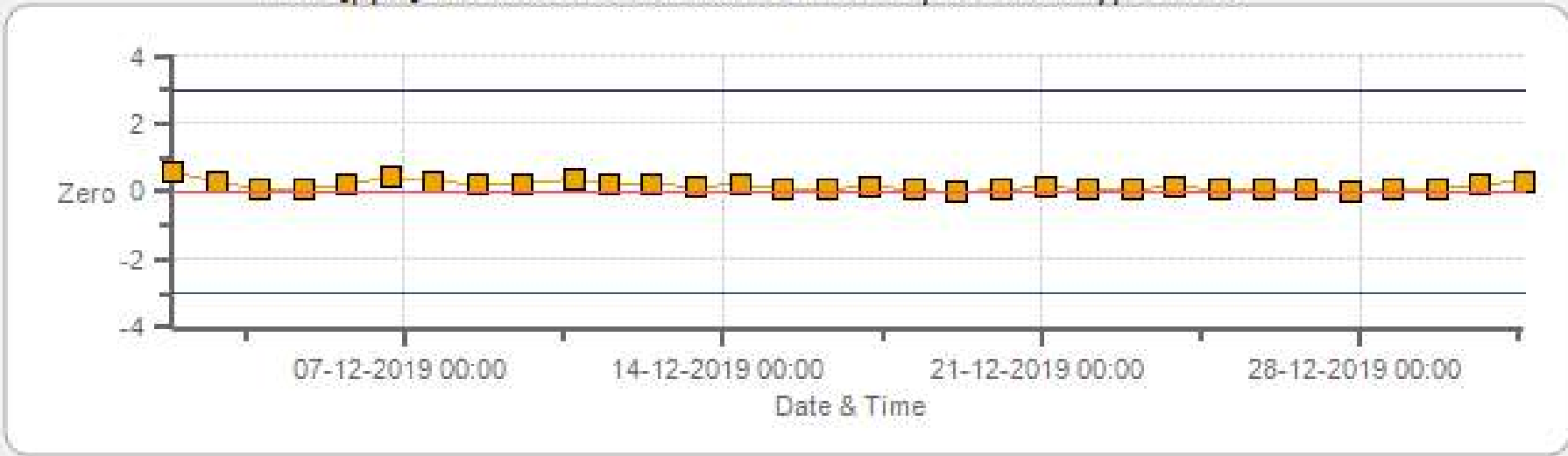
Zero Zero Ref Zero Low Zero High

NOx [ppb] Calibration: LICA St. Lina Monthly: 12-2019 Type: Span



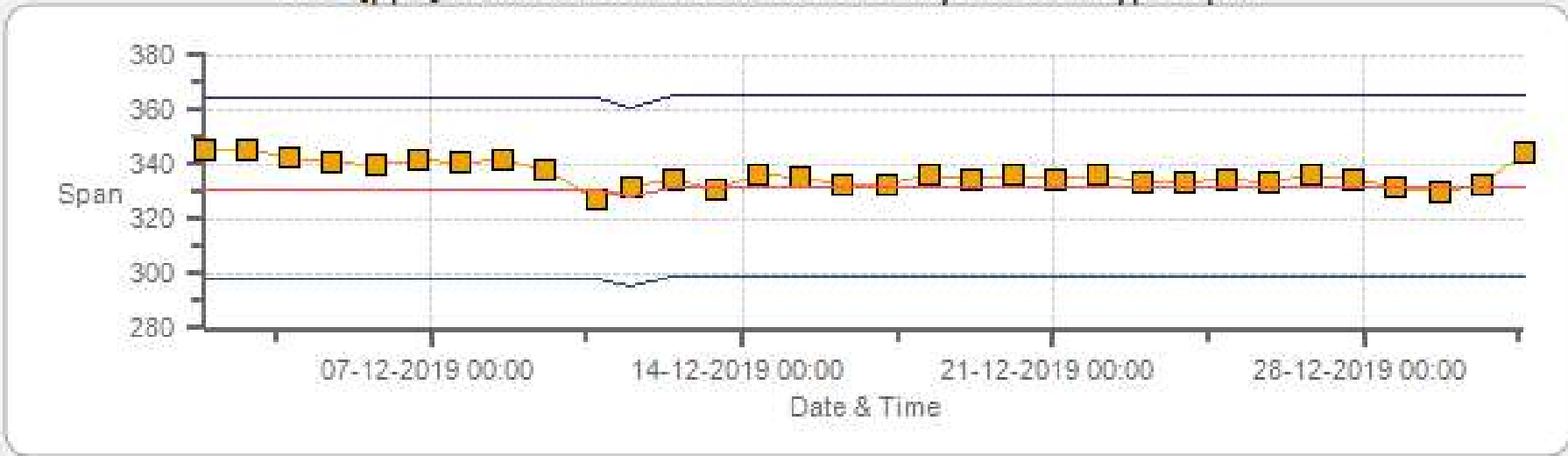
Span SpanRef Span Low Span High

NO2 [ppb] Calibration: LICA St. Lina Monthly: 12-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

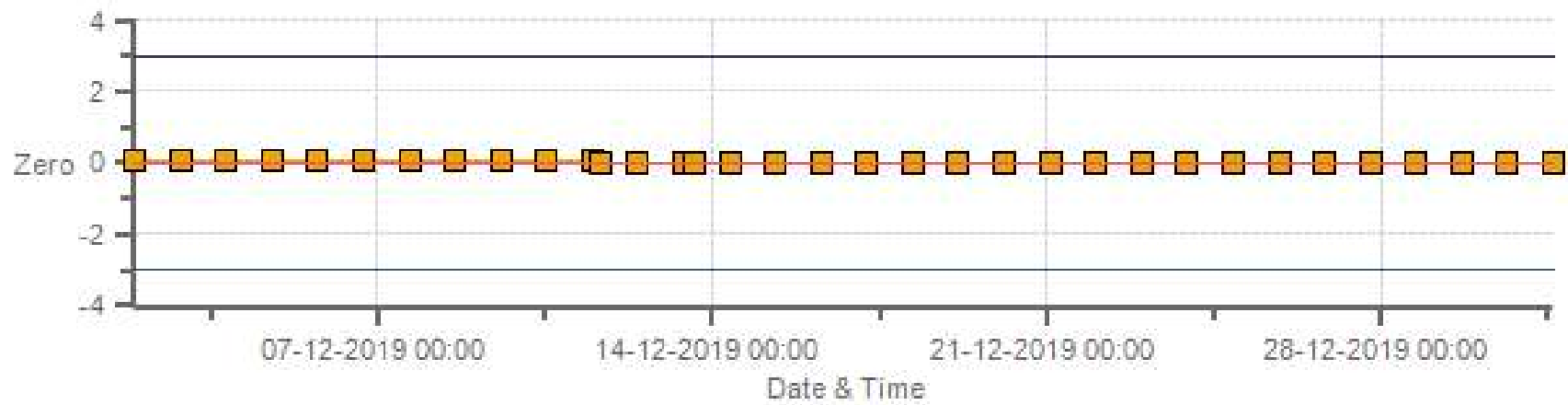
NO2 [ppb] Calibration: LICA St. Lina Monthly: 12-2019 Type: Span



Span SpanRef Span Low Span High

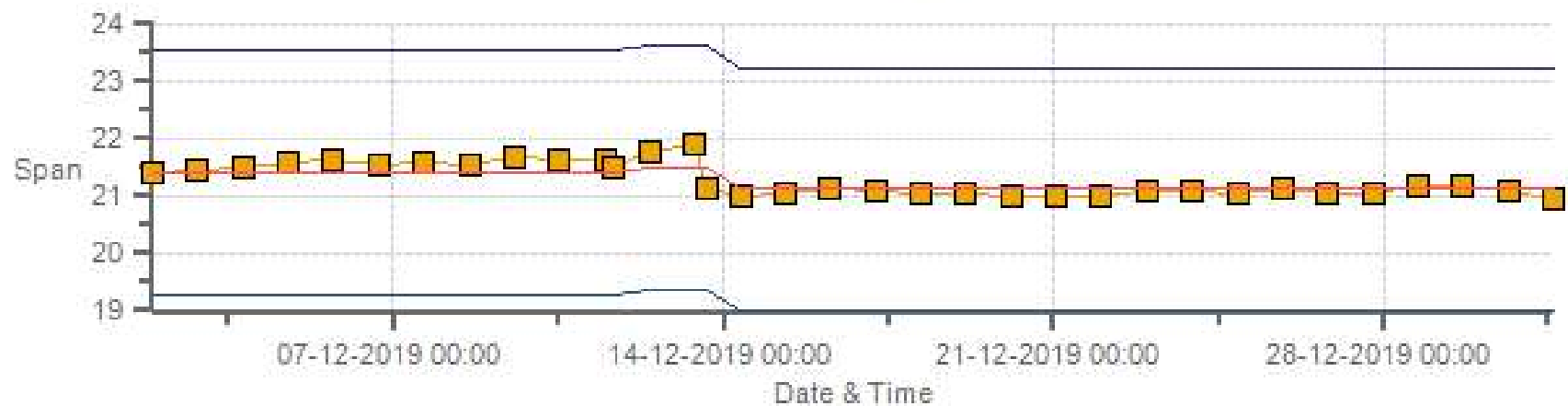


THC [ppm] Calibration: LICA St. Lina Monthly: 12-2019 Type: Zero



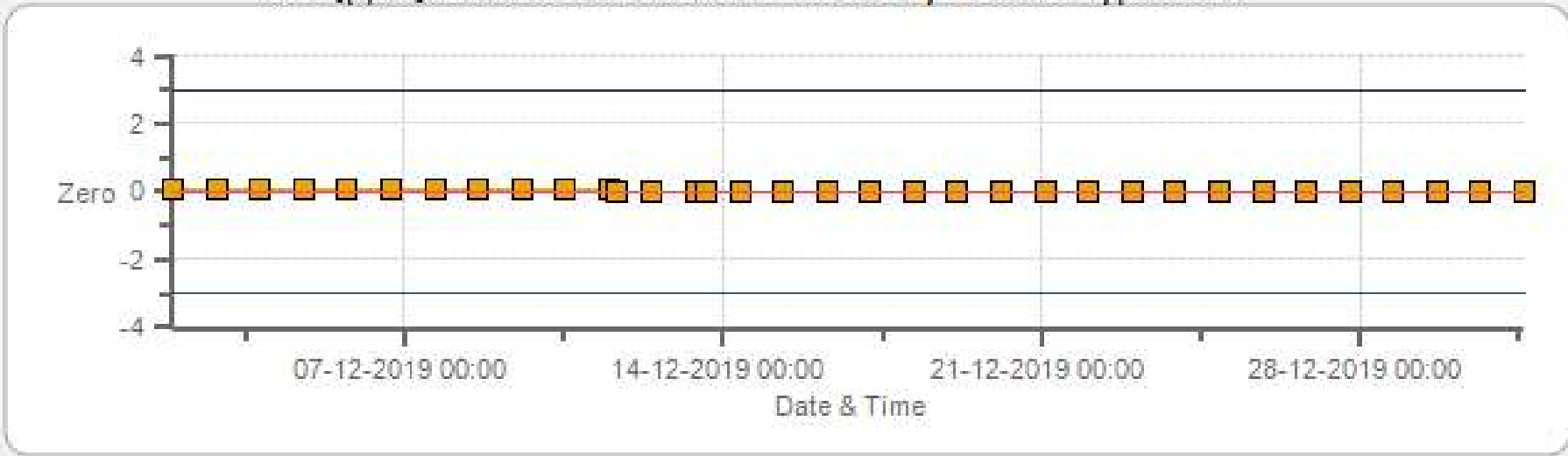
Zero Zero Ref Zero Low Zero High

THC [ppm] Calibration: LICA St. Lina Monthly: 12-2019 Type: Span



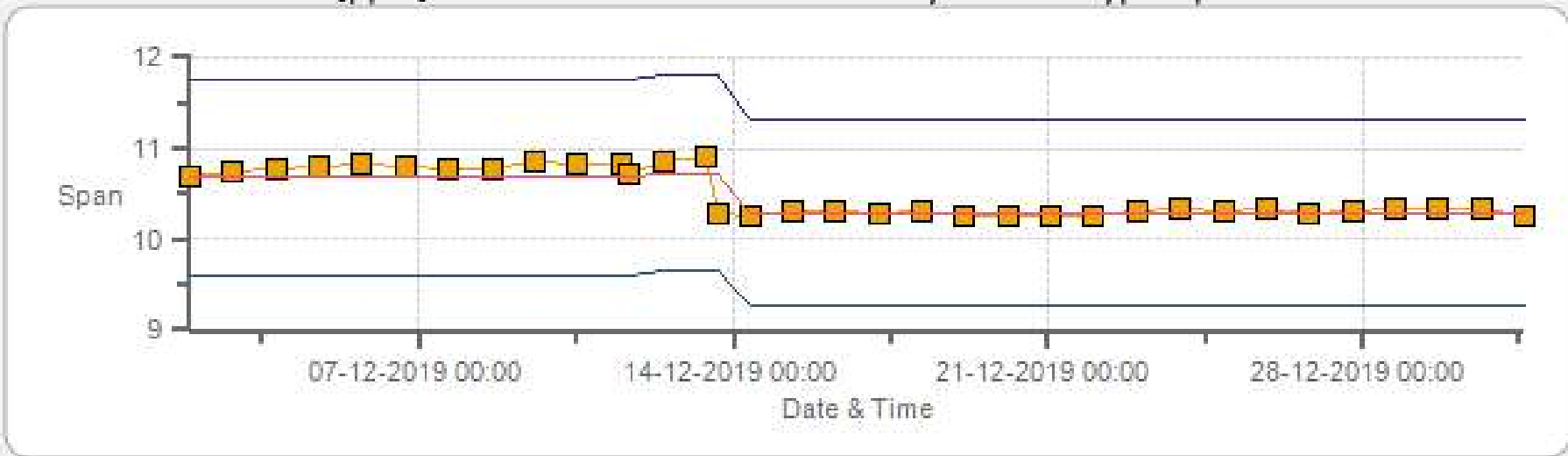
Span SpanRef Span Low Span High

CH4 [ppm] Calibration: LICA St. Lina Monthly: 12-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

