Lakeland Industry & Community Association

2022

Annual Ambient Air Quality Monitoring Report

LICA-2022

Report Prepared By:

Lakeland Industry & Community Association

March 31, 2023

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List of Acronyms

AAAQOs	Alberta Ambient Air Quality Objectives
AEP	Alberta Environment and Parks
AMD	Air Monitoring Directive
AT	Ambient Temperature
BP	Barometric Pressure
CH4	Methane
EPEA	Environmental Protection and Enhancement Act
H2S	Hydrogen Sulphide
kph	kilometers per hour
LICA	Lakeland Industry & Community Association
mb	millibar
mm	millimeter
NMHC	Non-Methane Hydrocarbons
NO	Nitric Oxide
NO2	Nitrogen Dioxide
NOx	Oxide of Nitrogen
PAC	Polycyclic Aromatic Compounds
ppb	parts per billion
ppm	parts per million
RH	Relative Humidity
SO2	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

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March 31, 2023

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RE: 2022 Annual Ambient Air Quality Monitoring Report -LICA Airshed

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Enclosed is the *2022 Annual Ambient Air Quality Monitoring Report* for the continuous and passive ambient air quality monitoring stations of the LICA Airshed regional air quality monitoring network, as operated in the year 2022.
The representative of the Person Responsible for this monitoring program is:

LICA Airshed
Michael Bisaga, Monitoring Programs Manager
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This report was prepared by Lily Lin and reviewed by Mike BIsaga of LICA Airshed.

LICA Airshed has retained the services of Bureau Veritas to conduct continuous ambient monitoring on its behalf.

Listing of Continuous Monitoring Stations

Station Name		Cold Lake South	Tamarack (formerly Maskwa)	St. Lina
Station ID		1174	1248	1250
Coordinates		54.41402, -110.23316	54.604935, -110.452637	54.215961, -111.503304
Continuous Monitoring Parameter	SO2	√	√	√
	TRS	√		
	H2S		√	√
	THC	√	√	√
	CH4	√	√	√
	NMHC	√	√	√
	NOX	√	√	√
	NO	√	√	√
	NO2	√	√	√
	O3	√		√
	PM2.5	√		√
	TPX	√	√	√
	RH	√	√	√
	BP		√	√
	PRECIPTATION		√	√
	WS	√	√	√
	WD	√	√	√
	STDWD	√	√	√

Listing of Passive Sampling Stations

Station ID	Name	Latitude	Longitude	Monitored Parameters
3	Therien	54.31085	-111.22607	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3
4	Flat Lake	54.07262	-111.2051	SO_2, NO_2, O_3, HNO_3, NH_3
5	Lake Eliza	53.82417	-111.16605	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3
6	Telegraph Creek	53.74068	-110.57655	SO_2, NO_2, O_3, HNO_3, NH_3
8	Muriel-Kehewin	54.0934	-110.74437	SO_2, NO_2, O_3, HNO_3, NH_3
9	Dupre	54.33462	-110.77965	SO_2, NO_2, O_3, HNO_3, NH_3
10	La Corey	54.49967	-110.81792	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3
11	Wolf lake	54.69542	-110.84253	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3
12	Foster Creek	55.03343	-110.50453	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3
13	Primrose	54.75848	-110.45217	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3
14	Tamarack (formerly Maskwa)	54.60518	-110.45263	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3
15	Ardmore	54.4067	-110.46202	SO_2, NO_2, O_3, HNO_3, NH_3
16	Frog Lake	53.89065	-110.38418	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3
17	Clear Range	53.55648	-110.15423	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3
18	Fishing Lake	53.90295	-110.07623	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3
19	Beaverdam	54.16925	-110.23285	SO_2, NO_2, O_3, HNO_3, NH_3
22	Cold Lake South (1)	54.4137	-110.23285	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3
23	Medley-Martineau	54.7243	-110.06618	SO_2, NO_2, O_3, HNO_3, NH_3
24	Fort George	53.8783	-110.74807	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3
25	Burnt Lake	54.79104	-110.33424	H_2S, SO_2, HNO_3, NH_3
26	Mahihkan	54.63738	-110.57538	H_2S, SO_2, HNO_3, NH_3
27	Mahkeses	54.59014	-110.38028	H_2S, SO_2, HNO_3, NH_3
28	Town of Bonnyville	54.2753	-110.74065	SO_2, NO_2, O_3, HNO_3, NH_3
29	Cold Lake South (2)	54.41385	-110.23283	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3
32	St. Lina	54.21639	-111.50295	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3
42	Lac La Biche	54.76516	-111.971449	H_2S, SO_2, NO_2, O_3, HNO_3, NH_3

List of Contractors who performed the 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	Bureau Veritas	LICA / Bureau Veritas	LICA
Passive	Bureau Veritas	Bureau Veritas	Bureau Veritas	LICA

Calibration Report and Data Submission

Hourly data and calibration reports for 2022 were submitted to Alberta's Ambient Air Data Warehouse for all stations. Data Qualifier Flags used in the monthly reports are summarized below.

Flag	Description	Instrument is operational?	Hour is valid?
P	Power failure	No	No
X	Machine malfunction / recovery	No	No
Y	Maintenance	Yes (unless otherwise noted)	No
K	Recording system failure	No	No
N	Instrument not in service	No	No
NRM	Repeat quality assurance checks	Yes	No
C	Calibration	Yes	No
S	Daily zero/span	Yes	No
Q	Quality assurance	Yes	No

Major Operations and Maintenance Events at Continuous Monitoring Stations During 2022

Cold Lake South Station:

- Five 24-Hour exceedances and seven 1-Hour exceedances of PM2.5 were recorded.
- The following exceedances of AAAQOs were observed at Cold Lake South Station:

Table 1 AAAQO Exceedances at Cold Lake South Station

Date	Time (MST)	Average Period	Pollutant	Average Value	Units	WS (kph)	WD (deg)	EPA
21-Aug	6	1-Hour	PM2.5	85	µg/m3	12.6	56	403005
21-Aug	12	1-Hour	PM2.5	81	µg/m3	6.3	68	403005
21-Aug	13	1-Hour	PM2.5	90	µg/m3	3.3	83	403005
21-Aug	14	1-Hour	PM2.5	105	µg/m3	4.9	127	403005
21-Aug	15	1-Hour	PM2.5	100	µg/m3	5.1	141	403005
21-Aug	16	1-Hour	PM2.5	93	µg/m3	6.7	141	403005
21-Aug	17	1-Hour	PM2.5	84	µg/m3	5.1	142	403005
21-Aug	-	24-Hour	PM2.5	67.4	µg/m3	4.2	57	403005
22-Aug	-	24-Hour	PM2.5	51.5	µg/m3	1.2	28	403061
11-Sep	-	24-Hour	PM2.5	40.1	µg/m3	2.2	37	404238
19-Oct	-	24-Hour	PM2.5	35.6	µg/m3	3	234	405887
13-Nov	-	24-Hour	PM2.5	30.4	µg/m3	2.7	223	406725

- In August, seven 1-Hour and two 24-hour PM2.5 exceedances were recorded this month and were caused by smoke drifting into the area from wildfires burning in British Columbia and Northern Saskatchewan.
- In September, one 24-hour PM2.5 exceedance was recorded and was caused by smoke being transported into the area from wildfires burning in British Columbia.
- In October, one 24-hour PM2.5 exceedance was recorded and was caused by smoke being transported into the area from wildfires burning in British Columbia.
- In November, one 24-hour PM2.5 exceedance was recorded this month and was caused by stagnant weather conditions; similar air quality observations were made at several monitoring stations across Alberta between November 10 – 13, 2022. This stagnant episode was marked by sustained low wind speeds which hindered the dispersion of pollutants causing them to become built-up in the area.
- **O3:** Highly variable 1-minute data were recorded variable on July 27. The analyzer was reset to correct the issue on August 3. Data collected between July 27 and August 3 were considered invalid and were discarded. One hundred and twelve hours of downtime were recorded in July. Monthly operational uptime was 84.9%. **AEP reference #: 402110.**
- **THC/CH4/NMHC:** The Thermo 55i analyzer, s/n: 1180930025, failed on August 5. The replacement Thermo 55i analyzer, s/n: 1236656107, was installed on August 6. However, the analyzer

registered NMHC noise at ambient concentrations. On August 8, the analyzer was removed, and the repaired Thermo 55i analyzer, s/n: 1180930025, was installed. A successful installation calibration was completed on August 9. Ninety hours of downtime were recorded. Monthly operational uptime was 87.9%. **AEP reference #: 404741.**

- **O3:** The Thermo 49i analyzer, s/n: 700419951 was removed following a successful shut-down calibration on November 23. The brand new Thermo 49iQ analyzer, s/n: 12208316585, was installed afterwards. A successful installation calibration was completed on November 24. Twenty-two hours of downtime were recorded due to this event.

Tamarack (formerly Maskwa) Station:

- Three 24-Hour exceedances and four 1-Hour exceedances of PM2.5 were recorded.
- One 1-Hour exceedance of H2S was recorded.
- The following exceedances of AAAQOs were recorded at Tamarack (formerly Maskwa) Station:

Table 2 AAAQO Exceedances at Tamarack (formerly Maskwa) Station

Date	Time (MST)	Average Period	Pollutant	Average Value	Units	WS (kph)	WD (deg)	EPA
23-Mar	7	1-Hour	PM2.5	167	µg/m3	0.8	176	388926
07-Jun	15	1-Hour	PM2.5	117	µg/m3	1.3	178	391464
07-Jun	16	1-Hour	PM2.5	95	µg/m3	2.9	233	391464
27-Aug	7	1-Hour	H2S	11	ppb	0.9	299	403392
21-Aug	-	24-Hour	PM2.5	46.9	µg/m3	4.6	48	404004
18-Oct	6	1-Hour	PM2.5	100	µg/m3	2.7	235	405736
18-Oct	-	24-Hour	PM2.5	30.5	µg/m3	2.8	269	405802
19-Oct	-	24-Hour	PM2.5	34.5	µg/m3	3.8	215	405888

- In March, one 1-Hour exceedances of PM2.5 was recorded. The cause was believed to be the result of local building up of emission, likely be spring road sweeping, given the low wind speeds recorded at the time.
- In June, two 1-Hour PM2.5 exceedances were recorded. The possible source causing the elevated PM concentrations was likely from the unpaved road around the station.
- In August, one 1-Hour H2S and one 24-Hour PM2.5 exceedances were recorded. The possible source for the H2S was believed to be the result of local buildup of emissions, given the low wind speeds recorded at the time. PM2.5 exceedances recorded this month were caused by smoke drifting into the area from wildfires burning in British Columbia and Northern Saskatchewan.
- In October, one 1-hour and two 24-hour PM2.5 exceedances were recorded and were caused by smoke being transported into the area from wildfires burning in British Columbia.
- **Precipitation:** The precipitation gauge was found to be non-functional (tipping bucket frozen) on January 5. The precipitation gauge failed the tip-test after troubleshooting on January 6. On January 12 the precipitation gauge was rechecked but failed the tip-test again when ambient

temperatures rose to around -6°C. The precipitation gauge was found to be working correctly though no changes were made on January 20. As a clear point of sensor failure and sensor recovery could not be determined, data collected from the time the ambient temperature dropped consistently below the sensor's operating range (-20°C), which was December 23, 2021 hour 21 to January 20, 2022 when the sensor was found working were invalidated. Four hundred sixty-nigh hours of data collected in January were discarded. Operational uptime 37.0%.

- Station reconfiguration was conducted between October 25 and 28 Forty-three to sixty-four hours of downtime were recorded as datalogger and/or individual instruments were put offline intermittently during the refit.

St. Lina Station:

- Three 24-Hour exceedances exceedances of PM2.5 were recorded.
- The following exceedances of AAAQOs were recorded at St. Lina Station:

Table 3 AAAQO Exceedances at St. Lina Station

Date	Time (MST)	Average Period	Pollutant	Average Value	Units	WS (kph)	WD (deg)	EPA
21-Aug	-	24-Hour	PM2.5	34.7	µg/m3	6.6	61	403008
22-Aug	-	24-Hour	PM2.5	45	µg/m3	3.3	88	403063
11-Sep	-	24-Hour	PM2.5	36.1	µg/m3	4.6	66	404239

- In August, two 24-Hour exceedances were recorded. PM2.5 exceedances recorded this month were caused by smoke drifting into the area from wildfires burning in British Columbia and Northern Saskatchewan.
- In September, one 24-Hour exceedance was recorded and was caused by smoke being transported into the area from wildfires burning in British Columbia.
- **THC/CH4/NMHC:** On December 18, 2021, the Thermo 55i analyzer, s/n: 1180030034, which had excessive NMHC noise issue, was reinstalled in order to maintain the CH4 readings and no other spare analyzer that could be used at that time. On January 19, 2022, the Thermo 55i analyzer, s/n: 1180030034, was removed following a successful shut-down calibration, and the Thermo 55i analyzer, s/n: 1505664392, was installed. Seven hours of downtime were recorded due to this event. During the 2021 annual data review and validation, data collected between December 18, 2021 and January 19, 2022 were deemed invalid and were discarded. Four hundred fifty-two hours of downtime recorded in January 2022 were recorded. Operational uptime 39.2%. **AEP reference #: 410492**
- **H2S:** in March, operational uptime 86.2%. **AEP reference #: 389551**
  - The analyzer failed the daily span check on March 1 and 2. On March 3, the Thermo 450i H2S analyzer, s/n: CM18010058, was removed following a successful shut-down calibration, and the Thermo 450i H2S analyzer, s/n: CM17360002, was installed. An installation calibration was completed on March 4. Twenty hours of downtime was recorded due to this event.
  - The analyzer failed daily zero-span check on March 8 and 9. A repeat multi-point calibration was completed to correct the drift. Seven hours of downtime were recorded due to this additional quality check.
  - The analyzer failed daily zero-span checks on March 15. The issue traced to unstable analyzer box temperature. An additional fan was added to the station to improve air circulation around

the analyzer on March 17. The analyzer failed the as-found zero point check on March 17. The drift was corrected, and a repeat multi-point calibration was completed. Data were invalidated back to the last valid zero-span check, which was March 14 hour 16. Seventy-five hours of downtime were recorded due to this event.

- **THC/CH4/NMHC**: On April 11, the Thermo 55i analyzer, s/n: 1505664392 was replaced with the LICA-owned Thermo 55i analyzer, s/n: 1505664392, on April 11. A successful installation calibration was completed on April 12.
- **H2S:** The analyzer failed on May 14 hour 3 due to the unstable photomultiplier (PMT) circuit. On May 18, the LICA-owned Thermo 450i H2S analyzer, s/n: CM17360002, was removed, and the BV-supplied API 101A H2S analyzer, s/n: 324, was installed following by a successful installation calibration. Data were invalidated back to the last valid calibration check, which was May 14 hour 1. One hundred twelve hours of downtime were recorded due to this event. Operational uptime 83.9%. **AEP reference #: 390727**.
- **THC/CH4/NMHC:** Apparent NMHC noise/spikes were recorded throughout in July. Occasional noise/spikes were recorded since the Thermo 55i HC analyzer, s/n: 1180930026, was installed on April 12. The issue became progressively worse after the June 16 monthly calibration. As data are believed not to be real ambient concentrations, data collected from June 16 to August 4 when the analyzer was replaced to Thermo 55i HC analyzer, s/n: 1180030034, were considered invalid and were discarded. Three hundred forty-three hours and seven hundred forty-four hours of downtime were recorded in June and July, respectively. Operational uptime for June and July was 47.6% and 0.0%. **AEP reference #: 402799.** Operational uptime for August 85.6%. **AEP reference #: 404742.**
- **O3:** Following a successful shut-down calibration on September 20, the Thermo 49i analyzer, s/n: 1002240371, was removed. The Thermo 49iQ analyzer, s/n: 12208316586, was then installed. The analyzer was allowed time to stabilize overnight. A successful installation calibration was completed on September 21. Twenty-three hours of downtime were recorded due to this event.
- Station reconfiguration was conducted between September 21 and 22. Five to eight hours of downtime were recorded as datalogger and/or individual instruments were put offline intermittently while refit was being performed.
- **TPX/RH:** A brand new Rotronic HC2-S3 TPX/RH sensor, s/n: 20404750 was installed on November 14. A successful sensor audit was completed on November 15. The existing Rotronic HC2-S3 TPX/RH sensor, s/n: 20221366, was removed following a successful sensor audit afterwards. One hour of downtime was recorded due to this event.

Passive Monitoring Summary

27 multi-parameter passive stations were used throughout the LICA Airshed. These stations monitored different combinations of SO_2, NO_2, O_3, and/or H_2S depending on the monitoring objective at a given location. In October, ammonia (NH3) and nitric acid (HNO3) were added to the network to support implementation of LICA's Acid Deposition Monitoring Strategy for the Cold Lake Region. The sample media were installed along with the existing passive parameters in all LICA passive monitoring stations during the October sample media deployment. Passive samples, including duplicate samples and blanks were handled and deployed in accordance with the AMD. Analyses of the passive samples were performed by Bureau Veritas Canada. The full results of these analyses were submitted to Alberta's Ambient Air Data Warehouse in accordance with the AMD.

Passive monitoring data indicated there were no exceedances of applicable AAAQOs for all parameters monitored in 2022.

Table 4 Summary of AAAQO Exceedances at Passive Stations

SO2 (ppb) 30-Day Objective: 11 ppb	
Month	**# Stations of Exceedance**
January	0
February	0
March	0
April	0
May	0
June	0
July	0
August	0
September	0
October	0
November	0
December	0
Total	**0**
SO2 (ppb) Annual Objective: 8.0 ppb	
Year	**AAAQO Exceedance**
2022	0
NO2 (ppb) Annual Objective: 24 ppb	
Year	**AAAQO Exceedance**
2022	0

Notification of Changes Made After Monthly Report Issuance

No revisions to historical data previously submitted to the Alberta's Ambient Air Quality Data Warehouse were made during the time this annual report is being prepared.

Deviations from Authorized Monitoring Methods

No deviations from authorized monitoring methods were recorded this year.

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.

Michael Bisaga, Monitoring Programs Manager, LICA Airshed

March 31, 2023

1. Summaries of Statistics and Data Qualifier Flag Summaries

1.1 Cold Lake South (CLS) Station

Table 5 CLS SO2 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	# of 30-day AAAQO Exceedances	Min. 1-hr (ppb)	Max. 1-hr (ppb)	# of 1-hr AAAQO Exceedances	Max. 24-hr (ppb)	# of 24-hr AAAQO Exceedances
January	100.0	707	0.3	0	0	5	0	1	0
February	100.0	639	0.3	0	0	4	0	1	0
March	100.0	707	0.2	0	0	3	0	1	0
April	100.0	685	0.1	0	0	2	0	1	0
May	100.0	706	0.0	0	0	3	0	1	0
June	100.0	684	0.1	0	0	5	0	1	0
July	98.5	697	0.0	0	0	2	0	0	0
August	100.0	706	0.0	0	0	2	0	0	0
September	100.0	683	0.1	0	0	1	0	0	0
October	100.0	707	0.1	0	0	2	0	1	0
November	100.0	684	0.2	0	0	2	0	1	0
December	100.0	706	0.3	0	0	3	0	1	0
Annual	99.9	8311	0.1	0	0	5	0	1	0

Table 6 CLS SO2 2022 Annual Continuous Data Summary

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 10	11 -50	51 -100	101 - 172	>172
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	100.0%	0.0%	0.0%	0.0%	0.0%

Table 7 CLS SO2 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	0	0	0	11	63	375	0

Total Hours of Downtime	11	Total Hours of Calibration Time	438	Total Hours of Flagged	449

Table 8 CLS TRS 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	Max. 24-hr (ppb)
January	100.0	707	0.1	0	1	1
February	100.0	639	0.1	0	14	2
March	100.0	707	0.1	0	1	0
April	100.0	685	0.1	0	1	1
May	100.0	706	0.2	0	2	1
June	100.0	684	0.3	0	2	1
July	100.0	707	0.3	0	5	1
August	100.0	706	0.4	0	3	1
September	100.0	683	0.3	0	2	1
October	100.0	707	0.1	0	2	1
November	100.0	684	0.1	0	1	1
December	94.4	665	0.1	0	1	1
Annual	99.5	8280	0.2	0	14	2

Table 9 CLS TRS 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 2	3 - 5	6 - 10	11 - 50	>50
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	99.5%	0.0%	0.2%	0.3%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	99.0%	1.0%	0.0%	0.0%	0.0%
August	99.7%	0.3%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.9%	0.1%	0.0%	0.0%	0.0%

Table 10 CLS TRS 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	41	0	0	0	1	64	374	0

Total Hours of Downtime	42	Total Hours of Calibration Time	438	Total Hours of Flagged	480

Table 11 CLS NOx 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	Max. 24-hr (ppb)
January	100.0	705	8.7	0	50	21
February	100.0	637	7.1	1	103	17
March	100.0	705	4.8	1	53	16
April	99.7	681	2.4	0	26	6
May	100.0	705	1.8	0	16	4
June	100.0	682	1.9	0	13	3
July	99.7	704	1.9	0	11	3
August	100.0	705	2.2	0	12	4
September	100.0	681	2.3	0	21	5
October	100.0	706	2.8	0	21	7
November	99.7	682	4.8	0	41	15
December	100.0	705	7.2	0	68	26
Annual	99.9	8298	4.0	0	103	26

Table 12 CLS NOx 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	94.5%	5.5%	0.0%	0.0%	0.0%
February	97.2%	2.2%	0.5%	0.2%	0.0%
March	99.4%	0.4%	0.1%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	99.7%	0.3%	0.0%	0.0%	0.0%
December	96.6%	1.7%	1.7%	0.0%	0.0%
Annual	98.9%	0.8%	0.2%	0.0%	0.0%

Table 13 CLS NOx 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	0	0	0	6	82	374	0

Total Hours of Downtime	6	Total Hours of Calibration Time	456	Total Hours of Flagged	462

Table 14 CLS NO 2022 Annual Frequency Distribution

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	Max. 24-hr (ppb)
January	100.0	705	1.5	0	29	6
February	100.0	637	1.4	0	95	5
March	100.0	705	0.6	0	28	3
April	99.7	681	0.2	0	15	3
May	100.0	705	0.1	0	7	1
June	100.0	682	0.2	0	5	1
July	99.7	704	0.1	0	6	1
August	100.0	705	0.3	0	8	1
September	100.0	681	0.4	0	17	2
October	100.0	706	0.4	0	12	2
November	99.7	682	0.6	0	17	4
December	100.0	705	1.4	0	47	12
Annual	99.9	8298	0.6	0	95	12

Table 15 CLS NO 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	99.8%	0.0%	0.0%	0.2%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	99.0%	1.0%	0.0%	0.0%	0.0%
Annual	99.9%	0.1%	0.0%	0.0%	0.0%

Table 16 CLS NO 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	0	0	0	6	82	374	0

Total Hours of Downtime	6	Total Hours of Calibration Time	456	Total Hours of Flagged	462

Table 17 CLS NO2 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	# of 1-hr AAAQO Exceedances	Max. 24-hr (ppb)
January	100.0	705	7.2	0	31	0	15
February	100.0	637	5.7	0	37	0	11
March	100.0	705	4.2	1	27	0	13
April	99.7	681	2.2	0	19	0	5
May	100.0	705	1.6	0	11	0	3
June	100.0	682	1.7	0	10	0	3
July	99.7	704	1.7	0	7	0	3
August	100.0	705	1.9	0	11	0	3
September	100.0	681	1.9	0	11	0	4
October	100.0	706	2.4	0	15	0	6
November	99.7	682	4.2	0	25	0	12
December	100.0	705	5.8	0	26	0	15
Annual	99.9	8298	3.4	0	37	0	15

Table 18 CLS NO2 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	99.6%	0.4%	0.0%	0.0%	0.0%
February	99.4%	0.6%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.9%	0.1%	0.0%	0.0%	0.0%

Table 19 CLS NO2 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	0	0	0	6	82	374	0

Total Hours of Downtime	6	Total Hours of Calibration Time	456	Total Hours of Flagged	462

Table 20 CLS O3 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	# of 1-hr AAAQO Exceedances	Max. 24-hr (ppb)
January	100.0	708	26.3	0.5	42.9	0	40.3
February	100.0	640	31.4	1.1	48.6	0	40.5
March	100.0	707	38.8	3.4	58.4	0	48.6
April	100.0	685	37.8	0.6	55.8	0	47.0
May	100.0	709	31.6	1.1	55.0	0	40.6
June	96.0	654	28.1	0.5	57.7	0	39.7
July	84.9	601	22.5	0.3	51.3	0	31.6
August	91.1	645	21.6	0.2	52.6	0	31.9
September	100.0	683	19.4	0.1	49.5	0	28.5
October	100.0	707	22.6	0.2	45.5	0	36.2
November	96.9	661	25.1	1.0	40.2	0	36.1
December	100.0	706	26.3	0.1	42.6	0	38.2
Annual	97.4	8106	27.6	0.1	58.4	0	48.6

Table 21 CLS O3 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	56.1%	43.9%	0.0%	0.0%	0.0%
February	38.0%	62.0%	0.0%	0.0%	0.0%
March	13.3%	78.9%	7.8%	0.0%	0.0%
April	19.1%	72.3%	8.6%	0.0%	0.0%
May	44.6%	53.3%	2.1%	0.0%	0.0%
June	54.1%	43.7%	2.1%	0.0%	0.0%
July	76.9%	22.8%	0.3%	0.0%	0.0%
August	73.8%	25.6%	0.6%	0.0%	0.0%
September	80.2%	19.8%	0.0%	0.0%	0.0%
October	72.1%	27.9%	0.0%	0.0%	0.0%
November	72.2%	27.8%	0.0%	0.0%	0.0%
December	60.6%	39.4%	0.0%	0.0%	0.0%
Annual	55.1%	43.1%	1.8%	0.0%	0.0%

Table 22 CLS O3 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	173	0	0	0	56	58	367	0

Total Hours of Downtime	229	Total Hours of Calibration Time	425	Total Hours of Flagged	654

Table 23 CLS THC 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppm)	Min. 1-hr (ppm)	Max. 1-hr (ppm)	Max. 24-hr (ppm)
January	99.9	707	2.00	1.80	2.79	2.22
February	100.0	640	1.97	1.84	2.33	2.06
March	97.3	689	1.89	1.78	2.15	2.03
April	99.9	684	1.84	1.77	2.18	1.94
May	100.0	709	1.82	1.74	2.07	1.89
June	100.0	683	1.87	1.74	2.40	2.01
July	99.1	701	2.01	1.84	2.92	2.22
August	87.9	623	2.05	1.82	2.82	2.20
September	100.0	683	2.03	1.86	2.54	2.17
October	100.0	707	2.05	1.90	3.16	2.24
November	100.0	682	2.04	1.90	2.46	2.27
December	99.9	706	2.11	1.94	2.70	2.40
Annual	98.7	8214	1.97	1.74	3.16	2.40

Table 24 CLS THC 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppm)				
	0 - 2	3 - 5	6 - 10	11 - 40	>40
January	99.2%	0.8%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	94.9%	5.1%	0.0%	0.0%	0.0%
August	93.4%	6.6%	0.0%	0.0%	0.0%
September	98.8%	1.2%	0.0%	0.0%	0.0%
October	97.7%	2.3%	0.0%	0.0%	0.0%
November	99.0%	1.0%	0.0%	0.0%	0.0%
December	94.3%	5.7%	0.0%	0.0%	0.0%
Annual	98.1%	1.9%	0.0%	0.0%	0.0%

Table 25 CLS THC 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	109	0	0	0	11	55	371	0

Total Hours of Downtime	120	Total Hours of Calibration Time	426	Total Hours of Flagged	546

