

**WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AMBIENT AIR QUALITY MONITORING REPORT
2021
REPORT HISTORY**

Original report release date: March 2021

Revised report release date: May 4, 2022

Revision 1: Resubmission of Ozone data at Anzac and Nitrogen Dioxide data at Janvier

In the annual data review of the 2021 data by the Alberta Environment and Parks, two issues were identified:

1. The reported Ozone (O₃) 1-hour average on January 30, 2021, at 02:00 MST was 74.5 ppb. The WBEA confirmed the spike was invalid due to an erroneous 5-min value which was inadvertently flagged incorrectly.
2. On January 12, 2022, at 16:00 MST, the calibration flags of the multi-channel analyzer, NO/NO₂/NO_x, were not applied equally to all individual channels, specifically the NO_x.

As result, O₃ data from Anzac and NO/NO₂/NO_x from Janvier of January 2021 was revised and flagged appropriately. On May 4, 2022, the monthly report, and data reports, for each affected station, were re-submitted to the Electronic Transfer System (ETS).

Original report release date: March 2021

Revised report release date: December 21, 2022

Revision 2 – Resubmission of Wind Data at Buffalo Viewpoint.

During the annual audit of the wind speed and wind direction (WS/WD) sensor, it was found that the sensor at Buffalo Viewpoint Air Monitoring Station (AMS) was not aligned with each set point used to calibrate the instrument. Further investigation of the faulty sensor determined that the internal components were not moving in unison, as designed, due to a loose set screw, which led to inaccurate wind direction readings. The misalignment was non-uniform, ranging from 15 to 23 degrees, depending on the conditions, and was undetectable during monthly field visual checks and data validation.

A review of wind direction data from Buffalo Viewpoint AMS compared to other air monitoring stations in the Wood Buffalo Environmental Association network showed an approximate and inconsistent, 15-to-23-degree shift in wind direction data at Buffalo Viewpoint AMS. The 2021 audit, conducted on June 3, had concluded that the sensor was in excellent working condition, and the data shift appears to occur after re-installation; therefore, it is believed the issue with the set screw occurred shortly after the 2021 audit, upon installation. Due to the non-uniformity of the sensor-shift since the last annual audit, wind data at Buffalo Viewpoint AMS from June 3, 2021, to October 6, 2022, was revised and flagged appropriately.

As a result, the WS/WD sensor at Buffalo Viewpoint AMS operated less than 90% for the month of June 2021 through to the month of October 2022, which is a contravention of Clause DQ 4-C, of Chapter 6 of

the Air Monitoring Directive (2016, as amended). The verbal report to Alberta Environment and Parks (AEP) was done on October 28, 2022 (reference number 406184).

Buffalo Viewpoint AMS monthly report and data report along with the network summary have been updated from the original version. The updated monthly report and revised data were re-submitted to the Electronic Transfer System (ETS) on November 25, 2022.



**WOOD BUFFALO
ENVIRONMENTAL ASSOCIATION**

Unit 3 - 805 Memorial Drive
Fort McMurray, AB T9K 0K4
P: 780.799.4420 E: info@wbea.org
wbea.org

Wood Buffalo Environmental Association

ANNUAL REPORT – VOLUME 1

2021 CONTINUOUS DATA

REVISED

December 2022

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM ANNUAL REPORT

ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Table of Contents

Continuous Monitoring Summaries

Annual Report Summary Letter	3
Annual Continuous Monitoring Network Summary	16
Continuous Air Quality Parameter Summaries	19
Sulphur Dioxide (SO ₂)	19
Hydrogen Sulphide (H ₂ S)	76
Total Reduced Sulphur (TRS)	110
Nitric Oxide (NO)	133
Nitrogen Dioxide (NO ₂)	182
Nitrogen Oxides (NO _x)	231
Ozone (O ₃)	279
Total Hydrocarbons (THC)	303
Non-Methane Hydrocarbons (NMHC)	347
Methane (CH ₄)	378
Carbon Monoxide (CO)	409
Carbon Dioxide (CO ₂)	418
Ammonia (NH ₃)	425
Particulate Matter 2.5µ(PM _{2.5})	430
Continuous Meteorological Parameter Summaries	461
Ambient Temperature	461
Relative Humidity	497
Barometric Pressure	532
Solar Radiation	536
Precipitation	541
Surface Wetness	546
Vertical Wind Speed	551
Wind Speed and Direction	559
Wind roses	595
Appendices	632
I. AAAQO Exceedances	632
II. Summary of Monthly Operation Times Below 90 Percent and Non-Compliances	641
III. 2011-2021 WBEA Data vs. LARP Triggers and Limits	650



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

Unit 3 - 805 Memorial Drive
Fort McMurray, AB T9K 0K4
P: 780.799.4420 E: info@wbea.org
wbea.org

March 31, 2022

Director, Environmental Monitoring and Evaluation Branch
Alberta Environment and Parks
11th Floor, Oxbridge Place
9820 106 Street
Edmonton, Alberta T5K 2J6

SUBMITTED VIA EMAIL

RE: Annual Ambient Air Quality Monitoring Report 2021 Wood Buffalo Environmental Association

Enclosed is the 2021 Annual Ambient Air Quality Monitoring Report for the Wood Buffalo Environmental Association regional air monitoring network.

The continuous ambient air quality monitoring network stations are:

AMS01 - Fort McKay - Bertha Ganter	AMS20 - MacKay River
AMS02 - Mildred Lake	AMS21 - Conklin
AMS03 - Lower Camp (Meteorology)	AMS22 - Janvier
AMS04 - Buffalo Viewpoint	AMS23 - Fort Hills
AMS05 - Mannix	AMS25 - Waskōw ohci Pimâtisiwin
AMS06 - Patricia McInnes	AMS26 - Christina Lake
AMS07 - Athabasca Valley	AMS27 - Jackfish 2/3
AMS08 - Fort Chipewyan	AMS29 - Surmont 2
AMS09 - Barge Landing	AMS30 - Ells River
AMS11 - Lower Camp (Air Quality)	AMS501 - Leismer
AMS13 - Fort McKay South	AMS505 - Sawbones Bay
AMS14 - Anzac	AMS506 - Jackfish 1
AMS17 - Wapasu	AMS507 - Kirby South
AMS18 - Stony Mountain	AMS508 - Kirby North
AMS19 - Firebag	

This report is submitted by the WBEA on behalf of its members. This report may also satisfy the ambient air reporting requirements in industry members' EPEA Approvals (as amended):



Government Members

Alberta Energy Regulator
Alberta Environment and Parks
Alberta Health
Alberta Health Services

Environment and Climate Change Canada
Health Canada
Parks Canada
Regional Municipality of Wood Buffalo

Indigenous Members

Athabasca Chipewyan First Nation
Chipewyan Prairie Dene First Nation
Christina River Dene Nation Council
Conklin Resource Development Advisory Council
Fort McKay First Nation

Fort McMurray #468 First Nation
Fort McKay Métis
Lakeland Métis Community Association
McMurray Métis
Mikisew Cree First Nation

Industry Members

Athabasca Oil Corporation

Canadian Natural

Cenovus Energy Inc.
CNOOC International
Connacher Oil and Gas Ltd.
ConocoPhillips Canada
Fort Hills Energy Corporation
Hammerstone Infrastructure Materials Ltd.
H.J. Baker Sulphur Canada ULC
Imperial Oil Limited
Inter Pipeline Limited
Keyera Energy Ltd.
MEG Energy Corp.
Parsons Creek Aggregates
PetroChina Canada Ltd.
Suncor Energy Inc.
Sunshine Oilsands Ltd.
Surmont Energy
Syncrude Canada Ltd.
Teck Resources Ltd.
Titan Tire Reclamation Corporation

EPEA Approval Numbers

289664-00-00; 241311-01-00
149968-01-00; 153125-01-00; 20809-02-00;
224816-01-00; 237382-01-00
48522-02-00; 206355-01-00
137467-01-00; 236394-00-00
240008-01-00
48263-01-00
151469-01-00
189942-01-00
426549-00-00
46586-01-00
73203-02-00
00000187-03-00
216466-01-00
231302-00
254465-00-00
94-03-00; 80105-01-00
305529-00-00
318401-00-00
26-03-00
247548-00-00
364232-00-00

Non-Government Organization Members

Keyano College

Pembina Institute



1. Introduction

The WBEA operates the largest airshed in the largest municipality in Canada. As a multi-stakeholder, community-based, not-for-profit association, the WBEA monitors the air in the Regional Municipality of Wood Buffalo (RMWB) 24 hours a day and 365 days a year. The WBEA works closely with Alberta Environment and Parks (AEP), and funding for this work was provided to the WBEA through the Oil Sands Monitoring Program (OSM).



Air Monitoring Parameters

Table 1 provides a list of stations with their names and corresponding WBEA identification number, and the air quality parameters measured by continuous methods at each site. Parameters measured may include hydrogen sulphide (H₂S), total reduced sulphur (TRS), sulphur dioxide (SO₂), nitrogen dioxide (NO₂), ozone (O₃), fine particulate matter (PM_{2.5}) total hydrocarbons (THC), methane (CH₄), non-methane hydrocarbons (NMHC), carbon dioxide (CO₂), carbon monoxide (CO) and ammonia (NH₃). Sites are categorized based on the purpose for which they were installed.

Table 1. Summary of stations and parameters measured continuously at WBEA stations

WBEA ID	TYPE	STATION NAME	SO ₂	NO ₂	O ₃	PM _{2.5}	TRS	H ₂ S	THC	Methane NMHC	CO	CO ₂	NH ₃
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X					X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKŌW OHCI PIMĀTISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				



Table 2 provides the list of stations and the meteorological parameters measured at each station. Parameters measured may include ambient temperature, relative humidity, barometric pressure, wind speed, wind direction, vertical wind speed, solar radiation, precipitation, and leaf wetness.

Table 2. Summary of stations and meteorological parameters measured continuously at WBEA stations.

WBEA ID	TYPE	STATION NAME	Temperature	RH	BP	Wind Speed	Wind Direction	Vertical Wind Speed	Solar Radiation	Precipitation	Leaf Wetness
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKÖW OHCI PIMĀTISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				



Table 3 provides a list of stations and air quality parameters measured by time-integrated methods. Parameters measured may include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM_{2.5}) including associated metal and ion analysis, particulate matter less than 10 µm aerodynamic diameter (PM₁₀), including associated metal and ion analysis, polycyclic aromatic hydrocarbons (PAH), wet precipitation, including major ion analysis.

Table 3. Summary of parameters measured using time-integrated methods at WBEA stations

WBEA ID	TYPE	STATION NAME	VOC	PM _{2.5} Mass, Metals and Ions	PM _{2.5} ECOC	PM ₁₀ Mass, Metals and Ions	PAH	PRECIP
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X	
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X	
9	ATTRIBUTION	BARGE LANDING	X					
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X		
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X	
17	COMPLIANCE	WAPASU			X			X
18	ENHANCED DEPOSITION/BACKGROUND	STONY MOUNTAIN			X			X
21	COMMUNITY	CONKLIN	X	X		X	X	
22	COMMUNITY	JANVIER	X	X		X	X	
30	COMPLIANCE	ELLS RIVER	X			X		

Air Monitoring Station Locations

The map in Figure 1 shows the locations of all WBEA continuous air quality monitoring stations. Continuous monitoring stations are distributed throughout the RMWB from Fort Chipewyan in the North to Conklin in the South.



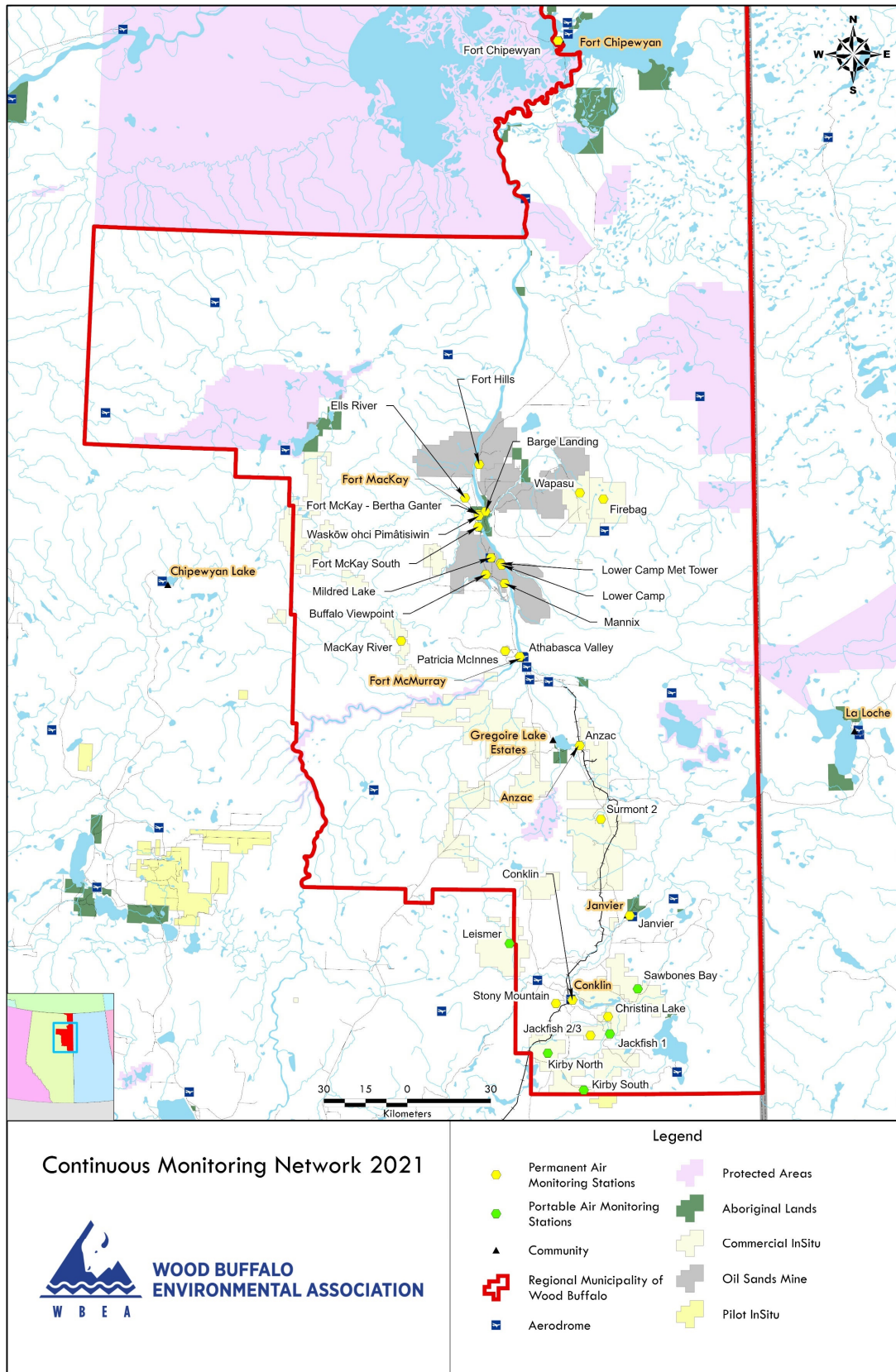


Figure 1: Continuous Air Monitoring Station Locations



2. Summary of Changes to the WBEA Air Monitoring Network

The WBEA relocated Kirby North air monitoring station to a new location within the Canadian Natural Resources Limited Kirby facility. Kirby North was removed from service on June 29, 2021 and was replaced with Kirby South on July 1, 2021. Kirby North and Kirby South fulfill EPEA approval number 237382-01-00. This station is equipped with ambient air quality analyzers for SO₂, H₂S, THC, NO, NO₂, NO_x, and meteorological sensors for ambient temperature, relative humidity, and wind speed and direction.

The WBEA deployed an ambient air monitoring station, Sawbones Bay, at the MEG Energy Christina Lake facility on July 1, 2021, to fulfill the requirements of EPEA approval number 216466-01, as amended. The current EPEA approval for the MEG Energy Christina Lake facility requires ambient air monitoring at the facility for six months per calendar year. This station is equipped with ambient air quality analyzers for SO₂, H₂S, NO, NO₂, NO_x, and meteorological sensors for ambient temperature, relative humidity, and wind speed and direction.

The WBEA completed ambient air quality monitoring at the Jackfish 1 air monitoring station, at the Canadian Natural Resources Limited Jackfish 1 facility on September 1, 2021, to fulfill the requirements of EPEA approval number 224816-00-00, as amended. The current EPEA approval for the Canadian Natural Jackfish 1 facility requires ambient air monitoring at the facility for six months per calendar year. This station was equipped with ambient air quality analyzers for SO₂, H₂S, NO, NO₂, NO_x, and meteorological sensors for ambient temperature, relative humidity, and wind speed and direction.

The WBEA deployed an ambient air quality monitoring station, Leismer, at the Athabasca Oil Leismer facility on October 1, 2021, to fulfill the requirements of EPEA approval number 241311-00, as amended. The current EPEA approval for the Athabasca Oil Leismer facility requires ambient air monitoring at the facility for three months per calendar year. This station was equipped with ambient air quality analyzers for SO₂, H₂S, NO, NO₂, NO_x, and meteorological sensors for ambient temperature, relative humidity, and wind speed and direction.



The following operational modifications are provided as per the Air Monitoring Directive requirements:

Table 4. Parameter changes to the WBEA network – 2021

Station	Station Name	Parameter	Date Effective	Comment
AMS01	Bertha Ganter – Fort McKay	H ₂ S	17-03-2021	New parameter
AMS09	Barge Landing	Wind Speed / Wind Direction 10 m	06-08-2021	Sensor relocated to 20m
AMS09	Barge Landing	Wind Speed / Wind Direction 20 m	06-08-2021	New sensor height to comply with AMD siting criteria.
AMS22	Janvier	Wind Speed / Wind Direction 10 m	23-09-2021	Sensor relocated to 20m
AMS22	Janvier	Wind Speed / Wind Direction 20 m	23-09-2021	New sensor height to comply with AMD siting criteria.
AMS18	Stony Mountain	Wind Speed / Wind Direction 10 m	27-10-2021	Sensor relocated to 20m
AMS18	Stony Mountain	Wind Speed / Wind Direction 20 m	27-10-2021	New sensor height to comply with AMD siting criteria.
AMS11	Lower Camp	Barometric Pressure Sensor	01-12-2021	New sensor installed at an industry members request.
AMS501	Kirby South	THC	02-09-2021	New parameter to comply with updated EPEA approval criteria.

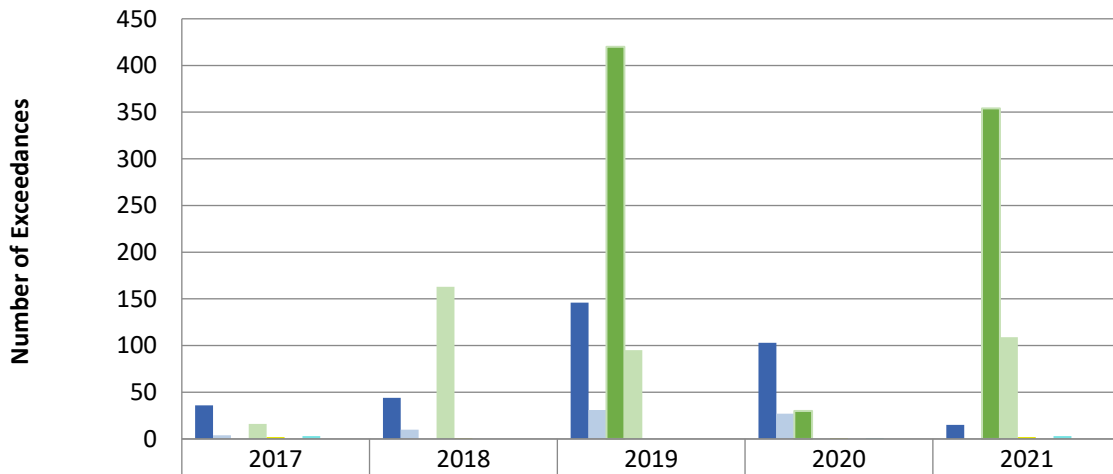
3. Concentrations in Excess of Alberta Ambient Air Quality Objectives and Guidelines

A detailed summary of ambient concentrations in excess of the Alberta Ambient Air Quality Objectives (AAAQOs) and Ambient Air Quality Guidelines (AAAQGs), including site, parameter, date & time, reference number, exceedance period, reported and final concentration, and status are included in Appendix I of the report. The summary of the previous 5-years of ambient concentrations that exceed the AAAQOs and AAAQGs are shown in Figure 3.

Please note, as the WBEA airshed reports ambient air concentrations of total reduced sulphur (TRS) that exceed the H₂S Ambient Air Quality Objectives, the H₂S summary in Figure 3 also includes the TRS concentrations that exceeded the H₂S objectives.



WBEA Ambient Air Monitoring Network Ground Level Concentrations in excess of AAAQOs and AAAQGs (2017-2021)



	2017	2018	2019	2020	2021
H2S/TRS - 1 hour	36	44	146	103	15
H2S/TRS - 24 hour	4	10	31	27	0
PM2.5 - 1 hour	0	0	420	30	354
PM2.5 - 24 hour	16	163	95	0	109
SO2 - 1 hour	2	1	0	1	2
SO2 - 24 hour	0	0	0	0	0
O3 - 1hour	3	0	0	1	3
NO2 - 1 hour	0	0	0	0	0
CO - 1 hour	0	0	0	0	0

*The PM_{2.5} 1-hour AAAQG was established on January 1, 2019

Figure 3 Ambient Air Concentrations in excess of the AAAQO and AAAQG (2017-2021)

4. Operational Status – Regulatory Non-compliance Instrument Operations

In 2021, there were 37 incidents resulting in regulatory non-compliance of monitoring instruments. A detailed summary of these incidents, including date, reference number, description, location, issue, and remedial action are included in Appendix II of the report.

5. External Audits and Results

There were no external audits of WBEA ambient air monitoring stations conducted for the 2021 reporting period.



6. Monthly Report Revisions

The following revisions were identified in the following monthly reports:

Month	Revision	Details
January	Inclusion of CO and CO ₂ at Stony Mountain	During data validation, it was identified that CO and CO ₂ data at Stony Mountain had not been included in the data uploaded to ETS, and formerly the Airdata Warehouse, dating back to the installation of the analyzer on October 1, 2019. Data for these parameters were uploaded to the ETS for October 2019 – January 2021 on March 1, 2021. Ambient Air Monitoring Reports and Calibration Reports included these parameters and did not require revisions.
February	Revision of SO ₂ at Patricia McInnes and NO ₂ at Athabasca Valley	During routine data review, it was identified that SO ₂ baseline points for Patricia McInnes and NO ₂ baseline points for Athabasca Valley Air Monitoring Stations had inadvertently been left unaccepted for January 2021. On March 30, 2021, SO ₂ data for Patricia McInnes and NO ₂ data for Athabasca Valley for January 2021 was resubmitted to the Electronic Transfer System to include baseline corrections.
October	Revision of O ₃ at Patricia McInnes	<p>A review of Ozone (O₃) data from Patricia McInnes Air Monitoring Station (AMS) compared to other air monitoring stations in the Wood Buffalo Environmental Association network revealed that measured values at Patricia McInnes AMS were higher. A review of the analyzer responses to the automated daily zeros checks and calibration zeros responses during the monthly multipoint calibrations showed a significant difference between these two values.</p> <p>Further investigation determined that a longer than expected stabilization during the automated daily zero checks resulted in negative values recorded as analyzer responses. During acceptance for baseline correction, this resulted in an elevated baseline for this parameter. These negative values are artifacts of the external system and not the true response of the analyzer. Therefore, analyzer zero responses recorded during the monthly multipoint calibrations were used to baseline correct the ozone data.</p> <p>As a result, O₃ data at Patricia McInnes AMS from June 2019 to May 2021 was revised. On October 12 through 15, 2021, the monthly reports and data reports, for each affected month, were re-submitted to the Electronic Transfer System (ETS).</p>



7. 2017-2021 WBEA Data Compared to LARP Triggers and Limits

A summary of data from the WBEA air monitoring stations compared to the Lower Athabasca Regional Plan (LARP) trigger levels and limits for NO₂ and SO₂ is provided in Appendix III.

8. 2021 Annual Air Concentrations

This report contains a summary of operational times for the year, the monthly averages, the number of readings in excess of the AAAQO/G, frequency distributions of 1-hour data, and annual average concentration plots over the past five years. Annual average concentration plots have been provided for stations for which there is more than one year of data, and for which 12-month monitoring is completed. Calculation of annual averages are not provided for portable monitoring stations which are only required to monitor for 3 or 6 months per year, based on their EPEA approval.

Annual statistics for time-integrated monitoring results are provided.

If additional information is required, please contact either Emilie Briggs at (780) 747-8219 or the Wood Buffalo Environmental Association at (780) 799-4420.

Yours sincerely,

Wood Buffalo Environmental Association

The representative of the Person Responsible for this monitoring program is Emilie Briggs, Operations Manager, WBEA.

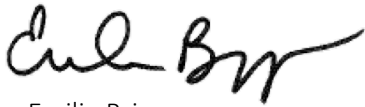
Report prepared and submitted by Asad Hidayat and Karina Fenwick of the WBEA and reviewed by Emilie Briggs of WBEA. The WBEA has retained the services of Whiteley Enterprises to conduct reporting functions on its behalf, specifically, Level 3 – Independent Assessment. As required, the contact information for WBEA staff is included below.

Asad Hidayat, Data Technician
Wood Buffalo Environmental Association
T: (780) 215-6000 | E: ahidayat@wbea.org

Karina Fenwick, Data Technician
Wood Buffalo Environmental Association
T: (780) 215-7499 | E: kfenwick@wbea.org



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.



Emilie Briggs
Operations Manager

Wood Buffalo Environmental Association
Unit 3 - 805 Memorial Drive
Fort McMurray AB T9K 0K4
www.wbea.org

T: (780) 747-8219 | E: ebriggs@wbea.org
R00_2021_Annual



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
ANNUAL AIR MONITORING SUMMARY
REVISED

2021

page 1 of 3


Prepared: December 21, 2022 8:00

APPROVAL NUMBERS	REPORT DATE						
	YEAR						
289664-00-00	2021						
241311-00-00	CONTINUOUS AMBIENT MONITORING						
20809-02-00							
149968-01-00			ONE-HOUR AVERAGE		24-HOUR AVERAGE		
237382-00-00	PARAMETER	STN. NO.	% TIME OPERATIONAL	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
48522-01-00	SO2(ppb)	1	100	39.6	0	6.7	0
240008-00-00	SO2(ppb)	2	100	150.1	0	18.5	0
48263-01-00	SO2(ppb)	4	100	76.2	0	12.1	0
224816-00-00	SO2(ppb)	5	99	124.9	0	19.1	0
151469-01-00	SO2(ppb)	6	100	35.3	0	11.6	0
189942-00-00	SO2(ppb)	7	100	27.4	0	6.1	0
206355-00-00	SO2(ppb)	8	100	12.1	0	3.2	0
46586-00-00	SO2(ppb)	9	98	36.7	0	7.1	0
73203-02-00	SO2(ppb)	11	99	186.8	2	22.6	0
216466-01-00	SO2(ppb)	13	100	64.5	0	9.9	0
137467-01-00	SO2(ppb)	14	100	18.6	0	4.2	0
236394-00-00	SO2(ppb)	17	100	47.3	0	9.6	0
254465-00-00	SO2(ppb)	18	97	14.8	0	2.4	0
094-02-00	SO2(ppb)	19	99	37.3	0	8.0	0
80105-01-00	SO2(ppb)	20	100	42.0	0	11.9	0
305529-00-00	SO2(ppb)	21	100	10.4	0	2.1	0
318401-00-00	SO2(ppb)	22	100	6.8	0	1.7	0
026-02-00	SO2(ppb)	23	99	30.5	0	5.3	0
364232-00-00	SO2(ppb)	25	99	39.1	0	6.7	0
228044-00-00	SO2(ppb)	26	100	47.5	0	15.0	0
231302-00-00	SO2(ppb)	27	100	12.4	0	2.8	0
153125-01-00	SO2(ppb)	29	100	18.9	0	2.6	0
	SO2(ppb)	30	100	37.2	0	6.9	0
	SO2(ppb)	501	100	30.4	0	6.6	0
	SO2(ppb)	505	99	40.3	0	12.2	0
	SO2(ppb)	506	100	72.8	0	13.6	0
	SO2(ppb)	507	100	27.5	0	10.4	0
	SO2(ppb)	508	100	13.3	0	3.3	0
	H2S(ppb)	1	99	3.5	0	0.9	0
	H2S(ppb)	2	100	17.2	4	2.0	0
	H2S(ppb)	4	100	9.7	0	1.4	0
	H2S(ppb)	5	99	10.3	1	2.9	0
	H2S(ppb)	11	99	16.8	7	2.2	0
	H2S(ppb)	17	99	2.2	0	0.6	0
	H2S(ppb)	19	99	3.6	0	0.6	0
	H2S(ppb)	20	100	16.1	1	2.2	0
	H2S(ppb)	25	100	3.3	0	1.5	0
	H2S(ppb)	26	100	5.0	0	0.8	0
	H2S(ppb)	27	100	1.0	0	0.4	0
	H2S(ppb)	29	99	0.7	0	0.3	0
	H2S(ppb)	501	100	1.8	0	0.4	0
	H2S(ppb)	505	97	4.2	0	1.3	0
	H2S(ppb)	506	97	6.4	0	0.7	0
	H2S(ppb)	507	98	2.6	0	1.1	0
	H2S(ppb)	508	98	4.3	0	0.8	0
	TRS(ppb)	1	99	4.1	0	1.9	0
	TRS(ppb)	6	100	1.5	0	0.7	0
	TRS(ppb)	7	99	5.5	0	1.8	0
	TRS(ppb)	9	98	3.3	0	1.6	0
	TRS(ppb)	13	100	3.5	0	1.5	0
	TRS(ppb)	14	100	3.2	0	0.3	0
	TRS(ppb)	18	97	0.7	0	0.3	0
	TRS(ppb)	21	100	1.7	0	0.7	0
	TRS(ppb)	22	98	0.5	0	0.3	0
	TRS(ppb)	23	99	10.6	2	1.4	0
	TRS(ppb)	30	99	4.0	0	0.8	0
	THC(ppm)	1	99	4.7	-	2.9	-
	THC(ppm)	2	99	7.7	-	3.2	-
	THC(ppm)	4	99	7.2	-	3.0	-
	THC55(ppm)	5	97	8.0	-	3.1	-
	THC51(ppm)	5	96	6.8	-	2.8	-
	THC(ppm)	6	98	3.4	-	2.4	-
	THC(ppm)	7	98	4.2	-	2.6	-
	THC(ppm)	9	96	4.9	-	3.0	-
	THC(ppm)	11	87	5.5	-	2.9	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
ANNUAL AIR MONITORING SUMMARY
REVISED

APPROVAL NUMBERS	2021 page 2 of 3 <small>Prepared: December 21, 2022 8:00</small>						
	REPORT DATE						
	YEAR						
289664-00-00	CONTINUOUS AMBIENT MONITORING						
241311-00-00				ONE-HOUR AVERAGE		24-HOUR AVERAGE	
20809-02-00	PARAMETER	STN. NO.	% TIME OPERATIONAL	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
149968-01-00							
237382-00-00	THC(ppm)	13	98	5.7	-	3.1	-
48522-01-00	THC(ppm)	14	99	3.9	-	2.4	-
240008-00-00	THC(ppm)	17	98	3.1	-	2.5	-
48263-01-00	THC(ppm)	18	95	2.3	-	2.2	-
224816-00-00	THC(ppm)	19	99	3.5	-	2.4	-
151469-01-00	THC(ppm)	20	100	3.5	-	2.6	-
189942-00-00	THC(ppm)	21	99	3.3	-	2.4	-
206355-00-00	THC(ppm)	22	97	3.0	-	2.2	-
46586-00-00	THC(ppm)	23	99	9.6	-	3.5	-
73203-02-00	THC(ppm)	29	99	3.0	-	2.6	-
216466-01-00	THC(ppm)	30	99	6.7	-	2.9	-
137467-01-00	THC(ppm)	507	98	4.8	-	2.9	-
236394-00-00	THC(ppm)	508	96	3.4	-	2.8	-
254465-00-00	THC(ppm)	1	100	101.7	1	44.6	-
094-02-00	O3(ppb)	4	100	101.9	1	47.5	-
80105-01-00	O3(ppb)	6	100	70.0	0	48.5	-
305529-00-00	O3(ppb)	7	100	74.3	0	43.5	-
318401-00-00	O3(ppb)	8	96	62.2	0	51.4	-
026-02-00	O3(ppb)	13	99	106.0	1	40.5	-
364232-00-00	O3(ppb)	14	100	74.5	0	46.9	-
228044-00-00	O3(ppb)	17	100	76.5	1	51.6	-
231302-00-00	O3(ppb)	18	97	62.8	0	49.4	-
153125-01-00	O3(ppb)	21	100	67.3	0	50.1	-
	O3(ppb)	22	97	69.4	0	49.1	-
	NO2(ppb)	1	100	44.7	0	28.2	-
	NO2(ppb)	4	99	47.0	0	25.1	-
	NO2(ppb)	6	100	44.1	0	21.1	-
	NO2(ppb)	7	100	41.2	0	22.4	-
	NO2(ppb)	8	100	22.2	0	10.6	-
	NO2(ppb)	9	97	51.6	0	36.7	-
	NO2(ppb)	13	100	45.9	0	27.9	-
	NO2(ppb)	14	98	37.3	0	14.0	-
	NO2(ppb)	17	99	30.4	0	12.8	-
	NO2(ppb)	18	97	26.5	0	6.6	-
	NO2(ppb)	19	99	79.1	0	16.1	-
	NO2(ppb)	20	100	35.0	0	21.0	-
	NO2(ppb)	21	100	21.5	0	7.6	-
	NO2(ppb)	22	99	16.9	0	7.2	-
	NO2(ppb)	23	99	58.5	0	34.4	-
	NO2(ppb)	26	100	39.3	0	11.4	-
	NO2(ppb)	27	99	18.6	0	8.3	-
	NO2(ppb)	29	99	20.6	0	10.2	-
	NO2(ppb)	30	100	46.0	0	25.8	-
	NO2(ppb)	501	100	15.1	0	7.2	-
	NO2(ppb)	505	97	33.2	0	16.3	-
	NO2(ppb)	506	100	30.5	0	8.9	-
	NO2(ppb)	507	100	27.3	0	8.2	-
	NO2(ppb)	508	98	74.5	0	8.8	-
	CO(ppm)	1	99	1.0	0	0.8	-
	CO(ppm)	7	100	1.5	0	0.6	-
	CO(ppm)	8	100	0.7	0	0.5	-
	CO(ppm)	18	96	1.4	0	0.8	-
	CO2(ppm)	1	100	594.5	0	462.8	-
	CO2(ppm)	8	100	451.9	0	443.2	-
	CO2(ppm)	18	97	485.9	0	455.3	-
	NH3(ppb)	1	92	0.0	-	0.0	-
	NH3(ppb)	6	90	24.8	-	10.4	-
	PM2.5(ug/m3)	1	100	228.4	25	97.0	6
	PM2.5(ug/m3)	4	100	172.1	25	94.8	10
	PM2.5(ug/m3)	6	99	138.0	18	76.3	5
	PM2.5(ug/m3)	7	100	146.3	17	84.1	4
	PM2.5(ug/m3)	8	100	121.1	5	59.4	4
	PM2.5(ug/m3)	9	99	269.1	33	96.0	7
	PM2.5(ug/m3)	13	100	161.3	20	108.3	8
	PM2.5(ug/m3)	14	100	148.2	21	82.7	7
	PM2.5(ug/m3)	17	99	152.4	19	93.4	8

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
ANNUAL AIR MONITORING SUMMARY
REVISED

APPROVAL NUMBERS	2021 page 3 of 3 <small>Prepared: December 21, 2022 8:00</small>						
289664-00-00	REPORT DATE						
241311-00-00	YEAR						
20809-02-00	2021						
149968-01-00	CONTINUOUS AMBIENT MONITORING						
237382-00-00	ONE-HOUR AVERAGE				24-HOUR AVERAGE		
48522-01-00	PARAMETER	STN. NO.	% TIME OPERATIONAL	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
240008-00-00	PM2.5(ug/m3)	18	100	194.0	34	95.1	10
48263-01-00	PM2.5(ug/m3)	21	100	193.3	38	93.8	8
224816-00-00	PM2.5(ug/m3)	22	100	213.4	41	91.2	13
151469-01-00	PM2.5(ug/m3)	23	99	224.4	31	100.4	8
189942-00-00	PM2.5(ug/m3)	29	100	133.8	12	65.8	7
206355-00-00	PM2.5(ug/m3)	30	100	135.4	15	89.7	4
46586-00-00	WS(km/h)	1	99	-	-	-	-
73203-02-00	WS(km/h)	2	100	-	-	-	-
216466-01-00	WS(km/h)	4	42	-	-	-	-
137467-01-00	WS(km/h)	5	99	-	-	-	-
236394-00-00	WS(km/h)	6	99	-	-	-	-
254465-00-00	WS(km/h)	7	99	-	-	-	-
094-02-00	WS(km/h)	8	100	-	-	-	-
80105-01-00	WS(km/h)	9	97	-	-	-	-
305529-00-00	WS10m(km/h)	9	98	-	-	-	-
318401-00-00	WS20m(km/h)	11	99	-	-	-	-
026-02-00	WS(km/h)	13	99	-	-	-	-
364232-00-00	WS(km/h)	14	96	-	-	-	-
228044-00-00	WS(km/h)	17	98	-	-	-	-
231302-00-00	WS(km/h)	18	100	-	-	-	-
153125-01-00	WS20m(km/h)	18	100	-	-	-	-
	WS(km/h)	19	95	-	-	-	-
	WS(km/h)	20	99	-	-	-	-
	WS(km/h)	21	98	-	-	-	-
	WS10m(km/h)	22	98	-	-	-	-
	WS20m(km/h)	22	98	-	-	-	-
	WS(km/h)	23	97	-	-	-	-
	WS(km/h)	25	98	-	-	-	-
	WS(km/h)	26	100	-	-	-	-
	WS(km/h)	27	100	-	-	-	-
	WS(km/h)	29	98	-	-	-	-
	WS(km/h)	30	98	-	-	-	-
	WS(km/h)	501	98	-	-	-	-
	WS(km/h)	505	100	-	-	-	-
	WS(km/h)	506	99	-	-	-	-
	WS(km/h)	507	99	-	-	-	-
	WS(km/h)	508	100	-	-	-	-
							
	SIGNATURE OF ASSOCIATION REPRESENTATIVE				FOR ALBERTA ENVIRONMENT USE ONLY		



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

SULPHUR DIOXIDE ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	707	1.4	17.8	0	3.6	0	100.0	0.0	0.0	0.0	0.0
February	100	639	0.8	13.6	0	3.2	0	100.0	0.0	0.0	0.0	0.0
March	100	707	1.1	22.0	0	4.7	0	99.6	0.4	0.0	0.0	0.0
April	100	684	1.3	39.6	0	6.7	0	98.7	1.3	0.0	0.0	0.0
May	99	705	1.2	16.0	0	5.2	0	100.0	0.0	0.0	0.0	0.0
June	100	683	0.5	12.5	0	2.5	0	100.0	0.0	0.0	0.0	0.0
July	100	706	1.0	19.7	0	3.9	0	100.0	0.0	0.0	0.0	0.0
August	100	707	1.1	30.4	0	5.5	0	99.6	0.4	0.0	0.0	0.0
September	100	686	0.5	21.2	0	3.6	0	99.9	0.2	0.0	0.0	0.0
October	99	704	0.9	21.0	0	4.3	0	99.9	0.1	0.0	0.0	0.0
November	100	685	0.5	11.8	0	2.6	0	100.0	0.0	0.0	0.0	0.0
December	100	708	0.5	11.0	0	2.8	0	100.0	0.0	0.0	0.0	0.0
Annual	100	8321	0.9	39.6	0	6.7	0	99.8	0.2	0.0	0.0	0.0



Wood Buffalo Environmental Association - Mildred Lake (AMS02)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	709	2.7	46.8	0	12.3	0	97.7	2.3	0.0	0.0	0.0
February	100	638	1.7	48.5	0	8.5	0	99.1	0.9	0.0	0.0	0.0
March	99	700	2.1	107.3	0	9.1	0	98.4	1.4	0.1	0.0	0.0
April	100	686	2.2	48.8	0	10.2	0	98.4	1.6	0.0	0.0	0.0
May	100	710	1.9	86.2	0	8.8	0	98.5	1.4	0.1	0.0	0.0
June	100	685	2.0	33.0	0	5.3	0	99.3	0.7	0.0	0.0	0.0
July	100	709	2.4	56.5	0	11.4	0	97.0	3.0	0.0	0.0	0.0
August	100	707	2.1	150.1	0	18.5	0	97.9	1.7	0.3	0.1	0.0
September	100	686	1.8	40.8	0	16.4	0	97.1	2.9	0.0	0.0	0.0
October	100	710	1.3	32.3	0	5.1	0	99.3	0.7	0.0	0.0	0.0
November	100	687	1.5	51.7	0	16.3	0	98.7	1.3	0.0	0.0	0.0
December	100	709	0.8	35.5	0	6.4	0	99.3	0.7	0.0	0.0	0.0
Annual	100	8336	1.9	150.1	0	18.5	0	98.4	1.6	0.1	0.0	0.0



Wood Buffalo Environmental Association - Buffalo Viewpoint (AMS04)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	710	1.1	24.7	0	5.3	0	99.4	0.6	0.0	0.0	0.0
February	100	640	0.9	17.4	0	3.1	0	100.0	0.0	0.0	0.0	0.0
March	100	710	1.0	46.2	0	8.7	0	99.0	1.0	0.0	0.0	0.0
April	96	657	1.9	41.4	0	9.4	0	98.3	1.7	0.0	0.0	0.0
May	100	708	1.1	37.9	0	7.6	0	98.9	1.1	0.0	0.0	0.0
June	99	681	1.0	69.3	0	10.2	0	99.1	0.7	0.2	0.0	0.0
July	100	710	0.7	24.8	0	4.0	0	99.9	0.1	0.0	0.0	0.0
August	100	709	1.3	76.2	0	12.1	0	98.2	1.6	0.3	0.0	0.0
September	100	686	0.2	7.8	0	1.5	0	100.0	0.0	0.0	0.0	0.0
October	100	708	0.3	19.0	0	3.0	0	100.0	0.0	0.0	0.0	0.0
November	100	687	0.2	11.7	0	1.2	0	100.0	0.0	0.0	0.0	0.0
December	100	710	0.2	3.1	0	0.7	0	100.0	0.0	0.0	0.0	0.0
Annual	100	8316	0.8	76.2	0	12.1	0	99.4	0.6	0.0	0.0	0.0



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Number of Values Exceeding	Maximum	Number of Values Exceeding	% of Data in Each Concentration Range				
				1-Hour Value	1-Hour Objective	24-Hour Value	24-Hour Objective	0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	709	1.8	41.2	0	9.4	0	98.9	1.1	0.0	0.0	0.0
February	100	640	3.0	50.9	0	14.3	0	96.7	3.3	0.0	0.0	0.0
March	100	708	2.5	55.1	0	12.0	0	97.6	2.4	0.0	0.0	0.0
April	99	680	4.5	124.9	0	19.1	0	94.0	5.7	0.2	0.2	0.0
May	100	709	2.5	77.7	0	14.8	0	97.5	2.3	0.3	0.0	0.0
June	100	686	1.0	27.5	0	4.8	0	99.6	0.4	0.0	0.0	0.0
July	100	709	0.9	71.4	0	13.7	0	98.9	0.9	0.3	0.0	0.0
August	100	708	1.1	40.3	0	8.6	0	99.0	1.0	0.0	0.0	0.0
September	100	686	0.3	24.0	0	1.8	0	99.9	0.2	0.0	0.0	0.0
October	100	708	0.6	30.0	0	3.8	0	99.7	0.3	0.0	0.0	0.0
November	93	638	1.1	32.0	0	9.3	0	98.9	1.1	0.0	0.0	0.0
December	100	709	1.7	51.2	0	12.6	0	98.9	1.1	0.0	0.0	0.0
Annual	99	8290	1.7	124.9	0	19.1	0	98.3	1.6	0.1	0.0	0.0



Wood Buffalo Environmental Association - Patricia McInnes (AMS06)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	710	1.8	33.3	0	8.9	0	99.3	0.7	0.0	0.0	0.0
February	100	640	2.3	35.3	0	11.6	0	99.2	0.8	0.0	0.0	0.0
March	100	710	1.1	27.1	0	5.4	0	99.7	0.3	0.0	0.0	0.0
April	100	684	1.3	21.9	0	5.4	0	99.7	0.3	0.0	0.0	0.0
May	100	707	1.0	21.8	0	5.7	0	99.7	0.3	0.0	0.0	0.0
June	100	685	0.5	12.1	0	2.5	0	100.0	0.0	0.0	0.0	0.0
July	100	708	0.5	14.7	0	3.5	0	100.0	0.0	0.0	0.0	0.0
August	100	707	0.3	7.6	0	2.5	0	100.0	0.0	0.0	0.0	0.0
September	100	684	0.3	21.9	0	2.5	0	99.9	0.2	0.0	0.0	0.0
October	100	708	0.5	21.6	0	4.8	0	99.9	0.1	0.0	0.0	0.0
November	100	684	0.4	15.7	0	2.1	0	100.0	0.0	0.0	0.0	0.0
December	100	710	1.1	14.6	0	5.0	0	100.0	0.0	0.0	0.0	0.0
Annual	100	8337	0.9	35.3	0	11.6	0	99.8	0.2	0.0	0.0	0.0



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	709	1.2	19.7	0	6.1	0	100.0	0.0	0.0	0.0	0.0
February	100	640	1.6	18.4	0	5.5	0	100.0	0.0	0.0	0.0	0.0
March	100	707	0.6	16.7	0	3.1	0	100.0	0.0	0.0	0.0	0.0
April	100	684	0.9	19.3	0	3.8	0	100.0	0.0	0.0	0.0	0.0
May	99	706	0.5	12.4	0	2.3	0	100.0	0.0	0.0	0.0	0.0
June	100	686	0.4	9.3	0	2.1	0	100.0	0.0	0.0	0.0	0.0
July	100	708	0.3	13.9	0	3.0	0	100.0	0.0	0.0	0.0	0.0
August	100	710	0.6	27.4	0	4.9	0	99.7	0.3	0.0	0.0	0.0
September	100	686	0.3	7.8	0	1.9	0	100.0	0.0	0.0	0.0	0.0
October	99	705	0.5	18.0	0	4.5	0	100.0	0.0	0.0	0.0	0.0
November	100	687	0.3	3.4	0	0.8	0	100.0	0.0	0.0	0.0	0.0
December	100	709	0.8	24.5	0	4.5	0	99.9	0.1	0.0	0.0	0.0
Annual	100	8337	0.7	27.4	0	6.1	0	100.0	0.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Fort Chipewyan (AMS08)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	707	0.5	12.1	0	2.4	0	100.0	0.0	0.0	0.0	0.0
February	100	639	0.4	6.3	0	3.0	0	100.0	0.0	0.0	0.0	0.0
March	100	706	0.2	4.4	0	1.2	0	100.0	0.0	0.0	0.0	0.0
April	100	684	0.1	2.6	0	1.2	0	100.0	0.0	0.0	0.0	0.0
May	100	707	0.1	3.0	0	1.2	0	100.0	0.0	0.0	0.0	0.0
June	100	685	0.0	2.6	0	0.3	0	100.0	0.0	0.0	0.0	0.0
July	99	702	0.1	5.2	0	0.5	0	100.0	0.0	0.0	0.0	0.0
August	100	706	0.2	3.7	0	1.6	0	100.0	0.0	0.0	0.0	0.0
September	100	682	0.2	7.1	0	1.3	0	100.0	0.0	0.0	0.0	0.0
October	100	705	0.2	5.0	0	1.2	0	100.0	0.0	0.0	0.0	0.0
November	100	680	0.3	8.1	0	1.5	0	100.0	0.0	0.0	0.0	0.0
December	100	707	0.4	7.3	0	3.2	0	100.0	0.0	0.0	0.0	0.0
Annual	100	8310	0.2	12.1	0	3.2	0	100.0	0.0	0.0	0.0	0.0



**Wood Buffalo Environmental Association - Barge Landing (AMS09)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average**

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding	Maximum 24-Hour Value	Number of Values Exceeding	% of Data in Each Concentration Range				
					1-Hour Objective		24-Hour Objective	0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	703	1.1	14.8	0	3.8	0	100.0	0.0	0.0	0.0	0.0
February	100	637	1.2	27.2	0	7.1	0	99.2	0.8	0.0	0.0	0.0
March	99	702	1.0	36.7	0	5.7	0	99.4	0.6	0.0	0.0	0.0
April	99	678	0.9	31.9	0	5.2	0	99.1	0.9	0.0	0.0	0.0
May	98	696	0.9	14.7	0	4.7	0	100.0	0.0	0.0	0.0	0.0
June	100	682	0.5	16.8	0	4.5	0	100.0	0.0	0.0	0.0	0.0
July	100	706	0.8	18.1	0	4.2	0	100.0	0.0	0.0	0.0	0.0
August	86	608	0.9	25.9	0	4.7	0	99.7	0.3	0.0	0.0	0.0
September	99	683	0.4	21.5	0	3.4	0	99.9	0.2	0.0	0.0	0.0
October	100	708	0.6	13.2	0	3.7	0	100.0	0.0	0.0	0.0	0.0
November	100	686	0.4	9.3	0	2.0	0	100.0	0.0	0.0	0.0	0.0
December	100	709	0.4	7.4	0	1.5	0	100.0	0.0	0.0	0.0	0.0
Annual	98	8198	0.8	36.7	0	7.1	0	99.9	0.1	0.0	0.0	0.0



Wood Buffalo Environmental Association - Lower Camp (AMS11)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	709	2.0	66.8	0	7.4	0	99.2	0.7	0.1	0.0	0.0
February	100	638	2.9	68.6	0	14.8	0	95.9	3.8	0.3	0.0	0.0
March	100	708	2.8	78.2	0	8.6	0	96.5	3.4	0.1	0.0	0.0
April	100	682	2.8	158.7	0	13.2	0	96.9	2.6	0.3	0.2	0.0
May	100	709	3.2	186.7	2	22.6	0	96.6	2.8	0.3	0.0	0.3
June	100	683	2.2	29.8	0	8.0	0	98.8	1.2	0.0	0.0	0.0
July	99	704	1.4	28.4	0	4.0	0	99.7	0.3	0.0	0.0	0.0
August	93	658	1.7	50.8	0	7.0	0	98.9	1.1	0.0	0.0	0.0
September	100	685	1.7	39.7	0	6.2	0	98.7	1.3	0.0	0.0	0.0
October	100	709	3.1	45.6	0	8.1	0	96.2	3.8	0.0	0.0	0.0
November	100	684	1.6	125.1	0	11.4	0	99.1	0.6	0.2	0.2	0.0
December	92	648	0.6	20.6	0	3.0	0	99.9	0.2	0.0	0.0	0.0
Annual	99	8217	2.2	186.7	2	22.6	0	98.0	1.8	0.1	0.0	0.0



Wood Buffalo Environmental Association - Fort McKay South (AMS13)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	708	1.2	25.5	0	5.5	0	99.7	0.3	0.0	0.0	0.0
February	100	638	0.6	9.3	0	1.9	0	100.0	0.0	0.0	0.0	0.0
March	100	706	1.0	19.9	0	4.0	0	100.0	0.0	0.0	0.0	0.0
April	100	683	1.2	42.0	0	7.1	0	98.2	1.8	0.0	0.0	0.0
May	99	703	1.8	40.1	0	9.9	0	98.9	1.1	0.0	0.0	0.0
June	100	683	0.9	17.4	0	2.7	0	100.0	0.0	0.0	0.0	0.0
July	100	705	1.1	22.1	0	5.0	0	99.7	0.3	0.0	0.0	0.0
August	100	706	1.4	64.5	0	7.6	0	98.6	1.3	0.1	0.0	0.0
September	100	683	0.6	14.9	0	3.4	0	100.0	0.0	0.0	0.0	0.0
October	100	709	1.2	19.5	0	4.5	0	100.0	0.0	0.0	0.0	0.0
November	100	686	0.6	7.5	0	1.8	0	100.0	0.0	0.0	0.0	0.0
December	100	710	0.6	11.0	0	2.4	0	100.0	0.0	0.0	0.0	0.0
Annual	100	8320	1.0	64.5	0	9.9	0	99.6	0.4	0.0	0.0	0.0



Wood Buffalo Environmental Association - Anzac (AMS14)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	707	1.1	18.6	0	3.7	0	100.0	0.0	0.0	0.0	0.0
February	100	638	1.2	12.1	0	4.2	0	100.0	0.0	0.0	0.0	0.0
March	100	705	0.6	11.1	0	3.0	0	100.0	0.0	0.0	0.0	0.0
April	100	682	0.4	10.1	0	2.4	0	100.0	0.0	0.0	0.0	0.0
May	100	708	0.2	6.6	0	1.4	0	100.0	0.0	0.0	0.0	0.0
June	100	687	0.3	5.1	0	1.3	0	100.0	0.0	0.0	0.0	0.0
July	100	709	0.3	14.3	0	3.3	0	100.0	0.0	0.0	0.0	0.0
August	100	708	0.3	8.4	0	1.4	0	100.0	0.0	0.0	0.0	0.0
September	100	686	0.3	6.8	0	1.7	0	100.0	0.0	0.0	0.0	0.0
October	99	701	0.4	10.4	0	2.2	0	100.0	0.0	0.0	0.0	0.0
November	99	682	0.3	3.2	0	0.7	0	100.0	0.0	0.0	0.0	0.0
December	100	708	0.7	12.8	0	3.1	0	100.0	0.0	0.0	0.0	0.0
Annual	100	8321	0.5	18.6	0	4.2	0	100.0	0.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Wapasu (AMS17)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	707	1.9	47.3	0	7.9	0	99.7	0.3	0.0	0.0	0.0
February	100	641	0.8	15.2	0	4.1	0	100.0	0.0	0.0	0.0	0.0
March	100	706	1.1	24.9	0	3.9	0	99.9	0.1	0.0	0.0	0.0
April	100	685	0.5	18.6	0	3.4	0	100.0	0.0	0.0	0.0	0.0
May	100	709	0.4	10.6	0	2.8	0	100.0	0.0	0.0	0.0	0.0
June	100	687	0.8	11.6	0	3.2	0	100.0	0.0	0.0	0.0	0.0
July	100	710	0.5	32.3	0	3.2	0	99.9	0.1	0.0	0.0	0.0
August	100	709	1.0	38.2	0	6.1	0	99.3	0.7	0.0	0.0	0.0
September	95	652	0.6	16.4	0	3.2	0	100.0	0.0	0.0	0.0	0.0
October	100	710	1.2	34.7	0	7.6	0	99.6	0.4	0.0	0.0	0.0
November	100	682	0.9	26.4	0	6.1	0	99.7	0.3	0.0	0.0	0.0
December	100	709	1.3	33.1	0	9.6	0	99.2	0.9	0.0	0.0	0.0
Annual	100	8307	0.9	47.3	0	9.6	0	99.8	0.2	0.0	0.0	0.0



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	707	0.6	7.0	0	2.3	0	100.0	0.0	0.0	0.0	0.0
February	100	638	0.8	14.8	0	2.4	0	100.0	0.0	0.0	0.0	0.0
March	100	707	0.5	7.1	0	2.4	0	100.0	0.0	0.0	0.0	0.0
April	100	683	0.4	4.4	0	1.3	0	100.0	0.0	0.0	0.0	0.0
May	100	707	0.3	3.4	0	1.0	0	100.0	0.0	0.0	0.0	0.0
June	99	675	0.2	4.0	0	0.6	0	100.0	0.0	0.0	0.0	0.0
July	95	668	0.2	2.1	0	0.6	0	100.0	0.0	0.0	0.0	0.0
August	99	701	0.2	2.9	0	0.5	0	100.0	0.0	0.0	0.0	0.0
September	100	682	0.2	2.5	0	0.5	0	100.0	0.0	0.0	0.0	0.0
October	100	707	0.4	4.2	0	1.1	0	100.0	0.0	0.0	0.0	0.0
November	100	682	0.4	5.1	0	1.1	0	100.0	0.0	0.0	0.0	0.0
December	77	544	0.5	7.1	0	2.4	0	100.0	0.0	0.0	0.0	0.0
Annual	97	8101	0.4	14.8	0	2.4	0	100.0	0.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Firebag (AMS19)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	708	2.1	33.6	0	8.0	0	99.2	0.9	0.0	0.0	0.0
February	100	639	0.7	13.1	0	2.9	0	100.0	0.0	0.0	0.0	0.0
March	100	705	1.3	21.5	0	5.0	0	99.9	0.1	0.0	0.0	0.0
April	100	685	0.4	12.9	0	2.8	0	100.0	0.0	0.0	0.0	0.0
May	100	705	0.4	17.0	0	2.1	0	100.0	0.0	0.0	0.0	0.0
June	94	648	0.8	9.9	0	2.8	0	100.0	0.0	0.0	0.0	0.0
July	100	710	0.5	13.7	0	2.8	0	100.0	0.0	0.0	0.0	0.0
August	100	709	1.2	24.4	0	4.0	0	99.9	0.1	0.0	0.0	0.0
September	100	686	0.7	17.8	0	2.6	0	100.0	0.0	0.0	0.0	0.0
October	100	708	1.0	23.7	0	5.7	0	99.9	0.1	0.0	0.0	0.0
November	100	687	1.0	32.8	0	5.4	0	99.7	0.3	0.0	0.0	0.0
December	100	709	1.6	37.3	0	6.6	0	99.7	0.3	0.0	0.0	0.0
Annual	99	8299	1.0	37.3	0	8.0	0	99.9	0.2	0.0	0.0	0.0



Wood Buffalo Environmental Association - Mackay River (AMS20)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	706	1.3	31.5	0	6.0	0	99.9	0.1	0.0	0.0	0.0
February	100	640	0.9	21.9	0	3.4	0	99.8	0.2	0.0	0.0	0.0
March	100	708	1.2	35.1	0	9.4	0	99.0	1.0	0.0	0.0	0.0
April	100	685	0.9	13.9	0	2.9	0	100.0	0.0	0.0	0.0	0.0
May	100	707	0.5	18.2	0	3.8	0	100.0	0.0	0.0	0.0	0.0
June	100	685	0.5	10.5	0	2.5	0	100.0	0.0	0.0	0.0	0.0
July	100	708	0.7	15.0	0	4.3	0	100.0	0.0	0.0	0.0	0.0
August	100	707	1.0	23.3	0	5.4	0	99.7	0.3	0.0	0.0	0.0
September	100	685	0.7	18.5	0	4.4	0	100.0	0.0	0.0	0.0	0.0
October	100	708	0.3	13.7	0	3.3	0	100.0	0.0	0.0	0.0	0.0
November	100	685	0.4	10.7	0	2.1	0	100.0	0.0	0.0	0.0	0.0
December	100	709	0.8	42.0	0	11.9	0	99.4	0.6	0.0	0.0	0.0
Annual	100	8333	0.8	42.0	0	11.9	0	99.8	0.2	0.0	0.0	0.0



**Wood Buffalo Environmental Association - Conklin (AMS21)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average**

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	708	0.4	4.8	0	1.3	0	100.0	0.0	0.0	0.0	0.0
February	100	639	0.6	9.9	0	1.8	0	100.0	0.0	0.0	0.0	0.0
March	100	709	0.4	10.4	0	1.0	0	100.0	0.0	0.0	0.0	0.0
April	100	686	0.3	4.1	0	1.0	0	100.0	0.0	0.0	0.0	0.0
May	100	709	0.3	4.3	0	1.0	0	100.0	0.0	0.0	0.0	0.0
June	100	686	0.2	3.2	0	0.5	0	100.0	0.0	0.0	0.0	0.0
July	100	706	0.2	2.1	0	0.9	0	100.0	0.0	0.0	0.0	0.0
August	100	710	0.2	3.9	0	0.7	0	100.0	0.0	0.0	0.0	0.0
September	100	684	0.2	3.3	0	0.4	0	100.0	0.0	0.0	0.0	0.0
October	100	709	0.3	4.1	0	0.9	0	100.0	0.0	0.0	0.0	0.0
November	100	687	0.4	9.2	0	1.4	0	100.0	0.0	0.0	0.0	0.0
December	100	710	0.5	6.0	0	2.1	0	100.0	0.0	0.0	0.0	0.0
Annual	100	8343	0.3	10.4	0	2.1	0	100.0	0.0	0.0	0.0	0.0



**Wood Buffalo Environmental Association - Janvier (AMS22)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average**

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	707	0.4	5.9	0	1.4	0	100.0	0.0	0.0	0.0	0.0
February	100	638	0.5	6.7	0	1.7	0	100.0	0.0	0.0	0.0	0.0
March	100	709	0.4	5.0	0	1.3	0	100.0	0.0	0.0	0.0	0.0
April	99	680	0.3	3.6	0	1.2	0	100.0	0.0	0.0	0.0	0.0
May	100	705	0.2	3.0	0	0.9	0	100.0	0.0	0.0	0.0	0.0
June	99	682	0.1	1.7	0	0.6	0	100.0	0.0	0.0	0.0	0.0
July	100	708	0.1	2.1	0	0.7	0	100.0	0.0	0.0	0.0	0.0
August	99	704	0.2	2.2	0	0.5	0	100.0	0.0	0.0	0.0	0.0
September	100	683	0.2	3.0	0	0.7	0	100.0	0.0	0.0	0.0	0.0
October	100	707	0.2	5.1	0	0.8	0	100.0	0.0	0.0	0.0	0.0
November	100	683	0.3	3.2	0	0.8	0	100.0	0.0	0.0	0.0	0.0
December	100	709	0.4	6.8	0	1.3	0	100.0	0.0	0.0	0.0	0.0
Annual	100	8315	0.3	6.8	0	1.7	0	100.0	0.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Fort Hills (AMS23)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	708	1.3	14.0	0	5.3	0	100.0	0.0	0.0	0.0	0.0
February	100	639	1.0	22.2	0	5.3	0	99.7	0.3	0.0	0.0	0.0
March	100	705	0.7	19.8	0	3.3	0	100.0	0.0	0.0	0.0	0.0
April	99	675	0.7	20.6	0	3.2	0	99.9	0.2	0.0	0.0	0.0
May	100	708	0.8	30.5	0	3.3	0	99.9	0.1	0.0	0.0	0.0
June	100	686	0.6	23.6	0	2.3	0	99.9	0.2	0.0	0.0	0.0
July	100	708	0.9	23.7	0	4.0	0	99.9	0.1	0.0	0.0	0.0
August	100	708	0.7	23.4	0	4.2	0	99.7	0.3	0.0	0.0	0.0
September	100	686	0.6	17.9	0	4.1	0	100.0	0.0	0.0	0.0	0.0
October	100	709	0.4	8.1	0	2.1	0	100.0	0.0	0.0	0.0	0.0
November	99	682	0.4	12.6	0	2.2	0	100.0	0.0	0.0	0.0	0.0
December	93	659	0.5	10.3	0	2.8	0	100.0	0.0	0.0	0.0	0.0
Annual	99	8273	0.7	30.5	0	5.3	0	99.9	0.1	0.0	0.0	0.0



Wood Buffalo Environmental Association - Waskow ohci Pimatisiwin (AMS25)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	97	686	1.4	18.2	0	4.2	0	100.0	0.0	0.0	0.0	0.0
February	96	612	0.7	11.8	0	2.7	0	100.0	0.0	0.0	0.0	0.0
March	99	703	1.1	21.7	0	4.1	0	99.9	0.1	0.0	0.0	0.0
April	100	684	1.2	39.1	0	6.7	0	98.7	1.3	0.0	0.0	0.0
May	99	704	1.3	25.8	0	6.2	0	99.7	0.3	0.0	0.0	0.0
June	99	682	0.4	12.1	0	1.9	0	100.0	0.0	0.0	0.0	0.0
July	100	709	0.8	18.5	0	3.2	0	100.0	0.0	0.0	0.0	0.0
August	100	709	0.9	25.0	0	4.9	0	99.9	0.1	0.0	0.0	0.0
September	100	687	0.4	19.9	0	3.2	0	100.0	0.0	0.0	0.0	0.0
October	98	696	0.8	18.2	0	4.3	0	100.0	0.0	0.0	0.0	0.0
November	100	686	0.5	9.5	0	2.1	0	100.0	0.0	0.0	0.0	0.0
December	100	709	0.5	10.5	0	2.6	0	100.0	0.0	0.0	0.0	0.0
Annual	99	8267	0.8	39.1	0	6.7	0	99.8	0.2	0.0	0.0	0.0



Wood Buffalo Environmental Association - Christina Lake (AMS26)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	707	1.8	45.7	0	9.2	0	99.2	0.9	0.0	0.0	0.0
February	100	637	3.0	41.8	0	15.0	0	96.7	3.3	0.0	0.0	0.0
March	100	706	2.2	47.5	0	6.9	0	98.4	1.6	0.0	0.0	0.0
April	100	684	2.1	33.1	0	10.2	0	98.5	1.5	0.0	0.0	0.0
May	94	671	1.0	28.8	0	5.9	0	99.3	0.8	0.0	0.0	0.0
June	100	684	2.8	36.4	0	7.6	0	97.5	2.5	0.0	0.0	0.0
July	100	707	2.2	47.2	0	9.0	0	97.2	2.8	0.0	0.0	0.0
August	100	707	2.1	41.2	0	11.5	0	96.9	3.1	0.0	0.0	0.0
September	100	684	1.8	29.0	0	13.1	0	98.8	1.2	0.0	0.0	0.0
October	100	707	1.0	34.5	0	7.1	0	99.3	0.7	0.0	0.0	0.0
November	100	685	1.1	19.2	0	3.7	0	100.0	0.0	0.0	0.0	0.0
December	100	705	1.9	40.5	0	8.0	0	99.2	0.9	0.0	0.0	0.0
Annual	100	8284	1.9	47.5	0	15.0	0	98.4	1.6	0.0	0.0	0.0



Wood Buffalo Environmental Association - Jackfish 2/3 (AMS27)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
					Objective		Objective	0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	708	0.9	12.4	0	2.1	0	100.0	0.0	0.0	0.0	0.0
February	100	637	1.2	8.7	0	2.4	0	100.0	0.0	0.0	0.0	0.0
March	100	705	0.7	8.4	0	1.7	0	100.0	0.0	0.0	0.0	0.0
April	100	683	0.7	9.2	0	1.8	0	100.0	0.0	0.0	0.0	0.0
May	100	709	0.6	7.8	0	1.2	0	100.0	0.0	0.0	0.0	0.0
June	100	686	0.7	8.3	0	1.6	0	100.0	0.0	0.0	0.0	0.0
July	100	708	0.6	6.0	0	1.7	0	100.0	0.0	0.0	0.0	0.0
August	100	710	0.6	5.6	0	1.5	0	100.0	0.0	0.0	0.0	0.0
September	100	687	0.4	5.6	0	1.4	0	100.0	0.0	0.0	0.0	0.0
October	100	709	0.4	5.9	0	1.3	0	100.0	0.0	0.0	0.0	0.0
November	100	684	0.5	5.6	0	0.9	0	100.0	0.0	0.0	0.0	0.0
December	100	706	1.0	9.5	0	2.8	0	100.0	0.0	0.0	0.0	0.0
Annual	100	8332	0.7	12.4	0	2.8	0	100.0	0.0	0.0	0.0	0.0



**Wood Buffalo Environmental Association - Surmont 2 (AMS29)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average**

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding	Maximum 24-Hour Value	Number of Values Exceeding	% of Data in Each Concentration Range				
					1-Hour Objective		24-Hour Objective	0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	707	0.6	9.5	0	2.4	0	100.0	0.0	0.0	0.0	0.0
February	100	638	0.8	9.1	0	2.2	0	100.0	0.0	0.0	0.0	0.0
March	100	709	0.5	7.3	0	1.9	0	100.0	0.0	0.0	0.0	0.0
April	100	685	0.3	4.5	0	1.0	0	100.0	0.0	0.0	0.0	0.0
May	99	699	0.2	3.5	0	0.6	0	100.0	0.0	0.0	0.0	0.0
June	100	686	0.3	3.2	0	0.9	0	100.0	0.0	0.0	0.0	0.0
July	100	708	0.3	3.2	0	1.4	0	100.0	0.0	0.0	0.0	0.0
August	100	709	0.3	3.6	0	1.1	0	100.0	0.0	0.0	0.0	0.0
September	100	686	0.3	5.6	0	1.5	0	100.0	0.0	0.0	0.0	0.0
October	100	706	0.3	18.9	0	2.3	0	100.0	0.0	0.0	0.0	0.0
November	100	684	0.3	5.2	0	1.6	0	100.0	0.0	0.0	0.0	0.0
December	100	709	0.6	10.2	0	2.6	0	100.0	0.0	0.0	0.0	0.0
Annual	100	8326	0.4	18.9	0	2.6	0	100.0	0.0	0.0	0.0	0.0



**Wood Buffalo Environmental Association - Ells River (AMS30)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average**

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	707	1.2	21.4	0	6.2	0	99.9	0.1	0.0	0.0	0.0
February	100	636	0.7	20.1	0	5.3	0	100.0	0.0	0.0	0.0	0.0
March	98	694	0.9	34.4	0	5.5	0	99.4	0.6	0.0	0.0	0.0
April	100	685	0.9	26.8	0	3.8	0	99.7	0.3	0.0	0.0	0.0
May	99	694	1.1	35.9	0	6.3	0	99.4	0.6	0.0	0.0	0.0
June	100	687	0.4	17.0	0	2.7	0	100.0	0.0	0.0	0.0	0.0
July	100	709	0.9	37.2	0	6.9	0	99.6	0.4	0.0	0.0	0.0
August	100	708	0.4	25.7	0	3.8	0	99.9	0.1	0.0	0.0	0.0
September	100	687	0.6	20.2	0	3.7	0	100.0	0.0	0.0	0.0	0.0
October	100	708	0.7	20.4	0	4.1	0	100.0	0.0	0.0	0.0	0.0
November	100	687	0.5	21.0	0	2.8	0	99.9	0.2	0.0	0.0	0.0
December	100	710	0.2	14.2	0	3.2	0	100.0	0.0	0.0	0.0	0.0
Annual	100	8312	0.7	37.2	0	6.9	0	99.8	0.2	0.0	0.0	0.0



Wood Buffalo Environmental Association - Leismer (AMS501)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
October	99	705	0.6	17.9	0	3.7	0	100.0	0.0	0.0	0.0	0.0
November	100	685	0.7	18.2	0	4.4	0	100.0	0.0	0.0	0.0	0.0
December	100	710	2.0	30.4	0	6.6	0	99.2	0.9	0.0	0.0	0.0
Annual	100	2100	1.1	30.4	0	6.6	0	99.7	0.3	0.0	0.0	0.0



Wood Buffalo Environmental Association - Sawbones Bay (AMS505)

Annual Summary for the Year 2021

Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
July	100	710	1.7	27.6	0	8.0	0	98.9	1.1	0.0	0.0	0.0
August	99	704	1.1	36.1	0	4.3	0	99.9	0.1	0.0	0.0	0.0
September	100	685	1.7	24.8	0	6.9	0	99.3	0.7	0.0	0.0	0.0
October	100	710	1.6	40.3	0	8.1	0	98.7	1.3	0.0	0.0	0.0
November	100	687	1.7	37.4	0	12.2	0	98.4	1.6	0.0	0.0	0.0
December	98	692	1.9	24.3	0	8.5	0	98.7	1.3	0.0	0.0	0.0
Annual	99	4188	1.6	40.3	0	12.2	0	99.0	1.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Jackfish 1 (AMS506)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	707	1.9	72.8	0	13.6	0	98.2	1.6	0.3	0.0	0.0
February	100	639	2.3	37.7	0	12.0	0	98.4	1.6	0.0	0.0	0.0
March	99	700	1.2	37.1	0	5.6	0	99.4	0.6	0.0	0.0	0.0
April	100	684	1.4	31.5	0	7.7	0	99.6	0.4	0.0	0.0	0.0
May	100	709	0.7	18.1	0	4.1	0	100.0	0.0	0.0	0.0	0.0
June	100	687	1.8	27.5	0	7.6	0	99.9	0.2	0.0	0.0	0.0
July	100	708	1.2	19.6	0	5.4	0	100.0	0.0	0.0	0.0	0.0
August	100	710	1.1	24.4	0	7.7	0	99.4	0.6	0.0	0.0	0.0
Annual	100	5544	1.4	72.8	0	13.6	0	99.4	0.6	0.0	0.0	0.0