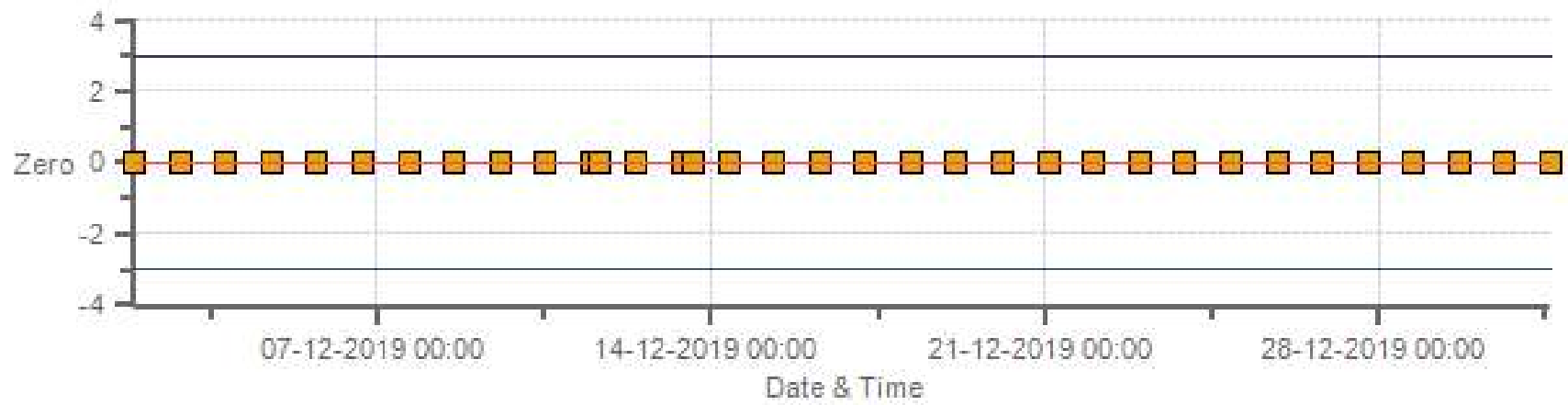
CH4 [ppm] Calibration: LICA St. Lina Monthly: 12-2019 Type: Span



Span SpanRef Span Low Span High

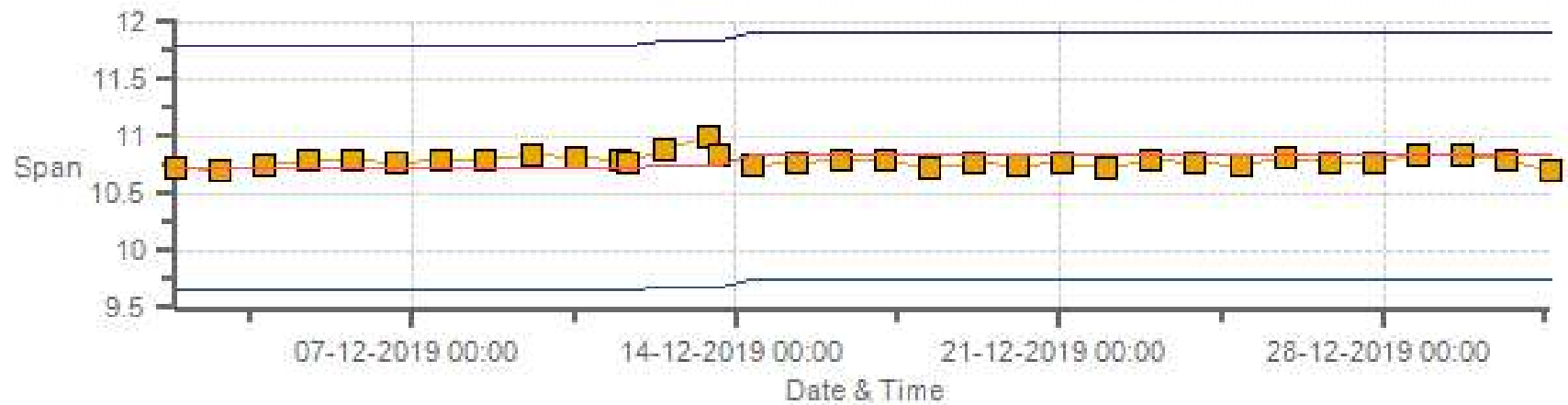


NMHC [ppm] Calibration: LICA St. Lina Monthly: 12-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

NMHC [ppm] Calibration: LICA St. Lina Monthly: 12-2019 Type: Span



Span SpanRef Span Low Span High

# MULTI-POINT CALIBRATION RECORDS

# SO2 Analyzer Calibration by Dilution



DATE:	10-Dec-2019	PREVIOUS CALIBRATION DATE:	19-Nov-2019
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	923
PURPOSE:	Routine	START TIME (MST):	11:19
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:35

## ANALYZER:

MAKE/MODEL	Thermo 43I-TLE	RANGE	1000 ppb
SERIAL #	1180930030	FLOW (mL/min)	437
INITIAL		FINAL	
BKG/OFFSET	3.98	BKG/OFFSET	4.05
COEF/SLOPE	1.131	COEF/SLOPE	1.132
Expected (reference) Value	400	Expected (reference) Value	386

## 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):	700	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	<del>77.80</del>	5000	0.00	0	0	<del>1.002</del>	<del>1.000</del>
4922	77.80	5000	770.22	769	770	1.002	1.000
4962	37.90	5000	375.21	n/a	374	n/a	1.003
4981	18.90	5000	187.11	n/a	186	n/a	1.006

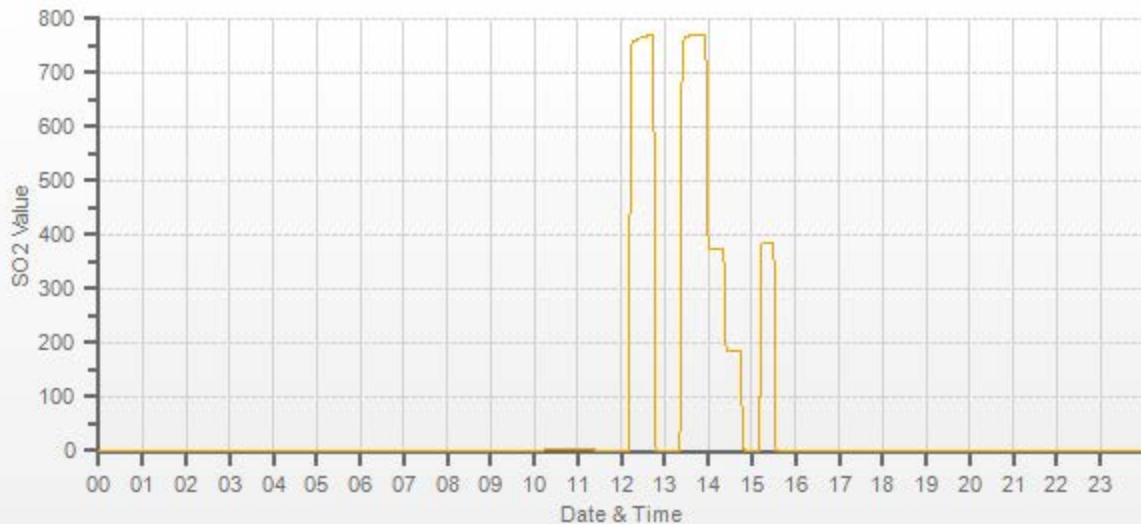
## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	-0.1%

## COMMENTS:

Sample filter was changed.

SO2[ppb] Station: St. Lina Daily: 10-12-2019 Type: AVG 1 Min. [1 Min.]



CAL-LICA-201912-01250

# H2S Analyzer Calibration by Dilution



DATE:	10-Dec-2019	PREVIOUS CALIBRATION DATE:	18-Nov-2019
PARAMETER:	H2S	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	923
PURPOSE:	Routine	START TIME (MST):	11:19
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:45

## ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	CM 18010058	FLOW (mL/min)	821
INITIAL		FINAL	
BKG/OFFSET	48.2	BKG/OFFSET	46.6
COEF/SLOPE	0.851	COEF/SLOPE	0.884
Expected (reference) Value	83.4	Expected (reference) Value	86.3

## 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):	1700	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:	11:24	SO2 Conc (ppb)	780
END TIME:	11:39	Analyzer Response (ppb)	0.0

## CALIBRATION:

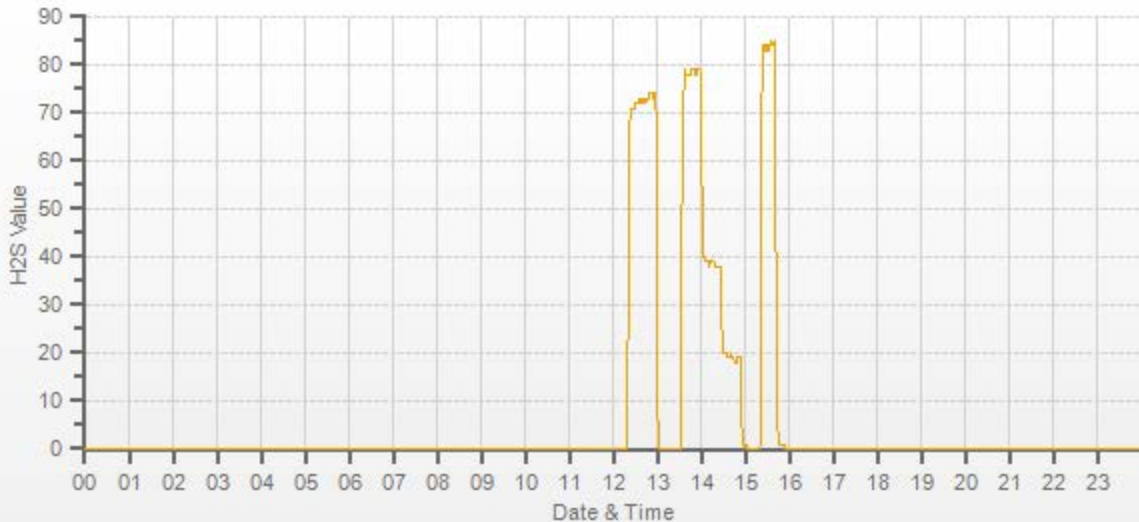
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	<del>58.50</del>	7500	0.00	-2.2	0	<del>1.024</del>	<del>1.000</del>
7442	58.50	7500	78.00	74	78	1.024	1.000
7472	28.50	7500	38.00	n/a	38.6	n/a	0.984
7486	14.20	7500	18.93	n/a	19.4	n/a	0.976

## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.999	0.3%

## COMMENTS:

Sample inlet filter was changed.



# NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	10-Dec-2019	PREVIOUS CALIBRATION DATE:	19-Nov-2019	MAKE/MODEL:	Thermo 42i	PREVIOUS CF.	
CLIENT:	LICA	TEMPERATURE (°C):	22.0	SERIAL #:	1180930029	NOx	1.000
LOCATION:	St. Lina	BAROMETRIC (mBar):	923.00	FLOW (mL/min)	512	NO	0.999
PURPOSE:	Routine	START TIME (MST):	11:19	RANGE (ppb)	1000	NO2	1.000
PERFORMED BY:	Alex Yakupov	END TIME (MST):	17:23	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   50.1	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:	6	6	n/a	BKG/OFFSET:	6	5	n/a
SLOPE/COEF/CE:	1	1	1.0	SLOPE/COEF/CE:	1	1	1.0

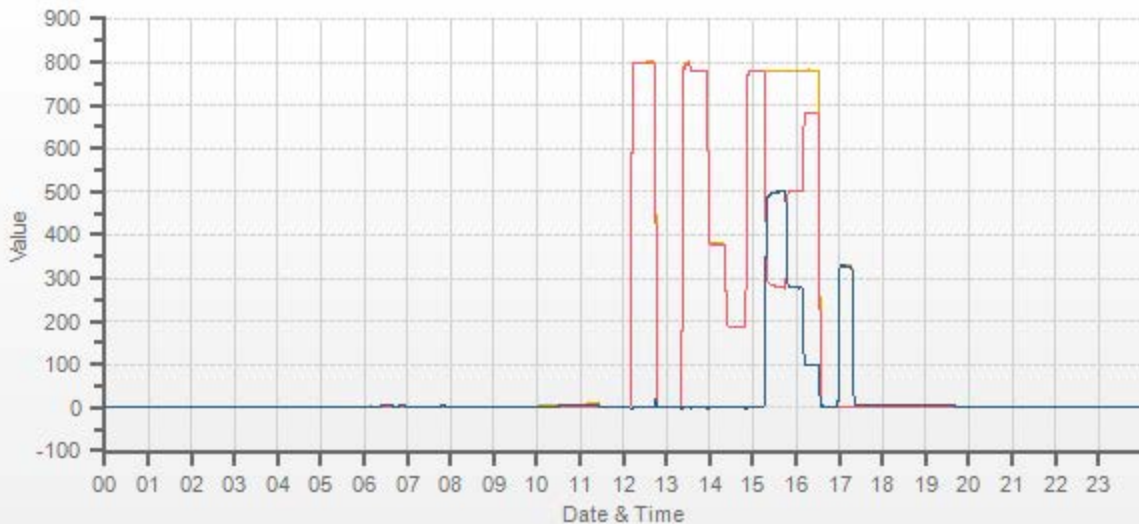
EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	334	3	331.0		334	3	332.0

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	<del>77.80</del>	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<del>0.977</del>	<del>0.976</del>	<del>0.999</del>	<del>0.999</del>	<del>0.999</del>	<del>0.999</del>
4922	77.80	5000	779.6	779.6	0.0	798.0	799.0	1.0	780.0	781.0	1.0	0.977	0.976	0.999	0.998	0.999	0.999
4962	37.90	5000	379.8	379.8	0.0	n/a	n/a	n/a	380.0	380.0	0.0	n/a	n/a	0.999	0.999	0.999	0.999
4981	18.90	5000	189.4	189.4	0.0	n/a	n/a	n/a	189.0	189.0	0.0	n/a	n/a	1.002	1.002	1.002	1.002

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	<del>500</del>	<del>500</del>	<del>1.000</del>	<del>100.00%</del>
AS-FOUND HIGH	77.80	5000	500	280.0	780.0	500.0	500	500	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	502.0	780.0	278.0	278	278	1.000	100.00%
LOW	77.80	5000	100	681.0	780.0	99.0	99	99	1.000	100.00%
NO2 adjustment not required.									AVERAGE:	100.00%

LINEAR REGRESSION ANALYSIS:				COMMENTS:
	CORRELATION	SLOPE	INTERCEPT	
NO	1.000	1.001	-0.02%	
NOx	1.000	1.000	-0.04%	
NO2	1.000	1.000	0.00%	



CAL-LICA-201912-01250



# Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	13-Dec-2019	PREVIOUS CALIBRATION DATE:	11-Dec-2019
PARAMETER:	Ozone	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	924
PURPOSE:	Removal/Shut-down	START TIME (MST):	11:26
PERFORMED BY:	Alex Yakupov	END TIME (MST):	13:12

## ANALYZER:

MAKE/MODEL	API 400A	RANGE	500 ppb
SERIAL #	446	FLOW (mL/min)	807
INITIAL		FINAL	
BKG/OFFSET	-4.3	BKG/OFFSET	n/a
COEF/SLOPE	1.056	COEF/SLOPE	n/a
Expected (reference) Value	322	Expected (reference) Value	n/a

## CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Thermo-Electron
MODEL:	2010 D	MODEL:	Model 111
ID:	11900613	ID:	111-22449-204
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:

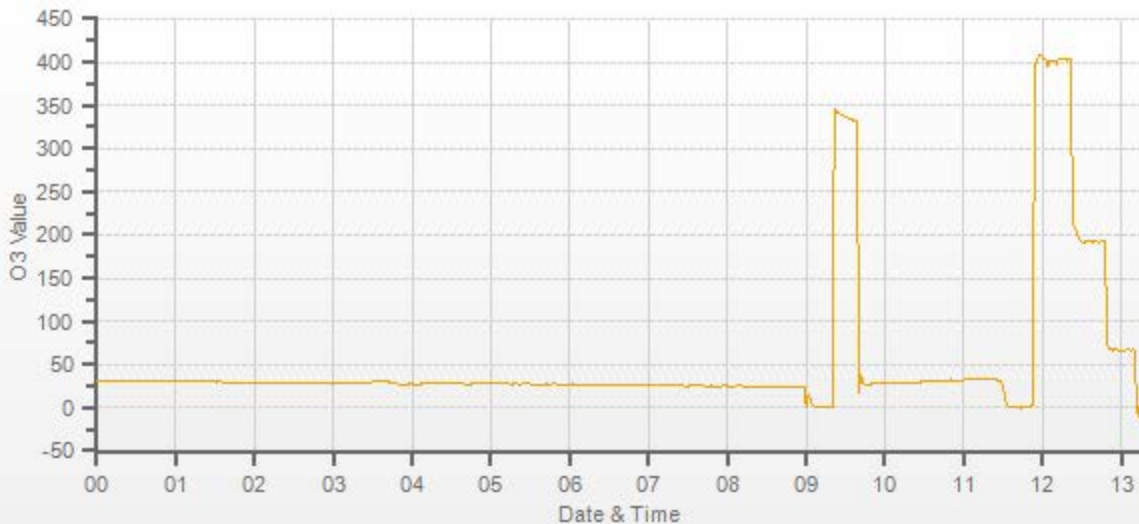
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	<del>5000</del>	5000	0.0	0.0	n/a	<del>0.950</del>	<del>n/a</del>
5000	<del>5000</del>	5000	380.0	400.0	n/a	0.950	n/a
5000	<del>5000</del>	5000	181.0	192.0	n/a	0.943	n/a
5000	<del>5000</del>	5000	61.0	66.0	n/a	0.924	n/a

## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.051	0.2%

## COMMENTS:

Shutdown was completed to install the LICA analyzer that came back after repair.



# Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	13-Dec-2019	PREVIOUS CALIBRATION DATE:	n/a
PARAMETER:	Ozone	PREVIOUS CORRECTION FACTOR:	n/a
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	924
PURPOSE:	Install/Post-Repair	START TIME (MST):	13:44
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:34

## ANALYZER:

MAKE/MODEL	Thermo 49i	RANGE	500 ppb
SERIAL #	1002240371	FLOW (mL/min)	1493
INITIAL		FINAL	
BKG/OFFSET	n/a	BKG/OFFSET	0.1
COEF/SLOPE	n/a	COEF/SLOPE	1.065
Expected (reference) Value	n/a	Expected (reference) Value	355

## CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Thermo-Electron
MODEL:	2010 D	MODEL:	Model 111
ID:	11900613	ID:	111-22449-204
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:

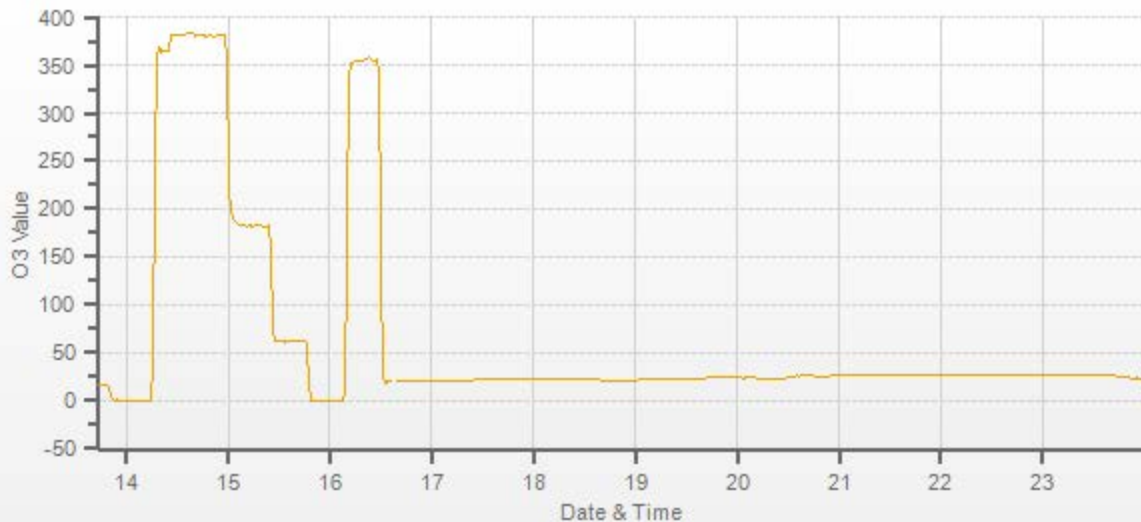
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	<del>          </del>	5000	0.0	0.0	0.0	<del>          </del>	<del>          </del>
5000	<del>          </del>	5000	380.0	n/a	380.0	n/a	1.000
5000	<del>          </del>	5000	181.0	n/a	182.0	n/a	0.995
5000	<del>          </del>	5000	61.0	n/a	62.0	n/a	0.984

## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.999	0.1%

## COMMENTS:

This LICA analyzer was repaired at BV Calgary Lab (ZS check valve was replaced) and it was installed back.



# Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	20-Dec-2019	PREVIOUS CALIBRATION DATE:	13-Dec-2019
PARAMETER:	Ozone	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	907
PURPOSE	Removal/Shut-down	START TIME (MST):	14:13
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:42

## ANALYZER:

MAKE/MODEL	Thermo 49i	RANGE	500 ppb
SERIAL #	1002240371	FLOW (mL/min)	1474
INITIAL		FINAL	
BKG/OFFSET	0.1	BKG/OFFSET	0.1
COEF/SLOPE	1.065	COEF/SLOPE	1.065
Expected (reference) Value	355	Expected (reference) Value	392

## CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Thermo-Electron
MODEL:	2010 D	MODEL:	Model 111
ID:	11900613	ID:	111-22449-204
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:

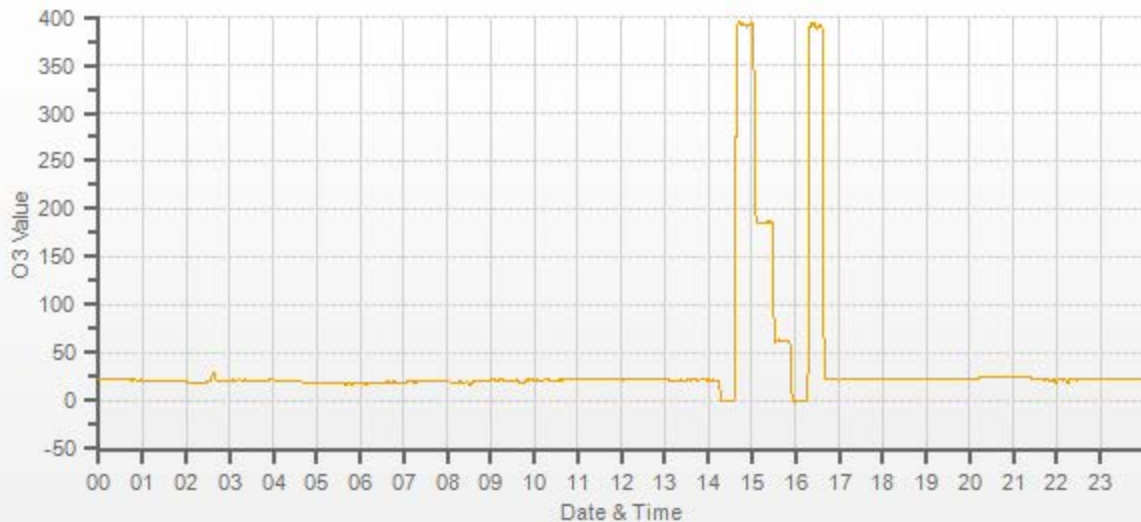
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	<del>          </del>	5000	0.0	0.0	n/a	<del>          </del>	<del>          </del>
5000	<del>          </del>	5000	380.0	389.0	n/a	0.977	n/a
5000	<del>          </del>	5000	180.0	185.0	n/a	0.973	n/a
5000	<del>          </del>	5000	60.0	62.0	n/a	0.968	n/a

## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.023	0.1%

## COMMENTS:

This is not a shutdown calibration but an AUDIT calibration to verify data as the ZS check problem prevented correct ZS daily check. All points are AS FOUND points, no adjustments were made. A new ZS check pump was installed.



# Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	11-Dec-2019	PREVIOUS CALIBRATION DATE:	18-Nov-2019	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1180930025	1210
LOCATION:	St. Lina	BAROMETRIC (mBar):	921	PARAMETER:	CH4	NMHC	THC
PURPOSE	Routine	START TIME (MST):	12:00	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:47	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 <sub>4</sub> /C <sub>3</sub> H <sub>8</sub> (ppm):	598.0   198.0	HIGH EXPIRY:	n/a
ID:	690	ID:	132	CYLINDER (psi):	500	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 <sub>4</sub> /NMHC)	HIGH	MID	LOW	CH <sub>4</sub> EQUIVILANCE		
TARGET	14	7	3.5	C <sub>3</sub> H <sub>8</sub> as CH <sub>4</sub>		544.5
RANGE	12 - 16	6 - 8	2 - 4	THC as CH <sub>4</sub>		1142.5

## EXPECTED (REFERENCE) VALUE:

INITIAL	CH <sub>4</sub>	NMHC	THC	FINAL	CH <sub>4</sub>	NMHC	THC
	10.68	10.73	21.41		10.73	10.76	21.49

## CALIBRATION:

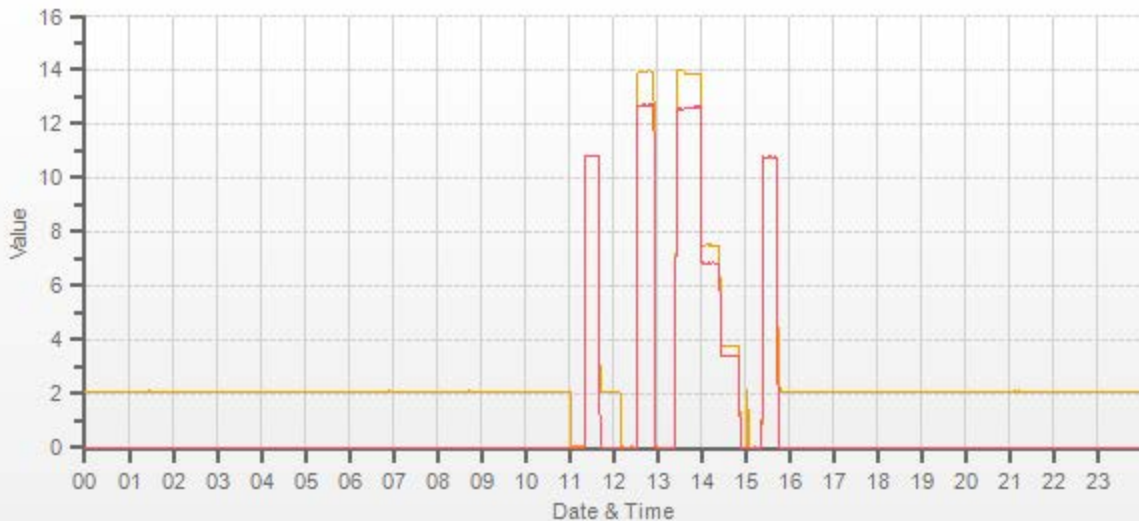
FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC
3025	<del>X</del>	3025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>
2955	70.00	3025	13.84	12.60	26.44	13.93	12.66	26.59	13.84	12.60	26.44	0.993	0.995	0.994	1.000	1.000	1.000
2987	38.00	3025	7.51	6.84	14.35	n/a	n/a	n/a	7.50	6.83	14.33	n/a	n/a	n/a	1.002	1.001	1.002
3006	19.00	3025	3.76	3.42	7.18	n/a	n/a	n/a	3.78	3.42	7.20	n/a	n/a	n/a	0.994	1.000	0.997

## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
CH <sub>4</sub>	1.000	0.999	0.0%
NMHC	1.000	1.000	0.0%
THC	1.000	1.000	0.0%

## COMMENTS:

Sample inlet filter was changed. Zero Chromatogram is completed and used.



CAL-LICA-201912-01250

Page 25 of 28  
CH4 [ppm] NMHC [ppm]



## Thermo 5030i SHARP Monitor Monthly Check



<b>Date:</b> December 11, 2019 <b>Company:</b> LICA <b>Station Name/Location:</b> St. Lina <b>Previous Audit Date:</b> November 28, 2019 <b>Parameter:</b> PM 2.5	<b>Performed By/Reviewer:</b> Alex Yakupov   Wunmi Adekanmbi <b>Start Time (mst):</b> 16:11 <b>End Time (mst):</b> 16:43 <b>Calibration Purpose:</b> routine monthly <b>Weather Conditions:</b> Light snow
---	--

**SHARP 5030i Information and Status:**  
**Serial Number:** CM 17091001      **Filter Tape Counter:** 256

Reference Standards:		Air Flow			
	Manometer	Orifice	Pressure:	Temp / RH:	
<b>Make:</b>	Dwyer	Chinook	Fisher Scientific	Fisher Scientific	
<b>Model:</b>	475 Mk. III	170101	FB61291	11-661-7B	11745843
<b>Serial Number:</b>	#3	#4	130168457	160348895	
<b>Calibration Expiration Date:</b>	January 17, 2020	January 31, 2020	Jan 17, 2020		June 19, 2020

Ambient Temperature (°C)				Range	Action
	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>	< ± 2°C	OK
#1	-18.20	-18.3	0.1	2-3 °C	Recalibrate
				> 3°C	Fail

Ambient Relative Humidity (%RH)				Range	Action
<b>As Found:</b>				< ± 2 %RH	OK
	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>	2-5 %RH	Recalibrate
#1	79.40	80.3	-0.9	> 5 %RH	Fail

Barometric Pressure (mmHg)				Range	Action
<b>As Found:</b>				< ± 10 mmHg	OK
	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>	10-12 mmHg	Recalibrate
#1	690.0	690.0	0.0	> 12 mmHg	Fail

Flow Audit (L/min)						Range	Action
<b>As Found:</b>						< ± 4%	OK
	<b>Reference</b>	<b>SHARP</b>		<b>% Difference</b>		4-5%	Recalibrate
#1	16.65	16.66		0.100120144		>5%	Fail
#2	16.64	16.66					
#3	16.65	16.67					
<b>Average</b>	16.65	16.66					

Leak Check (L/min)						
Without Leak Check Adapter			With leak Check Adapter			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	16.65	16.66	-0.01	16.62	16.64	-0.02
<b>LEAK RATE:</b>						<b>-0.01</b>

*Leak Limit: 0.80 L/min*



# 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**

**DECEMBER 2019**  
**Ambient Air Monitoring Calibration Report**  
**- BONNYVILLE EAST STATION-**  
**CAL-LICA-201912-01608**

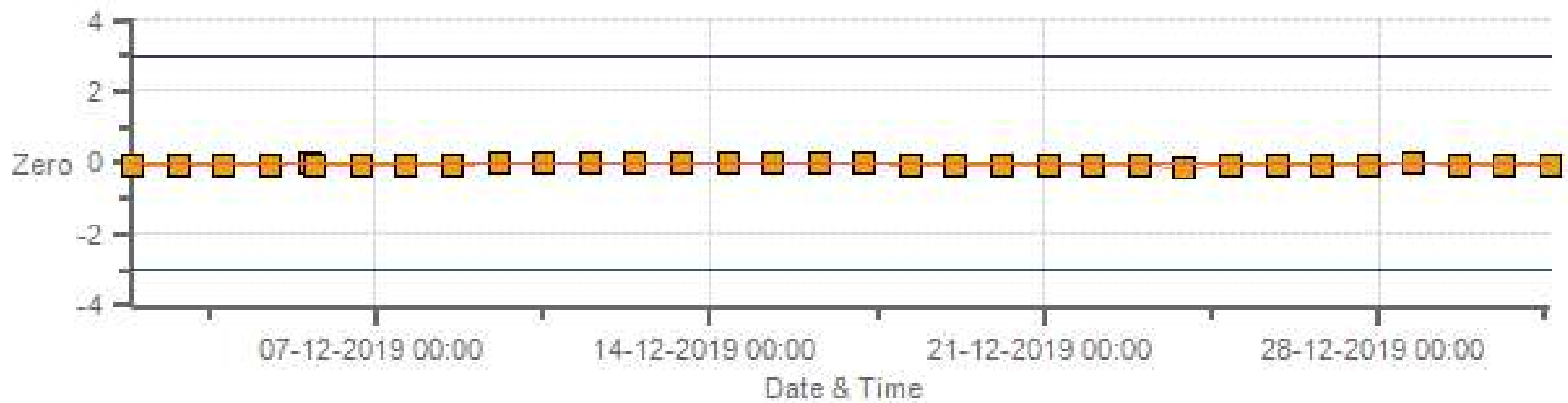
**Station Operation and Maintenance:**  
Bureau Veritas Canada