Table 26 CLS CH4 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppm)	Min. 1-hr (ppm)	Max. 1-hr (ppm)	Max. 24-hr (ppm)
January	99.9	707	2.00	1.80	2.79	2.22
February	100.0	640	1.97	1.84	2.33	2.06
March	97.3	689	1.89	1.78	2.15	2.03
April	99.9	684	1.84	1.77	2.18	1.94
May	100.0	709	1.82	1.74	2.07	1.89
June	100.0	683	1.87	1.74	2.40	2.00
July	99.1	701	2.01	1.84	2.92	2.22
August	87.9	623	2.05	1.82	2.82	2.20
September	100.0	683	2.03	1.86	2.54	2.17
October	100.0	707	2.05	1.90	2.71	2.24
November	100.0	682	2.04	1.90	2.46	2.27
December	99.9	706	2.11	1.94	2.70	2.40
Annual	98.7	8214	1.97	1.74	2.92	2.40

Table 27 CLS CH4 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppm)				
	0 - 2	3 - 5	6 - 10	11 - 20	>20
January	99.2%	0.8%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	94.9%	5.1%	0.0%	0.0%	0.0%
August	93.4%	6.6%	0.0%	0.0%	0.0%
September	98.8%	1.2%	0.0%	0.0%	0.0%
October	97.9%	2.1%	0.0%	0.0%	0.0%
November	99.0%	1.0%	0.0%	0.0%	0.0%
December	94.3%	5.7%	0.0%	0.0%	0.0%
Annual	98.1%	1.9%	0.0%	0.0%	0.0%

Table 28 CLS CH4 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	109	0	0	0	11	55	371	0

Total Hours of Downtime	120	Total Hours of Calibration Time	426	Total Hours of Flagged	546

Table 29 CLS NMHC 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppm)	Min. 1-hr (ppm)	Max. 1-hr (ppm)	Max. 24-hr (ppm)
January	99.9	707	0.00	0.00	0.20	0.01
February	100.0	640	0.00	0.00	0.04	0.00
March	97.3	689	0.00	0.00	0.01	0.00
April	99.9	684	0.00	0.00	0.00	0.00
May	100.0	709	0.00	0.00	0.05	0.00
June	100.0	683	0.00	0.00	0.05	0.00
July	99.1	701	0.00	0.00	0.06	0.00
August	87.9	623	0.00	0.00	0.06	0.00
September	100.0	683	0.00	0.00	0.01	0.00
October	100.0	707	0.00	0.00	1.05	0.05
November	100.0	682	0.00	0.00	0.06	0.00
December	99.9	706	0.00	0.00	0.05	0.00
Annual	98.7	8214	0.00	0.00	1.05	0.05

Table 30 CLS NMHC 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppm)				
	0 - 0.1	0.2 - 0.3	0.4 - 0.9	1 -2	>2
January	99.9%	0.1%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	99.9%	0.0%	0.0%	0.1%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	100.0%	0.0%	0.0%	0.0%	0.0%

Table 31 CLS NMHC 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	109	0	0	0	11	55	371	0

Total Hours of Downtime	120	Total Hours of Calibration Time	426	Total Hours of Flagged	546

Table 32 CLS PM2.5 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ug/m3)	Min. 1-hr (ug/m3)	Max. 1-hr (ug/m3)	# of 1-hr AAAQO Exceedances	Max. 24-hr (ug/m3)	# of 24-hr AAAQO Exceedances
January	100.0	743	5.8	0	23	0	15	0
February	100.0	671	4.3	0	26	0	8	0
March	100.0	742	4.2	0	45	0	11	0
April	100.0	719	3.9	0	15	0	8	0
May	100.0	742	4.0	0	16	0	8	0
June	100.0	718	7.5	3	55	0	18	0
July	100.0	743	8.5	1	65	0	41	1
August	97.6	725	12.7	1	105	7	67	2
September	100.0	719	9.4	1	68	0	40	1
October	100.0	742	8.6	1	62	0	36	1
November	100.0	719	9.5	1	49	0	30	1
December	100.0	743	7.7	1	31	0	22	0
Annual	99.8	8726	7.2	0	105	7	67	6

Table 33 CLS PM2.5 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (ug/m3)				
	0 - 50	51 - 80	81 - 120	121 - 240	>240
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	99.9%	0.1%	0.0%	0.0%	0.0%
July	98.4%	1.6%	0.0%	0.0%	0.0%
August	95.7%	3.3%	1.0%	0.0%	0.0%
September	97.6%	2.4%	0.0%	0.0%	0.0%
October	99.9%	0.1%	0.0%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.3%	0.6%	0.1%	0.0%	0.0%

Table 34 CLS PM2.5 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	17	1	0	0	0	16	0	0

Total Hours of Downtime	18	Total Hours of Calibration Time	16	Total Hours of Flagged	34

Table 35 CLS RH 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (%)	Min. 1-hr (%)	Max. 1-hr (%)	Max. 24-hr (%)
January	100.0	744	75.0	56	92	90
February	100.0	672	71.7	34	97	84
March	100.0	744	65.1	28	98	84
April	100.0	720	60.4	23	100	94
May	100.0	744	59.4	17	100	84
June	100.0	720	65.8	23	100	96
July	100.0	744	68.2	30	100	89
August	100.0	744	70.3	30	100	87
September	100.0	720	71.0	28	100	92
October	100.0	744	63.5	22	100	93
November	100.0	720	75.3	40	90	83
December	100.0	744	75.7	48	89	87
Annual	100.0	8760	68.4	17	100	96

Table 36 CLS RH 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	0	0	0	0	0	0	0

Total Hours of Downtime	0	Total Hours of Calibration Time	0	Total Hours of Flagged	0

Table 37 CLS BP 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (mb)	Min. 1-hr (mb)	Max. 1-hr (mb)	Max. 24-hr (mb)
January	100.0	744	951	932	971	970
February	100.0	672	954	929	974	972
March	100.0	744	950	933	965	964
April	100.0	720	950	922	966	963
May	100.0	744	946	922	961	959
June	100.0	720	949	932	960	959
July	100.0	744	950	941	956	955
August	100.0	744	950	931	959	958
September	100.0	720	950	940	961	959
October	100.0	744	949	930	970	967
November	100.0	720	952	924	978	971
December	100.0	744	953	929	980	978
Annual	100.0	8760	950	922	980	978

Table 38 CLS BP 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	0	0	0	0	0	0	0

Total Hours of Downtime	0	Total Hours of Calibration Time	0	Total Hours of Flagged	0

Table 39 CLS AT 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (°C)	Min. 1-hr (°C)	Max. 1-hr (°C)	Max. 24-hr (°C)
January	100.0	744	-15.5	-39.5	4.1	0.7
February	100.0	672	-14.6	-38.1	7.4	1.9
March	100.0	744	-5.2	-32.1	12.6	5.5
April	100.0	720	1.3	-13.5	14.0	7.4
May	100.0	744	9.7	-2.6	21.0	14.4
June	100.0	720	15.3	1.4	25.1	18.1
July	100.0	744	18.2	6.4	29.4	22.8
August	100.0	744	18.7	6.2	30.1	21.6
September	100.0	720	12.5	-1.9	29.3	19.9
October	100.0	744	6.6	-5.8	23.7	15.3
November	100.0	720	-7.8	-25.0	4.5	0.4
December	100.0	744	-17.5	-39.0	-2.9	-7.5
Annual	100.0	8760	1.8	-39.5	30.1	22.8

Table 40 CLS AT 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	0	0	0	0	0	0	0

Total Hours of Downtime	0	Total Hours of Calibration Time	0	Total Hours of Flagged	0

Table 41 CLS ST 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (°C)	Min. 1-hr (°C)	Max. 1-hr (°C)	Max. 24-hr (°C)
January	100.0	744	22.5	14.5	25.0	24.7
February	100.0	672	24.4	22.6	25.1	24.7
March	100.0	744	24.0	21.9	26.3	25.1
April	100.0	720	22.8	21.5	24.7	23.7
May	100.0	744	22.9	20.4	25.1	24.3
June	100.0	720	21.4	18.2	23.9	22.2
July	100.0	744	21.1	19.8	23.1	21.7
August	100.0	744	21.3	19.9	22.6	21.8
September	100.0	720	22.5	20.3	23.7	23.2
October	100.0	744	23.0	20.6	24.4	23.8
November	100.0	720	21.9	20.0	24.0	22.9
December	100.0	744	22.5	19.7	23.2	23.1
Annual	100.0	8760	22.5	14.5	26.3	25.1

Table 42 CLS ST 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	0	0	0	0	0	0	0

Total Hours of Downtime	0	Total Hours of Calibration Time	0	Total Hours of Flagged	0

Table 43 CLS WS 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (kph)	Min. 1-hr (kph)	Max. 1-hr (kph)	Max. 24-hr (kph)
January	100.0	744	1.9	0.0	23.1	14.4
February	100.0	672	1.0	0.0	23.0	9.9
March	100.0	744	1.8	0.0	29.0	16.4
April	100.0	720	1.9	0.0	25.9	17.8
May	100.0	744	1.8	0.0	20.7	12.4
June	100.0	720	2.0	0.0	23.4	18.7
July	100.0	742	1.3	0.0	18.0	10.9
August	100.0	744	1.3	0.0	19.2	9.5
September	100.0	720	1.0	0.0	19.7	9.0
October	100.0	744	2.0	0.0	27.8	14.9
November	100.0	720	2.3	0.0	21.9	15.4
December	100.0	744	0.6	0.0	28.7	13.4
Annual	100.0	8758	1.6	0.0	29.0	18.7

Table 44 CLS WS 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in kph)				
	0 - 6	7 - 15	16 - 29	30 -39	>39
January	69.0%	23.9%	7.1%	0.0%	0.0%
February	62.9%	32.0%	5.1%	0.0%	0.0%
March	56.6%	35.3%	8.1%	0.0%	0.0%
April	39.0%	49.6%	11.4%	0.0%	0.0%
May	44.4%	51.1%	4.6%	0.0%	0.0%
June	58.3%	36.0%	5.7%	0.0%	0.0%
July	64.8%	33.4%	1.8%	0.0%	0.0%
August	69.6%	28.6%	1.7%	0.0%	0.0%
September	66.8%	31.0%	2.2%	0.0%	0.0%
October	65.7%	29.2%	5.1%	0.0%	0.0%
November	54.4%	37.2%	8.3%	0.0%	0.0%
December	67.5%	31.3%	1.2%	0.0%	0.0%
Annual	59.9%	34.9%	5.2%	0.0%	0.0%

Table 45 CLS WS 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	0	0	0	0	2	0	0

Total Hours of Downtime	0	Total Hours of Calibration Time	2	Total Hours of Flagged	2

1.2 Tamarack (TR) Station

Table 46 TR SO2 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	# of 30-day AAAQO Exceedances	Min. 1-hr (ppb)	Max. 1-hr (ppb)	# of 1-hr AAAQO Exceedances	Max. 24-hr (ppb)	# of 24-hr AAAQO Exceedances
January	100.0	707	1.0	0	0	16	0	6	0
February	100.0	638	1.3	0	0	18	0	4	0
March	100.0	708	0.9	0	0	12	0	3	0
April	100.0	685	0.7	0	0	10	0	3	0
May	100.0	705	0.4	0	0	12	0	2	0
June	100.0	683	0.4	0	0	13	0	2	0
July	100.0	707	0.5	0	0	23	0	3	0
August	97.3	688	0.8	0	0	15	0	5	0
September	100.0	684	0.8	0	0	16	0	3	0
October	93.1	658	1.0	0	0	22	0	9	0
November	100.0	684	0.9	0	0	24	0	6	0
December	100.0	708	0.9	0	0	10	0	3	0
Annual	99.2	8255	0.8	0	0	24	0	9	0

Table 47 TR SO2 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 10	11 -50	51 -100	101 - 172	>172
January	98.4%	1.6%	0.0%	0.0%	0.0%
February	99.2%	0.8%	0.0%	0.0%	0.0%
March	99.7%	0.3%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	99.9%	0.1%	0.0%	0.0%	0.0%
June	99.9%	0.1%	0.0%	0.0%	0.0%
July	99.6%	0.4%	0.0%	0.0%	0.0%
August	99.4%	0.6%	0.0%	0.0%	0.0%
September	99.6%	0.4%	0.0%	0.0%	0.0%
October	98.3%	1.7%	0.0%	0.0%	0.0%
November	98.5%	1.5%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.4%	0.6%	0.0%	0.0%	0.0%

Table 48 TR SO2 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	51	0	0	20	60	374	0

Total Hours of Downtime	71	Total Hours of Calibration Time	434	Total Hours of Flagged	505

Table 49 TR H2S 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	# of 1-hr AAAQO Exceedances	Max. 24-hr (ppb)	# of 24-hr AAAQO Exceedances
January	96.4	679	0.0	0	2	0	0	0
February	100.0	638	0.1	0	2	0	0	0
March	100.0	707	0.0	0	1	0	0	0
April	100.0	684	0.0	0	3	0	1	0
May	100.0	705	0.0	0	2	0	0	0
June	100.0	683	0.1	0	6	0	1	0
July	100.0	707	0.1	0	4	0	0	0
August	100.0	707	0.2	0	11	1	1	0
September	99.3	679	0.2	0	8	0	1	0
October	93.1	658	0.1	0	4	0	1	0
November	99.7	681	0.0	0	1	0	0	0
December	100.0	707	0.0	0	2	0	0	0
Annual	99.0	8235	0.1	0	11	1	1	0

Table 50 TR H2S 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 2	3 - 5	6 - 10	11 - 50	>50
January	98.4%	1.6%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	99.7%	0.3%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	99.3%	0.4%	0.3%	0.0%	0.0%
July	99.9%	0.1%	0.0%	0.0%	0.0%
August	99.3%	0.4%	0.1%	0.1%	0.0%
September	97.3%	2.4%	0.3%	0.0%	0.0%
October	99.5%	0.5%	0.0%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.5%	0.5%	0.1%	0.0%	0.0%

Table 51 TR H2S 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	51	0	0	34	66	374	0

Total Hours of Downtime	85	Total Hours of Calibration Time	440	Total Hours of Flagged	525

Table 52 TR NOx 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	Max. 24-hr (ppb)
January	100.0	705	5.0	0	37	10
February	100.0	637	5.4	0	34	9
March	100.0	706	4.1	0	40	9
April	100.0	683	2.6	0	22	7
May	100.0	704	2.0	0	29	5
June	100.0	682	2.3	0	23	5
July	100.0	705	2.7	0	44	6
August	100.0	705	3.2	0	24	11
September	100.0	682	3.6	0	33	10
October	93.4	656	4.3	0	41	16
November	100.0	682	5.4	0	48	13
December	100.0	706	6.0	0	59	19
Annual	99.5	8253	3.9	0	59	19

Table 53 TR NOx 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	99.6%	0.4%	0.0%	0.0%	0.0%
February	99.8%	0.2%	0.0%	0.0%	0.0%
March	99.4%	0.6%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	99.7%	0.3%	0.0%	0.0%	0.0%
August	100.0%	0.0%	0.0%	0.0%	0.0%
September	99.9%	0.1%	0.0%	0.0%	0.0%
October	98.8%	1.2%	0.0%	0.0%	0.0%
November	99.0%	1.0%	0.0%	0.0%	0.0%
December	98.9%	1.0%	0.1%	0.0%	0.0%
Annual	99.6%	0.4%	0.0%	0.0%	0.0%

Table 54 TR NOx 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	49	0	0	0	85	373	0

Total Hours of Downtime	49	Total Hours of Calibration Time	458	Total Hours of Flagged	507

Table 55 TR NO 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	Max. 24-hr (ppb)
January	100.0	705	0.6	0	19	2
February	100.0	637	1.0	0	19	2
March	100.0	706	0.6	0	20	2
April	100.0	683	0.4	0	9	2
May	100.0	704	0.3	0	17	1
June	100.0	682	0.3	0	11	1
July	100.0	705	0.5	0	37	2
August	100.0	705	0.6	0	11	4
September	100.0	682	0.8	0	24	4
October	93.4	656	0.9	0	24	5
November	100.0	682	0.8	0	32	5
December	100.0	706	0.8	0	35	6
Annual	99.5	8253	0.6	0	37	6

Table 56 TR NO 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	99.9%	0.1%	0.0%	0.0%	0.0%
August	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	99.9%	0.1%	0.0%	0.0%	0.0%
December	99.9%	0.1%	0.0%	0.0%	0.0%
Annual	100.0%	0.0%	0.0%	0.0%	0.0%

Table 57 TR NO 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	49	0	0	0	85	373	0

Total Hours of Downtime	49	Total Hours of Calibration Time	458	Total Hours of Flagged	507

Table 58 TR NO2 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	# of 1-hr AAAQO Exceedances	Max. 24-hr (ppb)
January	100.0	705	4.4	0	23	0	8
February	100.0	637	4.4	0	21	0	8
March	100.0	706	3.4	0	28	0	8
April	100.0	683	2.3	0	17	0	6
May	100.0	704	1.7	0	19	0	4
June	100.0	682	2.0	0	12	0	4
July	100.0	705	2.2	0	22	0	4
August	100.0	705	2.6	0	16	0	6
September	100.0	682	2.8	0	16	0	6
October	93.4	656	3.3	0	23	0	10
November	100.0	682	4.6	0	28	0	12
December	100.0	706	5.2	0	27	0	15
Annual	99.5	8253	3.2	0	28	0	15

Table 59 TR NO2 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	100.0%	0.0%	0.0%	0.0%	0.0%

Table 60 TR NO2 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	49	0	0	0	85	373	0

Total Hours of Downtime	49	Total Hours of Calibration Time	458	Total Hours of Flagged	507

Table 61 TR O3 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	# of 1-hr AAAQO Exceedances	Max. 24-hr (ppb)
January	100.0	708	29.2	5.3	43.4	0	36.5
February	100.0	637	31.7	9.4	45.7	0	37.9
March	100.0	708	37.3	5.3	56.0	0	44.1
April	100.0	685	36.5	5.3	52.6	0	46.9
May	99.9	705	30.8	5.2	55.6	0	41.2
June	100.0	684	28.4	2.4	55.9	0	39.2
July	100.0	708	22.1	1.8	52.9	0	33.6
August	100.0	706	21.4	0.2	60.4	0	32.2
September	100.0	683	22.5	1.1	62.1	0	32.7
October	91.4	644	25.2	3.1	47.8	0	36.5
November	100.0	684	24.8	1.2	40.2	0	34.0
December	100.0	707	26.1	1.0	41.1	0	35.8
Annual	99.3	8259	28.0	0.2	62.1	0	46.9

Table 62 TR O3 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 30	31 - 50	51 - 76	77 - 159	>159
January	49.4%	50.6%	0.0%	0.0%	0.0%
February	39.4%	60.6%	0.0%	0.0%	0.0%
March	14.8%	82.1%	3.1%	0.0%	0.0%
April	20.0%	77.2%	2.8%	0.0%	0.0%
May	49.1%	49.5%	1.4%	0.0%	0.0%
June	56.3%	42.4%	1.3%	0.0%	0.0%
July	81.2%	17.8%	1.0%	0.0%	0.0%
August	77.3%	21.5%	1.1%	0.0%	0.0%
September	77.6%	21.2%	1.2%	0.0%	0.0%
October	68.8%	31.2%	0.0%	0.0%	0.0%
November	74.3%	25.7%	0.0%	0.0%	0.0%
December	63.5%	36.5%	0.0%	0.0%	0.0%
Annual	56.0%	43.0%	1.0%	0.0%	0.0%

Table 63 TR O3 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	64	0	0	1	61	375	0

Total Hours of Downtime	65	Total Hours of Calibration Time	436	Total Hours of Flagged	501

Table 64 TR THC 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppm)	Min. 1-hr (ppm)	Max. 1-hr (ppm)	Max. 24-hr (ppm)
January	100.0	708	1.96	1.83	2.37	2.11
February	100.0	638	1.97	1.84	2.37	2.06
March	97.8	692	1.91	1.79	2.91	2.00
April	100.0	684	1.89	1.82	2.46	1.95
May	99.9	705	1.88	1.82	2.37	1.92
June	96.3	658	1.89	1.80	2.77	2.07
July	100.0	708	1.97	1.84	2.70	2.10
August	100.0	706	2.07	1.86	6.58	2.47
September	95.0	650	2.05	1.89	3.29	2.23
October	93.1	658	1.99	1.85	2.80	2.24
November	99.7	681	2.02	1.90	2.58	2.33
December	97.0	685	2.05	1.93	2.75	2.33
Annual	98.2	8173	1.97	1.79	6.58	2.47

Table 65 TR THC 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppm)				
	0 - 2	3 - 5	6 - 10	11 - 40	>40
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9%	0.1%	0.0%	0.0%	0.0%
April	99.7%	0.3%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	99.1%	0.9%	0.0%	0.0%	0.0%
July	99.2%	0.8%	0.0%	0.0%	0.0%
August	96.6%	3.3%	0.1%	0.0%	0.0%
September	97.8%	2.2%	0.0%	0.0%	0.0%
October	99.1%	0.9%	0.0%	0.0%	0.0%
November	97.7%	2.3%	0.0%	0.0%	0.0%
December	98.1%	1.9%	0.0%	0.0%	0.0%
Annual	98.9%	1.1%	0.0%	0.0%	0.0%

Table 66 TR THC 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	98	51	0	0	6	59	373	0

Total Hours of Downtime	155	Total Hours of Calibration Time	432	Total Hours of Flagged	587

Table 67 TR CH4 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppm)	Min. 1-hr (ppm)	Max. 1-hr (ppm)	Max. 24-hr (ppm)
January	100.0	708	1.96	1.83	2.37	2.11
February	100.0	638	1.96	1.84	2.24	2.06
March	97.8	692	1.91	1.79	2.23	1.99
April	100.0	684	1.88	1.82	2.12	1.92
May	99.9	705	1.87	1.82	2.10	1.92
June	96.3	658	1.88	1.80	2.42	2.02
July	100.0	708	1.97	1.84	2.70	2.10
August	100.0	706	2.07	1.86	5.56	2.40
September	95.0	650	2.04	1.89	2.69	2.19
October	93.1	658	1.98	1.85	2.40	2.12
November	99.7	681	2.02	1.90	2.58	2.33
December	97.0	685	2.04	1.93	2.65	2.33
Annual	98.2	8173	1.97	1.79	5.56	2.40

Table 68 TR CH4 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppm)				
	0 - 2	3 - 5	6 - 10	11 - 20	>20
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	99.8%	0.2%	0.0%	0.0%	0.0%
July	99.2%	0.8%	0.0%	0.0%	0.0%
August	97.6%	2.3%	0.1%	0.0%	0.0%
September	98.5%	1.5%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	98.1%	1.9%	0.0%	0.0%	0.0%
December	98.4%	1.6%	0.0%	0.0%	0.0%
Annual	99.3%	0.7%	0.0%	0.0%	0.0%

Table 69 TR CH4 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	98	51	0	0	6	59	373	0

Total Hours of Downtime	155	Total Hours of Calibration Time	432	Total Hours of Flagged	587

Table 70 TR NMHC 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppm)	Min. 1-hr (ppm)	Max. 1-hr (ppm)	Max. 24-hr (ppm)
January	100.0	708	0.00	0.00	0.05	0.00
February	100.0	638	0.00	0.00	0.18	0.02
March	97.8	692	0.00	0.00	0.68	0.03
April	100.0	684	0.00	0.00	0.51	0.05
May	99.9	705	0.00	0.00	0.28	0.03
June	96.3	658	0.01	0.00	0.64	0.05
July	100.0	708	0.00	0.00	0.07	0.00
August	100.0	706	0.01	0.00	1.03	0.07
September	95.0	650	0.01	0.00	0.62	0.05
October	93.1	658	0.01	0.00	0.43	0.11
November	99.7	681	0.00	0.00	0.25	0.02
December	97.0	685	0.00	0.00	0.27	0.03
Annual	98.2	8173	0.00	0.00	1.03	0.11

Table 71 TR NMHC 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppm)				
	0 - 0.1	0.2 - 0.3	0.4 - 0.9	1 -2	>2
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	99.8%	0.2%	0.0%	0.0%	0.0%
March	99.6%	0.3%	0.1%	0.0%	0.0%
April	99.4%	0.1%	0.4%	0.0%	0.0%
May	99.6%	0.4%	0.0%	0.0%	0.0%
June	98.6%	1.1%	0.3%	0.0%	0.0%
July	100.0%	0.0%	0.0%	0.0%	0.0%
August	98.4%	1.3%	0.1%	0.1%	0.0%
September	98.6%	0.9%	0.5%	0.0%	0.0%
October	97.9%	1.8%	0.3%	0.0%	0.0%
November	99.7%	0.3%	0.0%	0.0%	0.0%
December	99.4%	0.6%	0.0%	0.0%	0.0%
Annual	99.3%	0.6%	0.1%	0.0%	0.0%

Table 72 TR NMHC 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	98	51	0	0	6	59	373	0

Total Hours of Downtime	155	Total Hours of Calibration Time	432	Total Hours of Flagged	587

Table 73 TR PM2.5 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ug/m3)	Min. 1-hr (ug/m3)	Max. 1-hr (ug/m3)	# of 1-hr AAAQO Exceedances	Max. 24-hr (ug/m3)	# of 24-hr AAAQO Exceedances
January	100.0	743	3.1	0	36	0	8	0
February	100.0	669	2.7	0	19	0	6	0
March	100.0	742	3.3	0	167	1	16	0
April	100.0	718	2.9	0	24	0	9	0
May	100.0	742	3.5	0	37	0	9	0
June	100.0	718	6.3	1	117	2	21	0
July	100.0	743	6.5	1	45	0	23	0
August	100.0	742	8.9	1	76	0	47	1
September	100.0	719	6.4	0	53	0	21	0
October	93.4	693	8.0	1	100	1	35	2
November	100.0	719	5.2	1	28	0	17	0
December	100.0	743	4.6	1	33	0	12	0
Annual	99.5	8691	5.1	0	167	4	47	3

Table 74 TR PM2.5 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ug/m3)				
	0 - 50	51 - 80	81 - 120	121 - 240	>240
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.6%	0.3%	0.0%	0.1%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	99.6%	0.1%	0.3%	0.0%	0.0%
July	100.0%	0.0%	0.0%	0.0%	0.0%
August	98.5%	1.5%	0.0%	0.0%	0.0%
September	99.7%	0.3%	0.0%	0.0%	0.0%
October	99.1%	0.7%	0.1%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.7%	0.2%	0.0%	0.0%	0.0%

Table 75 TR PM2.5 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	49	0	0	0	20	0	0

Total Hours of Downtime	49	Total Hours of Calibration Time	20	Total Hours of Flagged	69

Table 76 TR RH 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (%)	Min. 1-hr (%)	Max. 1-hr (%)	Max. 24-hr (%)
January	100.0	744	83.1	60	100	100
February	100.0	672	79.2	42	100	91
March	100.0	744	70.5	33	100	92
April	100.0	720	65.8	17	100	100
May	100.0	744	63.3	15	100	90
June	100.0	720	68.3	19	100	99
July	100.0	744	71.2	28	100	96
August	100.0	744	72.6	27	100	96
September	100.0	720	72.4	28	100	96
October	94.2	701	64.4	19	100	98
November	100.0	720	81.6	37	100	94
December	100.0	744	84.3	53	98	96
Annual	99.5	8717	73.1	15	100	100

Table 77 TR RH 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	43	0	0	0	0	0	0

Total Hours of Downtime	43	Total Hours of Calibration Time	0	Total Hours of Flagged	43

Table 78 TR BP 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (mb)	Min. 1-hr (mb)	Max. 1-hr (mb)	Max. 24-hr (mb)
January	100.0	744	936	915	956	953
February	100.0	672	938	914	957	955
March	100.0	744	936	918	949	948
April	100.0	720	936	909	952	949
May	100.0	744	933	911	948	946
June	100.0	720	936	920	948	947
July	100.0	744	938	929	944	942
August	100.0	744	938	920	948	946
September	100.0	720	937	926	947	946
October	94.2	701	936	917	956	953
November	100.0	720	936	910	961	955
December	100.0	744	936	913	964	961
Annual	99.5	8717	936	909	964	961

Table 79 TR BP 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	43	0	0	0	0	0	0

Total Hours of Downtime	43	Total Hours of Calibration Time	0	Total Hours of Flagged	43

Table 80 TR AT 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (°C)	Min. 1-hr (°C)	Max. 1-hr (°C)	Max. 24-hr (°C)
January	100.0	744	-15.3	-39.1	3.1	-0.3
February	100.0	672	-14.6	-37.0	6.9	1.5
March	100.0	744	-5.4	-32.6	11.7	5.5
April	100.0	720	0.5	-15.5	13.3	6.5
May	100.0	744	8.8	-2.4	19.7	13.5
June	100.0	720	14.7	2.1	24.7	17.4
July	100.0	744	17.6	4.9	29.1	22.3
August	100.0	744	18.2	7.3	29.5	21.4
September	100.0	720	12.5	-0.8	28.3	20.6
October	94.2	701	6.5	-4.8	22.0	14.5
November	100.0	720	-8.0	-24.5	4.6	0.2
December	100.0	744	-18.1	-37.7	-4.0	-7.9
Annual	99.5	8717	1.5	-39.1	29.5	22.3

Table 81 TR AT 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	43	0	0	0	0	0	0

Total Hours of Downtime	43	Total Hours of Calibration Time	0	Total Hours of Flagged	43

Table 82 TR ST 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (°C)	Min. 1-hr (°C)	Max. 1-hr (°C)	Max. 24-hr (°C)
January	100.0	744	21.4	19.9	23.0	21.9
February	100.0	672	21.7	21.0	23.8	22.9
March	100.0	744	22.3	20.6	25.4	23.9
April	100.0	720	22.7	20.9	24.6	23.3
May	100.0	744	23.3	21.8	24.6	23.9
June	100.0	720	21.8	19.9	23.5	22.3
July	100.0	744	21.6	20.1	23.2	22.3
August	100.0	744	21.7	21.1	22.9	21.9
September	100.0	720	22.0	20.4	41.6	26.8
October	94.2	701	21.8	19.4	22.8	22.1
November	100.0	720	20.6	19.0	22.4	22.1
December	100.0	744	20.3	18.7	22.7	20.8
Annual	99.5	8717	21.8	18.7	41.6	26.8

Table 83 TR ST 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	43	0	0	0	0	0	0

Total Hours of Downtime	43	Total Hours of Calibration Time	0	Total Hours of Flagged	43

Table 84 TR Precipitation 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Total (mm)	Min. Total 1-hr (mm)	Max. Total 1-hr (mm)	Max. Total 24-hr (mm)
January	37.0	275	11.3	0.0	1.5	6.3
February	100.0	672	12.3	0.0	1.5	2.2
March	100.0	744	4.4	0.0	0.5	1.9
April	100.0	720	5.1	0.0	1.2	0.1
May	100.0	743	20.0	0.0	5.2	6.1
June	100.0	720	13.9	0.0	1.1	0.1
July	99.7	742	24.7	0.0	3.1	3.4
August	99.9	742	33.2	0.0	4.3	10.4
September	100.0	720	19.9	0.0	3.6	0.3
October	94.2	700	2.2	0.0	0.3	1.0
November	100.0	720	12.6	0.0	0.7	0.1
December	100.0	744	26.6	0.0	1.8	5.5
Annual	94.2	8242	186.2*	0.0	5.2	10.4

* Data represents the total (sum) for the year.