Wood Buffalo Environmental Association - Kirby South (AMS507)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
July	100	702	0.8	17.8	0	3.6	0	100.0	0.0	0.0	0.0	0.0
August	100	708	0.6	17.3	0	2.9	0	100.0	0.0	0.0	0.0	0.0
September	97	663	1.1	27.5	0	10.4	0	99.4	0.6	0.0	0.0	0.0
October	100	707	0.8	19.1	0	5.4	0	100.0	0.0	0.0	0.0	0.0
November	100	683	0.9	25.2	0	4.1	0	99.6	0.4	0.0	0.0	0.0
December	100	707	1.2	18.1	0	3.8	0	100.0	0.0	0.0	0.0	0.0
Annual	100	4170	0.9	27.5	0	10.4	0	99.8	0.2	0.0	0.0	0.0



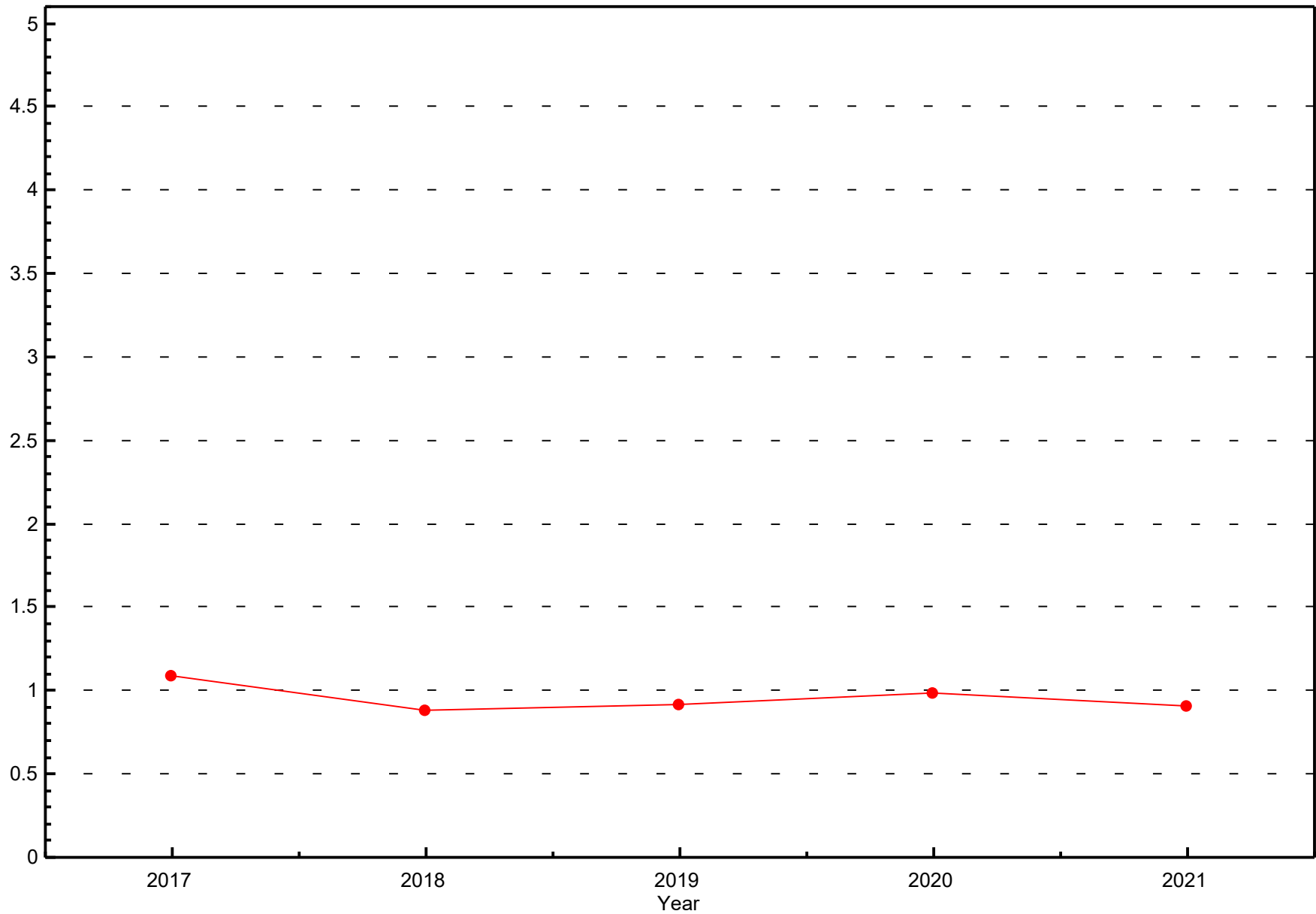
Wood Buffalo Environmental Association - Kirby North (AMS508)
Annual Summary for the Year 2021
Sulphur Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 20	21 - 60	61 - 110	111 - 170	171 - 340
January	100	707	0.8	12.2	0	2.1	0	100.0	0.0	0.0	0.0	0.0
February	100	638	0.9	12.9	0	2.2	0	100.0	0.0	0.0	0.0	0.0
March	100	705	0.5	5.6	0	1.5	0	100.0	0.0	0.0	0.0	0.0
April	100	683	0.7	13.3	0	3.3	0	100.0	0.0	0.0	0.0	0.0
May	100	706	0.4	9.2	0	1.5	0	100.0	0.0	0.0	0.0	0.0
June	100	654	0.7	9.7	0	3.3	0	100.0	0.0	0.0	0.0	0.0
Annual	100	4093	0.7	13.3	0	3.3	0	100.0	0.0	0.0	0.0	0.0



Yearly Averages

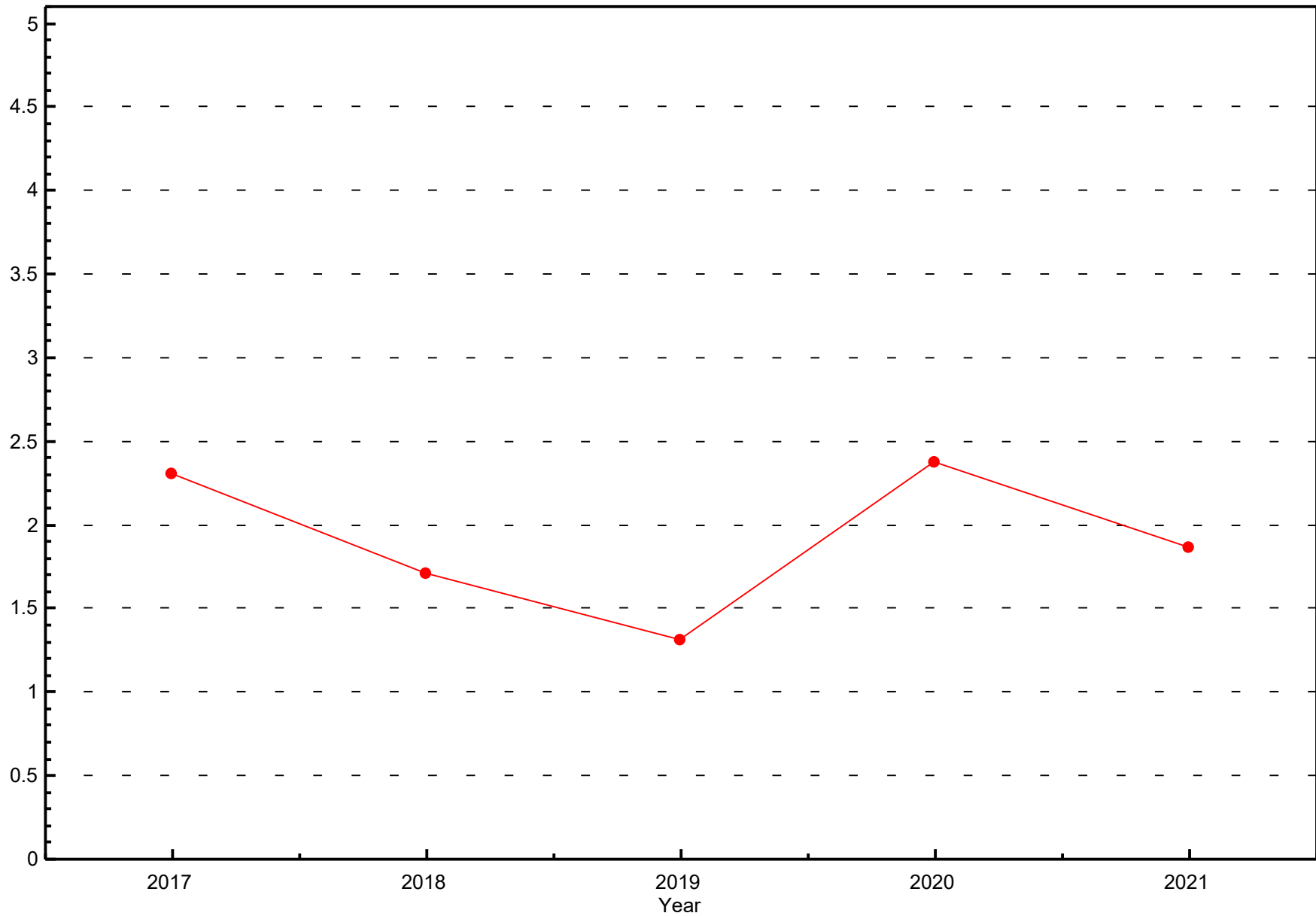
Sulphur Dioxide (SO₂) - ppb
Fort McKay - Bertha Ganter (2017 to 2021)





Yearly Averages

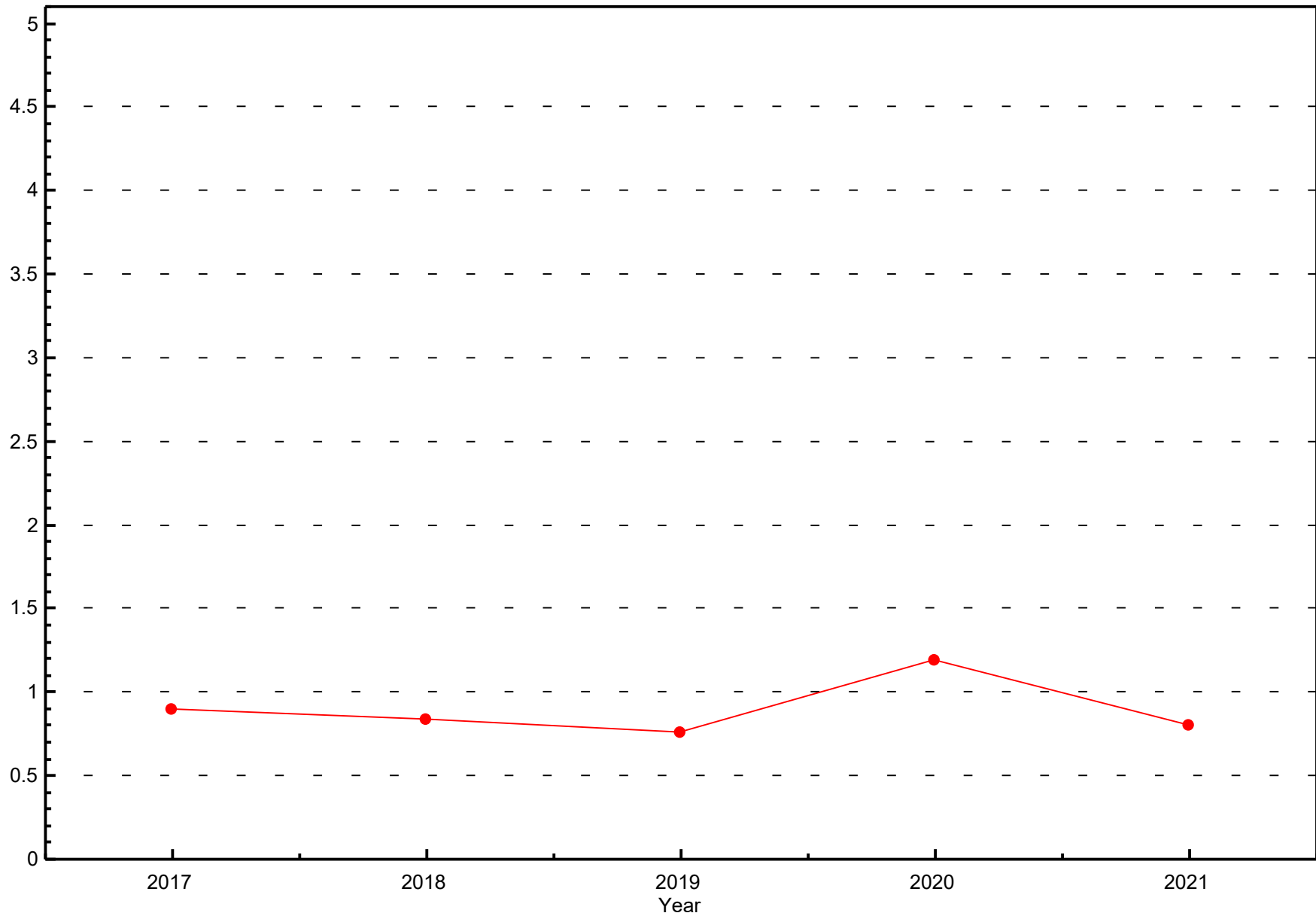
Sulphur Dioxide (SO₂) - ppb
Mildred Lake (2017 to 2021)





Yearly Averages

Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint (2017 to 2021)

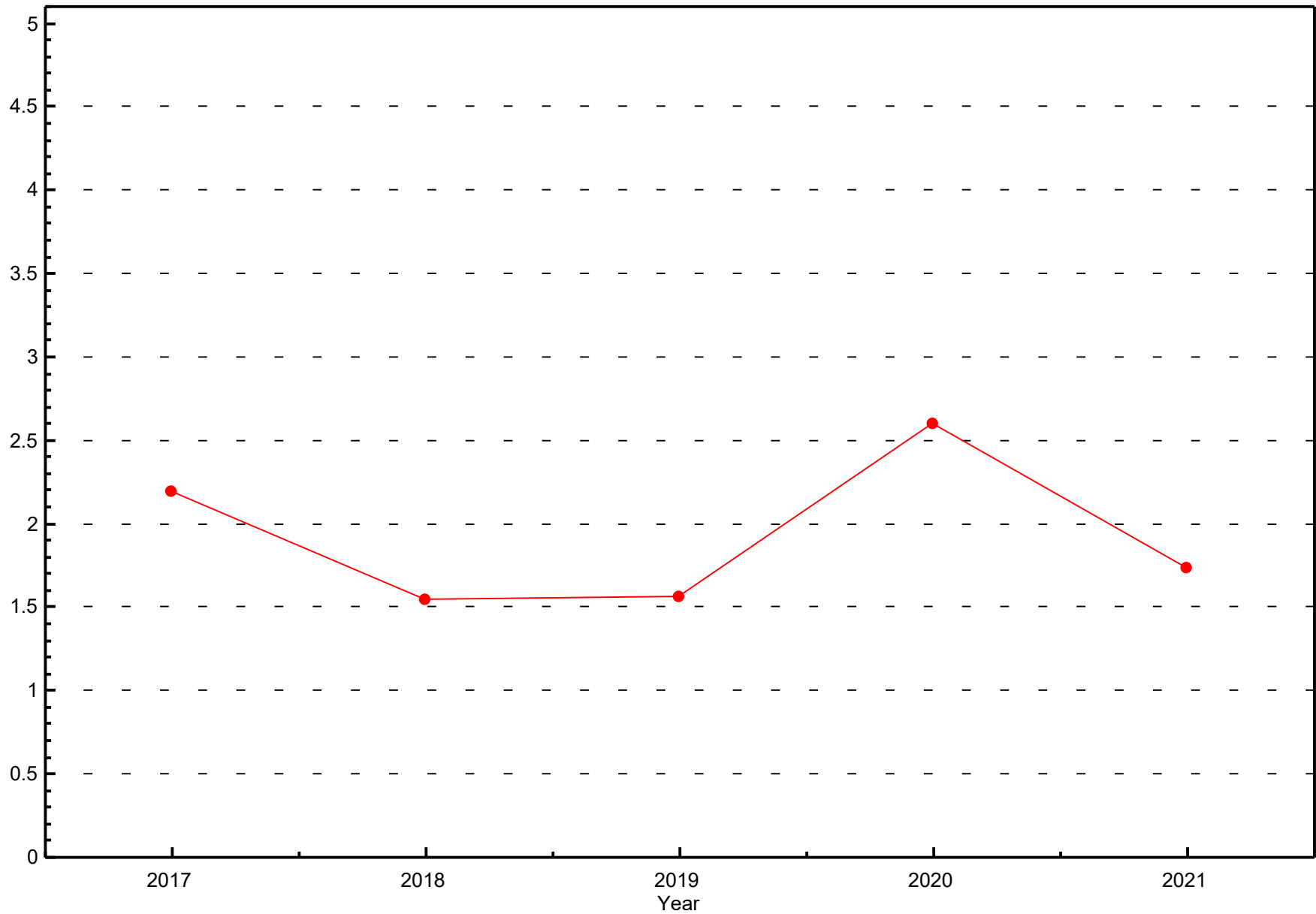




Yearly Averages

Sulphur Dioxide (SO₂) - ppb

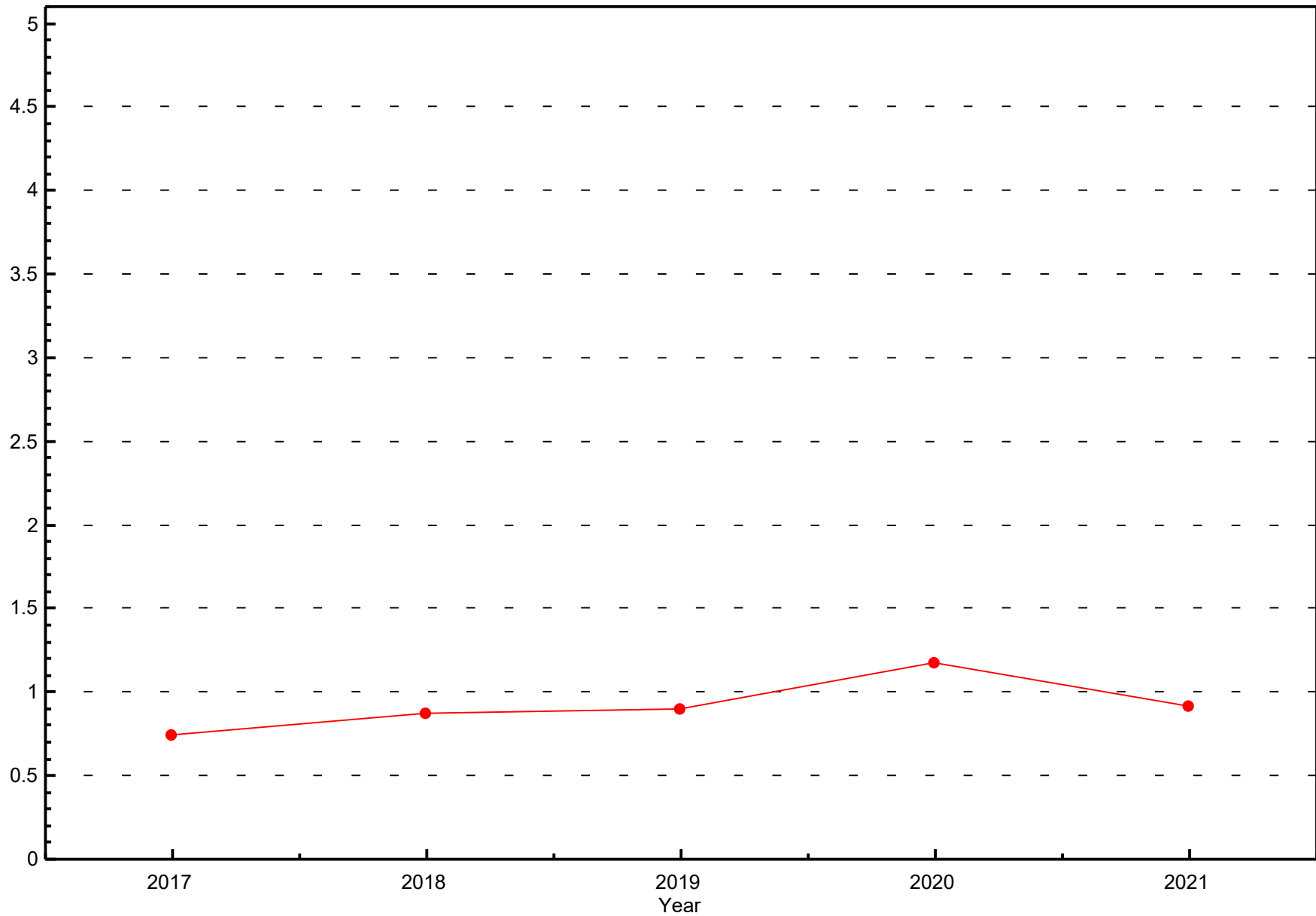
Mannix (2017 to 2021)





Yearly Averages

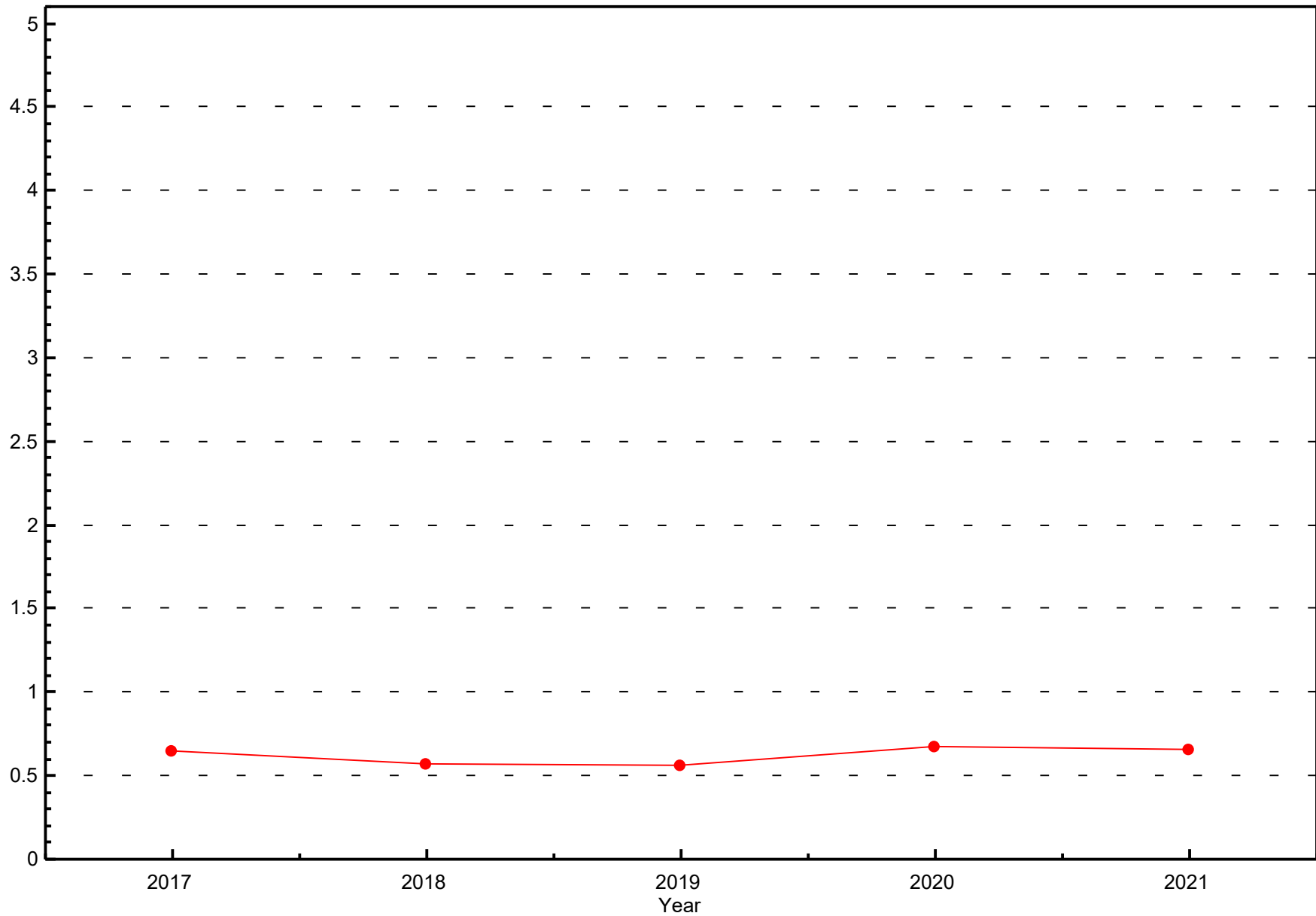
Sulphur Dioxide (SO₂) - ppb
Patricia McInnes (2017 to 2021)





Yearly Averages

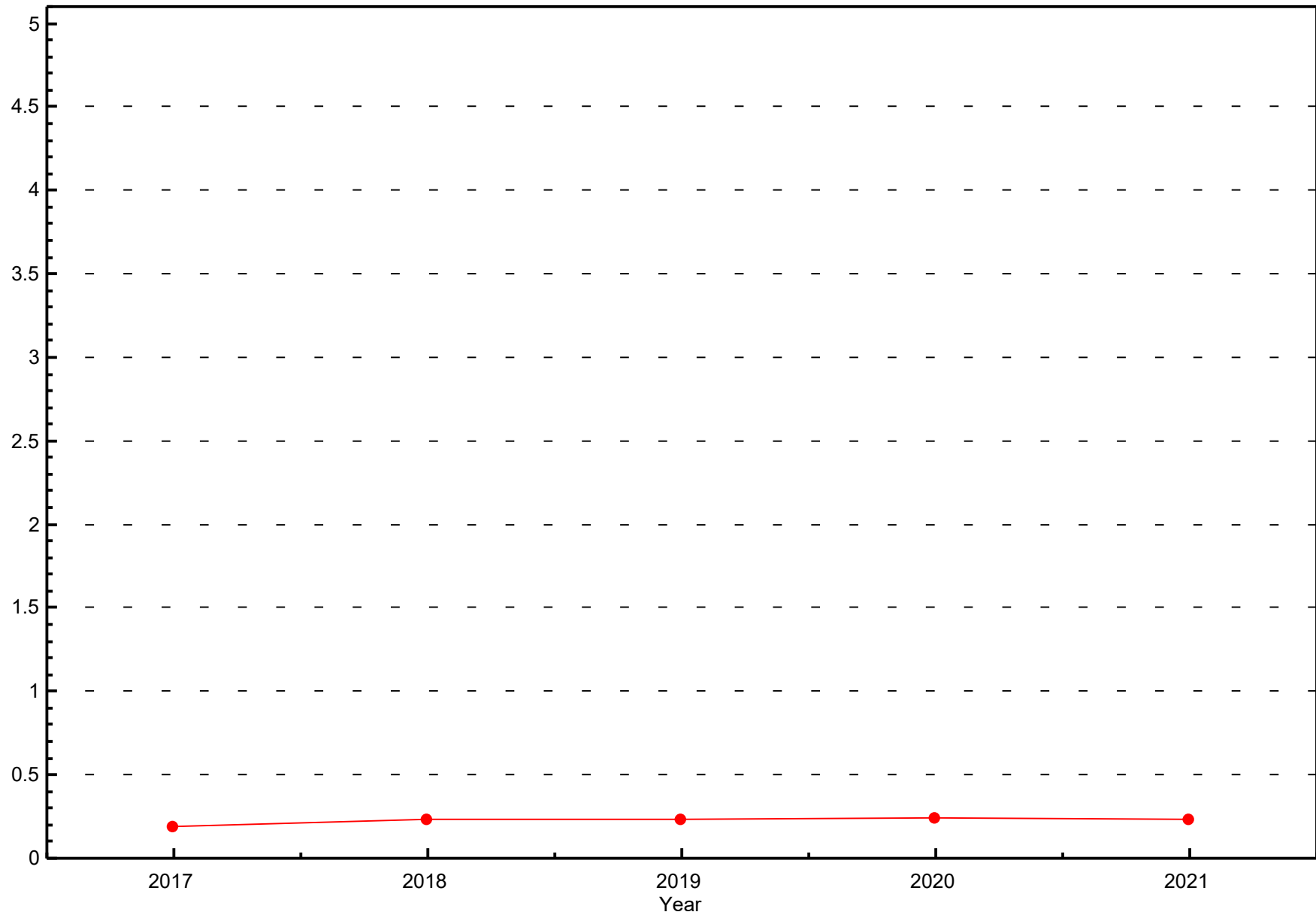
Sulphur Dioxide (SO₂) - ppb
Athabasca Valley (2017 to 2021)





Yearly Averages

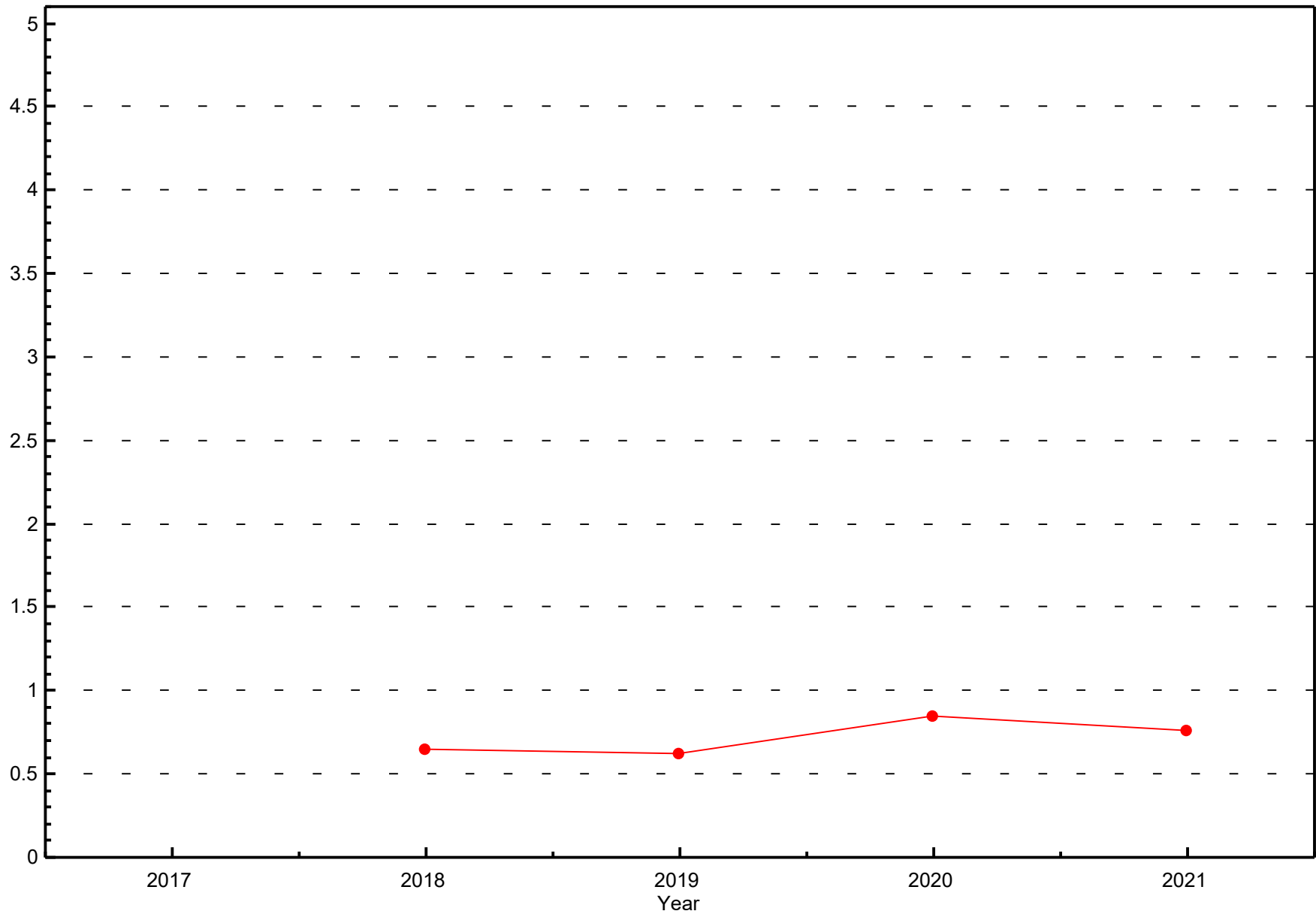
Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan (2017 to 2021)





Yearly Averages

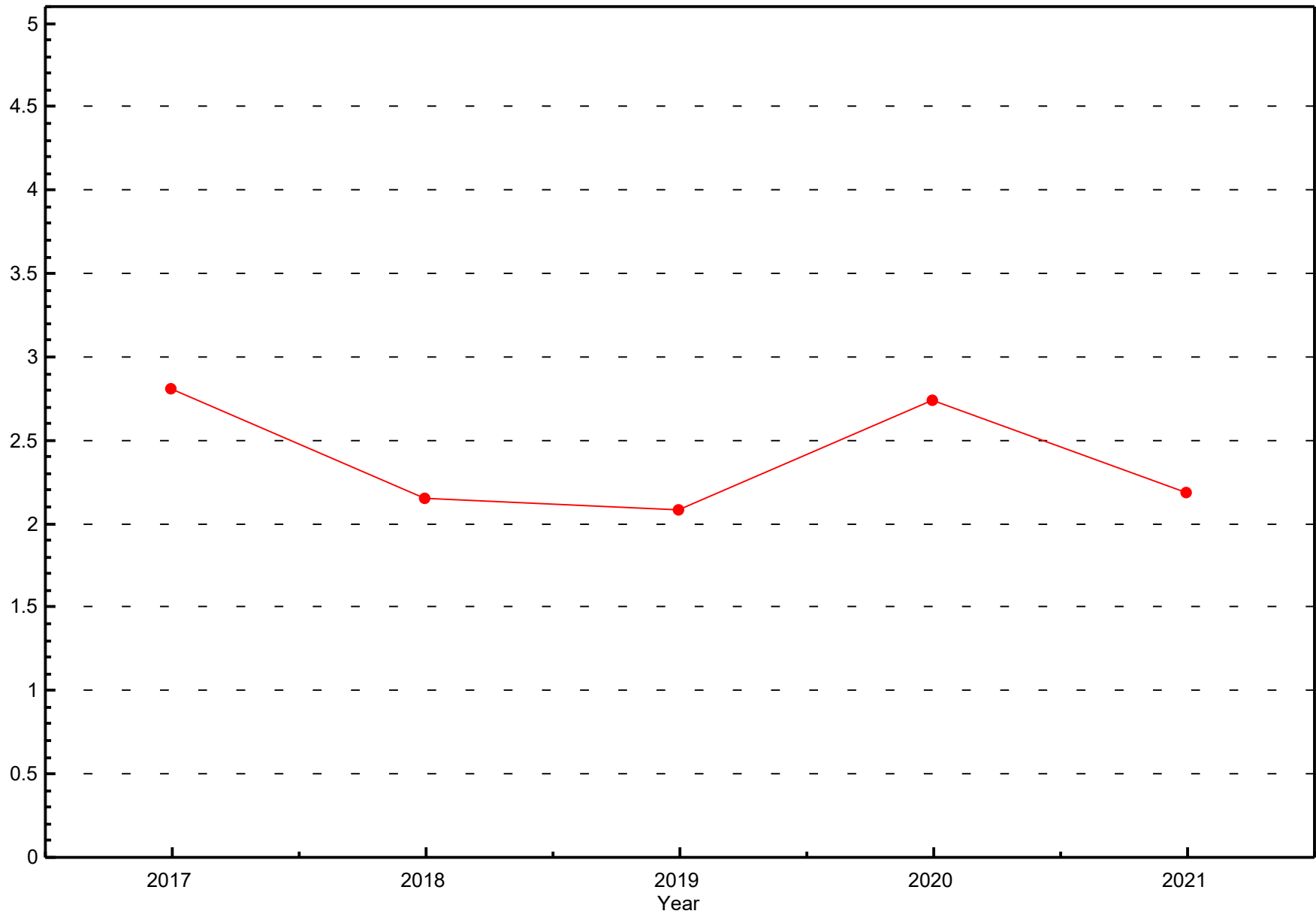
Sulphur Dioxide (SO₂) - ppb
Barge Landing (2017 to 2021)





Yearly Averages

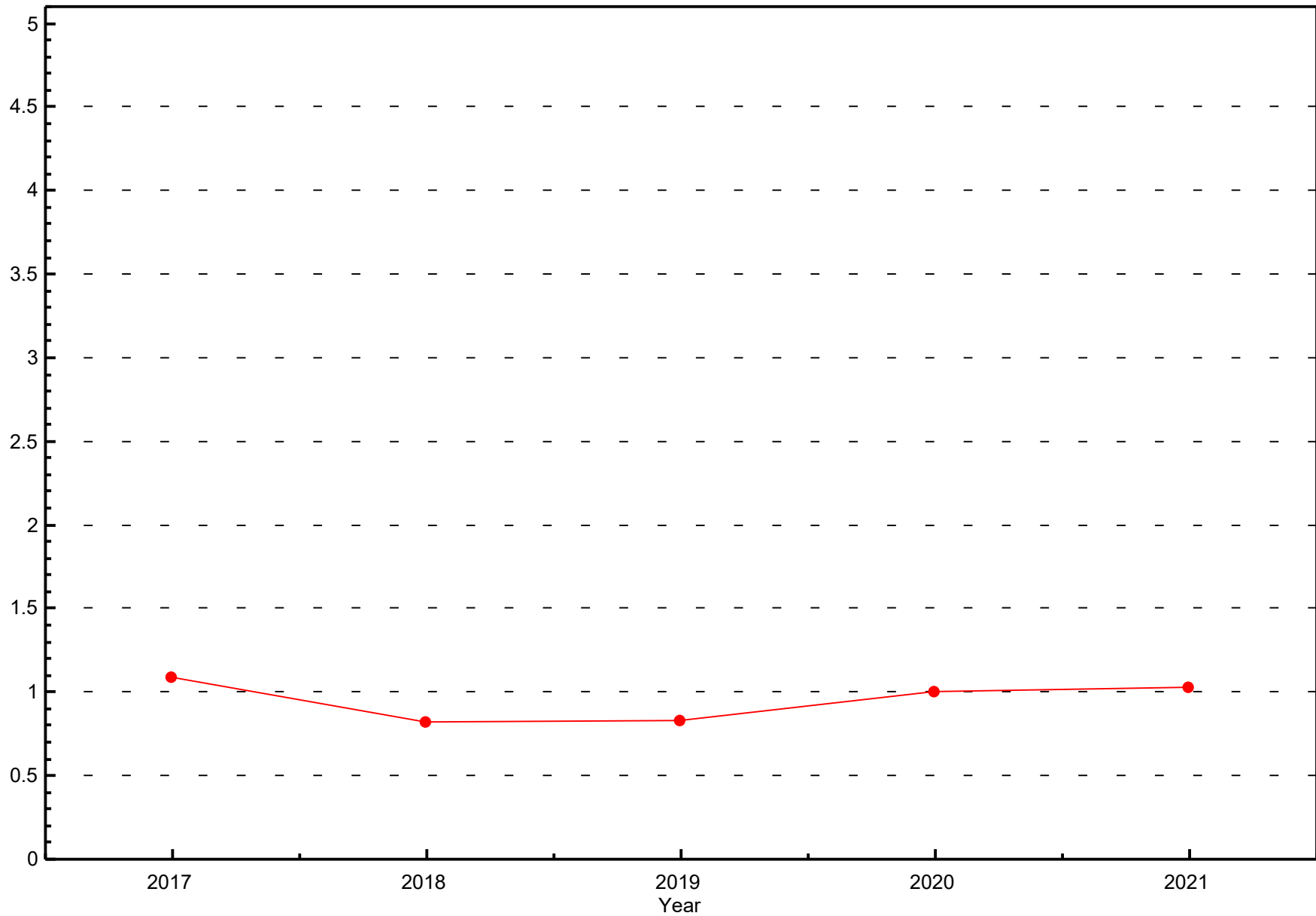
Sulphur Dioxide (SO₂) - ppb
Lower Camp (2017 to 2021)





Yearly Averages

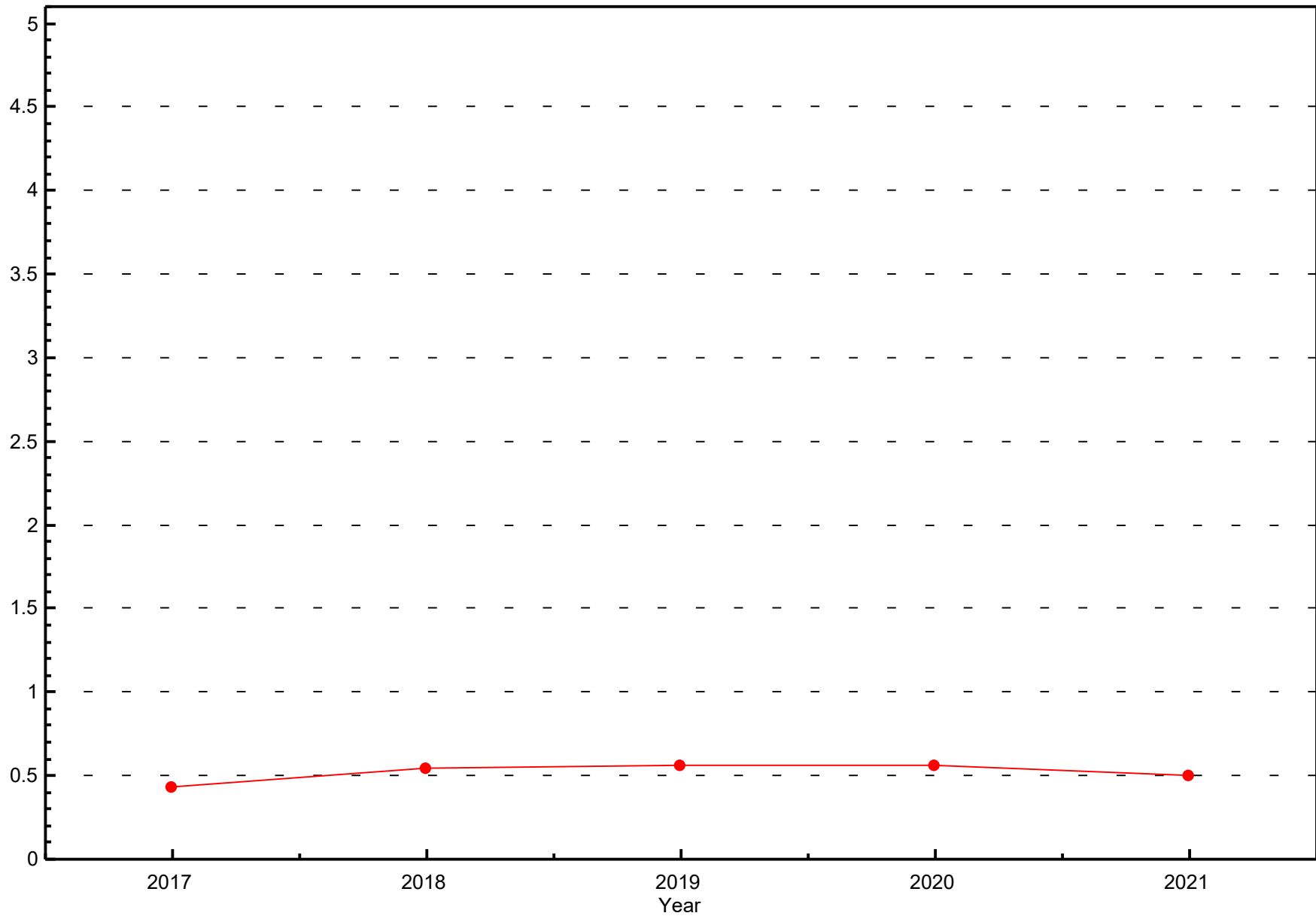
Sulphur Dioxide (SO₂) - ppb
Fort McKay South (2017 to 2021)





Yearly Averages

Sulphur Dioxide (SO₂) - ppb
Anzac (2017 to 2021)

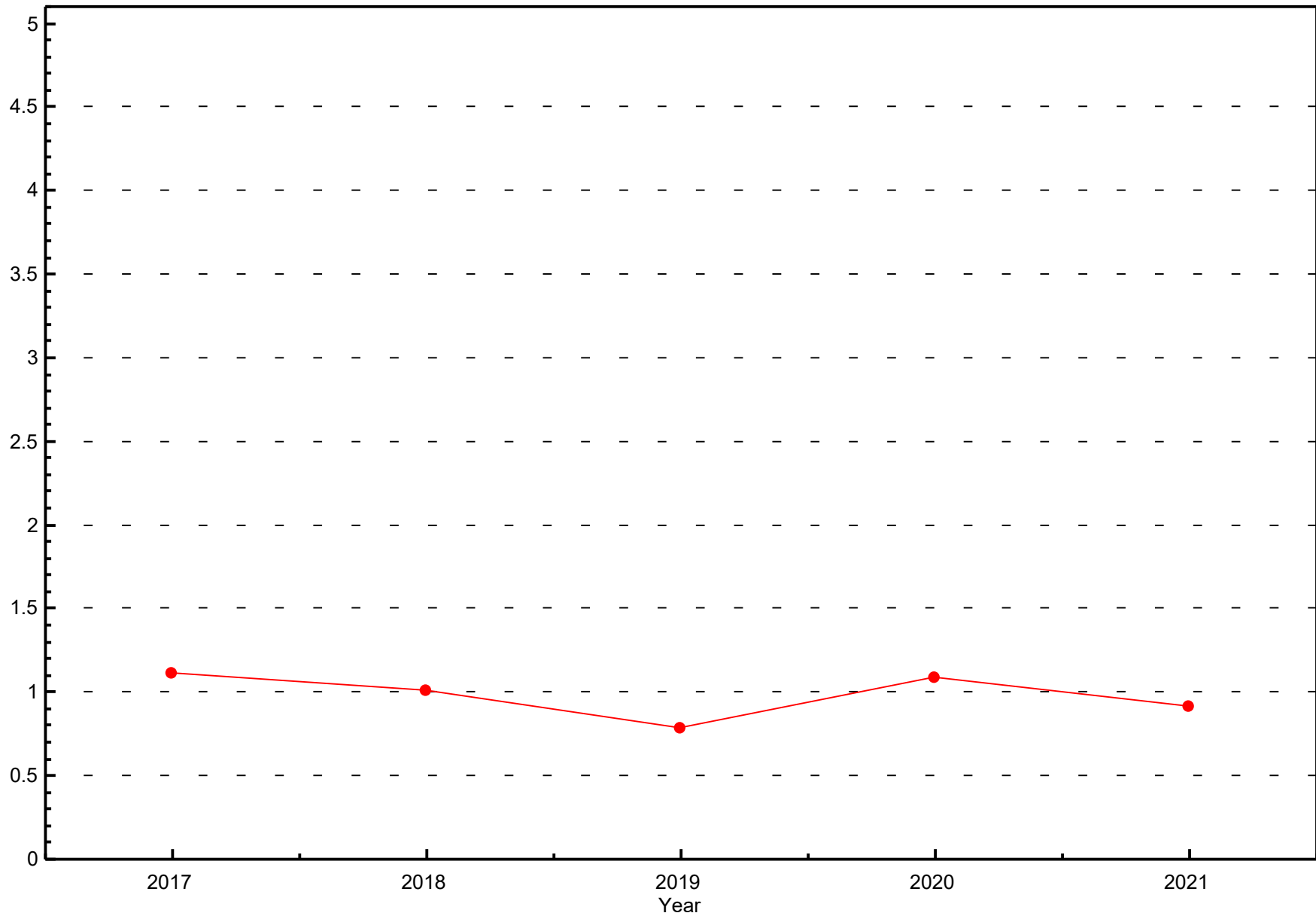




Yearly Averages

Sulphur Dioxide (SO₂) - ppb

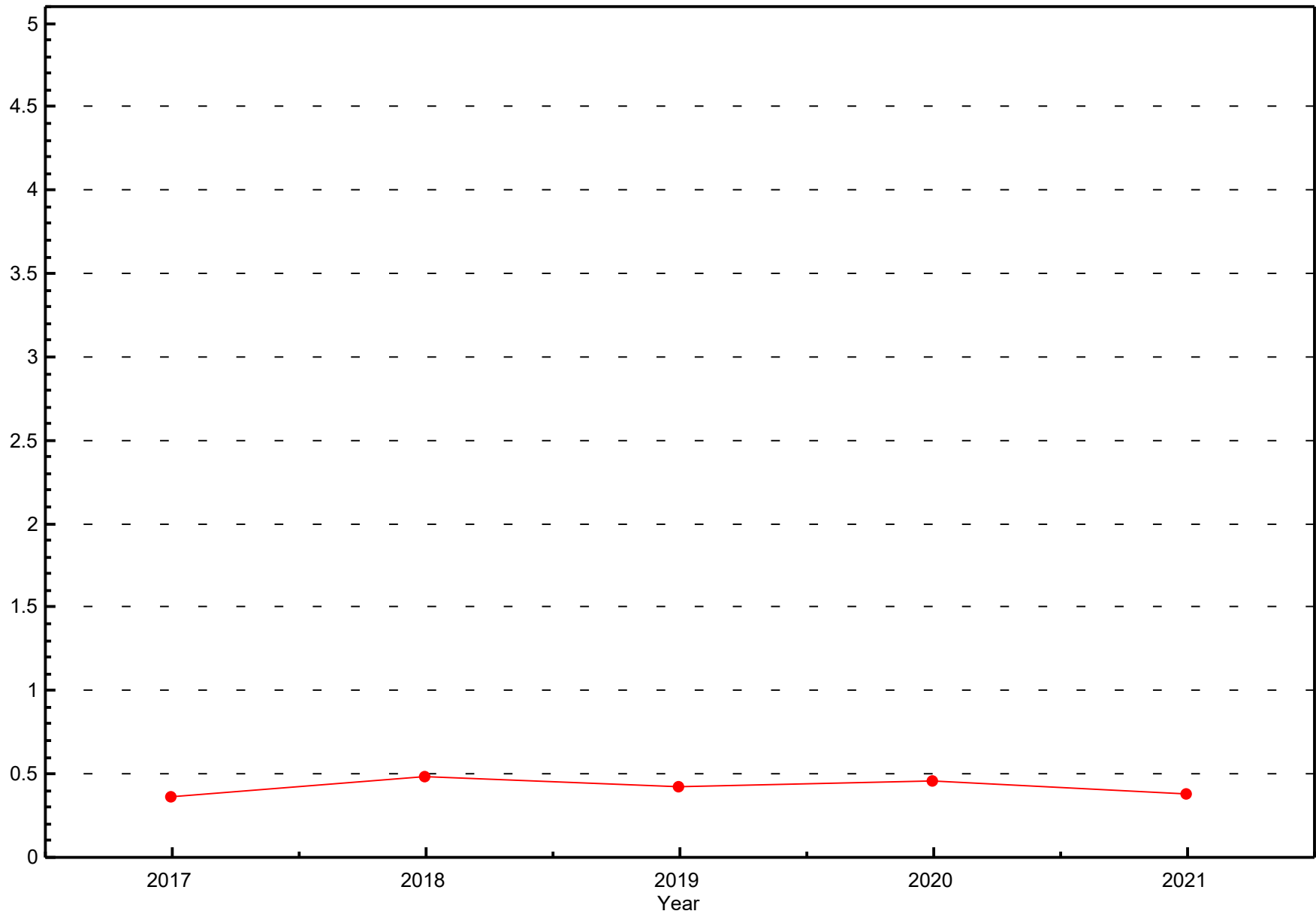
Wapasu (2017 to 2021)





Yearly Averages

Sulphur Dioxide (SO₂) - ppb
Stony Mountain (2017 to 2021)

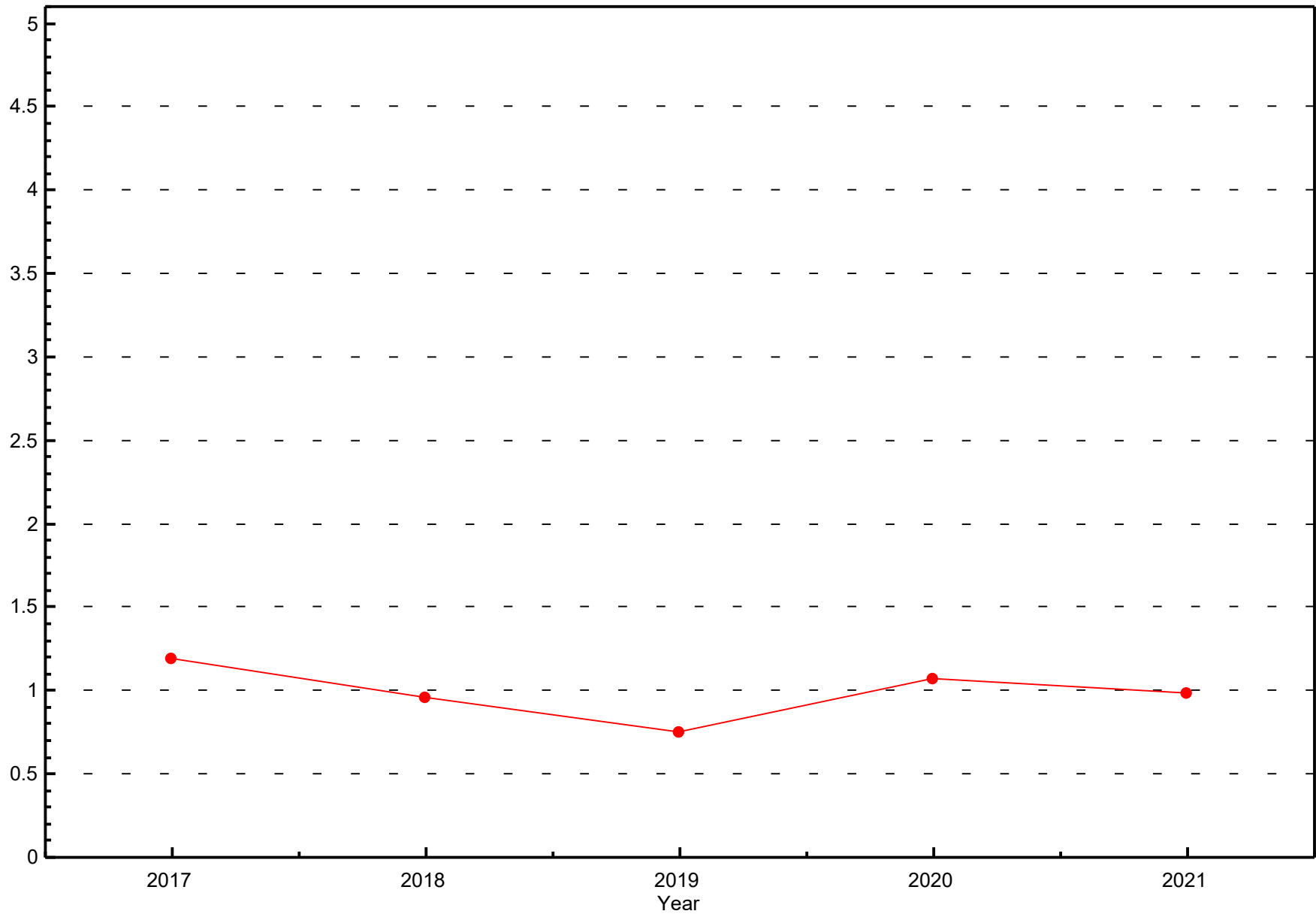




Yearly Averages

Sulphur Dioxide (SO₂) - ppb

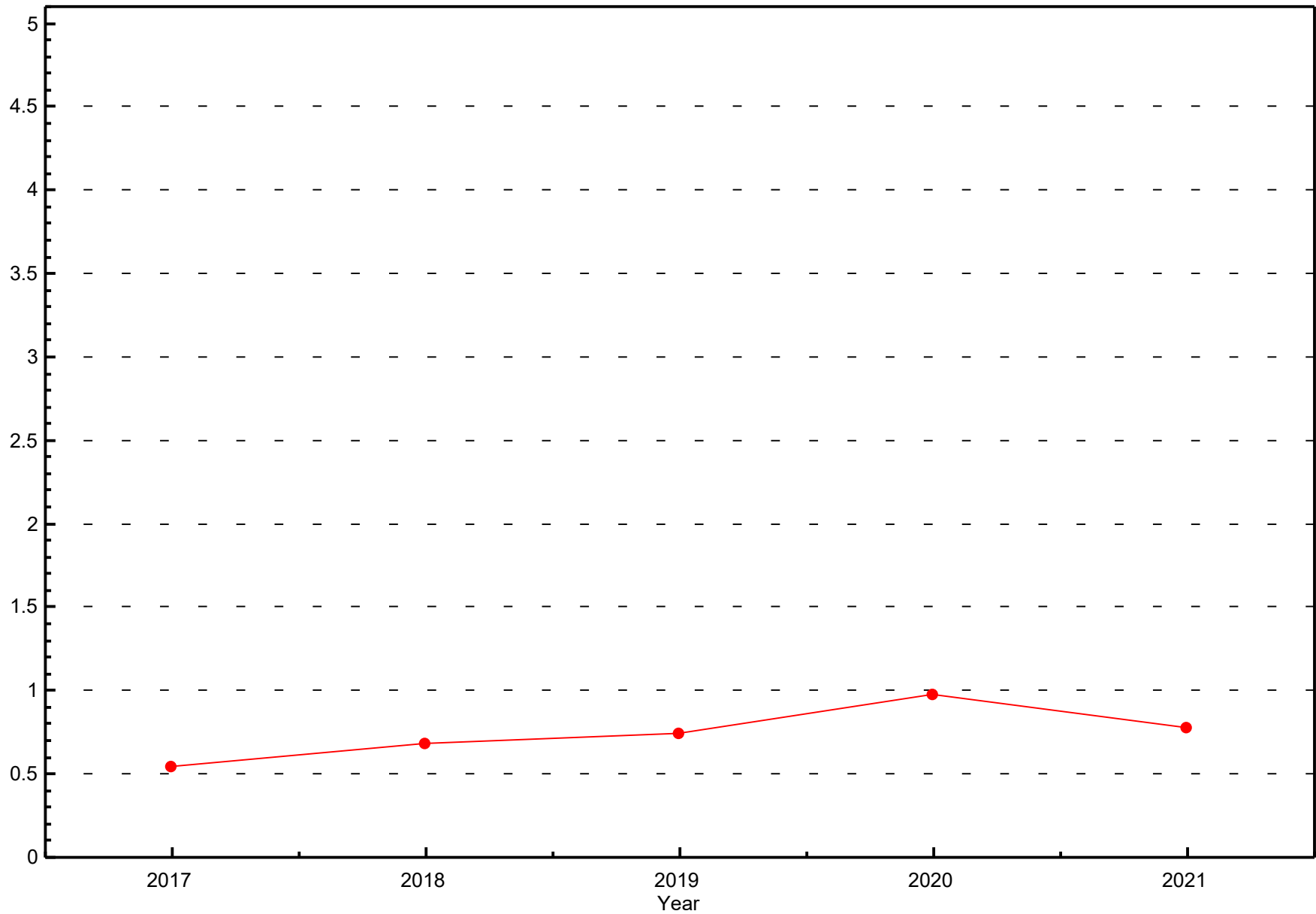
Firebag (2017 to 2021)





Yearly Averages

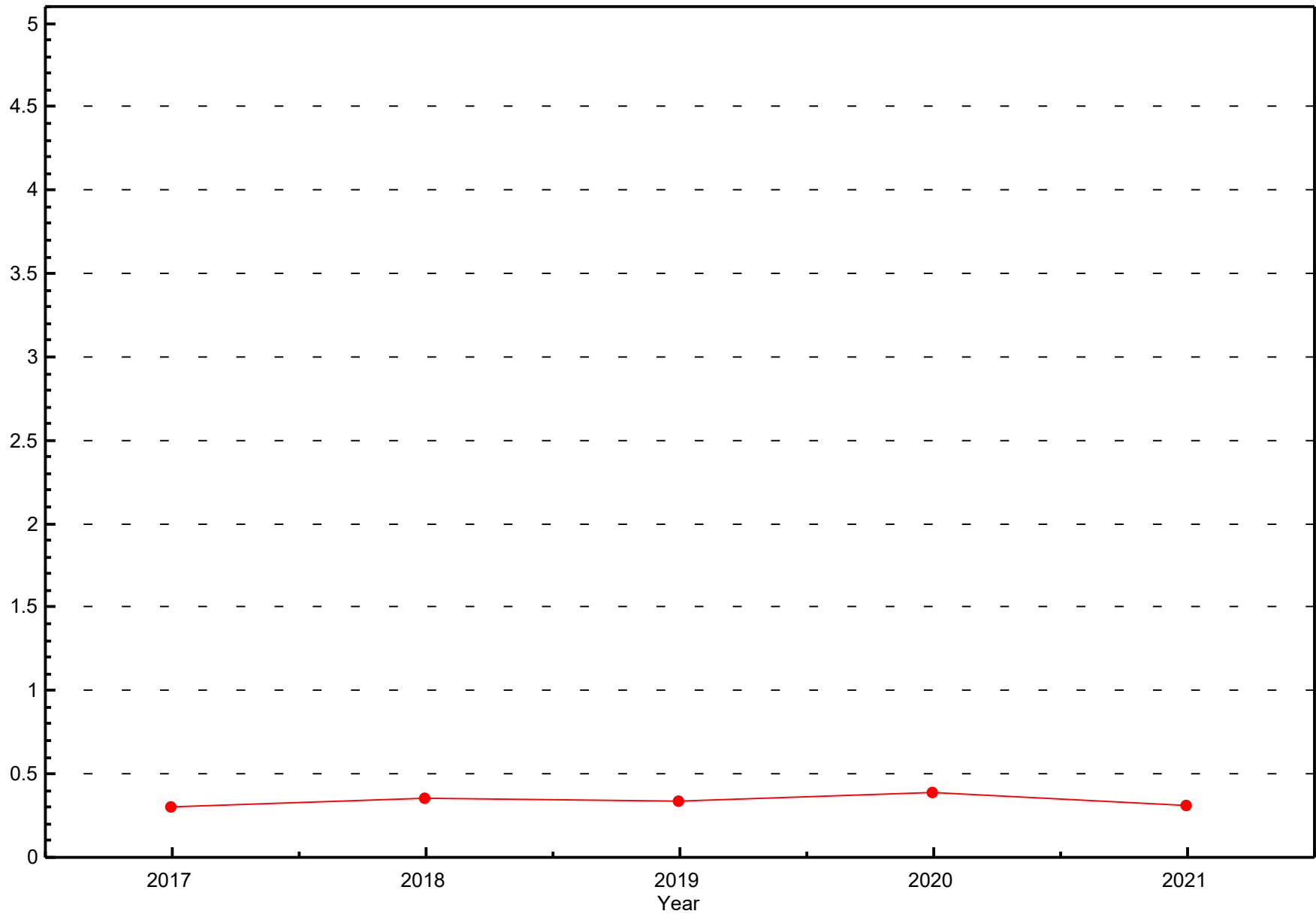
Sulphur Dioxide (SO₂) - ppb
Mackay River (2017 to 2021)





Yearly Averages

Sulphur Dioxide (SO₂) - ppb
Conklin (2017 to 2021)

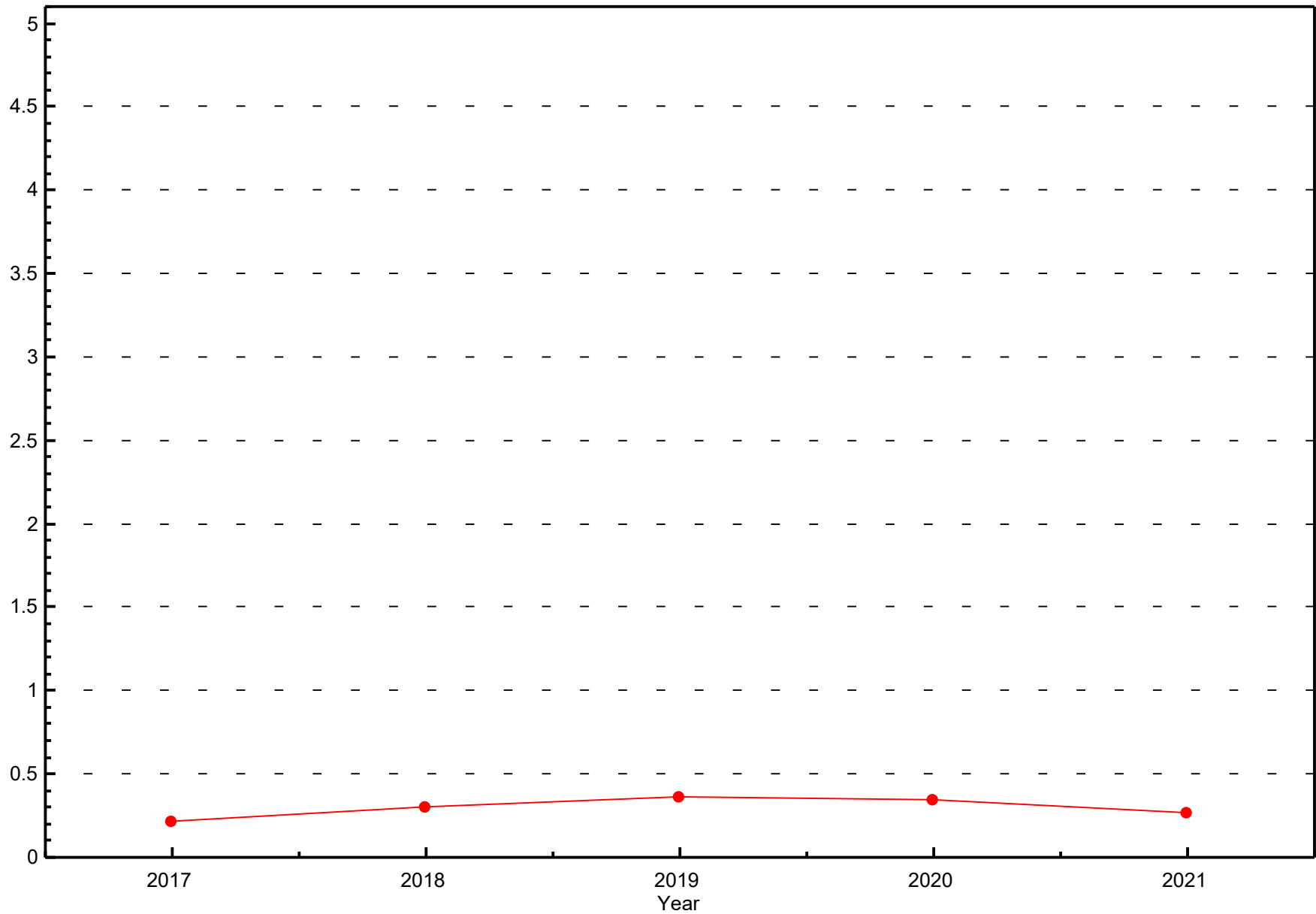




Yearly Averages

Sulphur Dioxide (SO₂) - ppb

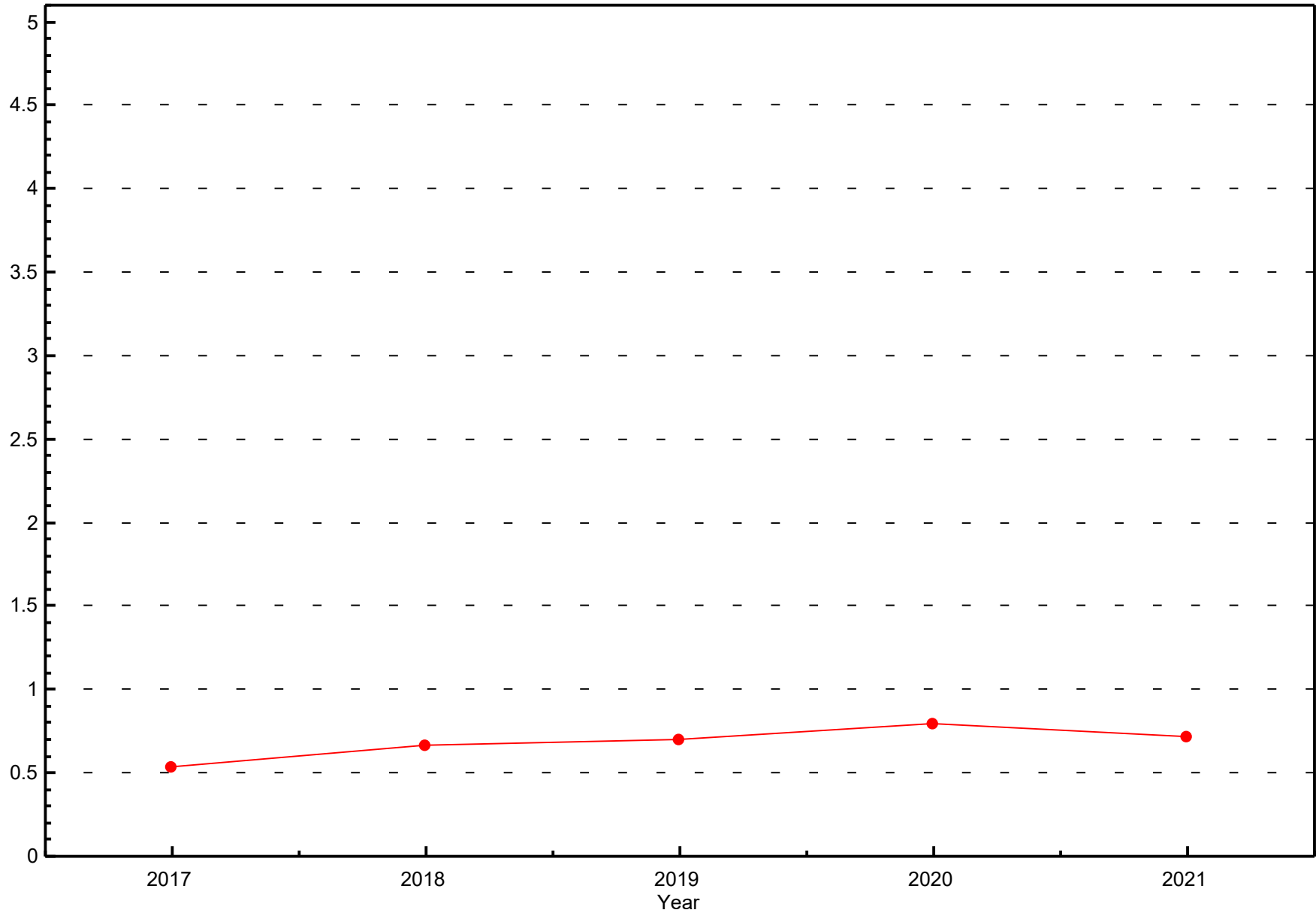
Janvier (2017 to 2021)