**Data Validation and Report:**  
Bureau Veritas Canada

January 13, 2020

# DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2 [ppb] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Zero



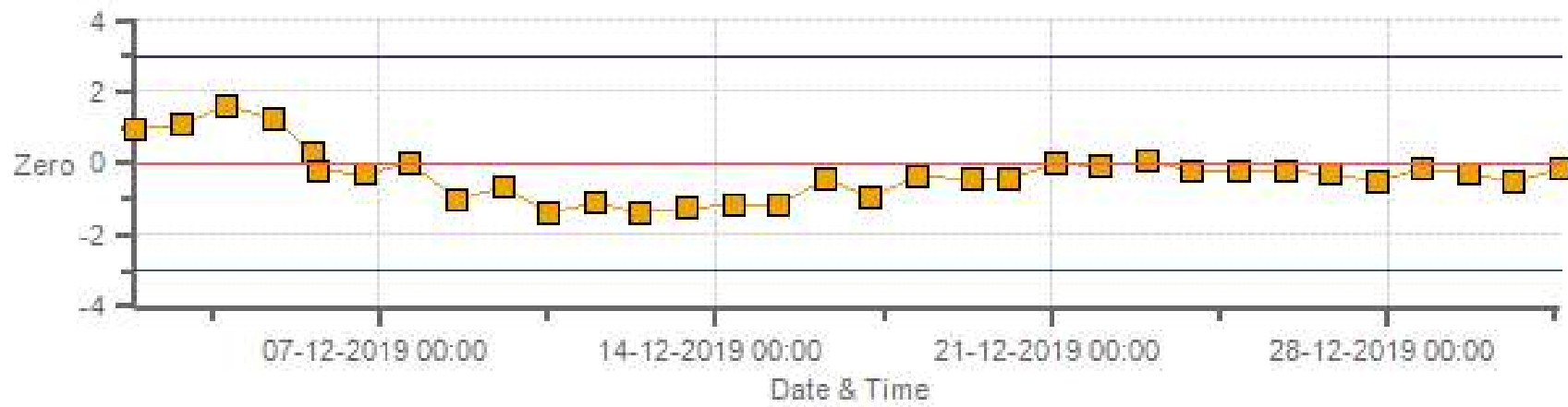
Zero Zero Ref Zero Low Zero High

SO2 [ppb] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Span



Span SpanRef Span Low Span High

H2S [ppb] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Zero



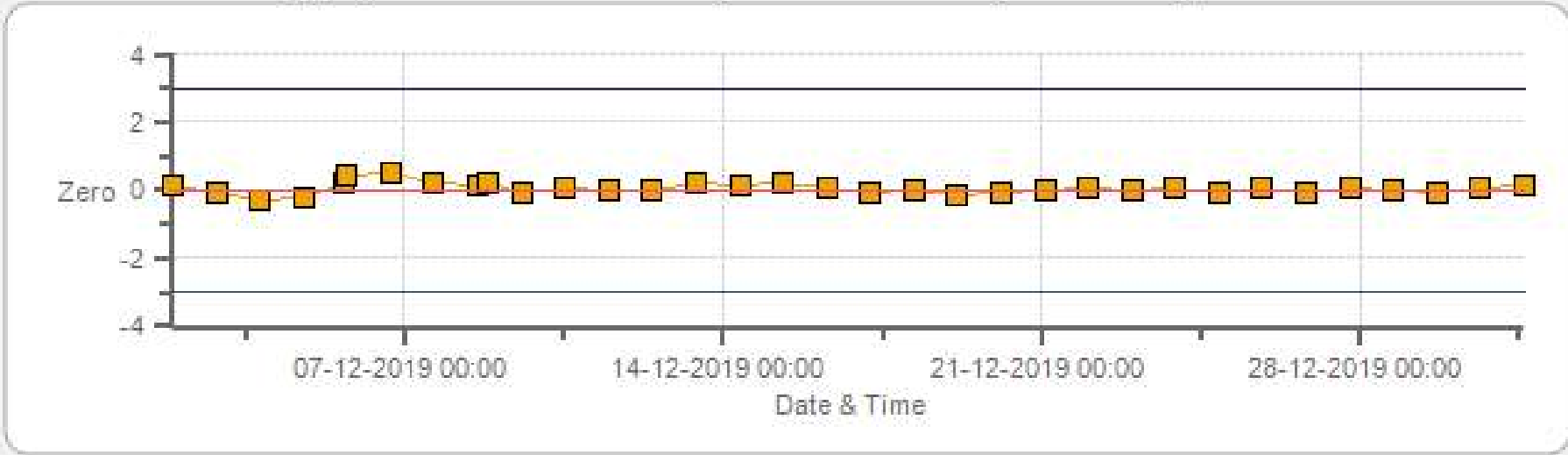
Zero Zero Ref Zero Low Zero High

H2S [ppb] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Span



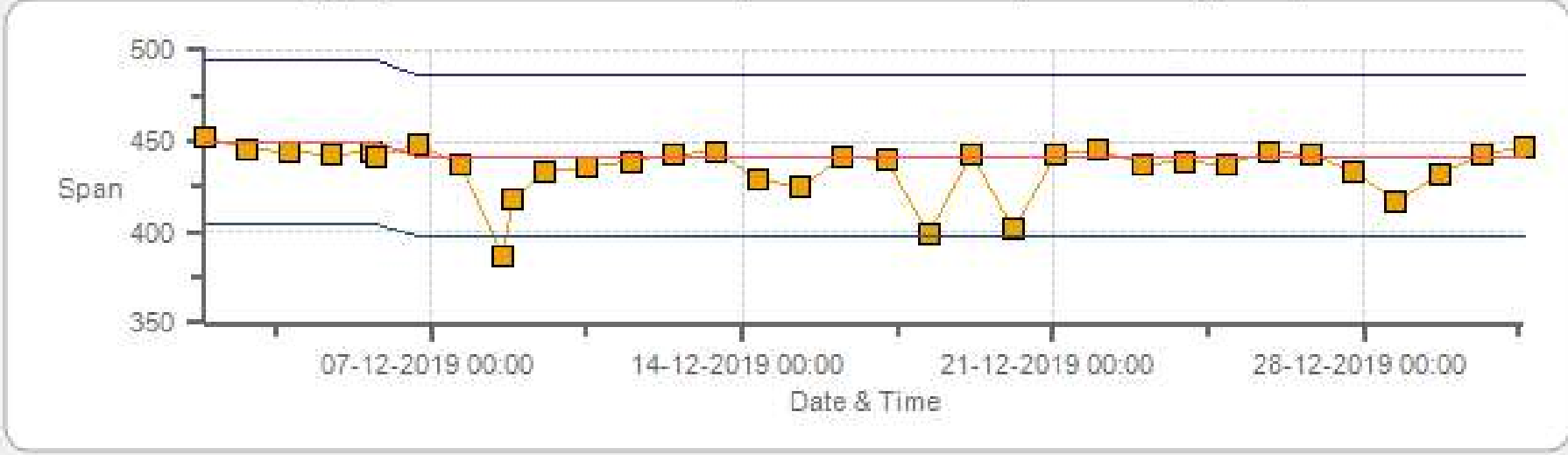
Span SpanRef Span Low Span High

NOx [ppb] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

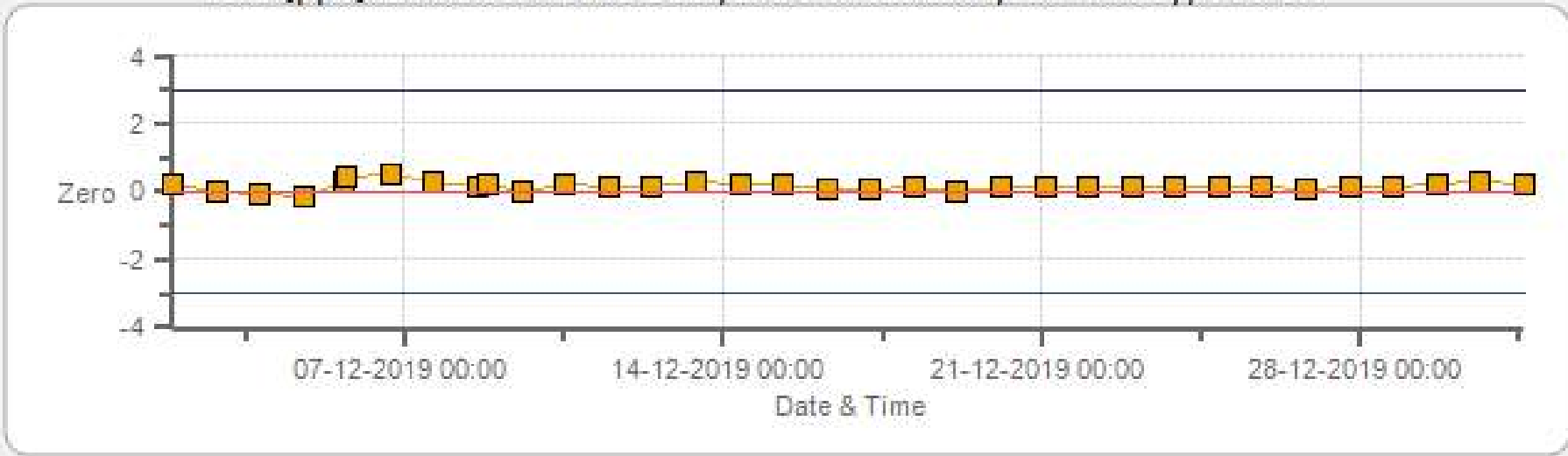
NOx [ppb] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Span