Table 85 TR Precipitation 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	469	45	0	0	1	3	0	0

Total Hours of Downtime	515	Total Hours of Calibration Time	3	Total Hours of Flagged	518

Table 86 TR WS 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (kph)	Min. 1-hr (kph)	Max. 1-hr (kph)	Max. 24-hr (kph)
January	100.0	744	1.6	0.0	20.5	10.3
February	100.0	672	1.2	0.0	20.3	9.6
March	100.0	744	1.1	0.0	18.6	10.4
April	100.0	720	1.4	0.0	18.8	14.7
May	100.0	744	1.9	0.1	19.1	12.8
June	100.0	720	1.8	0.0	20.0	13.6
July	100.0	743	1.7	0.0	17.6	10.8
August	100.0	744	1.6	0.0	18.1	7.8
September	100.0	720	1.5	0.0	17.6	8.9
October	93.8	698	2.3	0.0	19.6	11.8
November	100.0	720	2.0	0.1	19.9	12.4
December	100.0	744	1.0	0.0	16.1	10.3
Annual	99.5	8713	1.6	0.0	20.5	14.7

Table 87 TR WS 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in kph)				
	0 - 6	7 - 15	16 - 29	30 -39	>39
January	67.7%	30.9%	1.3%	0.0%	0.0%
February	61.0%	36.8%	2.2%	0.0%	0.0%
March	56.0%	42.6%	1.3%	0.0%	0.0%
April	46.1%	49.2%	4.7%	0.0%	0.0%
May	49.1%	48.1%	2.8%	0.0%	0.0%
June	60.4%	36.0%	3.6%	0.0%	0.0%
July	61.2%	37.8%	0.9%	0.0%	0.0%
August	69.9%	29.7%	0.4%	0.0%	0.0%
September	65.4%	34.3%	0.3%	0.0%	0.0%
October	61.3%	37.1%	1.6%	0.0%	0.0%
November	51.9%	46.9%	1.1%	0.0%	0.0%
December	70.6%	29.2%	0.3%	0.0%	0.0%
Annual	60.1%	38.2%	1.7%	0.0%	0.0%

Table 88 TR WS 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
0	0	46	0	0	0	1	0	0

Total Hours of Downtime	46	Total Hours of Calibration Time	1	Total Hours of Flagged	47

1.3 St. Lina (SL) Station

Table 89 SL SO2 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	# of 30-day AAAQO Exceedances	Min. 1-hr (ppb)	Max. 1-hr (ppb)	# of 1-hr AAAQO Exceedances	Max. 24-hr (ppb)	# of 24-hr AAAQO Exceedances
January	99.2	702	0.3	0	0	2	0	1	0
February	100.0	638	0.3	0	0	3	0	1	0
March	99.9	706	0.2	0	0	7	0	1	0
April	99.0	678	0.1	0	0	2	0	1	0
May	99.7	704	0.1	0	0	2	0	0	0
June	100.0	683	0.0	0	0	2	0	0	0
July	100.0	707	0.0	0	0	2	0	0	0
August	100.0	708	0.0	0	0	2	0	0	0
September	99.0	677	0.1	0	0	6	0	1	0
October	99.1	701	0.2	0	0	6	0	1	0
November	100.0	684	0.2	0	0	3	0	1	0
December	100.0	706	0.3	0	0	3	0	1	0
Annual	99.7	8294	0.1	0	0	7	0	1	0

Table 90 SL SO2 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 10	11 -50	51 -100	101 - 172	>172
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	100.0%	0.0%	0.0%	0.0%	0.0%

Table 91 SL SO2 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	1	0	0	6	4	59	377	0

Total Hours of Downtime	30	Total Hours of Calibration Time	436	Total Hours of Flagged	466

Table 92 SL H2S 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	# of 1-hr AAAQO Exceedances	Max. 24-hr (ppb)	# of 24-hr AAAQO Exceedances
January	94.2	667	0.8	0	3	0	2	0
February	98.4	627	0.3	0	3	0	2	0
March	86.2	606	0.1	0	2	0	1	0
April	90.1	616	0.1	0	3	0	1	0
May	83.9	591	0.1	0	2	0	1	0
June	100.0	683	0.1	0	3	0	1	0
July	100.0	707	0.1	0	3	0	0	0
August	96.5	680	0.7	0	4	0	2	0
September	99.0	677	0.1	0	1	0	1	0
October	99.1	701	0.0	0	2	0	0	0
November	100.0	684	0.0	0	1	0	0	0
December	100.0	706	0.0	0	1	0	0	0
Annual	95.6	7945	0.2	0	4	0	2	0

Table 93 SL H2S 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 2	3 - 5	6 - 10	11 - 50	>50
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	99.5%	0.5%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	99.8%	0.2%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	99.7%	0.3%	0.0%	0.0%	0.0%
July	99.9%	0.1%	0.0%	0.0%	0.0%
August	96.8%	3.2%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.6%	0.4%	0.0%	0.0%	0.0%

Table 94 SL H2S 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	268	0	0	6	95	64	363	0

Total Hours of Downtime	388	Total Hours of Calibration Time	427	Total Hours of Flagged	815

Table 95 SL NOx 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	Max. 24-hr (ppb)
January	99.2	701	3.6	0	33	12
February	100.0	636	2.3	0	12	5
March	99.9	704	2.1	0	16	6
April	99.0	676	1.3	0	8	3
May	99.7	702	1.3	0	8	2
June	100.0	681	1.4	0	6	3
July	100.0	704	1.2	0	7	2
August	100.0	706	1.3	0	9	3
September	98.6	672	1.7	0	11	5
October	99.1	699	2.0	0	13	5
November	100.0	682	3.7	0	24	13
December	100.0	704	4.1	0	20	11
Annual	99.6	8267	2.2	0	33	13

Table 96 SL NOx 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	99.9%	0.1%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	100.0%	0.0%	0.0%	0.0%	0.0%

Table 97 SL NOx 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	1	3	0	6	4	83	377	0

Total Hours of Downtime	33	Total Hours of Calibration Time	460	Total Hours of Flagged	493

Table 98 SL NO 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	Max. 24-hr (ppb)
January	99.2	701	0.2	0	23	1
February	100.0	636	0.1	0	4	1
March	99.9	704	0.1	0	2	0
April	99.0	676	0.0	0	1	0
May	99.7	702	0.0	0	4	0
June	100.0	681	0.0	0	1	0
July	100.0	704	0.0	0	2	0
August	100.0	706	0.0	0	5	0
September	98.6	672	0.0	0	2	0
October	99.1	699	0.1	0	3	0
November	100.0	682	0.2	0	5	1
December	100.0	704	0.2	0	5	1
Annual	99.6	8267	0.1	0	23	1

Table 99 SL NO 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	100.0%	0.0%	0.0%	0.0%	0.0%

Table 100 SL NO 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	1	3	0	6	4	83	377	0

Total Hours of Downtime	33	Total Hours of Calibration Time	460	Total Hours of Flagged	493

Table 101 SL NO2 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	# of 1-hr AAAQO Exceedances	Max. 24-hr (ppb)
January	99.2	701	3.4	0	18	0	10
February	100.0	636	2.2	0	12	0	5
March	99.9	704	2.0	0	16	0	6
April	99.0	676	1.3	0	8	0	2
May	99.7	702	1.2	0	7	0	2
June	100.0	681	1.4	0	6	0	3
July	100.0	704	1.2	0	6	0	2
August	100.0	706	1.3	0	8	0	2
September	98.6	672	1.6	0	11	0	5
October	99.1	699	2.0	0	13	0	4
November	100.0	682	3.4	0	24	0	12
December	100.0	704	3.8	0	20	0	10
Annual	99.6	8267	2.1	0	24	0	12

Table 102 SL NO2 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	100.0%	0.0%	0.0%	0.0%	0.0%

Table 103 SL NO2 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	1	3	0	6	4	83	377	0

Total Hours of Downtime	33	Total Hours of Calibration Time	460	Total Hours of Flagged	493

Table 104 SL O3 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppb)	Min. 1-hr (ppb)	Max. 1-hr (ppb)	# of 1-hr AAAQO Exceedances	Max. 24-hr (ppb)
January	99.2	702	33.0	15.3	47.6	0	41.2
February	100.0	638	36.3	15.6	51.2	0	46.3
March	99.9	705	42.4	24.3	58.1	0	49.4
April	99.0	678	40.2	23.0	53.1	0	48.3
May	99.7	705	36.7	17.0	58.8	0	47.0
June	100.0	683	33.0	11.7	56.7	0	47.0
July	100.0	707	25.6	7.6	46.9	0	37.2
August	100.0	706	26.6	7.3	54.3	0	40.8
September	96.0	657	27.7	10.5	57.8	0	44.5
October	99.1	701	29.7	7.6	48.8	0	40.5
November	100.0	684	30.8	9.1	43.1	0	40.5
December	100.0	706	27.2	10.1	40.9	0	38.6
Annual	99.4	8272	32.4	7.3	58.8	0	49.4

Table 105 SL O3 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppb)				
	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	32.6%	67.4%	0.0%	0.0%	0.0%
February	13.5%	86.1%	0.5%	0.0%	0.0%
March	1.3%	93.6%	5.1%	0.0%	0.0%
April	7.5%	86.4%	6.0%	0.0%	0.0%
May	27.8%	66.7%	5.5%	0.0%	0.0%
June	43.6%	52.0%	4.4%	0.0%	0.0%
July	74.3%	25.7%	0.0%	0.0%	0.0%
August	68.4%	31.2%	0.4%	0.0%	0.0%
September	64.2%	33.6%	2.1%	0.0%	0.0%
October	53.4%	46.6%	0.0%	0.0%	0.0%
November	41.7%	58.3%	0.0%	0.0%	0.0%
December	65.9%	34.1%	0.0%	0.0%	0.0%
Annual	41.2%	56.8%	2.0%	0.0%	0.0%

Table 106 SL O3 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	1	0	0	6	26	60	376	0

Total Hours of Downtime	52	Total Hours of Calibration Time	436	Total Hours of Flagged	488

Table 107 SL THC 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppm)	Min. 1-hr (ppm)	Max. 1-hr (ppm)	Max. 24-hr (ppm)
January	39.2	280	1.96	1.84	2.35	2.03
February	99.9	638	1.94	1.81	2.26	2.08
March	99.6	702	1.91	1.81	2.16	2.07
April	96.3	657	1.92	1.81	2.13	2.00
May	99.3	701	1.90	1.80	2.05	1.97
June	47.6	322	1.84	1.76	2.17	1.89
July	0.0	0	-	-	-	-
August	85.6	603	2.04	1.86	2.55	2.16
September	99.0	678	2.06	1.95	2.38	2.18
October	98.9	700	2.05	1.94	2.21	2.11
November	99.6	681	2.09	1.98	2.65	2.37
December	100.0	706	2.11	2.00	2.40	2.30
Annual	80.4	6668	1.98	1.76	2.65	2.37

Table 108 SL THC 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppm)				
	0 - 2	3 - 5	6 - 10	11 - 40	>40
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	0.0%	0.0%	0.0%	0.0%	0.0%
August	99.2%	0.8%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	97.7%	2.3%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	91.4%	0.3%	0.0%	0.0%	0.0%

Table 109 SL THC 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	1647	1	0	0	61	55	303	0

Total Hours of Downtime	1734	Total Hours of Calibration Time	358	Total Hours of Flagged	2092

Table 110 SL CH4 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppm)	Min. 1-hr (ppm)	Max. 1-hr (ppm)	Max. 24-hr (ppm)
January	39.2	280	1.96	1.84	2.35	2.03
February	99.9	638	1.94	1.81	2.26	2.08
March	99.6	702	1.91	1.81	2.16	2.07
April	96.3	657	1.92	1.81	2.13	1.99
May	99.3	701	1.90	1.80	2.05	1.97
June	47.6	322	1.84	1.76	2.15	1.89
July	0.0	0	-	-	-	-
August	85.6	603	2.04	1.86	2.55	2.16
September	99.0	678	2.06	1.95	2.38	2.18
October	98.9	700	2.05	1.94	2.21	2.11
November	99.6	681	2.09	1.98	2.65	2.37
December	100.0	706	2.11	2.00	2.40	2.30
Annual	80.4	6668	1.98	1.76	2.65	2.37

Table 111 SL CH4 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppm)				
	0 - 2	3 - 5	6 - 10	11 - 20	>20
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	0.0%	0.0%	0.0%	0.0%	0.0%
August	99.2%	0.8%	0.0%	0.0%	0.0%
September	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	97.7%	2.3%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	91.4%	0.3%	0.0%	0.0%	0.0%

Table 112 SL CH4 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	1647	1	0	0	61	55	303	0

Total Hours of Downtime	1734	Total Hours of Calibration Time	358	Total Hours of Flagged	2092

Table 113 SL NMHC 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ppm)	Min. 1-hr (ppm)	Max. 1-hr (ppm)	Max. 24-hr (ppm)
January	39.2	280	0.00	0.00	0.00	0.00
February	99.9	638	0.00	0.00	0.02	0.00
March	99.6	702	0.00	0.00	0.00	0.00
April	96.3	657	0.00	0.00	0.01	0.00
May	99.3	701	0.00	0.00	0.01	0.00
June	47.6	322	0.00	0.00	0.02	0.00
July	0.0	0	-	-	-	-
August	85.6	603	0.00	0.00	0.01	0.00
September	99.0	678	0.00	0.00	0.34	0.02
October	98.9	700	0.00	0.00	0.00	0.00
November	99.6	681	0.00	0.00	0.00	0.00
December	100.0	706	0.00	0.00	0.01	0.00
Annual	80.4	6668	0.00	0.00	0.34	0.02

Table 114 SL NMHC 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ppm)				
	0 - 0.1	0.2 - 0.3	0.4 - 0.9	1 -2	>2
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	0.0%	0.0%	0.0%	0.0%	0.0%
August	100.0%	0.0%	0.0%	0.0%	0.0%
September	99.9%	0.1%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	91.7%	0.0%	0.0%	0.0%	0.0%

Table 115 SL NMHC 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	1647	1	0	0	61	55	303	0

Total Hours of Downtime	1734	Total Hours of Calibration Time	358	Total Hours of Flagged	2092

Table 116 SL PM2.5 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (ug/m3)	Min. 1-hr (ug/m3)	Max. 1-hr (ug/m3)	# of 1-hr AAAQO Exceedances	Max. 24-hr (ug/m3)	# of 24-hr AAAQO Exceedances
January	99.3	738	4.0	0	33	0	10	0
February	100.0	669	3.5	0	14	0	7	0
March	99.9	742	3.1	0	27	0	10	0
April	99.4	714	3.0	0	25	0	8	0
May	99.7	741	3.0	0	10	0	7	0
June	100.0	719	5.1	1	35	0	10	0
July	100.0	743	4.8	1	24	0	14	0
August	100.0	743	7.9	1	80	0	45	2
September	98.9	711	7.4	0	57	0	36	1
October	99.1	735	5.8	0	34	0	25	0
November	100.0	719	5.9	0	35	0	26	0
December	100.0	743	6.1	0	30	0	17	0
Annual	99.7	8717	5.0	0	80	0	45	3

Table 117 SL PM2.5 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in ug/m3)				
	0 - 50	51 - 80	81 - 120	121 - 240	>240
January	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0%	0.0%	0.0%	0.0%	0.0%
August	98.0%	2.0%	0.0%	0.0%	0.0%
September	99.0%	1.0%	0.0%	0.0%	0.0%
October	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.7%	0.3%	0.0%	0.0%	0.0%

Table 118 SL PM2.5 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	0	0	0	8	0	16	0	0

Total Hours of Downtime	27	Total Hours of Calibration Time	16	Total Hours of Flagged	43

Table 119 SL RH 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (%)	Min. 1-hr (%)	Max. 1-hr (%)	Max. 24-hr (%)
January	99.3	739	84.7	30	100	100
February	100.0	672	81.8	46	100	98
March	99.9	743	76.3	35	100	100
April	99.4	716	65.3	23	100	99
May	99.7	742	60.8	17	100	91
June	100.0	720	70.6	19	100	100
July	100.0	744	75.3	34	100	100
August	100.0	744	73.5	30	100	99
September	99.2	714	68.4	23	100	100
October	99.1	737	63.2	17	100	100
November	99.9	719	83.1	34	100	100
December	100.0	744	81.7	44	95	91
Annual	99.7	8734	73.7	17	100	100

Table 120 SL RH 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	0	1	0	6	0	0	0	0

Total Hours of Downtime	26	Total Hours of Calibration Time	0	Total Hours of Flagged	26

Table 121 SL BP 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (mb)	Min. 1-hr (mb)	Max. 1-hr (mb)	Max. 24-hr (mb)
January	99.3	739	919	899	937	936
February	100.0	672	921	900	939	937
March	99.9	743	918	903	931	929
April	99.4	716	918	891	933	930
May	99.7	742	915	895	929	927
June	100.0	720	917	904	929	927
July	100.0	744	919	910	924	923
August	100.0	744	918	903	927	925
September	99.2	714	919	909	928	927
October	99.1	737	918	901	936	934
November	100.0	720	920	893	944	938
December	100.0	744	919	895	947	943
Annual	99.7	8735	918	891	947	943

Table 122 SL BP 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	0	0	0	6	0	0	0	0

Total Hours of Downtime	25	Total Hours of Calibration Time	0	Total Hours of Flagged	25

Table 123 SL AT 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (°C)	Min. 1-hr (°C)	Max. 1-hr (°C)	Max. 24-hr (°C)
January	99.3	739	-12.8	-34.0	6.7	0.9
February	100.0	672	-12.2	-31.9	8.9	3.4
March	99.9	743	-4.7	-23.0	10.2	5.9
April	99.4	716	1.0	-15.9	13.9	7.5
May	99.6	741	9.7	-2.4	20.9	14.4
June	100.0	720	15.2	6.2	25.2	17.4
July	100.0	744	17.9	8.4	29.5	23.0
August	100.0	744	19.1	8.3	29.6	23.3
September	99.2	714	13.7	2.7	30.4	21.9
October	99.1	737	7.5	-4.3	23.5	15.1
November	99.9	719	-7.7	-23.4	5.1	1.0
December	100.0	744	-17.7	-34.0	-3.5	-6.5
Annual	99.7	8733	2.4	-34.0	30.4	23.3

Table 124 SL AT 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	1	1	0	6	0	0	0	0

Total Hours of Downtime	27	Total Hours of Calibration Time	0	Total Hours of Flagged	27

Table 125 SL ST 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (°C)	Min. 1-hr (°C)	Max. 1-hr (°C)	Max. 24-hr (°C)
January	99.3	739	22.2	20.0	27.5	23.7
February	100.0	672	21.1	18.0	25.5	23.9
March	99.9	743	22.0	20.7	25.4	24.1
April	99.4	716	21.6	20.1	23.5	22.3
May	99.7	742	22.5	21.2	24.4	23.2
June	100.0	720	22.9	19.7	25.9	23.7
July	100.0	744	22.5	21.5	25.1	23.7
August	100.0	744	22.7	21.7	24.6	23.7
September	99.3	715	23.0	20.8	23.9	23.6
October	99.1	737	22.1	20.8	23.9	23.5
November	100.0	720	21.9	19.3	28.6	24.1
December	100.0	744	20.2	18.6	26.3	23.8
Annual	99.7	8736	22.1	18.0	28.6	24.1

Table 126 SL ST 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	0	0	0	5	0	0	0	0

Total Hours of Downtime	25	Total Hours of Calibration Time	0	Total Hours of Flagged	25

Table 127 SL Precipitation 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Total (mm)	Min. Total 1-hr (mm)	Max. Total 1-hr (mm)	Max. Total 24-hr (mm)
January	76.9	571	15.5	0.0	1.9	3.3
February	100.0	672	17.0	0.0	1.5	5.5
March	99.9	742	30.9	0.0	3.2	11.8
April	99.4	716	9.8	0.0	3.0	0.3
May	99.7	741	26.3	0.0	6.6	13.4
June	100.0	720	130.5	0.0	17.4	1.3
July	100.0	743	30.7	0.0	6.2	9.6
August	100.0	744	33.9	0.0	10.1	18.0
September	99.2	714	11.9	0.0	3.2	0.3
October	99.1	737	3.9	0.0	0.6	1.8
November	100.0	720	5.8	0.0	0.6	0.1
December	100.0	744	14.6	0.0	1.3	6.4
Annual	97.8	8564	330.8*	0.0	17.4	18.0

* Data represents the total (sum) for the year.

Table 128 SL Precipitation 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	167	0	0	0	0	4	0	0

Total Hours of Downtime	192	Total Hours of Calibration Time	4	Total Hours of Flagged	194

Table 129 SL WS 2022 Annual Continuous Data Summary

Month	Operational Uptime (%)	# of Readings	Monthly Avg. (kph)	Min. 1-hr (kph)	Max. 1-hr (kph)	Max. 24-hr (kph)
January	99.3	739	4.3	1.1	31.7	20.1
February	100.0	672	3.4	0.6	31.2	15.5
March	99.9	743	1.7	1.3	35.1	22.0
April	99.4	714	1.1	0.2	32.3	24.9
May	99.7	742	1.7	0.9	36.3	21.4
June	100.0	720	2.0	0.5	25.2	18.1
July	100.0	742	1.9	0.1	20.4	12.6
August	100.0	744	3.0	0.5	21.0	13.4
September	98.9	712	2.6	1.6	23.6	12.5
October	99.1	737	5.0	2.7	32.1	18.3
November	100.0	720	4.7	0.0	26.2	21.5
December	95.7	712	0.2	0.0	29.9	18.3
Annual	99.3	8697	2.6	0.0	36.3	24.9

Table 130 SL WS 2022 Annual Frequency Distribution

Month	Percentage of Readings in Concentration Range (in kph)				
	0 - 6	7 - 15	16 - 29	30 -39	>39
January	11.6%	65.8%	22.3%	0.3%	0.0%
February	15.5%	62.8%	21.6%	0.1%	0.0%
March	5.2%	71.9%	21.7%	1.2%	0.0%
April	11.1%	57.1%	31.2%	0.6%	0.0%
May	14.7%	66.7%	17.8%	0.8%	0.0%
June	40.0%	54.4%	5.6%	0.0%	0.0%
July	32.2%	62.8%	5.0%	0.0%	0.0%
August	31.9%	62.2%	5.9%	0.0%	0.0%
September	20.8%	73.5%	5.8%	0.0%	0.0%
October	10.9%	73.4%	15.6%	0.1%	0.0%
November	7.2%	66.8%	26.0%	0.0%	0.0%
December	19.0%	64.6%	16.3%	0.1%	0.0%
Annual	18.3%	65.2%	16.2%	0.3%	0.0%

Table 131 SL WS 2022 Qualifier Flag Summary

P	X	Y	K	N	NRM	C	S	Q
19	32	2	0	6	0	4	0	0

Total Hours of Downtime	59	Total Hours of Calibration Time	4	Total Hours of Flagged	63

1.4 Passive Stations

Table 132 SO2 Summary Statistics for Passive Stations

Parameter: SO2 (ppb)						
Station	**Annual Average**	**Maximum**	**Month**	**Minimum**	**Month**	**# of Samples**
3	0.4	0.6	January	0.2	May	12
3 DUP	0.3	0.3	-	0.3	-	1
4	0.5	0.9	January	0.2	May	12
4 DUP	0.5	0.5	-	0.5	-	1
5	0.5	0.9	December	0.2	April	12
5 DUP	0.7	0.7	-	0.7	-	1
6	0.6	1.1	December	0.3	April	12
6 DUP	0.5	0.5	-	0.5	-	1
8	0.6	0.8	July	0.3	April	12
8 DUP	0.5	0.5	-	0.5	-	1
9	0.4	0.6	January	0.2	May	12
9 DUP	0.5	0.7	-	0.4	-	2
10	0.5	0.9	December	0.3	March	12
10 DUP	0.4	0.7	-	0.2	-	2
11	0.5	0.9	December	0.3	June	12
11 DUP	0.5	0.6	-	0.4	-	2
12	0.5	0.8	January	0.2	June	11
12 DUP	0.5	0.6	-	0.3	-	2
13	0.5	0.9	January	0.2	May	12
13 DUP	0.8	0.8	-	0.8	-	2
14	1.4	1.9	November	0.7	May	12
14 DUP	2.0	2.1	-	1.9	-	2
15	0.4	0.6	January	0.2	October	12
15 DUP	0.4	0.5	-	0.3	-	2
16	0.4	0.7	December	0.2	April	12
16 DUP	0.6	0.7	-	0.5	-	2
17	0.7	1.5	December	0.3	April	12
17 DUP	0.9	1.2	-	0.6	-	2
18	0.4	0.7	December	0.1	July	11
18 DUP	0.5	0.7	-	0.2	-	2
19	0.4	0.7	January	0.2	May	12
19 DUP	0.4	0.6	-	0.2	-	2
22	0.3	0.5	January	0.1	May	12
22 DUP	0.4	0.5	-	0.3	-	2
23	0.3	0.5	December	0.1	May	12
23 DUP	0.3	0.3	-	0.2	-	3
24	0.5	0.9	December	0.2	April	12
24 DUP	0.3	0.3	-	0.3	-	1
25	NA	NA	NA	NA	NA	NA
25DUP	NA	NA	-	NA	-	0
26	0.6	2.2	March	0.4	May	12
26 DUP	0.4	0.7	-	0.4	-	1
27	1.4	0.7	November	0.5	April	12
27 DUP	0.7	0.0	-	0.7	-	1
28	0.5	0.6	January	0.3	March	11

28 DUP	NA	0.3	-	0.0	-	0
29	0.4	0.7	January	0.2	April	12
29 DUP	0.3	0.3	-	0.3	-	1
32	0.5	0.6	January	0.2	April	12
32 DUP	0.3	0.3	-	0.3	-	1
42	0.4	0.6	December	0.2	June	8
42 DUP	0.3	0.3	-	0.3	-	1

Notes:

- Results from passive samples and their duplicates were compared; all data were ± 0.3 ppb of each other throughout the year.
- The sample blanks indicated no apparent contamination throughout the year.
- Monitoring at the station 42 Lac La Biche station started in June. The annual average was calculated based on the results of June to December. The annual result cannot be used for the station comparison as the 75% of valid data collected in 2022 requirement did not meet.
- No samples were collected at station 25 throughout the year. The field technician has not completed the necessary safety orientation for the CNRL Primrose/Burnt Lake site and access is not permitted at this time.
- No samples were collected at station 12 and station 28 in May as the access to the station was not available during the sample media exchange.