Yearly Averages

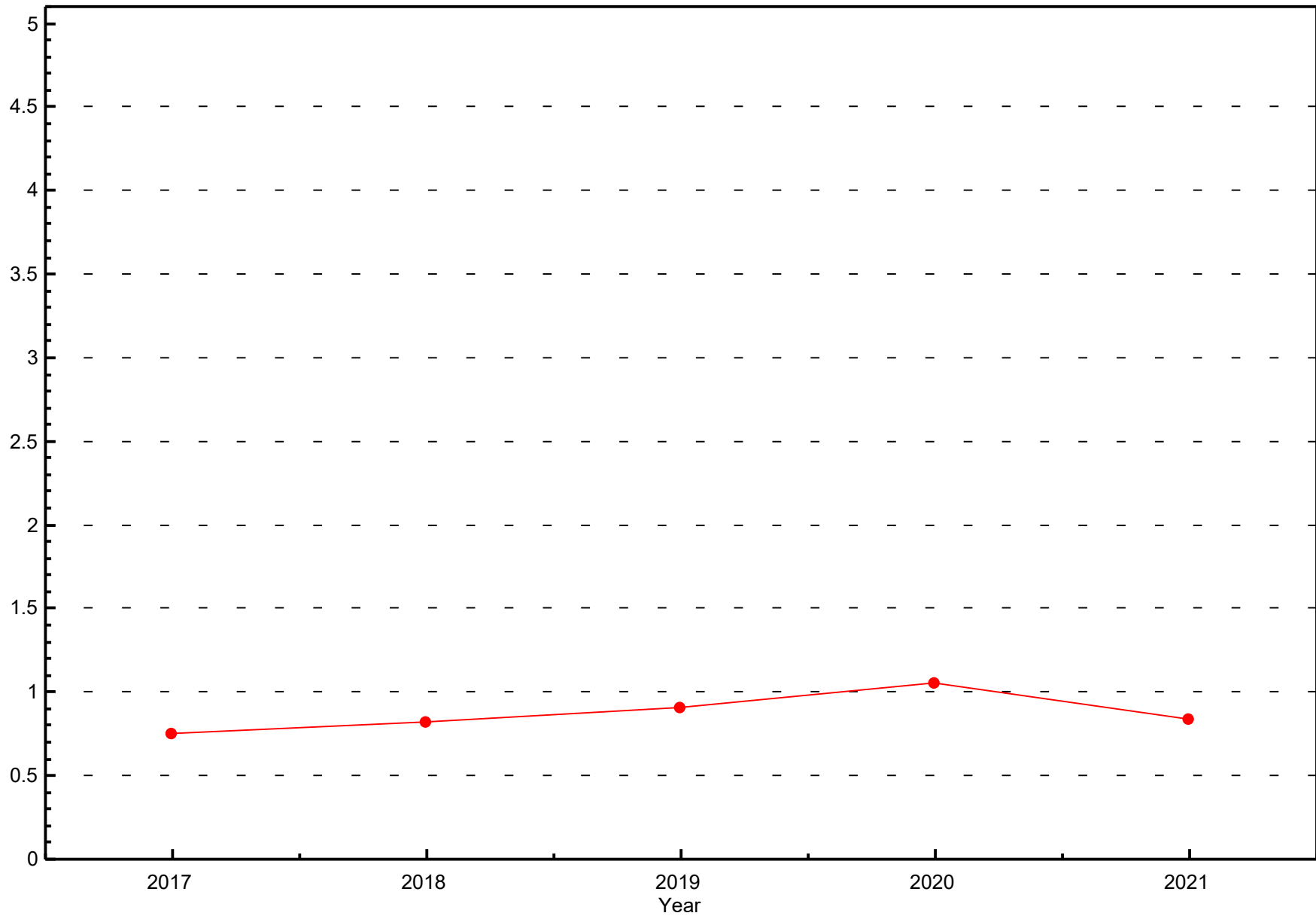
Sulphur Dioxide (SO₂) - ppb
Fort Hills (2017 to 2021)





Yearly Averages

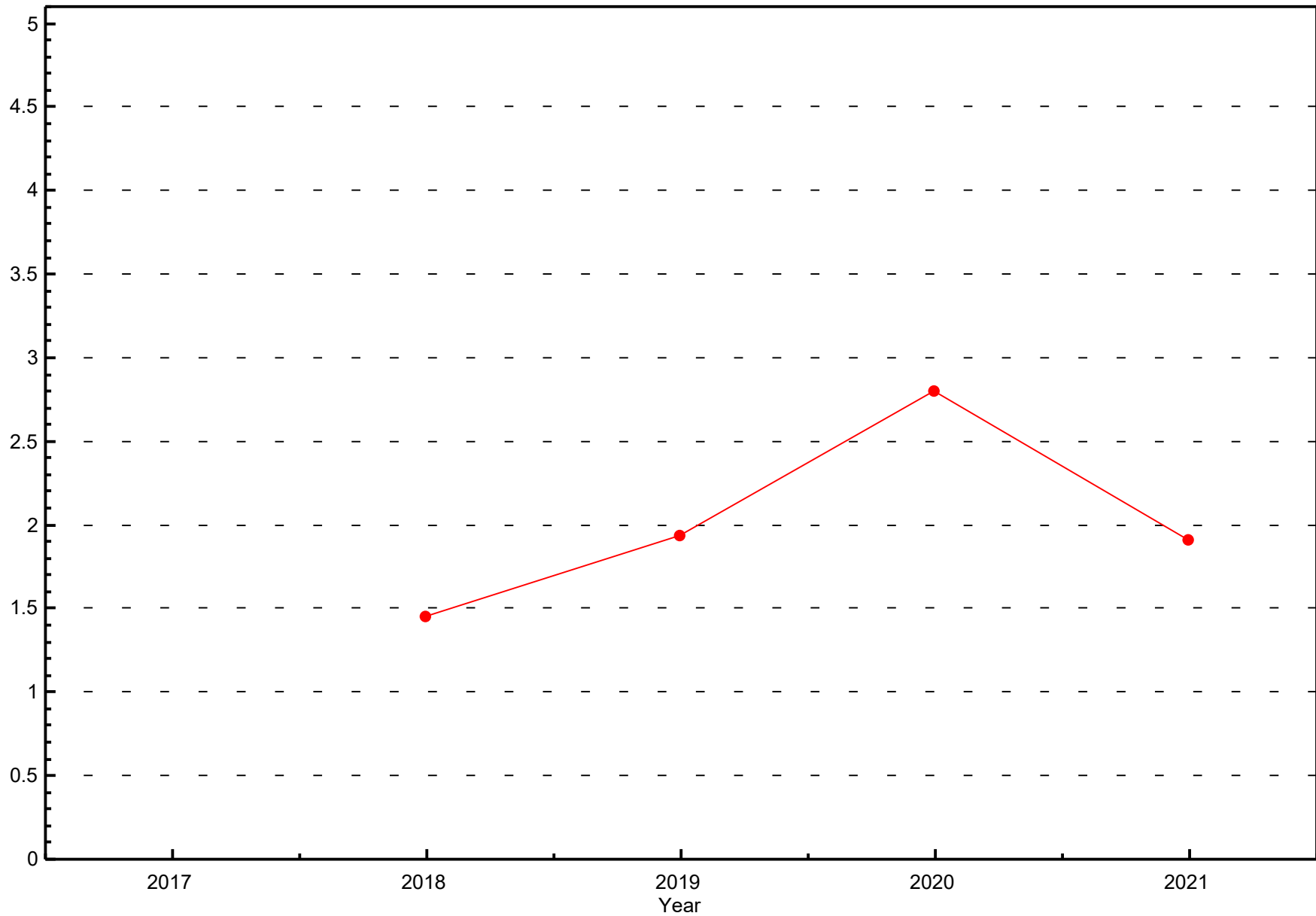
Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin (2017 to 2021)





Yearly Averages

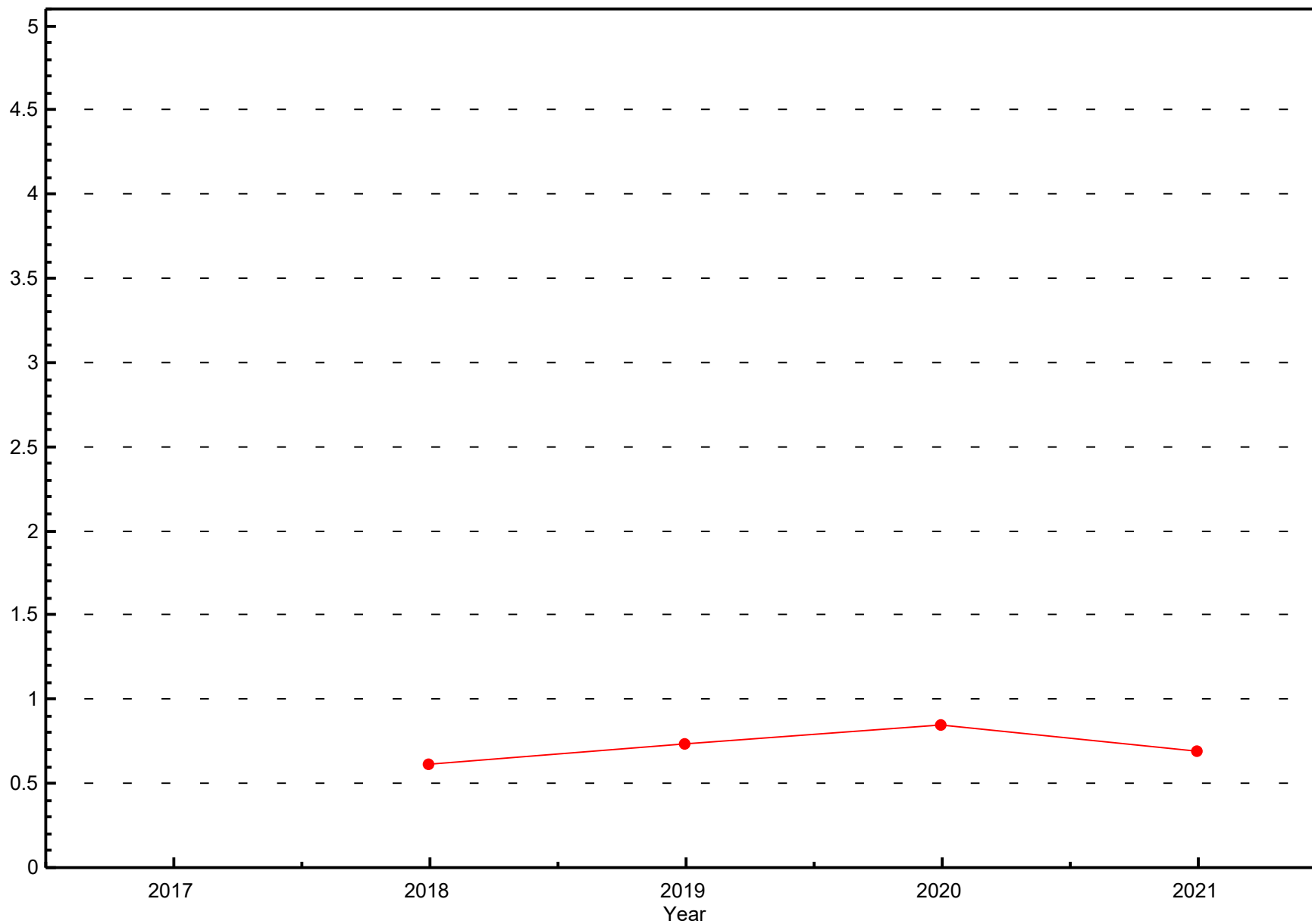
Sulphur Dioxide (SO₂) - ppb
Christina Lake (2017 to 2021)





Yearly Averages

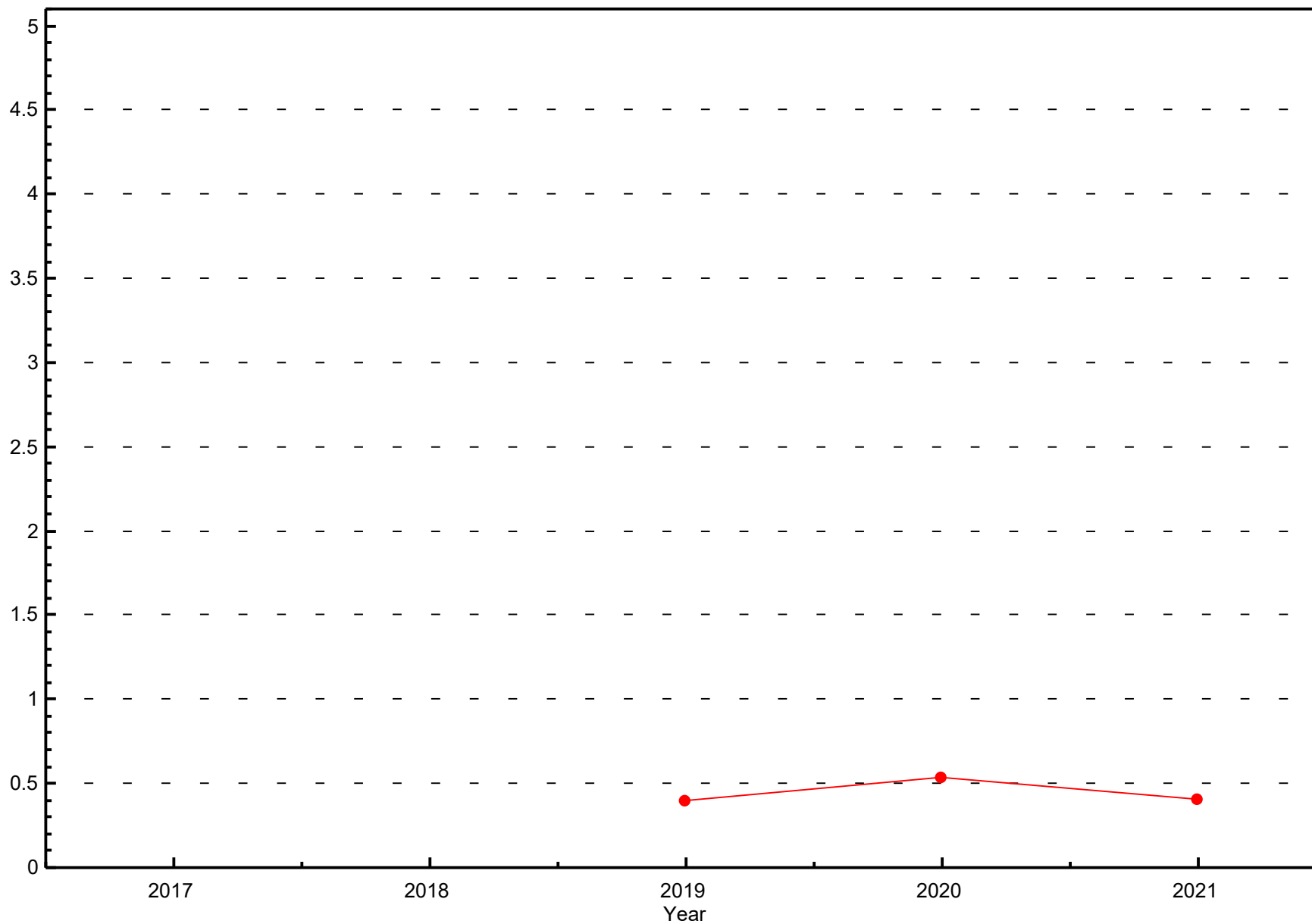
Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 (2017 to 2021)





Yearly Averages

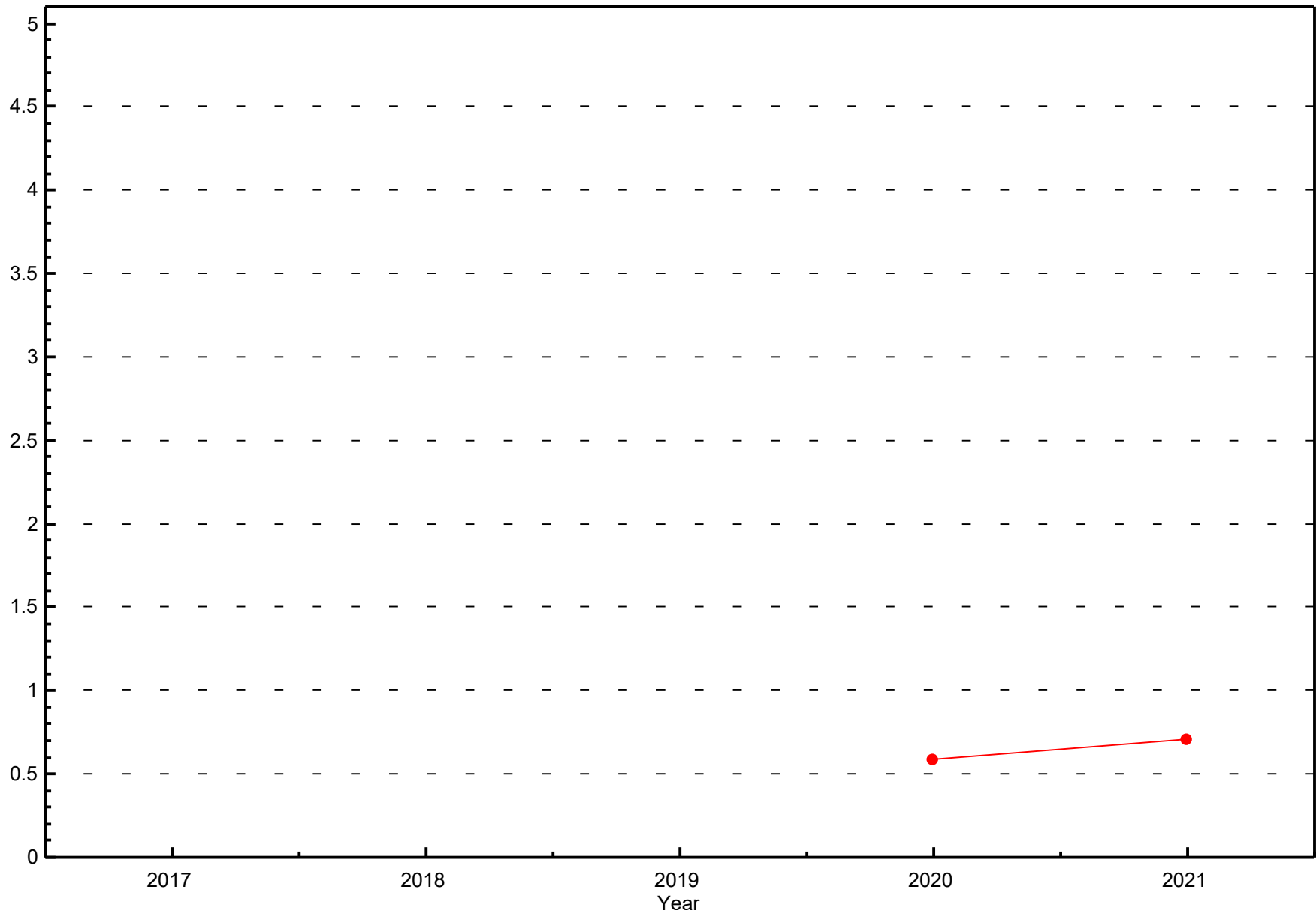
Sulphur Dioxide (SO₂) - ppb
Surmont 2 (2017 to 2021)





Yearly Averages

Sulphur Dioxide (SO₂) - ppb
Ells River (2017 to 2021)

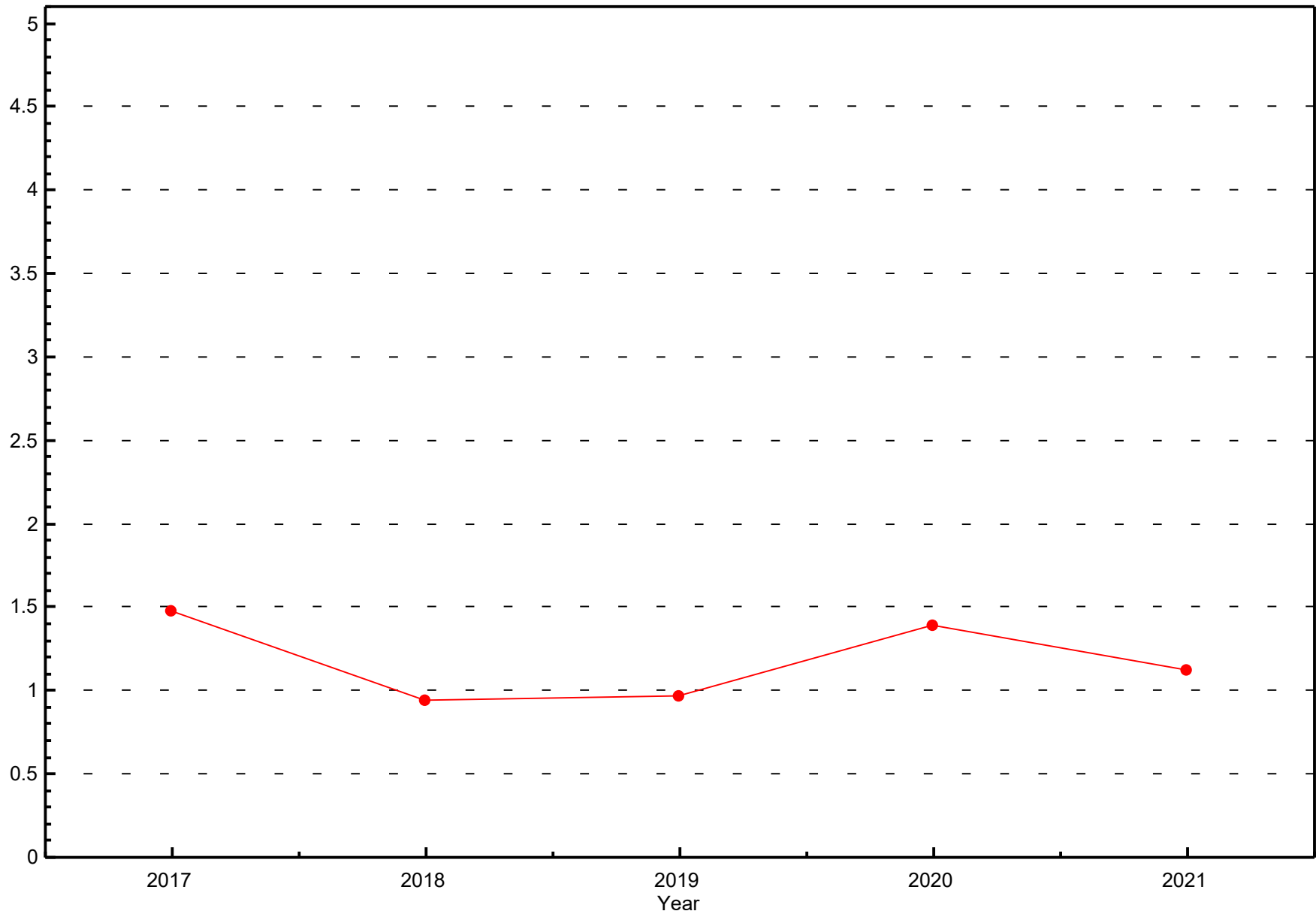




Yearly Averages

Sulphur Dioxide (SO₂) - ppb

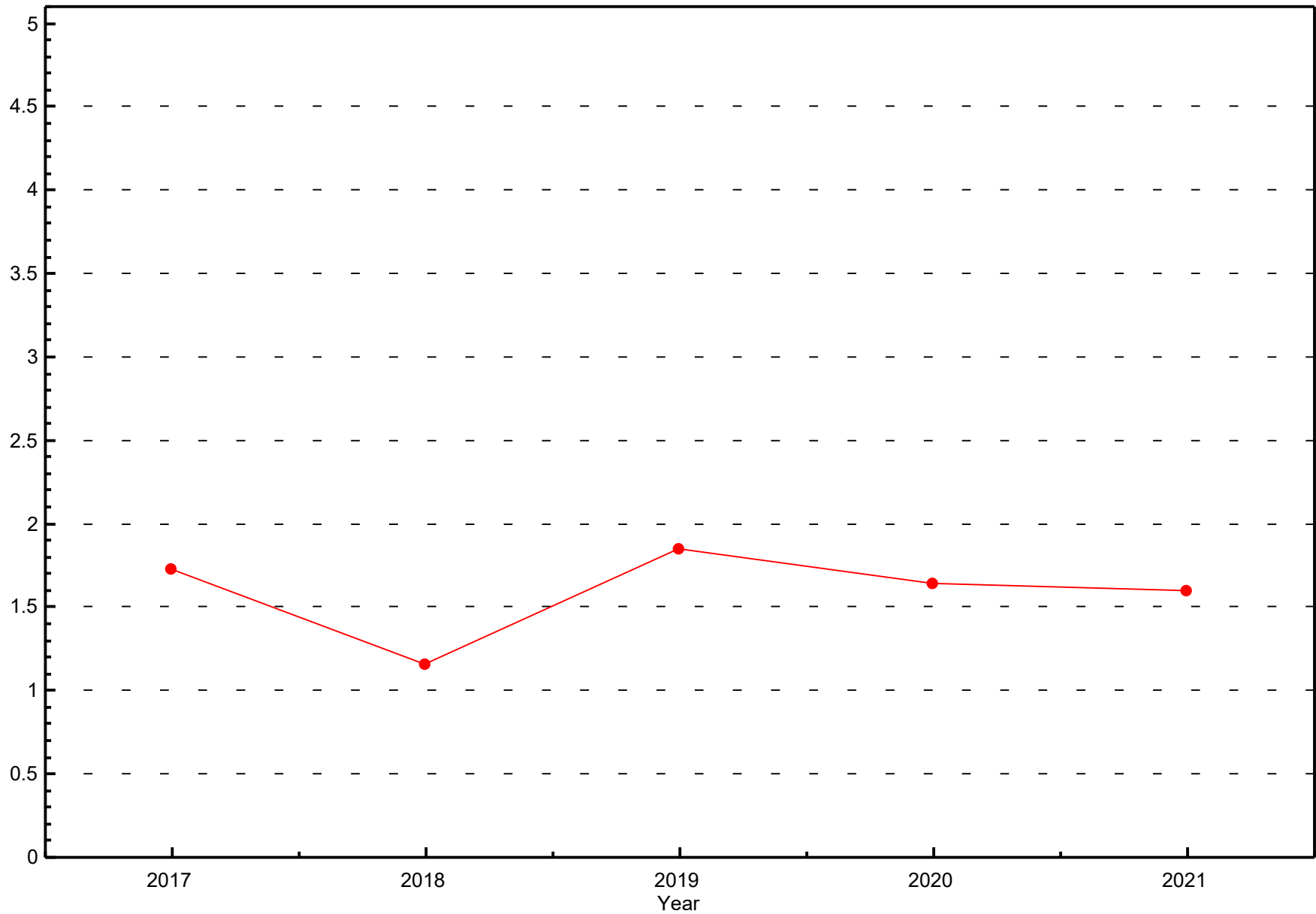
Leismer (2017 to 2021)





Yearly Averages

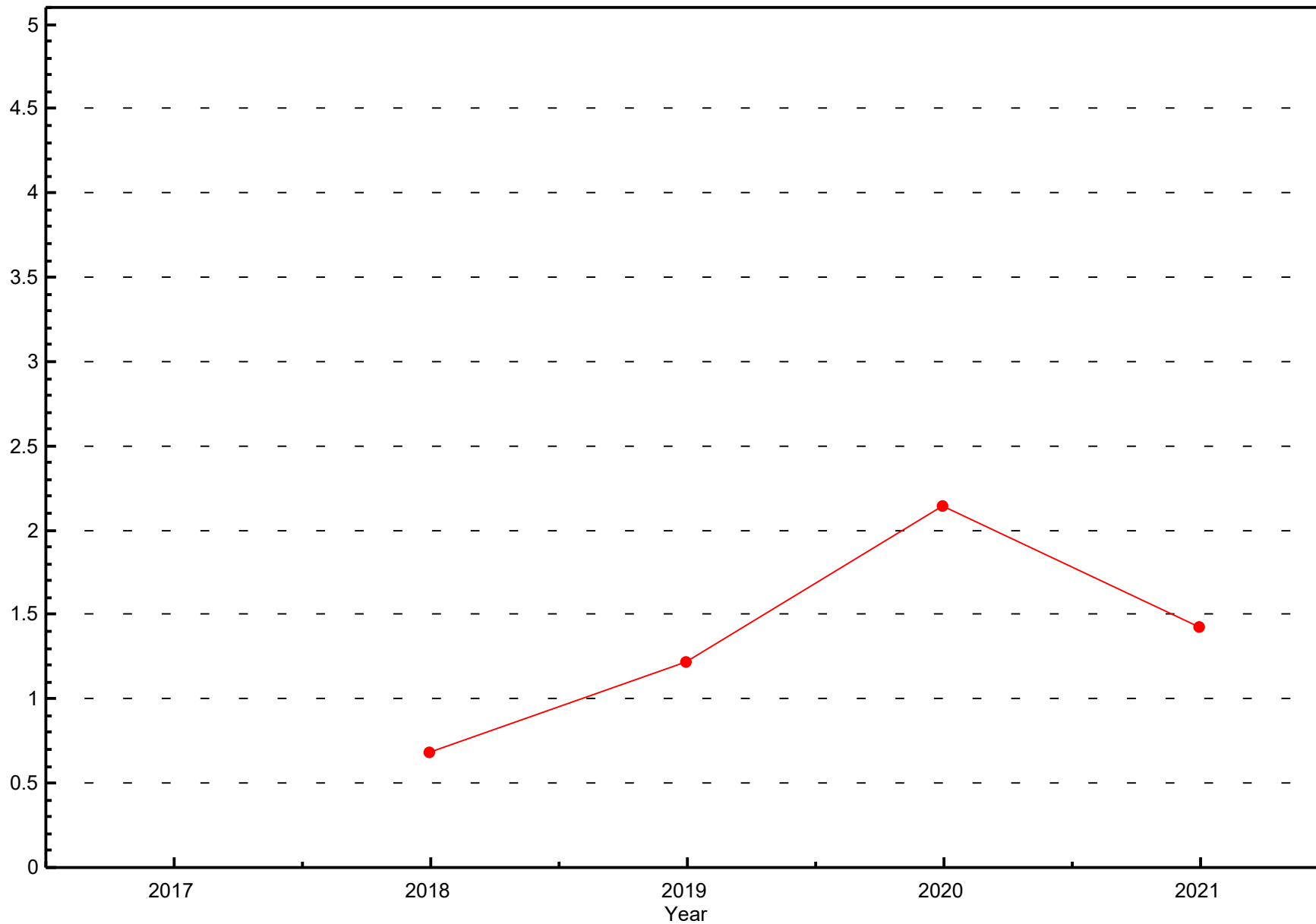
Sulphur Dioxide (SO₂) - ppb
Sawbones Bay (2017 to 2021)





Yearly Averages

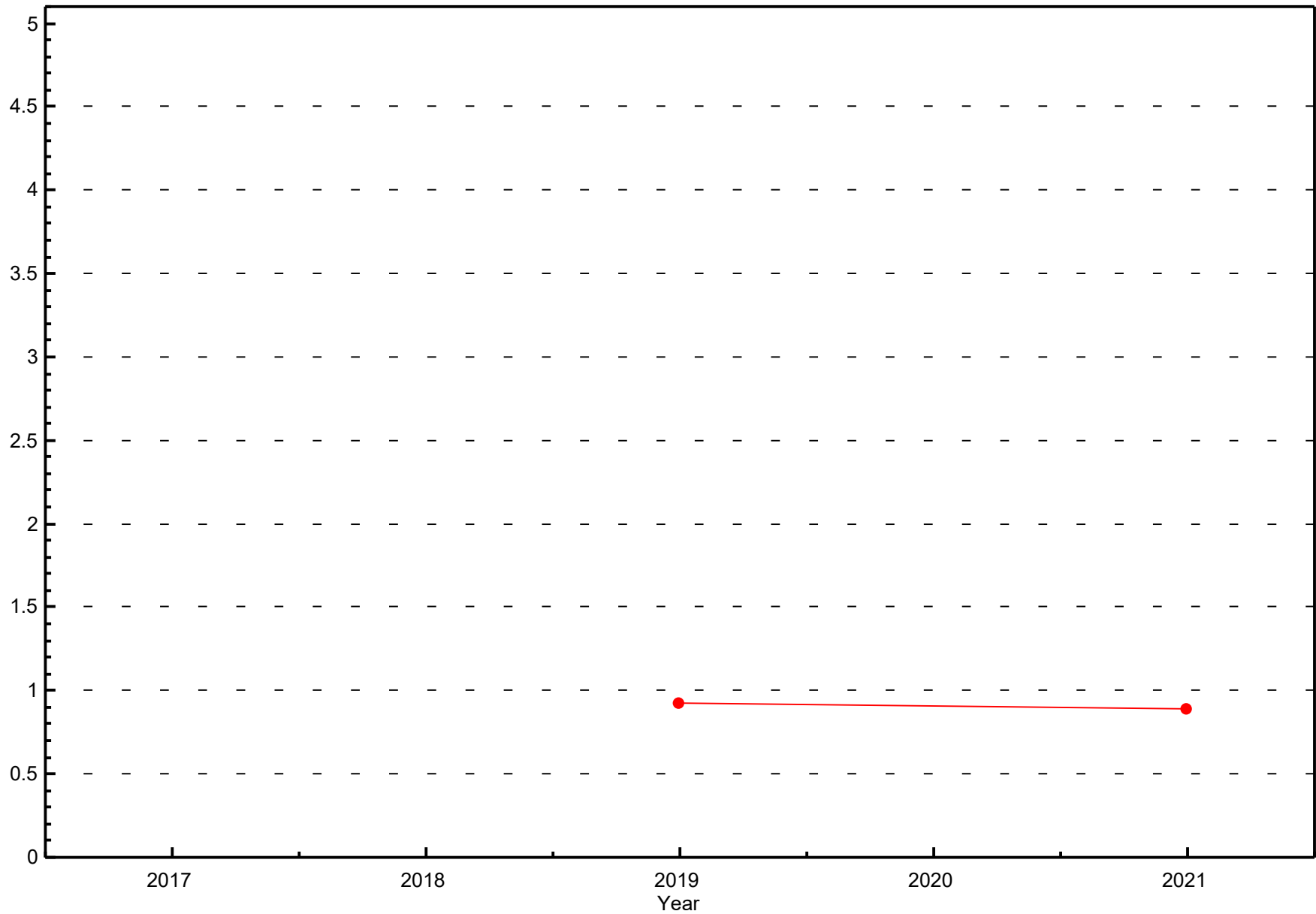
Sulphur Dioxide (SO₂) - ppb
Jackfish 1 (2017 to 2021)





Yearly Averages

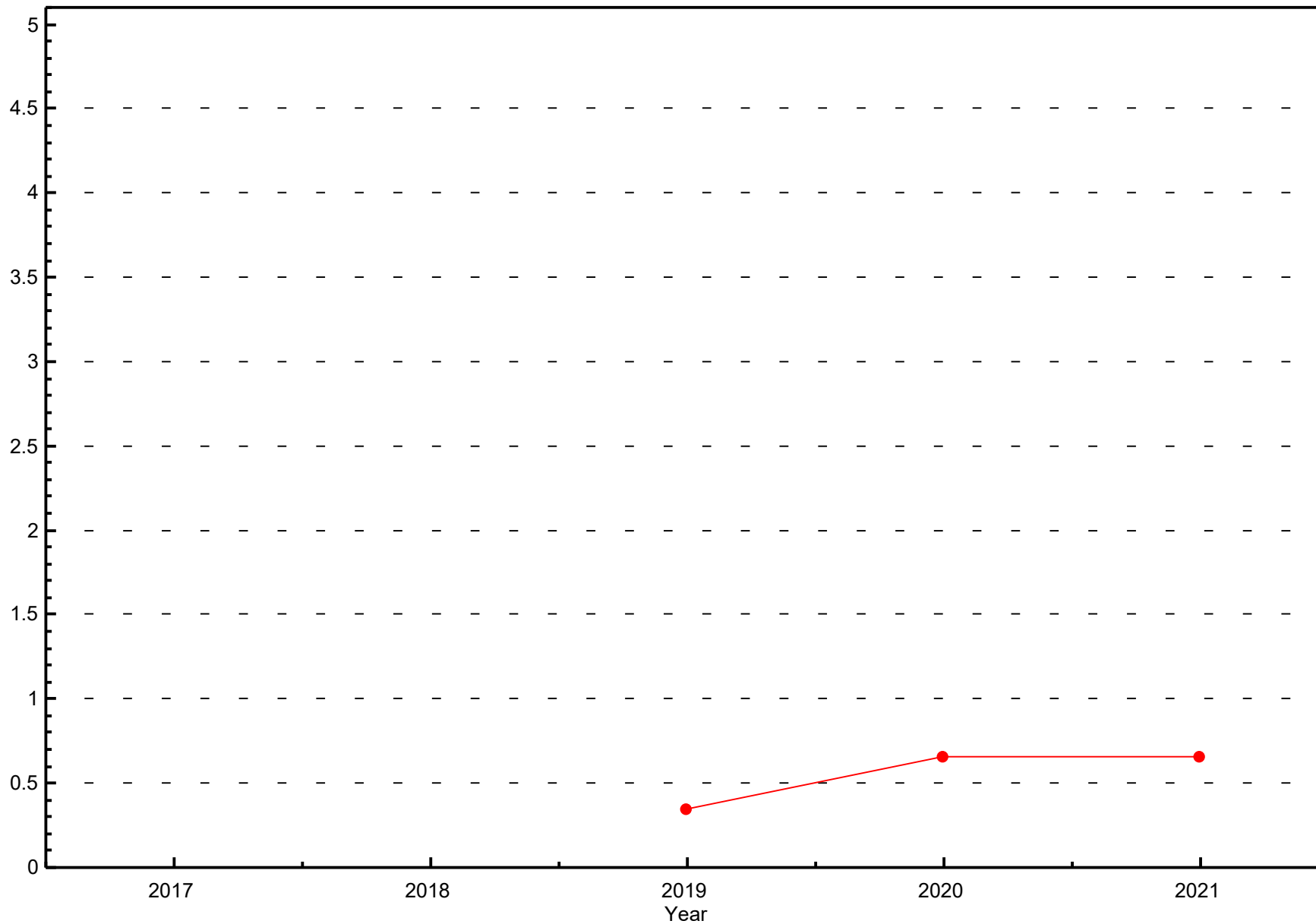
Sulphur Dioxide (SO₂) - ppb
Kirby South (2017 to 2021)





Yearly Averages

Sulphur Dioxide (SO₂) - ppb
Kirby North (2017 to 2021)





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

HYDROGEN SULPHIDE ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Number of Values		Number of Values		% of Data in Each Concentration Range			
				Maximum 1-Hour Value	Exceeding 1-Hour Objective	Maximum 24-Hour Value	Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
March	100	332	0.2	1.3	0	0.4	0	100.0	0.0	0.0	0.0
April	100	685	0.2	1.6	0	0.6	0	100.0	0.0	0.0	0.0
May	99	703	0.2	2.2	0	0.4	0	100.0	0.0	0.0	0.0
June	100	684	0.3	1.5	0	0.5	0	100.0	0.0	0.0	0.0
July	100	707	0.3	2.3	0	0.6	0	100.0	0.0	0.0	0.0
August	100	707	0.3	3.5	0	0.9	0	100.0	0.0	0.0	0.0
September	100	685	0.2	2.5	0	0.5	0	100.0	0.0	0.0	0.0
October	99	704	0.2	3.2	0	0.4	0	100.0	0.0	0.0	0.0
November	100	684	0.3	2.0	0	0.7	0	100.0	0.0	0.0	0.0
December	97	678	0.3	1.5	0	0.9	0	100.0	0.0	0.0	0.0
Annual	99	6569	0.2	3.5	0	0.9	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Mildred Lake (AMS02)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding	Maximum 24-Hour Value	Number of Values Exceeding	% of Data in Each Concentration Range			
					1-Hour Objective		24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	704	0.6	9.8	0	1.9	0	99.3	0.7	0.0	0.0
February	100	640	0.3	3.1	0	0.9	0	100.0	0.0	0.0	0.0
March	99	701	0.4	3.1	0	1.3	0	100.0	0.0	0.0	0.0
April	100	684	0.3	3.3	0	0.8	0	100.0	0.0	0.0	0.0
May	100	709	0.3	4.6	0	0.7	0	99.9	0.1	0.0	0.0
June	100	684	0.4	17.2	3	1.4	0	99.4	0.3	0.3	0.0
July	100	708	0.4	6.3	0	1.2	0	99.6	0.4	0.0	0.0
August	100	706	0.3	9.4	0	2.0	0	99.6	0.4	0.0	0.0
September	100	686	0.4	11.6	1	0.8	0	99.6	0.3	0.2	0.0
October	100	708	0.2	2.9	0	0.6	0	100.0	0.0	0.0	0.0
November	100	685	0.4	2.2	0	1.0	0	100.0	0.0	0.0	0.0
December	100	708	0.4	4.1	0	1.2	0	99.7	0.3	0.0	0.0
Annual	100	8323	0.4	17.2	4	2.0	0	99.8	0.2	0.0	0.0



Wood Buffalo Environmental Association - Buffalo Viewpoint (AMS04)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Number of Values		Number of Values		% of Data in Each Concentration Range			
				Maximum 1-Hour Value	Exceeding 1-Hour Objective	Maximum 24-Hour Value	Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	708	0.3	2.1	0	0.6	0	100.0	0.0	0.0	0.0
February	100	637	0.2	1.8	0	0.5	0	100.0	0.0	0.0	0.0
March	100	707	0.2	5.8	0	1.3	0	99.7	0.3	0.0	0.0
April	100	683	0.2	2.4	0	0.4	0	100.0	0.0	0.0	0.0
May	100	707	0.1	1.8	0	0.3	0	100.0	0.0	0.0	0.0
June	99	679	0.3	9.2	0	1.2	0	99.6	0.4	0.0	0.0
July	100	709	0.3	5.7	0	1.3	0	99.3	0.7	0.0	0.0
August	100	709	0.3	9.7	0	1.4	0	99.2	0.9	0.0	0.0
September	100	685	0.2	1.6	0	0.4	0	100.0	0.0	0.0	0.0
October	100	708	0.1	1.8	0	0.4	0	100.0	0.0	0.0	0.0
November	100	680	0.2	1.7	0	0.4	0	100.0	0.0	0.0	0.0
December	99	701	0.2	1.8	0	0.5	0	100.0	0.0	0.0	0.0
Annual	100	8313	0.2	9.7	0	1.4	0	99.8	0.2	0.0	0.0



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Number of Values		Number of Values		% of Data in Each Concentration Range			
				Maximum 1-Hour Value	Exceeding 1-Hour Objective	Maximum 24-Hour Value	Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	709	0.4	4.0	0	1.3	0	99.9	0.1	0.0	0.0
February	100	639	0.4	4.4	0	1.2	0	99.8	0.2	0.0	0.0
March	100	708	0.3	3.8	0	1.5	0	99.9	0.1	0.0	0.0
April	99	682	0.3	4.0	0	1.1	0	99.7	0.3	0.0	0.0
May	100	708	0.6	9.0	0	2.9	0	98.6	1.4	0.0	0.0
June	100	685	0.5	10.3	1	1.5	0	98.3	1.8	0.0	0.0
July	100	708	0.4	7.3	0	1.3	0	99.4	0.6	0.0	0.0
August	100	709	0.4	4.1	0	1.3	0	99.9	0.1	0.0	0.0
September	100	682	0.2	2.6	0	0.8	0	100.0	0.0	0.0	0.0
October	100	706	0.2	9.0	0	1.2	0	99.4	0.6	0.0	0.0
November	93	634	0.3	3.4	0	1.0	0	100.0	0.0	0.0	0.0
December	100	709	0.5	3.7	0	1.2	0	99.9	0.1	0.0	0.0
Annual	99	8279	0.4	10.3	1	2.9	0	99.6	0.5	0.0	0.0



Wood Buffalo Environmental Association - Lower Camp (AMS11)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding	Maximum 24-Hour Value	Number of Values Exceeding	% of Data in Each Concentration Range			
					1-Hour Objective		24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	706	0.8	6.2	0	1.9	0	98.9	1.1	0.0	0.0
February	95	603	0.6	12.4	1	2.2	0	97.7	2.2	0.2	0.0
March	100	707	0.6	16.4	3	1.9	0	97.9	1.8	0.3	0.0
April	100	685	0.4	16.8	2	1.6	0	98.8	0.9	0.3	0.0
May	100	709	0.5	9.6	0	1.5	0	97.6	2.4	0.0	0.0
June	100	686	0.6	9.2	0	1.3	0	97.7	2.3	0.0	0.0
July	100	708	0.5	5.7	0	1.3	0	99.0	1.0	0.0	0.0
August	92	647	0.4	3.9	0	1.0	0	99.9	0.2	0.0	0.0
September	100	685	0.6	4.6	0	1.3	0	99.6	0.4	0.0	0.0
October	100	708	0.5	3.9	0	1.1	0	99.7	0.3	0.0	0.0
November	99	681	0.5	11.1	1	1.5	0	99.3	0.6	0.2	0.0
December	98	691	0.4	3.9	0	1.0	0	99.9	0.1	0.0	0.0
Annual	99	8216	0.5	16.8	7	2.2	0	98.8	1.1	0.1	0.0



Wood Buffalo Environmental Association - Wapasu (AMS17)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Number of Values		Number of Values		% of Data in Each Concentration Range			
				Maximum 1-Hour Value	Exceeding 1-Hour Objective	Maximum 24-Hour Value	Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	99	698	0.2	1.4	0	0.5	0	100.0	0.0	0.0	0.0
February	100	640	0.1	1.7	0	0.3	0	100.0	0.0	0.0	0.0
March	100	708	0.1	0.8	0	0.2	0	100.0	0.0	0.0	0.0
April	100	684	0.1	0.5	0	0.2	0	100.0	0.0	0.0	0.0
May	99	703	0.1	0.6	0	0.3	0	100.0	0.0	0.0	0.0
June	100	684	0.1	1.3	0	0.3	0	100.0	0.0	0.0	0.0
July	100	708	0.1	0.9	0	0.4	0	100.0	0.0	0.0	0.0
August	100	709	0.1	1.8	0	0.4	0	100.0	0.0	0.0	0.0
September	98	671	0.1	2.2	0	0.6	0	100.0	0.0	0.0	0.0
October	96	678	0.1	1.2	0	0.3	0	100.0	0.0	0.0	0.0
November	100	685	0.1	1.4	0	0.3	0	100.0	0.0	0.0	0.0
December	100	708	0.2	1.3	0	0.4	0	100.0	0.0	0.0	0.0
Annual	99	8276	0.1	2.2	0	0.6	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Firebag (AMS19)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding	Maximum 24-Hour Value	Number of Values Exceeding	% of Data in Each Concentration Range			
					1-Hour Objective		24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	709	0.2	2.6	0	0.5	0	100.0	0.0	0.0	0.0
February	100	638	0.1	0.9	0	0.3	0	100.0	0.0	0.0	0.0
March	99	706	0.1	1.6	0	0.3	0	100.0	0.0	0.0	0.0
April	100	685	0.1	1.0	0	0.3	0	100.0	0.0	0.0	0.0
May	96	682	0.1	0.5	0	0.2	0	100.0	0.0	0.0	0.0
June	90	612	0.1	3.0	0	0.4	0	100.0	0.0	0.0	0.0
July	100	709	0.2	1.9	0	0.6	0	100.0	0.0	0.0	0.0
August	100	707	0.2	3.6	0	0.6	0	99.9	0.1	0.0	0.0
September	100	687	0.2	2.5	0	0.5	0	100.0	0.0	0.0	0.0
October	100	709	0.1	0.9	0	0.4	0	100.0	0.0	0.0	0.0
November	100	679	0.1	1.6	0	0.5	0	100.0	0.0	0.0	0.0
December	100	692	0.2	1.4	0	0.5	0	100.0	0.0	0.0	0.0
Annual	99	8215	0.1	3.6	0	0.6	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Mackay River (AMS20)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Number of Values		Number of Values		% of Data in Each Concentration Range			
				Maximum 1-Hour Value	Exceeding 1-Hour Objective	Maximum 24-Hour Value	Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	99	704	0.3	3.4	0	0.8	0	100.0	0.0	0.0	0.0
February	100	638	0.3	5.5	0	0.8	0	99.8	0.2	0.0	0.0
March	100	706	0.3	16.1	1	2.2	0	99.3	0.6	0.1	0.0
April	100	685	0.3	5.5	0	0.5	0	99.9	0.2	0.0	0.0
May	100	709	0.2	2.7	0	0.5	0	100.0	0.0	0.0	0.0
June	100	686	0.3	8.5	0	0.8	0	99.6	0.4	0.0	0.0
July	100	707	0.4	5.0	0	1.1	0	99.6	0.4	0.0	0.0
August	100	707	0.3	2.2	0	0.7	0	100.0	0.0	0.0	0.0
September	100	685	0.3	7.0	0	1.0	0	99.7	0.3	0.0	0.0
October	100	707	0.2	3.1	0	0.5	0	100.0	0.0	0.0	0.0
November	100	685	0.3	5.6	0	0.7	0	99.9	0.2	0.0	0.0
December	100	708	0.3	3.4	0	0.8	0	100.0	0.0	0.0	0.0
Annual	100	8327	0.3	16.1	1	2.2	0	99.8	0.2	0.0	0.0



Wood Buffalo Environmental Association - Waskow ohci Pimatisiwin (AMS25)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Number of Values		Number of Values		% of Data in Each Concentration Range			
				Maximum 1-Hour Value	Exceeding 1-Hour Objective	Maximum 24-Hour Value	Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	97	686	0.5	2.7	0	1.5	0	100.0	0.0	0.0	0.0
February	100	638	0.3	1.8	0	0.8	0	100.0	0.0	0.0	0.0
March	100	707	0.3	1.8	0	0.5	0	100.0	0.0	0.0	0.0
April	100	682	0.2	1.3	0	0.6	0	100.0	0.0	0.0	0.0
May	99	701	0.2	2.3	0	0.4	0	100.0	0.0	0.0	0.0
June	99	682	0.3	2.5	0	0.8	0	100.0	0.0	0.0	0.0
July	100	708	0.3	2.5	0	0.6	0	100.0	0.0	0.0	0.0
August	100	707	0.3	3.3	0	0.8	0	100.0	0.0	0.0	0.0
September	100	685	0.2	2.1	0	0.4	0	100.0	0.0	0.0	0.0
October	100	708	0.2	3.3	0	0.4	0	100.0	0.0	0.0	0.0
November	100	684	0.3	1.7	0	0.7	0	100.0	0.0	0.0	0.0
December	100	707	0.4	1.5	0	0.8	0	100.0	0.0	0.0	0.0
Annual	100	8295	0.3	3.3	0	1.5	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Christina Lake (AMS26)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Number of Values		Number of Values		% of Data in Each Concentration Range			
				Maximum 1-Hour Value	Exceeding 1-Hour Objective	Maximum 24-Hour Value	Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	708	0.3	2.1	0	0.6	0	100.0	0.0	0.0	0.0
February	100	640	0.3	1.6	0	0.7	0	100.0	0.0	0.0	0.0
March	100	708	0.1	1.2	0	0.4	0	100.0	0.0	0.0	0.0
April	100	684	0.2	1.7	0	0.5	0	100.0	0.0	0.0	0.0
May	99	705	0.1	2.2	0	0.3	0	100.0	0.0	0.0	0.0
June	100	684	0.2	1.8	0	0.4	0	100.0	0.0	0.0	0.0
July	100	709	0.2	1.3	0	0.5	0	100.0	0.0	0.0	0.0
August	100	706	0.2	1.7	0	0.5	0	100.0	0.0	0.0	0.0
September	100	685	0.3	5.0	0	0.8	0	99.7	0.3	0.0	0.0
October	100	707	0.2	2.6	0	0.4	0	100.0	0.0	0.0	0.0
November	100	684	0.2	1.4	0	0.7	0	100.0	0.0	0.0	0.0
December	99	704	0.3	1.2	0	0.6	0	100.0	0.0	0.0	0.0
Annual	100	8324	0.2	5.0	0	0.8	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Jackfish 2/3 (AMS27)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Number of Values		Number of Values		% of Data in Each Concentration Range			
				Maximum 1-Hour Value	Exceeding 1-Hour Objective	Maximum 24-Hour Value	Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	708	0.2	0.9	0	0.3	0	100.0	0.0	0.0	0.0
February	100	637	0.2	1.0	0	0.3	0	100.0	0.0	0.0	0.0
March	100	707	0.1	0.5	0	0.2	0	100.0	0.0	0.0	0.0
April	100	685	0.1	0.8	0	0.2	0	100.0	0.0	0.0	0.0
May	100	706	0.2	0.9	0	0.3	0	100.0	0.0	0.0	0.0
June	99	680	0.1	0.6	0	0.3	0	100.0	0.0	0.0	0.0
July	99	703	0.2	0.8	0	0.4	0	100.0	0.0	0.0	0.0
August	100	709	0.2	0.7	0	0.2	0	100.0	0.0	0.0	0.0
September	100	683	0.2	0.6	0	0.3	0	100.0	0.0	0.0	0.0
October	100	709	0.1	0.6	0	0.2	0	100.0	0.0	0.0	0.0
November	100	685	0.1	0.6	0	0.3	0	100.0	0.0	0.0	0.0
December	100	702	0.2	0.6	0	0.3	0	100.0	0.0	0.0	0.0
Annual	100	8314	0.2	1.0	0	0.4	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Surmont 2 (AMS29)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Number of Values		Number of Values		% of Data in Each Concentration Range			
				Maximum 1-Hour Value	Exceeding 1-Hour Objective	Maximum 24-Hour Value	Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	705	0.1	0.5	0	0.2	0	100.0	0.0	0.0	0.0
February	87	553	0.1	0.5	0	0.2	0	100.0	0.0	0.0	0.0
March	99	703	0.1	0.3	0	0.2	0	100.0	0.0	0.0	0.0
April	100	682	0.1	0.4	0	0.1	0	100.0	0.0	0.0	0.0
May	99	699	0.1	0.4	0	0.2	0	100.0	0.0	0.0	0.0
June	100	684	0.1	0.3	0	0.2	0	100.0	0.0	0.0	0.0
July	100	707	0.1	0.7	0	0.3	0	100.0	0.0	0.0	0.0
August	100	707	0.1	0.7	0	0.3	0	100.0	0.0	0.0	0.0
September	100	684	0.1	0.5	0	0.2	0	100.0	0.0	0.0	0.0
October	100	707	0.1	0.5	0	0.3	0	100.0	0.0	0.0	0.0
November	100	684	0.1	0.4	0	0.2	0	100.0	0.0	0.0	0.0
December	100	707	0.1	0.5	0	0.3	0	100.0	0.0	0.0	0.0
Annual	99	8222	0.1	0.7	0	0.3	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Leismer (AMS501)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values	Maximum 24-Hour Value	Number of Values	% of Data in Each Concentration Range			
					Exceeding 1-Hour Objective		Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
October	100	706	0.1	1.8	0	0.4	0	100.0	0.0	0.0	0.0
November	100	683	0.1	0.9	0	0.3	0	100.0	0.0	0.0	0.0
December	100	708	0.1	1.0	0	0.3	0	100.0	0.0	0.0	0.0
Annual	100	2097	0.1	1.8	0	0.4	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Sawbones Bay (AMS505)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values	Maximum 24-Hour Value	Number of Values	% of Data in Each Concentration Range			
					Exceeding 1-Hour Objective		Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
July	100	709	0.3	2.5	0	0.8	0	100.0	0.0	0.0	0.0
August	99	700	0.2	2.8	0	0.6	0	100.0	0.0	0.0	0.0
September	98	674	0.3	4.2	0	1.1	0	99.9	0.2	0.0	0.0
October	100	709	0.3	3.3	0	1.3	0	100.0	0.0	0.0	0.0
November	100	681	0.2	2.7	0	0.6	0	100.0	0.0	0.0	0.0
December	87	604	0.2	4.1	0	0.5	0	99.8	0.2	0.0	0.0
Annual	97	4077	0.3	4.2	0	1.3	0	100.0	0.1	0.0	0.0



Wood Buffalo Environmental Association - Jackfish 1 (AMS506)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Number of Values		Number of Values		% of Data in Each Concentration Range			
				Maximum 1-Hour Value	Exceeding 1-Hour Objective	Maximum 24-Hour Value	Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	709	0.1	0.8	0	0.3	0	100.0	0.0	0.0	0.0
February	72	460	0.1	0.9	0	0.4	0	100.0	0.0	0.0	0.0
March	99	701	0.1	1.0	0	0.2	0	100.0	0.0	0.0	0.0
April	100	686	0.1	1.1	0	0.2	0	100.0	0.0	0.0	0.0
May	100	708	0.1	5.8	0	0.7	0	99.7	0.3	0.0	0.0
June	100	686	0.1	0.9	0	0.3	0	100.0	0.0	0.0	0.0
July	100	708	0.2	6.4	0	0.7	0	99.9	0.1	0.0	0.0
August	100	709	0.1	3.3	0	0.4	0	100.0	0.0	0.0	0.0
Annual	96	5367	0.1	6.4	0	0.7	0	99.9	0.1	0.0	0.0



Wood Buffalo Environmental Association - Kirby South (AMS507)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values	Maximum 24-Hour Value	Number of Values	% of Data in Each Concentration Range			
					Exceeding 1-Hour Objective		Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
July	99	690	0.5	2.6	0	1.1	0	100.0	0.0	0.0	0.0
August	100	708	0.5	2.6	0	0.9	0	100.0	0.0	0.0	0.0
September	97	662	0.2	0.8	0	0.4	0	100.0	0.0	0.0	0.0
October	100	708	0.2	0.8	0	0.5	0	100.0	0.0	0.0	0.0
November	100	684	0.3	1.1	0	0.5	0	100.0	0.0	0.0	0.0
December	92	651	0.3	1.8	0	0.5	0	100.0	0.0	0.0	0.0
Annual	98	4103	0.3	2.6	0	1.1	0	100.0	0.0	0.0	0.0



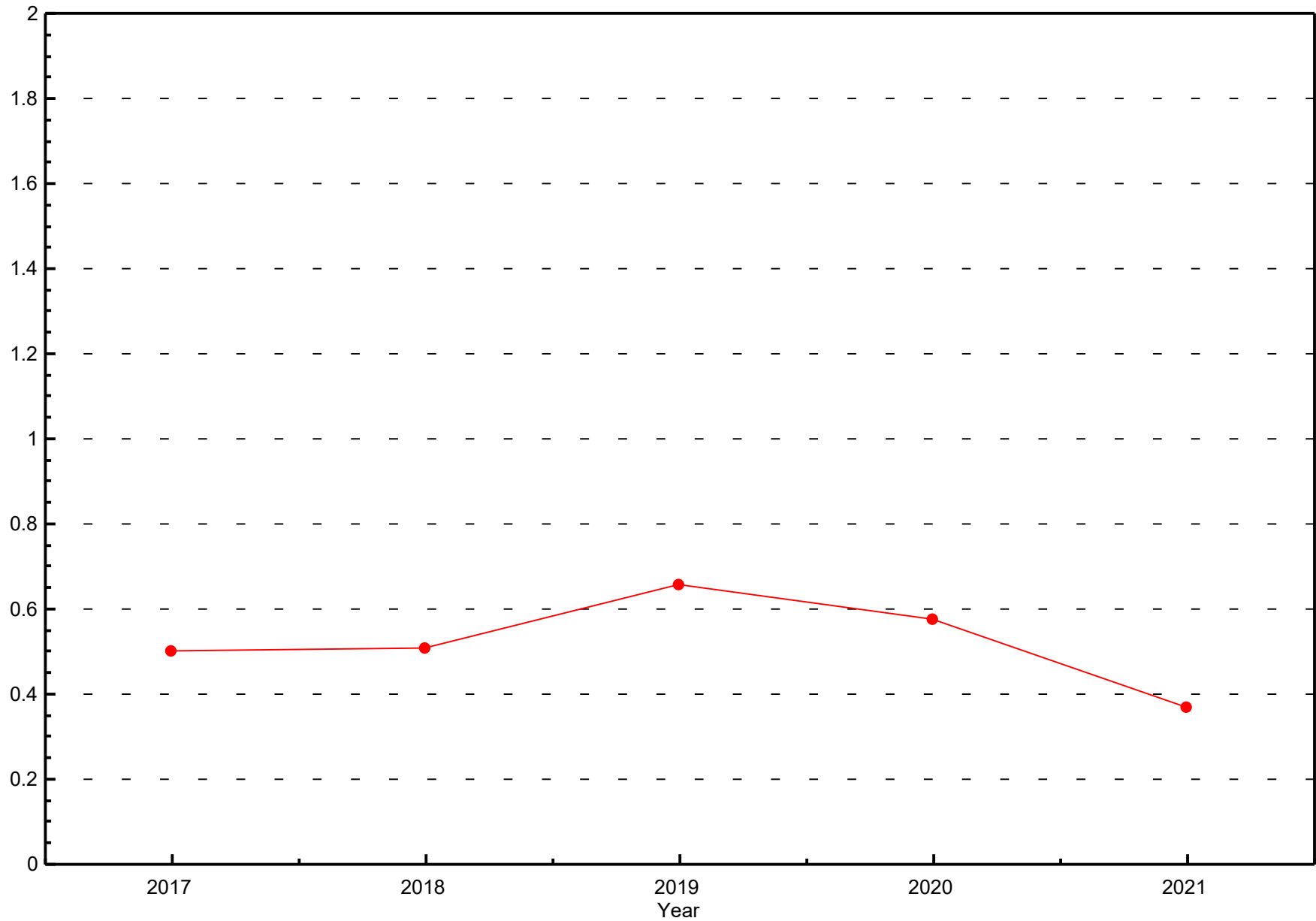
Wood Buffalo Environmental Association - Kirby North (AMS508)
Annual Summary for the Year 2021
Hydrogen Sulphide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values	Maximum 24-Hour Value	Number of Values	% of Data in Each Concentration Range			
					Exceeding 1-Hour Objective		Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	94	664	0.2	0.9	0	0.5	0	100.0	0.0	0.0	0.0
February	91	582	0.2	2.5	0	0.8	0	100.0	0.0	0.0	0.0
March	100	707	0.2	0.9	0	0.4	0	100.0	0.0	0.0	0.0
April	100	686	0.1	4.3	0	0.7	0	99.6	0.4	0.0	0.0
May	100	708	0.1	0.7	0	0.4	0	100.0	0.0	0.0	0.0
June	100	650	0.2	0.7	0	0.4	0	100.0	0.0	0.0	0.0
Annual	97	3997	0.2	4.3	0	0.8	0	99.9	0.1	0.0	0.0



Yearly Averages

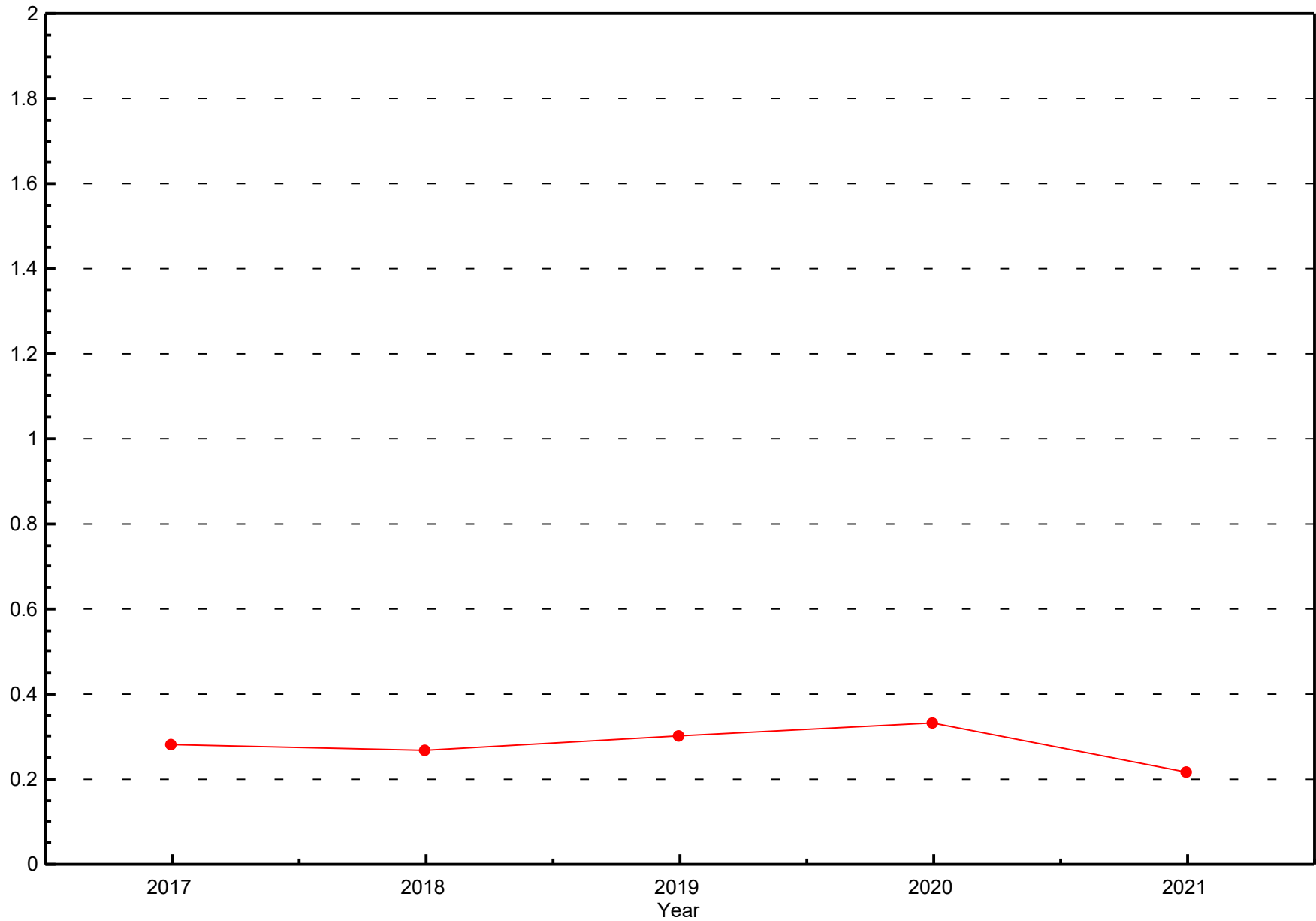
Hydrogen Sulphide (H₂S) - ppb
Mildred Lake (2017 to 2021)





Yearly Averages

Hydrogen Sulphide (H₂S) - ppb
Buffalo Viewpoint (2017 to 2021)

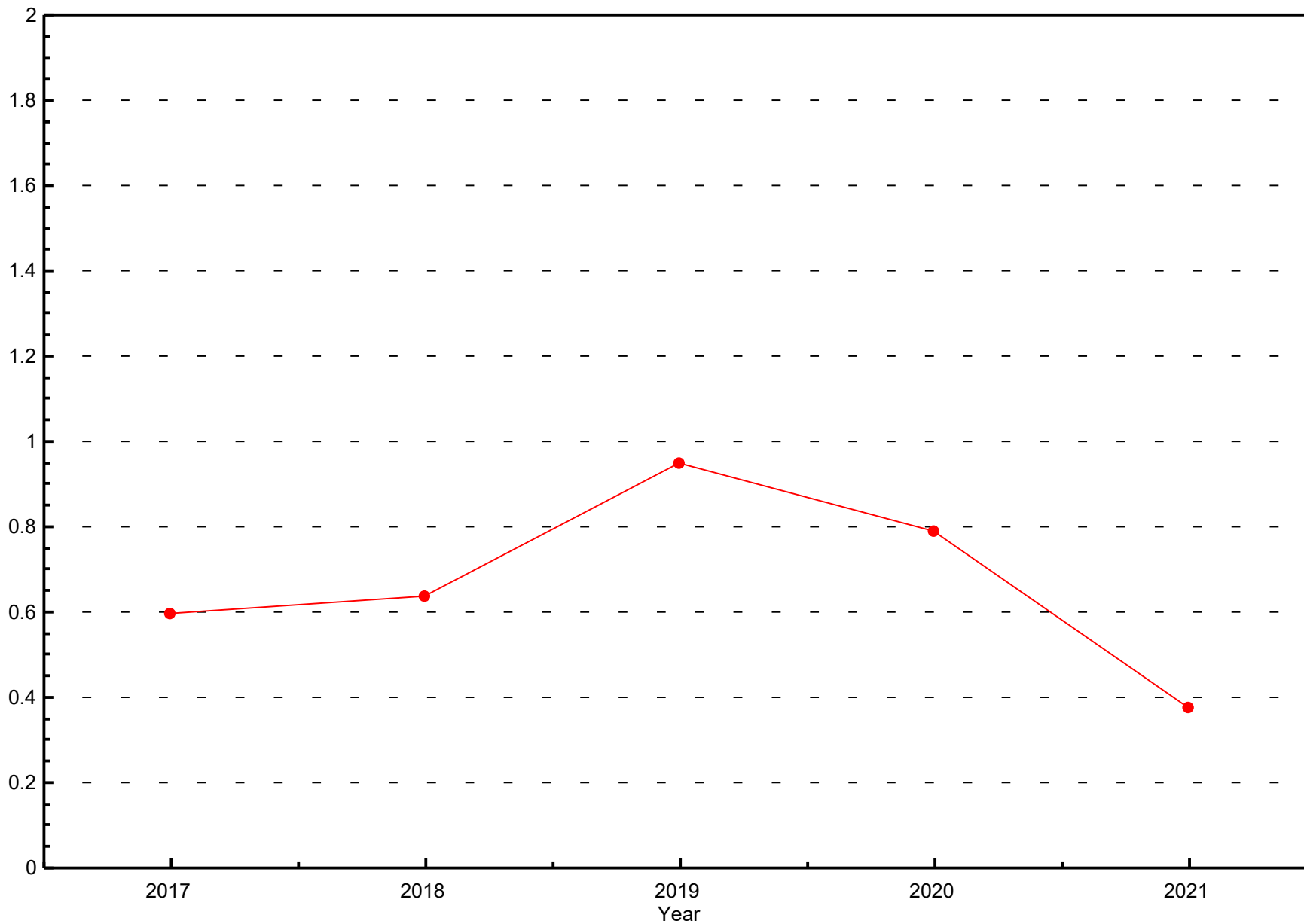




Yearly Averages

Hydrogen Sulphide (H₂S) - ppb

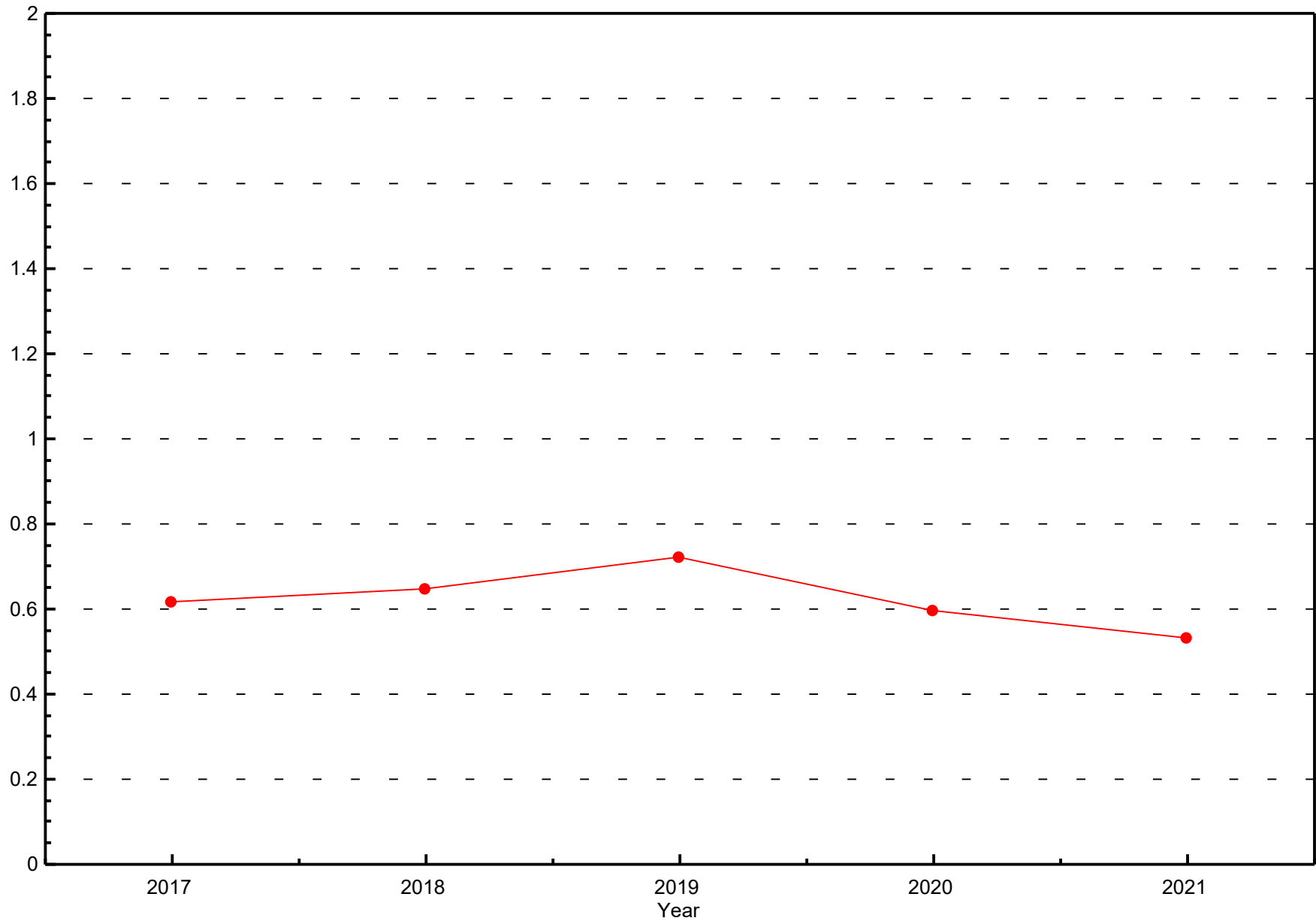
Mannix (2017 to 2021)





