Lakeland Industry & Community Association

2023

Annual Ambient Air Quality Monitoring Report

LICA-2023

Report Prepared By:

Lakeland Industry & Community Association

March 5, 2024

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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
HNO3	Nitric Acid
kph	kilometers per hour
LICA	Lakeland Industry & Community Association
mb	millibar
mm	millimeter
NH3	Ammonia
NMHC	Non-Methane Hydrocarbons
NO	Nitric Oxide
NO2	Nitrogen Dioxide
NOx	Oxide of Nitrogen
O3	Ozone
PAC	Polycyclic Aromatic Compounds
PAHs	Polycyclic Aromatic Hydrocarbons
PM2.5	Particulate Matters
ppb	parts per billion
ppm	parts per million
Precip	Precipitation
RH	Relative Humidity
SO2	Sulphur Dioxide
ST	Station Temperature
STDWD	Standard Deviation Wind Direction
THC	Total Hydrocarbons
TRS	Total Reduced Sulphur
VOCs	Volatile Organic Compounds
VWD	Vector Wind Direction
VWS	Vector Wind Speed
WD	Wind Direction
WS	Wind Speed
˚C	Degrees Celsius

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March 5, 2024

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

RE: 2023 Annual Ambient Air Quality Monitoring Report -LICA Airshed

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Enclosed is the *2023 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 2023.

The representative of the Person Responsible for this monitoring program is:

LICA Airshed
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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 and Integrated Sampling Stations

	Station Name	Cold Lake South	Tamarack	St. Lina	Lac La Biche
	Station ID	1174	1248	1250	1690
	Coordinates	54.41402	54.604935	54.215961	54.76516
		-110.23316	-110.452637	-111.503304	-111.9714490
Continuous Monitoring Parameter	SO2	√	√	√	√
	H2S		√	√	√
	TRS	√			
	NOX	√	√	√	√
	NOX	√	√	√	√
	NO2	√	√	√	√
	O3	√	√	√	√
	THC	√	√	√	√
	CH4	√	√	√	√
	NMHC	√	√	√	√
	RH	√	√	√	√
	BP	√	√	√	√
	AT	√	√	√	√
	ST	√	√	√	√
	PRECEIPITATION		√	√	
	WS	√	√	√	√
	WD	√	√	√	√
	STDWD	√	√	√	√
Integrated Sampling	VOCs	√			
	PAHs	√			
	Partisol	√			
	Passive	√			√
	NMHC Canister				√
	PAC			√	

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 2023 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
ND	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 2023

Cold Lake South Station:

- The following exceedances of AAAQOs were observed at the Cold Lake South Station:
  - **O3:** One1-hour O3 exceedance was recorded in 2023.

Date	Time (MST)	Parameter	Average Period	Concentration (ppb)	Wind speed (km/hr)	Wind Direction	Reference #
04-May	18	O3	1-Hour	77.2	8.7	121° (ESE)	412525

  - **PM2.5:** Two hundred thirty-two 1-hour PM2.5 exceedances were recorded in 2023.

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
04-May	19	PM2.5	1-Hour	81	6.4	107° (ESE)	415195
12-May	6	PM2.5	1-Hour	81	3.1	57° (ENE)	413092
12-May	7	PM2.5	1-Hour	126	2.7	39° (NE)	413092
12-May	8	PM2.5	1-Hour	154	3	31° (NNE)	413092
12-May	9	PM2.5	1-Hour	147	3.9	36° (NE)	413092
12-May	10	PM2.5	1-Hour	102	3.6	45° (NE)	413092
16-May	8	PM2.5	1-Hour	153	13.8	340° (NNW)	413527
16-May	21	PM2.5	1-Hour	122	4.7	284° (WNW)	413527
19-May	21	PM2.5	1-Hour	181	4.4	14° (NNE)	413527
19-May	22	PM2.5	1-Hour	671	6.2	16° (NNE)	413527
19-May	23	PM2.5	1-Hour	564	9.1	190° (SSW)	413527
20-May	0	PM2.5	1-Hour	391	4	7° (N)	413527
20-May	1	PM2.5	1-Hour	405	0.2	32° (NNE)	413527
20-May	2	PM2.5	1-Hour	384	1	242° (WSW)	413527
20-May	3	PM2.5	1-Hour	363	1.2	313° (NW)	413527
20-May	4	PM2.5	1-Hour	348	0.6	279° (W)	413527
20-May	5	PM2.5	1-Hour	329	0.3	20° (NNE)	413527
20-May	6	PM2.5	1-Hour	411	4.2	41° (NE)	413527
20-May	7	PM2.5	1-Hour	569	6.6	42° (NE)	413527
20-May	8	PM2.5	1-Hour	665	5.9	35° (NE)	413527
20-May	9	PM2.5	1-Hour	726	9.3	42° (NE)	413527
20-May	10	PM2.5	1-Hour	674	8.7	40° (NE)	413527
20-May	11	PM2.5	1-Hour	621	6.7	57° (ENE)	413527
20-May	12	PM2.5	1-Hour	579	5.6	39° (NE)	413527
20-May	13	PM2.5	1-Hour	509	5.4	58° (ENE)	413527
20-May	14	PM2.5	1-Hour	279	7.5	103° (ESE)	413527
20-May	15	PM2.5	1-Hour	151	7.6	104° (ESE)	413527
20-May	16	PM2.5	1-Hour	100	8.7	98° (E)	413527
20-May	21	PM2.5	1-Hour	151	6.4	94° (E)	413527
20-May	22	PM2.5	1-Hour	159	5.6	101° (E)	413527
20-May	23	PM2.5	1-Hour	120	9.3	57° (NE)	413527
22-May	18	PM2.5	1-Hour	165	20.1	50° (NE)	413933
22-May	19	PM2.5	1-Hour	527	17.8	52° (NE)	413933
22-May	20	PM2.5	1-Hour	571	14.2	56° (NE)	413933
22-May	21	PM2.5	1-Hour	281	16.9	87° (E)	413933
22-May	22	PM2.5	1-Hour	235	16.1	87° (E)	413933

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
22-May	23	PM2.5	1-Hour	280	9.7	51° (ENE)	413933
23-May	0	PM2.5	1-Hour	209	14.2	81° (E)	413933
23-May	1	PM2.5	1-Hour	193	12.9	75° (ENE)	413933
23-May	2	PM2.5	1-Hour	180	14.1	76° (ENE)	413933
23-May	3	PM2.5	1-Hour	160	14.1	85° (E)	413933
23-May	4	PM2.5	1-Hour	142	15.2	90° (E)	413933
23-May	5	PM2.5	1-Hour	124	13.8	95° (E)	413933
23-May	6	PM2.5	1-Hour	117	13.1	97° (E)	413933
23-May	7	PM2.5	1-Hour	91	13.2	100° (E)	413933
31-May	6	PM2.5	1-Hour	101	6.1	32° (NNE)	414423
31-May	7	PM2.5	1-Hour	169	4.8	37° (NE)	414423
31-May	8	PM2.5	1-Hour	209	4.9	21° (NNE)	414423
31-May	9	PM2.5	1-Hour	258	7.2	17° (NNE)	414423
31-May	10	PM2.5	1-Hour	248	6.5	45° (NE)	414423
31-May	11	PM2.5	1-Hour	144	6.9	28° (NNE)	414423
31-May	12	PM2.5	1-Hour	96	6.5	11° (NNE)	414423
31-May	13	PM2.5	1-Hour	85	9	350° (N)	414423
31-May	14	PM2.5	1-Hour	146	10.1	25° (NNE)	414423
08-Jun	6	PM2.5	1-Hour	88	5.2	19° (NNE)	414724
08-Jun	7	PM2.5	1-Hour	96	6.5	23° (NNE)	414724
08-Jun	8	PM2.5	1-Hour	94	7.7	49° (NE)	414724
12-Jun	6	PM2.5	1-Hour	91	5.5	25° (NNE)	415193
12-Jun	7	PM2.5	1-Hour	95	6.5	31° (NNE)	415193
12-Jun	8	PM2.5	1-Hour	94	7.2	43° (NE)	415193
12-Jun	9	PM2.5	1-Hour	87	7.8	31° (NNE)	415193
12-Jun	10	PM2.5	1-Hour	89	8.9	43° (NE)	415193
12-Jun	11	PM2.5	1-Hour	81	8.8	38° (NE)	415193
12-Jun	12	PM2.5	1-Hour	81	10.8	47° (NE)	415193
12-Jun	13	PM2.5	1-Hour	91	10.1	41° (NE)	415193
12-Jun	14	PM2.5	1-Hour	94	11.5	46° (NE)	415193
12-Jun	15	PM2.5	1-Hour	103	9.3	37° (NE)	415193
12-Jun	16	PM2.5	1-Hour	102	8.6	39° (NE)	415193
12-Jun	17	PM2.5	1-Hour	87	7.7	48° (NE)	415193
18-Jun	16	PM2.5	1-Hour	147	10.2	69° (ENE)	415193
18-Jun	17	PM2.5	1-Hour	140	10.4	61° (ENE)	415193
18-Jun	18	PM2.5	1-Hour	100	10.8	90° (E)	415193
18-Jun	19	PM2.5	1-Hour	88	13.2	61° (ENE)	415193
18-Jun	20	PM2.5	1-Hour	133	13.5	51° (NE)	415193
18-Jun	21	PM2.5	1-Hour	167	6.5	81° (E)	415193
18-Jun	22	PM2.5	1-Hour	123	15.5	58° (ENE)	415193
18-Jun	23	PM2.5	1-Hour	87	8.2	46° (NE)	415193
01-Jul	7	PM2.5	1-Hour	84	6.5	351° (N)	415804
09-Jul	11	PM2.5	1-Hour	97	6.6	54° (NE)	416191
09-Jul	12	PM2.5	1-Hour	115	4.9	52° (NE)	416191
09-Jul	13	PM2.5	1-Hour	112	4	68° (ENE)	416191
09-Jul	14	PM2.5	1-Hour	113	3.1	352° (N)	416191
09-Jul	15	PM2.5	1-Hour	107	6.1	354° (N)	416191
13-Jul	9	PM2.5	1-Hour	142	6.3	302° (WNW)	416552
13-Jul	10	PM2.5	1-Hour	136	10.4	305° (WNW)	416552

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
13-Jul	11	PM2.5	1-Hour	131	12	320° (NW)	416552
13-Jul	12	PM2.5	1-Hour	142	12.7	339° (NNW)	416552
13-Jul	14	PM2.5	1-Hour	156	15.1	324° (NW)	416552
13-Jul	15	PM2.5	1-Hour	106	13.4	320° (NW)	416552
13-Jul	16	PM2.5	1-Hour	89	13.3	314° (NW)	416552
13-Jul	21	PM2.5	1-Hour	88	4.7	264° (W)	416552
13-Jul	22	PM2.5	1-Hour	96	5.3	261° (W)	416552
13-Jul	23	PM2.5	1-Hour	99	6.2	272° (W)	416552
14-Jul	0	PM2.5	1-Hour	109	5.1	291° (WNW)	416552
14-Jul	1	PM2.5	1-Hour	122	4.3	269° (W)	416552
14-Jul	2	PM2.5	1-Hour	133	3.9	297° (WNW)	416552
14-Jul	3	PM2.5	1-Hour	156	4.4	304° (WNW)	416552
14-Jul	4	PM2.5	1-Hour	187	7.1	333° (NNW)	416552
14-Jul	5	PM2.5	1-Hour	193	7	333° (NNW)	416552
14-Jul	6	PM2.5	1-Hour	205	6.7	321° (NW)	416552
14-Jul	7	PM2.5	1-Hour	224	8.8	332° (NNW)	416552
14-Jul	8	PM2.5	1-Hour	358	11.4	337° (NNW)	416552
14-Jul	9	PM2.5	1-Hour	320	13.5	344° (NNW)	416552
14-Jul	10	PM2.5	1-Hour	219	12.9	347° (NNW)	416552
14-Jul	11	PM2.5	1-Hour	235	12.2	354° (N)	416552
14-Jul	12	PM2.5	1-Hour	175	10.8	2° (N)	416552
14-Jul	13	PM2.5	1-Hour	136	11.1	40° (NE)	416552
14-Jul	14	PM2.5	1-Hour	86	14	36° (NE)	416552
14-Jul	18	PM2.5	1-Hour	83	6.3	8° (N)	416552
14-Jul	19	PM2.5	1-Hour	82	1.6	3° (N)	416552
14-Jul	21	PM2.5	1-Hour	81	1.6	233° (SW)	416552
14-Jul	22	PM2.5	1-Hour	85	0.5	252° (WSW)	416552
14-Jul	23	PM2.5	1-Hour	82	1.7	235° (SW)	416552
15-Jul	0	PM2.5	1-Hour	89	0.9	247° (WSW)	416552
15-Jul	1	PM2.5	1-Hour	88	0.4	128° (SE)	416552
15-Jul	2	PM2.5	1-Hour	88	0.5	231° (SW)	416552
15-Jul	3	PM2.5	1-Hour	95	1.1	314° (NW)	416552
15-Jul	4	PM2.5	1-Hour	94	0.5	289° (WNW)	416552
15-Jul	5	PM2.5	1-Hour	94	0.9	249° (WSW)	416552
15-Jul	6	PM2.5	1-Hour	101	2.2	279° (W)	416552
15-Jul	7	PM2.5	1-Hour	168	5	352° (N)	416552
15-Jul	8	PM2.5	1-Hour	229	7.7	344° (NNW)	416552
15-Jul	9	PM2.5	1-Hour	194	8.7	349° (NNW)	416552
15-Jul	10	PM2.5	1-Hour	178	7.8	347° (NNW)	416552
15-Jul	11	PM2.5	1-Hour	164	6.3	359° (N)	416552
15-Jul	12	PM2.5	1-Hour	147	5.9	25° (NNE)	416552
15-Jul	13	PM2.5	1-Hour	131	6.3	38° (NE)	416552
15-Jul	14	PM2.5	1-Hour	112	7.5	52° (NE)	416552
14-Aug	18	PM2.5	1-Hour	84	0.6	280°(W)	418115
14-Aug	19	PM2.5	1-Hour	82	0.2	236°(SW)	418115
14-Aug	20	PM2.5	1-Hour	86	0.4	215°(SSW)	418115
14-Aug	21	PM2.5	1-Hour	84	0.6	220°(SW)	418115
14-Aug	22	PM2.5	1-Hour	87	0.5	224°(SW)	418115
14-Aug	23	PM2.5	1-Hour	82	0.8	227°(SW)	418115

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
18-Aug	18	PM2.5	1-Hour	94	8.6	2°(N)	418116
18-Aug	19	PM2.5	1-Hour	94	9	336°(NNW)	418116
27-Aug	8	PM2.5	1-Hour	88	2	323°(NW)	418437
27-Aug	9	PM2.5	1-Hour	155	2	47°(NE)	418437
27-Aug	10	PM2.5	1-Hour	163	3.3	349°(NNW)	418437
27-Aug	11	PM2.5	1-Hour	170	4.1	24°(NNE)	418437
27-Aug	12	PM2.5	1-Hour	153	1.6	47°(NE)	418437
27-Aug	13	PM2.5	1-Hour	110	2.1	166°(SSE)	418437
27-Aug	14	PM2.5	1-Hour	94	1.5	289°(WNW)	418437
27-Aug	15	PM2.5	1-Hour	83	3.3	229°(SW)	418437
27-Aug	23	PM2.5	1-Hour	83	0	355°(N)	418437
28-Aug	0	PM2.5	1-Hour	83	0.1	228°(SW)	418927
28-Aug	1	PM2.5	1-Hour	99	0.4	226°(SW)	418927
28-Aug	2	PM2.5	1-Hour	106	0.4	217°(SW)	418927
28-Aug	3	PM2.5	1-Hour	112	0.4	229°(SW)	418927
28-Aug	4	PM2.5	1-Hour	109	0.1	221°(SW)	418927
28-Aug	5	PM2.5	1-Hour	103	1.6	243°(WSW)	418927
28-Aug	6	PM2.5	1-Hour	89	1.8	262°(W)	418927
31-Aug	16	PM2.5	1-Hour	139	7.3	275°(W)	418927
31-Aug	17	PM2.5	1-Hour	141	8.1	293°(WNW)	418927
31-Aug	21	PM2.5	1-Hour	120	3.7	249°(WSW)	418927
31-Aug	22	PM2.5	1-Hour	203	3.9	268°(W)	418927
31-Aug	23	PM2.5	1-Hour	282	4.5	247°(WSW)	418927
01-Sep	0	PM2.5	1-Hour	315	3.7	249°(WSW)	418927
01-Sep	1	PM2.5	1-Hour	336	5.7	245°(WSW)	418927
01-Sep	2	PM2.5	1-Hour	318	4.1	243°(WSW)	418927
01-Sep	3	PM2.5	1-Hour	262	3.9	237°(SW)	418927
01-Sep	4	PM2.5	1-Hour	232	4.8	243°(WSW)	418927
01-Sep	5	PM2.5	1-Hour	208	5	247°(WSW)	418927
01-Sep	6	PM2.5	1-Hour	165	6.6	267°(W)	418927
01-Sep	7	PM2.5	1-Hour	142	5.9	276°(W)	418927
01-Sep	8	PM2.5	1-Hour	125	5.1	265°(W)	418927
01-Sep	9	PM2.5	1-Hour	95	6.3	259°(WSW)	418927
02-Sep	8	PM2.5	1-Hour	92	9.2	248°(WSW)	418927
02-Sep	9	PM2.5	1-Hour	110	8.9	265°(W)	418927
02-Sep	10	PM2.5	1-Hour	159	6	260°(WSW)	418927
02-Sep	11	PM2.5	1-Hour	224	6.2	259°(WSW)	418927
02-Sep	12	PM2.5	1-Hour	316	7.2	267°(W)	418927
02-Sep	13	PM2.5	1-Hour	333	8.7	270°(W)	418927
02-Sep	14	PM2.5	1-Hour	332	8.5	273°(W)	418927
02-Sep	15	PM2.5	1-Hour	356	8.3	267°(W)	418927
02-Sep	16	PM2.5	1-Hour	385	7.1	267°(W)	418927
02-Sep	17	PM2.5	1-Hour	393	4.7	240°(WSW)	418927
02-Sep	18	PM2.5	1-Hour	384	3.2	248°(WSW)	418927
02-Sep	19	PM2.5	1-Hour	373	0.6	233°(SW)	418927
02-Sep	20	PM2.5	1-Hour	370	0.5	184°(S)	418927
02-Sep	21	PM2.5	1-Hour	377	0.5	215°(SSW)	418927
02-Sep	22	PM2.5	1-Hour	411	3.4	232°(SW)	418927
02-Sep	23	PM2.5	1-Hour	453	3.5	243°(WSW)	418927

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
03-Sep	0	PM2.5	1-Hour	440	0.1	213°(SSW)	418927
03-Sep	1	PM2.5	1-Hour	424	0	137°(SE)	418927
03-Sep	2	PM2.5	1-Hour	427	0	131°(SE)	418927
03-Sep	3	PM2.5	1-Hour	401	0.1	46°(NE)	418927
03-Sep	4	PM2.5	1-Hour	399	1.1	234°(SW)	418927
03-Sep	5	PM2.5	1-Hour	387	0.5	327°(NW)	418927
03-Sep	6	PM2.5	1-Hour	382	0.6	108°(ESE)	418927
03-Sep	7	PM2.5	1-Hour	382	0.1	160°(SSE)	418927
03-Sep	8	PM2.5	1-Hour	378	0.8	351°(N)	418927
03-Sep	9	PM2.5	1-Hour	384	2.4	17°(NNE)	418927
03-Sep	10	PM2.5	1-Hour	393	0.7	338°(NNW)	418927
03-Sep	11	PM2.5	1-Hour	402	3	14°(NNE)	418927
03-Sep	12	PM2.5	1-Hour	397	7	359°(N)	418927
03-Sep	13	PM2.5	1-Hour	287	9.8	31°(NNE)	418927
03-Sep	14	PM2.5	1-Hour	168	13.7	41°(NE)	418927
03-Sep	15	PM2.5	1-Hour	129	10.8	35°(NE)	418927
03-Sep	16	PM2.5	1-Hour	116	8.6	31°(NNE)	418927
03-Sep	17	PM2.5	1-Hour	112	3	10°(N)	418927
03-Sep	18	PM2.5	1-Hour	110	1.1	153°(SSE)	418927
03-Sep	19	PM2.5	1-Hour	110	2	265°(W)	418927
03-Sep	20	PM2.5	1-Hour	110	1.6	258°(WSW)	418927
03-Sep	21	PM2.5	1-Hour	104	0.3	155°(SSE)	418927
03-Sep	22	PM2.5	1-Hour	101	0.4	202°(SSW)	418927
03-Sep	23	PM2.5	1-Hour	99	0.6	222°(SW)	418927
04-Sep	0	PM2.5	1-Hour	97	0.7	245°(WSW)	419223
04-Sep	1	PM2.5	1-Hour	97	3.4	241°(WSW)	419223
04-Sep	2	PM2.5	1-Hour	94	4.3	254°(WSW)	419223
04-Sep	3	PM2.5	1-Hour	95	4.2	305°(WNW)	419223
04-Sep	4	PM2.5	1-Hour	104	1	294°(WNW)	419223
04-Sep	5	PM2.5	1-Hour	105	0.9	231°(SW)	419223
04-Sep	6	PM2.5	1-Hour	114	1.7	230°(SW)	419223
04-Sep	7	PM2.5	1-Hour	135	5.2	274°(W)	419223
04-Sep	8	PM2.5	1-Hour	121	6.6	296°(WNW)	419223
04-Sep	9	PM2.5	1-Hour	89	10.5	314°(NW)	419223
18-Sep	0	PM2.5	1-Hour	83	0.4	175°(S)	419925
18-Sep	1	PM2.5	1-Hour	87	0.8	223°(SW)	419925
18-Sep	2	PM2.5	1-Hour	93	0.6	151°(SSE)	419925
18-Sep	3	PM2.5	1-Hour	103	0.3	237°(SW)	419925
18-Sep	4	PM2.5	1-Hour	108	0	342°(NNW)	419925
18-Sep	5	PM2.5	1-Hour	118	1	258°(WSW)	419925
18-Sep	6	PM2.5	1-Hour	121	0.1	230°(SW)	419925
18-Sep	7	PM2.5	1-Hour	127	0	153°(SSE)	419925
18-Sep	8	PM2.5	1-Hour	143	1.5	233°(SW)	419925
18-Sep	9	PM2.5	1-Hour	148	0.7	222°(SW)	419925
18-Sep	10	PM2.5	1-Hour	147	5.7	285°(WNW)	419925
18-Sep	11	PM2.5	1-Hour	160	5.3	275°(W)	419925
18-Sep	12	PM2.5	1-Hour	157	7.3	242°(WSW)	419925
18-Sep	13	PM2.5	1-Hour	146	13.3	259°(WSW)	419925
18-Sep	14	PM2.5	1-Hour	81	12.6	270°(W)	419925

- **PM2.5:** Thirty-nine 24-hour PM2.5 exceedances were recorded in 2023.

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
12-May	-	PM2.5	24-Hour	51	2.5	66° (ENE)	413092
19-May	-	PM2.5	24-Hour	87	4.7	203° (SSW)	413527
20-May	-	PM2.5	24-Hour	338	5.3	71° (ENE)	413527
21-May	-	PM2.5	24-Hour	51	5.6	91° (E)	413527
22-May	-	PM2.5	24-Hour	116	10.9	57° (ENE)	413933
23-May	-	PM2.5	24-Hour	66	13.5	102° (E)	413933
02-Jun	-	PM2.5	24-Hour	36	4.9	338° (NNW)	414423
08-Jun	-	PM2.5	24-Hour	51	4.5	49° (NE)	414724
09-Jun	-	PM2.5	24-Hour	40	3.6	110° (ESE)	414724
12-Jun	-	PM2.5	24-Hour	72	5.5	46° (NE)	415193
13-Jun	-	PM2.5	24-Hour	45	6.1	112° (ESE)	415193
16-Jun	-	PM2.5	24-Hour	31	4.2	220° (SW)	415193
08-Jul	-	PM2.5	24-Hour	35	5.7	258° (WSW)	416191
09-Jul	-	PM2.5	24-Hour	50	5.5	37° (NE)	416191
13-Jul	-	PM2.5	24-Hour	72	7.3	303° (WNW)	416552
14-Jul	-	PM2.5	24-Hour	147	7.4	351° (N)	416552
15-Jul	-	PM2.5	24-Hour	97	3.9	19° (NNE)	416552
21-Jul	-	PM2.5	24-Hour	46	3	268° (W)	416956
22-Jul	-	PM2.5	24-Hour	51	2.5	353° (N)	416956
23-Jul	-	PM2.5	24-Hour	31	3	142° (SE)	416956
24-Jul	-	PM2.5	24-Hour	44	7.2	103° (ESE)	417875
25-Jul	-	PM2.5	24-Hour	30	8.3	268° (W)	417875
02-Aug	-	PM2.5	24-Hour	33	2	72°(ENE)	419457
03-Aug	-	PM2.5	24-Hour	52	6.1	48°(NE)	419457
14-Aug	-	PM2.5	24-Hour	32	6	261°(W)	418115
18-Aug	-	PM2.5	24-Hour	30	6.8	300°(WNW)	418116
27-Aug	-	PM2.5	24-Hour	75	1.8	265°(W)	418437
28-Aug	-	PM2.5	24-Hour	66	2.5	243°(WSW)	418927
29-Aug	-	PM2.5	24-Hour	40	2.7	131°(SE)	418927
30-Aug	-	PM2.5	24-Hour	41	3.7	71°(ENE)	418927
31-Aug	-	PM2.5	24-Hour	72	3.7	292°(WNW)	418927
01-Sep	-	PM2.5	24-Hour	127	6.3	245°(WSW)	418927
02-Sep	-	PM2.5	24-Hour	230	5.5	250°(WSW)	418927
03-Sep	-	PM2.5	24-Hour	277	2.8	24°(NNE)	418927
04-Sep	-	PM2.5	24-Hour	52	6	300°(WNW)	419223
07-Sep	-	PM2.5	24-Hour	31	2.3	217°(SW)	419223
18-Sep	-	PM2.5	24-Hour	82	4.3	263°(W)	419925
21-Sep	-	PM2.5	24-Hour	37	2.6	229°(SW)	419925
29-Sep	-	PM2.5	24-Hour	31	5.5	1°(N)	420405

- **NOx/NO/NO2:** Due to a marked change in sample flow rate, a shut-down calibration was performed in order to rebuild the sample pump on February 21. The analyzer failed at the low GPT-point check. Following the pump maintenance on February 21, a successful post-repair calibration was completed. After reviewing diagnostic data, data were invalidated back to the point the issue occurred, which was February 18 hour 18. Seventy-five hours of down time were recorded due to this event. Operational uptime was 88.8%. **Alberta EPA reference #: 410432**.

- **O3:**
    - The Thermo 49iQ analyzer, s/n: 12208316585, failed due to power supply failure on August 15. The analyzer was replaced with the Thermo 49i analyzer, s/n: 1002240371, on August 17. Forty-two hours of downtime were recorded due to this event.
    - The analyzer failed the daily span check on September 3 and the as-found points check on September 5. As no specific problems could be identified, the calibration proceeded to correct the drift. Due to this issue, data were invalidated back to the last valid calibration check, which was September 2. Eighty-one hours of downtime were recorded. Operational uptime was 88.8%. **AEPA reference #: 420862**.
    - The Thermo 49i analyzer, s/n: 1002240371, was removed following a successful shut-down calibration on October 15. The Thermo 49iQ analyzer, s/n: 12208316585, was installed afterwards. This analyzer swap was to address the span drift issues, which occurred between October 11 and October 15. One hour of downtime was recorded due to this event.
- **THC/CH4/NMHC:**
    - A new zero air generator was installed on September 25. One hour of downtime was recorded due to this event.
    - THC/CH4/NMHC data collected between December 7 hour 18 and December 31 hour 23 were deemed invalid after an analyzer check on January 4. The analyzer failed the as-found points check on January 4. In the absence of a clear point of failure, data were invalidated back to the last multi-point calibration check, which was December 7, 2023. Five hundred eighty-two hours of downtime were recorded in December 2023. Data resubmission was completed on February 27, 2024. **DINC0005054. ETS Request #: 4647252**.

Tamarack Station:

- The following exceedances of AAAQOs were recorded at the Tamarack Station:
    - **PM2.5:** One hundred eighty-four 1-hour PM2.5 exceedances were recorded in 2023.

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
11-Apr	5	PM2.5	1-Hour	82	1.8	188° (S)	411587
02-May	6	PM2.5	1-Hour	116.3	1.9	279° (W)	412784
02-May	7	PM2.5	1-Hour	101.2	2.3	353° (N)	412784
12-May	6	PM2.5	1-Hour	82.4	2.3	47° (NE)	413091
12-May	7	PM2.5	1-Hour	102.4	3.8	41° (NE)	413091
16-May	6	PM2.5	1-Hour	103.2	7.4	348° (NNW)	413524
16-May	7	PM2.5	1-Hour	180.9	10.3	2° (N)	413524
16-May	8	PM2.5	1-Hour	103.7	11.1	354° (N)	413524
19-May	17	PM2.5	1-Hour	80.2	4.8	256° (WSW)	413524
19-May	21	PM2.5	1-Hour	100.5	4.5	360° (N)	413524
19-May	22	PM2.5	1-Hour	119	5.6	8° (N)	413524
19-May	23	PM2.5	1-Hour	156.4	10.5	200° (SSW)	413524
20-May	0	PM2.5	1-Hour	132.2	5.6	7° (N)	413524
20-May	1	PM2.5	1-Hour	102.9	2.7	31° (NNE)	413524
20-May	2	PM2.5	1-Hour	98.2	1.3	289° (WNW)	413524
20-May	3	PM2.5	1-Hour	91.1	2.7	294° (WNW)	413524
20-May	4	PM2.5	1-Hour	92.4	1.8	355° (N)	413524
20-May	5	PM2.5	1-Hour	95.7	2.1	16° (NNE)	413524
20-May	6	PM2.5	1-Hour	251.1	3.5	31° (NNE)	413524
20-May	7	PM2.5	1-Hour	462.3	5	53° (NE)	413524
20-May	8	PM2.5	1-Hour	473.8	7.4	46° (NE)	413524
20-May	9	PM2.5	1-Hour	509.4	8.6	50° (NE)	413524
20-May	10	PM2.5	1-Hour	489.7	8.1	50° (NE)	413524
20-May	11	PM2.5	1-Hour	424.6	8.6	38° (NE)	413524
20-May	12	PM2.5	1-Hour	335.7	5.9	88° (E)	413524
20-May	13	PM2.5	1-Hour	302.7	7	88° (E)	413524
20-May	14	PM2.5	1-Hour	252.9	5.7	88° (E)	413524
20-May	15	PM2.5	1-Hour	210.4	7.5	127° (SE)	413524
20-May	16	PM2.5	1-Hour	105.1	6.7	125° (SE)	413524
20-May	17	PM2.5	1-Hour	82.2	9.2	119° (ESE)	413524
20-May	22	PM2.5	1-Hour	82.1	4.6	91° (E)	413524
20-May	23	PM2.5	1-Hour	83.2	8.6	38° (E)	413524
22-May	15	PM2.5	1-Hour	82.3	19.7	50° (NE)	413925
22-May	16	PM2.5	1-Hour	240.4	17.7	54° (NE)	413925
22-May	17	PM2.5	1-Hour	302.7	18	53° (NE)	413925
22-May	18	PM2.5	1-Hour	376.7	14.9	69° (ENE)	413925
22-May	19	PM2.5	1-Hour	420.5	14.2	60° (ENE)	413925
22-May	20	PM2.5	1-Hour	424.3	12.9	70° (ENE)	413925
22-May	21	PM2.5	1-Hour	460.7	12.1	79° (ENE)	413925
22-May	22	PM2.5	1-Hour	398	11.2	78° (ENE)	413925
22-May	23	PM2.5	1-Hour	297.7	9.8	50° (NE)	413925
23-May	0	PM2.5	1-Hour	293	8.8	73° (ENE)	413925
23-May	1	PM2.5	1-Hour	208.9	8.8	74° (ENE)	413925
23-May	2	PM2.5	1-Hour	89.9	10.4	72° (ENE)	413925
31-May	6	PM2.5	1-Hour	173.7	4.2	64° (ENE)	414427

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
31-May	7	PM2.5	1-Hour	332.5	5.7	36° (NE)	414427
31-May	8	PM2.5	1-Hour	264.3	5.7	56° (NE)	414427
31-May	9	PM2.5	1-Hour	223.4	8.5	43° (NE)	414427
31-May	10	PM2.5	1-Hour	160	8.3	71° (ENE)	414427
31-May	11	PM2.5	1-Hour	114.8	8.8	49° (NE)	414427
31-May	12	PM2.5	1-Hour	113.9	0.6	51° (NE)	414427
31-May	19	PM2.5	1-Hour	81.7	5.1	14° (NNE)	414427
08-Jun	3	PM2.5	1-Hour	80.7	2.1	22° (NNE)	414721
08-Jun	4	PM2.5	1-Hour	95	1.7	40° (NE)	414721
08-Jun	5	PM2.5	1-Hour	90.3	0.5	121° (ESE)	414721
08-Jun	6	PM2.5	1-Hour	93.6	0.7	30° (NNE)	414721
11-Jun	17	PM2.5	1-Hour	96	6.2	306° (NW)	414721
12-Jun	7	PM2.5	1-Hour	93	4.9	34° (NE)	414190
12-Jun	8	PM2.5	1-Hour	105.8	4.5	26° (NNE)	414190
12-Jun	9	PM2.5	1-Hour	97.2	3.3	340° (NNW)	414190
12-Jun	10	PM2.5	1-Hour	95.1	3.8	347° (NNW)	414190
12-Jun	11	PM2.5	1-Hour	90.3	6	347° (NNW)	414190
12-Jun	12	PM2.5	1-Hour	118.8	8.4	16° (NNE)	414190
12-Jun	13	PM2.5	1-Hour	119.3	6.5	17° (NNE)	414190
12-Jun	14	PM2.5	1-Hour	128.4	5.1	66° (ENE)	414190
12-Jun	15	PM2.5	1-Hour	152.2	5.6	99° (E)	414190
12-Jun	16	PM2.5	1-Hour	114.8	6.8	109° (ESE)	414190
13-Jun	0	PM2.5	1-Hour	99	2	118° (ESE)	414190
13-Jun	6	PM2.5	1-Hour	99.3	4.4	104° (ESE)	414190
13-Jun	7	PM2.5	1-Hour	111.9	4.9	118° (ESE)	414190
13-Jun	8	PM2.5	1-Hour	113.2	4.9	108° (ESE)	414190
13-Jun	9	PM2.5	1-Hour	112.3	5.2	115° (ESE)	414190
13-Jun	10	PM2.5	1-Hour	108.3	4.8	111° (ESE)	414190
13-Jun	11	PM2.5	1-Hour	101.4	4.9	117° (ESE)	414190
13-Jun	12	PM2.5	1-Hour	94.1	6.1	91° (E)	414190
13-Jun	13	PM2.5	1-Hour	95.8	5.1	94° (E)	414190
13-Jun	14	PM2.5	1-Hour	88.3	9	124° (ESE)	414190
13-Jun	22	PM2.5	1-Hour	80.6	10.1	99° (E)	414190
13-Jun	23	PM2.5	1-Hour	101.1	5.2	117° (E)	414190
14-Jun	0	PM2.5	1-Hour	88.4	10.9	118° (ESE)	414190
18-Jun	17	PM2.5	1-Hour	93.7	9.6	71° (ENE)	414190
18-Jun	18	PM2.5	1-Hour	176.2	9.7	68° (ENE)	414190
18-Jun	19	PM2.5	1-Hour	83.8	9.5	97° (E)	414190
18-Jun	20	PM2.5	1-Hour	112.2	7.2	48° (NE)	414190
09-Jul	10	PM2.5	1-Hour	82.2	4	6° (N)	416194
09-Jul	11	PM2.5	1-Hour	103.7	6.3	357° (N)	416194
09-Jul	12	PM2.5	1-Hour	110	8.9	16° (NNE)	416194
09-Jul	13	PM2.5	1-Hour	94.2	6.8	9° (N)	416194
13-Jul	8	PM2.5	1-Hour	107.6	5	302° (WNW)	416549
13-Jul	9	PM2.5	1-Hour	116.8	5.3	322° (NW)	416549
13-Jul	10	PM2.5	1-Hour	87.7	6.2	323° (NW)	416549
13-Jul	13	PM2.5	1-Hour	95.9	7.9	331° (NNW)	416549
14-Jul	1	PM2.5	1-Hour	81	4.3	318° (NW)	416549
14-Jul	2	PM2.5	1-Hour	92.8	3.6	347° (NNW)	416549

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
14-Jul	3	PM2.5	1-Hour	98.4	4.1	355° (N)	416549
14-Jul	4	PM2.5	1-Hour	107.6	2.2	353° (N)	416549
14-Jul	5	PM2.5	1-Hour	137.9	3.1	330° (NNW)	416549
14-Jul	6	PM2.5	1-Hour	168.4	4.6	330° (NNW)	416549
14-Jul	7	PM2.5	1-Hour	197.5	3.5	329° (NNW)	416549
14-Jul	8	PM2.5	1-Hour	139.6	4.7	315° (NW)	416549
14-Jul	9	PM2.5	1-Hour	124.2	8.3	359° (N)	416549
14-Jul	10	PM2.5	1-Hour	225.5	9.4	344° (NNW)	416549
14-Jul	11	PM2.5	1-Hour	109.2	10.8	7° (N)	416549
14-Jul	12	PM2.5	1-Hour	82.1	10.1	359° (N)	416549
15-Jul	6	PM2.5	1-Hour	114.8	1.8	328° (NNW)	416549
15-Jul	7	PM2.5	1-Hour	152.6	4.4	358° (N)	416549
15-Jul	8	PM2.5	1-Hour	172.1	4.4	349° (NNW)	416549
15-Jul	9	PM2.5	1-Hour	135.4	4.4	347° (NNW)	416549
15-Jul	10	PM2.5	1-Hour	105.9	6.5	5° (N)	416549
15-Jul	11	PM2.5	1-Hour	91.3	5.7	352° (N)	416549
10-Aug	1	H2S	1-Hour	11	6	119° (ESE)	417687
14-Aug	16	PM2.5	1-Hour	84.5	3.7	328°(NNW)	418117
27-Aug	6	PM2.5	1-Hour	93.1	0.2	43°(NE)	418440
27-Aug	7	PM2.5	1-Hour	102.5	1.4	223°(SW)	418440
27-Aug	8	PM2.5	1-Hour	126	2.3	25°(NNE)	418440
27-Aug	9	PM2.5	1-Hour	149.9	0.8	92°(E)	418440
27-Aug	10	PM2.5	1-Hour	127	1.3	336°(NNW)	418440
27-Aug	11	PM2.5	1-Hour	100.9	1.9	318°(NW)	418440
27-Aug	21	PM2.5	1-Hour	86	3.1	218°(SW)	418440
27-Aug	22	PM2.5	1-Hour	107.1	2.9	222°(SW)	418440
27-Aug	23	PM2.5	1-Hour	99.4	4	212°(SSW)	418440
28-Aug	0	PM2.5	1-Hour	90.6	3.8	213°(SSW)	418930
28-Aug	1	PM2.5	1-Hour	87.5	3.2	218°(SW)	418930
31-Aug	15	PM2.5	1-Hour	95.7	5.5	287°(WNW)	418930
31-Aug	16	PM2.5	1-Hour	110.9	4.6	318°(NW)	418930
31-Aug	20	PM2.5	1-Hour	144.4	6	289°(WNW)	418930
31-Aug	21	PM2.5	1-Hour	181	3.9	322°(NW)	418930
31-Aug	22	PM2.5	1-Hour	209.4	4.1	313°(NW)	418930
31-Aug	23	PM2.5	1-Hour	228.6	5.3	291°(WNW)	418930
01-Sep	0	PM2.5	1-Hour	199.2	4.6	314°(NW)	418930
01-Sep	1	PM2.5	1-Hour	167.8	4.1	305°(WNW)	418930
01-Sep	2	PM2.5	1-Hour	138.9	3.7	307°(NW)	418930
01-Sep	3	PM2.5	1-Hour	120.8	3.4	279°(W)	418930
01-Sep	4	PM2.5	1-Hour	104.9	4.6	246°(WSW)	418930
01-Sep	5	PM2.5	1-Hour	90.5	6.4	261°(W)	418930
02-Sep	9	PM2.5	1-Hour	111.8	7.4	274°(W)	418930
02-Sep	10	PM2.5	1-Hour	205.4	7.3	282°(W)	418930
02-Sep	11	PM2.5	1-Hour	237	5.9	264°(W)	418930
02-Sep	12	PM2.5	1-Hour	235.1	7.2	271°(W)	418930
02-Sep	13	PM2.5	1-Hour	225.7	7.1	269°(W)	418930
02-Sep	14	PM2.5	1-Hour	197.1	8.9	267°(W)	418930
02-Sep	15	PM2.5	1-Hour	217.4	7.6	267°(W)	418930
02-Sep	16	PM2.5	1-Hour	239.4	7.2	267°(W)	418930

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
02-Sep	17	PM2.5	1-Hour	251.4	6.2	256°(WSW)	418930
02-Sep	18	PM2.5	1-Hour	246.8	5.7	266°(W)	418930
02-Sep	19	PM2.5	1-Hour	237.1	4.9	256°(WSW)	418930
02-Sep	20	PM2.5	1-Hour	234.7	3.6	275°(W)	418930
02-Sep	21	PM2.5	1-Hour	236.2	3.4	255°(WSW)	418930
02-Sep	22	PM2.5	1-Hour	233.9	5.5	213°(SSW)	418930
02-Sep	23	PM2.5	1-Hour	242.2	4.6	210°(SSW)	418930
03-Sep	0	PM2.5	1-Hour	245.8	3.7	217°(SW)	418930
03-Sep	1	PM2.5	1-Hour	238.7	3.5	206°(SSW)	418930
03-Sep	2	PM2.5	1-Hour	234.9	1.4	186°(S)	418930
03-Sep	3	PM2.5	1-Hour	235	0.9	154°(SSE)	418930
03-Sep	4	PM2.5	1-Hour	219.5	1	168°(SSE)	418930
03-Sep	5	PM2.5	1-Hour	251.3	4.6	203°(SSW)	418930
03-Sep	6	PM2.5	1-Hour	240.5	0.3	172°(S)	418930
03-Sep	7	PM2.5	1-Hour	238	1.2	54°(NE)	418930
03-Sep	8	PM2.5	1-Hour	230.7	0.2	81°(E)	418930
03-Sep	9	PM2.5	1-Hour	233.4	1	49°(NE)	418930
03-Sep	10	PM2.5	1-Hour	252.1	1.8	57°(ENE)	418930
03-Sep	11	PM2.5	1-Hour	255.3	5.3	11°(NNE)	418930
03-Sep	12	PM2.5	1-Hour	132.7	7.1	10°(N)	418930
17-Sep	20	PM2.5	1-Hour	104.5	5.9	280°(W)	419627
17-Sep	21	PM2.5	1-Hour	120.3	3.6	288°(WNW)	419627
17-Sep	22	PM2.5	1-Hour	119.2	2.3	275°(W)	419627
17-Sep	23	PM2.5	1-Hour	119.9	4.2	262°(W)	419627
18-Sep	0	PM2.5	1-Hour	122.7	3	261°(W)	419928
18-Sep	1	PM2.5	1-Hour	124.2	4	258°(WSW)	419928
18-Sep	2	PM2.5	1-Hour	121.3	2.7	201°(SSW)	419928
18-Sep	3	PM2.5	1-Hour	115	2.7	191°(S)	419928
18-Sep	4	PM2.5	1-Hour	113.5	2.2	180°(S)	419928
18-Sep	5	PM2.5	1-Hour	112.3	0.7	245°(WSW)	419928
18-Sep	6	PM2.5	1-Hour	106.6	0.6	129°(SE)	419928
18-Sep	7	PM2.5	1-Hour	112.8	0.8	131°(SE)	419928
18-Sep	8	PM2.5	1-Hour	112.5	0.3	332°(NNW)	419928
18-Sep	9	PM2.5	1-Hour	109.7	1.4	318°(NW)	419928
18-Sep	10	PM2.5	1-Hour	102.2	6.4	253°(WSW)	419928
18-Sep	11	PM2.5	1-Hour	107.6	4.1	272°(W)	419928
18-Sep	12	PM2.5	1-Hour	102.5	5.8	218°(SW)	419928
20-Sep	11	PM2.5	1-Hour	86.6	5.3	284°(WNW)	419928
16-Oct	7	PM2.5	1-Hour	100	0.1	233°(SW)	422410
16-Oct	8	PM2.5	1-Hour	93	1.3	221°(SW)	422410
01-Nov	7	PM2.5	1-Hour	157	1.8	217°(SW)	521437

- **PM2.5:** Thirty-two 24-hour PM2.5 exceedances were recorded in 2023.

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
12-May	-	PM2.5	24-Hour	35.7	2.9	77° (ENE)	413091
19-May	-	PM2.5	24-Hour	48.7	7.1	199° (SSW)	413524
20-May	-	PM2.5	24-Hour	202.7	5.5	77° (ENE)	413524
21-May	-	PM2.5	24-Hour	39	3.7	114° (ESE)	413524

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
22-May	-	PM2.5	24-Hour	144.3	10.3	59° (ENE)	413925
23-May	-	PM2.5	24-Hour	40.7	10.5	90° (E)	413925
31-May	-	PM2.5	24-Hour	91.9	5.6	36° (NE)	414427
01-Jun	-	PM2.5	24-Hour	30.5	7	3° (N)	414427
08-Jun	-	PM2.5	24-Hour	42	4.1	34° (NE)	414721
11-Jun	-	PM2.5	24-Hour	32.7	5.6	217° (SW)	414721
12-Jun	-	PM2.5	24-Hour	77.6	3.7	48° (NE)	414190
13-Jun	-	PM2.5	24-Hour	80.4	6.7	115° (ESE)	414190
18-Jun	-	PM2.5	24-Hour	29.4	7.8	55° (NE)	414190
08-Jul	-	PM2.5	24-Hour	30	5.9	264° (W)	416194
09-Jul	-	PM2.5	24-Hour	33.9	6.2	5° (N)	416194
13-Jul	-	PM2.5	24-Hour	53.2	5.5	305° (WNW)	416549
14-Jul	-	PM2.5	24-Hour	94.8	6	357° (N)	416549
15-Jul	-	PM2.5	24-Hour	67.9	3.4	12° (NNE)	416549
21-Jul	-	PM2.5	24-Hour	37.4	3.1	283° (W)	416954
22-Jul	-	PM2.5	24-Hour	40	2.7	350° (N)	416954
02-Aug	-	PM2.5	24-Hour	38.8	3	316°(NW)	419459
03-Aug	-	PM2.5	24-Hour	29.8	4.7	58°(ENE)	419459
27-Aug	-	PM2.5	24-Hour	71.1	2.8	233°(SW)	418440
28-Aug	-	PM2.5	24-Hour	43.8	3.8	215°(SSW)	418930
29-Aug	-	PM2.5	24-Hour	29.8	2.8	134°(SE)	418930
31-Aug	-	PM2.5	24-Hour	63.1	3.3	305°(WNW)	418930
01-Sep	-	PM2.5	24-Hour	63.5	6.6	247°(WSW)	418930
02-Sep	-	PM2.5	24-Hour	152.2	6.3	258°(WSW)	418930
03-Sep	-	PM2.5	24-Hour	144.9	3.8	18°(NNE)	418930
17-Sep	-	PM2.5	24-Hour	33.1	3.9	308°(NW)	419627
18-Sep	-	PM2.5	24-Hour	67.9	5.1	258°(WSW)	419928
20-Sep	-	PM2.5	24-Hour	29.4	2.8	268°(W)	419928

- **THC/CH4/NMHC:** To address bad injection issues, the Thermo 55i HC analyzer, s/n: 1314057759, was removed, and the Thermo 55i HC analyzer, s/n: 1180930026, was installed on January 5. Nineteen hours of downtime were recorded due to this event.
- **THC/CH4/NMHC**:
    - The Thermo 55i analyzer, s/n: 1180930026, failed on September 14. The replacement Thermo 55i analyzer, s/n: 1180030034, was installed on September 16. The analyzer was allowed time to stabilize overnight (column conditioning was being performed). A successful installation calibration was completed on September 17. Sixty-one hours of downtime were recorded due to this event.
    - A new zero air generator was installed on September 25. One hour of downtime was recorded due to this event.
    - LICA's Thermo 55i analyzer, s/n: 1180030034, was removed following a successful shut-down calibration on October 19. BV's Thermo 55i analyzer, s/n: 1505664392, was installed. The analyzer was allowed time to stabilize overnight (column conditioning was being performed). A successful installation calibration was completed on October 20. This analyzer swap was to address the NMHC noise issue. Eighteen hours of downtime were recorded.
    - **THC/CH4/NMHC:** Data collected between September 17 hour 15 and October 19 hour 15 were reviewed and revised during annual data review in January 2024. It was noticed that elevated NMHC concentrations were recorded by the Thermo 55i analyzer, s/n:

1180030034 after the analyzer's installation calibration on September 17. The analyzer was removed from the station following a successful shut-down calibration on October 19. As the analyzer passed daily zero-span checks each day, September 17's installation calibration and October 19's shut-down calibration, data were deemed valid during the monthly report preparation. However, during annual data review which was conducted in January 2024, it was determined that data collected from September 17 hour 15 to October 19 hour 15 were compromised by analyzer noise and were therefore invalidated**.** The operational uptime for September and October were 46.9% and 37.4%, respectively. **DINC000584.**

- **O3:** On November 23, the Thermo 49iQ analyzer, s/n: 1202068570, was removed following a successful shut-down calibration due to the ozonator failure. The Thermo 49i analyzer, s/n: 1002240371, was installed following by a installation calibration on the same day.
- **Precipitation:** Sporadic 0.1mm measurements were recorded throughout the month in September. The readings were considered noise and were corrected to zero. The cause was likely because the wiring to the precipitation gauge, which runs underground, is degrading. An adjustment was made to the digital interface to try to filter out this noise on October 18. A permeant solution will be to relocate the gauge onto the trailer roof, which will be scheduled in spring 2024. As the issue started in mid-August, data collected in August were reviewed and revised using the same data validation method. The revised monthly total of precipitation collected in August was 23.9mm instead of 115.7mm. **ETS Request # 4603484**.

St. Lina Station:

- The following exceedances of AAAQOs were recorded at the St. Lina Station:
  - **O3:** Ten 1-hour O3 exceedance was recorded in 2023.

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
07-Jun	18	O3	1-Hour	79.9	6.8	308° (NW)	414435
10-Jun	14	O3	1-Hour	78.4	13.9	157° (SSE)	414625
10-Jun	15	O3	1-Hour	81.2	14.8	163° (SSE)	414625
10-Jun	16	O3	1-Hour	81	13.8	168° (SSE)	414625
10-Jun	17	O3	1-Hour	80.6	12.2	154° (SSE)	414625
10-Jun	18	O3	1-Hour	80.3	11.4	152° (SSE)	414625
10-Jun	19	O3	1-Hour	77.6	10	143° (SE)	414625
13-Jun	14	O3	1-Hour	86.3	15.8	141° (SE)	414828
13-Jun	15	O3	1-Hour	86.5	17.3	134° (SE)	414828
13-Jun	16	O3	1-Hour	78.8	12.1	138° (SE)	414828

  - **PM2.5:** Two hundred and one 1-hour PM2.5 exceedances were recorded in 2023.

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
19-May	16	PM2.5	1-Hour	143	15	281° (W)	413525
19-May	17	PM2.5	1-Hour	209	7.9	306° (NW)	413525
19-May	18	PM2.5	1-Hour	196	9.5	304° (WNW)	413525
19-May	19	PM2.5	1-Hour	211	7.6	313° (NW)	413525
19-May	20	PM2.5	1-Hour	247	8.4	330° (NNW)	413525
19-May	21	PM2.5	1-Hour	261	9.2	337° (NNW)	413525
19-May	22	PM2.5	1-Hour	267	8.4	331° (NNW)	413525
19-May	23	PM2.5	1-Hour	268	17.6	219° (SW)	413525
20-May	0	PM2.5	1-Hour	239	7.2	6° (N)	413525
20-May	1	PM2.5	1-Hour	191	6.8	7° (N)	413525
20-May	2	PM2.5	1-Hour	155	7.2	4° (N)	413525
20-May	3	PM2.5	1-Hour	144	6.2	351° (N)	413525
20-May	4	PM2.5	1-Hour	126	7.4	1° (N)	413525
20-May	5	PM2.5	1-Hour	108	7.6	22° (NNE)	413525
20-May	6	PM2.5	1-Hour	99	7	45° (NE)	413525
20-May	7	PM2.5	1-Hour	102	8.6	62° (ENE)	413525
20-May	8	PM2.5	1-Hour	150	7.5	77° (ENE)	413525
20-May	9	PM2.5	1-Hour	192	4.4	76° (ENE)	413525
20-May	10	PM2.5	1-Hour	251	3	76° (ENE)	413525
20-May	11	PM2.5	1-Hour	304	3.9	71° (ENE)	413525
20-May	12	PM2.5	1-Hour	296	4.2	92° (E)	413525
20-May	13	PM2.5	1-Hour	358	5.5	76° (ENE)	413525
20-May	14	PM2.5	1-Hour	410	9.4	87° (E)	413525
20-May	15	PM2.5	1-Hour	493	9.6	85° (E)	413525
20-May	16	PM2.5	1-Hour	373	9.9	91° (E)	413525
20-May	17	PM2.5	1-Hour	273	10.5	103° (ESE)	413525
20-May	18	PM2.5	1-Hour	190	10.7	109° (ESE)	413525
20-May	19	PM2.5	1-Hour	137	8.1	106° (ESE)	413525
20-May	20	PM2.5	1-Hour	113	8.9	101° (E)	413525
20-May	21	PM2.5	1-Hour	81	9.1	93° (E)	413525
21-May	3	PM2.5	1-Hour	98	10	133° (SE)	413525

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
21-May	4	PM2.5	1-Hour	95	7.6	116° (ESE)	413525
21-May	5	PM2.5	1-Hour	105	8.1	116° (ESE)	413525
21-May	6	PM2.5	1-Hour	121	6.7	136° (SE)	413525
21-May	7	PM2.5	1-Hour	114	6.2	129° (SE)	413525
21-May	8	PM2.5	1-Hour	107	6.8	167° (SSE)	413525
21-May	9	PM2.5	1-Hour	102	6.8	160° (SSE)	413525
21-May	10	PM2.5	1-Hour	93	5.5	162° (SSE)	413525
21-May	11	PM2.5	1-Hour	85	5.9	139° (SE)	413525
22-May	17	PM2.5	1-Hour	107	22.6	68° (ENE)	413928
22-May	18	PM2.5	1-Hour	164	23.2	71° (ENE)	413928
22-May	19	PM2.5	1-Hour	188	25.4	78° (ENE)	413928
22-May	20	PM2.5	1-Hour	276	25.9	82° (E)	413928
22-May	21	PM2.5	1-Hour	285	15	94° (E)	413928
22-May	22	PM2.5	1-Hour	198	12.7	81° (E)	413928
22-May	23	PM2.5	1-Hour	112	13.8	85° (E)	413928
23-May	0	PM2.5	1-Hour	119	21.3	82° (E)	413928
23-May	1	PM2.5	1-Hour	139	22.2	88° (E)	413928
23-May	2	PM2.5	1-Hour	136	23.1	88° (E)	413928
23-May	3	PM2.5	1-Hour	140	21.7	90° (E)	413928
23-May	4	PM2.5	1-Hour	139	20	92° (E)	413928
23-May	5	PM2.5	1-Hour	136	20.3	98° (E)	413928
23-May	6	PM2.5	1-Hour	125	19.2	103° (ESE)	413928
23-May	7	PM2.5	1-Hour	111	15.9	100° (E)	413928
31-May	13	PM2.5	1-Hour	94	11.3	41° (NE)	414425
31-May	14	PM2.5	1-Hour	118	11	47° (NE)	414425
31-May	15	PM2.5	1-Hour	116	10.3	51° (NE)	414425
31-May	16	PM2.5	1-Hour	110	10	44° (NE)	414425
31-May	17	PM2.5	1-Hour	100	9.4	38° (NE)	414425
31-May	18	PM2.5	1-Hour	89	9.3	29° (NNE)	414425
12-Jun	19	PM2.5	1-Hour	97	7.9	106° (ESE)	415191
12-Jun	20	PM2.5	1-Hour	103	8.1	103° (ESE)	415191
12-Jun	21	PM2.5	1-Hour	105	9.7	109° (ESE)	415191
12-Jun	22	PM2.5	1-Hour	107	9	130° (SE)	415191
12-Jun	23	PM2.5	1-Hour	128	2.2	319° (NNW)	415191
13-Jun	0	PM2.5	1-Hour	148	10.6	172° (S)	415191
13-Jun	1	PM2.5	1-Hour	150	12.3	186° (S)	415191
13-Jun	2	PM2.5	1-Hour	130	11.8	187° (S)	415191
13-Jun	3	PM2.5	1-Hour	127	11.4	192° (S)	415191
13-Jun	4	PM2.5	1-Hour	123	11	196° (SSW)	415191
13-Jun	5	PM2.5	1-Hour	108	12.1	196° (SSW)	415191
13-Jun	6	PM2.5	1-Hour	96	10.5	203° (SSW)	415191
13-Jun	7	PM2.5	1-Hour	93	8	200° (SSW)	415191
13-Jun	8	PM2.5	1-Hour	95	8.7	187° (S)	415191
13-Jun	9	PM2.5	1-Hour	98	8.8	186° (S)	415191
13-Jun	10	PM2.5	1-Hour	97	5.9	138° (SE)	415191
13-Jun	11	PM2.5	1-Hour	93	6.4	125° (SE)	415191
09-Jul	17	PM2.5	1-Hour	81	6.1	25° (NNE)	416193
13-Jul	9	PM2.5	1-Hour	95	8.3	313° (NW)	416550
13-Jul	10	PM2.5	1-Hour	96	10.1	304° (WNW)	416550

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
13-Jul	11	PM2.5	1-Hour	95	11.3	320° (NW)	416550
13-Jul	12	PM2.5	1-Hour	92	11.5	326° (NW)	416550
13-Jul	13	PM2.5	1-Hour	99	12.5	324° (NW)	416550
13-Jul	14	PM2.5	1-Hour	132	13.1	336° (NNW)	416550
13-Jul	15	PM2.5	1-Hour	114	14.8	331° (NNW)	416550
13-Jul	16	PM2.5	1-Hour	109	14	334° (NNW)	416550
13-Jul	17	PM2.5	1-Hour	111	11.7	336° (NNW)	416550
13-Jul	18	PM2.5	1-Hour	88	8.2	332° (NNW)	416550
13-Jul	20	PM2.5	1-Hour	95	8.6	302° (WNW)	416550
13-Jul	21	PM2.5	1-Hour	96	9.4	298° (WNW)	416550
13-Jul	22	PM2.5	1-Hour	89	10.9	289° (WNW)	416550
13-Jul	23	PM2.5	1-Hour	84	10.5	286° (WNW)	416550
14-Jul	5	PM2.5	1-Hour	102	8.4	338° (NNW)	416550
14-Jul	6	PM2.5	1-Hour	135	8.6	339° (NNW)	416550
14-Jul	7	PM2.5	1-Hour	206	7	342° (NNW)	416550
14-Jul	8	PM2.5	1-Hour	202	7.6	329° (NNW)	416550
14-Jul	9	PM2.5	1-Hour	184	9.2	342° (NNW)	416550
14-Jul	10	PM2.5	1-Hour	217	10.4	338° (NNW)	416550
14-Jul	11	PM2.5	1-Hour	175	11	348° (NNW)	416550
14-Jul	12	PM2.5	1-Hour	216	11.3	348° (NNW)	416550
14-Jul	13	PM2.5	1-Hour	199	11.8	335° (NNW)	416550
14-Jul	14	PM2.5	1-Hour	146	12.7	336° (NNW)	416550
14-Jul	15	PM2.5	1-Hour	103	14.3	341° (NNW)	416550
14-Jul	16	PM2.5	1-Hour	108	12.5	341° (NNW)	416550
14-Jul	17	PM2.5	1-Hour	140	10.2	341° (NNW)	416550
14-Jul	18	PM2.5	1-Hour	129	7.3	337° (NNW)	416550
14-Jul	19	PM2.5	1-Hour	124	5.5	320° (NW)	416550
14-Jul	20	PM2.5	1-Hour	123	5.1	302° (WNW)	416550
14-Jul	21	PM2.5	1-Hour	123	4.3	246° (WSW)	416550
14-Jul	22	PM2.5	1-Hour	132	6.9	267° (W)	416550
14-Jul	23	PM2.5	1-Hour	149	9.2	291° (WNW)	416550
15-Jul	0	PM2.5	1-Hour	140	9.8	286° (WNW)	416550
15-Jul	1	PM2.5	1-Hour	126	9.4	291° (WNW)	416550
15-Jul	2	PM2.5	1-Hour	119	10.5	292° (WNW)	416550
15-Jul	3	PM2.5	1-Hour	120	8.6	306° (NW)	416550
15-Jul	4	PM2.5	1-Hour	126	9.4	301° (WNW)	416550
15-Jul	5	PM2.5	1-Hour	126	9.2	306° (NW)	416550
15-Jul	6	PM2.5	1-Hour	126	8.1	313° (NW)	416550
15-Jul	7	PM2.5	1-Hour	124	6.7	325° (NW)	416550
15-Jul	8	PM2.5	1-Hour	116	4.3	13° (NNE)	416550
15-Jul	9	PM2.5	1-Hour	115	4.5	38° (NE)	416550
15-Jul	10	PM2.5	1-Hour	115	3.2	13° (NNE)	416550
15-Jul	11	PM2.5	1-Hour	129	3.2	16° (NNE)	416550
15-Jul	12	PM2.5	1-Hour	153	3.9	342° (NNW)	416550
15-Jul	13	PM2.5	1-Hour	173	6.1	339° (NNW)	416550
15-Jul	14	PM2.5	1-Hour	162	6	319° (NW)	416550
15-Jul	16	PM2.5	1-Hour	137	4.9	19° (NNE)	416550
15-Jul	17	PM2.5	1-Hour	133	4.3	26° (NNE)	416550
15-Jul	18	PM2.5	1-Hour	124	4.4	83° (E)	416550

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
15-Jul	19	PM2.5	1-Hour	123	4.3	94° (E)	416550
15-Jul	20	PM2.5	1-Hour	116	4.7	101° (E)	416550
15-Jul	21	PM2.5	1-Hour	94	6.5	108° (ESE)	416550
27-Aug	8	PM2.5	1-Hour	100	3.7	46°(NE)	418439
27-Aug	9	PM2.5	1-Hour	95	2.7	76°(ENE)	418439
27-Aug	10	PM2.5	1-Hour	86	2.9	163°(SSE)	418439
27-Aug	11	PM2.5	1-Hour	92	1.8	261°(W)	418439
27-Aug	12	PM2.5	1-Hour	90	1.5	252°(WSW)	418439
27-Aug	13	PM2.5	1-Hour	103	1.3	206°(SSW)	418439
27-Aug	14	PM2.5	1-Hour	125	1.9	217°(SW)	418439
27-Aug	15	PM2.5	1-Hour	104	2.3	252°(WSW)	418439
27-Aug	16	PM2.5	1-Hour	92	2.5	221°(SW)	418439
27-Aug	17	PM2.5	1-Hour	93	2.7	155°(SSE)	418439
27-Aug	18	PM2.5	1-Hour	89	4.9	169°(SSE)	418439
27-Aug	19	PM2.5	1-Hour	86	7.8	187°(S)	418439
27-Aug	20	PM2.5	1-Hour	83	8.2	199°(SSW)	418439
31-Aug	8	PM2.5	1-Hour	108	8.3	334°(NNW)	418929
31-Aug	9	PM2.5	1-Hour	126	10.3	334°(NNW)	418929
31-Aug	10	PM2.5	1-Hour	131	9.1	325°(NW)	418929
31-Aug	11	PM2.5	1-Hour	123	10.3	315°(NW)	418929
31-Aug	12	PM2.5	1-Hour	114	11.4	322°(NW)	418929
31-Aug	13	PM2.5	1-Hour	132	10.8	320°(NW)	418929
31-Aug	14	PM2.5	1-Hour	88	10.4	302°(WNW)	418929
31-Aug	15	PM2.5	1-Hour	85	11.3	311°(NW)	418929
02-Sep	8	PM2.5	1-Hour	96	11.4	289°(WNW)	418929
02-Sep	9	PM2.5	1-Hour	135	12.1	295°(WNW)	418929
02-Sep	10	PM2.5	1-Hour	155	11.3	281°(W)	418929
02-Sep	11	PM2.5	1-Hour	182	12.4	277°(W)	418929
02-Sep	12	PM2.5	1-Hour	198	13.5	286°(WNW)	418929
02-Sep	13	PM2.5	1-Hour	193	9.9	305°(WNW)	418929
02-Sep	14	PM2.5	1-Hour	242	10.5	303°(WNW)	418929
02-Sep	15	PM2.5	1-Hour	286	10.6	308°(NW)	418929
02-Sep	16	PM2.5	1-Hour	270	7.4	325°(NW)	418929
02-Sep	17	PM2.5	1-Hour	264	6.4	312°(NW)	418929
02-Sep	18	PM2.5	1-Hour	251	6.9	336°(NNW)	418929
02-Sep	19	PM2.5	1-Hour	247	7.9	305°(WNW)	418929
02-Sep	20	PM2.5	1-Hour	249	7.8	262°(W)	418929
02-Sep	21	PM2.5	1-Hour	254	8.9	277°(W)	418929
02-Sep	22	PM2.5	1-Hour	249	6.6	272°(W)	418929
02-Sep	23	PM2.5	1-Hour	236	7.2	318°(NW)	418929
03-Sep	0	PM2.5	1-Hour	235	4.8	322°(NW)	418929
03-Sep	1	PM2.5	1-Hour	239	3.8	321°(NW)	418929
03-Sep	2	PM2.5	1-Hour	231	6.1	215°(SSW)	418929
03-Sep	3	PM2.5	1-Hour	242	8.7	208°(SSW)	418929
03-Sep	4	PM2.5	1-Hour	243	8.8	195°(SSW)	418929
03-Sep	5	PM2.5	1-Hour	231	8.5	195°(SSW)	418929
03-Sep	6	PM2.5	1-Hour	237	9.4	189°(S)	418929
03-Sep	7	PM2.5	1-Hour	245	9.4	200°(SSW)	418929
03-Sep	8	PM2.5	1-Hour	256	4.2	159°(SSE)	418929

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
03-Sep	9	PM2.5	1-Hour	238	7.7	12°(NNE)	418929
03-Sep	10	PM2.5	1-Hour	232	6.1	32°(NNE)	418929
03-Sep	11	PM2.5	1-Hour	187	9.6	22°(NNE)	418929
03-Sep	12	PM2.5	1-Hour	123	10	48°(NE)	418929
03-Sep	13	PM2.5	1-Hour	85	9.8	49°(NE)	418929
04-Sep	4	PM2.5	1-Hour	82	9.7	321°(NW)	419222
04-Sep	5	PM2.5	1-Hour	85	7.6	331°(NNW)	419222
04-Sep	6	PM2.5	1-Hour	82	6.5	326°(NW)	419222
17-Sep	20	PM2.5	1-Hour	92	7.9	298°(WNW)	419601
17-Sep	21	PM2.5	1-Hour	97	7.9	282°(W)	419601
17-Sep	22	PM2.5	1-Hour	105	7.6	284°(WNW)	419601
17-Sep	23	PM2.5	1-Hour	110	7.2	295°(WNW)	419601
18-Sep	0	PM2.5	1-Hour	111	8.5	286°(WNW)	419927
18-Sep	1	PM2.5	1-Hour	110	6.7	305°(WNW)	419927
18-Sep	2	PM2.5	1-Hour	107	6.9	247°(WSW)	419927
18-Sep	3	PM2.5	1-Hour	111	7.6	273°(W)	419927
18-Sep	4	PM2.5	1-Hour	117	6	263°(W)	419927
18-Sep	5	PM2.5	1-Hour	110	7.2	211°(SSW)	419927
18-Sep	6	PM2.5	1-Hour	104	6.5	222°(SW)	419927
18-Sep	7	PM2.5	1-Hour	113	8.2	200°(SSW)	419927
18-Sep	8	PM2.5	1-Hour	110	7.7	219°(SW)	419927
18-Sep	9	PM2.5	1-Hour	102	11.1	300°(WNW)	419927
18-Sep	10	PM2.5	1-Hour	88	13.2	328°(NNW)	419927

- **PM2.5:** Twenty-nine 24-hour PM2.5 exceedances were recorded in 2023.

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
19-May	-	PM2.5	24-Hour	95	12.9	227° (SW)	413525
20-May	-	PM2.5	24-Hour	203	7.6	71° (ENE)	413525
21-May	-	PM2.5	24-Hour	65	8.1	111° (ESE)	413525
22-May	-	PM2.5	24-Hour	79	15.4	77° (ENE)	413928
23-May	-	PM2.5	24-Hour	62	18.2	108° (ESE)	413928
31-May	-	PM2.5	24-Hour	46	9.2	23° (NNE)	414425
08-Jun	-	PM2.5	24-Hour	45	7.1	65° (ENE)	415191
09-Jun	-	PM2.5	24-Hour	31	9	106° (ESE)	415191
10-Jun	-	PM2.5	24-Hour	33	12.5	166° (SSE)	415191
11-Jun	-	PM2.5	24-Hour	36	9.2	249° (WSW)	415191
12-Jun	-	PM2.5	24-Hour	75	6.1	64° (ENE)	415191
13-Jun	-	PM2.5	24-Hour	87	11.6	151° (SSE)	415191
14-Jun	-	PM2.5	24-Hour	38	9.5	359° (N)	415191
07-Jul	-	PM2.5	24-Hour	31	5.8	1° (N)	416193
09-Jul	-	PM2.5	24-Hour	44	7.2	320° (NW)	416193
13-Jul	-	PM2.5	24-Hour	74	10.3	314° (NW)	416550
14-Jul	-	PM2.5	24-Hour	136	9.3	325° (NW)	416550
15-Jul	-	PM2.5	24-Hour	122	6.4	341° (NNW)	416550
16-Jul	-	PM2.5	24-Hour	39	9.6	136° (SE)	416550
21-Jul	-	PM2.5	24-Hour	38	4.7	305° (WNW)	416955
22-Jul	-	PM2.5	24-Hour	35	6.3	94° (E)	416955
27-Aug	-	PM2.5	24-Hour	74	5.7	269°(W)	418439

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
31-Aug	-	PM2.5	24-Hour	62	9.4	323°(NW)	418929
01-Sep	-	PM2.5	24-Hour	50	11.4	265°(W)	418929
02-Sep	-	PM2.5	24-Hour	158	10.7	284°(WNW)	418929
03-Sep	-	PM2.5	24-Hour	147	7.3	328°(NNW)	418929
04-Sep	-	PM2.5	24-Hour	33	8.2	323°(NW)	419222
17-Sep	-	PM2.5	24-Hour	39	8.9	261°(W)	419601
18-Sep	-	PM2.5	24-Hour	54	9.6	279°(W)	419927

- **Precipitation**: The precipitation gauge was found to be non-functional (tipping bucket and drain holes were blocked by ice) on January 15. Due to insufficient field time for troubleshooting, the issue was not addressed until January 19. Data were invalidated back to January 14 hour 10, when a nearby air monitoring station (St. Lina station), started recording precipitation data. One hundred twenty-one hours of downtime were recorded due to this event. (83.6%).
- **THC/CH4/NMHC**:
    - Following the March 11's successful shut-down calibration, the Thermo 55i analyzer, s/n: 1180030034, was removed, and the Thermo 55i analyzer, s/n: 1236656107, was installed. The analyzer was allowed time to stabilize overnight. A successful installation calibration was completed on March 12. Nineteen hours of downtime were recorded.
    - Due to frequent bad injections, the Thermo 55i analyzer, s/n: 1236656107, was removed and the Thermo 55i analyzer, s/n: 1180030034, was installed on May 5. The analyzer was allowed to stabilize overnight for column conditioning. An installation calibration was completed on May 6. Twenty-four hours of downtime were recorded due to this event.
    - Following the August 13's monthly calibration, significant NMHC noise was noted. On August 17, an investigation was completed, and maintenance was performed on the H2 generator. A repeat multi-point calibration was completed on August 18. However, the issue continued. Therefore, on August 25, the Thermo 55i analyzer, s/n: 1180030034, was removed for maintenance, and the Thermo 55i analyzer, s/n: 1236656107, analyzer was installed. The analyzer was put offline overnight for column conditioning. A successful post-repair calibration was completed on August 26. Thirty-five hours of downtime were recorded due to these maintenance activities.
    - Data collected between August 13 hour 14 and September 26 hour 15 were reviewed and revised during annual data review. It was noticed that NMHC noises were recorded by the Thermo 55i analyzer, s/n: 1180030034, after August 13's monthly calibration. As the analyzer passed daily zero-span checks each day, August 18's repeat multi-point calibration and August 25's shut-down calibration, data were deemed valid during the monthly report preparation. The replacement Thermo 55i analyzer, s/n: 1236656107, were installed following a successful installation calibration on August 26. Elevated NMHC concentration continued being record until the zero-air generator was replaced on September 26. During annual data review, it was determined that data collected between August 13 hour 14 and September 26 hour 15 were more likely analyzer's noise and therefore were invalidated. Operational uptime for August was 40.7%. **EDGE reference # 419572**. Operational uptime for September was 10.8%. **DINC0003583.**
    - A new zero air generator was installed on September 26. Two hours of downtime were recorded due to this event.
    - On November 7, the Thermo 55i analyzer, s/n: 1236656107, failed the shut-down calibration, and it was replaced with the Thermo 55i analyzer, s/n: 1180930026. The replacement analyzer was allowed time to stabilize overnight. A successful installation calibration was completed on November 8. Data were invalidated back to the last valid calibration check,

which was November 3 hour 15. Ninety hours of downtime were recorded. Operational uptime was 79.6%. **DINC0003273**.

- **H2S:**
    - LICA's Thermo 450i analyzer, s/n: CM18010058, failed due to unstable PMT on June 20. A shut-down calibration was attempted on June 21, but was unsuccessful due to PMT instability. The analyzer was replaced with BV's Teledyne T100 analyzer, s/n: 1014, on June 22. A successful shut down calibration was completed afterward. Fifty-nine hours of downtime were recorded due to this event. Additionally, other downtime events occurred throughout the month, namely intermittent datalogger polling issues and analyzer maintenance; the 90% uptime requirement was not met. Operational uptime was 86.7%. **EPA reference #: 416669**.
    - The analyzer failed the October 10 shut-down calibration due to an abrupt change in UV lamp performance. Troubleshooting was performed, and a successful-post-repair calibration was completed on October 11. Based on the diagnostic data, the failure occurred on October 10 hour 9. Data were invalidated back to the point of failure. Twenty-five hours of downtime were recorded due to this event. The analyzer failed the October 12 and 13's daily span checks, October 13's repeat zero-span check, and October 14's as-found points check. The cause was due to UV lamp voltage drift. The issue was corrected following by a successful post-repair calibration on October 14. Data were invalidated back to the last valid calibration check, which was October 11. Sixty-eight hours of downtime were recorded. Operational uptime for October was 85.8%. **DINC0002455**.
- **SO2:** LICA's Thermo 43i-TL analyzer, s/n: 1180930030, failed on October 8 hour 2. On October 10, the analyzer was removed, and BV's Thermo 43i analyzer, s/n: 1226154720, was installed. The analyzer was allowed time to stabilize overnight. A successful installation calibration was completed on October 11. Eight-one hours of downtime were recorded due to this event. Operational uptime was 87.8%. **DINC0002453.**
- **SO2, H2S, NOx/NO/NO2, O3 and THC/CH4/NMHC:** The main fan that cools the radiator stopped working causing the HVAC unit to fail on August 25. The motor was replaced on September 9. Due to this issue, the station temperatures rose above the manufacturer's recommended operation temperature ranges. Data quality collected during this period could have been affected by the issue and therefore were discarded. Downtime was variable among the instruments however, 128 hours to 150 hours of downtime were recorded in August and 181 hours of downtime were recorded in September as a result. As a result, the analyzers did not meet the 90% operational uptime requirement in September. **AEPA reference #: 419572**.
- **Station HVAC unit:** The main fan that cools the radiator stopped working leading the HVAC unit to fail. on August 25. The motor was replaced on September 9. Due to this issue, the station temperatures rose above the manufacturer's recommended operation temperature ranges. Data quality collected during this period could have been affected by the issue and therefore were discarded. Downtime was variable among the instruments however, 128 hours to 150 hours of downtime were recorded in August as a result.
- **AQHI values:** Due to the HVAC unit issue, data quality for data collected by the most gas analyzers between August 25 hour 18 and September 8 hour 12 (for PM2.5 data: between August 28 hour 15 and August 29 hour 12) were affected and were invalidated. As NO2, O3 and PM2.5 are the parameters used to calculate the AQHI value, the AQHI values during this period were affected. However, considering that 1) although elevated, the station temperature was still within the operating range of the PM2.5 instrument, and 2) ambient air and wildfires conditions in and around the LICA region this season led to elevated PM2.5 concentrations, PM2.5 was the predominant parameter driving the AQHI values during the time the HVAC unit failed. As a result, AQHI values were not discarded and were kept for *reference use*.

PAM Station – Lac La Biche Station:

- The following exceedances of AAAQOs were recorded at the PAM Station:
  - **O3:** Four 1-hour O3 exceedances were recorded in 2023.

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
10-Jun	17	O3	1-Hour	76.7	9.1	145° (SE)	416667
10-Jun	19	O3	1-Hour	76.6	9.3	133° (SE)	416667
13-Jun	15	O3	1-Hour	83.7	13.5	130° (SE)	414827
13-Jun	16	O3	1-Hour	85.9	15.4	133° (SE)	414827

  - **PM2.5:** Two hundred thirty 1-hour PM2.5 exceedances were recorded in 2023.

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
19-May	16	PM2.5	1-Hour	167.9	8.9	277° (W)	413526
19-May	17	PM2.5	1-Hour	227.6	8.6	300° (WNW)	413526
19-May	18	PM2.5	1-Hour	262.9	11.8	320° (NW)	413526
19-May	19	PM2.5	1-Hour	291.1	9.2	321° (NW)	413526
19-May	20	PM2.5	1-Hour	265.6	6.3	319° (NW)	413526
19-May	21	PM2.5	1-Hour	237.6	4.6	330° (NNW)	413526
19-May	22	PM2.5	1-Hour	238.3	3.4	2° (N)	413526
19-May	23	PM2.5	1-Hour	200	7.1	187° (S)	413526
20-May	0	PM2.5	1-Hour	151.2	3.9	348° (NNW)	413526
20-May	1	PM2.5	1-Hour	134	4.8	347° (NNW)	413526
20-May	2	PM2.5	1-Hour	147.3	3.8	336° (NNW)	413526
20-May	3	PM2.5	1-Hour	119.3	4.2	353° (N)	413526
20-May	4	PM2.5	1-Hour	103.3	2.8	23° (NNE)	413526
20-May	5	PM2.5	1-Hour	100.5	4.4	17° (NNE)	413526
20-May	6	PM2.5	1-Hour	93.2	3.3	26° (NNE)	413526
20-May	7	PM2.5	1-Hour	89.8	2.1	15° (NNE)	413526
20-May	8	PM2.5	1-Hour	89.4	3.5	322° (NW)	413526
20-May	9	PM2.5	1-Hour	96.4	3.8	4° (N)	413526
20-May	10	PM2.5	1-Hour	124.9	4.9	340° (NNW)	413526
20-May	11	PM2.5	1-Hour	138.9	4.9	336° (NNW)	413526
20-May	12	PM2.5	1-Hour	172.6	3.7	356° (N)	413526
20-May	13	PM2.5	1-Hour	184.5	3.4	7° (N)	413526
20-May	14	PM2.5	1-Hour	215.9	1.5	121° (ESE)	413526
20-May	15	PM2.5	1-Hour	256.7	7	139° (SE)	413526
20-May	16	PM2.5	1-Hour	404.5	5.4	121° (ESE)	413526
20-May	17	PM2.5	1-Hour	410.5	6.2	109° (ESE)	413526
20-May	18	PM2.5	1-Hour	248.4	7.1	115° (ESE)	413526
20-May	19	PM2.5	1-Hour	176.3	4.2	128° (SE)	413526
20-May	20	PM2.5	1-Hour	135.6	4.2	127° (SE)	413526
21-May	5	PM2.5	1-Hour	93.3	8.6	132° (SE)	413526
21-May	6	PM2.5	1-Hour	100.3	7.1	143° (SE)	413526
21-May	7	PM2.5	1-Hour	104.1	8.4	137° (SE)	413526
21-May	8	PM2.5	1-Hour	106.1	6	144° (SE)	413526
21-May	9	PM2.5	1-Hour	106.3	5.2	124° (ESE)	413526
21-May	10	PM2.5	1-Hour	104.4	5.4	106° (ESE)	413526
21-May	11	PM2.5	1-Hour	100.3	7.5	127° (SE)	413526
21-May	13	PM2.5	1-Hour	91	6.7	107° (ESE)	413526

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
21-May	14	PM2.5	1-Hour	93.4	5.5	104° (ESE)	413526
21-May	15	PM2.5	1-Hour	101	5.9	109° (ESE)	413526
21-May	16	PM2.5	1-Hour	104.4	5.7	147° (SE)	413526
21-May	17	PM2.5	1-Hour	94.9	6.6	125° (SE)	413526
21-May	18	PM2.5	1-Hour	85.1	5.8	128° (SE)	413526
21-May	19	PM2.5	1-Hour	80.2	3.1	110° (ESE)	413526
22-May	13	PM2.5	1-Hour	88	11.6	42° (NE)	413932
22-May	14	PM2.5	1-Hour	143.8	15.8	47° (NE)	413932
22-May	15	PM2.5	1-Hour	146.8	15.1	54° (NE)	413932
22-May	16	PM2.5	1-Hour	184.1	18	61° (ENE)	413932
22-May	17	PM2.5	1-Hour	240	18.4	65° (ENE)	413932
22-May	18	PM2.5	1-Hour	250.9	19.7	71° (ENE)	413932
22-May	19	PM2.5	1-Hour	281.2	19.6	75° (ENE)	413932
22-May	20	PM2.5	1-Hour	319.9	16.9	80° (E)	413932
22-May	21	PM2.5	1-Hour	351	11	90° (E)	413932
22-May	22	PM2.5	1-Hour	380.5	8.1	88° (E)	413932
22-May	23	PM2.5	1-Hour	370	6.7	46° (NE)	413932
23-May	0	PM2.5	1-Hour	343.9	13.4	75° (ENE)	413932
23-May	1	PM2.5	1-Hour	331.6	12.4	80° (E)	413932
23-May	2	PM2.5	1-Hour	225.9	12.4	85° (E)	413932
23-May	3	PM2.5	1-Hour	139.8	11	91° (E)	413932
23-May	4	PM2.5	1-Hour	111	12.2	97° (E)	413932
23-May	5	PM2.5	1-Hour	103.8	12.9	102° (E)	413932
23-May	6	PM2.5	1-Hour	97.2	15.7	110° (ESE)	413932
23-May	7	PM2.5	1-Hour	94.2	14.6	109° (ESE)	413932
23-May	8	PM2.5	1-Hour	83.3	14.8	108° (ESE)	413932
31-May	11	PM2.5	1-Hour	87.2	4.6	285° (WNW)	414424
31-May	12	PM2.5	1-Hour	85.4	8.3	64° (ENE)	414424
31-May	15	PM2.5	1-Hour	91.5	6.5	339° (NNW)	414424
02-Jun	17	PM2.5	1-Hour	80.1	7.1	62° (ENE)	414424
12-Jun	10	PM2.5	1-Hour	83.1	6.1	357° (N)	415192
12-Jun	11	PM2.5	1-Hour	104	5.6	2° (N)	415192
12-Jun	12	PM2.5	1-Hour	127.7	5.6	24° (NNE)	415192
12-Jun	13	PM2.5	1-Hour	137.6	7	342° (NNW)	415192
12-Jun	14	PM2.5	1-Hour	120.5	5.7	359° (N)	415192
12-Jun	15	PM2.5	1-Hour	104.5	5.2	3° (N)	415192
12-Jun	16	PM2.5	1-Hour	93.8	4.2	358° (N)	415192
12-Jun	17	PM2.5	1-Hour	91.7	3	12° (NNE)	415192
12-Jun	18	PM2.5	1-Hour	99.7	3.4	150° (SSE)	415192
12-Jun	19	PM2.5	1-Hour	107.1	5.5	138° (SE)	415192
12-Jun	20	PM2.5	1-Hour	104.5	5	135° (SE)	415192
12-Jun	21	PM2.5	1-Hour	116.2	8	140° (SE)	415192
12-Jun	22	PM2.5	1-Hour	140.8	8.5	143° (SE)	415192
12-Jun	23	PM2.5	1-Hour	151	6.2	2° (NNE)	415192
13-Jun	0	PM2.5	1-Hour	143.1	7.2	154° (SSE)	415192
13-Jun	1	PM2.5	1-Hour	143.4	6.6	146° (SE)	415192
13-Jun	2	PM2.5	1-Hour	146	5	146° (SE)	415192
13-Jun	3	PM2.5	1-Hour	146.5	6.1	133° (SE)	415192
13-Jun	4	PM2.5	1-Hour	152.9	7.8	134° (SE)	415192

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
13-Jun	5	PM2.5	1-Hour	149.9	8.2	141° (SE)	415192
13-Jun	6	PM2.5	1-Hour	139.1	7.4	149° (SSE)	415192
13-Jun	7	PM2.5	1-Hour	131.5	7.3	154° (SSE)	415192
13-Jun	8	PM2.5	1-Hour	120.9	7.4	141° (SE)	415192
13-Jun	9	PM2.5	1-Hour	111.5	4.8	116° (ESE)	415192
13-Jun	10	PM2.5	1-Hour	91.7	5.3	100° (E)	415192
13-Jun	11	PM2.5	1-Hour	90	9.1	129° (SE)	415192
13-Jun	12	PM2.5	1-Hour	86.2	9.4	118° (ESE)	415192
13-Jun	13	PM2.5	1-Hour	83.8	12	134° (SE)	415192
13-Jun	14	PM2.5	1-Hour	91.6	12	137° (SE)	415192
09-Jul	14	PM2.5	1-Hour	84.5	5.8	354° (N)	416192
09-Jul	15	PM2.5	1-Hour	91	4.5	351° (N)	416192
09-Jul	16	PM2.5	1-Hour	93	5.4	8° (N)	416192
09-Jul	17	PM2.5	1-Hour	85	5.5	21° (NNE)	416192
13-Jul	7	PM2.5	1-Hour	85.4	6.5	316° (NW)	416551
13-Jul	8	PM2.5	1-Hour	100.8	6.5	319° (NW)	416551
13-Jul	9	PM2.5	1-Hour	128.1	7.2	330° (NNW)	416551
13-Jul	10	PM2.5	1-Hour	119	12.1	318° (NW)	416551
13-Jul	11	PM2.5	1-Hour	127.2	15.3	315° (NW)	416551
13-Jul	12	PM2.5	1-Hour	147	15.4	316° (NW)	416551
13-Jul	13	PM2.5	1-Hour	120.3	15.1	327° (NW)	416551
13-Jul	14	PM2.5	1-Hour	112.4	14.6	326° (NW)	416551
13-Jul	15	PM2.5	1-Hour	109	12.6	335° (NNW)	416551
13-Jul	21	PM2.5	1-Hour	88.7	7.3	294° (WNW)	416551
13-Jul	22	PM2.5	1-Hour	85.7	7.7	286° (WNW)	416551
14-Jul	2	PM2.5	1-Hour	111.8	7.2	342° (NNW)	416551
14-Jul	3	PM2.5	1-Hour	132.5	7.8	326° (NW)	416551
14-Jul	4	PM2.5	1-Hour	191	8.4	325° (NW)	416551
14-Jul	5	PM2.5	1-Hour	252	8.1	328° (NNW)	416551
14-Jul	6	PM2.5	1-Hour	295.3	7.4	345° (NNW)	416551
14-Jul	7	PM2.5	1-Hour	324.7	9.5	327° (NW)	416551
14-Jul	8	PM2.5	1-Hour	324.6	10.7	325° (NW)	416551
14-Jul	9	PM2.5	1-Hour	337.6	11.6	329° (NNW)	416551
14-Jul	10	PM2.5	1-Hour	260.8	13.9	327° (NW)	416551
14-Jul	11	PM2.5	1-Hour	254.5	16.7	323° (NW)	416551
14-Jul	12	PM2.5	1-Hour	337.4	13	325° (NW)	416551
14-Jul	13	PM2.5	1-Hour	106.7	10.3	347° (NNW)	416551
14-Jul	14	PM2.5	1-Hour	121.9	11.5	345° (NNW)	416551
14-Jul	15	PM2.5	1-Hour	154.6	8.9	355° (N)	416551
14-Jul	16	PM2.5	1-Hour	99.8	8	341° (NNW)	416551
14-Jul	17	PM2.5	1-Hour	89.8	9.1	316° (NW)	416551
14-Jul	19	PM2.5	1-Hour	91.1	5.7	289° (WNW)	416551
14-Jul	20	PM2.5	1-Hour	96.4	2.5	268° (W)	416551
14-Jul	21	PM2.5	1-Hour	105.6	1	203° (SSW)	416551
14-Jul	22	PM2.5	1-Hour	117.8	1.1	184° (S)	416551
14-Jul	23	PM2.5	1-Hour	120.2	3	208° (SSW)	416551
15-Jul	0	PM2.5	1-Hour	112.9	0.6	221° (SW)	416551
15-Jul	1	PM2.5	1-Hour	112.3	1.1	241° (WSW)	416551
15-Jul	2	PM2.5	1-Hour	106.4	2.7	324° (NW)	416551

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
15-Jul	3	PM2.5	1-Hour	107.3	1.9	265° (W)	416551
15-Jul	4	PM2.5	1-Hour	109	1.7	273° (W)	416551
15-Jul	5	PM2.5	1-Hour	110.5	2.8	259° (WSW)	416551
15-Jul	6	PM2.5	1-Hour	110.3	1.8	265° (W)	416551
15-Jul	7	PM2.5	1-Hour	110.2	3.6	325° (NW)	416551
15-Jul	8	PM2.5	1-Hour	110.2	4	329° (NNW)	416551
15-Jul	9	PM2.5	1-Hour	113.7	4	339° (NNW)	416551
15-Jul	10	PM2.5	1-Hour	114.5	3.1	343° (NNW)	416551
15-Jul	11	PM2.5	1-Hour	122.5	3.8	348° (NNW)	416551
15-Jul	12	PM2.5	1-Hour	139.3	4.4	359° (N)	416551
15-Jul	13	PM2.5	1-Hour	155.2	5.7	1° (N)	416551
15-Jul	14	PM2.5	1-Hour	194.1	4.6	1° (N)	416551
15-Jul	15	PM2.5	1-Hour	162.5	3.8	341° (NNW)	416551
15-Jul	16	PM2.5	1-Hour	150.6	3.8	16° (NNE)	416551
15-Jul	17	PM2.5	1-Hour	150	5.3	48° (NE)	416551
15-Jul	18	PM2.5	1-Hour	144.8	4.8	79° (ENE)	416551
15-Jul	19	PM2.5	1-Hour	142.8	3	86° (E)	416551
15-Jul	20	PM2.5	1-Hour	139.2	2	117° (ESE)	416551
15-Jul	21	PM2.5	1-Hour	120.4	4	88° (E)	416551
15-Jul	22	PM2.5	1-Hour	100.1	4.3	105° (ESE)	416551
15-Jul	23	PM2.5	1-Hour	90.1	3.7	106° (ESE)	416551
27-Aug	6	PM2.5	1-Hour	90.2	1.8	16°(NNE)	418438
27-Aug	7	PM2.5	1-Hour	124.8	2.1	42°(NE)	418438
27-Aug	8	PM2.5	1-Hour	127	1.4	44°(NE)	418438
27-Aug	9	PM2.5	1-Hour	131.1	2.3	156°(SSE)	418438
27-Aug	10	PM2.5	1-Hour	126.8	2.2	192°(S)	418438
27-Aug	11	PM2.5	1-Hour	101.9	3.1	193°(S)	418438
27-Aug	12	PM2.5	1-Hour	106.2	2.6	194°(SSW)	418438
27-Aug	13	PM2.5	1-Hour	109.7	3	184°(S)	418438
27-Aug	14	PM2.5	1-Hour	126.3	3	149°(SSE)	418438
27-Aug	15	PM2.5	1-Hour	143.1	2.9	178°(S)	418438
27-Aug	16	PM2.5	1-Hour	129.7	3.9	146°(SE)	418438
27-Aug	17	PM2.5	1-Hour	132.7	3.4	126°(SE)	418438
27-Aug	18	PM2.5	1-Hour	138.8	4	143°(SE)	418438
27-Aug	19	PM2.5	1-Hour	125	3.5	153°(SSE)	418438
27-Aug	20	PM2.5	1-Hour	114.3	3.7	155°(SSE)	418438
27-Aug	21	PM2.5	1-Hour	111.1	4.8	153°(SSE)	418438
27-Aug	22	PM2.5	1-Hour	100.2	4.6	156°(SSE)	418438
27-Aug	23	PM2.5	1-Hour	84.2	4.8	164°(SSE)	418438
31-Aug	5	PM2.5	1-Hour	102.7	7.6	319°(NW)	418928
31-Aug	6	PM2.5	1-Hour	91.2	8.9	313°(NW)	418928
31-Aug	7	PM2.5	1-Hour	101.6	10.4	320°(NW)	418928
31-Aug	8	PM2.5	1-Hour	98.8	10.3	324°(NW)	418928
31-Aug	9	PM2.5	1-Hour	96.3	9.3	318°(NW)	418928
31-Aug	10	PM2.5	1-Hour	91.1	10.6	320°(NW)	418928
31-Aug	11	PM2.5	1-Hour	102.5	9.8	319°(NW)	418928
31-Aug	16	PM2.5	1-Hour	83.8	9.7	297°(WNW)	418928
02-Sep	8	PM2.5	1-Hour	114.9	2.2	171°(S)	418928
02-Sep	9	PM2.5	1-Hour	118.4	2.2	182°(S)	418928

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
02-Sep	10	PM2.5	1-Hour	154.8	4.6	273°(W)	418928
02-Sep	11	PM2.5	1-Hour	180.8	9.1	273°(W)	418928
02-Sep	12	PM2.5	1-Hour	196.9	7.9	279°(W)	418928
02-Sep	13	PM2.5	1-Hour	203.9	7.2	274°(W)	418928
02-Sep	14	PM2.5	1-Hour	214.7	9.1	279°(W)	418928
02-Sep	15	PM2.5	1-Hour	230.3	8.3	268°(W)	418928
02-Sep	16	PM2.5	1-Hour	251.4	7	287°(WNW)	418928
02-Sep	17	PM2.5	1-Hour	256	6.8	299°(WNW)	418928
02-Sep	18	PM2.5	1-Hour	254.8	1.5	258°(WSW)	418928
02-Sep	19	PM2.5	1-Hour	246.7	2.3	183°(S)	418928
02-Sep	20	PM2.5	1-Hour	245.6	1.2	175°(S)	418928
02-Sep	21	PM2.5	1-Hour	246	3.1	169°(SSE)	418928
02-Sep	22	PM2.5	1-Hour	238.6	3.6	159°(SSE)	418928
02-Sep	23	PM2.5	1-Hour	246.2	3.6	155°(SSE)	418928
03-Sep	0	PM2.5	1-Hour	248.5	3.9	144°(SE)	418928
03-Sep	1	PM2.5	1-Hour	246.7	3.5	134°(SE)	418928
03-Sep	2	PM2.5	1-Hour	228.9	3.2	152°(SSE)	418928
03-Sep	3	PM2.5	1-Hour	230.4	3.4	148°(SE)	418928
03-Sep	4	PM2.5	1-Hour	233.6	5	158°(SSE)	418928
03-Sep	5	PM2.5	1-Hour	233	4.9	154°(SSE)	418928
03-Sep	6	PM2.5	1-Hour	228.2	2.9	149°(SSE)	418928
03-Sep	7	PM2.5	1-Hour	222.3	2.5	165°(SSE)	418928
03-Sep	8	PM2.5	1-Hour	220.6	0.3	183°(S)	418928
03-Sep	9	PM2.5	1-Hour	189.1	3.6	337°(NNW)	418928
03-Sep	10	PM2.5	1-Hour	107	10.2	332°(NNW)	418928
04-Sep	0	PM2.5	1-Hour	84.6	6.6	310°(NW)	419221
04-Sep	1	PM2.5	1-Hour	98.4	12	322°(NW)	419221
04-Sep	2	PM2.5	1-Hour	96.1	10.2	334°(NNW)	419221
04-Sep	3	PM2.5	1-Hour	91.5	11.1	332°(NNW)	419221
04-Sep	4	PM2.5	1-Hour	89.8	8.6	336°(NNW)	419221
17-Sep	18	PM2.5	1-Hour	83.2	3.7	260°(WSW)	419600
17-Sep	19	PM2.5	1-Hour	105.7	3.8	242°(WSW)	419600
17-Sep	20	PM2.5	1-Hour	116.3	3.4	238°(SW)	419600
17-Sep	21	PM2.5	1-Hour	119.1	3.3	202°(SSW)	419600
17-Sep	22	PM2.5	1-Hour	115.6	1.8	153°(SSE)	419600
17-Sep	23	PM2.5	1-Hour	118.1	3	185°(S)	419600
18-Sep	0	PM2.5	1-Hour	115.2	2.8	167°(SSE)	419926
18-Sep	1	PM2.5	1-Hour	116.2	4.1	153°(SSE)	419926
18-Sep	2	PM2.5	1-Hour	119.1	3.1	179°(S)	419926
18-Sep	3	PM2.5	1-Hour	118.8	4.1	149°(SSE)	419926
18-Sep	4	PM2.5	1-Hour	120.1	4.1	124°(ESE)	419926
18-Sep	5	PM2.5	1-Hour	110.3	4.2	146°(SE)	419926
18-Sep	6	PM2.5	1-Hour	112.8	4.4	158°(SSE)	419926
18-Sep	7	PM2.5	1-Hour	117.8	1.7	216°(SW)	419926
18-Sep	8	PM2.5	1-Hour	118.3	3.2	192°(S)	419926
18-Sep	9	PM2.5	1-Hour	106.2	12.1	303°(WNW)	419926

- **PM2.5:** Twenty-right 24-hour PM2.5 exceedances were recorded in 2023.

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
19-May	-	PM2.5	24-Hour	100	7.6	204° (SSW)	413526
20-May	-	PM2.5	24-Hour	155.8	4.9	72° (ENE)	413526
21-May	-	PM2.5	24-Hour	84.6	6.9	127° (SE)	413526
22-May	-	PM2.5	24-Hour	143.5	10.2	65° (ENE)	413932
23-May	-	PM2.5	24-Hour	80.4	12.9	102° (E)	413932
31-May	-	PM2.5	24-Hour	39.7	6	357° (N)	414424
02-Jun	-	PM2.5	24-Hour	52.2	5.2	349° (NNW)	414424
08-Jun	-	PM2.5	24-Hour	49	4.8	8° (N)	414723
10-Jun	-	PM2.5	24-Hour	35.8	10.7	147° (SE)	414723
11-Jun	-	PM2.5	24-Hour	49.2	6.7	296° (WNW)	414723
12-Jun	-	PM2.5	24-Hour	90.8	5.3	14° (NNE)	415192
13-Jun	-	PM2.5	24-Hour	95.1	9.2	127° (SE)	415192
14-Jun	-	PM2.5	24-Hour	35	10.1	337° (NNW)	415192
13-Jul	-	PM2.5	24-Hour	83.5	9.2	318° (NW)	416551
14-Jul	-	PM2.5	24-Hour	172.8	8.6	326° (NW)	416551
15-Jul	-	PM2.5	24-Hour	126.2	3.4	9° (N)	416551
16-Jul	-	PM2.5	24-Hour	33.8	8.9	135° (SE)	416551
21-Jul	-	PM2.5	24-Hour	36.4	2.8	4° (N)	416957
27-Aug	-	PM2.5	24-Hour	100.8	2.6	159°(SSE)	418438
28-Aug	-	PM2.5	24-Hour	40.6	3	189°(S)	418928
29-Aug	-	PM2.5	24-Hour	31.5	4.2	138°(SE)	418928
31-Aug	-	PM2.5	24-Hour	64.2	7.3	310°(NW)	418928
01-Sep	-	PM2.5	24-Hour	45.3	6.6	232°(SW)	418928
02-Sep	-	PM2.5	24-Hour	155.2	5.5	255°(WSW)	418928
03-Sep	-	PM2.5	24-Hour	127.5	4.1	160°(SSE)	418928
04-Sep	-	PM2.5	24-Hour	33.8	8.7	309°(NW)	419221
17-Sep	-	PM2.5	24-Hour	51.4	5.1	264°(W)	419600
18-Sep	-	PM2.5	24-Hour	53.9	7.2	271°(W)	419926

- **H2S:** On May 18, the BV's API 101A analyzer, s/n: 324, was removed, and the LICA's Thermo 450i analyzer, s/n: CM17360002, was installed. The analyzer was allowed time to stabilize overnight. A successful installation calibration was completed on May 19. Twenty-one hours of downtime were recorded due to this event.