Table 133 NO2 Summary Statistics for Passive Stations

Parameter: NO2 (ppb)						
Station	**Annual Average**	**Maximum**	**Month**	**Minimum**	**Month**	**# of Samples**
3	1.2	2.9	January	0.5	July	12
3 DUP	2.6	2.6	-	2.6	-	1
4	1.0	2.1	January	0.4	March	12
4 DUP	2.1	2.1	-	2.1	-	2
5	1.0	2.6	December	0.4	April	12
5 DUP	2.2	2.2	-	2.2	-	1
6	2.9	5.0	January	1.6	April	12
6 DUP	5.2	7.0	-	3.4	-	2
8	1.1	4.7	November	0.3	July	12
8 DUP	0.9	0.9	-	0.9	-	1
9	1.5	3.9	December	0.3	April	12
9 DUP	0.5	0.5	-	0.5	-	1
10	3.6	6.6	January	1.6	April	12
10 DUP	2.5	2.5	-	2.5	-	1
11	1.5	7.2	November	0.3	July	12
11 DUP	0.4	0.4	-	0.4	-	1
12	0.8	1.9	November	0.1	August	11
12 DUP	0.3	0.3	-	0.3	-	1
13	0.7	1.6	January	0.2	April	12
13 DUP	0.2	0.2	-	0.2	-	1
14	1.6	3.4	January	0.6	May	12
14 DUP	0.6	0.6	-	0.6	-	1
15	1.5	3.3	December	0.2	April	12
15 DUP	1.2	1.2	-	1.2	-	1
16	1.5	3.4	November	0.4	May	12
16 DUP	0.6	0.6	-	0.6	-	1
17	1.4	3.9	November	0.5	March	12
17 DUP	0.7	0.7	-	0.7	-	1
18	1.0	2.7	December	0.2	April	12
18 DUP	0.5	0.5	-	0.5	-	1
19	1.0	2.5	December	0.3	May	12
19 DUP	0.3	0.3	-	0.3	-	1
22	1.4	3.5	January	0.5	May	12
22 DUP	0.5	0.5	-	0.5	-	1
23	0.7	2.6	November	<0.1	April	12
23 DUP	0.3	0.3	-	0.3	-	1
24	1.8	4.1	December	0.9	November	12
24 DUP	1.8	1.8	-	1.8	-	1
28	3.5	7.3	January	1.2	August	11
28 DUP	3.4	3.4	-	3.4	-	1
29	1.7	4.0	January	0.4	May	12
29 DUP	1.5	1.5	-	1.5	-	1
32	0.9	2.3	January	0.2	May	12
32 DUP	1.7	1.7	-	1.7	-	1
42	2.4	6.7	January	0.4	July	7
42 DUP	4.1	4.1	-	4.1	-	1

Notes:

- Results from passive samples and their duplicates were compared; all data are ± 0.5 ppb of each other throughout the year.
- The sample blanks indicated no apparent contamination throughout the year.
- Monitoring at the station 42 Lac La Biche station started in June. The annual average was calculated based on the results of June to December. The annual result cannot be used for the station comparison as the 75% of valid data collected in 2022 requirement did not meet.
- No samples were collected at station 12 and station 28 in May as the access to the station was not available during the sample media exchange.

Table 134 O3 Summary Statistics for Passive Stations

Parameter: O3 (ppb)						
Station	**Annual Average**	**Maximum**	**Month**	**Minimum**	**Month**	**# of Samples**
3	32.9	52.2	March	24.2	October	12
3 DUP	34.2	37.7	-	34.2	-	1
4	35.0	51.3	March	24.9	September	12
4 DUP	32.6	38.7	-	30.3	-	2
5	32.5	48.0	March	24.0	July	12
5 DUP	39.5	39.7	-	39.5	-	1
6	30.1	43.1	March	20.8	August	12
6 DUP	37.6	40.7	-	34.9	-	2
8	33.0	43.5	March	24.1	July	12
8 DUP	44.4	41.7	-	44.4	-	1
9	30.0	45.6	March	20.0	September	12
9 DUP	47.9	42.7	-	47.9	-	1
10	27.1	43.2	March	16.4	September	12
10 DUP	42.0	43.7	-	42.0	-	1
11	25.2	37.9	March	16.8	September	12
11 DUP	33.1	44.7	-	33.1	-	1
12	29.3	38.0	March	20.5	August	11
12 DUP	36.7	45.7	-	36.7	-	1
13	26.1	38.3	March	16.4	August	12
13 DUP	26.9	46.7	-	26.9	-	1
14	32.6	43.3	March	24.8	October	12
14 DUP	28.5	47.7	-	28.5	-	1
15	29.2	40.7	March	17.1	August	12
15 DUP	28.6	48.7	-	28.6	-	1
16	28.5	41.4	March	18.7	July	12
16 DUP	32.7	49.7	-	32.7	-	1
17	36.7	53.5	March	25.0	August	12
17 DUP	23.9	50.7	-	23.9	-	1
18	29.9	40.6	March	20.0	July	10
18 DUP	20.9	51.7	-	20.9	-	1
19	33.9	42.8	March	24.0	September	12
19 DUP	25.7	52.7	-	25.7	-	1
22	28.4	37.8	March	18.6	August	12
22 DUP	22.9	53.7	-	22.9	-	1
23	25.1	38.9	April	13.9	September	12
23 DUP	15.0	54.7	-	15.0	-	1
24	32.0	46.8	March	24.2	August	12
24 DUP	26.1	55.7	-	26.1	-	1
28	28.7	37.4	March	23.5	September	11
28 DUP	27.7	56.7	-	27.7	-	1
29	30.1	39.8	March	20.3	September	12
29 DUP	30.8	57.7	-	30.8	-	1
32	35.3	48.0	March	26.4	September	12
32 DUP	36.5	58.7	-	36.5	-	1
42	29.4	32.3	September	24.5	October	7
42 DUP	32.1	59.7	-	32.1	-	1

Notes:

- Results from passive samples and their duplicates were compared; all data are ± 9.2 ppb of each other throughout the year.
- The sample blanks indicated no apparent contamination throughout the year.
- Monitoring at the station 42 Lac La Biche station started in June. The annual average was calculated based on the results of June to December. The annual result cannot be used for the station comparison as the 75% of valid data collected in 2022 requirement did not meet.
- No samples were collected at station 12 and station 28 in May as the access to the station was not available during the sample media exchange.
- The O3 sample media for station 18 was found damaged during sample collection on August 31 and was found missing during the sample collection on September 29. No analytical result could be reported in August and September.

Table 135 H2S Summary Statistics for Passive Stations

Parameter: H2S (ppb)						
Station	**Annual Average**	**Maximum**	**Month**	**Minimum**	**Month**	**# of Samples**
3	0.21	0.50	July	0.07	April	12
3 DUP	0.52	0.52	-	0.52	-	1
5	0.38	1.21	August	0.11	March	12
5 DUP	1.05	1.05	-	1.05	-	1
10	0.23	0.51	July	0.10	April	11
10 DUP	0.44	0.44	-	0.44	-	1
11	0.14	0.24	December	0.07	October	12
11 DUP	0.15	0.15	-	0.15	-	1
12	0.12	0.19	December	0.05	October	11
12 DUP	0.11	0.11	-	0.11	-	1
13	0.12	0.18	January	0.06	June	12
13 DUP	0.18	0.21	-	0.14	-	2
14	0.28	0.46	September	0.16	October	12
14 DUP	0.23	0.31	-	0.14	-	2
16	0.18	0.34	August	0.10	October	12
16 DUP	0.14	0.19	-	0.09	-	2
17	0.30	0.68	August	0.15	April	12
17 DUP	0.22	0.25	-	0.19	-	2
18	0.14	0.24	August	0.06	October	11
18 DUP	0.12	0.15	-	0.09	-	2
22	0.20	0.46	July	0.07	April	12
22 DUP	0.16	0.21	-	0.11	-	2
24	0.22	0.43	August	0.10	April	12
24 DUP	0.18	0.27	-	0.09	-	2
25	NA	NA	NA	NA	NA	0
25 DUP	NA	NA	-	NA	-	0
26	0.24	0.48	November	0.16	May	12
26 DUP	0.20	0.22	-	0.18	-	2
27	0.90	3.01	September	0.18	March	12
27 DUP	0.33	0.36	-	0.30	-	2
28	0.29	0.64	September	0.12	November	4
29	0.21	0.37	August	0.09	April	12
29 DUP	0.12	0.12	-	0.12	-	1
32	0.24	0.53	August	0.11	March	12
32 DUP	0.38	0.38	-	0.38	-	1
42	0.26	0.39	August	0.10	October	7
42 DUP	0.37	0.37	-	0.37	-	1

Notes:

- Results from passive samples and their duplicates were compared; all data are ± 0.09 ppb of each other throughout the year.
- The sample blanks indicated no apparent contamination throughout the year.
- No samples were collected at station 12 in May as the access to the station was not available during the sample media exchange.
- The H2S sample for station 10 was found missing in May. No analytical result could be reported.

- The H2S sample media for station 18 was found missing during the sample collection on September 29. No analytical result could be reported in September.
- Monitoring at the station 42 Lac La Biche station started in June. The annual average was calculated based on the results of June to December. The annual result cannot be used for the station comparison as the 75% of valid data collected in 2022 requirement did not meet.
- H2S sample collection was added at station 28 in September. Four sample collections were completed in 2022. The annual result cannot be used for the station comparison as the 75% of valid data collected in 2022 requirement did not meet.

Table 136 HNO3 Summary Statistics for Passive Stations

Parameter: HNO3 (ug/m3)						
Station	**Annual Average**	**Maximum**	**Month**	**Minimum**	**Month**	**# of Samples**
3	0.99	0.68	November	0.68	October	3
3 DUP	NA	NA	-	NA	-	0
4	0.76	0.62	November	0.62	December	3
4 DUP	NA	NA	-	NA	-	0
5	1.15	0.93	October	0.93	November	3
5 DUP	NA	NA	-	NA	-	0
6	0.82	0.51	November	0.51	December	3
6 DUP	NA	NA	-	NA	-	0
8	1.06	0.68	November	0.68	October	3
8 DUP	NA	NA	-	NA	-	0
9	0.74	0.56	December	0.56	October	3
9 DUP	NA	NA	-	NA	-	0
10	1.71	0.91	November	0.91	December	3
10 DUP	NA	NA	-	NA	-	0
11	1.54	1.04	December	1.04	November	3
11 DUP	NA	NA	-	NA	-	0
12	0.89	0.65	November	0.65	December	3
12 DUP	NA	NA	-	NA	-	0
13	0.95	0.74	November	0.74	December	3
13 DUP	NA	NA	-	1.16	-	1
14	0.91	0.69	November	0.69	October	3
14 DUP	NA	NA	-	0.83	-	1
15	0.95	0.64	November	0.64	December	3
15 DUP	NA	NA	-	1.92	-	1
16	1.09	0.75	November	0.75	December	3
16 DUP	NA	NA	-	0.42	-	2
17	1.37	0.84	November	0.84	December	3
17 DUP	NA	NA	-	0.81	-	1
18	1.49	1.12	October	1.12	November	3
18 DUP	NA	NA	-	NA	-	0
19	1.37	0.95	October	0.95	December	3
19 DUP	NA	NA	-	NA	-	0
22	1.16	0.81	October	0.81	December	3
22 DUP	NA	NA	-	NA	-	0
23	0.74	0.51	November	0.51	October	3
23 DUP	NA	NA	-	NA	-	0
24	1.19	0.73	November	0.73	October	3
24 DUP	NA	NA	-	NA	-	0
25	NA	NA	NA	NA	NA	0
25DUP	NA	NA	NA	NA	NA	0
26	1.63	1.16	November	1.16	December	3
26 DUP	NA	NA	-	NA	-	0
27	1.24	0.72	November	0.72	December	3
27 DUP	NA	NA	-	NA	-	0
28	1.88	0.76	November	0.76	October	3
28 DUP	NA	NA	-	NA	-	0
29	1.11	0.60	November	0.60	October	3
29 DUP	NA	NA	-	NA	-	0

32	1.88	0.74	December	0.74	October	3
32 DUP	NA	NA	-	NA	-	0
42	1.59	1.22	November	1.22	December	3
42 DUP	NA	NA	-	NA	-	0

Notes:

- Results from passive samples and their duplicates were compared; all data are ± 1.12 ug/m3 of each other throughout the monitoring months.
- The sample blanks indicated no apparent contamination throughout the monitoring months.
- In October, nitric acid (HNO3) wase added to the network to support implementation of LICA's Acid Deposition Monitoring Strategy for the Cold Lake Region. The sample media were installed along with the existing passive parameters (SO2, H2S, NO2 and O3) in all LICA passive monitoring stations.
- The annual average was calculated based on the results of October to December. The annual result cannot be used for the station comparison as the 75% of valid data collected in 2022 requirement did not meet.

Table 137 NH3 Summary Statistics for Passive Stations

Parameter: NH3 (ppb)						
Station	**Annual Average**	**Maximum**	**Month**	**Minimum**	**Month**	**# of Samples**
3	1.8	2.6	November	0.8	December	3
3 DUP	NA	NA	-	NA	-	0
4	1.3	1.7	November	1.1	October	3
4 DUP	NA	NA	-	NA	-	0
5	1.1	1.6	October	0.7	November	3
5 DUP	NA	NA	-	NA	-	0
6	1.1	1.3	October	0.8	November	3
6 DUP	NA	NA	-	NA	-	0
8	1.2	1.9	October	0.3	December	3
8 DUP	NA	NA	-	NA	-	0
9	0.6	1.2	October	0.2	December	3
9 DUP	NA	NA	-	NA	-	0
10	0.9	1.4	December	0.5	November	3
10 DUP	NA	NA	-	NA	-	0
11	0.5	0.7	October	0.4	December	3
11 DUP	NA	NA	-	NA	-	0
12	0.5	0.6	October	0.3	November	3
12 DUP	NA	NA	-	NA	-	0
13	0.6	0.9	December	0.3	October	3
13 DUP	NA	NA	-	0.5	-	1
14	0.6	0.8	October	0.3	December	3
14 DUP	NA	NA	-	0.8	-	1
15	0.9	1.3	October	0.6	December	3
15 DUP	NA	NA	-	1.0	-	1
16	1.5	3.3	October	0.4	December	3
16 DUP	NA	NA	-	1.6	-	2
17	1.2	2.1	October	0.6	November	3
17 DUP	NA	NA	-	1.0	-	1
18	0.9	1.2	November	0.6	October	3
18 DUP	NA	NA	-	NA	-	0
19	0.9	1.2	November	0.7	October	3
19 DUP	NA	NA	-	NA	-	0
22	1.2	1.6	November	0.6	December	3
22 DUP	NA	NA	-	NA	-	0
23	0.5	0.7	November	0.4	December	3
23 DUP	NA	NA	-	NA	-	0
24	0.9	1.1	October	0.7	December	3
24 DUP	NA	NA	-	NA	-	0
25	NA	NA	NA	NA	NA	0
25DUP	NA	NA	-	NA	-	0
26	0.8	0.9	December	0.6	November	3
26 DUP	NA	NA	-	NA	-	0
27	0.9	1.1	October	0.7	December	3
27 DUP	NA	NA	-	NA	-	0
28	1.7	2.1	November	1.4	December	3
28 DUP	NA	NA	-	NA	-	0
29	1.0	1.1	October	0.9	November	3
29 DUP	NA	NA	-	NA	-	0

32	0.8	1.6	October	0.2	November	3
32 DUP	NA	NA	-	NA	-	0
42	1.3	1.5	October	1.2	November	3
42 DUP	NA	NA	-	NA	-	0

Notes:

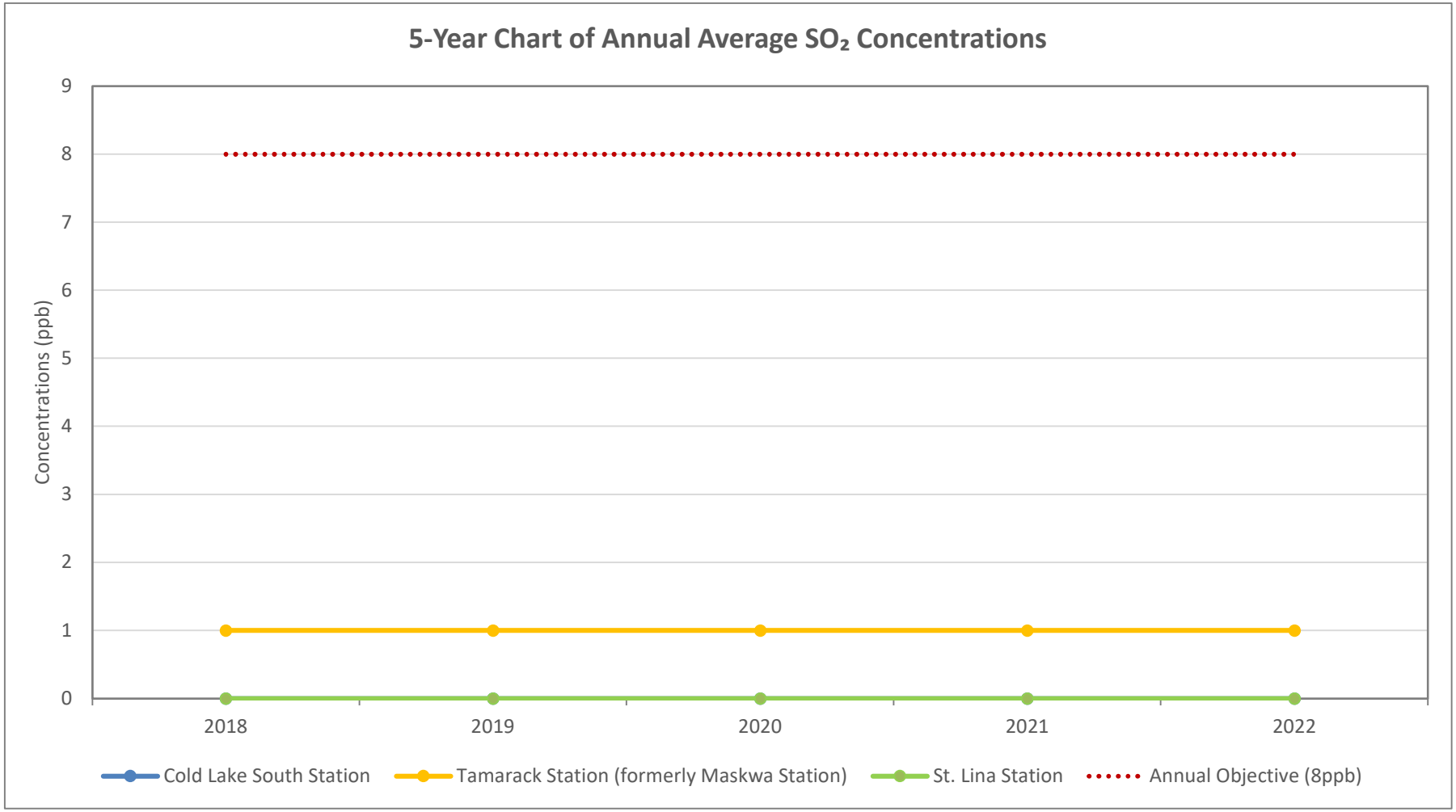
- Results from passive samples and their duplicates were compared; all data are ± 0.8 ppb of each other throughout the monitoring months.
- The sample blanks indicated no apparent contamination throughout the monitoring months.
- In October, ammonia (NH3) was added to the network to support implementation of LICA's Acid Deposition Monitoring Strategy for the Cold Lake Region. The sample media were installed along with the existing passive parameters (SO2, H2S, NO2 and O3) in all LICA passive monitoring stations.
- The annual average was calculated based on the results of October to December. The annual result cannot be used for the station comparison as the 75% of valid data collected in 2022 requirement did not meet.

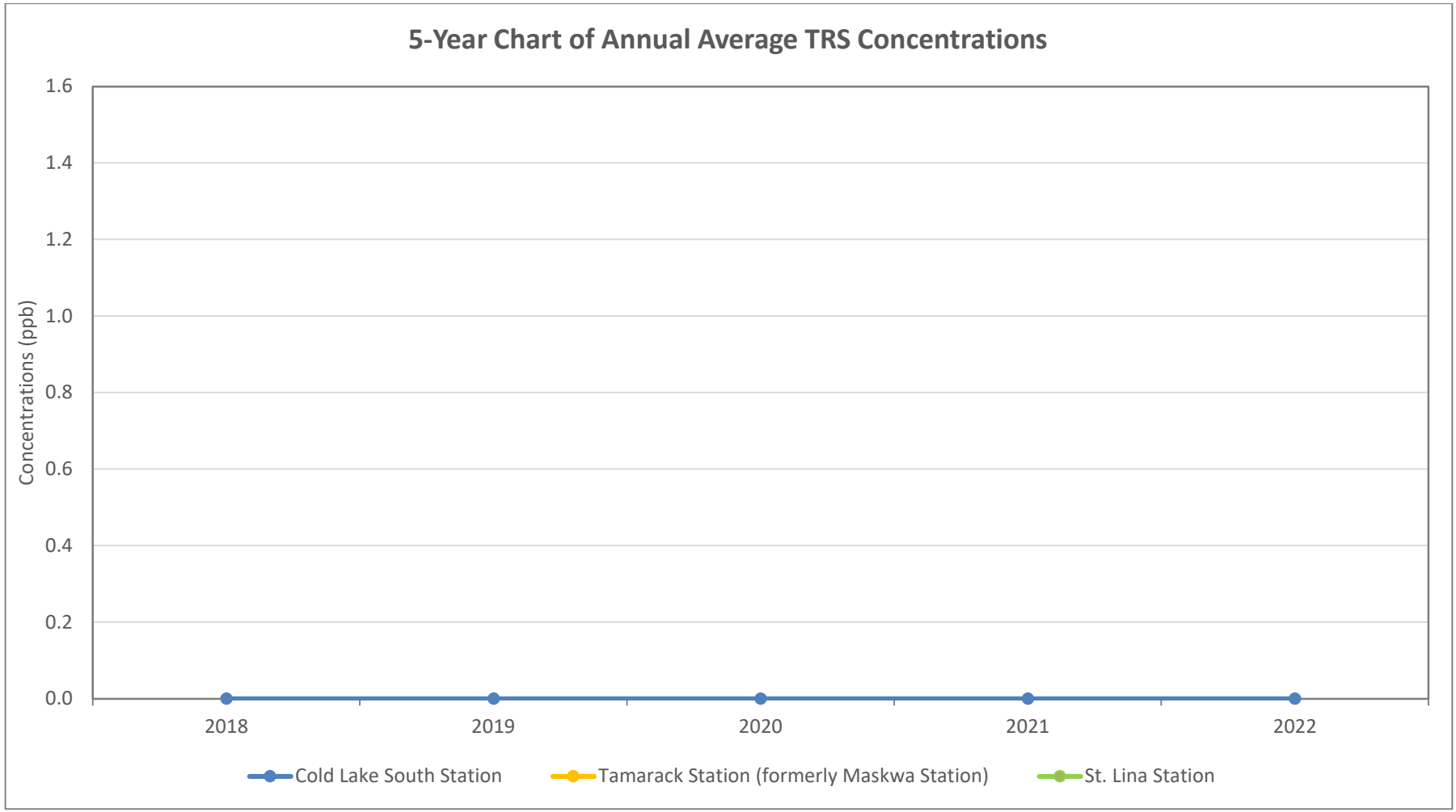
Table 138 Summary of AAAQO Exceedances at Passive Stations

SO2 (ppb) 30-Day Objective: 11 ppb	
Month	**# Stations of Exceedance**
January	0
February	0
March	0
April	0
May	0
June	0
July	0
August	0
September	0
October	0
November	0
December	0
Total	**0**
SO2 (ppb) Annual Objective: 8.0 ppb	
Year	**AAAQO Exceedance**
2022	0
NO2 (ppb) Annual Objective: 24 ppb	
Year	**AAAQO Exceedance**
2022	0