Yearly Averages

Hydrogen Sulphide (H₂S) - ppb
Lower Camp (2017 to 2021)

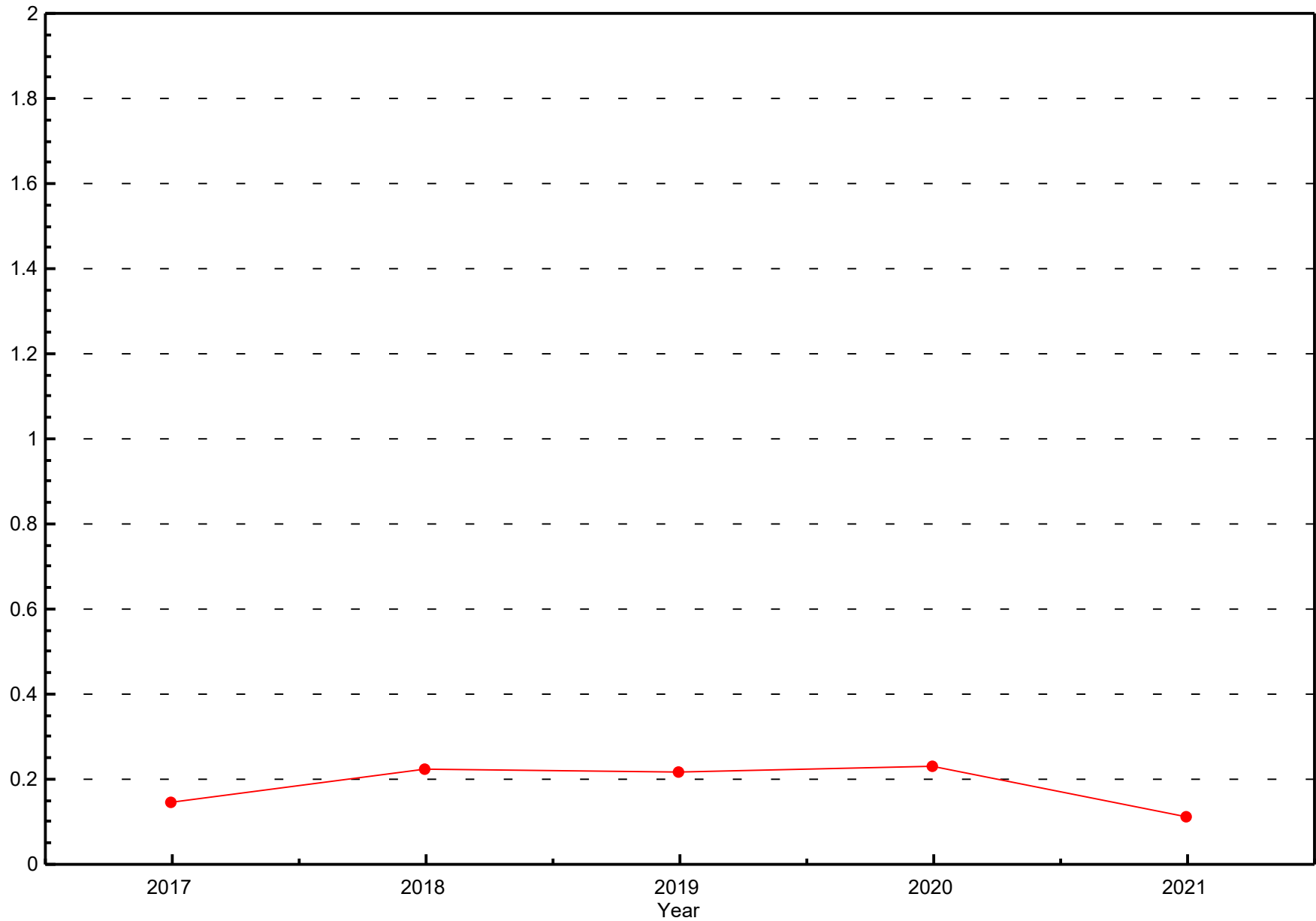




Yearly Averages

Hydrogen Sulphide (H₂S) - ppb

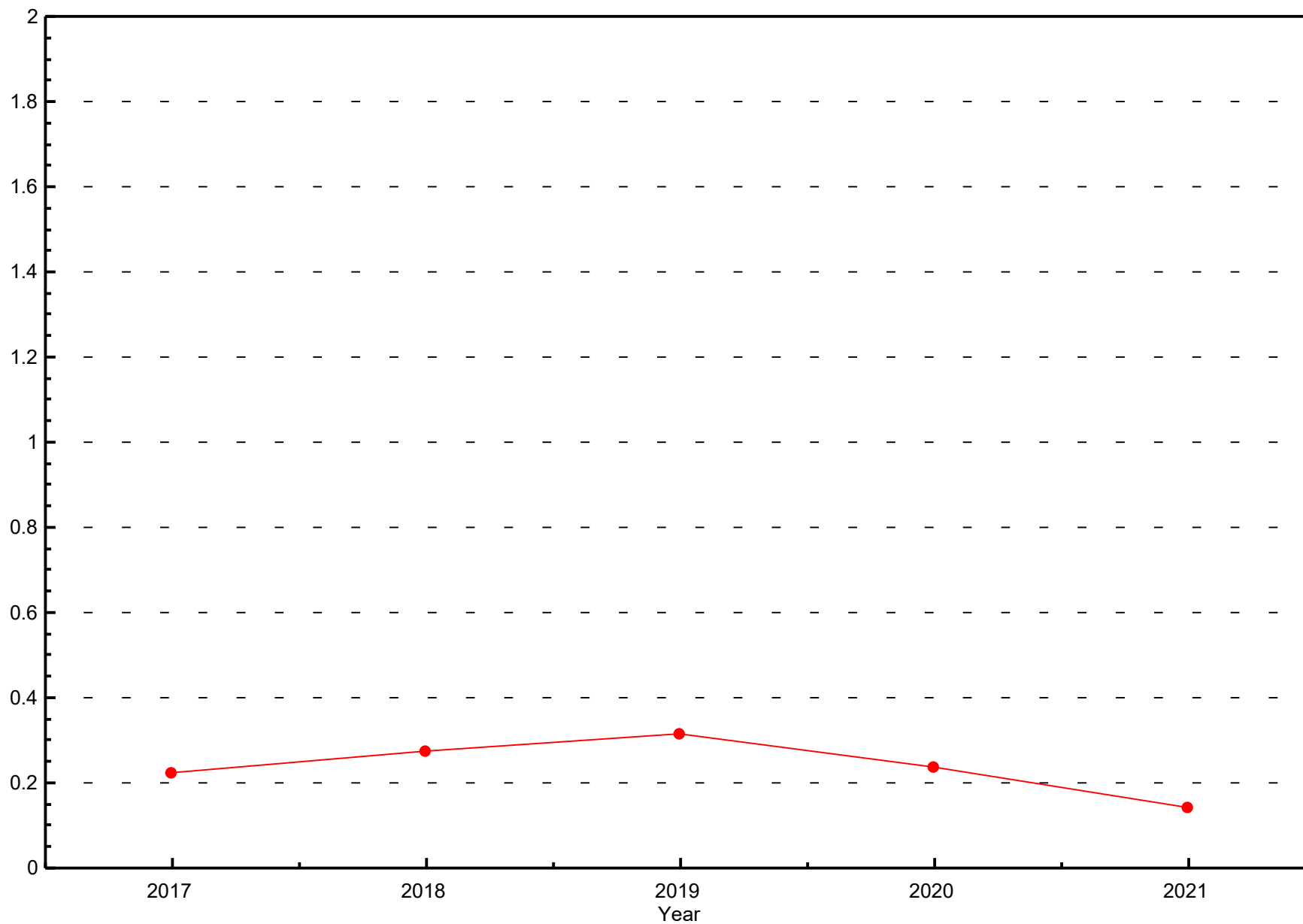
Wapasu (2017 to 2021)





Yearly Averages

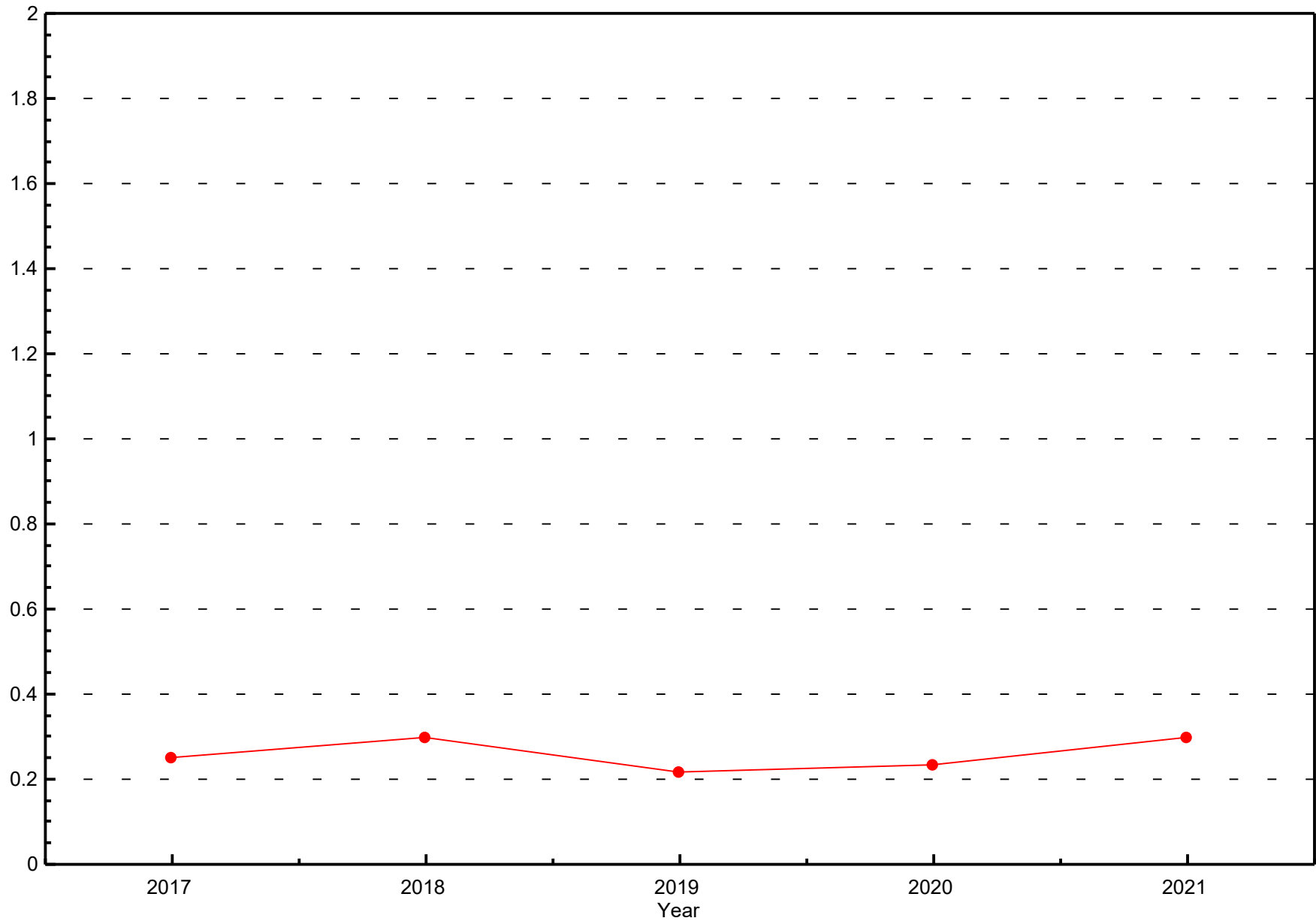
Hydrogen Sulphide (H₂S) - ppb
Firebag (2017 to 2021)





Yearly Averages

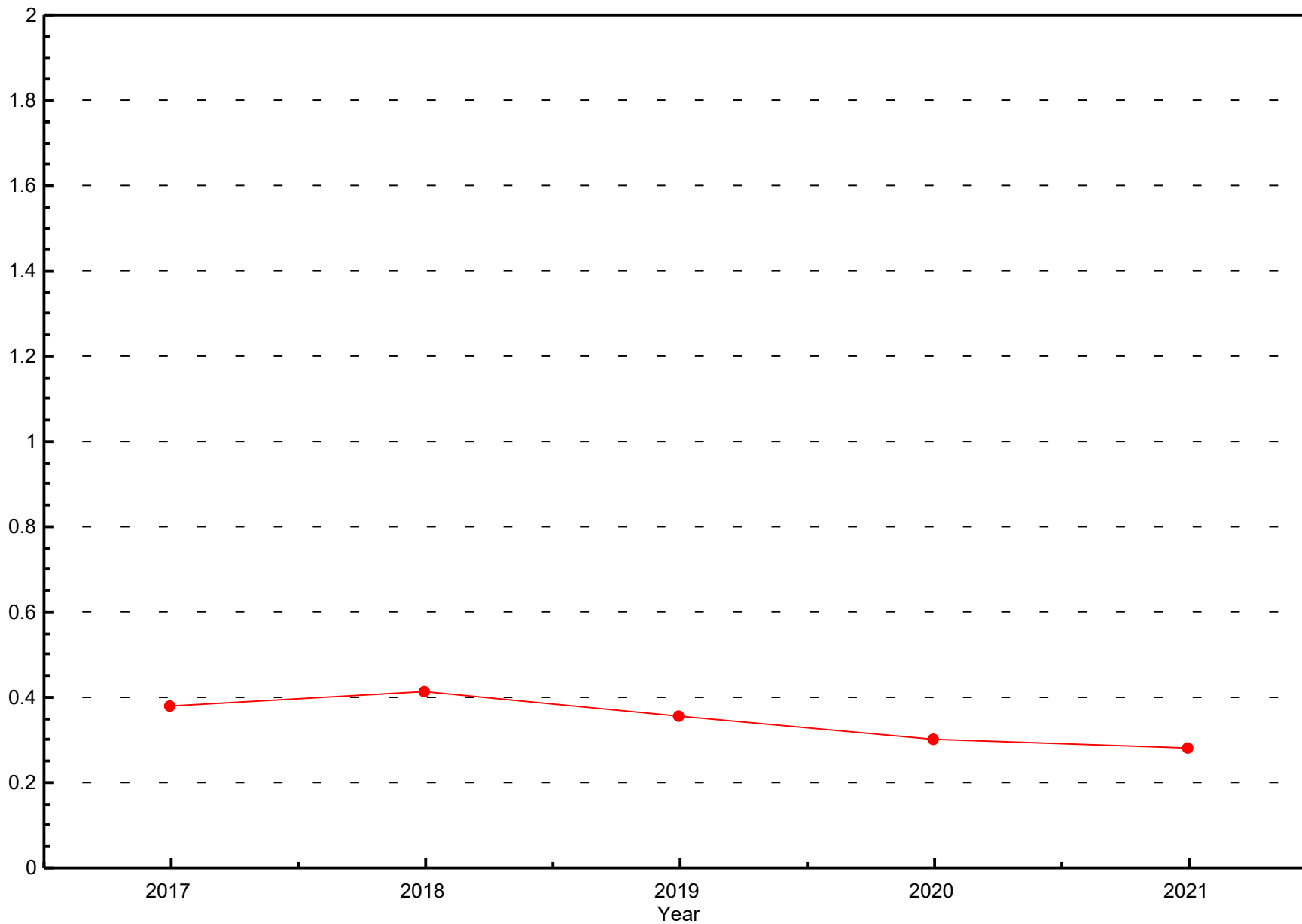
Hydrogen Sulphide (H₂S) - ppb
Mackay River (2017 to 2021)





Yearly Averages

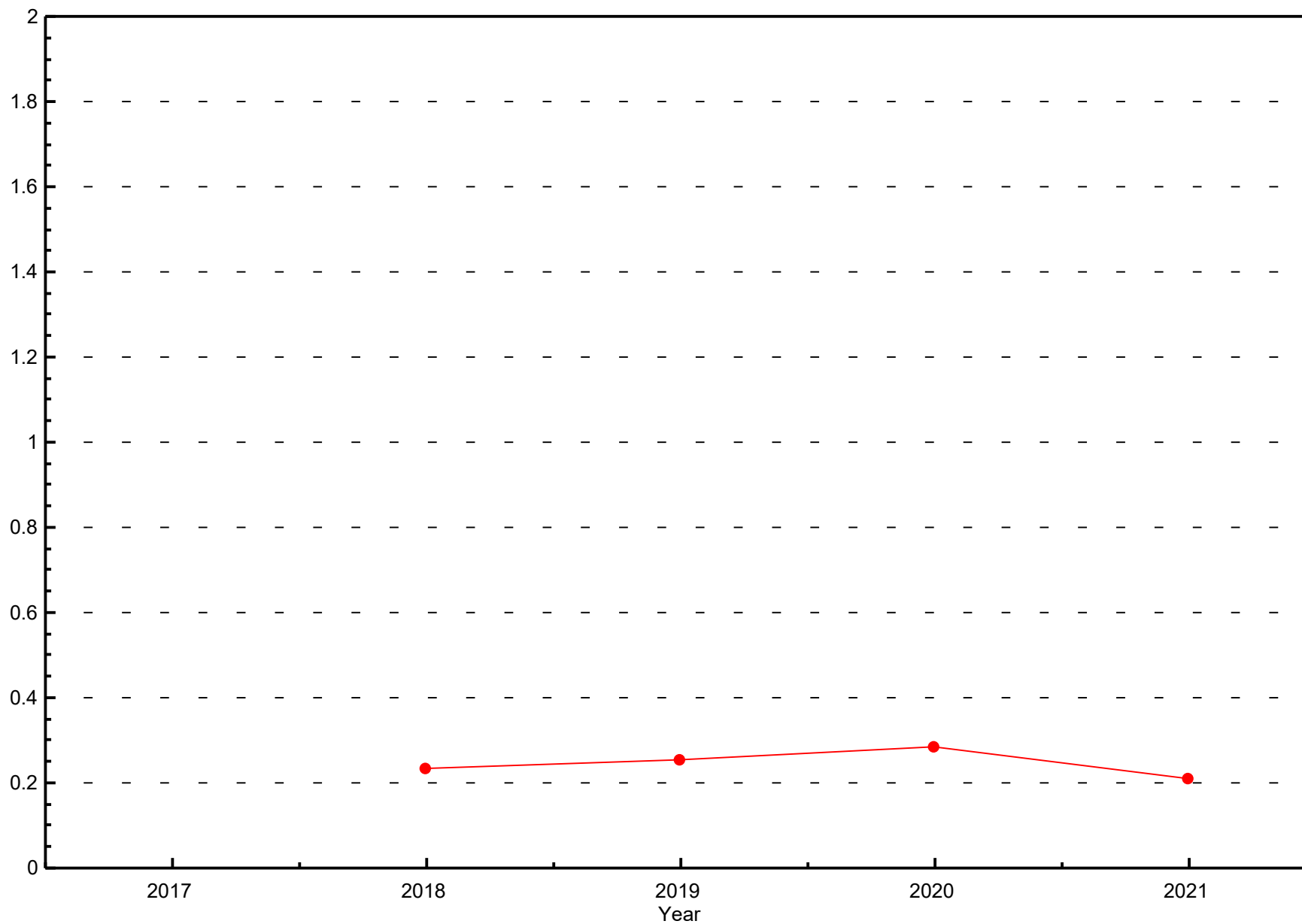
Hydrogen Sulphide (H₂S) - ppb Waskow ohci Pimatisiwin (2017 to 2021)





Yearly Averages

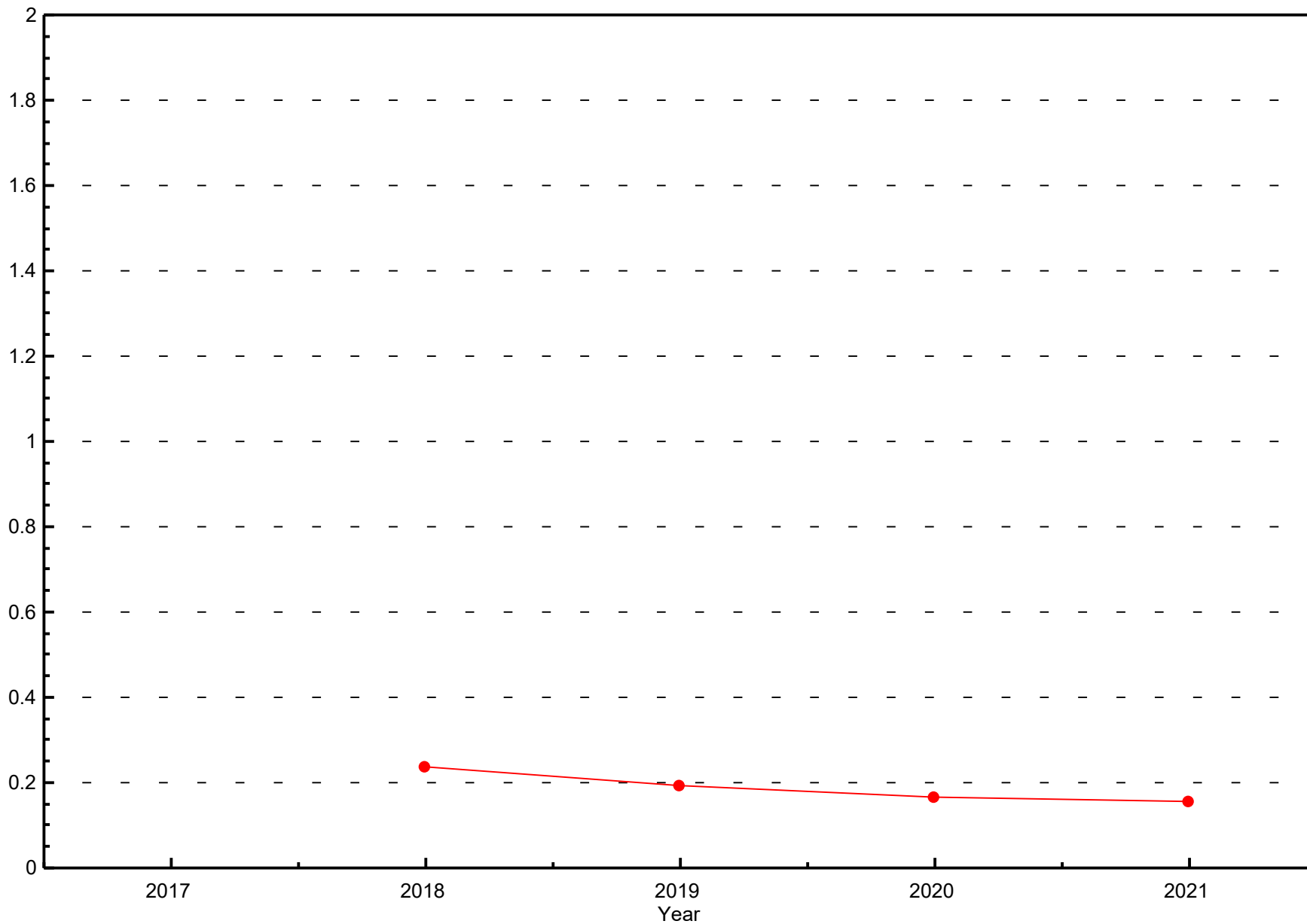
Hydrogen Sulphide (H₂S) - ppb
Christina Lake (2017 to 2021)





Yearly Averages

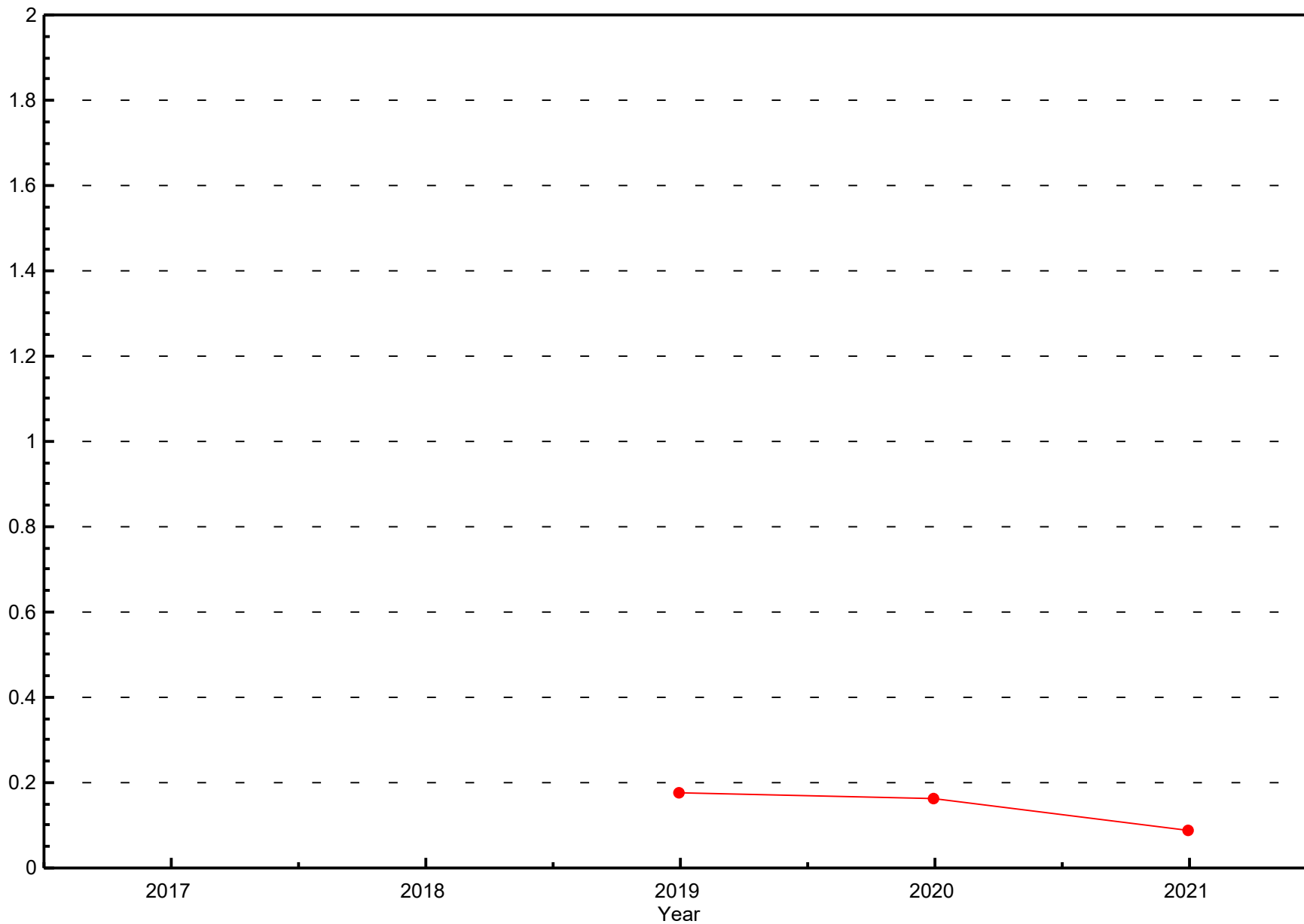
Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3 (2017 to 2021)





Yearly Averages

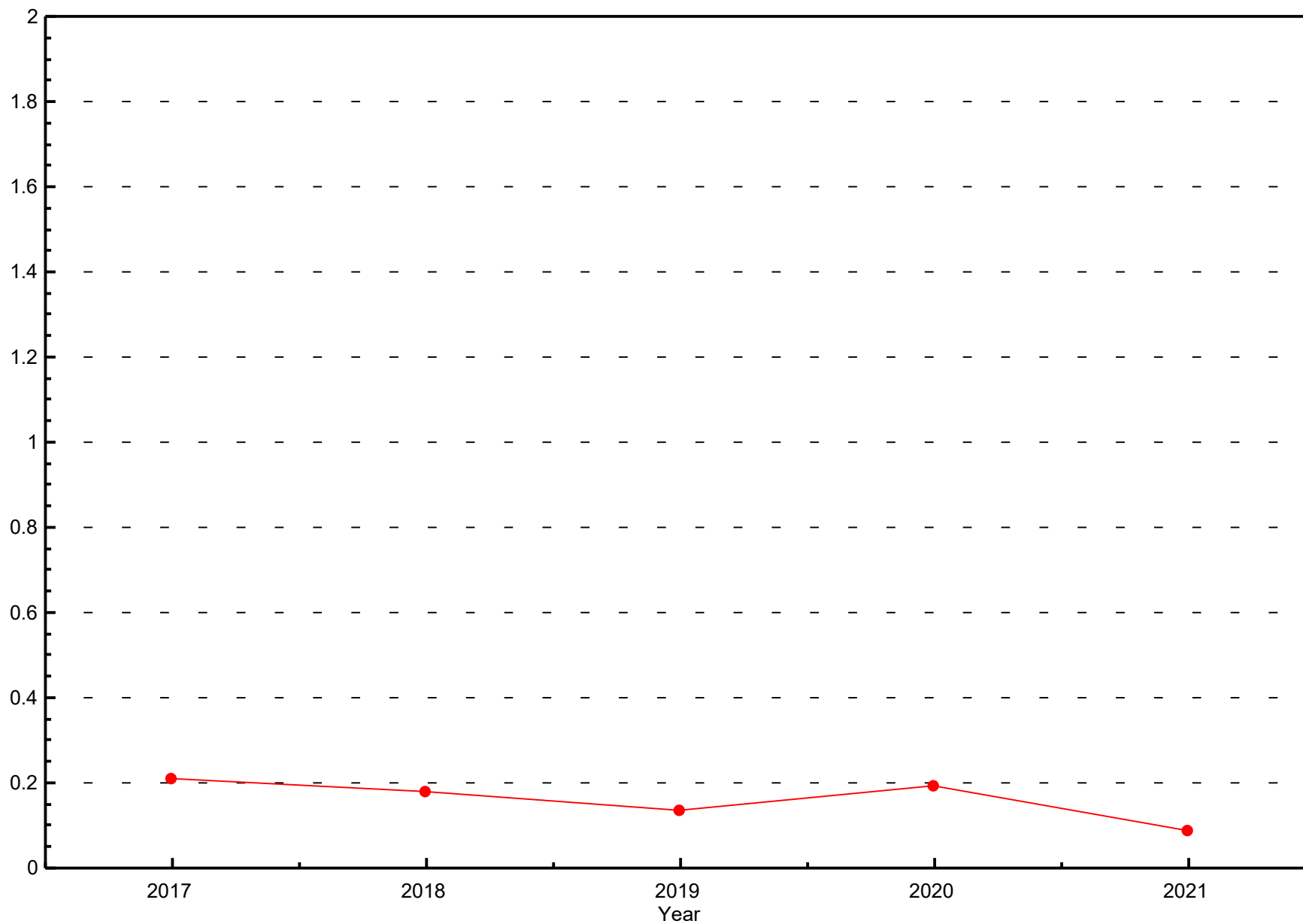
Hydrogen Sulphide (H₂S) - ppb
Surmont 2 (2017 to 2021)





Yearly Averages

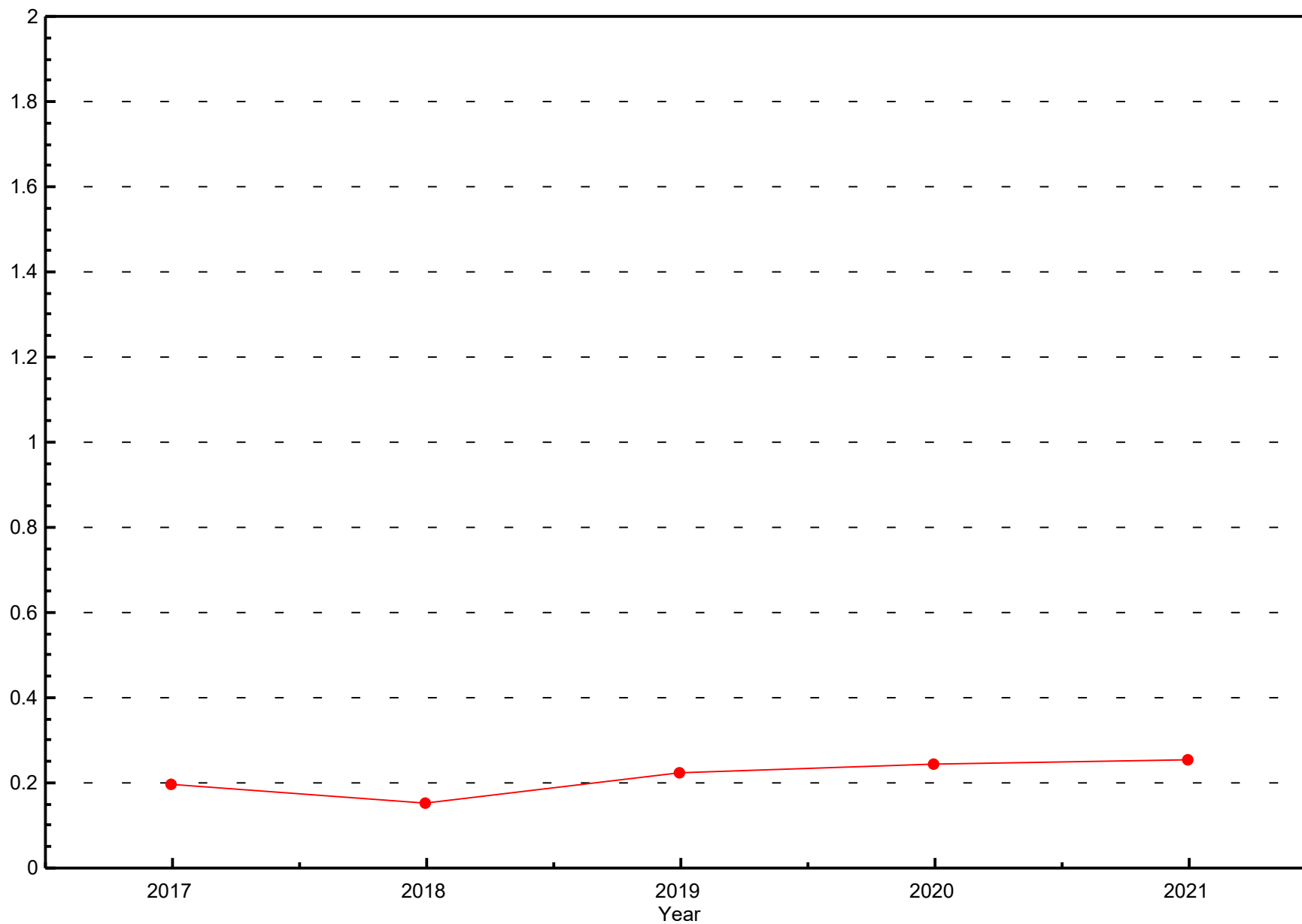
Hydrogen Sulphide (H₂S) - ppb
Leismer (2017 to 2021)





Yearly Averages

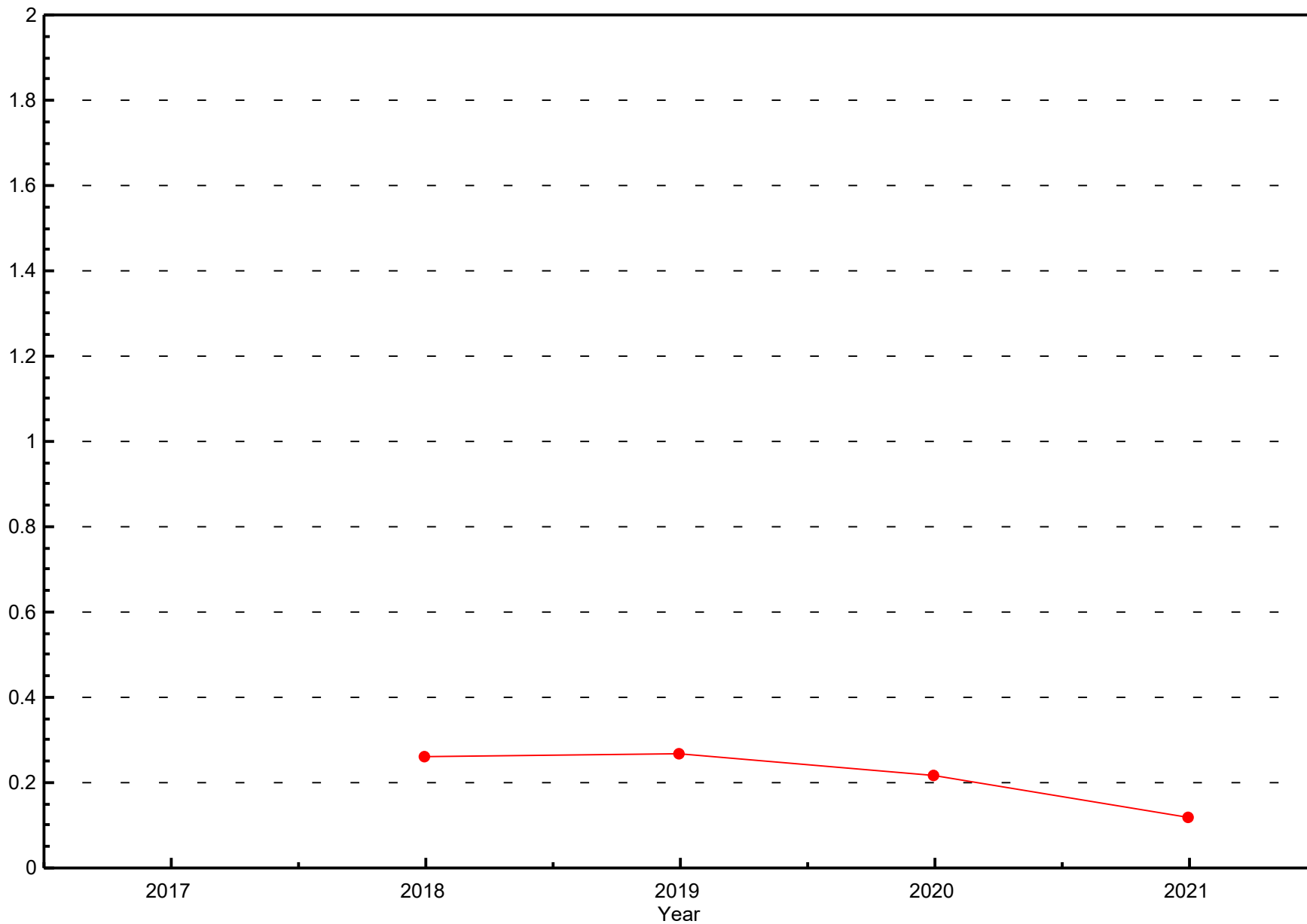
Hydrogen Sulphide (H₂S) - ppb
Sawbones Bay (2017 to 2021)





Yearly Averages

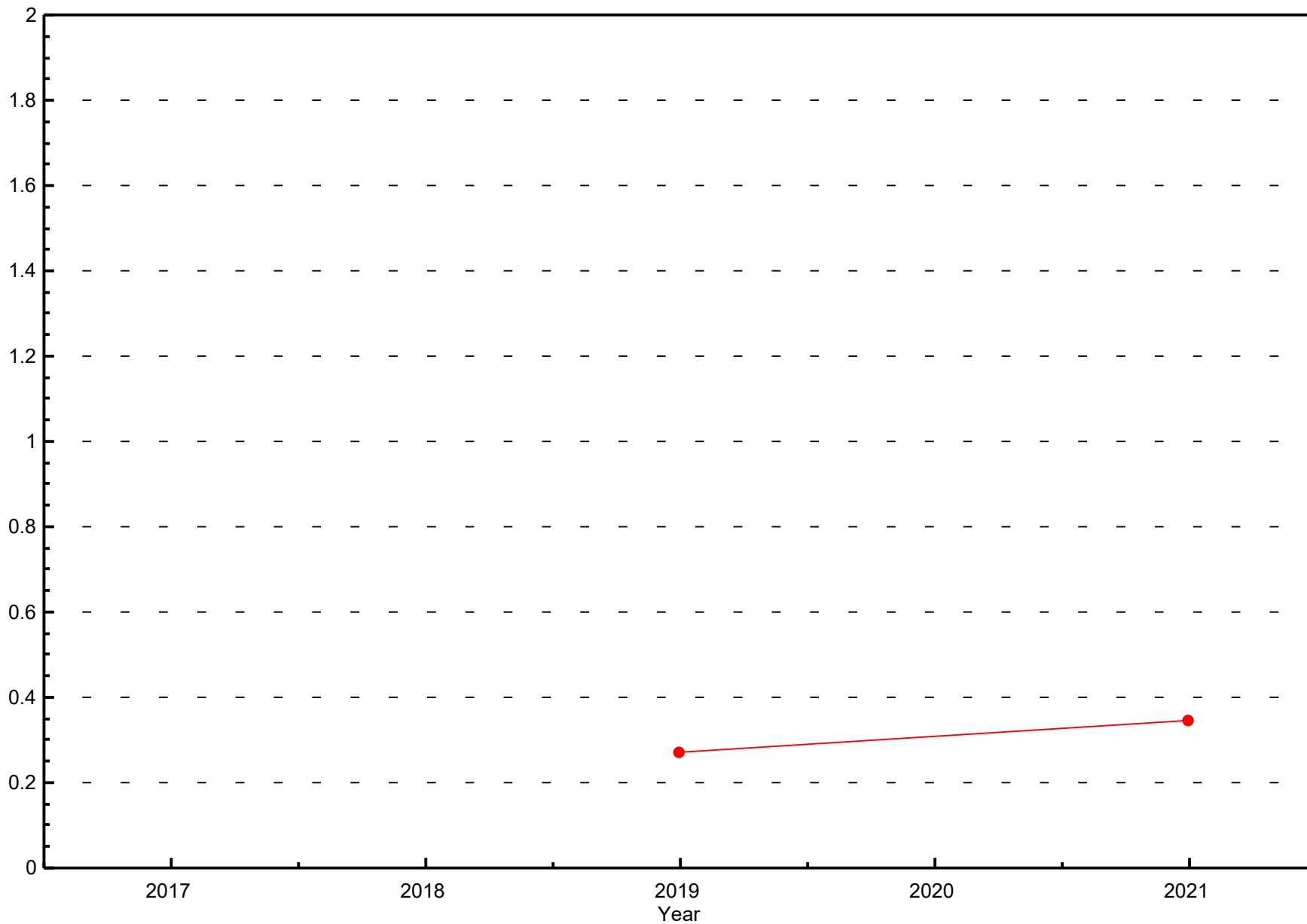
Hydrogen Sulphide (H₂S) - ppb
Jackfish 1 (2017 to 2021)





Yearly Averages

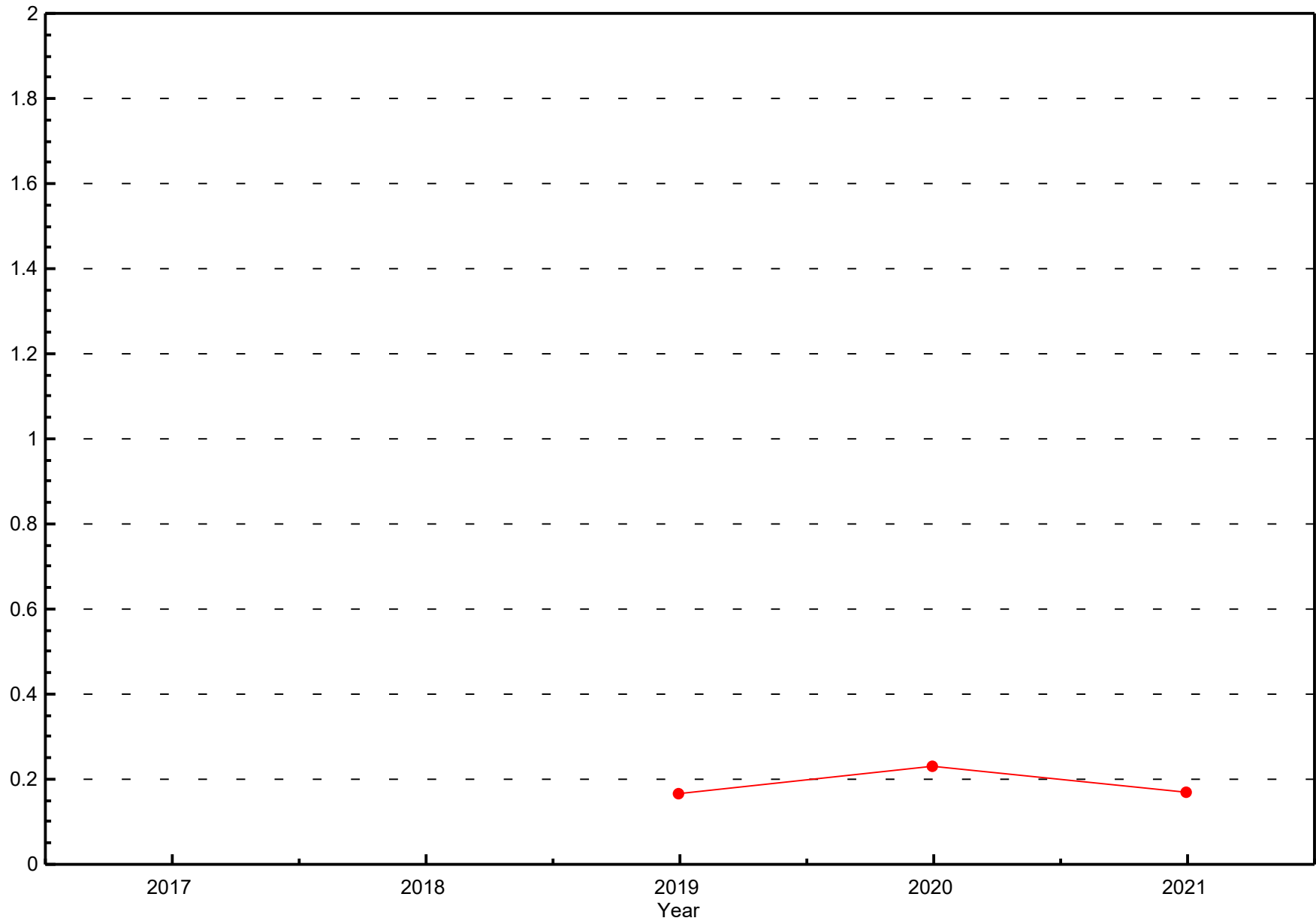
Hydrogen Sulphide (H₂S) - ppb
Kirby South (2017 to 2021)





Yearly Averages

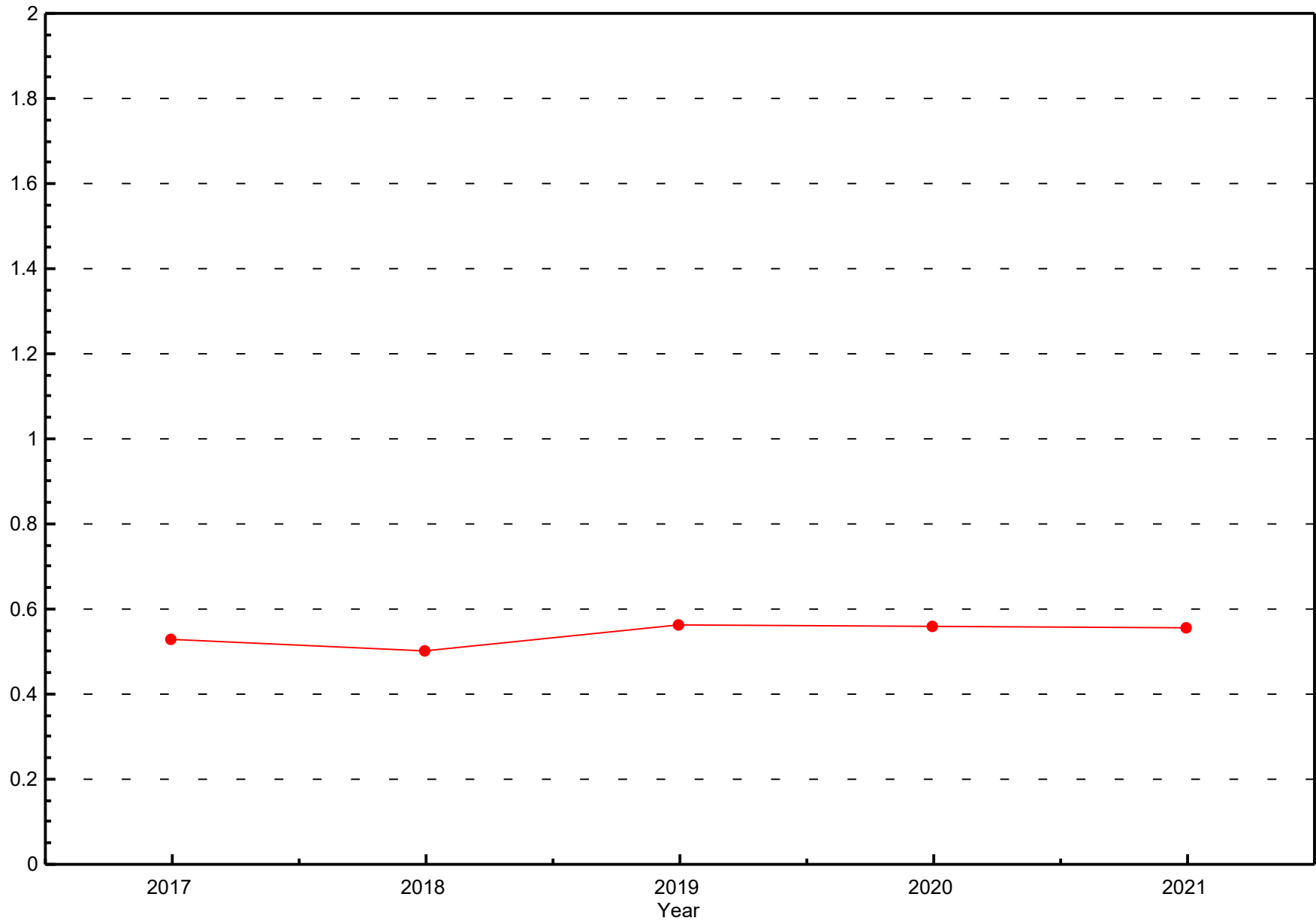
Hydrogen Sulphide (H₂S) - ppb
Kirby North (2017 to 2021)





Yearly Averages

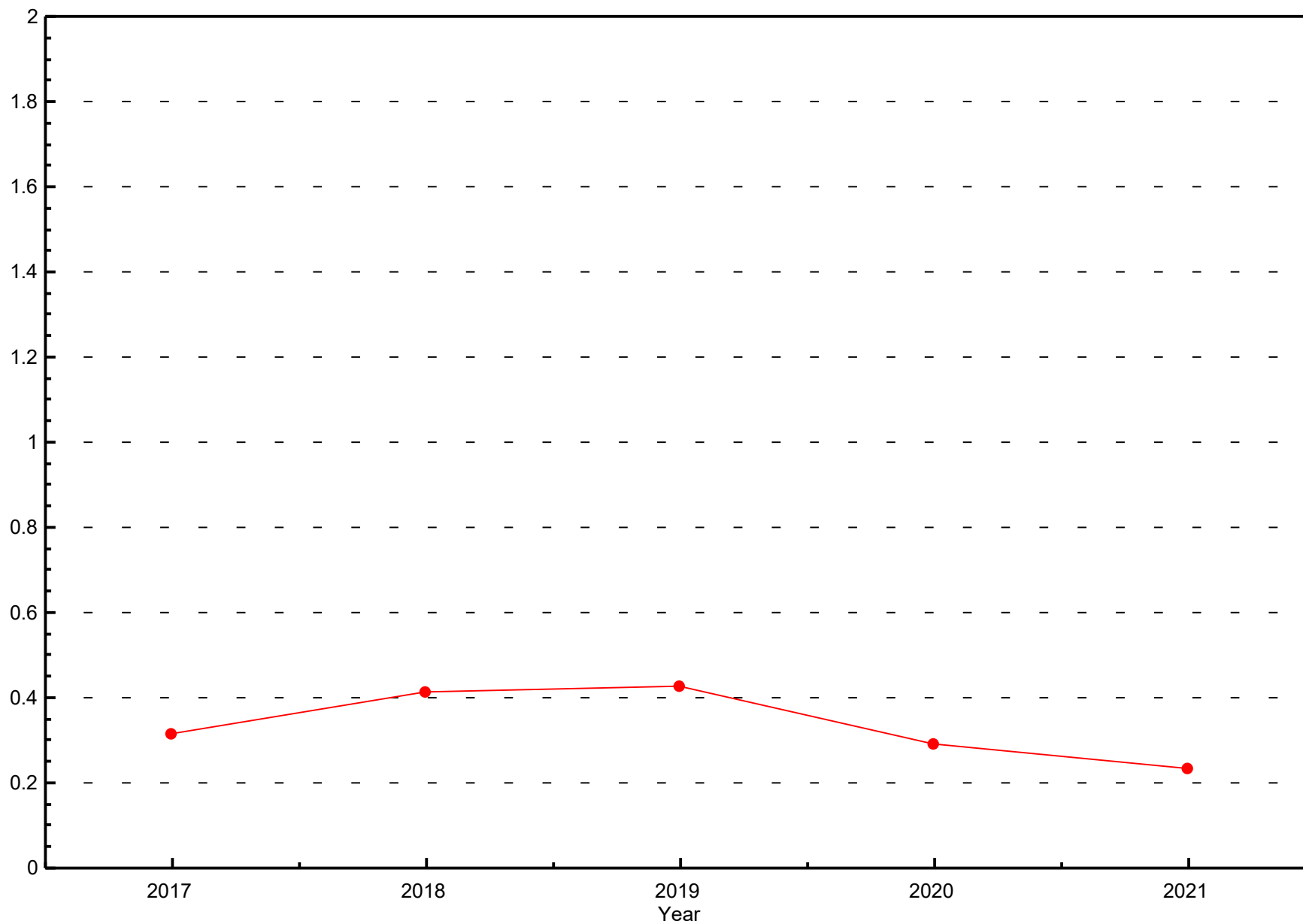
Total Reduced Sulphur (TRS) - ppb
Fort McKay - Bertha Ganter (2017 to 2021)





Yearly Averages

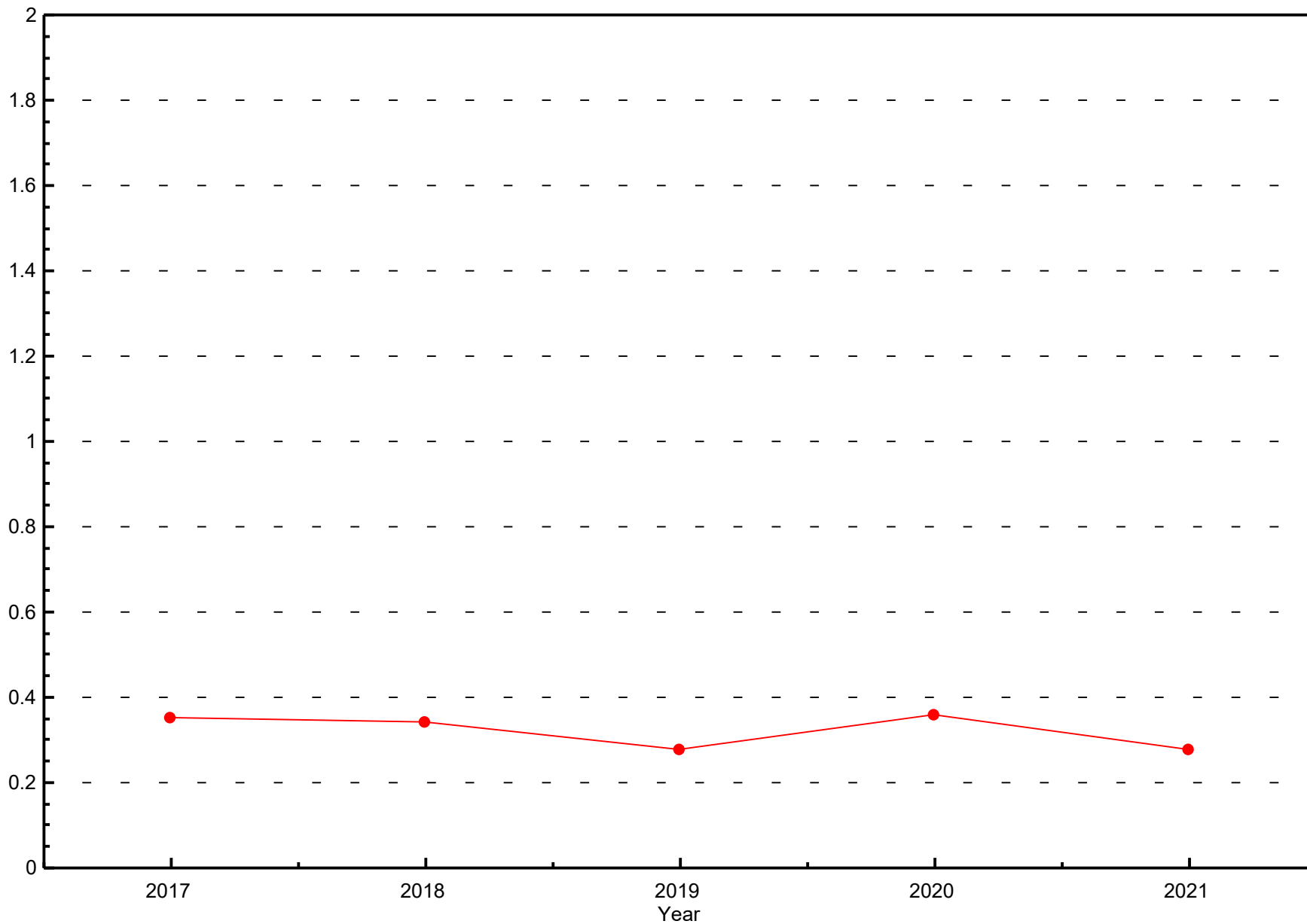
Total Reduced Sulphur (TRS) - ppb
Patricia McInnes (2017 to 2021)





Yearly Averages

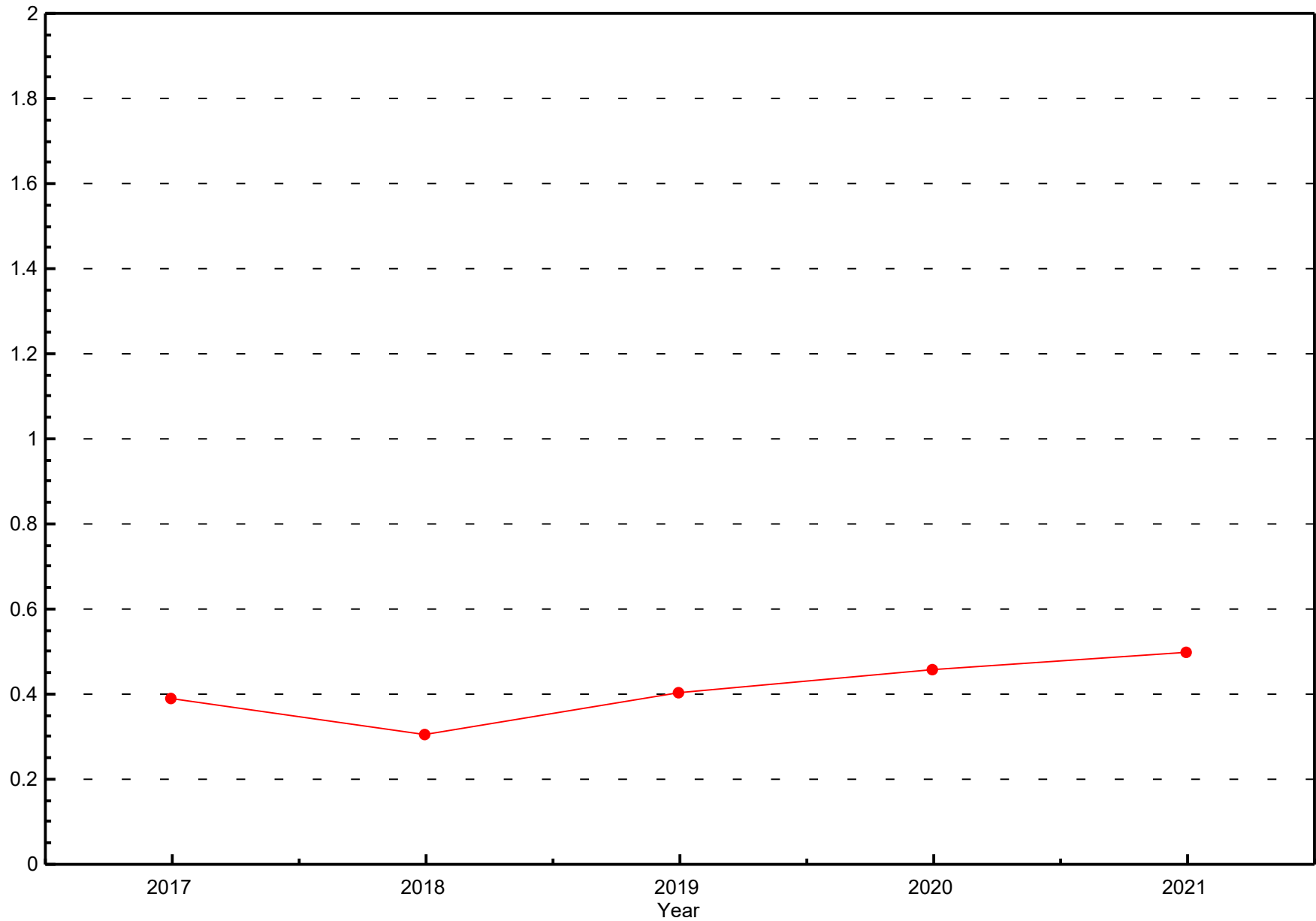
Total Reduced Sulphur (TRS) - ppb
Athabasca Valley (2017 to 2021)





Yearly Averages

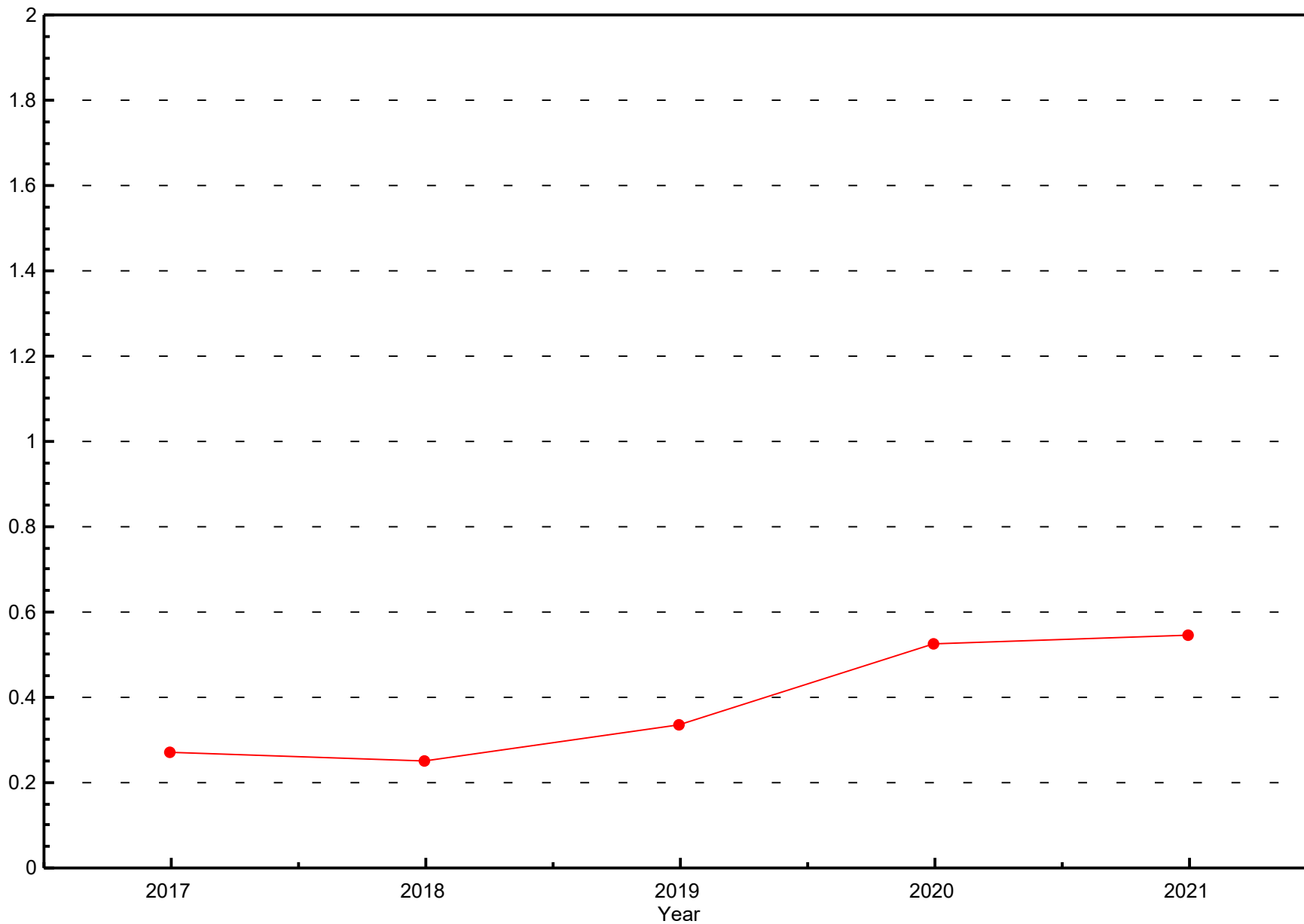
Total Reduced Sulphur (TRS) - ppb
Barge Landing (2017 to 2021)





Yearly Averages

Total Reduced Sulphur (TRS) - ppb
Fort McKay South (2017 to 2021)

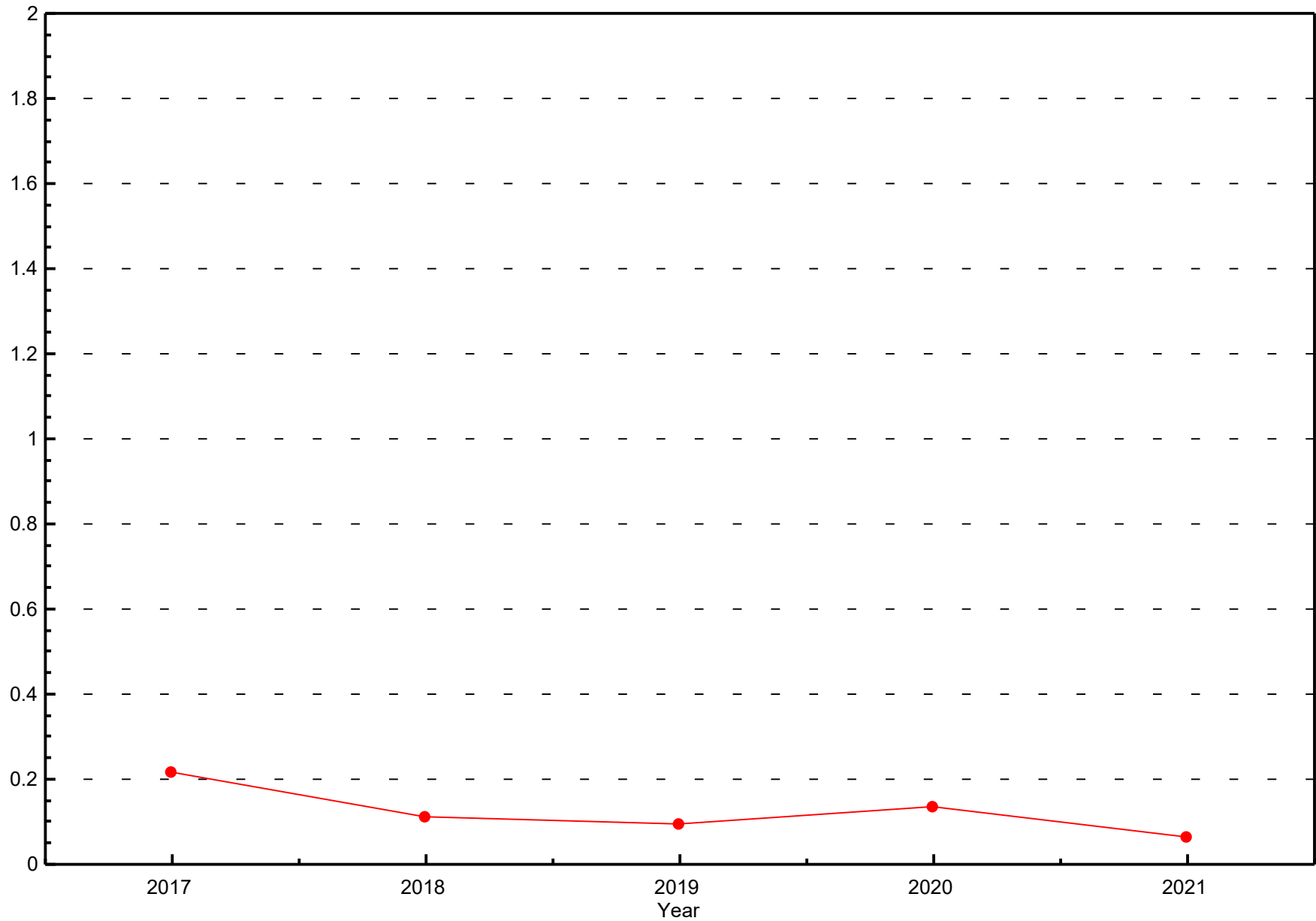




Yearly Averages

Total Reduced Sulphur (TRS) - ppb

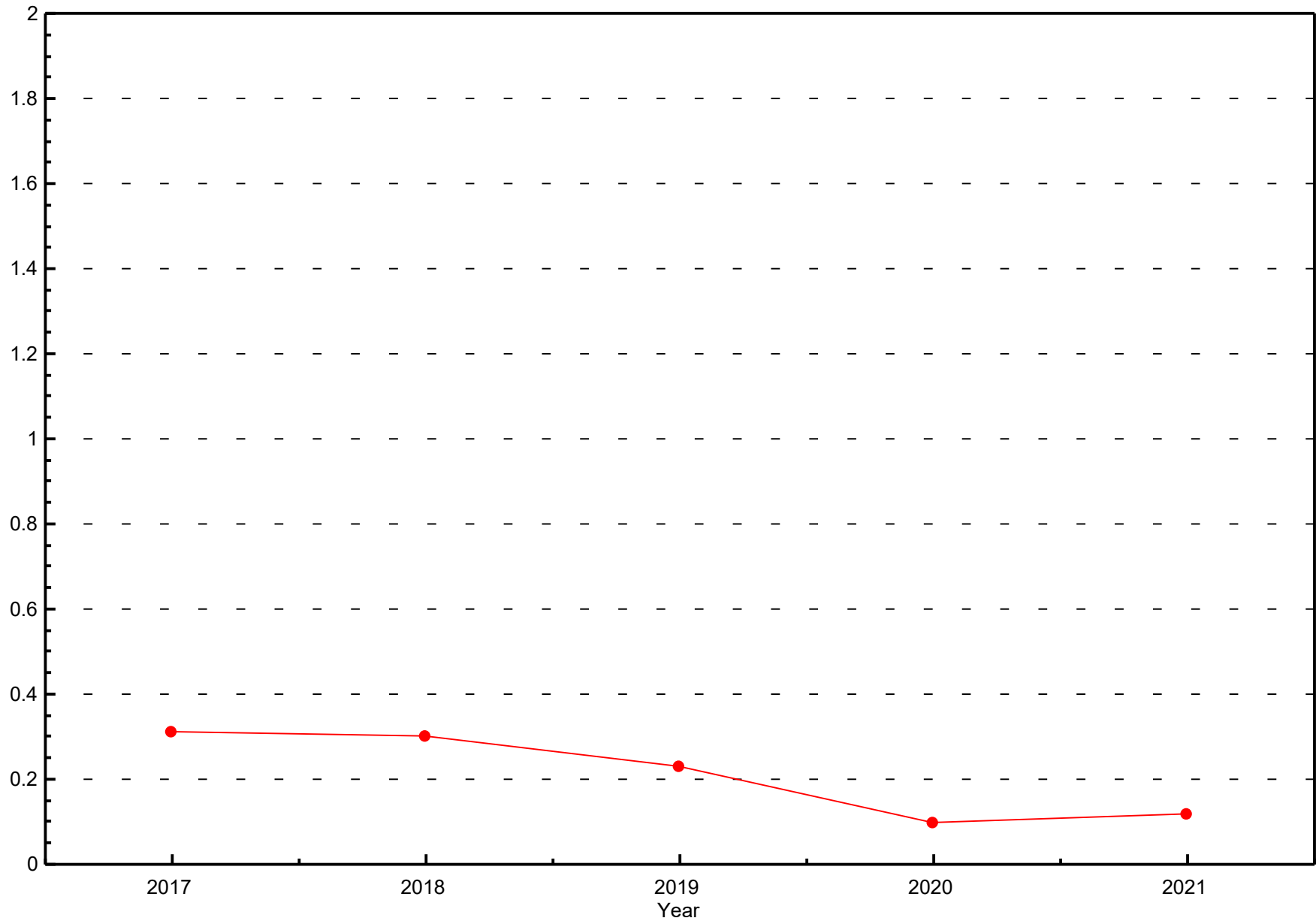
Anzac (2017 to 2021)