Span SpanRef Span Low Span High

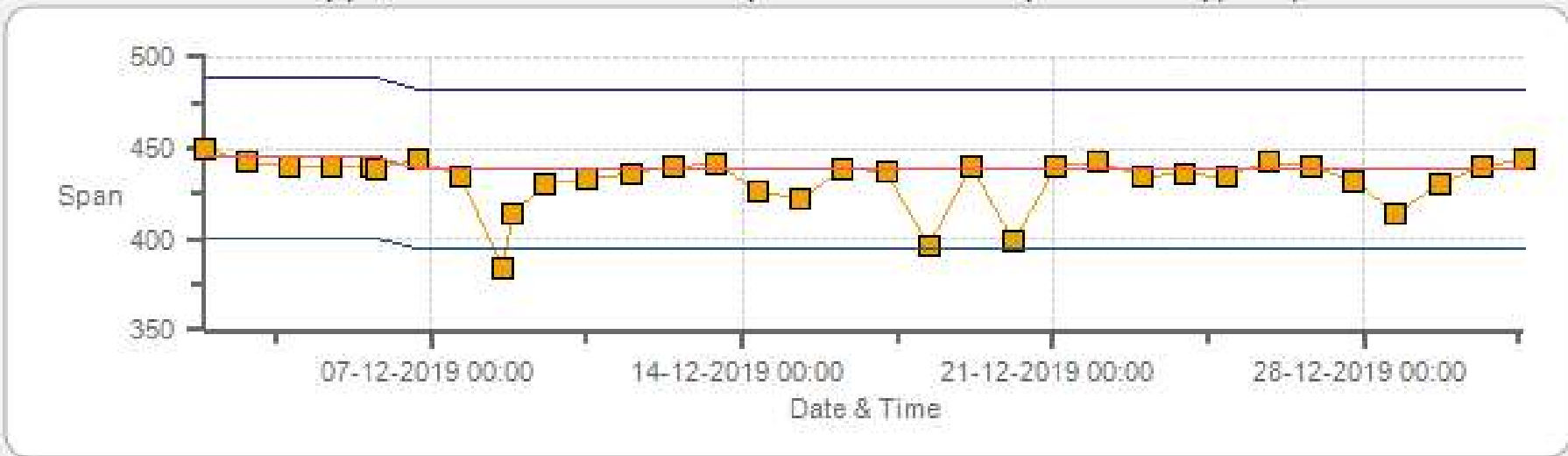


NO2 [ppb] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Zero



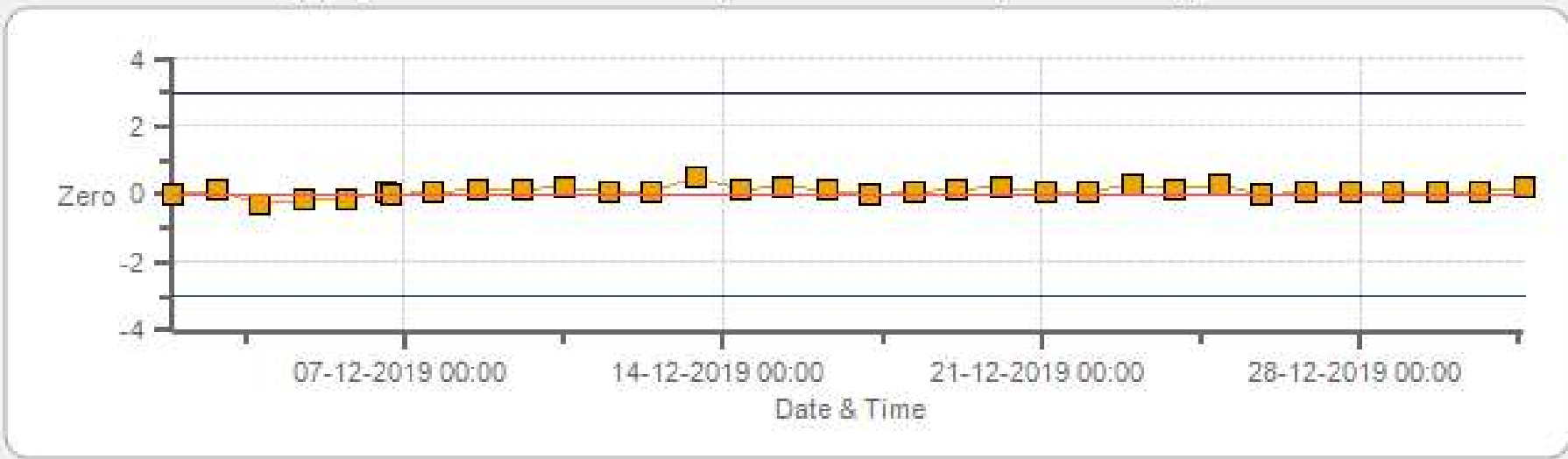
Zero Zero Ref Zero Low Zero High

NO2 [ppb] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Span



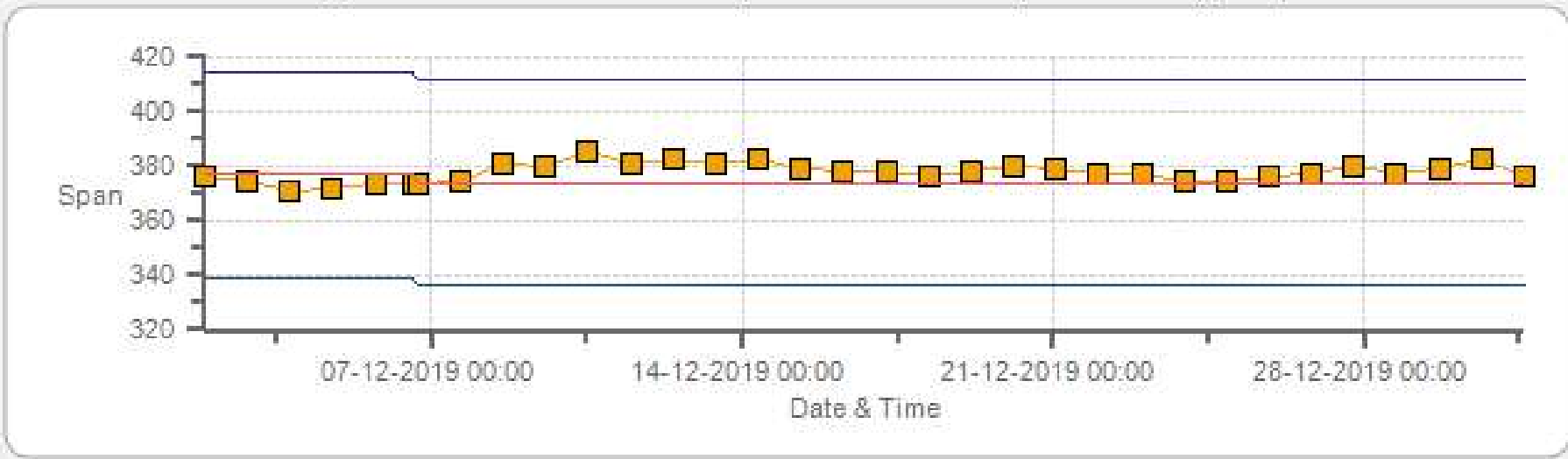
Span SpanRef Span Low Span High

O3 [ppb] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Zero



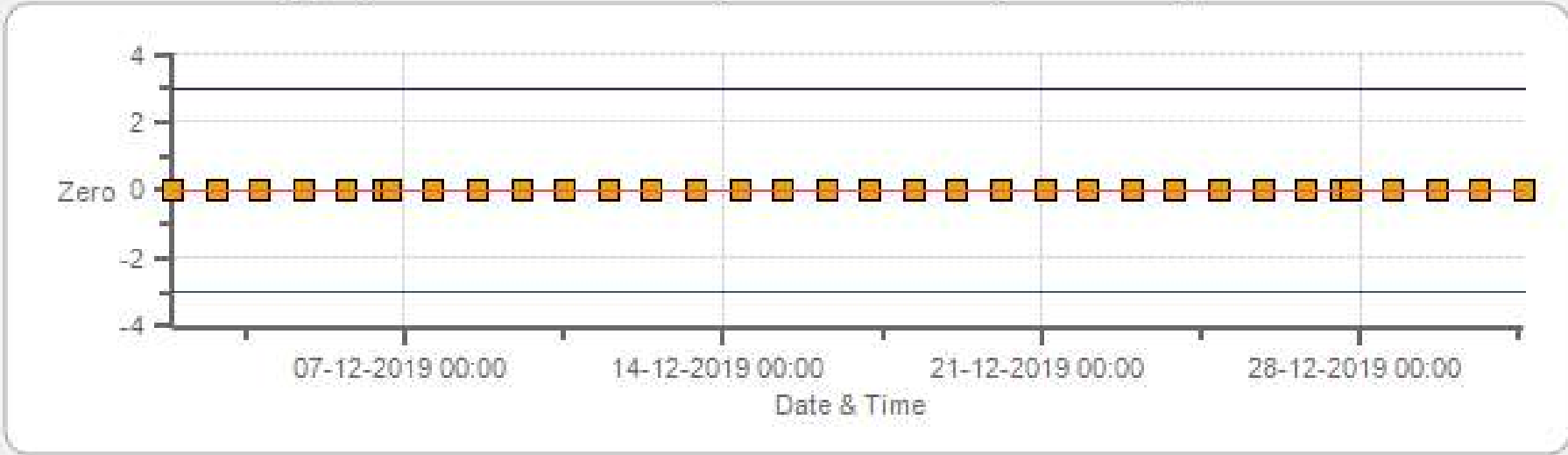
Zero Zero Ref Zero Low Zero High

O3 [ppb] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Span



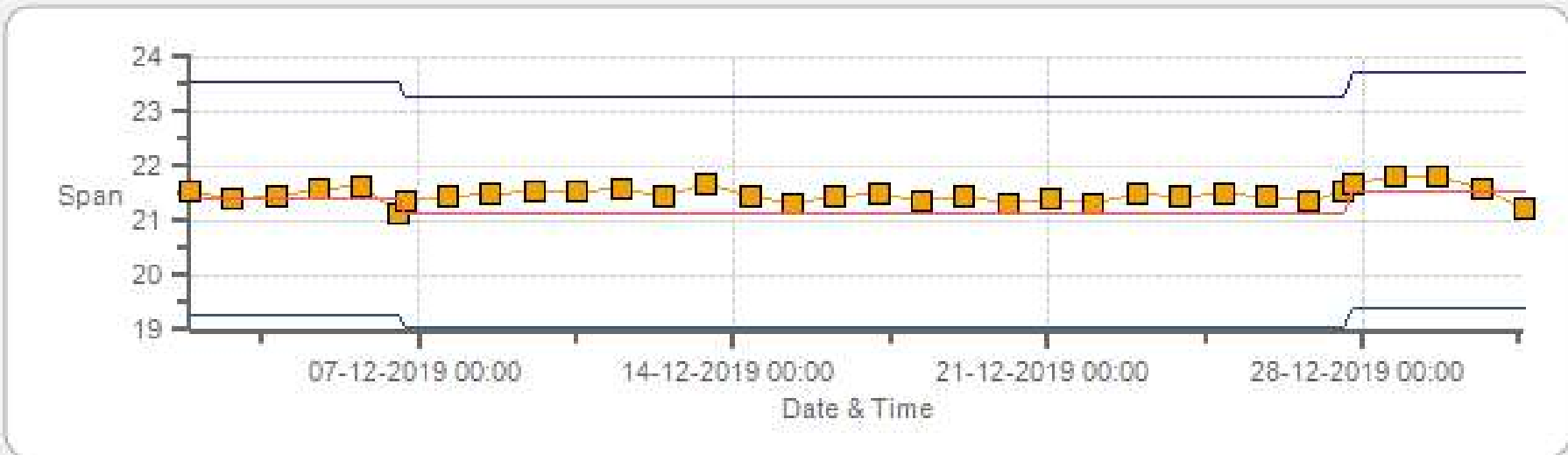
Span SpanRef Span Low Span High

THC [ppm] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Zero



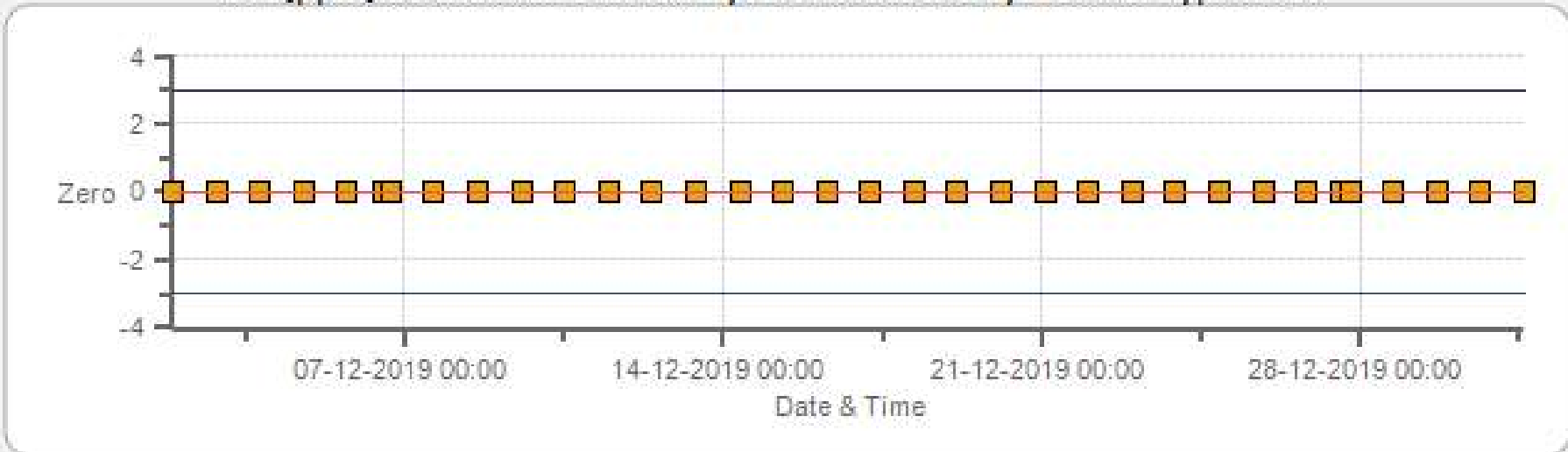
Zero Zero Ref Zero Low Zero High

THC [ppm] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Span



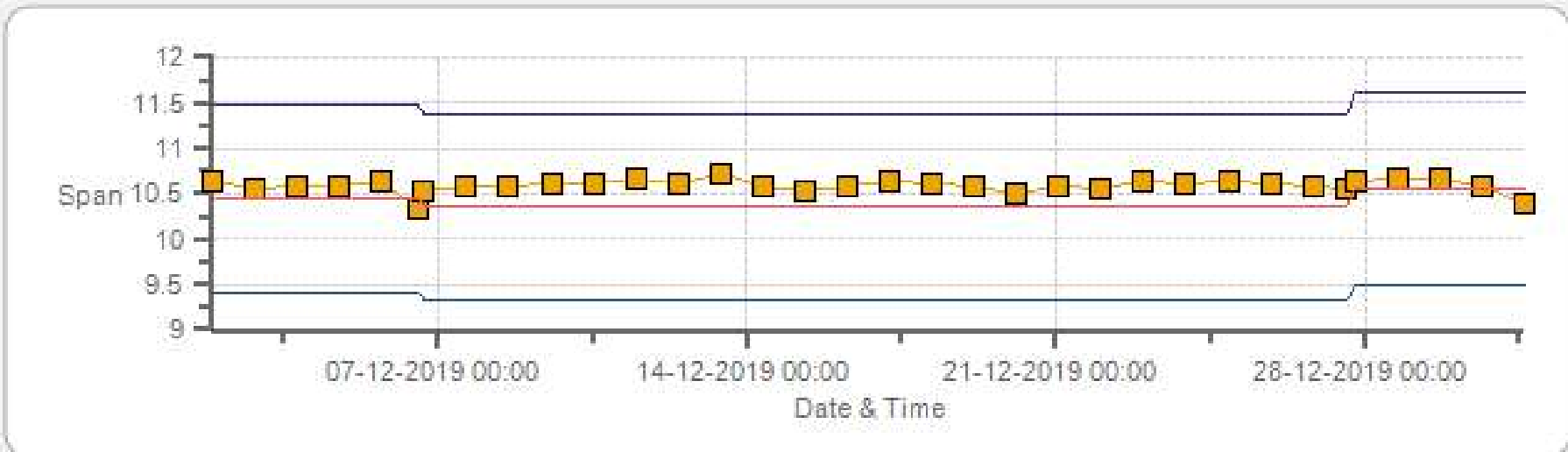
Span SpanRef Span Low Span High

CH4 [ppm] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Zero



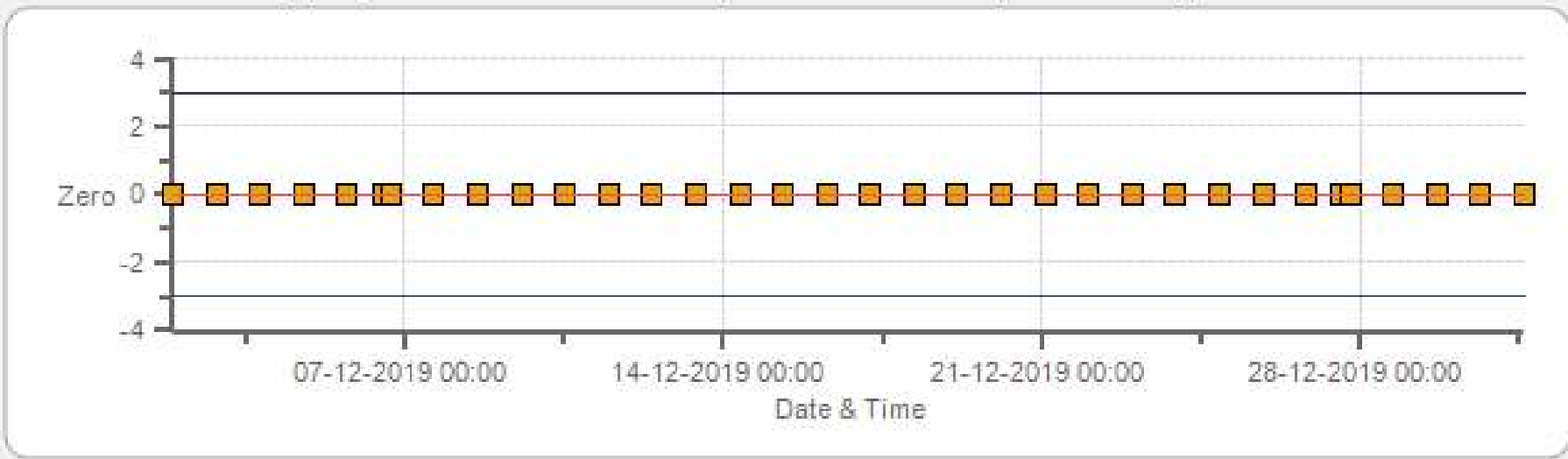
Zero Zero Ref Zero Low Zero High

CH4 [ppm] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Span



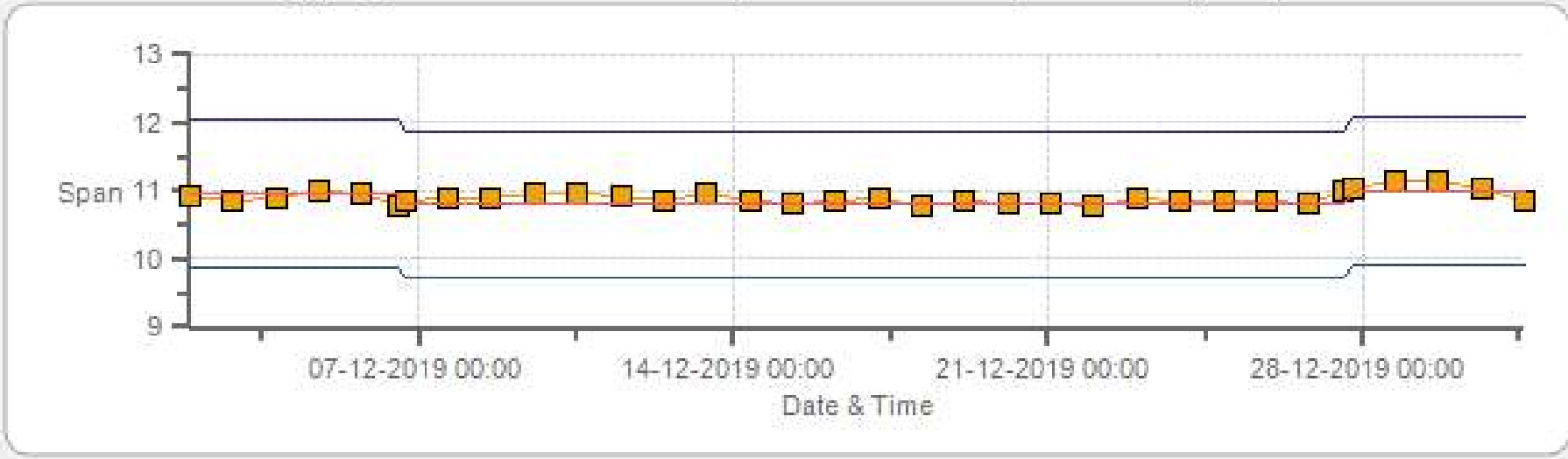
Span SpanRef Span Low Span High

NMHC [ppm] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Zero



Zero Zero Ref Zero Low Zero High

NMHC [ppm] Calibration: LICA Bonnyville-East Monthly: 12-2019 Type: Span



Span SpanRef Span Low Span High

# MULTI-POINT CALIBRATION RECORDS

# SO2 Analyzer Calibration by Dilution



DATE:	05-Dec-2019	PREVIOUS CALIBRATION DATE:	07-Nov-2019
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	24.0
LOCATION:	Bonnyville - East	BAROMETRIC (mBar):	946
PURPOSE:	Routine	START TIME (MST):	10:24
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:20

## ANALYZER:

MAKE/MODEL	Thermo 43I-TLE	RANGE	1000 ppb
SERIAL #	1180320043	FLOW (mL/min)	455
INITIAL		FINAL	
BKG/OFFSET	5.15	BKG/OFFSET	5.13
COEF/SLOPE	0.975	COEF/SLOPE	0.969
Expected (reference) Value	586	Expected (reference) Value	582

## 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):	700	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	<del>77.80</del>	5000	0.00	0	0	<del>0.996</del>	<del>1.000</del>
4922	77.80	5000	770.22	773	770	0.996	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

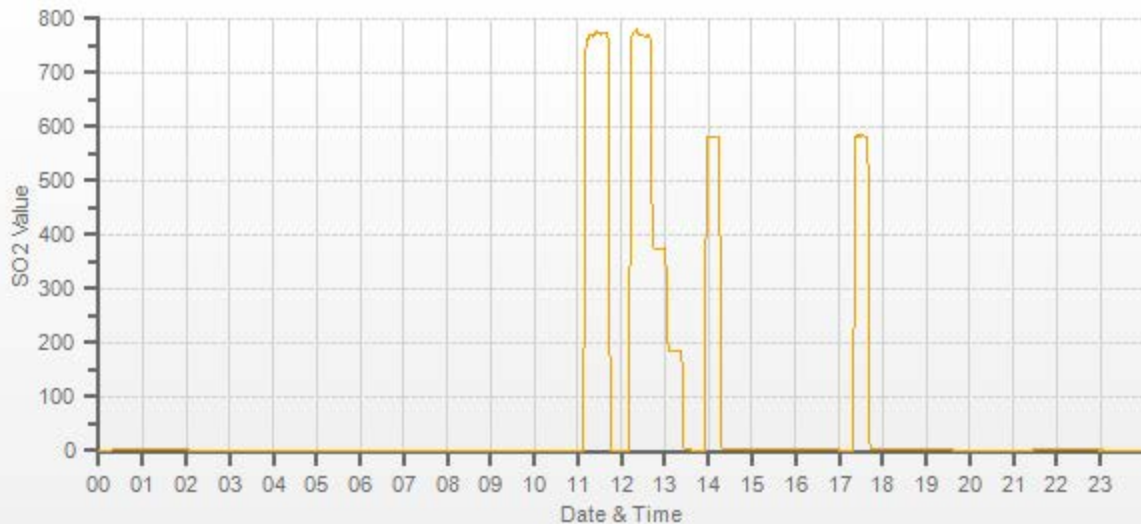
## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	0.0%

## COMMENTS:

Sample inlet filter was changed.