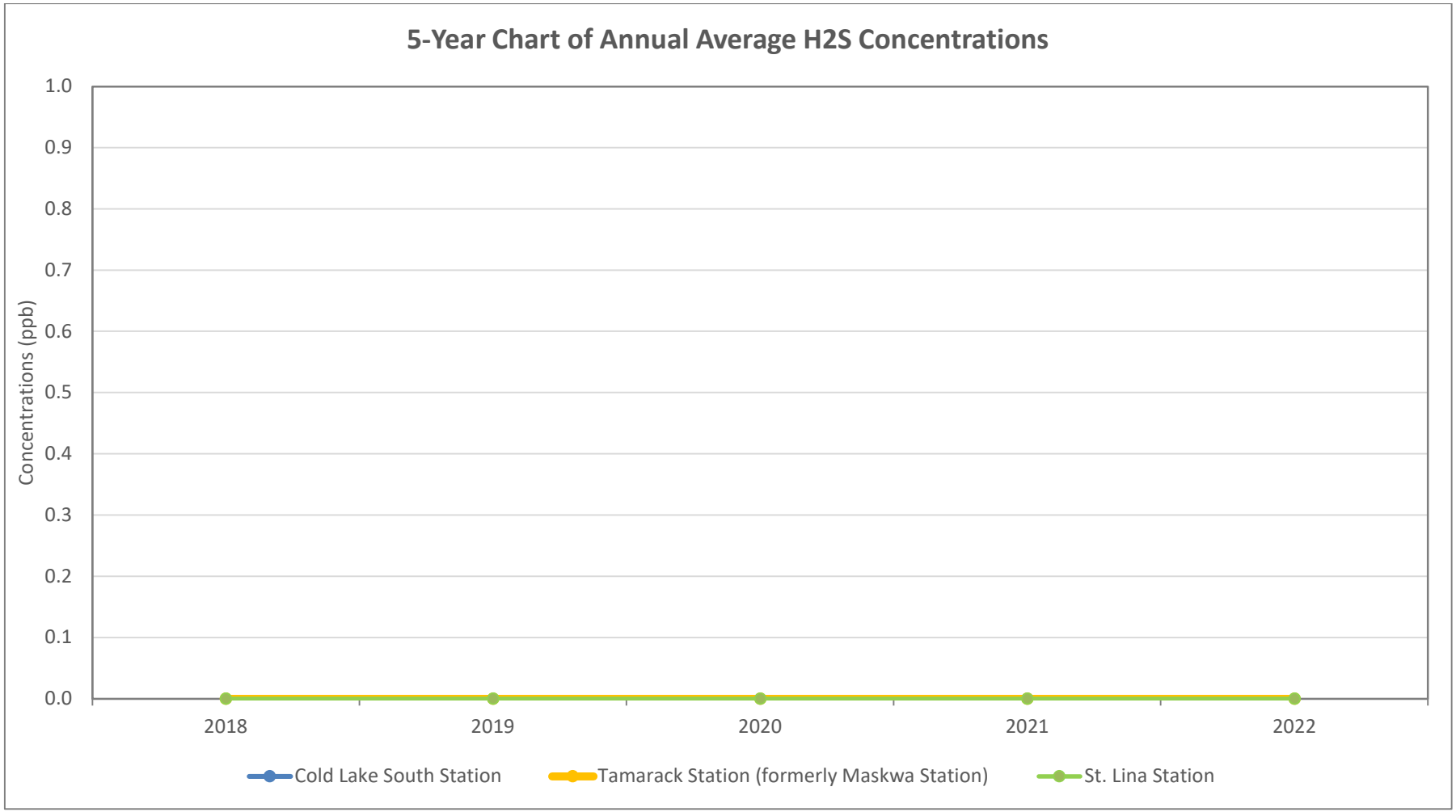
2. 5-Year Charts of Annual Average Concentrations

2.1 Continuous Stations

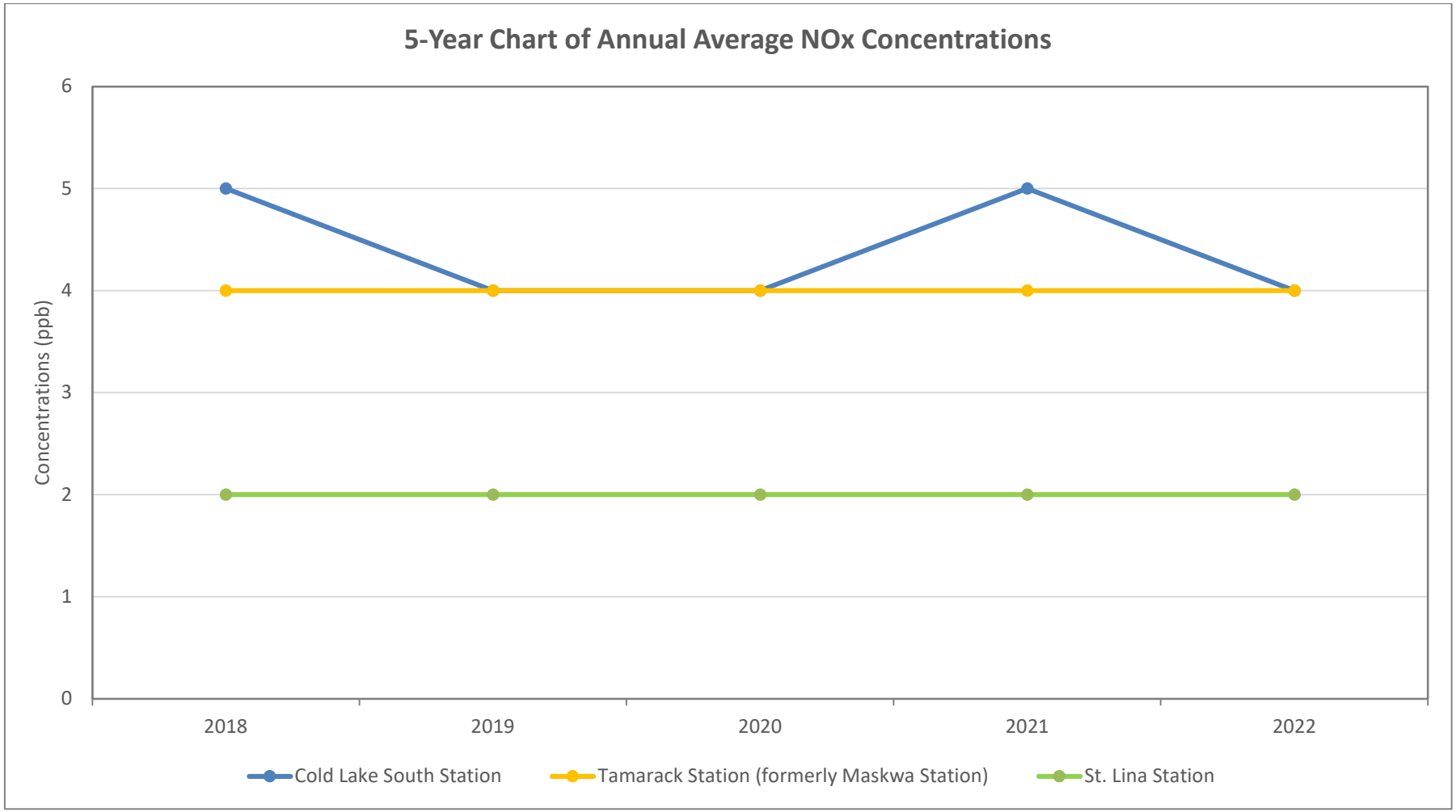


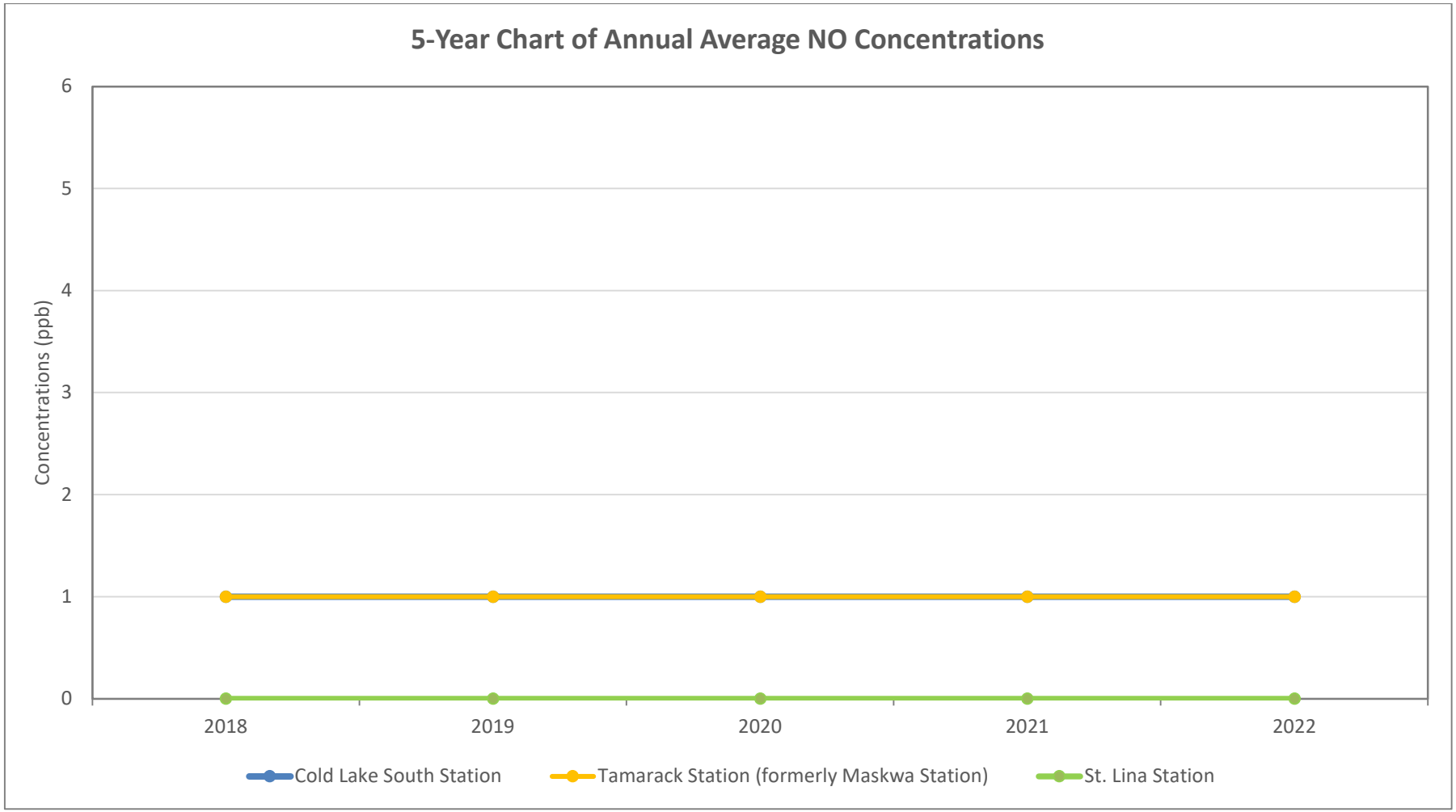


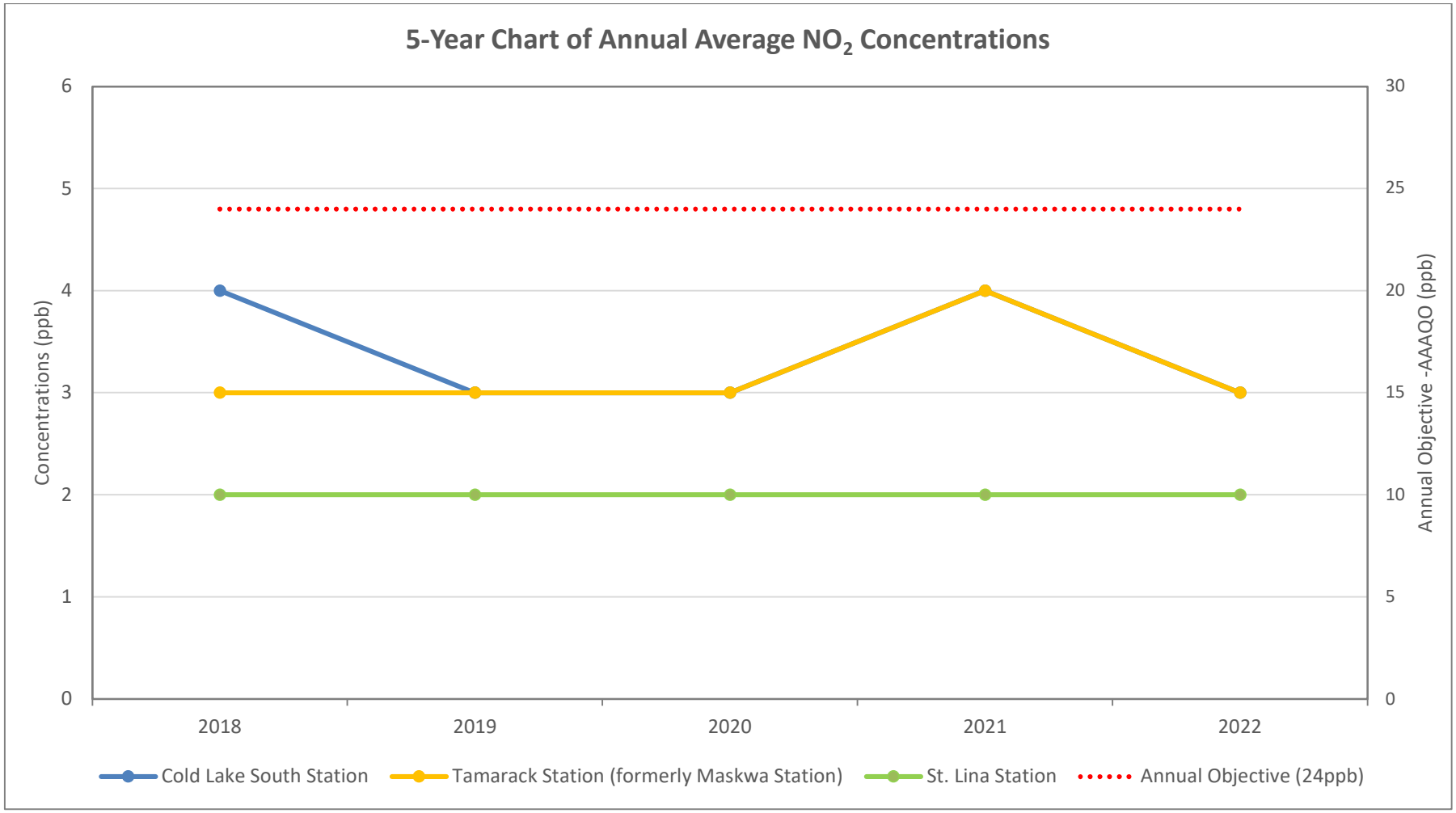
Note: TRS was only monitored at Cold Lake South Station.



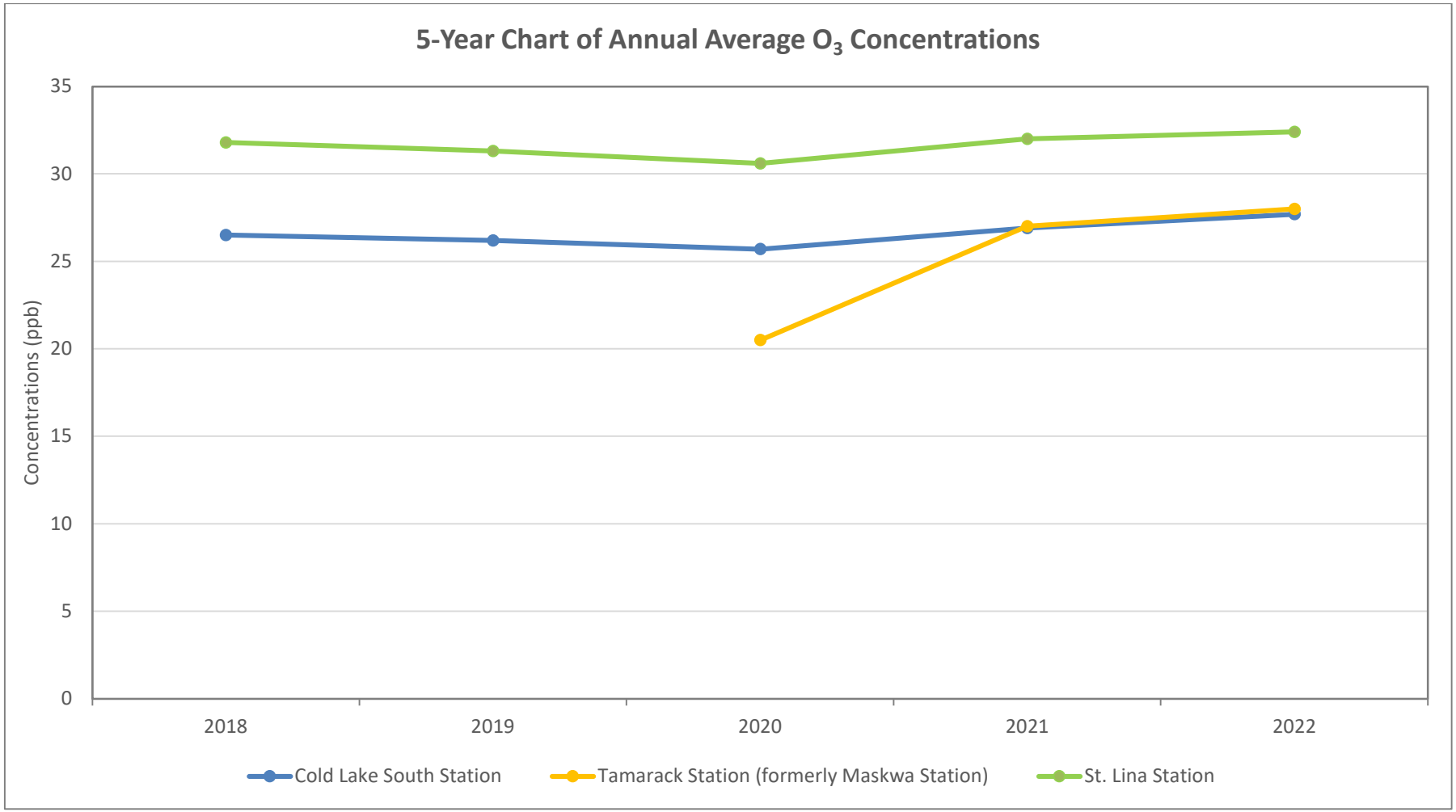
Note: H2S was not monitored at Cold Lake South Station.


5-Year Chart of Annual Average NOx Concentrations
Concentrations (ppb)
6
5
4
3
2
1
0
2018
2019
2020
2021
2022
Cold Lake South Station
Tamarack Station (formerly Maskwa Station)
St. Lina Station

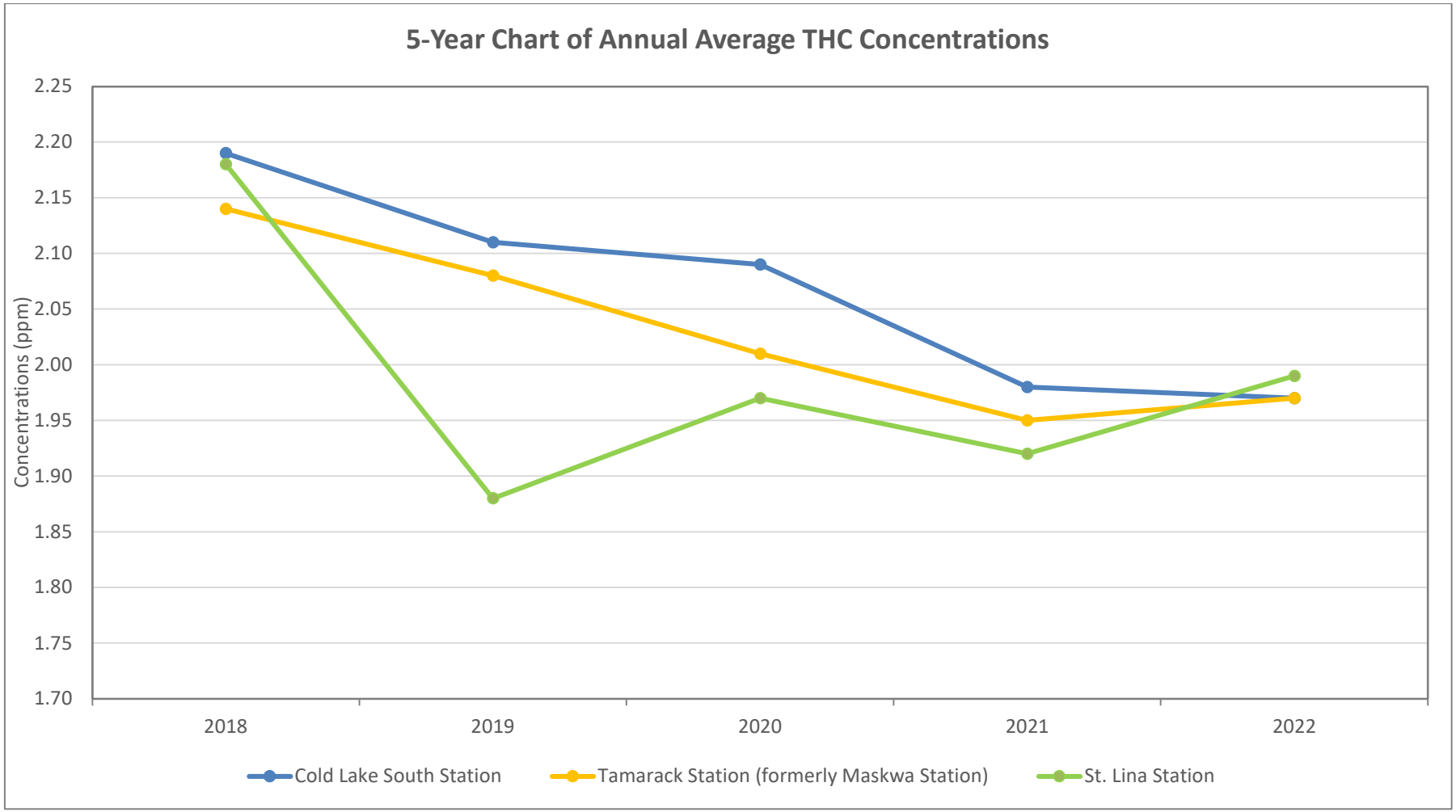

5-Year Chart of Annual Average NO Concentrations
Concentrations (ppb)
6
5
4
3
2
1
0
2018
2019
2020
2021
2022
Cold Lake South Station
Tamarack Station (formerly Maskwa Station)
St. Lina Station

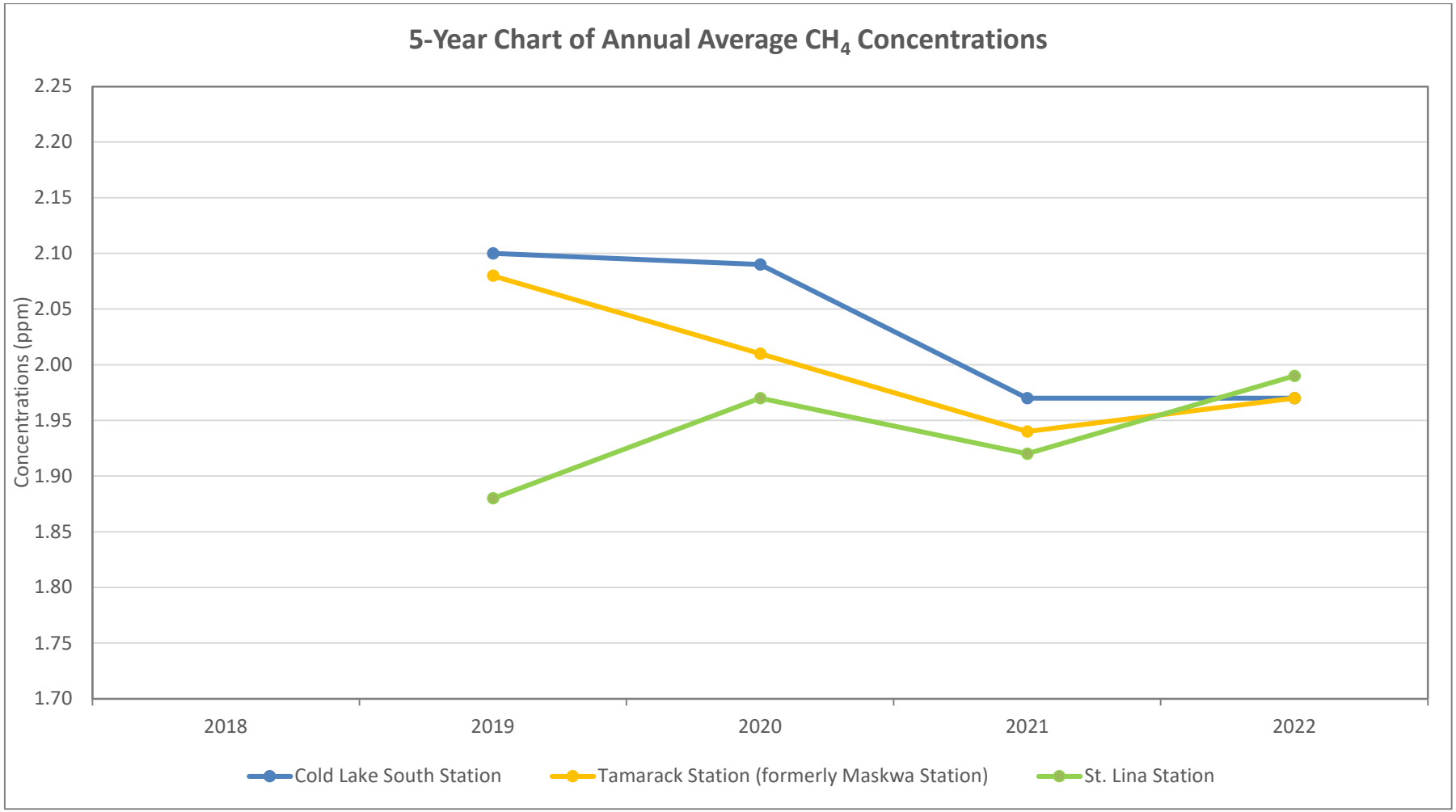


Note: Alberta Ambient Air Quality Objective (AAAQO) is graphed on the secondary y-axis.

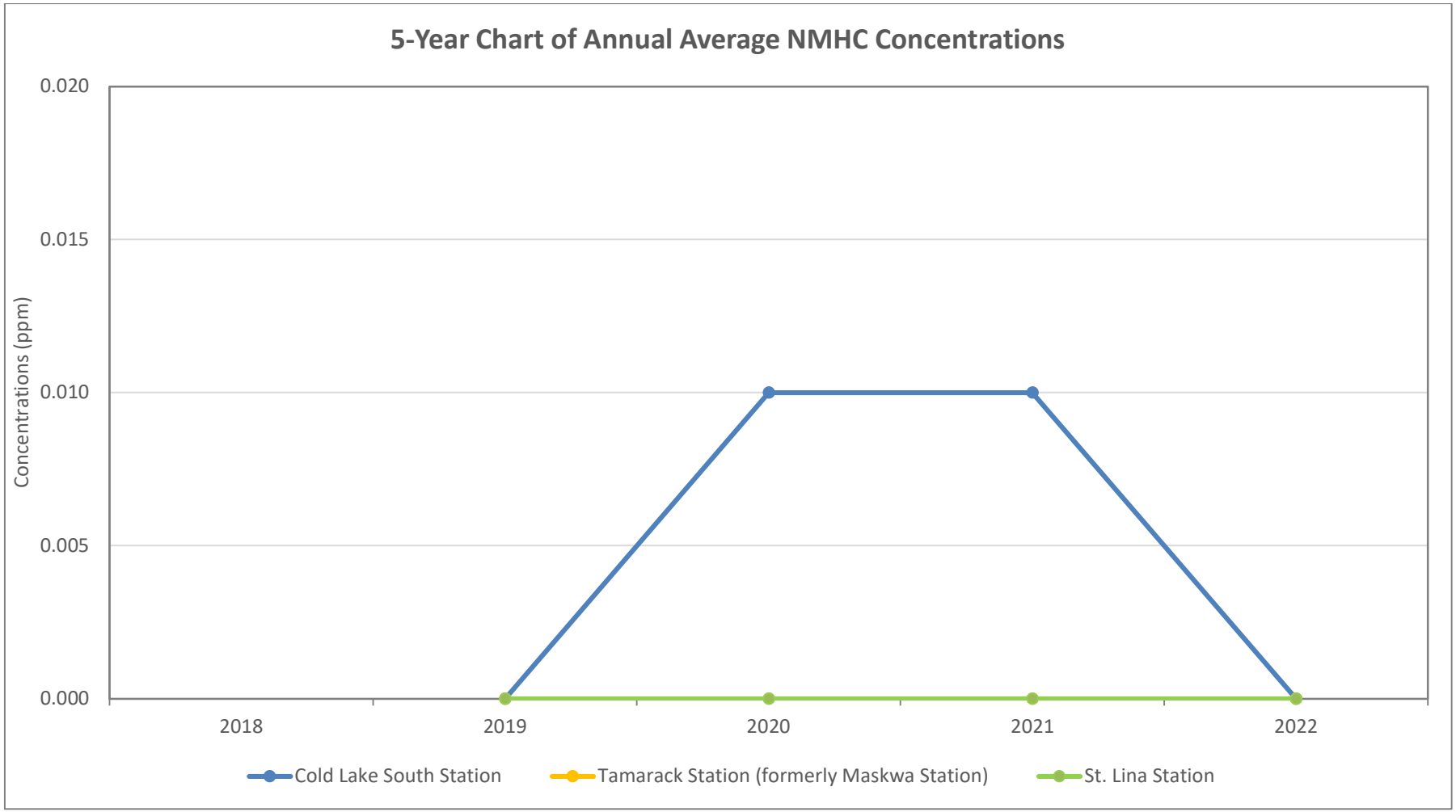


Note: O3 was not monitored at Tamarack (formerly Maskwa) Station until October 2020 – no previous data available.