Yearly Averages

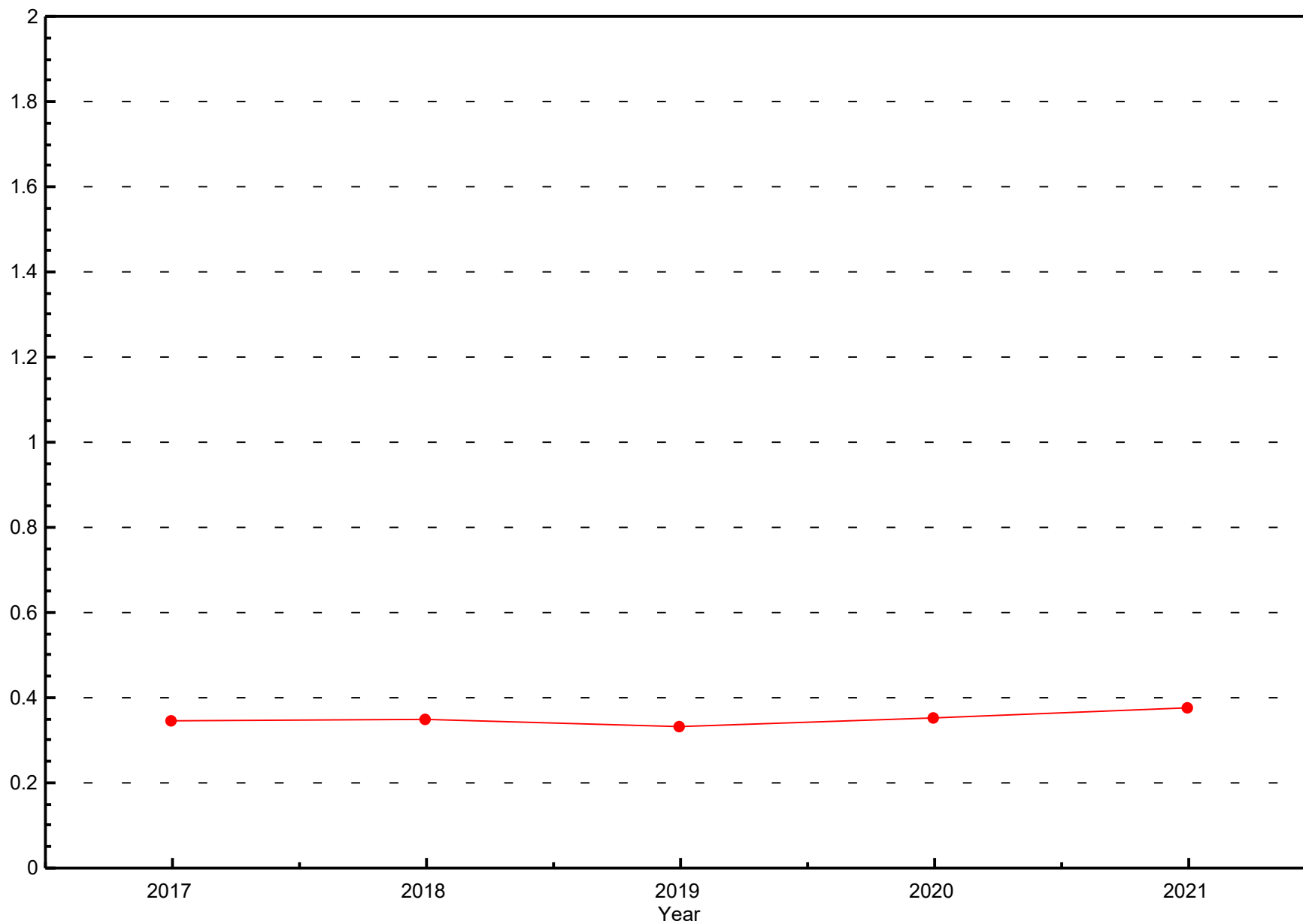
Total Reduced Sulphur (TRS) - ppb
Stony Mountain (2017 to 2021)





Yearly Averages

Total Reduced Sulphur (TRS) - ppb
Conklin (2017 to 2021)

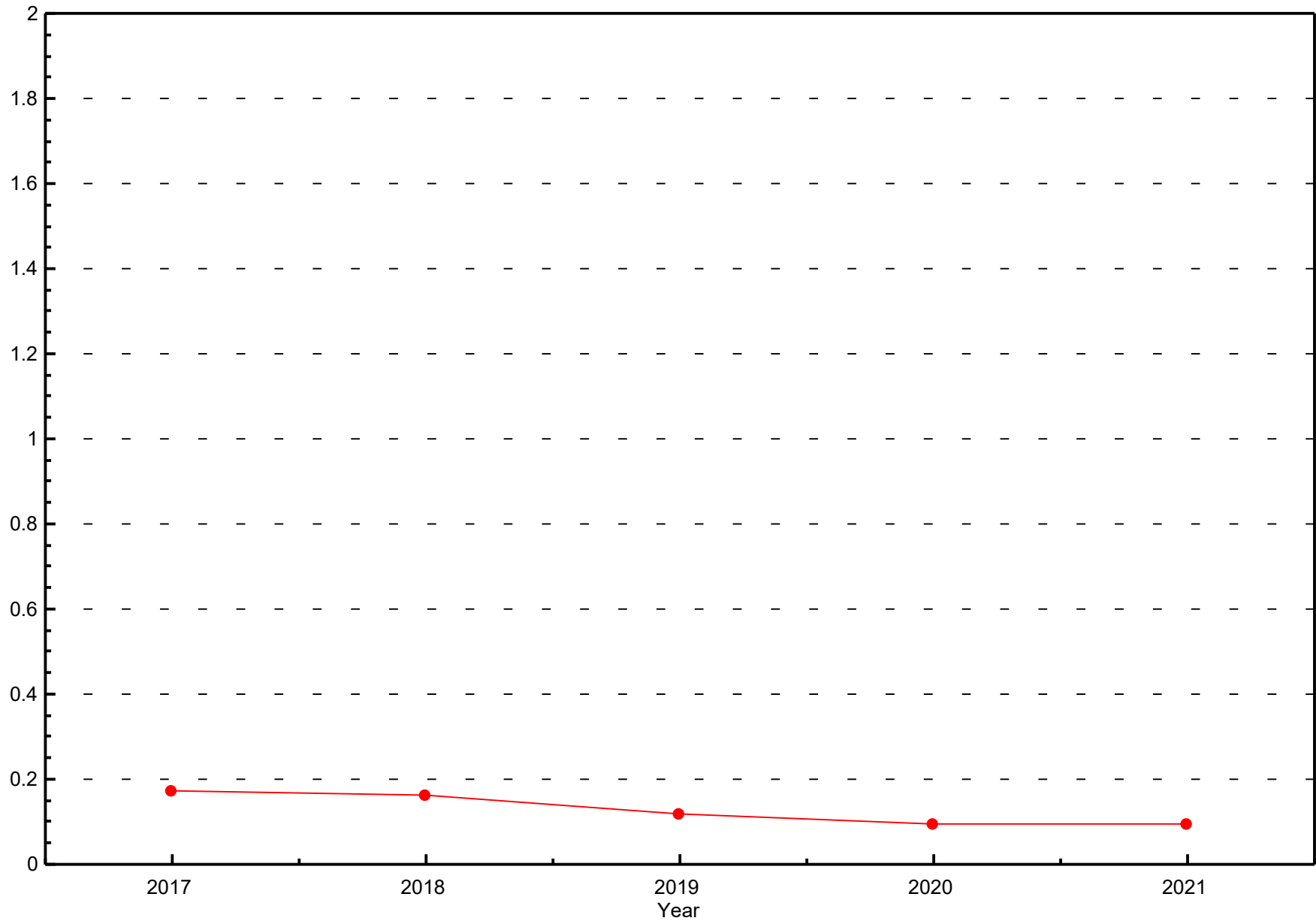




Yearly Averages

Total Reduced Sulphur (TRS) - ppb

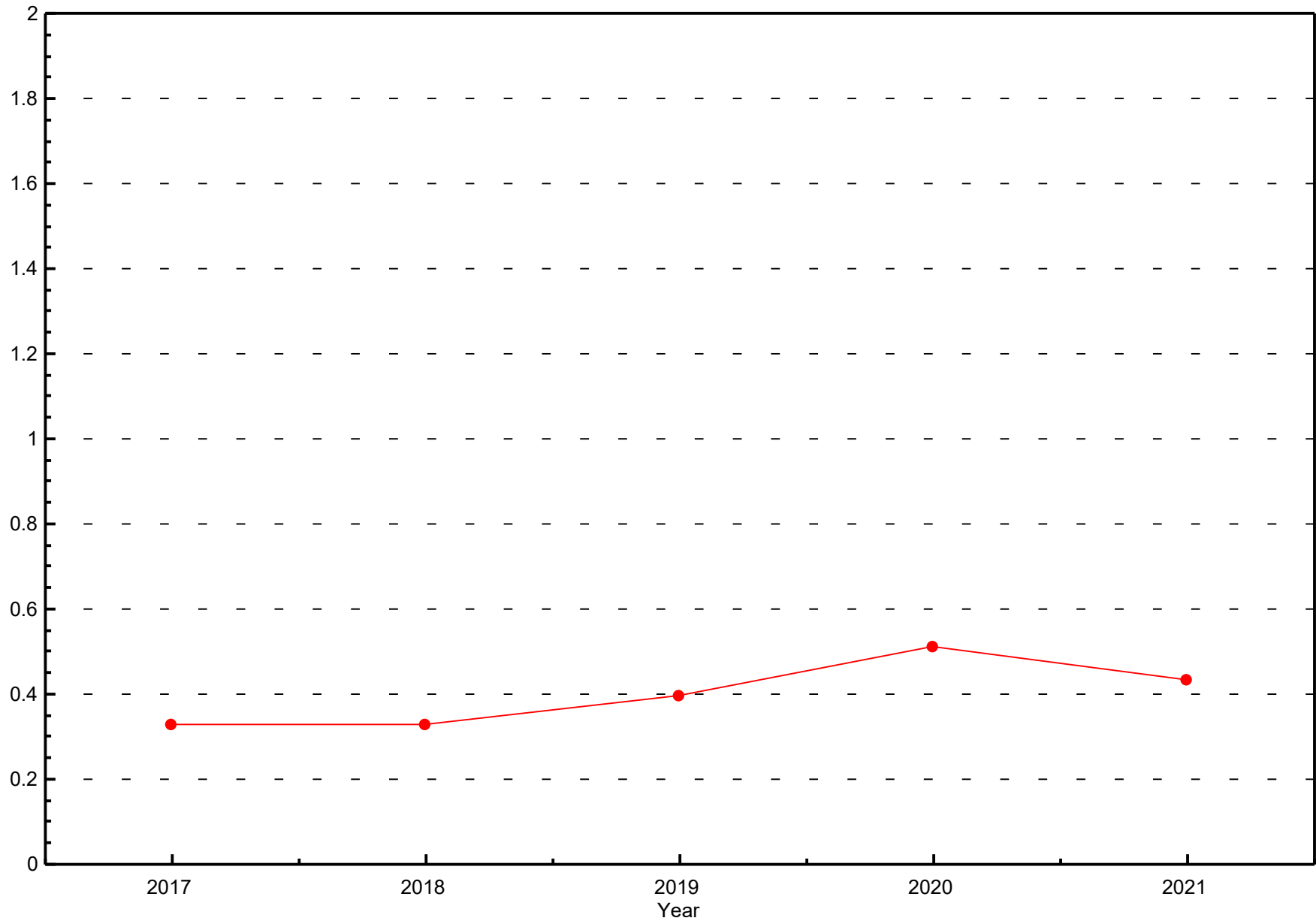
Janvier (2017 to 2021)





Yearly Averages

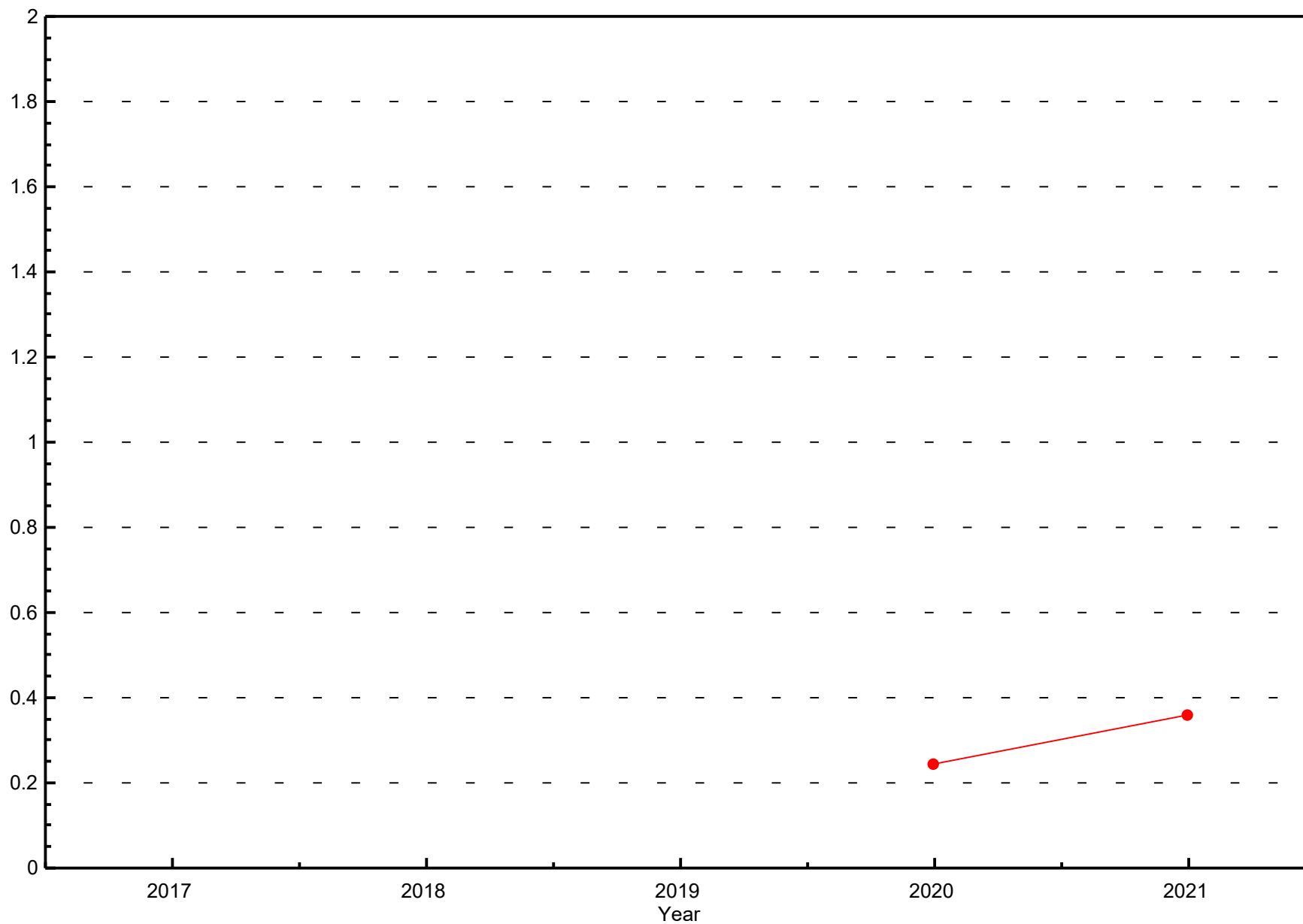
Total Reduced Sulphur (TRS) - ppb
Fort Hills (2017 to 2021)





Yearly Averages

Total Reduced Sulphur (TRS) - ppb
Ells River (2017 to 2021)





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

TOTAL REDUCED SULPHUR ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Total Reduced Sulphur (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding	Maximum 24-Hour Value	Number of Values Exceeding	% of Data in Each Concentration Range			
					1-Hour Objective		24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	706	0.8	3.2	0	1.9	0	100.0	0.0	0.0	0.0
February	100	639	0.6	2.0	0	1.0	0	100.0	0.0	0.0	0.0
March	100	708	0.6	2.3	0	0.9	0	100.0	0.0	0.0	0.0
April	100	685	0.5	2.0	0	1.0	0	100.0	0.0	0.0	0.0
May	99	703	0.5	2.7	0	0.8	0	100.0	0.0	0.0	0.0
June	100	684	0.6	2.1	0	1.0	0	100.0	0.0	0.0	0.0
July	100	707	0.6	2.7	0	1.2	0	100.0	0.0	0.0	0.0
August	97	690	0.5	4.1	0	1.3	0	99.9	0.1	0.0	0.0
September	100	685	0.4	2.9	0	0.7	0	100.0	0.0	0.0	0.0
October	99	704	0.4	3.4	0	0.6	0	100.0	0.0	0.0	0.0
November	100	684	0.5	2.3	0	1.0	0	100.0	0.0	0.0	0.0
December	97	682	0.6	2.1	0	1.0	0	100.0	0.0	0.0	0.0
Annual	99	8277	0.6	4.1	0	1.9	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Patricia McInnes (AMS06)
Annual Summary for the Year 2021
Total Reduced Sulphur (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding	Maximum 24-Hour Value	Number of Values Exceeding	% of Data in Each Concentration Range			
					1-Hour Objective		24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	99	704	0.3	1.4	0	0.6	0	100.0	0.0	0.0	0.0
February	100	638	0.3	1.3	0	0.6	0	100.0	0.0	0.0	0.0
March	100	708	0.2	1.2	0	0.7	0	100.0	0.0	0.0	0.0
April	99	679	0.2	0.7	0	0.3	0	100.0	0.0	0.0	0.0
May	100	706	0.2	0.9	0	0.4	0	100.0	0.0	0.0	0.0
June	99	677	0.2	0.7	0	0.3	0	100.0	0.0	0.0	0.0
July	100	706	0.3	1.0	0	0.4	0	100.0	0.0	0.0	0.0
August	100	707	0.2	1.5	0	0.5	0	100.0	0.0	0.0	0.0
September	100	683	0.2	0.7	0	0.4	0	100.0	0.0	0.0	0.0
October	100	707	0.2	0.8	0	0.3	0	100.0	0.0	0.0	0.0
November	100	681	0.2	1.0	0	0.4	0	100.0	0.0	0.0	0.0
December	100	706	0.3	0.8	0	0.5	0	100.0	0.0	0.0	0.0
Annual	100	8302	0.2	1.5	0	0.7	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)
Annual Summary for the Year 2021
Total Reduced Sulphur (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding	Maximum 24-Hour Value	Number of Values Exceeding	% of Data in Each Concentration Range			
					1-Hour Objective		24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	707	0.5	2.4	0	1.1	0	100.0	0.0	0.0	0.0
February	100	639	0.5	3.4	0	1.0	0	100.0	0.0	0.0	0.0
March	97	686	0.3	3.3	0	1.2	0	100.0	0.0	0.0	0.0
April	99	679	0.2	0.6	0	0.3	0	100.0	0.0	0.0	0.0
May	99	700	0.2	0.8	0	0.3	0	100.0	0.0	0.0	0.0
June	100	684	0.2	1.1	0	0.4	0	100.0	0.0	0.0	0.0
July	99	697	0.2	0.8	0	0.4	0	100.0	0.0	0.0	0.0
August	98	685	0.3	5.5	0	1.6	0	99.7	0.3	0.0	0.0
September	100	686	0.3	4.5	0	1.8	0	99.4	0.6	0.0	0.0
October	99	701	0.2	1.5	0	0.5	0	100.0	0.0	0.0	0.0
November	100	684	0.2	1.3	0	0.5	0	100.0	0.0	0.0	0.0
December	100	707	0.2	1.0	0	0.5	0	100.0	0.0	0.0	0.0
Annual	99	8255	0.3	5.5	0	1.8	0	99.9	0.1	0.0	0.0



Wood Buffalo Environmental Association - Barge Landing (AMS09)
Annual Summary for the Year 2021
Total Reduced Sulphur (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range			
								0 - 3	4 - 10	11 - 50	> 50
January	99	705	0.8	3.3	0	1.6	0	100.0	0.0	0.0	0.0
February	100	639	0.7	2.4	0	1.4	0	100.0	0.0	0.0	0.0
March	99	703	0.6	2.8	0	1.3	0	100.0	0.0	0.0	0.0
April	100	685	0.6	2.3	0	1.0	0	100.0	0.0	0.0	0.0
May	90	633	0.5	2.3	0	0.7	0	100.0	0.0	0.0	0.0
June	99	681	0.4	2.0	0	0.7	0	100.0	0.0	0.0	0.0
July	100	708	0.4	1.7	0	0.7	0	100.0	0.0	0.0	0.0
August	86	609	0.3	2.2	0	0.8	0	100.0	0.0	0.0	0.0
September	99	682	0.3	2.7	0	0.7	0	100.0	0.0	0.0	0.0
October	100	708	0.4	2.4	0	0.7	0	100.0	0.0	0.0	0.0
November	100	685	0.4	2.1	0	1.0	0	100.0	0.0	0.0	0.0
December	100	709	0.5	1.8	0	0.9	0	100.0	0.0	0.0	0.0
Annual	98	8147	0.5	3.3	0	1.6	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Fort McKay South (AMS13)
Annual Summary for the Year 2021
Total Reduced Sulphur (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range			
								0 - 3	4 - 10	11 - 50	> 50
January	100	709	0.7	2.9	0	1.5	0	100.0	0.0	0.0	0.0
February	100	639	0.6	2.7	0	1.1	0	100.0	0.0	0.0	0.0
March	100	709	0.5	2.0	0	0.8	0	100.0	0.0	0.0	0.0
April	100	684	0.5	3.5	0	1.1	0	99.9	0.2	0.0	0.0
May	99	705	0.5	3.0	0	0.8	0	100.0	0.0	0.0	0.0
June	100	684	0.7	3.2	0	1.1	0	100.0	0.0	0.0	0.0
July	100	708	0.6	3.3	0	1.2	0	100.0	0.0	0.0	0.0
August	100	706	0.5	3.5	0	1.2	0	99.9	0.1	0.0	0.0
September	100	683	0.4	1.6	0	0.6	0	100.0	0.0	0.0	0.0
October	100	706	0.5	2.9	0	0.8	0	100.0	0.0	0.0	0.0
November	100	685	0.5	1.6	0	0.9	0	100.0	0.0	0.0	0.0
December	100	708	0.6	3.1	0	1.1	0	100.0	0.0	0.0	0.0
Annual	100	8326	0.5	3.5	0	1.5	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Anzac (AMS14)
Annual Summary for the Year 2021
Total Reduced Sulphur (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding	Maximum 24-Hour Value	Number of Values Exceeding	% of Data in Each Concentration Range			
					1-Hour Objective		24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	710	0.1	1.0	0	0.3	0	100.0	0.0	0.0	0.0
February	100	636	0.1	0.4	0	0.2	0	100.0	0.0	0.0	0.0
March	100	709	0.0	1.2	0	0.1	0	100.0	0.0	0.0	0.0
April	100	685	0.0	0.9	0	0.1	0	100.0	0.0	0.0	0.0
May	100	707	0.0	3.1	0	0.2	0	100.0	0.0	0.0	0.0
June	100	685	0.1	2.3	0	0.2	0	100.0	0.0	0.0	0.0
July	100	707	0.1	1.9	0	0.3	0	100.0	0.0	0.0	0.0
August	100	707	0.0	1.8	0	0.1	0	100.0	0.0	0.0	0.0
September	100	685	0.0	0.3	0	0.1	0	100.0	0.0	0.0	0.0
October	99	699	0.0	1.8	0	0.1	0	100.0	0.0	0.0	0.0
November	99	681	0.1	0.3	0	0.1	0	100.0	0.0	0.0	0.0
December	100	706	0.2	3.2	0	0.3	0	100.0	0.0	0.0	0.0
Annual	100	8317	0.1	3.2	0	0.3	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Total Reduced Sulphur (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Number of Values		Number of Values		% of Data in Each Concentration Range			
				Maximum 1-Hour Value	Exceeding 1-Hour Objective	Maximum 24-Hour Value	Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	708	0.1	0.4	0	0.2	0	100.0	0.0	0.0	0.0
February	100	636	0.1	0.7	0	0.2	0	100.0	0.0	0.0	0.0
March	100	709	0.1	0.3	0	0.1	0	100.0	0.0	0.0	0.0
April	100	684	0.1	0.3	0	0.1	0	100.0	0.0	0.0	0.0
May	100	707	0.1	0.3	0	0.1	0	100.0	0.0	0.0	0.0
June	97	662	0.1	0.6	0	0.2	0	100.0	0.0	0.0	0.0
July	95	670	0.1	0.4	0	0.3	0	100.0	0.0	0.0	0.0
August	99	697	0.1	0.6	0	0.2	0	100.0	0.0	0.0	0.0
September	99	678	0.1	0.4	0	0.2	0	100.0	0.0	0.0	0.0
October	94	662	0.1	0.3	0	0.2	0	100.0	0.0	0.0	0.0
November	99	679	0.2	0.6	0	0.3	0	100.0	0.0	0.0	0.0
December	77	544	0.2	0.5	0	0.3	0	100.0	0.0	0.0	0.0
Annual	97	8036	0.1	0.7	0	0.3	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Conklin (AMS21)
Annual Summary for the Year 2021
Total Reduced Sulphur (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range			
					Objective		Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	708	0.4	0.8	0	0.4	0	100.0	0.0	0.0	0.0
February	100	639	0.4	0.8	0	0.5	0	100.0	0.0	0.0	0.0
March	100	708	0.4	0.6	0	0.4	0	100.0	0.0	0.0	0.0
April	100	685	0.4	0.9	0	0.4	0	100.0	0.0	0.0	0.0
May	100	706	0.4	0.7	0	0.5	0	100.0	0.0	0.0	0.0
June	100	684	0.4	1.7	0	0.6	0	100.0	0.0	0.0	0.0
July	100	708	0.4	1.0	0	0.7	0	100.0	0.0	0.0	0.0
August	100	709	0.4	0.9	0	0.5	0	100.0	0.0	0.0	0.0
September	99	681	0.3	0.7	0	0.4	0	100.0	0.0	0.0	0.0
October	100	707	0.3	1.5	0	0.4	0	100.0	0.0	0.0	0.0
November	100	685	0.3	0.6	0	0.4	0	100.0	0.0	0.0	0.0
December	100	707	0.4	0.6	0	0.4	0	100.0	0.0	0.0	0.0
Annual	100	8327	0.4	1.7	0	0.7	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Janvier (AMS22)
Annual Summary for the Year 2021
Total Reduced Sulphur (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range			
					Objective		Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	707	0.1	0.3	0	0.2	0	100.0	0.0	0.0	0.0
February	97	619	0.1	0.3	0	0.2	0	100.0	0.0	0.0	0.0
March	97	688	0.1	0.3	0	0.1	0	100.0	0.0	0.0	0.0
April	94	638	0.1	0.5	0	0.1	0	100.0	0.0	0.0	0.0
May	100	707	0.0	0.2	0	0.1	0	100.0	0.0	0.0	0.0
June	99	678	0.1	0.2	0	0.1	0	100.0	0.0	0.0	0.0
July	99	694	0.1	0.3	0	0.2	0	100.0	0.0	0.0	0.0
August	97	680	0.1	0.3	0	0.1	0	100.0	0.0	0.0	0.0
September	100	682	0.1	0.2	0	0.1	0	100.0	0.0	0.0	0.0
October	100	706	0.1	0.3	0	0.2	0	100.0	0.0	0.0	0.0
November	100	684	0.1	0.5	0	0.2	0	100.0	0.0	0.0	0.0
December	100	708	0.2	0.5	0	0.3	0	100.0	0.0	0.0	0.0
Annual	98	8191	0.1	0.5	0	0.3	0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Fort Hills (AMS23)
Annual Summary for the Year 2021
Total Reduced Sulphur (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range			
					Objective		Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	710	0.6	7.2	0	1.4	0	98.9	1.1	0.0	0.0
February	100	640	0.6	4.8	0	1.4	0	99.4	0.6	0.0	0.0
March	100	708	0.4	9.2	0	1.1	0	99.4	0.6	0.0	0.0
April	99	678	0.4	10.6	1	1.0	0	99.9	0.0	0.2	0.0
May	100	708	0.3	3.9	0	0.6	0	99.9	0.1	0.0	0.0
June	100	684	0.5	6.5	0	0.9	0	99.7	0.3	0.0	0.0
July	100	708	0.5	10.5	1	1.2	0	99.6	0.4	0.0	0.0
August	100	708	0.4	6.8	0	1.0	0	99.3	0.7	0.0	0.0
September	100	684	0.4	3.8	0	0.8	0	99.9	0.2	0.0	0.0
October	100	708	0.3	1.7	0	0.6	0	100.0	0.0	0.0	0.0
November	100	682	0.3	1.7	0	0.6	0	100.0	0.0	0.0	0.0
December	94	659	0.5	3.2	0	1.1	0	100.0	0.0	0.0	0.0
Annual	99	8277	0.4	10.6	2	1.4	0	99.6	0.4	0.0	0.0



Wood Buffalo Environmental Association - Ells River (AMS30)
Annual Summary for the Year 2021
Total Reduced Sulphur (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values	Maximum 24-Hour Value	Number of Values	% of Data in Each Concentration Range			
					Exceeding 1-Hour Objective		Exceeding 24-Hour Objective	0 - 3	4 - 10	11 - 50	> 50
January	100	707	0.4	2.3	0	0.7	0	100.0	0.0	0.0	0.0
February	96	615	0.3	2.2	0	0.7	0	100.0	0.0	0.0	0.0
March	100	706	0.3	1.2	0	0.5	0	100.0	0.0	0.0	0.0
April	100	684	0.2	1.8	0	0.6	0	100.0	0.0	0.0	0.0
May	99	705	0.2	1.5	0	0.4	0	100.0	0.0	0.0	0.0
June	99	678	0.3	3.3	0	0.7	0	100.0	0.0	0.0	0.0
July	95	671	0.4	4.0	0	0.8	0	99.9	0.2	0.0	0.0
August	99	702	0.4	2.0	0	0.7	0	100.0	0.0	0.0	0.0
September	100	686	0.4	1.6	0	0.7	0	100.0	0.0	0.0	0.0
October	100	709	0.4	1.4	0	0.6	0	100.0	0.0	0.0	0.0
November	100	686	0.4	1.7	0	0.7	0	100.0	0.0	0.0	0.0
December	100	708	0.5	1.5	0	0.7	0	100.0	0.0	0.0	0.0
Annual	99	8257	0.4	4.0	0	0.8	0	100.0	0.0	0.0	0.0



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM ANNUAL REPORT

NITRIC OXIDE ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	8.0	119.0	29.3	95.8	4.0	0.3	0.0
February	100	639	5.0	72.3	26.2	97.7	2.4	0.0	0.0
March	100	707	3.0	63.0	17.9	99.3	0.7	0.0	0.0
April	100	684	1.4	34.8	4.7	100.0	0.0	0.0	0.0
May	99	701	0.9	20.8	3.4	100.0	0.0	0.0	0.0
June	100	683	1.0	30.3	3.6	100.0	0.0	0.0	0.0
July	100	706	1.1	36.1	4.3	100.0	0.0	0.0	0.0
August	100	708	1.8	118.0	11.5	99.4	0.1	0.4	0.0
September	100	682	2.1	108.1	17.8	99.3	0.4	0.3	0.0
October	99	703	2.1	53.8	9.1	99.7	0.3	0.0	0.0
November	100	684	6.0	99.2	21.0	96.9	2.5	0.6	0.0
December	100	706	6.8	92.8	31.2	95.5	4.3	0.3	0.0
Annual	100	8310	3.3	119.0	31.2	98.6	1.2	0.2	0.0



Wood Buffalo Environmental Association - Buffalo Viewpoint (AMS04)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	97	684	2.5	71.5	14.3	99.3	0.7	0.0	0.0
February	99	632	2.8	86.3	13.1	99.1	0.8	0.2	0.0
March	100	706	1.3	67.2	8.0	99.9	0.1	0.0	0.0
April	99	680	1.6	69.7	11.9	99.4	0.6	0.0	0.0
May	99	679	0.9	86.0	7.8	99.7	0.2	0.2	0.0
June	97	656	0.7	26.2	3.3	100.0	0.0	0.0	0.0
July	100	707	0.4	31.4	2.8	100.0	0.0	0.0	0.0
August	100	706	1.0	67.3	10.3	99.7	0.3	0.0	0.0
September	100	685	0.8	34.4	5.5	100.0	0.0	0.0	0.0
October	100	707	0.9	91.7	11.8	99.7	0.0	0.3	0.0
November	100	684	2.0	71.7	16.3	98.8	1.2	0.0	0.0
December	100	707	4.2	91.6	16.0	97.6	2.1	0.3	0.0
Annual	99	8233	1.6	91.7	16.3	99.5	0.5	0.1	0.0



Wood Buffalo Environmental Association - Patricia McInnes (AMS06)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	5.4	54.5	17.2	98.9	1.1	0.0	0.0
February	100	638	3.5	39.0	10.2	100.0	0.0	0.0	0.0
March	100	708	1.9	47.0	9.7	99.9	0.1	0.0	0.0
April	100	683	1.1	35.1	4.5	100.0	0.0	0.0	0.0
May	100	705	0.7	17.4	3.3	100.0	0.0	0.0	0.0
June	99	681	0.5	12.3	1.8	100.0	0.0	0.0	0.0
July	100	707	0.6	11.0	1.7	100.0	0.0	0.0	0.0
August	100	708	0.7	12.6	2.8	100.0	0.0	0.0	0.0
September	100	684	0.9	20.2	3.3	100.0	0.0	0.0	0.0
October	100	707	1.4	33.1	6.2	100.0	0.0	0.0	0.0
November	99	680	3.1	59.6	13.2	99.1	0.9	0.0	0.0
December	100	707	3.7	77.4	13.2	98.9	1.1	0.0	0.0
Annual	100	8315	2.0	77.4	17.2	99.7	0.3	0.0	0.0



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	708	6.0	58.6	18.6	98.5	1.6	0.0	0.0
February	100	638	3.5	39.7	8.9	100.0	0.0	0.0	0.0
March	100	705	2.7	38.7	9.4	100.0	0.0	0.0	0.0
April	100	682	1.6	18.9	3.8	100.0	0.0	0.0	0.0
May	99	701	0.6	13.4	2.4	100.0	0.0	0.0	0.0
June	100	683	0.9	17.0	2.9	100.0	0.0	0.0	0.0
July	100	707	0.9	13.0	2.7	100.0	0.0	0.0	0.0
August	97	685	1.1	18.1	4.5	100.0	0.0	0.0	0.0
September	100	684	2.0	28.6	6.5	100.0	0.0	0.0	0.0
October	99	704	3.3	44.8	12.5	99.7	0.3	0.0	0.0
November	100	682	5.5	91.8	25.3	98.1	1.8	0.2	0.0
December	100	708	4.7	60.4	14.2	99.7	0.3	0.0	0.0
Annual	100	8287	2.7	91.8	25.3	99.7	0.3	0.0	0.0



Wood Buffalo Environmental Association - Fort Chipewyan (AMS08)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	706	0.2	3.8	0.9	100.0	0.0	0.0	0.0
February	100	639	0.2	6.0	1.2	100.0	0.0	0.0	0.0
March	99	704	0.2	6.2	1.0	100.0	0.0	0.0	0.0
April	100	684	0.1	2.3	0.4	100.0	0.0	0.0	0.0
May	100	706	0.1	1.2	0.4	100.0	0.0	0.0	0.0
June	100	684	0.1	3.7	0.4	100.0	0.0	0.0	0.0
July	100	707	0.1	2.9	0.3	100.0	0.0	0.0	0.0
August	100	705	0.1	3.4	0.5	100.0	0.0	0.0	0.0
September	100	681	0.1	2.8	0.5	100.0	0.0	0.0	0.0
October	99	704	0.2	10.2	1.6	100.0	0.0	0.0	0.0
November	99	680	0.2	5.4	1.4	100.0	0.0	0.0	0.0
December	100	707	0.2	6.2	1.5	100.0	0.0	0.0	0.0
Annual	100	8307	0.2	10.2	1.6	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Barge Landing (AMS09)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	704	10.1	141.8	38.2	92.6	6.7	0.7	0.0
February	100	637	8.8	145.8	57.9	94.4	4.7	0.9	0.0
March	99	702	4.4	89.6	22.5	98.3	1.3	0.4	0.0
April	99	677	2.2	90.9	9.6	99.4	0.4	0.2	0.0
May	98	694	0.9	27.4	2.7	100.0	0.0	0.0	0.0
June	99	674	1.1	39.1	4.0	100.0	0.0	0.0	0.0
July	100	704	1.3	45.8	5.5	99.9	0.1	0.0	0.0
August	74	512	2.1	50.8	5.7	99.6	0.4	0.0	0.0
September	100	681	3.7	124.0	30.4	98.2	1.3	0.4	0.0
October	99	701	3.9	76.3	17.8	99.1	0.9	0.0	0.0
November	100	684	8.3	165.0	32.1	95.0	4.1	0.7	0.2
December	100	709	12.0	162.0	61.5	90.1	7.9	1.8	0.1
Annual	97	8079	4.9	165.0	61.5	96.2	3.1	0.7	0.1



Wood Buffalo Environmental Association - Fort McKay South (AMS13)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	708	11.2	175.3	41.6	91.1	7.2	1.6	0.1
February	100	638	6.8	207.9	46.0	96.9	1.4	1.4	0.3
March	100	707	3.9	177.4	36.5	98.2	1.1	0.6	0.1
April	100	683	1.9	67.3	11.6	99.4	0.6	0.0	0.0
May	99	703	1.2	46.5	5.7	99.9	0.1	0.0	0.0
June	100	683	1.8	46.6	6.4	99.7	0.3	0.0	0.0
July	100	705	1.3	53.5	6.3	99.7	0.3	0.0	0.0
August	100	706	2.0	75.1	9.8	98.7	1.3	0.0	0.0
September	100	682	2.5	55.2	11.5	99.6	0.4	0.0	0.0
October	100	703	4.2	84.3	21.5	98.2	1.7	0.1	0.0
November	100	685	8.6	241.6	58.6	95.3	3.4	0.6	0.7
December	100	708	9.9	124.1	37.8	91.1	7.2	1.7	0.0
Annual	100	8311	4.6	241.6	58.6	97.4	2.1	0.5	0.1



Wood Buffalo Environmental Association - Anzac (AMS14)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	0.8	76.8	4.9	99.9	0.1	0.0	0.0
February	99	634	0.8	65.2	4.3	99.8	0.2	0.0	0.0
March	84	593	0.6	43.7	2.2	99.8	0.2	0.0	0.0
April	100	683	0.3	5.2	0.7	100.0	0.0	0.0	0.0
May	96	682	0.3	32.6	0.8	100.0	0.0	0.0	0.0
June	100	685	0.3	5.7	0.7	100.0	0.0	0.0	0.0
July	100	706	0.2	5.8	0.8	100.0	0.0	0.0	0.0
August	100	707	0.3	12.5	1.2	100.0	0.0	0.0	0.0
September	100	684	0.4	12.8	1.8	100.0	0.0	0.0	0.0
October	99	701	0.3	12.0	1.4	100.0	0.0	0.0	0.0
November	99	682	0.5	19.9	3.0	100.0	0.0	0.0	0.0
December	93	644	0.8	45.1	3.6	99.8	0.2	0.0	0.0
Annual	98	8108	0.5	76.8	4.9	100.0	0.1	0.0	0.0



Wood Buffalo Environmental Association - Wapasu (AMS17)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	0.7	32.3	6.8	100.0	0.0	0.0	0.0
February	100	639	0.6	39.8	3.2	100.0	0.0	0.0	0.0
March	100	705	0.4	9.0	1.1	100.0	0.0	0.0	0.0
April	97	663	0.3	7.8	0.9	100.0	0.0	0.0	0.0
May	100	708	0.2	10.5	1.3	100.0	0.0	0.0	0.0
June	100	682	0.5	17.4	1.7	100.0	0.0	0.0	0.0
July	100	707	0.3	7.7	0.9	100.0	0.0	0.0	0.0
August	100	707	0.4	6.5	0.9	100.0	0.0	0.0	0.0
September	98	668	0.5	18.0	3.2	100.0	0.0	0.0	0.0
October	100	707	0.4	20.5	2.4	100.0	0.0	0.0	0.0
November	100	685	0.5	16.1	2.6	100.0	0.0	0.0	0.0
December	100	709	0.5	35.8	2.8	100.0	0.0	0.0	0.0
Annual	99	8287	0.4	39.8	6.8	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	0.1	3.4	0.8	100.0	0.0	0.0	0.0
February	100	638	0.2	10.6	1.1	100.0	0.0	0.0	0.0
March	100	707	0.1	1.4	0.3	100.0	0.0	0.0	0.0
April	100	681	0.1	3.6	0.7	100.0	0.0	0.0	0.0
May	100	707	0.1	0.8	0.2	100.0	0.0	0.0	0.0
June	98	672	0.1	1.0	0.2	100.0	0.0	0.0	0.0
July	95	671	0.2	0.8	0.4	100.0	0.0	0.0	0.0
August	99	700	0.1	0.5	0.3	100.0	0.0	0.0	0.0
September	100	682	0.1	2.2	0.3	100.0	0.0	0.0	0.0
October	100	707	0.1	2.2	0.4	100.0	0.0	0.0	0.0
November	99	680	0.1	3.9	0.5	100.0	0.0	0.0	0.0
December	77	545	0.1	19.4	1.2	100.0	0.0	0.0	0.0
Annual	97	8097	0.1	19.4	1.2	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Firebag (AMS19)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	92	654	1.1	50.7	6.0	99.9	0.2	0.0	0.0
February	100	639	0.9	19.5	4.7	100.0	0.0	0.0	0.0
March	99	704	0.9	36.8	3.6	100.0	0.0	0.0	0.0
April	100	685	0.4	8.1	1.0	100.0	0.0	0.0	0.0
May	100	705	0.2	8.3	1.4	100.0	0.0	0.0	0.0
June	99	677	0.3	4.7	0.6	100.0	0.0	0.0	0.0
July	100	707	0.3	20.2	1.8	100.0	0.0	0.0	0.0
August	100	705	0.4	9.5	2.8	100.0	0.0	0.0	0.0
September	100	685	0.6	39.0	2.9	100.0	0.0	0.0	0.0
October	100	709	0.8	48.8	6.7	99.7	0.3	0.0	0.0
November	100	682	1.6	150.5	8.7	99.9	0.0	0.2	0.0
December	100	708	1.6	39.5	7.9	100.0	0.0	0.0	0.0
Annual	99	8260	0.7	150.5	8.7	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Mackay River (AMS20)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	705	0.6	19.6	4.1	100.0	0.0	0.0	0.0
February	100	639	0.3	14.6	1.6	100.0	0.0	0.0	0.0
March	99	700	0.3	15.4	3.9	100.0	0.0	0.0	0.0
April	100	684	0.2	5.1	0.8	100.0	0.0	0.0	0.0
May	100	706	0.2	8.8	1.3	100.0	0.0	0.0	0.0
June	100	684	0.1	9.0	0.9	100.0	0.0	0.0	0.0
July	100	704	0.1	4.9	0.9	100.0	0.0	0.0	0.0
August	100	708	0.3	10.1	2.7	100.0	0.0	0.0	0.0
September	100	684	0.1	6.8	0.8	100.0	0.0	0.0	0.0
October	100	707	0.1	6.5	1.1	100.0	0.0	0.0	0.0
November	100	681	0.4	42.9	2.8	99.9	0.2	0.0	0.0
December	100	708	0.4	16.4	5.2	100.0	0.0	0.0	0.0
Annual	100	8310	0.3	42.9	5.2	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Conklin (AMS21)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	708	0.5	15.6	1.4	100.0	0.0	0.0	0.0
February	100	639	0.4	15.9	0.8	100.0	0.0	0.0	0.0
March	100	708	0.3	19.4	1.9	100.0	0.0	0.0	0.0
April	100	685	0.2	16.3	0.9	100.0	0.0	0.0	0.0
May	100	708	0.2	8.8	0.5	100.0	0.0	0.0	0.0
June	100	686	0.2	12.5	0.6	100.0	0.0	0.0	0.0
July	100	707	0.2	14.9	1.0	100.0	0.0	0.0	0.0
August	100	707	0.3	13.3	1.7	100.0	0.0	0.0	0.0
September	97	659	0.4	20.4	2.1	100.0	0.0	0.0	0.0
October	100	705	0.4	22.7	1.9	100.0	0.0	0.0	0.0
November	100	685	0.4	11.1	1.4	100.0	0.0	0.0	0.0
December	100	708	0.3	8.4	0.9	100.0	0.0	0.0	0.0
Annual	100	8305	0.3	22.7	2.1	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Janvier (AMS22)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	0.5	9.1	1.7	100.0	0.0	0.0	0.0
February	100	638	0.5	10.4	1.1	100.0	0.0	0.0	0.0
March	100	708	0.3	5.0	0.7	100.0	0.0	0.0	0.0
April	100	683	0.1	5.6	0.9	100.0	0.0	0.0	0.0
May	99	704	0.2	8.0	0.7	100.0	0.0	0.0	0.0
June	99	680	0.3	2.8	0.6	100.0	0.0	0.0	0.0
July	100	705	0.2	2.3	0.4	100.0	0.0	0.0	0.0
August	97	683	0.2	2.6	0.5	100.0	0.0	0.0	0.0
September	97	659	0.3	7.9	0.9	100.0	0.0	0.0	0.0
October	100	707	0.4	9.4	1.1	100.0	0.0	0.0	0.0
November	100	683	0.4	5.5	0.8	100.0	0.0	0.0	0.0
December	100	707	0.4	7.0	1.3	100.0	0.0	0.0	0.0
Annual	99	8264	0.3	10.4	1.7	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Fort Hills (AMS23)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	708	15.1	234.7	81.8	89.4	6.1	3.4	1.1
February	100	639	10.2	197.8	53.3	94.5	4.4	0.9	0.2
March	100	705	5.5	182.0	31.4	97.5	1.6	0.9	0.1
April	98	673	3.9	190.4	21.2	98.2	1.0	0.6	0.2
May	100	706	2.8	67.2	9.0	98.9	1.1	0.0	0.0
June	100	685	2.7	172.0	10.8	99.0	0.9	0.0	0.2
July	100	708	2.2	87.1	8.0	99.4	0.4	0.1	0.0
August	100	708	2.4	90.4	11.0	99.2	0.7	0.1	0.0
September	100	683	5.5	143.5	21.3	96.9	2.5	0.6	0.0
October	100	707	5.5	127.2	17.0	96.9	2.3	0.9	0.0
November	99	680	8.8	181.2	30.4	94.7	2.5	2.5	0.3
December	94	653	12.2	200.0	70.3	90.7	5.8	3.2	0.3
Annual	99	8255	6.3	234.7	81.8	96.2	2.5	1.1	0.2



Wood Buffalo Environmental Association - Christina Lake (AMS26)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	708	2.1	41.3	8.3	99.9	0.1	0.0	0.0
February	100	637	2.1	25.9	4.6	100.0	0.0	0.0	0.0
March	99	700	1.2	36.6	4.7	100.0	0.0	0.0	0.0
April	100	684	1.3	32.5	3.6	100.0	0.0	0.0	0.0
May	100	705	0.4	12.1	2.2	100.0	0.0	0.0	0.0
June	100	684	1.1	11.6	3.5	100.0	0.0	0.0	0.0
July	100	707	1.0	16.9	2.7	100.0	0.0	0.0	0.0
August	100	706	1.5	34.2	6.4	100.0	0.0	0.0	0.0
September	100	684	1.5	28.1	4.7	100.0	0.0	0.0	0.0
October	100	704	2.6	131.4	20.9	98.7	0.9	0.4	0.0
November	100	685	1.4	24.3	3.7	100.0	0.0	0.0	0.0
December	100	704	2.2	44.8	7.4	99.9	0.1	0.0	0.0
Annual	100	8308	1.5	131.4	20.9	99.9	0.1	0.0	0.0



Wood Buffalo Environmental Association - Jackfish 2/3 (AMS27)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	706	0.2	3.5	0.9	100.0	0.0	0.0	0.0
February	100	637	0.2	7.4	0.5	100.0	0.0	0.0	0.0
March	100	705	0.2	1.8	0.4	100.0	0.0	0.0	0.0
April	98	674	0.2	4.4	0.8	100.0	0.0	0.0	0.0
May	100	708	0.1	3.7	0.5	100.0	0.0	0.0	0.0
June	100	685	0.2	2.8	0.6	100.0	0.0	0.0	0.0
July	100	708	0.2	4.3	0.4	100.0	0.0	0.0	0.0
August	97	689	0.2	4.6	0.5	100.0	0.0	0.0	0.0
September	99	680	0.2	3.5	0.8	100.0	0.0	0.0	0.0
October	100	706	0.2	3.5	0.5	100.0	0.0	0.0	0.0
November	100	683	0.2	3.7	0.7	100.0	0.0	0.0	0.0
December	99	703	0.2	2.9	0.7	100.0	0.0	0.0	0.0
Annual	99	8284	0.2	7.4	0.9	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Surrmont 2 (AMS29)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	0.3	10.6	2.2	100.0	0.0	0.0	0.0
February	100	638	0.4	15.2	2.8	100.0	0.0	0.0	0.0
March	100	707	0.2	2.2	0.5	100.0	0.0	0.0	0.0
April	99	680	0.2	3.8	0.7	100.0	0.0	0.0	0.0
May	98	696	0.1	1.8	0.5	100.0	0.0	0.0	0.0
June	100	685	0.2	1.2	0.3	100.0	0.0	0.0	0.0
July	93	651	0.2	1.3	0.3	100.0	0.0	0.0	0.0
August	100	708	0.2	5.3	0.6	100.0	0.0	0.0	0.0
September	100	684	0.2	6.9	0.7	100.0	0.0	0.0	0.0
October	100	706	0.1	4.3	0.6	100.0	0.0	0.0	0.0
November	100	681	0.1	6.9	0.5	100.0	0.0	0.0	0.0
December	100	707	0.2	4.1	0.9	100.0	0.0	0.0	0.0
Annual	99	8250	0.2	15.2	2.8	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Ells River (AMS30)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	5.7	87.3	20.9	96.2	3.4	0.4	0.0
February	100	638	3.8	103.7	24.5	98.9	0.8	0.3	0.0
March	99	703	2.0	71.2	18.9	99.2	0.9	0.0	0.0
April	100	684	1.0	29.0	3.2	100.0	0.0	0.0	0.0
May	99	702	0.9	33.3	2.5	100.0	0.0	0.0	0.0
June	100	684	0.8	25.4	4.3	100.0	0.0	0.0	0.0
July	100	708	1.1	53.8	7.1	99.9	0.1	0.0	0.0
August	100	708	0.8	25.8	2.7	100.0	0.0	0.0	0.0
September	100	684	1.7	82.9	12.2	99.4	0.4	0.2	0.0
October	100	707	1.8	128.6	20.3	99.4	0.1	0.4	0.0
November	100	685	3.4	151.8	18.3	98.7	1.2	0.2	0.0
December	100	708	4.3	85.3	25.1	97.5	2.4	0.1	0.0
Annual	100	8318	2.3	151.8	25.1	99.1	0.8	0.1	0.0



Wood Buffalo Environmental Association - Leismer (AMS501)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
October	99	703	0.4	14.6	2.5	100.0	0.0	0.0	0.0
November	100	685	0.4	8.1	1.6	100.0	0.0	0.0	0.0
December	100	708	0.9	12.2	2.7	100.0	0.0	0.0	0.0
Annual	100	2096	0.5	14.6	2.7	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Sawbones Bay (AMS505)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
July	97	676	0.8	14.9	3.8	100.0	0.0	0.0	0.0
August	98	690	0.6	15.0	2.2	100.0	0.0	0.0	0.0
September	100	681	1.0	24.3	5.1	100.0	0.0	0.0	0.0
October	100	708	1.0	18.0	3.5	100.0	0.0	0.0	0.0
November	93	628	1.5	22.3	5.5	100.0	0.0	0.0	0.0
December	98	693	1.4	33.5	7.0	100.0	0.0	0.0	0.0
Annual	97	4076	1.1	33.5	7.0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Jackfish 1 (AMS506)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	0.7	22.3	3.9	100.0	0.0	0.0	0.0
February	100	639	1.1	14.7	5.3	100.0	0.0	0.0	0.0
March	99	700	0.4	15.2	2.2	100.0	0.0	0.0	0.0
April	100	682	0.5	11.6	3.3	100.0	0.0	0.0	0.0
May	100	706	0.3	10.6	1.9	100.0	0.0	0.0	0.0
June	100	685	0.8	17.0	4.1	100.0	0.0	0.0	0.0
July	100	705	0.5	9.8	2.6	100.0	0.0	0.0	0.0
August	100	708	0.6	14.4	4.2	100.0	0.0	0.0	0.0
Annual	100	5532	0.6	22.3	5.3	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Kirby South (AMS507)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
July	100	702	0.4	44.9	3.5	99.9	0.1	0.0	0.0
August	100	708	0.8	62.4	12.3	99.7	0.3	0.0	0.0
September	98	663	0.4	9.5	3.9	100.0	0.0	0.0	0.0
October	100	707	0.3	5.7	1.4	100.0	0.0	0.0	0.0
November	100	683	0.4	22.0	2.9	100.0	0.0	0.0	0.0
December	100	707	1.0	60.8	8.0	99.4	0.6	0.0	0.0
Annual	100	4170	0.6	62.4	12.3	99.8	0.2	0.0	0.0



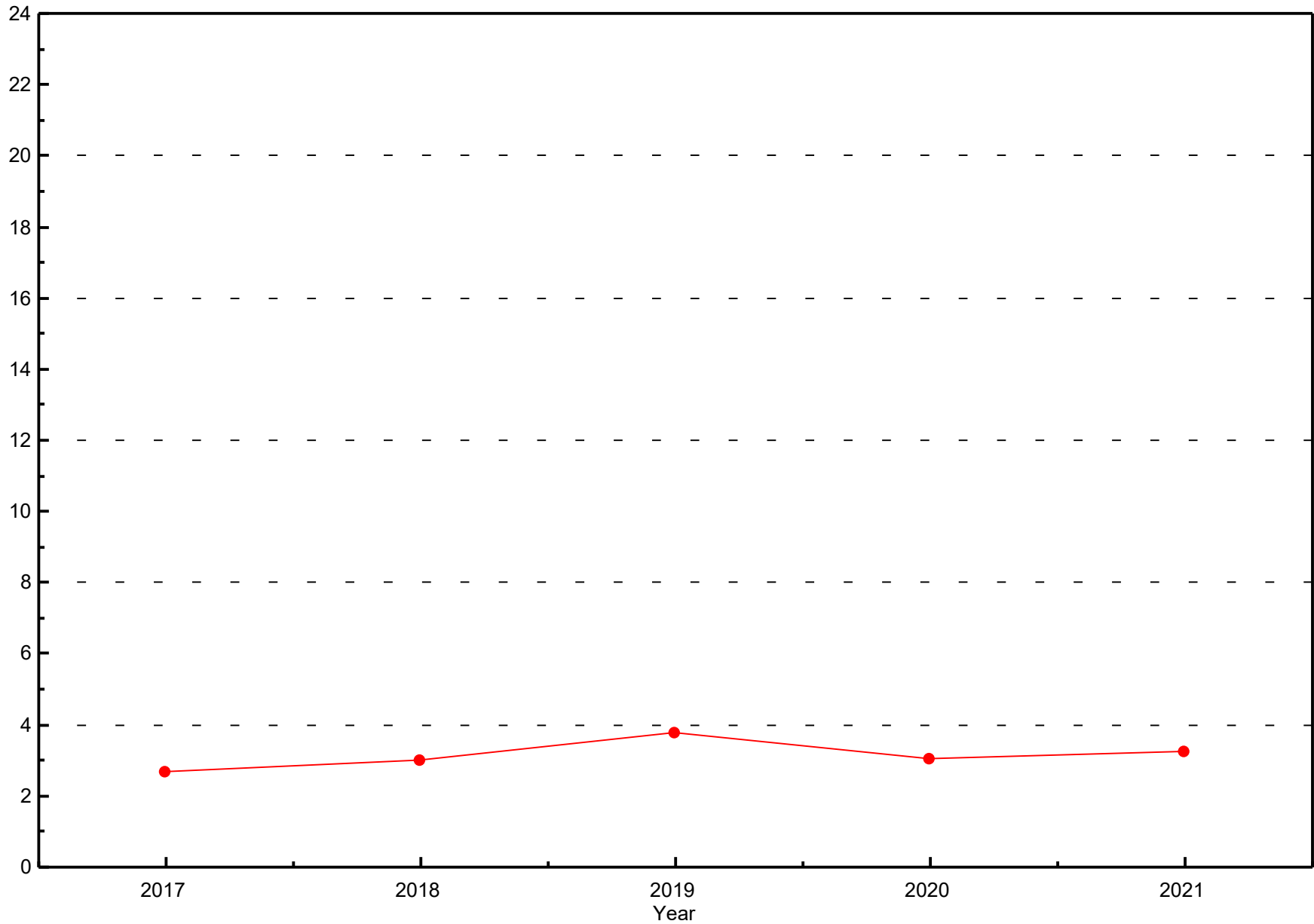
Wood Buffalo Environmental Association - Kirby North (AMS508)
Annual Summary for the Year 2021
Nitrogen Oxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	90	635	0.4	17.5	1.2	100.0	0.0	0.0	0.0
February	100	638	0.4	10.1	2.0	100.0	0.0	0.0	0.0
March	100	705	0.2	2.0	0.5	100.0	0.0	0.0	0.0
April	100	683	0.8	126.8	14.6	99.4	0.3	0.3	0.0
May	100	706	0.1	4.2	0.4	100.0	0.0	0.0	0.0
June	100	653	0.3	4.5	1.3	100.0	0.0	0.0	0.0
Annual	98	4020	0.4	126.8	14.6	99.9	0.1	0.1	0.0



Yearly Averages

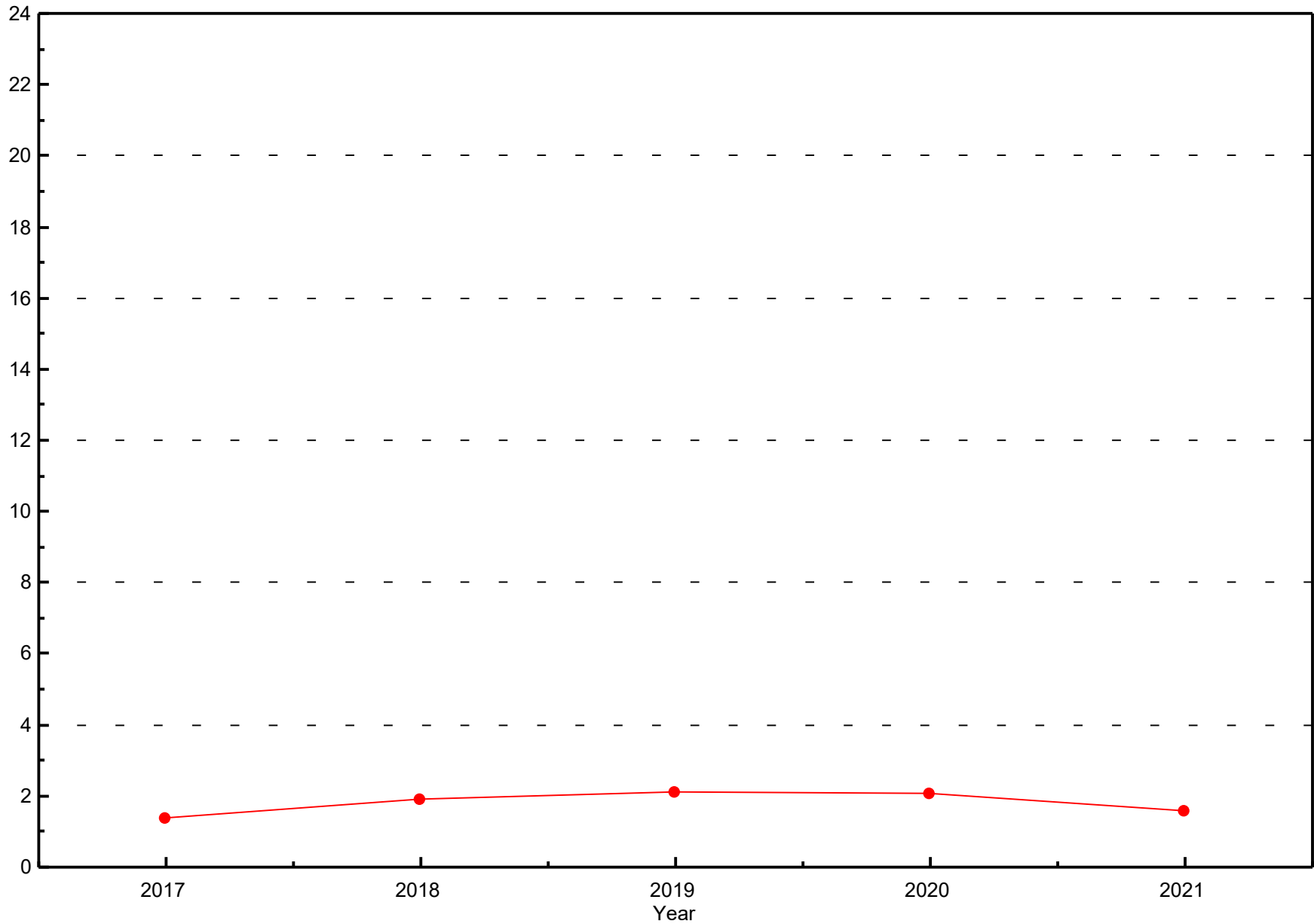
Nitric Oxide (NO) - ppb
Fort McKay - Bertha Ganter (2017 to 2021)





Yearly Averages

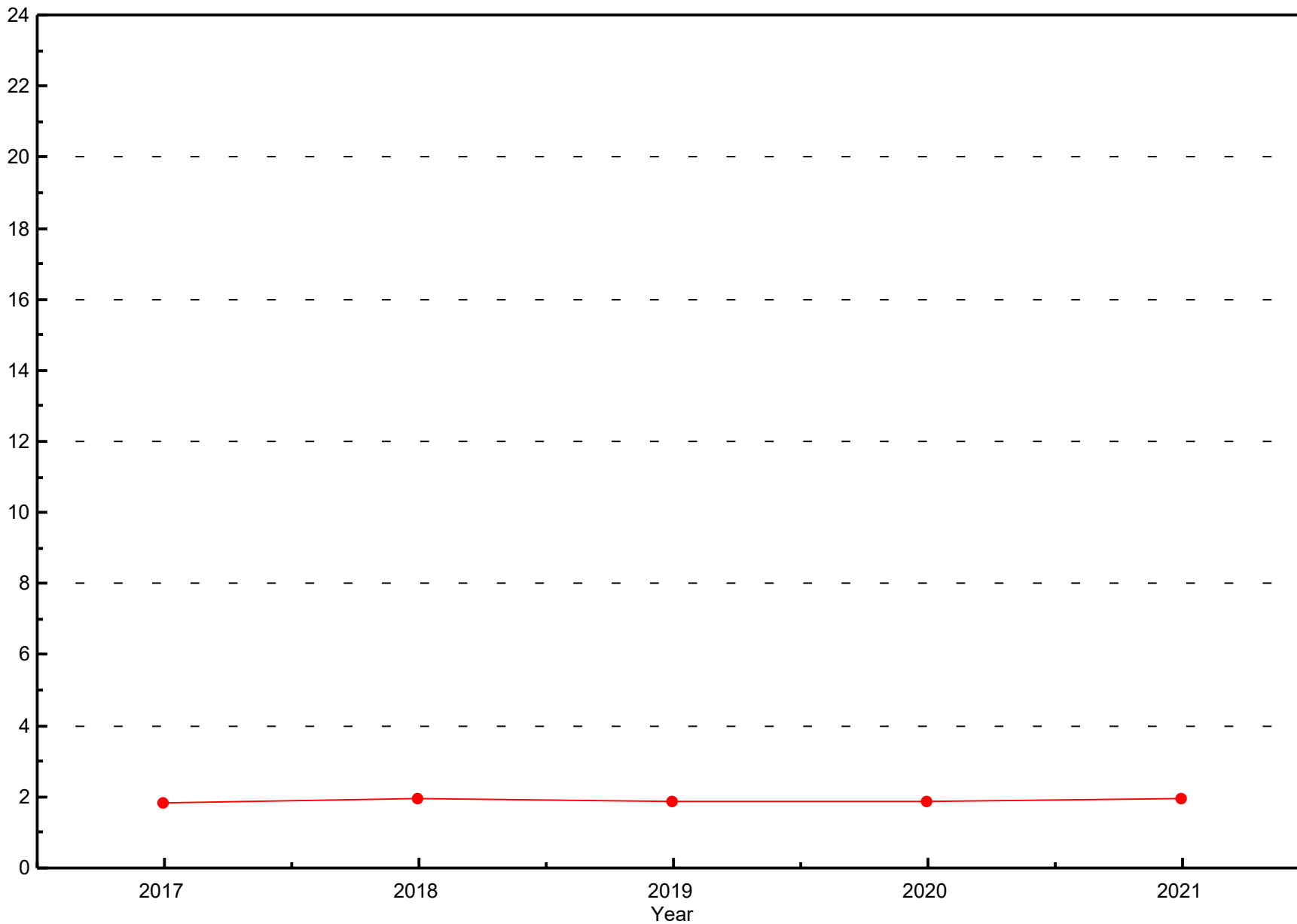
Nitric Oxide (NO) - ppb
Buffalo Viewpoint (2017 to 2021)





Yearly Averages

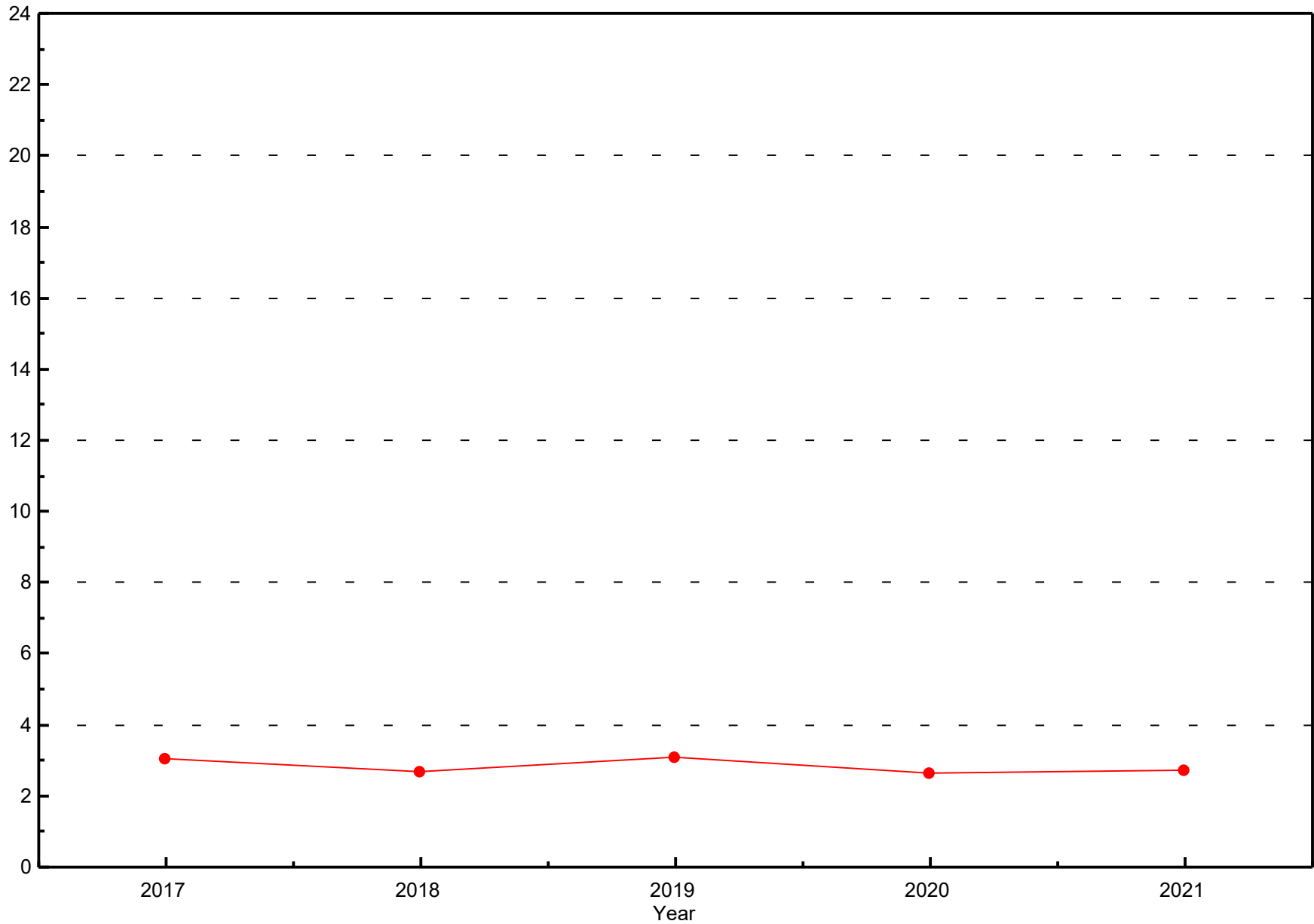
Nitric Oxide (NO) - ppb
Patricia McInnes (2017 to 2021)