Major Operations and Maintenance Events on the Integrated Sampling Systems During 2023

Passive Sampling System

27 multi-parameter passive stations were used throughout the LICA Airshed. These stations monitored different combinations of SO_2, NO_2, O_3, H_2S, NH_3 and/or HNO_3 depending on the monitoring objective at a given location. 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 ETS in accordance with the AMD.

Passive monitoring data indicated there were no exceedances of applicable AAAQOs for all parameters monitored in 2023.

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**
2023	0
NO2 (ppb) Annual Objective: 24 ppb	
Year	**AAAQO Exceedance**
2023	0

Partisol Sampling System

The Partisol sampler was programed to collect a 24-hour sample of air every sixth day as per National Air Pollution Surveillance schedule (NAPS). Both Particulate Matter 2.5 ($PM_{2.5}$) and Particulate Matter 2.5-10 ($PM_{2.5\text{-}10}$) samples were collected throughout the year as per scheduled. The full results of these analyses were submitted to Alberta's ETS in accordance with the AMD. The Partisol sampling system is in place at the Cold Lake South Station. A total of 60 $PM_{2.5}$ samples and 60 $PM_{2.5\text{-}10}$ samples were collected in 2023.

There were two PM2.5 intermittent samples above the AAAQO in 2023. The cause for the exceedance was due to widespread wildfire smoke.

PM2.5 24-hour Objective: 0.029 mg/m3			
Month	**# Samples of Exceedance**	**AEPA reference #**	**Sample collected on**
January	0	-	-
February	0	-	-
March	0	-	-
April	0	-	-
May	0	-	-
June	0	-	-
July	0	-	-
August	1	419814	28-Aug
September	1	420863	03-Sep
October	0	-	-
November	0	-	-
December	0	-	-
Total	**2**	**-**	**-**

The maximum concentration result of PM2.5 was the sample that was collected on September 3, at concentration of 178.313 ug/m3.
The maximum concentration result of PM2.5-10 was the sample that was collected on August 28, at concentration of 139.827 ug/m3.

VOCs Sampling System

The VOC sampler is programed to collect a 24-hour sample of air every sixth day as per the National Air Pollution Surveillance schedule (NAPS). The VOCs sampling system is in place at the Cold Lake South Station. The VOCs samples were collected throughout the year as per scheduled. The full results of these analyses were submitted to Alberta's ETS in accordance with the AMD. A total of 59 VOC canister samples were collected in 2023. A total of 102 parameters were analyzed in each sample collection.

Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable. The maximum concentration that was analyzed was the parameter of ethanol on the October 15 sample collection, at concentration of 9.3ppb.

PAHs Sampling System

The PUF sampler is programed to collect a 24-hour sample of air every sixth day as per the National Air Pollution Surveillance schedule (NAPS). The PAHs sampling system is in place at the Cold Lake South Station. The PAH samples were collected throughout the year as per scheduled. The full results of these analyses were submitted to Alberta's ETS in accordance with the AMD. A total of 59 PAHs samples were collected in 2023.A total of 27 parameters were analyzed in each sample collection.

The maximum concentration that was analyzed was parameter of Benzo(e)pyrene on the October 15 sample collection, at concentration of 9.68 ug/Filter, which was 29.30 ng/m3.

NMHC Canister Sampling System

The canister sampling program collects a 1-hour sample of air when the continuously non-methane hydrocarbon (NMHC) concentration reaches a specified trigger point. The current trigger point is 0.3 ppm and is based on real-time monitoring data that are averaged over a 5-minute period. Canister sample collection System is in place at the PAM – Lac La Biche Station.

- The NMHC canister system was triggered 15 times in 2023. However, only 11 valid canister samples were collected in 2023.
- One canister event was recorded on May 25 at 07:35, at concentration of 0.47ppm. However, the canister event was missed during the daily data review. The sample therefore passed the sample hold time and became invalid. Investigation is being conducted to determine the root cause to prevent future reoccurrence.
- A canister event was recorded on June 2 at 22:30, at concentration of 0.30 ppm. However, due to tech errors, the June 2 sample was not collected properly. Therefore, it was discarded.
- Four canister events were recorded in August. However, due to field operator errors, two canisters, which were triggered on August 12 at 13:55 and on August 30 at 8:35, were not collected. To improve the reliability of the canister system, an automatic alarming system will be installed. When the NMHC concentration reaches to the triggered point, an automatic alarm notification will be generated and sent out.
- To address issues of missing canister events, a pressure sensor was installed on the canister system on December 15. The pressure sensor is now connected to the datalogger so the pressure changes can be monitored daily. Alerts/ notifications are also setup to enhance the canister system's reliability.

Notification of Changes Made After Monthly Report Issuance

St. Lina: THC/CH4/NMHC data collected between August 13 hour 14 and September 26 hour 15 were reviewed and revised during annual data review. It was noticed that NMHC noises were recorded by the Thermo 55i analyzer, s/n: 1180030034, after August 13's monthly calibration. As the analyzer passed daily zero-span checks each day, August 18's repeat multi-point calibration and August 25's shut-down calibration, data were deemed valid during the monthly report preparation. The replacement Thermo 55i analyzer, s/n: 1236656107, were installed following a successful installation calibration on August 26. Elevated NMHC concentration continued being record until the zero-air generator was replaced on September 26. During annual data review, it was determined that data collected between August 13 hour 14 and September 26 hour 15 were more likely analyzer's noise and therefore were invalidated.

Month	Operational Uptime (%)	EDGE # / DINC #	ETS Request #	Notes
August	40.7	EDGE419572	4630622	Event was reported to AEPA and EDGE # were received in September 2023.
September	10.8	DINC0003583	4630625	Event was reported to AEPA and DINC # were received in January 2024.

Tamarack: THC/CH4/NMHC data collected between September 17 hour 15 and October 19 hour 15 were reviewed and revised during annual data review. It was noticed that elevated NMHC concentrations were recorded by the Thermo 55i analyzer, s/n: 1180030034 after the analyzer's installation calibration on September 17. The analyzer was removed from the station following a successful shut-down calibration on October 19. As the analyzer passed daily zero-span checks each day, September 17's installation calibration and October 19's shut-down calibration, data were deemed valid during the monthly report preparation. However, during annual data review which was conducted in January 2024, it was determined that data collected between September 17 hour 15 and October 19 hour 15 were more likely analyzer's noise and therefore were invalidated.

Month	Operational Uptime (%)	EDGE # / DINC #	ETS Request #	Notes
September	46.9	DINC0003584	4630625	Event was reported to AEPA and DINC # were received in January 2024.
October	37.4	DINC0003584	4630628	Event was reported to AEPA and DINC # were received in January 2024.

Cold Lake South: THC/CH4/NMHC data collected between December 7 hour 18 and December 31 hour 23 were deemed invalid after an analyzer check on January 4. The analyzer failed the as-found points check on January 4. In the absence of a clear point of failure, data were invalidated back to the last multi-point calibration check, which was December 7, 2023. Five hundred eighty-two hours of downtime were recorded in December 2023. Data resubmission was completed on February 27, 2024.

Month	Operational Uptime (%)	EDGE # / DINC #	ETS Request #	Notes
December	21.8	DINC0005054	4647252	Event was reported to AEPA and EDGE # were received in February 2024.

Cold Lake South: The PM2.5 data collected in April 2020 was resubmitted. The Sharp 5030 was removed, and the Teledyne T640 analyzer was installed on April 24, 2020. The VVC code, VVC 153, should be used for data collected between April 24 and April 30, 2020, instead of VVC142. This issue only affected data information on ETS. The correction requires to be made for the preparation of AEPA T640 data adjustment in the later year of 2024. Data resubmission was completed on February 27, 2024.

Month	Operational Uptime (%)	EDGE # / DINC #	ETS Request #	Notes
April 2020	N/A	N/A	4647251	PM2.5 data collected between April 24 and April 30 were resubmitted to ETS using VVC code VVC153.

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 5, 2024

1.0 Continuous Monitoring Statistics and Data Qualifier Flag Summaries – 2023

1.1 Cold Lake South Station

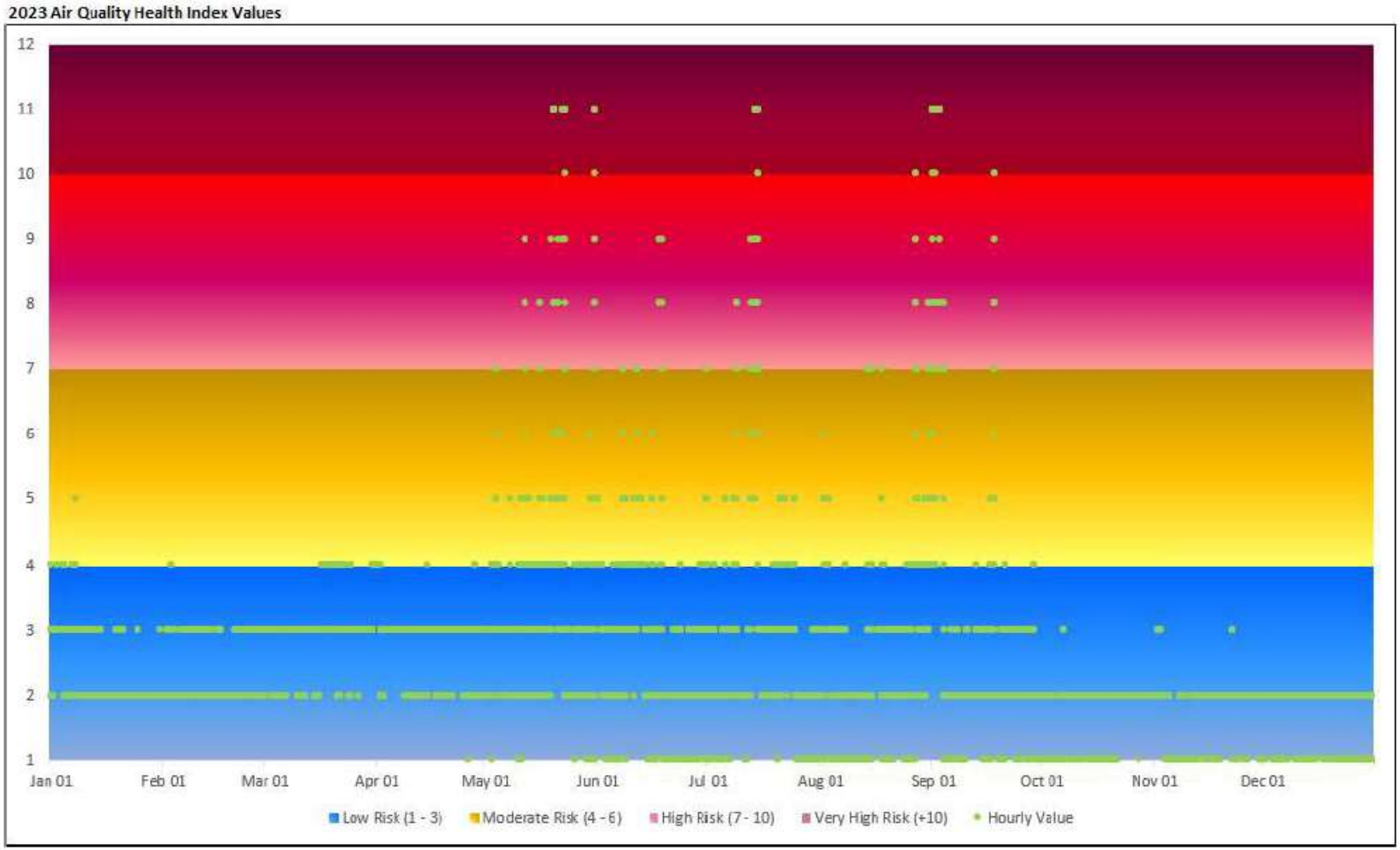
1.1.1 Parameters Monitoring Summary

Date & Time	SO2	TRS	NOX	NO	NO2	O3	THC55	CH4	NMHC	PM2.5
	ppb	ppb	ppb	ppb	ppb	ppb	ppm	ppm	ppm	ug/m3(L)
Minimum Conc.	0	0	0	0	0	0	1.87	1.87	0.00	0
Min Conc. Date	2023-01-01 00:00:00	2023-01-01 00:00:00	2023-02-05 19:00:00	2023-01-01 00:00:00	2023-02-05 19:00:00	2023-10-16 03:00:00	2023-06-25 12:00:00	2023-06-25 12:00:00	2023-01-01 00:00:00	2023-01-22 17:00:00
Maximum Conc.	4	5	114	76	38	77.2	3.26	2.99	1.06	726
Max Conc. Date	2023-03-15 9:00:00	2023-07-04 23:00:00	2023-11-23 11:00:00	2023-11-23 11:00:00	2023-03-18 06:00:00	2023-05-04 18:00:00	2023-09-06 11:00:00	2023-01-02 21:00:00	2023-09-06 11:00:00	2023-05-20 09:00:00
Annual Average	0	0	5	1	4	28.4	2.08	2.07	0.00	17
# of hour	8275	8253	8171	8171	8171	8157	7614	7614	7614	8621
Valid Data[%]	94.46	94.21	93.28	93.28	93.28	93.12	86.92	86.92	86.92	98.41

Date & Time	RH	BP	AT	WDS	WDV	STDWD
	%RH	mb	C°	kph	Deg	Deg
Minimum Conc.	16	923	-36.8	0.0	0	0
Min Conc. Date	2023-05-04 15:00:00	2023-02-13 11:00:00	2023-02-02 06:00:00	2023-01-02 00:00:00	2023-03-21 07:00:00	2023-01-14 19:00:00
Maximum Conc.	100	972	29.3	24.7	360	81
Max Conc. Date	2023-04-11 22:00:00	2023-02-23 07:00:00	2023-05-04 13:00:00	2023-10-05 13:00:00	2023-05-25 17:00:00	2023-01-09 19:00:00
Annual Average	71	949	4	0.5	187	19
# of hour	8721	8721	8721	8666	8666	8666
Valid Data[%]	99.55	99.55	99.55	98.93	98.93	98.93

1.1.2 AQHI

LICA - COLD LAKE SOUTH STATION
AIR QUALITY HEALTH INDEX (AQHI)



1.1.3 Monitoring Parameters – 2023 Continuous Data Summary and Frequency Distribution

LICA - COLD LAKE SOUTH STATION
SULPHUR DIOXIDE (SO_2) in parts per billion (ppb)

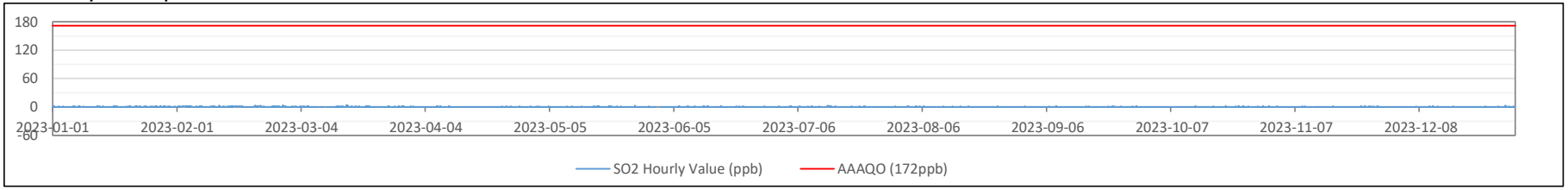
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQOExceedances				Percentage Readings in Concentration Range				
							1-hour	24-hour	30-day	Annual	0 - 10	11 -50	51 -100	101 - 172	>172
January	100.0	707	0	2	1	0.2	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0	637	0	3	1	0.4	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
March	97.8	690	0	4	1	0.2	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
April	99.9	684	0	2	0	0.0	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
May	98.8	698	0	3	0	0.1	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
June	98.2	671	0	1	0	0.1	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	707	0	3	1	0.1	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0	706	0	2	0	0.0	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0	683	0	2	0	0.0	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
October	99.7	705	0	2	0	0.0	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0	683	0	1	0	0.1	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0	704	0	3	0	0.0	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.5	8275	0	4	1	0.1	0	0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%

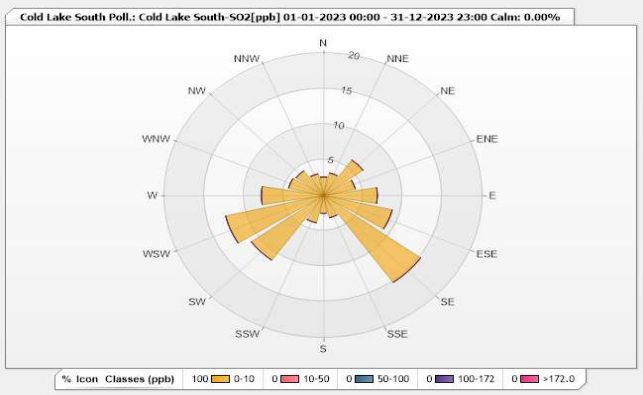
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	3	15	22	1	65	377	2
Total Hours of Downtime		41	Total Hours of Calibration		444	Total Hours of Flagged		485

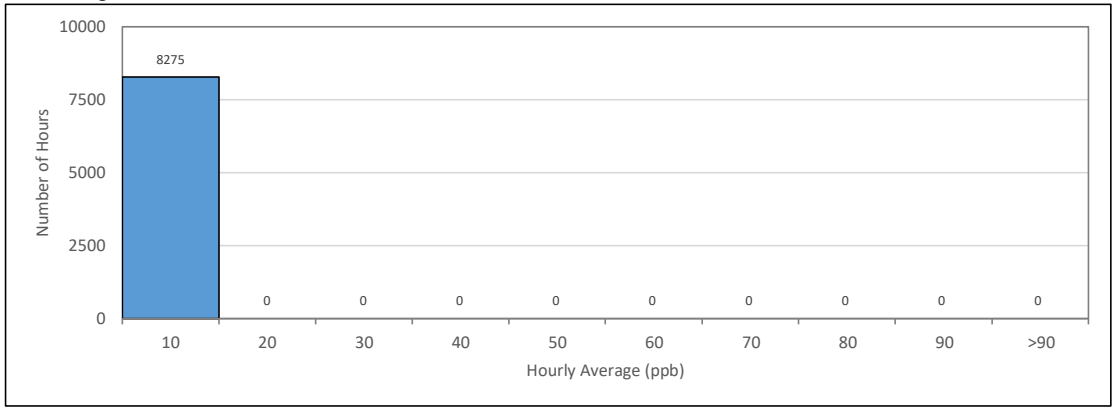
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - COLD LAKE SOUTH STATION
TOTAL REDUCED SULPHUR (TRS) in parts per billion (ppb)

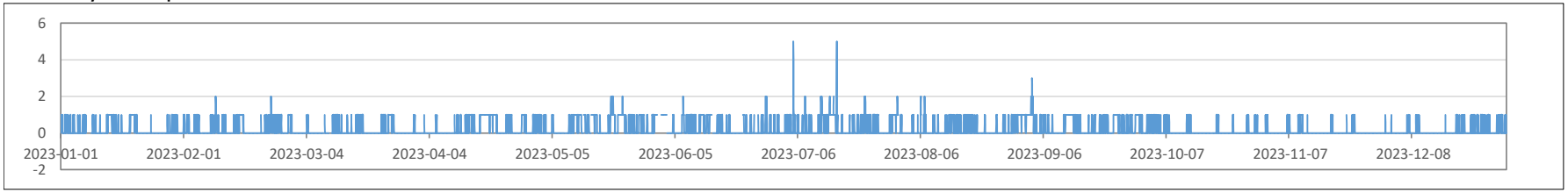
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 2	3 - 5	6 - 10	11 - 50	>50
January	97.4	685	0	1	1	0.2	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0	637	0	2	1	0.3	100.0%	0.0%	0.0%	0.0%	0.0%
March	97.8	690	0	1	1	0.2	100.0%	0.0%	0.0%	0.0%	0.0%
April	99.9	684	0	1	1	0.3	100.0%	0.0%	0.0%	0.0%	0.0%
May	98.8	698	0	2	1	0.4	100.0%	0.0%	0.0%	0.0%	0.0%
June	98.2	671	0	2	1	0.3	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	707	0	5	1	0.4	99.7%	0.3%	0.0%	0.0%	0.0%
August	100.0	706	0	2	1	0.2	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0	683	0	3	1	0.4	99.9%	0.1%	0.0%	0.0%	0.0%
October	99.7	705	0	1	1	0.1	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0	683	0	1	0	0.1	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0	704	0	1	1	0.1	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.3	8253	0	5	1	0.2	100.0%	0.0%	0.0%	0.0%	0.0%

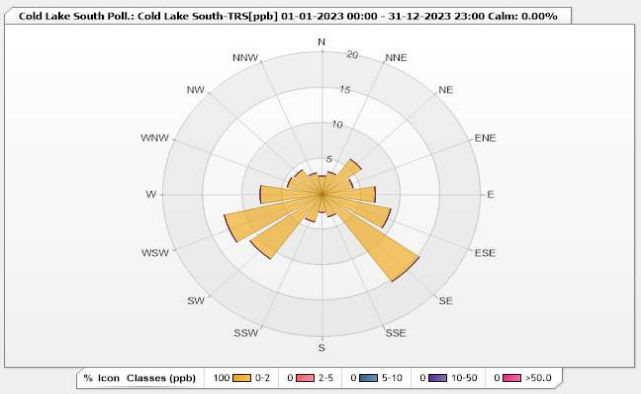
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	3	15	22	20	69	376	2
Total Hours of Downtime		60	Total Hours of Calibration		447	Total Hours of Flagged		507

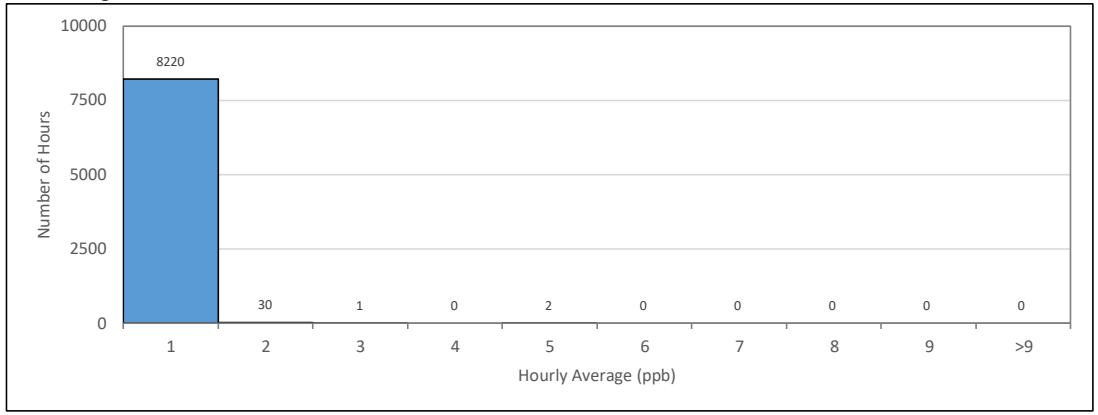
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - COLD LAKE SOUTH STATION
OXIDES OF NITROGEN (NOx) in parts per billion (ppb)

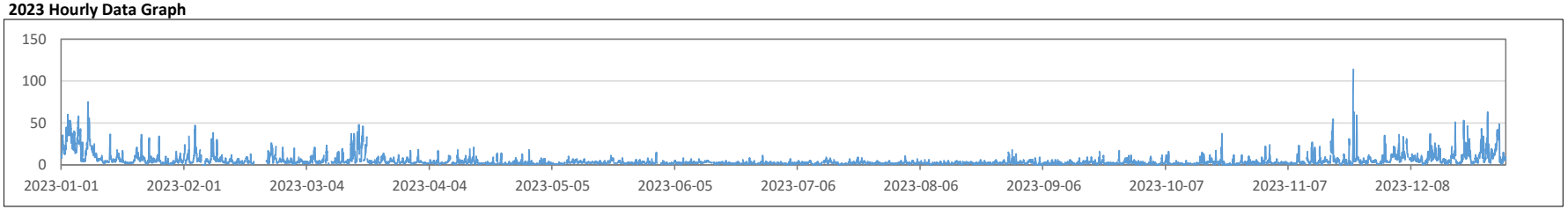
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0	705	1	75	36	11.1	90.1%	7.7%	2.3%	0.0%	0.0%
February	88.8	563	0	47	16	6.4	98.6%	1.4%	0.0%	0.0%	0.0%
March	97.4	685	1	48	20	6.2	98.0%	2.0%	0.0%	0.0%	0.0%
April	99.9	681	0	21	6	2.9	100.0%	0.0%	0.0%	0.0%	0.0%
May	98.7	695	1	15	5	2.6	100.0%	0.0%	0.0%	0.0%	0.0%
June	98.2	669	0	11	4	2.1	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	705	0	9	4	2.0	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0	704	0	18	5	2.2	100.0%	0.0%	0.0%	0.0%	0.0%
September	99.9	680	0	17	5	2.4	100.0%	0.0%	0.0%	0.0%	0.0%
October	99.7	703	0	37	6	2.3	99.9%	0.1%	0.0%	0.0%	0.0%
November	99.9	681	0	114	18	5.1	98.4%	1.0%	0.4%	0.1%	0.0%
December	100.0	700	0	63	21	10.0	95.4%	4.1%	0.4%	0.0%	0.0%
Annual	98.5	8171	0	114	36	4.6	98.4%	1.4%	0.3%	0.0%	0.0%

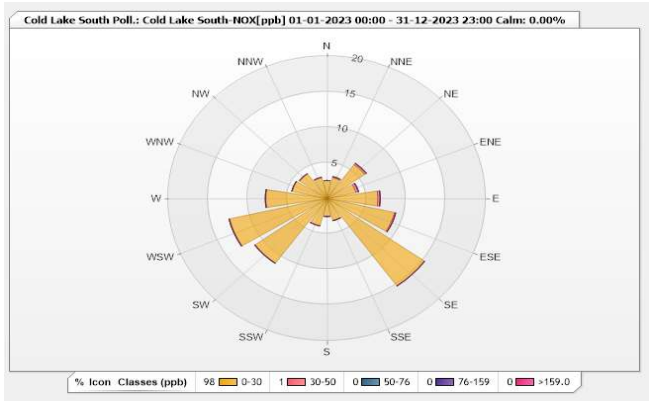
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	66	3	15	22	16	89	374	4
Total Hours of Downtime		122	Total Hours of Calibration		467	Total Hours of Flagged		589

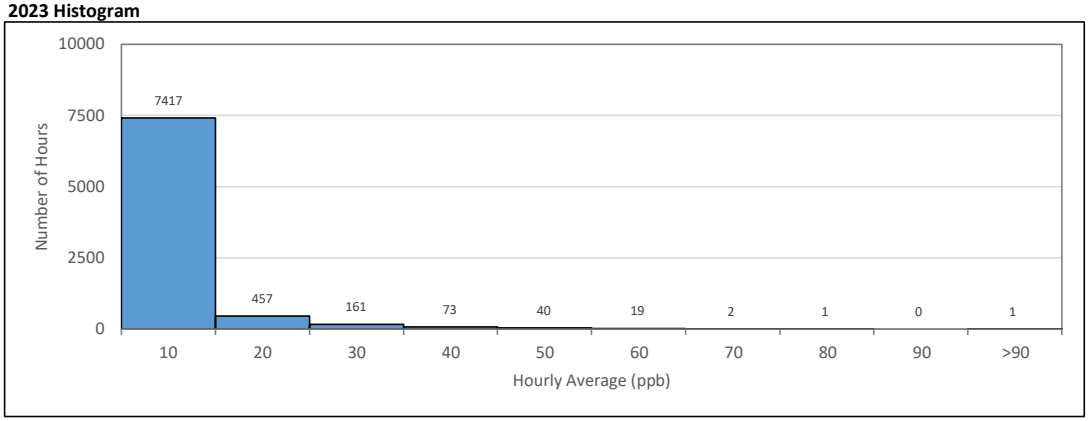
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - COLD LAKE SOUTH STATION
NITRIC OXIDE (NO) in parts per billion (ppb)

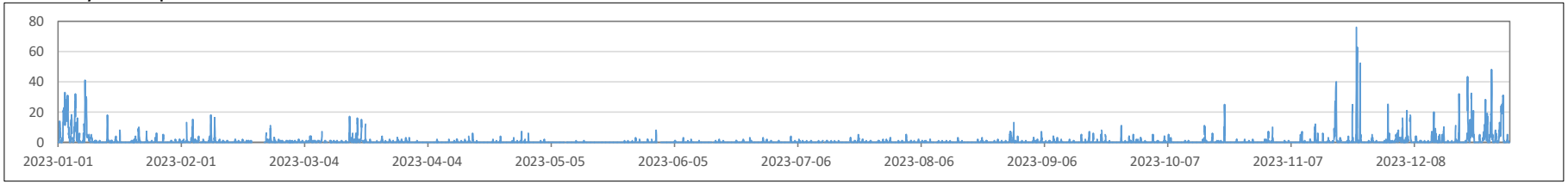
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0	705	0	41	15	2.5	99.4%	0.6%	0.0%	0.0%	0.0%
February	88.8	563	0	18	3	0.7	100.0%	0.0%	0.0%	0.0%	0.0%
March	97.4	685	0	17	3	0.6	100.0%	0.0%	0.0%	0.0%	0.0%
April	99.9	681	0	7	1	0.1	100.0%	0.0%	0.0%	0.0%	0.0%
May	98.7	695	0	8	0	0.1	100.0%	0.0%	0.0%	0.0%	0.0%
June	98.2	669	0	3	1	0.1	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	705	0	5	1	0.2	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0	704	0	13	2	0.2	100.0%	0.0%	0.0%	0.0%	0.0%
September	99.9	680	0	11	2	0.4	100.0%	0.0%	0.0%	0.0%	0.0%
October	99.7	703	0	25	3	0.3	100.0%	0.0%	0.0%	0.0%	0.0%
November	99.9	681	0	76	11	1.3	98.7%	0.9%	0.4%	0.0%	0.0%
December	100.0	700	0	48	11	2.9	98.9%	1.1%	0.0%	0.0%	0.0%
Annual	98.5	8171	0	76	15	0.8	99.7%	0.2%	0.0%	0.0%	0.0%

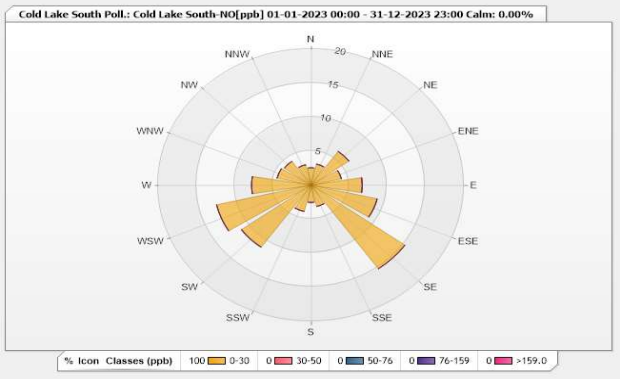
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	66	3	15	22	16	89	374	4
Total Hours of Downtime		122	Total Hours of Calibration		467	Total Hours of Flagged		589

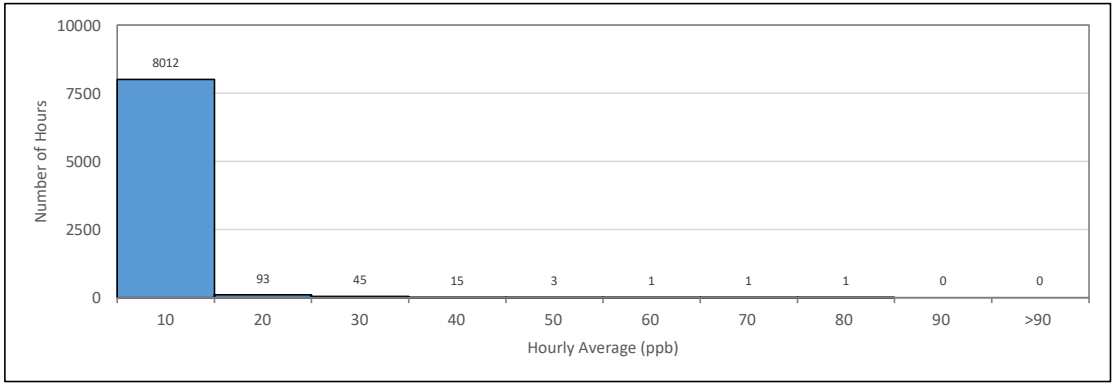
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - COLD LAKE SOUTH STATION
NITROGEN DIOXIDE (NO_2) in parts per billion (ppb)

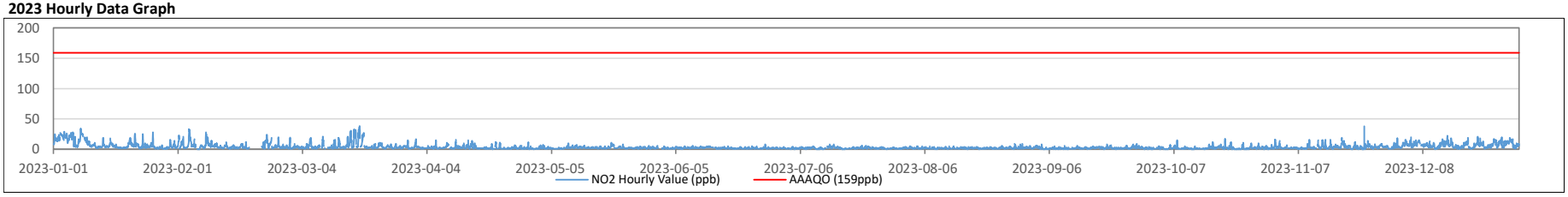
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances	Percentage Readings in Concentration Range				
							1-hour	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0	705	1	34	23	8.6	0	99.9%	0.1%	0.0%	0.0%	0.0%
February	88.8	563	0	33	12	5.7	0	99.3%	0.7%	0.0%	0.0%	0.0%
March	97.4	685	1	38	17	5.5	0	98.7%	1.3%	0.0%	0.0%	0.0%
April	99.9	681	0	17	6	2.7	0	100.0%	0.0%	0.0%	0.0%	0.0%
May	98.7	695	1	11	5	2.5	0	100.0%	0.0%	0.0%	0.0%	0.0%
June	98.2	669	0	8	4	2.0	0	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	705	0	8	4	1.8	0	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0	704	0	9	3	2.0	0	100.0%	0.0%	0.0%	0.0%	0.0%
September	99.9	680	0	9	4	2.1	0	100.0%	0.0%	0.0%	0.0%	0.0%
October	99.7	703	0	17	4	2.0	0	100.0%	0.0%	0.0%	0.0%	0.0%
November	99.9	681	0	38	7	3.8	0	99.9%	0.1%	0.0%	0.0%	0.0%
December	100.0	700	0	22	13	7.1	0	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	98.5	8171	0	38	23	3.8	0	99.8%	0.2%	0.0%	0.0%	0.0%

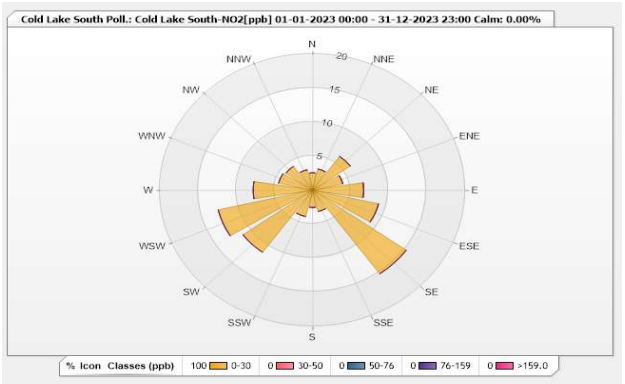
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	66	3	15	22	16	89	374	4
Total Hours of Downtime		122	Total Hours of Calibration		467	Total Hours of Flagged		589

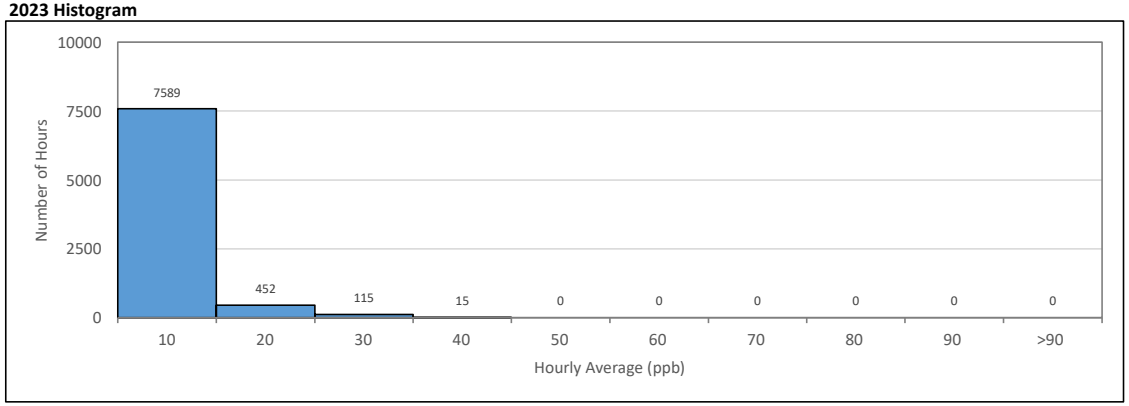
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - COLD LAKE SOUTH STATION
OZONE (O_3) in parts per billion (ppb)

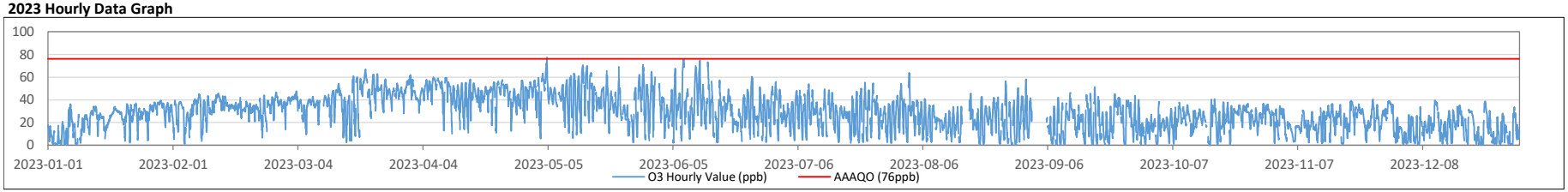
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances	Percentage Readings in Concentration Range				
							1-hour	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0	708	0.1	39.4	36.4	22.4	0	74.6%	25.4%	0.0%	0.0%	0.0%
February	100.0	638	1.1	46.6	42.0	32.1	0	30.9%	69.1%	0.0%	0.0%	0.0%
March	98.0	692	2.4	66.9	58.7	41.0	0	15.9%	64.5%	19.7%	0.0%	0.0%
April	99.9	683	10.1	59.9	55.0	44.8	0	10.7%	55.2%	34.1%	0.0%	0.0%
May	97.8	691	2.2	77.2	59.8	40.6	1	25.6%	47.2%	27.1%	0.1%	0.0%
June	98.2	672	2.0	75.8	48.9	32.2	0	46.4%	42.0%	11.6%	0.0%	0.0%
July	100.0	708	1.8	55.2	34.0	26.9	0	59.2%	38.8%	2.0%	0.0%	0.0%
August	94.4	667	0.2	63.8	31.9	22.3	0	70.9%	27.1%	1.9%	0.0%	0.0%
September	88.8	605	0.2	51.2	35.8	20.2	0	73.2%	26.6%	0.2%	0.0%	0.0%
October	99.6	703	0.0	40.5	31.7	22.7	0	79.7%	20.3%	0.0%	0.0%	0.0%
November	100.0	683	0.9	40.3	34.2	21.2	0	81.1%	18.9%	0.0%	0.0%	0.0%
December	100.0	707	0.4	39.5	34.1	14.7	0	92.9%	7.1%	0.0%	0.0%	0.0%
Annual	98.0	8157	0.0	77.2	59.8	28.4	1	55.1%	36.9%	8.0%	0.0%	0.0%

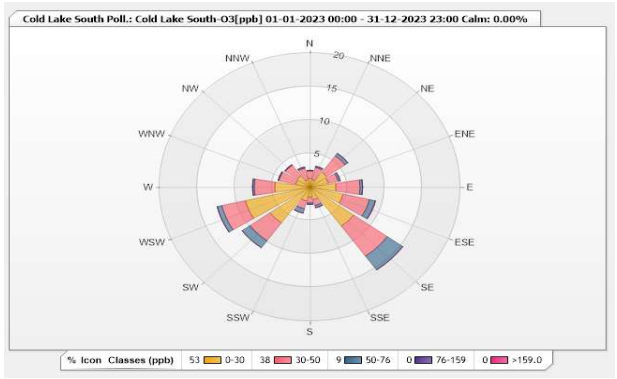
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	120	2	15	22	12	58	372	2
Total Hours of Downtime		171	Total Hours of Calibration		432	Total Hours of Flagged		603

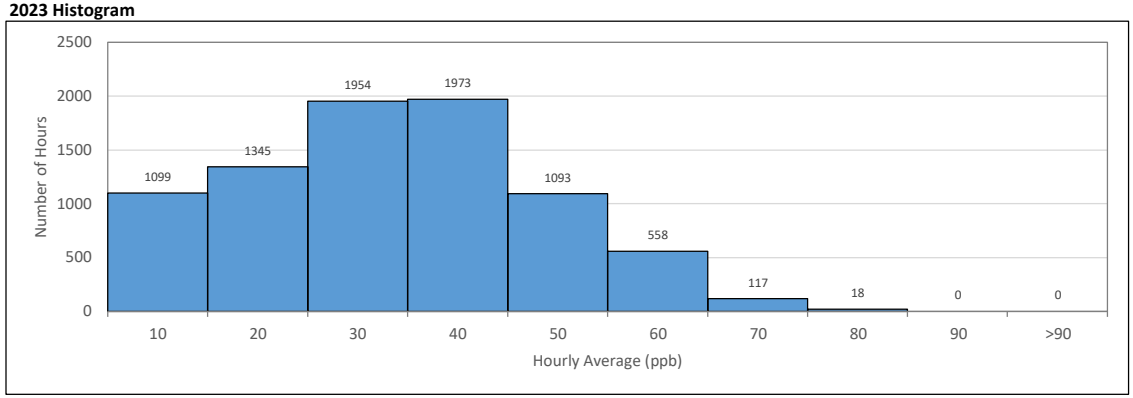
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - COLD LAKE SOUTH STATION
TOTAL HYDROCARBONS (THC) in parts per million (ppm)

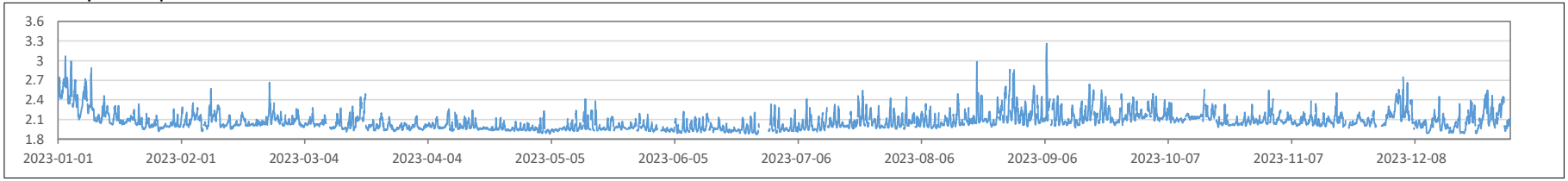
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 2	3 - 5	6 - 10	11 - 40	>40
January	99.7	706	1.92	3.06	2.67	2.18	83.6%	16.4%	0.0%	0.0%	0.0%
February	99.9	637	1.92	2.66	2.22	2.08	99.1%	0.9%	0.0%	0.0%	0.0%
March	98.0	692	1.91	2.49	2.21	2.03	99.0%	1.0%	0.0%	0.0%	0.0%
April	99.9	683	1.92	2.26	2.06	1.99	100.0%	0.0%	0.0%	0.0%	0.0%
May	98.5	696	1.88	2.41	2.05	1.98	99.9%	0.1%	0.0%	0.0%	0.0%
June	90.4	618	1.87	2.33	2.06	1.97	100.0%	0.0%	0.0%	0.0%	0.0%
July	99.5	704	1.91	2.54	2.19	2.04	98.9%	1.1%	0.0%	0.0%	0.0%
August	100.0	707	1.95	2.98	2.35	2.12	93.2%	6.8%	0.0%	0.0%	0.0%
September	99.9	683	1.97	3.26	2.30	2.17	92.5%	7.5%	0.0%	0.0%	0.0%
October	99.3	703	1.98	2.63	2.31	2.12	98.4%	1.6%	0.0%	0.0%	0.0%
November	93.6	638	1.97	2.54	2.20	2.08	98.6%	1.4%	0.0%	0.0%	0.0%
December	99.7	701	1.89	2.75	2.41	2.11	93.9%	6.1%	0.0%	0.0%	0.0%
Annual	98.2	8168	1.87	3.26	2.67	2.07	96.4%	3.6%	0.0%	0.0%	0.0%

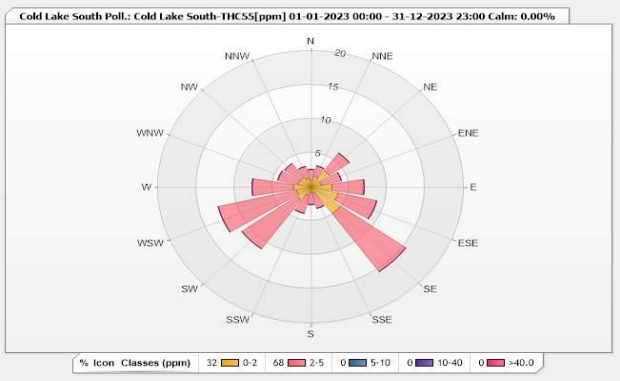
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	100	8	15	22	12	58	375	2
Total Hours of Downtime		157	Total Hours of Calibration		435	Total Hours of Flagged		592

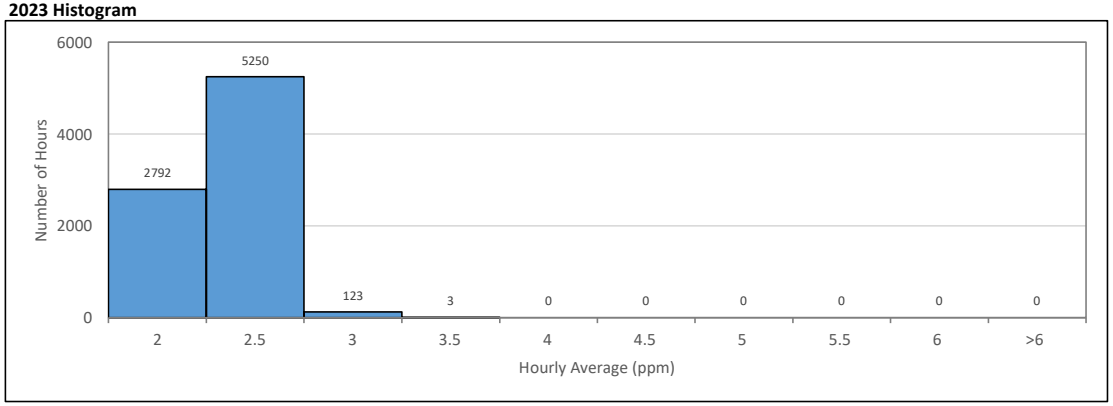
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - COLD LAKE SOUTH STATION
METHANE (CH_4) in parts per million (ppm)

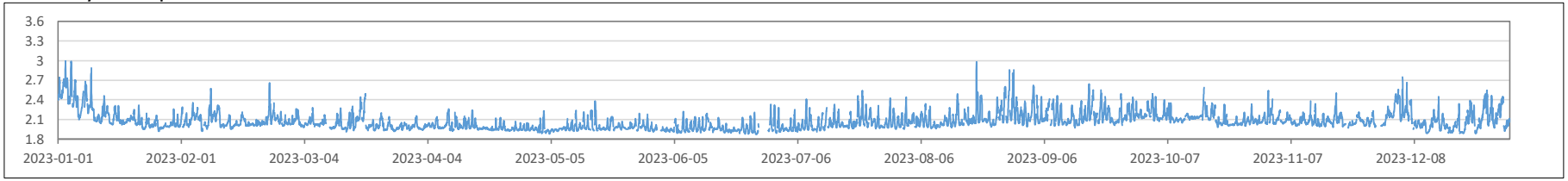
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 2	3 - 5	6 - 10	11 - 20	>20
January	99.7	706	1.92	2.99	2.66	2.18	84.0%	16.0%	0.0%	0.0%	0.0%
February	99.9	637	1.92	2.66	2.22	2.08	99.1%	0.9%	0.0%	0.0%	0.0%
March	98.0	692	1.91	2.49	2.21	2.03	99.0%	1.0%	0.0%	0.0%	0.0%
April	99.9	683	1.92	2.26	2.06	1.99	100.0%	0.0%	0.0%	0.0%	0.0%
May	98.5	696	1.88	2.38	2.05	1.98	100.0%	0.0%	0.0%	0.0%	0.0%
June	90.4	618	1.87	2.33	2.06	1.97	100.0%	0.0%	0.0%	0.0%	0.0%
July	99.5	704	1.91	2.54	2.19	2.04	98.9%	1.1%	0.0%	0.0%	0.0%
August	100.0	707	1.95	2.98	2.35	2.12	93.2%	6.8%	0.0%	0.0%	0.0%
September	99.9	683	1.97	2.64	2.30	2.17	93.3%	6.7%	0.0%	0.0%	0.0%
October	99.3	703	1.98	2.65	2.32	2.12	98.4%	1.6%	0.0%	0.0%	0.0%
November	93.6	638	1.97	2.54	2.20	2.08	98.6%	1.4%	0.0%	0.0%	0.0%
December	99.7	701	1.89	2.75	2.41	2.11	93.9%	6.1%	0.0%	0.0%	0.0%
Annual	98.2	8168	1.87	2.99	2.66	2.07	96.5%	3.5%	0.0%	0.0%	0.0%

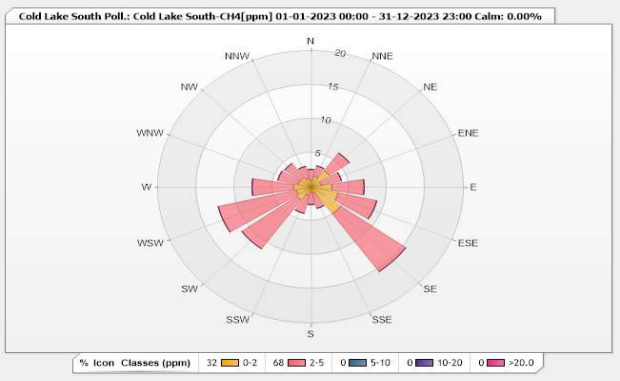
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	100	8	15	22	12	58	375	2
Total Hours of Downtime		157	Total Hours of Calibration		435	Total Hours of Flagged		592

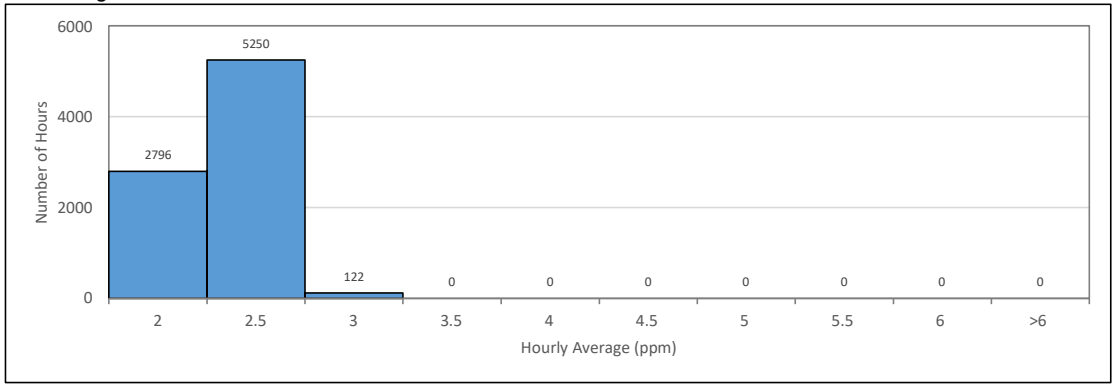
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - COLD LAKE SOUTH STATION
NON-METHANE HYDROCARBONS (NMHC) in parts per million (ppm)

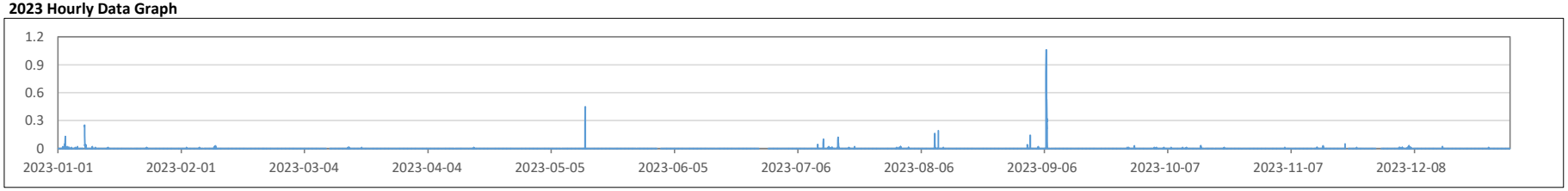
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 0.1	0.2 - 0.3	0.4 - 0.9	1 -2	>2
January	99.7	706	0.00	0.25	0.03	0.00	99.7%	0.3%	0.0%	0.0%	0.0%
February	99.9	637	0.00	0.03	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
March	98.0	692	0.00	0.03	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
April	99.9	683	0.00	0.01	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
May	98.5	696	0.00	0.45	0.02	0.00	99.9%	0.0%	0.1%	0.0%	0.0%
June	90.4	618	0.00	0.00	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
July	99.5	704	0.00	0.12	0.01	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0	707	0.00	0.19	0.01	0.00	99.7%	0.3%	0.0%	0.0%	0.0%
September	99.9	683	0.00	1.06	0.14	0.01	99.1%	0.4%	0.3%	0.1%	0.0%
October	99.3	703	0.00	0.03	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
November	93.6	638	0.00	0.05	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
December	99.7	701	0.00	0.03	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	98.2	8168	0.00	1.06	0.14	0.00	99.9%	0.1%	0.0%	0.0%	0.0%

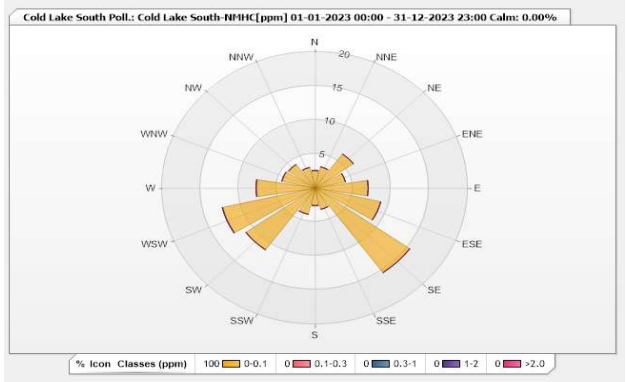
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	100	8	15	22	12	58	375	2
Total Hours of Downtime		157	Total Hours of Calibration		435	Total Hours of Flagged		592

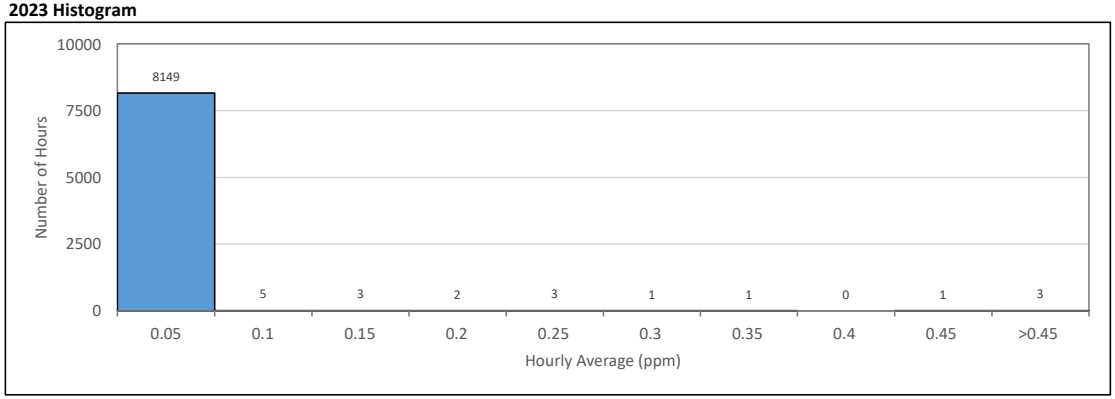
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - COLD LAKE SOUTH STATION

PARTICULATE MATTER 2.5 ($PM_{2.5}$) in microgram per cubic meter ($\mu g/m^3$)

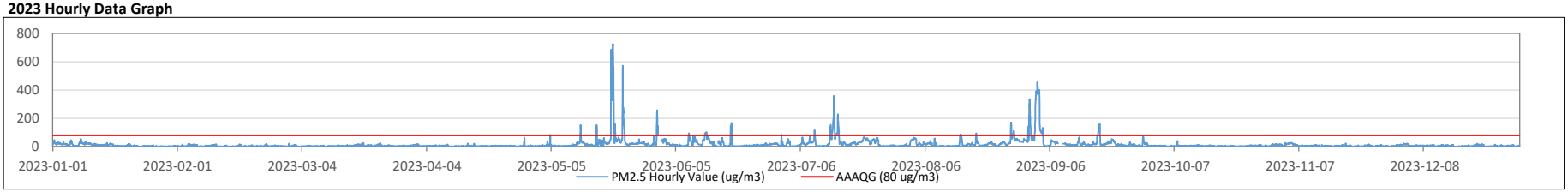
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances		Percentage Readings in Concentration Range				
							1-hour	24-hour	0 - 50	51 - 80	81 - 120	121 - 240	>240
January	100.0	740	0	55	26	11.0	0	0	99.9%	0.1%	0.0%	0.0%	0.0%
February	100.0	670	1	21	12	5.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
March	98.1	728	1	27	15	6.5	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
April	99.9	717	1	63	15	5.5	0	0	99.9%	0.1%	0.0%	0.0%	0.0%
May	98.8	733	3	726	338	37.0	54	6	89.2%	3.4%	1.4%	2.9%	3.1%
June	96.8	696	1	167	72	20.6	23	7	89.7%	7.0%	2.6%	0.7%	0.0%
July	100.0	743	1	358	147	28.0	51	10	84.7%	8.5%	3.5%	3.1%	0.3%
August	100.0	743	1	282	75	24.3	29	9	88.6%	7.5%	2.8%	0.9%	0.1%
September	94.9	682	4	453	277	42.1	75	8	84.3%	4.7%	3.8%	2.8%	4.4%
October	99.7	740	1	41	13	5.9	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0	718	1	28	21	7.3	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
December	95.8	711	0	23	18	7.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	98.7	8621	0	726	338	16.7	232	40	94.7%	2.6%	1.2%	0.9%	0.7%

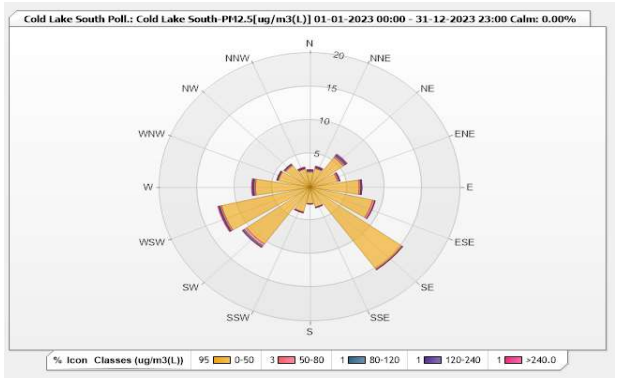
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	37	3	55	22	0	22	0	0
Total Hours of Downtime		117	Total Hours of Calibration		22	Total Hours of Flagged		139

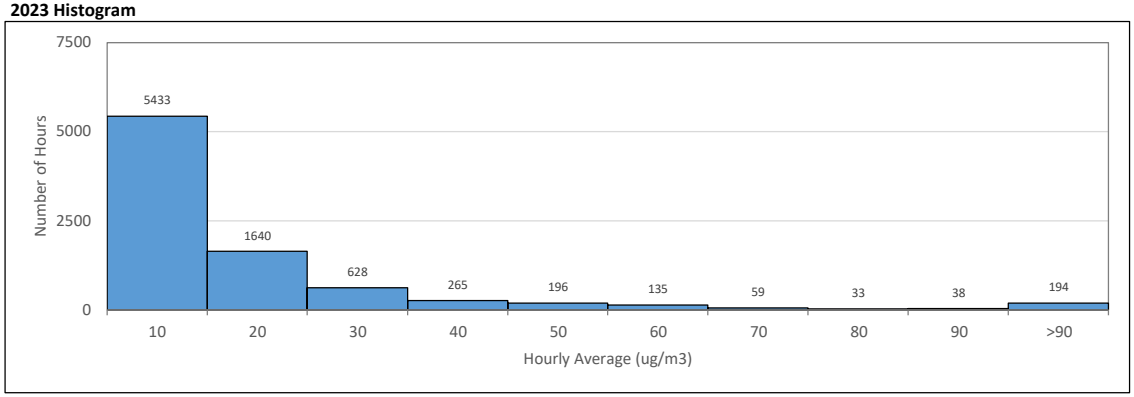
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - COLD LAKE SOUTH STATION
RELATIVE HUMIDITY (RH) in percent (%)

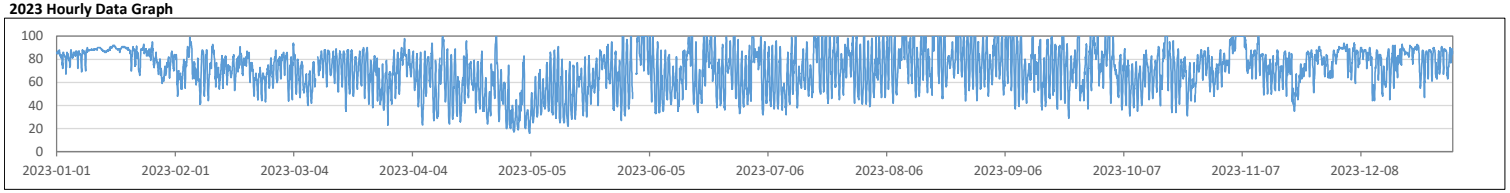
2023 Annual Continuous Data Summary

Month	Operational	# of Reading	Monthly Avg.	Min. 1-hr	Max. 1-hr	Max. 24-hr
January	100.0	744	83.7	59	95	91
February	100.0	672	70.9	41	99	88
March	98.1	730	68.1	23	94	79
April	99.9	719	58.9	17	100	86
May	98.8	735	54.7	16	100	80
June	98.2	707	69.6	33	100	93
July	100.0	744	70.8	32	100	93
August	100.0	744	79.1	39	100	99
September	100.0	720	74.3	29	100	91
October	99.7	742	68.6	31	100	89
November	100.0	720	76.6	35	100	100
December	100.0	744	80.1	44	94	91
Annual	99.6	8721	71.3	16	100	100

2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	2	15	22	0	0	0	0
Total Hours of Downtime		39	Total Hours of Calibration		0	Total Hours of Flagged		39

2023 Hourly Data Graph



LICA - COLD LAKE SOUTH STATION
AMBIENT TEMPERATURE (AT) in degree celsius (°C)

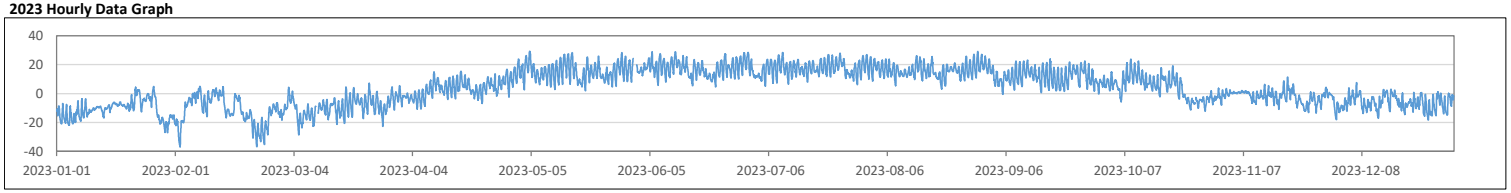
2023 Annual Continuous Data Summary

Month	Operational	# of Reading	Monthly Avg.	Min. 1-hr	Max. 1-hr	Max. 24-hr
January	100.0	744	-10.9	-27.0	4.9	0.5
February	100.0	672	-11.6	-36.8	5.1	1.1
March	98.1	730	-8.7	-28.6	7.2	-1.0
April	99.9	719	3.7	-10.6	18.3	12.3
May	98.8	735	15.3	1.9	29.3	22.1
June	98.2	707	17.6	4.7	29.0	22.8
July	100.0	744	17.3	5.2	28.4	22.0
August	100.0	744	16.5	3.2	29.2	20.7
September	100.0	720	12.1	-0.4	24.0	18.3
October	99.7	742	4.4	-12.2	23.8	15.2
November	100.0	720	-2.0	-13.3	11.5	1.7
December	100.0	744	-6.3	-18.3	7.6	-0.6
Annual	99.6	8721	3.9	-36.8	29.3	22.8

2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	2	15	22	0	0	0	0
Total Hours of Downtime		39	Total Hours of Calibration		0	Total Hours of Flagged		39

2023 Hourly Data Graph



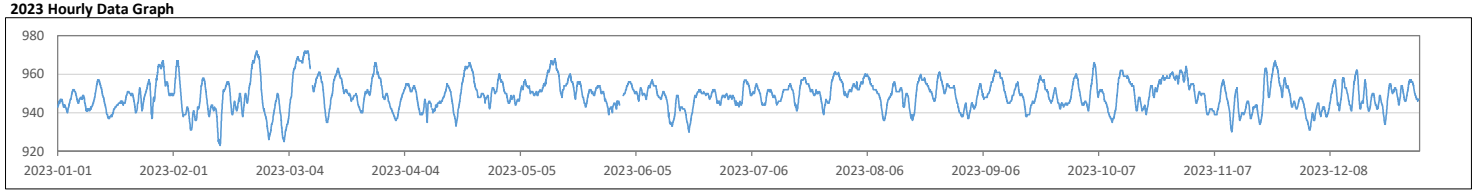
2023 Annual Continuous Data Summary

Month	Operational	# of Reading	Monthly Avg.	Min. 1-hr	Max. 1-hr	Max. 24-hr
January	100.0	744	948	937	967	964
February	100.0	672	946	923	972	970
March	98.1	730	952	925	972	972
April	99.9	719	949	933	966	965
May	98.8	735	952	939	968	966
June	98.2	707	948	930	957	955
July	100.0	744	951	939	961	960
August	100.0	744	951	936	961	959
September	100.0	720	949	937	962	961
October	99.7	742	952	935	966	961
November	100.0	720	947	930	967	965
December	100.0	744	947	931	962	956
Annual	99.6	8721	949	923	972	972

2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	2	15	22	0	0	0	0
Total Hours of Downtime		39	Total Hours of Calibration		0	Total Hours of Flagged		39

2023 Hourly Data Graph



LICA - COLD LAKE SOUTH STATION
VECTOR WIND SPEED (VWS) in kilometer per hour (km/hr)

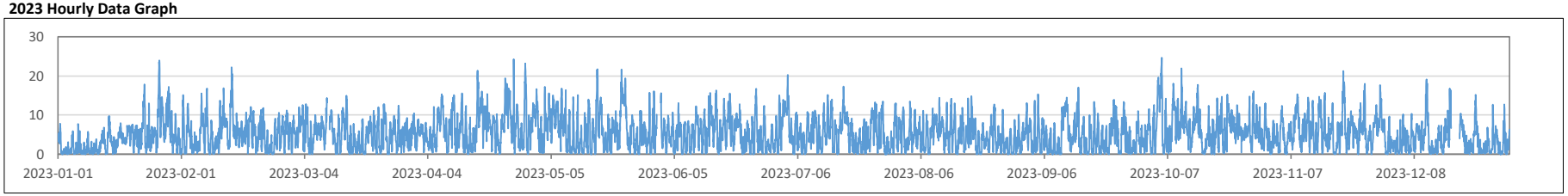
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 6	7 - 15	16 - 29	30 -39	>39
January	100.0	744	0.0	24.0	12.6	0.8	80.9%	17.6%	1.5%	0.0%	0.0%
February	100.0	672	0.0	22.2	12.3	1.2	64.3%	33.6%	2.1%	0.0%	0.0%
March	98.1	730	0.0	14.9	7.3	1.3	62.7%	37.3%	0.0%	0.0%	0.0%
April	99.9	719	0.0	24.2	12.8	2.8	50.2%	44.6%	5.1%	0.0%	0.0%
May	98.8	735	0.0	21.7	13.5	2.8	55.5%	40.7%	3.8%	0.0%	0.0%
June	97.9	705	0.0	16.7	8.9	0.6	60.9%	38.3%	0.9%	0.0%	0.0%
July	100.0	744	0.0	20.1	11.7	0.4	59.9%	39.5%	0.5%	0.0%	0.0%
August	100.0	744	0.0	14.8	7.4	1.1	72.3%	27.7%	0.0%	0.0%	0.0%
September	100.0	720	0.0	17.0	11.9	1.3	70.1%	29.7%	0.1%	0.0%	0.0%
October	99.7	742	0.0	24.7	13.2	0.3	55.1%	40.0%	4.9%	0.0%	0.0%
November	100.0	720	0.0	21.2	11.7	2.0	60.1%	37.2%	2.6%	0.0%	0.0%
December	93.3	691	0.0	19.1	9.0	1.4	82.6%	16.2%	1.2%	0.0%	0.0%
Annual	99.0	8666	0.0	24.7	13.5	0.5	64.6%	33.5%	1.9%	0.0%	0.0%

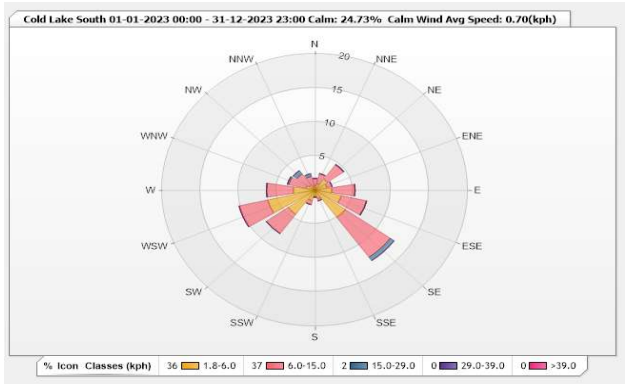
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	50	4	15	22	0	3	0	0
Total Hours of Downtime		91	Total Hours of Calibration		3	Total Hours of Flagged		94

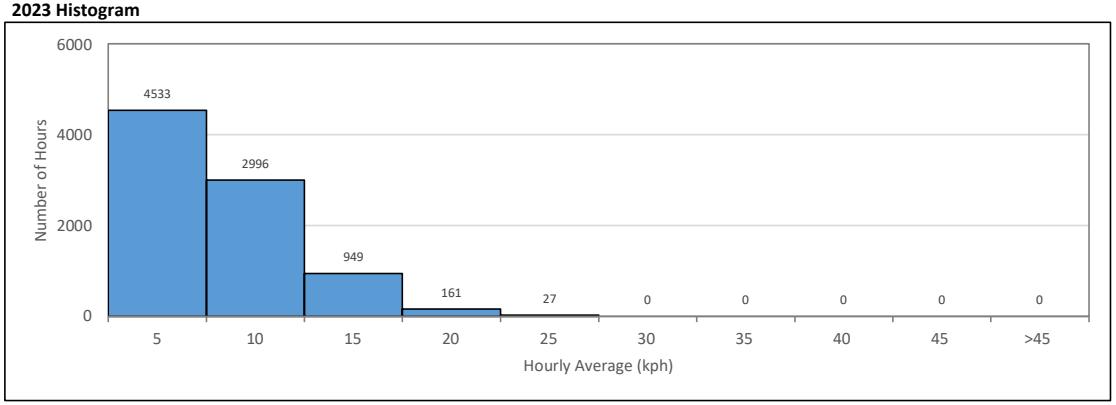
2023 Hourly Data Graph



2023 Wind Rose



2023 Histogram



1.2 Tamarack Station

1.2.1 Parameters Monitoring Summary

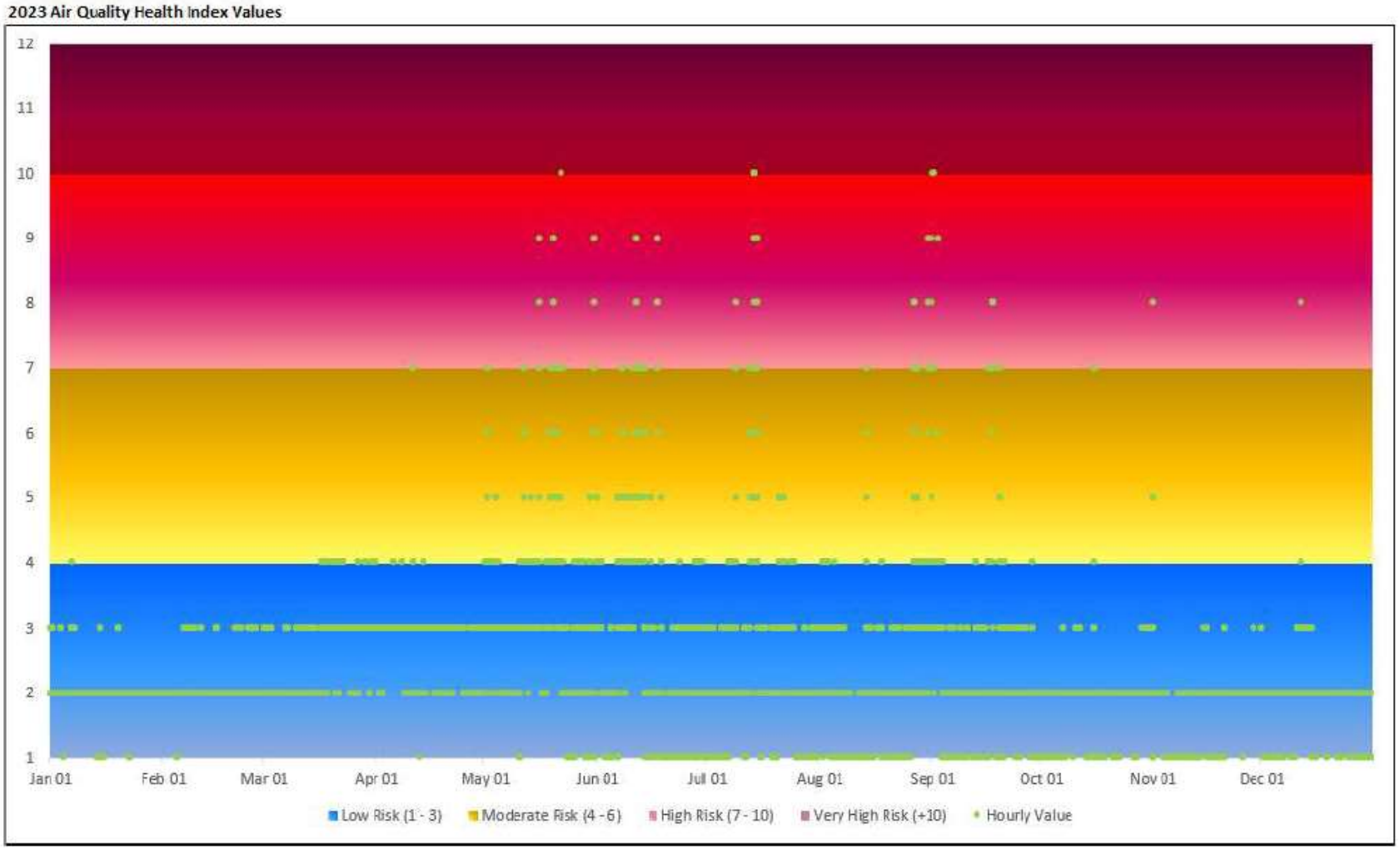
Date & Time	SO2	H2S	NOX	NO	NO2	O3	THC55	CH4	NMHC	PM2.5
	ppb	ppb	ppb	ppb	ppb	ppb	ppm	ppm	ppm	ug/m3(L)
Minimum Conc.	0	0	0.00	0.00	0	0.4	1.92	1.92	0.00	0.0
Min Conc. Date	2023-01-01 05:00:00	2023-01-01 00:00:00	2023-01-22 20:00:00	2023-01-01 00:00:00	2023-01-22 20:00:00	2023-05-30 04:00:00	2023-06-14 17:00:00	2023-06-14 17:00:00	2023-01-01 00:00:00	2023-06-19 21:00:00
Maximum Conc.	21	11	65	47	34	74.5	5.13	3.53	2.44	509.4
Max Conc. Date	2023-02-08 10:00:00	2023-08-10 01:00:00	2023-01-04 08:00:00	2023-10-21 07:00:00	2023-01-07 17:00:00	2023-06-11 16:00:00	2023-12-07 01:00:00	2023-04-22 00:00:00	2023-12-07 01:00:00	2023-05-20 09:00:00
Annual Average	1	0	5	1	4	28.4	2.07	2.07	0.00	12.6
# of hour	8193	8219	8217	8217	8217	8213	7413	7413	7413	8659
Valid Data[%]	93.53	93.82	93.8	93.8	93.8	93.76	84.62	84.62	84.62	98.85

Date & Time	RH	BP	AT	Precipitation	WDS	WDV	STDWD
	%RH	mb	C°	mm	kph	Deg	Deg
Minimum Conc.	13	909	-37.6	0.0	0.0	0.0	3
Min Conc. Date	2023-05-04 14:00:00	2023-02-13 06:00:00	2023-02-02 07:00:00	2023-01-01 00:00:00	2023-01-02 07:00:00	2023-01-24 02:00:00	2023-02-09 04:00:00
Maximum Conc.	100	956	28.9	20.5	19.7	360	79
Max Conc. Date	2023-01-20 11:00:00	2023-02-23 06:00:00	2023-05-04 14:00:00	2023-06-15 10:00:00	2023-05-22 15:00:00	2023-03-04 18:00:00	2023-07-14 23:00:00
Annual Average	75	935	3.8	272.7*	1.0	199	19
# of hour	8680	8680	8680	8673	8641	8641	8641
Valid Data[%]	99.09	99.09	99.09	99.01	98.64	98.64	98.64

* The value indicates a total amount of precipitation collected in 2023.

1.2.2 AQHI

LICA - TAMARACK STATION
AIR QUALITY HEALTH INDEX (AQHI)



1.2.3 Monitoring Parameters – 2023 Continuous Data Summary and Frequency Distribution

LICA - TAMARACK STATION
SULPHUR DIOXIDE (SO_2) in parts per billion (ppb)

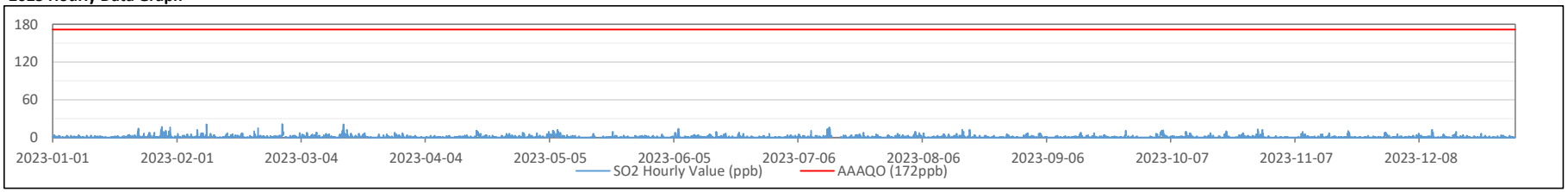
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQOExceedances				Percentage Readings in Concentration Range				
							1-hour	24-hour	30-day	Annual	0 - 10	11 -50	51 -100	101 - 172	>172
January	100.0	708	0	17	5	1.0	0	0	0	-	99.3%	0.7%	0.0%	0.0%	0.0%
February	98.1	624	0	21	2	1.1	0	0	0	-	99.2%	0.8%	0.0%	0.0%	0.0%
March	99.9	707	0	21	5	1.2	0	0	0	-	99.4%	0.6%	0.0%	0.0%	0.0%
April	100.0	684	0	11	4	0.7	0	0	0	-	99.9%	0.1%	0.0%	0.0%	0.0%
May	96.5	681	0	12	4	0.8	0	0	0	-	99.7%	0.3%	0.0%	0.0%	0.0%
June	100.0	683	0	14	3	0.7	0	0	0	-	99.6%	0.4%	0.0%	0.0%	0.0%
July	93.5	662	0	16	4	0.7	0	0	0	-	99.4%	0.6%	0.0%	0.0%	0.0%
August	100.0	707	0	12	3	0.7	0	0	0	-	99.7%	0.3%	0.0%	0.0%	0.0%
September	100.0	682	0	11	3	0.6	0	0	0	-	99.9%	0.1%	0.0%	0.0%	0.0%
October	98.4	694	0	13	5	1.0	0	0	0	-	99.3%	0.7%	0.0%	0.0%	0.0%
November	97.8	668	0	10	3	0.6	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
December	98.3	693	0	12	3	0.6	0	0	0	-	99.7%	0.3%	0.0%	0.0%	0.0%
Annual	98.5	8193	0	21	5	0.8	0	0	0	0	99.6%	0.4%	0.0%	0.0%	0.0%

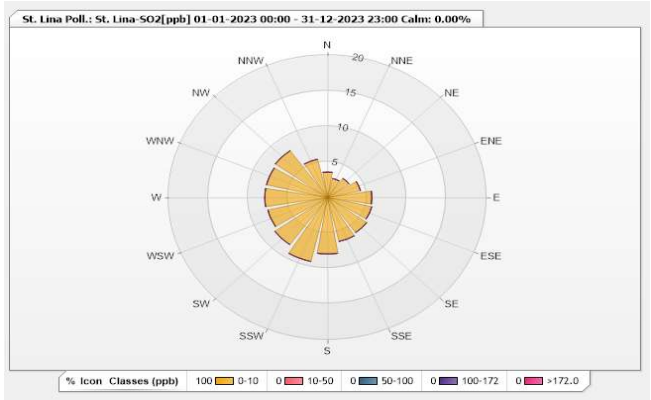
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
8	48	1	46	23	3	61	375	2
Total Hours of Downtime		129	Total Hours of Calibration		438	Total Hours of Flagged		567

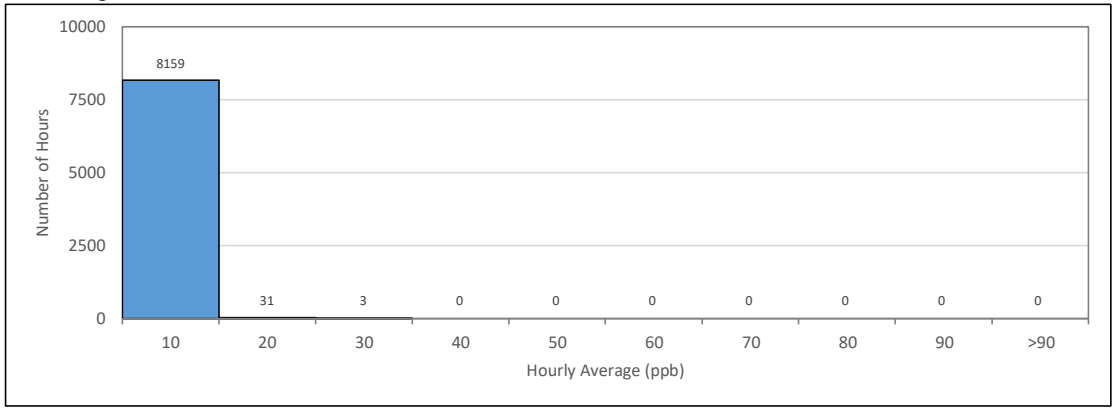
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - TAMARACK STATION
HYDROGEN SULPHIDE (H_2S) in parts per billion (ppb)

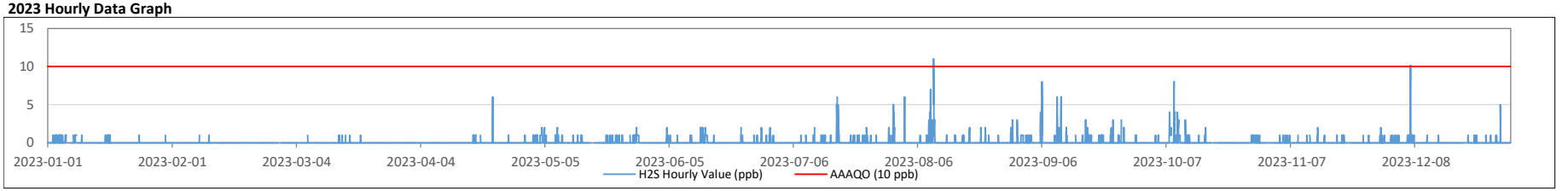
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances		Percentage Readings in Concentration Range				
							1-hour	24-hour	0 - 2	3 - 5	6 - 10	11 - 50	>50
January	98.0	691	0	1	1	0.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
February	98.1	624	0	1	0	0.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	706	0	1	0	0.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0	684	0	6	0	0.0	0	0	99.9%	0.0%	0.1%	0.0%	0.0%
May	96.5	681	0	2	1	0.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0	683	0	2	1	0.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	707	0	6	1	0.1	0	0	98.7%	1.1%	0.1%	0.0%	0.0%
August	100.0	707	0	11	1	0.2	1	0	98.2%	1.4%	0.3%	0.1%	0.0%
September	100.0	682	0	8	1	0.2	0	0	98.4%	1.0%	0.6%	0.0%	0.0%
October	98.3	693	0	8	2	0.2	0	0	98.4%	1.4%	0.1%	0.0%	0.0%
November	97.8	668	0	2	0	0.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
December	98.3	693	0	10	1	0.1	0	0	99.6%	0.1%	0.3%	0.0%	0.0%
Annual	98.9	8219	0	11	2	0.1	1	0	99.4%	0.4%	0.1%	0.0%	0.0%

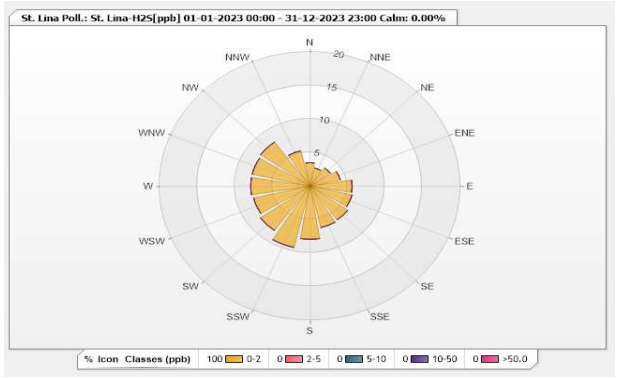
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
8	0	1	46	23	19	66	376	2
Total Hours of Downtime		97	Total Hours of Calibration		444	Total Hours of Flagged		541

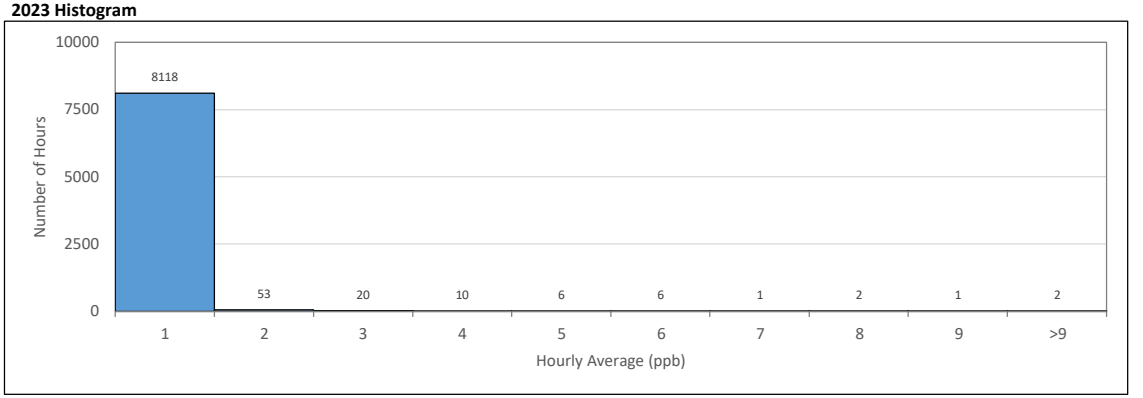
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - TAMARACK STATION
OXIDES OF NITROGEN (NOx) in parts per billion (ppb)

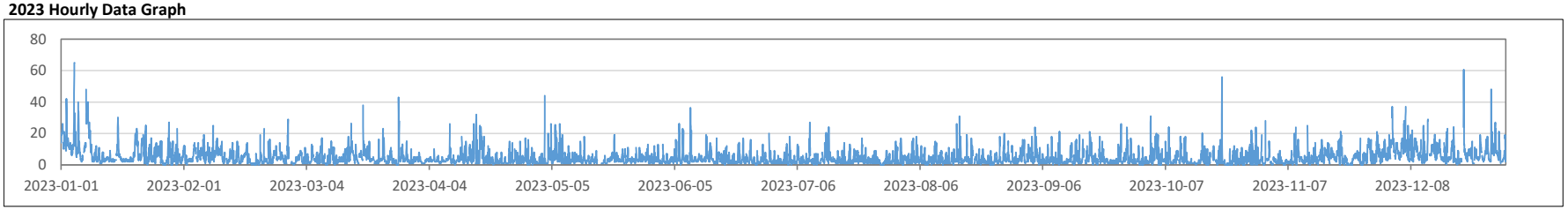
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0	706	0	65	26	8.0	98.0%	1.7%	0.3%	0.0%	0.0%
February	98.1	622	0	29	10	5.0	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	705	0	43	10	4.4	99.7%	0.3%	0.0%	0.0%	0.0%
April	100.0	682	0	32	11	3.9	99.9%	0.1%	0.0%	0.0%	0.0%
May	96.5	679	1	44	8	3.9	99.9%	0.1%	0.0%	0.0%	0.0%
June	100.0	681	0	36	7	3.7	99.9%	0.1%	0.0%	0.0%	0.0%
July	100.0	705	0	27	8	3.1	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0	705	0	31	6	3.5	99.9%	0.1%	0.0%	0.0%	0.0%
September	100.0	681	0	26	8	4.0	100.0%	0.0%	0.0%	0.0%	0.0%
October	98.4	692	0	56	11	3.9	99.7%	0.1%	0.1%	0.0%	0.0%
November	97.9	669	0	28	12	4.5	100.0%	0.0%	0.0%	0.0%	0.0%
December	98.3	690	0	60	18	8.5	98.7%	1.0%	0.3%	0.0%	0.0%
Annual	99.1	8217	0	65	26	4.7	99.6%	0.3%	0.1%	0.0%	0.0%

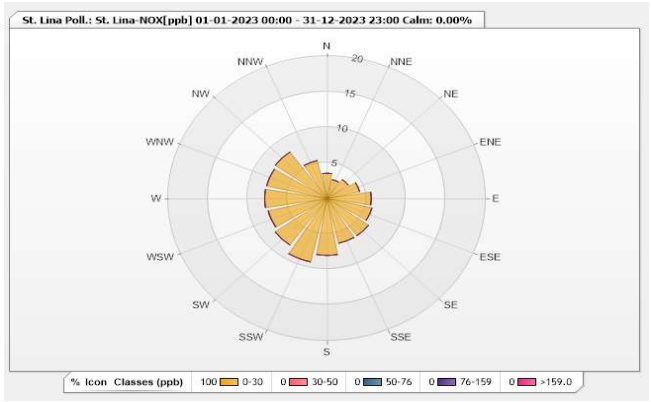
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
8	0	1	46	23	2	82	377	4
Total Hours of Downtime		80	Total Hours of Calibration		463	Total Hours of Flagged		543

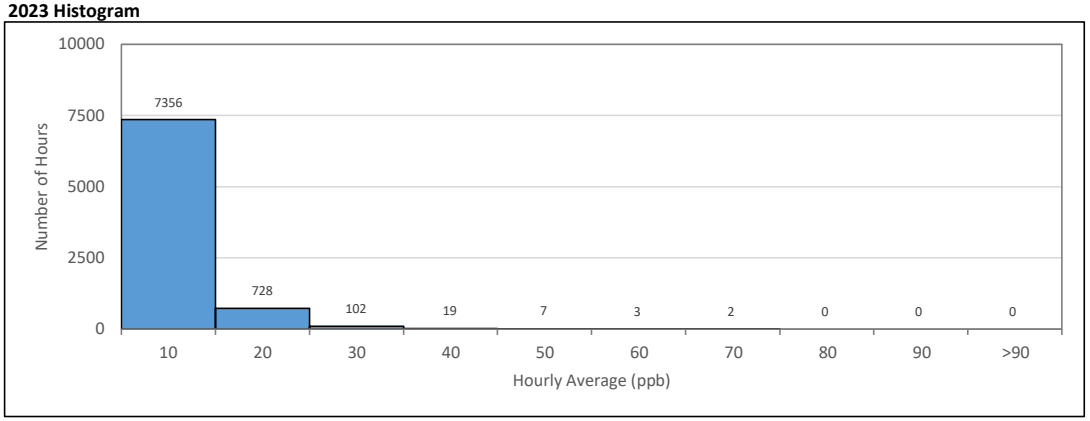
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - TAMARACK STATION
NITRIC OXIDE (NO) in parts per billion (ppb)

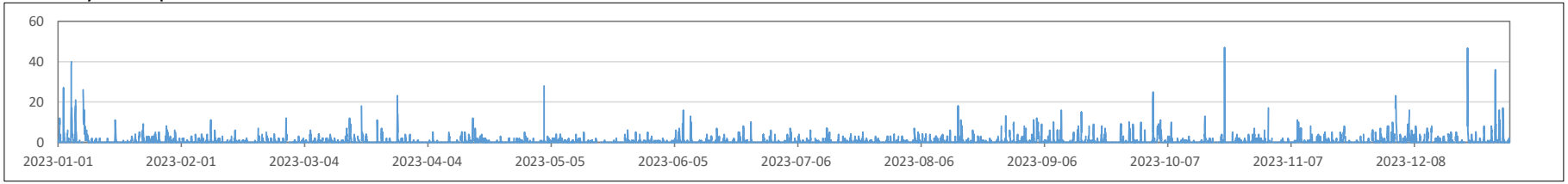
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0	706	0	40	6	1.2	99.7%	0.3%	0.0%	0.0%	0.0%
February	98.1	622	0	12	1	0.5	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	705	0	23	2	0.7	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0	682	0	12	2	0.3	100.0%	0.0%	0.0%	0.0%	0.0%
May	96.5	679	0	28	1	0.3	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0	681	0	16	2	0.5	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	705	0	7	1	0.4	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0	705	0	18	2	0.6	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0	681	0	16	3	0.8	100.0%	0.0%	0.0%	0.0%	0.0%
October	98.4	692	0	47	4	0.7	99.9%	0.1%	0.0%	0.0%	0.0%
November	97.9	669	0	17	2	0.6	100.0%	0.0%	0.0%	0.0%	0.0%
December	98.3	690	0	46	6	1.4	99.4%	0.6%	0.0%	0.0%	0.0%
Annual	99.1	8217	0	47	6	0.7	99.9%	0.1%	0.0%	0.0%	0.0%

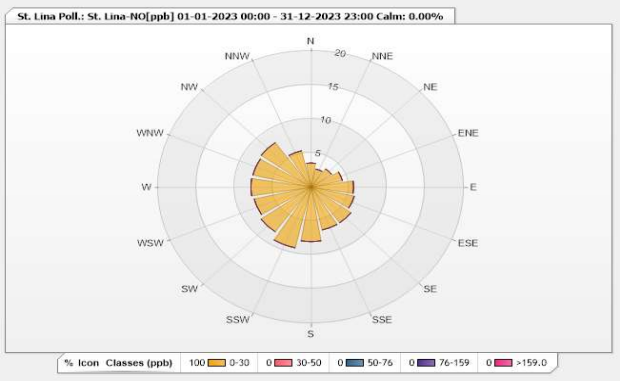
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
8	0	1	46	23	2	82	377	4
Total Hours of Downtime		80	Total Hours of Calibration		463	Total Hours of Flagged		543

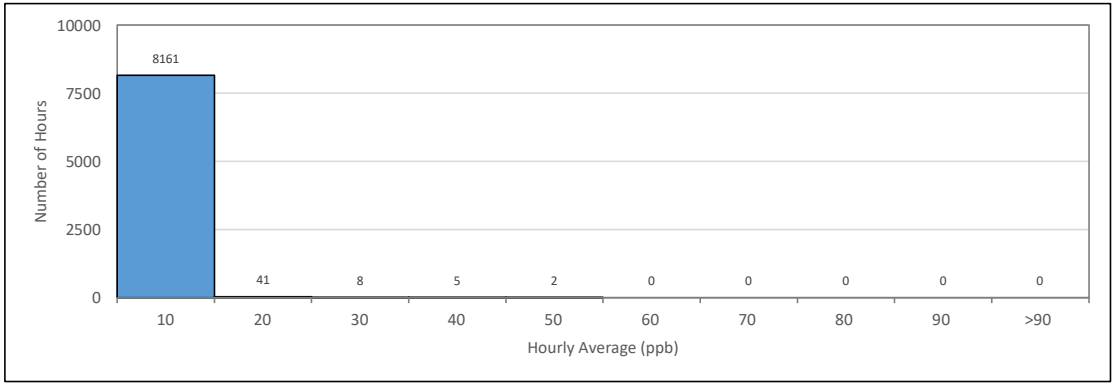
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - TAMARACK STATION
NITROGEN DIOXIDE (NO_2) in parts per billion (ppb)

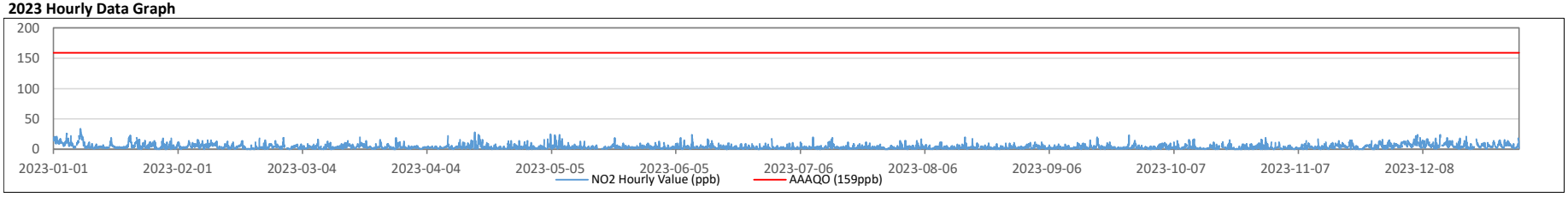
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances	Percentage Readings in Concentration Range				
							1-hour	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0	706	0	34	20	6.8	0	99.4%	0.6%	0.0%	0.0%	0.0%
February	98.1	622	0	19	9	4.5	0	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	705	0	20	7	3.8	0	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0	682	0	28	9	3.5	0	100.0%	0.0%	0.0%	0.0%	0.0%
May	96.5	679	1	25	7	3.5	0	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0	681	0	24	6	3.2	0	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	705	0	20	7	2.7	0	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0	705	0	20	4	2.9	0	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0	681	0	23	6	3.2	0	100.0%	0.0%	0.0%	0.0%	0.0%
October	98.4	692	0	19	7	3.1	0	100.0%	0.0%	0.0%	0.0%	0.0%
November	97.9	669	0	17	10	3.9	0	100.0%	0.0%	0.0%	0.0%	0.0%
December	98.3	690	0	24	14	7.0	0	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.1	8217	0	34	20	4.0	0	100.0%	0.0%	0.0%	0.0%	0.0%