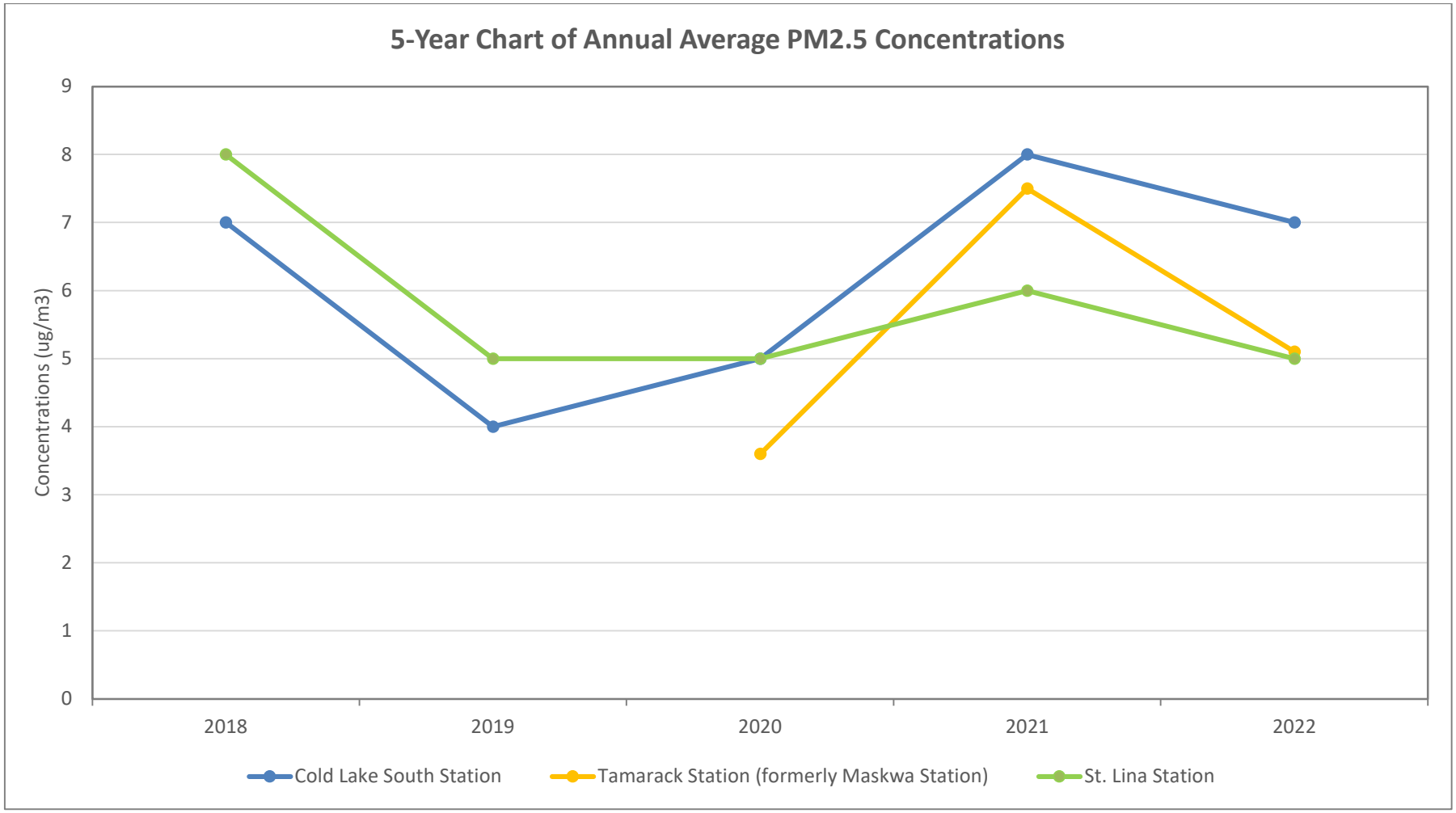

5-Year Chart of Annual Average THC Concentrations
Concentrations (ppm)
2.25
2.20
2.15
2.10
2.05
2.00
1.95
1.90
1.85
1.80
1.75
1.70
2018
2019
2020
2021
2022
Cold Lake South Station
Tamarack Station (formerly Maskwa Station)
St. Lina Station



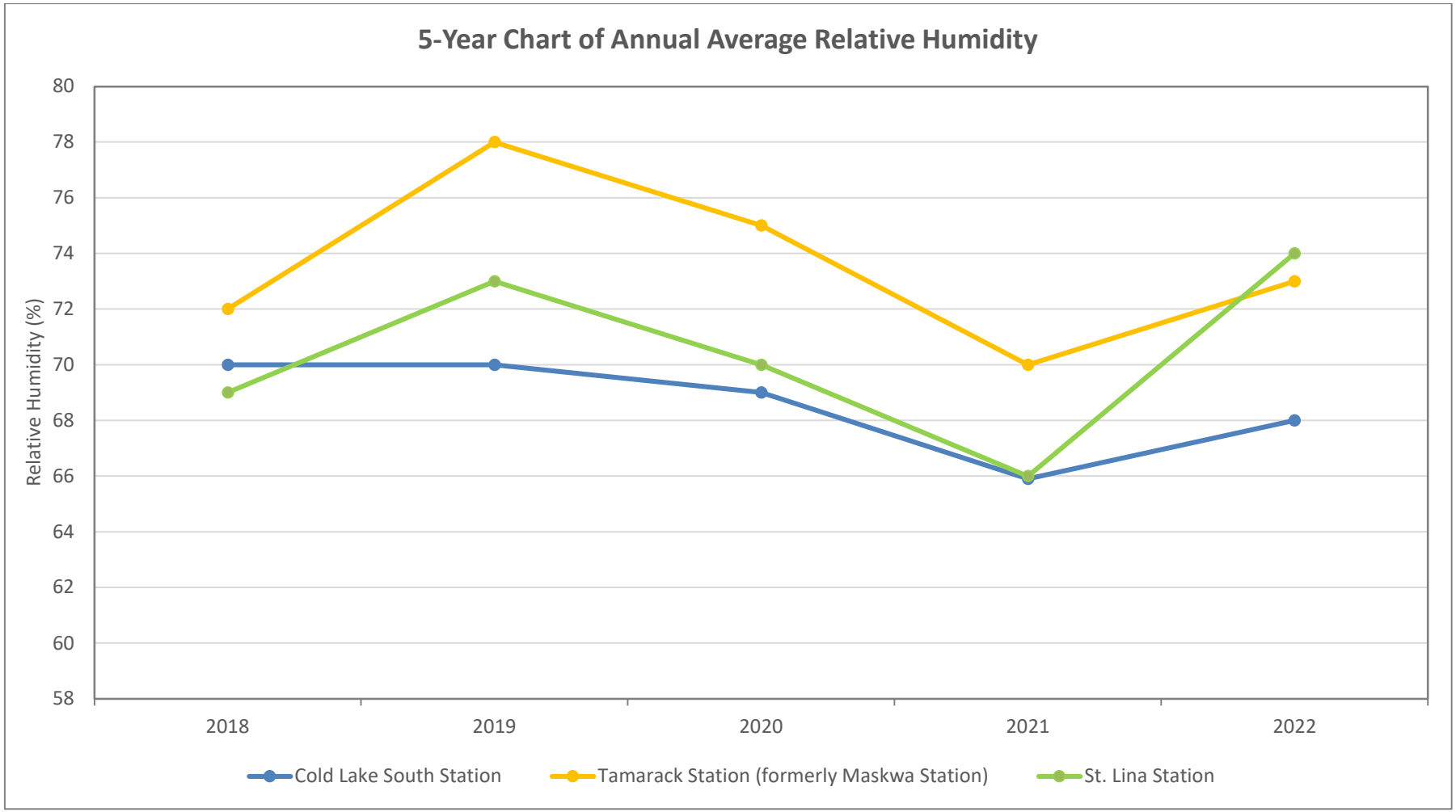
Note: HC analyzer, which collected CH4 data, was not installed in Cold Lake South, Tamarack (formerly Maskwa) and St. Lina until 2019 – no previous data available.

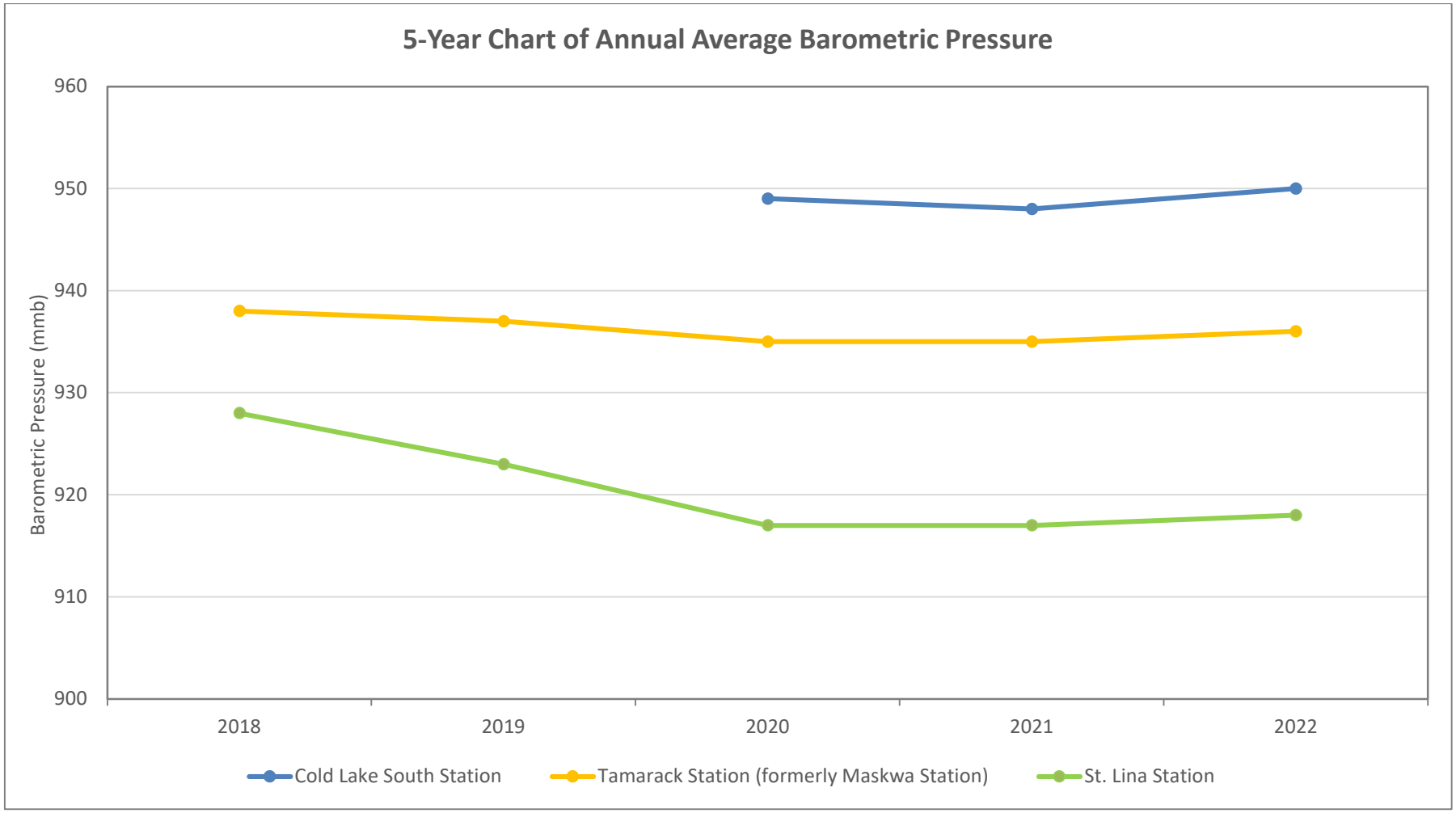


Note: HC analyzer, which collected NMHC data, was not installed in Cold Lake South, Tamarack (formerly Maskwa) and St. Lina until 2019 – no previous data available.

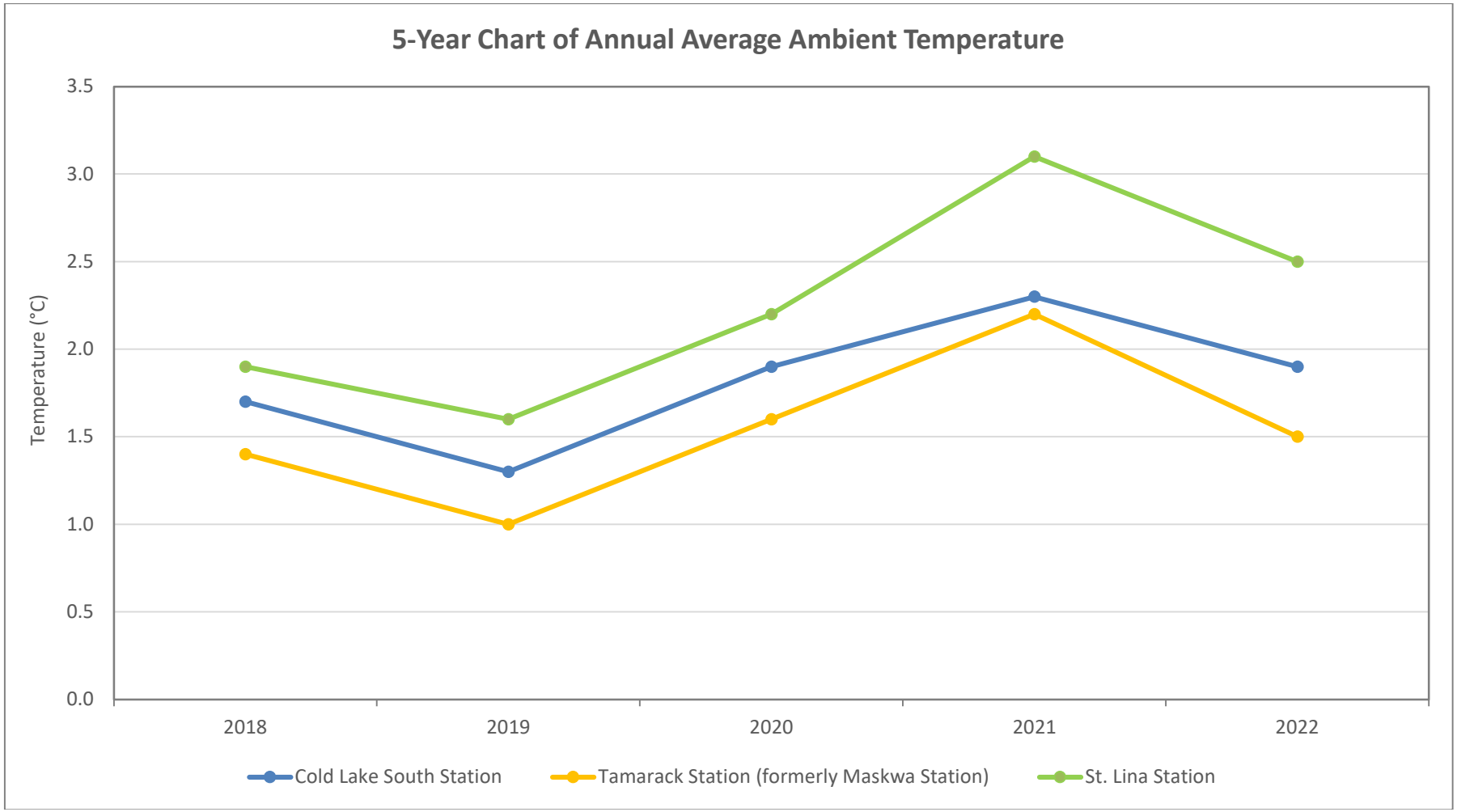


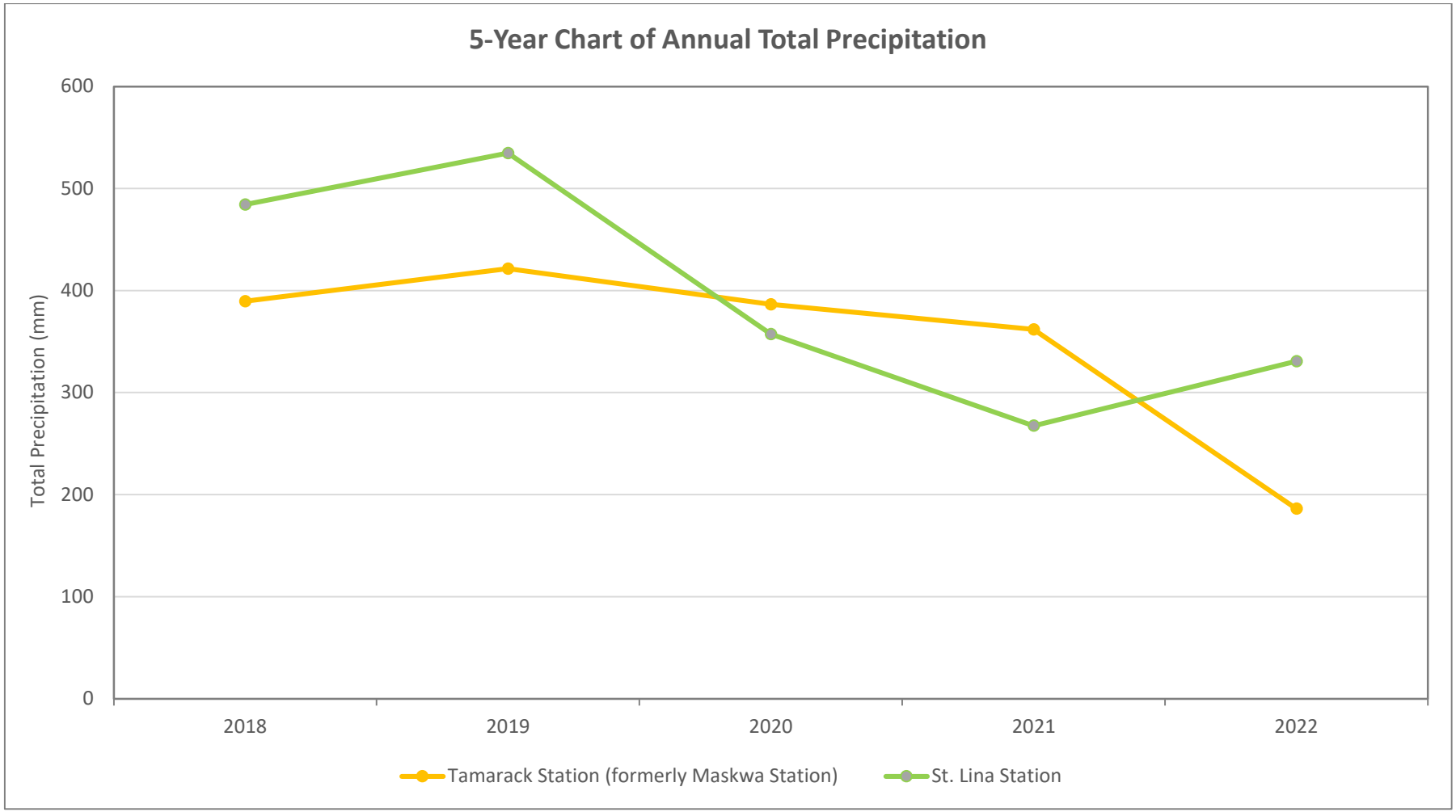
Note: PM2.5 was not monitored at Tamarack (formerly Maskwa) until June 2020 – no previous data available.


5-Year Chart of Annual Average Relative Humidity
Relative Humidity (%)
80
78
76
74
72
70
68
66
64
62
60
58
2018
2019
2020
2021
2022
Cold Lake South Station
Tamarack Station (formerly Maskwa Station)
St. Lina Station

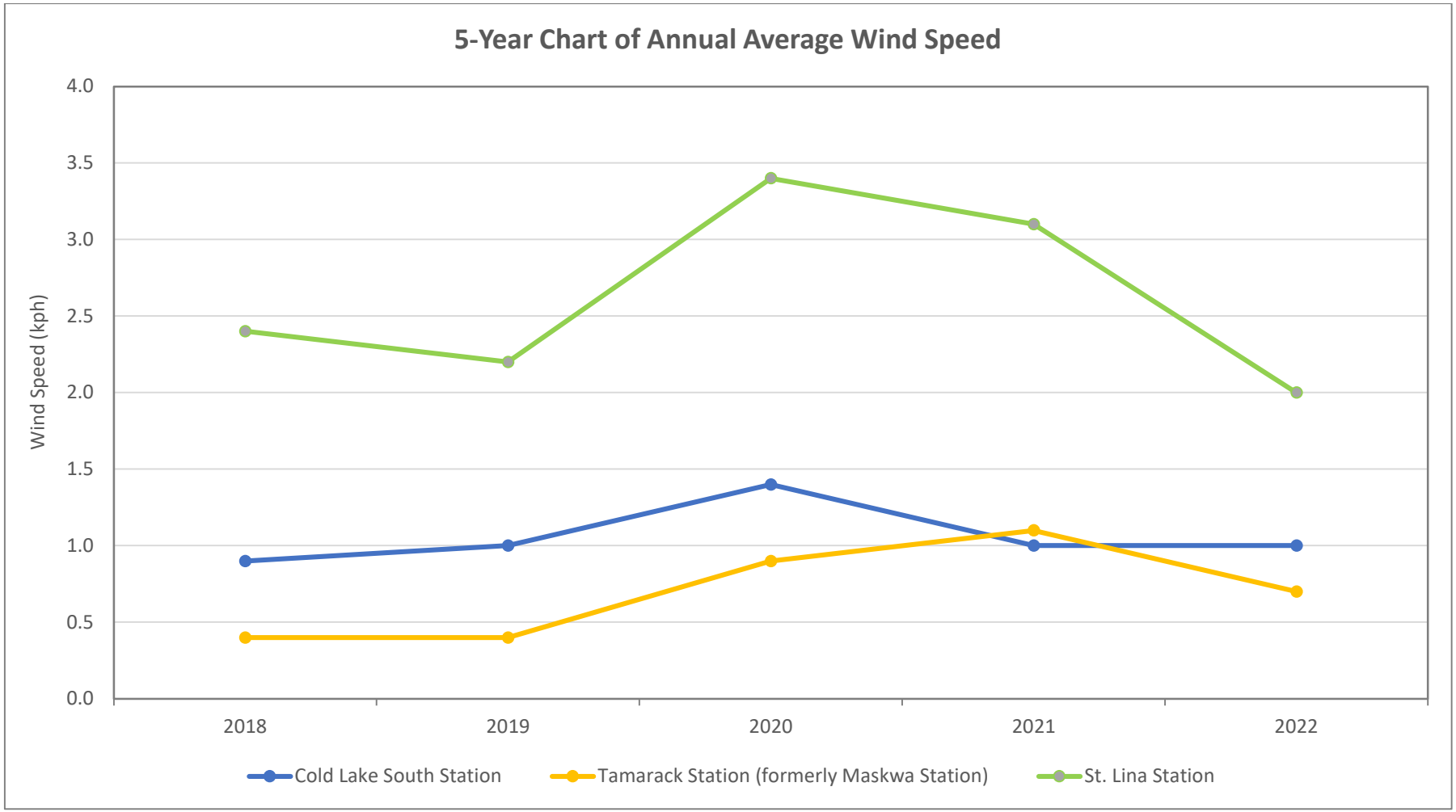


Note: BP was not monitored at Cold Lake South Station until September 2020 – no previous data available.