Yearly Averages

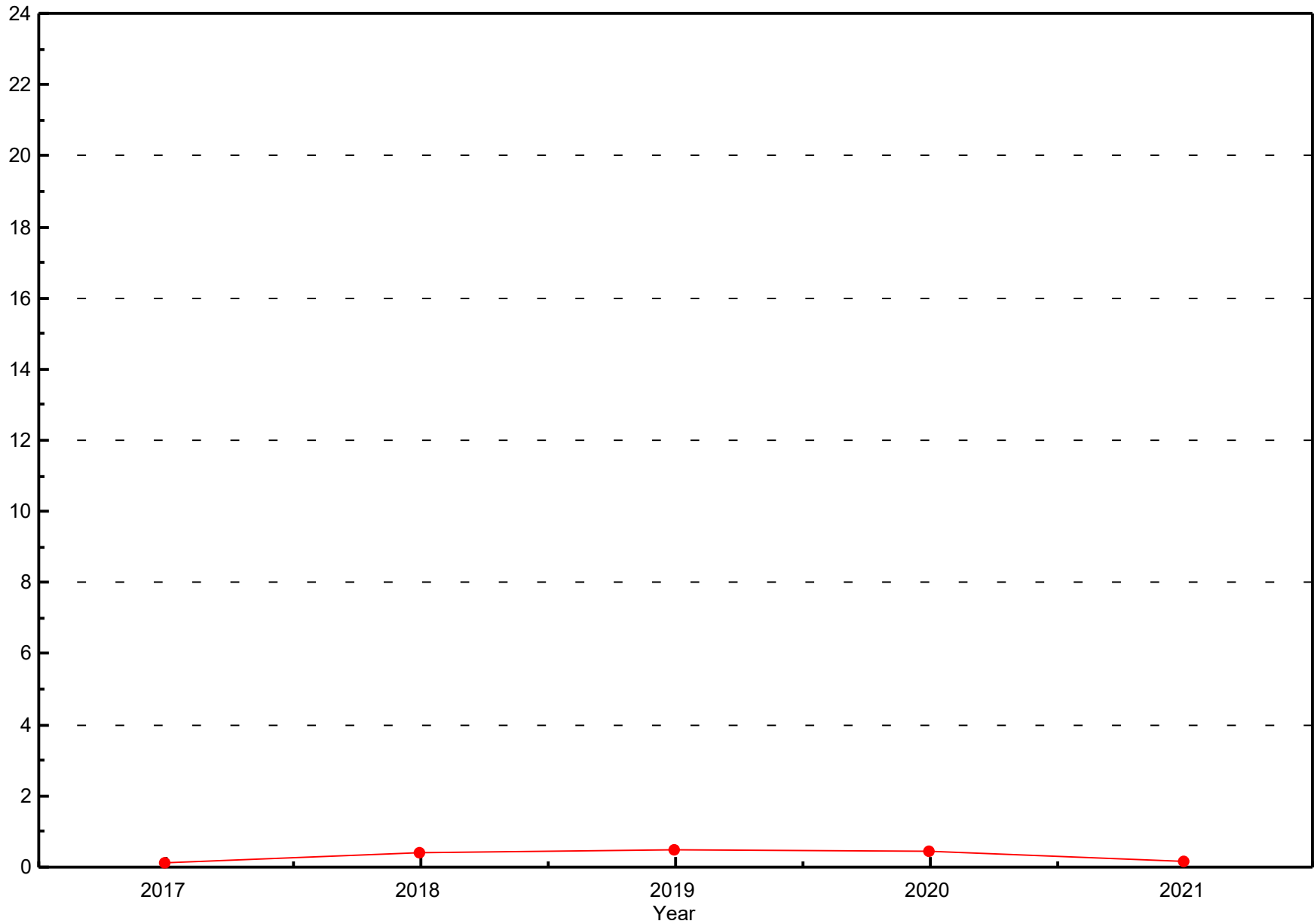
Nitric Oxide (NO) - ppb
Athabasca Valley (2017 to 2021)





Yearly Averages

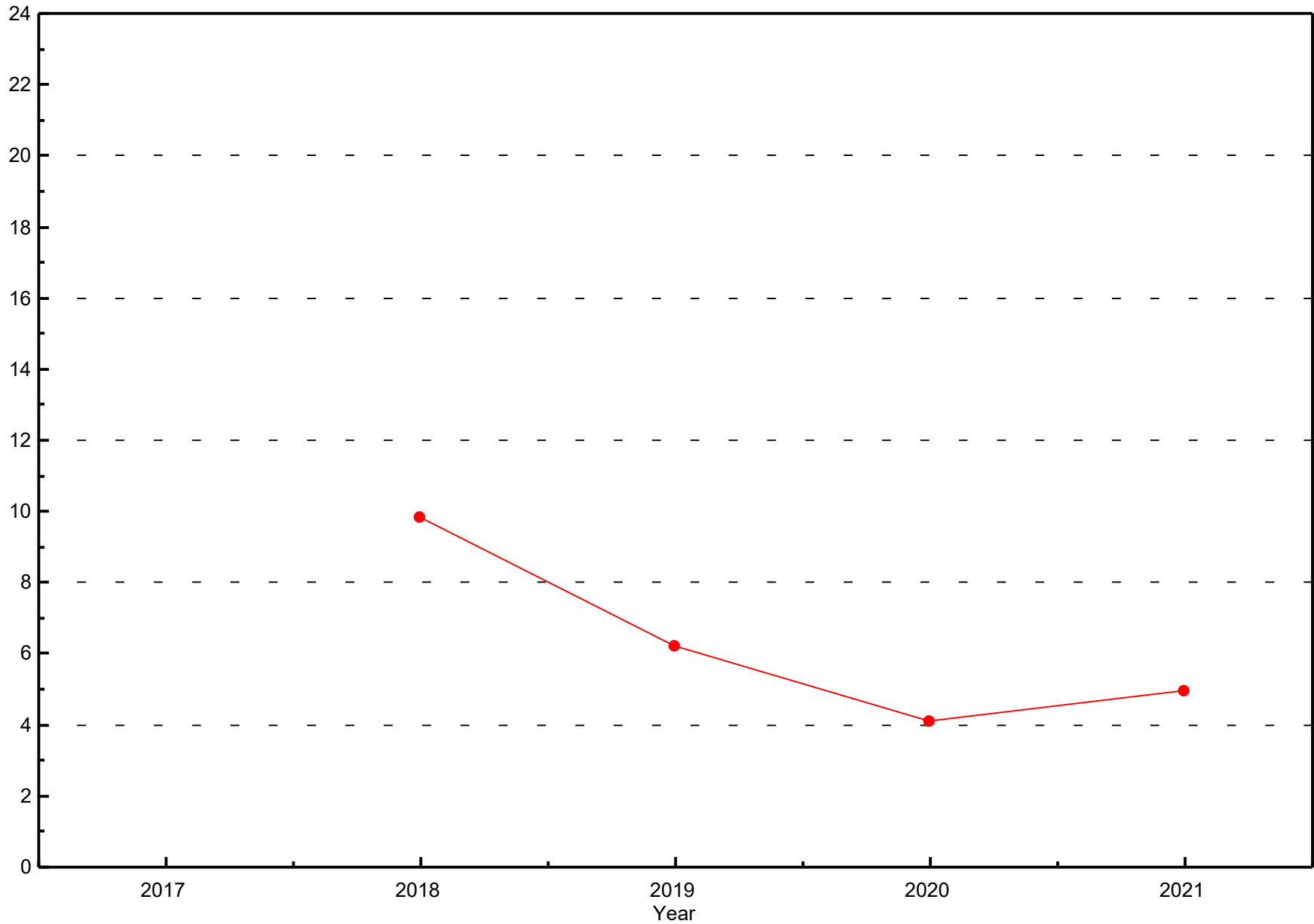
Nitric Oxide (NO) - ppb
Fort Chipewyan (2017 to 2021)





Yearly Averages

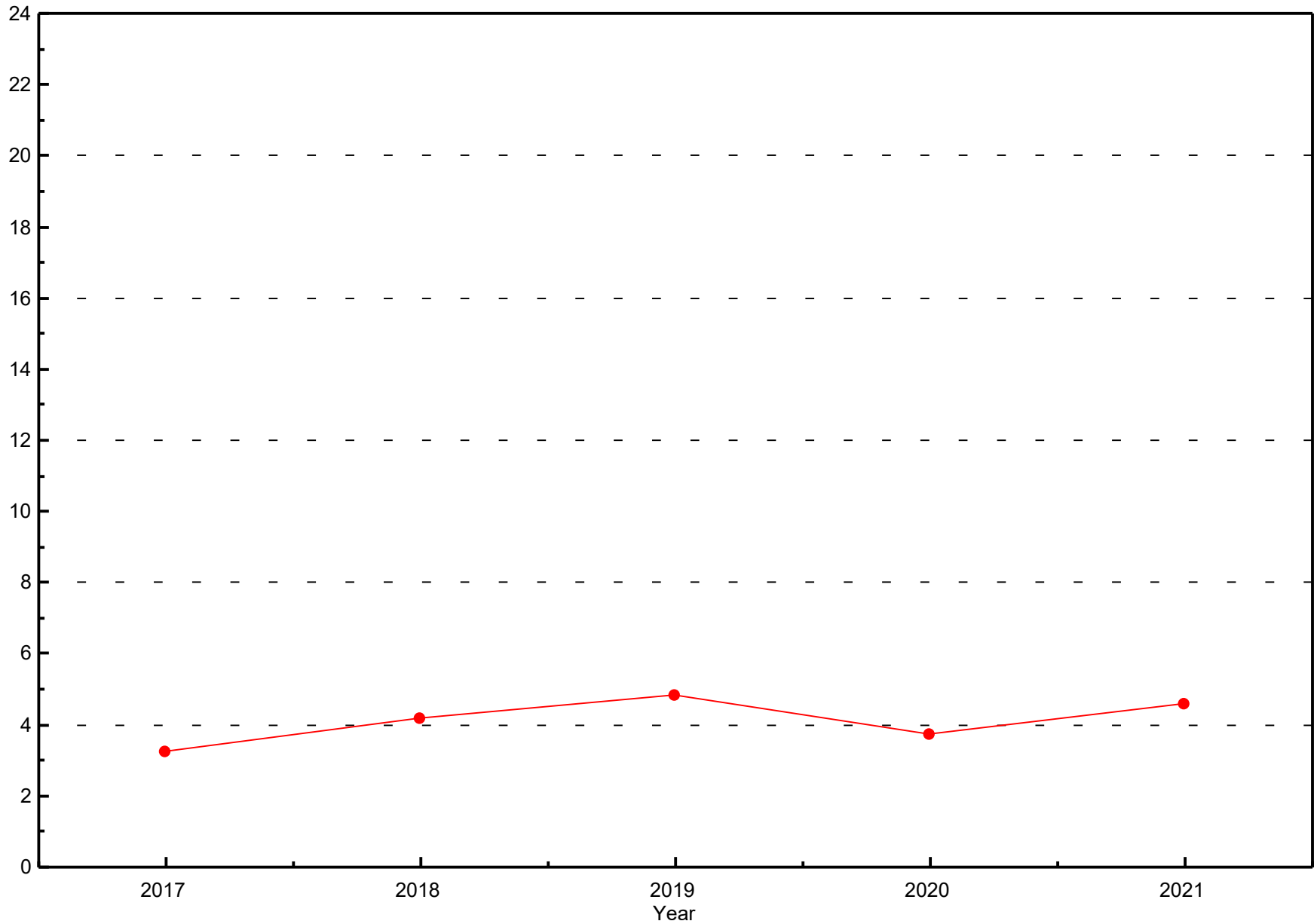
Nitric Oxide (NO) - ppb
Barge Landing (2017 to 2021)





Yearly Averages

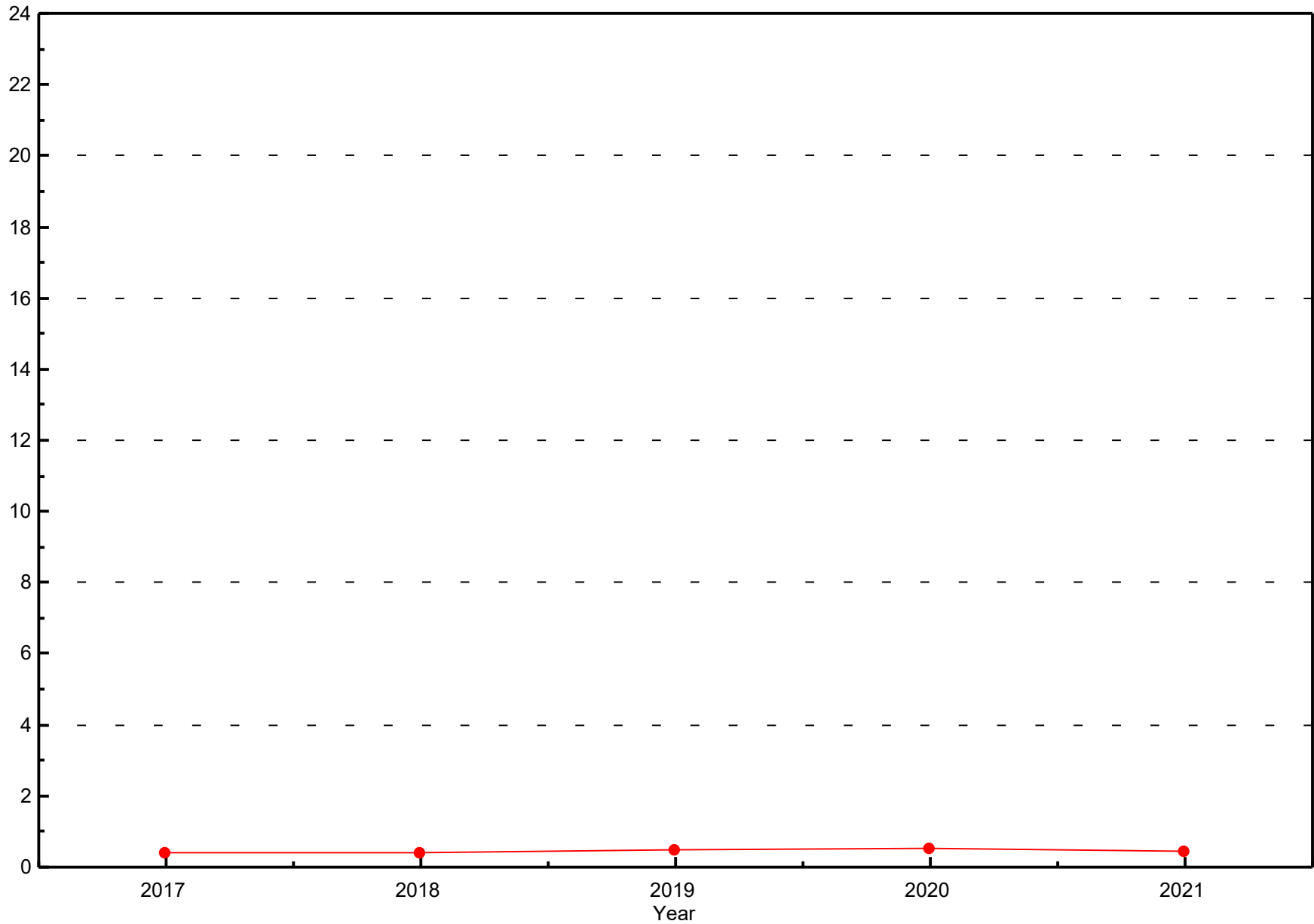
Nitric Oxide (NO) - ppb
Fort McKay South (2017 to 2021)





Yearly Averages

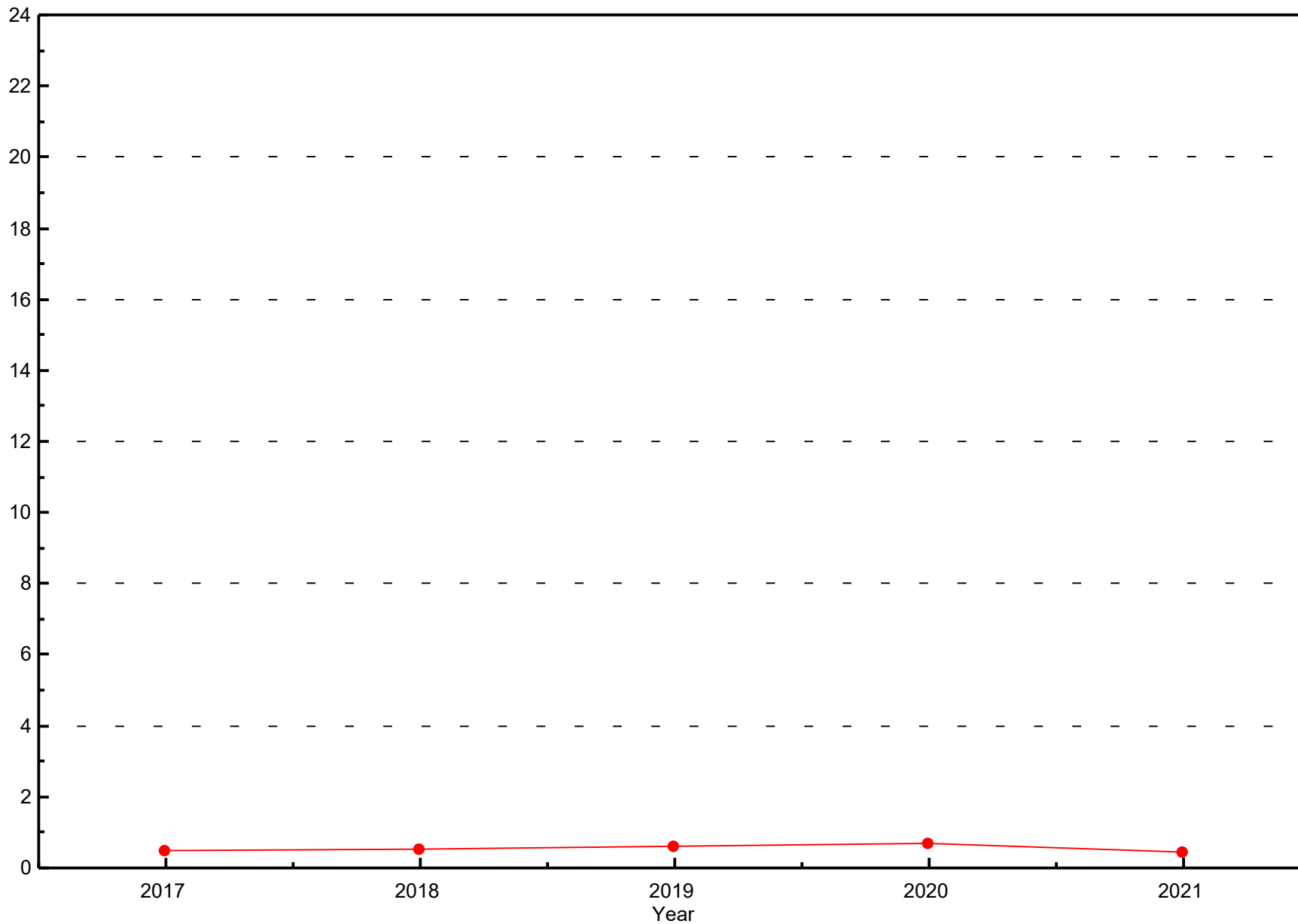
Nitric Oxide (NO) - ppb
Anzac (2017 to 2021)





Yearly Averages

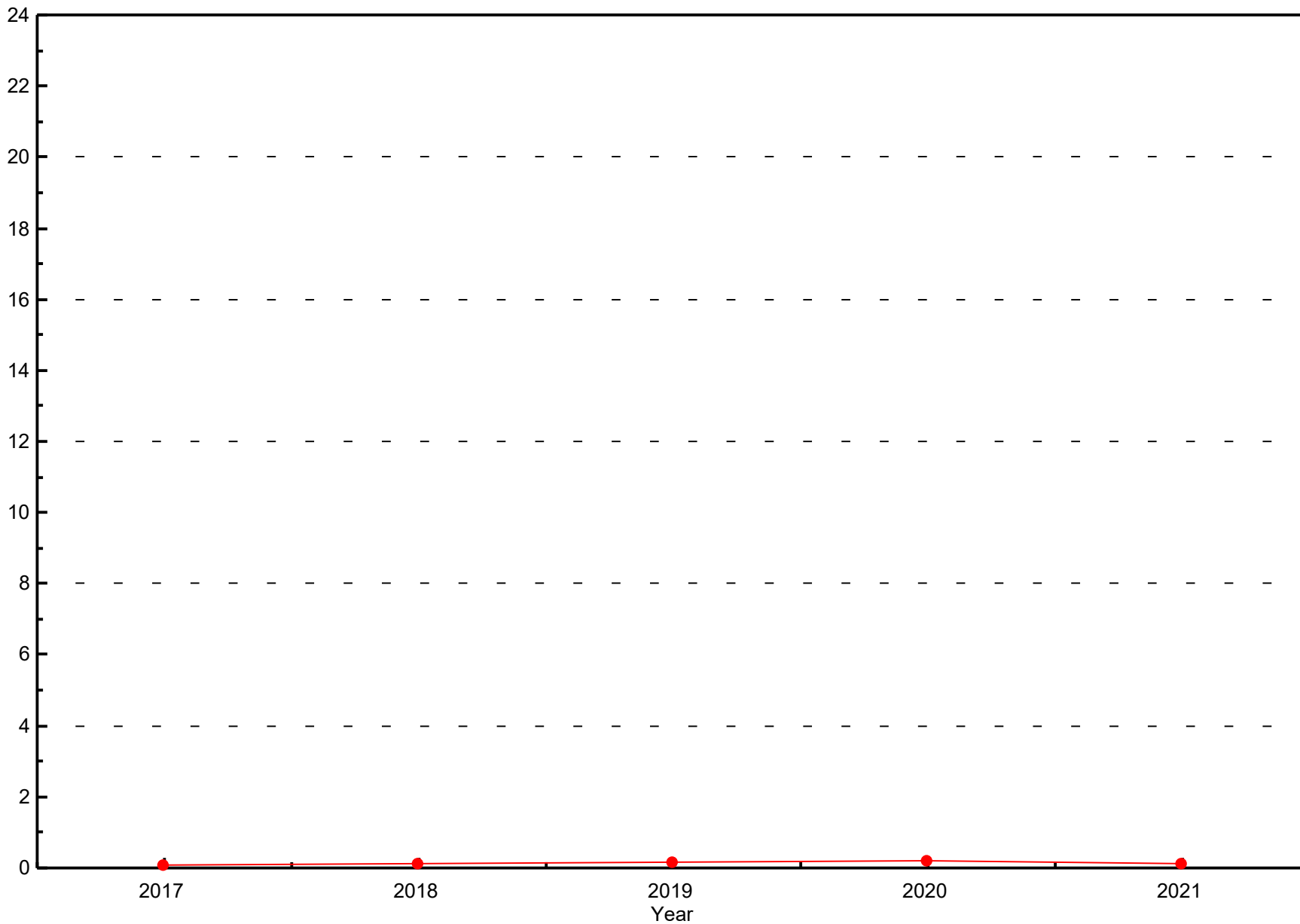
Nitric Oxide (NO) - ppb
Wapasu (2017 to 2021)





Yearly Averages

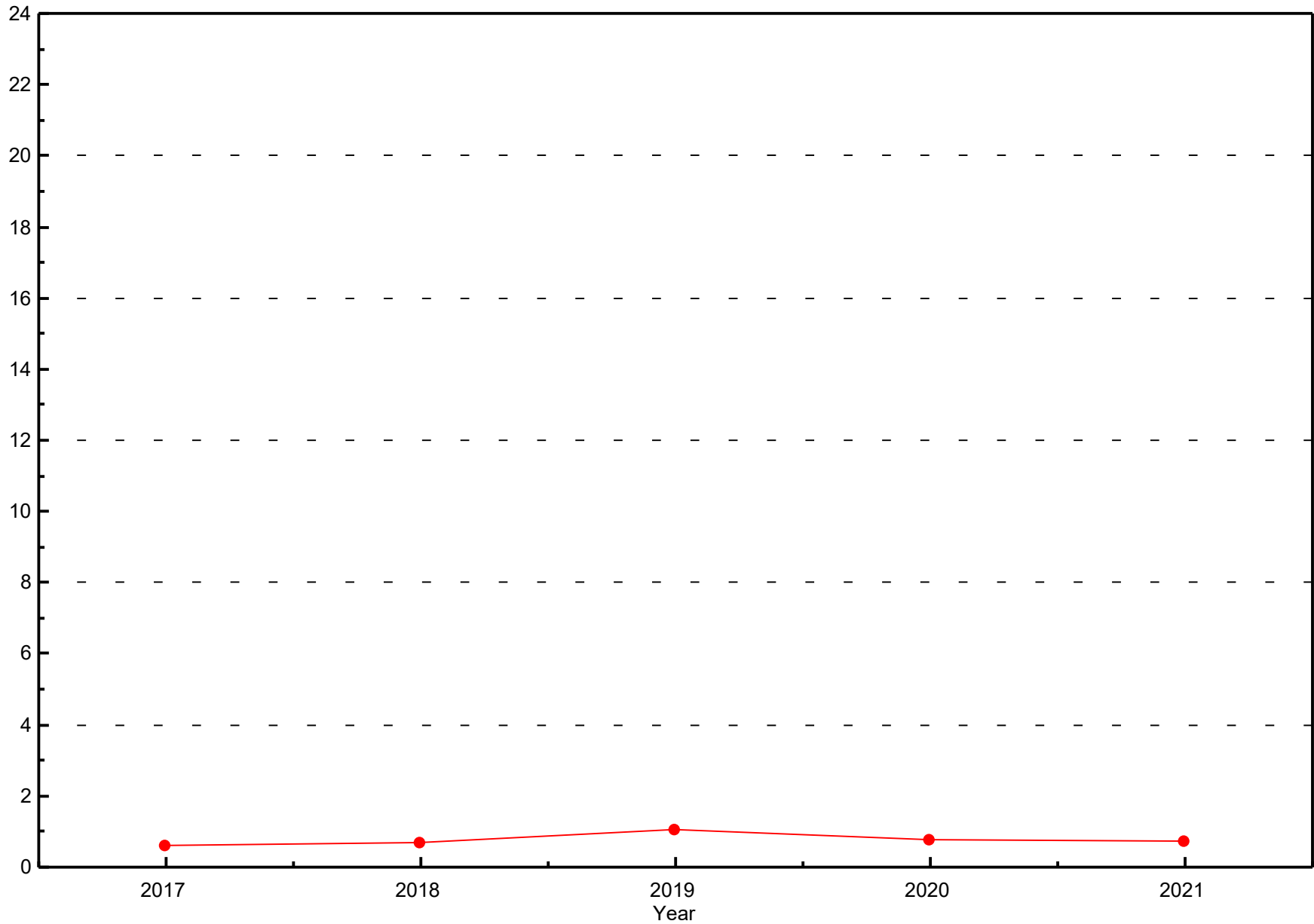
Nitric Oxide (NO) - ppb
Stony Mountain (2017 to 2021)





Yearly Averages

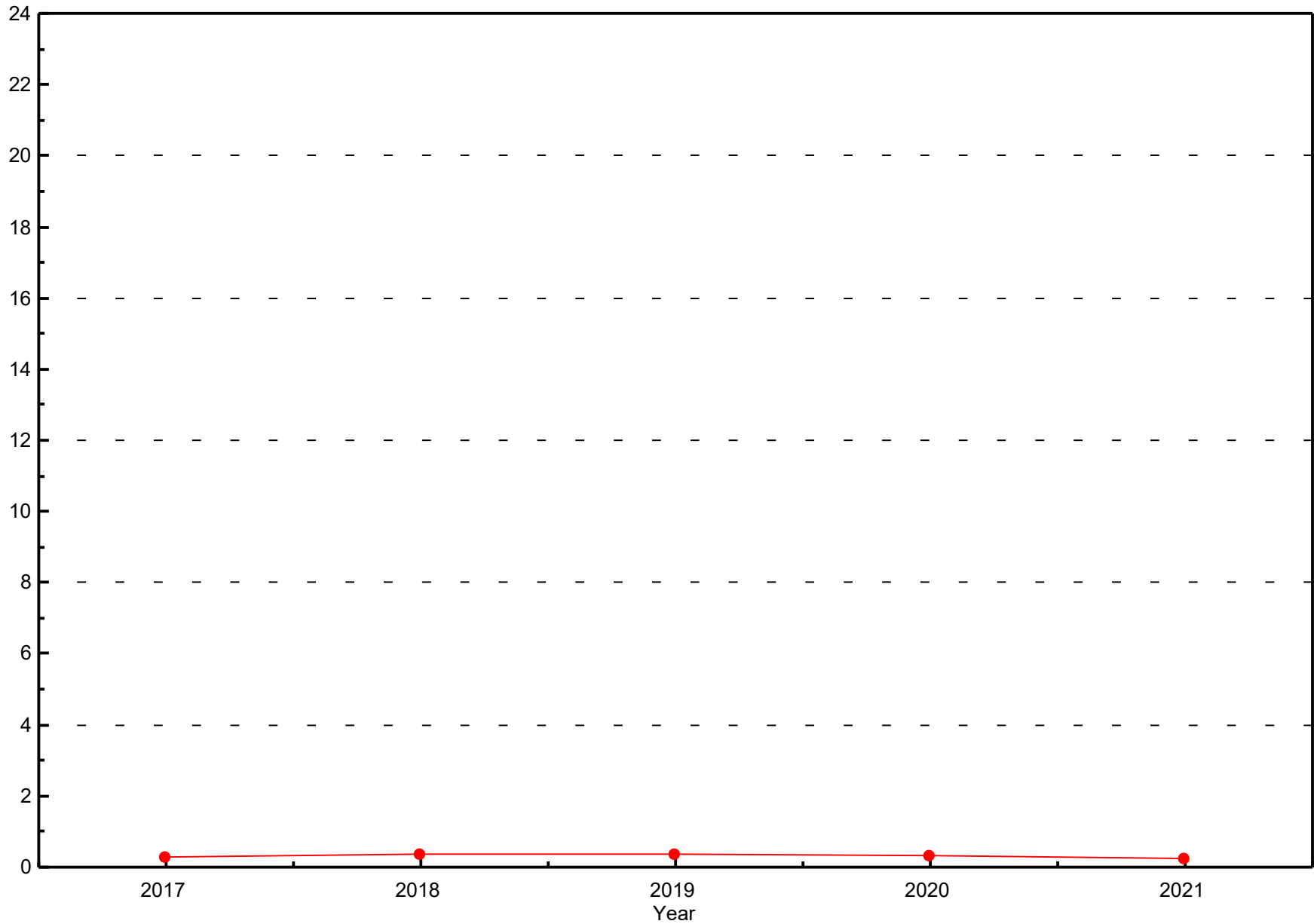
Nitric Oxide (NO) - ppb
Firebag (2017 to 2021)





Yearly Averages

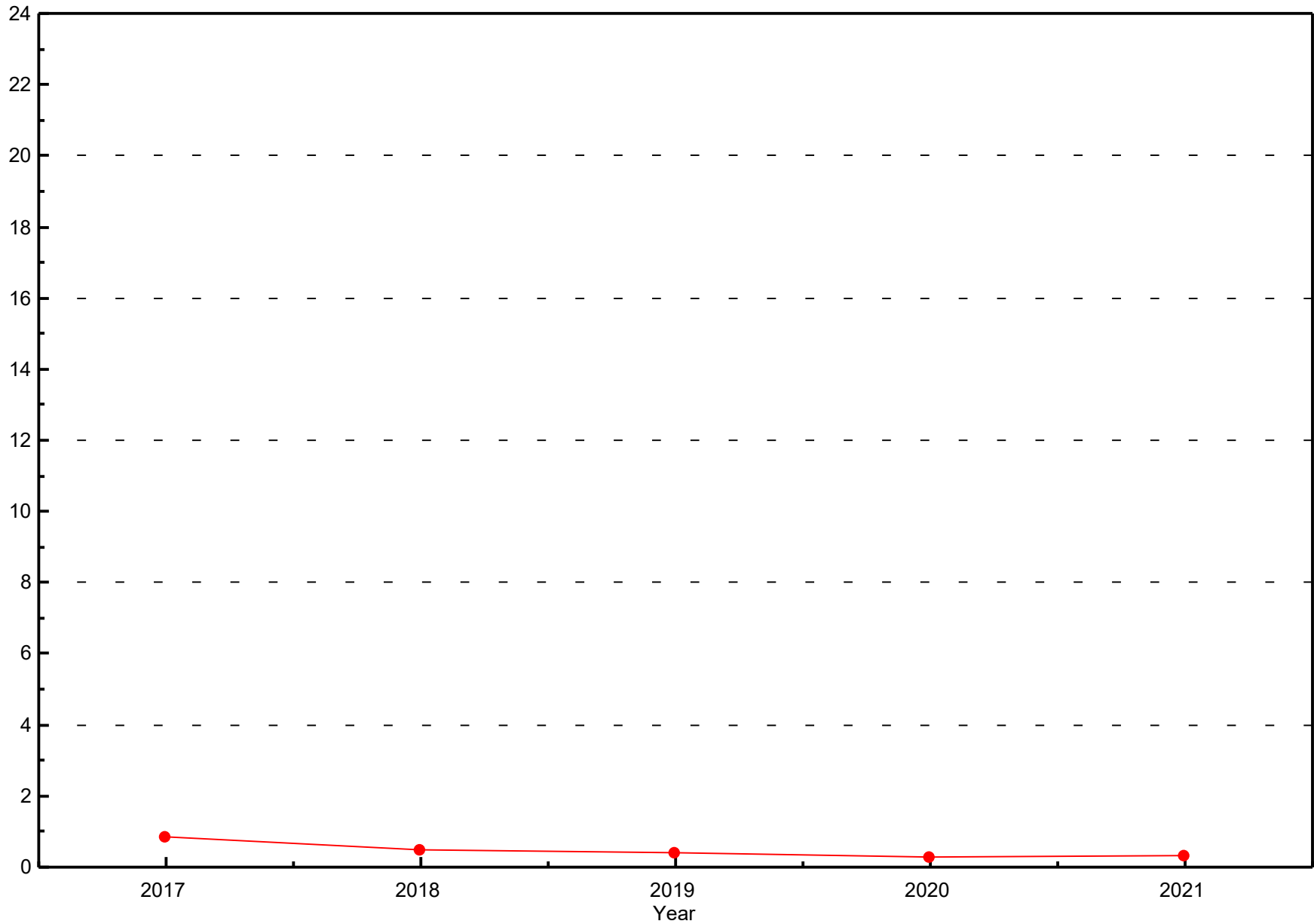
Nitric Oxide (NO) - ppb
Mackay River (2017 to 2021)





Yearly Averages

Nitric Oxide (NO) - ppb
Conklin (2017 to 2021)

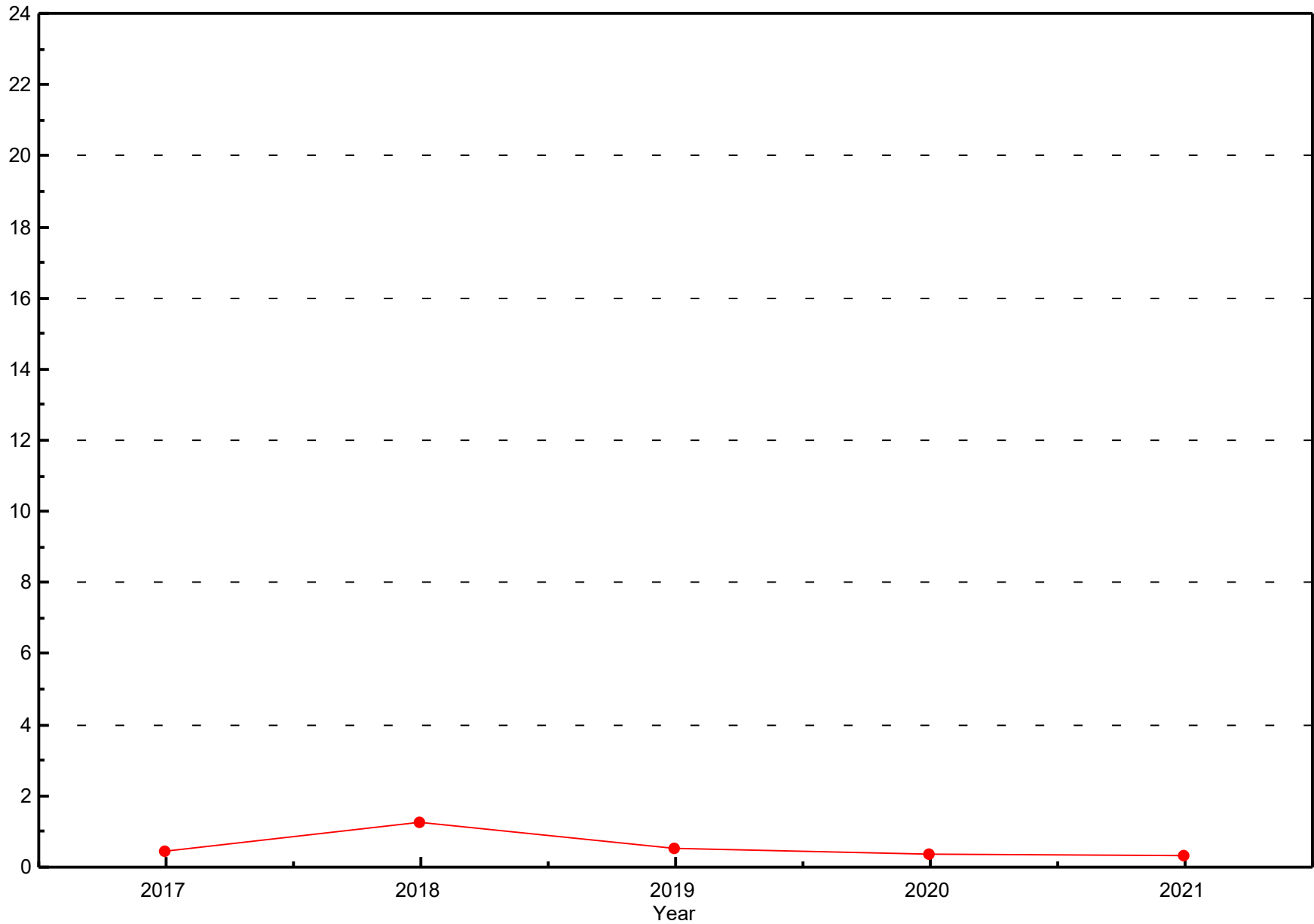




Yearly Averages

Nitric Oxide (NO) - ppb

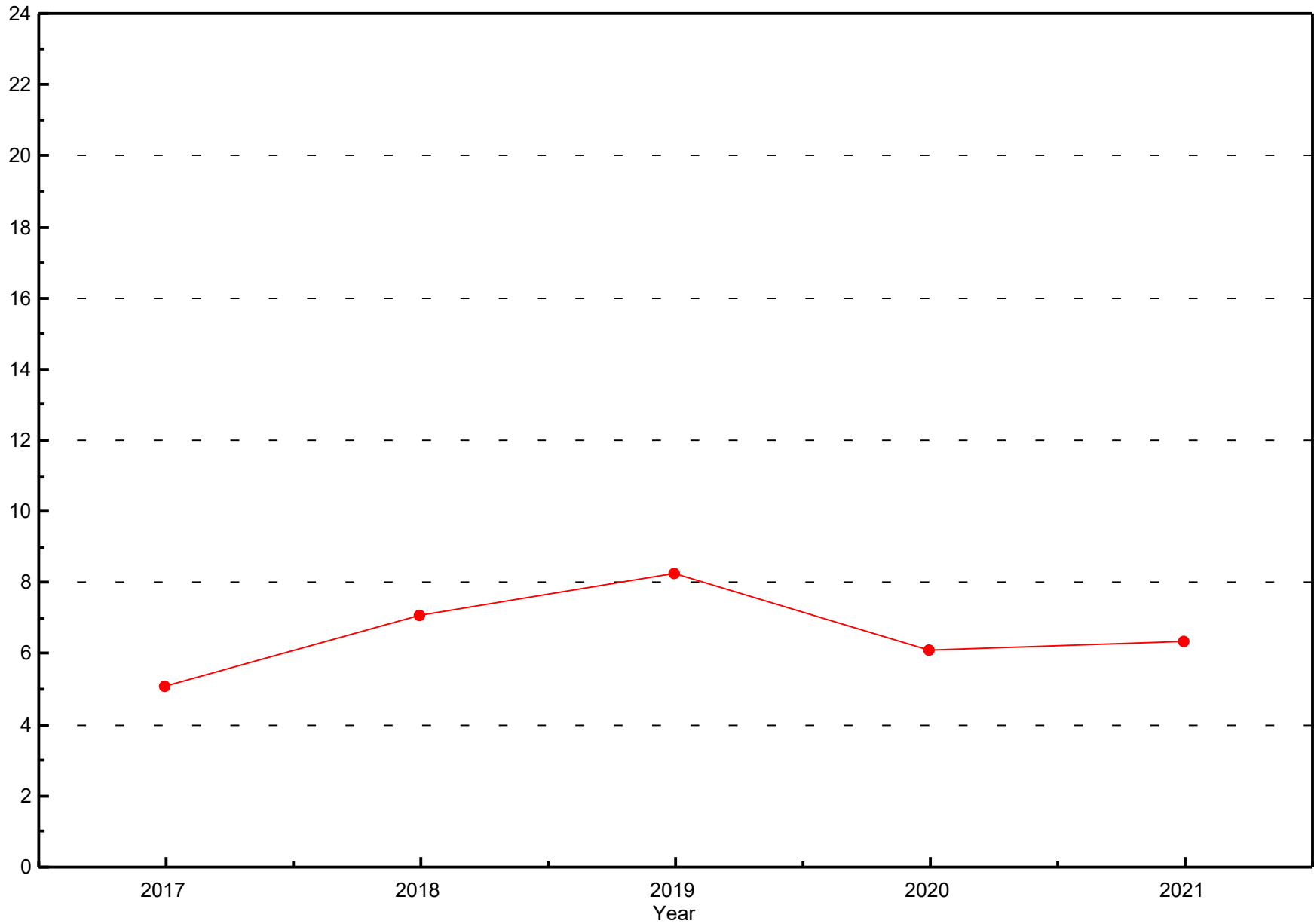
Janvier (2017 to 2021)





Yearly Averages

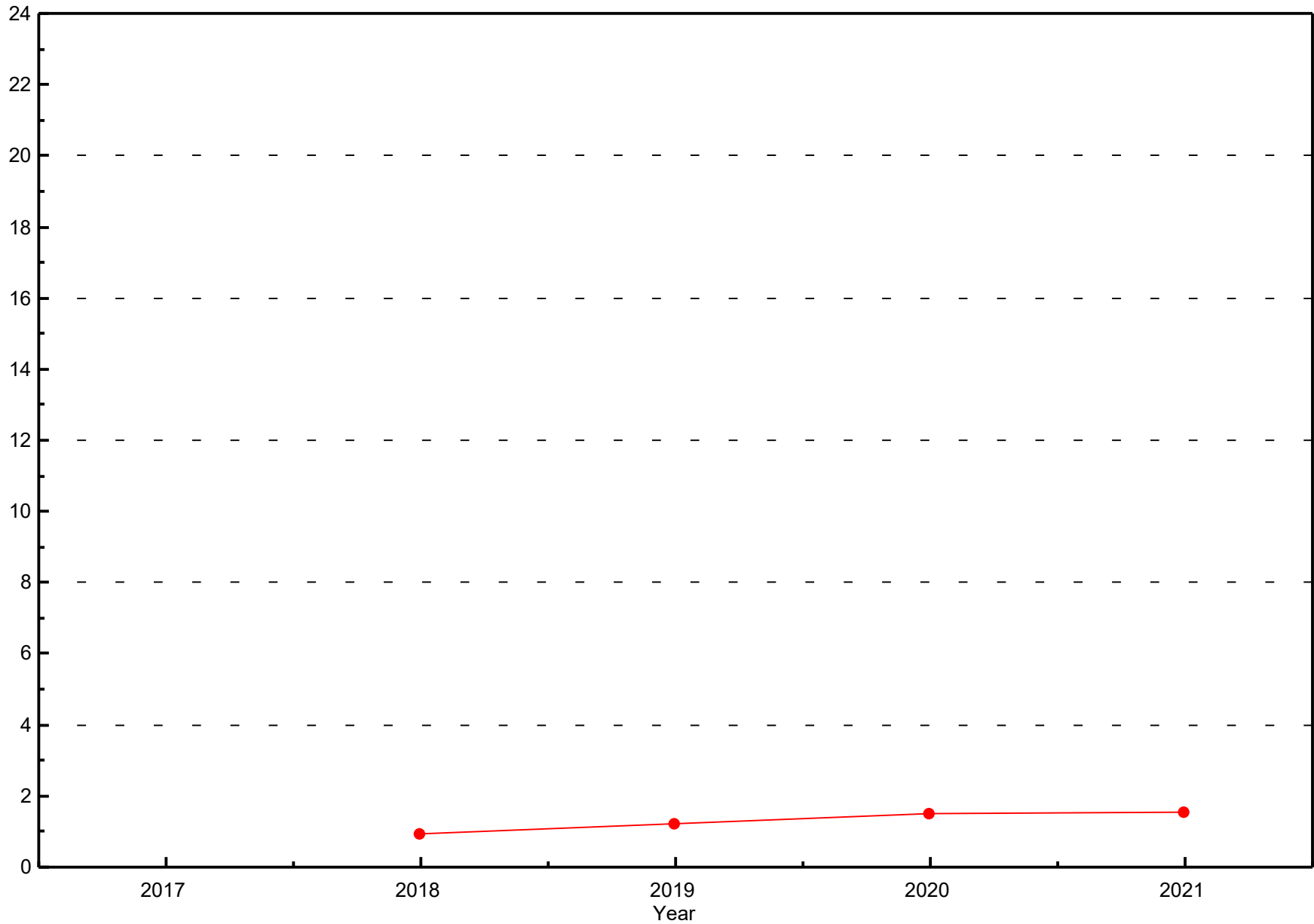
Nitric Oxide (NO) - ppb
Fort Hills (2017 to 2021)





Yearly Averages

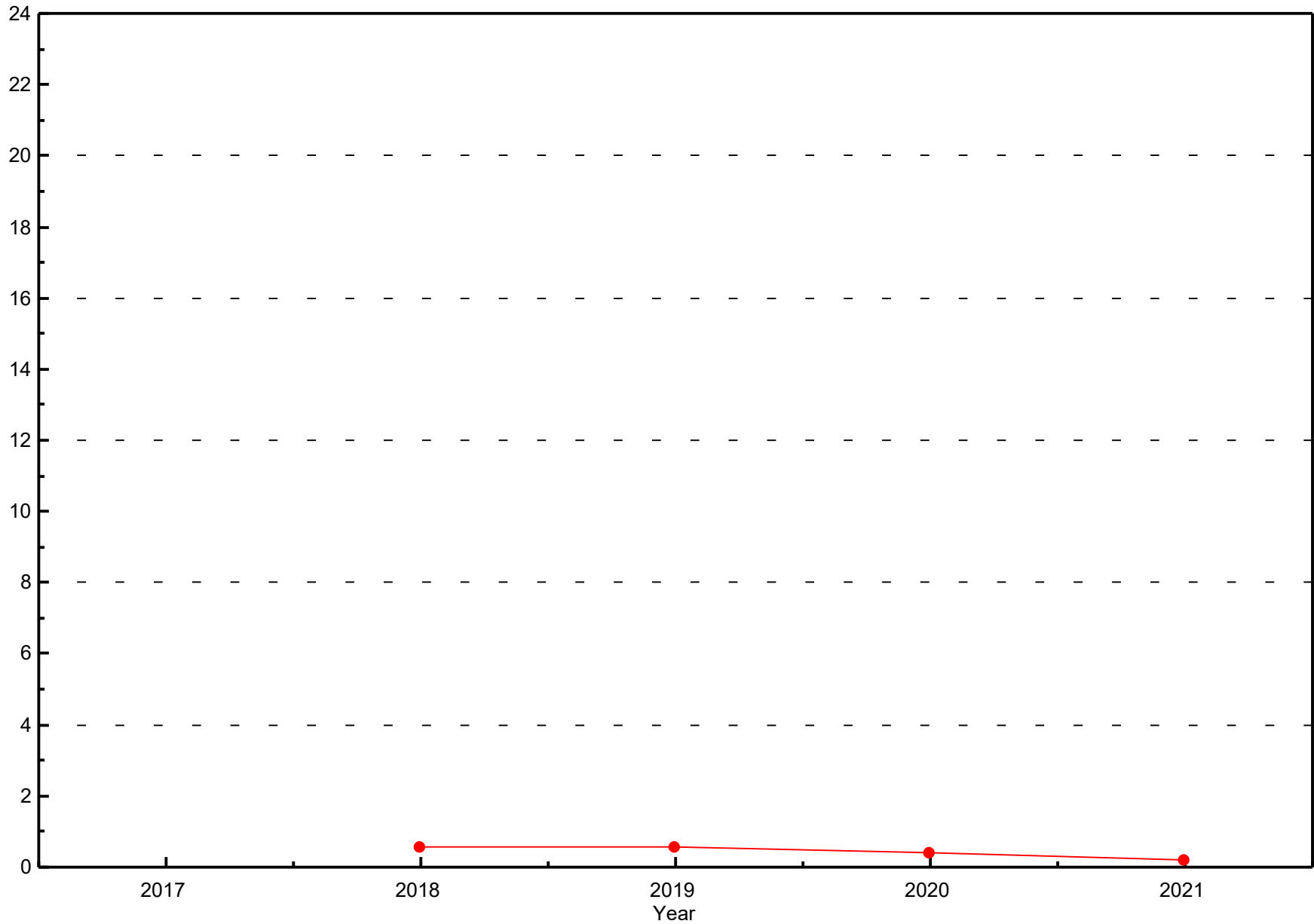
Nitric Oxide (NO) - ppb
Christina Lake (2017 to 2021)





Yearly Averages

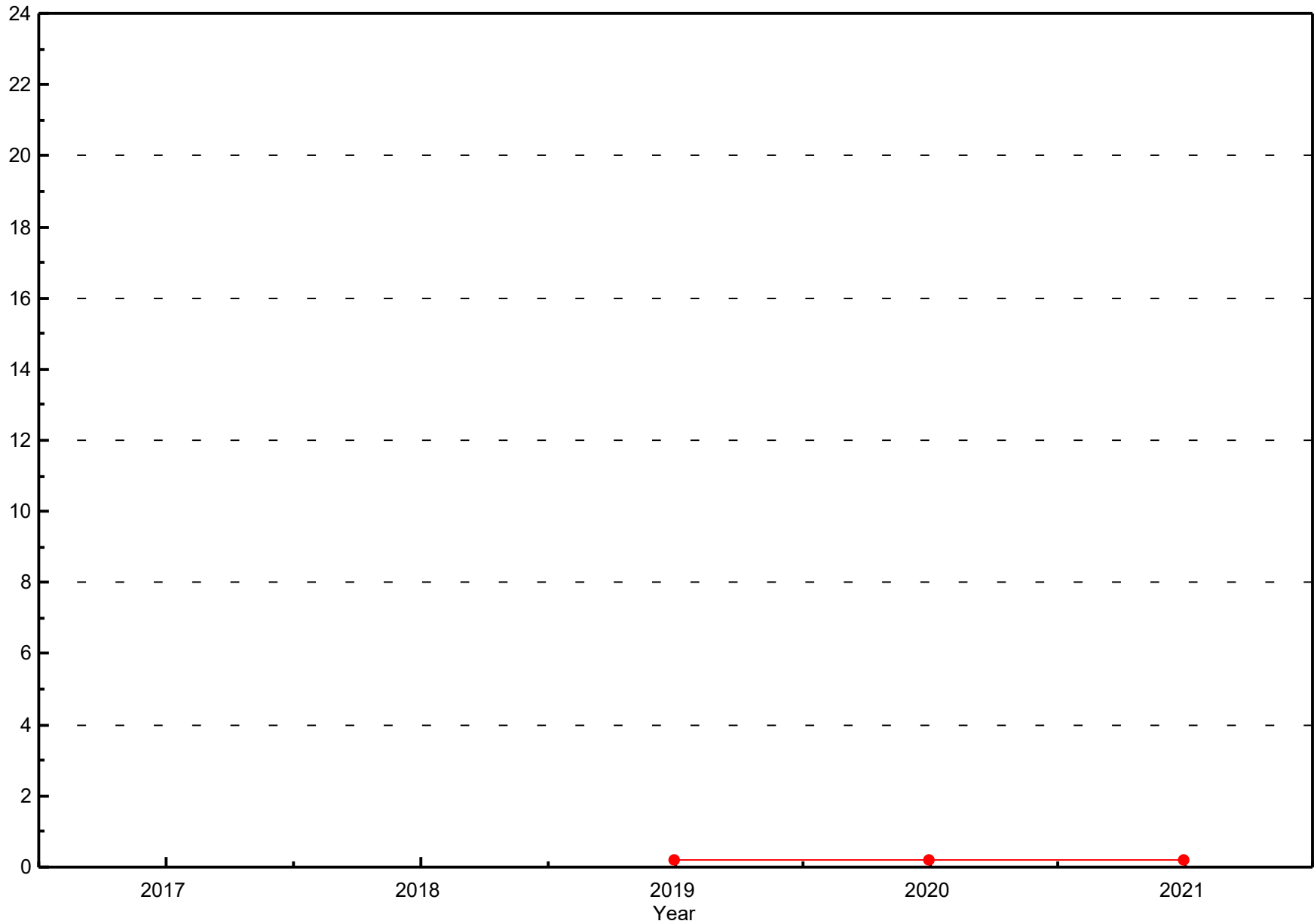
Nitric Oxide (NO) - ppb
Jackfish 2/3 (2017 to 2021)





Yearly Averages

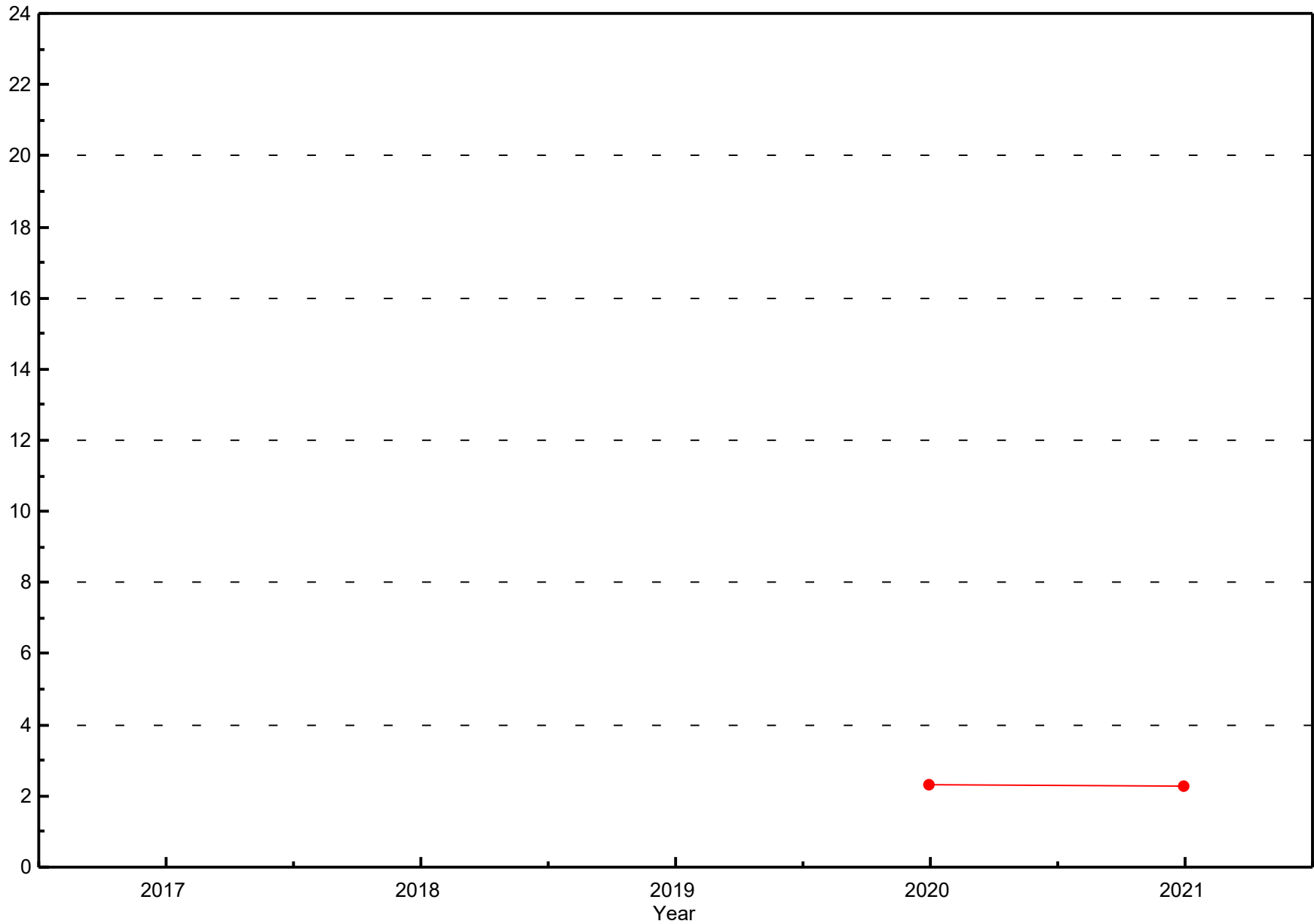
Nitric Oxide (NO) - ppb
Surmont 2 (2017 to 2021)





Yearly Averages

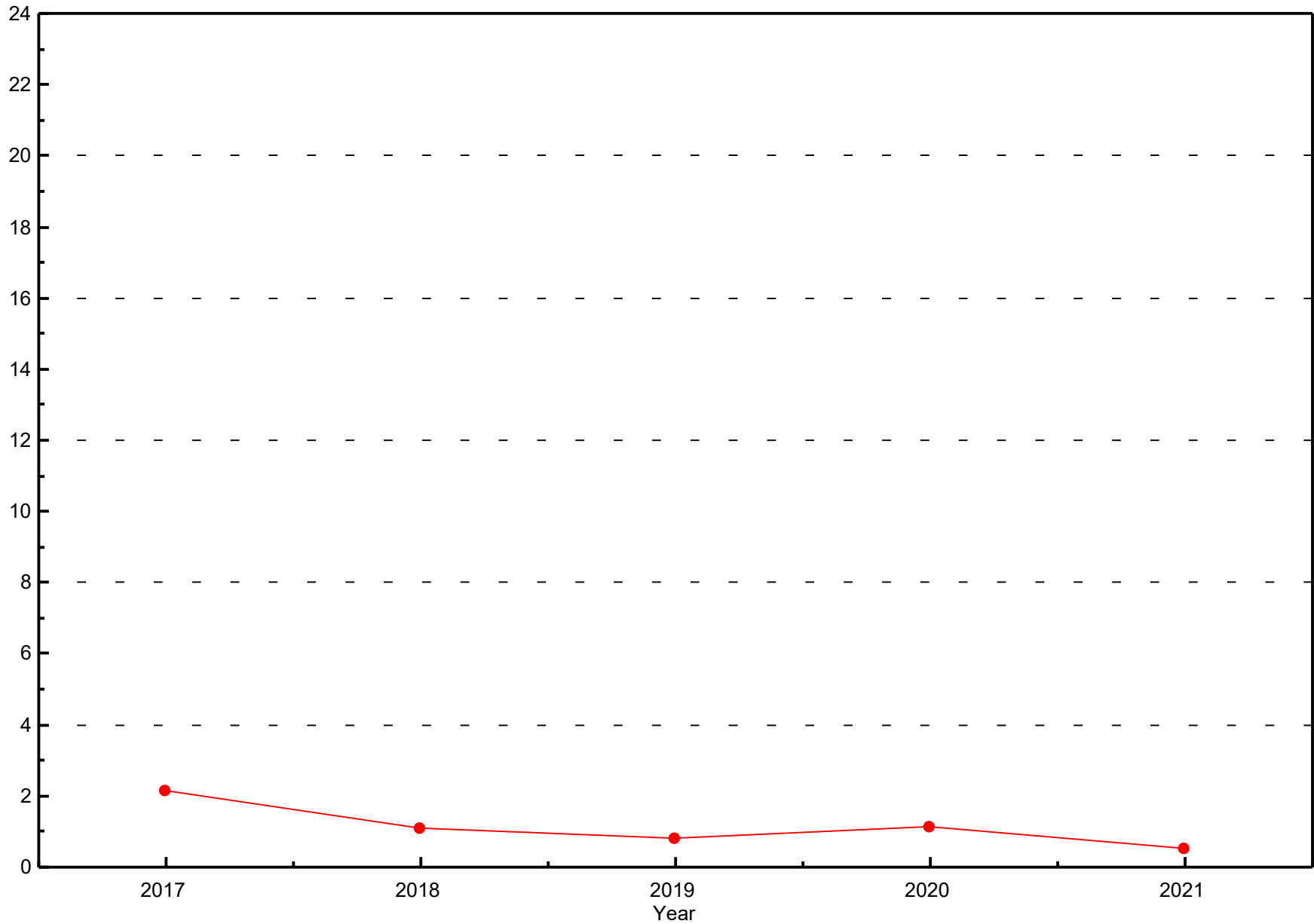
Nitric Oxide (NO) - ppb
Ells River (2017 to 2021)





Yearly Averages

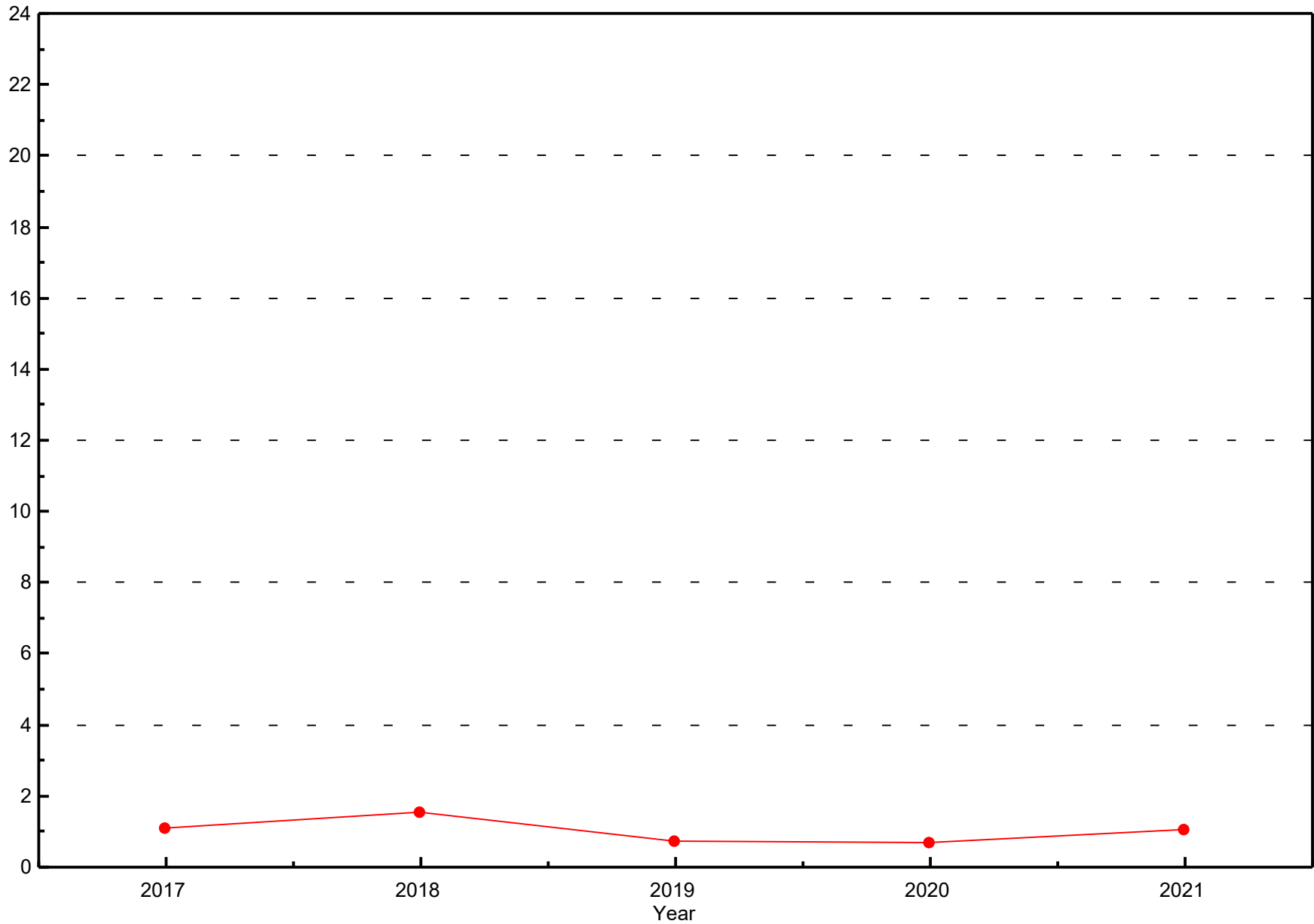
Nitric Oxide (NO) - ppb
Leismer (2017 to 2021)





Yearly Averages

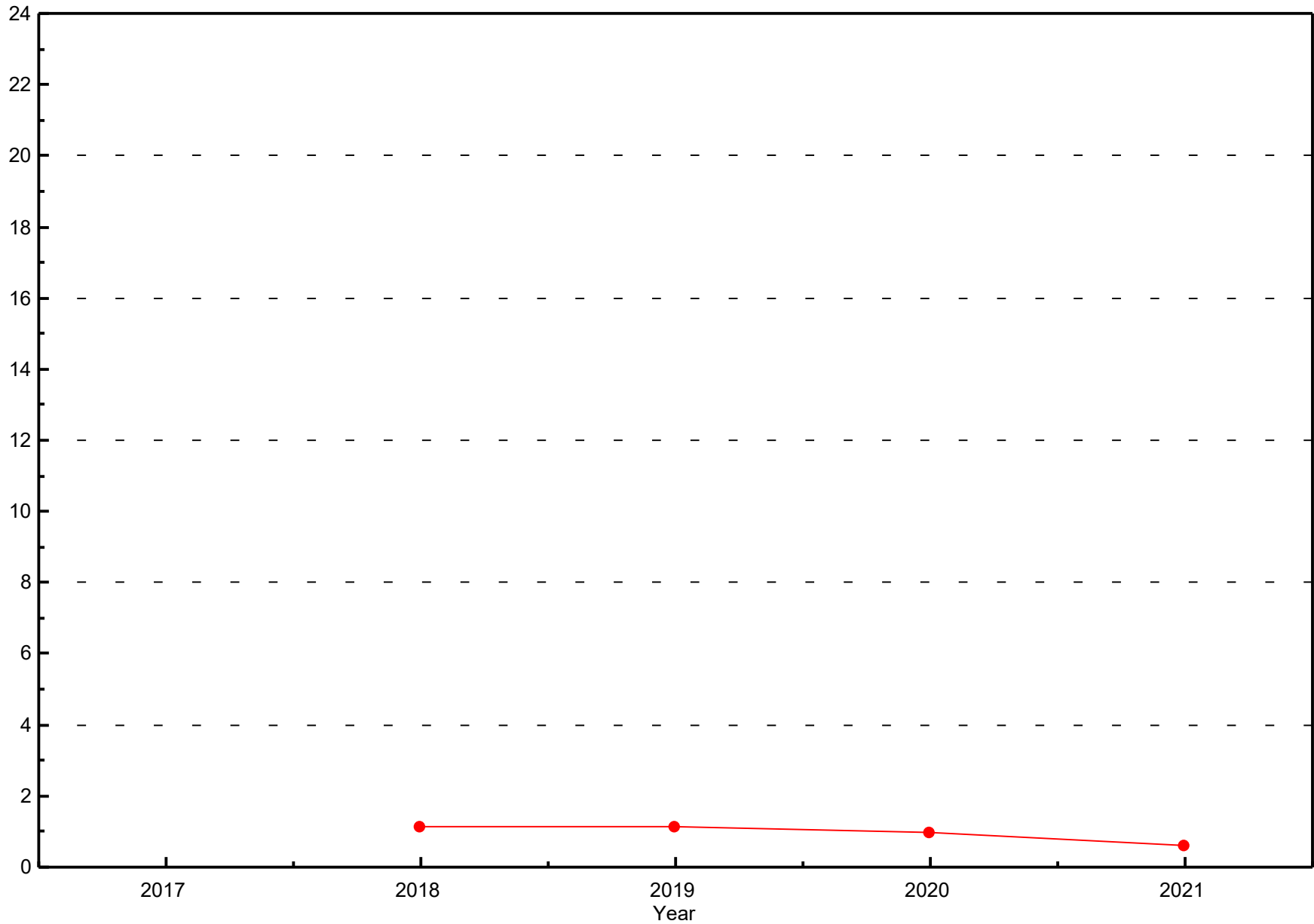
Nitric Oxide (NO) - ppb
Sawbones Bay (2017 to 2021)





Yearly Averages

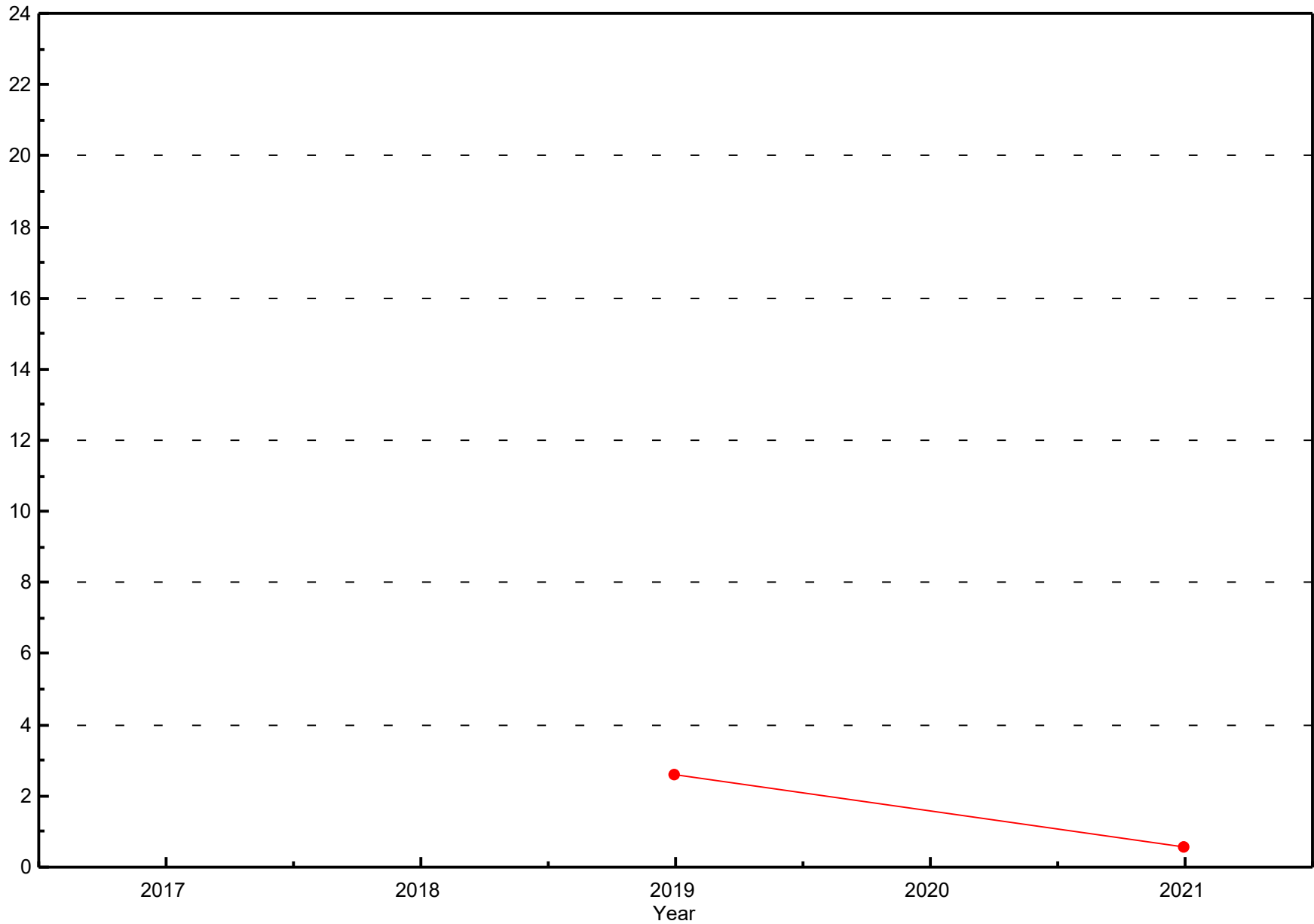
Nitric Oxide (NO) - ppb
Jackfish 1 (2017 to 2021)