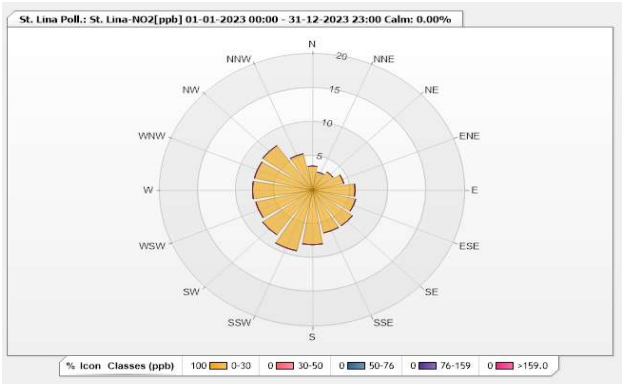
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
8	0	1	46	23	2	82	377	4
Total Hours of Downtime		80	Total Hours of Calibration		463	Total Hours of Flagged		543

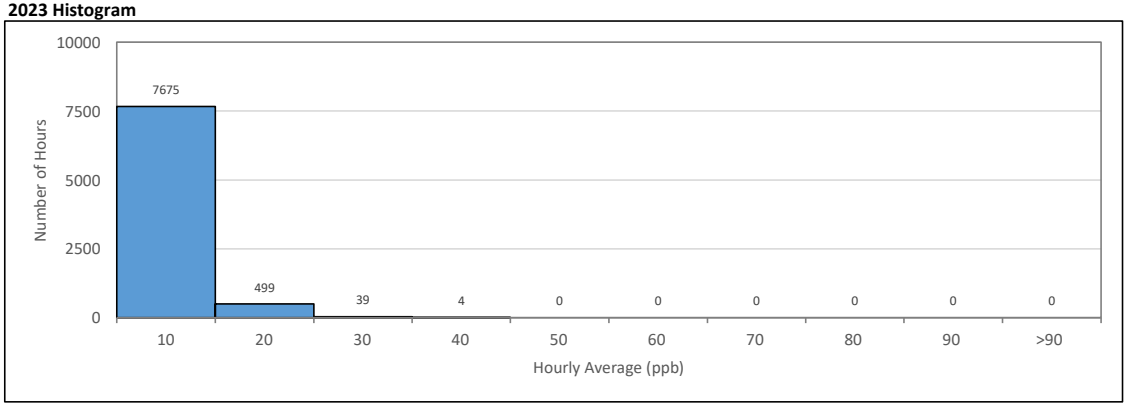
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - TAMARACK STATION
OZONE (O_3) in parts per billion (ppb)

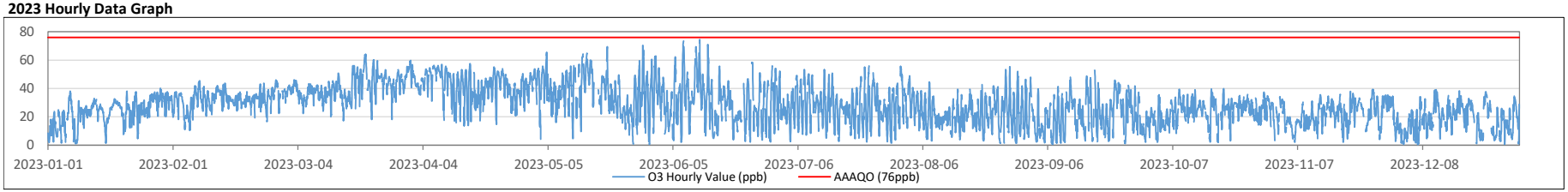
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances 1-hour	Percentage Readings in Concentration Range				
								0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0	707	1.0	40.0	33.1	23.5	0	76.9%	23.1%	0.0%	0.0%	0.0%
February	98.1	625	10.5	45.9	41.4	32.4	0	33.4%	66.6%	0.0%	0.0%	0.0%
March	99.9	706	17.1	64.2	56.7	41.2	0	9.3%	77.1%	13.6%	0.0%	0.0%
April	100.0	684	13.7	57.4	52.7	41.8	0	13.3%	65.6%	21.1%	0.0%	0.0%
May	96.4	681	0.4	70.1	52.4	37.6	0	31.1%	48.6%	20.3%	0.0%	0.0%
June	98.6	673	2.0	74.5	48.7	30.0	0	52.0%	38.2%	9.8%	0.0%	0.0%
July	100.0	707	1.5	55.9	36.5	27.1	0	62.2%	35.4%	2.4%	0.0%	0.0%
August	100.0	708	0.0	53.5	32.4	21.7	0	76.6%	22.9%	0.6%	0.0%	0.0%
September	100.0	683	0.5	52.8	37.1	21.2	0	74.4%	25.3%	0.3%	0.0%	0.0%
October	98.4	695	2.1	39.8	29.8	23.9	0	79.4%	20.6%	0.0%	0.0%	0.0%
November	95.0	651	2.1	39.3	33.2	21.8	0	84.0%	16.0%	0.0%	0.0%	0.0%
December	98.3	693	0.4	39.1	31.3	18.1	0	88.5%	11.5%	0.0%	0.0%	0.0%
Annual	98.7	8213	0.0	74.5	56.7	28.4	0	56.8%	37.6%	5.7%	0.0%	0.0%

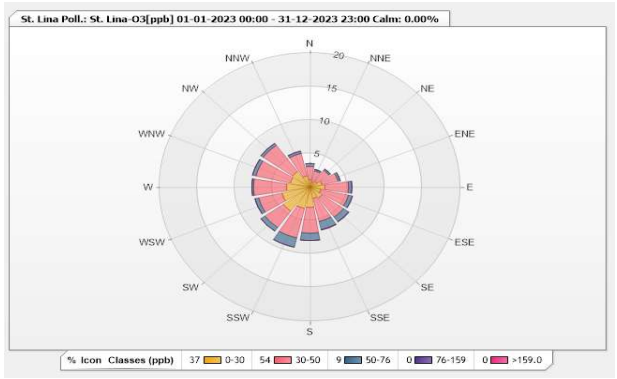
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
8	14	1	47	23	19	55	377	3
Total Hours of Downtime		112	Total Hours of Calibration		435	Total Hours of Flagged		547

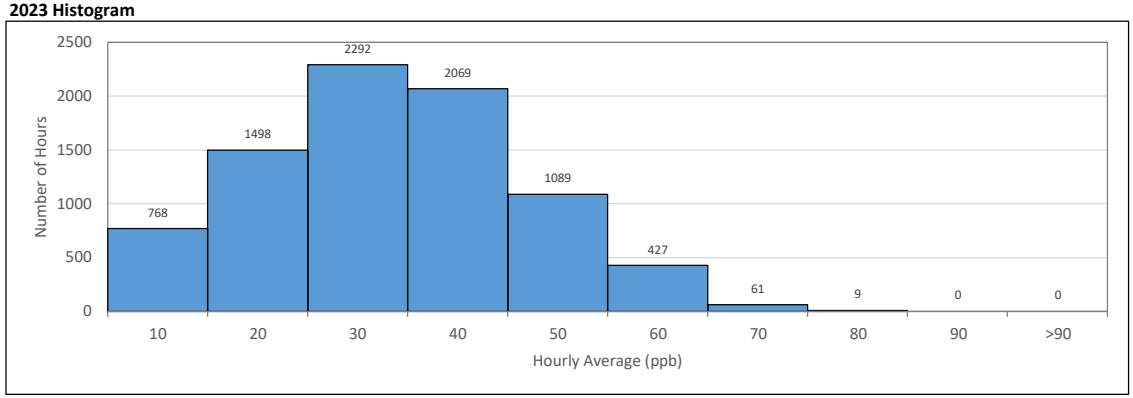
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - TAMARACK STATION

PARTICULATE MATTER 2.5 ($PM_{2.5}$) in microgram per cubic meter ($\mu g/m^3$)

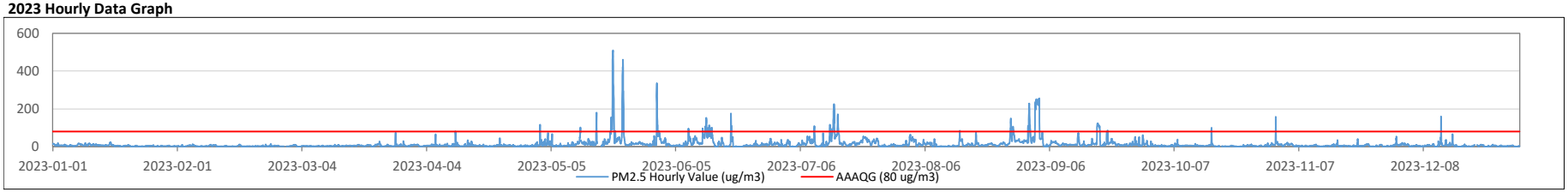
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances		Percentage Readings in Concentration Range				
							1-hour	24-hour	0 - 50	51 - 80	81 - 120	121 - 240	>240
January	100.0	743	1	23.5	13.4	5.7	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
February	98.1	657	1	14.4	7.1	3.2	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	742	1	74.5	10.6	4.9	0	0	99.9%	0.1%	0.0%	0.0%	0.0%
April	100.0	717	1	81.7	12.9	5.6	1	0	99.7%	0.1%	0.1%	0.0%	0.0%
May	96.4	716	2	509.4	202.7	30.6	51	7	89.0%	4.1%	3.1%	1.3%	2.7%
June	100.0	718	0	176.2	80.4	19.0	32	6	90.0%	5.6%	4.0%	0.4%	0.0%
July	100.0	742	0	225.5	94.8	20.1	26	7	91.2%	5.3%	2.3%	1.2%	0.0%
August	100.0	743	1	228.6	71.1	17.9	18	6	94.1%	3.5%	1.5%	0.9%	0.0%
September	100.0	718	1	255.3	152.2	27.3	52	6	89.1%	3.6%	2.5%	3.6%	1.1%
October	98.4	730	1	100.3	18.2	4.9	2	0	99.6%	0.1%	0.3%	0.0%	0.0%
November	98.1	704	1	157.4	24.6	5.6	1	0	99.7%	0.1%	0.0%	0.1%	0.0%
December	98.1	729	1	159.2	22.7	6.0	1	0	99.6%	0.3%	0.0%	0.1%	0.0%
Annual	99.1	8659	0	509.4	202.7	12.6	184	32	96.0%	1.9%	1.2%	0.6%	0.3%

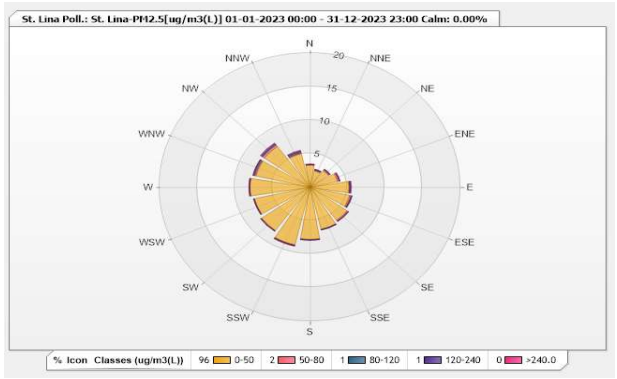
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
7	0	1	49	23	1	20	0	0
Total Hours of Downtime		81	Total Hours of Calibration		20	Total Hours of Flagged		101

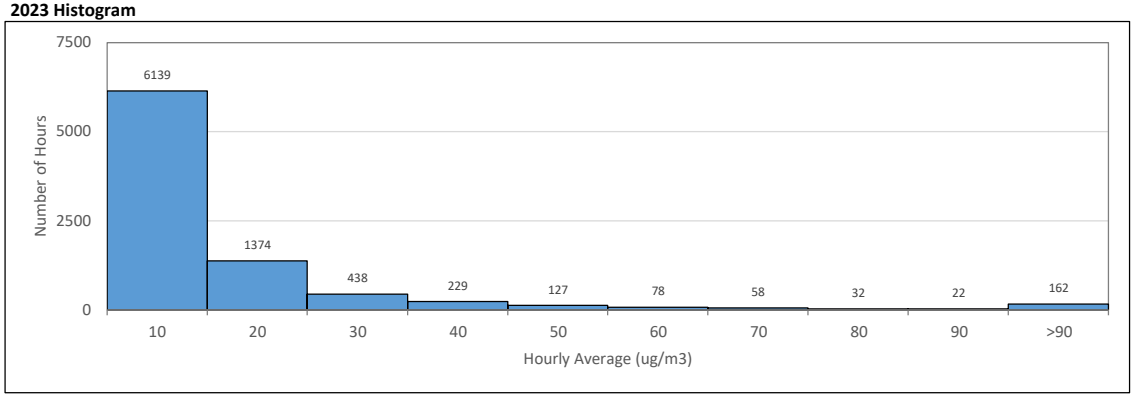
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - TAMARACK STATION
TOTAL HYDROCARBONS (THC) in parts per million (ppm)

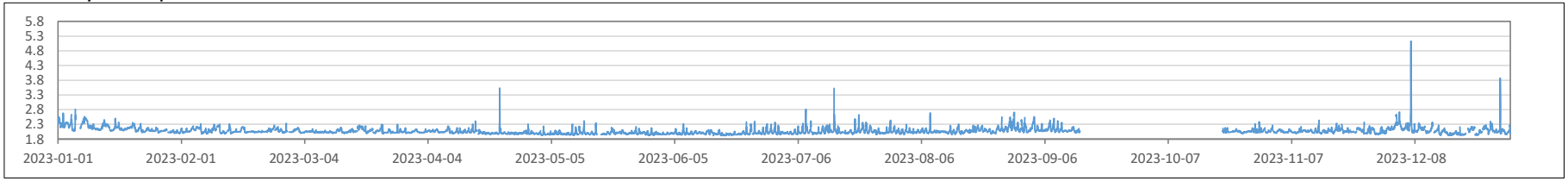
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 2	3 - 5	6 - 10	11 - 40	>40
January	96.6	681	2.00	2.81	2.43	2.18	93.0%	7.0%	0.0%	0.0%	0.0%
February	97.9	624	1.98	2.33	2.18	2.08	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	706	1.98	2.29	2.17	2.06	100.0%	0.0%	0.0%	0.0%	0.0%
April	99.7	683	1.96	3.53	2.10	2.03	99.7%	0.3%	0.0%	0.0%	0.0%
May	96.4	681	1.93	2.42	2.06	2.00	99.9%	0.1%	0.0%	0.0%	0.0%
June	100.0	683	1.92	2.39	2.08	2.01	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	707	1.96	3.52	2.20	2.06	98.6%	1.4%	0.0%	0.0%	0.0%
August	99.9	707	1.96	2.71	2.28	2.09	97.3%	2.7%	0.0%	0.0%	0.0%
September	46.9	318	2.01	2.56	2.25	NA	96.2%	3.8%	0.0%	0.0%	0.0%
October	37.4	259	1.99	2.38	2.11	NA	100.0%	0.0%	0.0%	0.0%	0.0%
November	97.9	671	1.96	2.44	2.16	2.06	99.9%	0.1%	0.0%	0.0%	0.0%
December	98.3	693	1.93	5.13	2.38	2.11	97.5%	2.5%	0.0%	0.0%	0.0%
Annual	89.2	7413	1.92	5.13	2.43	2.07	98.5%	1.5%	0.0%	0.0%	0.0%

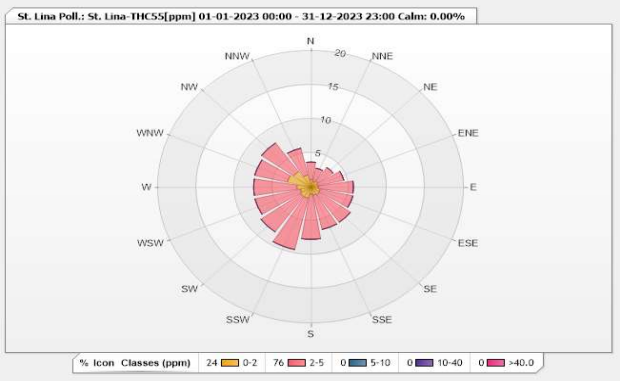
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
6	833	4	35	23	45	58	341	2
Total Hours of Downtime		946	Total Hours of Calibration		401	Total Hours of Flagged		1347

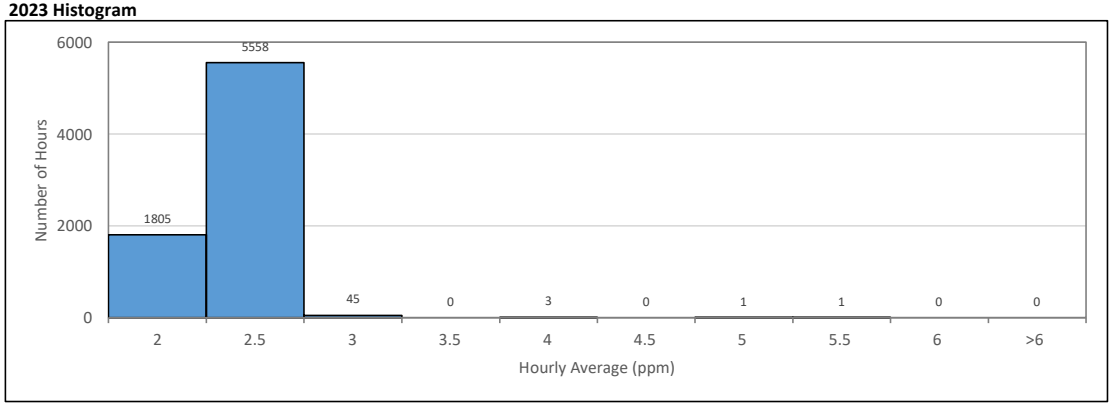
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - TAMARACK STATION
METHANE (CH_4) in parts per million (ppm)

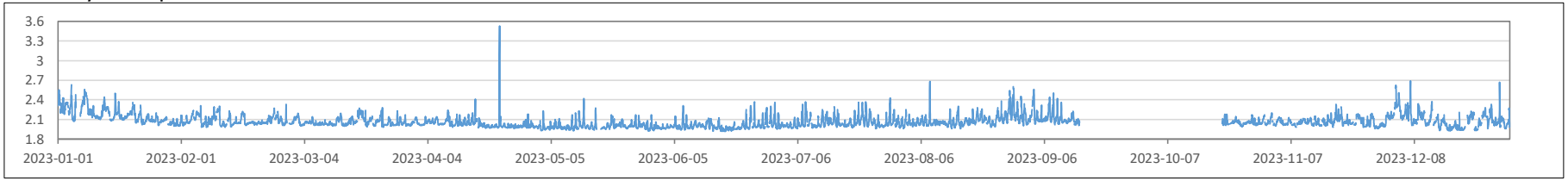
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 2	3 - 5	6 - 10	11 - 20	>20
January	96.6	681	2.00	2.63	2.42	2.17	93.7%	6.3%	0.0%	0.0%	0.0%
February	97.9	624	1.98	2.33	2.18	2.08	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	706	1.98	2.28	2.17	2.06	100.0%	0.0%	0.0%	0.0%	0.0%
April	99.7	683	1.96	3.53	2.10	2.03	99.7%	0.3%	0.0%	0.0%	0.0%
May	96.4	681	1.93	2.42	2.06	2.00	99.9%	0.1%	0.0%	0.0%	0.0%
June	100.0	683	1.92	2.37	2.08	2.01	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	707	1.96	2.43	2.13	2.05	99.9%	0.1%	0.0%	0.0%	0.0%
August	99.9	707	1.96	2.68	2.28	2.09	97.6%	2.4%	0.0%	0.0%	0.0%
September	46.9	318	2.01	2.56	2.25	NA	96.2%	3.8%	0.0%	0.0%	0.0%
October	37.4	259	1.99	2.18	2.08	NA	100.0%	0.0%	0.0%	0.0%	0.0%
November	97.9	671	1.96	2.33	2.16	2.06	100.0%	0.0%	0.0%	0.0%	0.0%
December	98.3	693	1.93	2.69	2.38	2.10	98.1%	1.9%	0.0%	0.0%	0.0%
Annual	89.2	7413	1.92	3.53	2.42	2.07	98.8%	1.2%	0.0%	0.0%	0.0%

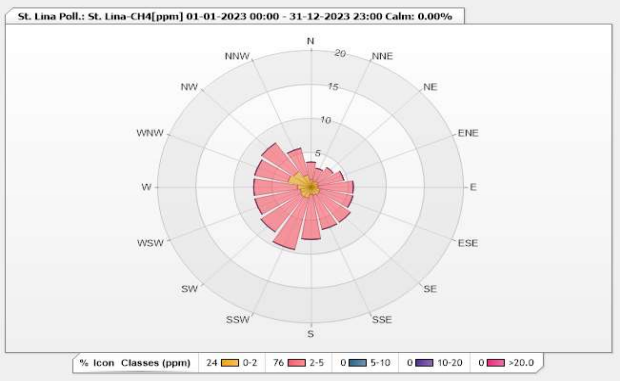
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
6	833	4	35	23	45	58	341	2
Total Hours of Downtime		946	Total Hours of Calibration		401	Total Hours of Flagged		1347

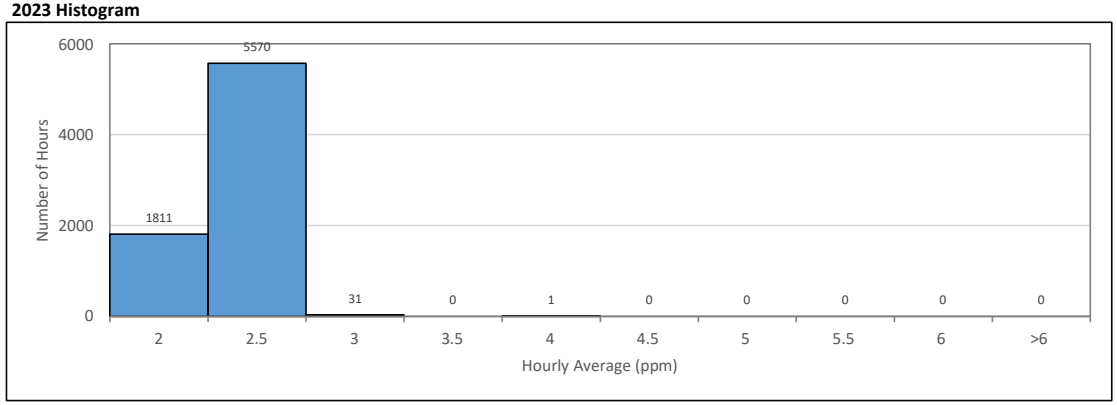
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - TAMARACK STATION
NON-METHANE HYDROCARBONS (NMHC) in parts per million (ppm)

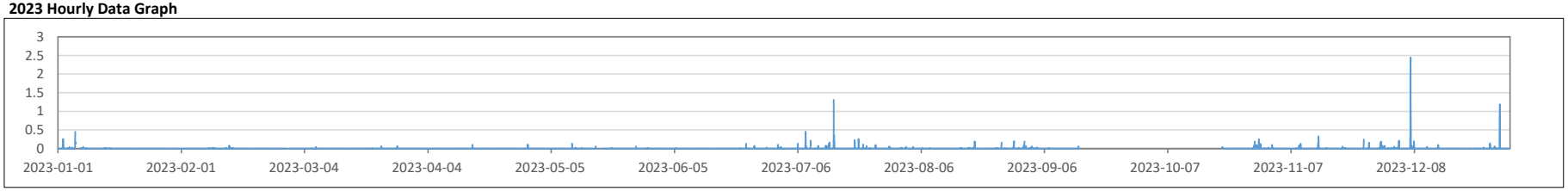
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 0.1	0.2 - 0.3	0.4 - 0.9	1 -2	>2
January	96.6	681	0.00	0.45	0.04	0.00	99.1%	0.7%	0.1%	0.0%	0.0%
February	97.9	624	0.00	0.08	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	706	0.00	0.06	0.01	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
April	99.7	683	0.00	0.11	0.01	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
May	96.4	681	0.00	0.13	0.01	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0	683	0.00	0.13	0.01	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	707	0.00	1.31	0.11	0.01	98.6%	0.8%	0.4%	0.1%	0.0%
August	99.9	707	0.00	0.20	0.02	0.00	99.4%	0.6%	0.0%	0.0%	0.0%
September	46.9	318	0.00	0.06	0.01	NA	100.0%	0.0%	0.0%	0.0%	0.0%
October	37.4	259	0.00	0.24	0.03	NA	98.5%	1.5%	0.0%	0.0%	0.0%
November	97.9	671	0.00	0.32	0.03	0.00	99.3%	0.7%	0.0%	0.0%	0.0%
December	98.3	693	0.00	2.44	0.23	0.01	98.6%	1.0%	0.1%	0.3%	0.0%
Annual	89.2	7413	0.00	2.44	0.23	0.00	99.5%	0.5%	0.1%	0.0%	0.0%

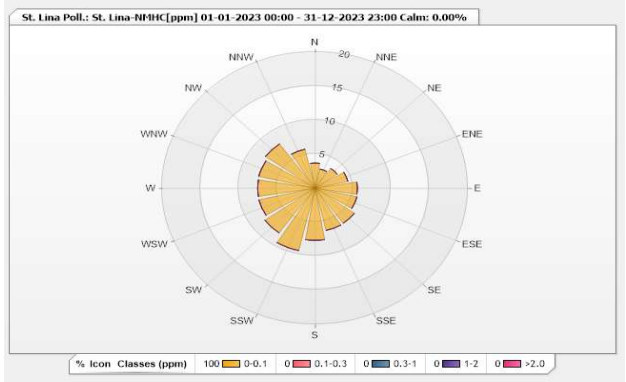
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
6	833	4	35	23	45	58	341	2
Total Hours of Downtime		946	Total Hours of Calibration		401	Total Hours of Flagged		1347

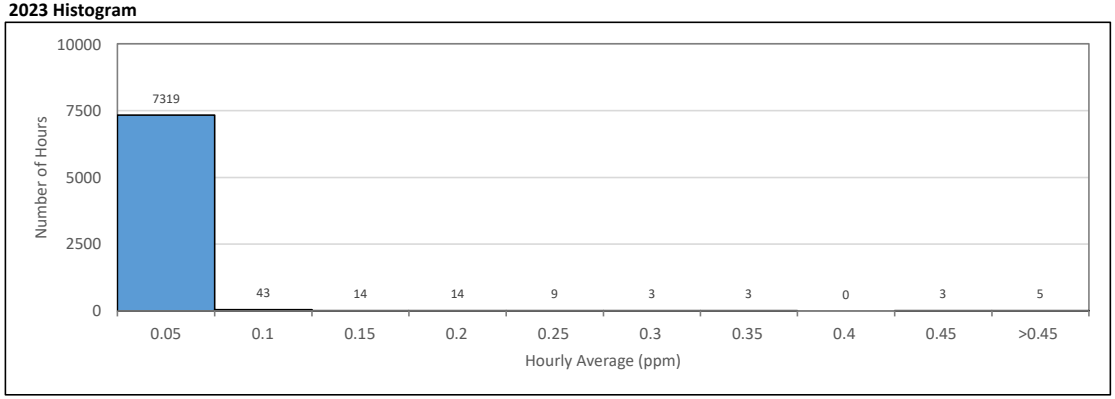
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - TAMARACK STATION

PARTICULATE MATTER 2.5 ($PM_{2.5}$) in microgram per cubic meter ($\mu g/m^3$)

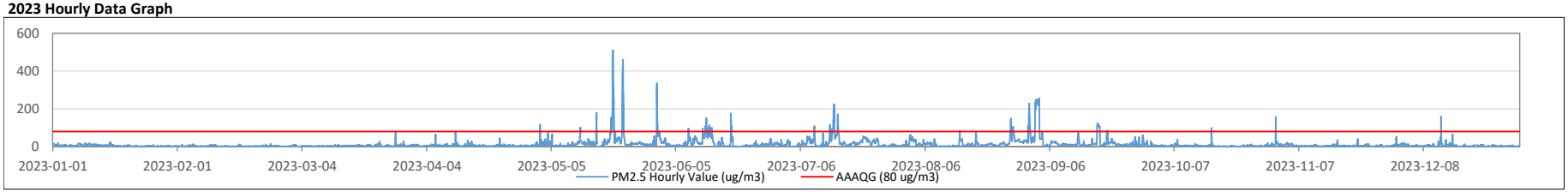
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances		Percentage Readings in Concentration Range				
							1-hour	24-hour	0 - 50	51 - 80	81 - 120	121 - 240	>240
January	100.0	743	1	23.5	13.4	5.7	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
February	98.1	657	1	14.4	7.1	3.2	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	742	1	74.5	10.6	4.9	0	0	99.9%	0.1%	0.0%	0.0%	0.0%
April	100.0	717	1	81.7	12.9	5.6	1	0	99.7%	0.1%	0.1%	0.0%	0.0%
May	96.4	716	2	509.4	202.7	30.6	51	7	89.0%	4.1%	3.1%	1.3%	2.7%
June	100.0	718	0	176.2	80.4	19.0	32	6	90.0%	5.6%	4.0%	0.4%	0.0%
July	100.0	742	0	225.5	94.8	20.1	26	7	91.2%	5.3%	2.3%	1.2%	0.0%
August	100.0	743	1	228.6	71.1	17.9	18	6	94.1%	3.5%	1.5%	0.9%	0.0%
September	100.0	718	1	255.3	152.2	27.3	52	6	89.1%	3.6%	2.5%	3.6%	1.1%
October	98.4	730	1	100.3	18.2	4.9	2	0	99.6%	0.1%	0.3%	0.0%	0.0%
November	98.1	704	1	157.4	24.6	5.6	1	0	99.7%	0.1%	0.0%	0.1%	0.0%
December	98.1	729	1	159.2	22.7	6.0	1	0	99.6%	0.3%	0.0%	0.1%	0.0%
Annual	99.1	8659	0	509.4	202.7	12.6	184	32	96.0%	1.9%	1.2%	0.6%	0.3%

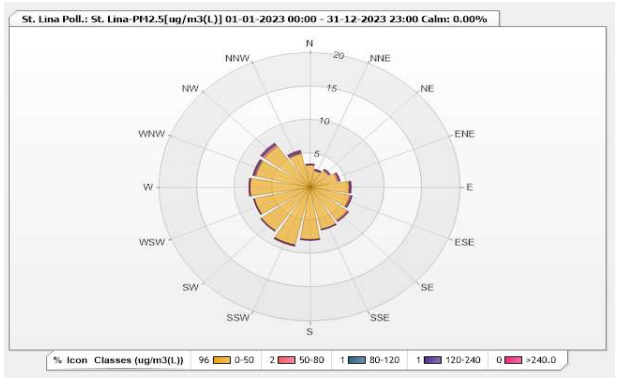
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
7	0	1	49	23	1	20	0	0
Total Hours of Downtime		81	Total Hours of Calibration		20	Total Hours of Flagged		101

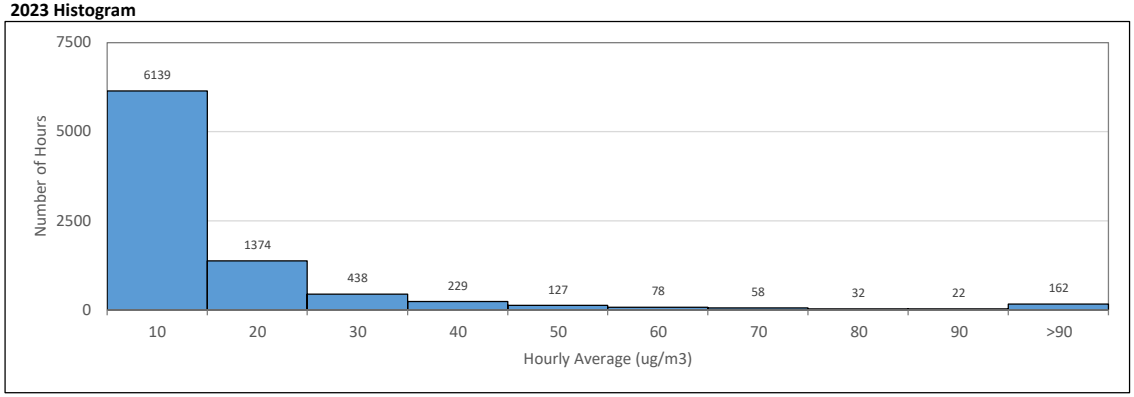
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - TAMARACK STATION
RELATIVE HUMIDITY (RH) in percent (%)

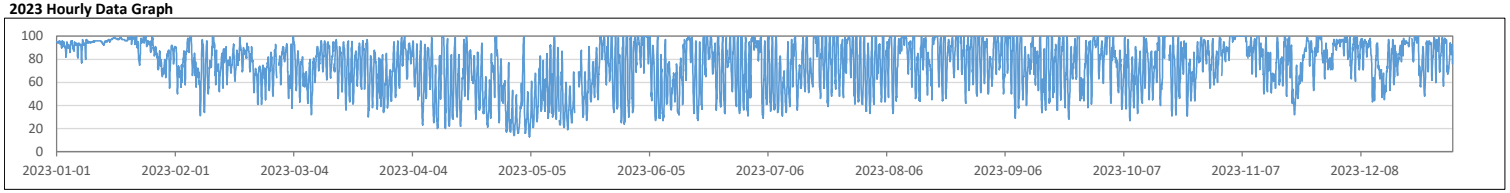
2023 Annual Continuous Data Summary

Month	Operational	# of Reading	Monthly Avg.	Min. 1-hr	Max. 1-hr	Max. 24-hr
January	100.0	744	91.8	55	100	98
February	98.1	659	74.8	31	100	94
March	99.9	743	71.2	30	100	86
April	100.0	720	61.1	14	100	90
May	96.4	717	56.2	13	100	93
June	100.0	720	71.7	27	100	95
July	100.0	744	73.9	29	100	96
August	100.0	744	80.9	33	100	98
September	100.0	720	76.2	28	100	96
October	98.4	732	74.1	27	100	95
November	98.2	707	82.7	32	100	100
December	98.1	730	83.9	43	100	99
Annual	99.1	8680	74.9	13	100	100

2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
6	0	1	49	23	1	0	0	0
Total Hours of Downtime		80	Total Hours of Calibration		0	Total Hours of Flagged		80

2023 Hourly Data Graph



LICA - TAMARACK STATION
AMBIENT TEMPERATURE (AT) in degree celsius (°C)

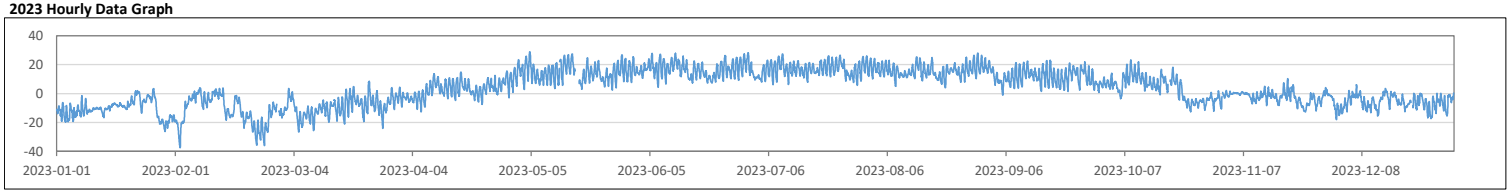
2023 Annual Continuous Data Summary

Month	Operational	# of Reading	Monthly Avg.	Min. 1-hr	Max. 1-hr	Max. 24-hr
January	100.0	744	-10.5	-26.3	3.5	-0.6
February	98.1	659	-11.8	-37.6	3.9	0.8
March	99.9	743	-8.8	-26.6	8.5	-1.5
April	100.0	720	3.1	-12.6	18.0	11.3
May	96.4	717	14.8	2.4	28.9	21.2
June	100.0	720	16.8	4.3	28.2	22.1
July	100.0	744	16.7	5.8	27.5	21.7
August	100.0	744	16.1	4.1	28.2	19.5
September	100.0	720	11.9	-0.8	23.1	18.4
October	98.4	732	3.8	-12.5	23.1	14.5
November	98.2	707	-2.3	-12.7	10.4	1.6
December	98.1	730	-6.0	-18.1	6.1	0.2
Annual	99.1	8680	3.7	-37.6	28.9	22.1

2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
6	0	1	49	23	1	0	0	0
Total Hours of Downtime		80	Total Hours of Calibration		0	Total Hours of Flagged		80

2023 Hourly Data Graph



LICA - TAMARACK STATION
BAROMETRIC PRESSURE (BP) in millibar (mbar)

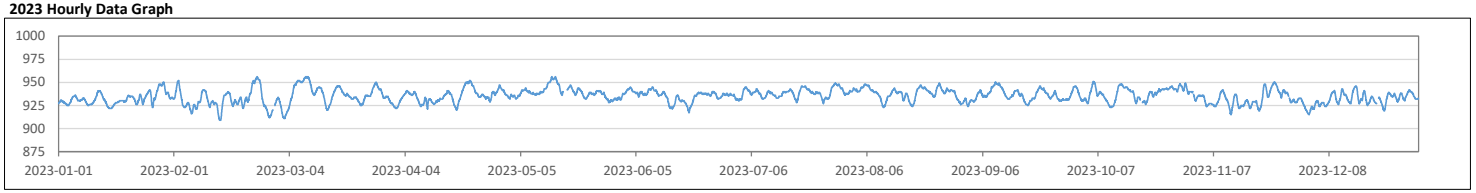
2023 Annual Continuous Data Summary

Month	Operational	# of Reading	Monthly Avg.	Min. 1-hr	Max. 1-hr	Max. 24-hr
January	100.0	744	932	922	950	947
February	98.1	659	931	909	956	954
March	99.9	743	937	911	956	956
April	100.0	720	935	920	952	950
May	96.4	717	939	928	956	954
June	100.0	720	935	917	945	943
July	100.0	744	938	924	949	948
August	100.0	744	938	923	949	947
September	100.0	720	936	924	950	948
October	98.4	732	938	923	951	947
November	98.2	707	932	915	950	949
December	98.1	730	932	915	946	941
Annual	99.1	8680	935	909	956	956

2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
6	0	1	49	23	1	0	0	0
Total Hours of Downtime		80	Total Hours of Calibration		0	Total Hours of Flagged		80

2023 Hourly Data Graph



LICA - TAMARACK STATION
PRECIPITATION in millimeter (mm)

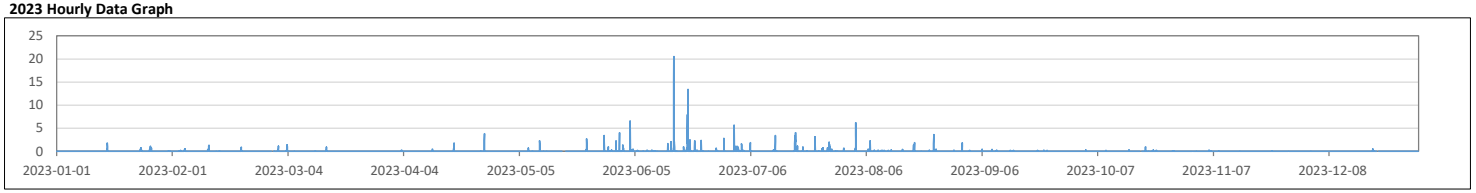
2023 Annual Continuous Data Summary

Month	Operational	# of Reading	Monthly Avg.	Min. 1-hr	Max. 1-hr	Max. 24-hr
January	100.0	744	11.1	0.0	1.8	4.4
February	98.1	658	8.0	0.0	1.3	3.6
March	99.9	742	6.8	0.0	1.4	3.1
April	100.0	720	9.5	0.0	3.8	4.3
May	96.4	717	19.8	0.0	4.0	4.1
June	100.0	719	127.2	0.0	20.5	43.6
July	100.0	743	58.8	0.0	5.7	8.5
August	100.0	743	23.9	0.0	6.2	7.1
September	100.0	720	2.4	0.0	0.4	0.4
October	98.4	731	3.7	0.0	1.0	1.5
November	98.2	706	0.7	0.0	0.3	0.4
December	98.1	730	0.8	0.0	0.5	0.7
Annual	99.1	8673	272.7	0.0	20.5	43.6

2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
6	0	1	49	23	1	7	0	0
Total Hours of Downtime		80	Total Hours of Calibration		7	Total Hours of Flagged		87

2023 Hourly Data Graph



LICA - TAMARACK STATION
VECTOR WIND SPEED (VWS) in kilometer per hour (km/hr)

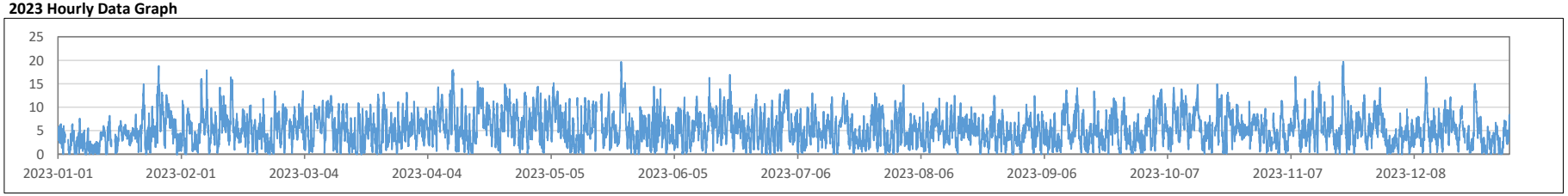
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 6	7 - 15	16 - 29	30 -39	>39
January	95.0	707	0.0	18.8	8.9	1.2	84.3%	15.3%	0.4%	0.0%	0.0%
February	98.1	659	0.0	17.8	9.8	1.5	66.8%	32.2%	1.1%	0.0%	0.0%
March	99.9	743	0.0	13.4	9.6	1.8	62.3%	37.7%	0.0%	0.0%	0.0%
April	100.0	720	0.1	18.0	11.9	3.0	50.4%	48.8%	0.8%	0.0%	0.0%
May	96.4	717	0.0	19.7	10.5	2.7	58.9%	40.6%	0.6%	0.0%	0.0%
June	100.0	720	0.0	16.9	8.3	0.4	61.7%	38.1%	0.3%	0.0%	0.0%
July	100.0	744	0.0	13.7	10.1	0.5	63.7%	36.3%	0.0%	0.0%	0.0%
August	100.0	744	0.0	14.7	7.4	1.1	75.5%	24.5%	0.0%	0.0%	0.0%
September	100.0	718	0.0	14.1	9.0	1.8	68.9%	31.1%	0.0%	0.0%	0.0%
October	98.4	732	0.1	14.9	10.5	0.9	56.8%	43.2%	0.0%	0.0%	0.0%
November	98.2	707	0.1	19.7	11.8	2.3	63.6%	35.1%	1.3%	0.0%	0.0%
December	98.1	730	0.0	16.4	10.4	2.4	80.0%	19.9%	0.1%	0.0%	0.0%
Annual	98.7	8641	0.0	19.7	11.9	1.0	66.1%	33.5%	0.4%	0.0%	0.0%

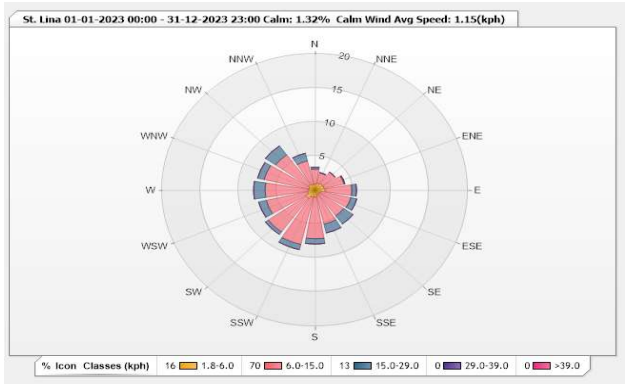
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
6	37	1	49	23	1	2	0	0
Total Hours of Downtime		117	Total Hours of Calibration		2	Total Hours of Flagged		119

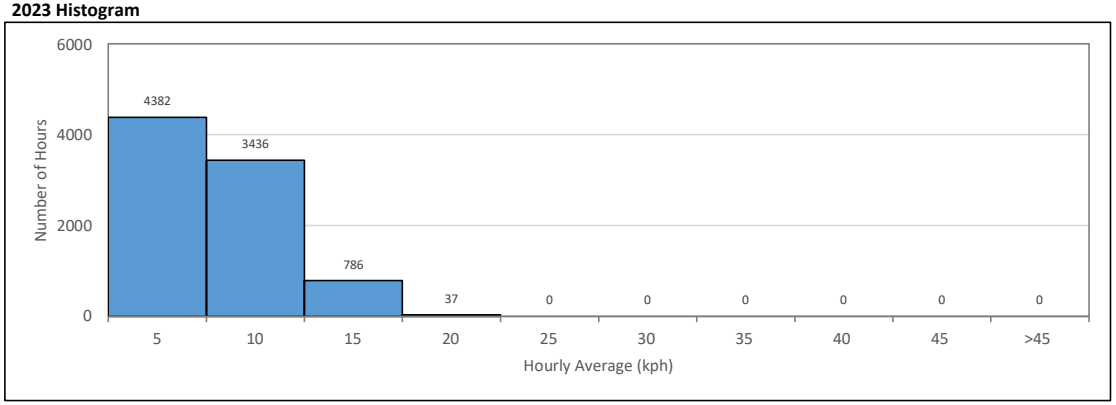
2023 Hourly Data Graph



2023 Wind Rose



2023 Histogram



1.3 St. Lina Station

1.3.1 Parameters Monitoring Summary

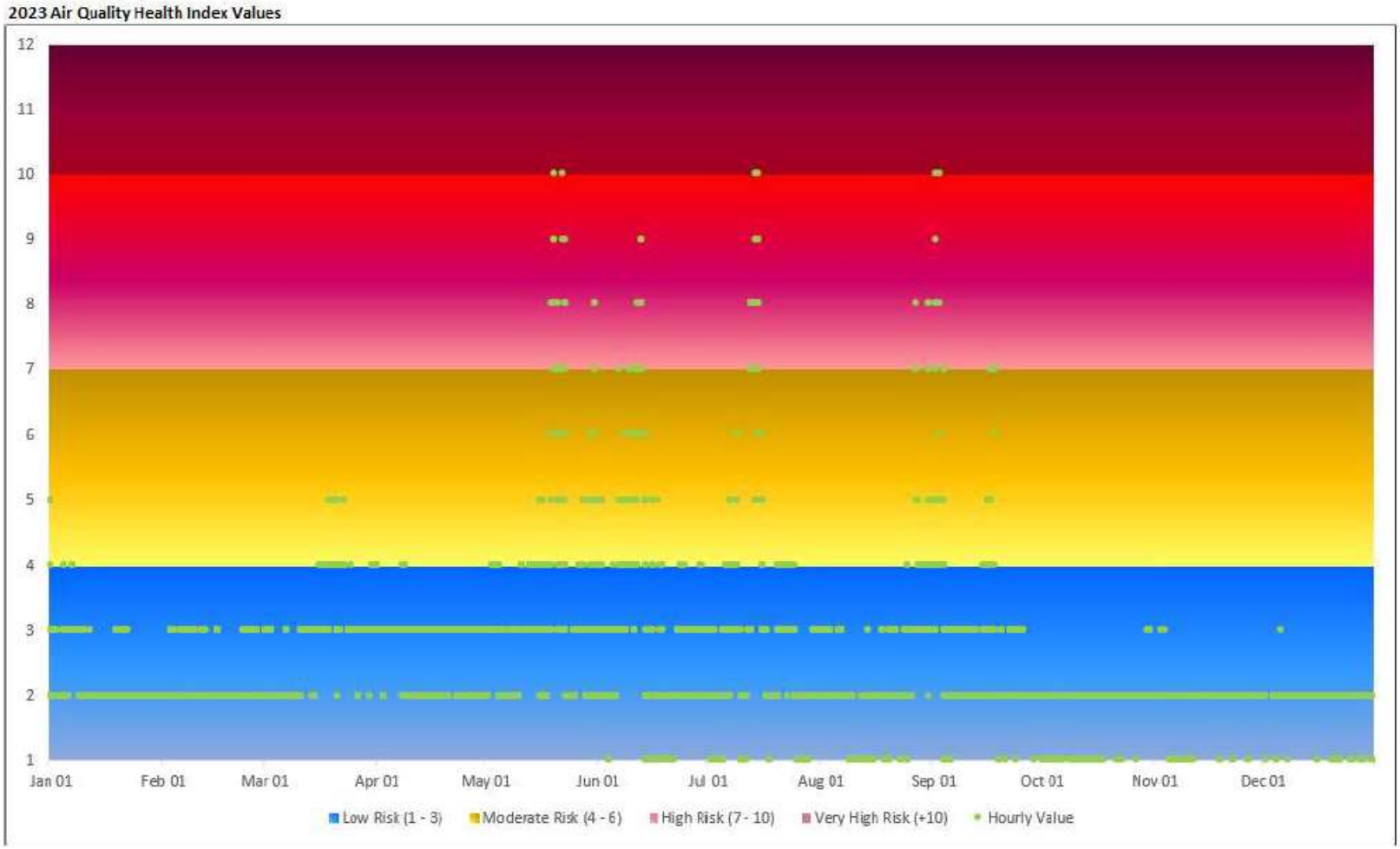
Date & Time	SO2	H2S	NOX	NO	NO2	O3	THC55	CH4	NMHC	PM2.5
	ppb	ppb	ppb	ppb	ppb	ppb	ppm	ppm	ppm	ug/m3(L)
Minimum Conc.	0	0	0	0	0	0	1.82	1.82	0.00	0
Min Conc. Date	2023-01-01 00:00:00	2023-01-01 10:00:00	2023-01-26 12:00:00	2023-01-01 00:00:00	2023-01-26 12:00:00	2023-01-01 04:00:00	2023-10-16 12:00:00	2023-10-16 12:00:00	2023-01-01 00:00:00	2023-01-20 14:00:00
Maximum Conc.	7	6	53	22	32	86.5	2.75	2.75	0.14	493
Max Conc. Date	2023-01-21 18:00:00	2023-05-23 07:00:00	2023-01-01 05:00:00	2023-01-01 05:00:00	2023-01-01 06:00:00	2023-06-13 15:00:00	2023-01-09 14:00:00	2023-01-09 14:00:00	2023-11-08 17:00:00	2023-05-20 15:00:00
Annual Average	0	0	3	0	3	34.3	2.06	2.06	0.00	12
# of hour	7772	7678	7827	7827	7827	7862	7001	7001	7001	8561
Valid Data[%]	88.72	87.65	89.35	89.35	89.35	89.75	79.92	79.92	79.92	97.73

Date & Time	RH	BP	AT	Precipitation	WDS	WDV	STDWD
	%RH	mb	C°	mm	kph	Deg	Deg
Minimum Conc.	14	895	-32.3	0.0	0.0	0	1
Min Conc. Date	2023-05-04 13:00:00	2023-02-13 05:00:00	2023-02-22 06:00:00	2023-01-01 00:00:00	2023-01-14 13:00:00	2023-01-31 12:00:00	2023-01-20 17:00:00
Maximum Conc.	100	938	29.4	15.2	28.5	360	78
Max Conc. Date	2023-11-06 12:00:00	2023-03-08 21:00:00	2023-05-04 15:00:00	2023-07-26 17:00:00	2023-01-26 11:00:00	2023-02-13 20:00:00	2023-07-28 08:00:00
Annual Average	71	918	4.7	281.9*	2.4	226	11
# of hour	8609	8609	8609	8483	8591	8591	8591
Valid Data[%]	98.28	98.28	98.28	96.84	98.07	98.07	98.07

*The value indicates a total amount of precipitation collected in 2023.

1.3.2 AQHI

LICA - ST. LINA STATION
AIR QUALITY HEALTH INDEX (AQHI)



1.3.3 Monitoring Parameters – 2023 Continuous Data Summary and Frequency Distribution

LICA - ST. LINA STATION
SULPHUR DIOXIDE (SO_2) in parts per billion (ppb)

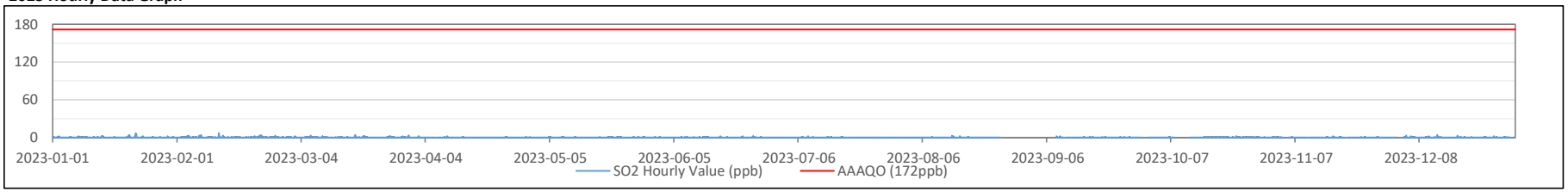
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQOExceedances				Percentage Readings in Concentration Range				
							1-hour	24-hour	30-day	Annual	0 - 10	11 -50	51 -100	101 - 172	>172
January	99.9	706	0	7	2	0.3	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
February	99.0	631	0	7	1	0.5	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	707	0	4	1	0.3	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0	683	0	2	0	0.0	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0	708	0	1	1	0.1	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
June	99.0	678	0	2	0	0.1	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
July	99.5	702	0	2	0	0.0	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
August	79.8	562	0	3	0	0.0	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
September	71.3	484	0	2	0	NA	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
October	87.8	620	0	2	0	0.0	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
November	92.4	631	0	2	1	0.1	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
December	93.5	660	0	4	1	0.2	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	93.5	7772	0	7	2	0.1	0	0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%

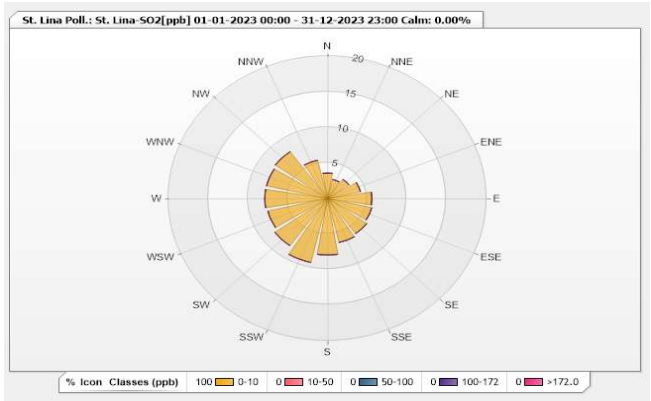
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	412	0	125	27	7	59	356	2
Total Hours of Downtime		571	Total Hours of Calibration		417	Total Hours of Flagged		988

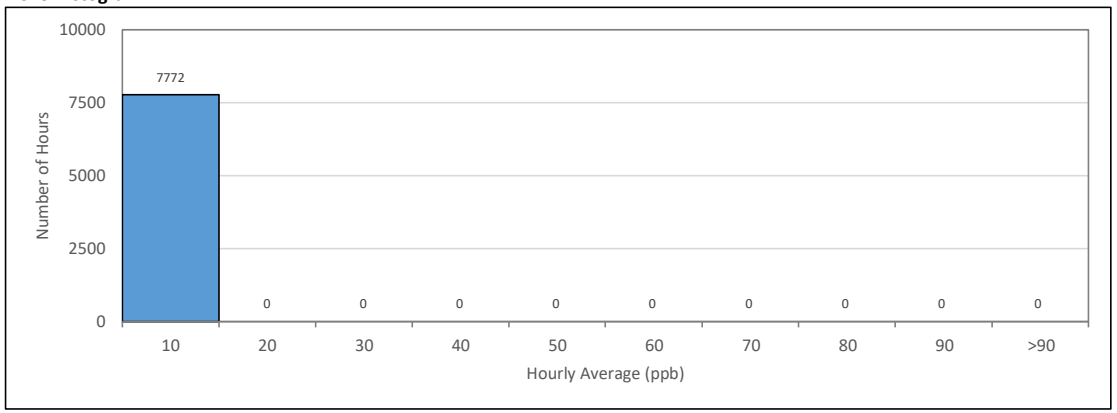
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - ST. LINA STATION
HYDROGEN SULPHIDE (H_2S) in parts per billion (ppb)

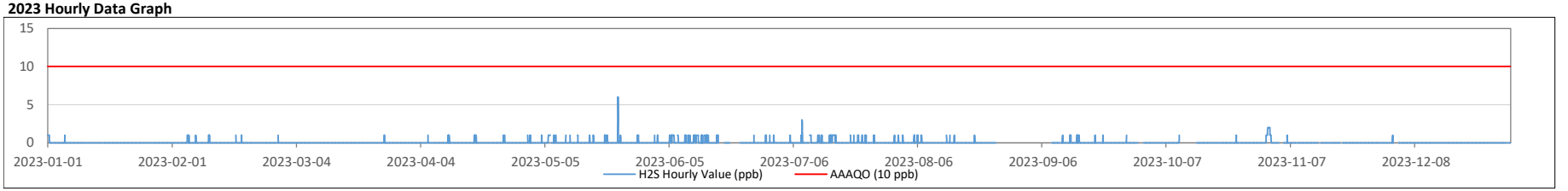
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances		Percentage Readings in Concentration Range				
							1-hour	24-hour	0 - 2	3 - 5	6 - 10	11 - 50	>50
January	99.9	706	0	1	0	0.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
February	99.0	631	0	1	0	0.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	706	0	1	0	0.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0	683	0	1	0	0.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0	709	0	6	1	0.1	0	0	99.7%	0.1%	0.1%	0.0%	0.0%
June	86.7	591	0	1	1	0.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
July	99.5	702	0	3	1	0.1	0	0	99.9%	0.1%	0.0%	0.0%	0.0%
August	79.8	562	0	1	0	0.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
September	71.5	486	0	1	0	NA	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
October	85.8	605	0	1	0	0.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
November	92.4	630	0	2	2	0.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
December	94.5	667	0	1	0	0.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	92.4	7678	0	6	2	0.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%

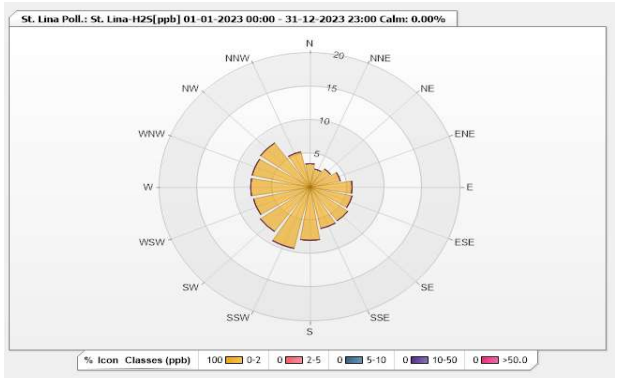
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	479	0	116	27	44	64	350	2
Total Hours of Downtime		666	Total Hours of Calibration		416	Total Hours of Flagged		1082

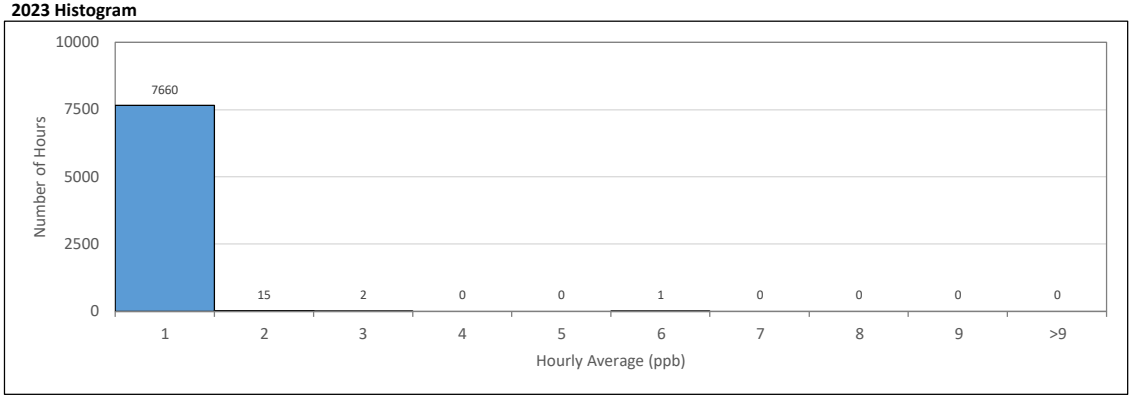
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - ST. LINA STATION
OXIDES OF NITROGEN (NOx) in parts per billion (ppb)

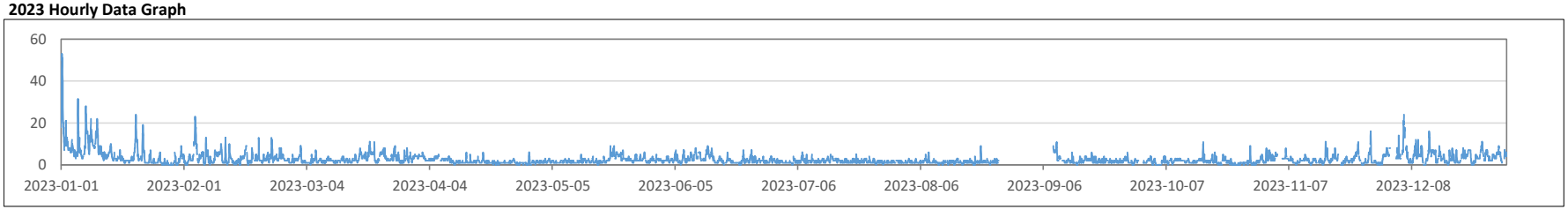
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 30	31 - 50	51 - 82	83 - 159	>159
January	99.9	705	0	53	26	5.8	98.7%	1.0%	0.3%	0.0%	0.0%
February	99.0	629	0	23	9	3.5	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	705	0	11	6	3.0	100.0%	0.0%	0.0%	0.0%	0.0%
April	99.9	680	0	6	4	1.7	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0	707	0	9	5	2.2	100.0%	0.0%	0.0%	0.0%	0.0%
June	99.0	676	0	9	6	2.5	100.0%	0.0%	0.0%	0.0%	0.0%
July	99.5	700	0	6	3	1.6	100.0%	0.0%	0.0%	0.0%	0.0%
August	79.8	560	0	9	2	1.3	100.0%	0.0%	0.0%	0.0%	0.0%
September	71.3	483	0	11	5	NA	100.0%	0.0%	0.0%	0.0%	0.0%
October	99.2	699	0	11	3	1.5	100.0%	0.0%	0.0%	0.0%	0.0%
November	92.4	629	0	16	6	2.5	100.0%	0.0%	0.0%	0.0%	0.0%
December	93.5	654	0	24	7	4.3	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	94.4	7827	0	53	26	2.7	99.9%	0.1%	0.0%	0.0%	0.0%

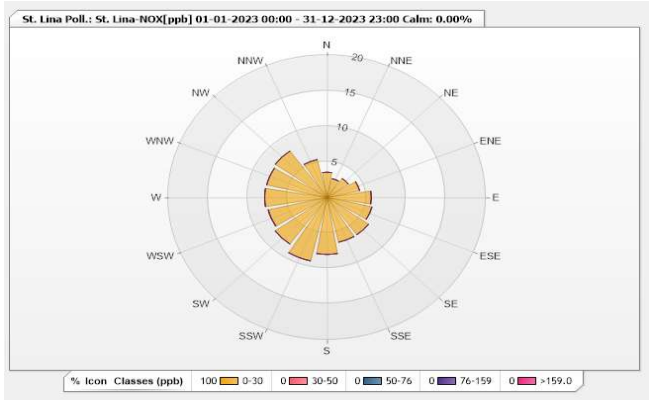
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	331	0	125	27	4	82	359	5
Total Hours of Downtime		487	Total Hours of Calibration		446	Total Hours of Flagged		933

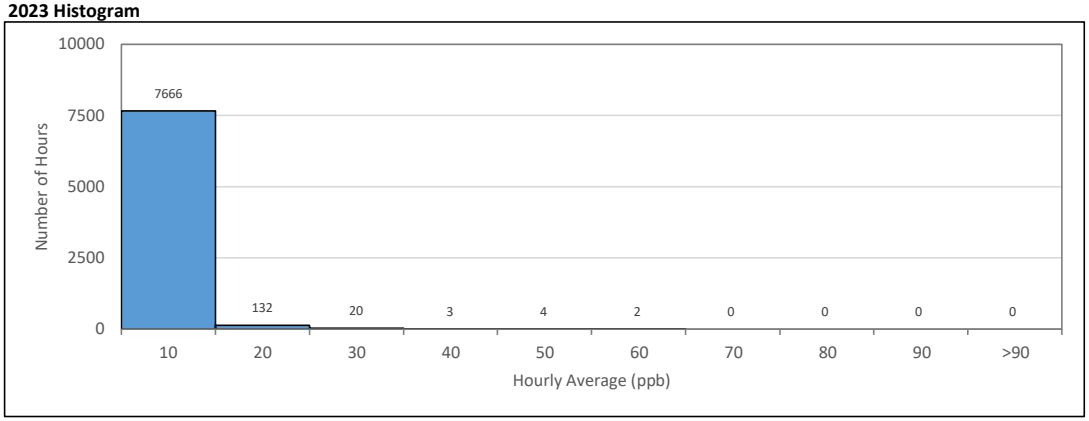
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - ST. LINA STATION
NITRIC OXIDE (NO) in parts per billion (ppb)

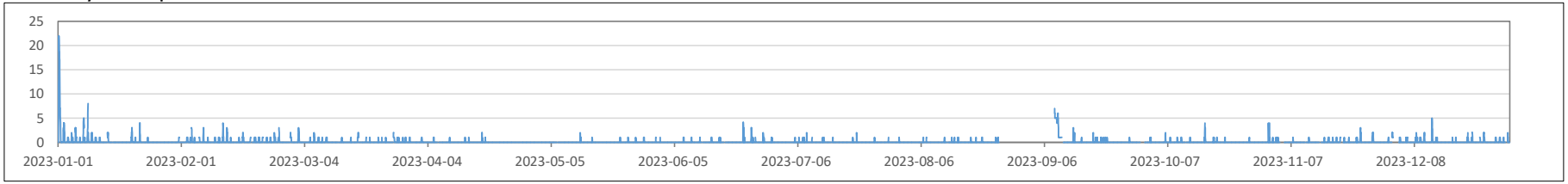
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 30	31 - 50	51 - 82	83 - 159	>159
January	99.9	705	0	22	7	0.5	100.0%	0.0%	0.0%	0.0%	0.0%
February	99.0	629	0	4	1	0.2	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	705	0	3	0	0.1	100.0%	0.0%	0.0%	0.0%	0.0%
April	99.9	680	0	2	0	0.0	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0	707	0	2	0	0.0	100.0%	0.0%	0.0%	0.0%	0.0%
June	99.0	676	0	4	1	0.1	100.0%	0.0%	0.0%	0.0%	0.0%
July	99.5	700	0	2	0	0.0	100.0%	0.0%	0.0%	0.0%	0.0%
August	79.8	560	0	1	0	0.0	100.0%	0.0%	0.0%	0.0%	0.0%
September	71.3	483	0	7	3	NA	100.0%	0.0%	0.0%	0.0%	0.0%
October	99.2	699	0	4	0	0.1	100.0%	0.0%	0.0%	0.0%	0.0%
November	92.4	629	0	4	1	0.1	100.0%	0.0%	0.0%	0.0%	0.0%
December	93.5	654	0	5	1	0.2	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	94.4	7827	0	22	7	0.1	100.0%	0.0%	0.0%	0.0%	0.0%

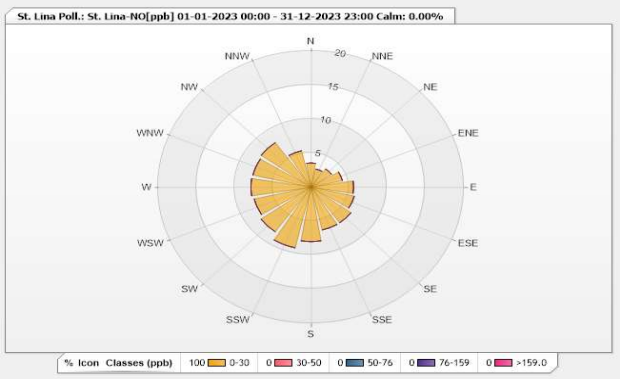
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	331	0	125	27	4	82	359	5
Total Hours of Downtime		487	Total Hours of Calibration		446	Total Hours of Flagged		933

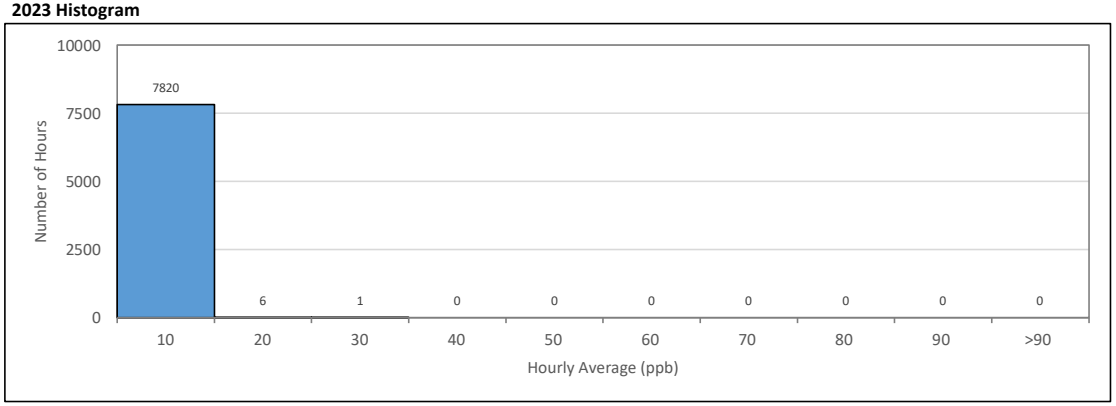
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - ST. LINA STATION
NITROGEN DIOXIDE (NO_2) in parts per billion (ppb)

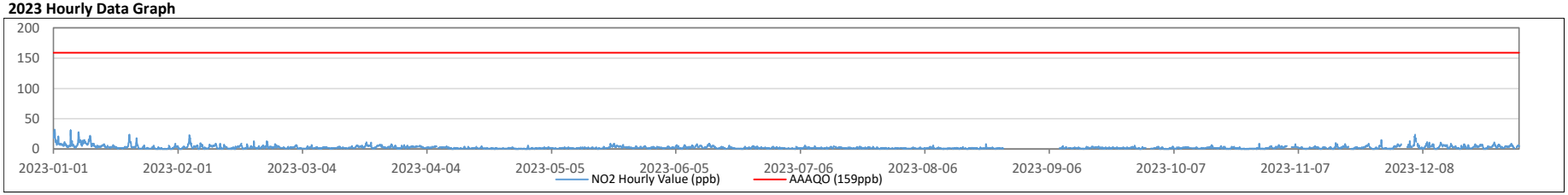
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances	Percentage Readings in Concentration Range				
							1-hour	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	99.9	705	0	32	19	5.3	0	99.3%	0.7%	0.0%	0.0%	0.0%
February	99.0	629	0	23	9	3.2	0	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	705	0	11	6	2.8	0	100.0%	0.0%	0.0%	0.0%	0.0%
April	99.9	680	0	6	4	1.7	0	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0	707	0	9	5	2.2	0	100.0%	0.0%	0.0%	0.0%	0.0%
June	99.0	676	0	9	6	2.4	0	100.0%	0.0%	0.0%	0.0%	0.0%
July	99.5	700	0	6	3	1.6	0	100.0%	0.0%	0.0%	0.0%	0.0%
August	79.8	560	0	8	2	1.3	0	100.0%	0.0%	0.0%	0.0%	0.0%
September	71.3	483	0	6	3	NA	0	100.0%	0.0%	0.0%	0.0%	0.0%
October	99.2	699	0	9	3	1.5	0	100.0%	0.0%	0.0%	0.0%	0.0%
November	92.4	629	0	15	5	2.4	0	100.0%	0.0%	0.0%	0.0%	0.0%
December	93.5	654	0	24	6	4.2	0	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	94.4	7827	0	32	19	2.6	0	99.9%	0.1%	0.0%	0.0%	0.0%

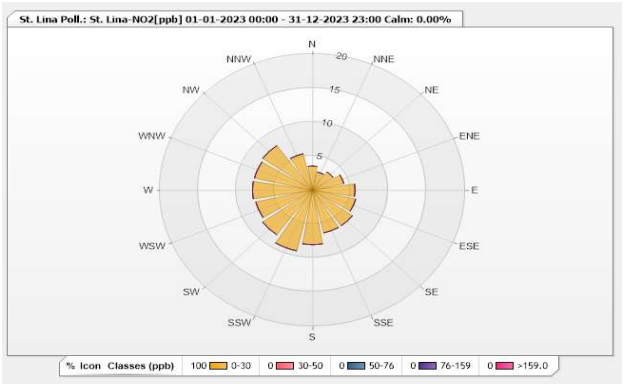
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	331	0	125	27	4	82	359	5
Total Hours of Downtime		487	Total Hours of Calibration		446	Total Hours of Flagged		933

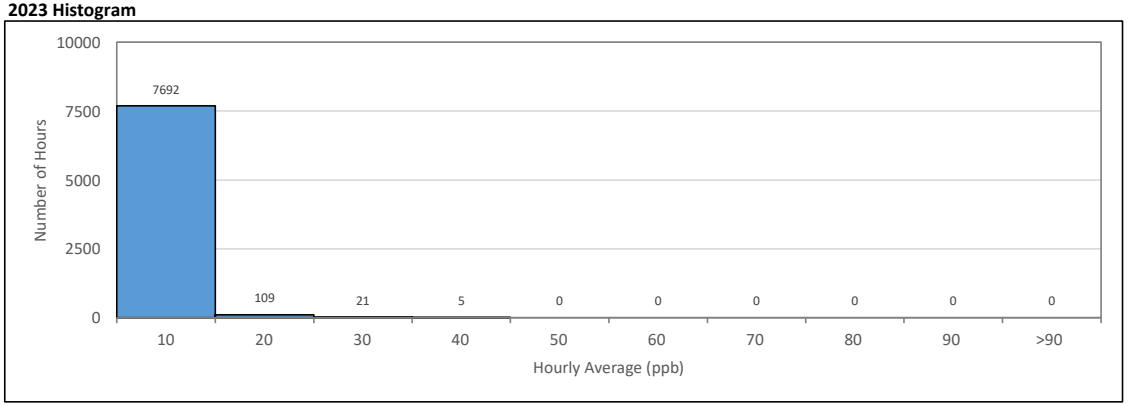
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - ST. LINA STATION
OZONE (O_3) in parts per billion (ppb)

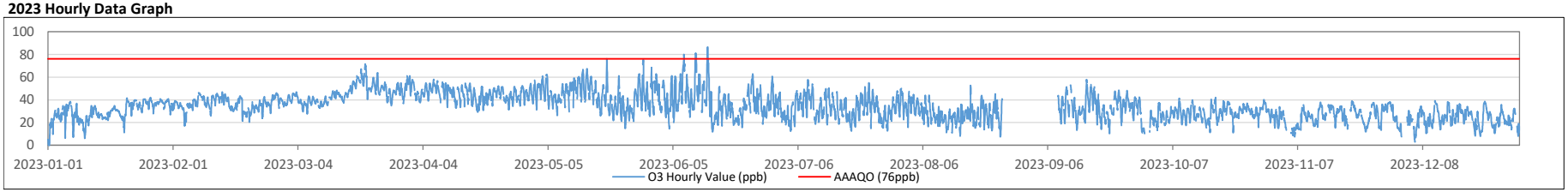
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances 1-hour	Percentage Readings in Concentration Range				
								0 - 30	31 - 50	51 - 82	83 - 159	>159
January	99.9	707	0.0	41.9	38.8	29.5	0	48.5%	51.5%	0.0%	0.0%	0.0%
February	99.0	632	16.8	46.8	43.6	36.2	0	13.6%	86.4%	0.0%	0.0%	0.0%
March	99.9	706	27.5	71.6	61.7	45.7	0	0.8%	73.8%	25.4%	0.0%	0.0%
April	100.0	683	29.1	57.9	53.6	45.1	0	0.6%	78.3%	21.1%	0.0%	0.0%
May	100.0	708	14.6	76.0	54.0	43.7	0	13.8%	57.2%	29.0%	0.0%	0.0%
June	99.0	679	11.7	86.5	60.0	39.0	10	27.1%	52.6%	18.9%	1.5%	0.0%
July	99.5	703	12.3	57.6	43.9	32.7	0	43.8%	54.1%	2.1%	0.0%	0.0%
August	79.8	563	7.5	52.6	36.8	27.7	0	65.0%	34.8%	0.2%	0.0%	0.0%
September	71.5	487	10.2	57.6	41.5	NA	0	39.2%	57.5%	3.3%	0.0%	0.0%
October	98.7	698	11.1	42.0	35.2	27.9	0	64.5%	35.5%	0.0%	0.0%	0.0%
November	92.2	630	7.3	38.9	35.5	25.8	0	68.6%	31.4%	0.0%	0.0%	0.0%
December	94.4	666	2.7	39.0	34.7	23.2	0	83.8%	16.2%	0.0%	0.0%	0.0%
Annual	94.5	7862	0.0	86.5	61.7	34.2	10	39.1%	52.4%	8.3%	0.1%	0.0%

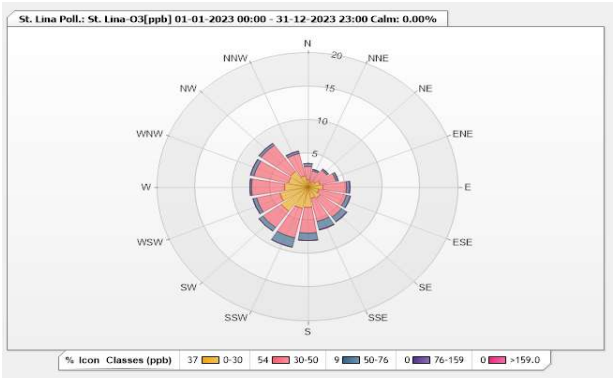
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	331	0	117	27	8	55	358	2
Total Hours of Downtime		483	Total Hours of Calibration		415	Total Hours of Flagged		898

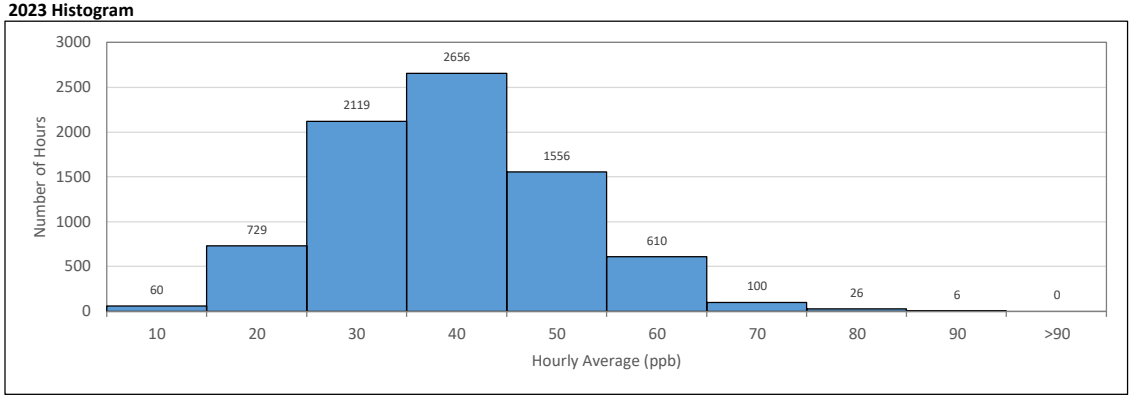
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - ST. LINA STATION
TOTAL HYDROCARBONS (THC) in parts per million (ppm)

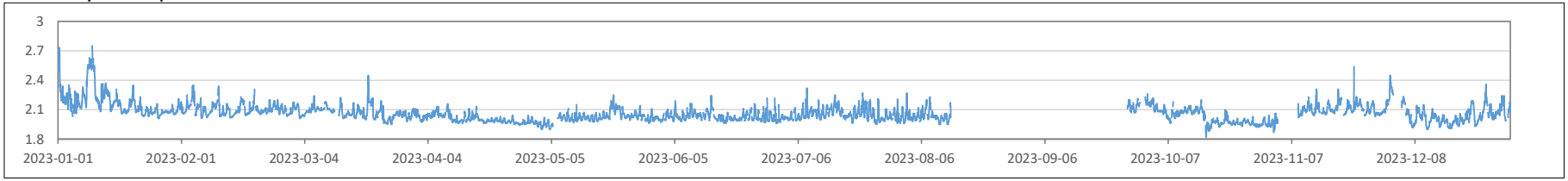
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 2	3 - 5	6 - 10	11 - 40	>40
January	99.9	707	2.01	2.75	2.58	2.18	92.1%	7.9%	0.0%	0.0%	0.0%
February	99.0	632	2.01	2.35	2.20	2.10	100.0%	0.0%	0.0%	0.0%	0.0%
March	96.5	682	1.95	2.45	2.20	2.07	99.7%	0.3%	0.0%	0.0%	0.0%
April	100.0	683	1.94	2.16	2.08	2.00	100.0%	0.0%	0.0%	0.0%	0.0%
May	96.5	682	1.90	2.25	2.15	2.02	100.0%	0.0%	0.0%	0.0%	0.0%
June	99.0	679	1.96	2.24	2.11	2.03	100.0%	0.0%	0.0%	0.0%	0.0%
July	99.5	702	1.95	2.32	2.16	2.05	100.0%	0.0%	0.0%	0.0%	0.0%
August	40.7	285	1.95	2.27	2.09	NA	100.0%	0.0%	0.0%	0.0%	0.0%
September	10.8	74	2.07	2.21	2.17	NA	100.0%	0.0%	0.0%	0.0%	0.0%
October	97.0	686	1.82	2.26	2.16	2.02	100.0%	0.0%	0.0%	0.0%	0.0%
November	79.6	544	1.87	2.54	2.17	2.09	99.8%	0.2%	0.0%	0.0%	0.0%
December	91.5	645	1.90	2.45	2.25	2.05	99.5%	0.5%	0.0%	0.0%	0.0%
Annual	84.2	7001	1.82	2.75	2.58	2.06	99.3%	0.7%	0.0%	0.0%	0.0%

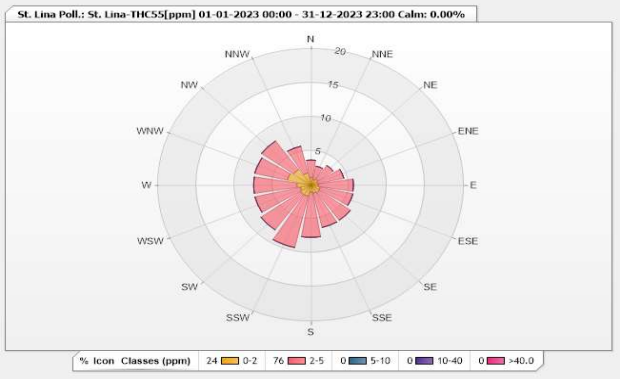
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	1217	5	88	27	49	51	320	2
Total Hours of Downtime		1386	Total Hours of Calibration		373	Total Hours of Flagged		1759

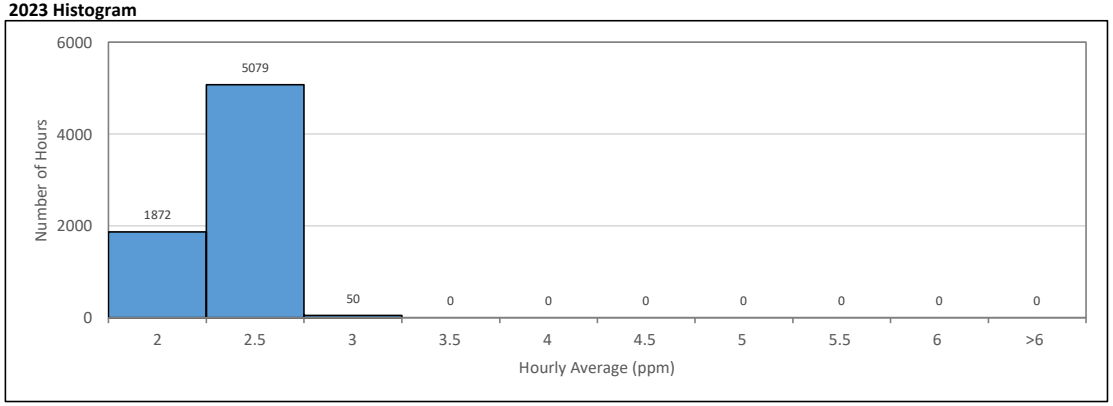
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - ST. LINA STATION
METHANE (CH_4) in parts per million (ppm)

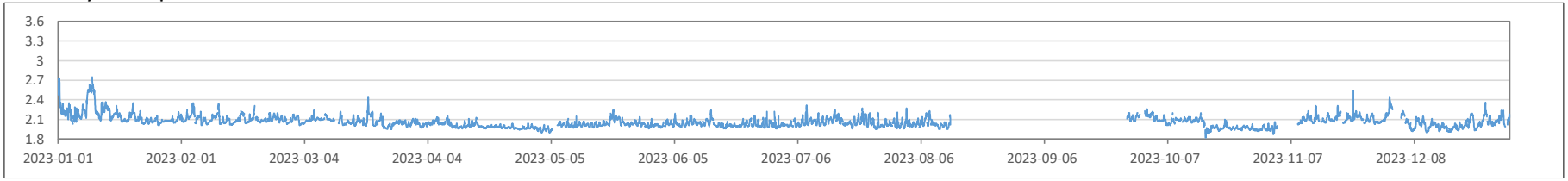
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 2	3 - 5	6 - 10	11 - 20	>20
January	99.9	707	2.01	2.75	2.58	2.18	92.1%	7.9%	0.0%	0.0%	0.0%
February	99.0	632	2.01	2.35	2.20	2.10	100.0%	0.0%	0.0%	0.0%	0.0%
March	96.5	682	1.95	2.45	2.20	2.07	99.7%	0.3%	0.0%	0.0%	0.0%
April	100.0	683	1.94	2.16	2.08	2.00	100.0%	0.0%	0.0%	0.0%	0.0%
May	96.5	682	1.90	2.25	2.15	2.02	100.0%	0.0%	0.0%	0.0%	0.0%
June	99.0	679	1.96	2.24	2.11	2.03	100.0%	0.0%	0.0%	0.0%	0.0%
July	99.5	702	1.95	2.32	2.16	2.05	100.0%	0.0%	0.0%	0.0%	0.0%
August	40.7	285	1.95	2.27	2.09	NA	100.0%	0.0%	0.0%	0.0%	0.0%
September	10.8	74	2.07	2.20	2.17	NA	100.0%	0.0%	0.0%	0.0%	0.0%
October	97.0	686	1.82	2.26	2.16	2.03	100.0%	0.0%	0.0%	0.0%	0.0%
November	79.6	544	1.87	2.54	2.17	2.09	99.8%	0.2%	0.0%	0.0%	0.0%
December	91.5	645	1.90	2.45	2.25	2.05	99.5%	0.5%	0.0%	0.0%	0.0%
Annual	84.2	7001	1.82	2.75	2.58	2.06	99.3%	0.7%	0.0%	0.0%	0.0%

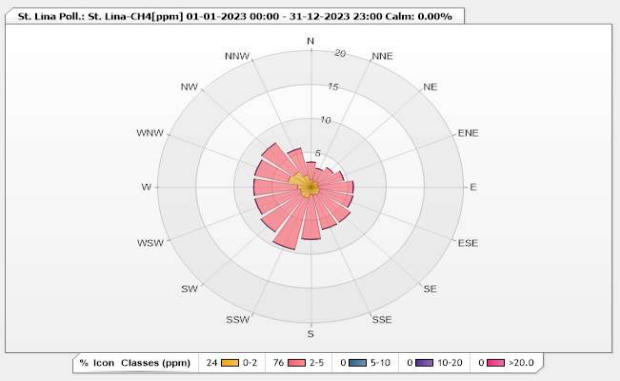
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	1217	5	88	27	49	51	320	2
Total Hours of Downtime		1386	Total Hours of Calibration		373	Total Hours of Flagged		1759

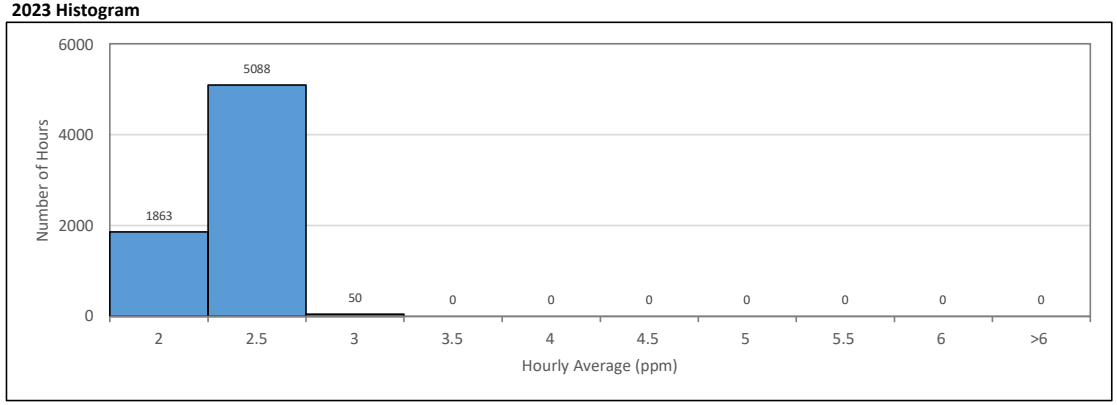
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - ST. LINA STATION
NON-METHANE HYDROCARBONS (NMHC) in parts per million (ppm)

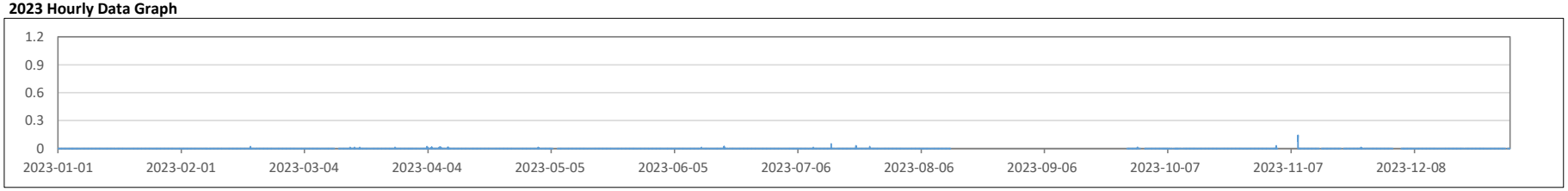
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 0.1	0.2 - 0.3	0.4 - 0.9	1 -2	>2
January	99.9	707	0.00	0.00	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
February	99.0	632	0.00	0.02	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
March	96.5	682	0.00	0.01	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0	683	0.00	0.02	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
May	96.5	682	0.00	0.01	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
June	99.0	679	0.00	0.02	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
July	99.5	702	0.00	0.05	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
August	40.7	285	0.00	0.00	0.00	NA	100.0%	0.0%	0.0%	0.0%	0.0%
September	10.8	74	0.00	0.01	0.00	NA	100.0%	0.0%	0.0%	0.0%	0.0%
October	97.0	686	0.00	0.00	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
November	79.6	544	0.00	0.14	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
December	91.5	645	0.00	0.00	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	84.2	7001	0.00	0.14	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%

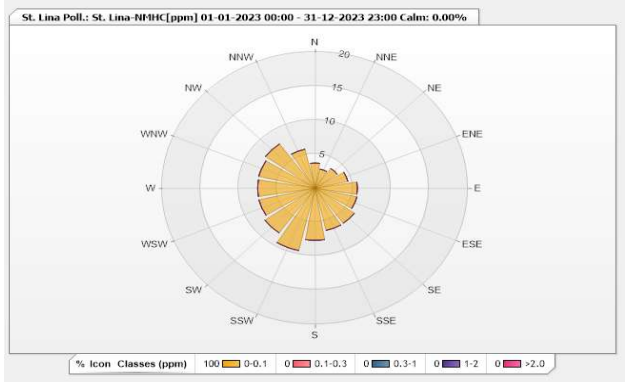
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	1217	5	88	27	49	51	320	2
Total Hours of Downtime		1386	Total Hours of Calibration		373	Total Hours of Flagged		1759

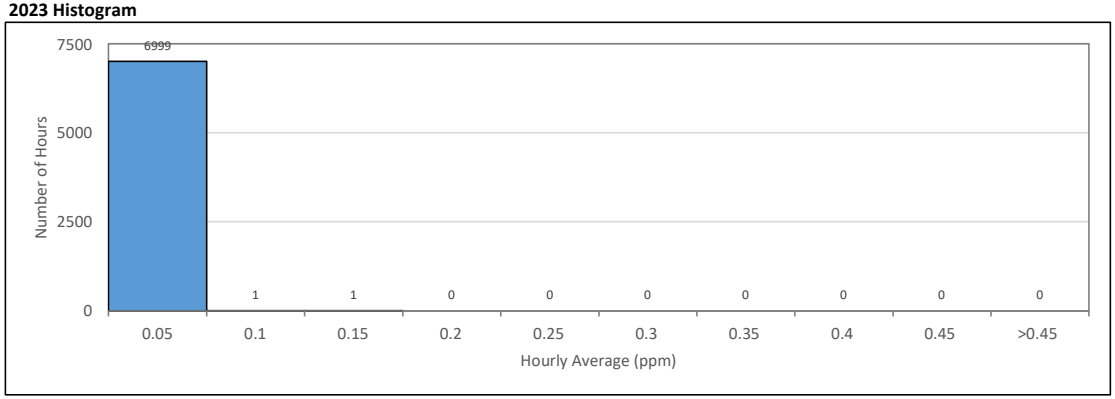
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - ST. LINA STATION

PARTICULATE MATTER 2.5 ($PM_{2.5}$) in microgram per cubic meter ($\mu g/m^3$)

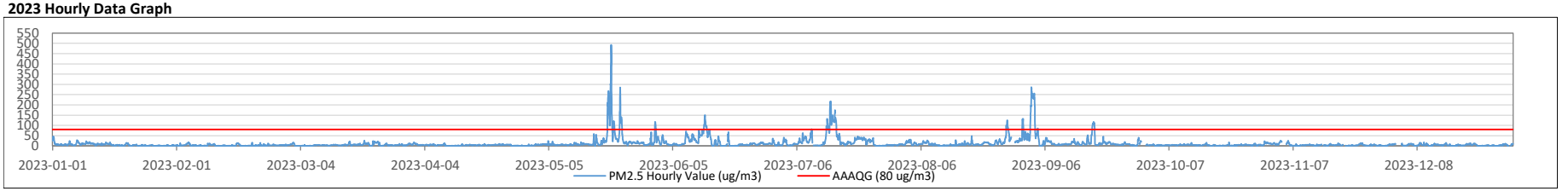
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances		Percentage Readings in Concentration Range				
							1-hour	24-hour	0 - 50	51 - 80	81 - 120	121 - 240	>240
January	99.9	741	0	46	22	6.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
February	99.0	663	0	18	10	3.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
March	99.9	742	0	25	15	5.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
April	100.0	717	0	17	11	3.8	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0	742	1	493	203	25.6	60	6	88.9%	3.0%	3.1%	3.1%	1.9%
June	99.0	712	0	150	87	18.7	17	7	89.5%	8.1%	1.5%	0.8%	0.0%
July	99.5	739	0	217	136	24.3	55	8	89.3%	3.2%	3.2%	4.2%	0.0%
August	97.0	720	1	132	74	14.8	21	2	96.1%	1.0%	2.2%	0.7%	0.0%
September	96.4	692	0	286	158	25.7	48	6	88.2%	4.9%	2.9%	2.2%	1.9%
October	99.2	736	0	23	15	4.3	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
November	92.6	665	0	24	13	4.8	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
December	93.5	692	0	18	9	4.5	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	98.0	8561	0	493	203	11.7	201	29	96.0%	1.7%	1.1%	0.9%	0.3%

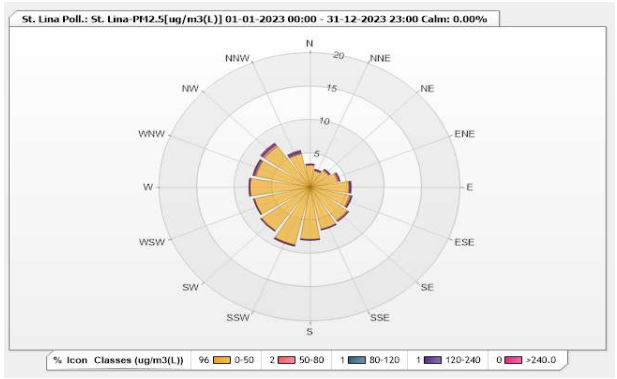
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	22	0	125	27	1	24	0	0
Total Hours of Downtime		175	Total Hours of Calibration		24	Total Hours of Flagged		199

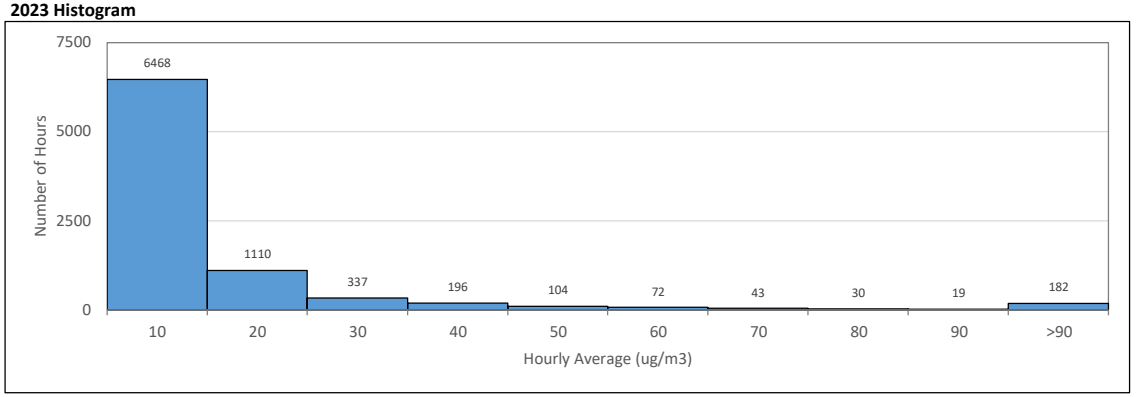
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - ST. LINA STATION
RELATIVE HUMIDITY (RH) in percent (%)

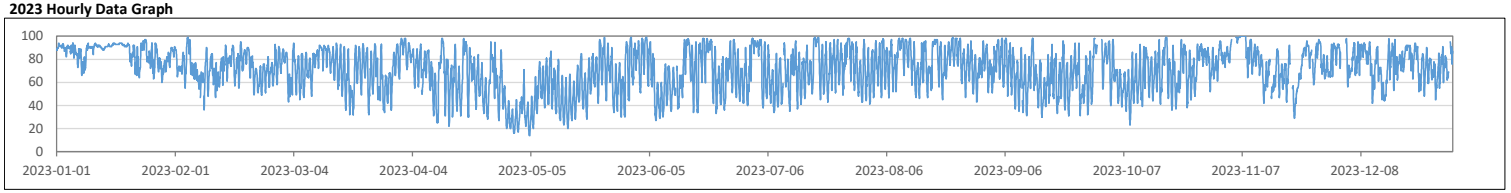
2023 Annual Continuous Data Summary

Month	Operational	# of Reading	Monthly Avg.	Min. 1-hr	Max. 1-hr	Max. 24-hr
January	99.9	743	86.1	60	97	94
February	99.0	665	72.6	36	99	94
March	99.9	743	70.7	32	94	86
April	99.9	719	63.2	16	98	93
May	100.0	744	54.7	14	99	79
June	99.0	713	68.2	27	99	93
July	99.5	740	72.2	34	99	97
August	100.0	744	76.9	41	99	95
September	96.5	695	65.9	30	98	90
October	99.2	738	69.0	23	99	85
November	92.6	667	76.9	29	100	100
December	93.8	698	76.1	42	98	90
Annual	98.3	8609	71.0	14	100	100

2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	0	123	27	1	0	0	0
Total Hours of Downtime		151	Total Hours of Calibration		0	Total Hours of Flagged		151