SO2[ppb] Station: Bonnyville East Daily: 05-12-2019 Type: AVG 1 Min. [1 Min.]



CAL-LICA-201912-01608



# H2S Analyzer Calibration by Dilution



DATE:	05-Dec-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):	946
PURPOSE:	Routine	START TIME (MST):	10:24
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:06

## ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	CM 17360002	FLOW (mL/min)	951
INITIAL		FINAL	
BKG/OFFSET	31	BKG/OFFSET	31.9
COEF/SLOPE	1.216	COEF/SLOPE	1.208
Expected (reference) Value	56.7	Expected (reference) Value	57.9

## 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:	10:31	SO2 Conc (ppb)	780
END TIME:	10:46	Analyzer Response (ppb)	0.0

## CALIBRATION:

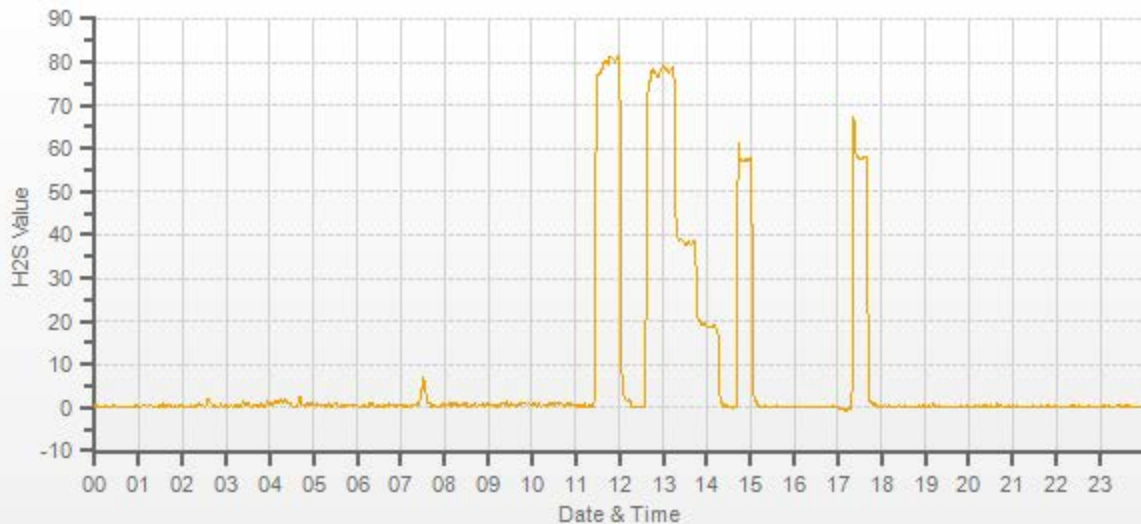
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	<del>58.50</del>	7500	0.00	1	0	<del>0.980</del>	<del>1.000</del>
7441	58.50	7499	78.01	80.6	78	0.980	1.000
7470	28.50	7498	38.01	n/a	38	n/a	1.000
7486	14.20	7500	18.93	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.



# NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	05-Dec-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):	946.00	FLOW (mL/min)	629	NO	0.999
PURPOSE:	Routine	START TIME (MST):	10:24	RANGE (ppb)	1000	NO2	1.000
PERFORMED BY:	Alex Yakupov	END TIME (MST):	17:45	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):	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

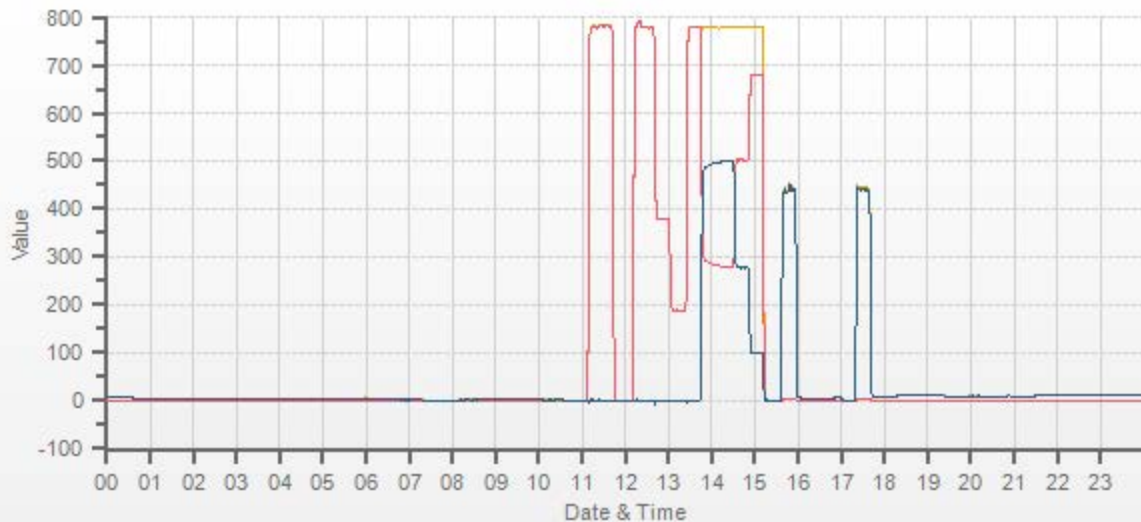
EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	416	3	413.0		442	3	439.0

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	<del>77.80</del>	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<del>0.999</del>	<del>1.000</del>	<del>1.000</del>	<del>0.999</del>	<del>1.000</del>	<del>1.000</del>
4922	77.80	5000	779.6	781.1	1.6	780.0	781.0	1.0	780.0	781.0	1.0	0.999	1.000	1.000	0.999	1.000	1.000
4962	37.90	5000	379.8	380.5	0.8	n/a	n/a	n/a	378.0	379.0	0.0	n/a	n/a	1.005	1.004	1.004	1.004
4981	18.90	5000	189.4	189.8	0.4	n/a	n/a	n/a	189.0	189.0	0.0	n/a	n/a	1.002	1.004	1.004	1.004

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	<del>498</del>	<del>497</del>	<del>1.002</del>	<del>99.80%</del>
AS-FOUND HIGH	77.80	5000	500	282.0	779.0	497.0	498	497	1.002	99.80%
ADJUSTED HIGH	77.80	5000	500	281.0	780.0	499.0	499	499	1.000	100.00%
MID	77.80	5000	275	502.0	781.0	278.0	278	278	1.000	100.00%
LOW	77.80	5000	100	679.0	780.0	101.0	101	101	1.000	100.00%
NO2 COEF/CONVERTER EFFICIENCY ADJUSTED									AVERAGE:	100.00%