Yearly Averages

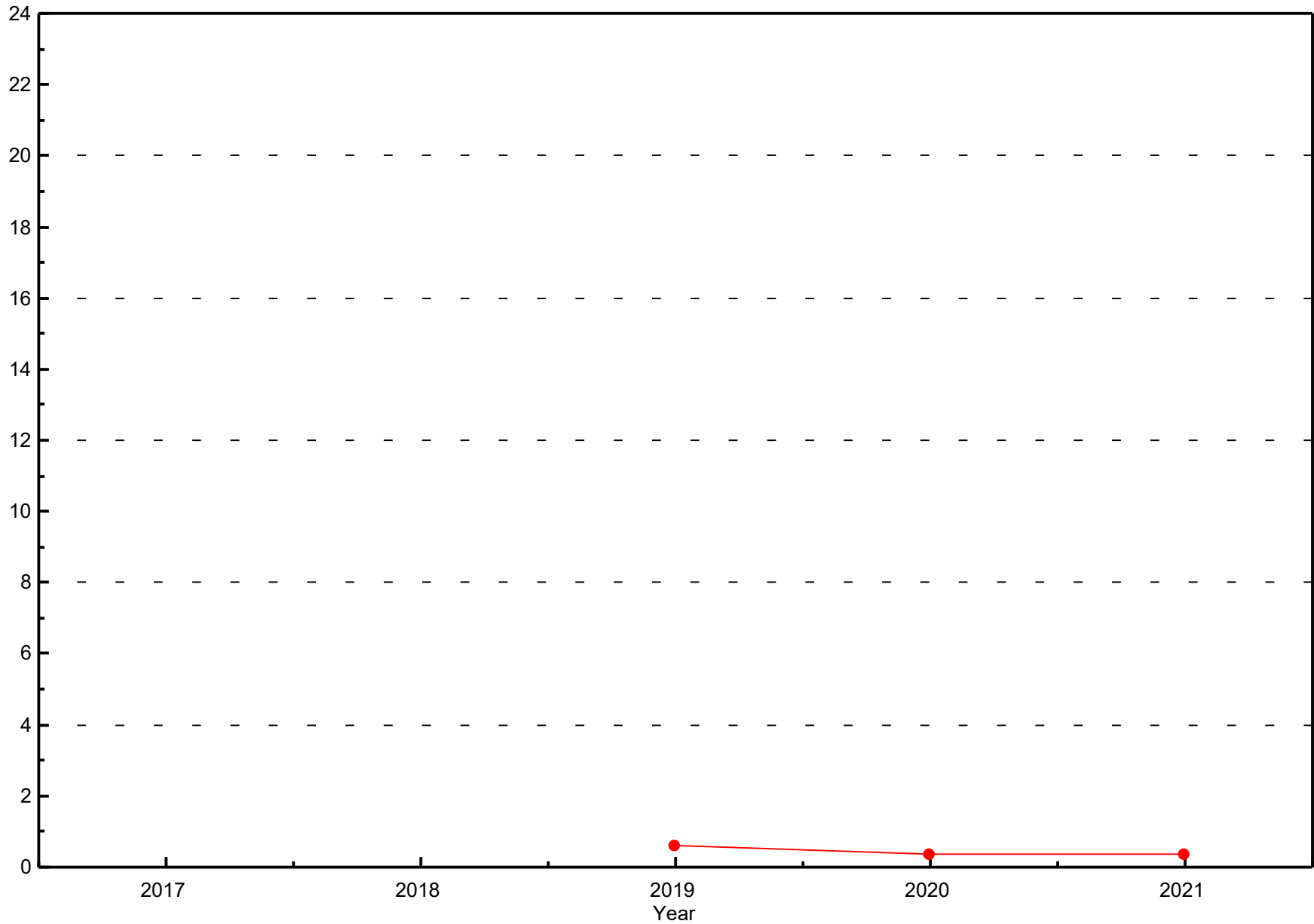
Nitric Oxide (NO) - ppb
Kirby South (2017 to 2021)





Yearly Averages

Nitric Oxide (NO) - ppb
Kirby North (2017 to 2021)





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

NITROGEN DIOXIDE ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	707	16.2	38.5	0	26.9	100	0.0	0.0	0.0
February	100	639	13.3	44.0	0	28.2	99	1.1	0.0	0.0
March	100	707	9.8	43.1	0	20.9	100	0.1	0.0	0.0
April	100	684	6.6	44.7	0	12.3	100	0.2	0.0	0.0
May	99	701	4.9	35.8	0	10.1	100	0.0	0.0	0.0
June	100	683	3.7	38.0	0	7.6	100	0.0	0.0	0.0
July	100	706	4.0	24.4	0	7.7	100	0.0	0.0	0.0
August	100	708	3.9	28.2	0	8.4	100	0.0	0.0	0.0
September	100	682	4.0	29.8	0	10.8	100	0.0	0.0	0.0
October	99	703	6.8	30.5	0	14.5	100	0.0	0.0	0.0
November	100	684	10.6	30.9	0	22.8	100	0.0	0.0	0.0
December	100	706	14.0	31.6	0	25.5	100	0.0	0.0	0.0
Annual	100	8310	8.1	44.7	0	28.2	100	0.1	0.0	0.0



**Wood Buffalo Environmental Association - Buffalo Viewpoint (AMS04)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average**

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	97	684	9.1	36.3	0	25.1	100	0.0	0.0	0.0
February	99	632	8.6	44.7	0	24.7	99	0.6	0.0	0.0
March	100	706	5.4	47.0	0	23.5	100	0.4	0.0	0.0
April	99	680	4.9	40.1	0	10.7	100	0.0	0.0	0.0
May	99	679	2.7	37.1	0	10.4	100	0.0	0.0	0.0
June	97	656	2.4	27.7	0	6.1	100	0.0	0.0	0.0
July	100	707	2.0	22.9	0	5.6	100	0.0	0.0	0.0
August	100	706	2.3	38.0	0	9.4	100	0.0	0.0	0.0
September	100	685	2.4	19.3	0	9.1	100	0.0	0.0	0.0
October	100	707	2.8	30.3	0	12.0	100	0.0	0.0	0.0
November	100	684	5.1	29.6	0	15.5	100	0.0	0.0	0.0
December	100	707	10.1	38.5	0	22.0	100	0.0	0.0	0.0
Annual	99	8233	4.8	47.0	0	25.1	100	0.1	0.0	0.0



Wood Buffalo Environmental Association - Patricia McInnes (AMS06)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	707	11.9	37.9	0	21.0	100	0.0	0.0	0.0
February	100	638	9.7	38.0	0	16.5	100	0.0	0.0	0.0
March	100	708	5.9	39.9	0	21.1	100	0.0	0.0	0.0
April	100	683	4.6	35.0	0	9.5	100	0.0	0.0	0.0
May	100	705	2.7	21.5	0	7.2	100	0.0	0.0	0.0
June	99	681	2.0	15.1	0	5.1	100	0.0	0.0	0.0
July	100	707	1.8	11.7	0	4.4	100	0.0	0.0	0.0
August	100	708	2.4	18.1	0	7.2	100	0.0	0.0	0.0
September	100	684	2.5	20.4	0	7.3	100	0.0	0.0	0.0
October	100	707	3.7	27.1	0	9.4	100	0.0	0.0	0.0
November	99	680	6.2	34.7	0	14.7	100	0.0	0.0	0.0
December	100	707	9.3	44.1	0	18.0	100	0.1	0.0	0.0
Annual	100	8315	5.2	44.1	0	21.1	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	708	13.3	41.2	0	22.4	100	0.1	0.0	0.0
February	100	638	10.9	40.5	0	19.5	100	0.2	0.0	0.0
March	100	705	8.8	40.5	0	22.2	100	0.1	0.0	0.0
April	100	682	6.0	40.3	0	10.8	100	0.0	0.0	0.0
May	99	701	3.4	17.0	0	5.9	100	0.0	0.0	0.0
June	100	683	3.4	14.7	0	5.5	100	0.0	0.0	0.0
July	100	707	3.0	14.5	0	5.2	100	0.0	0.0	0.0
August	97	685	3.6	15.3	0	8.8	100	0.0	0.0	0.0
September	100	684	4.2	22.2	0	8.4	100	0.0	0.0	0.0
October	99	704	6.9	32.3	0	11.6	100	0.0	0.0	0.0
November	100	682	9.0	34.4	0	19.1	100	0.0	0.0	0.0
December	100	708	11.3	33.8	0	17.9	100	0.0	0.0	0.0
Annual	100	8287	7.0	41.2	0	22.4	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Fort Chipewyan (AMS08)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	706	2.2	22.1	0	8.5	100	0.0	0.0	0.0
February	100	639	1.4	13.3	0	5.9	100	0.0	0.0	0.0
March	99	704	1.3	13.4	0	5.3	100	0.0	0.0	0.0
April	100	684	0.5	7.3	0	1.7	100	0.0	0.0	0.0
May	100	706	0.5	5.1	0	2.9	100	0.0	0.0	0.0
June	100	684	0.3	6.7	0	1.1	100	0.0	0.0	0.0
July	100	707	0.6	9.2	0	2.0	100	0.0	0.0	0.0
August	100	705	0.6	12.8	0	3.4	100	0.0	0.0	0.0
September	100	681	0.6	9.9	0	2.8	100	0.0	0.0	0.0
October	99	704	1.1	12.8	0	5.5	100	0.0	0.0	0.0
November	99	680	1.8	20.1	0	10.0	100	0.0	0.0	0.0
December	100	707	1.9	22.2	0	10.6	100	0.0	0.0	0.0
Annual	100	8307	1.1	22.2	0	10.6	100	0.0	0.0	0.0



**Wood Buffalo Environmental Association - Barge Landing (AMS09)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average**

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	704	17.3	43.6	0	29.6	100	0.3	0.0	0.0
February	100	637	15.2	51.6	0	36.7	97	3.3	0.0	0.0
March	99	702	12.0	43.8	0	26.5	100	0.4	0.0	0.0
April	99	677	7.7	41.2	0	16.0	100	0.2	0.0	0.0
May	98	694	5.4	39.4	0	8.9	100	0.0	0.0	0.0
June	99	674	4.4	23.6	0	8.9	100	0.0	0.0	0.0
July	100	704	4.6	23.4	0	7.7	100	0.0	0.0	0.0
August	74	512	5.1	25.3	0	10.7	100	0.0	0.0	0.0
September	100	681	5.6	28.0	0	14.2	100	0.0	0.0	0.0
October	99	701	8.7	32.3	0	19.6	100	0.0	0.0	0.0
November	100	684	12.4	39.3	0	23.2	100	0.0	0.0	0.0
December	100	709	16.7	45.0	0	30.0	99	0.6	0.0	0.0
Annual	97	8079	9.7	51.6	0	36.7	100	0.1	0.0	0.0



Wood Buffalo Environmental Association - Fort McKay South (AMS13)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	708	14.9	42.4	0	21.6	100	0.1	0.0	0.0
February	100	638	11.8	45.9	0	27.9	100	0.3	0.0	0.0
March	100	707	9.1	37.8	0	17.4	100	0.0	0.0	0.0
April	100	683	6.1	39.6	0	11.1	100	0.0	0.0	0.0
May	99	703	4.1	35.0	0	10.9	100	0.0	0.0	0.0
June	100	683	4.0	30.7	0	8.9	100	0.0	0.0	0.0
July	100	705	3.4	27.2	0	8.5	100	0.0	0.0	0.0
August	100	706	3.1	23.2	0	6.0	100	0.0	0.0	0.0
September	100	682	3.4	25.7	0	10.2	100	0.0	0.0	0.0
October	100	703	7.6	30.7	0	15.2	100	0.0	0.0	0.0
November	100	685	9.3	31.9	0	20.6	100	0.0	0.0	0.0
December	100	708	13.6	31.6	0	23.1	100	0.0	0.0	0.0
Annual	100	8311	7.5	45.9	0	27.9	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Anzac (AMS14)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	707	4.2	29.3	0	14.0	100	0.0	0.0	0.0
February	99	634	4.2	28.0	0	10.7	100	0.0	0.0	0.0
March	84	593	2.4	24.6	0	6.2	100	0.0	0.0	0.0
April	100	683	1.7	20.8	0	4.5	100	0.0	0.0	0.0
May	96	682	1.0	8.8	0	2.0	100	0.0	0.0	0.0
June	100	685	1.1	7.2	0	2.5	100	0.0	0.0	0.0
July	100	706	1.0	11.4	0	3.7	100	0.0	0.0	0.0
August	100	707	1.0	9.1	0	2.2	100	0.0	0.0	0.0
September	100	684	1.2	10.2	0	3.4	100	0.0	0.0	0.0
October	99	701	1.7	12.6	0	4.1	100	0.0	0.0	0.0
November	99	682	2.1	18.0	0	8.5	100	0.0	0.0	0.0
December	93	644	4.2	37.3	0	11.4	100	0.0	0.0	0.0
Annual	98	8108	2.1	37.3	0	14.0	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Wapasu (AMS17)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	707	4.6	29.4	0	12.8	100	0.0	0.0	0.0
February	100	639	3.9	30.3	0	10.8	100	0.0	0.0	0.0
March	100	705	2.7	24.0	0	5.7	100	0.0	0.0	0.0
April	97	663	2.0	30.4	0	5.8	100	0.0	0.0	0.0
May	100	708	1.2	15.4	0	3.7	100	0.0	0.0	0.0
June	100	682	2.0	20.2	0	4.5	100	0.0	0.0	0.0
July	100	707	1.3	11.6	0	3.9	100	0.0	0.0	0.0
August	100	707	1.4	14.5	0	4.0	100	0.0	0.0	0.0
September	98	668	1.8	13.8	0	4.0	100	0.0	0.0	0.0
October	100	707	2.4	20.8	0	7.0	100	0.0	0.0	0.0
November	100	685	3.0	25.3	0	6.7	100	0.0	0.0	0.0
December	100	709	4.7	27.8	0	12.3	100	0.0	0.0	0.0
Annual	99	8287	2.6	30.4	0	12.8	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	707	2.3	11.0	0	6.6	100	0.0	0.0	0.0
February	100	638	2.1	26.5	0	6.3	100	0.0	0.0	0.0
March	100	707	1.3	9.6	0	3.2	100	0.0	0.0	0.0
April	100	681	0.9	9.1	0	2.4	100	0.0	0.0	0.0
May	100	707	0.8	3.1	0	1.2	100	0.0	0.0	0.0
June	98	672	0.6	2.7	0	1.3	100	0.0	0.0	0.0
July	95	671	0.7	3.1	0	1.5	100	0.0	0.0	0.0
August	99	700	0.6	2.4	0	1.2	100	0.0	0.0	0.0
September	100	682	0.5	3.1	0	1.9	100	0.0	0.0	0.0
October	100	707	1.0	5.8	0	3.0	100	0.0	0.0	0.0
November	99	680	1.9	13.4	0	5.7	100	0.0	0.0	0.0
December	77	545	2.2	15.7	0	6.4	100	0.0	0.0	0.0
Annual	97	8097	1.2	26.5	0	6.6	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Firebag (AMS19)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	92	654	5.8	33.0	0	13.3	100	0.0	0.0	0.0
February	100	639	4.3	29.9	0	16.1	100	0.0	0.0	0.0
March	99	704	3.6	40.6	0	10.4	100	0.1	0.0	0.0
April	100	685	2.0	25.5	0	5.4	100	0.0	0.0	0.0
May	100	705	1.2	21.8	0	3.5	100	0.0	0.0	0.0
June	99	677	1.8	18.8	0	3.9	100	0.0	0.0	0.0
July	100	707	1.5	17.8	0	4.4	100	0.0	0.0	0.0
August	100	705	1.9	15.3	0	3.9	100	0.0	0.0	0.0
September	100	685	2.5	17.4	0	5.6	100	0.0	0.0	0.0
October	100	709	3.1	24.4	0	9.2	100	0.0	0.0	0.0
November	100	682	3.9	79.1	0	8.5	100	0.2	0.0	0.0
December	100	708	5.9	37.6	0	13.3	100	0.0	0.0	0.0
Annual	99	8260	3.1	79.1	0	16.1	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Mackay River (AMS20)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	705	4.4	35.0	0	14.5	100	0.0	0.0	0.0
February	100	639	3.1	34.6	0	10.9	100	0.0	0.0	0.0
March	99	700	2.5	33.6	0	16.3	100	0.0	0.0	0.0
April	100	684	1.4	20.3	0	4.0	100	0.0	0.0	0.0
May	100	706	1.3	17.3	0	5.2	100	0.0	0.0	0.0
June	100	684	0.7	8.9	0	1.5	100	0.0	0.0	0.0
July	100	704	1.0	8.7	0	3.5	100	0.0	0.0	0.0
August	100	708	1.3	14.3	0	7.5	100	0.0	0.0	0.0
September	100	684	0.8	15.3	0	3.4	100	0.0	0.0	0.0
October	100	707	1.2	21.5	0	7.9	100	0.0	0.0	0.0
November	100	681	2.1	31.7	0	10.1	100	0.0	0.0	0.0
December	100	708	3.4	29.6	0	21.0	100	0.0	0.0	0.0
Annual	100	8310	1.9	35.0	0	21.0	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Conklin (AMS21)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	708	3.2	21.0	0	7.4	100	0.0	0.0	0.0
February	100	639	2.8	20.1	0	6.0	100	0.0	0.0	0.0
March	100	708	2.0	21.5	0	6.8	100	0.0	0.0	0.0
April	100	685	1.5	18.3	0	3.0	100	0.0	0.0	0.0
May	100	708	1.1	14.4	0	2.4	100	0.0	0.0	0.0
June	100	686	0.9	15.1	0	1.5	100	0.0	0.0	0.0
July	100	707	0.9	8.1	0	1.9	100	0.0	0.0	0.0
August	100	707	0.8	8.1	0	1.4	100	0.0	0.0	0.0
September	97	659	1.0	9.2	0	2.4	100	0.0	0.0	0.0
October	100	705	1.6	14.4	0	3.2	100	0.0	0.0	0.0
November	100	685	2.5	20.9	0	7.3	100	0.0	0.0	0.0
December	100	708	2.8	15.9	0	7.6	100	0.0	0.0	0.0
Annual	100	8305	1.8	21.5	0	7.6	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Janvier (AMS22)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	707	2.2	10.8	0	4.9	100	0.0	0.0	0.0
February	100	638	2.2	13.3	0	5.8	100	0.0	0.0	0.0
March	100	708	0.9	8.0	0	2.3	100	0.0	0.0	0.0
April	100	683	0.7	10.6	0	1.7	100	0.0	0.0	0.0
May	99	704	0.7	6.8	0	1.6	100	0.0	0.0	0.0
June	99	680	0.6	3.6	0	1.3	100	0.0	0.0	0.0
July	100	705	0.6	4.6	0	1.3	100	0.0	0.0	0.0
August	97	683	0.4	3.1	0	0.9	100	0.0	0.0	0.0
September	97	659	0.7	7.2	0	2.2	100	0.0	0.0	0.0
October	100	707	1.2	8.3	0	2.5	100	0.0	0.0	0.0
November	100	683	2.1	7.7	0	5.2	100	0.0	0.0	0.0
December	100	707	2.8	16.9	0	7.2	100	0.0	0.0	0.0
Annual	99	8264	1.3	16.9	0	7.2	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Fort Hills (AMS23)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	708	15.8	53.5	0	31.9	97	3.0	0.0	0.0
February	100	639	14.4	50.4	0	34.4	98	2.0	0.0	0.0
March	100	705	10.2	58.5	0	24.0	98	1.7	0.0	0.0
April	98	673	7.1	47.3	0	20.5	99	0.7	0.0	0.0
May	100	706	6.5	40.0	0	13.5	100	0.0	0.0	0.0
June	100	685	5.5	40.1	0	12.7	100	0.0	0.0	0.0
July	100	708	5.3	34.1	0	12.8	100	0.0	0.0	0.0
August	100	708	5.0	41.9	0	13.1	100	0.1	0.0	0.0
September	100	683	6.2	31.2	0	14.5	100	0.0	0.0	0.0
October	100	707	7.6	33.9	0	16.4	100	0.0	0.0	0.0
November	99	680	10.7	42.4	0	20.0	100	0.3	0.0	0.0
December	94	653	15.2	47.3	0	30.2	100	0.5	0.0	0.0
Annual	99	8255	9.1	58.5	0	34.4	99	0.7	0.0	0.0



Wood Buffalo Environmental Association - Christina Lake (AMS26)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	708	5.2	30.8	0	10.1	100	0.0	0.0	0.0
February	100	637	5.0	32.2	0	10.8	100	0.0	0.0	0.0
March	99	700	3.4	21.3	0	6.7	100	0.0	0.0	0.0
April	100	684	3.4	39.3	0	6.0	100	0.0	0.0	0.0
May	100	705	1.5	12.6	0	3.6	100	0.0	0.0	0.0
June	100	684	2.1	12.4	0	4.0	100	0.0	0.0	0.0
July	100	707	2.1	16.1	0	4.1	100	0.0	0.0	0.0
August	100	706	2.2	13.7	0	4.1	100	0.0	0.0	0.0
September	100	684	2.2	17.9	0	4.8	100	0.0	0.0	0.0
October	100	704	3.0	30.1	0	5.9	100	0.0	0.0	0.0
November	100	685	3.7	14.1	0	7.5	100	0.0	0.0	0.0
December	100	704	5.1	29.3	0	11.4	100	0.0	0.0	0.0
Annual	100	8308	3.2	39.3	0	11.4	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Jackfish 2/3 (AMS27)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	706	2.0	14.0	0	5.0	100	0.0	0.0	0.0
February	100	637	2.1	18.6	0	4.2	100	0.0	0.0	0.0
March	100	705	1.0	7.3	0	2.6	100	0.0	0.0	0.0
April	98	674	0.7	7.2	0	1.6	100	0.0	0.0	0.0
May	100	708	0.6	5.6	0	1.1	100	0.0	0.0	0.0
June	100	685	0.7	6.9	0	1.4	100	0.0	0.0	0.0
July	100	708	0.9	5.5	0	1.9	100	0.0	0.0	0.0
August	97	689	0.9	4.7	0	1.6	100	0.0	0.0	0.0
September	99	680	0.8	5.5	0	1.7	100	0.0	0.0	0.0
October	100	706	1.1	8.2	0	2.8	100	0.0	0.0	0.0
November	100	683	1.9	12.5	0	5.2	100	0.0	0.0	0.0
December	99	703	2.5	15.9	0	8.3	100	0.0	0.0	0.0
Annual	99	8284	1.2	18.6	0	8.3	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Surmont 2 (AMS29)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	707	3.0	17.4	0	8.1	100	0.0	0.0	0.0
February	100	638	3.4	15.4	0	7.6	100	0.0	0.0	0.0
March	100	707	1.8	13.3	0	4.1	100	0.0	0.0	0.0
April	99	680	1.2	18.7	0	3.4	100	0.0	0.0	0.0
May	98	696	0.7	19.6	0	1.9	100	0.0	0.0	0.0
June	100	685	0.7	6.3	0	1.4	100	0.0	0.0	0.0
July	93	651	0.8	5.3	0	1.4	100	0.0	0.0	0.0
August	100	708	0.7	6.3	0	1.7	100	0.0	0.0	0.0
September	100	684	0.7	8.1	0	1.9	100	0.0	0.0	0.0
October	100	706	1.1	11.1	0	3.0	100	0.0	0.0	0.0
November	100	681	1.7	9.0	0	4.2	100	0.0	0.0	0.0
December	100	707	3.1	20.6	0	10.2	100	0.0	0.0	0.0
Annual	99	8250	1.6	20.6	0	10.2	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Ells River (AMS30)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	707	10.9	38.0	0	17.4	100	0.0	0.0	0.0
February	100	638	10.1	46.0	0	25.8	99	1.4	0.0	0.0
March	99	703	6.1	40.3	0	17.3	100	0.0	0.0	0.0
April	100	684	5.2	39.8	0	12.9	100	0.0	0.0	0.0
May	99	702	3.5	37.3	0	9.0	100	0.0	0.0	0.0
June	100	684	3.2	28.7	0	9.7	100	0.0	0.0	0.0
July	100	708	3.6	36.0	0	8.6	100	0.0	0.0	0.0
August	100	708	2.8	36.8	0	8.9	100	0.0	0.0	0.0
September	100	684	2.8	28.3	0	7.7	100	0.0	0.0	0.0
October	100	707	3.6	31.3	0	8.9	100	0.0	0.0	0.0
November	100	685	6.5	38.7	0	18.5	100	0.0	0.0	0.0
December	100	708	8.9	34.5	0	23.1	100	0.0	0.0	0.0
Annual	100	8318	5.6	46.0	0	25.8	100	0.1	0.0	0.0



Wood Buffalo Environmental Association - Leismer (AMS501)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
October	99	703	1.2	13.0	0	3.5	100	0.0	0.0	0.0
November	100	685	1.7	15.0	0	5.3	100	0.0	0.0	0.0
December	100	708	2.6	15.1	0	7.2	100	0.0	0.0	0.0
Annual	100	2096	1.8	15.1	0	7.2	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Sawbones Bay (AMS505)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
July	97	676	2.3	15.7	0	5.4	100	0.0	0.0	0.0
August	98	690	1.5	14.9	0	4.1	100	0.0	0.0	0.0
September	100	681	2.4	17.6	0	7.1	100	0.0	0.0	0.0
October	100	708	2.8	21.9	0	8.5	100	0.0	0.0	0.0
November	93	628	4.5	23.3	0	10.0	100	0.0	0.0	0.0
December	98	693	5.3	33.2	0	16.3	100	0.0	0.0	0.0
Annual	97	4076	3.1	33.2	0	16.3	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Jackfish 1 (AMS506)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	100	707	3.6	26.1	0	6.8	100	0.0	0.0	0.0
February	100	639	3.9	30.5	0	8.9	100	0.0	0.0	0.0
March	99	700	2.1	20.6	0	3.4	100	0.0	0.0	0.0
April	100	682	2.0	24.6	0	5.9	100	0.0	0.0	0.0
May	100	706	1.0	15.8	0	3.2	100	0.0	0.0	0.0
June	100	685	1.8	13.4	0	5.7	100	0.0	0.0	0.0
July	100	705	1.6	18.1	0	4.1	100	0.0	0.0	0.0
August	100	708	1.4	15.2	0	4.0	100	0.0	0.0	0.0
Annual	100	5532	2.2	30.5	0	8.9	100	0.0	0.0	0.0



Wood Buffalo Environmental Association - Kirby South (AMS507)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
July	100	702	0.9	14.4	0	2.6	100	0.0	0.0	0.0
August	100	708	1.2	24.8	0	8.2	100	0.0	0.0	0.0
September	98	663	0.6	8.1	0	3.3	100	0.0	0.0	0.0
October	100	707	1.0	13.6	0	2.8	100	0.0	0.0	0.0
November	100	683	1.8	23.0	0	5.6	100	0.0	0.0	0.0
December	100	707	3.0	27.3	0	7.0	100	0.0	0.0	0.0
Annual	100	4170	1.4	27.3	0	8.2	100	0.0	0.0	0.0



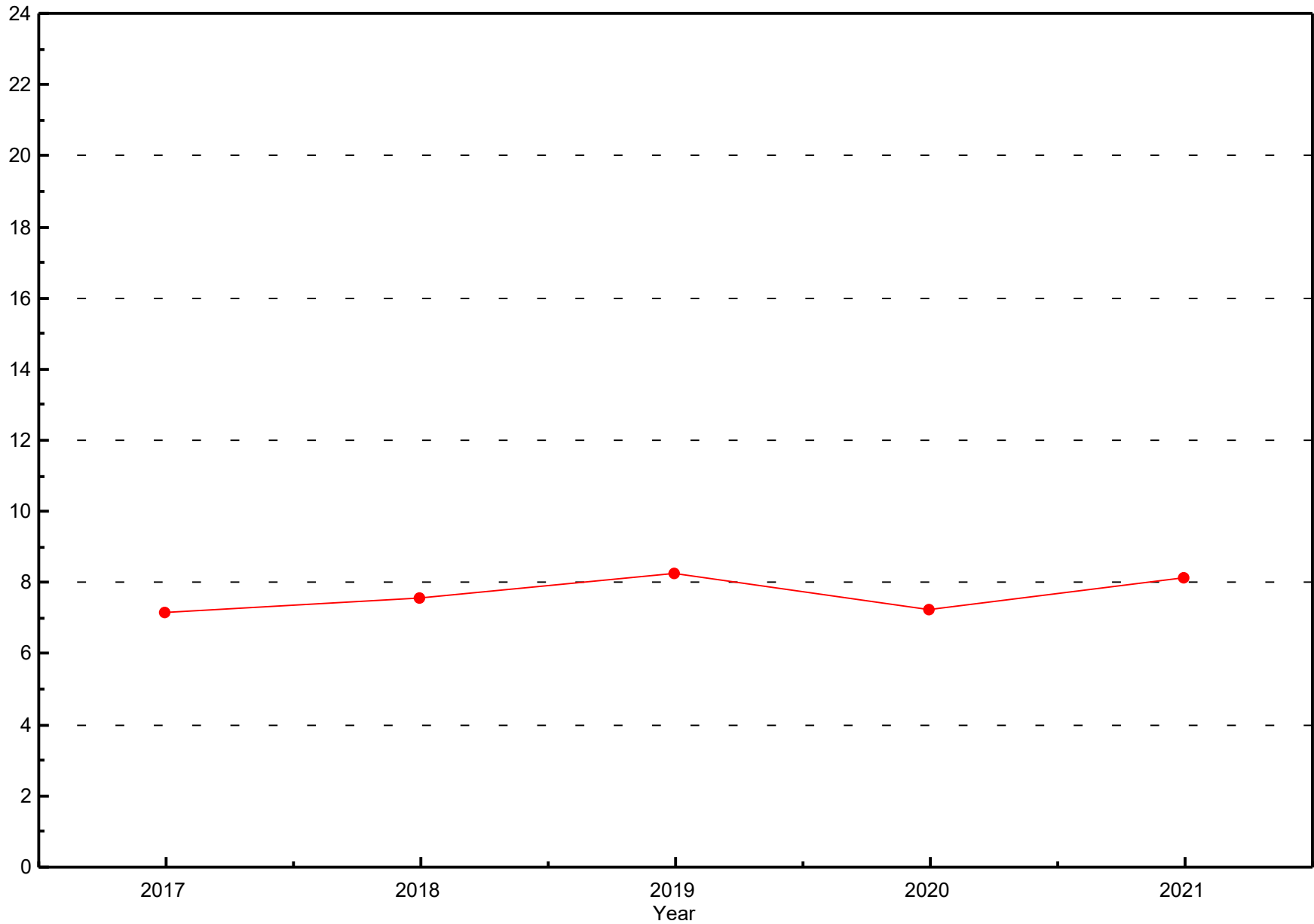
Wood Buffalo Environmental Association - Kirby North (AMS508)
Annual Summary for the Year 2021
Nitrogen Dioxide (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range			
							0 - 40	41 - 80	81 - 159	>159
January	90	635	2.3	14.0	0	5.2	100	0.0	0.0	0.0
February	100	638	2.0	13.9	0	3.3	100	0.0	0.0	0.0
March	100	705	1.2	8.3	0	3.0	100	0.0	0.0	0.0
April	100	683	1.4	74.5	0	8.8	100	0.3	0.0	0.0
May	100	706	0.6	5.4	0	1.2	100	0.0	0.0	0.0
June	100	653	0.8	4.3	0	1.6	100	0.0	0.0	0.0
Annual	98	4020	1.4	74.5	0	8.8	100	0.1	0.0	0.0



Yearly Averages

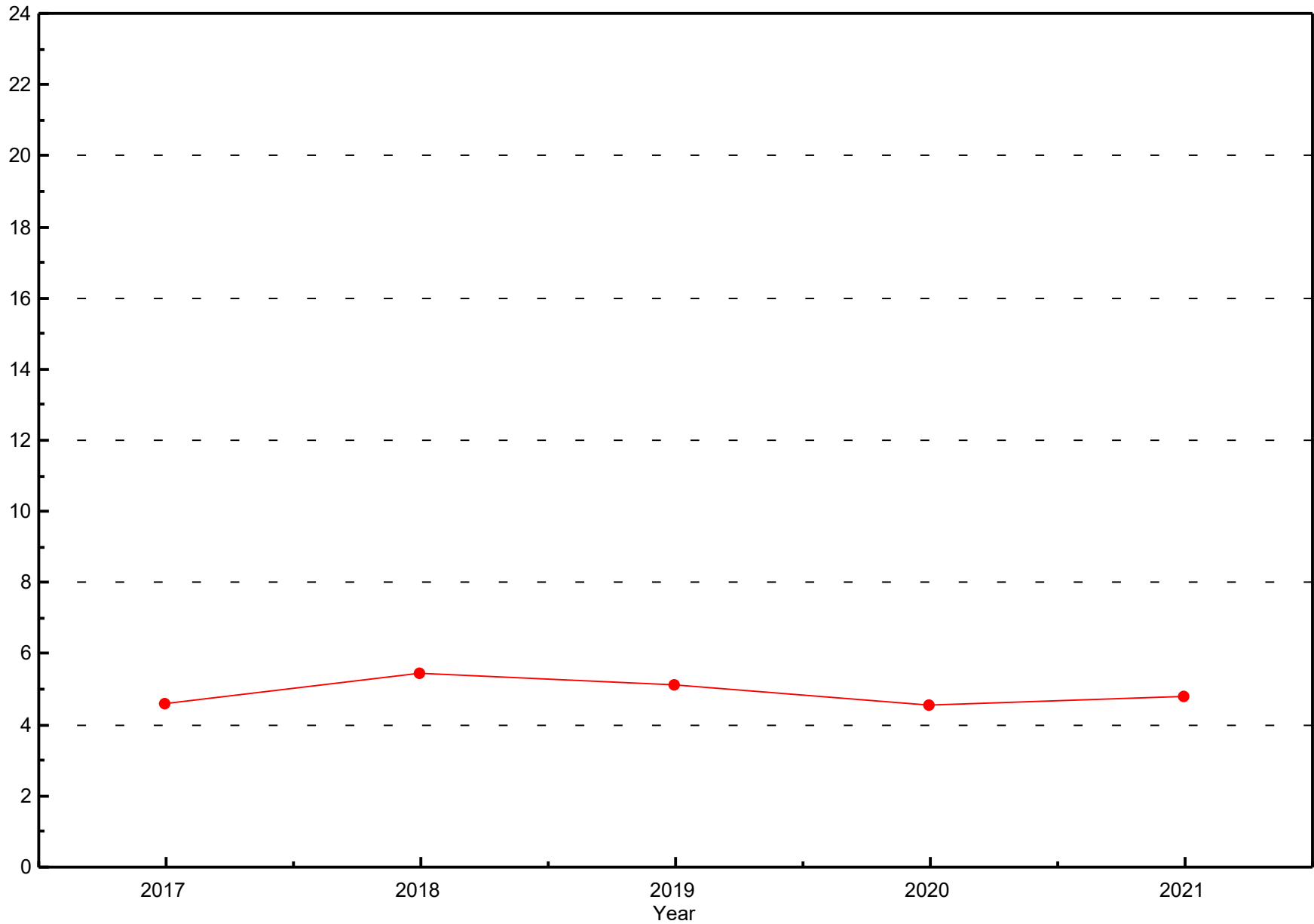
Nitrogen Dioxide (NO₂) - ppb
Fort McKay - Bertha Ganter (2017 to 2021)





Yearly Averages

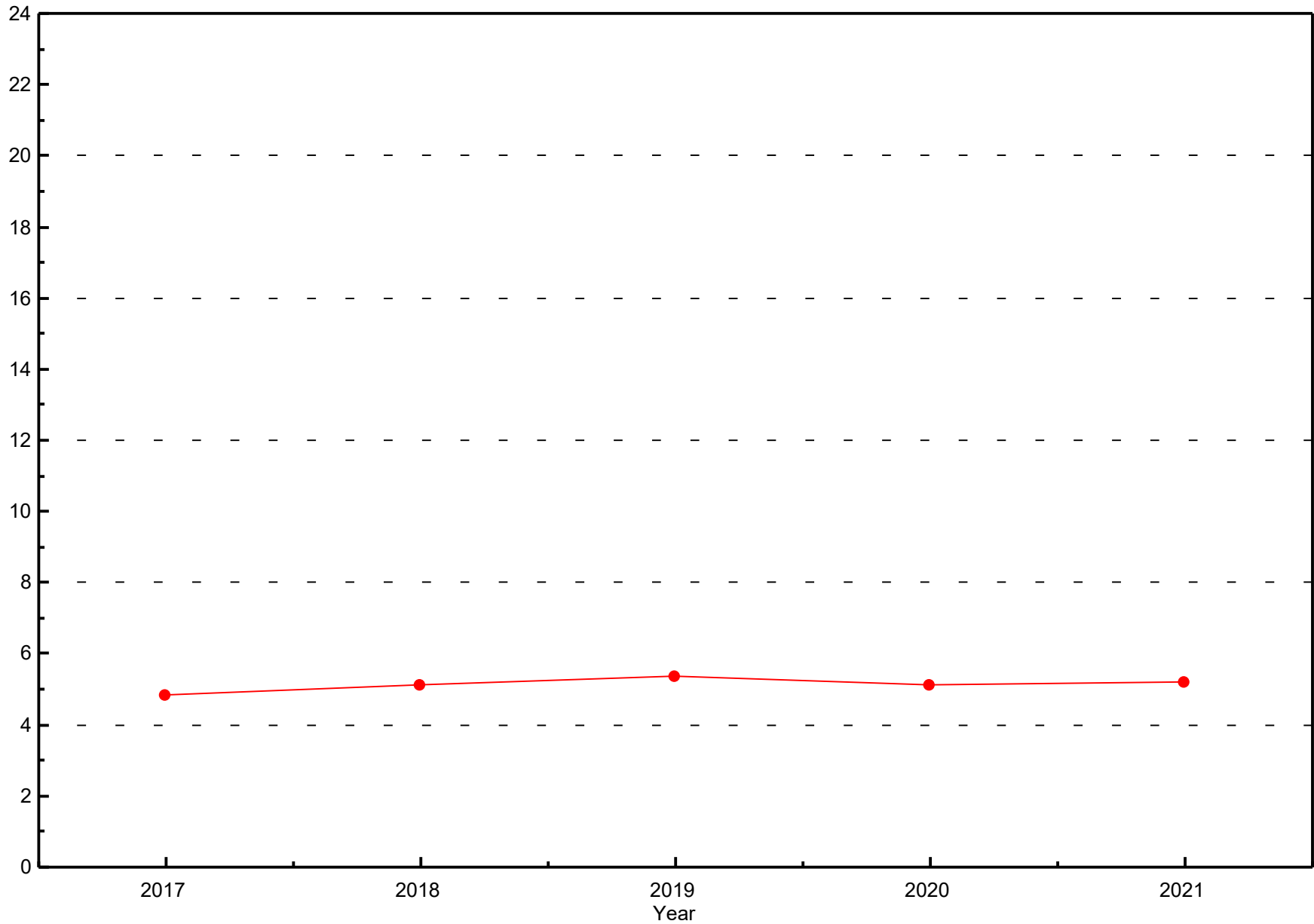
Nitrogen Dioxide (NO₂) - ppb
Buffalo Viewpoint (2017 to 2021)





Yearly Averages

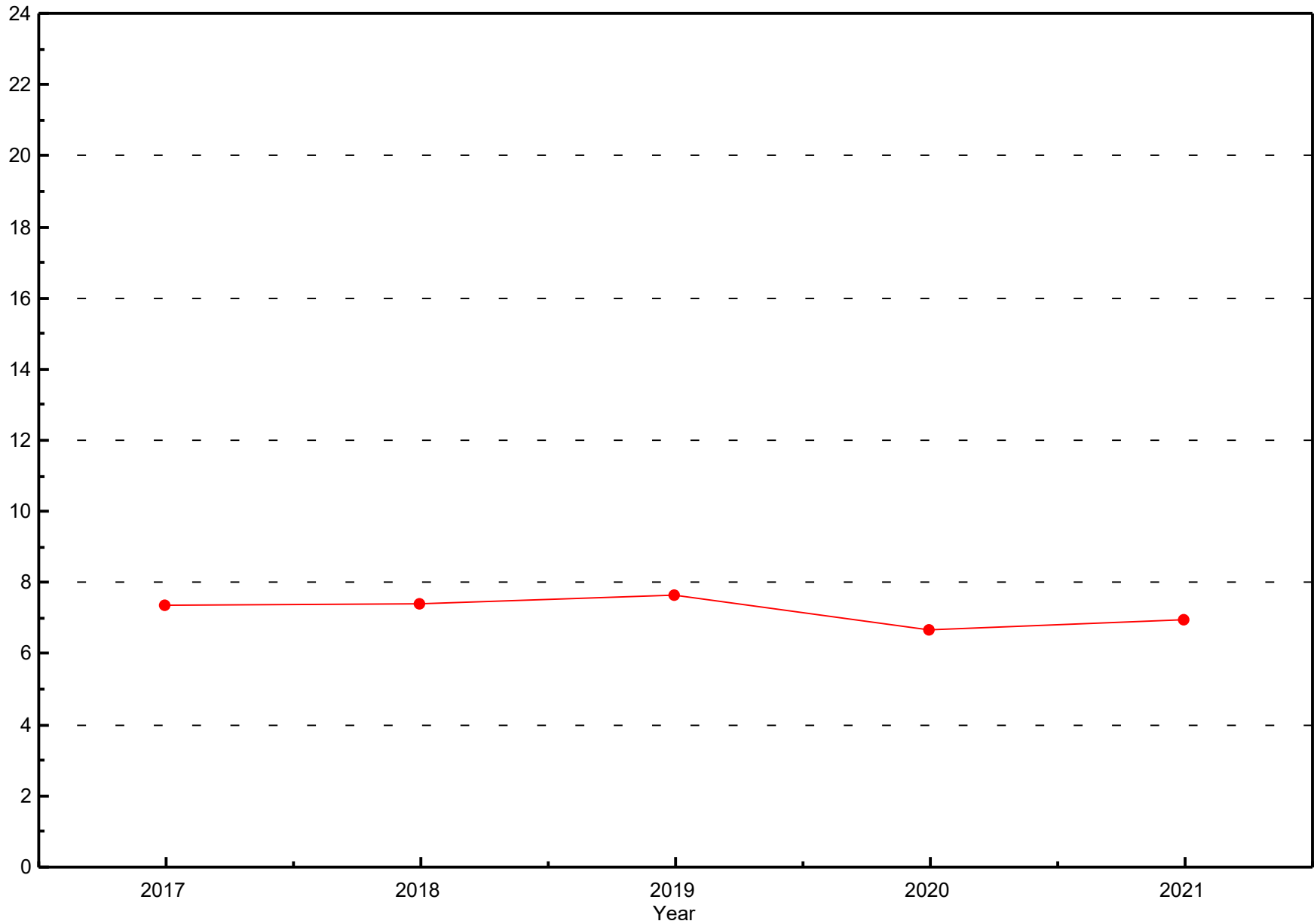
Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes (2017 to 2021)





Yearly Averages

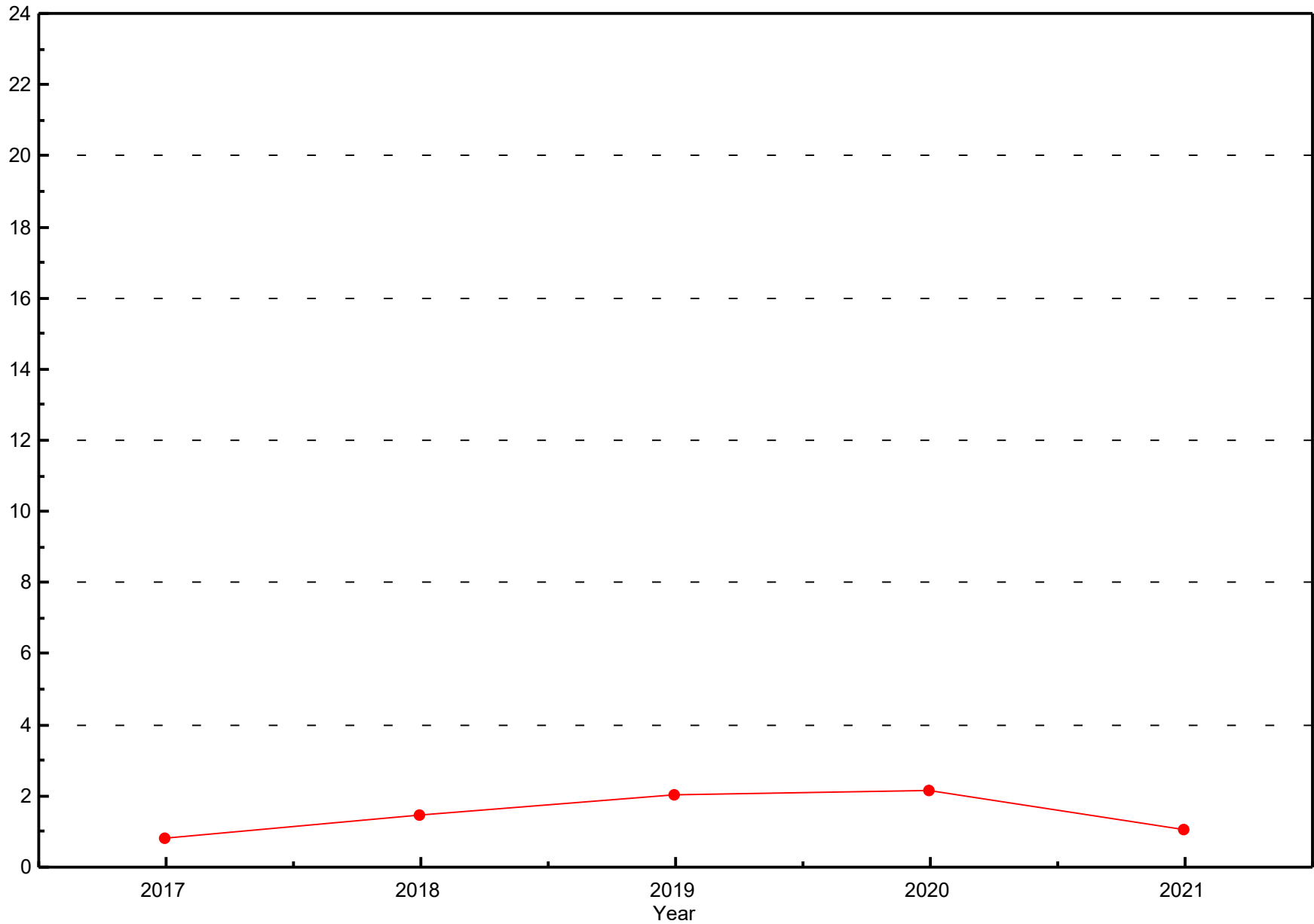
Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley (2017 to 2021)





Yearly Averages

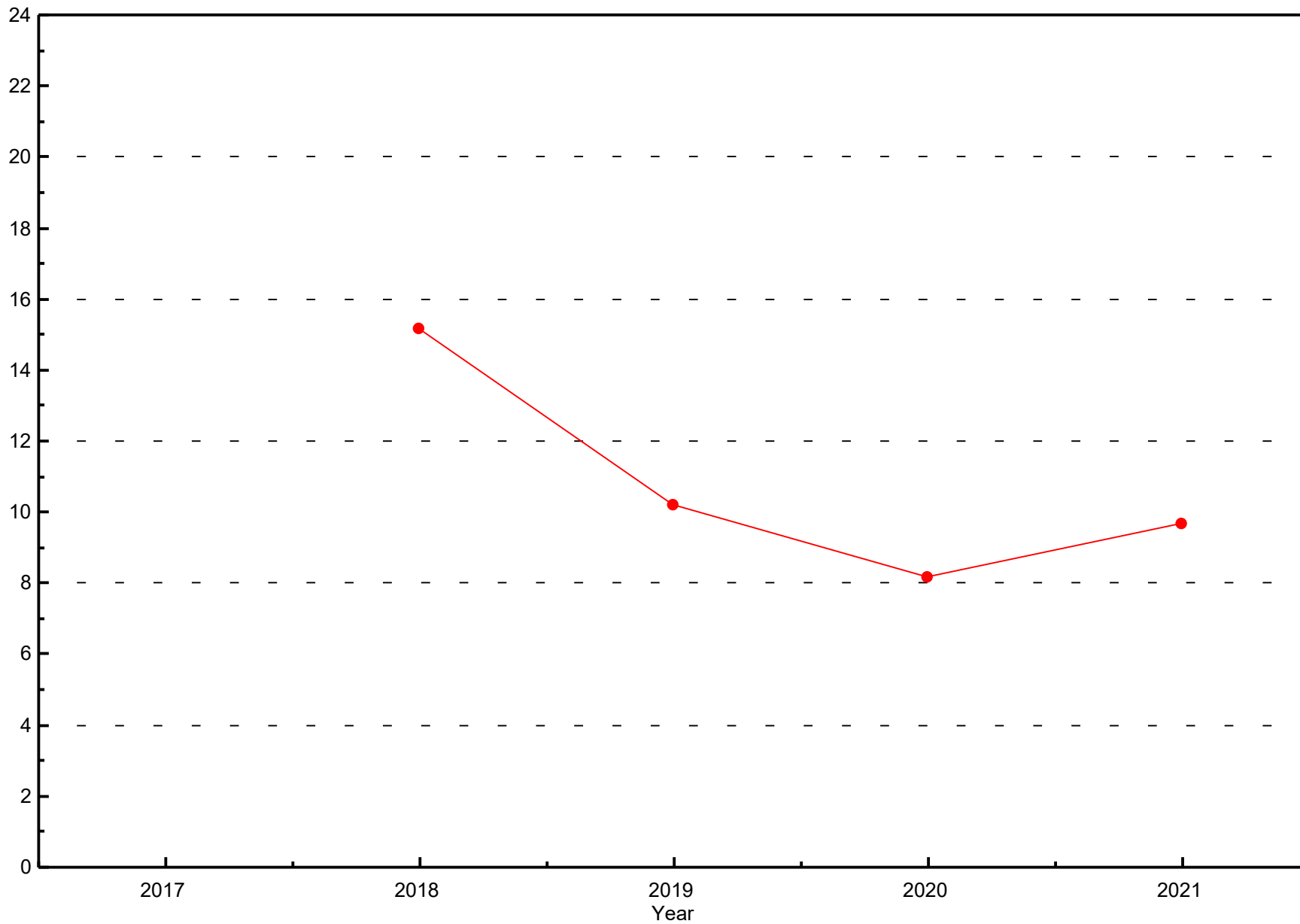
Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan (2017 to 2021)





Yearly Averages

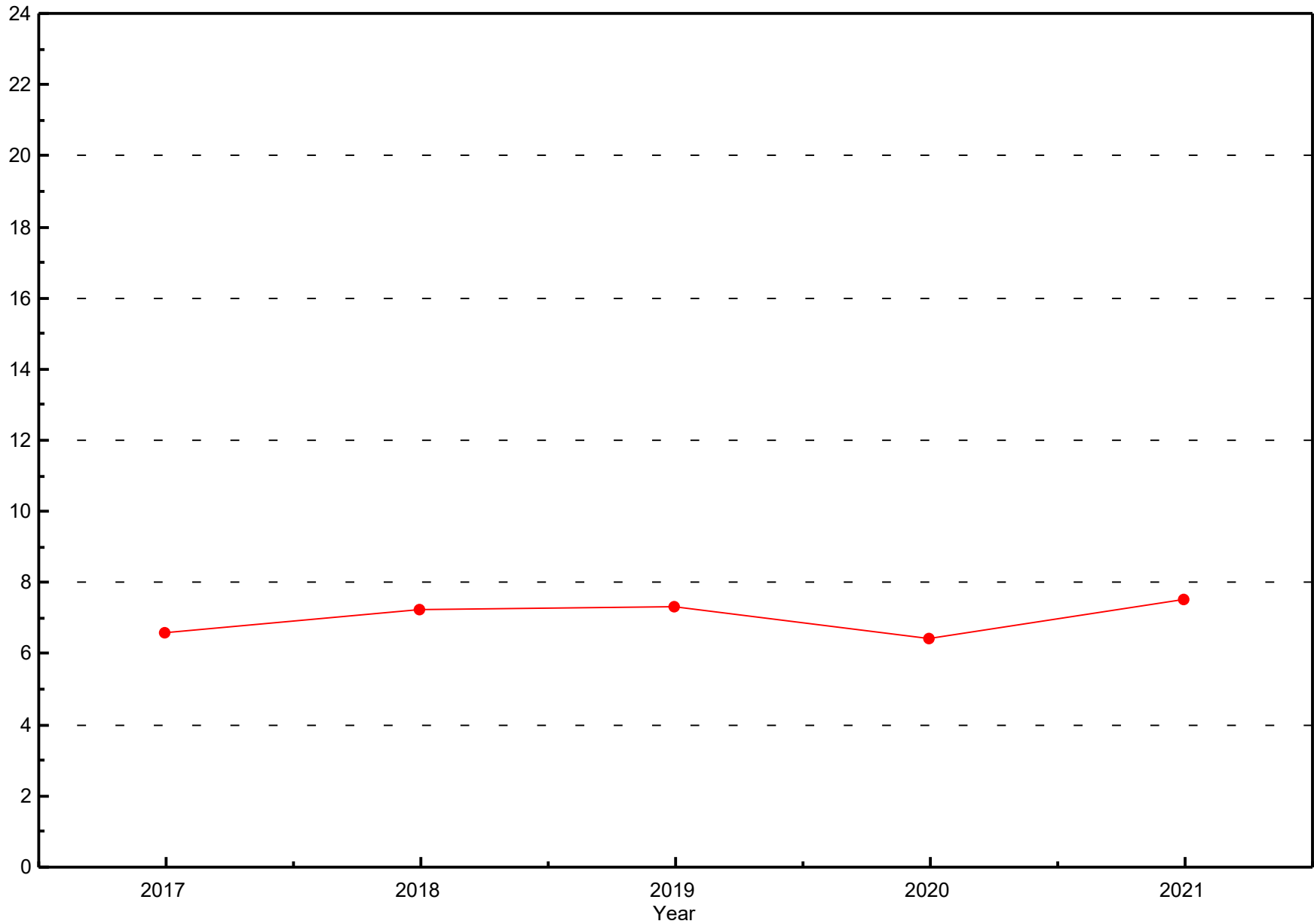
Nitrogen Dioxide (NO₂) - ppb
Barge Landing (2017 to 2021)





Yearly Averages

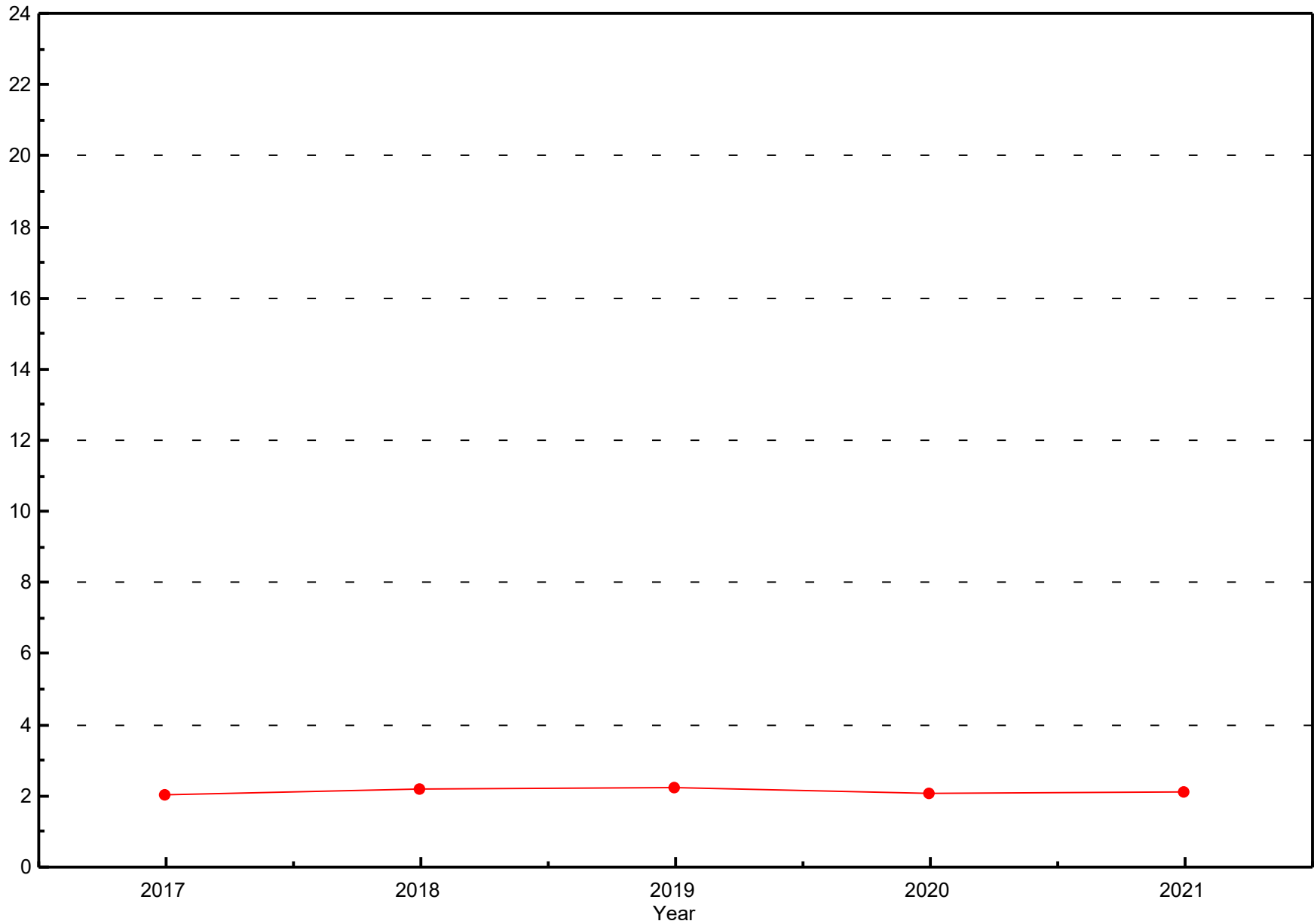
Nitrogen Dioxide (NO₂) - ppb
Fort McKay South (2017 to 2021)





Yearly Averages

Nitrogen Dioxide (NO₂) - ppb
Anzac (2017 to 2021)

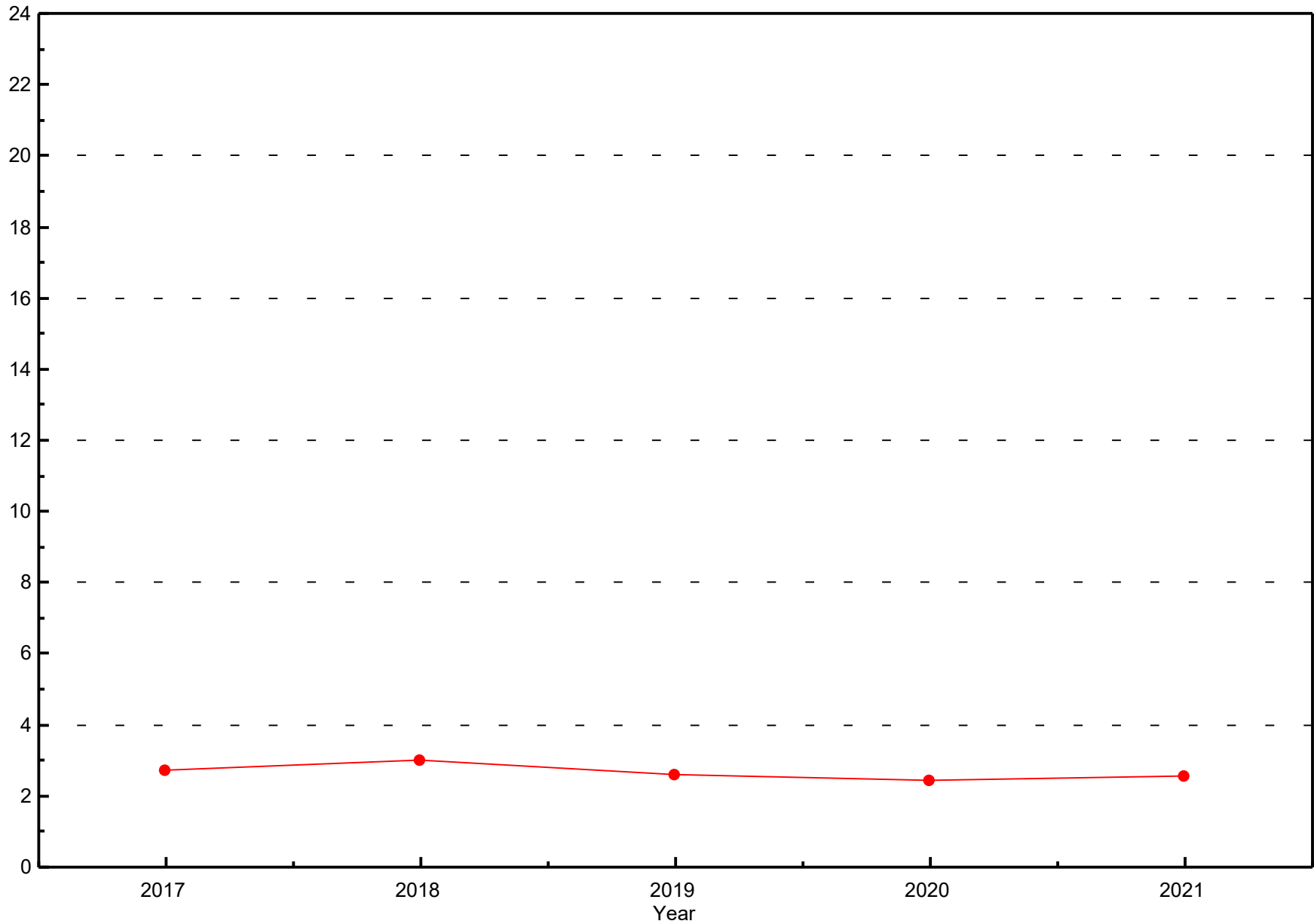




Yearly Averages

Nitrogen Dioxide (NO₂) - ppb

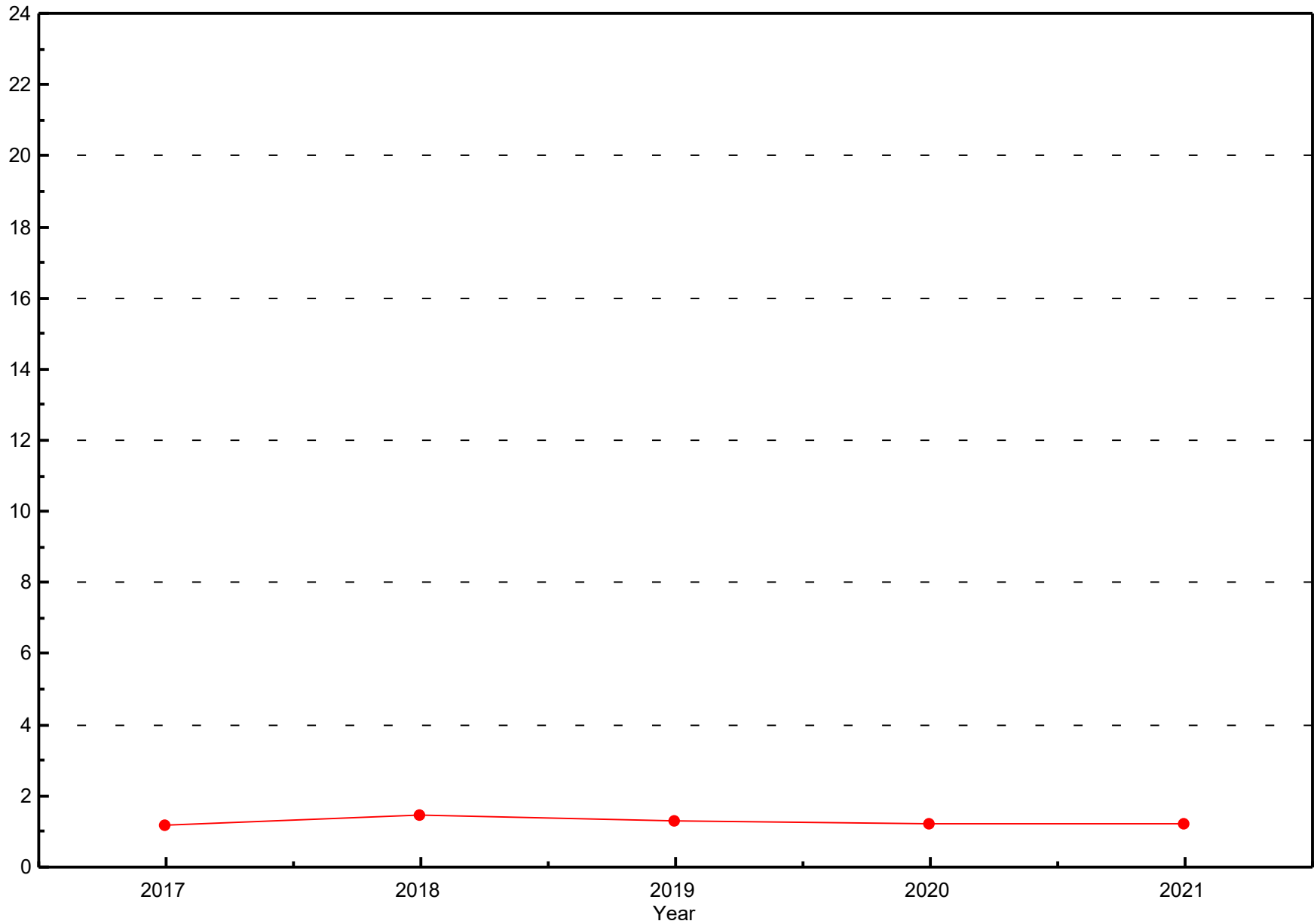
Wapasu (2017 to 2021)





Yearly Averages

Nitrogen Dioxide (NO₂) - ppb
Stony Mountain (2017 to 2021)

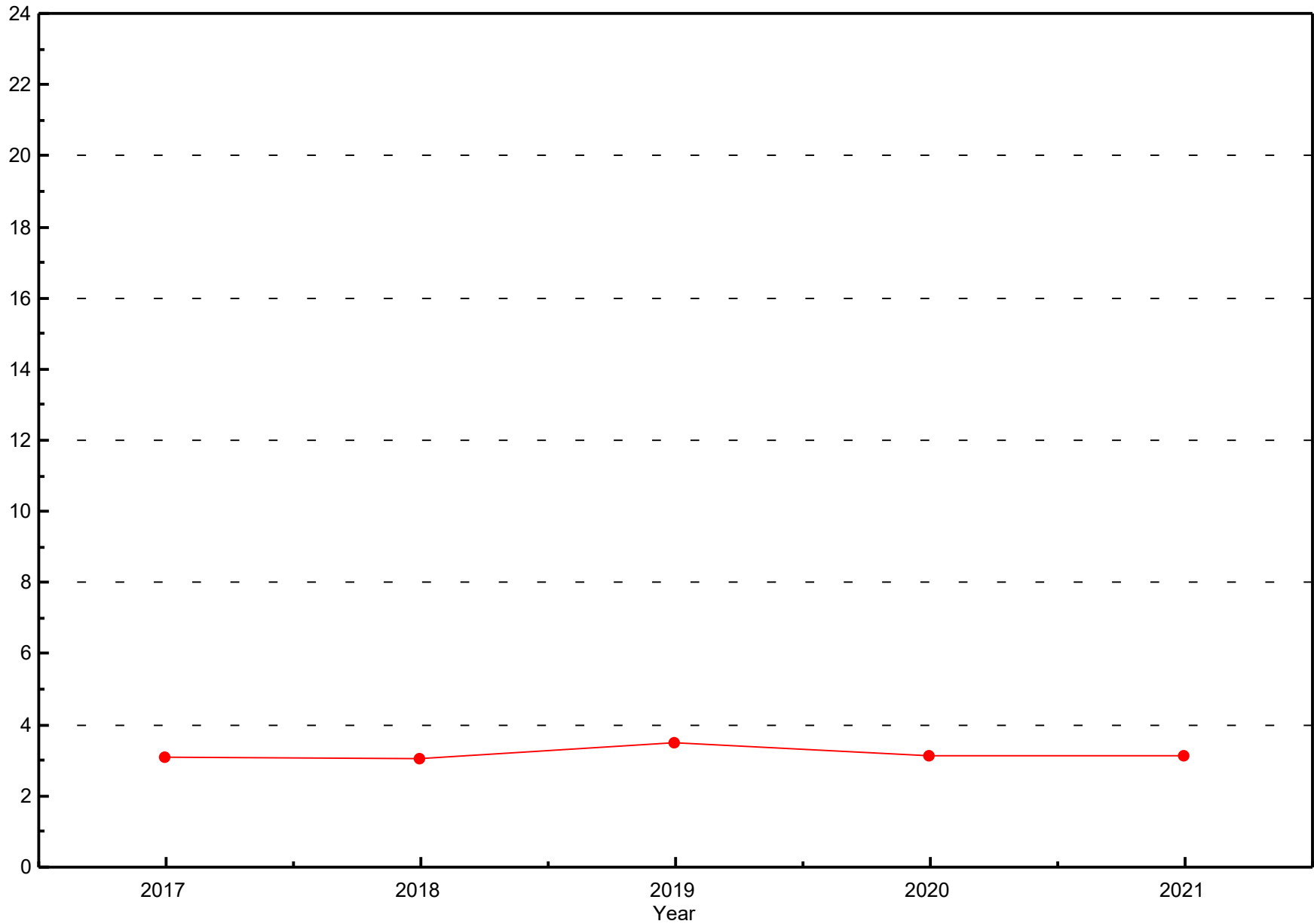




Yearly Averages

Nitrogen Dioxide (NO₂) - ppb

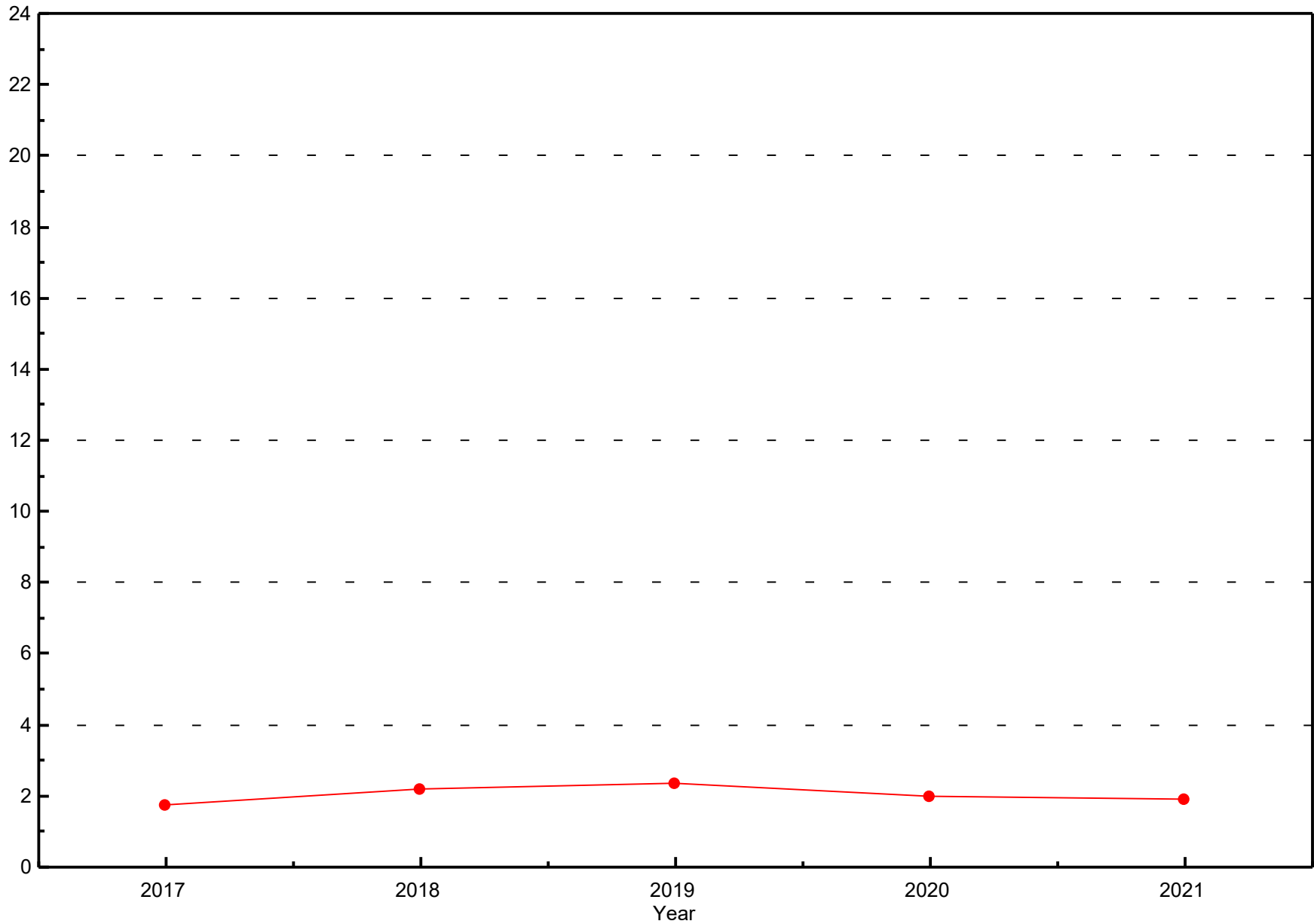
Firebag (2017 to 2021)