2023 Hourly Data Graph



LICA - ST. LINA STATION
AMBIENT TEMPERATURE (AT) in degree celsius (°C)

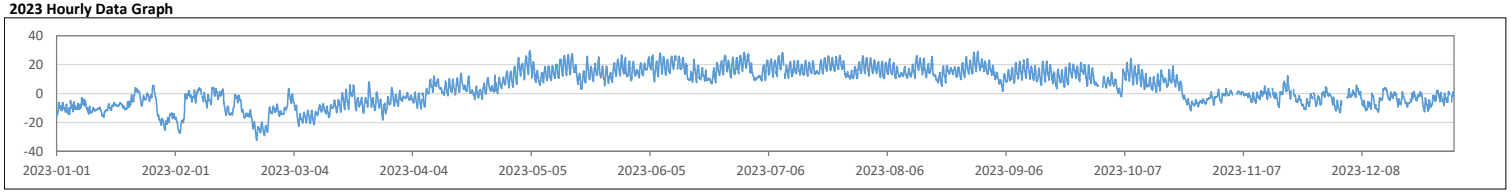
2023 Annual Continuous Data Summary

Month	Operational	# of Reading	Monthly Avg.	Min. 1-hr	Max. 1-hr	Max. 24-hr
January	99.9	743	-9.2	-25.2	5.7	2.0
February	99.0	665	-10.6	-32.3	4.2	2.5
March	99.9	743	-8.3	-22.6	8.1	0.8
April	99.9	719	3.2	-10.6	19.0	12.3
May	100.0	744	15.7	3.1	29.4	22.1
June	99.0	713	17.4	6.9	28.5	22.9
July	99.5	740	17.3	8.7	28.3	22.7
August	100.0	744	16.6	5.2	29.1	22.4
September	96.5	695	13.3	1.8	24.1	17.8
October	99.2	738	4.7	-11.7	24.3	16.0
November	92.6	667	-1.8	-11.0	12.3	5.0
December	93.8	698	-3.9	-13.4	5.7	1.6
Annual	98.3	8609	4.5	-32.3	29.4	22.9

2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	0	123	27	1	0	0	0
Total Hours of Downtime		151	Total Hours of Calibration		0	Total Hours of Flagged		151

2023 Hourly Data Graph



LICA - ST. LINA STATION
BAROMETRIC PRESSURE (BP) in millibar (mbar)

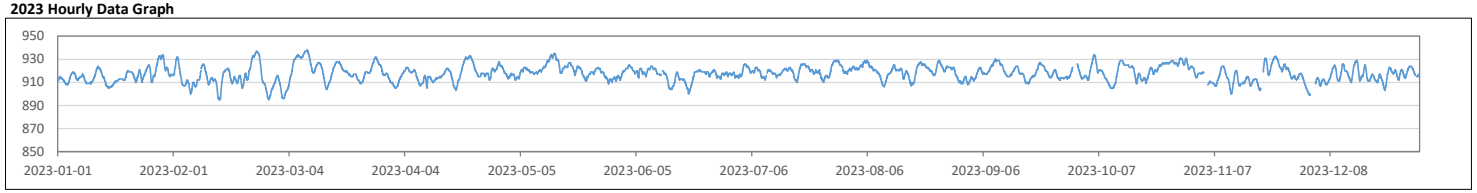
2023 Annual Continuous Data Summary

Month	Operational	# of Reading	Monthly Avg.	Min. 1-hr	Max. 1-hr	Max. 24-hr
January	99.9	743	916	905	934	932
February	99.0	665	914	895	937	936
March	99.9	743	919	896	938	937
April	99.9	719	917	903	933	932
May	100.0	744	920	909	935	933
June	99.0	713	917	900	925	924
July	99.5	740	920	910	929	929
August	100.0	744	920	906	929	928
September	96.5	695	918	908	930	929
October	99.2	738	921	905	934	930
November	92.6	667	916	900	933	931
December	93.8	698	916	899	929	924
Annual	98.3	8609	918	895	938	937

2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	0	123	27	1	0	0	0
Total Hours of Downtime		151	Total Hours of Calibration		0	Total Hours of Flagged		151

2023 Hourly Data Graph



LICA - ST. LINA STATION
PRECIPITATION in millimeter (mm)

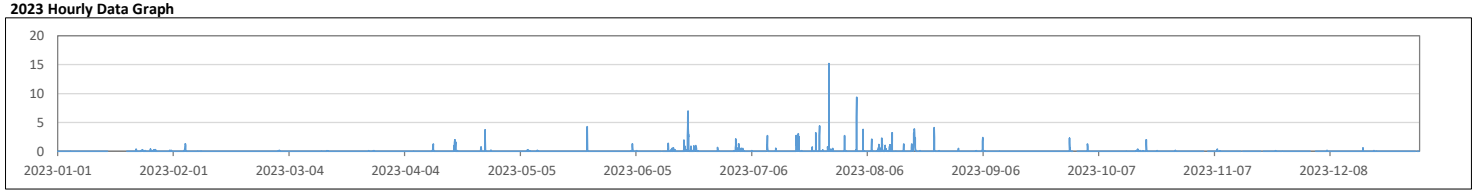
2023 Annual Continuous Data Summary

Month	Operational	# of Reading	Monthly Avg.	Min. 1-hr	Max. 1-hr	Max. 24-hr
January	83.6	621	4.4	0.0	0.4	1.2
February	99.0	665	4.7	0.0	1.3	4.5
March	99.9	742	1.0	0.0	0.2	0.4
April	99.9	719	19.3	0.0	3.7	9.2
May	100.0	743	13.1	0.0	4.3	12.0
June	99.0	713	56.9	0.0	7.0	24.6
July	99.5	740	80.0	0.0	15.2	17.9
August	100.0	743	86.6	0.0	9.4	29.7
September	96.5	695	7.5	0.0	2.4	4.2
October	99.2	737	6.5	0.0	2.0	2.2
November	92.6	667	0.6	0.0	0.4	0.4
December	93.8	698	1.3	0.0	0.6	0.7
Annual	96.9	8483	23.5	0.0	15.2	29.7

2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	120	0	123	27	2	5	0	0
Total Hours of Downtime		272	Total Hours of Calibration		5	Total Hours of Flagged		277

2023 Hourly Data Graph



LICA - ST. LINA STATION
VECTOR WIND SPEED (VWS) in kilometer per hour (km/hr)

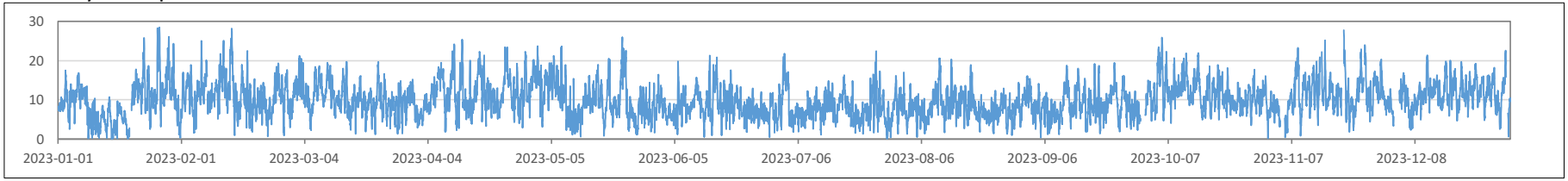
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 6	7 - 15	16 - 29	30 -39	>39
January	98.1	730	0.0	28.5	19.0	3.6	30.5%	58.8%	10.7%	0.0%	0.0%
February	99.0	665	0.7	28.2	20.0	4.1	13.4%	69.9%	16.7%	0.0%	0.0%
March	99.9	743	1.2	21.2	14.8	3.0	13.3%	75.9%	10.8%	0.0%	0.0%
April	99.9	719	1.9	25.4	18.7	4.6	12.1%	66.9%	21.0%	0.0%	0.0%
May	100.0	744	0.6	25.9	18.2	4.3	25.5%	57.4%	17.1%	0.0%	0.0%
June	98.8	711	0.5	21.3	13.8	0.4	29.5%	66.8%	3.7%	0.0%	0.0%
July	99.5	740	0.1	22.4	16.0	1.5	35.0%	60.8%	4.2%	0.0%	0.0%
August	100.0	744	0.7	20.6	13.6	2.3	33.6%	63.0%	3.4%	0.0%	0.0%
September	96.5	695	0.4	19.4	14.1	3.2	28.3%	67.5%	4.2%	0.0%	0.0%
October	99.2	738	3.5	25.9	16.5	2.4	6.5%	77.1%	16.4%	0.0%	0.0%
November	92.6	667	0.2	27.8	17.6	5.9	12.7%	70.3%	16.9%	0.0%	0.0%
December	94.0	695	0.6	22.6	15.7	6.8	7.6%	78.8%	13.5%	0.0%	0.0%
Annual	98.1	8591	0.0	28.5	20.0	2.4	20.7%	67.8%	11.5%	0.0%	0.0%

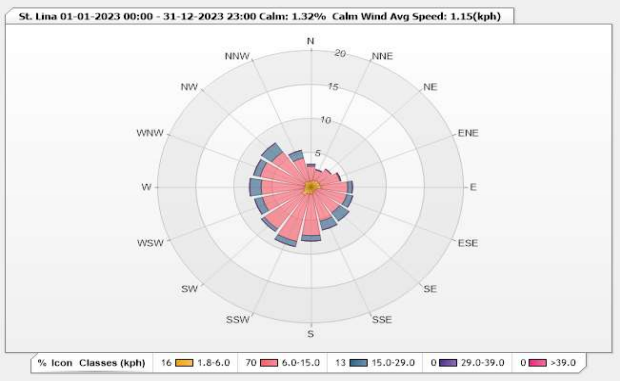
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	12	2	123	27	1	4	0	0
Total Hours of Downtime		165	Total Hours of Calibration		4	Total Hours of Flagged		169

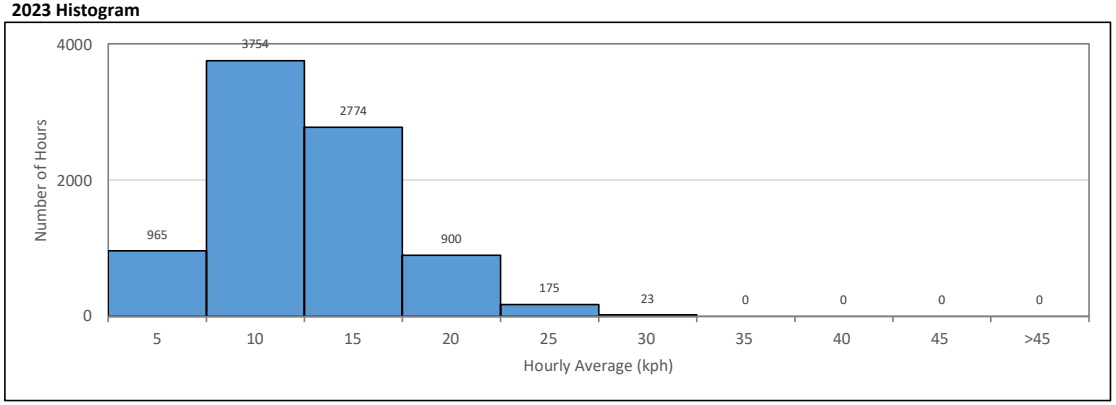
2023 Hourly Data Graph



2023 Wind Rose



2023 Histogram



1.4 Lac La Biche

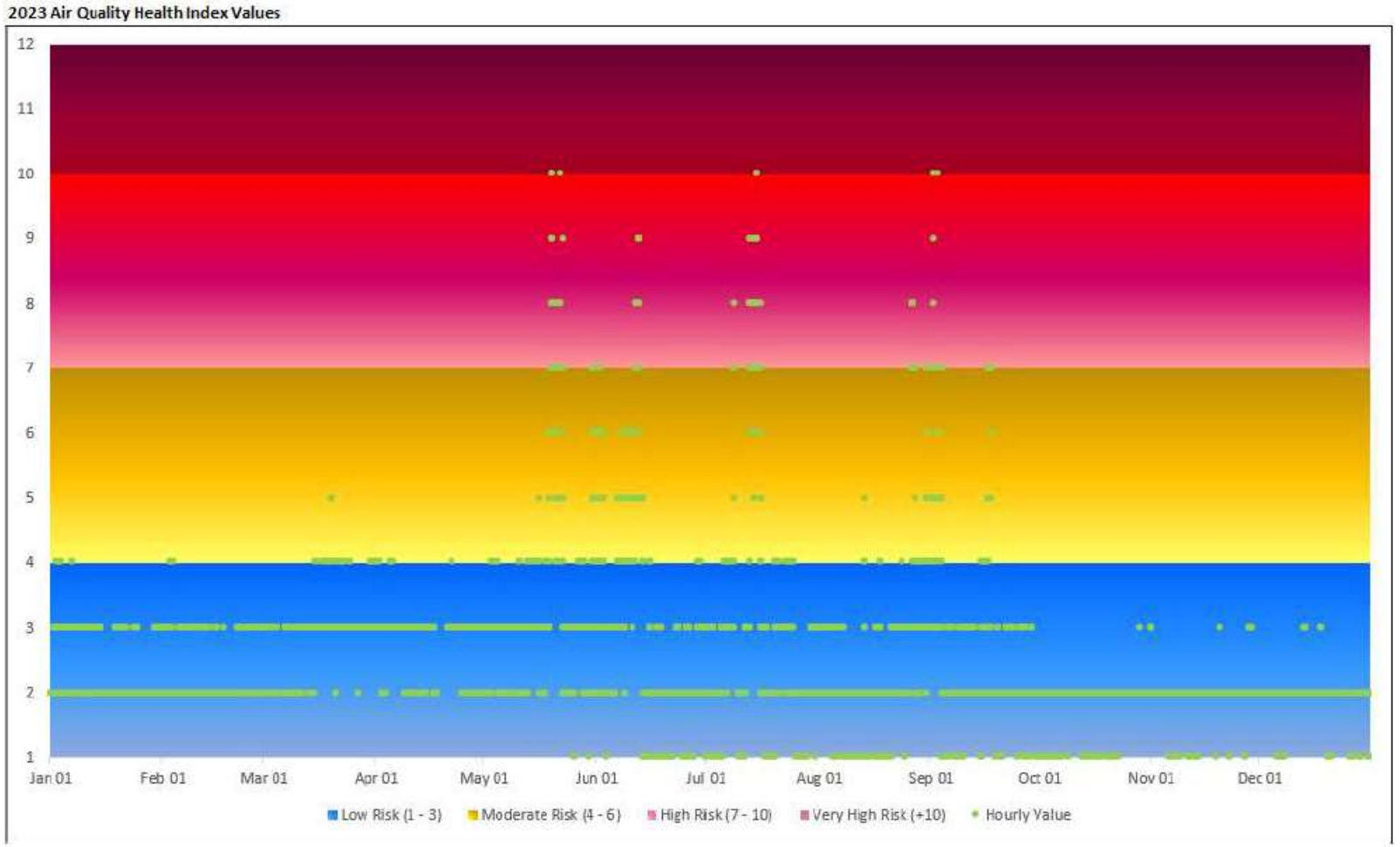
1.4.1 Parameters Monitoring Summary

Date & Time	SO2	H2S	NOX	NO	NO2	O3	THC55	CH4	NMHC	PM2.5
	ppb	ppb	ppb	ppb	ppb	ppb	ppm	ppm	ppm	ug/m3(L)
Minimum Conc.	0	0	0	0	0	0.5	1.85	1.85	0.00	0.2
Min Conc. Date	2023-01-01 00:00:00	2023-01-01 00:00:00	2023-06-20 18:00:00	2023-01-01 01:00:00	2023-06-20 18:00:00	2023-10-16 07:00:00	2023-12-23 03:00:00	2023-12-23 03:00:00	2023-01-01 00:00:00	2023-02-12 03:00:00
Maximum Conc.	6	3	157	119	38	85.9	2.75	2.73	0.15	410.5
Max Conc. Date	2023-02-22 11:00:00	2023-01-04 15:00:00	2023-01-04 15:00:00	2023-01-04 15:00:00	2023-01-04 15:00:00	2023-06-13 16:00:00	2023-03-28 05:00:00	2023-03-28 05:00:00	2023-10-03 07:00:00	2023-05-20 17:00:00
Annual Average	0	0	6	1	5	29.2	2.05	2.05	0.00	12.7
# of hour	8268	8228	8227	8227	8227	8258	8233	8233	8233	8671
Valid Data[%]	94.38	93.93	93.92	93.92	93.92	94.27	93.98	93.98	93.98	98.98

Date & Time	RH	BP	AT	WDS	WDV	STDWD
	%RH	mb	C°	kph	Deg	Deg
Minimum Conc.	12	920	-33.3	0.0	0	0
Min Conc. Date	2023-05-04 16:00:00	2023-02-13 10:00:00	2023-02-22 07:00:00	2023-06-03 04:00:00	2023-03-04 02:00:00	2023-12-16 17:00:00
Maximum Conc.	100	968	31	28.7	360	79
Max Conc. Date	2023-01-15 17:00:00	2023-02-23 07:00:00	2023-05-04 15:00:00	2023-10-04 17:00:00	2023-01-27 12:00:00	2023-01-31 07:00:00
Annual Average	72	946	5.0	1.2	172	15
# of hour	8711	8711	8711	8708	8708	8708
Valid Data[%]	99.44	99.44	99.44	99.41	99.41	99.41

1.4.2 AQHI

LICA - LAC LA BICHE STATION
AIR QUALITY HEALTH INDEX (AQHI)



1.4.3 Monitoring Parameters – 2023 Continuous Data Summary and Frequency Distribution

LICA - LAC LA BICHE STATION
SULPHUR DIOXIDE (SO_2) in parts per billion (ppb)

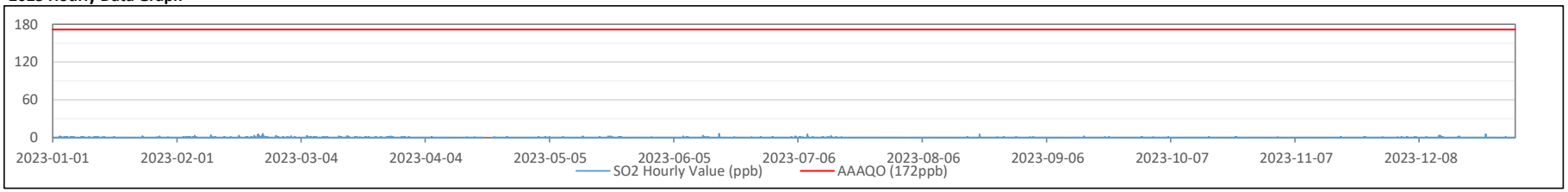
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQOExceedances				Percentage Readings in Concentration Range				
							1-hour	24-hour	30-day	Annual	0 - 10	11 -50	51 -100	101 - 172	>172
January	100.0	707	0	2	1	0.1	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0	638	0	6	2	0.3	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0	706	0	3	1	0.2	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
April	93.2	635	0	1	0	0.0	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
May	99.9	705	0	2	1	0.1	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0	684	0	6	1	0.1	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	705	0	5	1	0.1	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0	708	0	5	0	0.0	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0	683	0	2	0	0.0	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0	706	0	1	0	0.0	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0	685	0	1	0	0.0	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0	706	0	5	1	0.1	0	0	0	-	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.4	8268	0	6	2	0.1	0	0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%

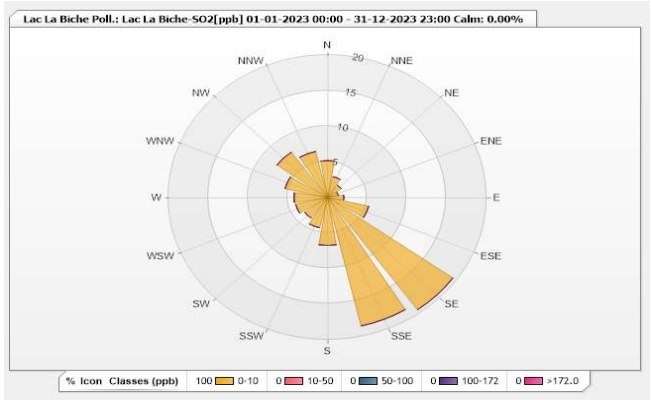
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	0	49	0	1	63	376	3
Total Hours of Downtime		50	Total Hours of Calibration		442	Total Hours of Flagged		492

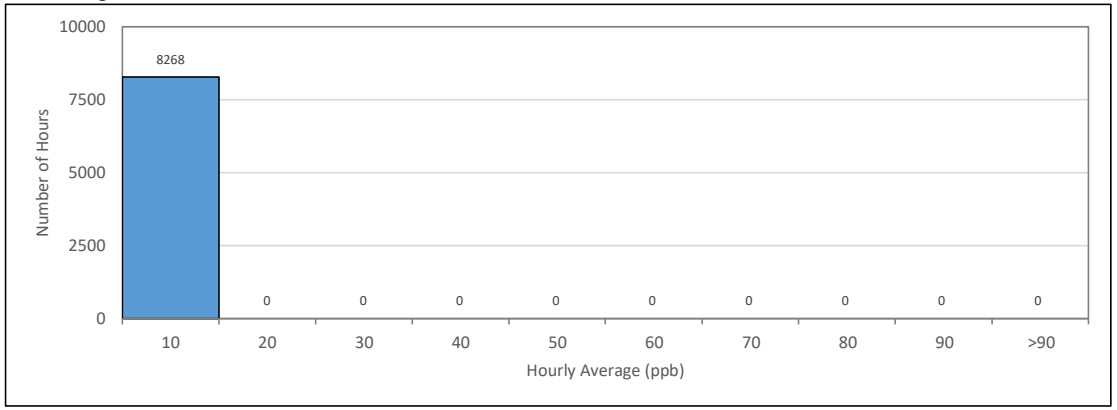
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - LAC LA BICHE STATION
HYDROGEN SULPHIDE (H_2S) in parts per billion (ppb)

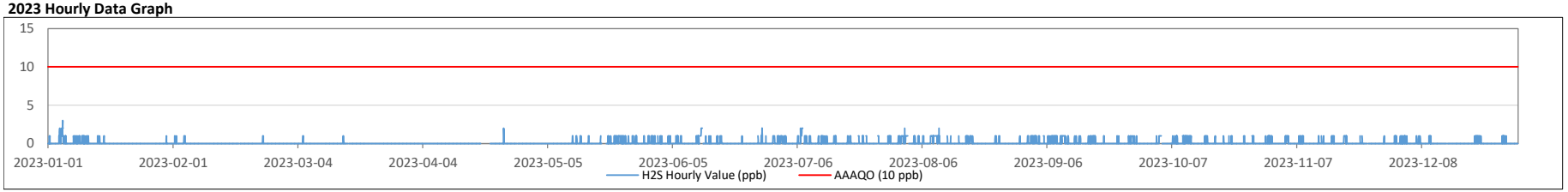
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances		Percentage Readings in Concentration Range				
							1-hour	24-hour	0 - 2	3 - 5	6 - 10	11 - 50	>50
January	100.0	707	0	3	1	0.1	0	0	99.9%	0.1%	0.0%	0.0%	0.0%
February	100.0	638	0	1	0	0.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0	707	0	1	0	0.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
April	92.4	629	0	2	0	0.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
May	96.0	677	0	1	1	0.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
June	99.7	682	0	2	1	0.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	705	0	2	0	0.2	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0	708	0	2	1	0.2	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0	683	0	1	1	0.2	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
October	99.9	705	0	1	1	0.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
November	99.7	681	0	1	1	0.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0	706	0	1	0	0.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.0	8228	0	3	1	0.1	0	0	100.0%	0.0%	0.0%	0.0%	0.0%

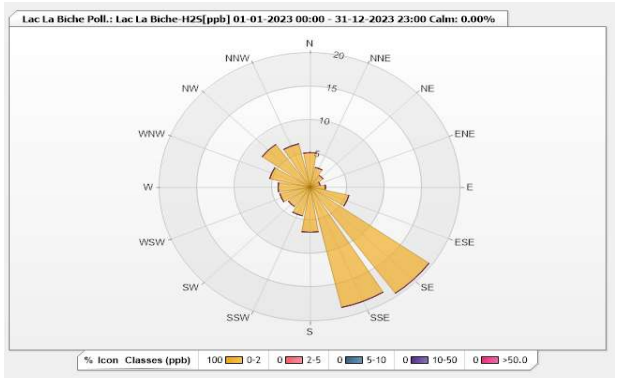
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	0	49	0	41	66	373	3
Total Hours of Downtime		90	Total Hours of Calibration		442	Total Hours of Flagged		532

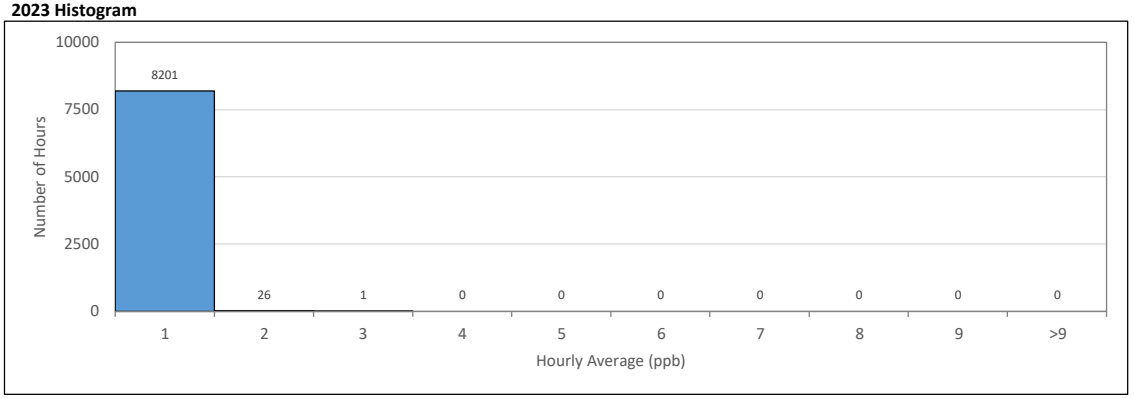
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - LAC LA BICHE STATION
OXIDES OF NITROGEN (NOx) in parts per billion (ppb)

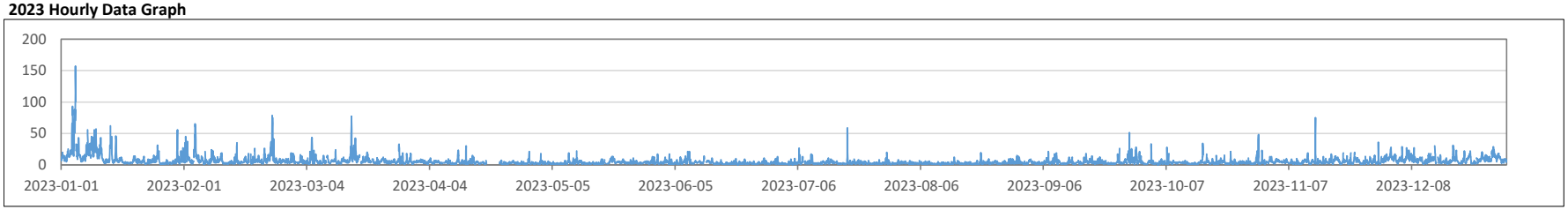
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0	705	1	157	53	12.2	93.0%	3.8%	2.0%	1.1%	0.0%
February	100.0	636	1	78	26	8.4	97.2%	1.6%	1.3%	0.0%	0.0%
March	100.0	706	1	76	24	6.8	98.2%	1.6%	0.3%	0.0%	0.0%
April	90.8	614	1	30	8	3.7	100.0%	0.0%	0.0%	0.0%	0.0%
May	99.9	703	1	22	7	3.4	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0	681	0	21	10	3.3	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	704	0	58	7	3.2	99.7%	0.1%	0.1%	0.0%	0.0%
August	100.0	706	0	19	7	2.8	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0	682	1	51	11	4.5	99.9%	0.0%	0.1%	0.0%	0.0%
October	100.0	704	0	48	8	3.7	99.6%	0.4%	0.0%	0.0%	0.0%
November	100.0	683	1	75	9	5.2	99.7%	0.1%	0.1%	0.0%	0.0%
December	100.0	703	1	31	17	8.8	99.9%	0.1%	0.0%	0.0%	0.0%
Annual	99.2	8227	0	157	53	5.5	98.9%	0.7%	0.3%	0.1%	0.0%

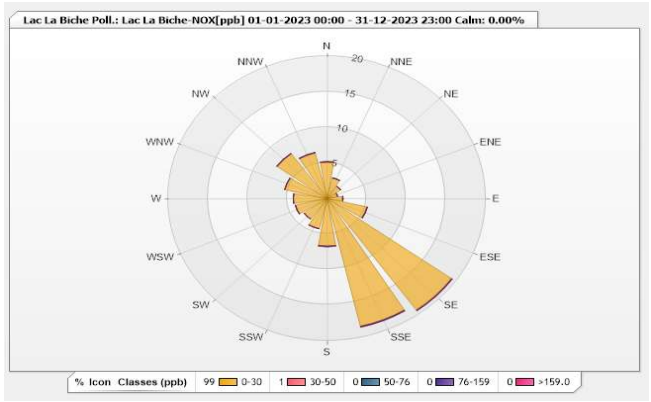
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	0	49	0	18	89	373	4
Total Hours of Downtime		67	Total Hours of Calibration		466	Total Hours of Flagged		533

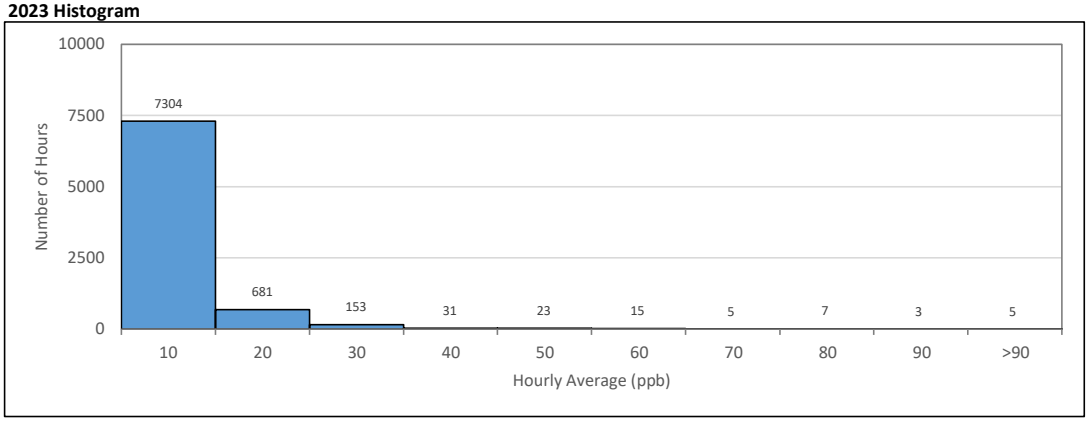
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - LAC LA BICHE STATION
NITRIC OXIDE (NO) in parts per billion (ppb)

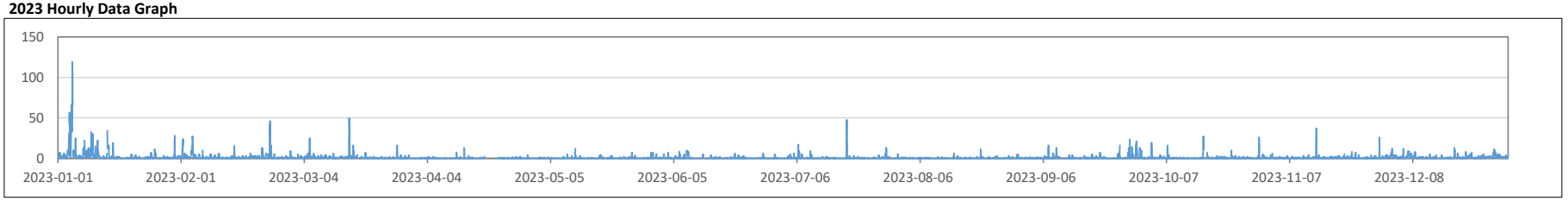
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0	705	0	119	30	3.3	97.6%	1.1%	1.1%	0.1%	0.0%
February	100.0	636	0	46	9	1.7	99.5%	0.5%	0.0%	0.0%	0.0%
March	100.0	706	0	49	7	1.1	99.7%	0.3%	0.0%	0.0%	0.0%
April	90.8	614	0	13	1	0.2	100.0%	0.0%	0.0%	0.0%	0.0%
May	99.9	703	0	12	1	0.3	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0	681	0	10	3	0.4	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	704	0	47	4	0.5	99.9%	0.1%	0.0%	0.0%	0.0%
August	100.0	706	0	11	1	0.2	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0	682	0	23	6	0.9	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0	704	0	27	2	0.6	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0	683	0	37	3	0.7	99.9%	0.1%	0.0%	0.0%	0.0%
December	100.0	703	0	13	4	1.3	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.2	8227	0	119	30	0.9	99.7%	0.2%	0.1%	0.0%	0.0%

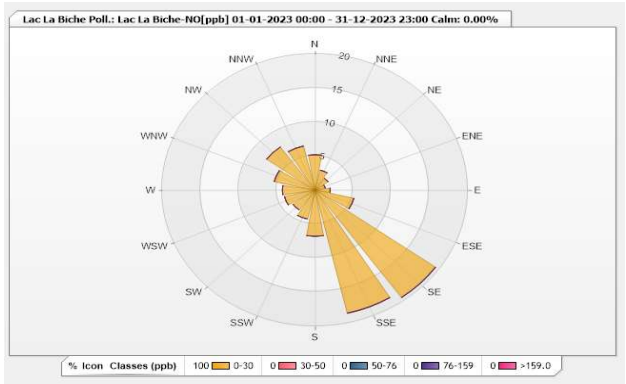
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	0	49	0	18	89	373	4
Total Hours of Downtime		67	Total Hours of Calibration		466	Total Hours of Flagged		533

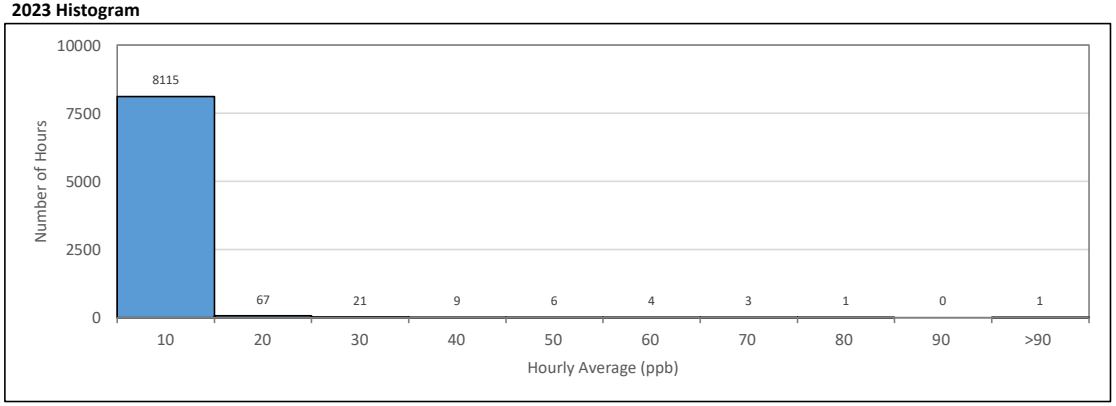
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - LAC LA BICHE STATION
NITROGEN DIOXIDE (NO_2) in parts per billion (ppb)

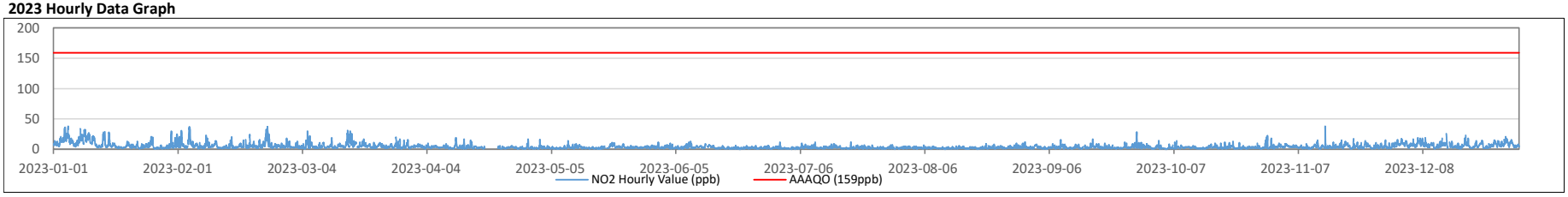
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances	Percentage Readings in Concentration Range				
							1-hour	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0	705	1	38	22	8.8	0	98.3%	1.7%	0.0%	0.0%	0.0%
February	100.0	636	1	37	17	6.7	0	98.4%	1.6%	0.0%	0.0%	0.0%
March	100.0	706	1	31	17	5.6	0	99.9%	0.1%	0.0%	0.0%	0.0%
April	90.8	614	1	19	7	3.5	0	100.0%	0.0%	0.0%	0.0%	0.0%
May	99.9	703	1	16	7	3.1	0	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0	681	0	13	6	2.9	0	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	704	0	12	5	2.6	0	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0	706	0	12	6	2.5	0	100.0%	0.0%	0.0%	0.0%	0.0%
September	100.0	682	1	28	7	3.6	0	100.0%	0.0%	0.0%	0.0%	0.0%
October	100.0	704	0	22	6	3.1	0	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0	683	1	38	7	4.4	0	99.9%	0.1%	0.0%	0.0%	0.0%
December	100.0	703	1	26	12	7.4	0	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.2	8227	0	38	22	4.5	0	99.7%	0.3%	0.0%	0.0%	0.0%

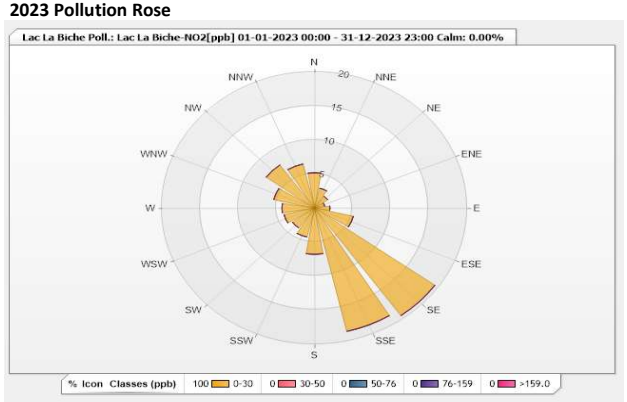
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	0	49	0	18	89	373	4
Total Hours of Downtime		67	Total Hours of Calibration		466	Total Hours of Flagged		533

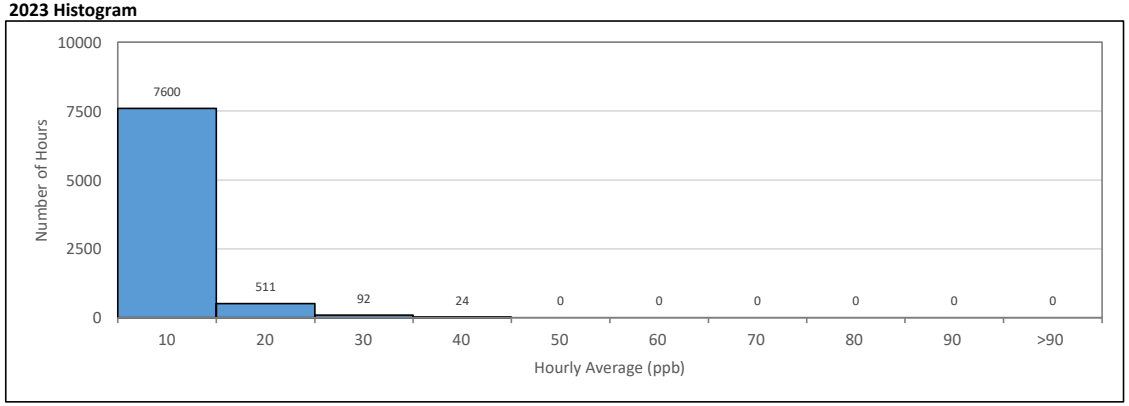
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - LAC LA BICHE STATION
OZONE (O_3) in parts per billion (ppb)

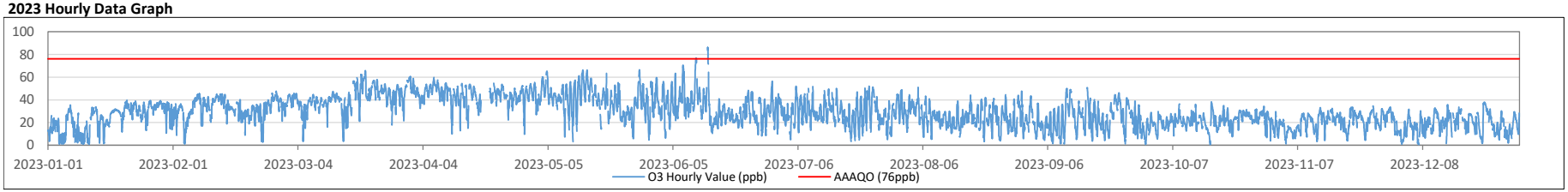
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances	Percentage Readings in Concentration Range				
							1-hour	0 - 30	31 - 50	51 - 82	83 - 159	>159
January	100.0	707	0.8	39.6	36.6	23.8	0	65.8%	34.2%	0.0%	0.0%	0.0%
February	100.0	638	1.0	47.5	42.8	32.2	0	35.9%	64.1%	0.0%	0.0%	0.0%
March	100.0	707	3.2	65.6	57.1	41.9	0	9.5%	72.7%	17.8%	0.0%	0.0%
April	93.2	636	9.5	59.7	52.0	44.1	0	5.5%	73.0%	21.5%	0.0%	0.0%
May	99.9	707	3.0	66.4	54.0	40.1	0	21.8%	56.6%	21.6%	0.0%	0.0%
June	100.0	684	6.2	85.9	52.6	32.6	4	48.7%	42.8%	7.9%	0.6%	0.0%
July	100.0	706	3.2	52.0	39.1	28.8	0	58.1%	41.1%	0.8%	0.0%	0.0%
August	100.0	708	3.3	51.0	35.1	24.5	0	74.4%	25.4%	0.1%	0.0%	0.0%
September	99.9	683	0.6	50.6	38.6	23.0	0	72.2%	27.7%	0.1%	0.0%	0.0%
October	99.9	704	0.5	38.0	27.5	21.7	0	93.3%	6.7%	0.0%	0.0%	0.0%
November	100.0	686	1.2	34.4	29.6	20.7	0	92.9%	7.1%	0.0%	0.0%	0.0%
December	97.8	692	0.6	37.9	34.4	18.2	0	93.1%	6.9%	0.0%	0.0%	0.0%
Annual	99.2	8258	0.5	85.9	57.1	29.3	4	55.9%	38.2%	5.8%	0.0%	0.0%

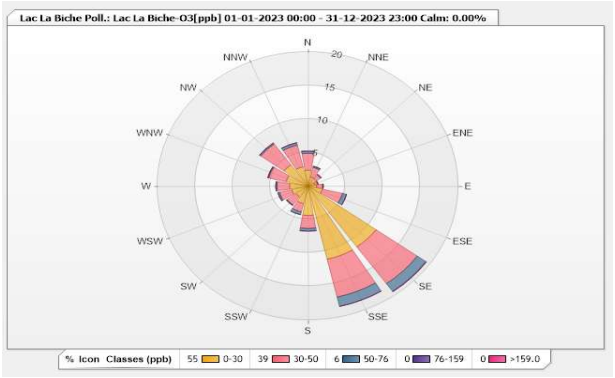
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	14	0	49	0	5	56	376	2
Total Hours of Downtime		68	Total Hours of Calibration		434	Total Hours of Flagged		502

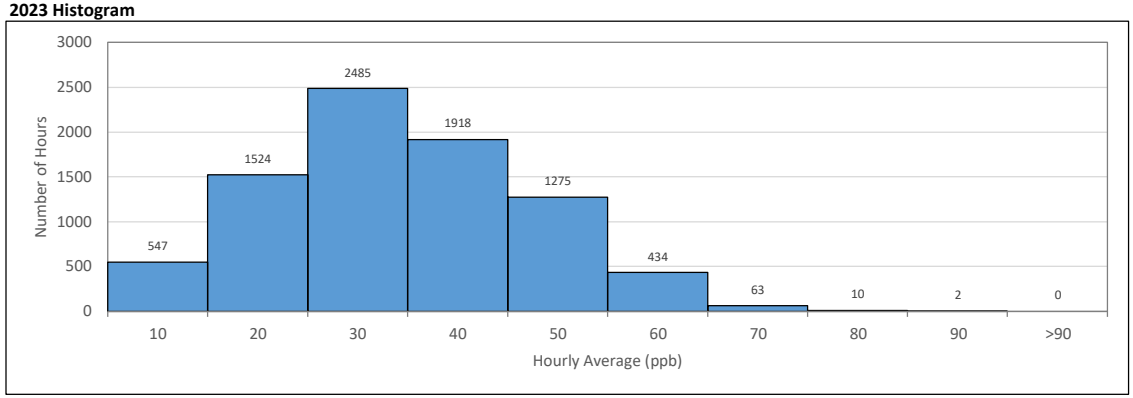
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - LAC LA BICHE STATION
TOTAL HYDROCARBONS (THC) in parts per million (ppm)

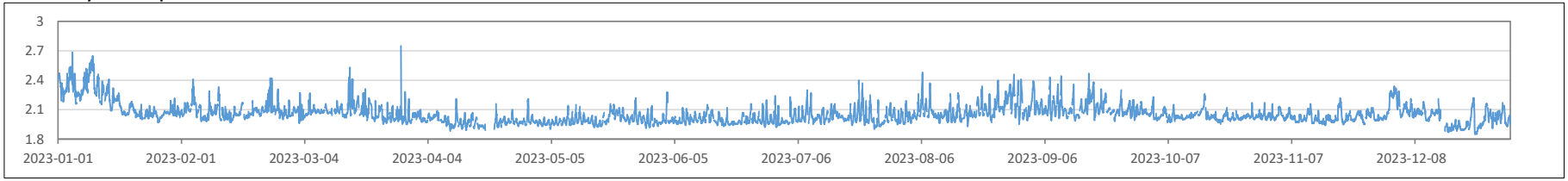
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 2	3 - 5	6 - 10	11 - 40	>40
January	99.7	705	1.97	2.68	2.54	2.19	88.7%	11.3%	0.0%	0.0%	0.0%
February	100.0	638	1.97	2.42	2.18	2.08	99.5%	0.5%	0.0%	0.0%	0.0%
March	98.4	697	1.95	2.75	2.23	2.07	99.3%	0.7%	0.0%	0.0%	0.0%
April	92.9	634	1.88	2.21	2.04	1.98	100.0%	0.0%	0.0%	0.0%	0.0%
May	99.7	706	1.90	2.22	2.08	2.00	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0	684	1.92	2.28	2.06	2.00	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	706	1.90	2.40	2.12	2.02	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0	708	1.93	2.48	2.23	2.09	99.4%	0.6%	0.0%	0.0%	0.0%
September	99.7	683	1.98	2.47	2.25	2.12	99.3%	0.7%	0.0%	0.0%	0.0%
October	99.3	701	1.95	2.26	2.11	2.04	100.0%	0.0%	0.0%	0.0%	0.0%
November	99.6	683	1.94	2.22	2.09	2.02	100.0%	0.0%	0.0%	0.0%	0.0%
December	97.4	688	1.85	2.34	2.26	2.04	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	98.9	8233	1.85	2.75	2.54	2.05	98.8%	1.2%	0.0%	0.0%	0.0%

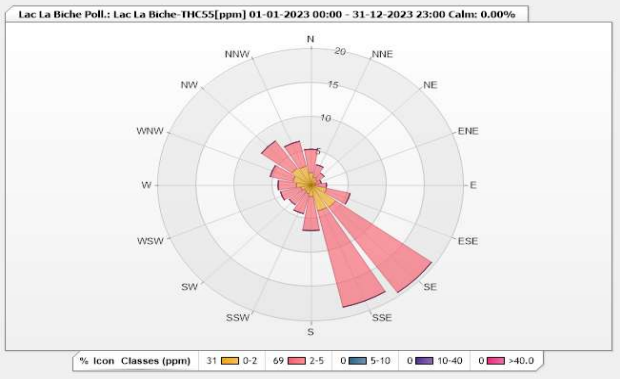
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	17	4	49	0	26	54	375	2
Total Hours of Downtime		96	Total Hours of Calibration		431	Total Hours of Flagged		527

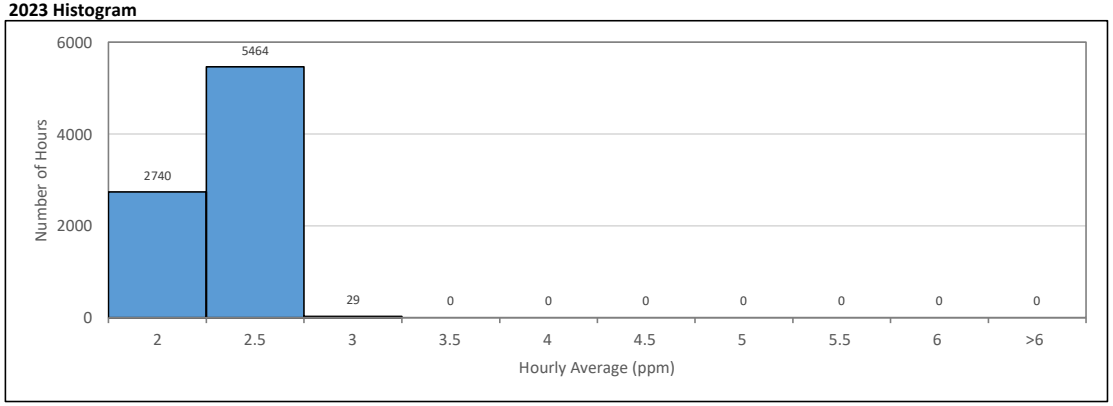
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - LAC LA BICHE STATION
METHANE (CH_4) in parts per million (ppm)

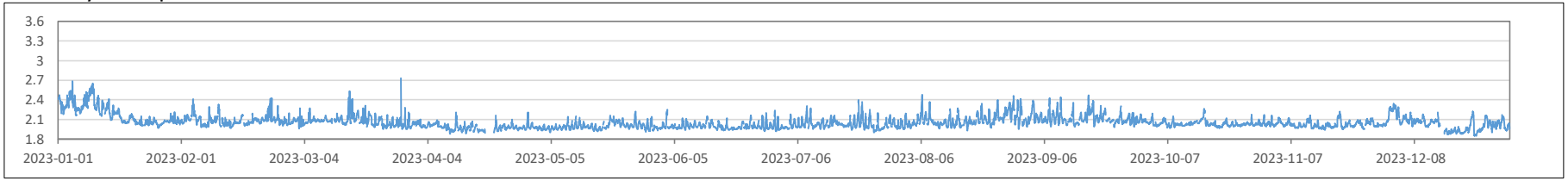
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 2	3 - 5	6 - 10	11 - 20	>20
January	99.7	705	1.97	2.68	2.54	2.19	88.8%	11.2%	0.0%	0.0%	0.0%
February	100.0	638	1.97	2.42	2.18	2.08	99.5%	0.5%	0.0%	0.0%	0.0%
March	98.4	697	1.95	2.73	2.23	2.07	99.3%	0.7%	0.0%	0.0%	0.0%
April	92.9	634	1.88	2.21	2.04	1.98	100.0%	0.0%	0.0%	0.0%	0.0%
May	99.7	706	1.90	2.22	2.08	2.00	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0	684	1.92	2.25	2.06	2.00	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	706	1.90	2.40	2.12	2.02	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0	708	1.93	2.48	2.23	2.09	99.4%	0.6%	0.0%	0.0%	0.0%
September	99.7	683	1.98	2.47	2.25	2.12	99.3%	0.7%	0.0%	0.0%	0.0%
October	99.3	701	1.97	2.26	2.11	2.04	100.0%	0.0%	0.0%	0.0%	0.0%
November	99.6	683	1.94	2.22	2.09	2.02	100.0%	0.0%	0.0%	0.0%	0.0%
December	97.4	688	1.85	2.34	2.26	2.03	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	98.9	8233	1.85	2.73	2.54	2.05	98.9%	1.1%	0.0%	0.0%	0.0%

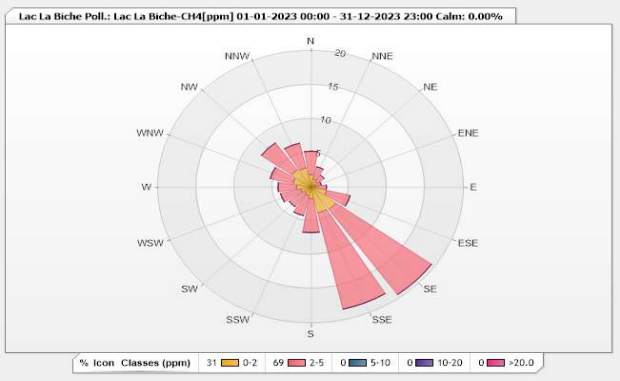
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	17	4	49	0	26	54	375	2
Total Hours of Downtime		96	Total Hours of Calibration		431	Total Hours of Flagged		527

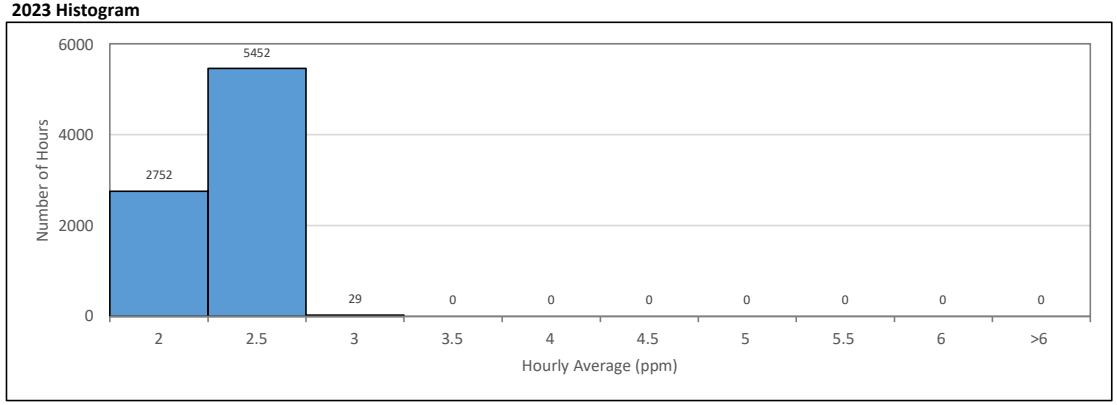
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - LAC LA BICHE STATION
NON-METHANE HYDROCARBONS (NMHC) in parts per million (ppm)

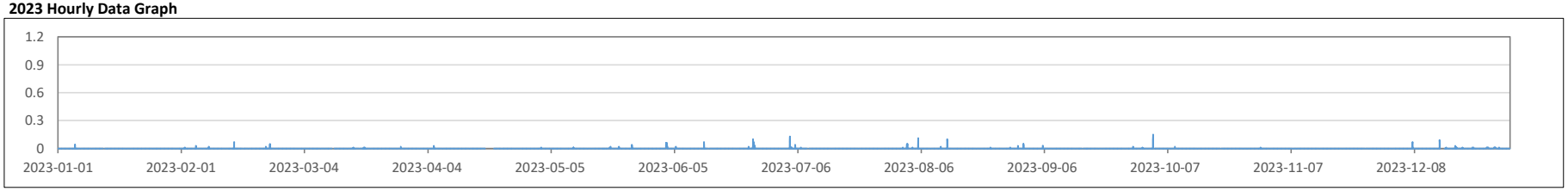
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 0.1	0.2 - 0.3	0.4 - 0.9	1 -2	>2
January	99.7	705	0.00	0.04	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0	638	0.00	0.07	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
March	98.4	697	0.00	0.02	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
April	92.9	634	0.00	0.03	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
May	99.7	706	0.00	0.04	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
June	100.0	684	0.00	0.10	0.01	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
July	100.0	706	0.00	0.13	0.01	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
August	100.0	708	0.00	0.11	0.01	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
September	99.7	683	0.00	0.03	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
October	99.3	701	0.00	0.15	0.00	0.00	99.9%	0.1%	0.0%	0.0%	0.0%
November	99.6	683	0.00	0.00	0.00	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
December	97.4	688	0.00	0.09	0.01	0.00	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	98.9	8233	0.00	0.15	0.01	0.00	100.0%	0.0%	0.0%	0.0%	0.0%

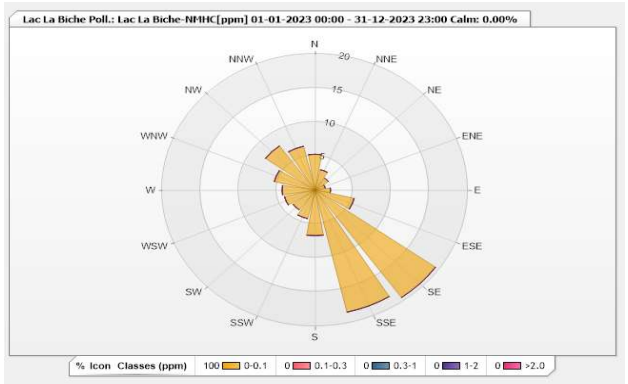
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	17	4	49	0	26	54	375	2
Total Hours of Downtime		96	Total Hours of Calibration		431	Total Hours of Flagged		527

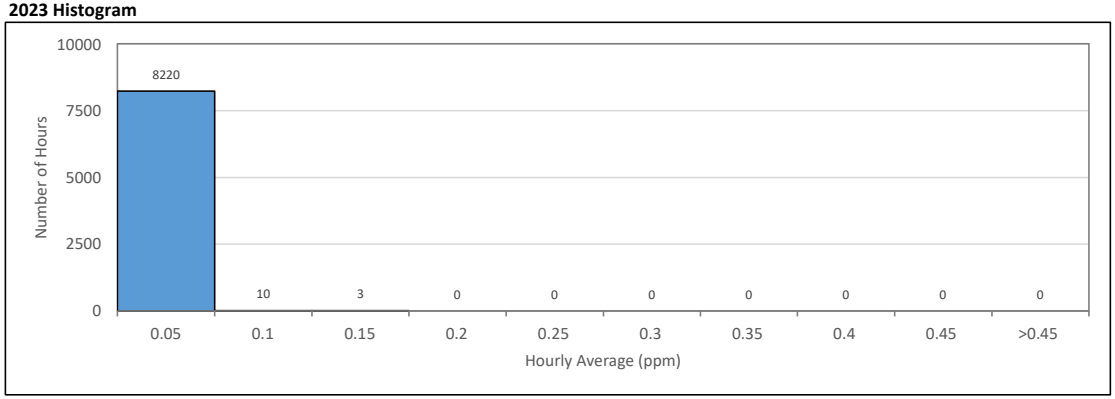
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - LAC LA BICHE STATION

PARTICULATE MATTER 2.5 ($PM_{2.5}$) in microgram per cubic meter ($\mu g/m^3$)

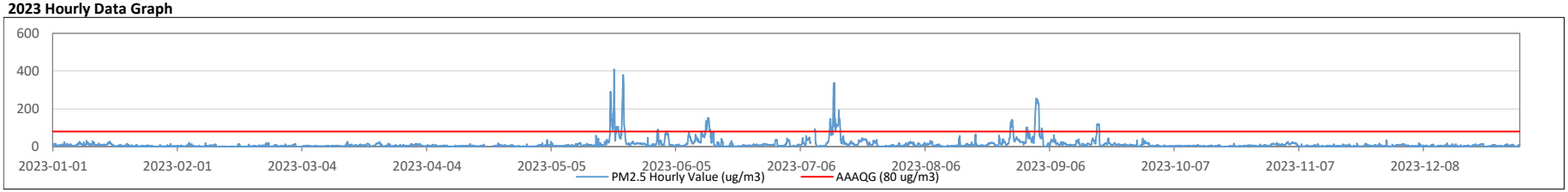
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	# of AAAQO Exceedances		Percentage Readings in Concentration Range				
							1-hour	24-hour	0 - 50	51 - 80	81 - 120	121 - 240	>240
January	100.0	742	0	32	17	6.7	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
February	100.0	671	0	22	8	3.3	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
March	100.0	742	0	26	13	5.2	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
April	93.2	668	0	18	11	4.2	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
May	100.0	743	1	411	156	27.2	66	6	87.3%	3.9%	3.9%	2.8%	2.0%
June	100.0	719	1	153	95	21.3	30	7	85.5%	10.4%	2.1%	1.9%	0.0%
July	97.0	721	1	338	173	25.3	60	5	89.2%	2.5%	4.9%	2.4%	1.1%
August	100.0	742	0	143	101	17.4	26	4	94.1%	2.4%	2.2%	1.3%	0.0%
September	100.0	718	1	256	155	26.3	48	6	90.3%	3.1%	3.3%	2.1%	1.3%
October	100.0	743	1	16	13	4.0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
November	100.0	719	1	35	19	5.8	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
December	100.0	743	0	19	12	4.9	0	0	100.0%	0.0%	0.0%	0.0%	0.0%
Annual	99.2	8671	0	411	173	12.6	230	28	95.5%	1.9%	1.4%	0.9%	0.4%

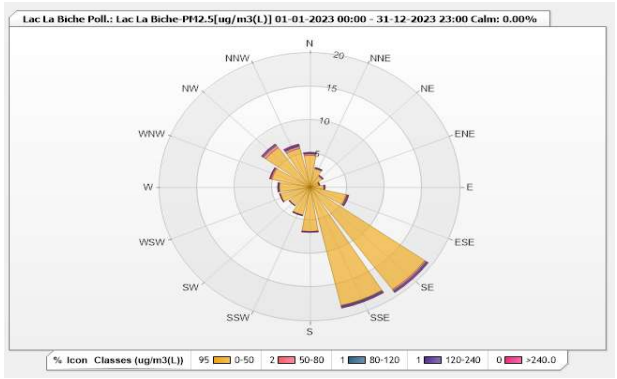
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	22	0	49	0	0	18	0	0
Total Hours of Downtime		71	Total Hours of Calibration		18	Total Hours of Flagged		89

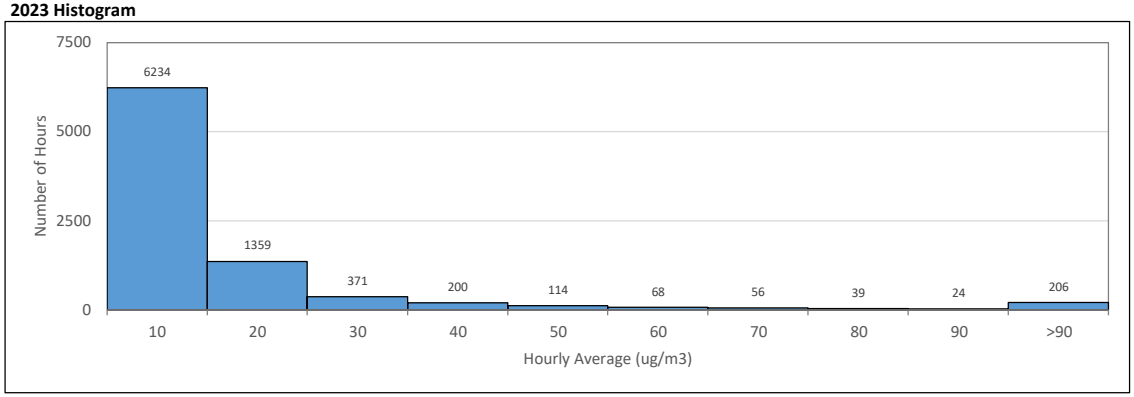
2023 Hourly Data Graph



2023 Pollution Rose



2023 Histogram



LICA - LAC LA BICHE STATION
RELATIVE HUMIDITY (RH) in percent (%)

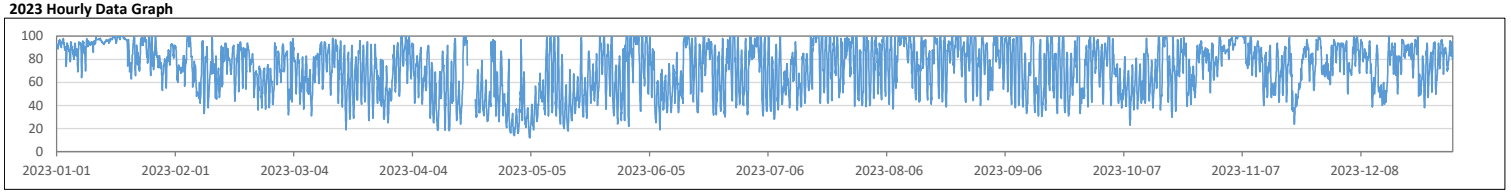
2023 Annual Continuous Data Summary

Month	Operational	# of Reading	Monthly Avg.	Min. 1-hr	Max. 1-hr	Max. 24-hr
January	100.0	744	89.1	53	100	99
February	100.0	672	71.1	33	100	98
March	100.0	744	66.5	19	98	86
April	93.2	671	57.6	14	100	89
May	100.0	744	55.3	12	100	86
June	100.0	720	69.1	19	100	98
July	100.0	744	74.0	28	100	99
August	100.0	744	80.5	37	100	99
September	100.0	720	72.3	31	100	94
October	100.0	744	69.6	23	100	92
November	100.0	720	77.6	24	100	100
December	100.0	744	77.9	38	100	94
Annual	99.4	8711	71.7	12	100	100

2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	0	49	0	0	0	0	0
Total Hours of Downtime		49	Total Hours of Calibration		0	Total Hours of Flagged		49

2023 Hourly Data Graph



LICA - LAC LA BICHE STATION
AMBIENT TEMPERATURE (AT) in degree celsius (°C)

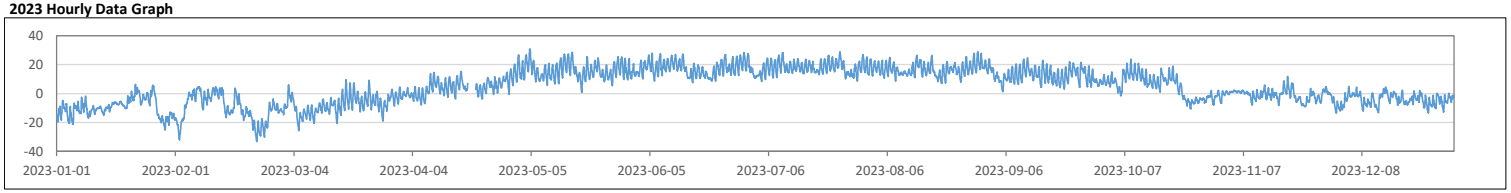
2023 Annual Continuous Data Summary

Month	Operational	# of Reading	Monthly Avg.	Min. 1-hr	Max. 1-hr	Max. 24-hr
January	100.0	744	-9.4	-25.0	6.4	1.8
February	100.0	672	-10.1	-33.3	4.9	1.9
March	100.0	744	-7.4	-25.7	9.6	-0.7
April	93.2	671	4.4	-7.9	20.4	13.6
May	100.0	744	16.0	0.8	31.0	23.2
June	100.0	720	17.7	7.8	28.4	22.3
July	100.0	744	17.8	8.4	28.8	23.2
August	100.0	744	17.0	7.1	28.9	21.7
September	100.0	720	12.8	1.3	24.8	18.6
October	100.0	744	5.3	-10.6	23.8	15.3
November	100.0	720	-0.9	-9.4	11.9	4.3
December	100.0	744	-4.3	-13.4	4.9	0.8
Annual	99.4	8711	4.9	-33.3	31.0	23.2

2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	0	49	0	0	0	0	0
Total Hours of Downtime		49	Total Hours of Calibration		0	Total Hours of Flagged		49

2023 Hourly Data Graph



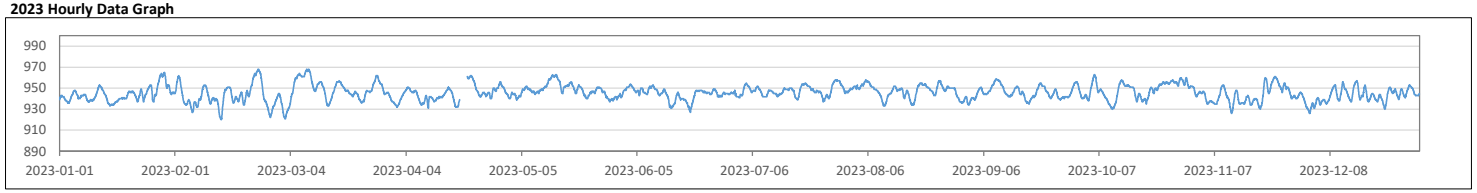
2023 Annual Continuous Data Summary

Month	Operational	# of Reading	Monthly Avg.	Min. 1-hr	Max. 1-hr	Max. 24-hr
January	100.0	744	944	933	965	962
February	100.0	672	942	920	968	966
March	100.0	744	948	921	968	967
April	93.2	671	945	931	962	961
May	100.0	744	948	937	963	962
June	100.0	720	945	927	954	952
July	100.0	744	948	937	958	957
August	100.0	744	947	933	958	957
September	100.0	720	946	934	959	958
October	100.0	744	948	930	963	959
November	100.0	720	944	926	961	960
December	100.0	744	943	926	957	952
Annual	99.4	8711	946	920	968	967

2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	0	49	0	0	0	0	0
Total Hours of Downtime		49	Total Hours of Calibration		0	Total Hours of Flagged		49

2023 Hourly Data Graph



LICA - LAC LA BICHE STATION
VECTOR WIND SPEED (VWS) in kilometer per hour (km/hr)

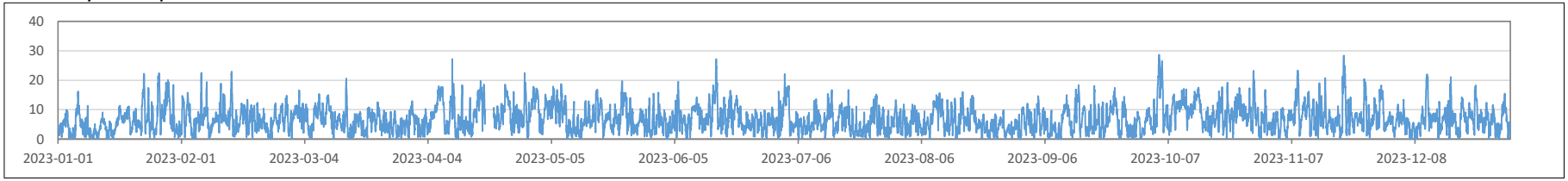
2023 Annual Continuous Data Summary and Annual Frequency Distribution

Month	Operational Uptime (%)	# of Reading	Min. 1-hr	Max. 1-hr	Max. 24-hr	Monthly Avg.	Percentage Readings in Concentration Range				
							0 - 6	7 - 15	16 - 29	30 -39	>39
January	100.0	744	0.1	22.4	15.5	1.2	66.3%	28.8%	5.0%	0.0%	0.0%
February	100.0	672	0.1	23.0	11.6	1.0	51.3%	46.0%	2.7%	0.0%	0.0%
March	100.0	744	0.1	20.6	10.2	2.2	53.0%	46.2%	0.8%	0.0%	0.0%
April	93.2	671	0.1	27.2	15.0	3.6	41.4%	47.2%	11.3%	0.0%	0.0%
May	100.0	744	0.1	19.7	13.6	3.4	46.9%	48.7%	4.4%	0.0%	0.0%
June	100.0	720	0.0	27.2	15.2	1.0	50.6%	46.0%	3.5%	0.0%	0.0%
July	100.0	744	0.1	22.0	13.1	0.7	59.5%	38.0%	2.4%	0.0%	0.0%
August	100.0	744	0.0	16.0	12.2	1.1	66.0%	33.6%	0.4%	0.0%	0.0%
September	100.0	717	0.0	18.3	12.7	1.8	58.2%	40.3%	1.5%	0.0%	0.0%
October	100.0	744	0.0	28.7	17.5	1.3	29.2%	61.8%	9.0%	0.0%	0.0%
November	100.0	720	0.0	28.4	15.7	2.0	46.0%	46.4%	7.6%	0.0%	0.0%
December	100.0	744	0.0	22.0	11.6	3.5	51.6%	45.3%	3.1%	0.0%	0.0%
Annual	99.4	8708	0.0	28.7	17.5	1.2	51.7%	44.0%	4.3%	0.0%	0.0%

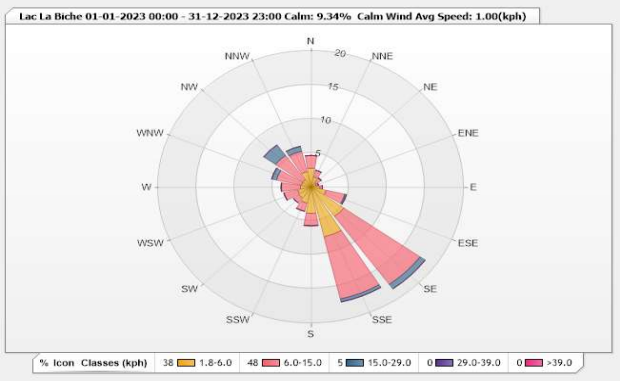
2023 Data Qualifier Flag Summary

P	X	Y	K	ND	NRM	C	S	Q
0	0	0	49	0	0	3	0	0
Total Hours of Downtime		49	Total Hours of Calibration		3	Total Hours of Flagged		52

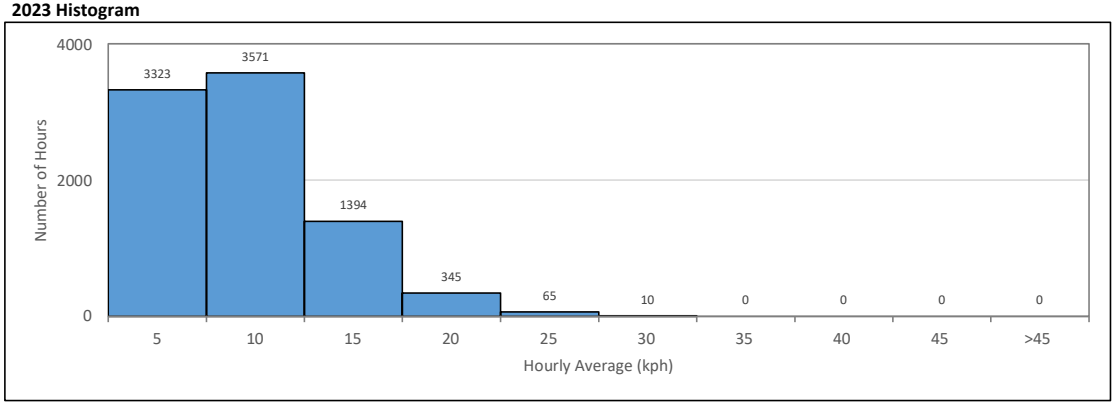
2023 Hourly Data Graph



2023 Wind Rose

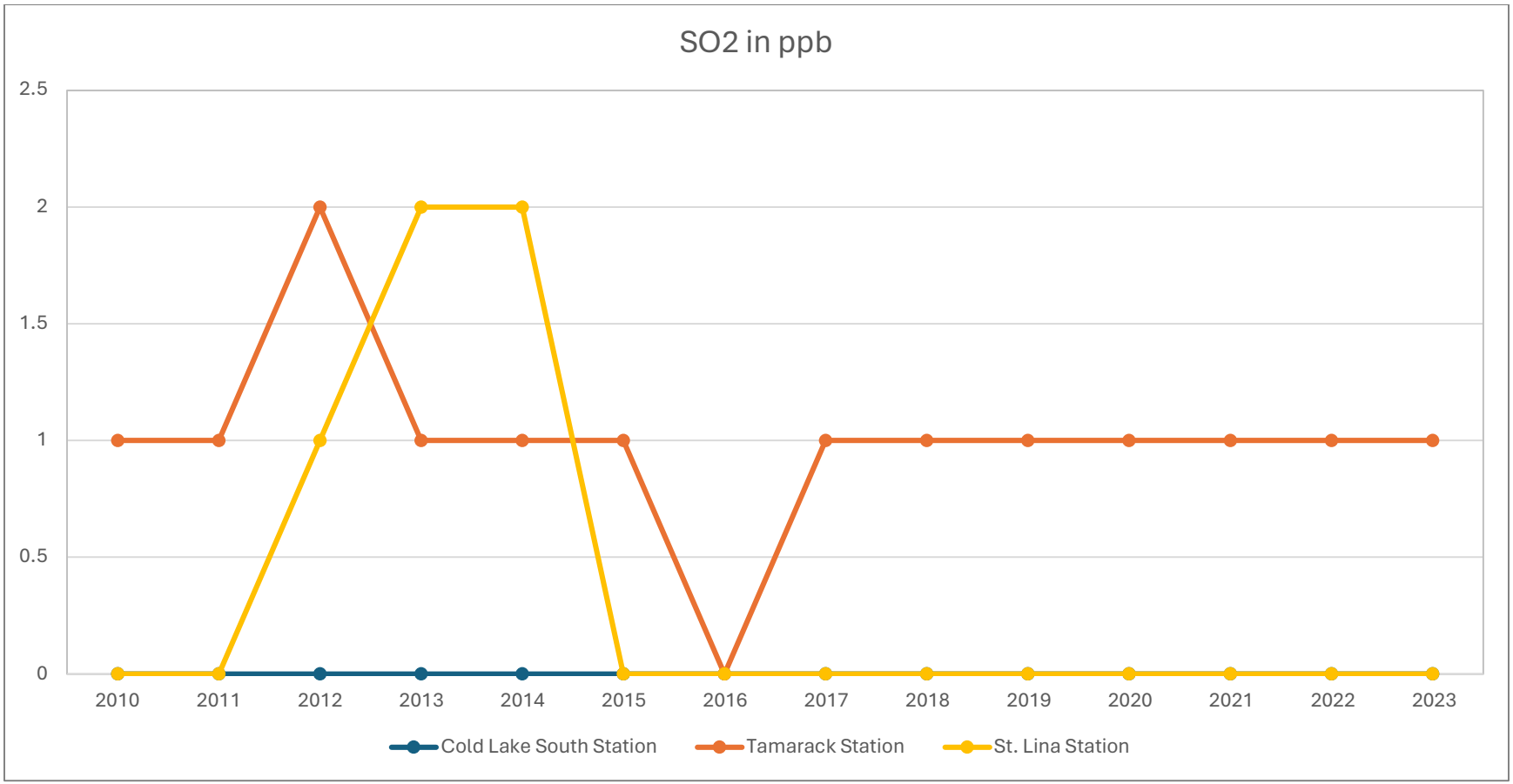


2023 Histogram

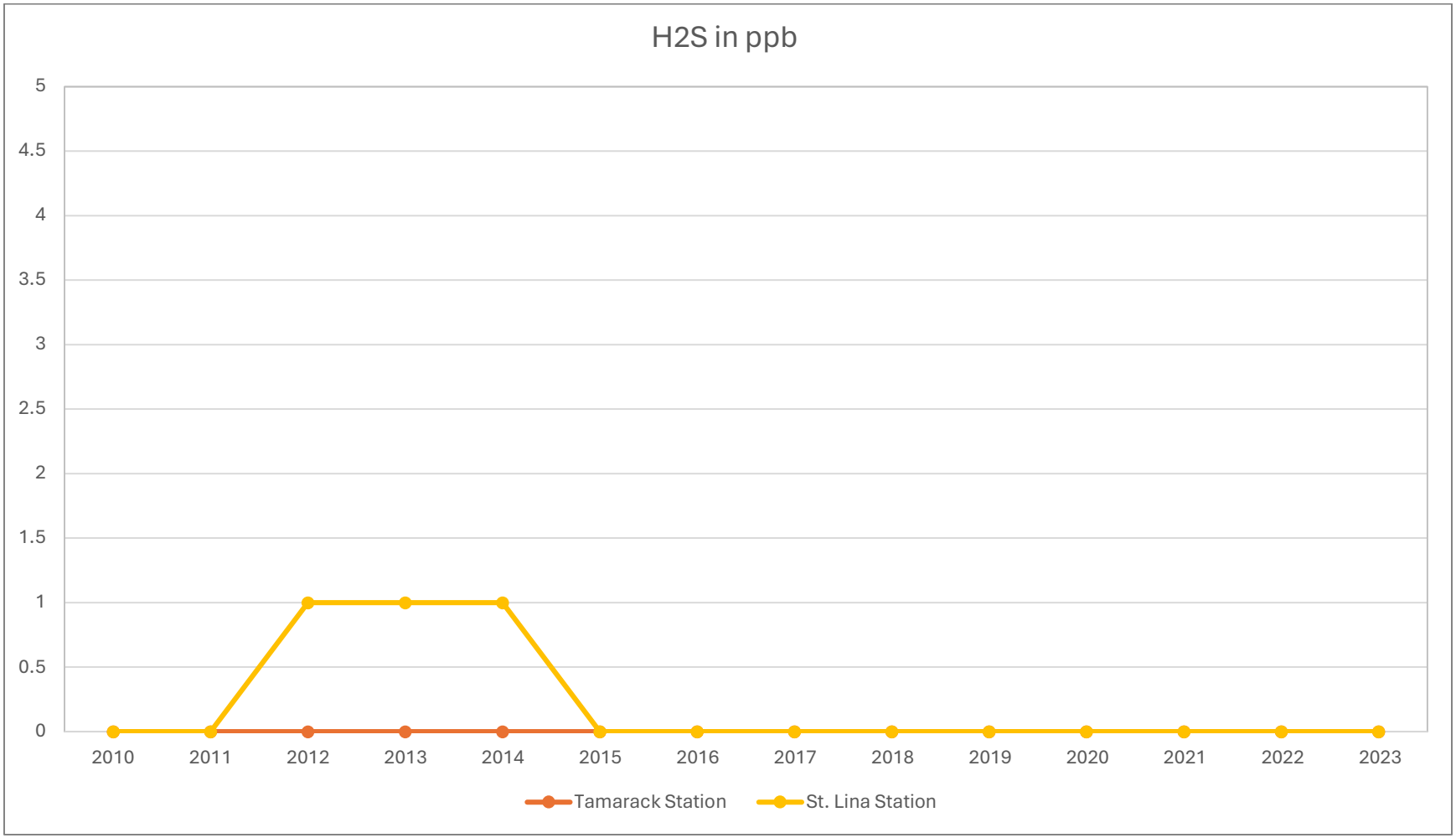


2.0 Continuous Monitoring 13-Year Charts (2010 – 2023) of Annual Average Concentrations

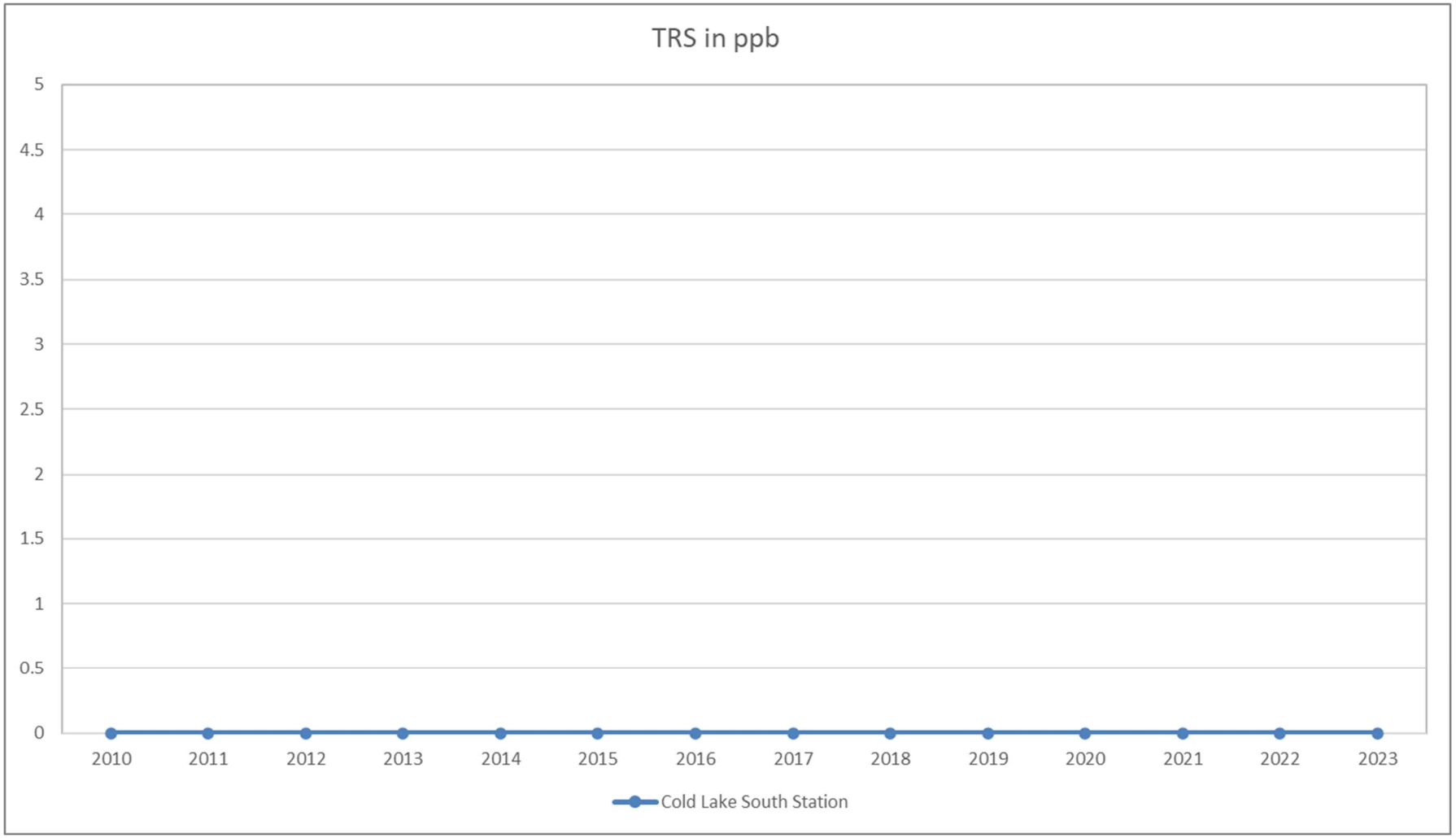
2.1 Sulphur Dioxide (SO_2)



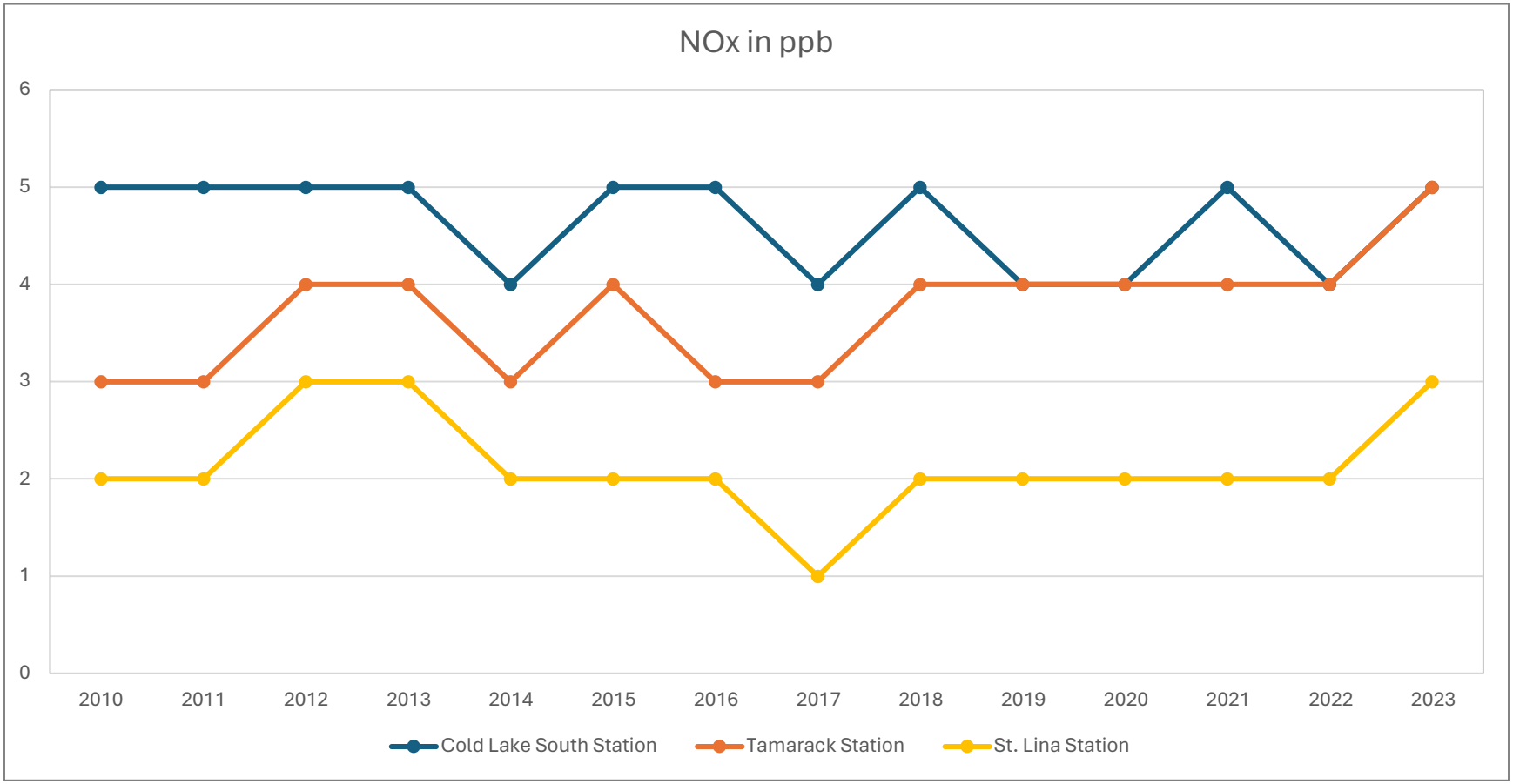
2.2 Hydrogen Sulphide (H_2S)



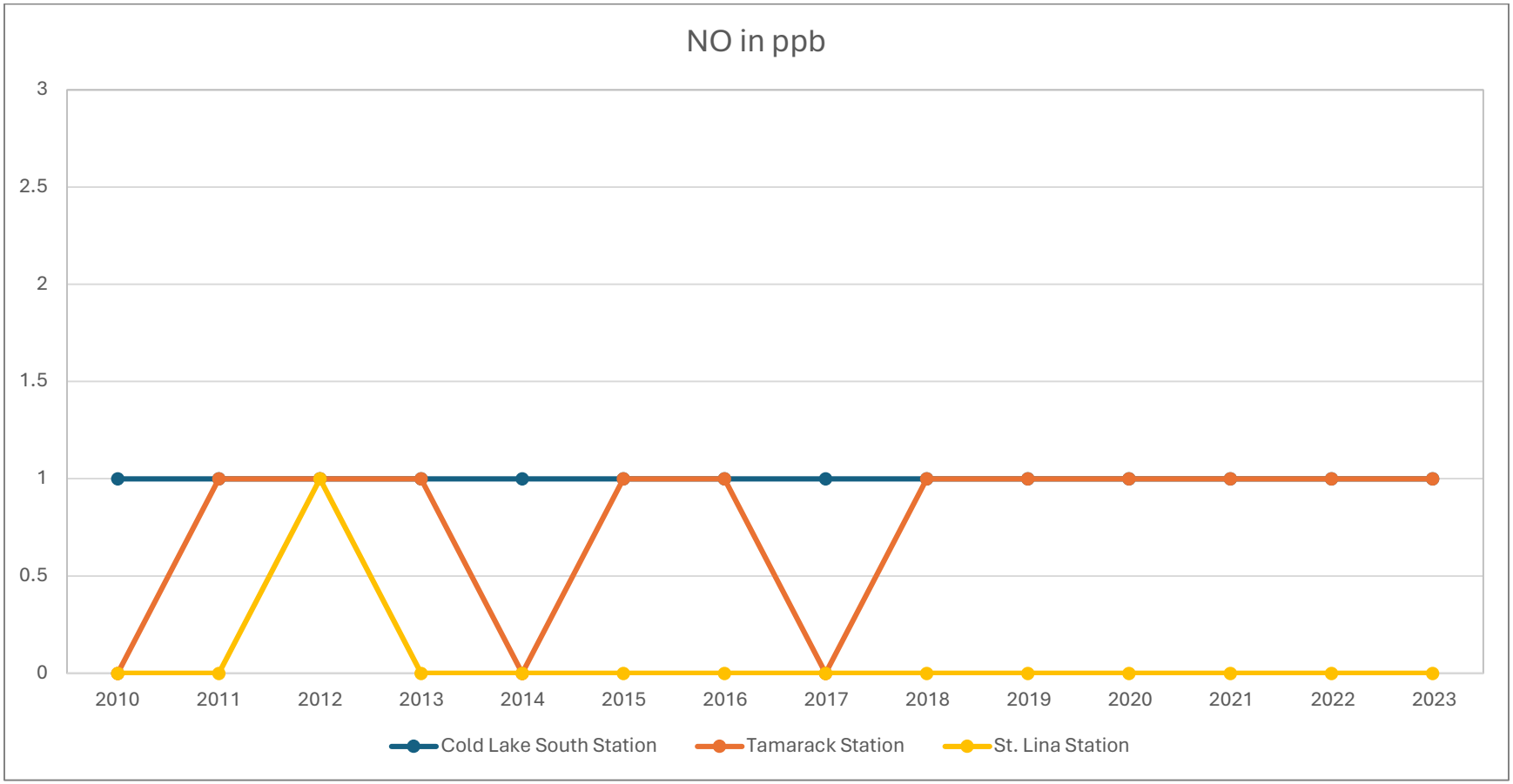
2.3 Total Reduced Sulphur (TRS)



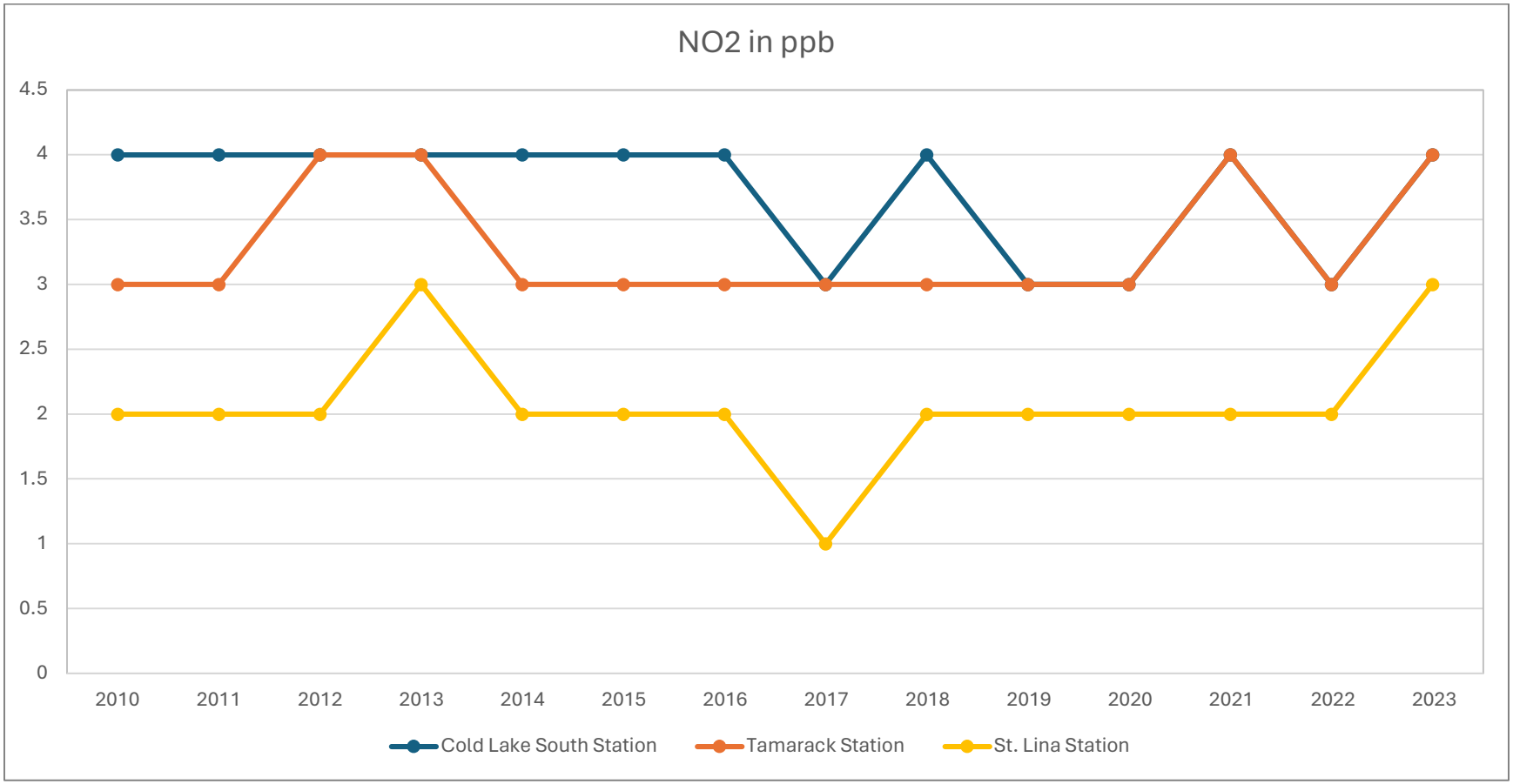
2.4 Oxide of Nitrogen (NOx)



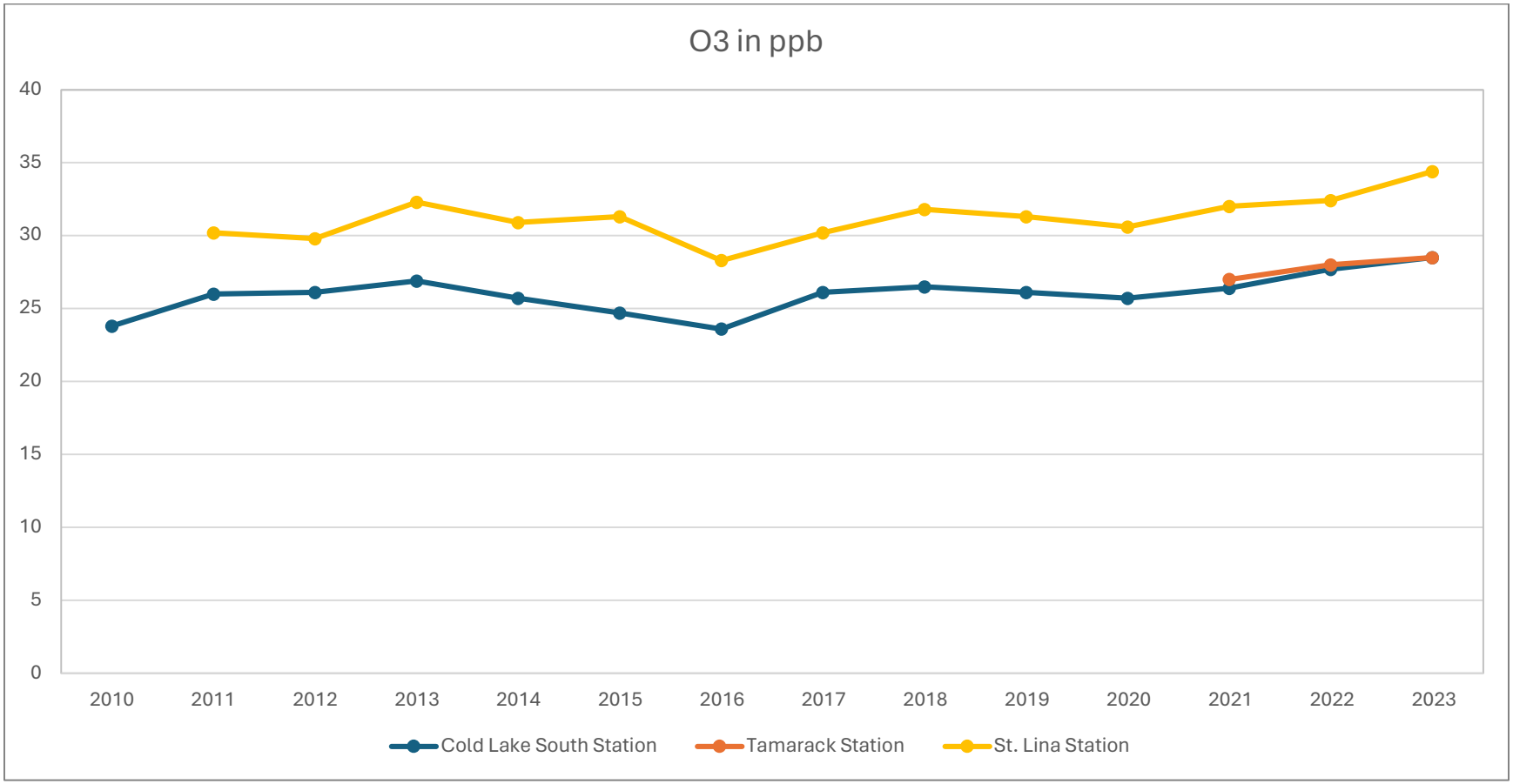
2.5 Nitric Oxide (NO)