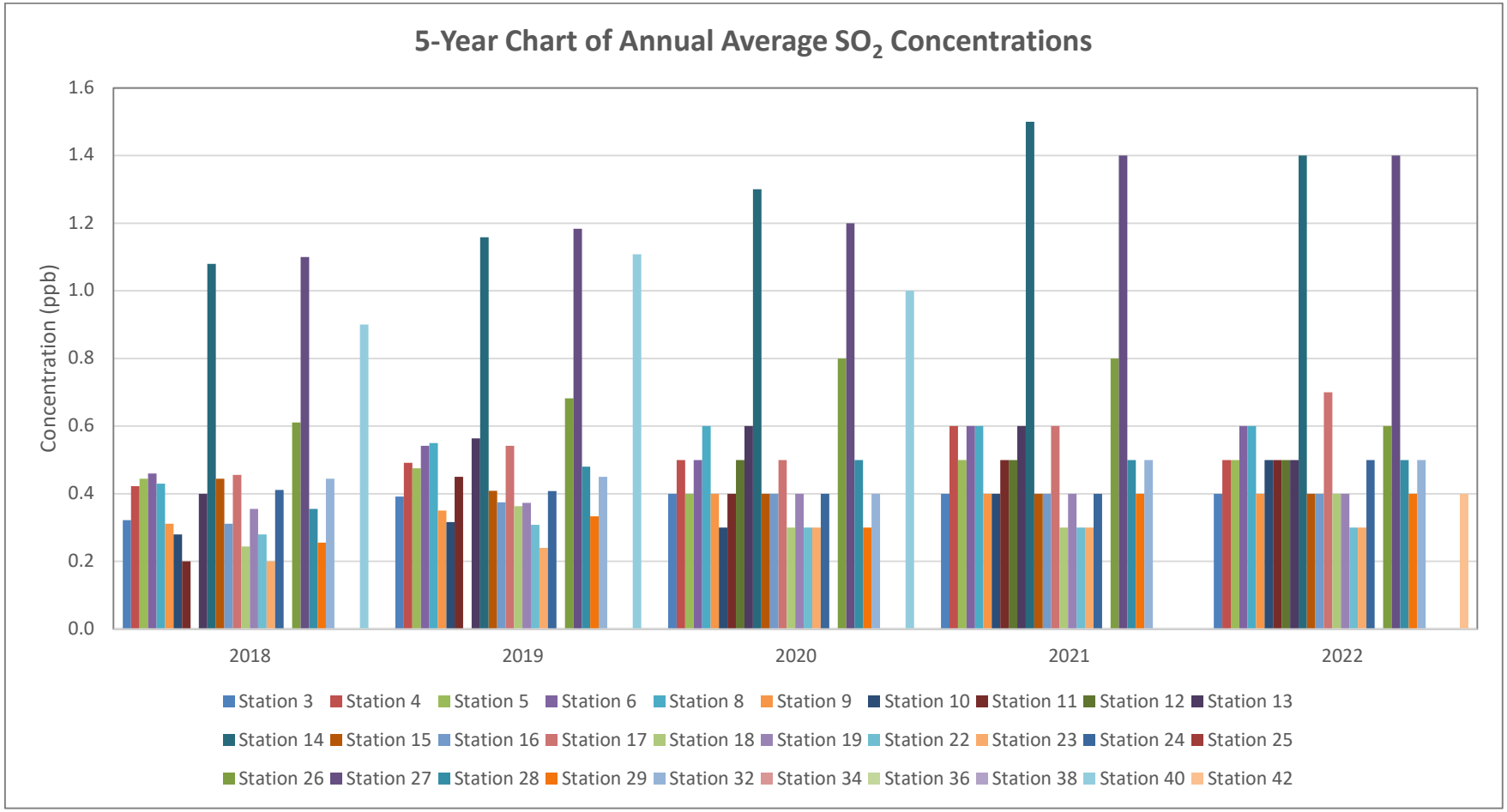

5-Year Chart of Annual Average Ambient Temperature
Temperature (°C)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2018
2019
2020
2021
2022
Cold Lake South Station
Tamarack Station (formerly Maskwa Station)
St. Lina Station

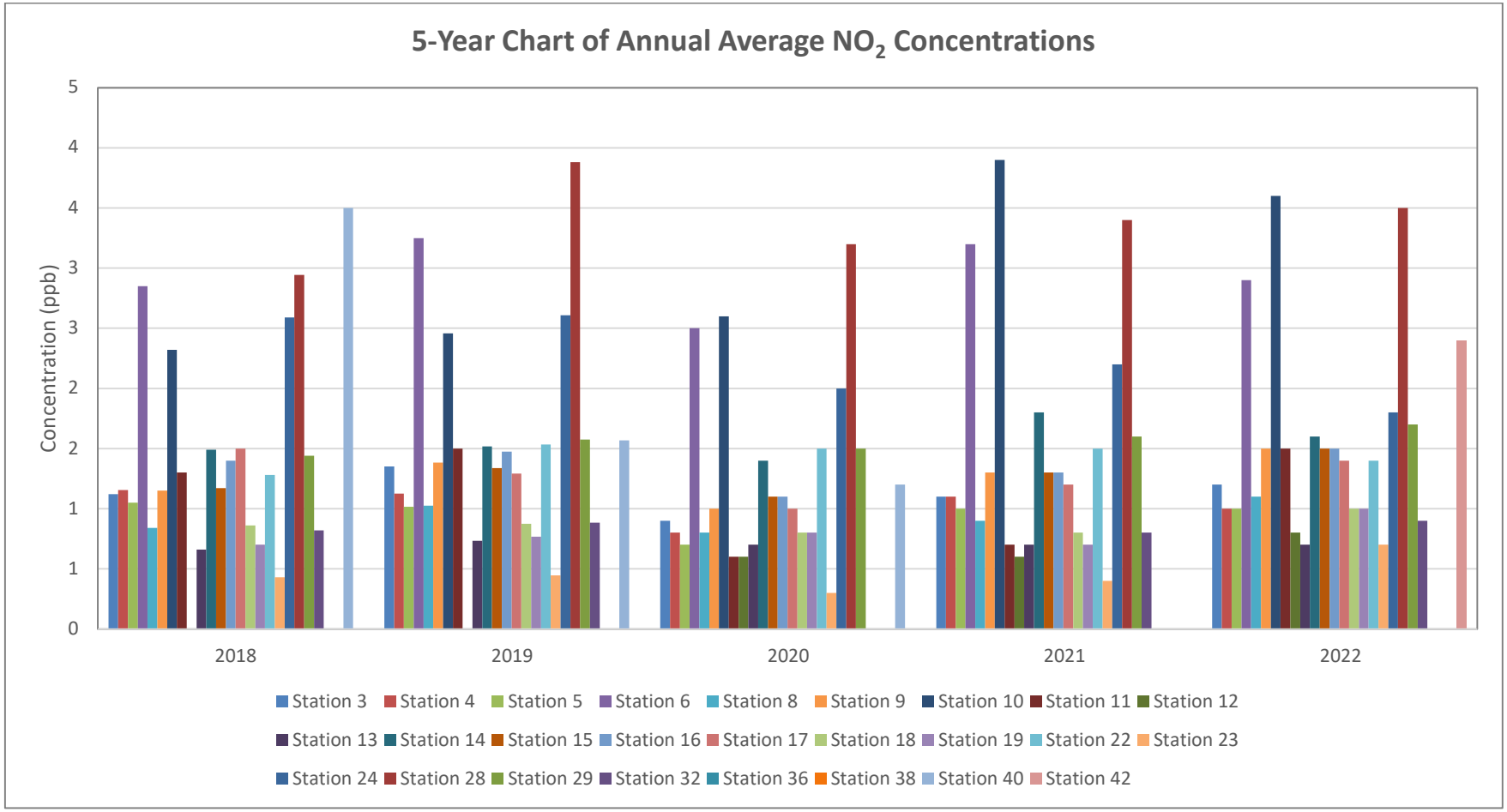


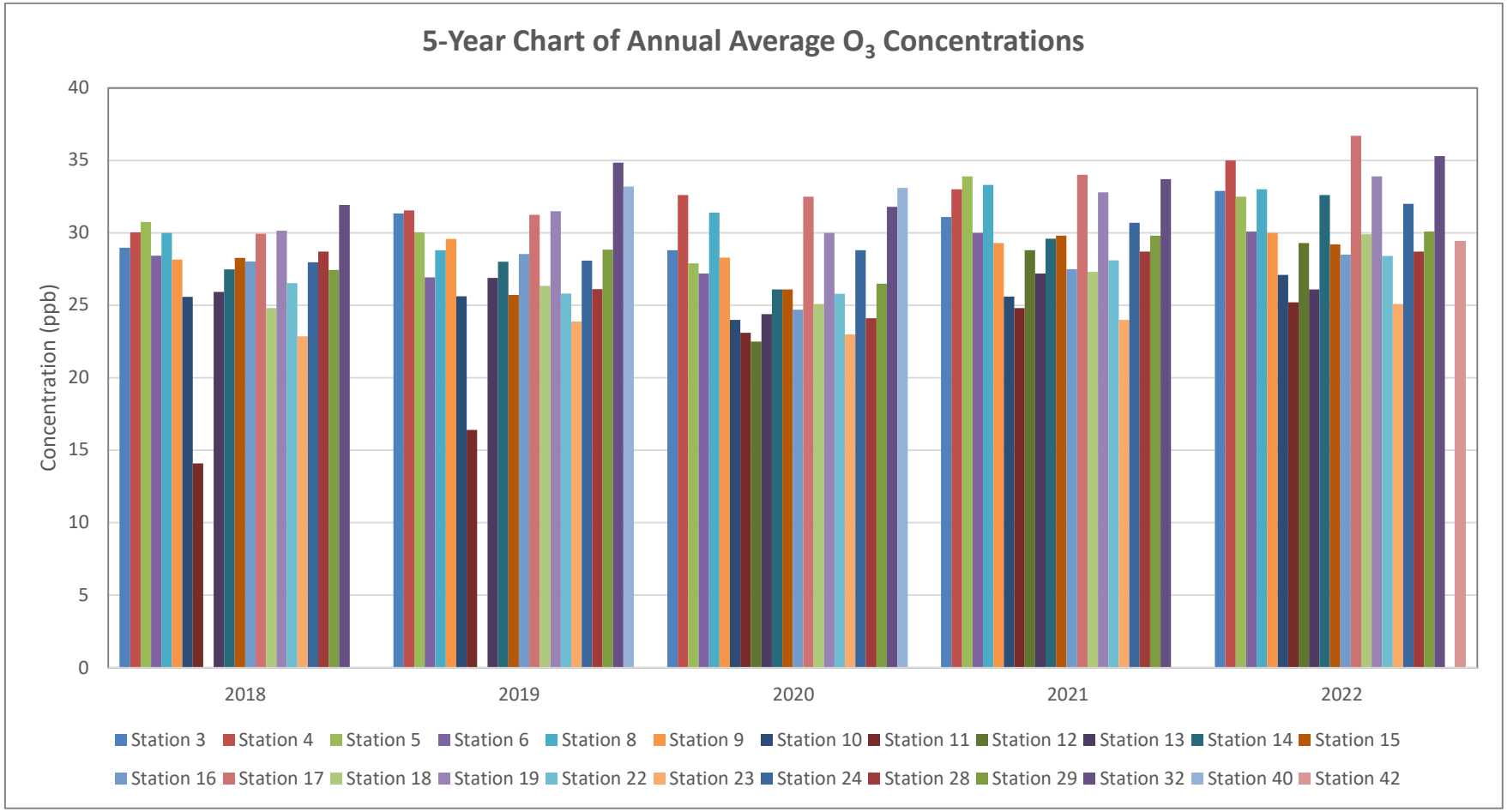
Note: Precipitation was not monitored at Cold Lake South Station.

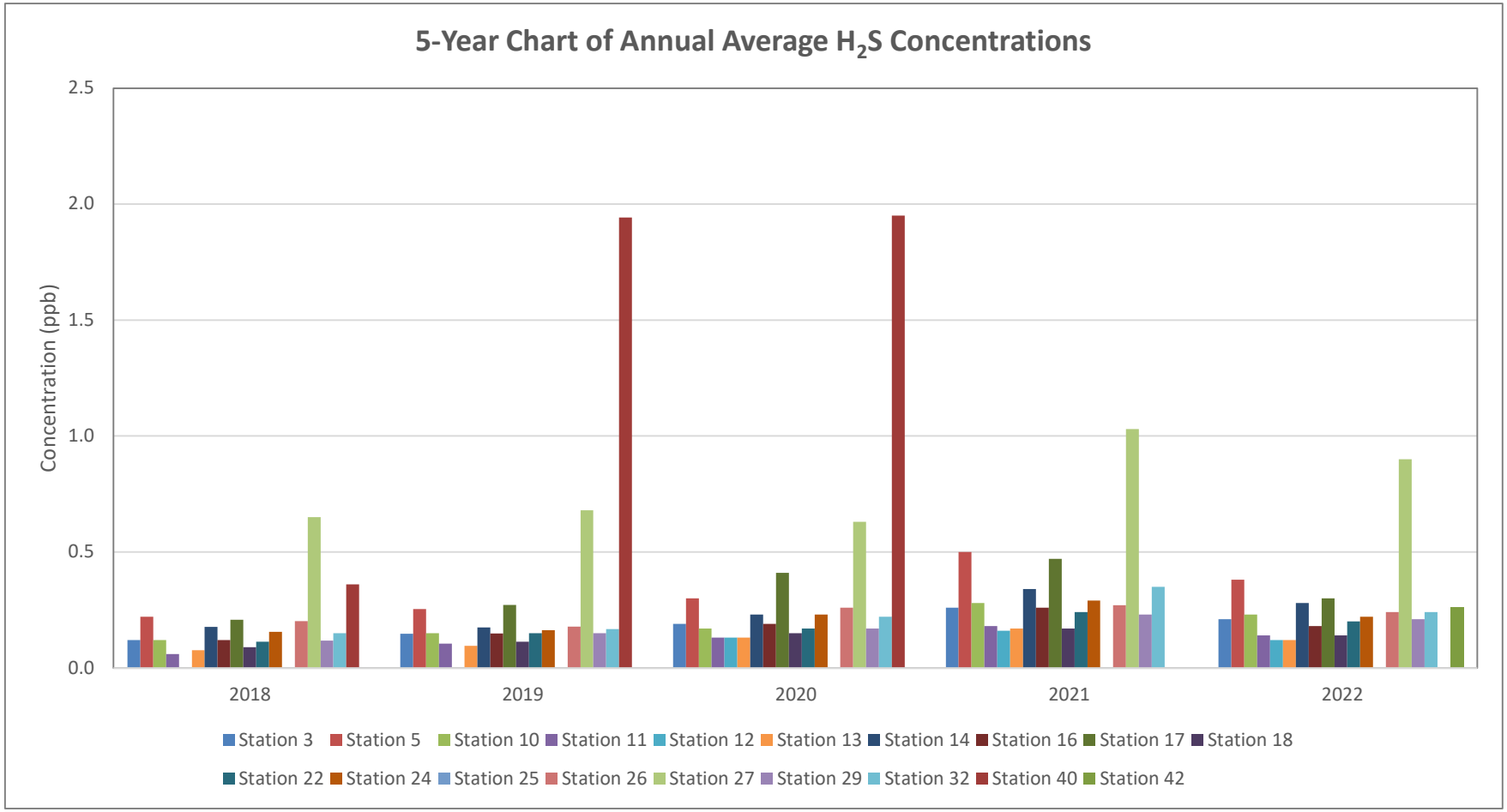

5-Year Chart of Annual Average Wind Speed
Wind Speed (kph)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2018
2019
2020
2021
2022
Cold Lake South Station
Tamarack Station (formerly Maskwa Station)
St. Lina Station

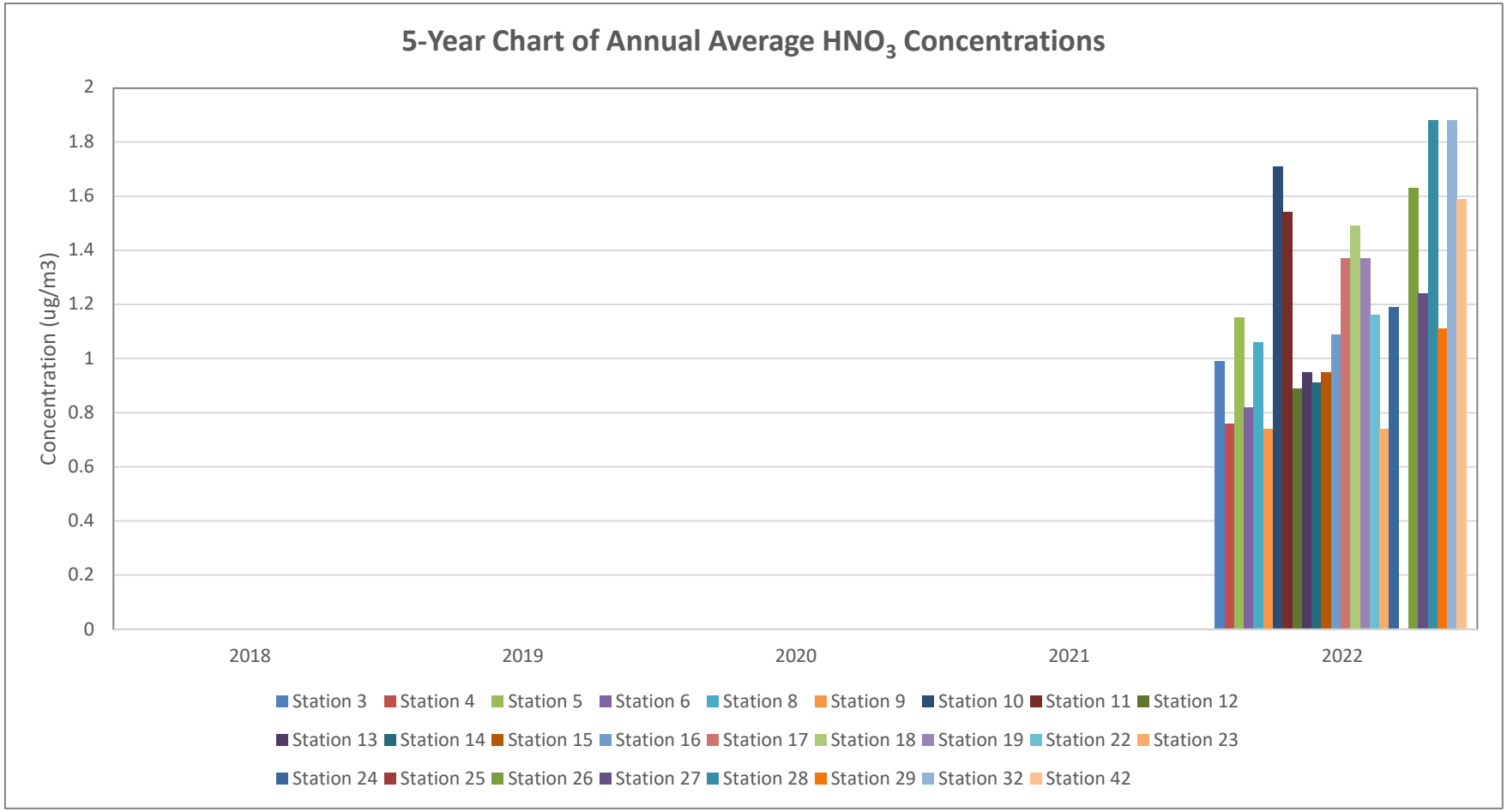
2.2 Passive Stations



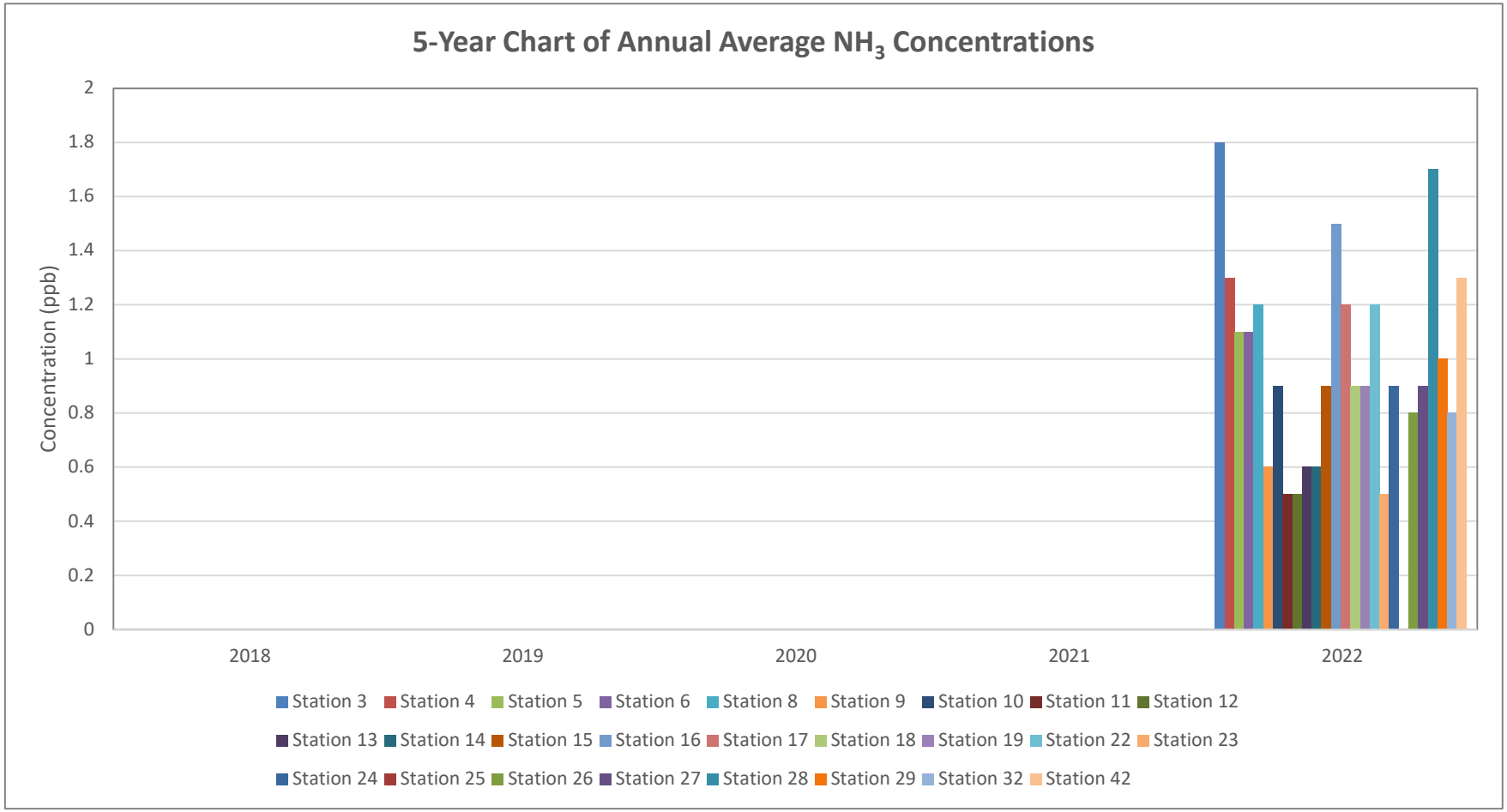

5-Year Chart of Annual Average NO2 Concentrations
Concentration (ppb)
0
1
1
2
2
3
3
4
4
5
2018
2019
2020
2021
2022
Station 3
Station 4
Station 5
Station 6
Station 8
Station 9
Station 10
Station 11
Station 12
Station 13
Station 14
Station 15
Station 16
Station 17
Station 18
Station 19
Station 22
Station 23
Station 24
Station 28
Station 29
Station 32
Station 36
Station 38
Station 40
Station 42


5-Year Chart of Annual Average O_3 Concentrations
Concentration (ppb)
40
35
30
25
20
15
10
5
0
2018
2019
2020
2021
2022
Station 3
Station 4
Station 5
Station 6
Station 8
Station 9
Station 10
Station 11
Station 12
Station 13
Station 14
Station 15
Station 16
Station 17
Station 18
Station 19
Station 22
Station 23
Station 24
Station 28
Station 29
Station 32
Station 40
Station 42


5-Year Chart of Annual Average H_2S Concentrations
Concentration (ppb)
2.5
2.0
1.5
1.0
0.5
0.0
2018
2019
2020
2021
2022
Station 3
Station 5
Station 10
Station 11
Station 12
Station 13
Station 14
Station 16
Station 17
Station 18
Station 22
Station 24
Station 25
Station 26
Station 27
Station 29
Station 32
Station 40
Station 42



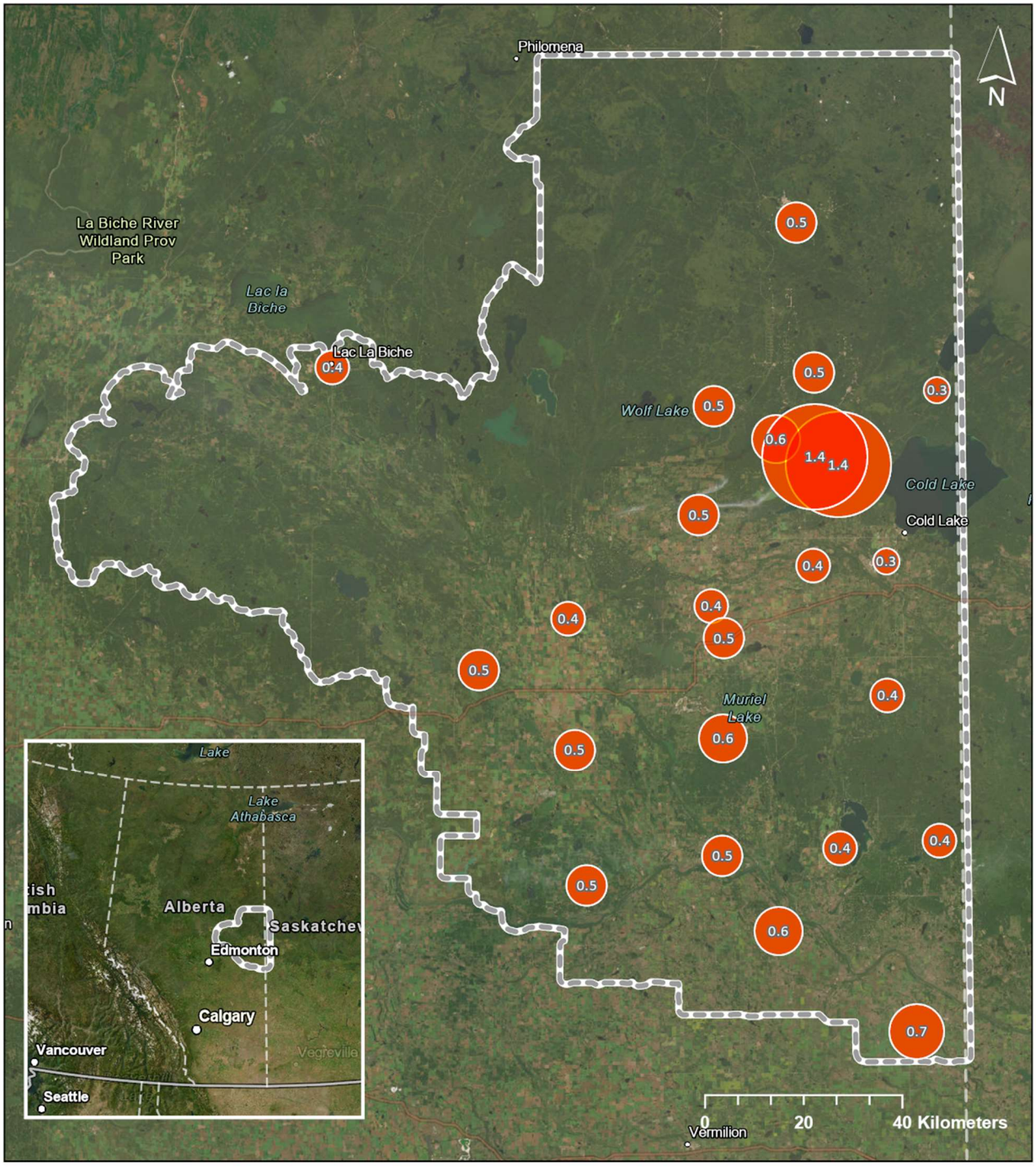
Note: No samples were taken in 2018-2021. HNO3 samples were installed at all designated locations in late September 2022. The first valid analytical results for HNO3 were for the sampling period of October 2022.



Note: No samples were taken in 2018-2021. NH3 samples were installed at all designated locations in late September 2022. The first valid analytical results for NH3 were for the sampling period of October 2022.