LINEAR REGRESSION ANALYSIS:				COMMENTS:
	CORRELATION	SLOPE	INTERCEPT	
NO	1.000	1.001	-0.06%	
NOx	1.000	1.000	-0.06%	
NO2	1.000	1.000	0.00%	



CAL-LICA-201912-01608

# Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	06-Dec-2019	PREVIOUS CALIBRATION DATE:	12-Nov-2019
PARAMETER:	Ozone	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	23.0
LOCATION:	Bonnyville - East	BAROMETRIC (mBar):	941
PURPOSE:	Routine	START TIME (MST):	09:50
PERFORMED BY:	Alex Yakupov	END TIME (MST):	13:45

## ANALYZER:

MAKE/MODEL	Thermo 49i	RANGE	500 ppb
SERIAL #	10022440372	FLOW (mL/min)	1518
INITIAL		FINAL	
BKG/OFFSET	0	BKG/OFFSET	-0.2
COEF/SLOPE	1.024	COEF/SLOPE	1.027
Expected (reference) Value	377	Expected (reference) Value	374

## 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	<del>          </del>	5000	0.0	0.0	0.0	<del>          </del>	<del>          </del>
5000	<del>          </del>	5000	378.0	378.0	378.0	1.000	1.000
5000	<del>          </del>	5000	180.0	n/a	180.0	n/a	1.000
5000	<del>          </del>	5000	60.0	n/a	61.0	n/a	0.984

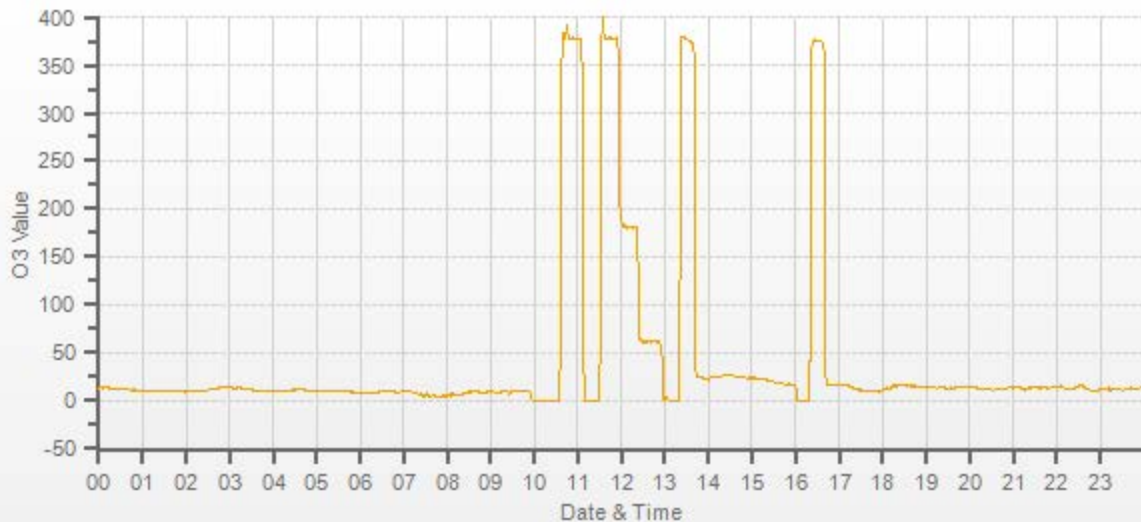
## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.999	0.1%

## COMMENTS:

Sample inlet filter was changed.

O3[ppb] Station: Bonnyville East Daily: 06-12-2019 Type: AVG 1 Min. [1 Min.]



CAL-LICA-201912-01608

# Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	06-Dec-2019	PREVIOUS CALIBRATION DATE:	12-Nov-2019	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	23.0		Thermo 55i	1180320044	1050
LOCATION:	Bonnyville - East	BAROMETRIC (mBar):	491	PARAMETER:	CH4	NMHC	THC
PURPOSE	Routine	START TIME (MST):	09:50	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	13:20	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 <sub>4</sub> /C <sub>3</sub> H <sub>8</sub> (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 <sub>4</sub> /NMHC)	HIGH	MID	LOW	CH <sub>4</sub> EQUIVILANCE		
TARGET	14	7	3.5	C <sub>3</sub> H <sub>8</sub> as CH <sub>4</sub>		544.5
RANGE	12 - 16	6 - 8	2 - 4	THC as CH <sub>4</sub>		1142.5

## EXPECTED (REFERENCE) VALUE:

INITIAL	CH <sub>4</sub>	NMHC	THC	FINAL	CH <sub>4</sub>	NMHC	THC
	10.44	10.97	21.41		10.35	10.80	21.15

## CALIBRATION:

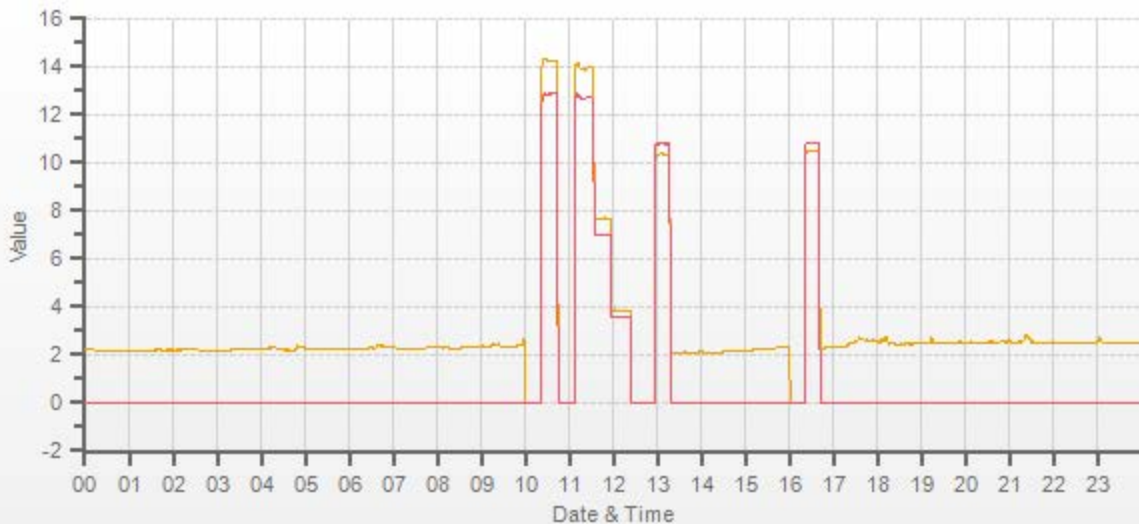
FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC
3000	<del>X</del>	3000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>
2930	70.00	3000	13.95	12.71	26.66	14.32	12.89	27.20	13.95	12.71	26.66	0.974	0.986	0.980	1.000	1.000	1.000
2962	38.00	3000	7.57	6.90	14.47	n/a	n/a	n/a	7.66	6.97	14.64	n/a	n/a	n/a	0.989	0.990	0.989
2981	19.00	3000	3.79	3.45	7.24	n/a	n/a	n/a	3.86	3.57	7.43	n/a	n/a	n/a	0.981	0.966	0.974

## LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
CH <sub>4</sub>	1.000	0.999	0.2%
NMHC	1.000	0.998	0.3%
THC	1.000	0.999	0.3%

## COMMENTS:

Sample inlet filter was changed.



CAL-LICA-201912-01608

Page 21 of 24  
CH4 [ppm] NMHC [ppm]





# Thermo 5030i SHARP Monitor Calibration

Date: December 23, 2019  
 Company: LICA  
 Station Name/Location: Bonnyville - East  
 Previous Audit Date: November 26, 2019  
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Wunmi Adekanmbi  
 Start Time (mst): 14:23  
 End Time (mst): 15:37  
 Calibration Purpose: Quarterly  
 Weather Conditions: Light snow

SHARP 5030i Information and Status:  
 Serial Number: CM 17071016 Filter Tape Counter 355

Reference Standards: Air Flow						
	Manometer	Orifice	Pressure:		Temp / RH:	
Make:	Dwyer	chinook	Fisher Scientific	Jan 17, 2020	Fisher Scientific	11745843
Model:	475 Mk. III	CHN0901	FB61291		11-661-7B	
Serial Number:	#3	#2	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	-5.60	-5.5	-0.1	-5.60	-5.5	-0.1
#2	-5.40	-5.3	-0.1	-5.40	-5.3	-0.1
#3	-5.60	-5.5	-0.1	-5.60	-5.5	-0.1
Average	-5.5	-5.4	-0.1	-5.5	-5.4	-0.1

Temp Limit: ± 2°C

Ambient Relative Humidity (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Offset (ZERO)	Reference	SHARP	Offset (ZERO)
#1	88.50	89.6	-1.1	90.10	90.1	0.0
#2	88.60	89.7	-1.1	90.00	90.0	0.0
#3	88.90	90.1	-1.2	90.10	90.1	0.0
Average	88.7	89.8	-1.1	90.1	90.1	0.0

RH Limit: ± 2 %RH

Flow Temperature (°C)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	23.10	23.4	-0.3	23.10	23.4	-0.3
#2	23.40	23.6	-0.2	23.40	23.6	-0.2
#3	23.60	23.9	-0.3	23.60	23.9	-0.3
Average	23.4	23.6	-0.3	23.4	23.6	-0.3

Temp Limit: ± 2°C

Barometric Pressure (mmHg)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	705.8	706.3	-0.5	705.8	705.8	0.0

BP Limit: ± 2 mmHg

Nephelometer Relative Humidity (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	20.55	20.5	0.1	20.55	20.5	0.1

RH Limit: ± 2 %RH

Nephelometer Temperature (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	24.30	24.1	0.2	24.30	24.1	0.2

Temp Limit: ± 2°C

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	

IRE D Limit (as found): 60-70 mA  
Adjusted IRE D Limit (as left): 65 mA

Detector Calibration (Auto)						
As Found:			As Left:			
Detector Auto Calibration Completed:			Variable	Value		
YES			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	7032.2		MASS COEF	6962.5		
FOIL VALUE	0		FOIL VALUE	1328		
Beta Avg	10088		Beta Avg	8336		
difference	Foil Set# 9258		difference	-1.0		

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	16.67	-0.02	16.65	16.67	-0.02
#2	16.65	16.68	-0.03	16.65	16.68	-0.03
#3	16.66	16.67	-0.01	16.66	16.67	-0.01
Average	16.65	16.67	-0.02	16.65	16.67	-0.02

Flow Limit: 16.67 ± 0.33 L/min

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	16.62	16.64	-0.02

LEAK RATE: -0.01  
Leak Limit: 0.08 L/min



# Meteorological Sensor Audit/Calibration

## Location Information

Company:	LICA	Performed By:	Alex Yakupov
Audit Location:	Bonnyville East	Reviewed By:	Wunmi Adekanmbi
Audit Date:	October 25, 2019	Start/End Time (mst):	8:46 / 10:00
Calibration Purpose:	routine annual	Weather Conditions:	Light rain/scattered showers

## 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 #:	56778	Direction Voltage Output Range:	0-1 V
Previous Cal/Audit Date:	October 24, 2018	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	18.4	18.4	1.000
2000	36.9	36.8	36.8	1.003
3000	55.3	55.3	55.3	1.000
4000	73.7	73.8	73.8	0.999
5000	92.2	92.2	92.2	1.000
6000	110.6	110.6	110.6	1.000
7000	129.0	129.0	129.0	1.000
8000	147.4	147.5	147.5	0.999
9000	165.9	165.8	165.9	1.000
10000	184.3	184.3	184.4	1.000
The audit meets AMD requirements.			Average Correction Factor=	1.000

### 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	0.2	-0.4	0.3
30	330	30	330	-0.3	-0.3	0.3
60	300	60	300	-0.2	-0.2	0.2
90	270	91	271	-1.0	-0.6	0.8
120	240	121	241	-0.8	-0.7	0.7
150	210	151	211	-0.5	-0.6	0.5
180	180	181	182	-0.6	-1.5	1.1
210	150	210	152	-0.3	-1.8	1.1
240	120	240	122	0.1	-1.5	0.8
270	90	270	92	0.0	-2.0	1.0
300	60	300	62	0.1	-1.6	0.9
330	30	330	32	0.0	-1.5	0.8
355	0	355	0	-0.4	0.3	0.3
The audit meets AMD requirements.			Average Absolute Degrees Difference=		0.7	

## Comments:

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

# End of Report