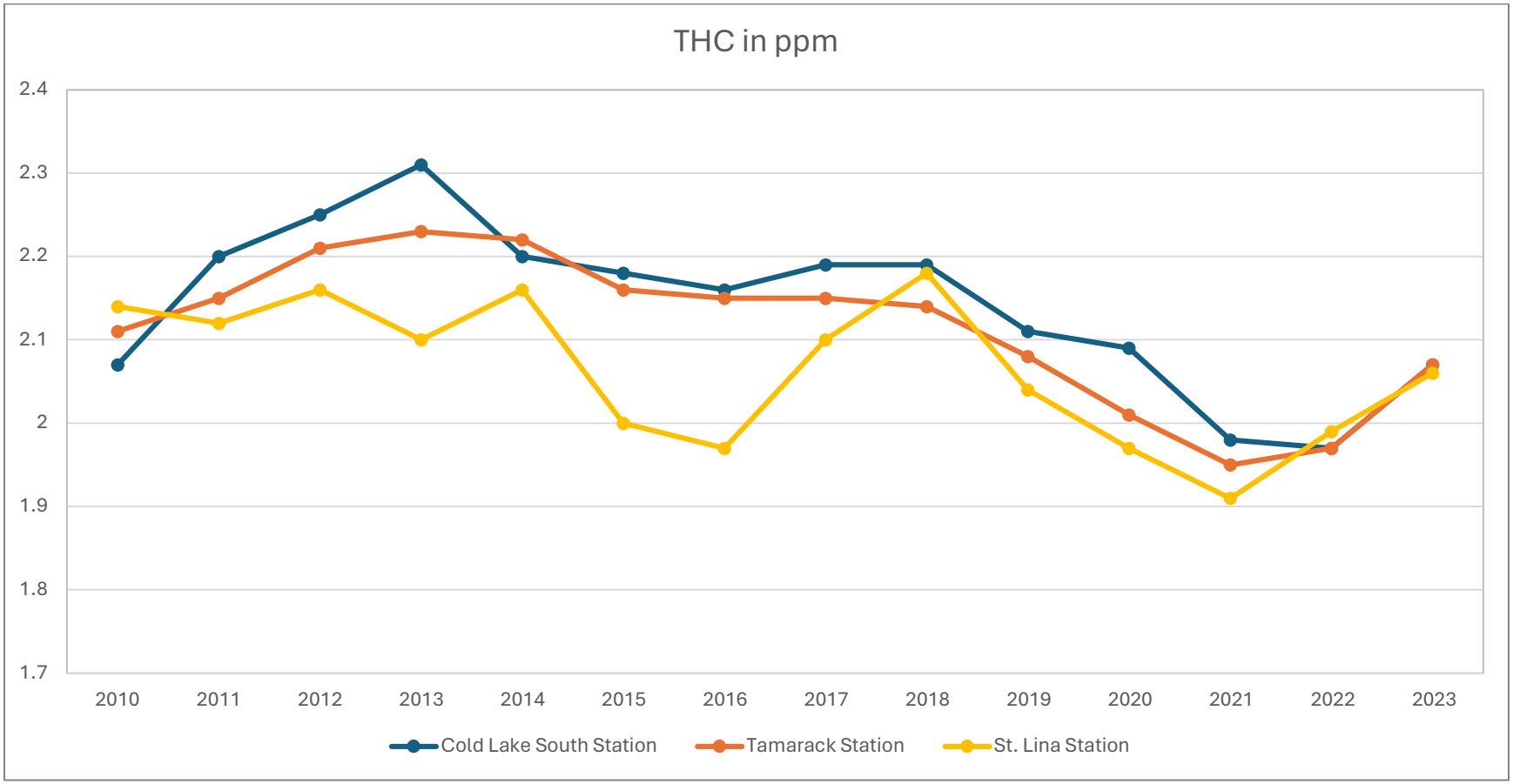
2.6 Nitrogen Dioxide (NO_2)



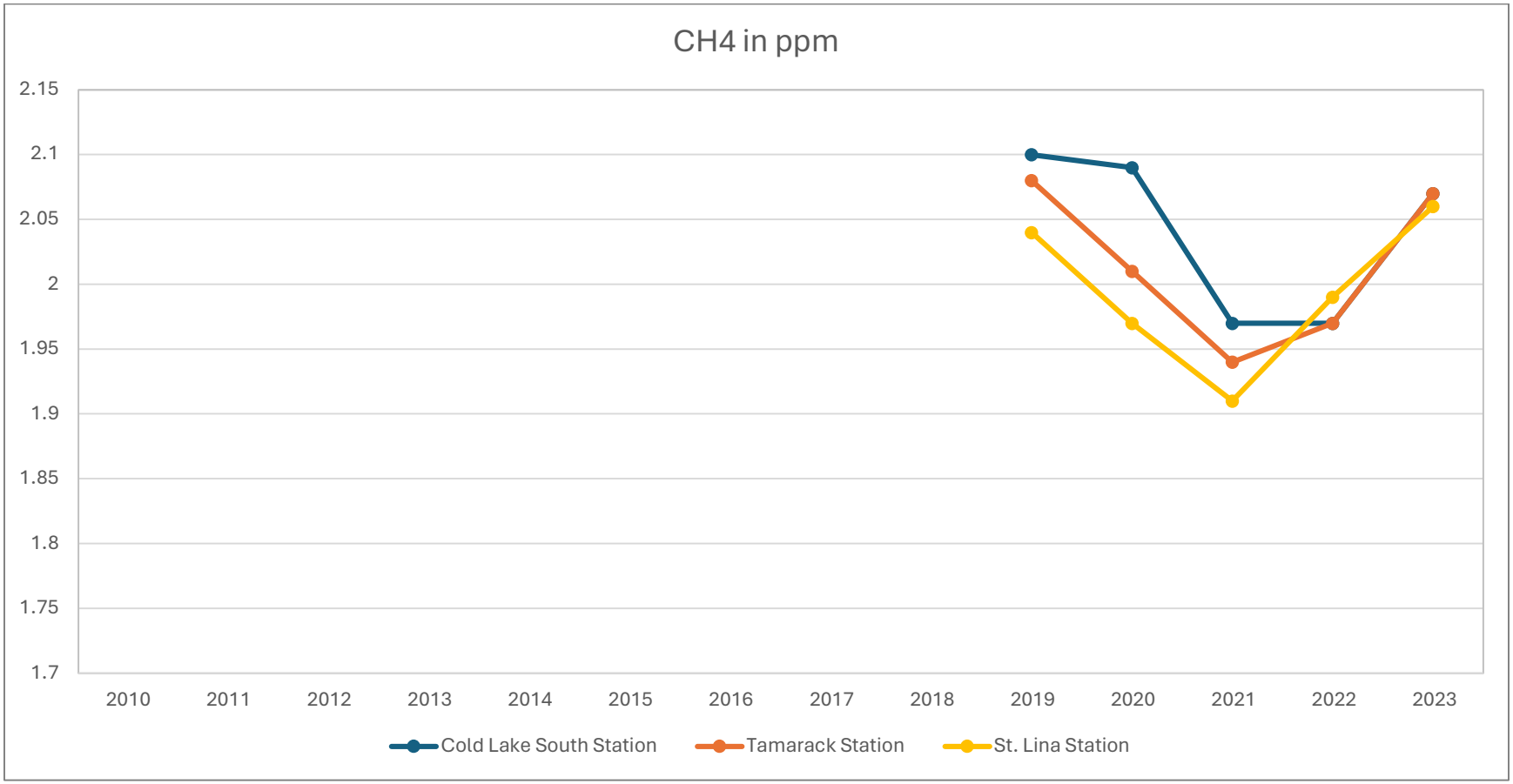
2.7 Ozone (O_3)


O3 in ppb
40
35
30
25
20
15
10
5
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Cold Lake South Station
Tamarack Station
St. Lina Station

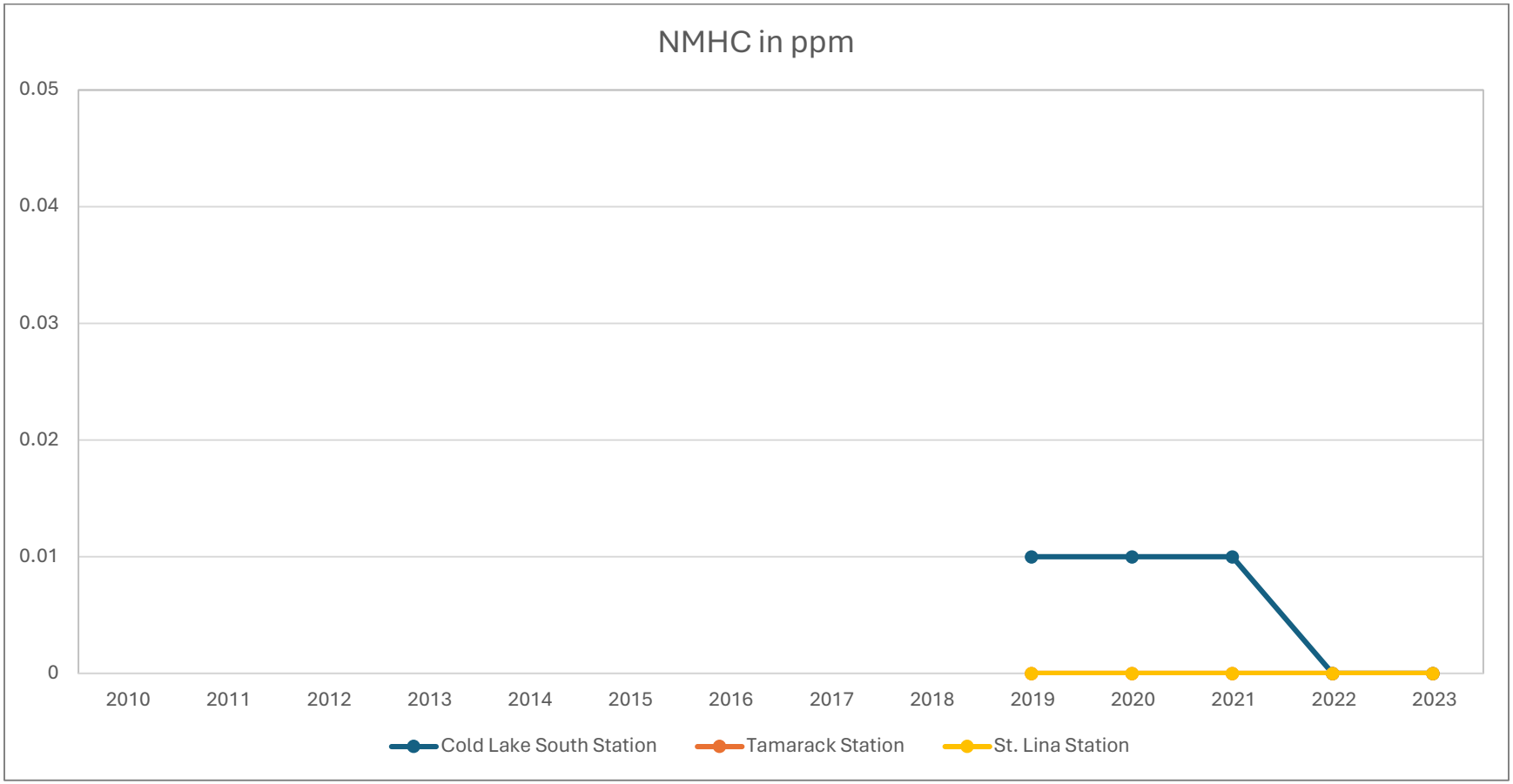
2.8 Total Hydrocarbons (THC)



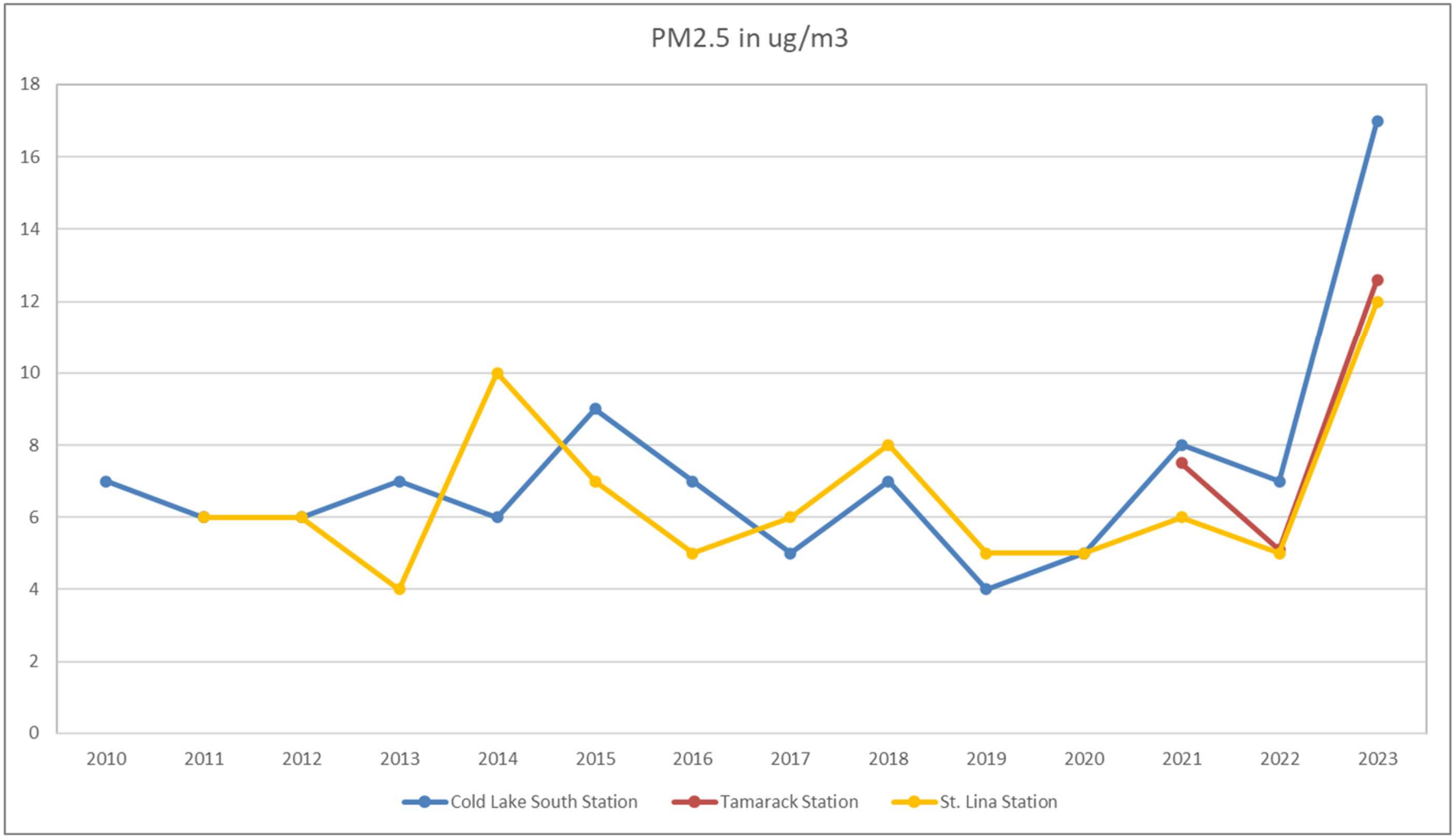
2.9 Methane (CH_4)



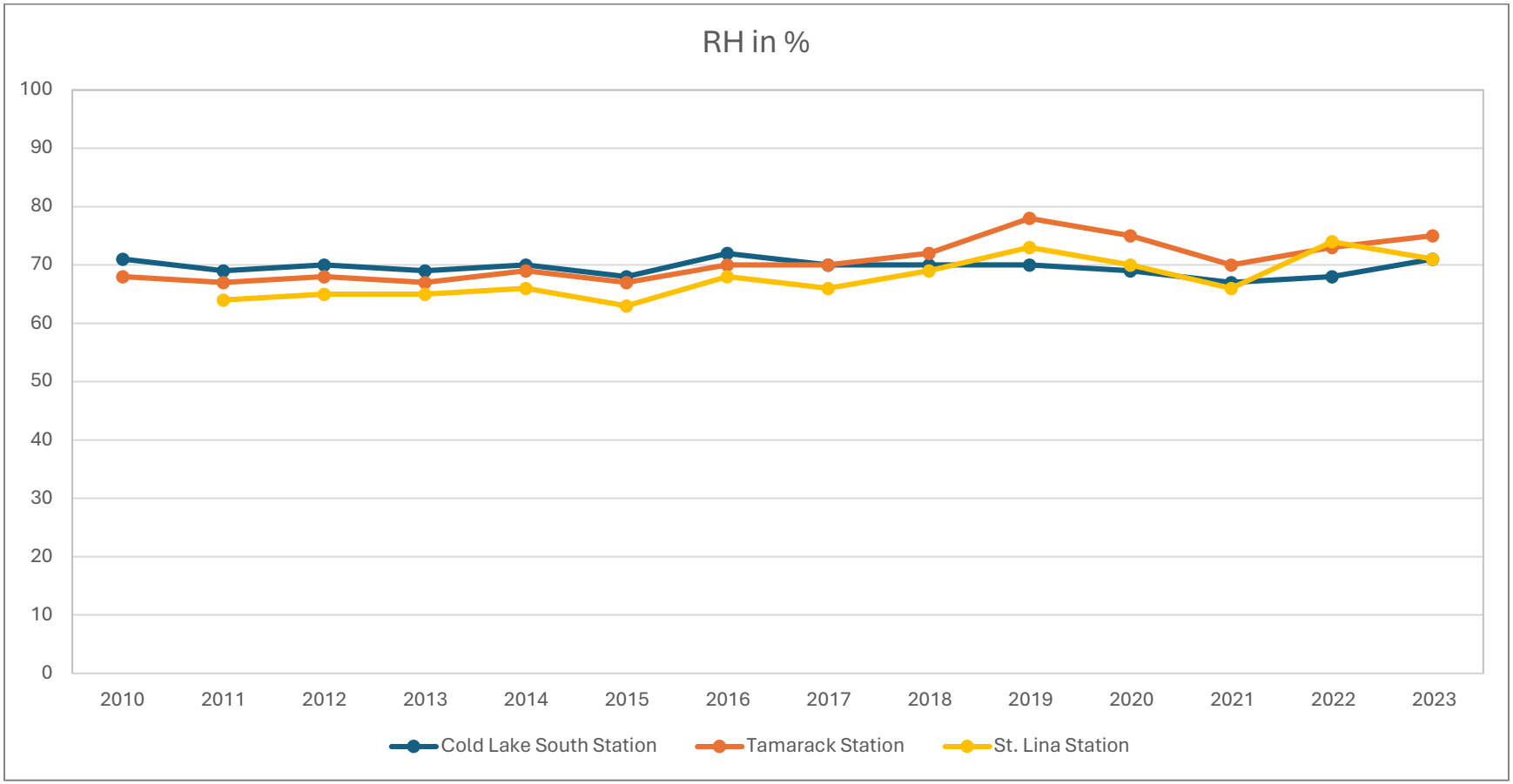
2.10 Non-Methane Hydrocarbons (NMHC)



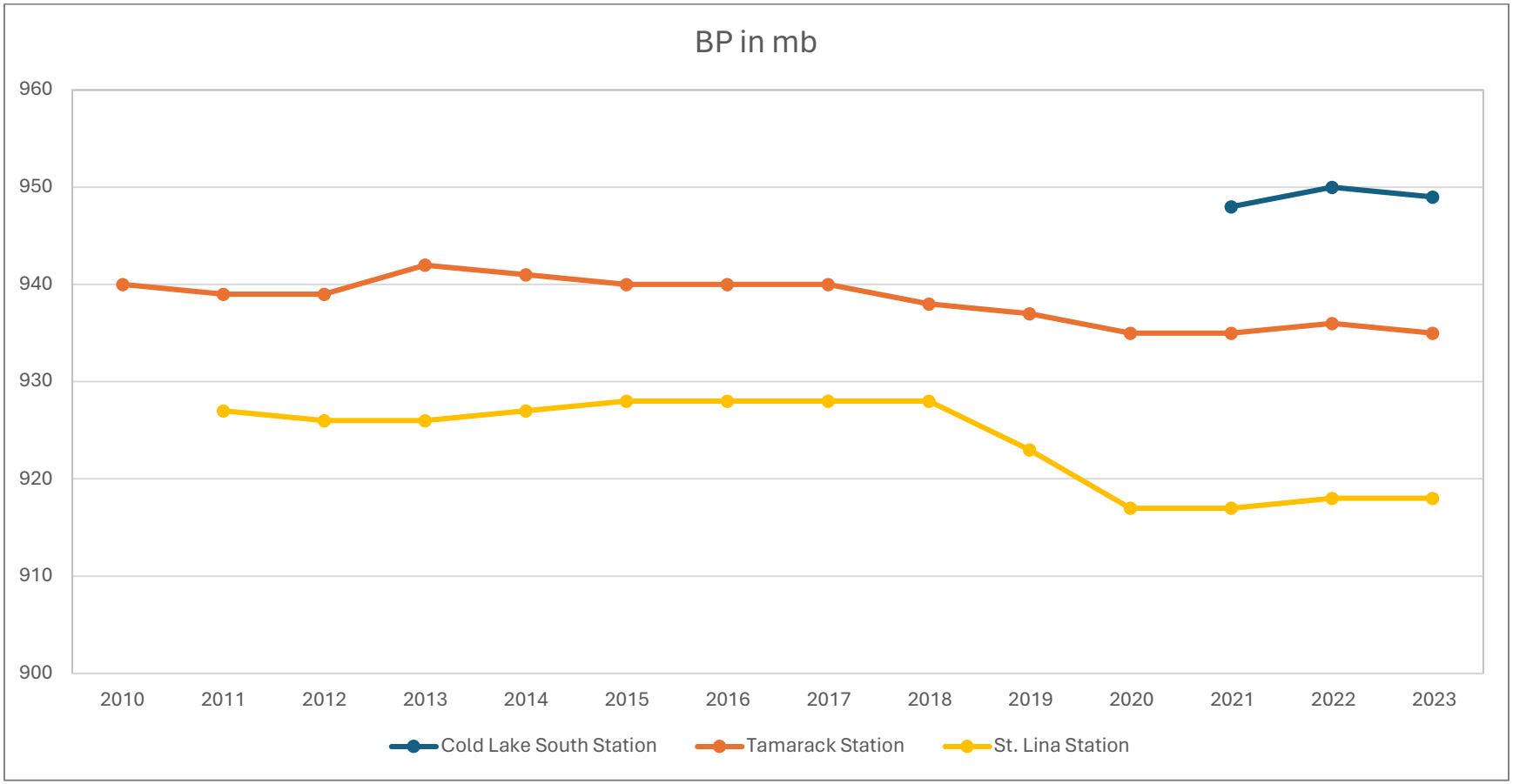
2.11 Particulate Matter 2.5 ($PM_{2.5}$)



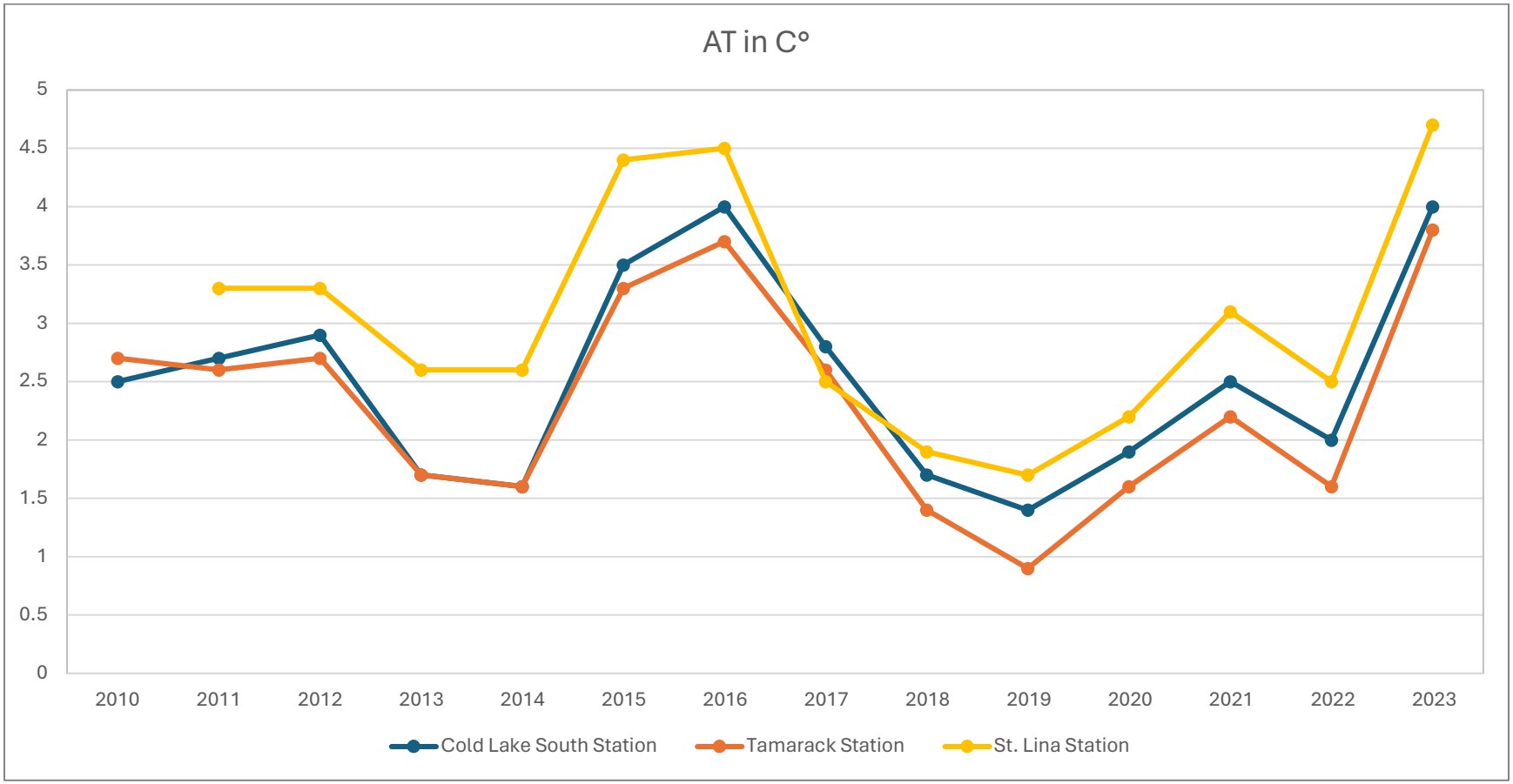
2.12 Relative Humidity (RH)



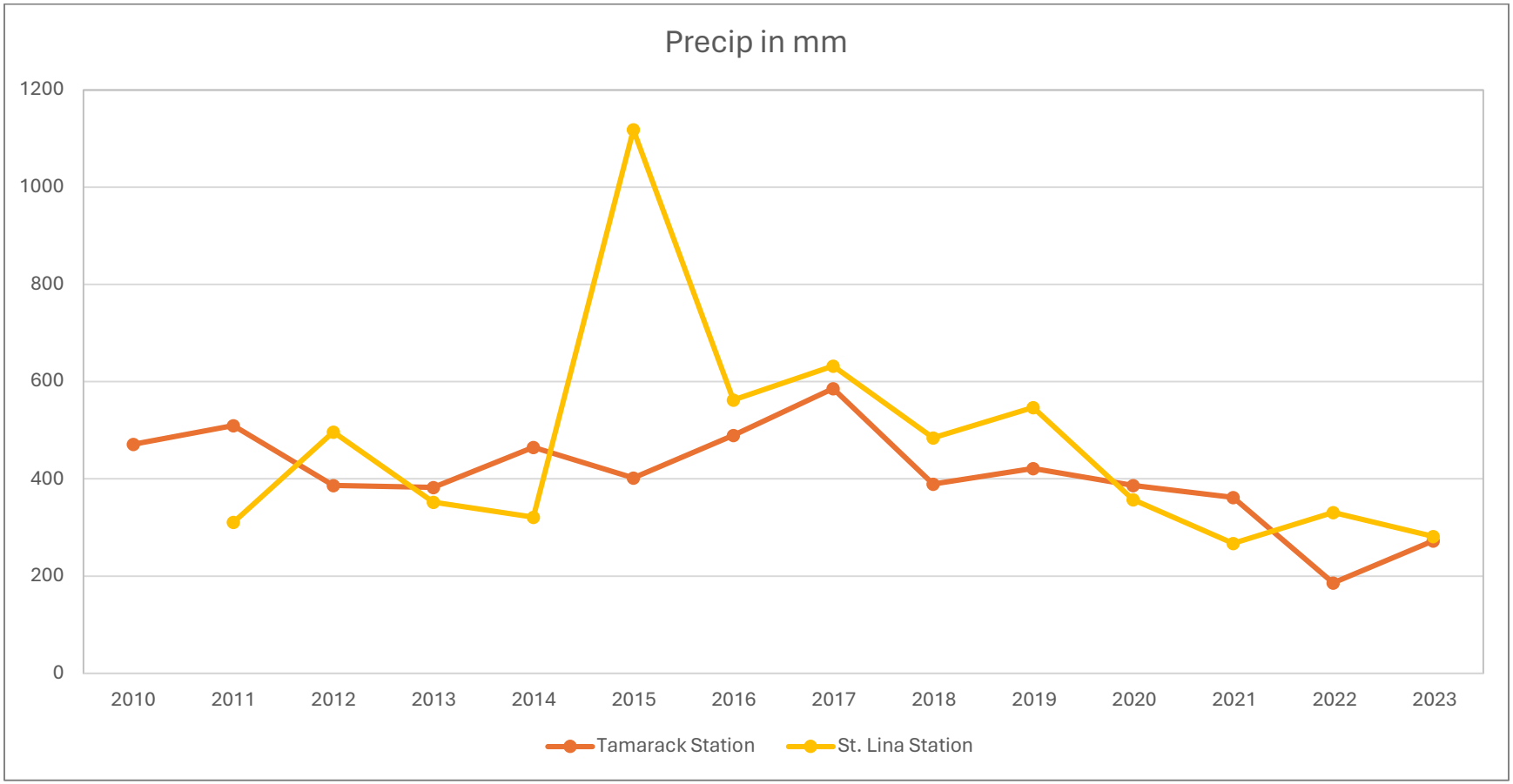
2.13 Barometric Pressure (BP)



2.14 Ambient Temperature (AT)

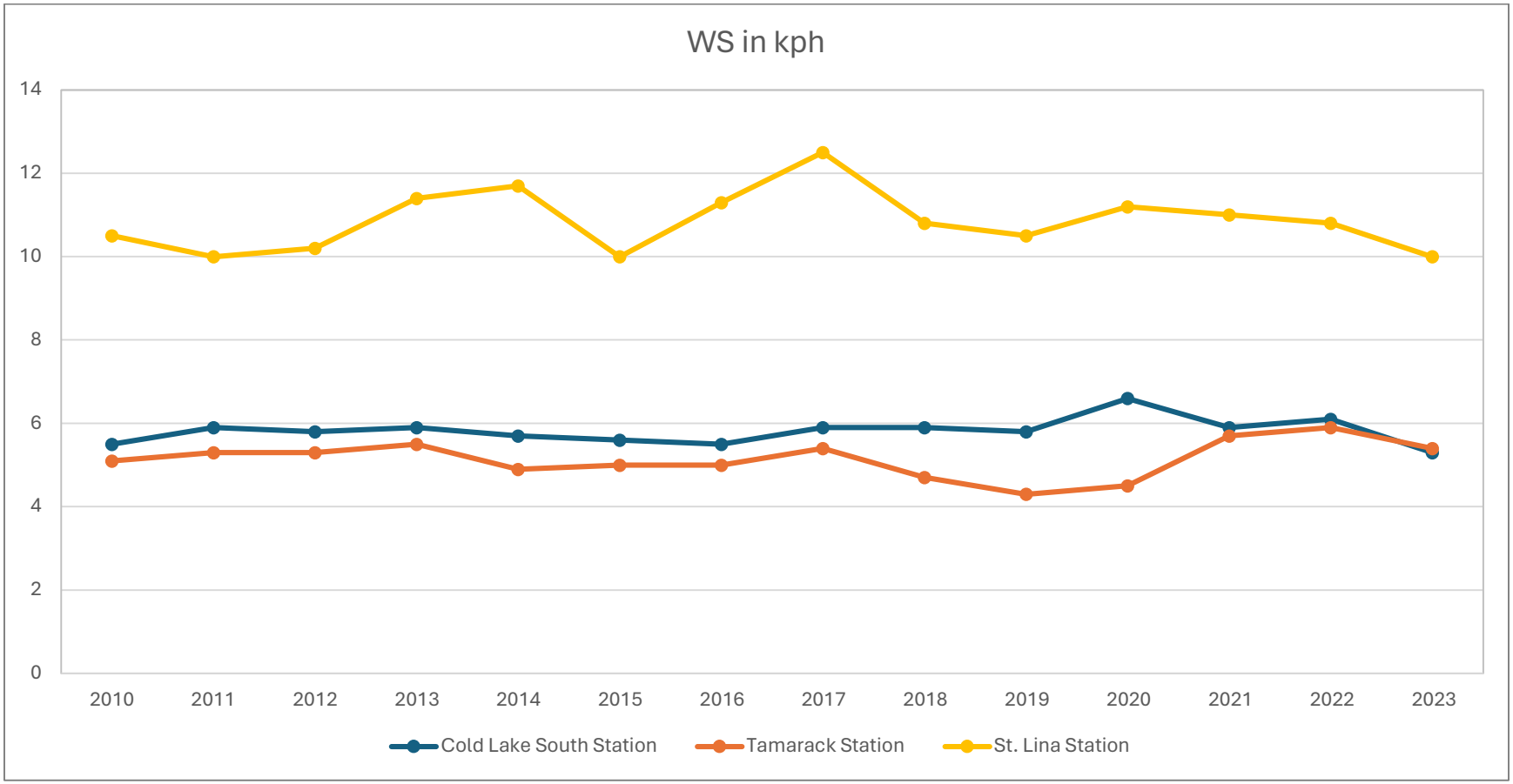


2.15 Precipitation (Precip)

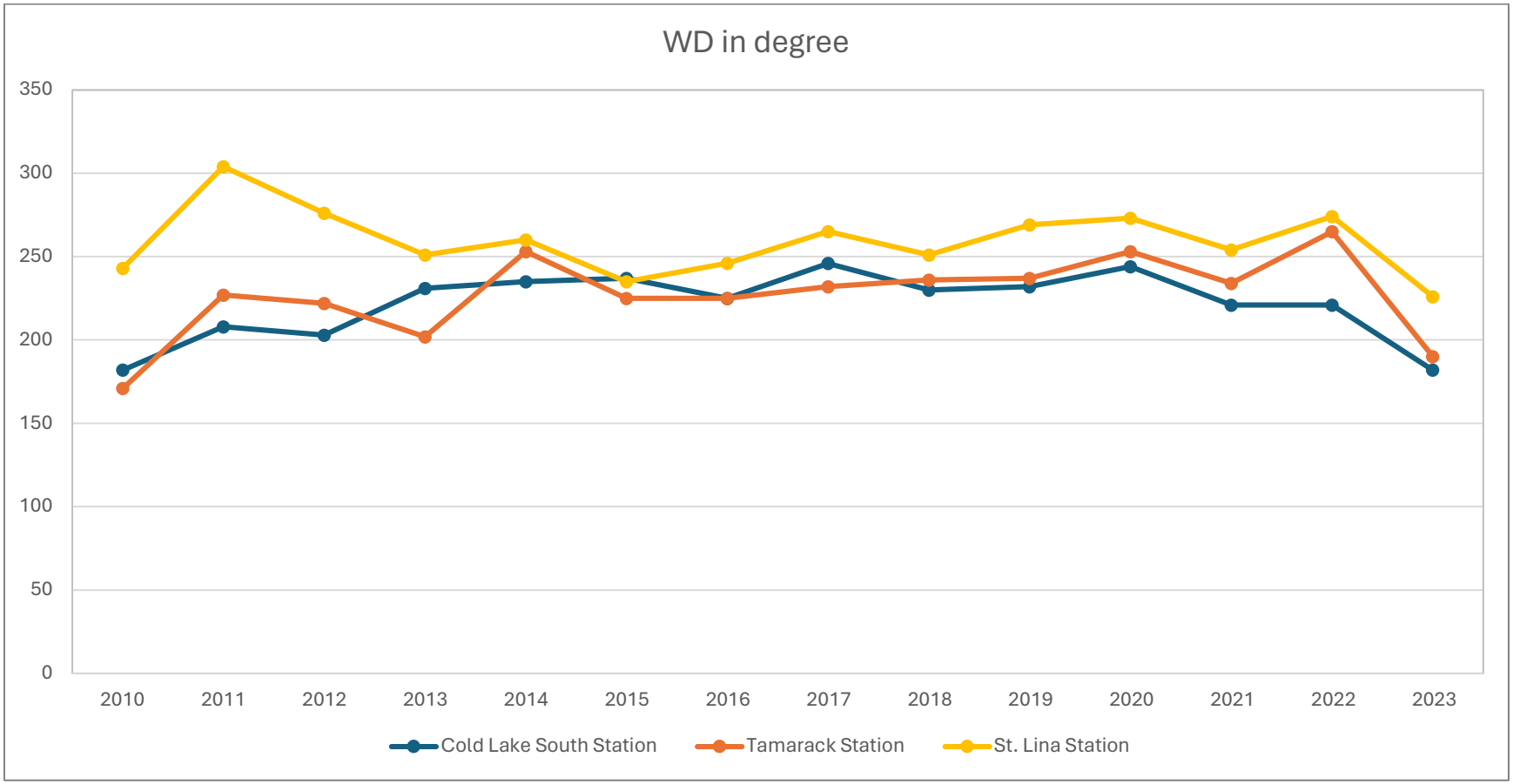


Note: Total amount in a year is reported instead of annual average.

2.16 Vector Wind Speed (WS)



2.17 Vector Wind Direction (WD)



3.0 Integrated Monitoring Statistics Summaries– 2023

3.1 Passive Sampling System

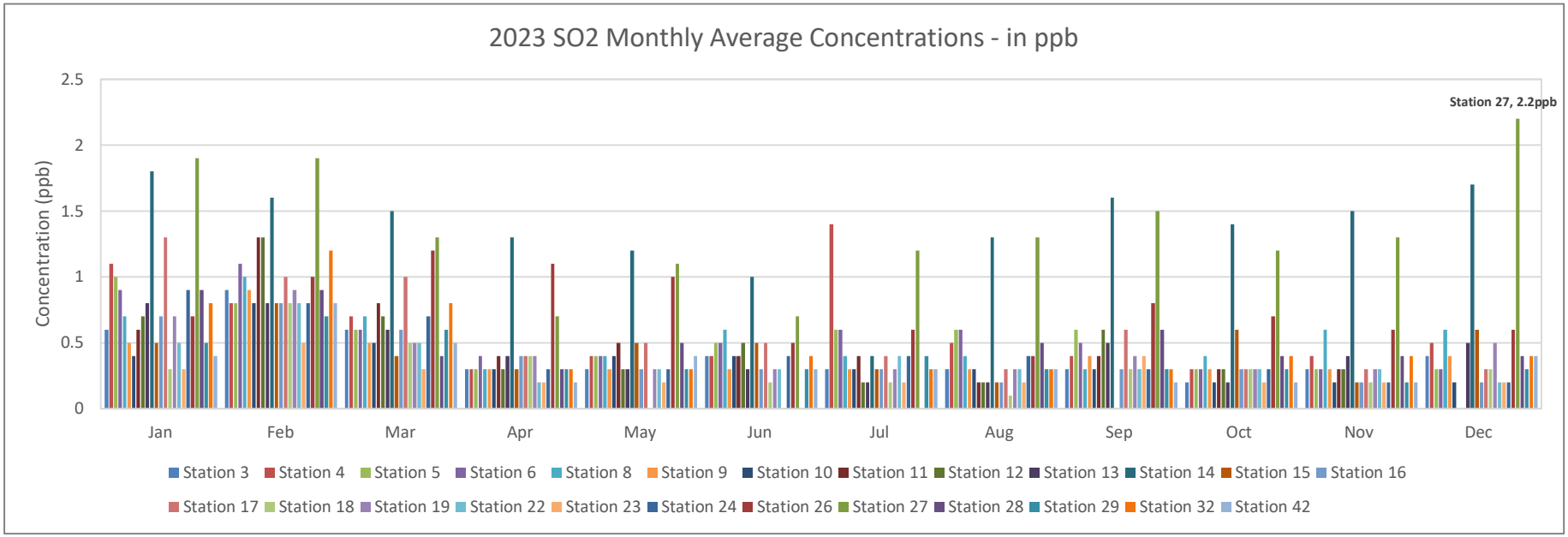
3.1.1 Sulphur Dioxide (SO_2)

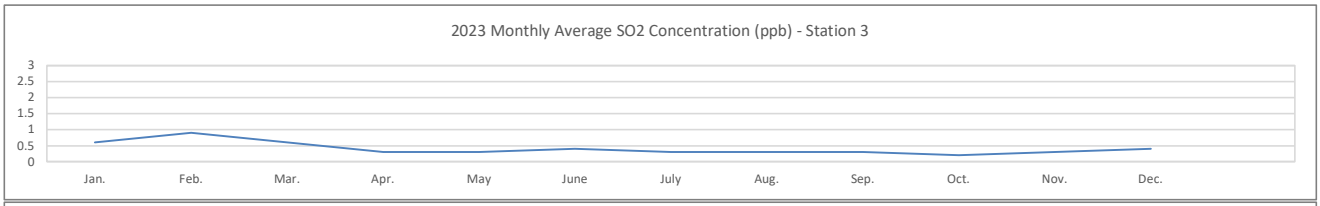
Station	Annual Average	Maximum	Month	Minimum	Month	# of Samples
3	0.4	0.9	February	0.2	October	12
3 DUP	0.4	0.4	-	0.3	-	2
4	0.6	1.4	July	0.3	April	12
4 DUP	0.2	0.2	-	0.2	-	1
5	0.5	1.0	January	0.3	April	12
5 DUP	0.4	0.4	-	0.4	-	1
6	0.5	1.1	February	0.3	October	12
6 DUP	0.4	0.4	-	0.4	-	1
8	0.5	1.0	February	0.3	April	12
8 DUP	0.4	0.4	-	0.4	-	1
9	0.4	0.9	February	0.3	April	12
9 DUP	0.3	0.3	-	0.3	-	1
10	0.4	0.8	February	0.2	October	12
10 DUP	0.4	0.4	-	0.4	-	1
11	0.5	1.3	February	0.2	August	11
11 DUP	0.3	0.3	-	0.3	-	1
12	0.5	1.3	February	0.2	July	11
12 DUP	0.3	0.3	-	0.3	-	1
13	0.4	0.8	January	0.2	July	12
13 DUP	0.2	0.2	-	0.2	-	1
14	1.4	1.8	January	0.4	July	12
14 DUP	0.4	0.4	-	0.4	-	1
15	0.4	0.8	February	0.2	August	11
15 DUP	0.2	0.2	-	0.2	-	1
16	0.4	0.8	February	0.2	August	12
16 DUP	0.3	0.3	-	0.3	-	1
17	0.6	1.3	January	0.3	August	12
17 DUP	0.4	0.4	-	0.4	-	1
18	0.3	0.8	February	0.1	August	11
18 DUP	0.4	0.4	-	0.4	-	1
19	0.4	0.9	February	0.3	May	12
19 DUP	0.5	0.6	-	0.3	-	2
22	0.4	0.8	February	0.2	April	12
22 DUP	0.4	0.5	-	0.3	-	2
23	0.3	0.5	February	0.2	April	11
23 DUP	0.3	0.3	-	0.2	-	2
24	0.4	0.9	January	0.2	November	12
24 DUP	0.6	0.8	-	0.3	-	2
25	NA	NA	NA	NA	NA	NA
25DUP	NA	NA	-	NA	-	0
26	0.8	1.2	March	0.4	August	12
26 DUP	0.9	1.0	-	0.8	-	2
27	1.4	2.2	December	0.7	April	12
27 DUP	1.6	1.7	-	1.4	-	2

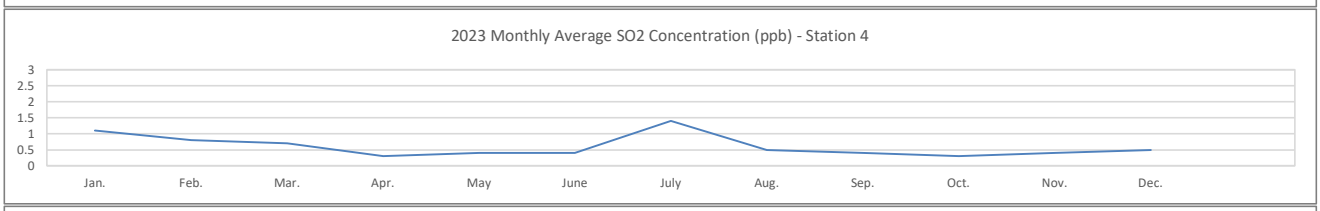
Station	Annual Average	Maximum	Month	Minimum	Month	# of Samples
28	0.5	0.9	January	0.3	April	10
28 DUP	0.3	0.4	-	0.2	-	2
29	0.4	0.7	February	0.2	November	12
29 DUP	0.3	0.4	-	0.2	-	2
32	0.5	1.2	February	0.3	April	12
32 DUP	0.5	0.6	-	0.4	-	2
42	0.4	0.8	February	0.2	April	12
42 DUP	0.4	0.5	-	0.2	-	2

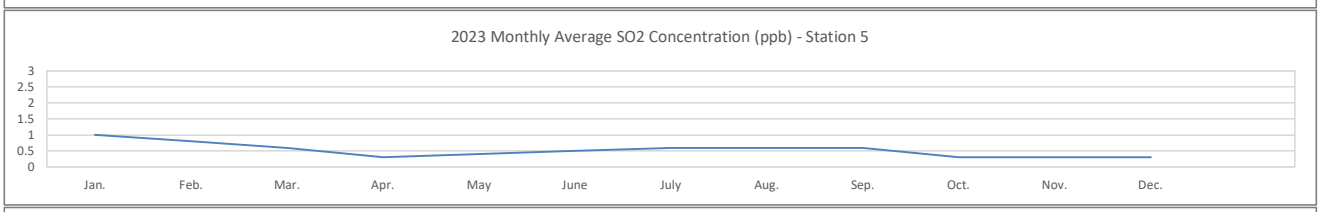
Notes:

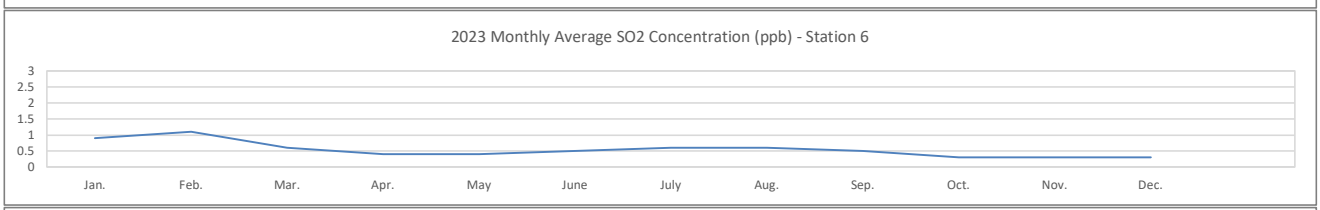
- Concentration unit: ppb
- Results from passive samples and their duplicates were compared; all data were ± 0.2 ppb of each other throughout the year.
- The sample blanks indicated no apparent contamination throughout the year, except station 15 in September. Analytical result came out lower than expected, which indicated potential errors during sample collections or lab errors. In order to maintain the meaningful historical data trend, analytical result was excluded from the historical data analysis.
- 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.
- Analytical results for station 11 in December, station 12 in December, station 18 in May, station 23 in June and station 28 in June and June were not available because sample filters either got damaged or were missing or the access to the station was not available during the sample media exchange.

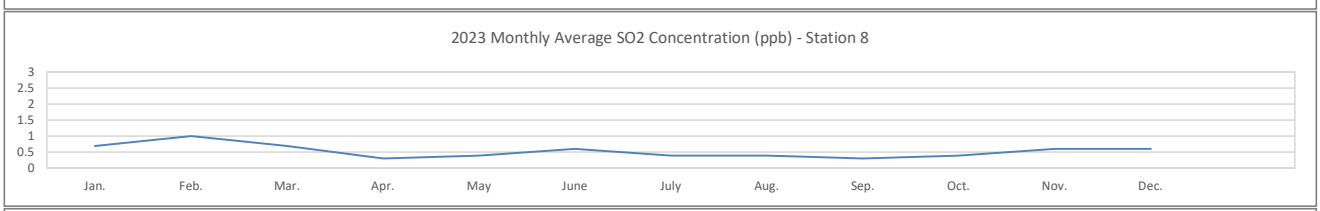

2023 SO2 Monthly Average Concentrations - in ppb
Concentration (ppb)
2.5
2
1.5
1
0.5
0
Station 27, 2.2ppb
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Station 3
Station 4
Station 5
Station 6
Station 8
Station 9
Station 10
Station 11
Station 12
Station 13
Station 14
Station 15
Station 16
Station 17
Station 18
Station 19
Station 22
Station 23
Station 24
Station 26
Station 27
Station 28
Station 29
Station 32
Station 42

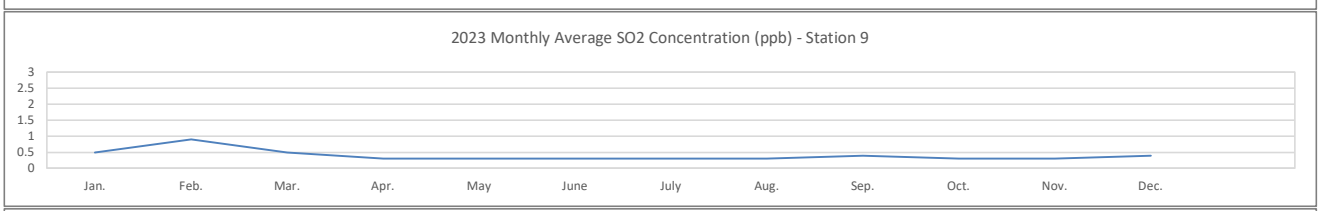

2023 Monthly Average SO2 Concentration (ppb) - Station 3
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

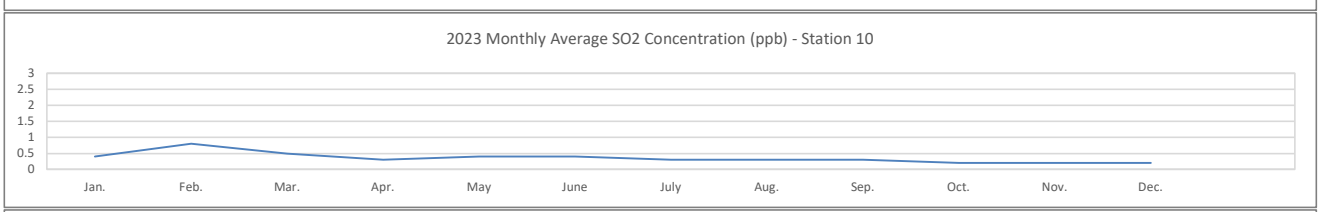

2023 Monthly Average SO2 Concentration (ppb) - Station 4
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

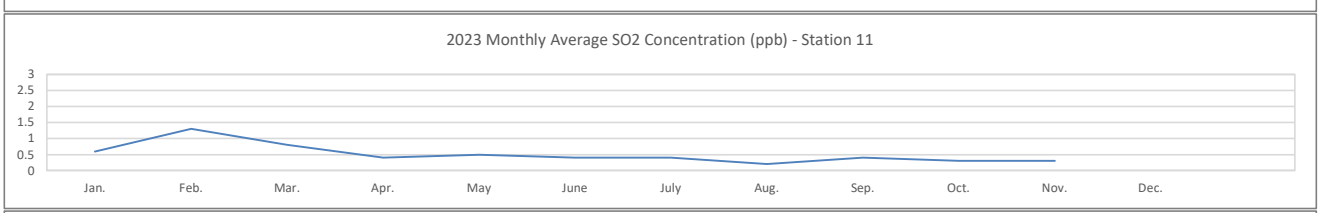

2023 Monthly Average SO2 Concentration (ppb) - Station 5
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

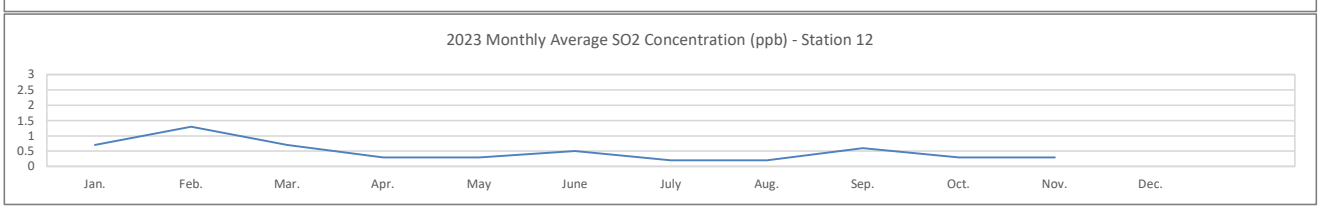

2023 Monthly Average SO2 Concentration (ppb) - Station 6
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

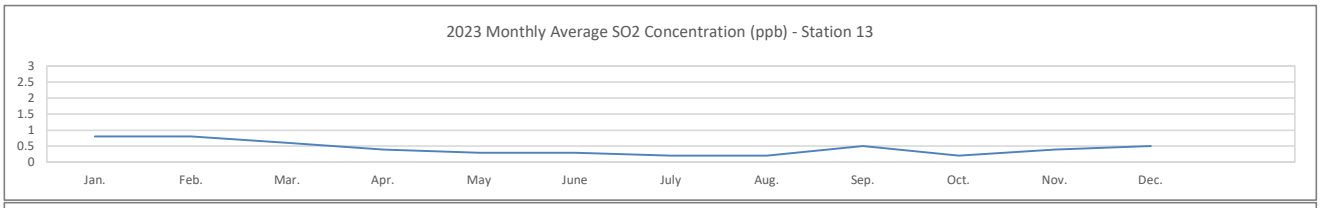

2023 Monthly Average SO2 Concentration (ppb) - Station 8
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

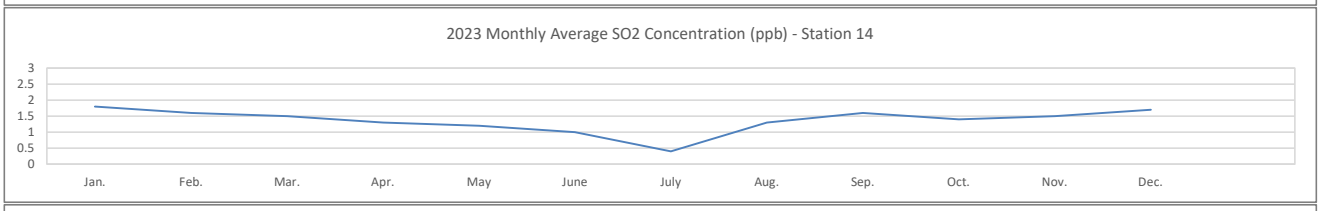

2023 Monthly Average SO2 Concentration (ppb) - Station 9
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

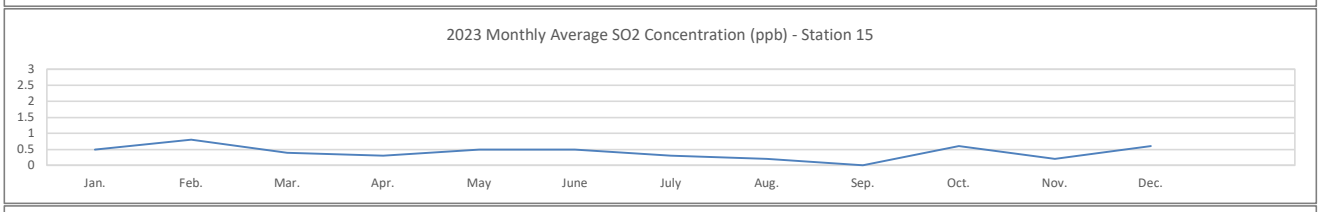

2023 Monthly Average SO2 Concentration (ppb) - Station 10
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

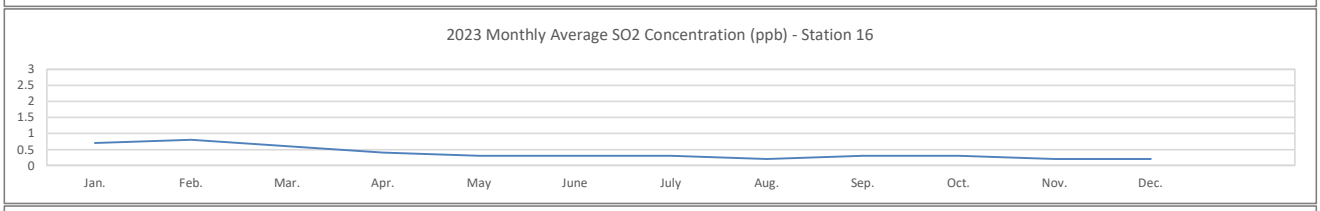

2023 Monthly Average SO2 Concentration (ppb) - Station 11
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

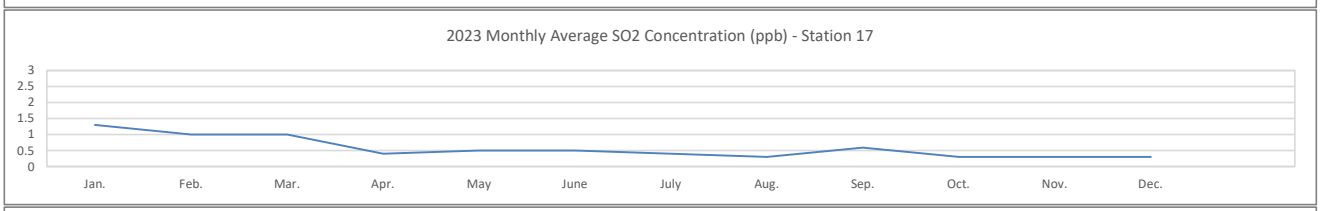

2023 Monthly Average SO2 Concentration (ppb) - Station 12
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

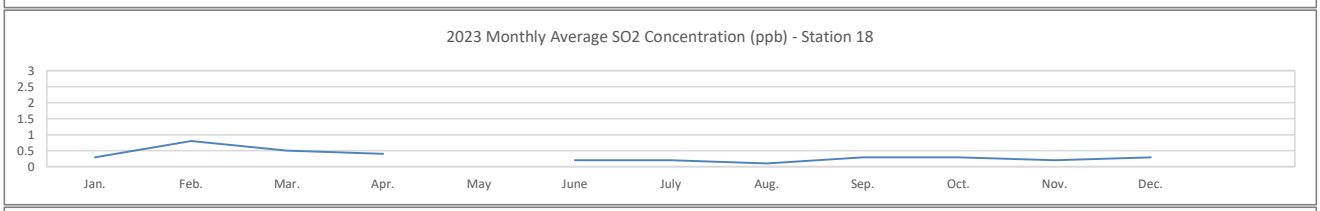

2023 Monthly Average SO2 Concentration (ppb) - Station 13
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

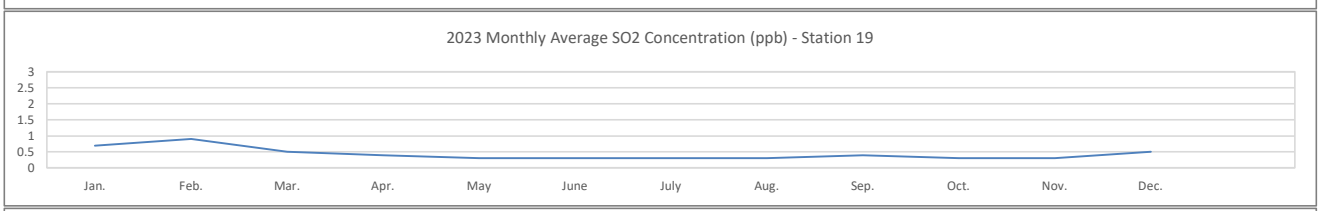

2023 Monthly Average SO2 Concentration (ppb) - Station 14
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

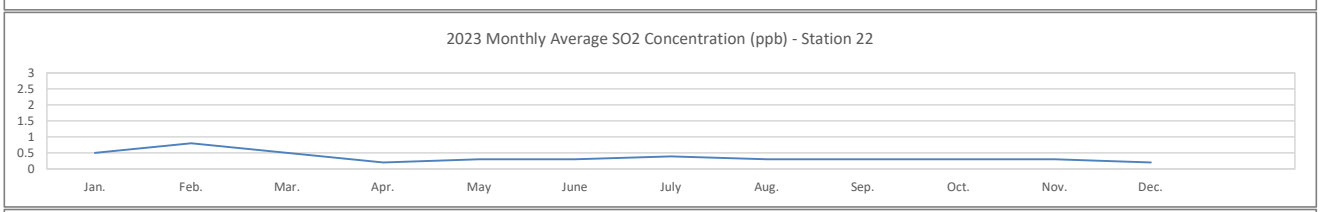

2023 Monthly Average SO2 Concentration (ppb) - Station 15
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

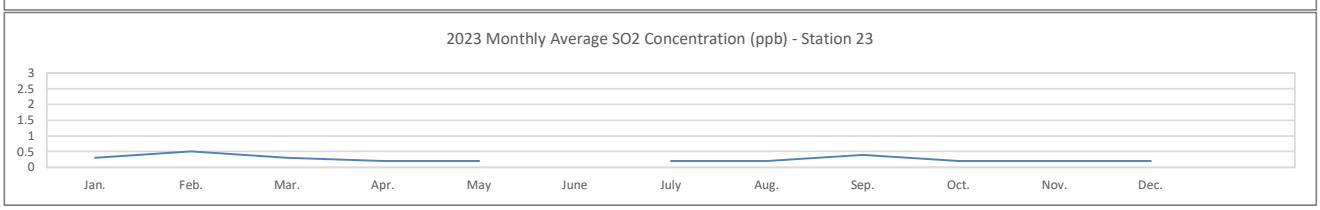

2023 Monthly Average SO2 Concentration (ppb) - Station 16
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

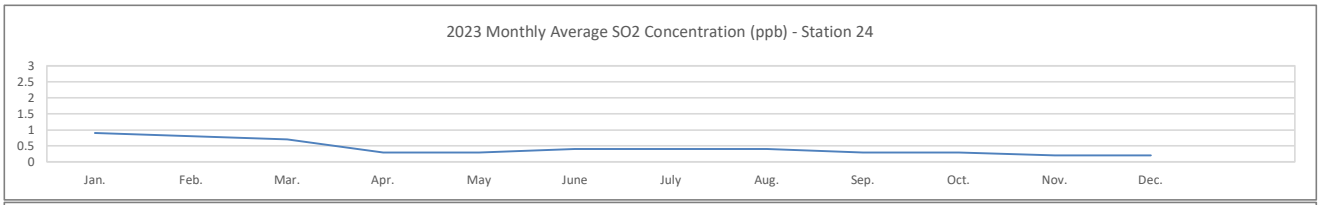

2023 Monthly Average SO2 Concentration (ppb) - Station 17
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

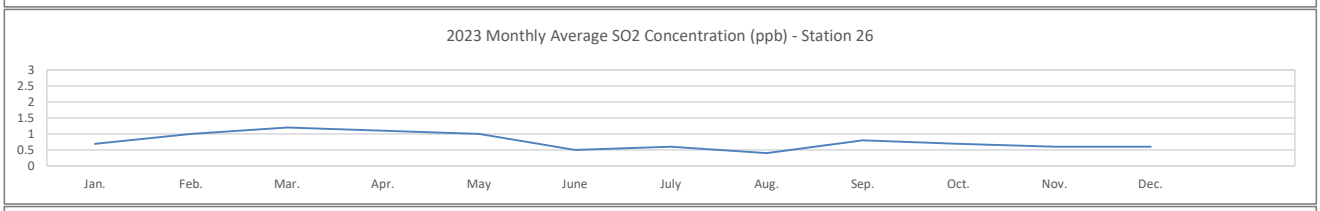

2023 Monthly Average SO2 Concentration (ppb) - Station 18
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

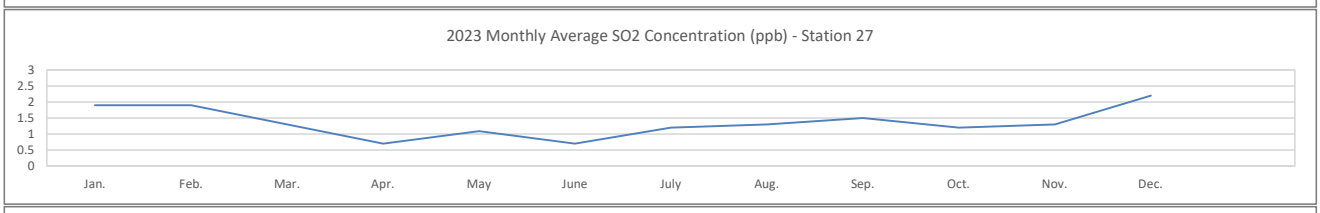

2023 Monthly Average SO2 Concentration (ppb) - Station 19
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

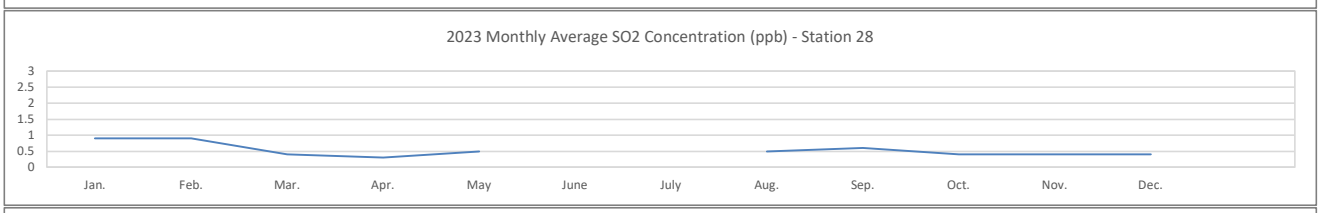

2023 Monthly Average SO2 Concentration (ppb) - Station 22
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

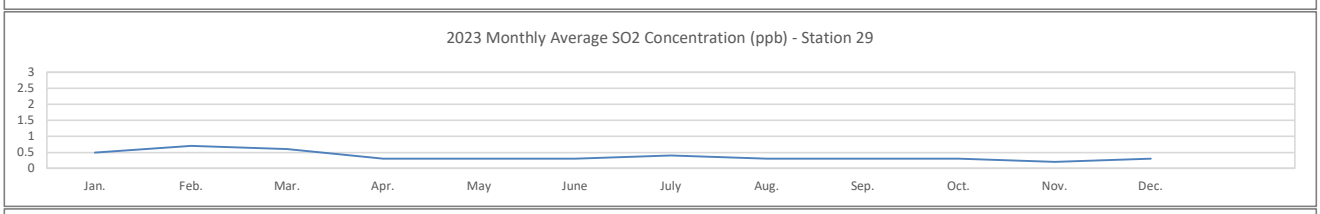

2023 Monthly Average SO2 Concentration (ppb) - Station 23
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

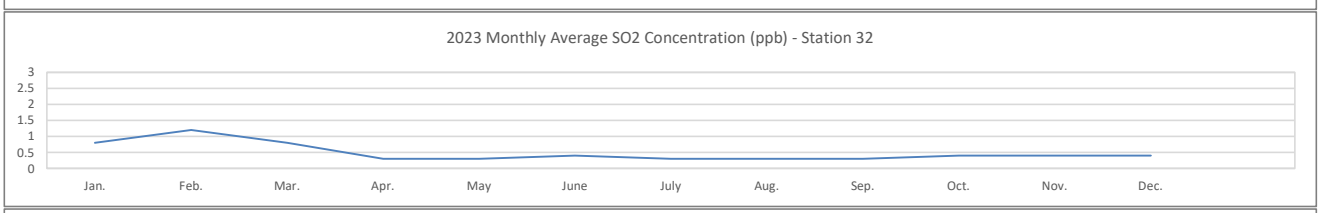

2023 Monthly Average SO2 Concentration (ppb) - Station 24
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

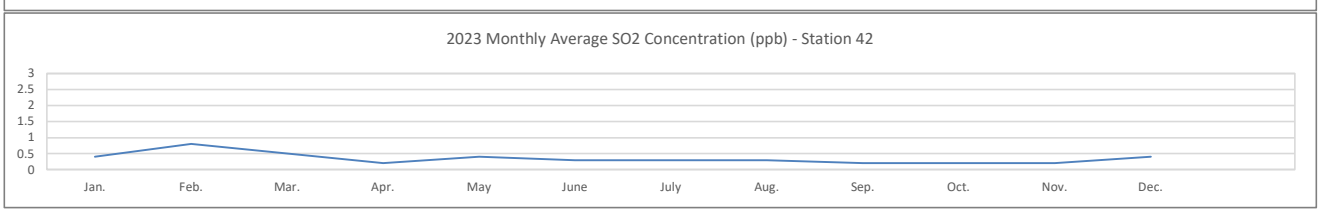

2023 Monthly Average SO2 Concentration (ppb) - Station 26
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

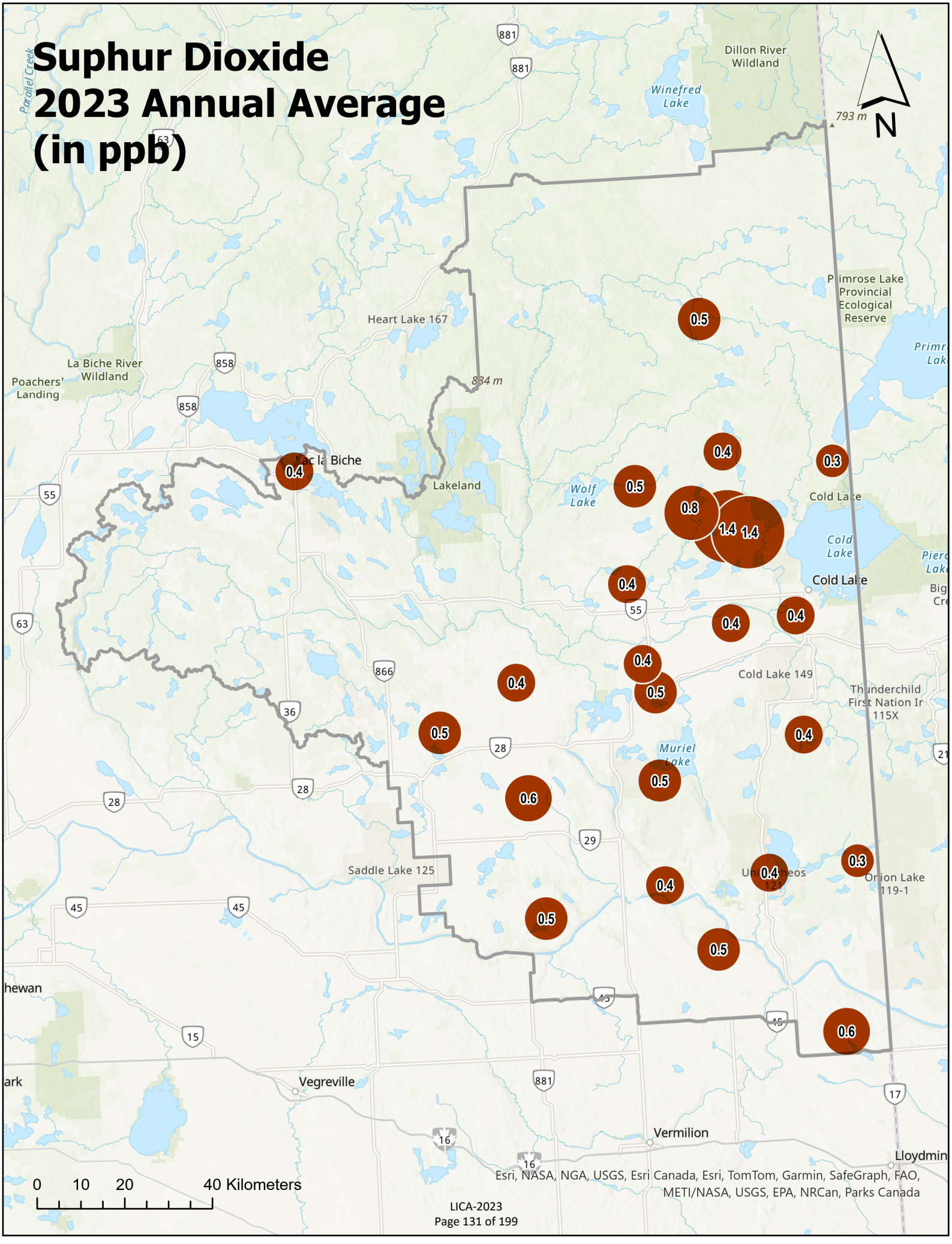

2023 Monthly Average SO2 Concentration (ppb) - Station 27
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average SO2 Concentration (ppb) - Station 28
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average SO2 Concentration (ppb) - Station 29
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average SO2 Concentration (ppb) - Station 32
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average SO2 Concentration (ppb) - Station 42
3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


Suphur Dioxide
2023 Annual Average
(in ppb)
N
Dillon River Wildland
Winefred Lake
793 m
Primrose Lake Provincial Ecological Reserve
Heart Lake 167
834 m
La Biche River Wildland
Poachers' Landing
Lac la Biche
Lakeland
Wolf Lake
Cold Lake
Cold Lake
Cold Lake 149
Thunderchild First Nation Ir 115X
Muriel Lake
Orion Lake 119-1
Saddle Lake 125
Vegreville
Vermilion
Lloydmin
0.4
0.3
0.5
0.8
1.4
1.4
0.4
0.4
0.4
0.4
0.5
0.5
0.4
0.5
0.6
0.4
0.4
0.3
0.5
0.5
0.6
0 10 20 40 Kilometers
Esri, NASA, NGA, USGS, Esri Canada, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NRCan, Parks Canada

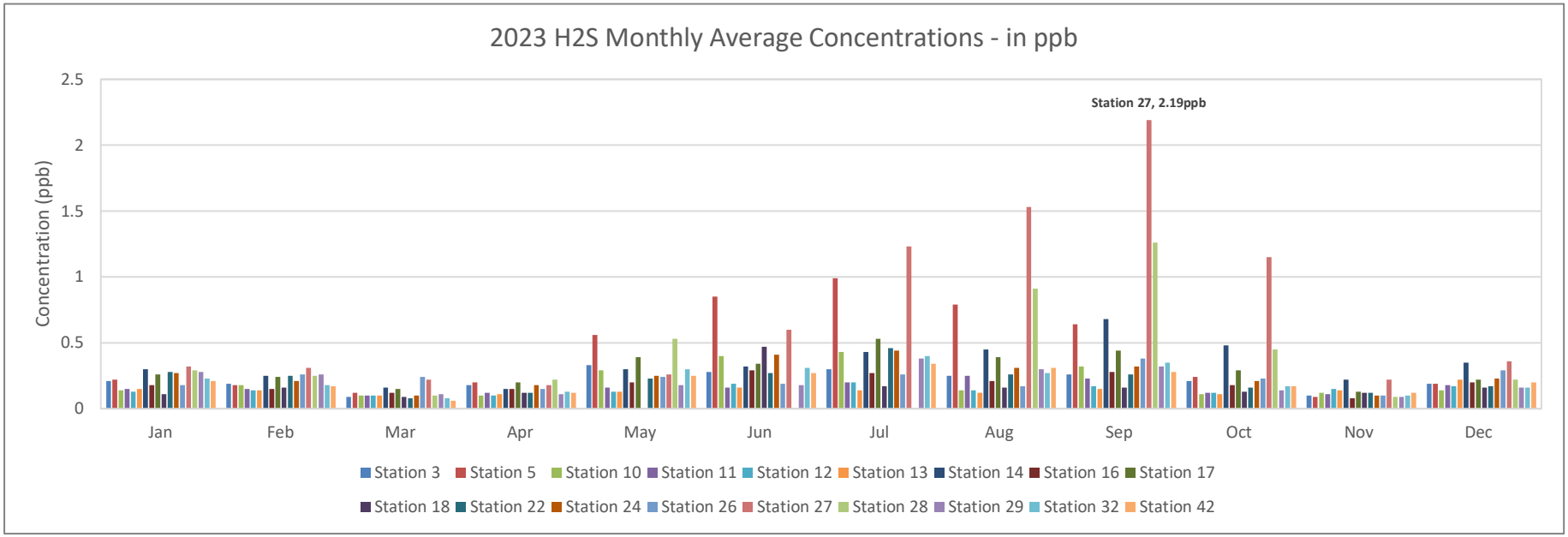
3.1.2 Hydrogen Sulphide (H_2S)

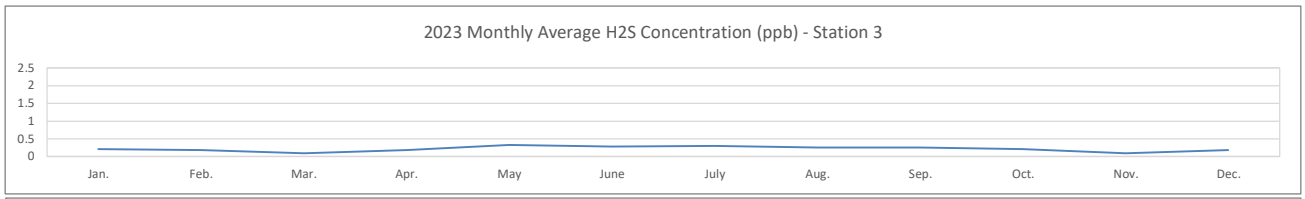
Station	Annual Average	Maximum	Month	Minimum	Month	# of Samples
3	0.22	0.33	May	0.09	March	12
3 DUP	0.13	0.13	-	0.13	-	1
5	0.42	0.99	July	0.09	November	12
5 DUP	0.18	0.18	-	0.18	-	1
10	0.21	0.43	July	0.10	March	12
10 DUP	0.33	0.33	-	0.33	-	1
11	0.16	0.25	August	0.10	March	12
11 DUP	0.15	0.15	-	0.15	-	1
12	0.15	0.20	July	0.10	March	12
12 DUP	0.15	0.15	-	0.15	-	1
13	0.14	0.22	December	0.10	March	12
13 DUP	0.16	0.16	-	0.16	-	1
14	0.34	0.68	September	0.15	April	12
14 DUP	0.46	0.46	-	0.46	-	1
16	0.19	0.29	June	0.08	November	12
16 DUP	0.29	0.29	-	0.29	-	1
17	0.30	0.53	July	0.13	November	12
17 DUP	0.55	0.55	-	0.55	-	1
18	0.17	0.47	June	0.09	March	11
18 DUP	0.14	0.14	-	0.14	-	1
22	0.22	0.46	July	0.08	March	12
22 DUP	0.26	0.26	-	0.26	-	1
24	0.25	0.44	July	0.10	March	12
24 DUP	0.37	0.37	-	0.37	-	1
25	NA	NA	-	NA	-	0
25 DUP	NA	NA	-	NA	-	0
26	0.22	0.38	September	0.10	November	12
26 DUP	0.18	0.18	-	0.18	-	1
27	0.71	2.19	September	0.18	April	12
27 DUP	0.82	1.34	-	0.30	-	2
28	0.43	1.26	September	0.09	November	10
28 DUP			-		-	0
29	0.21	0.38	July	0.09	November	12
29 DUP	0.16	0.23	-	0.08	-	2
32	0.22	0.40	July	0.08	March	12
32 DUP	0.16	0.23	-	0.09	-	2
42	0.21	0.34	July	0.06	March	12
42 DUP	0.14	0.19	-	0.09	-	2

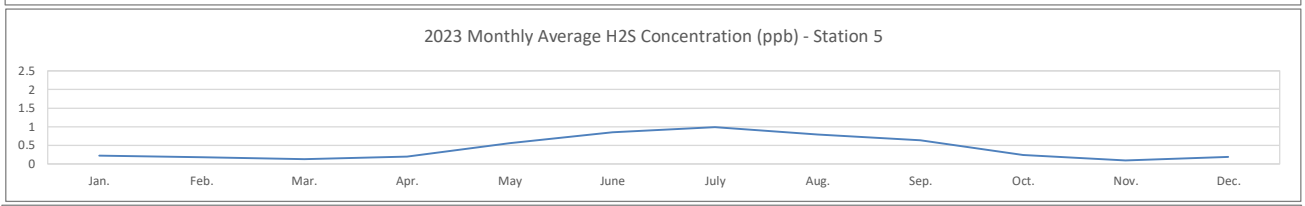
Notes:

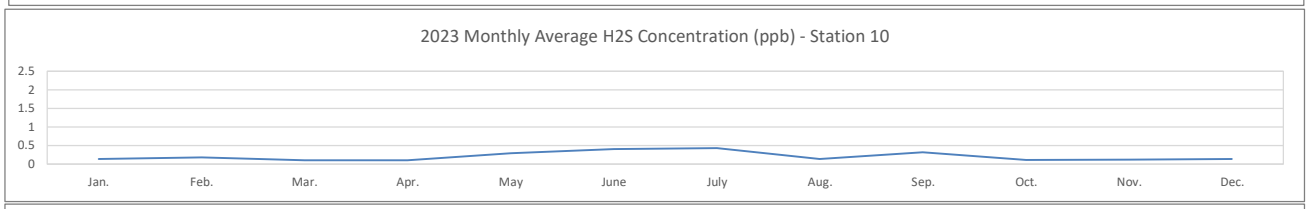
- Concentration unit: ppb
- Results from passive samples and their duplicates were compared; all data were ± 0.19 ppb of each other throughout the year.
- The sample blanks indicated no apparent contamination throughout the year.
- No samples were collected at station 25 throughout the year. The field technician has not completed the necessary safety orientation for the CNRL Primrose/Burnt Lake site and access is not permitted at this time.

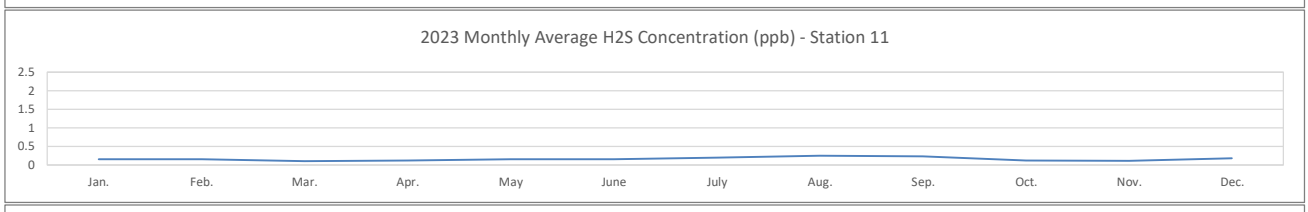
- Analytical results for station 18 in May, station 23 in June and station 28 in June and June were not available because sample filters either got damaged or were missing or the access to the station was not available during the sample media exchange.

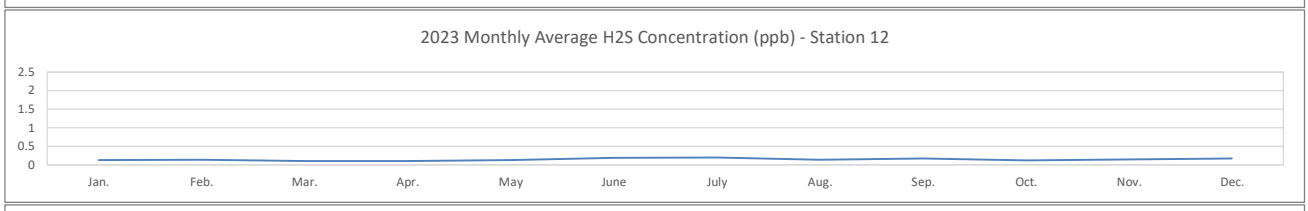

2023 H2S Monthly Average Concentrations - in ppb
Concentration (ppb)
2.5
2
1.5
1
0.5
0
Station 27, 2.19ppb
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Station 3
Station 5
Station 10
Station 11
Station 12
Station 13
Station 14
Station 16
Station 17
Station 18
Station 22
Station 24
Station 26
Station 27
Station 28
Station 29
Station 32
Station 42

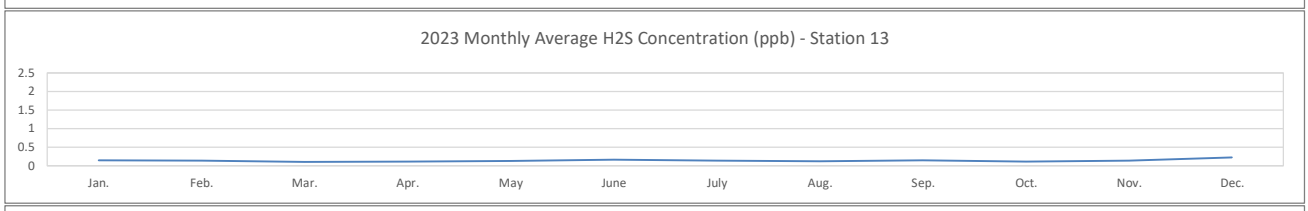

2023 Monthly Average H2S Concentration (ppb) - Station 3
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

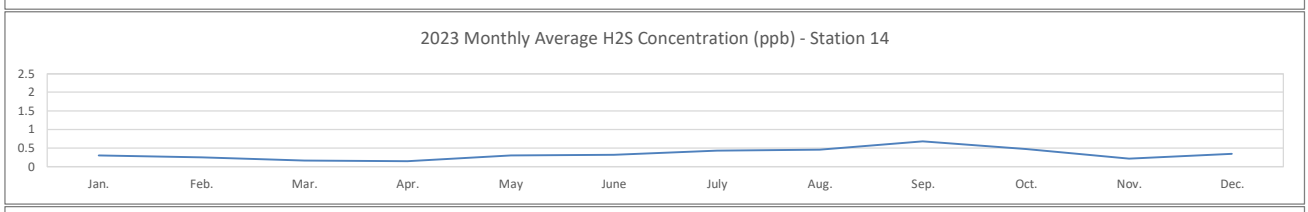

2023 Monthly Average H2S Concentration (ppb) - Station 5
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

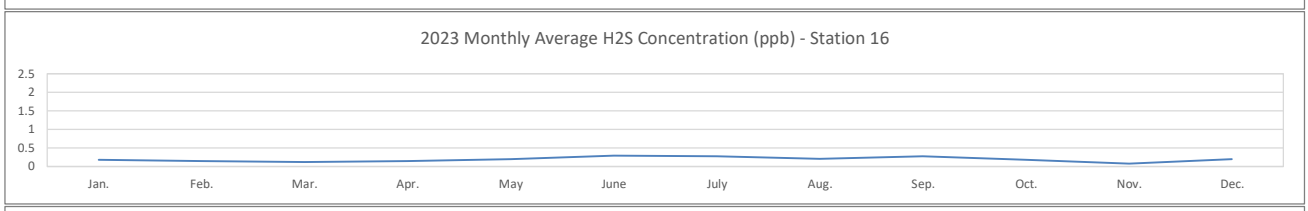

2023 Monthly Average H2S Concentration (ppb) - Station 10
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

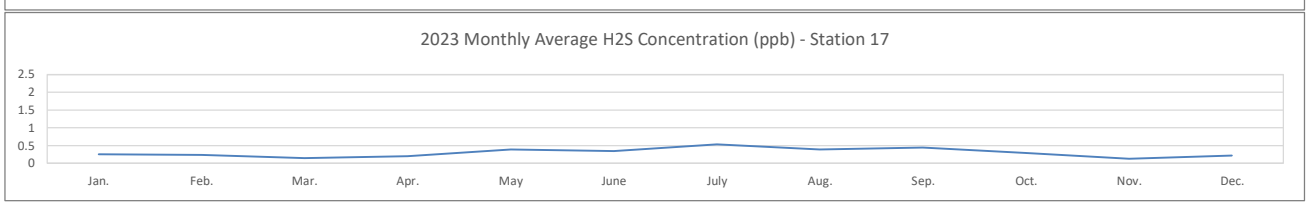

2023 Monthly Average H2S Concentration (ppb) - Station 11
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

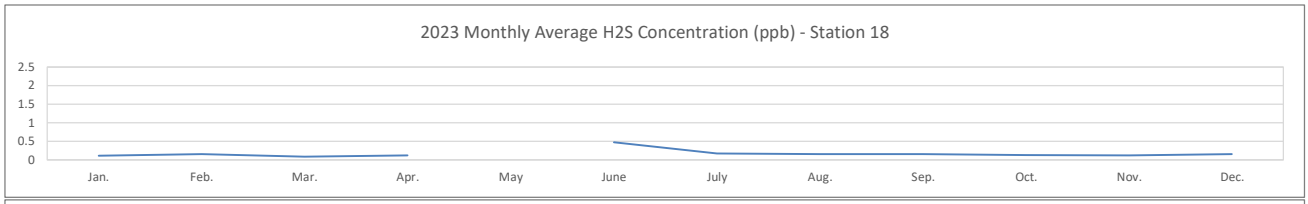

2023 Monthly Average H2S Concentration (ppb) - Station 12
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

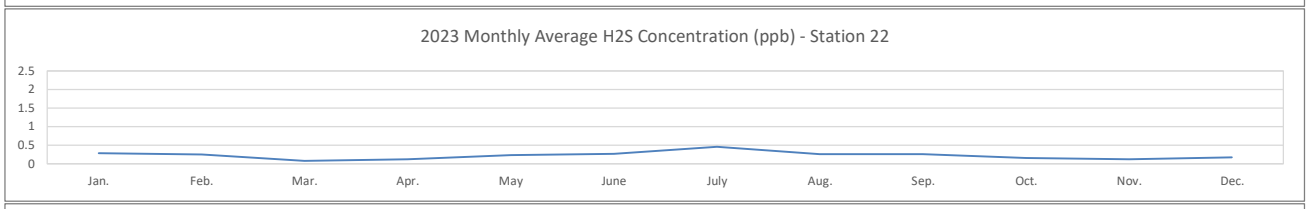

2023 Monthly Average H2S Concentration (ppb) - Station 13
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

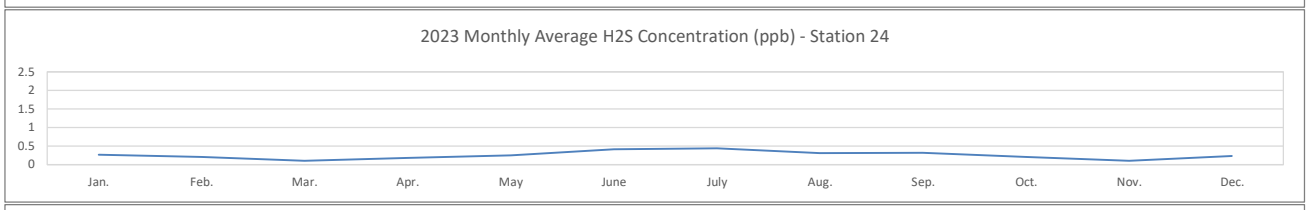

2023 Monthly Average H2S Concentration (ppb) - Station 14
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

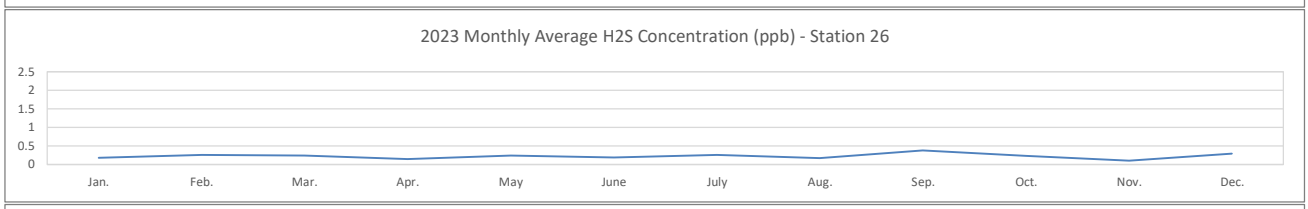

2023 Monthly Average H2S Concentration (ppb) - Station 16
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

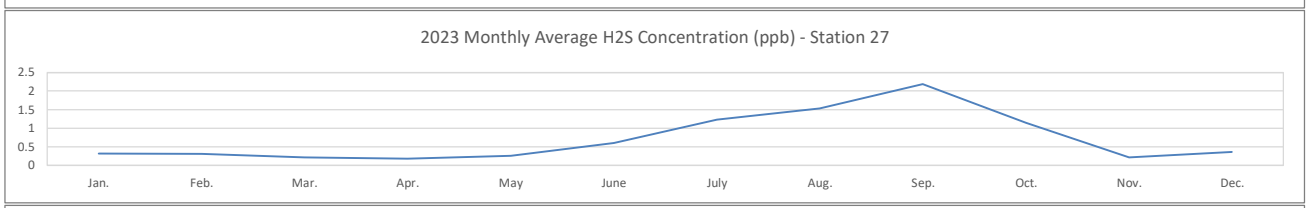

2023 Monthly Average H2S Concentration (ppb) - Station 17
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

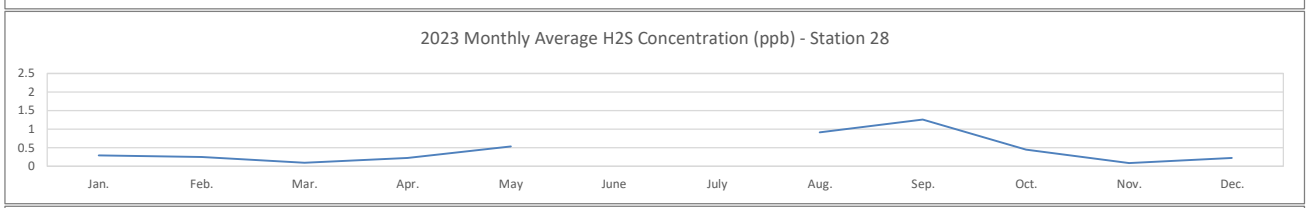

2023 Monthly Average H2S Concentration (ppb) - Station 18
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

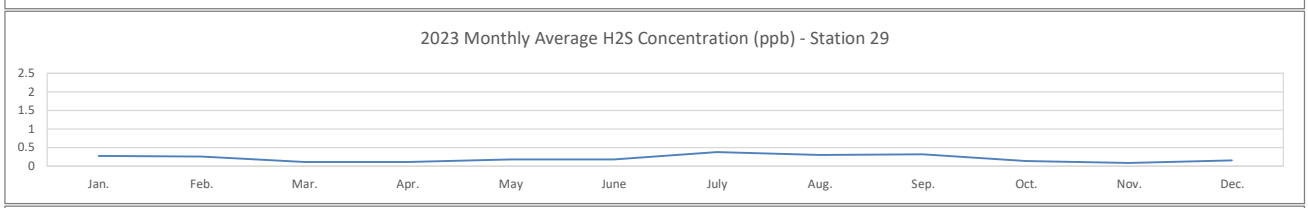

2023 Monthly Average H2S Concentration (ppb) - Station 22
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

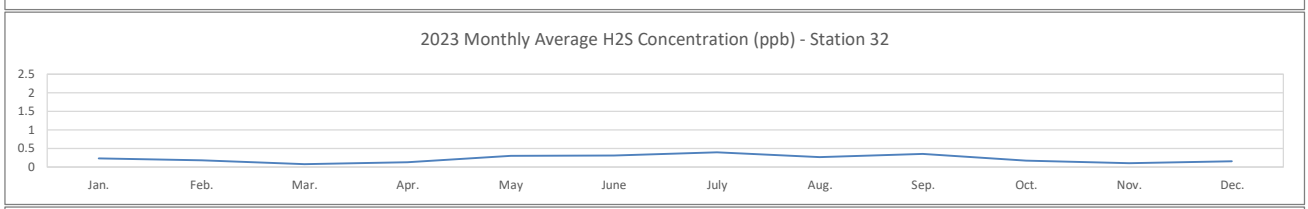

2023 Monthly Average H2S Concentration (ppb) - Station 24
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

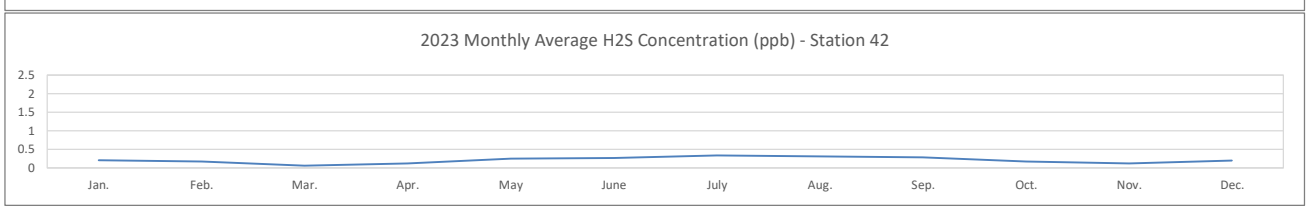

2023 Monthly Average H2S Concentration (ppb) - Station 26
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average H2S Concentration (ppb) - Station 27
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

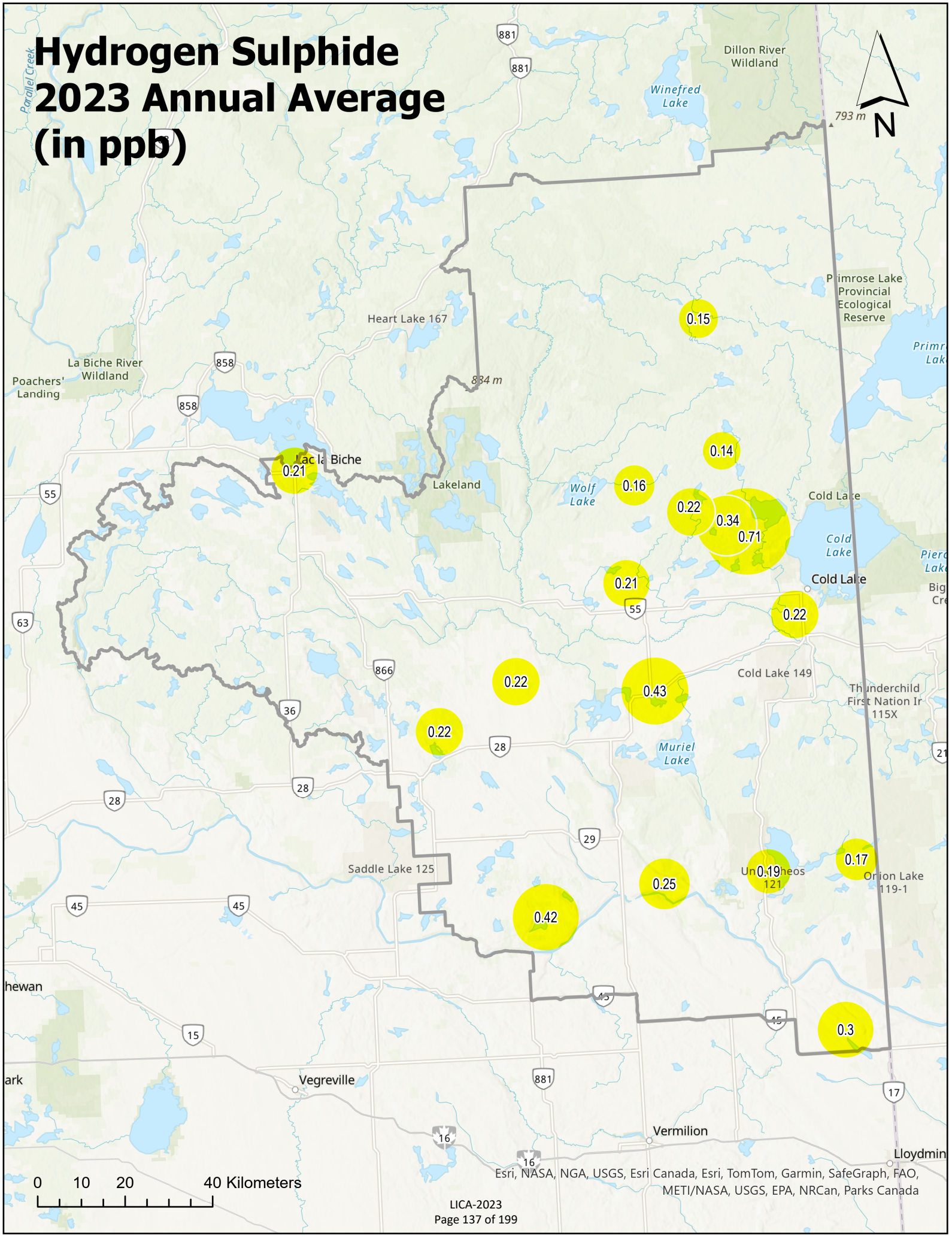

2023 Monthly Average H2S Concentration (ppb) - Station 28
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average H2S Concentration (ppb) - Station 29
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average H2S Concentration (ppb) - Station 32
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average H2S Concentration (ppb) - Station 42
2.5
2
1.5
1
0.5
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

Hydrogen Sulphide 2023 Annual Average (in ppb)

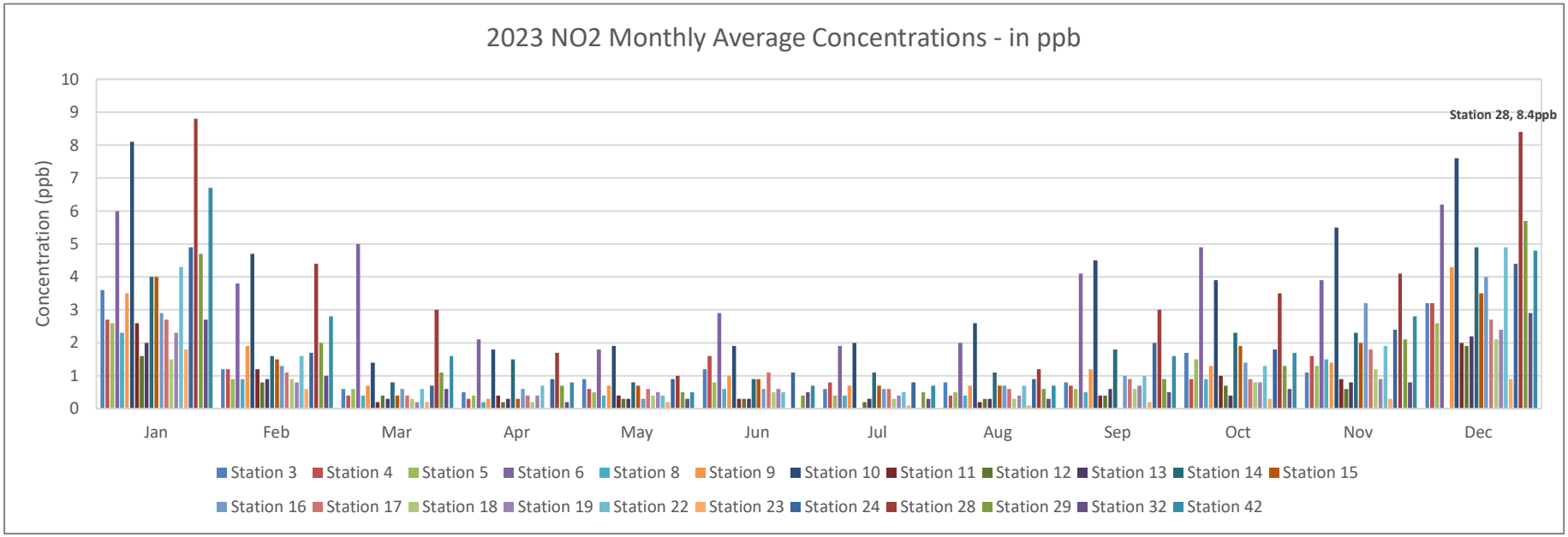


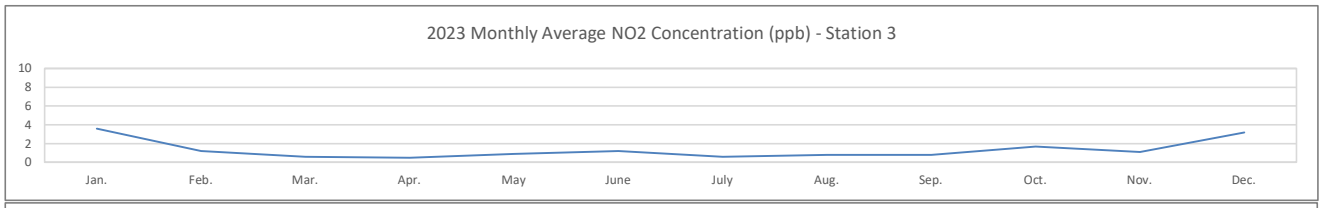
3.1.3 Nitrogen Dioxide (NO_2)

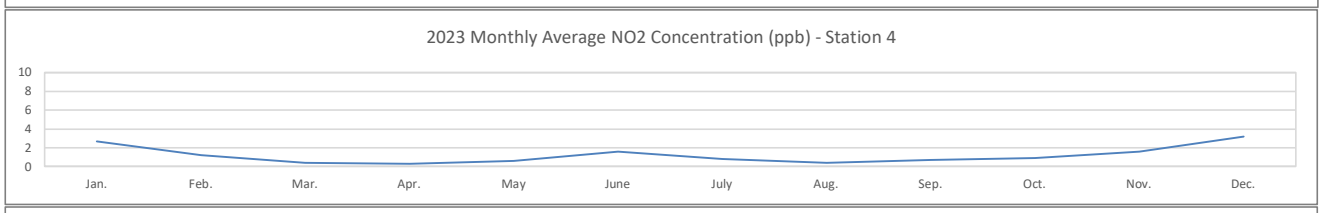
Station	Annual Average	Maximum	Month	Minimum	Month	# of Samples
3	1.4	3.6	January	0.5	April	12
3 DUP	1.8	1.8	-	1.8	-	1
4	1.2	3.2	December	0.3	April	12
4 DUP	-	-	-	-	-	0
5	1.1	2.6	January	0.4	April	12
5 DUP	2.8	2.8	-	2.7	-	2
6	3.7	6.2	December	1.8	May	12
6 DUP	7.1	7.1	-	7.0	-	2
8	0.8	2.3	January	0.2	April	11
8 DUP	0.9	0.9	-	0.9	-	1
9	1.5	4.3	December	0.3	April	12
9 DUP	1.8	1.8	-	1.8	-	1
10	3.8	8.1	January	1.4	March	12
10 DUP	1.7	1.7	-	1.7	-	1
11	0.9	2.6	January	0.2	March	11
11 DUP	0.3	0.3	-	0.3	-	1
12	0.6	1.9	December	0.2	April	12
12 DUP	0.3	0.3	-	0.3	-	1
13	0.7	2.2	December	0.3	March	12
13 DUP	0.5	0.5	-	0.5	-	1
14	1.9	4.9	December	0.8	March	12
14 DUP	0.9	0.9	-	0.9	-	1
15	1.5	4.0	January	0.3	April	11
15 DUP	0.6	0.6	-	0.6	-	1
16	1.4	4.0	December	0.3	May	12
16 DUP	0.5	0.5	-	0.5	-	1
17	1.2	2.7	January	0.4	March	12
17 DUP	1.0	1.0	-	1.0	-	1
18	0.8	2.1	December	0.2	April	12
18 DUP	0.3	0.3	-	0.3	-	1
19	0.9	2.4	December	0.2	March	12
19 DUP	0.5	0.5	-	0.5	-	1
22	1.5	4.9	December	0.4	May	12
22 DUP	0.6	0.6	-	0.6	-	1
23	0.5	1.8	January	0.1	July	12
23 DUP	0.1	0.1	-	0.1	-	1
24	1.9	4.9	January	0.7	March	12
24 DUP	1.9	1.9	-	1.9	-	1
28	3.9	8.8	January	1.0	May	10
28 DUP	2.6	2.6	-	2.6	-	1
29	1.7	5.7	December	0.4	June	12
29 DUP	1.5	1.5	-	1.5	-	1
32	0.9	2.9	December	0.2	April	12
32 DUP	0.6	0.6	-	0.6	-	1
42	2.1	6.7	January	0.5	May	12
42 DUP	3.0	3.0	-	3.0	-	1

Notes:

- Concentration unit: ppb
- Results from passive samples and their duplicates were compared; all data were ± 1.0 ppb of each other throughout the year.
- The sample blanks indicated no apparent contamination throughout the year, except station 15 in September. Analytical result came out lower than expected, which indicated potential errors during sample collections or lab errors. In order to maintain the meaningful historical data trend, analytical result was excluded from the historical data analysis.
- 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.
- Analytical results for station 8 in December, station 11 in July and station 28 in June and June were not available because sample filters either got damaged or were missing or the access to the station was not available during the sample media exchange.