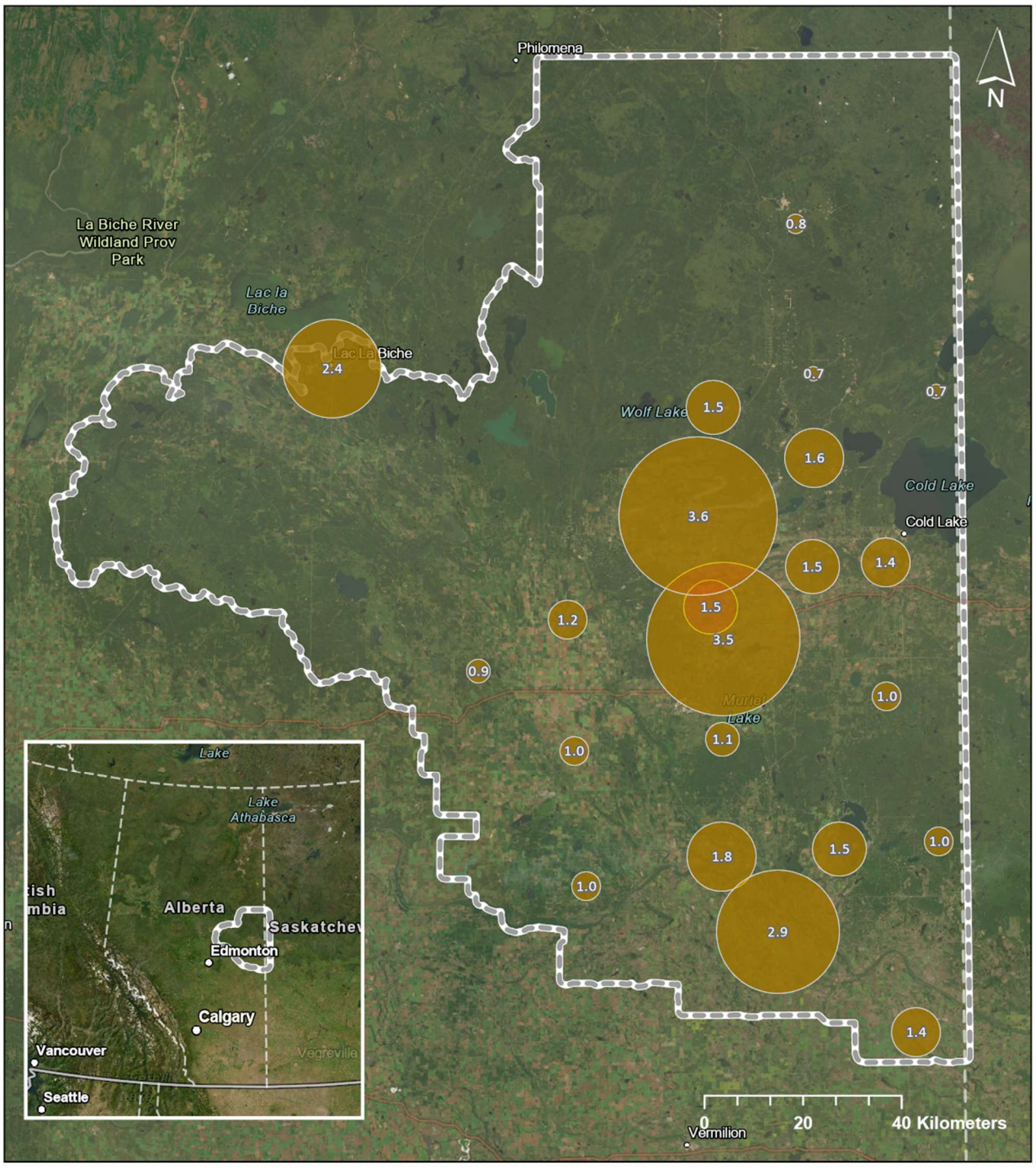
1. Spatial Plots of Annual Average Results from Passive Samplers

LICA Passive Network: 2022 Annual Average Sulphur Dioxide in parts per billion



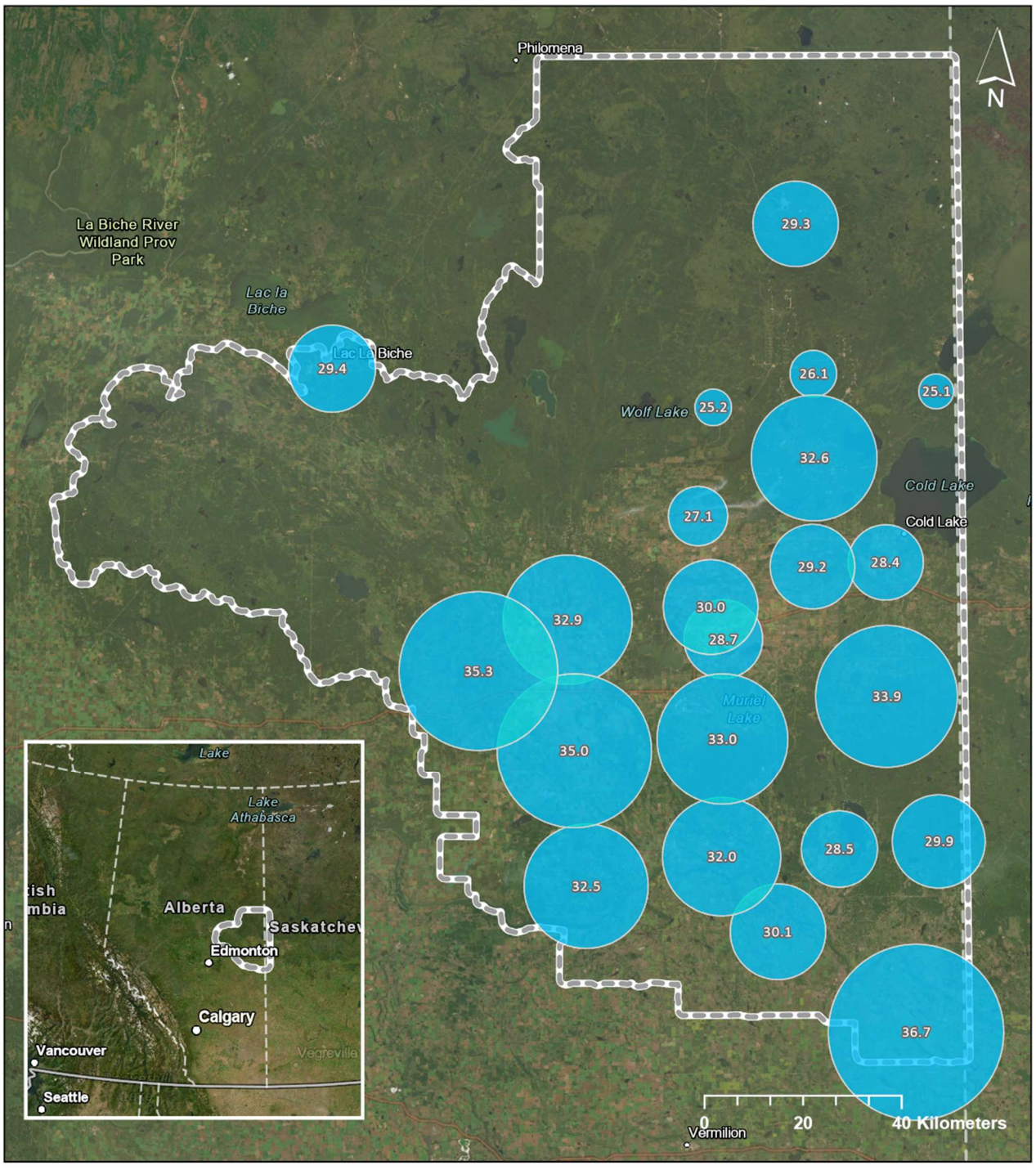
Service Layer Credit: Esri, Garmin, FAO, NOAA, USGS, EPA, NRCan, Parks Canada, Earthstar Geographics, Esri Canada, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NRCan, Parks Canada

LICA Passive Network: 2022 Annual Average Nitrogen Dioxide in parts per billion



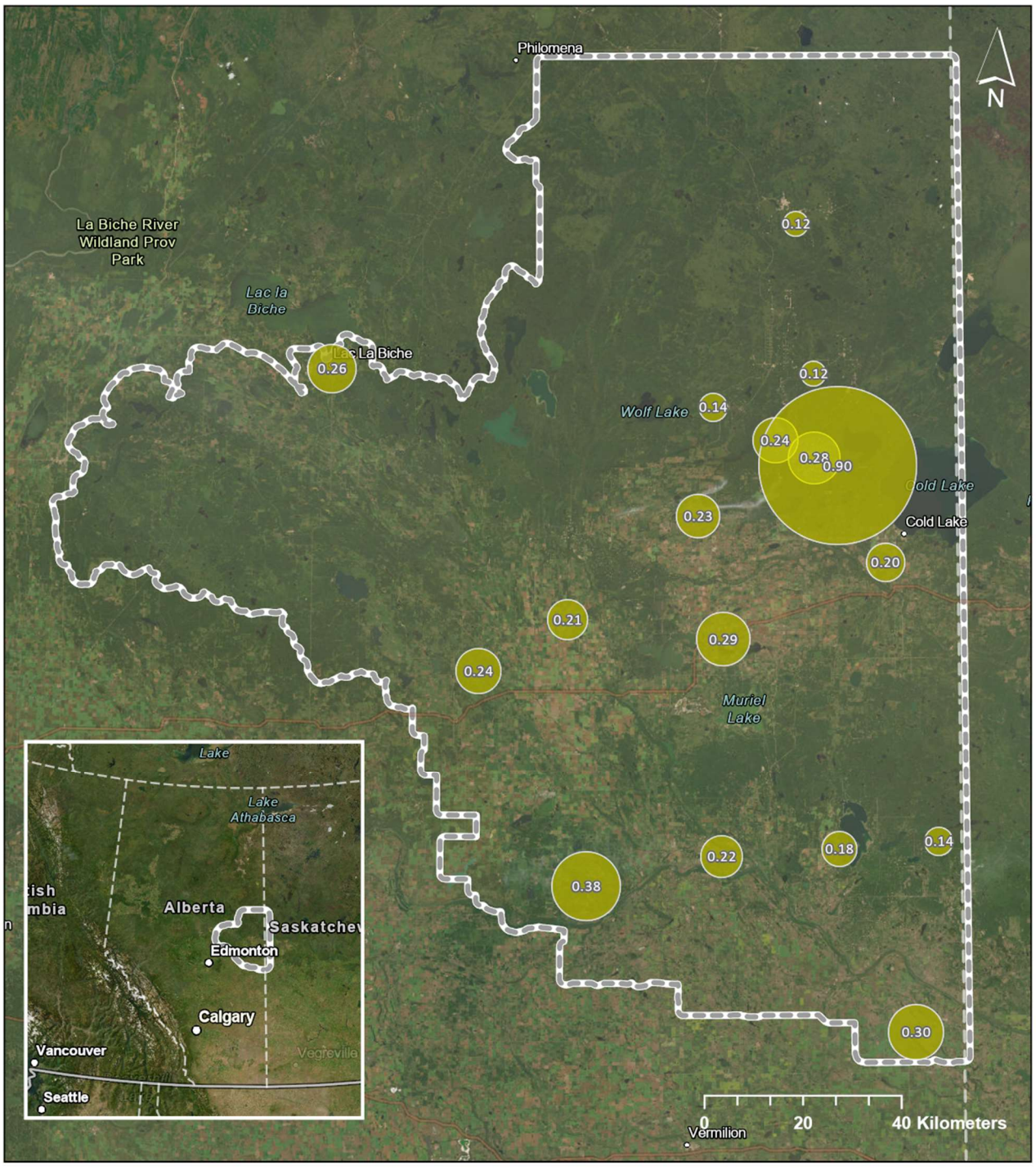
Service Layer Credit: Esri, Garmin, FAO, NOAA, USGS, EPA, NRCan, Parks Canada, Earthstar Geographics, Esri Canada, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NRCan, Parks Canada

LICA Passive Network: 2022 Annual Average Ozone in parts per billion



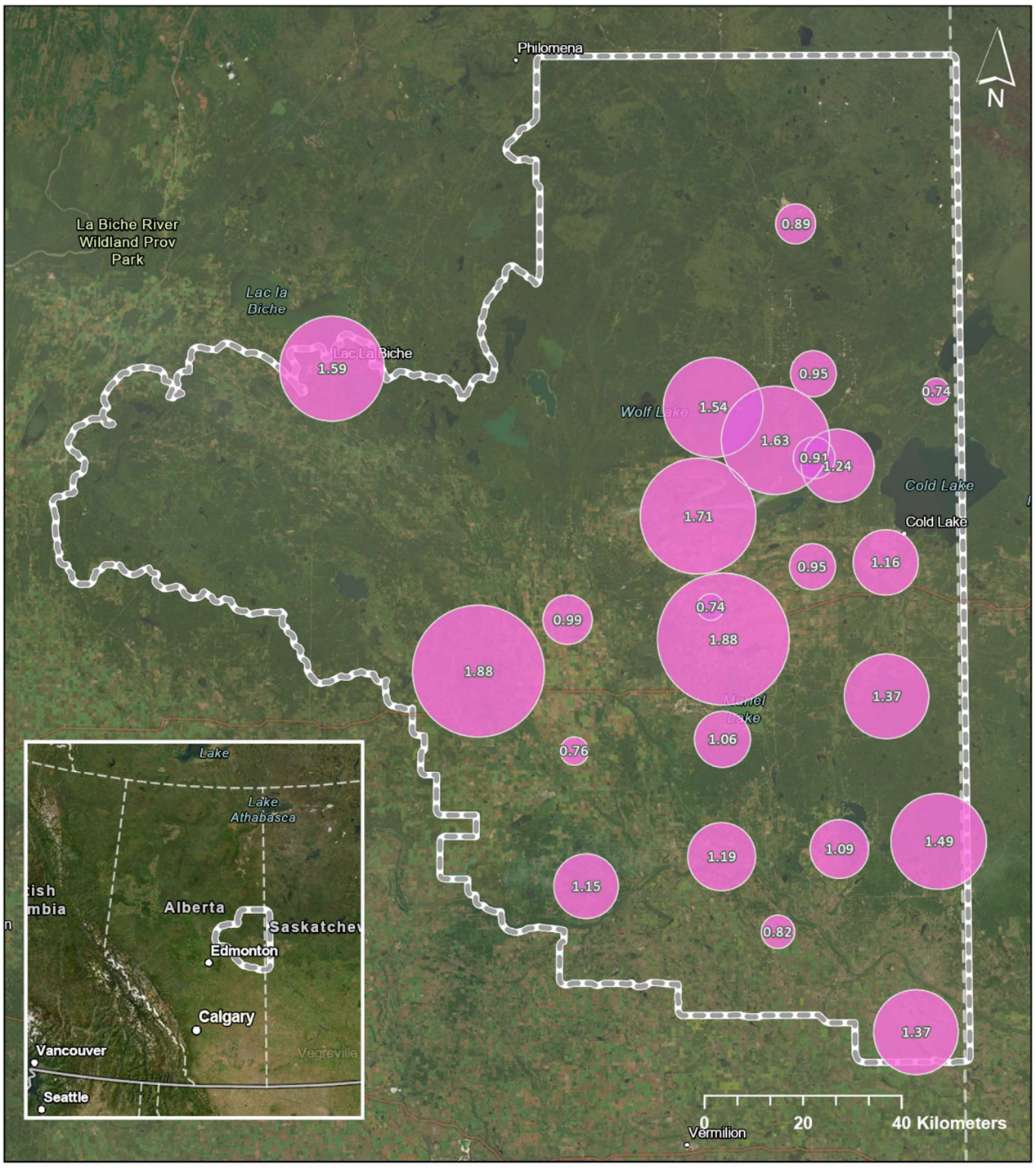
Service Layer Credit: Esri, Garmin, FAO, NOAA, USGS, EPA, NRCan, Parks Canada, Earthstar Geographics, Esri Canada, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NRCan, Parks Canada

LICA Passive Network: 2022 Annual Average Hydrogen Sulphide in parts per billion



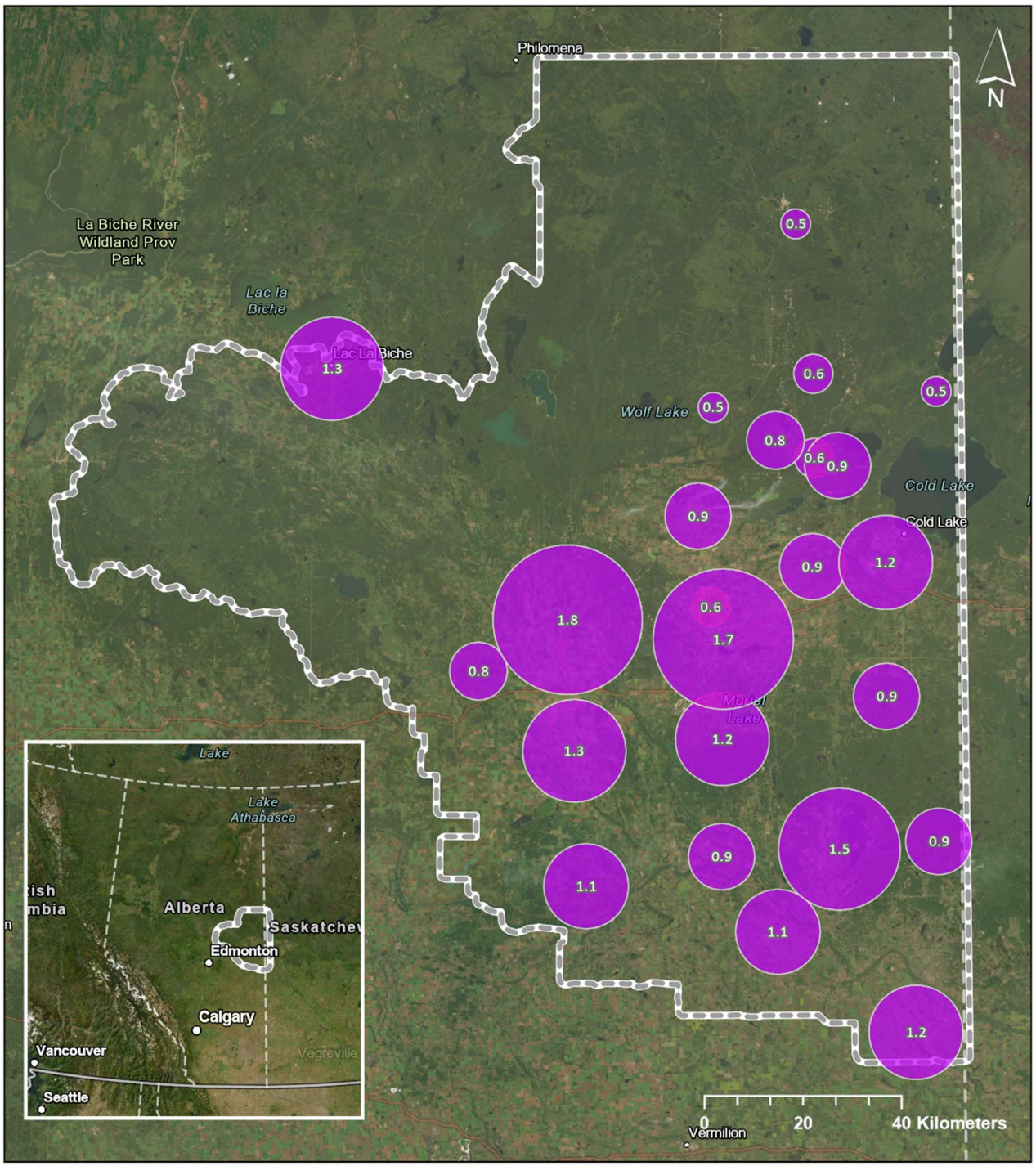
Service Layer Credit: Esri, Garmin, FAO, NOAA, USGS, EPA, NRCan, Parks Canada, Earthstar Geographics, Esri Canada, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NRCan, Parks Canada

LICA Passive Network: 2022 Annual Average Nitric Acid in micrograms per cubic meter



Service Layer Credit: Esri, Garmin, FAO, NOAA, USGS, EPA, NRCan, Parks Canada, Earthstar Geographics, Esri Canada, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NRCan, Parks Canada

LICA Passive Network: 2022 Annual Average Ammonia in parts per billion



Service Layer Credit: Esri, Garmin, FAO, NOAA, USGS, EPA, NRCan, Parks Canada, Earthstar Geographics, Esri Canada, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NRCan, Parks Canada

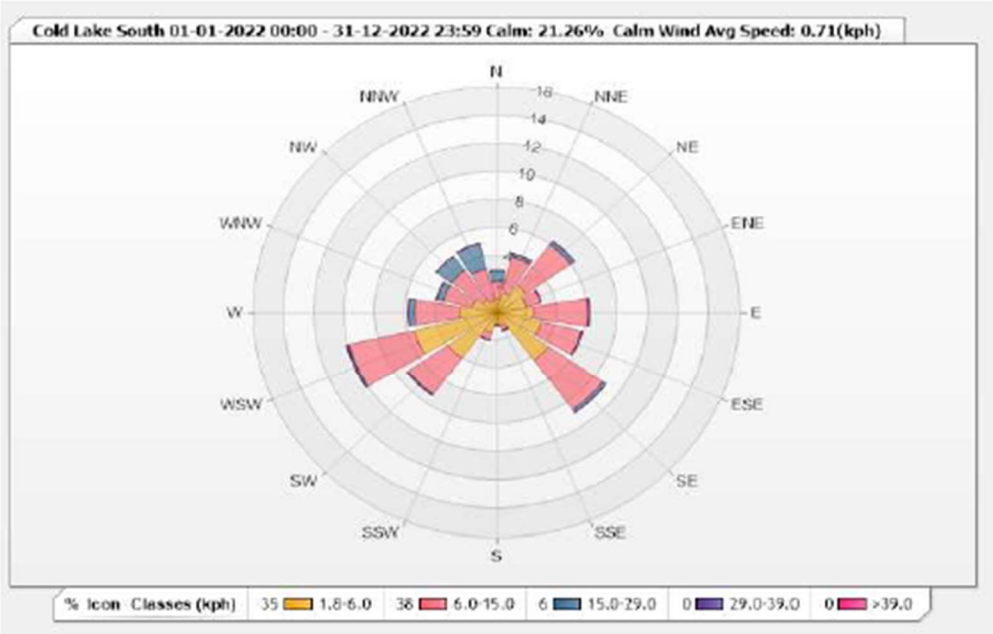
2. Annual Windrose Plots

Station: Cold Lake South Monitor: WDS [kph] Periodically: 01-01-2022 00:00-31-12-2022 23:59

Type: Wind Rose
Direction: Blowing From (Wind Frequency)
Time Base: 1 - Hour

Calm (WS<1.8kph): 21.26% Valid Data: 99.97%

Direction	1.8-6.0	6.0-15.0	15.0-29.0	29.0-39.0	>39.0	Total
N	0.98	1.28	0.73	0	0	2.99
NNE	1.48	2.6	0.23	0	0	4.31
NE	2.34	3.6	0.31	0	0	6.25
ENE	1.96	1.02	0	0	0	2.98
E	2.39	3.62	0.06	0	0	6.07
ESE	2.99	2.71	0.05	0	0	5.75
SE	4.17	4.36	0.24	0	0	8.77
SSE	0.98	0.33	0	0	0	1.31
S	0.81	0.14	0	0	0	0.95
SSW	1.43	0.58	0	0	0	2.01
SW	4.01	3.2	0.08	0	0	7.29
WSW	5.61	4.4	0.13	0	0	10.14
W	2.49	2.97	0.42	0	0	5.88
WNW	1.68	1.96	0.45	0	0	4.09
NW	1.1	2.59	1.23	0	0	4.92
NNW	0.84	2.35	1.86	0	0	5.05
Summary	35.26	37.71	5.79	0	0	78.76

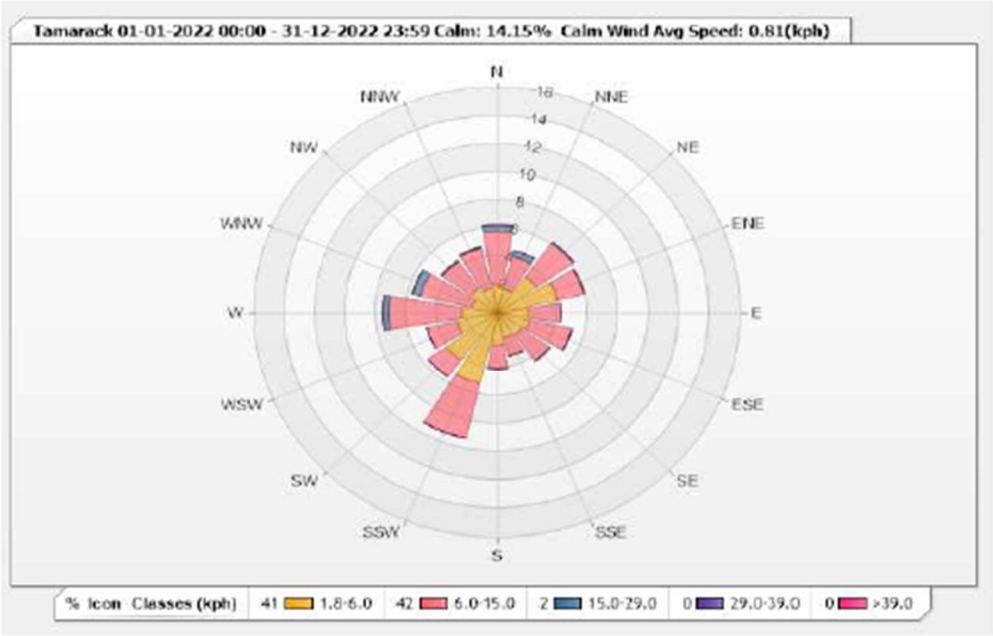


Station: Tamarack Monitor: WDS [kph] Periodically: 01-01-2022 00:00-31-12-2022 23:59

Type: Wind Rose
Direction: Blowing From (Wind Frequency)
Time Base: 1 - Hour

Calm (WS<1.8kph): 14.15% Valid Data: 99.45%

Direction	1.8-6.0	6.0-15.0	15.0-29.0	29.0-39.0	>39.0	Total
N	2	3.81	0.46	0	0	6.27
NNE	1.73	2.41	0.42	0	0	4.56
NE	3.14	2.96	0.07	0	0	6.17
ENE	4.04	1.81	0	0	0	5.85
E	2.09	2.03	0.02	0	0	4.14
ESE	2.17	2.82	0.03	0	0	5.02
SE	1.91	2.27	0.06	0	0	4.24
SSE	1.77	1.39	0	0	0	3.16
S	2.27	1.76	0.01	0	0	4.04
SSW	5.21	4.01	0	0	0	9.22
SW	4.17	1.47	0	0	0	5.64
WSW	2.75	2.03	0	0	0	4.78
W	2.39	4.79	0.39	0	0	7.57
WNW	1.72	3.53	0.54	0	0	5.79
NW	2.15	2.31	0.11	0	0	4.57
NNW	1.78	2.96	0.08	0	0	4.82
Summary	41.29	42.36	2.19	0	0	85.84

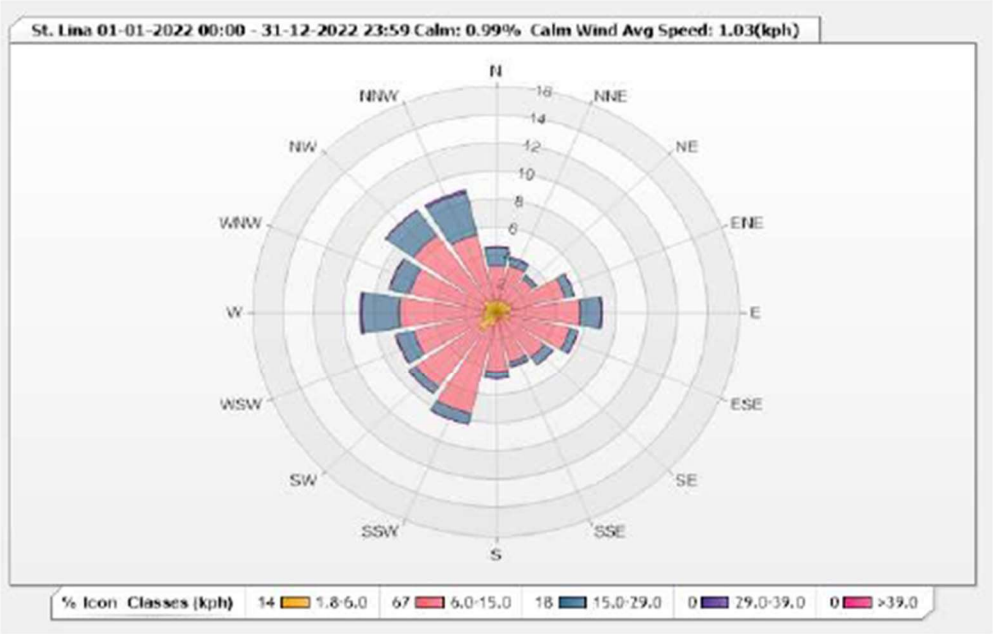


Station: St. Lina Monitor: WDS [kph] Periodically: 01-01-2022 00:00-31-12-2022 23:59

Type: Wind Rose
Direction: Blowing From (Wind Frequency)
Time Base: 1 - Hour

Calm (WS<1.8kph): 0.99% Valid Data: 99.27%

Direction	1.8-6.0	6.0-15.0	15.0-29.0	29.0-39.0	>39.0	Total
N	0.89	2.45	1.3	0	0	4.64
NNE	0.9	2.53	0.55	0	0	3.98
NE	0.87	2.07	0.3	0	0	3.24
ENE	1.09	3.53	0.61	0	0	5.23
E	0.67	4.85	1.36	0	0	6.88
ESE	0.98	3.97	0.54	0	0	5.49
SE	0.46	3.43	0.67	0	0	4.56
SSE	0.44	3.17	0.36	0	0	3.97
S	0.56	3.67	0.49	0	0	4.72
SSW	1	6.44	0.78	0	0	8.22
SW	1.51	5.07	0.55	0	0	7.13
WSW	1	4.62	1.18	0.01	0	6.81
W	0.91	5.52	2.46	0.11	0	9
WNW	0.78	5.12	1.32	0	0	7.22
NW	1.13	5.63	2.2	0.03	0	8.99
NNW	0.85	4.83	3.08	0.17	0	8.93
Summary	14.04	66.9	17.75	0.32	0	99.01



End of Report

This page, 110 of 110, ends the 2022 Annual Ambient Air Quality Monitoring Report.