2023 NO2 Monthly Average Concentrations - in ppb
Concentration (ppb)
10
9
8
7
6
5
4
3
2
1
0
Station 28, 8.4ppb
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
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 42


2023 Monthly Average NO2 Concentration (ppb) - Station 3
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NO2 Concentration (ppb) - Station 4
10
8
6
4
2
0
Jan.
Feb.
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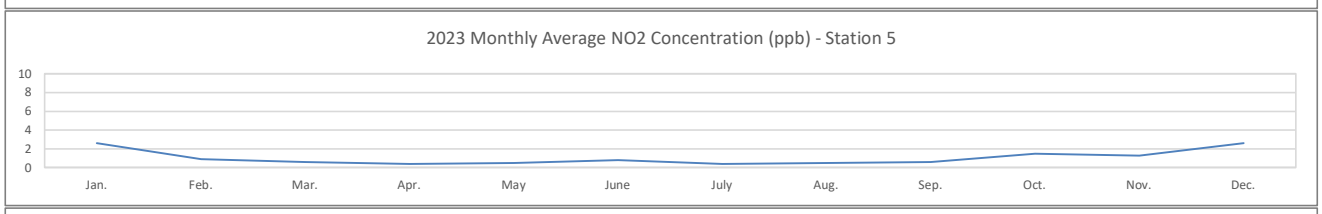
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NO2 Concentration (ppb) - Station 5
10
8
6
4
2
0
Jan.
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May
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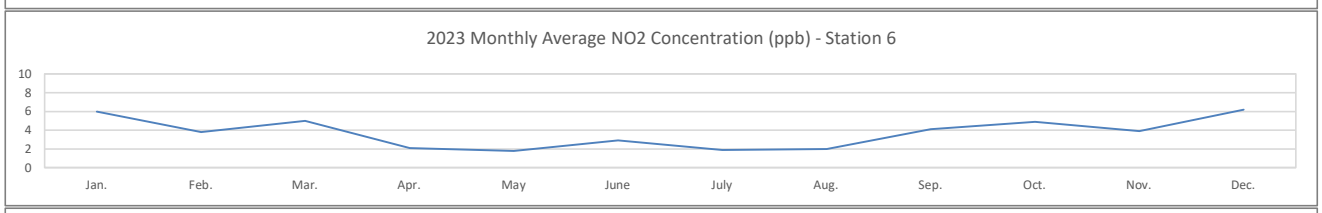
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NO2 Concentration (ppb) - Station 6
10
8
6
4
2
0
Jan.
Feb.
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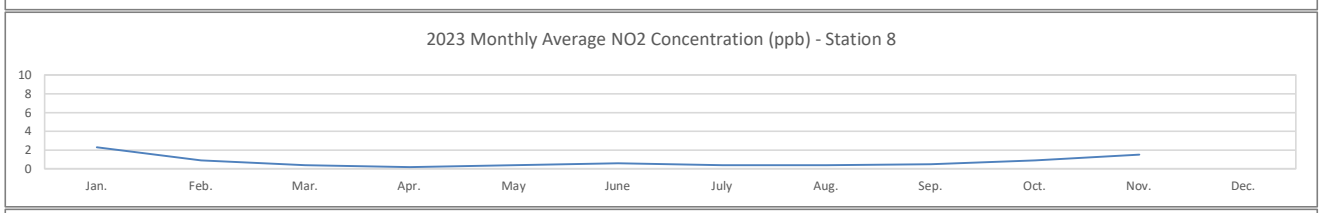
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NO2 Concentration (ppb) - Station 8
10
8
6
4
2
0
Jan.
Feb.
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May
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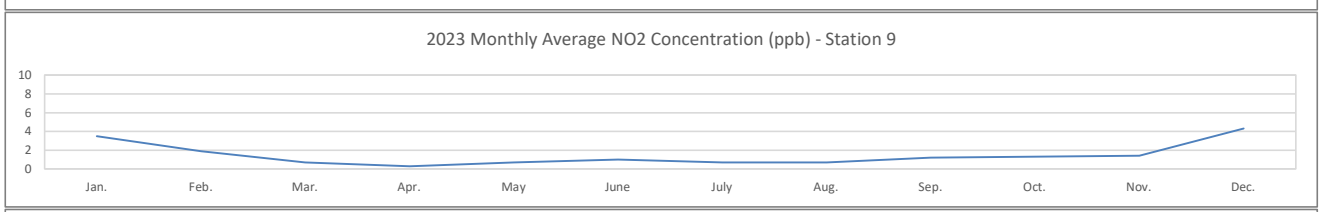
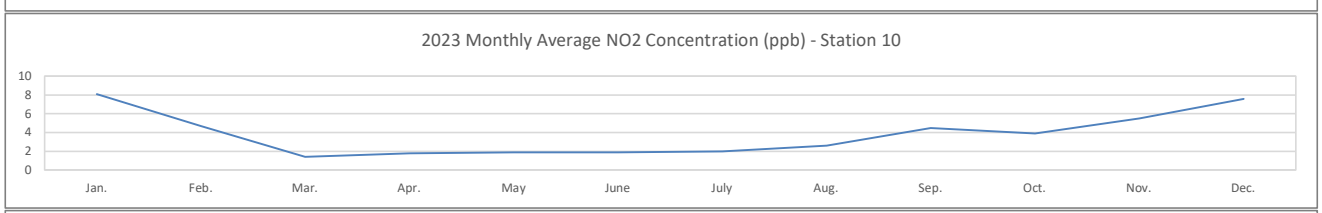
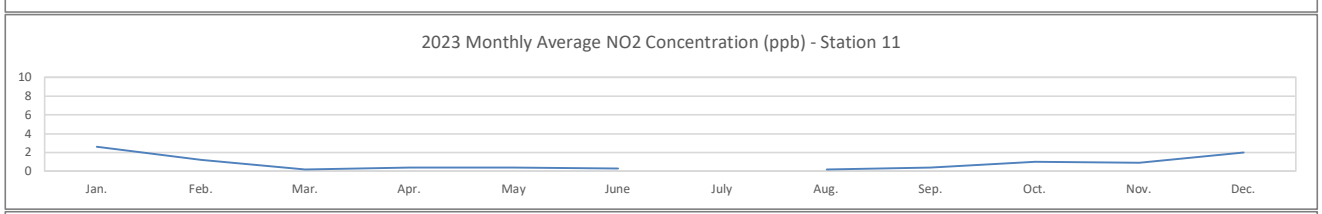
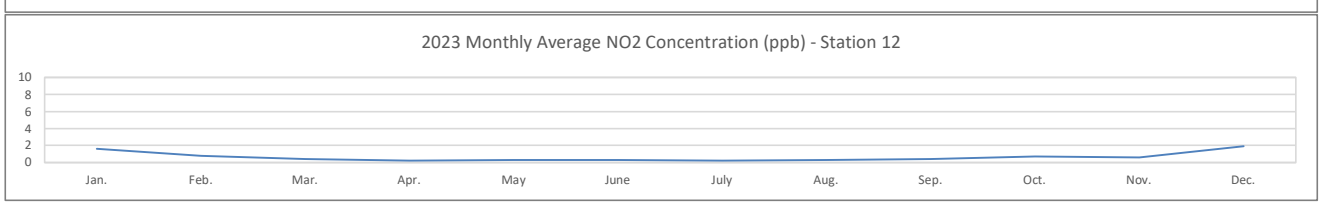
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NO2 Concentration (ppb) - Station 9
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NO2 Concentration (ppb) - Station 10
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NO2 Concentration (ppb) - Station 11
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NO2 Concentration (ppb) - Station 12
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
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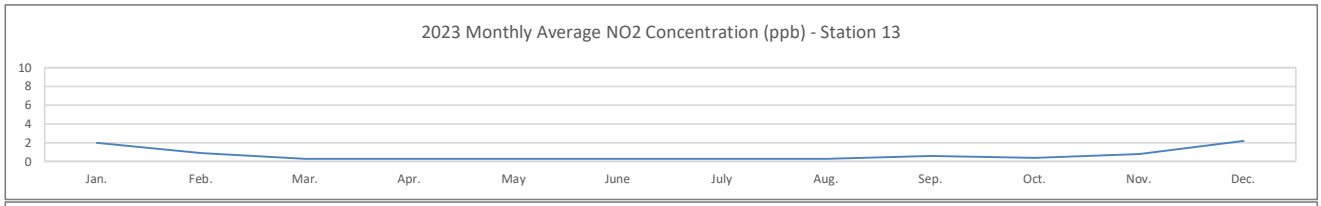
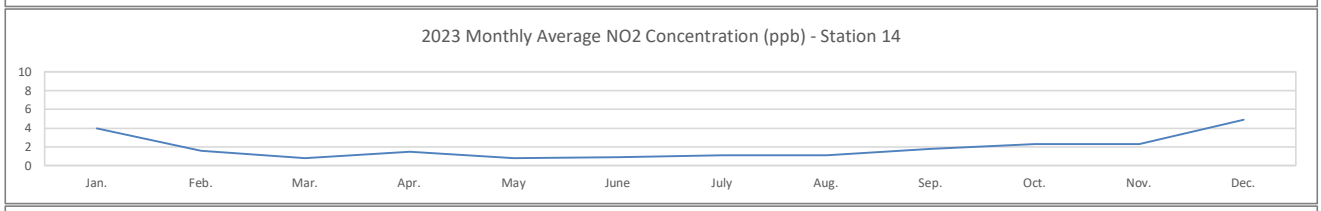
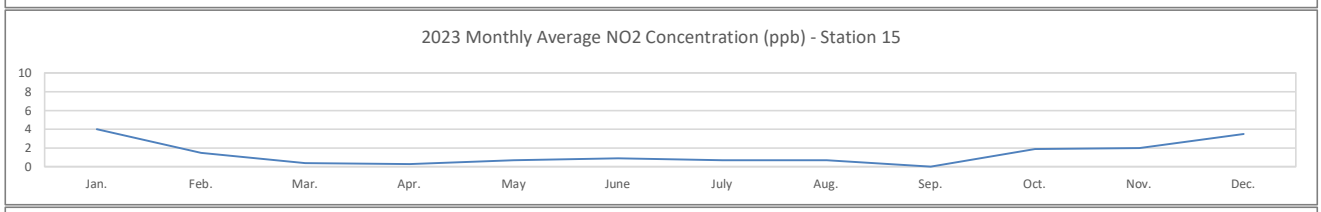
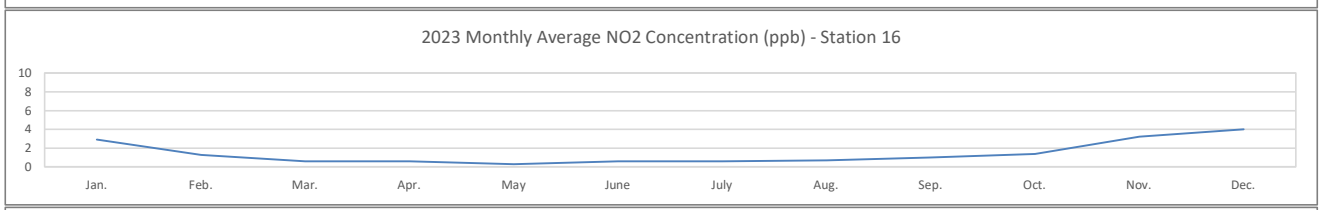
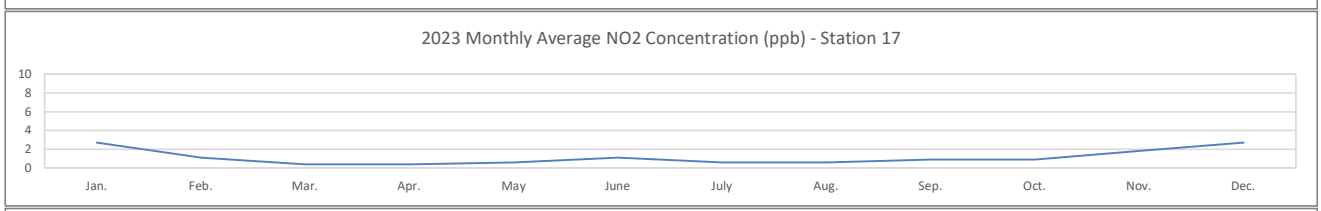
Aug.
Sep.
Oct.
Nov.
Dec.

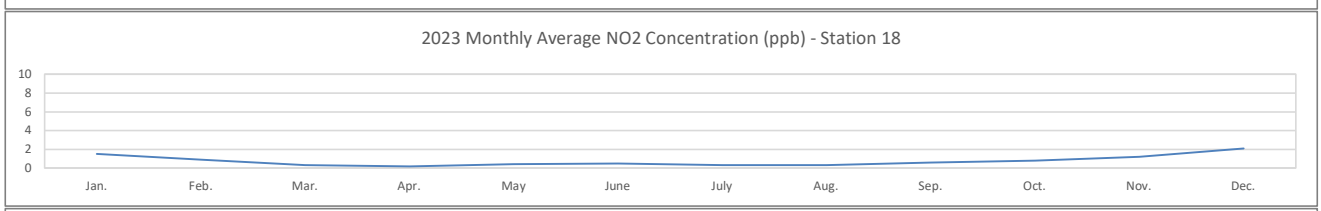

2023 Monthly Average NO2 Concentration (ppb) - Station 13
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

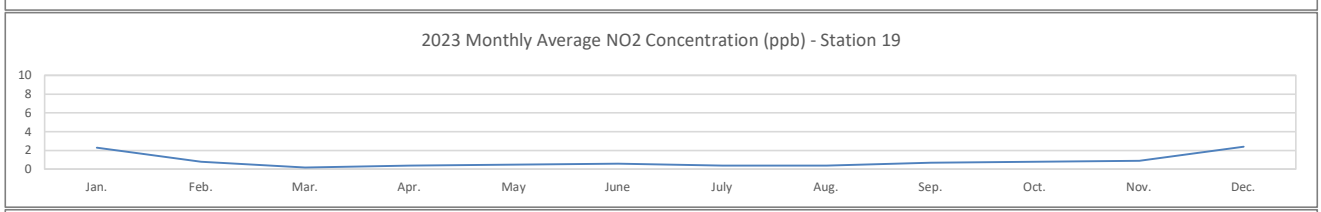

2023 Monthly Average NO2 Concentration (ppb) - Station 14
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

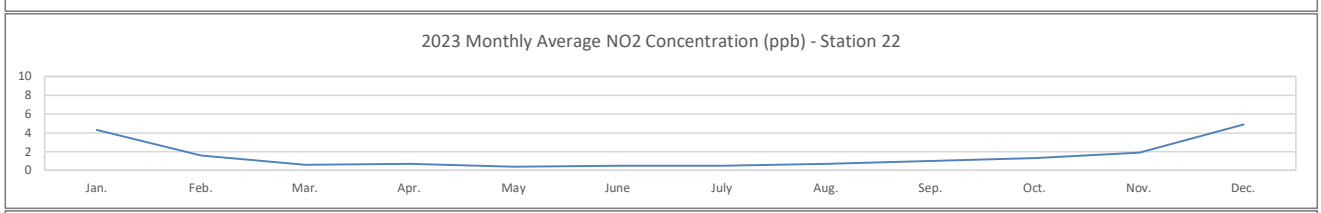

2023 Monthly Average NO2 Concentration (ppb) - Station 15
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

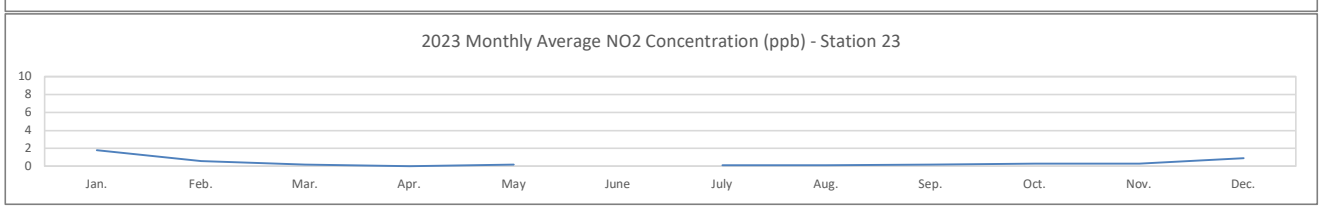

2023 Monthly Average NO2 Concentration (ppb) - Station 16
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

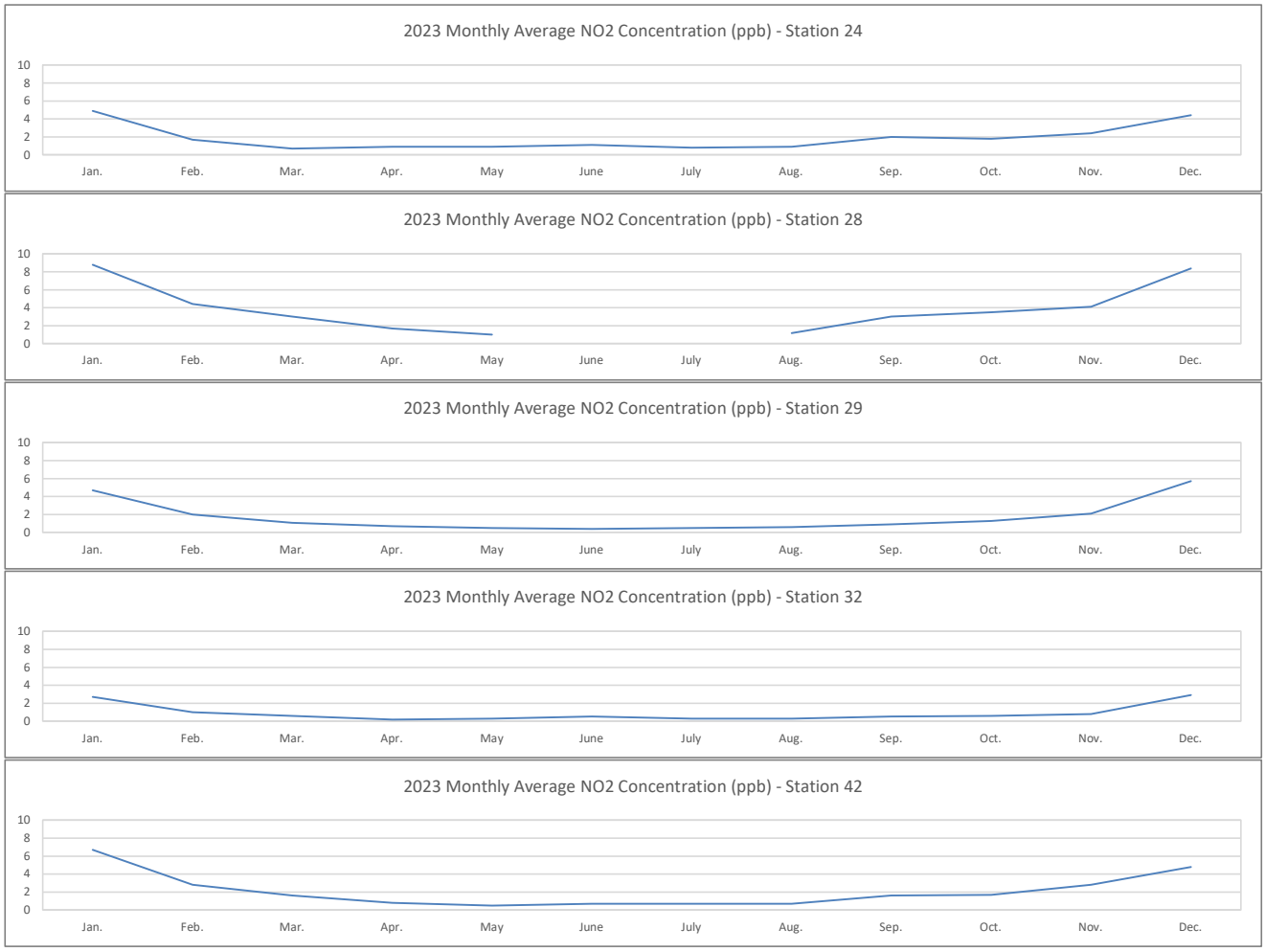

2023 Monthly Average NO2 Concentration (ppb) - Station 17
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

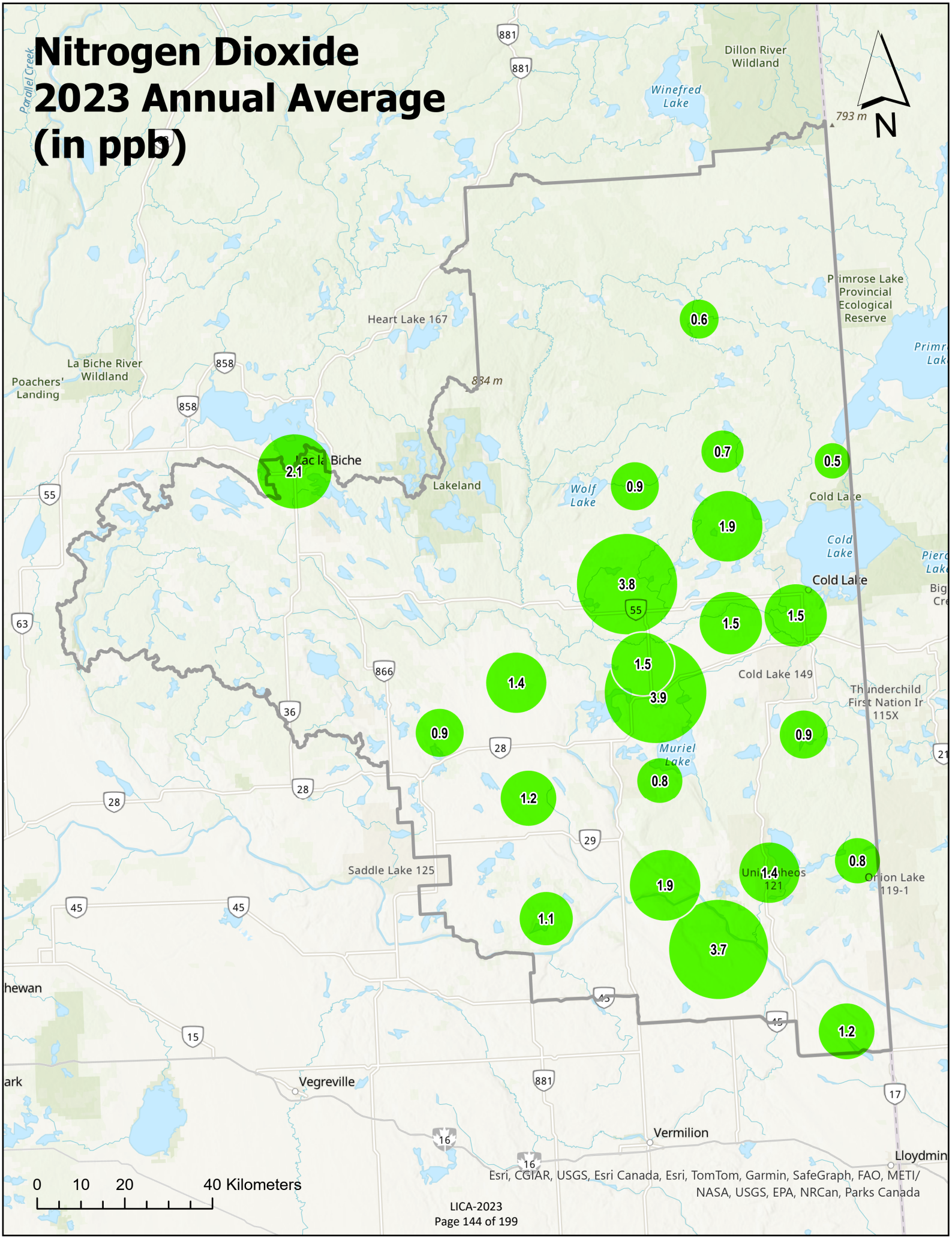

2023 Monthly Average NO2 Concentration (ppb) - Station 18
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NO2 Concentration (ppb) - Station 19
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NO2 Concentration (ppb) - Station 22
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NO2 Concentration (ppb) - Station 23
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NO2 Concentration (ppb) - Station 24
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.
2023 Monthly Average NO2 Concentration (ppb) - Station 28
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.
2023 Monthly Average NO2 Concentration (ppb) - Station 29
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.
2023 Monthly Average NO2 Concentration (ppb) - Station 32
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.
2023 Monthly Average NO2 Concentration (ppb) - Station 42
10
8
6
4
2
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

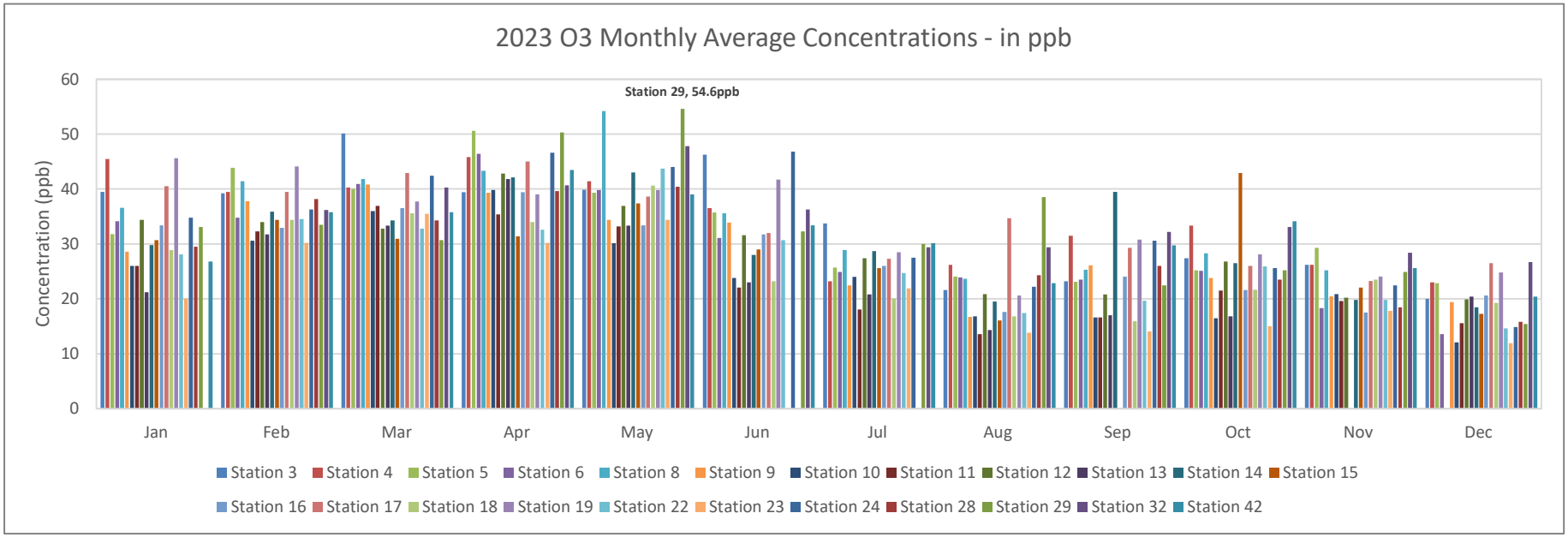

Nitrogen Dioxide
2023 Annual Average
(in ppb)
N
0.6
0.7
0.5
0.9
1.9
3.8
1.5
1.5
1.5
3.9
1.4
0.9
0.9
0.8
1.2
1.9
1.4
0.8
1.1
3.7
1.2
2.1
Dillon River Wildland
Winefred Lake
793 m
Primrose Lake Provincial Ecological Reserve
Heart Lake 167
834 m
La Biche River Wildland
Poachers' Landing
Lac la Biche
Lakeland
Wolf Lake
Cold Lake
Cold Lake
Cold Lake 149
Thunderchild First Nation Ir 115X
Muriel Lake
Saddle Lake 125
Orion Lake 119-1
Vegreville
Vermilion
Lloydmin
0 10 20 40 Kilometers
Esri, CGIAR, USGS, Esri Canada, Esri, TomTom, Garmin, SafeGraph, FAO, METI/ NASA, USGS, EPA, NRCan, Parks Canada

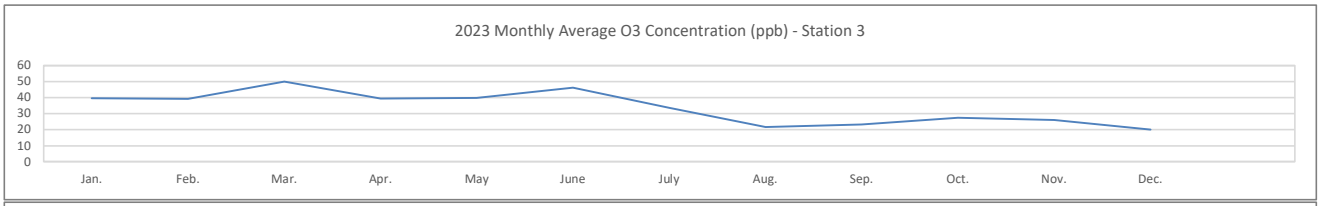
3.1.4 Ozone (O_3)

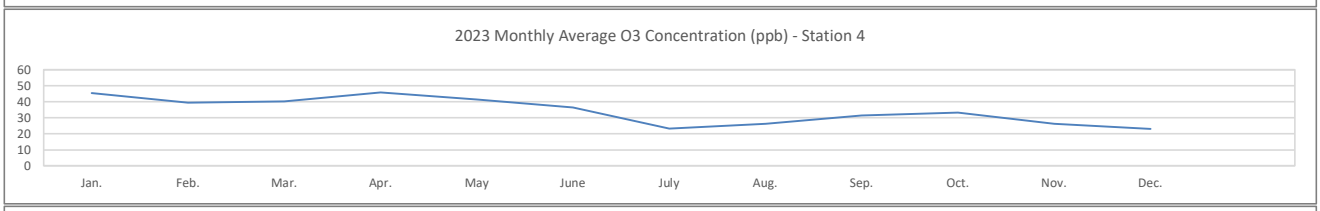
Station	Annual Average	Maximum	Month	Minimum	Month	# of Samples
3	33.9	50.1	March	20.0	December	12
3 DUP	24.4	37.7	-	24.4	-	1
4	34.4	45.8	April	23.0	December	12
4 DUP	-	-	-	-	-	0
5	32.6	50.6	April	22.9	December	12
5 DUP	32.7	39.7	-	20.8	-	2
6	29.7	46.4	April	13.6	December	12
6 DUP	26.7	40.7	-	18.4	-	2
8	34.9	54.2	May	23.7	August	11
8 DUP	42.1	41.7	-	42.1	-	1
9	28.7	40.8	March	16.7	August	12
9 DUP	36.4	42.7	-	36.4	-	1
10	24.4	39.8	April	12.1	December	12
10 DUP	36.3	43.7	-	36.3	-	1
11	24.2	36.9	March	13.6	August	12
11 DUP	35.9	44.7	-	35.9	-	1
12	29.0	42.8	April	19.9	December	12
12 DUP	36.3	45.7	-	36.3	-	1
13	24.9	41.8	April	14.3	August	11
13 DUP	33.6	46.7	-	33.6	-	1
14	30.5	43.0	May	18.5	December	12
14 DUP	46.5	47.7	-	46.5	-	1
15	28.9	42.9	October	16.1	August	11
15 DUP	37.3	48.7	-	37.3	-	1
16	27.9	39.4	April	17.5	November	12
16 DUP	29.1	49.7	-	29.1	-	1
17	33.8	45.0	April	23.3	November	12
17 DUP	33.6	50.7	-	33.6	-	1
18	26.2	40.6	May	15.9	September	12
18 DUP	21.8	51.7	-	21.8	-	1
19	33.7	45.6	January	20.6	August	12
19 DUP	28.8	52.7	-	28.8	-	1
22	27.0	43.7	May	14.6	December	12
22 DUP	17.6	53.7	-	17.6	-	1
23	22.3	35.5	March	11.9	December	11
23 DUP	12.4	54.7	-	12.4	-	1
24	32.9	46.8	June	14.9	December	12
24 DUP	27.6	55.7	-	27.6	-	1
28	29.0	40.4	May	15.8	December	10
28 DUP	25.8	56.7	-	25.8	-	1
29	32.6	54.6	May	15.4	December	12
29 DUP	23.6	57.7	-	23.6	-	1
32	34.6	47.8	May	26.7	December	11
32 DUP	37.0	58.7	-	37.0	-	1
42	31.4	43.5	April	20.4	December	12
42 DUP	31.1	59.7	-	31.1	-	1

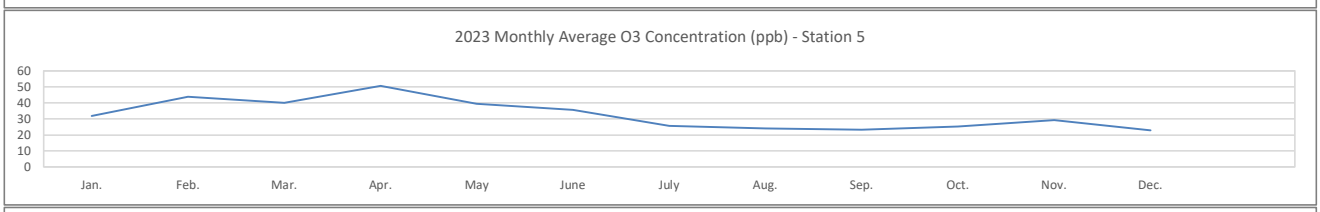
Notes:

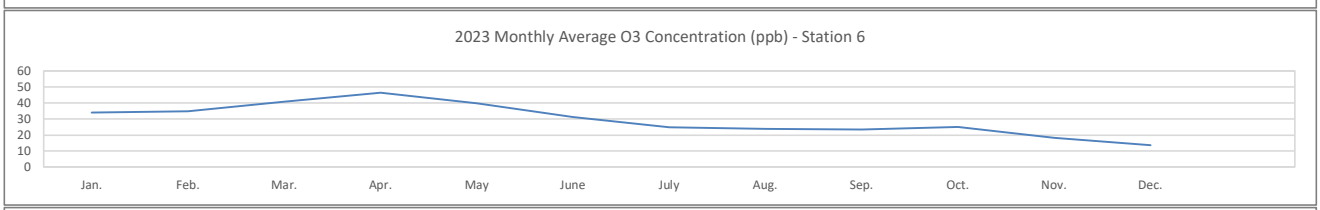
- Concentration unit: ppb
- Results from passive samples and their duplicates were compared; all data were ± 12.7 ppb of each other throughout the year.
- The sample blanks indicated no apparent contamination throughout the year, except station 15 in September. Analytical result came out lower than expected, which indicated potential errors during sample collections or lab errors. In order to maintain the meaningful historical data trend, analytical result was excluded from the historical data analysis.
- 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.
- Analytical results for station 8 in December, station 13 in November, station 28 in June and station 32 in January were not available because sample filters either got damaged or were missing or the access to the station was not available during the sample media exchange.

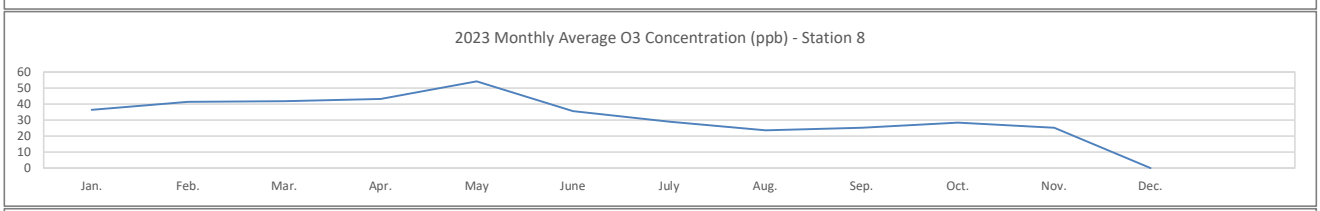

2023 O3 Monthly Average Concentrations - in ppb
Station 29, 54.6ppb
Concentration (ppb)
60
50
40
30
20
10
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Station 3
Station 4
Station 5
Station 6
Station 8
Station 9
Station 10
Station 11
Station 12
Station 13
Station 14
Station 15
Station 16
Station 17
Station 18
Station 19
Station 22
Station 23
Station 24
Station 28
Station 29
Station 32
Station 42

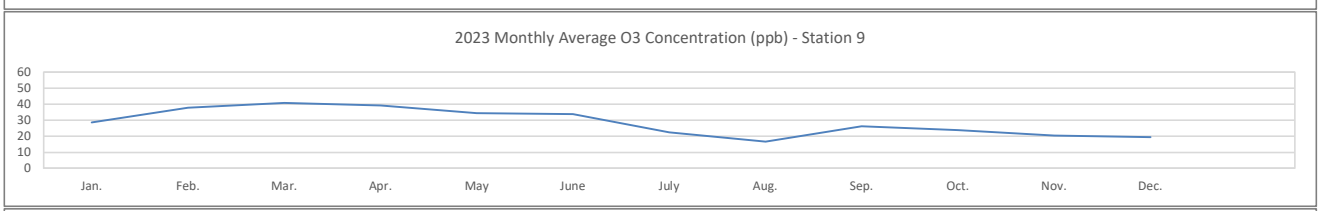

2023 Monthly Average O3 Concentration (ppb) - Station 3
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

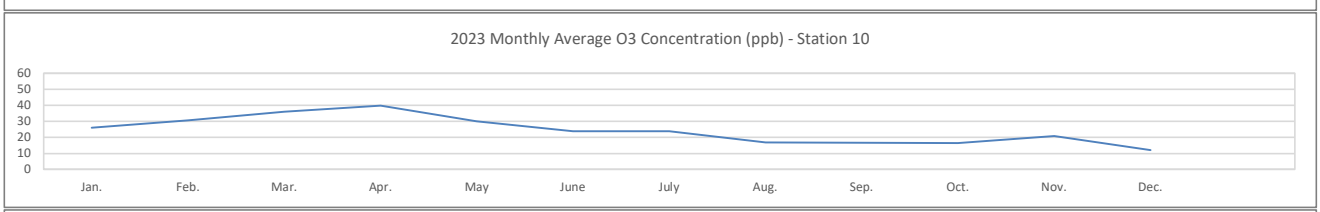

2023 Monthly Average O3 Concentration (ppb) - Station 4
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

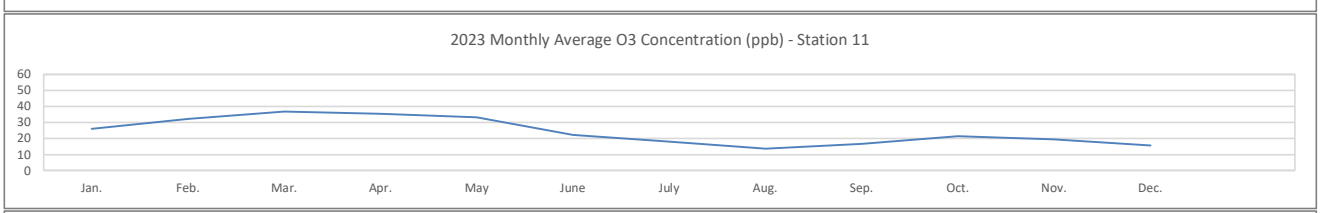

2023 Monthly Average O3 Concentration (ppb) - Station 5
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

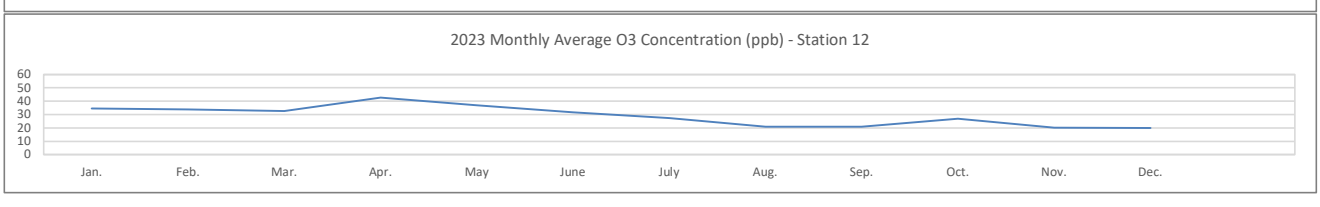

2023 Monthly Average O3 Concentration (ppb) - Station 6
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

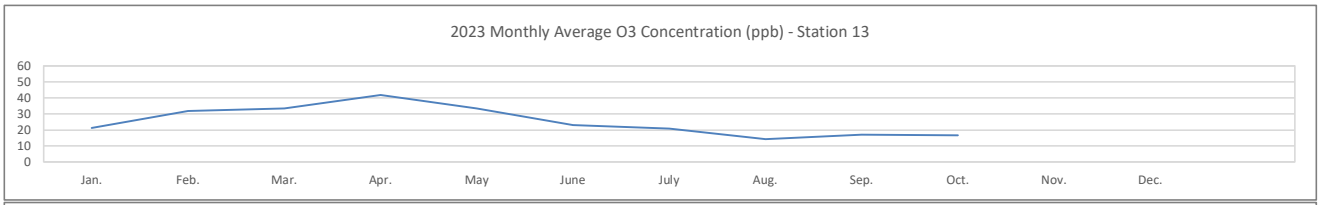

2023 Monthly Average O3 Concentration (ppb) - Station 8
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

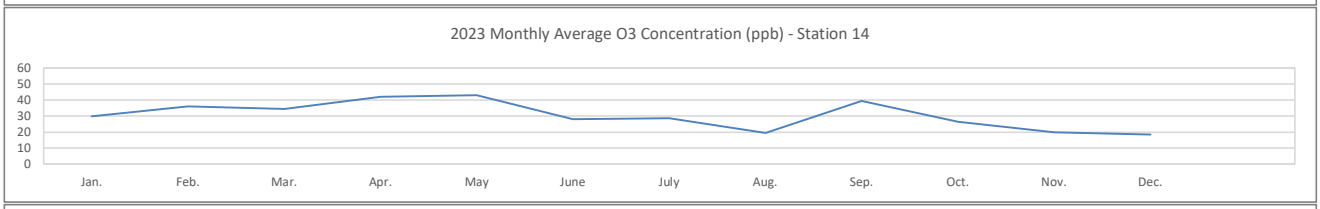

2023 Monthly Average O3 Concentration (ppb) - Station 9
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

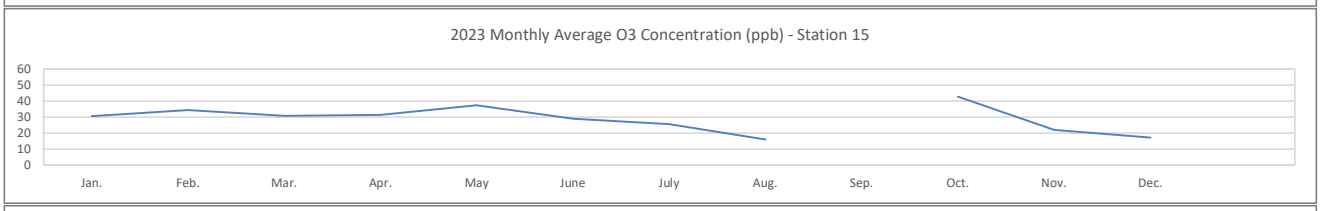

2023 Monthly Average O3 Concentration (ppb) - Station 10
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

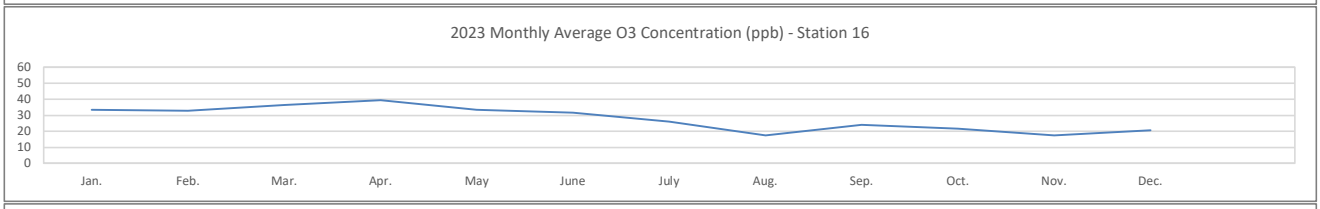

2023 Monthly Average O3 Concentration (ppb) - Station 11
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

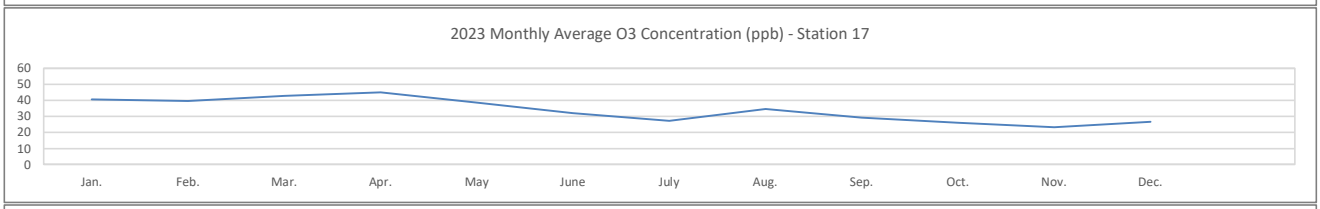

2023 Monthly Average O3 Concentration (ppb) - Station 12
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

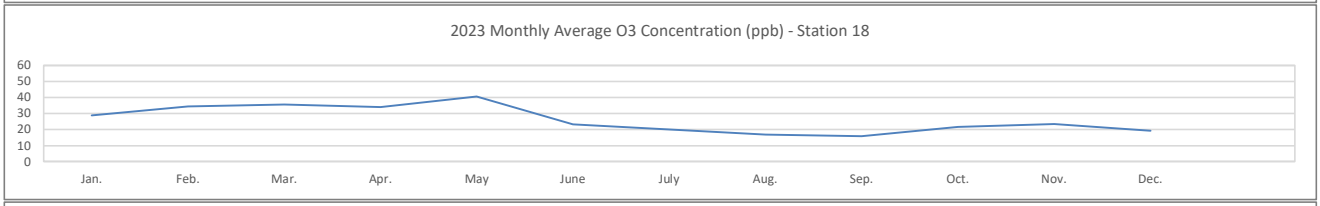

2023 Monthly Average O3 Concentration (ppb) - Station 13
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

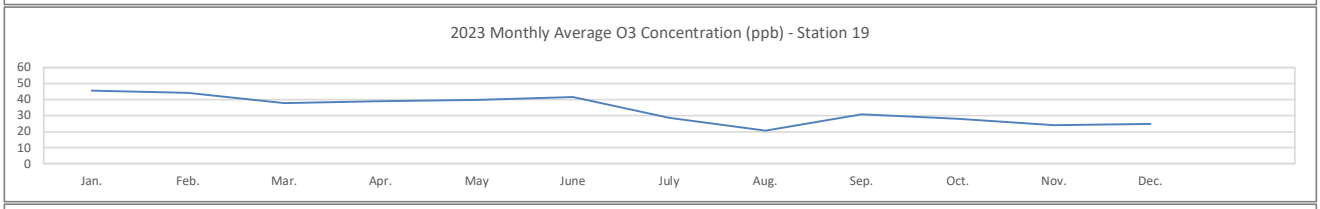

2023 Monthly Average O3 Concentration (ppb) - Station 14
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

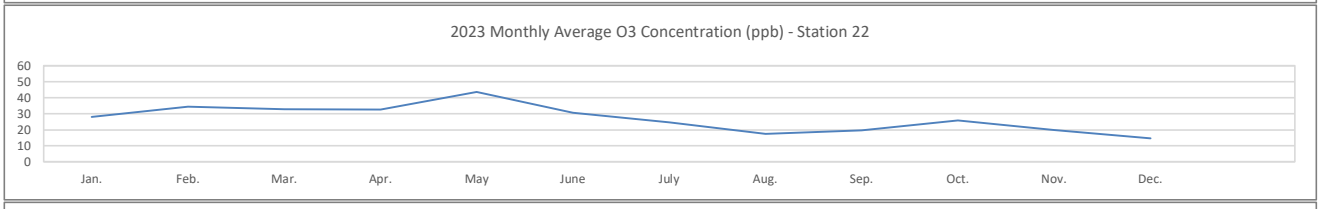

2023 Monthly Average O3 Concentration (ppb) - Station 15
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

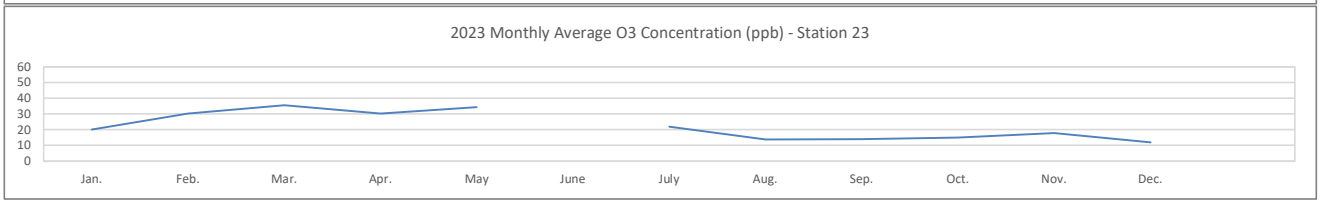

2023 Monthly Average O3 Concentration (ppb) - Station 16
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

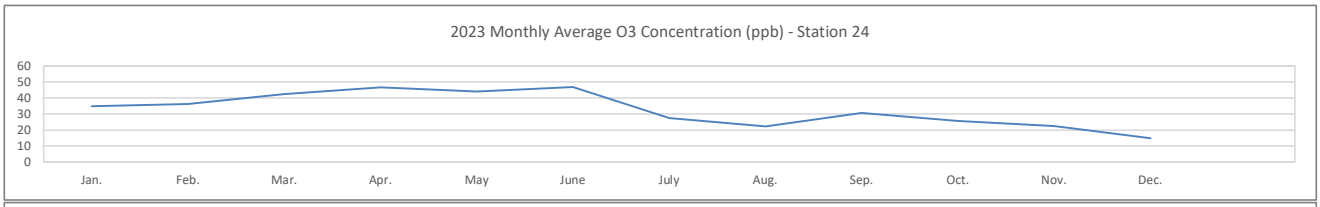

2023 Monthly Average O3 Concentration (ppb) - Station 17
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

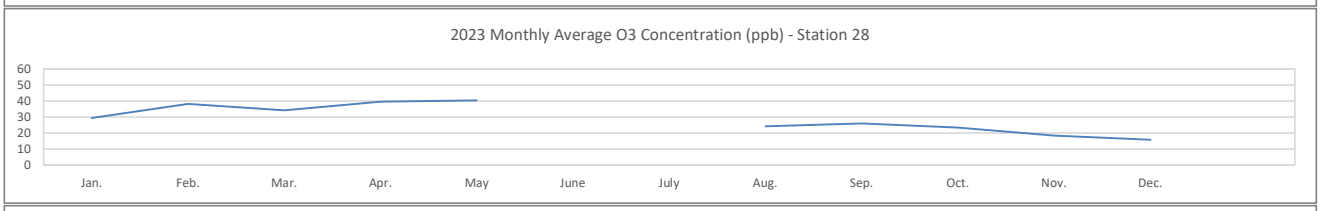

2023 Monthly Average O3 Concentration (ppb) - Station 18
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

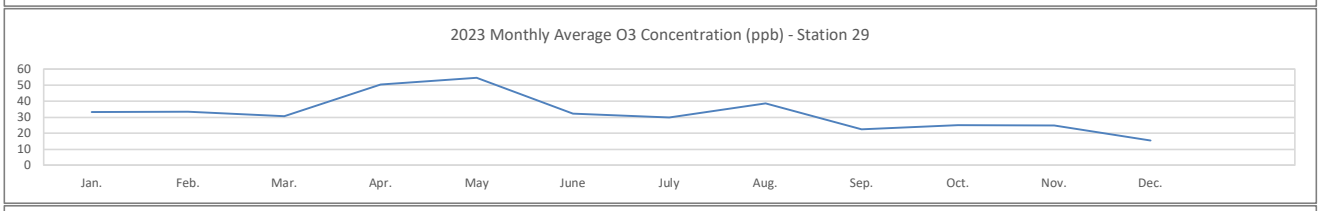

2023 Monthly Average O3 Concentration (ppb) - Station 19
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

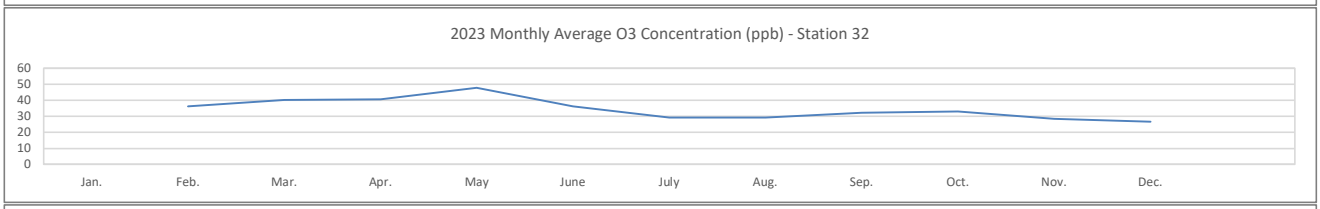

2023 Monthly Average O3 Concentration (ppb) - Station 22
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

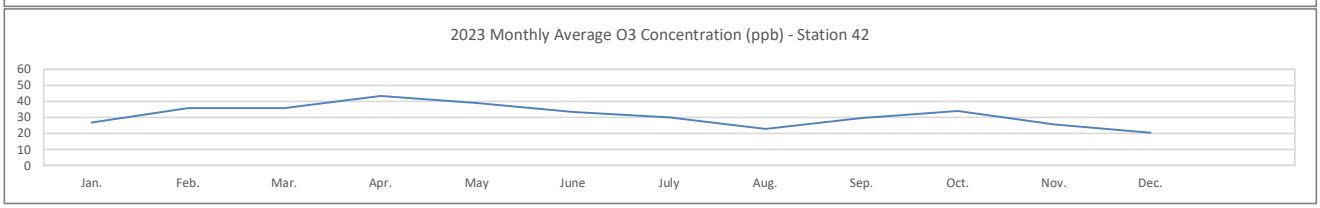

2023 Monthly Average O3 Concentration (ppb) - Station 23
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average O3 Concentration (ppb) - Station 24
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

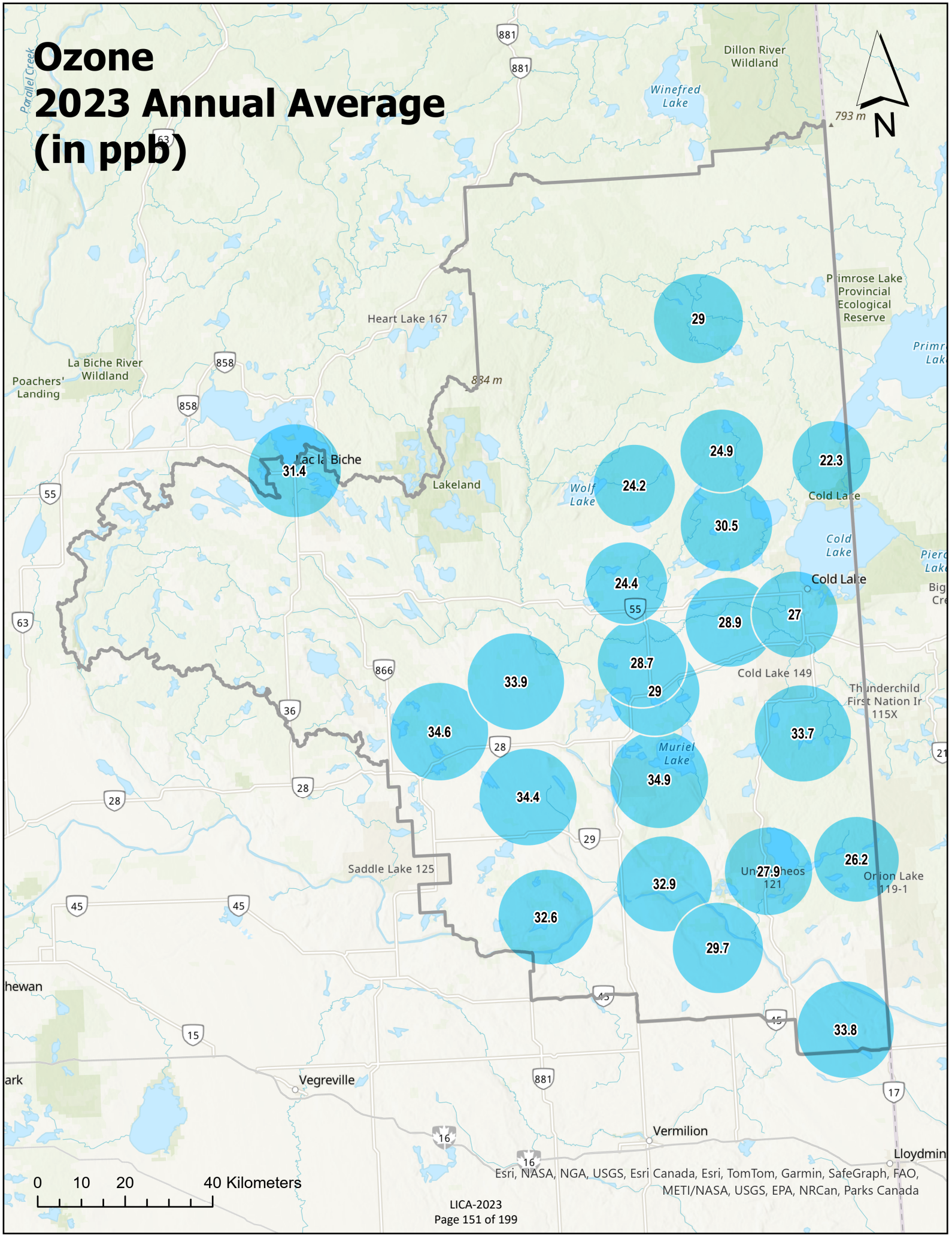

2023 Monthly Average O3 Concentration (ppb) - Station 28
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average O3 Concentration (ppb) - Station 29
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average O3 Concentration (ppb) - Station 32
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average O3 Concentration (ppb) - Station 42
60
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

Ozone
2023 Annual Average
(in ppb)



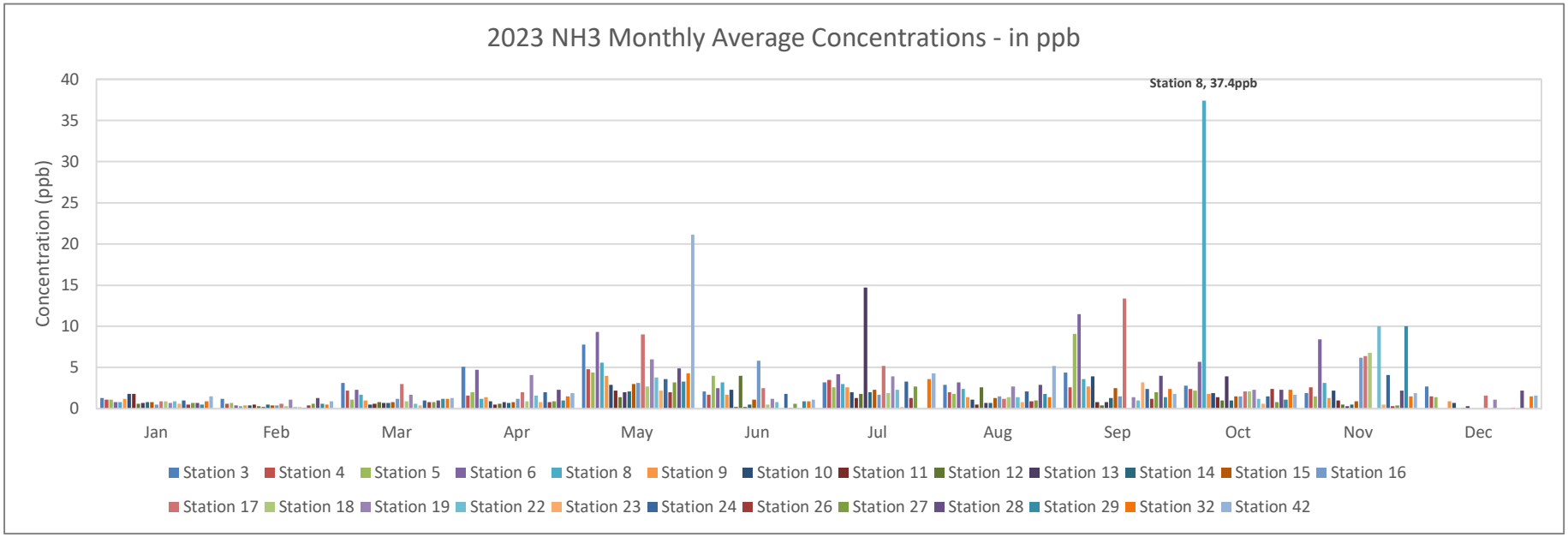
3.1.5 Ammonia (NH_3)

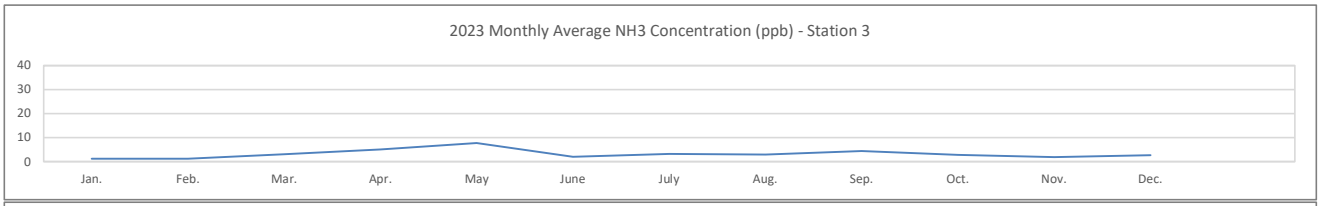
Station	Annual Average	Maximum	Month	Minimum	Month	# of Samples
3	3.2	7.8	May	1.2	February	12
3 DUP	6.9	6.9	-	6.9	-	1
4	2.2	4.8	May	0.6	February	12
4 DUP	1.5	1.5	-	1.5	-	1
5	2.7	9.1	September	0.7	February	12
5 DUP	4.7	4.7	-	4.7	-	1
6	4.8	11.5	September	0.4	February	11
6 DUP	3.2	3.2	-	3.2	-	1
8	5.7	37.4	October	0.3	February	11
8 DUP	3.4	3.4	-	3.4	-	1
9	1.7	4.0	May	0.4	February	12
9 DUP	1.2	1.2	-	1.2	-	1
10	1.7	3.9	September	0.4	February	12
10 DUP	1.1	1.1	-	1.1	-	1
11	1.0	2.2	May	0.2	June	11
11 DUP	1.0	1.0	-	1.0	-	1
12	1.2	4.0	June	0.1	December	12
12 DUP	1.0	1.0	-	1.0	-	1
13	2.1	14.7	July	0.2	February	12
13 DUP	0.5	0.5	-	0.5	-	1
14	1.0	2.1	May	0.5	February	11
14 DUP	0.4	0.4	-	0.4	-	1
15	1.4	3.0	May	0.4	February	11
15 DUP	0.8	0.8	-	0.8	-	1
16	2.2	6.2	November	0.4	February	11
16 DUP	3.3	3.3	-	3.3	-	1
17	4.0	13.4	September	0.6	February	12
17 DUP	NA	NA	-	NA	-	0
18	1.8	6.8	November	0.3	February	10
18 DUP	NA	NA	-	NA	-	0
19	2.4	6.0	May	0.7	January	11
19 DUP	1.2	1.2	-	1.2	-	1
22	2.2	10.0	November	0.2	February	11
22 DUP	0.9	0.9	-	0.9	-	1
23	1.0	3.2	September	0.2	February	10
23 DUP	NA	NA	-	0.0	-	0
24	2.1	4.1	November	0.1	February	11
24 DUP	0.4	0.4	-	0.4	-	1
25	NA	NA	NA	NA	NA	0
25DUP	NA	NA	-	NA	-	0
26	0.9	2.4	October	0.1	June	12
26 DUP	0.2	0.2	-	0.2	-	1
27	1.2	3.2	May	0.4	November	11
27 DUP	0.7	0.7	-	0.7	-	1
28	2.4	4.9	May	0.7	January	10
28 DUP	0.9	0.9	-	0.9	-	1

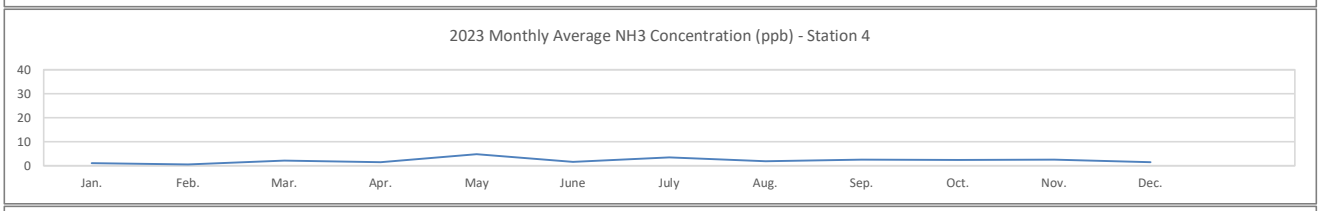
Station	Annual Average	Maximum	Month	Minimum	Month	# of Samples
29	2.2	10.0	November	0.5	January	10
29 DUP	1.6	1.6	-	1.6	-	1
32	1.8	4.3	May	0.5	February	12
32 DUP	1.6	1.6	-	1.6	-	1
42	3.7	21.1	May	0.9	February	12
42 DUP	16.9	16.9	-	16.9	-	1

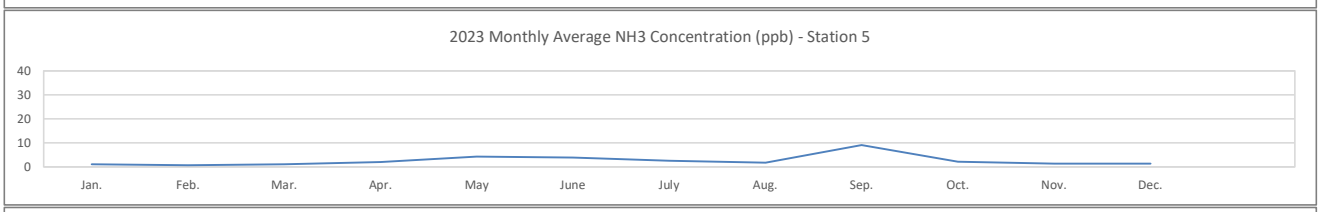
Notes:

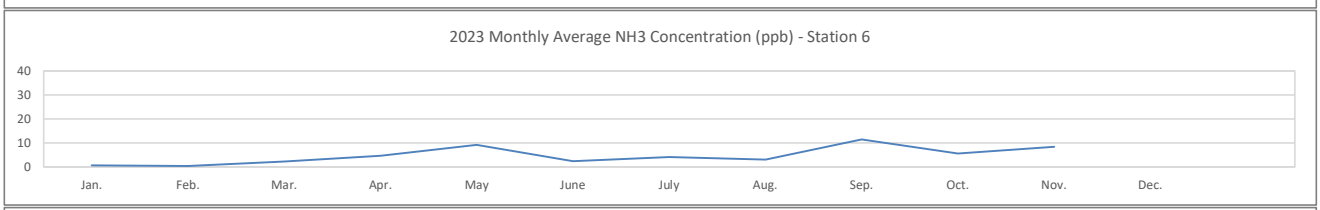
- Concentration unit: ppb
- Results from passive samples and their duplicates were compared; all data were ± 37.4 ppb of each other throughout the year.
- No samples were collected at station 25 throughout the year. The field technician has not completed the necessary safety orientation for the CNRL Primrose/Burnt Lake site and access is not permitted at this time.
- Analytical results for station 23 and station 28 in June, station 28 and station 29 in July and station 18 in September were not available because sample filters either got damaged or were missing or the access to the station was not available during the sample media exchange.
- In December, due to lab errors, sixteen NMH3 samples were prepared incorrectly. The analytical results are unreportable. The affected stations included station 7, 8, 11, 14, 15, 16, 17 (duplicate sample), 18 (sample and duplicate sample), 22, 23, 24, 27, 29, Blank -1 and Blank -2.

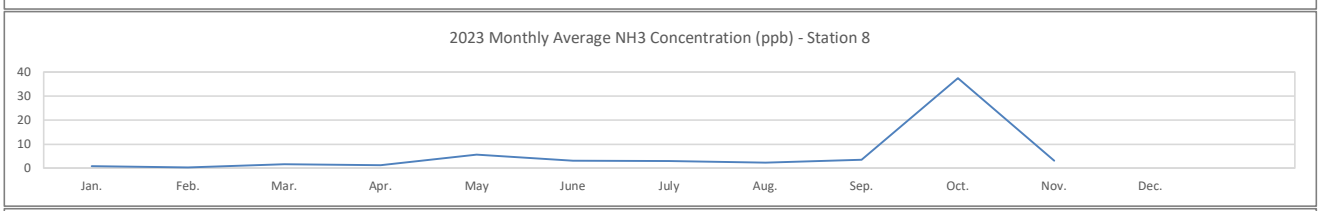

2023 NH3 Monthly Average Concentrations - in ppb
Concentration (ppb)
40
35
30
25
20
15
10
5
0
Station 8, 37.4ppb
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Station 3
Station 4
Station 5
Station 6
Station 8
Station 9
Station 10
Station 11
Station 12
Station 13
Station 14
Station 15
Station 16
Station 17
Station 18
Station 19
Station 22
Station 23
Station 24
Station 26
Station 27
Station 28
Station 29
Station 32
Station 42

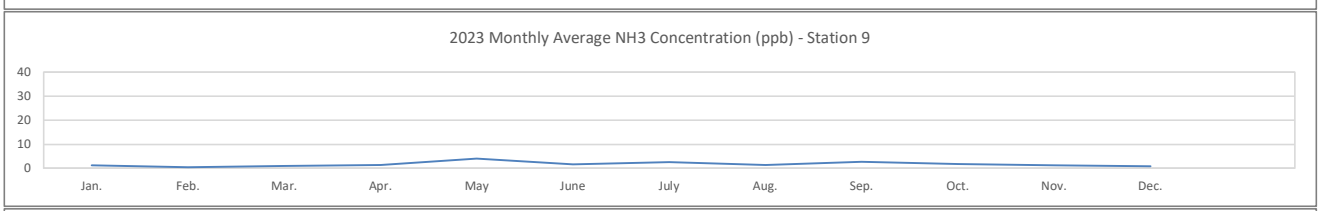

2023 Monthly Average NH3 Concentration (ppb) - Station 3
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

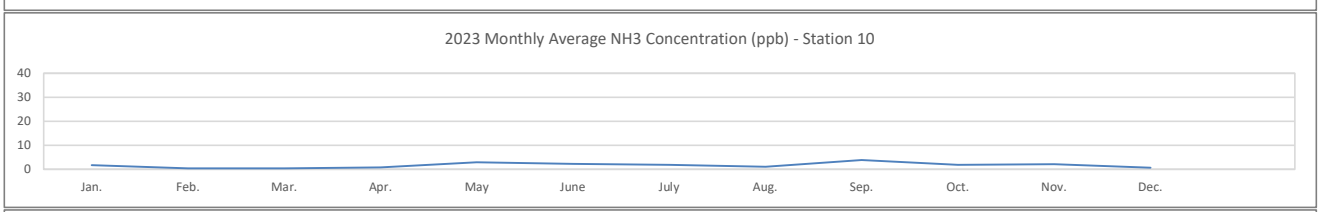

2023 Monthly Average NH3 Concentration (ppb) - Station 4
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

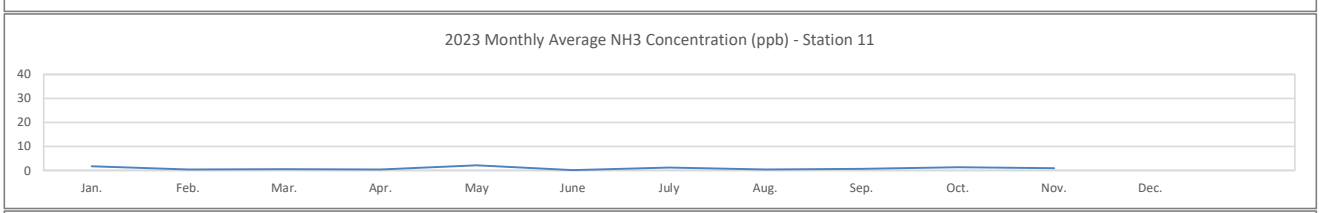

2023 Monthly Average NH3 Concentration (ppb) - Station 5
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

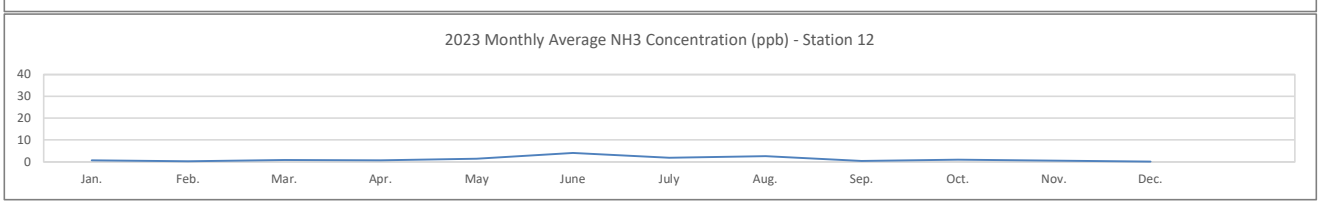

2023 Monthly Average NH3 Concentration (ppb) - Station 6
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

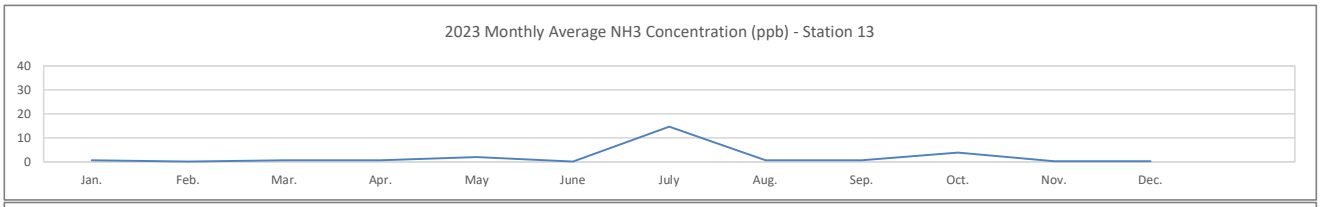

2023 Monthly Average NH3 Concentration (ppb) - Station 8
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

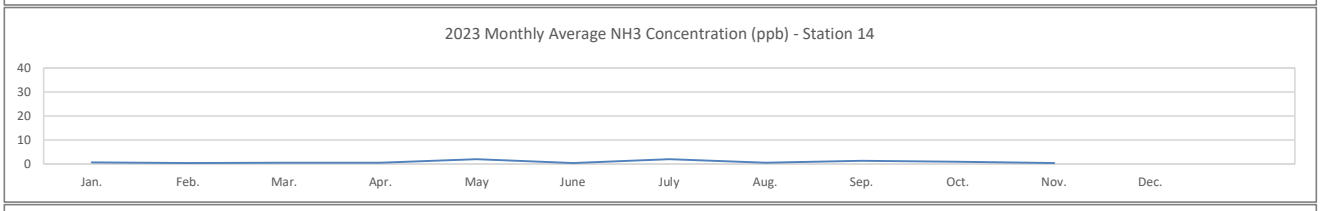

2023 Monthly Average NH3 Concentration (ppb) - Station 9
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

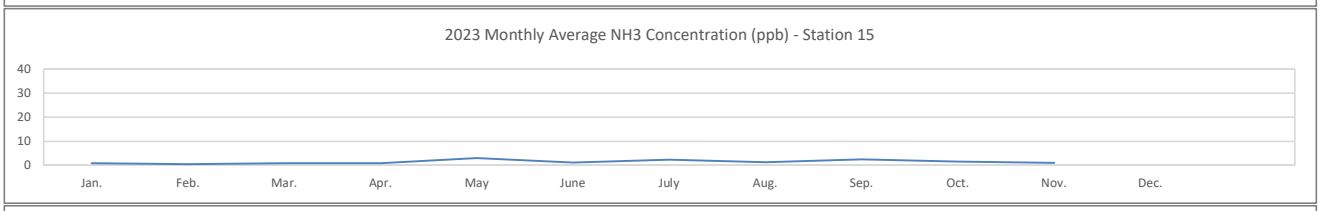

2023 Monthly Average NH3 Concentration (ppb) - Station 10
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

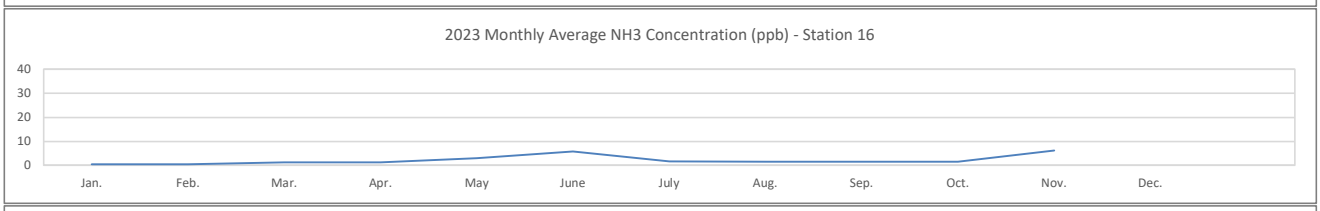

2023 Monthly Average NH3 Concentration (ppb) - Station 11
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

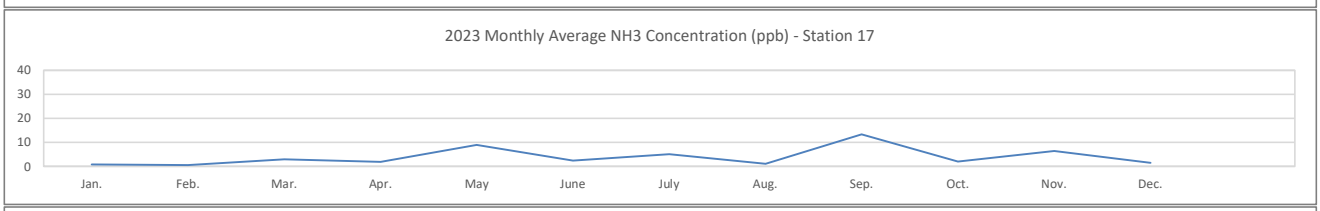

2023 Monthly Average NH3 Concentration (ppb) - Station 12
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

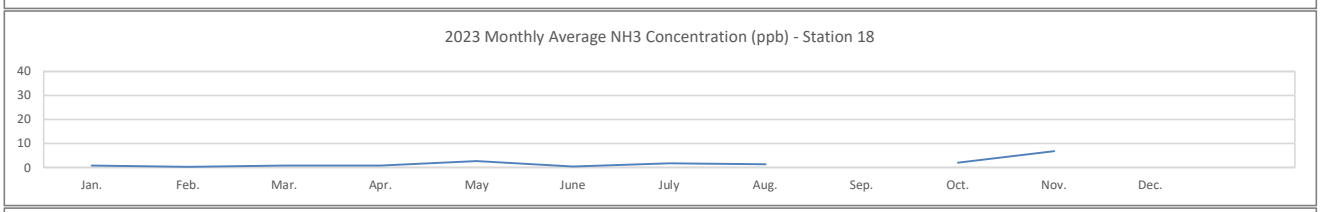

2023 Monthly Average NH3 Concentration (ppb) - Station 13
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

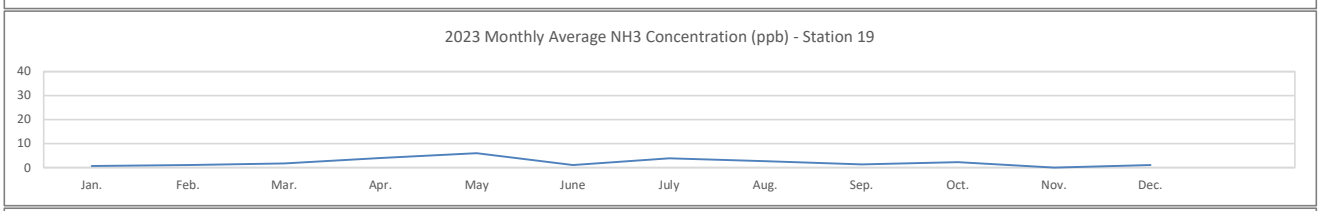

2023 Monthly Average NH3 Concentration (ppb) - Station 14
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

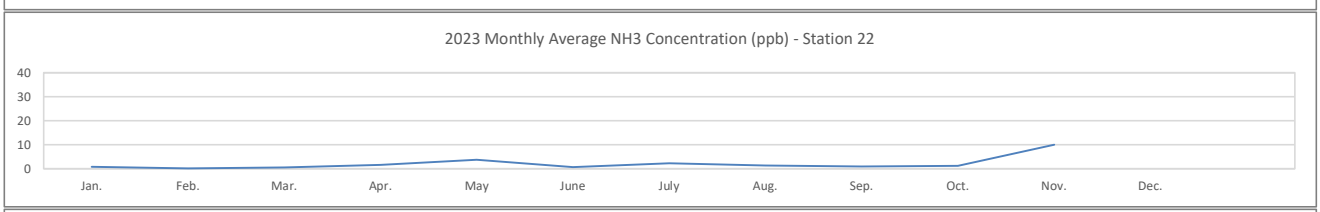

2023 Monthly Average NH3 Concentration (ppb) - Station 15
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

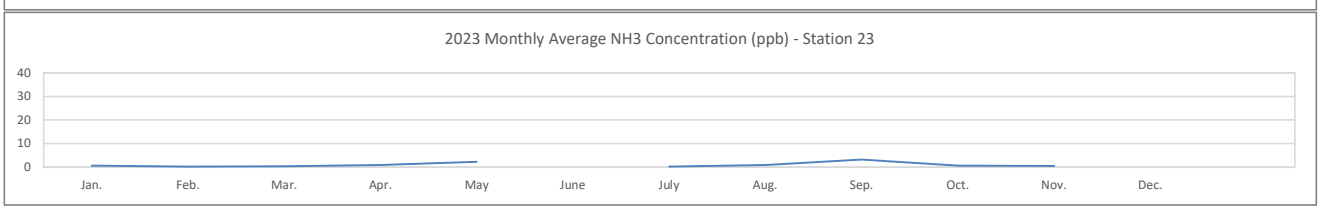

2023 Monthly Average NH3 Concentration (ppb) - Station 16
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

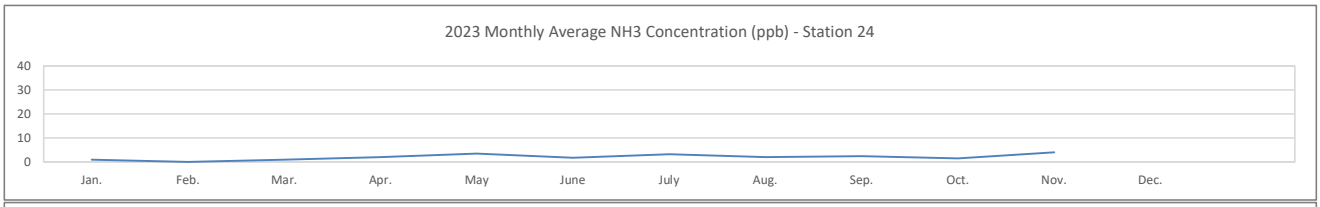

2023 Monthly Average NH3 Concentration (ppb) - Station 17
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

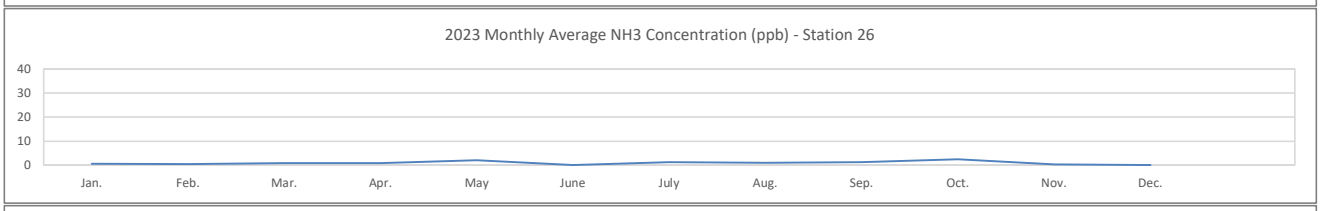

2023 Monthly Average NH3 Concentration (ppb) - Station 18
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

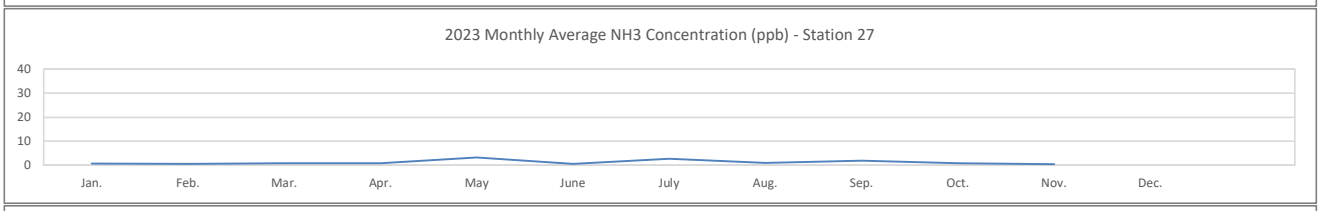

2023 Monthly Average NH3 Concentration (ppb) - Station 19
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

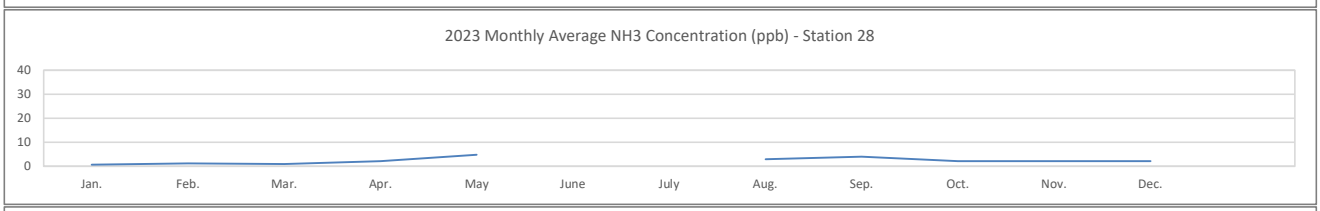

2023 Monthly Average NH3 Concentration (ppb) - Station 22
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

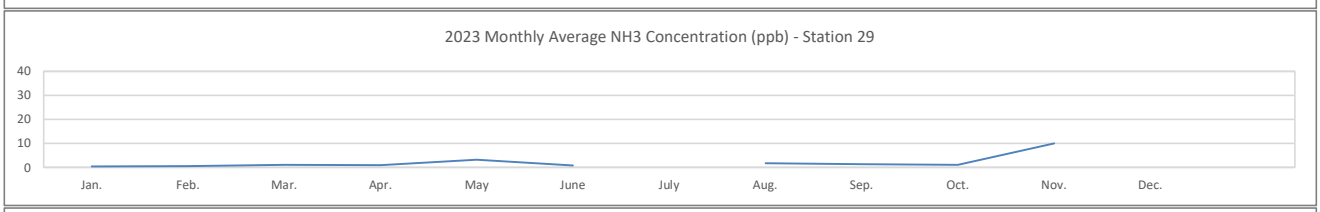

2023 Monthly Average NH3 Concentration (ppb) - Station 23
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

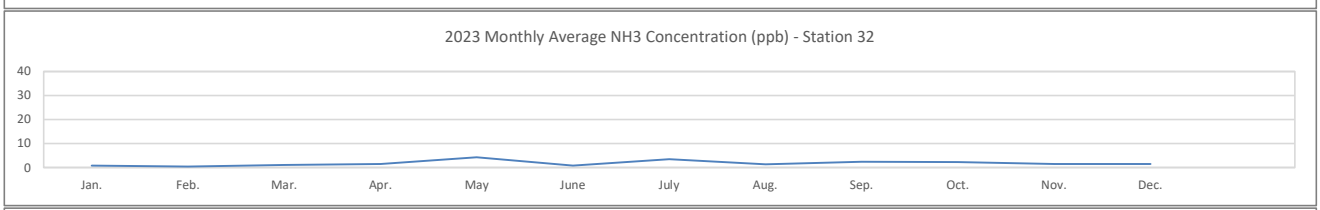

2023 Monthly Average NH3 Concentration (ppb) - Station 24
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

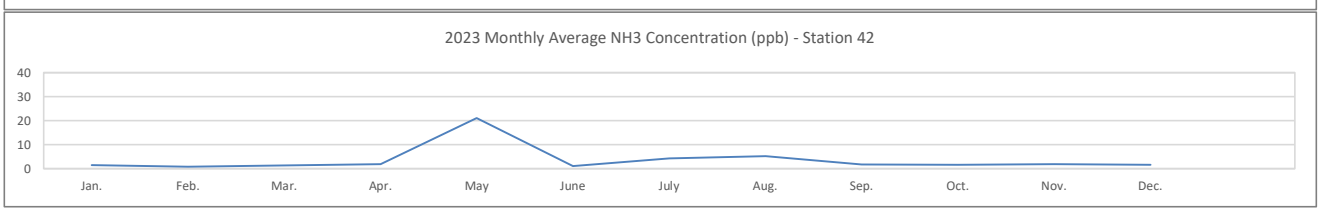

2023 Monthly Average NH3 Concentration (ppb) - Station 26
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NH3 Concentration (ppb) - Station 27
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

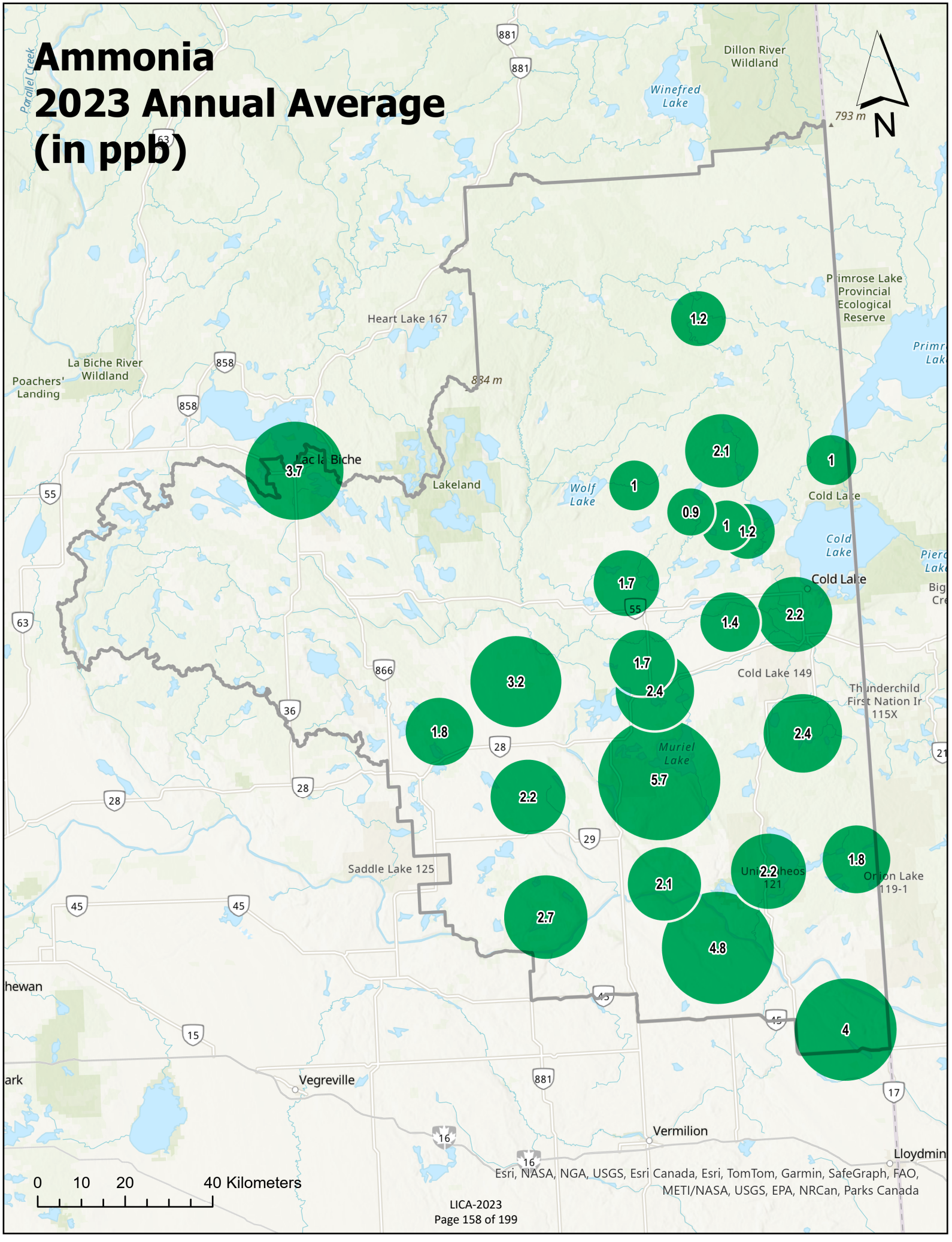

2023 Monthly Average NH3 Concentration (ppb) - Station 28
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NH3 Concentration (ppb) - Station 29
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NH3 Concentration (ppb) - Station 32
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average NH3 Concentration (ppb) - Station 42
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

Ammonia 2023 Annual Average (in ppb)



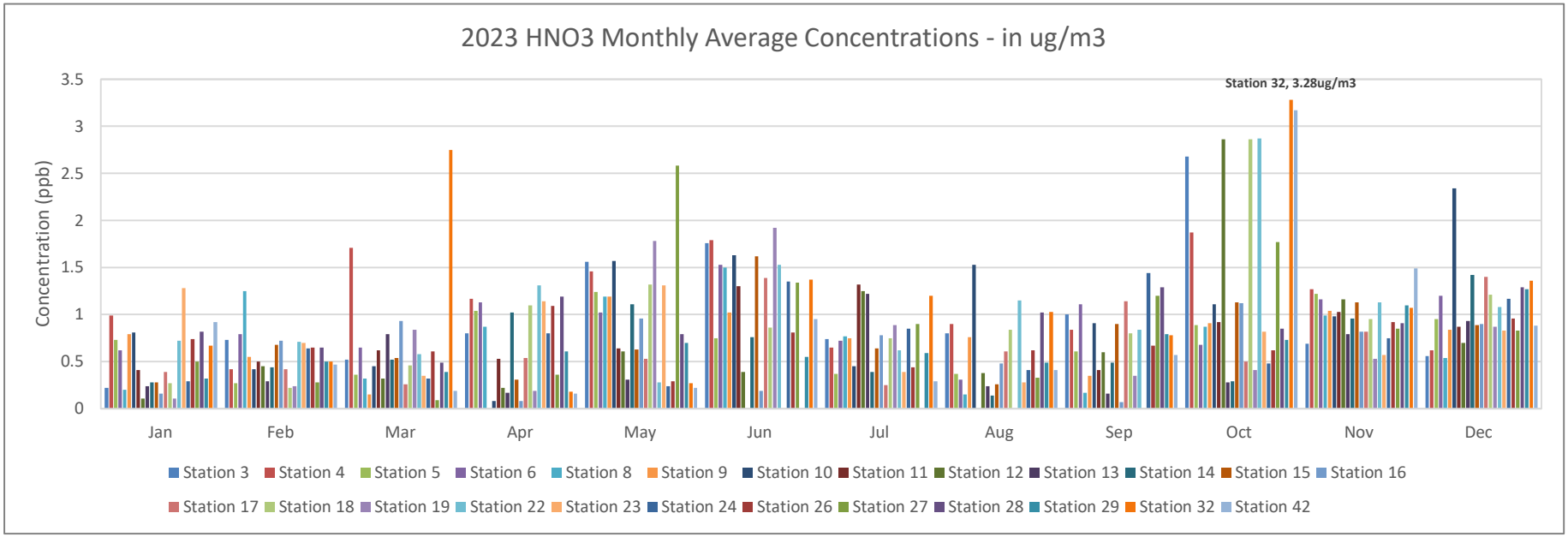
3.1.6 Nitric Acid (HNO_3)

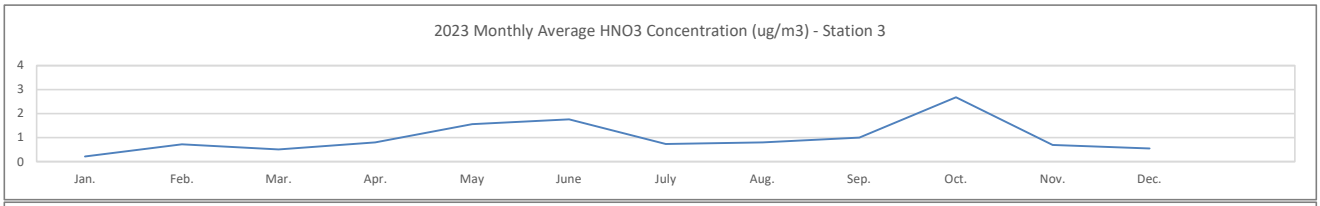
Station	Annual Average	Maximum	Month	Minimum	Month	# of Samples
3	1.01	2.68	October	0.22	January	12
3 DUP	0.41	0.41	-	0.41	-	1
4	1.14	1.87	October	0.42	February	12
4 DUP	1.86	1.86	-	1.86	-	1
5	0.73	1.24	May	0.27	February	12
5 DUP	2.53	2.53	-	2.53	-	1
6	0.91	1.53	June	0.31	August	12
6 DUP	0.50	0.50	-	0.50	-	1
8	0.74	1.50	June	0.15	August	12
8 DUP	0.82	0.82	-	0.82	-	1
9	0.76	1.19	May	0.15	March	12
9 DUP	0.29	0.29	-	0.29	-	1
10	1.02	2.34	December	0.08	April	12
10 DUP	0.99	0.99	-	0.99	-	1
11	0.78	1.32	July	0.41	January	12
11 DUP	0.63	0.63	-	0.63	-	1
12	0.75	2.86	October	0.11	January	12
12 DUP	0.73	0.73	-	0.73	-	1
13	0.49	1.22	July	0.16	September	12
13 DUP	0.69	0.69	-	0.69	-	1
14	0.65	1.42	December	0.14	August	12
14 DUP	1.19	1.19	-	1.19	-	1
15	0.75	1.62	June	0.26	August	12
15 DUP	1.05	1.05	-	1.05	-	1
16	0.60	1.12	October	0.07	September	12
16 DUP	0.81	0.81	-	0.81	-	1
17	0.69	1.40	December	0.25	July	12
17 DUP	0.83	0.83	-	0.83	-	1
18	0.97	2.86	October	0.22	February	12
18 DUP	0.74	0.74	-	0.74	-	1
19	0.74	1.92	June	0.11	January	12
19 DUP	0.61	0.61	-	0.61	-	1
22	1.07	2.87	October	0.28	May	12
22 DUP	1.25	1.25	-	1.25	-	1
23	0.77	1.31	May	0.28	August	11
23 DUP	NA	NA	-	NA	-	0
24	0.73	1.44	September	0.24	May	12
24 DUP	0.52	0.52	-	0.52	-	1
25	NA	NA	NA	NA	NA	0
25DUP	NA	NA	-	NA	-	0
26	0.70	1.09	April	0.29	May	12
26 DUP	0.54	0.54	-	0.54	-	1
27	0.92	2.58	May	0.09	March	12
27 DUP	0.12	0.12	-	0.12	-	1
28	0.93	1.29	September	0.49	March	10
28 DUP	0.92	0.92	-	0.92	-	1

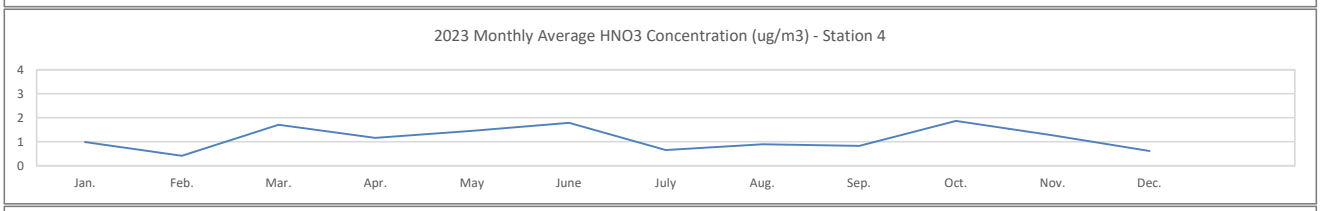
Station	Annual Average	Maximum	Month	Minimum	Month	# of Samples
29	0.67	1.27	December	0.32	January	12
29 DUP	1.14	1.14	-	1.14	-	1
32	1.21	3.28	October	0.18	April	12
32 DUP	2.02	2.02	-	2.02	-	1
42	0.81	3.17	October	0.16	April	12
42 DUP	NA	NA	-	NA	-	0

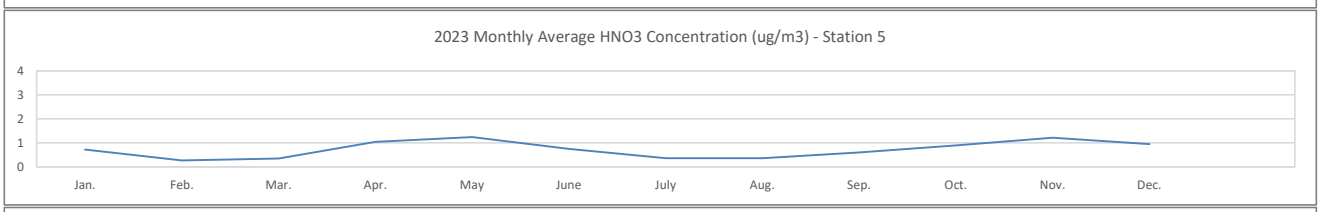
Notes:

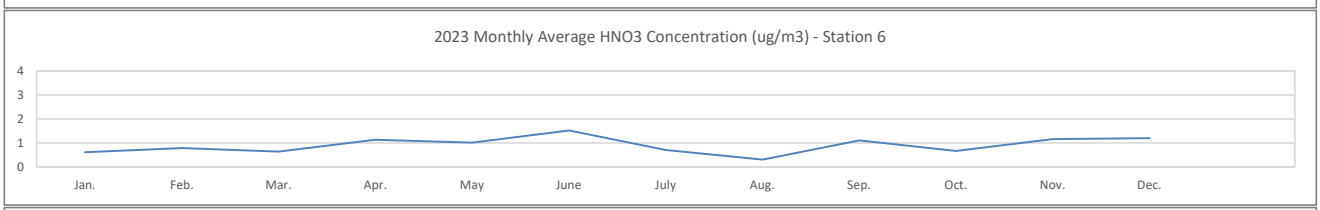
- Concentration unit: ug/m3
- Results from passive samples and their duplicates were compared; all data were ± 3.28 ppb of each other throughout the year.
- No samples were collected at station 25 throughout the year. The field technician has not completed the necessary safety orientation for the CNRL Primrose/Burnt Lake site and access is not permitted at this time.
- Analytical results for station 23 in June and station 28 in June and July were not available because sample filters either got damaged or were missing or the access to the station was not available during the sample media exchange.

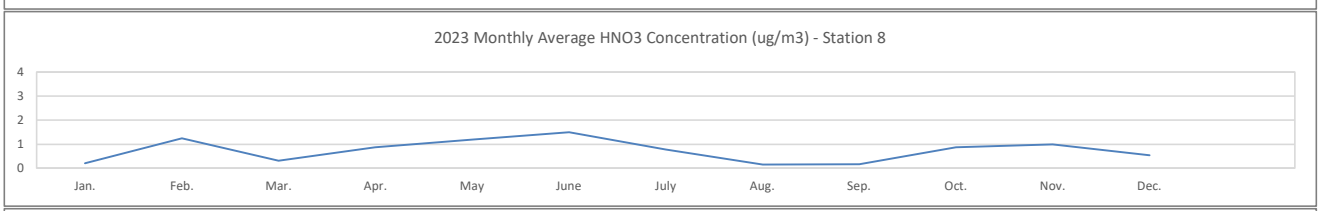

2023 HNO3 Monthly Average Concentrations - in ug/m3
Concentration (ppb)
3.5
3
2.5
2
1.5
1
0.5
0
Station 32, 3.28ug/m3
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Station 3
Station 4
Station 5
Station 6
Station 8
Station 9
Station 10
Station 11
Station 12
Station 13
Station 14
Station 15
Station 16
Station 17
Station 18
Station 19
Station 22
Station 23
Station 24
Station 26
Station 27
Station 28
Station 29
Station 32
Station 42

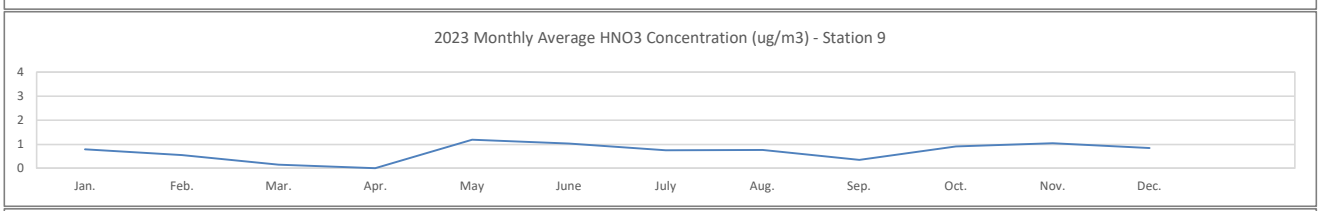

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 3
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

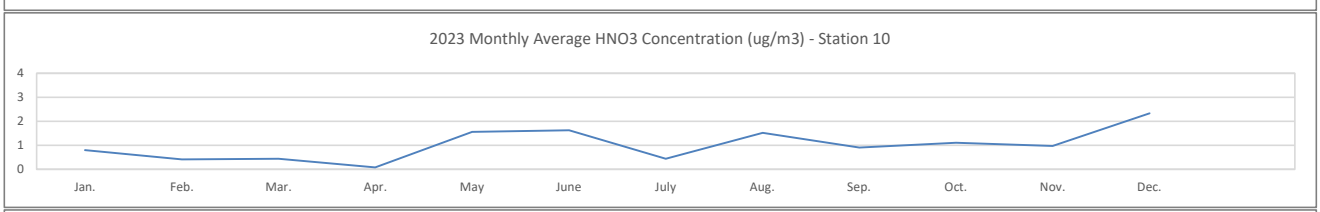

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 4
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

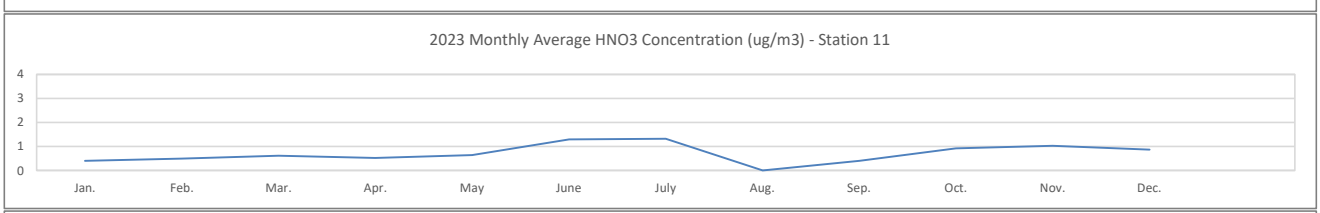

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 5
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

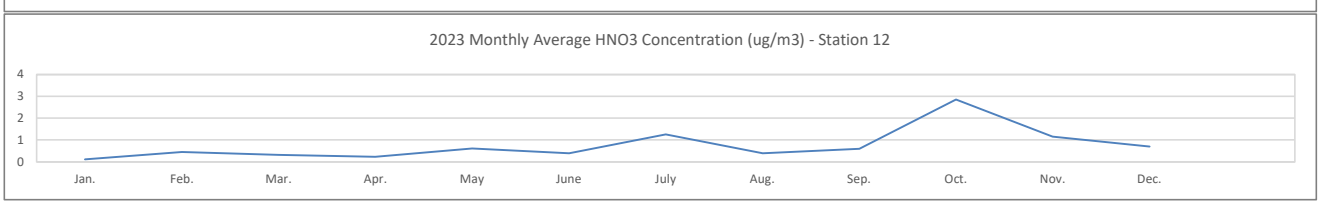

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 6
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

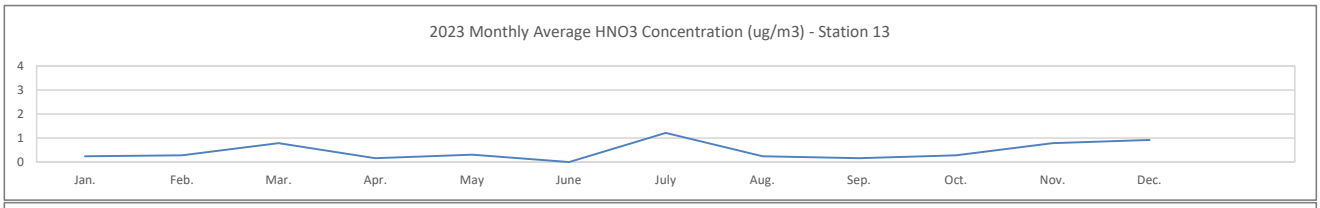

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 8
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

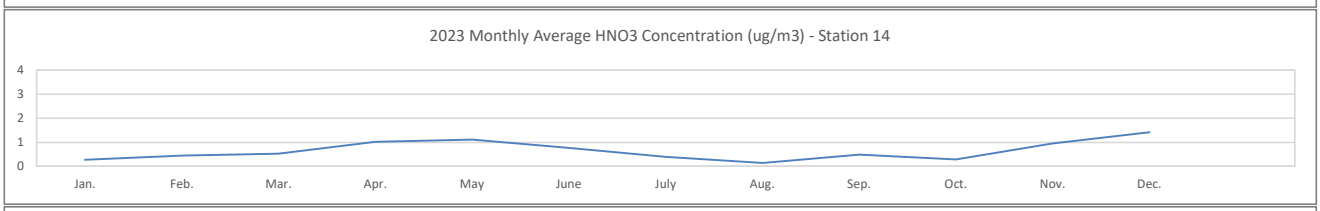

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 9
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

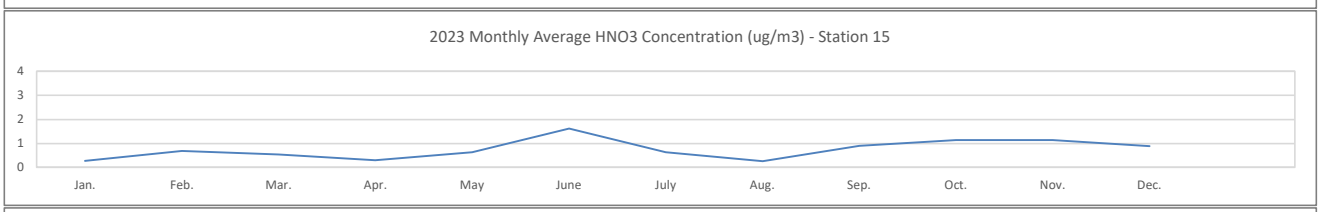

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 10
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

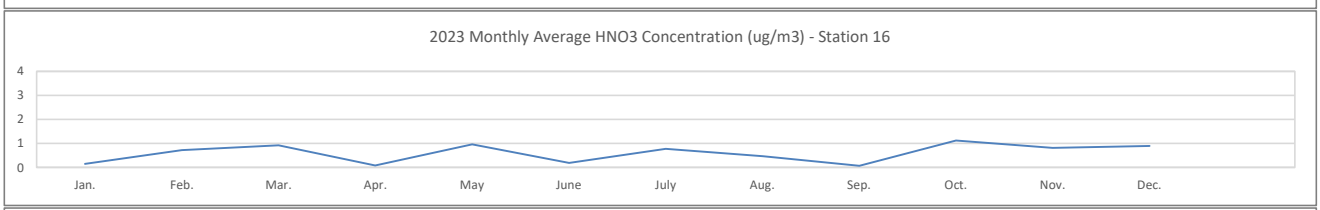

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 11
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

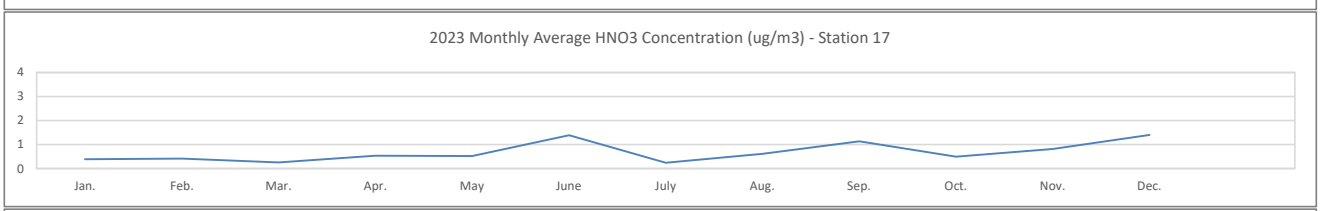

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 12
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

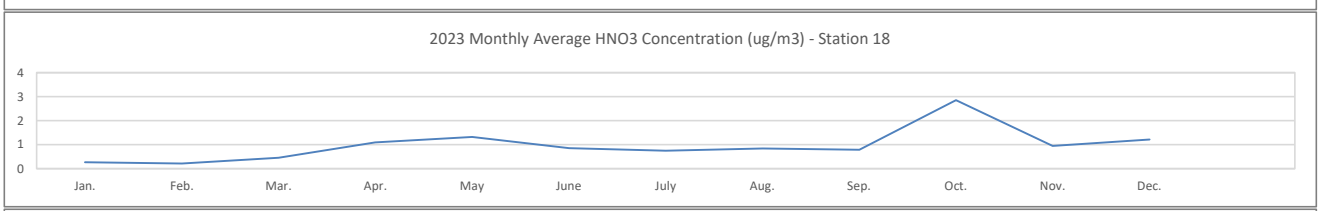

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 13
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

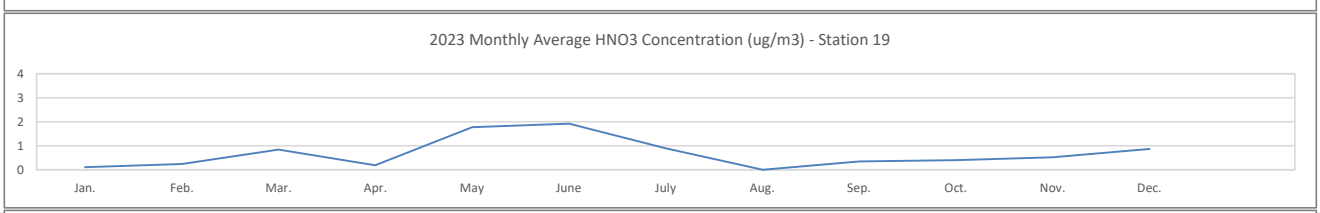

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 14
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

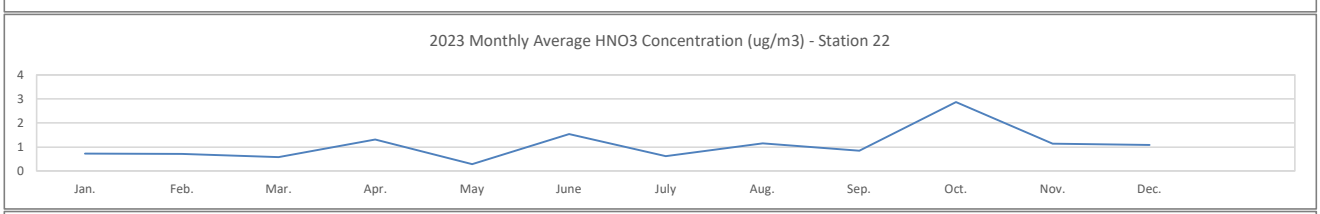

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 15
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

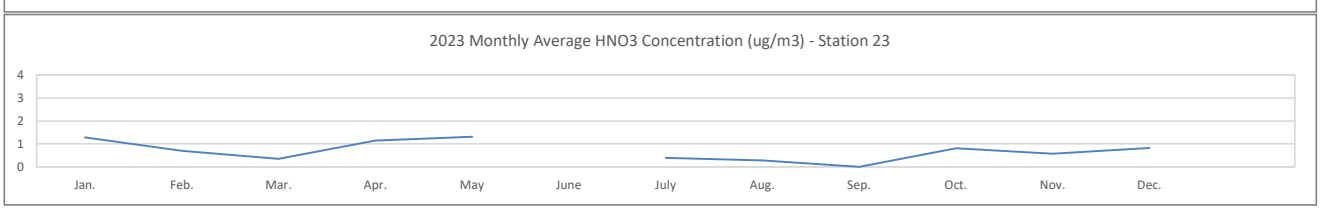

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 16
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

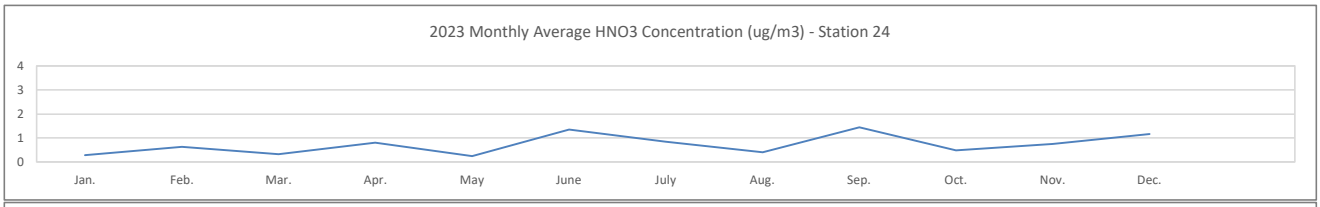

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 17
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

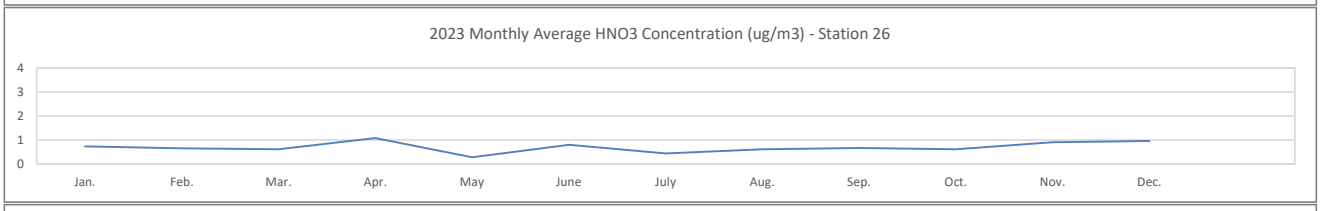

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 18
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

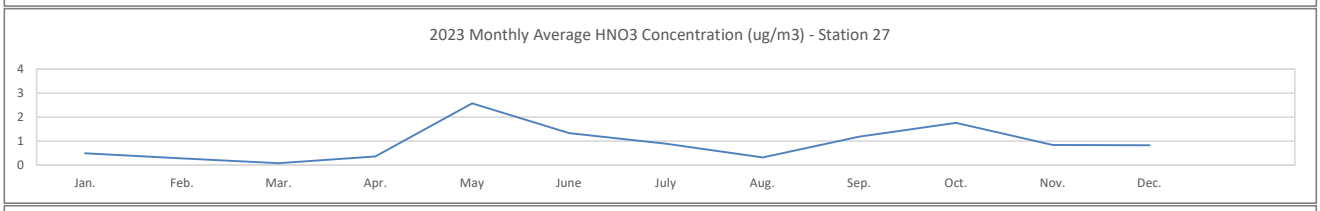

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 19
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

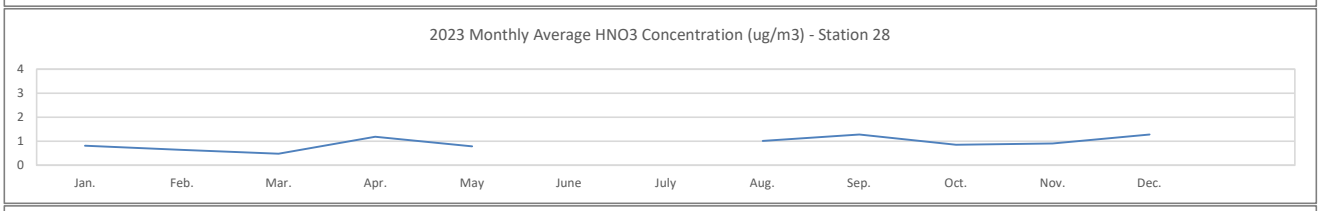

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 22
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

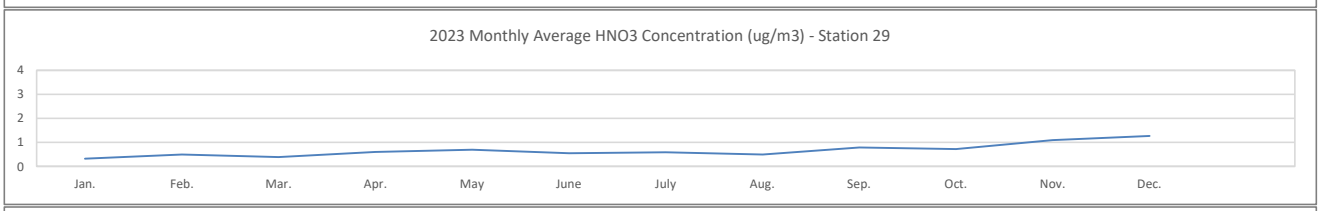

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 23
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

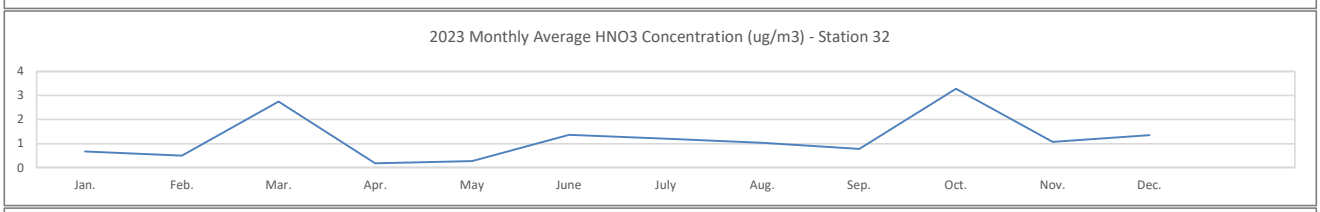

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 24
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

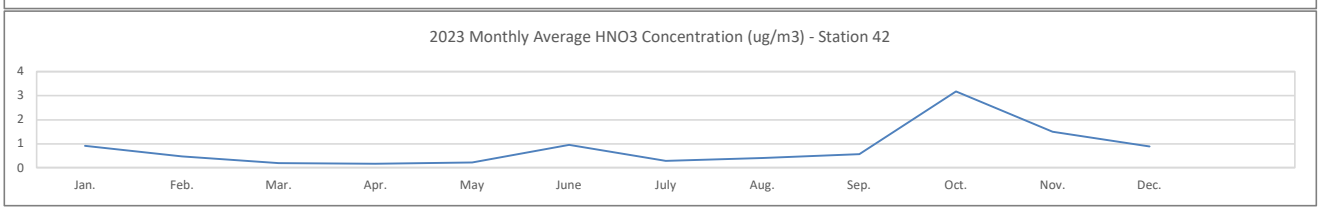

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 26
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average HNO3 Concentration (ug/m3) - Station 27
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

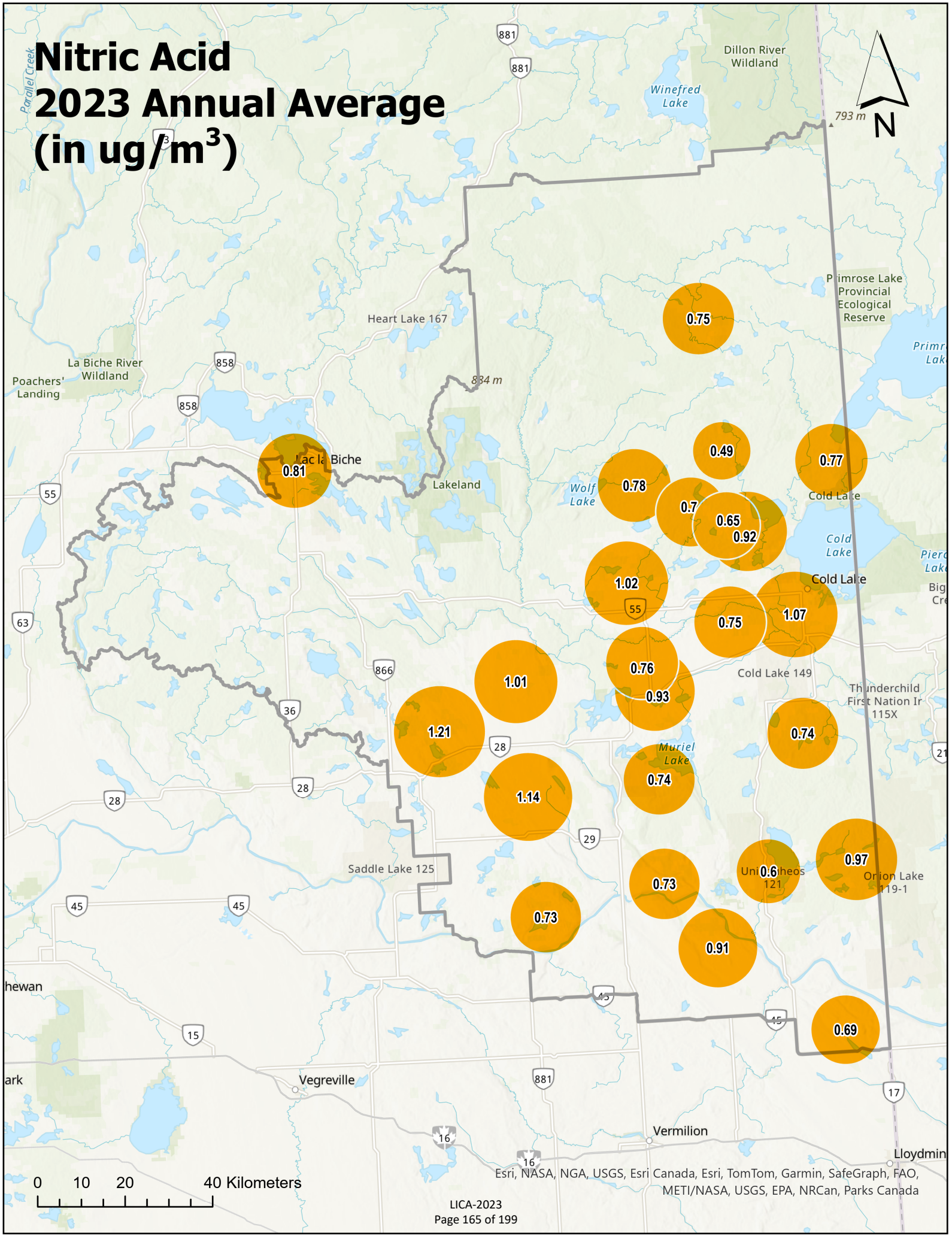

2023 Monthly Average HNO3 Concentration (ug/m3) - Station 28
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average HNO3 Concentration (ug/m3) - Station 29
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average HNO3 Concentration (ug/m3) - Station 32
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.


2023 Monthly Average HNO3 Concentration (ug/m3) - Station 42
4
3
2
1
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

Nitric Acid 2023 Annual Average (in ug/m^3)



3.2 Partisol Sampling System

3.2.1 Particulate Matter 2.5 ($PM_{2.5}$)

Sample Date	Filter #	Volume (Vstd m^3)	PM2.5 Mass (mg)	PM2.5 Mass in ug/m3
2023-01-06	C9694337	23.1	0.057	2.468
2023-01-12	C9694339	23.1	0.147	6.364
2023-01-18	C9694259	22.7	0.036	1.586
2023-01-24	C9694257	22.4	0.030	1.339
2023-01-30	C9694255	23.8	<0.004	0.168
2023-02-05	C9694251	22.1	0.100	4.525
2023-02-11	C1165505	21.9	<0.004	0.183
2023-02-17	C9494261	22.3	<0.004	0.179
2023-02-23	C9694253	24.9	0.025	1.004
2023-03-01	C1165517	22.9	0.034	1.485
2023-03-07	C1165515	23.7	0.009	0.380
2023-03-13	C1165507	22.9	0.055	2.402
2023-03-19	C1165543	22.6	0.078	3.451
2023-03-25	C1165513	22.7	0.072	3.172
2023-03-31	C1165541	22.0	0.104	4.727
2023-04-06	C1165519	22.5	0.029	1.289
2023-04-12	C1169948	21.7	0.036	1.659
2023-04-18	C1165509	21.5	<0.004	0.186
2023-04-24	C1165524	21.6	0.057	2.639
2023-04-30	C9700059	21.3	0.048	2.254
2023-05-06	C1165511	21.3	0.011	0.516
2023-05-12	C9700057	21.1	0.651	30.853
2023-05-18	C9700067	21.5	0.349	16.233
2023-05-24	C9700063	21.1	0.155	7.346
2023-05-30	C9700065	20.6	0.149	7.233
2023-06-05	C9700061	20.5	0.142	6.927
2023-06-11	C1170493	20.3	0.609	30.000
2023-06-17	C1168579	20.6	0.059	2.864
2023-06-23	C1169916	20.7	0.067	3.237
2023-06-29	C1169914	20.4	0.257	12.598
2023-07-05	C1167726	20.8	0.074	3.558
2023-07-11	C1170473	20.8	0.064	3.077
2023-07-17	C1168573	20.6	0.212	10.291
2023-07-23	C1168575	20.6	0.508	24.660
2023-07-29	C9700149	21.0	0.097	4.619
2023-08-04	C9700147	20.9	0.229	10.957
2023-08-10	C1168577	20.7	0.031	1.498
2023-08-16	C9700143	21.6	0.219	10.139
2023-08-22	C9700141	21.6	0.330	15.278
2023-08-28	C9700139	21.6	0.768	35.556
2023-09-03	C9700145	16.6	2.960	178.313
2023-09-09	AT78793	21.2	0.179	8.443
2023-09-15	AT78797	21.2	0.119	5.613
2023-09-21	AT78795	21.4	0.436	20.374
2023-09-27	AT78791	21.1	0.134	6.351
2023-10-03	AT78789	21.3	0.030	1.408
2023-10-09	AT78779	20.8	0.093	4.471

Sample Date	Filter #	Volume (Vstd m^3)	PM2.5 Mass (mg)	PM2.5 Mass in ug/m3
2023-10-15	AT85161	21.7	0.082	3.779
2023-10-23	AT85577	22.2	0.012	0.541
2023-10-27	AT79088	22.2	0.071	3.198
2023-11-02	AT79044	22.0	0.129	5.864
2023-11-08	AT79091	22.0	0.011	0.500
2023-11-14	AT85575	21.9	0.026	1.187
2023-11-20	AT79090	22.3	<0.004	0.179
2023-11-26	AT85573	22.6	0.018	0.796
2023-12-02	AT79026	22.4	0.182	8.125
2023-12-08	AT85569	22.8	0.090	3.947
2023-12-14	AT83968	22.2	0.049	2.207
2023-12-20	AT85571	22.4	0.069	3.080
2023-12-26	AT83608	22.7	0.040	1.762

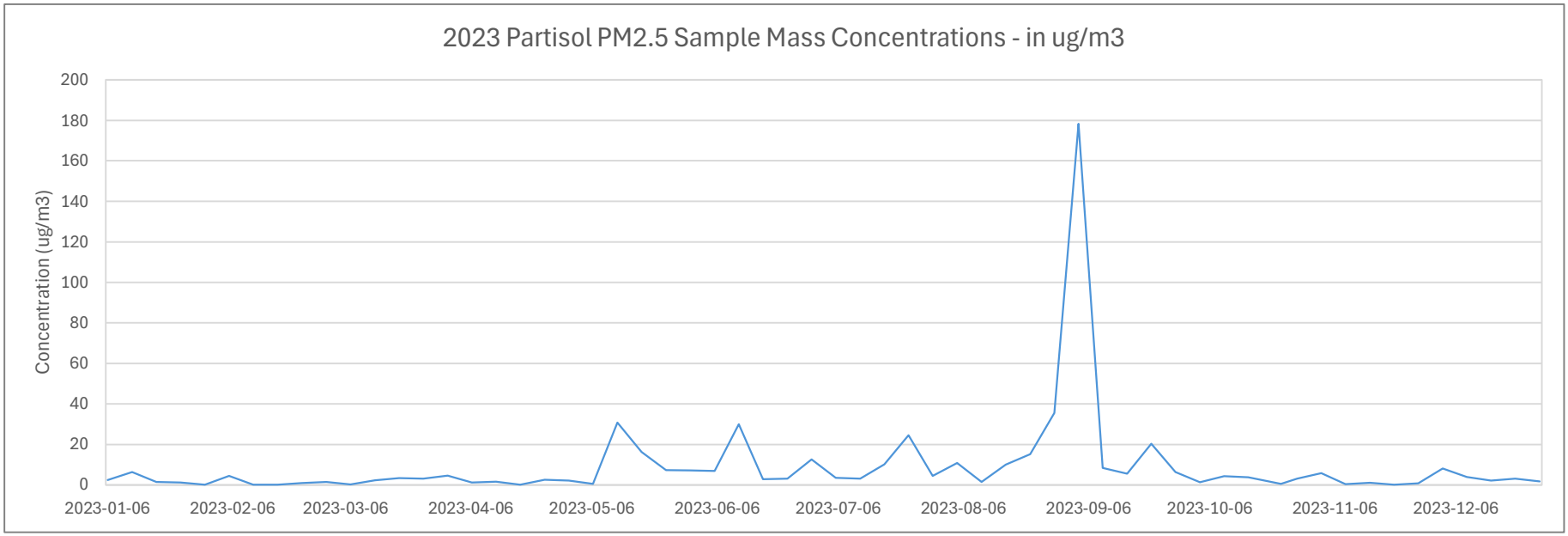
Note: Sampling was conducted during an extreme intense smoke event in the area on September 3. The filter was found clogged as a result.

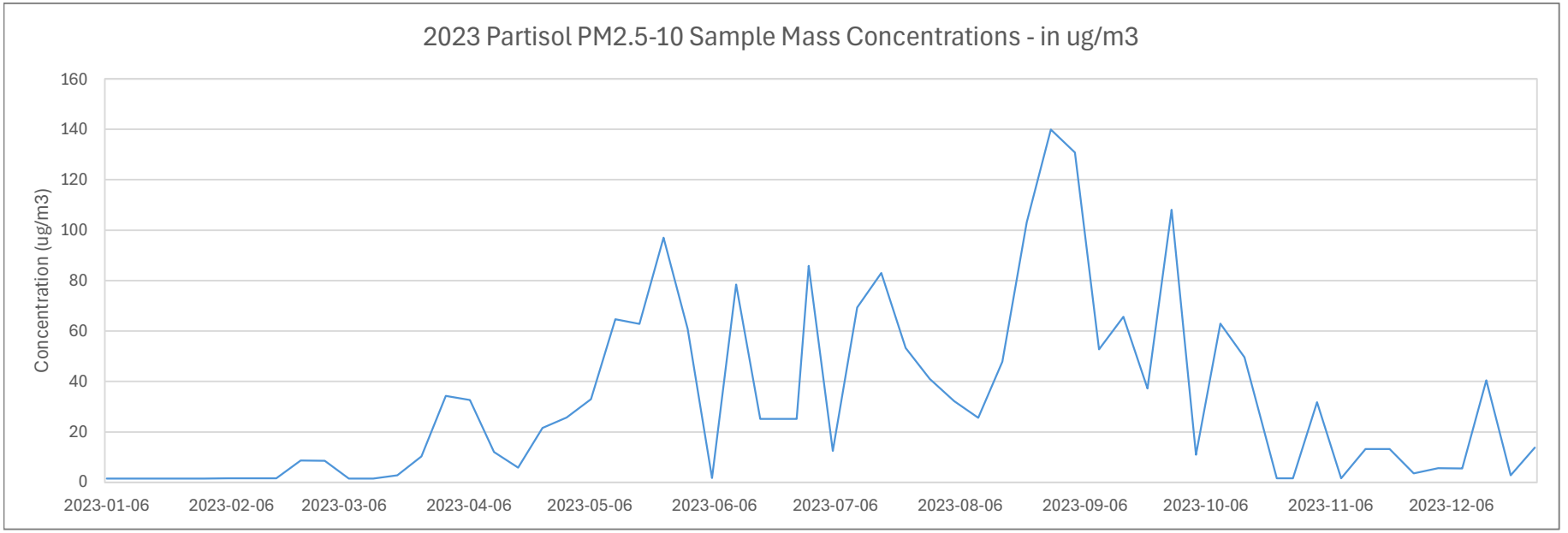
3.2.2 Particulate Matter 2.5-10 ($PM_{2.5-10}$)

Sample Date	Filter #	Volume (Vstd m^3)	PM2.5-10 Mass (mg)	PM2.5-10 Mass in ug/m3
2023-01-06	C9694338	2.57	<0.004	1.556
2023-01-12	C9694340	2.57	<0.004	1.556
2023-01-18	C9694260	2.53	<0.004	1.581
2023-01-24	C9694258	2.49	<0.004	1.606
2023-01-30	C9694256	2.65	<0.004	1.509
2023-02-05	C969452	2.45	<0.004	1.633
2023-02-11	C1165506	2.44	<0.004	1.639
2023-02-17	C9494262	2.48	<0.004	1.613
2023-02-23	C9694254	2.77	0.024	8.664
2023-03-01	C1165518	2.56	0.022	8.594
2023-03-07	C1165516	2.64	<0.004	1.515
2023-03-13	C1165508	2.55	<0.004	1.569
2023-03-19	C1165544	2.51	0.007	2.789
2023-03-25	C1165514	2.52	0.026	10.317
2023-03-31	C1165542	2.45	0.084	34.286
2023-04-06	C1165520	2.51	0.082	32.669
2023-04-12	C1169949	2.42	0.029	11.983
2023-04-18	C1165510	2.39	0.014	5.858
2023-04-24	C1165525	2.41	0.052	21.577
2023-04-30	C9700060	2.37	0.061	25.738
2023-05-06	C1165512	2.37	0.078	32.911
2023-05-12	C9700058	2.35	0.152	64.681
2023-05-18	C9700068	2.39	0.150	62.762
2023-05-24	C9700064	2.35	0.228	97.021
2023-05-30	C9700066	2.30	0.140	60.870
2023-06-05	C9700062	2.28	<0.004	1.754
2023-06-11	C1170494	2.27	0.178	78.414
2023-06-17	C1168580	2.30	0.058	25.217
2023-06-26	C1169917	2.31	0.058	25.108

Sample Date	Filter #	Volume (Vstd m^3)	PM2.5-10 Mass (mg)	PM2.5-10 Mass in ug/m3
2023-06-29	C1169915	2.27	0.195	85.903
2023-07-05	C1167727	2.32	0.029	12.500
2023-07-11	C1170474	2.32	0.161	69.397
2023-07-17	C1168574	2.29	0.190	82.969
2023-07-23	C1168576	2.29	0.122	53.275
2023-07-29	C9700150	2.34	0.096	41.026
2023-08-04	C9700148	2.33	0.075	32.189
2023-08-10	C1168578	2.30	0.059	25.652
2023-08-16	C9700144	2.32	0.111	47.845
2023-08-22	C9700142	2.32	0.239	103.017
2023-08-28	C9700140	2.31	0.323	139.827
2023-09-03	C9700146	1.85*	0.242	130.811
2023-09-09	AT78794	2.37	0.125	52.743
2023-09-15	AT78798	2.36	0.155	65.678
2023-09-21	AT78796	2.39	0.089	37.238
2023-09-27	AT78792	2.35	0.254	108.085
2023-10-03	AT78790	2.38	0.026	10.924
2023-10-09	AT78780	2.32	0.146	62.931
2023-10-15	AT78974	2.42	0.120	49.587
2023-10-23	AT85578	2.47	<0.004	1.619
2023-10-27	AT79089	2.47	<0.004	1.619
2023-11-02	AT85160	2.45	0.078	31.837
2023-11-08	AT79092	2.45	<0.004	1.633
2023-11-14	AT85576	2.42	0.032	13.223
2023-11-20	AT79042	2.49	0.033	13.253
2023-11-26	AT85574	2.51	0.009	3.586
2023-12-02	AT79040	2.5	0.014	5.600
2023-12-08	AT85570	2.54	0.014	5.512
2023-12-14	AT83967	2.47	0.100	40.486
2023-12-20	AT85572	2.49	0.007	2.811
2023-12-26	AT83609	2.53	0.035	13.834

Note: Sampling was conducted during an extreme intense smoke event in the area on September 3. The filter was found clogged as a result.


2023 Partisol PM2.5 Sample Mass Concentrations - in ug/m3
Concentration (ug/m3)
200
180
160
140
120
100
80
60
40
20
0
2023-01-06
2023-02-06
2023-03-06
2023-04-06
2023-05-06
2023-06-06
2023-07-06
2023-08-06
2023-09-06
2023-10-06
2023-11-06
2023-12-06


2023 Partisol PM2.5-10 Sample Mass Concentrations - in ug/m3
Concentration (ug/m3)
160
140
120
100
80
60
40
20
0
2023-01-06
2023-02-06
2023-03-06
2023-04-06
2023-05-06
2023-06-06
2023-07-06
2023-08-06
2023-09-06
2023-10-06
2023-11-06
2023-12-06

3.3 VOCs Sampling System

Sample Date	Canister ID	Maximum Reading (ppbv)	Parameter
2023-01-06	32241	1.3	Ethanol
2023-01-12	28946	n/a	n/a
2023-01-18	32263	2.44	n-Butane
2023-01-24	28910	0.9	Ethanol
2023-01-30	32229	1.4	Acetone
2023-02-05	28887	2.17	n-Butane
2023-02-11	32215	1.2	Acetone
2023-02-17	28904	1.2	Acetone
2023-02-23	28881	0.7	Acetone
2023-03-01	32224	1.4	Acetone
2023-03-07	32275	1.6	Acetone
2023-03-13	29026	1.6	Acetone
2023-03-19	28966	7.55	n-Butane
2023-03-25	29004	1.7	Acetone
2023-03-31	32247	3.5	Acetone
2023-04-06	32265	2.1	Acetone
2023-04-12	28896	2.3	Acetone
2023-04-18	28888	2.7	Acetone
2023-04-24	31821	3	Acetone
2023-04-30	32211	2.6	Acetone
2023-05-06	32243	1.3	Ethanol
2023-05-12	28953	5.5	Acetone
2023-05-18	29038	3.3	Acetone
2023-05-24	32189	3.1	Acetone
2023-05-30	32261	3.8	Acetone
2023-06-05	28951	4.4	Acetone
2023-06-11	28908	5.7	Acetone
2023-06-17	31826	2.2	Acetone
2023-06-23	28917	4.4	Acetone
2023-06-29	29018	6.1	Acetone
2023-07-05	32255	2.5	Acetone
2023-07-11	29031	3	Acetone
2023-07-17	32263	3.8	Acetone
2023-07-23	28968	6.9	Acetone
2023-07-29	28957	2.3	Acetone
2023-08-04	31818	3.7	Acetone
2023-08-10	32254	2	Acetone
2023-08-16	28896	2.5	Acetone
2023-08-22	32274	5.6	Acetone
2023-08-28	32199	4.3	Acetone

Sample Date	Canister ID	Maximum Reading (ppbv)	Parameter
2023-09-03	32187	5.1	Acetone
2023-09-09	29028	2.4	Acetone
2023-09-15	28912	1.6	Acetone
2023-09-21	28942	1.7	Acetone
2023-09-27	32241	2	Acetone
2023-10-03	28907	1.1	Acetone
2023-10-09	32237	2.2	Acetone
2023-10-15	28904	9.3	Ethanol
2023-10-23	32225	0.8	Ethanol
2023-10-27	31818	0.9	Acetone
2023-11-02	32219	1.2	Acetone
2023-11-08	47977	0.8	Acetone
2023-11-14	32201	0.8	Acetone
2023-11-20	31825	1.05	n-Butane
2023-11-26	32213	0.8	Acetone
2023-12-02	28950	1.4	n-Butane
2023-12-08	32243	1.56	n-Butane
2023-12-14	A47746	1.3	Acetone
2023-12-20	A47740	0.7	Acetone
2023-12-26	29029	2.2	Ethanol

Notes: No sample was collected on the January 12 sample run due to a broken sampler.

3.4 PAHs Sampling System

Sample Date	PUF S/N	Volume (Vstd m^3)	Maximum Reading		Parameter
2023-01-06	TE-12	330.39	ug	0.55	Naphthalene
			ng/m3	1.66	
2023-01-12	TE-03	330.43	ug	0.29	Phenanthrene
			ng/m3	0.88	
2023-01-18	9802	330.39	ug	0.37	Phenanthrene
			ng/m3	1.12	
2023-01-24	TE-09	330.42	ug	0.88	Naphthalene
			ng/m3	2.66	
2023-01-30	TE-06	330.40	ug	0.18	Phenanthrene
			ng/m3	0.54	
2023-02-05	A13-02	330.39	ug	0.60	Phenanthrene
			ng/m3	1.82	
2023-02-11	TE-01	330.40	ug	0.32	Phenanthrene
			ng/m3	0.97	
2023-02-17	TE-08	330.40	ug	0.25	Naphthalene
			ng/m3	0.76	
2023-02-23	TE-07	330.42	ug	1.21	Naphthalene
			ng/m3	3.66	
2023-03-01	P13-01	330.42	ug	0.17	Naphthalene
			ng/m3	0.51	
2023-03-07	TE-12	330.41	ug	0.39	Naphthalene
			ng/m3	1.18	

Sample Date	PUF S/N	Volume (Vstd m^3)	Maximum Reading		Parameter
2023-03-13	TE-05	330.44	ug	0.40	Naphthalene
			ng/m3	1.21	
2023-03-19	9802	330.41	ug	0.23	Phenanthrene
			ng/m3	0.70	
2023-03-25	TE-11	330.42	ug	0.15	2-Methylnaphthalene
			ng/m3	0.45	
2023-03-31	TE-06	330.42	ug	0.10	Phenanthrene
			ng/m3	0.30	
2023-04-06	TE-07	330.42	ug	0.16	Phenanthrene
			ng/m3	0.48	
2023-04-12	P13-01	330.40	ug	0.35	2-Methylnaphthalene
			ng/m3	1.06	
2023-04-18	TE-03	330.41	ug	0.22	Phenanthrene
			ng/m3	0.67	
2023-04-24	TE-08	330.38	ug	0.15	Phenanthrene
			ng/m3	0.45	
2023-04-30	TE-09	330.41	ug	0.42	Phenanthrene
			ng/m3	1.27	
2023-05-06	TE-12	330.4	ug	0.73	Retene
			ng/m3	2.21	
2023-05-12	A13-02	330.41	ug	4.03	Retene
			ng/m3	12.20	
2023-05-18	TE-01	330.40	ug	4.08	Retene
			ng/m3	12.35	
2023-05-24	TE-04	330.40	ug	0.60	Retene
			ng/m3	1.82	
2023-05-30	TE-06	330.42	ug	0.34	Retene
			ng/m3	1.03	
2023-06-05	9803	342.21	ug	n/a	n/a
			ng/m3	n/a	
2023-06-11	TE-02	330.41	ug	0.28	Phenanthrene
			ng/m3	0.85	
2023-06-17	9801	330.41	ug	0.42	Benzo(c)phenanthrene
			ng/m3	1.27	
2023-06-23	9802	330.41	ug	0.34	Benzo(c)phenanthrene
			ng/m3	1.03	
2023-06-29	TE-10	330.41	ug	0.27	Phenanthrene
			ng/m3	0.82	
2023-07-05	TE-08	330.42	ug	0.39	Phenanthrene
			ng/m3	1.18	
2023-07-11	TE-09	330.41	ug	0.34	Phenanthrene
			ng/m3	1.03	
2023-07-17	TE-03	330.44	ug	0.43	Phenanthrene
			ng/m3	1.30	
2023-07-23	TE-01	330.48	ug	0.74	Phenanthrene
			ng/m3	2.24	
2023-07-29	TE-12	330.41	ug	0.38	Phenanthrene
			ng/m3	1.15	
2023-08-04	TE-02	330.43*	ug	0.22	Phenanthrene
			ng/m3	0.67	
2023-08-10	P13-041	330.40	ug	0.15	Phenanthrene
			ng/m3	0.45	
2023-08-16	A13-02	330.40	ug	0.32	Phenanthrene
			ng/m3	0.97	

Sample Date	PUF S/N	Volume (Vstd m^3)	Maximum Reading		Parameter
2023-08-22	TE-06	330.40	ug	0.47	Phenanthrene
			ng/m3	1.42	
2023-08-28	TE-10	330.42	ug	0.46	Phenanthrene
			ng/m3	1.39	
2023-09-03	9801	237.75*	ug	7.14	Retene
			ng/m3	30.03	
2023-09-09	9802	330.39	ug	0.84	Phenanthrene
			ng/m3	2.54	
2023-09-15	TE-01	330.40	ug	0.36	Phenanthrene
			ng/m3	1.09	
2023-09-21	TE-09	330.39	ug	0.59	Phenanthrene
			ng/m3	1.79	
2023-09-27	TE-12	330.42	ug	0.53	2-Methylnaphthalene
			ng/m3	1.60	
2023-10-03	TE-08	330.41	ug	0.39	Phenanthrene
			ng/m3	1.18	
2023-10-09	9702	330.41	ug	0.92	Benzo(e)pyrene
			ng/m3	2.78	
2023-10-15	TE-03	330.42	ug	9.68	Benzo(e)pyrene
			ng/m3	29.30	
2023-10-23	TE-02	330.40	ug	1.66	Benzo(e)pyrene
			ng/m3	5.02	
2023-10-27	P13-01	330.40	ug	0.98	Benzo(e)pyrene
			ng/m3	2.97	
2023-11-02	TE-06	330.40	ug	6.10	Benzo(e)pyrene
			ng/m3	18.46	
2023-11-08	9801	330.43	ug	0.49	Phenanthrene
			ng/m3	1.48	
2023-11-14	A13-02	330.41	ug	0.44	2-Methylnaphthalene
			ng/m3	1.33	
2023-11-20	TE-10	330.43	ug	0.17	2-Methylnaphthalene
			ng/m3	0.51	
2023-11-26	TE-08	330.41	ug	0.57	Phenanthrene
			ng/m3	1.73	
2023-12-02	TE-03	330.42	ug	0.52	Phenanthrene
			ng/m3	1.57	
2023-12-08	TE-06	330.42	ug	0.65	2-Methylnaphthalene
			ng/m3	1.97	
2023-12-14	TE-11	330.41	ug	0.47	2-Methylnaphthalene
			ng/m3	1.42	
2023-12-20	9802	330.39	ug	0.53	Phenanthrene
			ng/m3	1.60	
2023-12-26	P13-01	330.40	ug	0.74	Naphthalene
			ng/m3	2.24	

Note: Due to a lab error, the scheduled June 5 sample could not be collected.

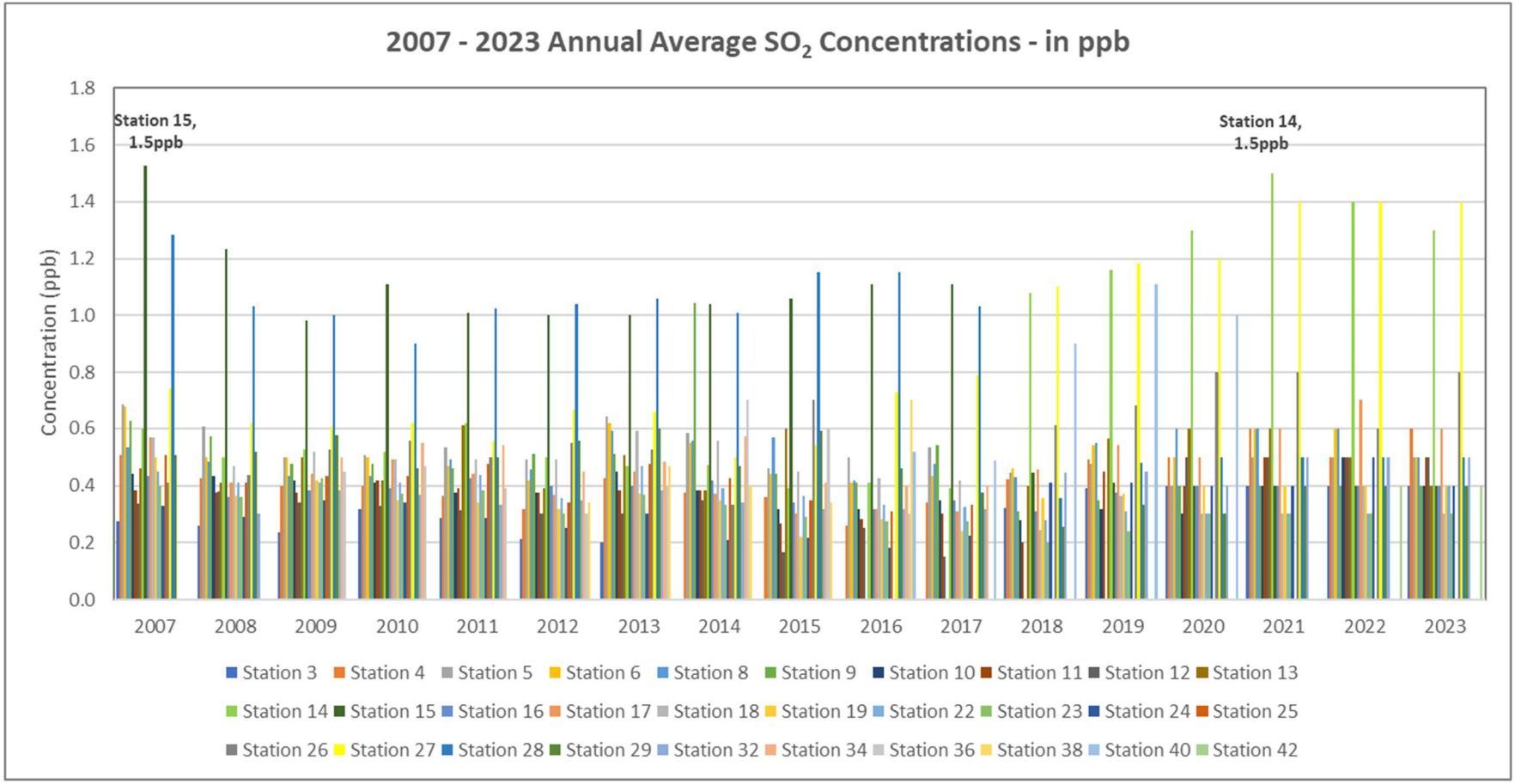
3.5 NMHC Canister Sampling System

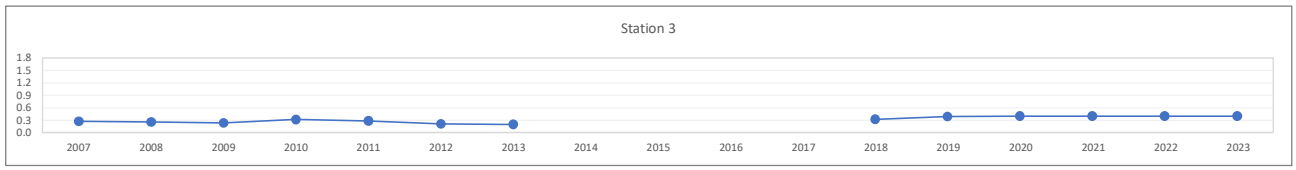
Sample Date/Time	Canister Triggered Conc. (ppm)	Canister ID	Maximum Reading (ppbv)	Parameter
2023-01-05 @07:55	0.37	32261	1	Ethanol
2023-02-14 @07:50	0.55	32250	1.7	Ethanol
2023-02-23 @07:40	0.5	32206	2.8	Ethanol
2023-06-24 @18:50	0.4	28906	5.9	Acetone
2023-07-04 @00:45	0.37	32247	13.4	n-Butane
2023-08-02 @10:20	0.65	32207	5.8	Acetone
2023-08-05 @06:45	0.44	32188	10.6	n-Butane
2023-09-05 @15:00	0.36	32219	5.8	Acetone
2023-10-03 @07:05	0.63	28938	17.7	n-Butane
2023-12-07 @12:10	0.68	28955	1.9	Acetone
2023-12-14 @08:45	0.92	32215	2.1	n-Butane

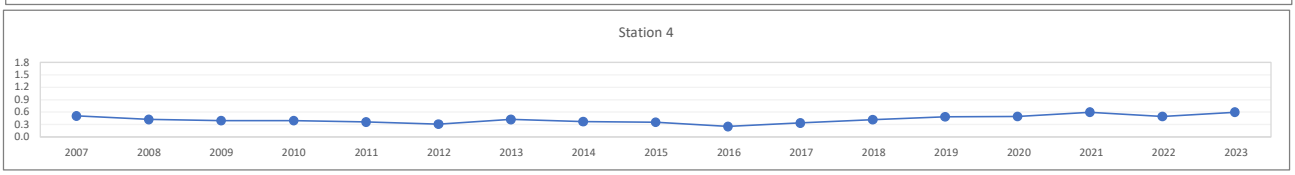
4.0 Integrated Monitoring 17-Year (2007 – 2023) Charts of Annual Average Concentrations

4.1 Passive Sampling System

4.1.1 Sulphur Dioxide (SO_2)




Station 3
1.8
1.5
1.2
0.9
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 4
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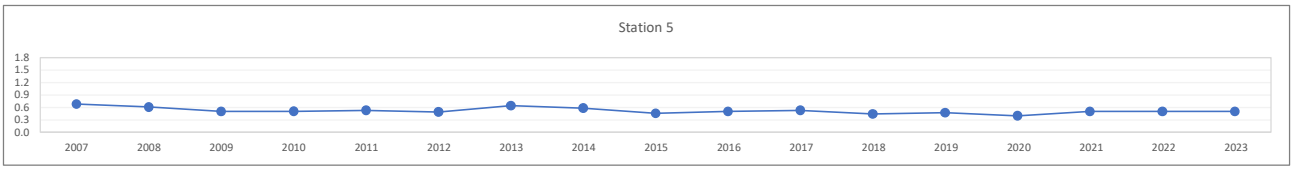
Station 5
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0.6
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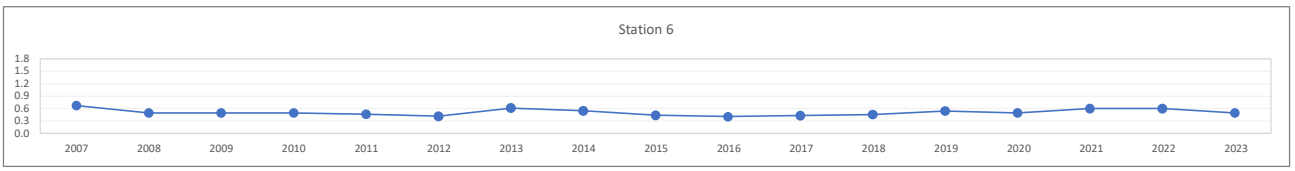
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023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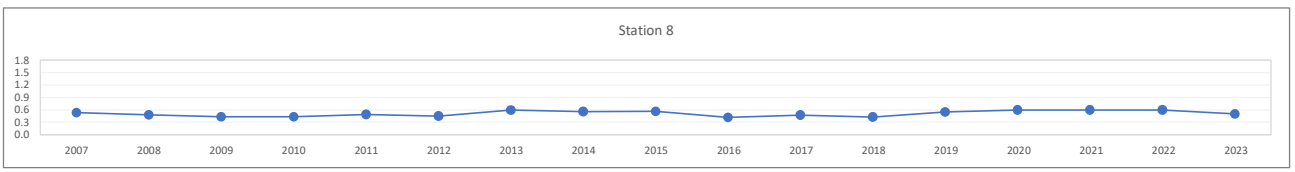
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 8
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0.6
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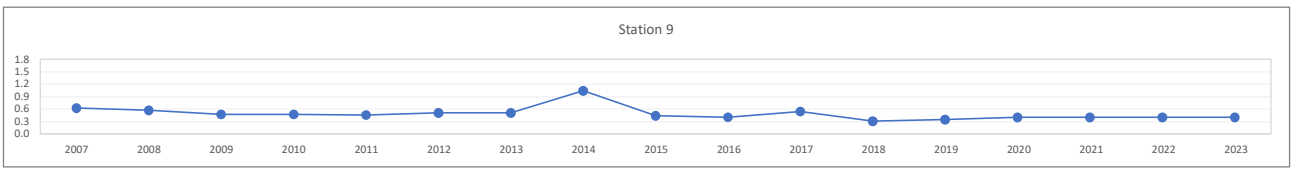
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023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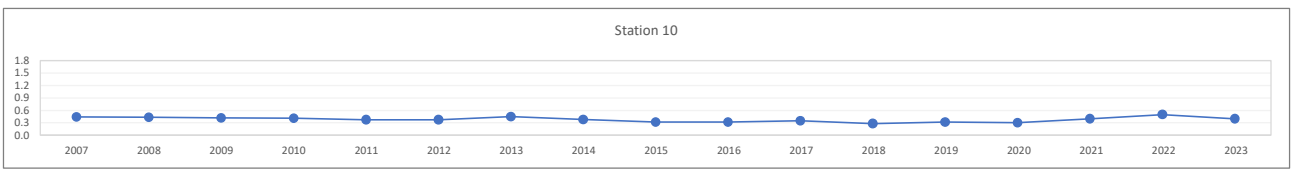
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 10
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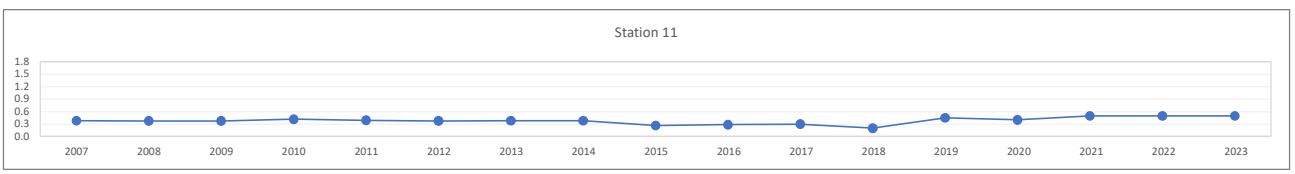
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 11
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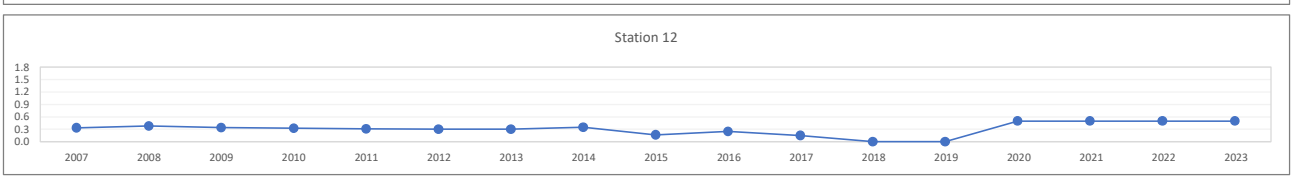
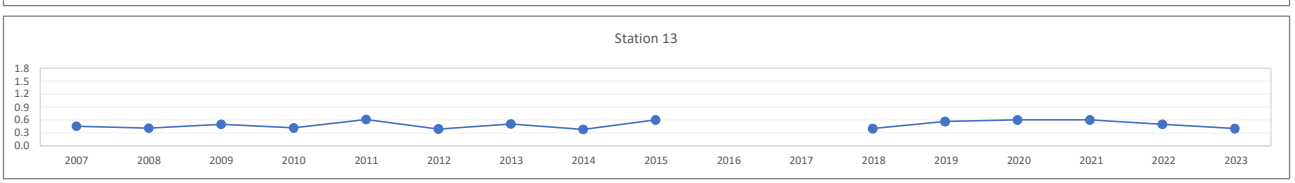
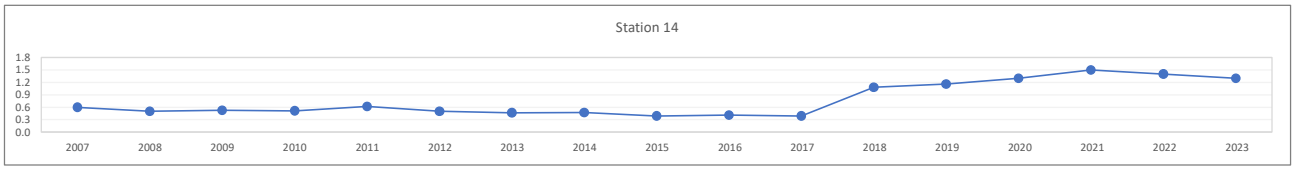
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 12
1.8
1.5
1.2
0.9
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 13
1.8
1.5
1.2
0.9
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 14
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1.2
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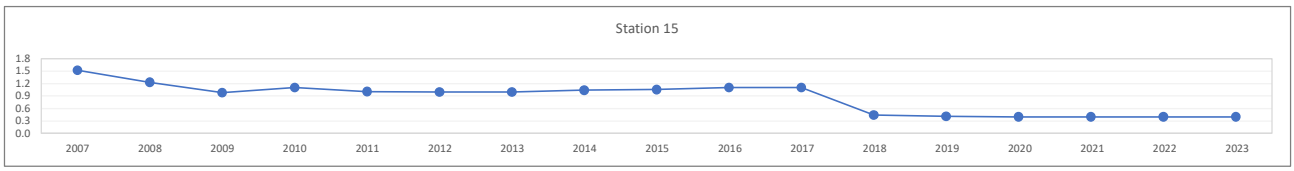
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 15
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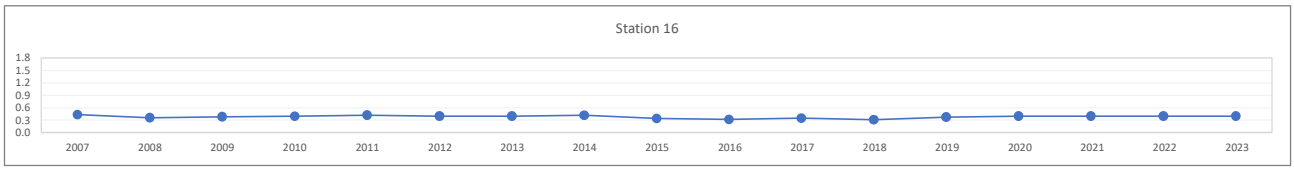
1.2
0.9
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 16
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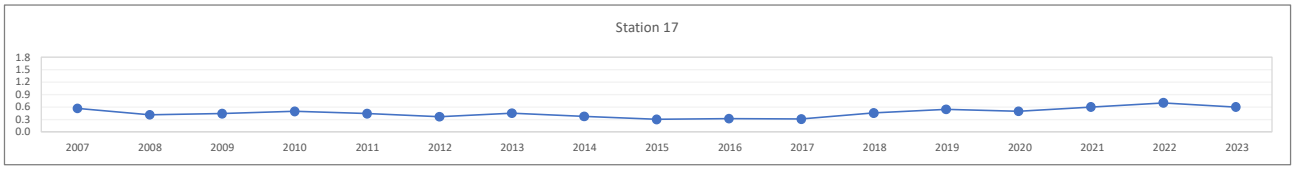
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 17
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1.2
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0.6
0.3
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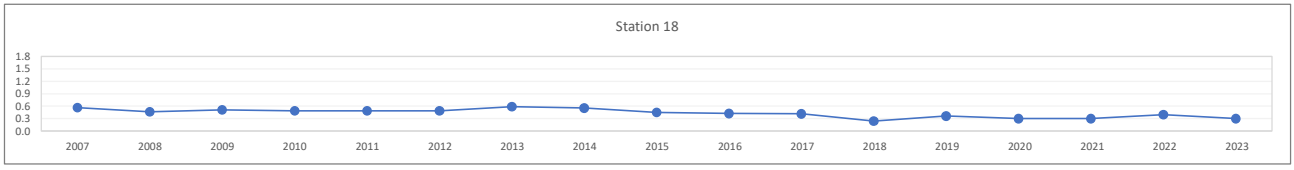
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 18
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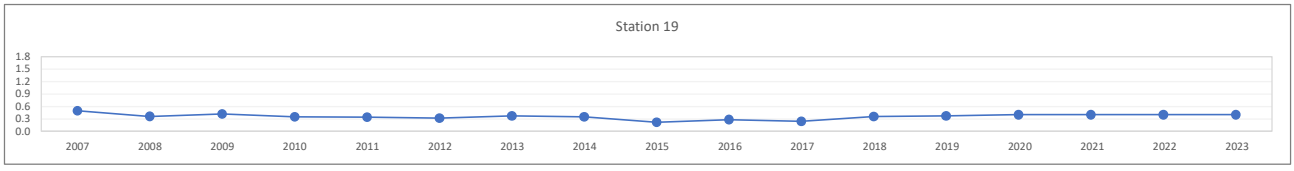
Station 19
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1.2
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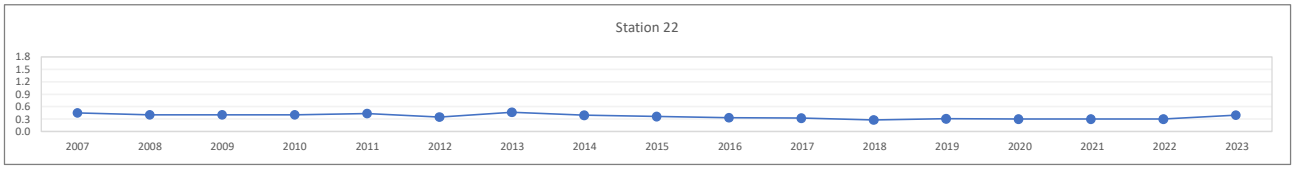
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 22
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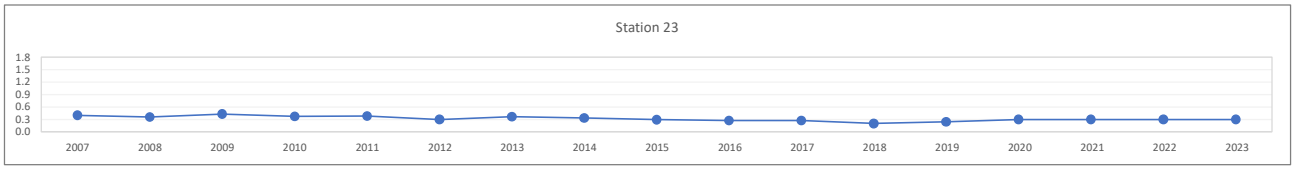
1.2
0.9
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 23
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1.2
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0.6
0.3
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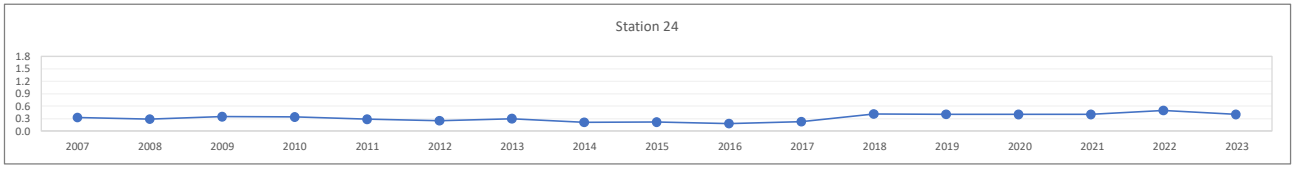
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 24
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1.2
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0.6
0.3
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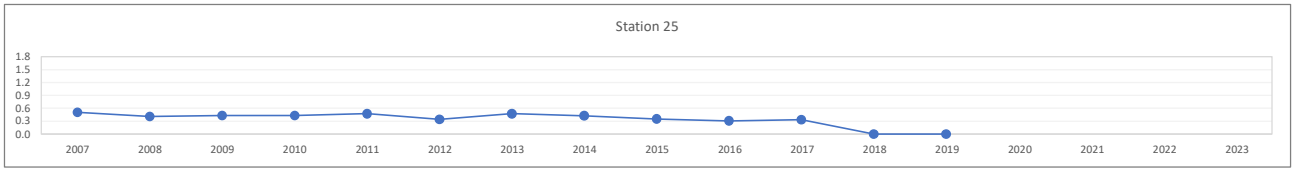
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 25
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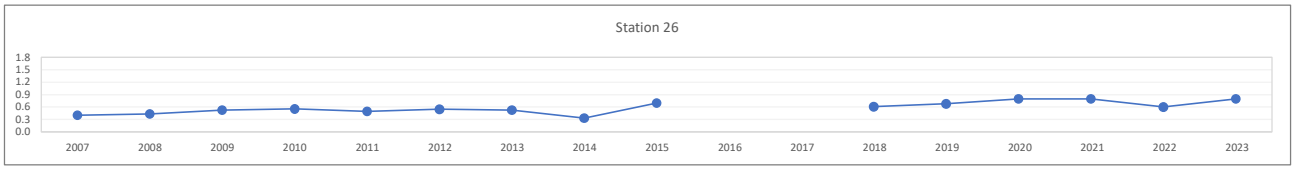
1.2
0.9
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 26
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1.2
0.9
0.6
0.3
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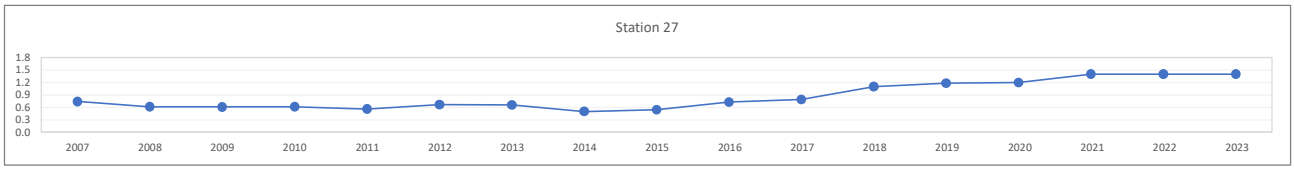
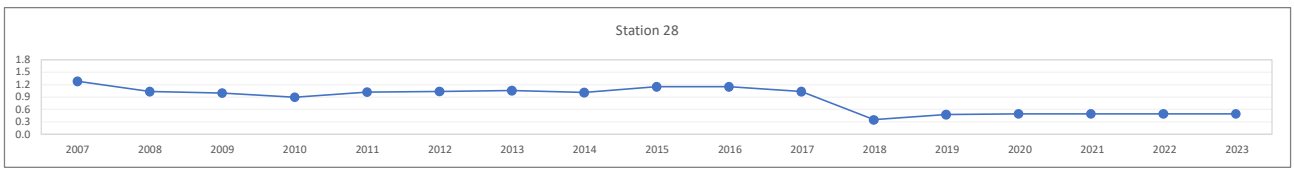
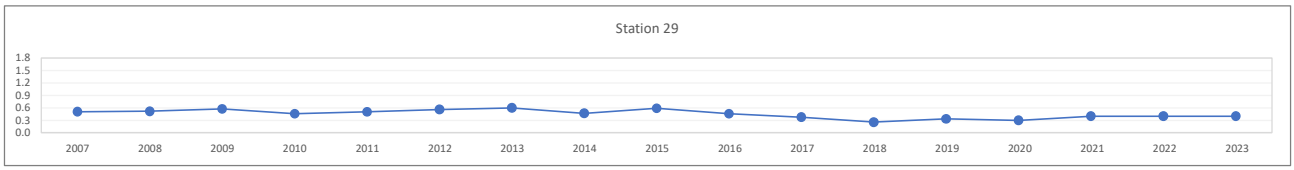
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 27
1.8
1.5
1.2
0.9
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 28
1.8
1.5
1.2
0.9
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 29
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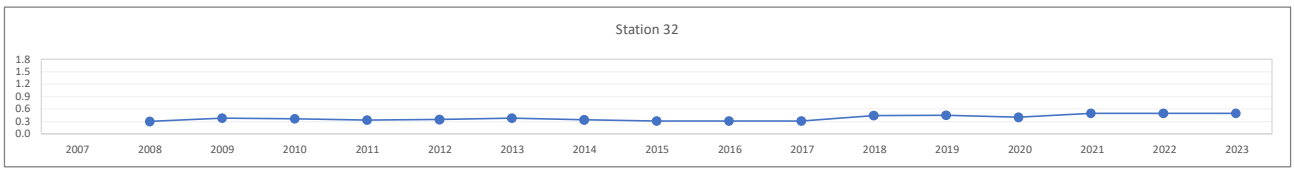
1.2
0.9
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 32
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1.2
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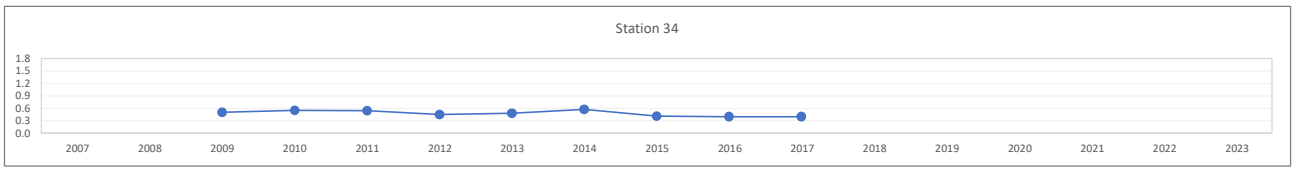
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 34
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1.2
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0.3
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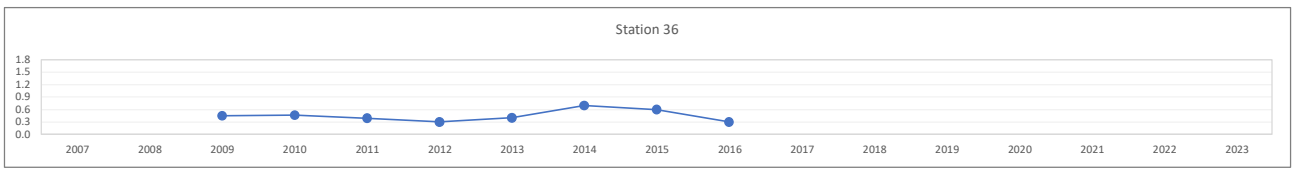
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 36
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1.2
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0.6
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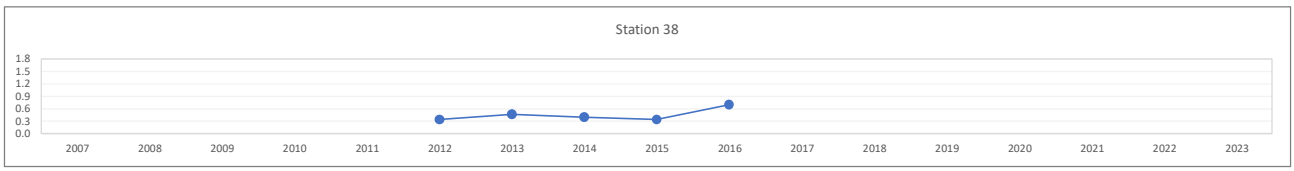
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 38
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1.2
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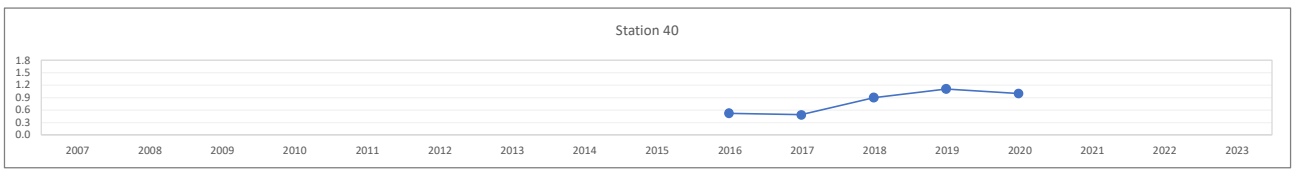
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 40
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1.2
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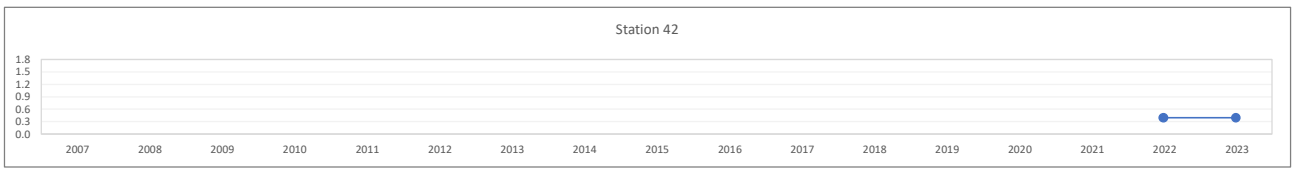
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 42
1.8
1.5
1.2
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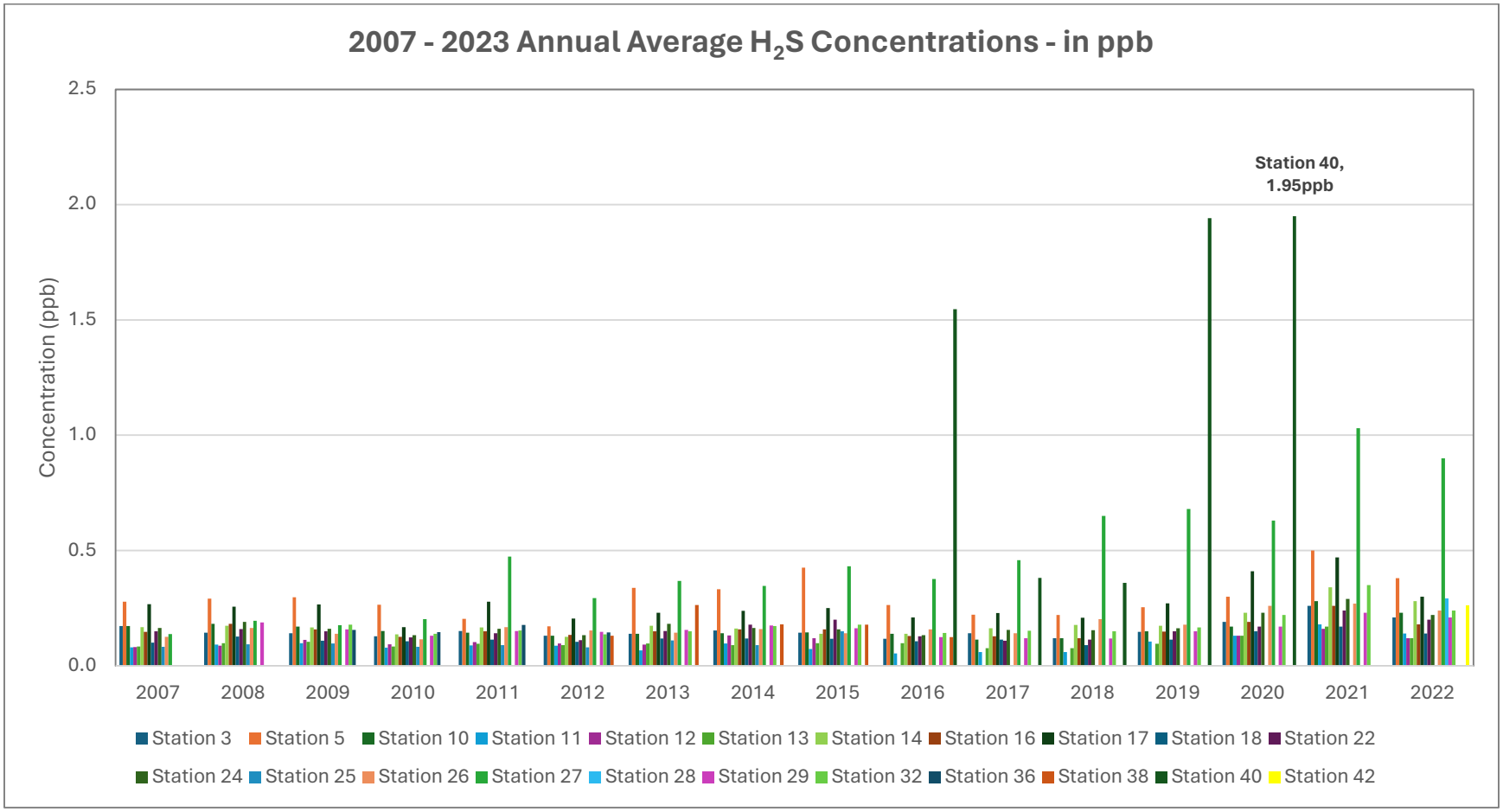
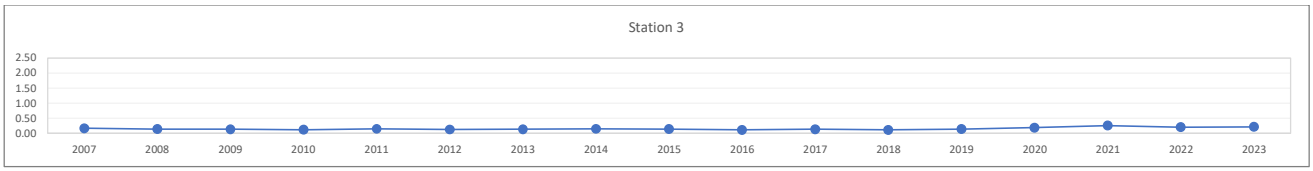
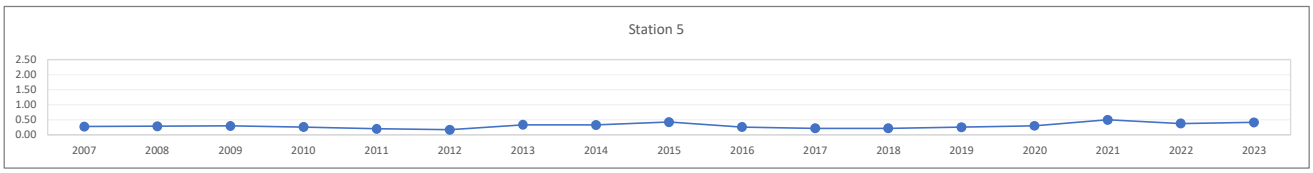
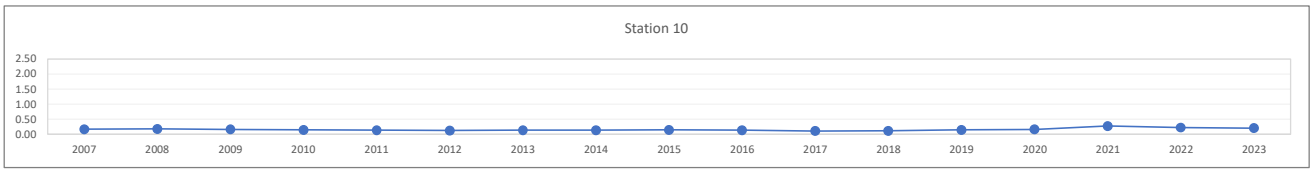
0.6
0.3
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

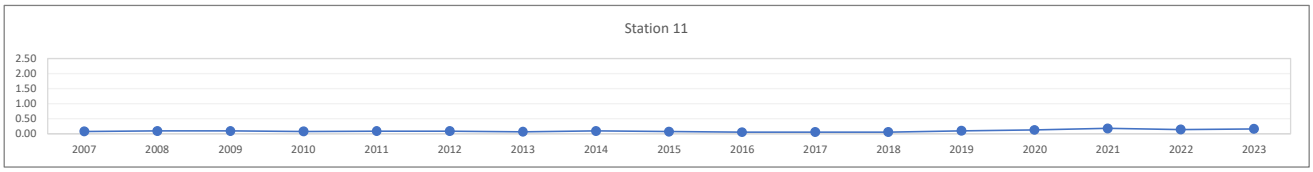
4.1.2 Hydrogen Sulphide (H_2S)

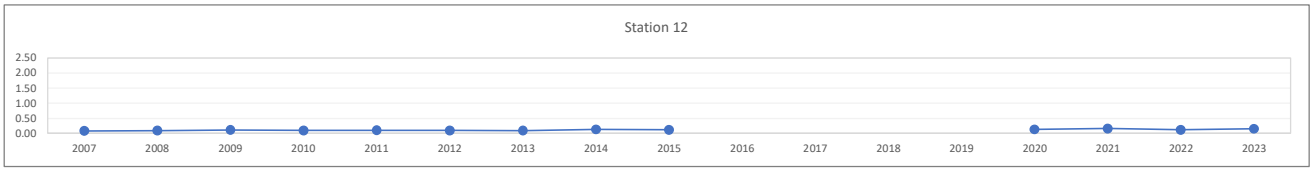



Station 3
2.50
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 5
2.50
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 10
2.50
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 11
2.50
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 12
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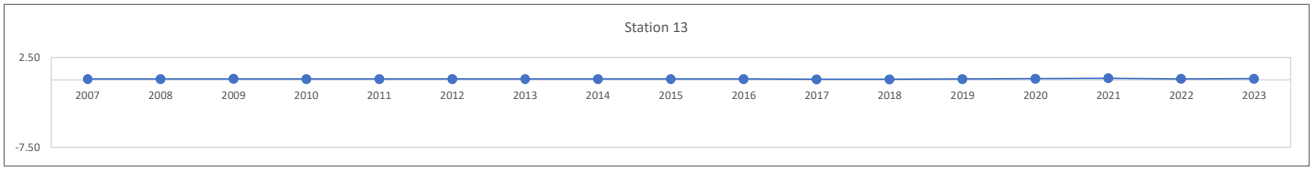
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 13
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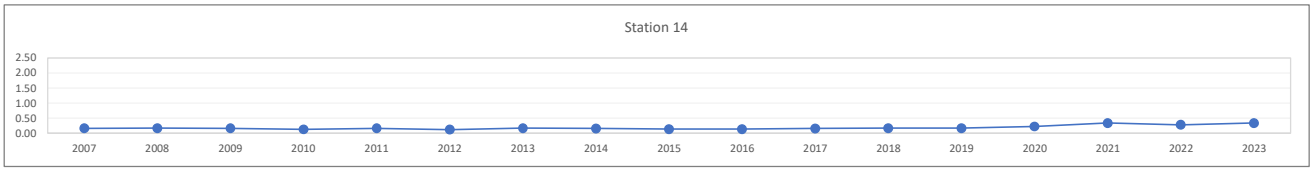
-7.50
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 14
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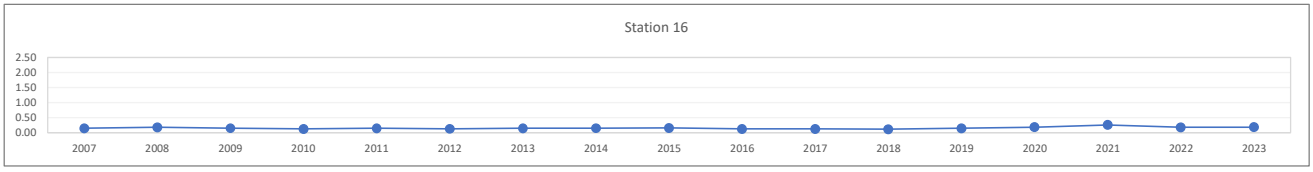
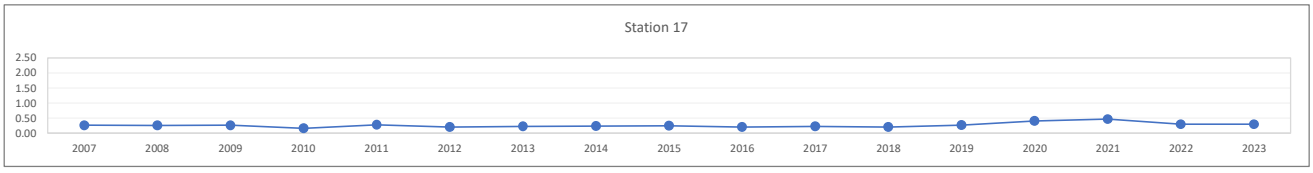
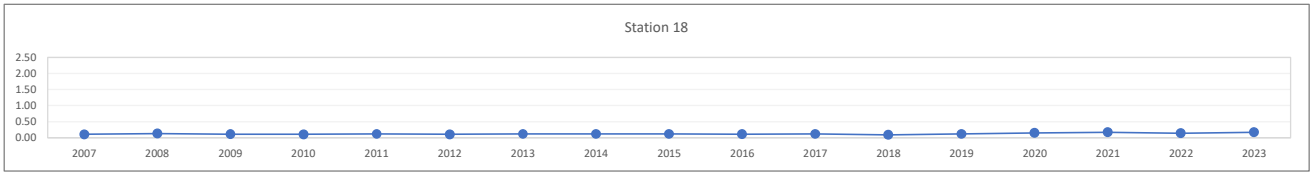
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 16
2.50
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 17
2.50
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 18
2.50
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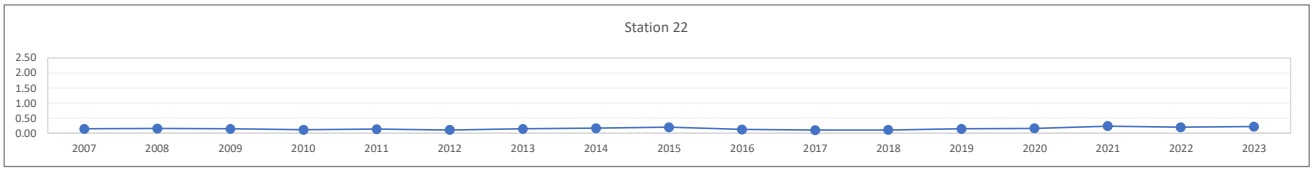
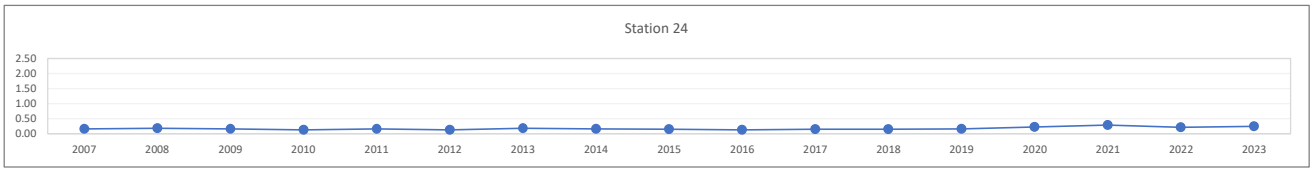
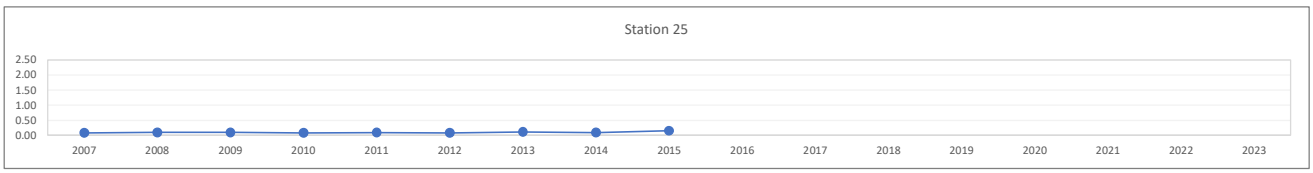
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 22
2.50
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 24
2.50
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 25
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1.00
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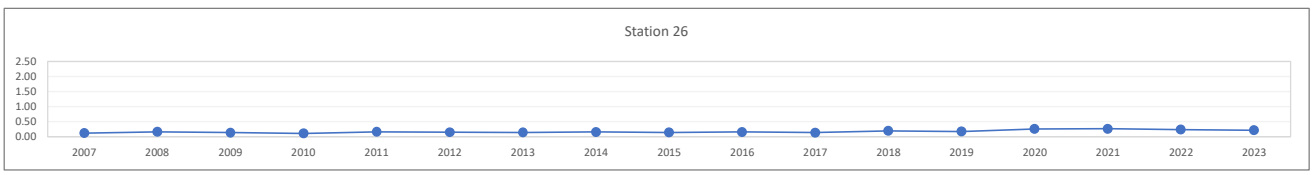
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 26
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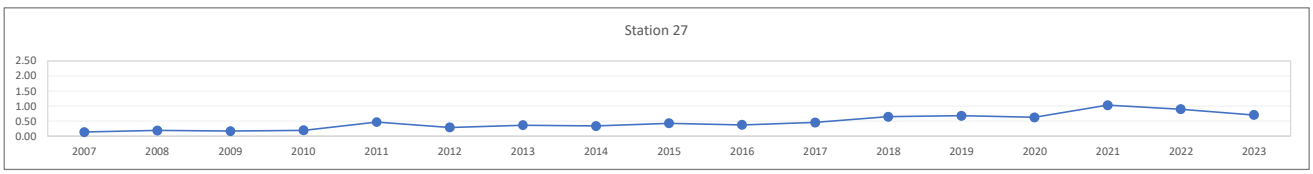
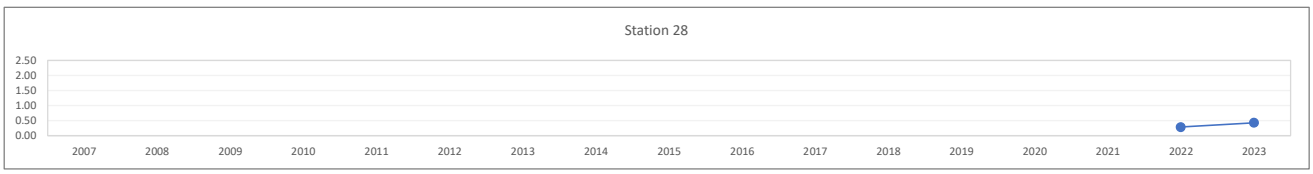
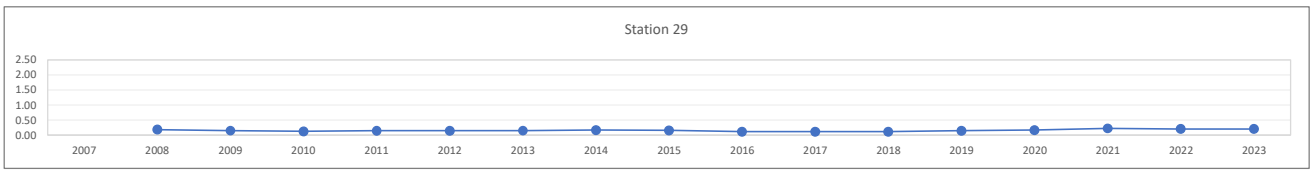
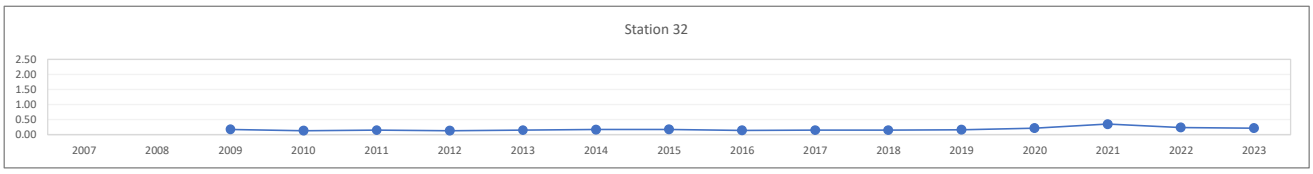
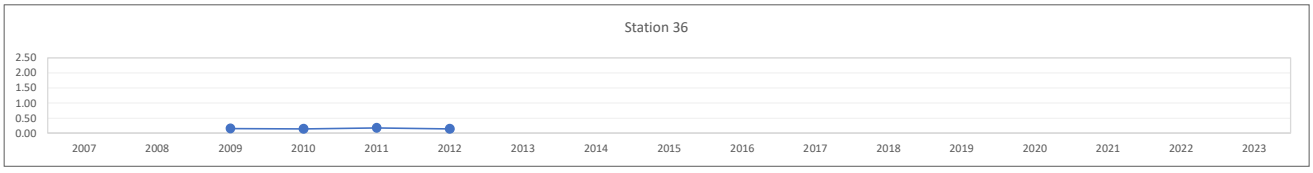
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

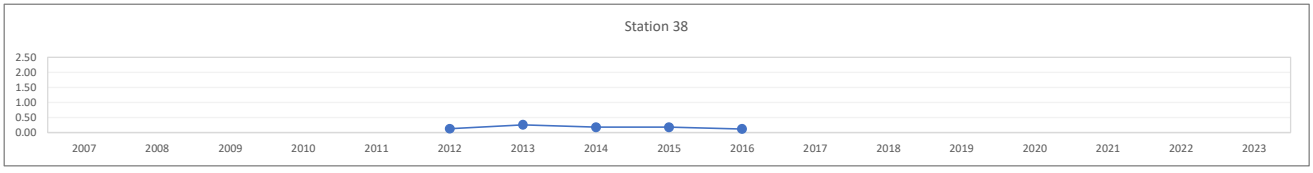

Station 27
2.50
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

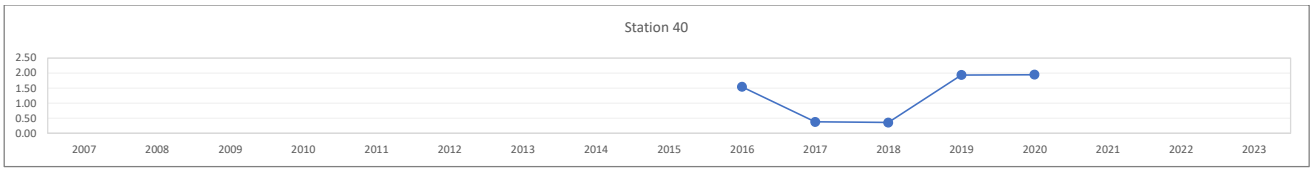

Station 28
2.50
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

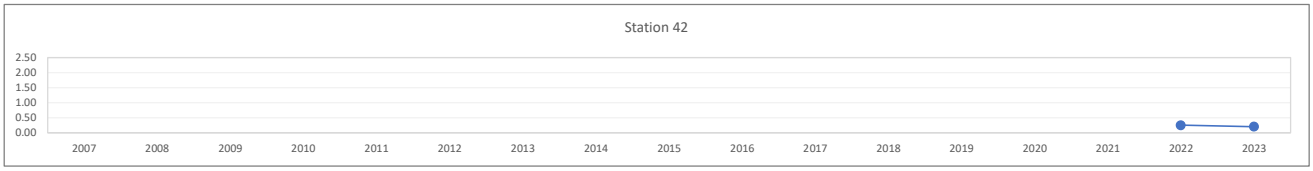

Station 29
2.50
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 32
2.50
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

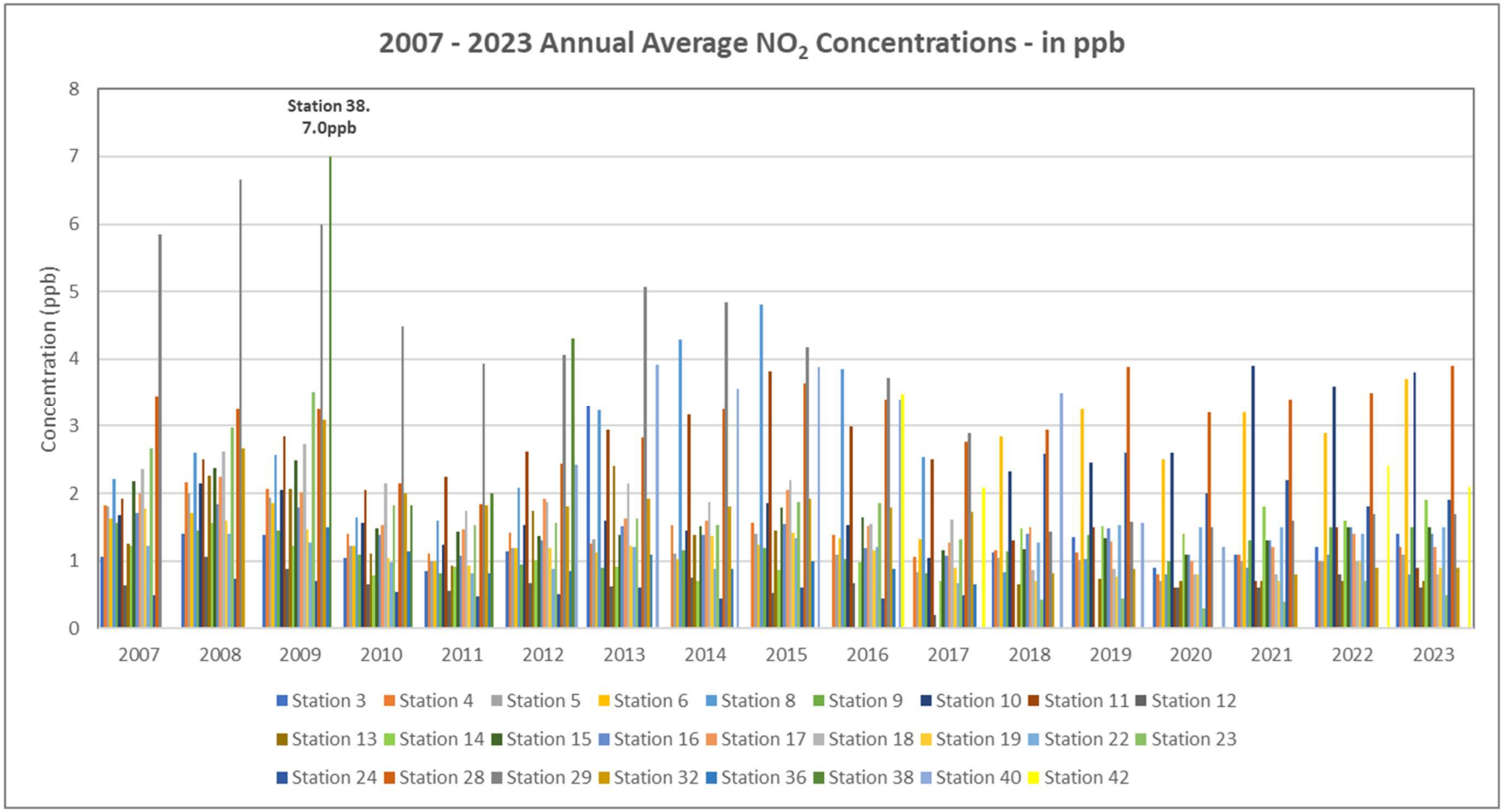

Station 36
2.50
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

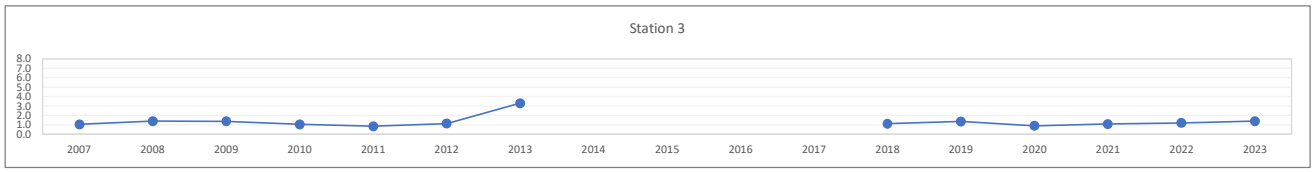

Station 38
2.50
2.00
1.50
1.00
0.50
0.00
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

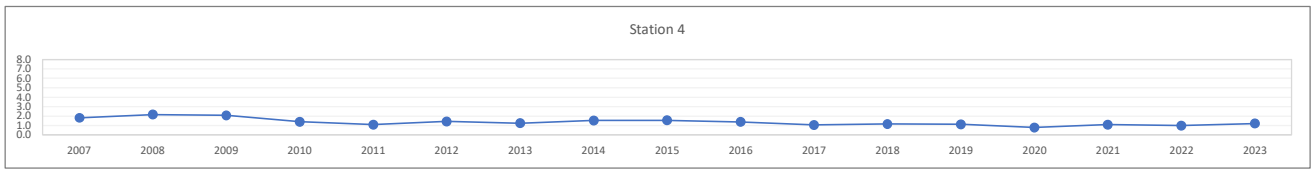

Station 40
2.50
2.00
1.50
1.00
0.50
0.00
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

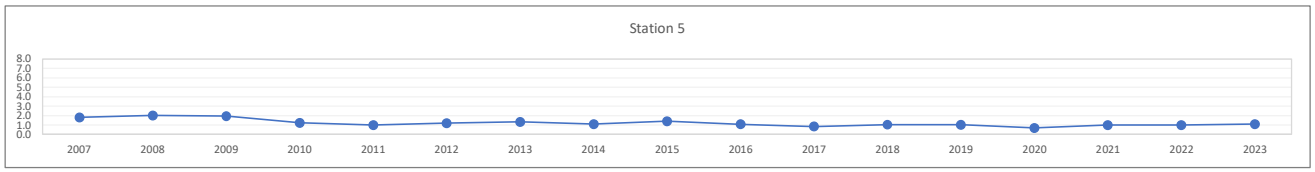

Station 42
2.50
2.00
1.50
1.00
0.50
0.00
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

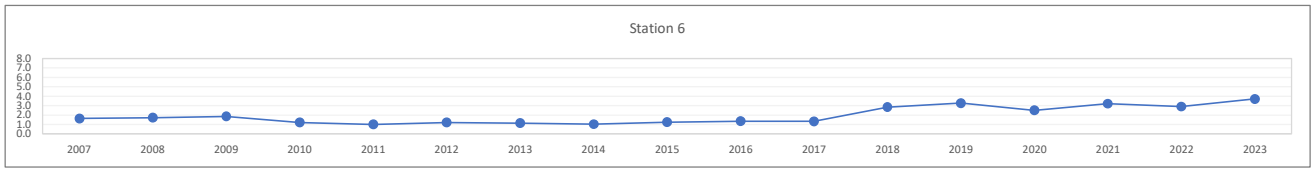
4.1.3 Nitrogen Dioxide (NO_2)

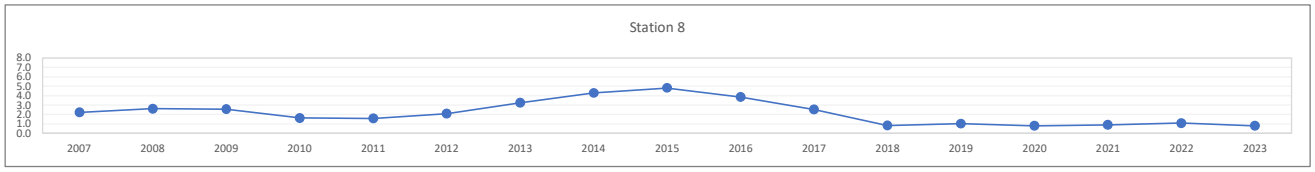


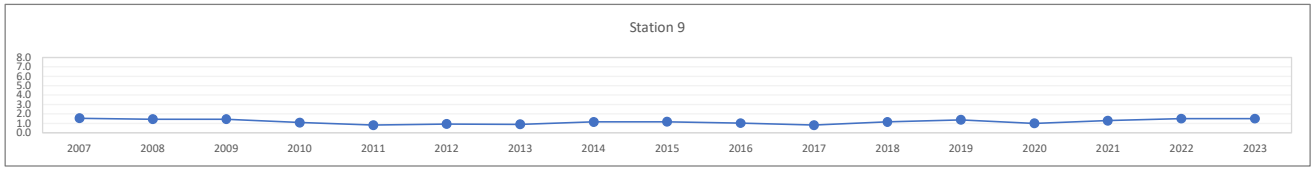

Station 3
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

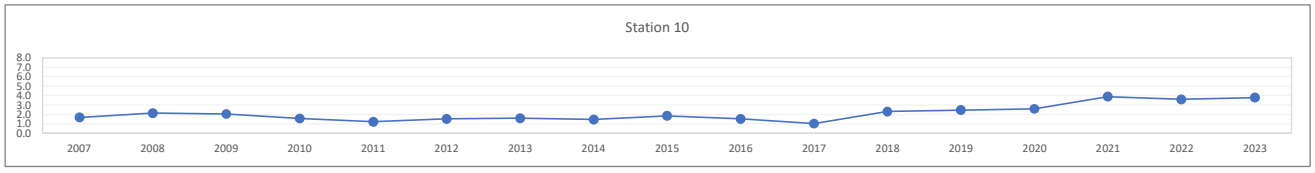

Station 4
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

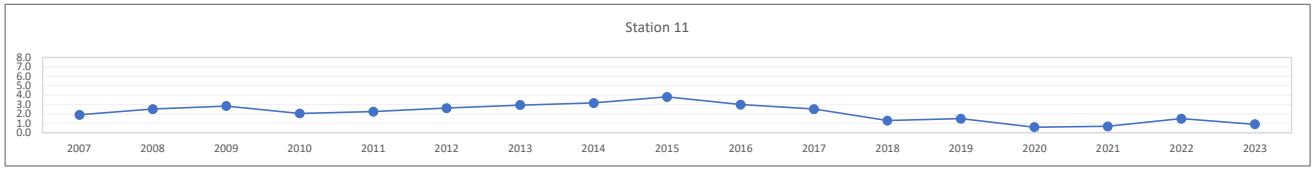

Station 5
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

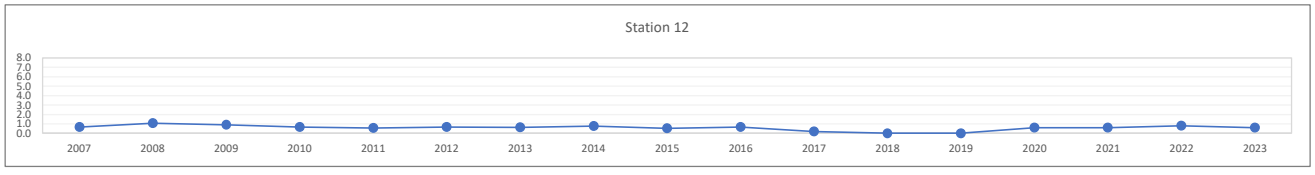

Station 6
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

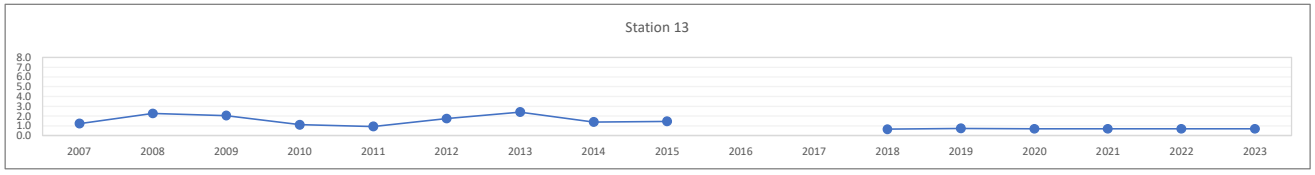

Station 8
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

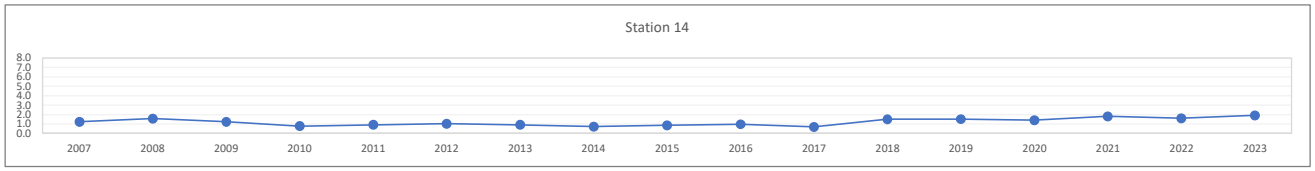

Station 9
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

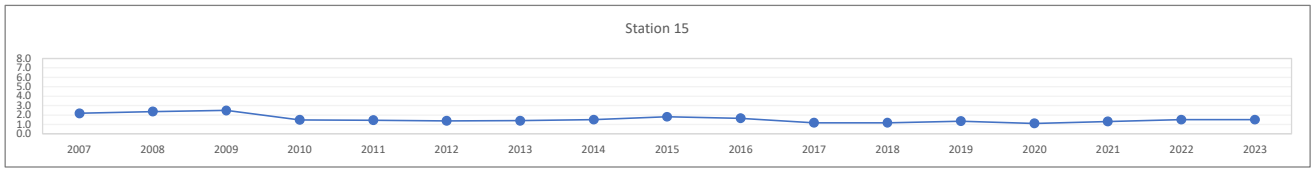

Station 10
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 11
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 12
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 13
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 14
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 15
8.0
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4.0
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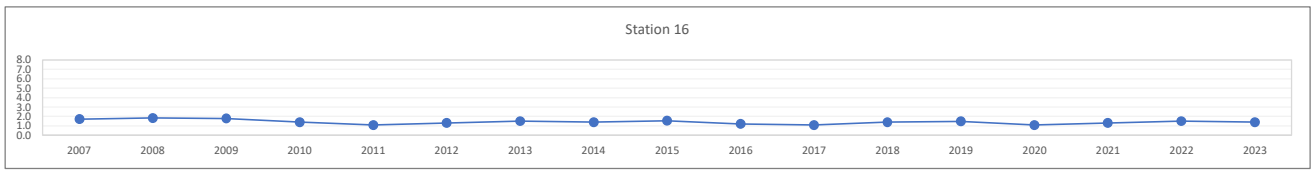
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 16
8.0
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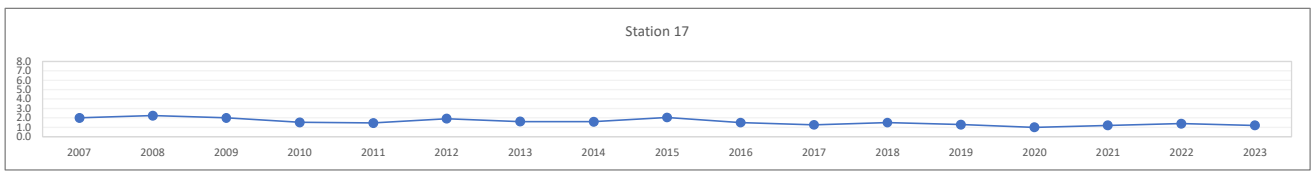
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 17
8.0
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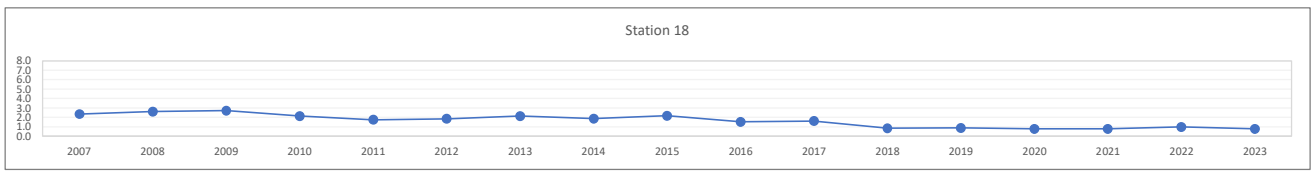
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 18
8.0
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4.0
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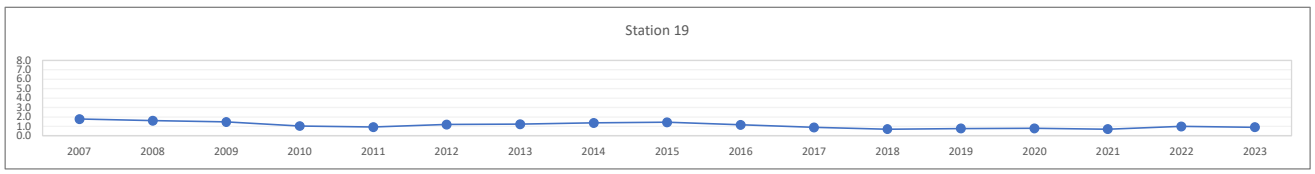
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 19
8.0
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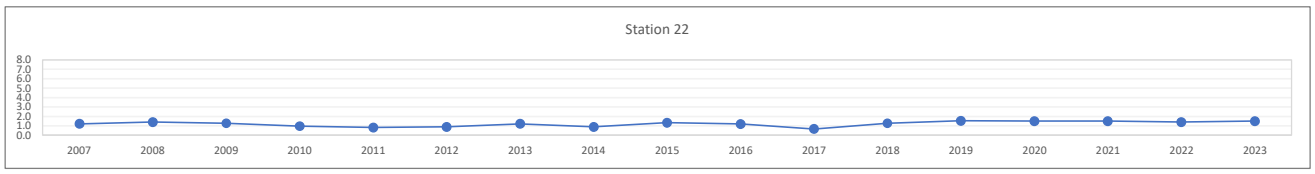
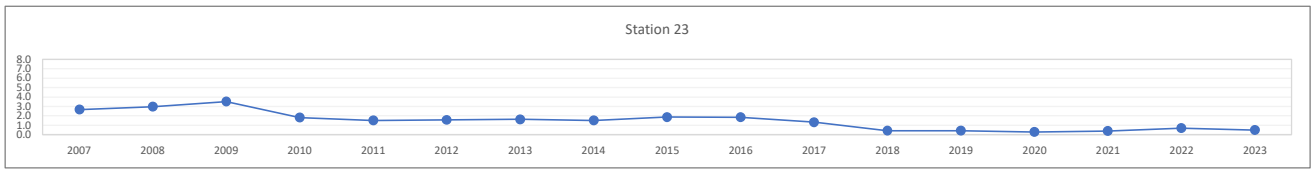
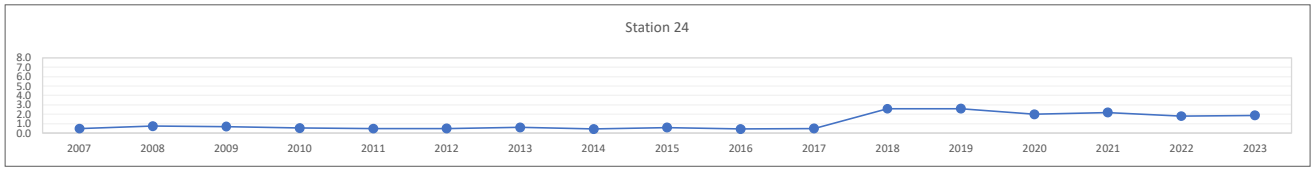
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 22
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 23
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 24
8.0
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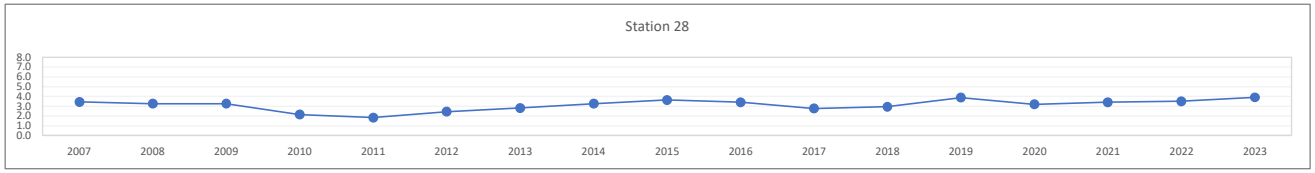
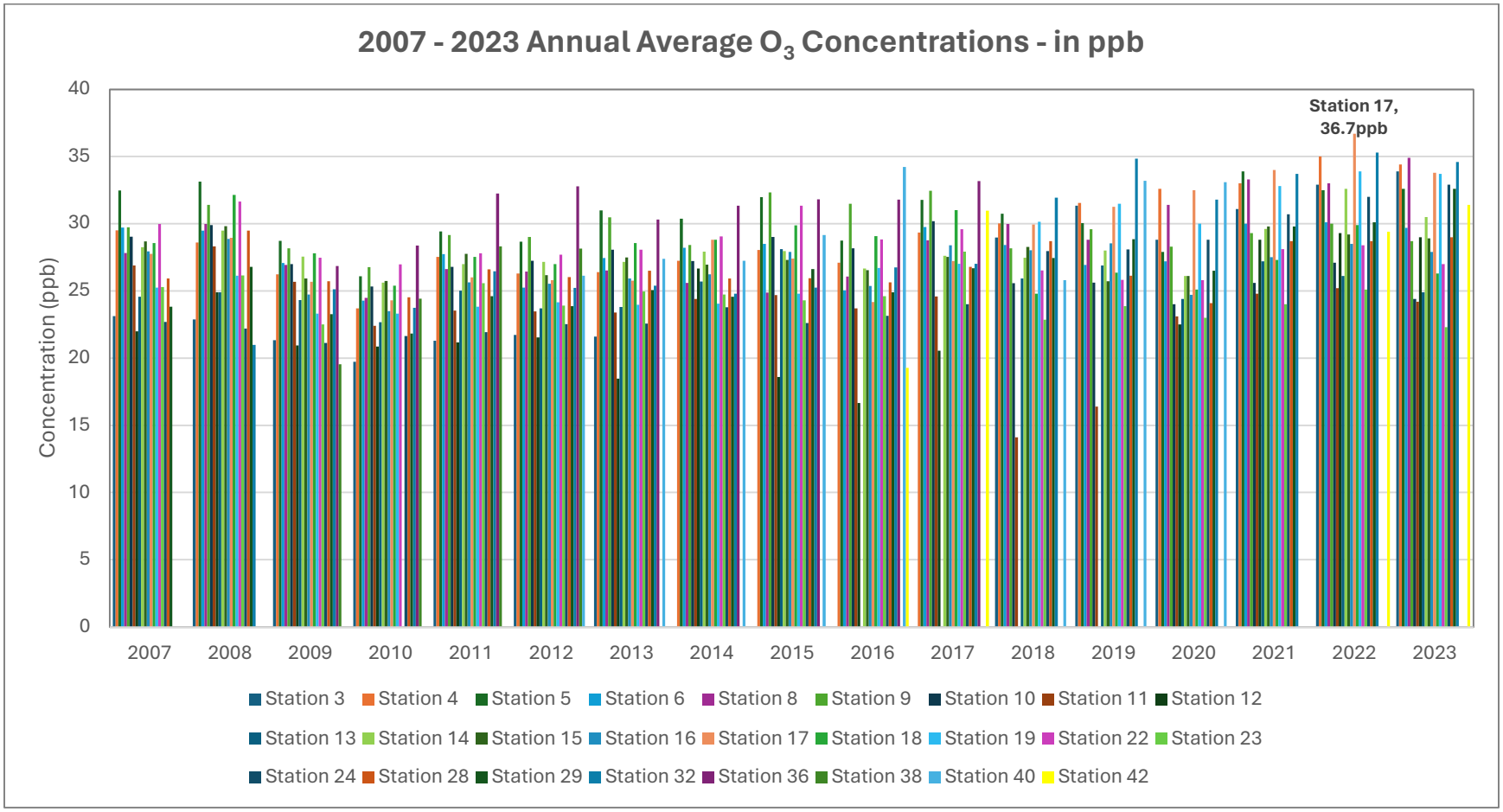
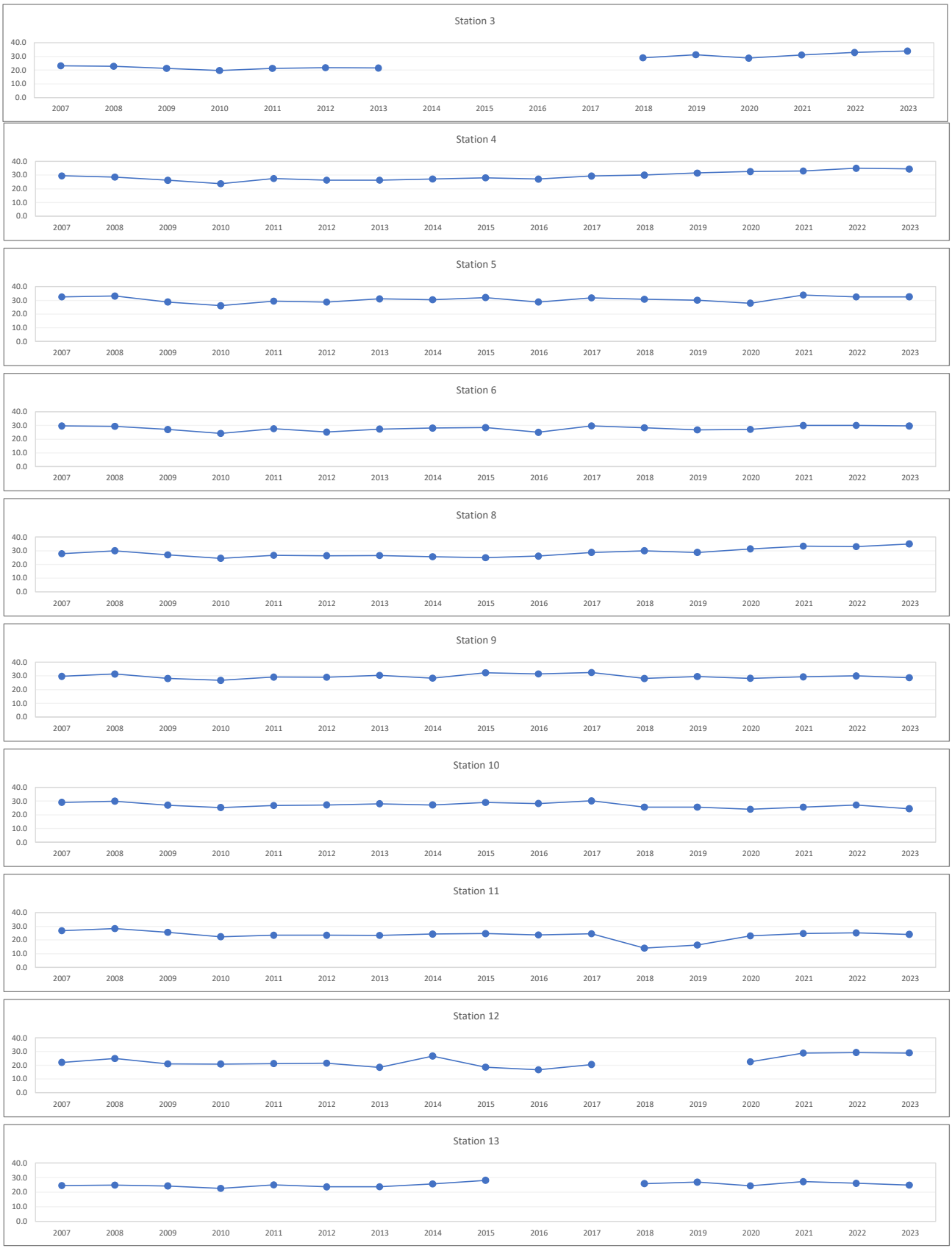
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

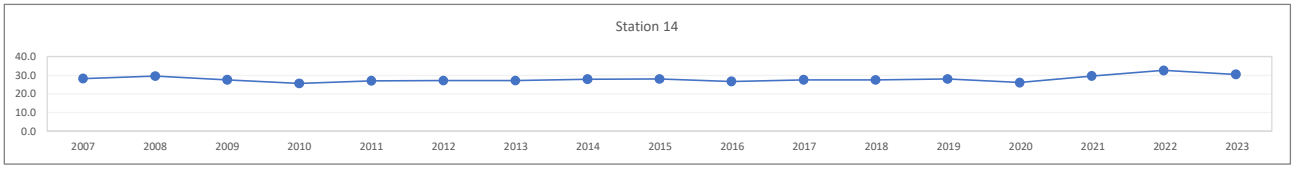

Station 28
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

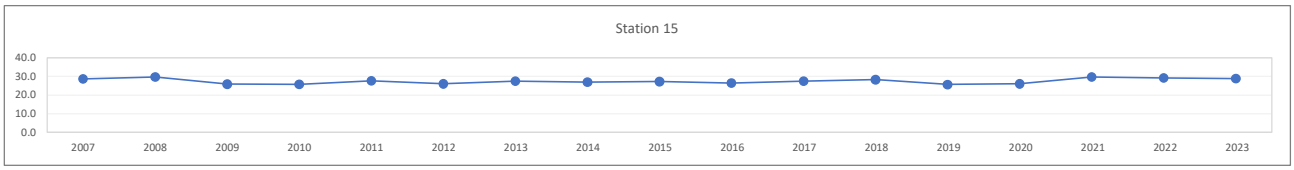

Station 29
Station 32
Station 36
Station 38
Station 40
Station 42
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

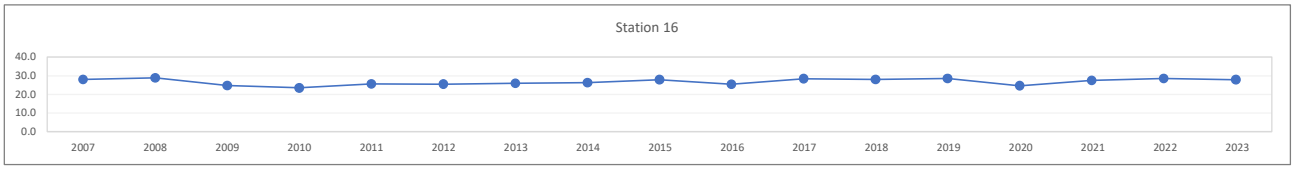
4.1.4 Ozone (O_3)

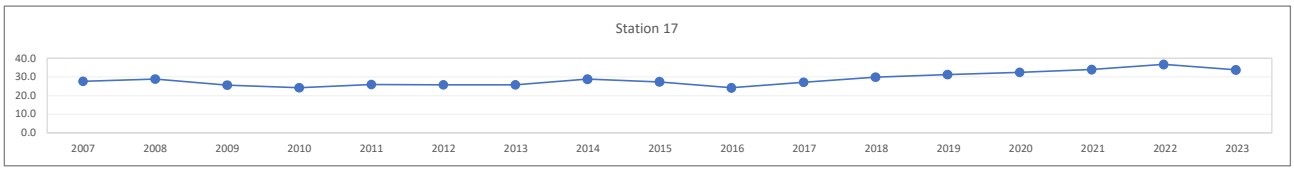

2007 - 2023 Annual Average O3 Concentrations - in ppb
Concentration (ppb)
0
5
10
15
20
25
30
35
40
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Station 17, 36.7ppb
Station 3
Station 4
Station 5
Station 6
Station 8
Station 9
Station 10
Station 11
Station 12
Station 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

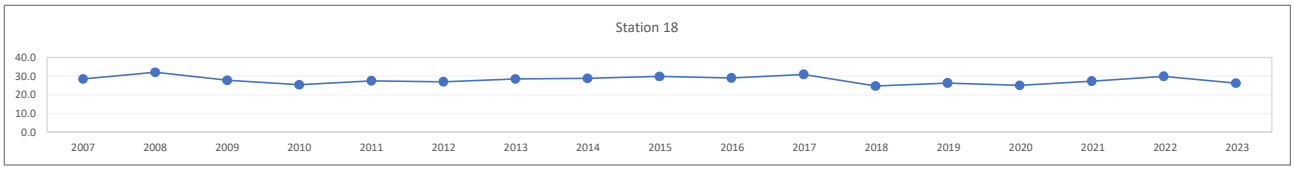

Station 3
Station 4
Station 5
Station 6
Station 8
Station 9
Station 10
Station 11
Station 12
Station 13
40.0
30.0
20.0
10.0
0.0
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

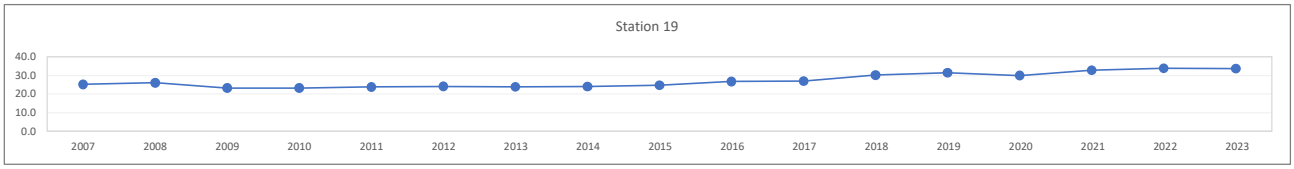

Station 14
40.0
30.0
20.0
10.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

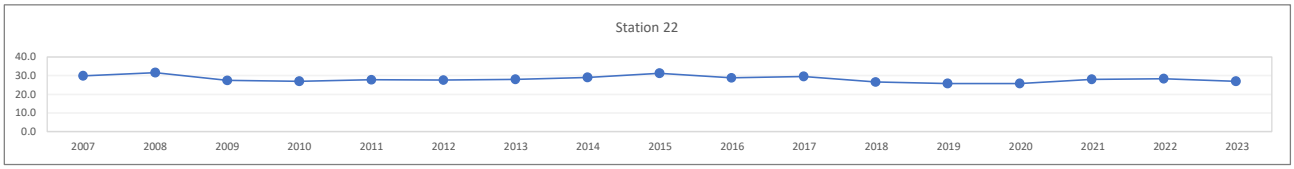

Station 15
40.0
30.0
20.0
10.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 16
40.0
30.0
20.0
10.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 17
40.0
30.0
20.0
10.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 18
40.0
30.0
20.0
10.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 19
40.0
30.0
20.0
10.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 22
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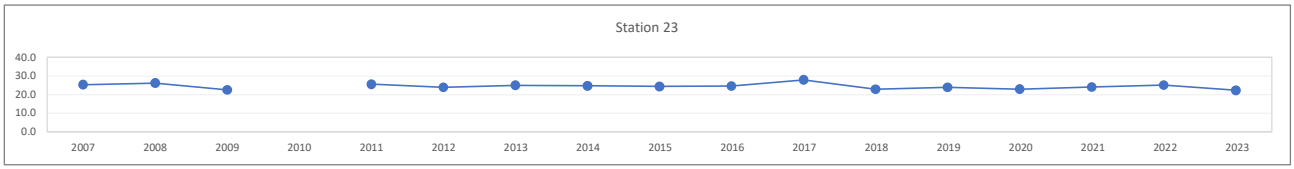
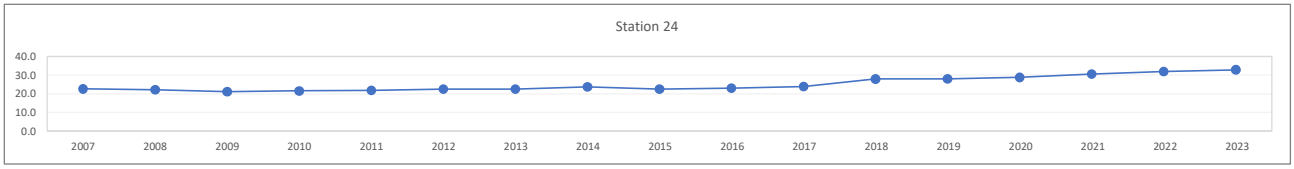
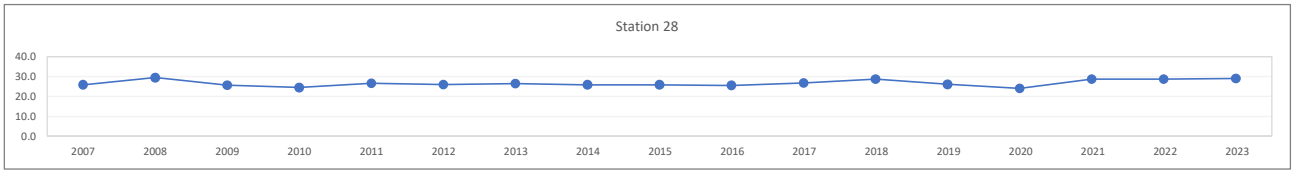
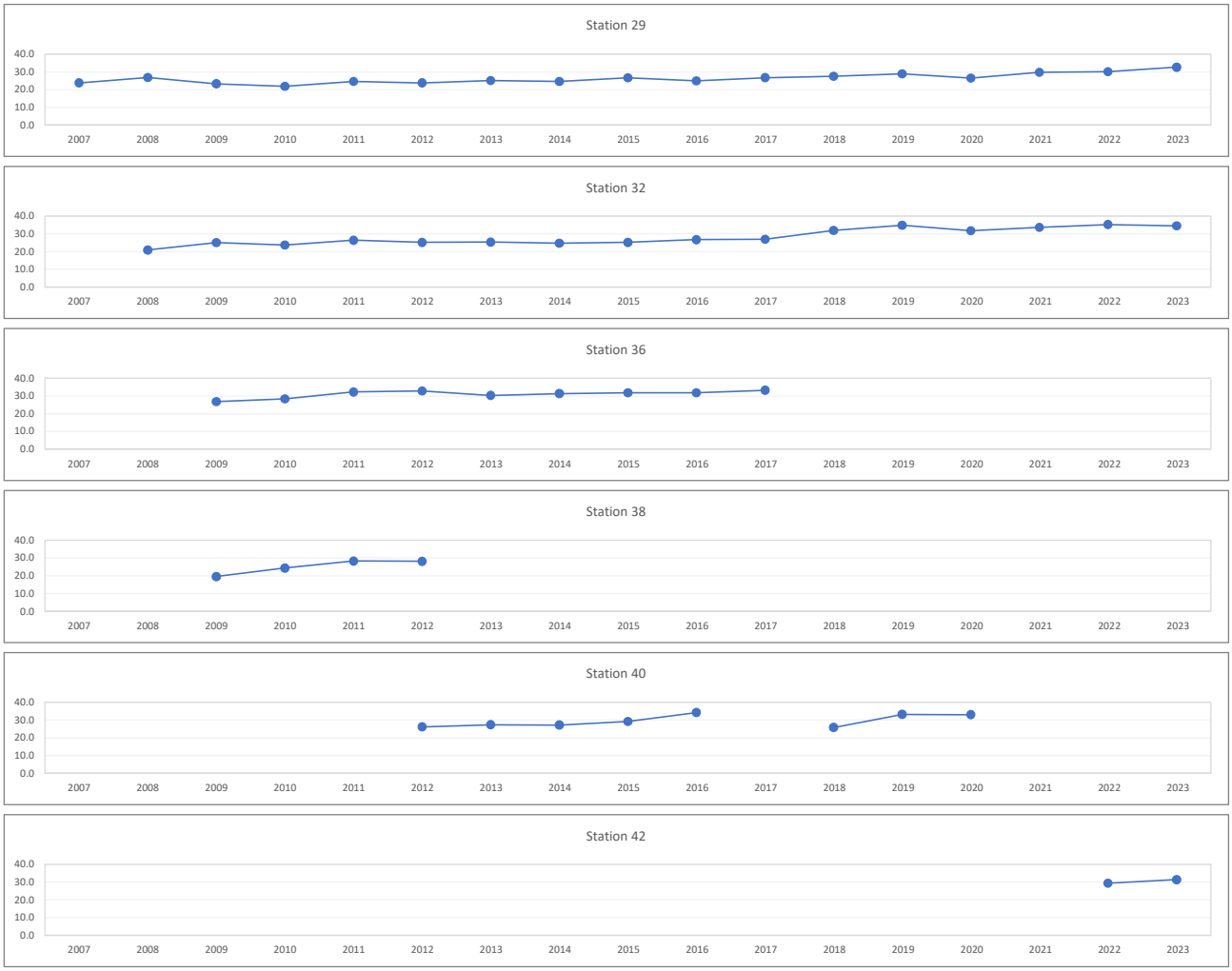
30.0
20.0
10.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

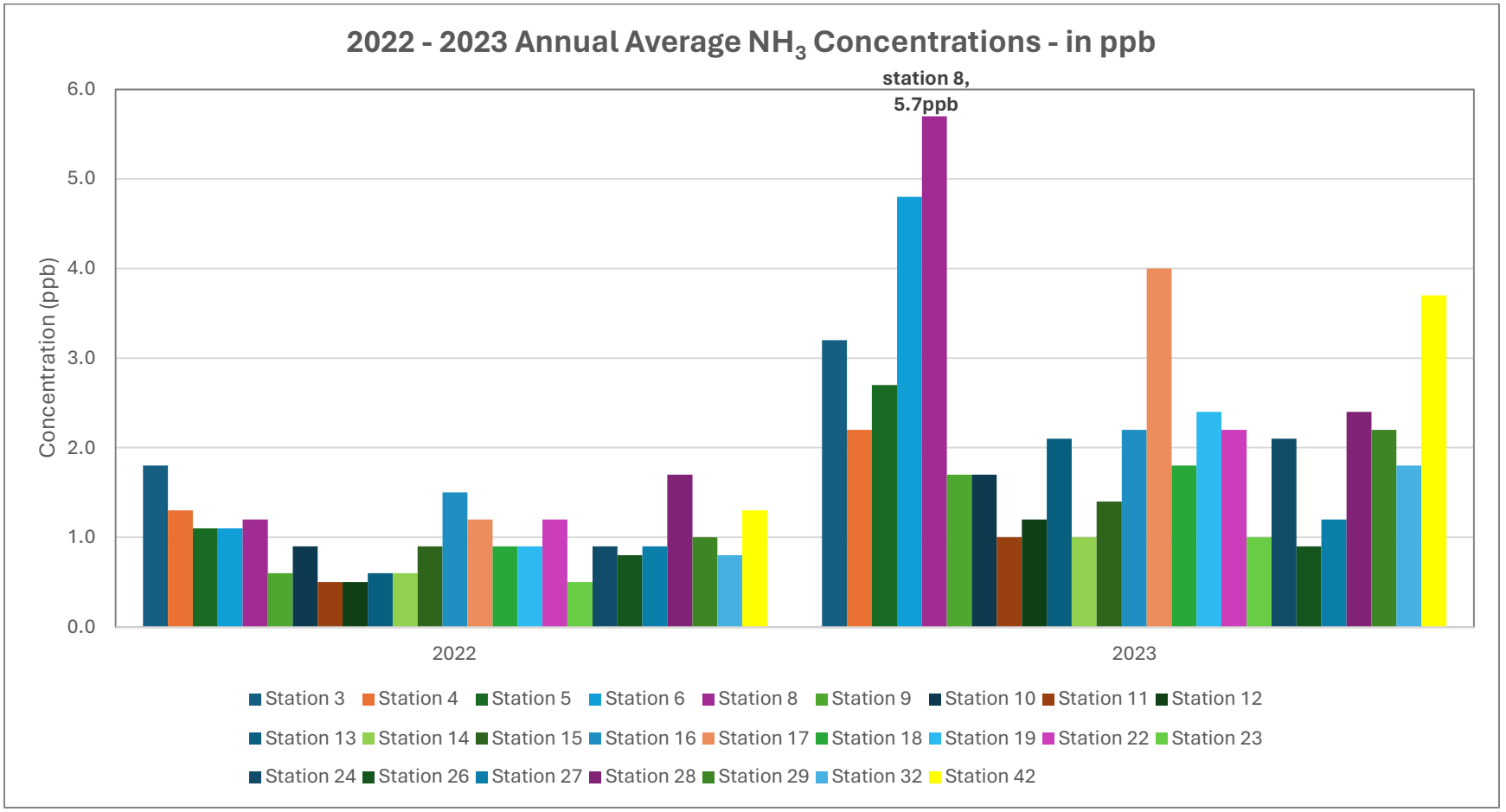

Station 23
40.0
30.0
20.0
10.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Station 24
40.0
30.0
20.0
10.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

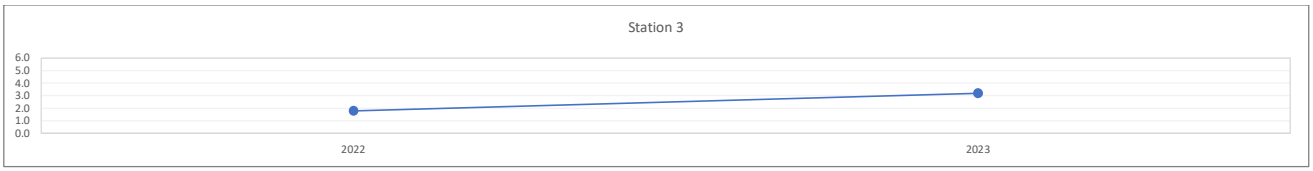

Station 28
40.0
30.0
20.0
10.0
0.0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

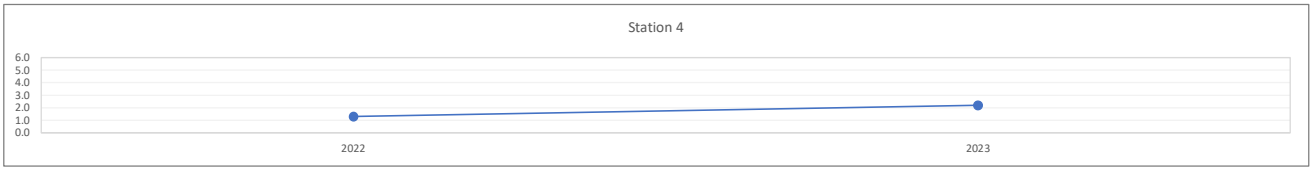

Station 29
Station 32
Station 36
Station 38
Station 40
Station 42
40.0
30.0
20.0
10.0
0.0
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

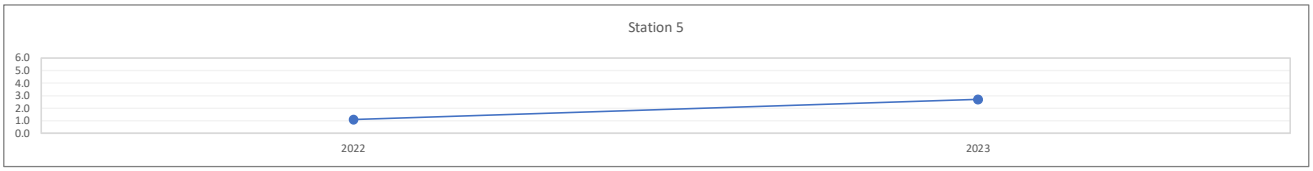
4.1.5 Ammonia (NH_3)

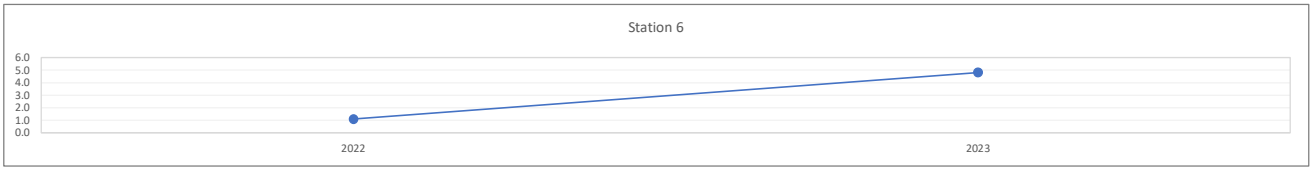


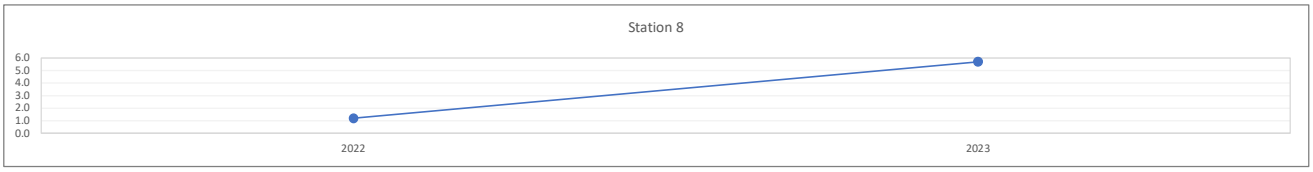
Notes: NH3 passive sample collection starts in 2022.

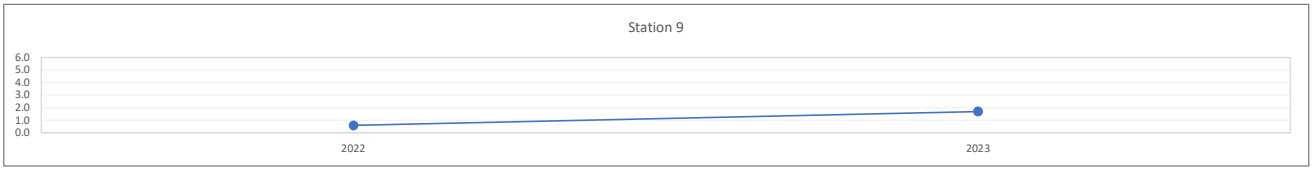

Station 3
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

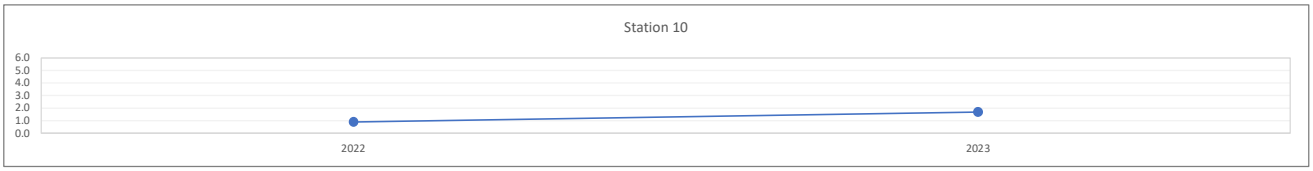

Station 4
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

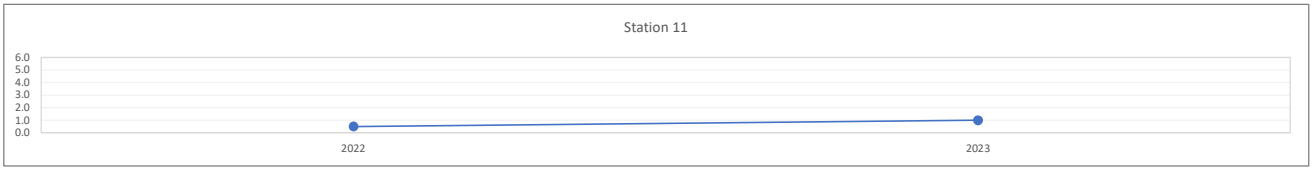

Station 5
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

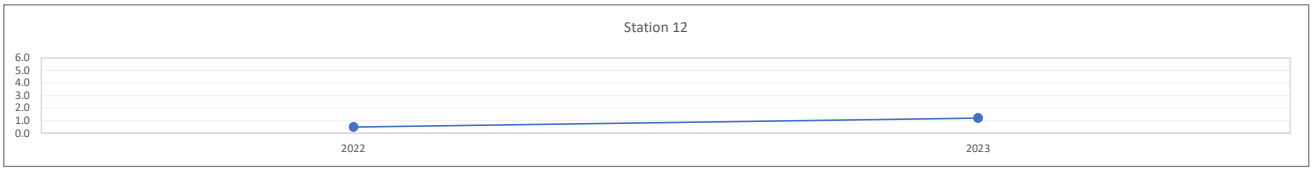

Station 6
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

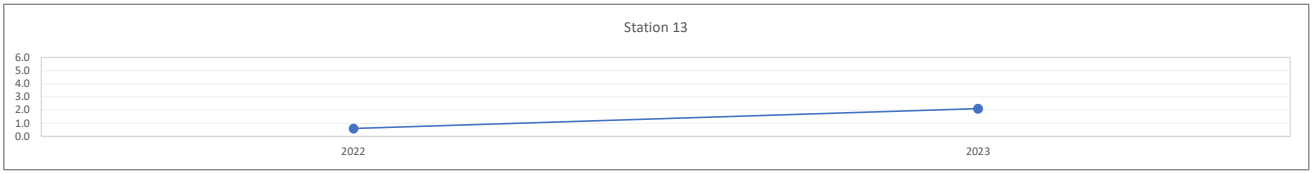

Station 8
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

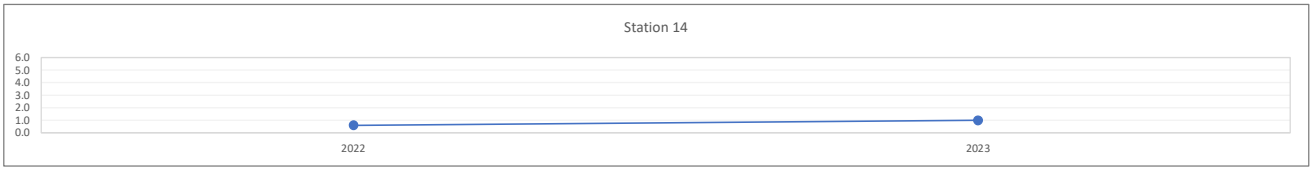

Station 9
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

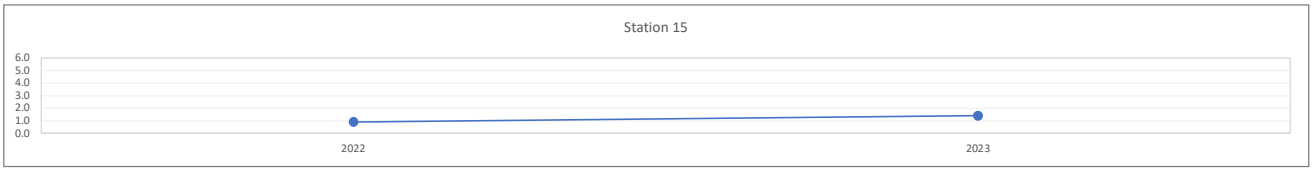

Station 10
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023


Station 11
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023


Station 12
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023


Station 13
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023


Station 14
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023


Station 15
6.0
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4.0
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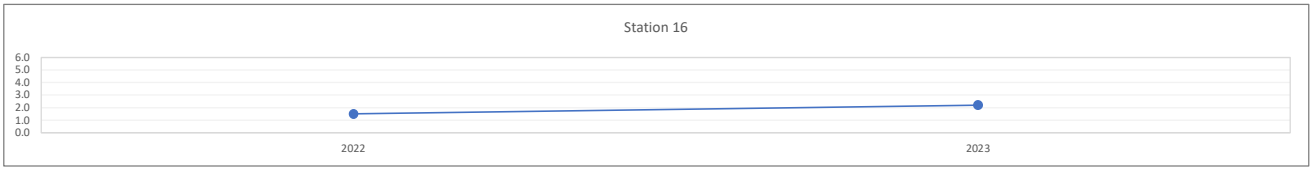
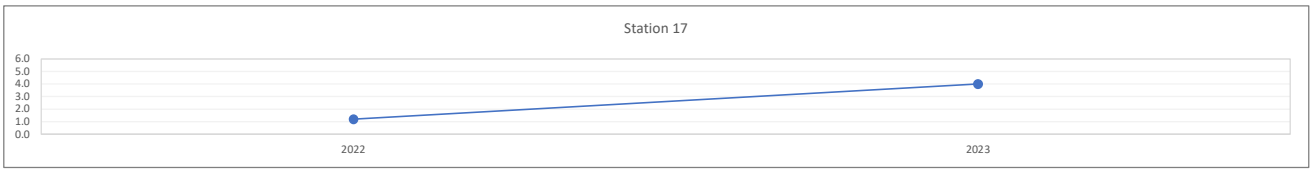
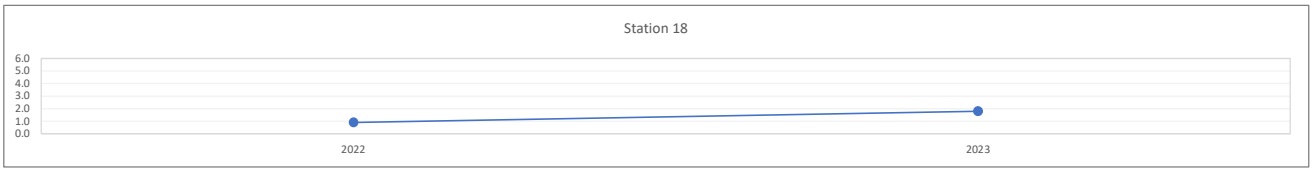
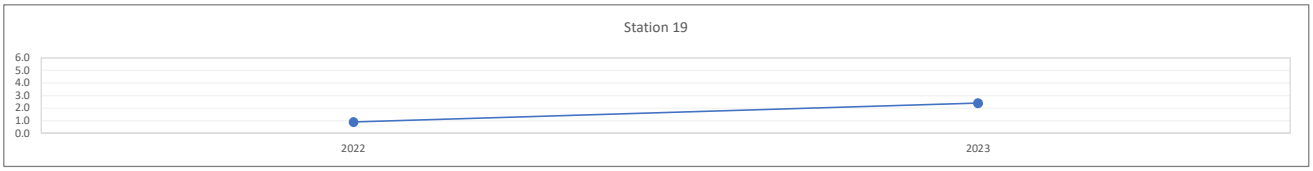
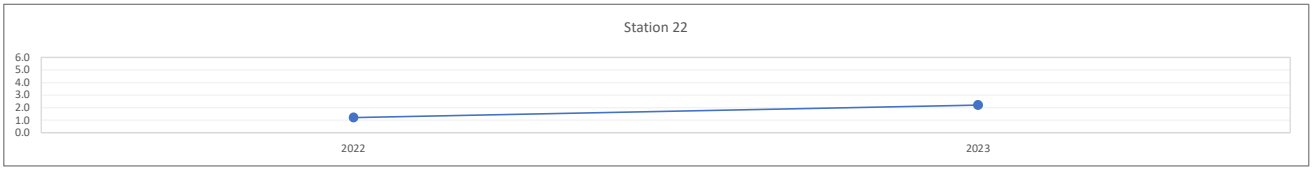
2.0
1.0
0.0
2022
2023

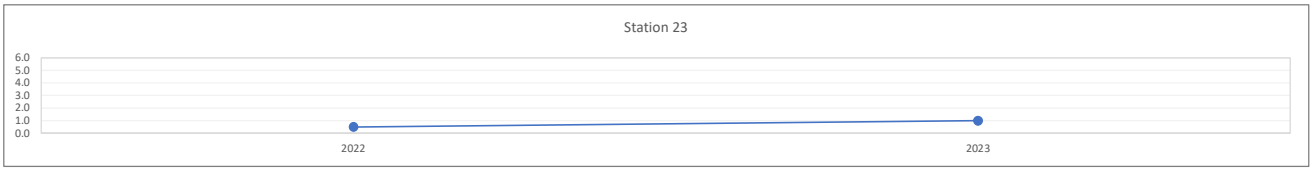

Station 16
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

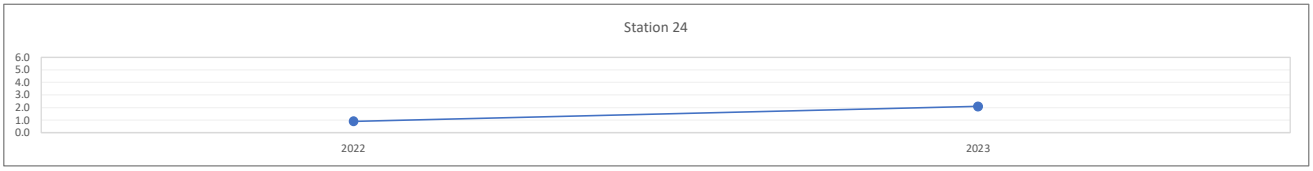

Station 17
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

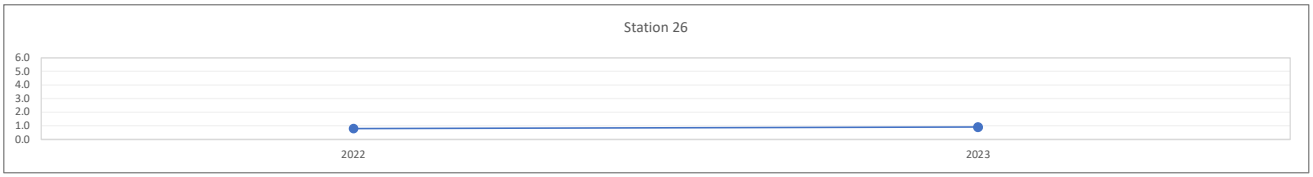

Station 18
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

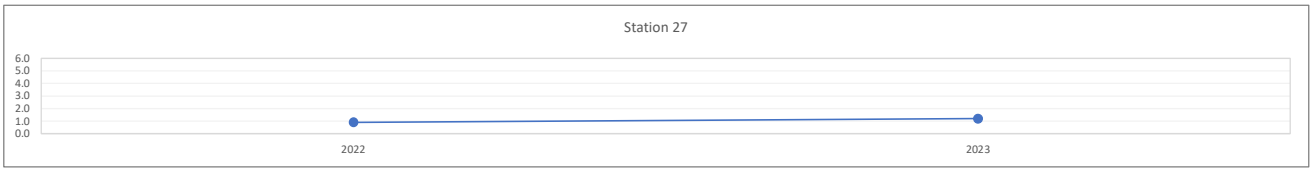

Station 19
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

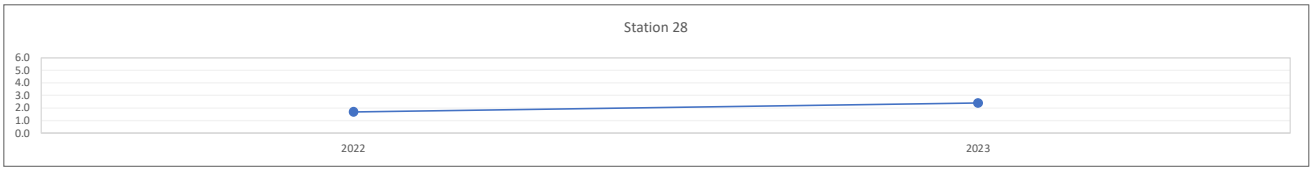

Station 22
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

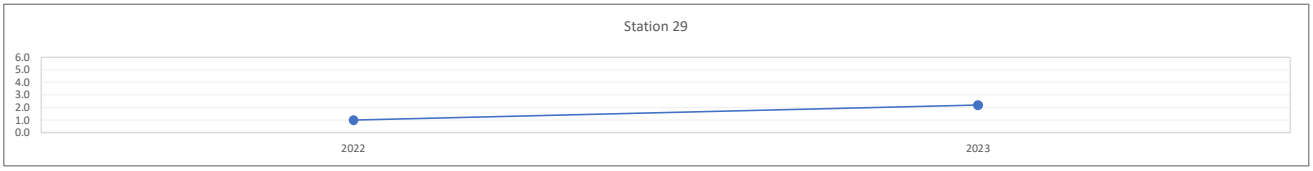

Station 23
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

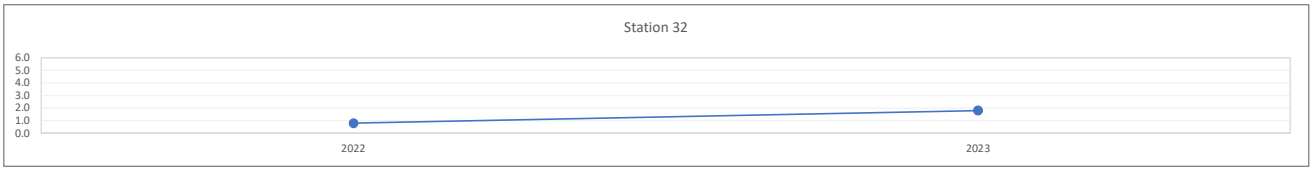

Station 24
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

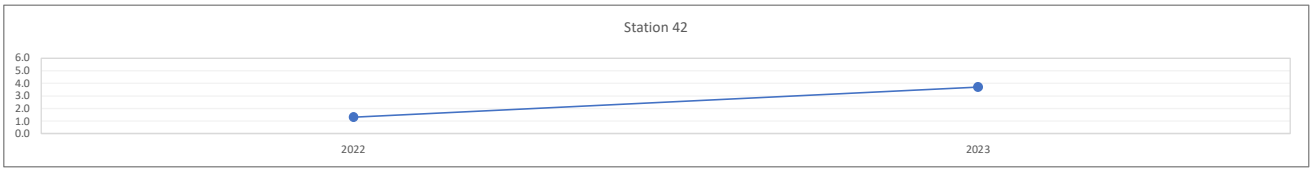

Station 26
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023


Station 27
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

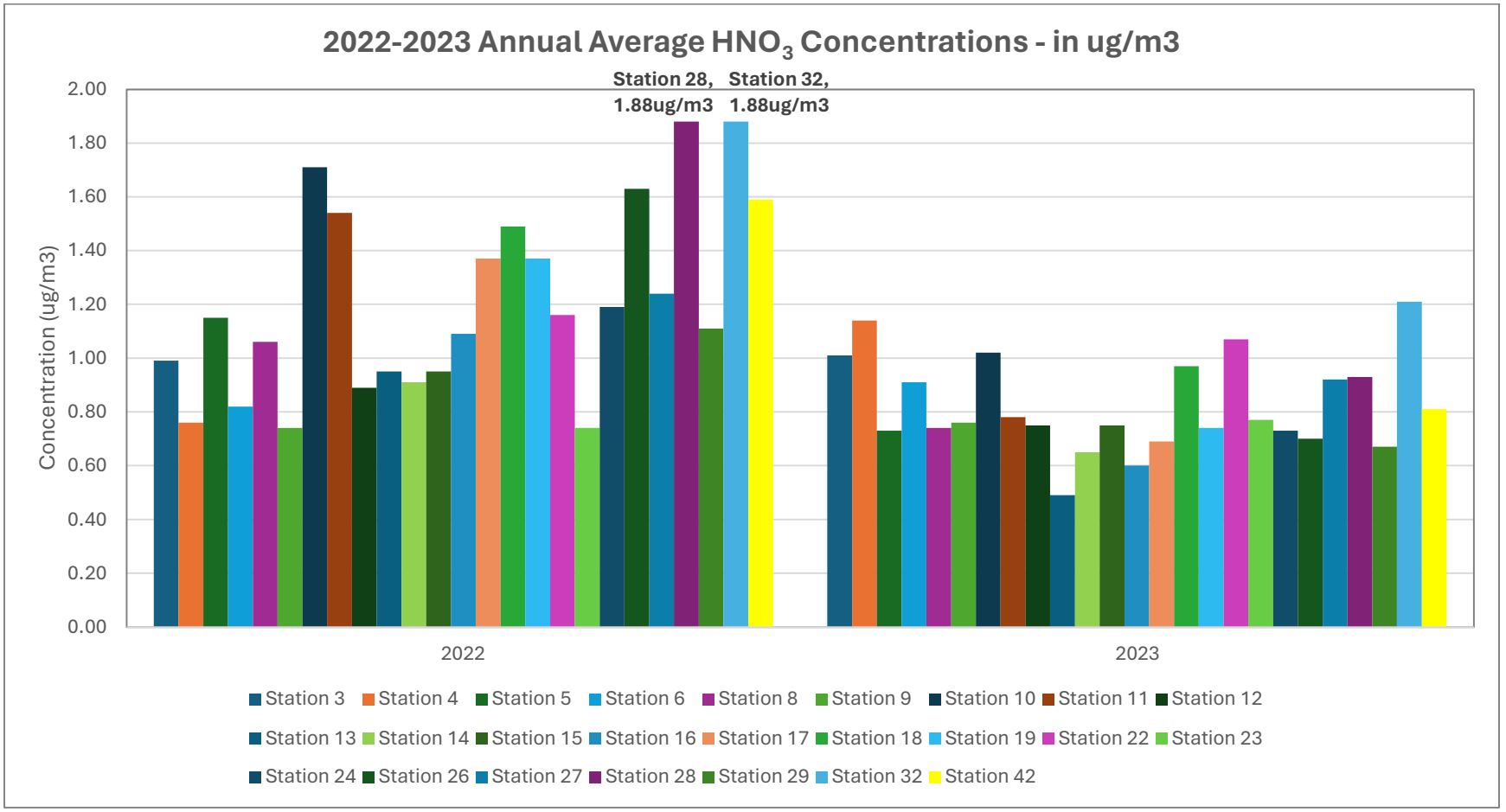

Station 28
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023


Station 29
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

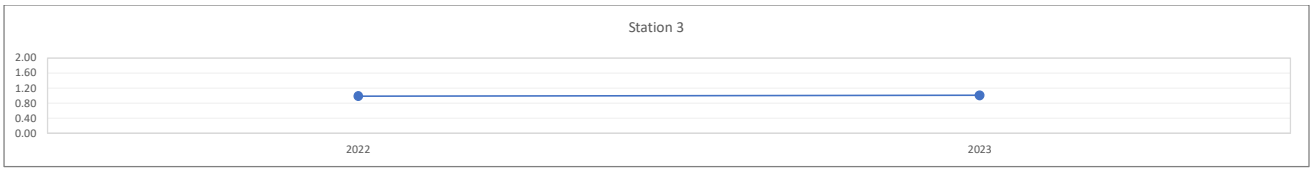

Station 32
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

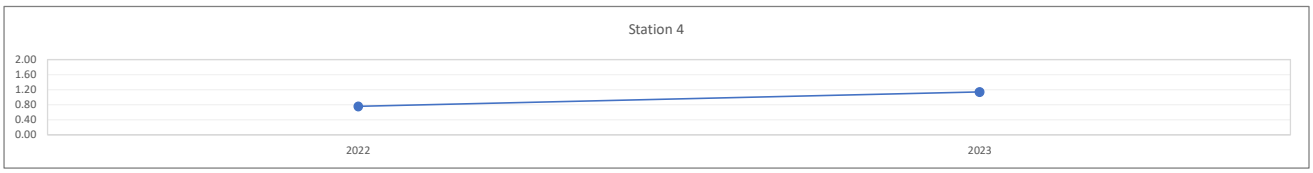

Station 42
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2022
2023

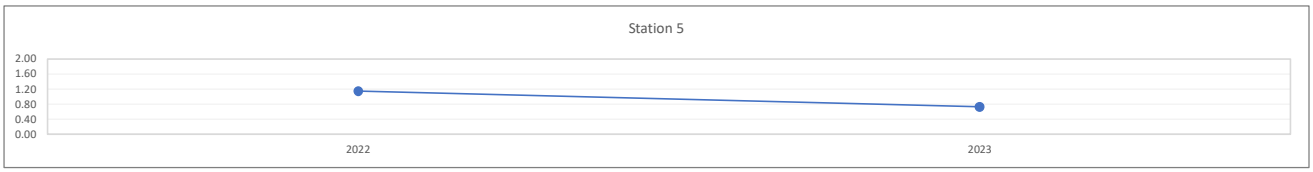
4.1.6 Ammonia (NH_3)

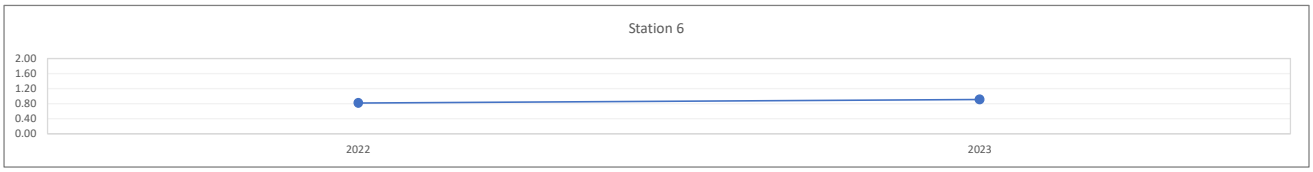


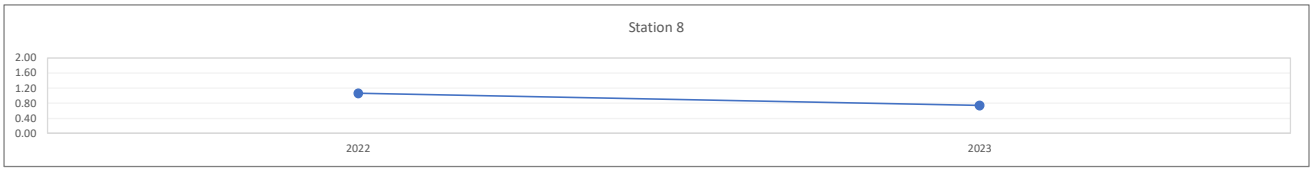
Notes: HNO3 passive sample collection starts in 2022.

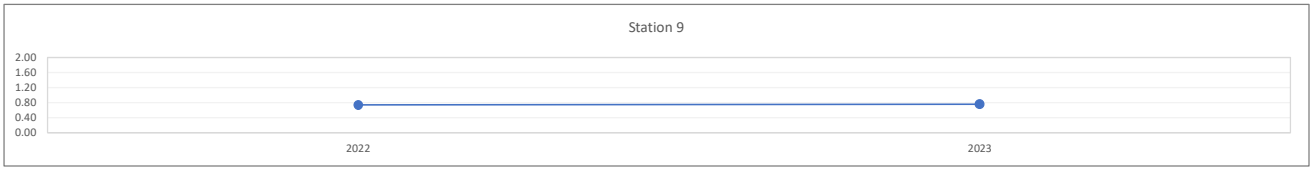

Station 3
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023

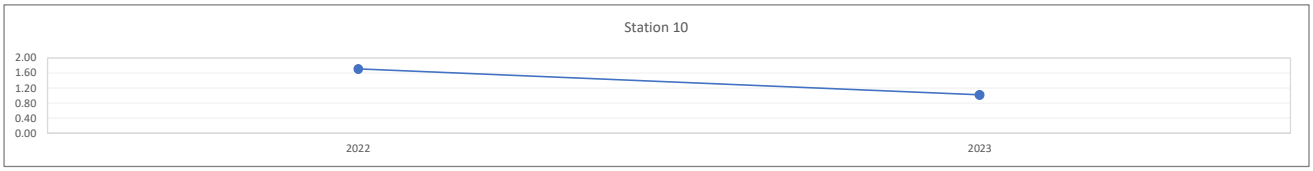

Station 4
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023

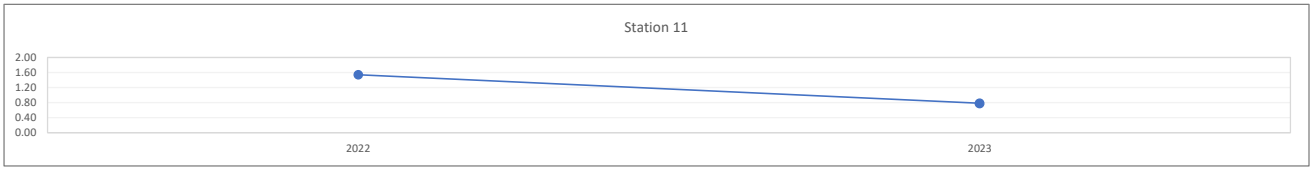

Station 5
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023

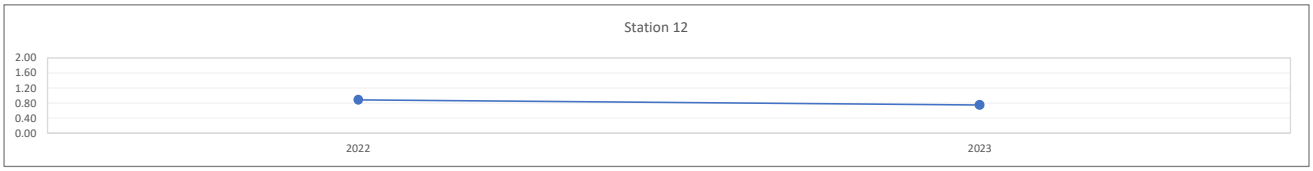

Station 6
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023

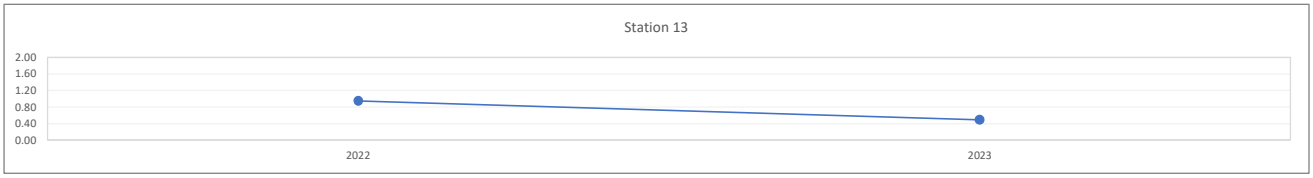

Station 8
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023

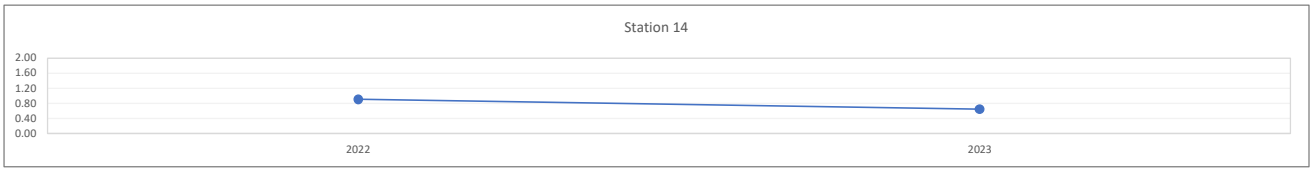

Station 9
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023

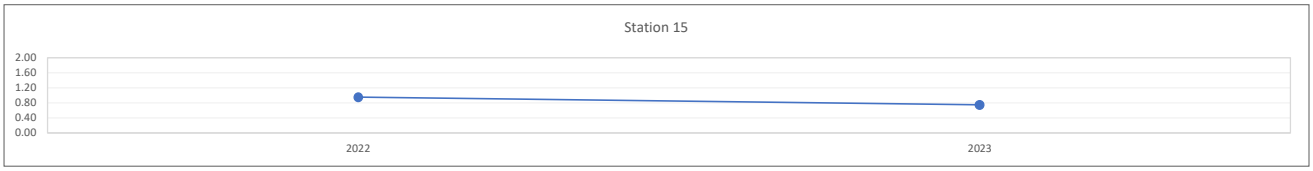

Station 10
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023

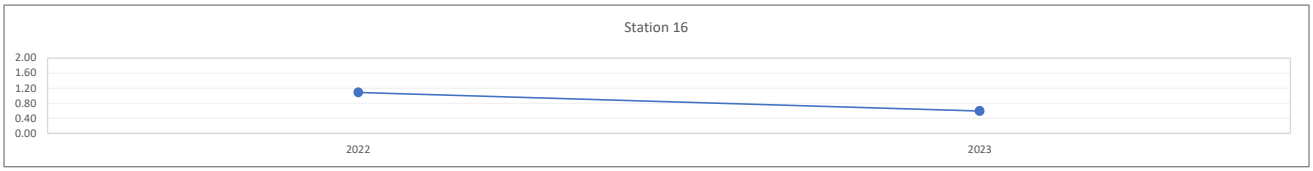

Station 11
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023


Station 12
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023


Station 13
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023


Station 14
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023


Station 15
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023


Station 16
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0.80
0.40
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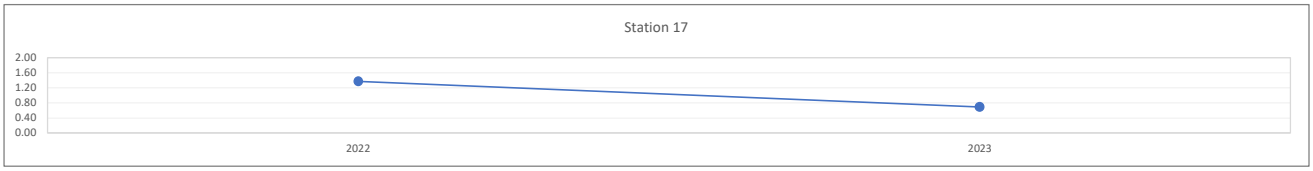
2022
2023


Station 17
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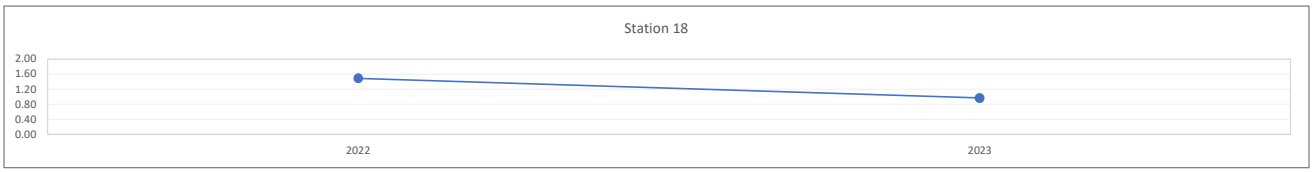
1.20
0.80
0.40
0.00
2022
2023


Station 18
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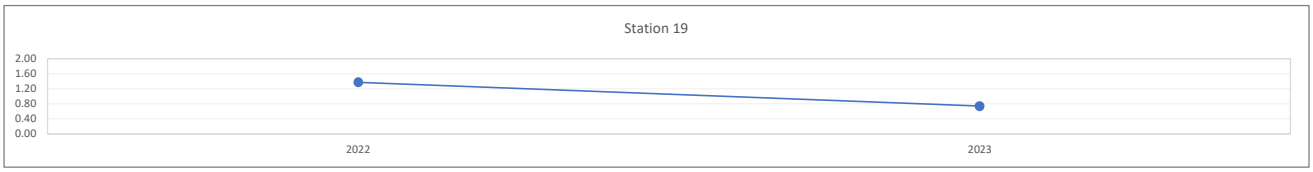
1.60
1.20
0.80
0.40
0.00
2022
2023


Station 19
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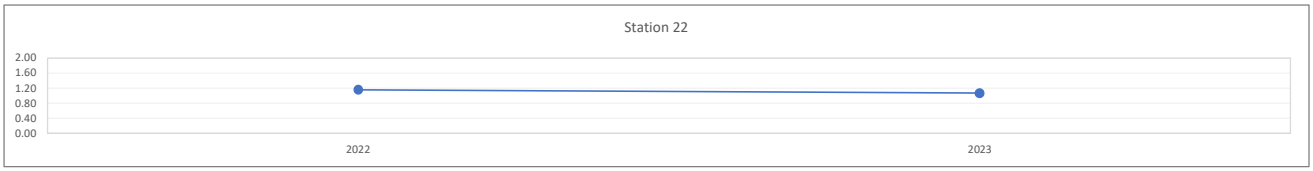
1.20
0.80
0.40
0.00
2022
2023


Station 22
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1.20
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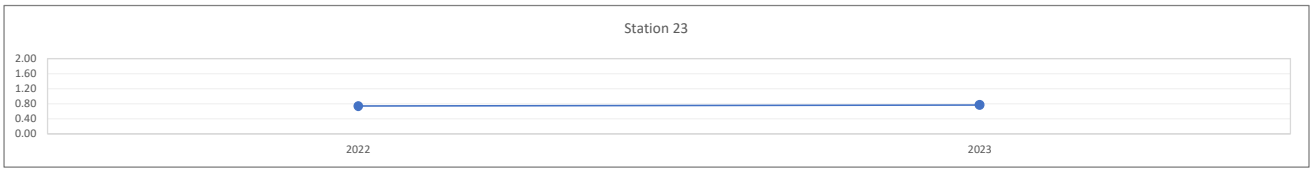
0.00
2022
2023


Station 23
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1.20
0.80
0.40
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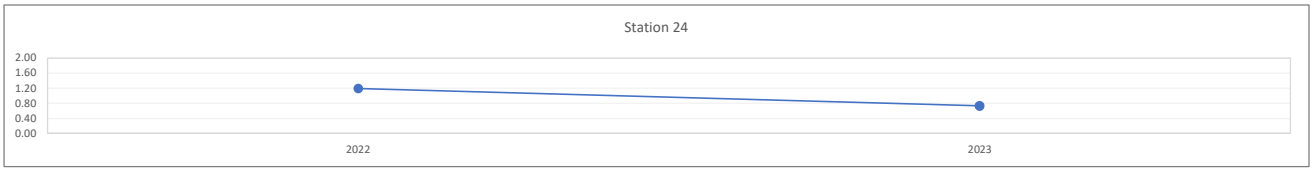
2022
2023


Station 24
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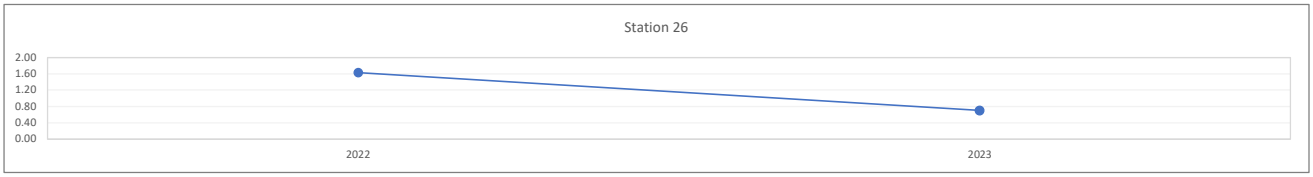
2023


Station 26
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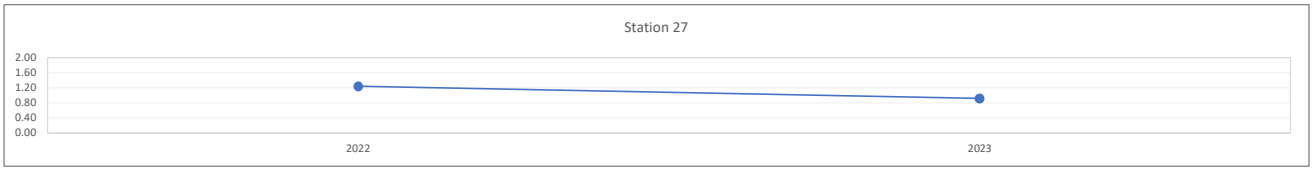
0.00
2022
2023


Station 27
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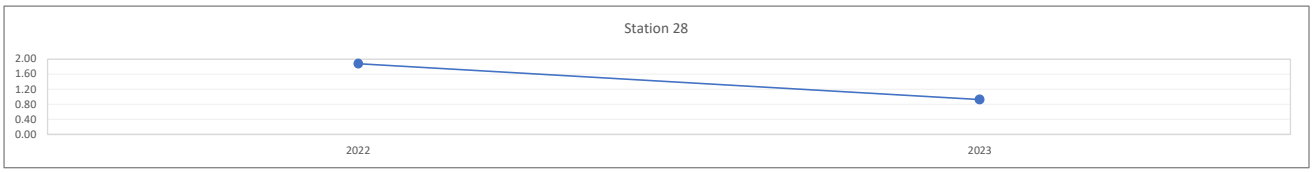
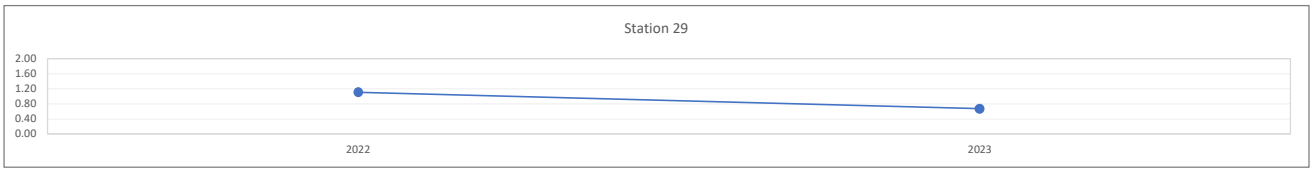
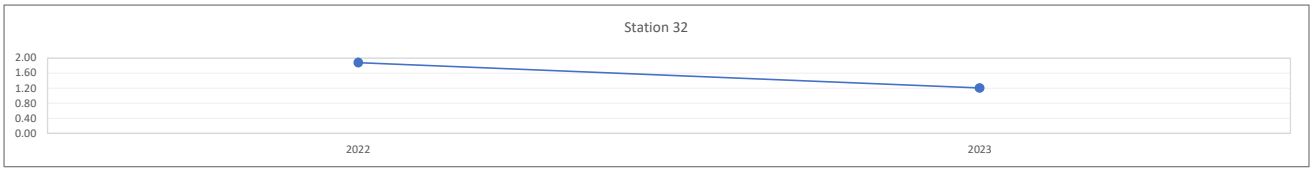
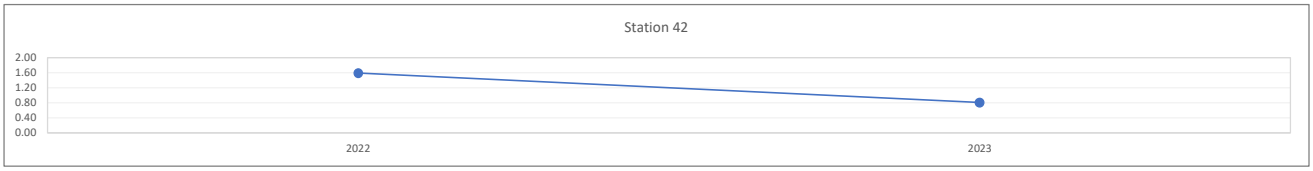
1.20
0.80
0.40
0.00
2022
2023


Station 28
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023


Station 29
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023


Station 32
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023


Station 42
2.00
1.60
1.20
0.80
0.40
0.00
2022
2023

END OF REPORT

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