Yearly Averages

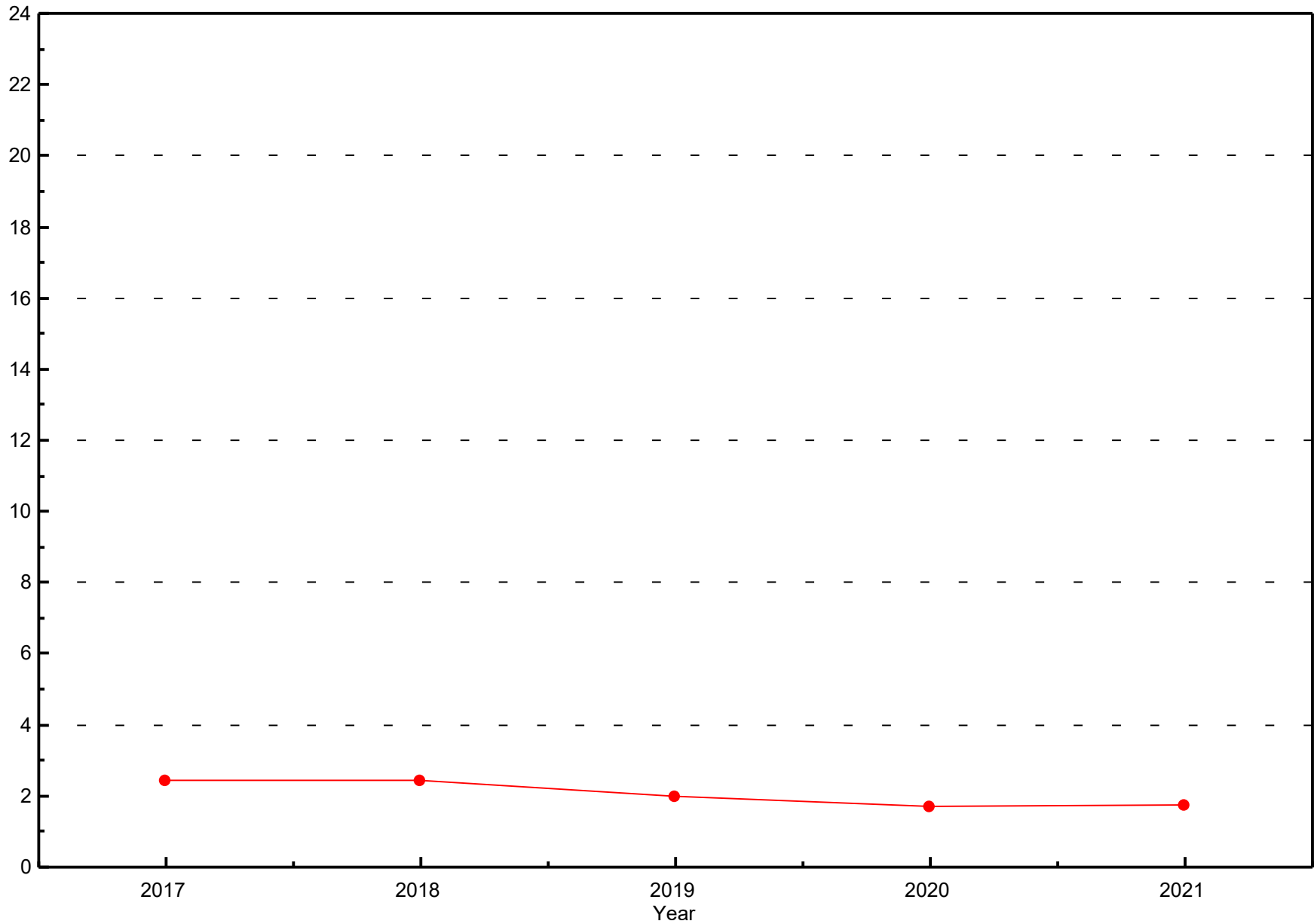
Nitrogen Dioxide (NO₂) - ppb
Mackay River (2017 to 2021)





Yearly Averages

Nitrogen Dioxide (NO₂) - ppb
Conklin (2017 to 2021)

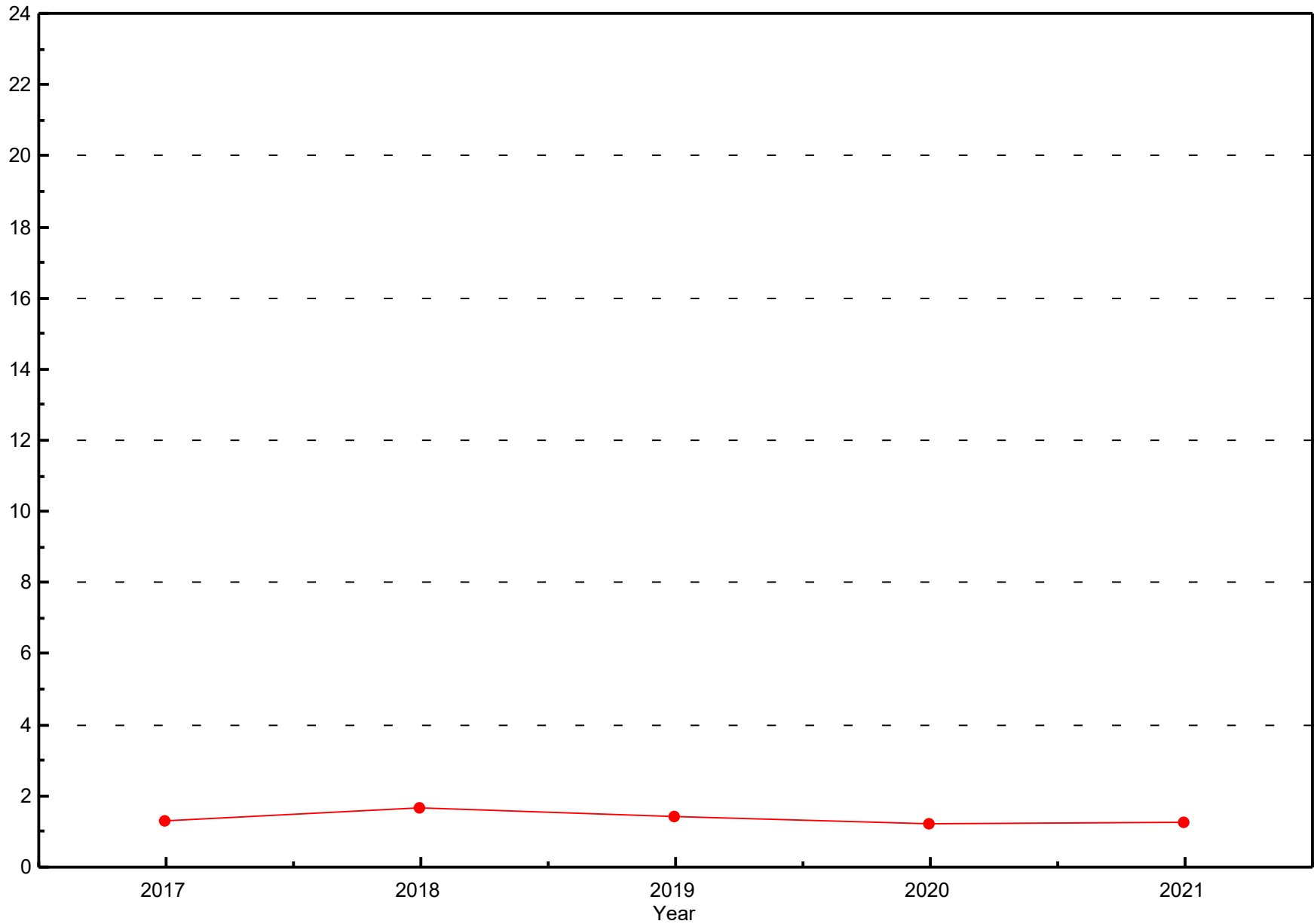




Yearly Averages

Nitrogen Dioxide (NO₂) - ppb

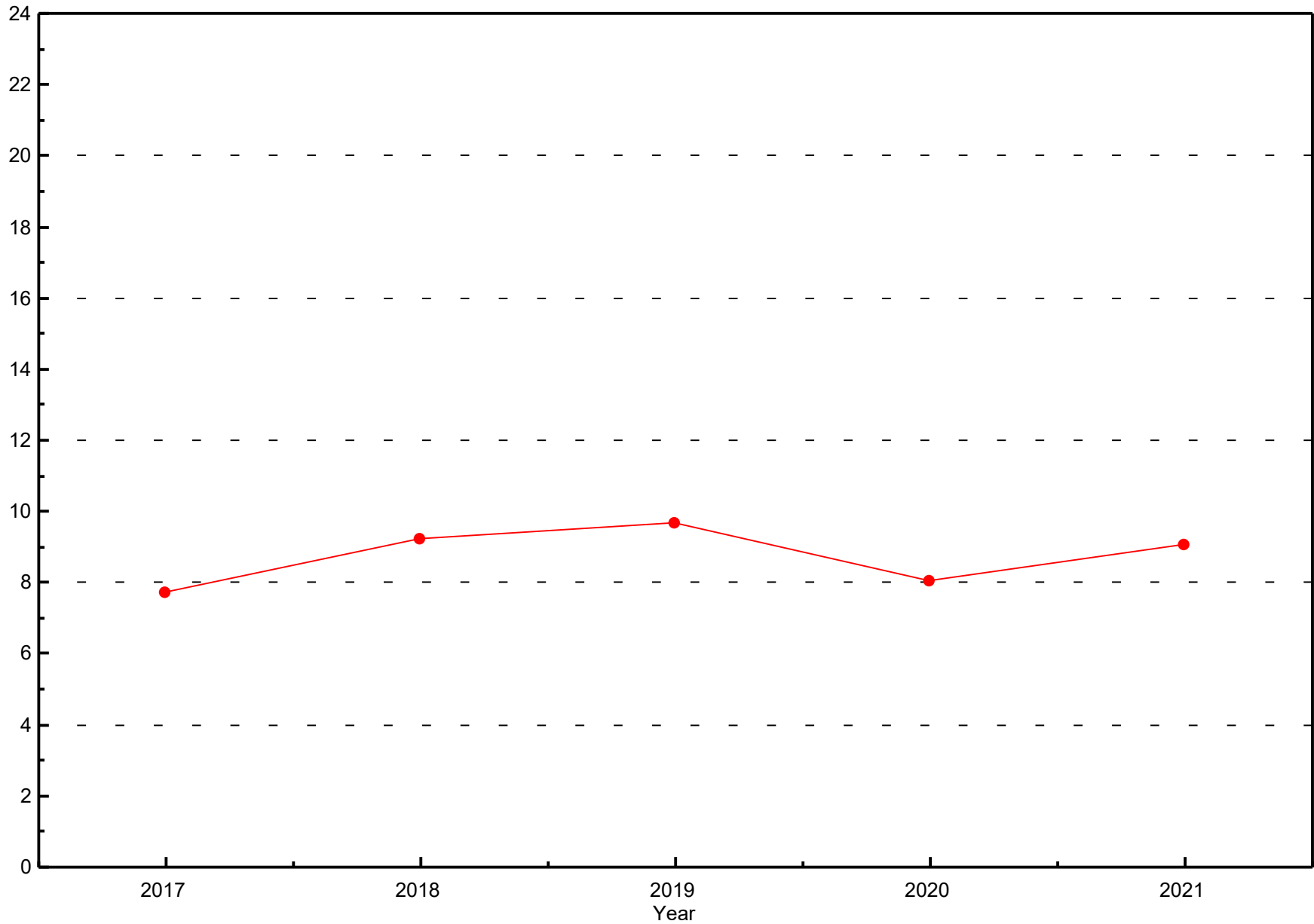
Janvier (2017 to 2021)





Yearly Averages

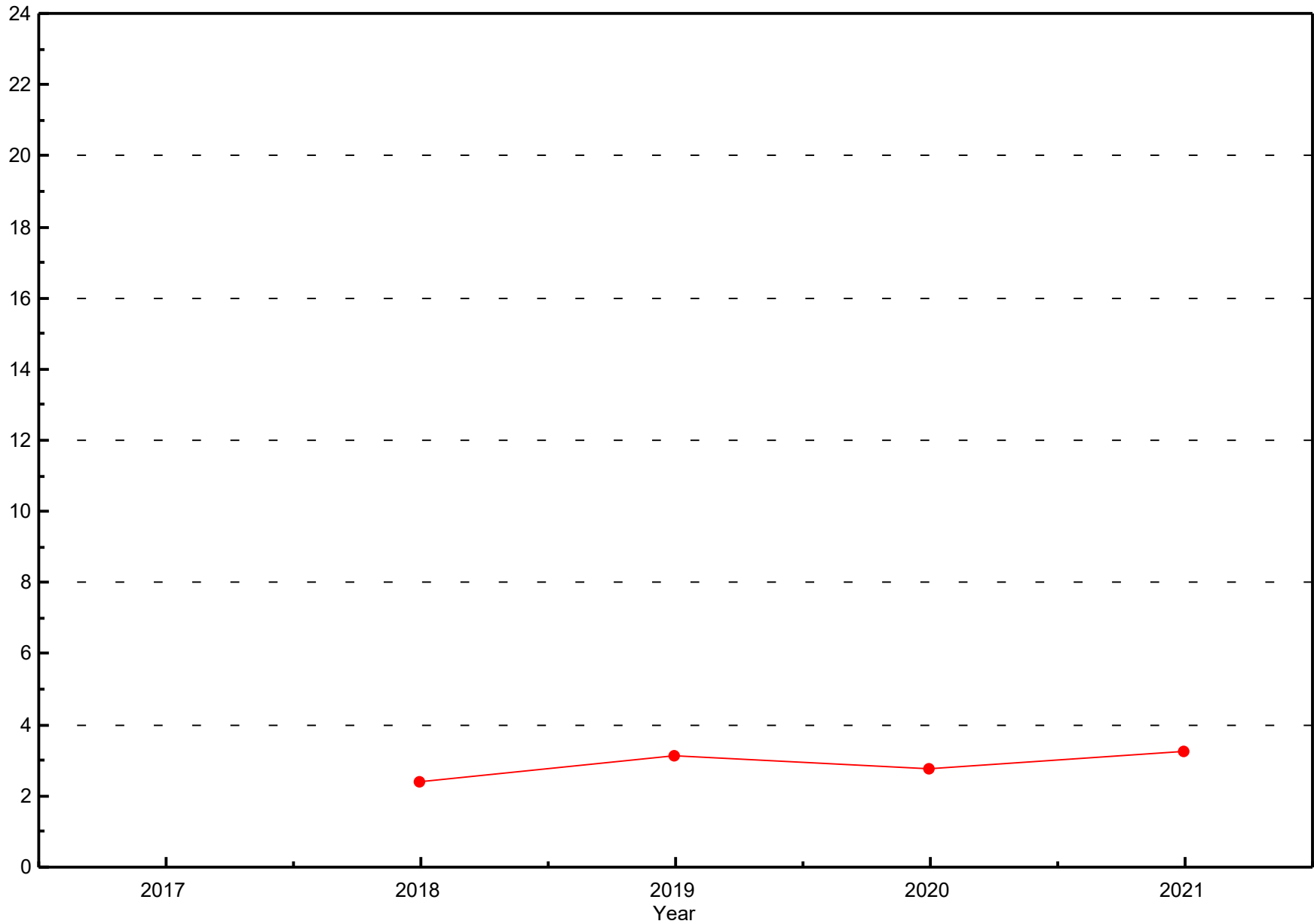
Nitrogen Dioxide (NO₂) - ppb
Fort Hills (2017 to 2021)





Yearly Averages

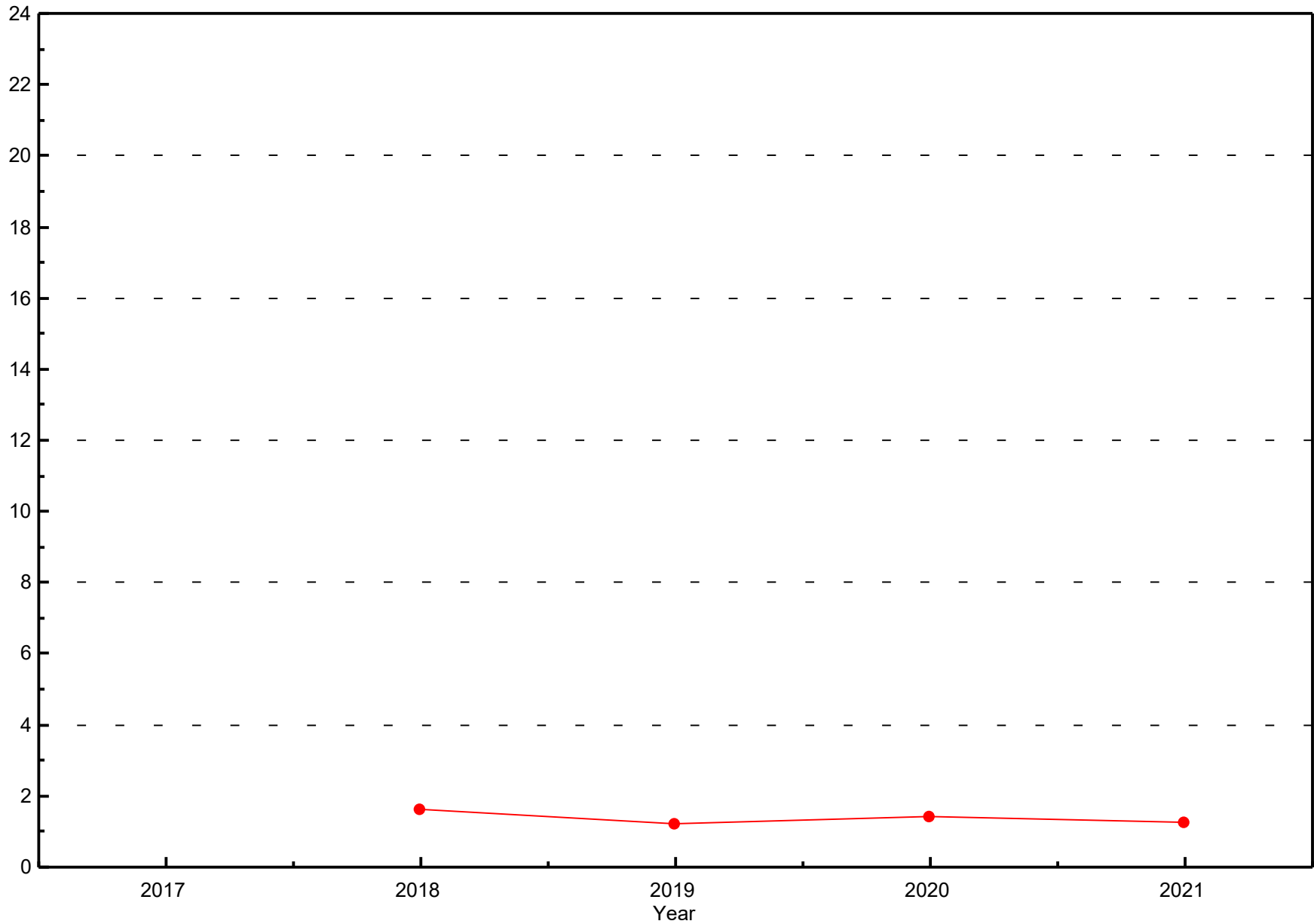
Nitrogen Dioxide (NO₂) - ppb
Christina Lake (2017 to 2021)





Yearly Averages

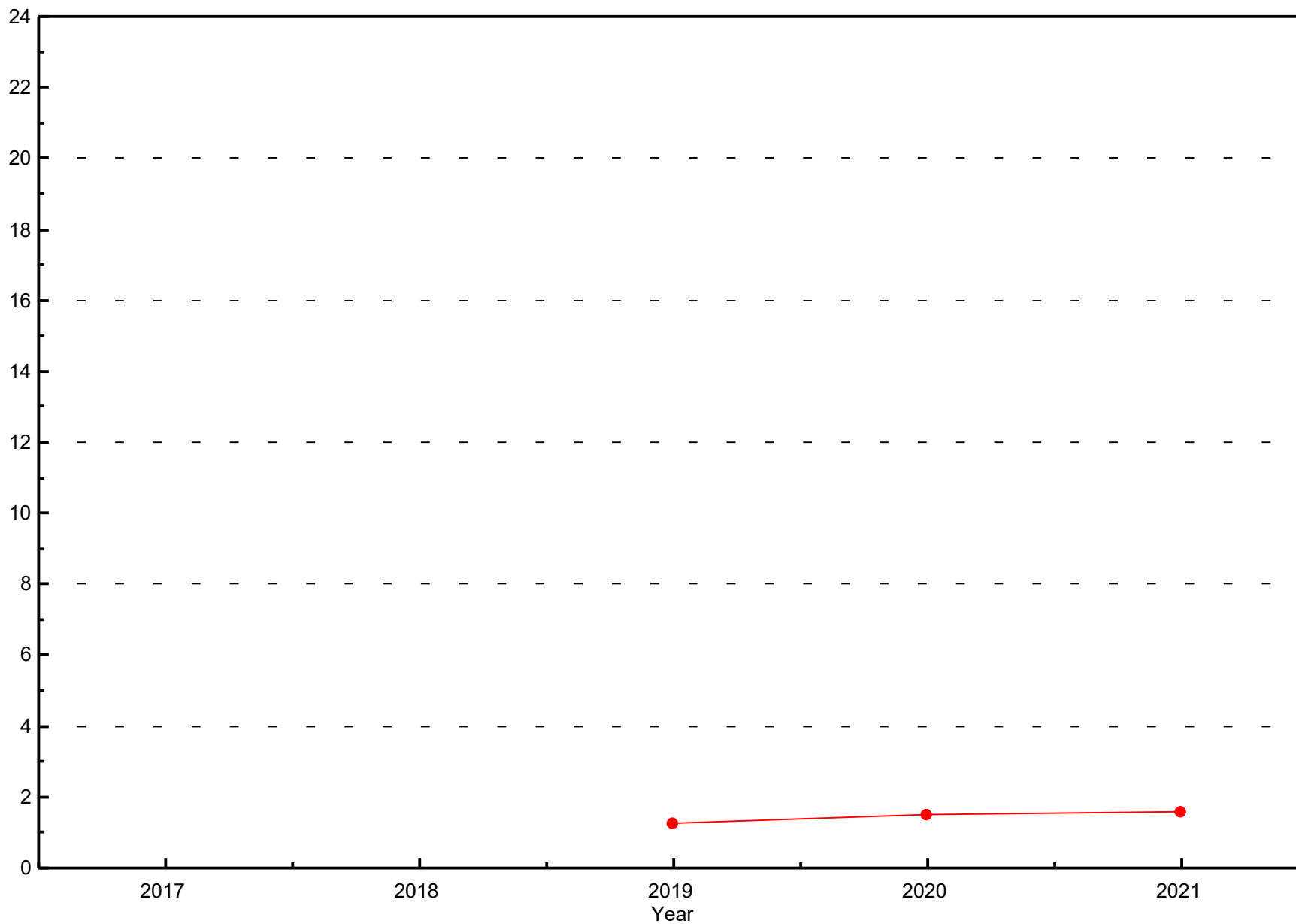
Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3 (2017 to 2021)





Yearly Averages

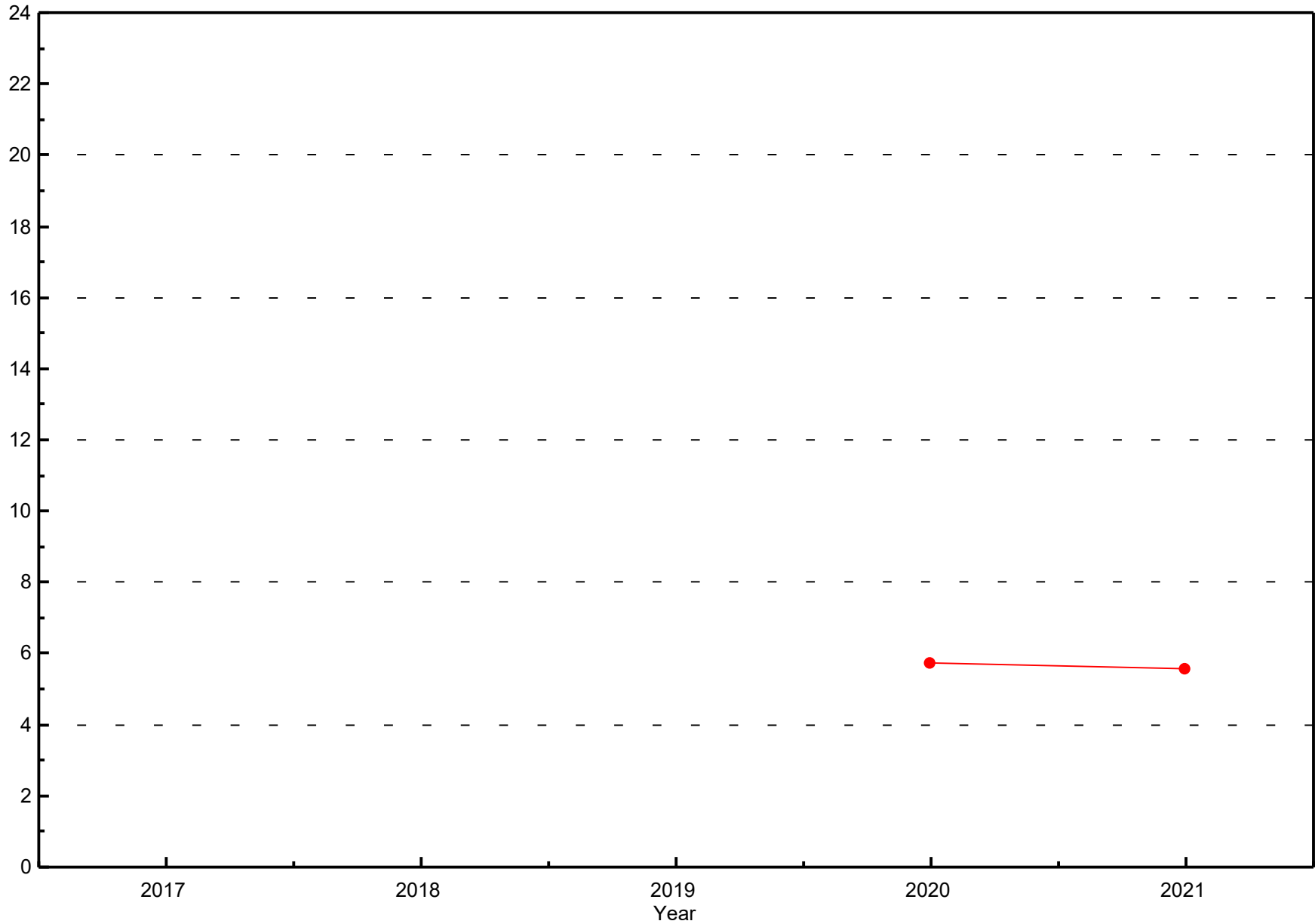
Nitrogen Dioxide (NO₂) - ppb
Surmont 2 (2017 to 2021)





Yearly Averages

Nitrogen Dioxide (NO₂) - ppb
Ells River (2017 to 2021)

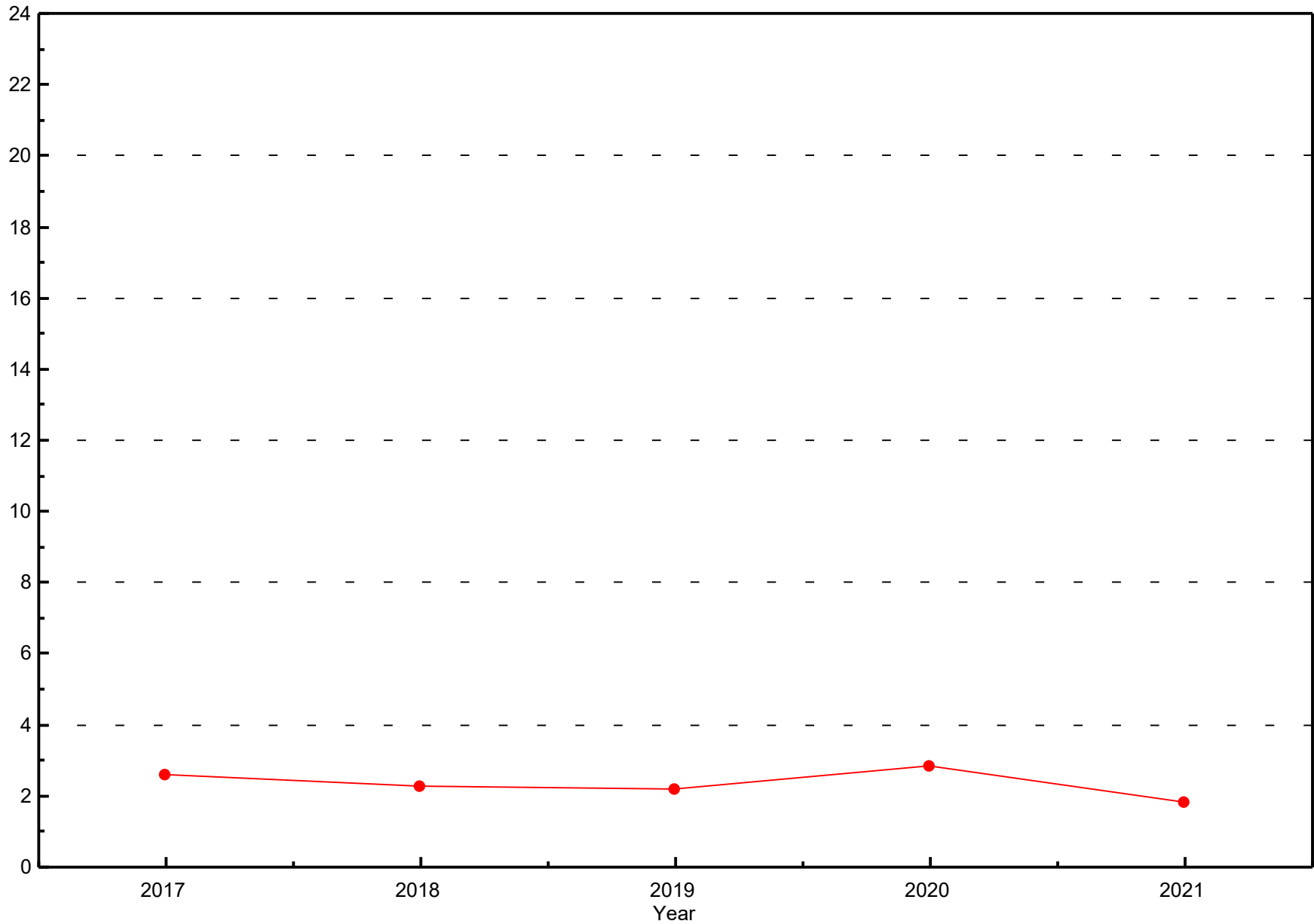




Yearly Averages

Nitrogen Dioxide (NO₂) - ppb

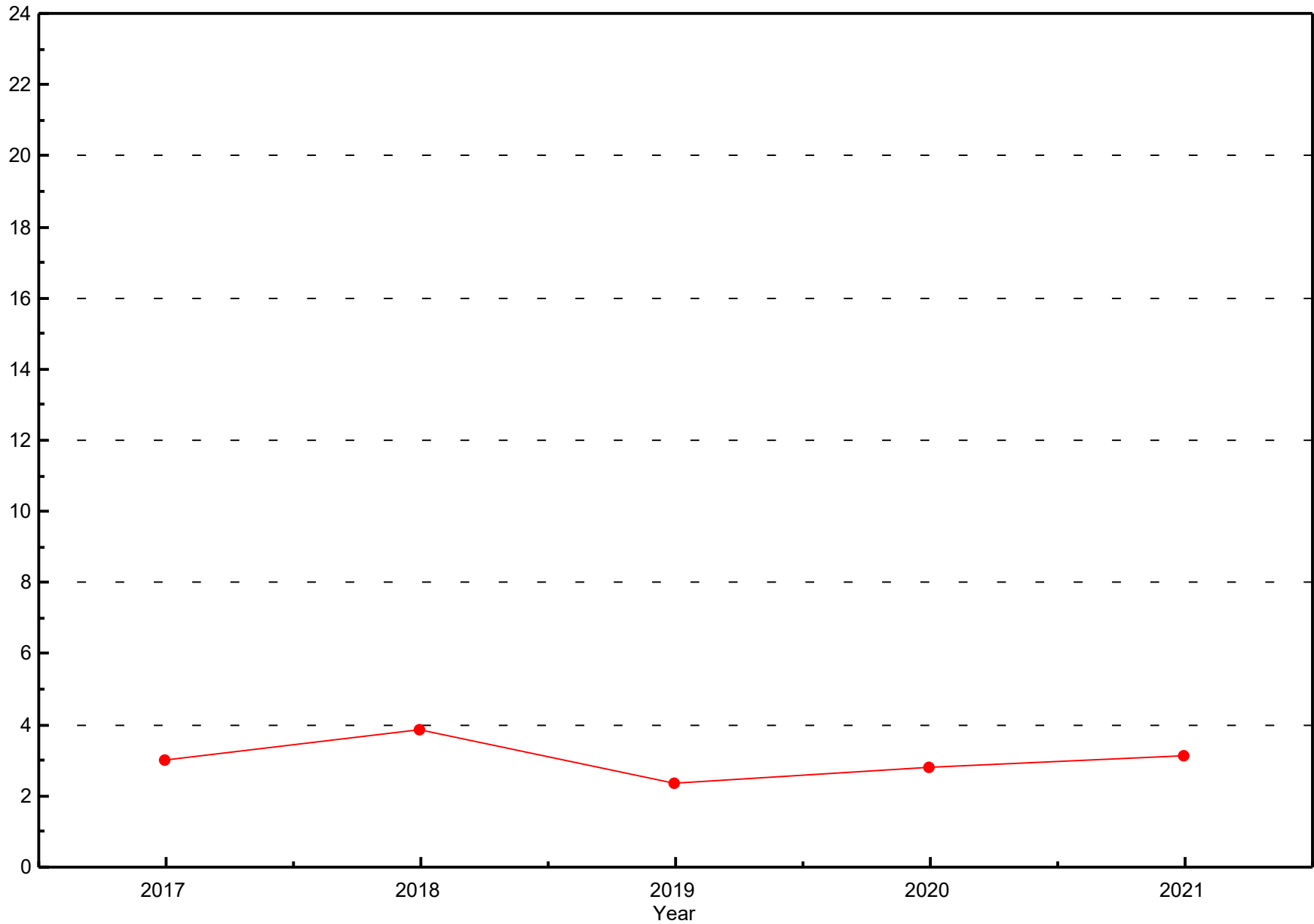
Leismer (2017 to 2021)





Yearly Averages

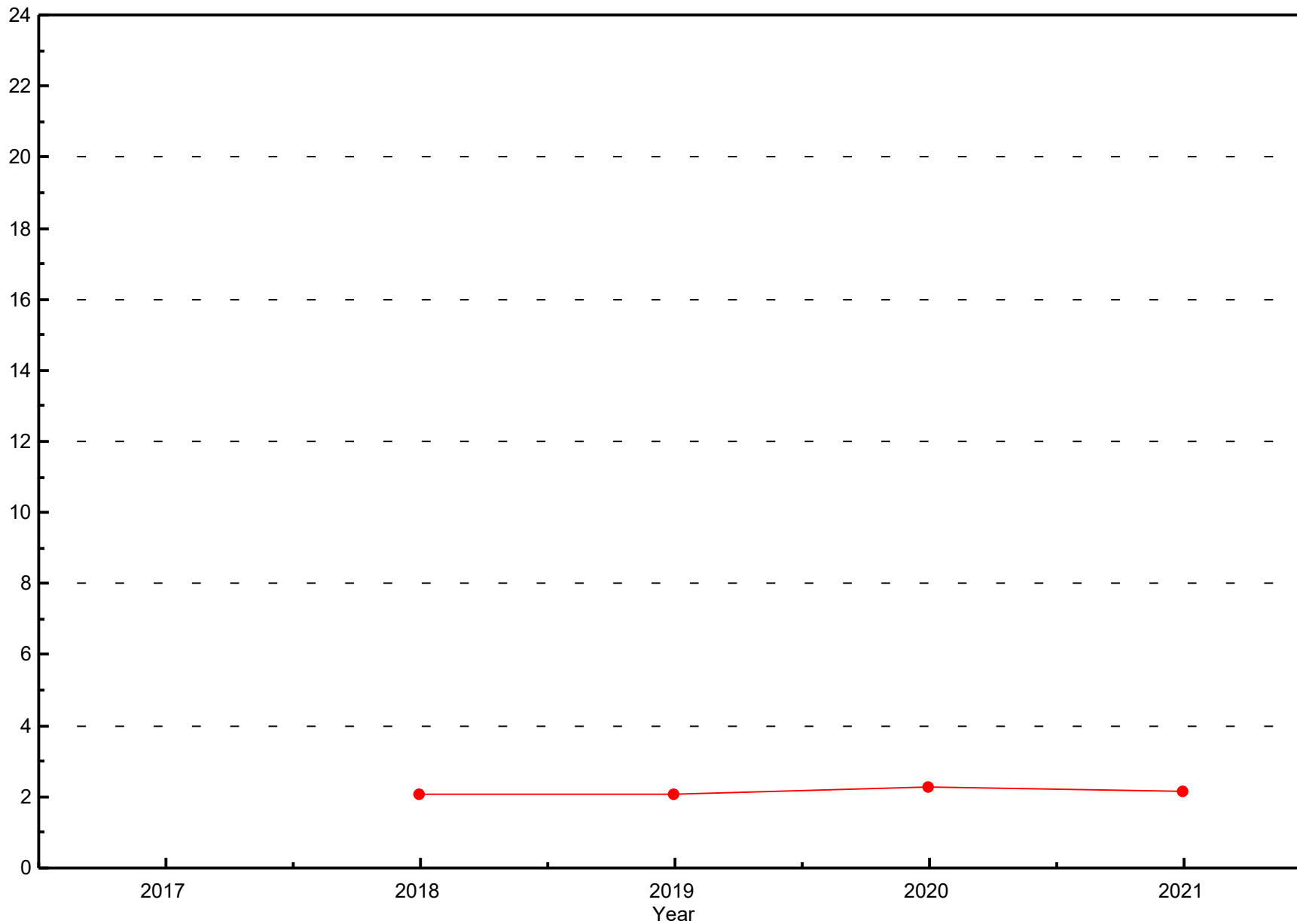
Nitrogen Dioxide (NO₂) - ppb
Sawbones Bay (2017 to 2021)





Yearly Averages

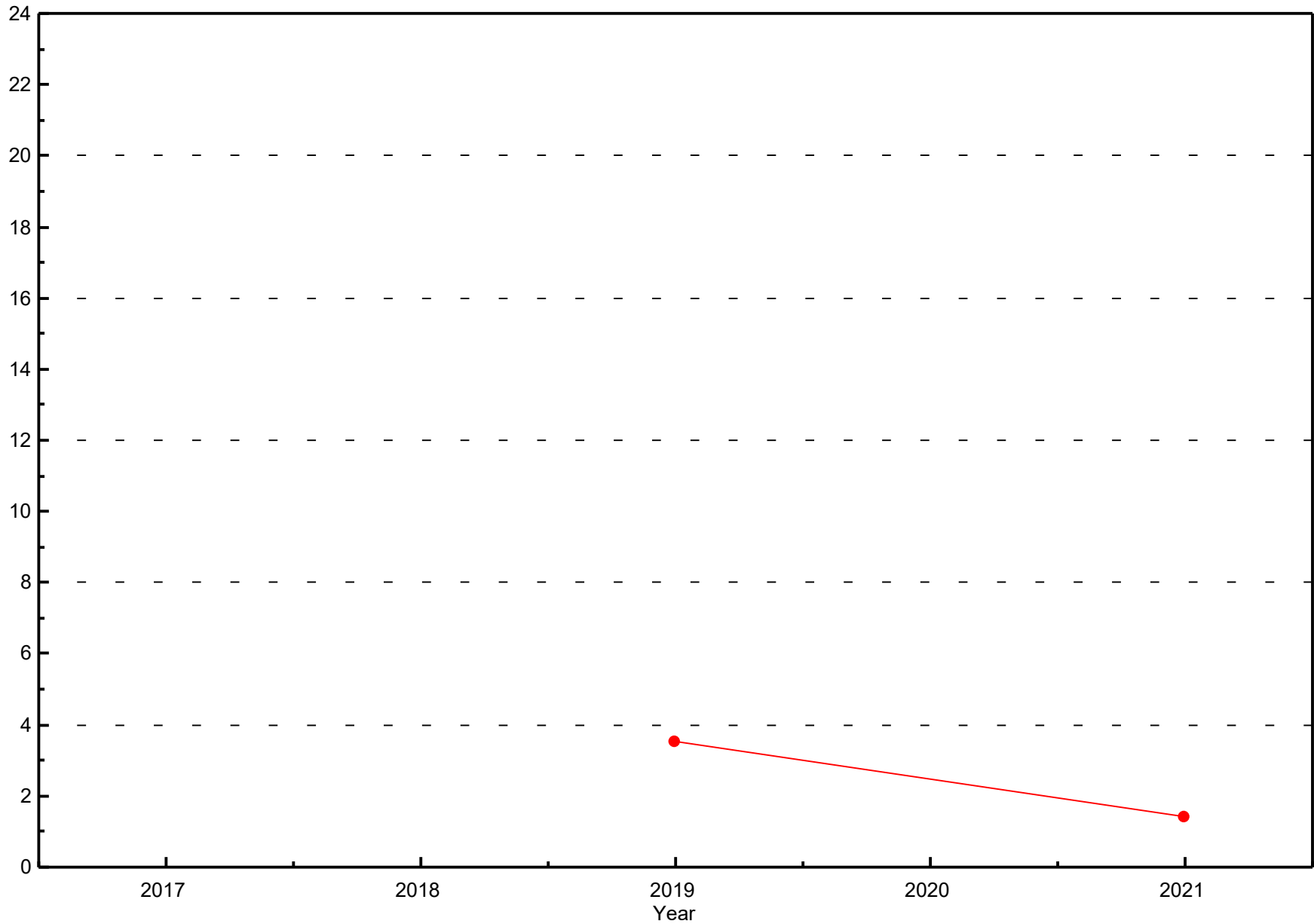
Nitrogen Dioxide (NO₂) - ppb
Jackfish 1 (2017 to 2021)





Yearly Averages

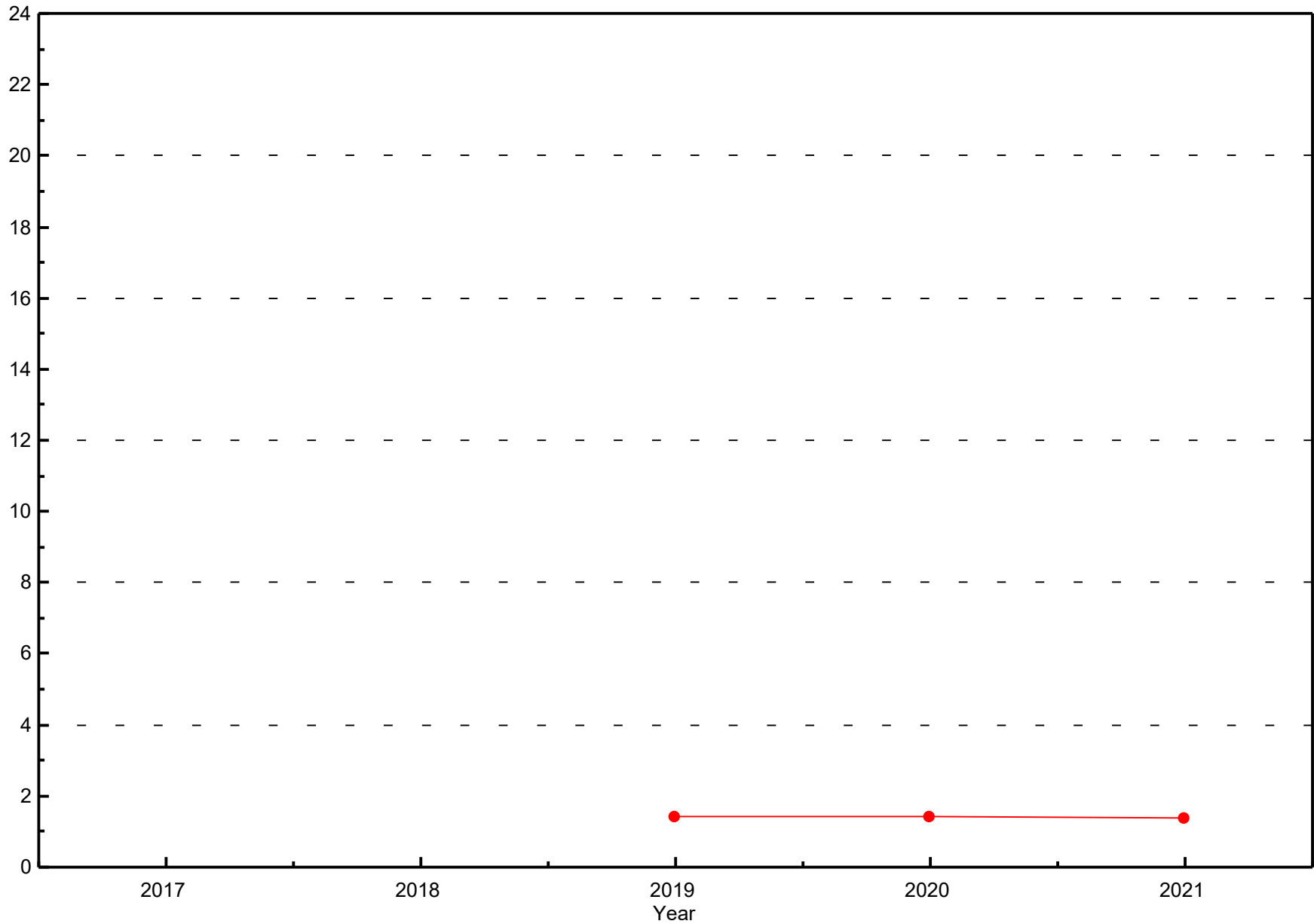
Nitrogen Dioxide (NO₂) - ppb
Kirby South (2017 to 2021)





Yearly Averages

Nitrogen Dioxide (NO₂) - ppb
Kirby North (2017 to 2021)





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

OXIDES OF NITROGEN ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	24.2	154.7	52.0	80.3	17.7	2.0	0.0
February	100	639	18.3	103.7	54.4	91.4	6.7	1.9	0.0
March	100	707	12.8	99.5	38.8	96.2	3.4	0.4	0.0
April	100	684	8.0	60.8	17.0	99.1	0.9	0.0	0.0
May	99	701	5.8	45.5	12.8	99.9	0.1	0.0	0.0
June	100	683	4.6	44.9	9.6	99.6	0.4	0.0	0.0
July	100	706	5.1	60.5	11.9	99.6	0.4	0.0	0.0
August	100	708	5.7	130.1	14.5	98.9	0.6	0.6	0.0
September	100	682	6.1	137.9	28.6	98.5	1.0	0.4	0.0
October	99	703	8.9	84.3	21.5	98.7	1.1	0.1	0.0
November	100	684	16.6	125.0	38.1	91.5	7.0	1.5	0.0
December	100	706	20.8	122.5	53.0	86.7	12.0	1.3	0.0
Annual	100	8310	11.4	154.7	54.4	95.0	4.3	0.7	0.0



Wood Buffalo Environmental Association - Buffalo Viewpoint (AMS04)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	97	684	11.7	101.0	39.4	95.2	4.5	0.3	0.0
February	99	632	11.4	131.0	37.5	94.6	4.6	0.8	0.0
March	100	706	6.7	100.1	30.6	97.6	2.3	0.1	0.0
April	99	680	6.5	107.4	20.5	97.7	1.9	0.4	0.0
May	99	679	3.6	123.1	18.2	99.4	0.4	0.2	0.0
June	97	656	3.1	47.4	9.0	99.5	0.5	0.0	0.0
July	100	707	2.4	51.1	8.5	99.9	0.1	0.0	0.0
August	100	706	3.3	84.1	17.4	99.2	0.7	0.1	0.0
September	100	685	3.2	48.8	14.2	99.6	0.4	0.0	0.0
October	100	707	3.7	117.9	23.7	99.3	0.4	0.3	0.0
November	100	684	7.1	99.8	29.8	97.1	2.1	0.9	0.0
December	100	707	14.3	129.1	32.4	91.2	7.2	1.6	0.0
Annual	99	8233	6.4	131.0	39.4	97.6	2.1	0.4	0.0



Wood Buffalo Environmental Association - Patricia McInnes (AMS06)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	17.3	87.3	37.6	90.2	9.6	0.1	0.0
February	100	638	13.1	74.1	26.3	96.4	3.6	0.0	0.0
March	100	708	7.8	77.2	30.8	97.9	2.1	0.0	0.0
April	100	683	5.7	60.5	12.7	99.7	0.3	0.0	0.0
May	100	705	3.4	37.8	10.5	100.0	0.0	0.0	0.0
June	99	681	2.5	25.8	6.3	100.0	0.0	0.0	0.0
July	100	707	2.4	20.3	5.3	100.0	0.0	0.0	0.0
August	100	708	3.1	23.3	9.7	100.0	0.0	0.0	0.0
September	100	684	3.4	31.5	10.7	100.0	0.0	0.0	0.0
October	100	707	5.1	55.5	15.6	99.3	0.7	0.0	0.0
November	99	680	9.3	85.9	27.7	96.6	2.8	0.6	0.0
December	100	707	13.0	121.5	29.0	95.6	3.7	0.7	0.0
Annual	100	8315	7.2	121.5	37.6	98.0	1.9	0.1	0.0



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	708	19.2	93.3	41.1	91.5	7.9	0.6	0.0
February	100	638	14.4	68.7	26.0	96.2	3.8	0.0	0.0
March	100	705	11.5	78.7	31.6	96.2	3.8	0.0	0.0
April	100	682	7.6	59.2	14.1	99.7	0.3	0.0	0.0
May	99	701	4.0	29.8	8.2	100.0	0.0	0.0	0.0
June	100	683	4.3	23.8	8.2	100.0	0.0	0.0	0.0
July	100	707	3.9	19.6	6.5	100.0	0.0	0.0	0.0
August	97	685	4.7	28.4	12.0	100.0	0.0	0.0	0.0
September	100	684	6.2	39.5	14.6	100.0	0.0	0.0	0.0
October	99	704	10.2	66.6	21.1	97.4	2.6	0.0	0.0
November	100	682	14.5	126.0	44.4	93.8	5.9	0.3	0.0
December	100	708	16.0	94.2	31.6	94.6	5.2	0.1	0.0
Annual	100	8287	9.7	126.0	44.4	97.4	2.5	0.1	0.0



Wood Buffalo Environmental Association - Fort Chipewyan (AMS08)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	706	2.4	22.5	9.1	100.0	0.0	0.0	0.0
February	100	639	1.7	14.7	7.0	100.0	0.0	0.0	0.0
March	99	704	1.5	14.0	6.3	100.0	0.0	0.0	0.0
April	100	684	0.6	9.6	2.0	100.0	0.0	0.0	0.0
May	100	706	0.5	6.0	3.3	100.0	0.0	0.0	0.0
June	100	684	0.4	9.6	1.6	100.0	0.0	0.0	0.0
July	100	707	0.7	11.2	2.4	100.0	0.0	0.0	0.0
August	100	705	0.7	13.1	3.8	100.0	0.0	0.0	0.0
September	100	681	0.7	10.7	3.1	100.0	0.0	0.0	0.0
October	99	704	1.3	22.9	7.0	100.0	0.0	0.0	0.0
November	99	680	2.0	20.4	11.3	100.0	0.0	0.0	0.0
December	100	707	2.2	23.1	12.1	100.0	0.0	0.0	0.0
Annual	100	8307	1.2	23.1	12.1	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Barge Landing (AMS09)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	704	27.4	180.0	65.2	78.1	17.9	3.8	0.1
February	100	637	23.9	196.7	94.6	82.0	13.2	4.4	0.5
March	99	702	16.4	131.8	39.9	91.9	6.7	1.4	0.0
April	99	677	9.8	119.4	24.6	97.2	2.5	0.3	0.0
May	98	694	6.3	43.9	10.0	99.4	0.6	0.0	0.0
June	99	674	5.5	52.1	10.3	99.9	0.2	0.0	0.0
July	100	704	5.8	59.6	11.8	99.6	0.4	0.0	0.0
August	74	512	7.2	67.2	14.6	99.0	1.0	0.0	0.0
September	100	681	9.3	150.9	44.6	97.8	1.5	0.7	0.0
October	99	701	12.5	101.6	37.5	93.6	6.3	0.1	0.0
November	100	684	20.7	204.3	51.4	88.2	8.9	2.6	0.3
December	100	709	28.7	207.0	89.4	76.6	16.9	5.8	0.7
Annual	97	8079	14.6	207.0	94.6	90.3	7.5	2.0	0.2



Wood Buffalo Environmental Association - Fort McKay South (AMS13)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	708	26.1	217.7	61.6	81.6	13.3	4.8	0.3
February	100	638	18.7	250.5	73.9	88.9	8.6	1.9	0.6
March	100	707	13.0	215.2	53.8	95.6	3.1	1.1	0.1
April	100	683	8.1	84.8	22.7	97.8	1.9	0.3	0.0
May	99	703	5.3	56.7	15.8	99.2	0.9	0.0	0.0
June	100	683	5.8	71.8	13.9	98.8	1.2	0.0	0.0
July	100	705	4.6	67.1	14.7	98.9	1.1	0.0	0.0
August	100	706	5.1	81.8	12.1	98.7	1.1	0.1	0.0
September	100	682	6.0	75.7	21.8	98.8	1.2	0.0	0.0
October	100	703	11.8	100.2	31.8	95.5	4.3	0.3	0.0
November	100	685	17.9	271.2	71.1	90.5	7.5	1.3	0.7
December	100	708	23.5	154.3	60.9	84.8	10.5	4.8	0.0
Annual	100	8311	12.1	271.2	73.9	94.2	4.4	1.2	0.2



Wood Buffalo Environmental Association - Anzac (AMS14)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	5.0	99.5	16.6	99.4	0.4	0.1	0.0
February	99	634	5.0	81.0	14.9	99.7	0.2	0.2	0.0
March	84	593	3.0	58.8	7.5	99.8	0.2	0.0	0.0
April	100	683	1.9	21.8	5.0	100.0	0.0	0.0	0.0
May	96	682	1.3	39.7	2.8	100.0	0.0	0.0	0.0
June	100	685	1.3	10.7	2.9	100.0	0.0	0.0	0.0
July	100	706	1.3	13.3	4.1	100.0	0.0	0.0	0.0
August	100	707	1.3	18.9	3.2	100.0	0.0	0.0	0.0
September	100	684	1.5	23.0	5.1	100.0	0.0	0.0	0.0
October	99	701	2.0	17.1	5.1	100.0	0.0	0.0	0.0
November	99	682	2.6	37.9	11.4	100.0	0.0	0.0	0.0
December	93	644	5.0	82.4	13.0	99.7	0.2	0.2	0.0
Annual	98	8108	2.6	99.5	16.6	99.9	0.1	0.0	0.0



Wood Buffalo Environmental Association - Wapasu (AMS17)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	5.3	59.8	19.6	99.3	0.7	0.0	0.0
February	100	639	4.6	68.3	14.0	99.7	0.3	0.0	0.0
March	100	705	3.1	29.0	6.5	100.0	0.0	0.0	0.0
April	97	663	2.4	38.2	6.7	100.0	0.0	0.0	0.0
May	100	708	1.4	22.5	4.2	100.0	0.0	0.0	0.0
June	100	682	2.5	37.6	5.7	100.0	0.0	0.0	0.0
July	100	707	1.5	15.4	4.5	100.0	0.0	0.0	0.0
August	100	707	1.7	15.6	4.6	100.0	0.0	0.0	0.0
September	98	668	2.3	26.2	7.0	100.0	0.0	0.0	0.0
October	100	707	2.8	41.3	8.3	99.9	0.1	0.0	0.0
November	100	685	3.4	40.1	8.4	100.0	0.0	0.0	0.0
December	100	709	5.2	57.6	15.1	99.9	0.1	0.0	0.0
Annual	99	8287	3.0	68.3	19.6	99.9	0.1	0.0	0.0



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	2.4	12.6	6.8	100.0	0.0	0.0	0.0
February	100	638	2.3	27.6	6.7	100.0	0.0	0.0	0.0
March	100	707	1.4	9.7	3.4	100.0	0.0	0.0	0.0
April	100	681	1.0	12.7	3.1	100.0	0.0	0.0	0.0
May	100	707	0.8	3.2	1.3	100.0	0.0	0.0	0.0
June	98	672	0.7	3.2	1.5	100.0	0.0	0.0	0.0
July	95	671	0.9	3.2	1.6	100.0	0.0	0.0	0.0
August	99	700	0.7	2.6	1.3	100.0	0.0	0.0	0.0
September	100	682	0.7	4.1	2.0	100.0	0.0	0.0	0.0
October	100	707	1.1	8.0	3.3	100.0	0.0	0.0	0.0
November	99	680	2.0	15.1	6.1	100.0	0.0	0.0	0.0
December	77	545	2.3	25.5	6.8	100.0	0.0	0.0	0.0
Annual	97	8097	1.3	27.6	6.8	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Firebag (AMS19)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	92	654	6.9	83.7	19.3	99.5	0.3	0.2	0.0
February	100	639	5.2	49.4	20.7	99.8	0.2	0.0	0.0
March	99	704	4.4	70.8	13.5	99.3	0.7	0.0	0.0
April	100	685	2.4	31.2	6.4	100.0	0.0	0.0	0.0
May	100	705	1.4	25.5	5.0	100.0	0.0	0.0	0.0
June	99	677	2.0	19.5	4.4	100.0	0.0	0.0	0.0
July	100	707	1.8	27.3	4.9	100.0	0.0	0.0	0.0
August	100	705	2.3	17.3	5.6	100.0	0.0	0.0	0.0
September	100	685	3.1	44.6	7.0	99.9	0.2	0.0	0.0
October	100	709	3.9	69.5	12.1	99.7	0.3	0.0	0.0
November	100	682	5.5	229.6	17.2	99.7	0.2	0.0	0.2
December	100	708	7.5	75.5	21.2	98.6	1.4	0.0	0.0
Annual	99	8260	3.9	229.6	21.2	99.7	0.3	0.0	0.0



Wood Buffalo Environmental Association - Mackay River (AMS20)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	705	4.9	54.6	16.7	99.0	1.0	0.0	0.0
February	100	639	3.4	41.1	12.0	99.5	0.5	0.0	0.0
March	99	700	2.8	39.6	20.2	100.0	0.0	0.0	0.0
April	100	684	1.6	20.4	4.3	100.0	0.0	0.0	0.0
May	100	706	1.5	26.1	6.5	100.0	0.0	0.0	0.0
June	100	684	0.8	17.9	2.4	100.0	0.0	0.0	0.0
July	100	704	1.1	11.5	3.9	100.0	0.0	0.0	0.0
August	100	708	1.5	24.4	10.2	100.0	0.0	0.0	0.0
September	100	684	1.0	22.1	4.0	100.0	0.0	0.0	0.0
October	100	707	1.3	28.0	8.9	100.0	0.0	0.0	0.0
November	100	681	2.5	74.6	12.8	99.3	0.7	0.0	0.0
December	100	708	3.8	46.0	25.6	99.7	0.3	0.0	0.0
Annual	100	8310	2.2	74.6	25.6	99.8	0.2	0.0	0.0



Wood Buffalo Environmental Association - Conklin (AMS21)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	708	3.7	32.3	8.7	100.0	0.0	0.0	0.0
February	100	639	3.1	20.4	6.3	100.0	0.0	0.0	0.0
March	100	708	2.4	36.7	8.2	100.0	0.0	0.0	0.0
April	100	685	1.7	34.6	3.3	100.0	0.0	0.0	0.0
May	100	708	1.3	16.3	2.8	100.0	0.0	0.0	0.0
June	100	686	1.0	26.2	2.1	100.0	0.0	0.0	0.0
July	100	707	1.1	19.4	2.5	100.0	0.0	0.0	0.0
August	100	707	1.1	15.2	2.8	100.0	0.0	0.0	0.0
September	97	659	1.4	25.1	3.3	100.0	0.0	0.0	0.0
October	100	705	2.0	32.6	4.4	100.0	0.0	0.0	0.0
November	100	685	3.0	29.8	8.7	100.0	0.0	0.0	0.0
December	100	708	3.1	17.9	8.3	100.0	0.0	0.0	0.0
Annual	100	8305	2.1	36.7	8.7	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Janvier (AMS22)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	708	2.7	19.1	6.5	100.0	0.0	0.0	0.0
February	100	638	2.6	20.3	6.9	100.0	0.0	0.0	0.0
March	100	708	1.2	10.5	2.5	100.0	0.0	0.0	0.0
April	100	683	0.8	16.2	2.6	100.0	0.0	0.0	0.0
May	99	704	0.9	13.3	2.2	100.0	0.0	0.0	0.0
June	99	680	0.9	5.9	1.9	100.0	0.0	0.0	0.0
July	100	705	0.7	5.4	1.6	100.0	0.0	0.0	0.0
August	97	683	0.6	5.2	1.1	100.0	0.0	0.0	0.0
September	97	659	1.1	11.5	3.0	100.0	0.0	0.0	0.0
October	100	707	1.6	15.5	3.0	100.0	0.0	0.0	0.0
November	100	683	2.5	11.8	6.0	100.0	0.0	0.0	0.0
December	100	707	3.2	17.0	8.1	100.0	0.0	0.0	0.0
Annual	99	8264	1.6	20.3	8.1	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Fort Hills (AMS23)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	708	30.8	288.2	113.7	75.7	15.5	6.1	2.7
February	100	639	24.5	241.0	87.7	78.6	16.6	4.1	0.8
March	100	705	15.7	234.9	49.0	90.9	6.7	1.7	0.7
April	98	673	11.0	237.7	41.7	94.1	4.6	1.2	0.2
May	100	706	9.2	97.7	20.6	95.6	3.7	0.7	0.0
June	100	685	8.2	201.3	21.2	96.8	2.6	0.4	0.2
July	100	708	7.5	110.5	18.5	98.2	1.7	0.1	0.0
August	100	708	7.4	117.8	23.8	97.2	2.7	0.1	0.0
September	100	683	11.7	161.0	29.3	93.4	5.3	1.2	0.2
October	100	707	13.0	146.1	32.0	93.4	5.0	1.7	0.0
November	99	680	19.6	222.3	49.2	88.4	7.4	3.4	0.9
December	94	653	27.4	247.3	100.5	81.0	11.0	7.0	0.9
Annual	99	8255	15.4	288.2	113.7	90.3	6.8	2.3	0.6



Wood Buffalo Environmental Association - Christina Lake (AMS26)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	708	7.3	71.0	18.3	99.2	0.9	0.0	0.0
February	100	637	7.1	53.0	15.1	99.4	0.6	0.0	0.0
March	99	700	4.6	51.7	11.2	99.9	0.1	0.0	0.0
April	100	684	4.7	65.2	9.4	99.7	0.3	0.0	0.0
May	100	705	1.9	20.4	5.5	100.0	0.0	0.0	0.0
June	100	684	3.2	21.3	5.9	100.0	0.0	0.0	0.0
July	100	707	3.1	31.8	6.1	100.0	0.0	0.0	0.0
August	100	706	3.7	47.9	9.5	99.7	0.3	0.0	0.0
September	100	684	3.8	43.2	9.2	99.9	0.2	0.0	0.0
October	100	704	5.6	161.5	26.8	98.2	1.1	0.6	0.1
November	100	685	5.2	35.5	10.5	100.0	0.0	0.0	0.0
December	100	704	7.2	65.5	16.6	99.6	0.4	0.0	0.0
Annual	100	8308	4.8	161.5	26.8	99.6	0.3	0.1	0.0



Wood Buffalo Environmental Association - Jackfish 2/3 (AMS27)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	706	2.3	14.4	5.2	100.0	0.0	0.0	0.0
February	100	637	2.3	18.7	4.5	100.0	0.0	0.0	0.0
March	100	705	1.1	7.5	2.7	100.0	0.0	0.0	0.0
April	98	674	0.9	11.6	2.4	100.0	0.0	0.0	0.0
May	100	708	0.7	7.0	1.5	100.0	0.0	0.0	0.0
June	100	685	0.9	7.7	1.8	100.0	0.0	0.0	0.0
July	100	708	1.1	7.9	2.1	100.0	0.0	0.0	0.0
August	97	689	1.1	7.1	1.9	100.0	0.0	0.0	0.0
September	99	680	1.0	6.3	2.4	100.0	0.0	0.0	0.0
October	100	706	1.3	11.7	3.0	100.0	0.0	0.0	0.0
November	100	683	2.1	14.2	5.6	100.0	0.0	0.0	0.0
December	99	703	2.7	18.4	9.0	100.0	0.0	0.0	0.0
Annual	99	8284	1.4	18.7	9.0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Surmont 2 (AMS29)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	3.3	25.9	10.3	100.0	0.0	0.0	0.0
February	100	638	3.8	26.8	10.3	100.0	0.0	0.0	0.0
March	100	707	1.9	13.4	4.4	100.0	0.0	0.0	0.0
April	99	680	1.4	21.2	4.0	100.0	0.0	0.0	0.0
May	98	696	0.9	20.6	2.1	100.0	0.0	0.0	0.0
June	100	685	0.9	6.9	1.7	100.0	0.0	0.0	0.0
July	93	651	1.0	5.5	1.7	100.0	0.0	0.0	0.0
August	100	708	1.0	11.6	2.3	100.0	0.0	0.0	0.0
September	100	684	0.9	15.0	2.5	100.0	0.0	0.0	0.0
October	100	706	1.2	15.0	3.6	100.0	0.0	0.0	0.0
November	100	681	1.8	11.2	4.6	100.0	0.0	0.0	0.0
December	100	707	3.2	23.3	11.0	100.0	0.0	0.0	0.0
Annual	99	8250	1.8	26.8	11.0	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Ells River (AMS30)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	16.6	125.3	36.4	89.5	8.6	1.8	0.0
February	100	638	13.9	141.4	50.3	92.6	6.1	1.3	0.0
March	99	703	8.1	107.2	36.2	96.9	2.6	0.6	0.0
April	100	684	6.2	62.3	15.9	98.5	1.5	0.0	0.0
May	99	702	4.4	55.8	11.5	99.3	0.7	0.0	0.0
June	100	684	4.0	40.9	12.4	99.9	0.2	0.0	0.0
July	100	708	4.7	65.2	15.6	99.4	0.6	0.0	0.0
August	100	708	3.6	50.8	11.7	99.2	0.9	0.0	0.0
September	100	684	4.5	108.2	19.9	99.0	0.7	0.3	0.0
October	100	707	5.4	159.9	29.1	98.2	1.3	0.4	0.1
November	100	685	9.9	190.5	36.7	94.3	4.8	0.7	0.2
December	100	708	13.3	118.1	48.1	92.1	7.1	0.9	0.0
Annual	100	8318	7.9	190.5	50.3	96.5	3.0	0.5	0.0



Wood Buffalo Environmental Association - Leismer (AMS501)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
October	99	703	1.6	24.0	5.1	100.0	0.0	0.0	0.0
November	100	685	2.0	22.7	6.5	100.0	0.0	0.0	0.0
December	100	708	3.5	20.9	7.9	100.0	0.0	0.0	0.0
Annual	100	2096	2.4	24.0	7.9	100.0	0.0	0.0	0.0



Wood Buffalo Environmental Association - Sawbones Bay (AMS505)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
July	97	676	3.0	26.3	9.2	100.0	0.0	0.0	0.0
August	98	690	2.2	27.8	6.3	100.0	0.0	0.0	0.0
September	100	681	3.4	33.1	12.2	100.0	0.0	0.0	0.0
October	100	708	3.8	33.3	11.5	100.0	0.0	0.0	0.0
November	93	628	6.0	39.6	15.6	100.0	0.0	0.0	0.0
December	98	693	6.7	61.9	23.3	99.3	0.7	0.0	0.0
Annual	97	4076	4.2	61.9	23.3	99.9	0.1	0.0	0.0



Wood Buffalo Environmental Association - Jackfish 1 (AMS506)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	100	707	4.2	48.4	9.8	99.6	0.4	0.0	0.0
February	100	639	5.0	39.7	14.2	100.0	0.0	0.0	0.0
March	99	700	2.5	33.7	5.6	100.0	0.0	0.0	0.0
April	100	682	2.5	33.5	9.2	100.0	0.0	0.0	0.0
May	100	706	1.3	21.7	4.8	100.0	0.0	0.0	0.0
June	100	685	2.6	26.3	9.3	100.0	0.0	0.0	0.0
July	100	705	2.2	20.6	6.4	100.0	0.0	0.0	0.0
August	100	708	2.0	24.5	8.2	100.0	0.0	0.0	0.0
Annual	100	5532	2.7	48.4	14.2	100.0	0.1	0.0	0.0



Wood Buffalo Environmental Association - Kirby South (AMS507)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
July	100	702	1.3	53.3	5.6	99.9	0.1	0.0	0.0
August	100	708	2.0	87.2	20.5	99.2	0.7	0.1	0.0
September	98	663	1.0	17.4	7.2	100.0	0.0	0.0	0.0
October	100	707	1.3	17.4	3.4	100.0	0.0	0.0	0.0
November	100	683	2.2	45.0	8.5	99.9	0.2	0.0	0.0
December	100	707	4.0	88.1	13.3	99.4	0.4	0.1	0.0
Annual	100	4170	2.0	88.1	20.5	99.7	0.2	0.1	0.0



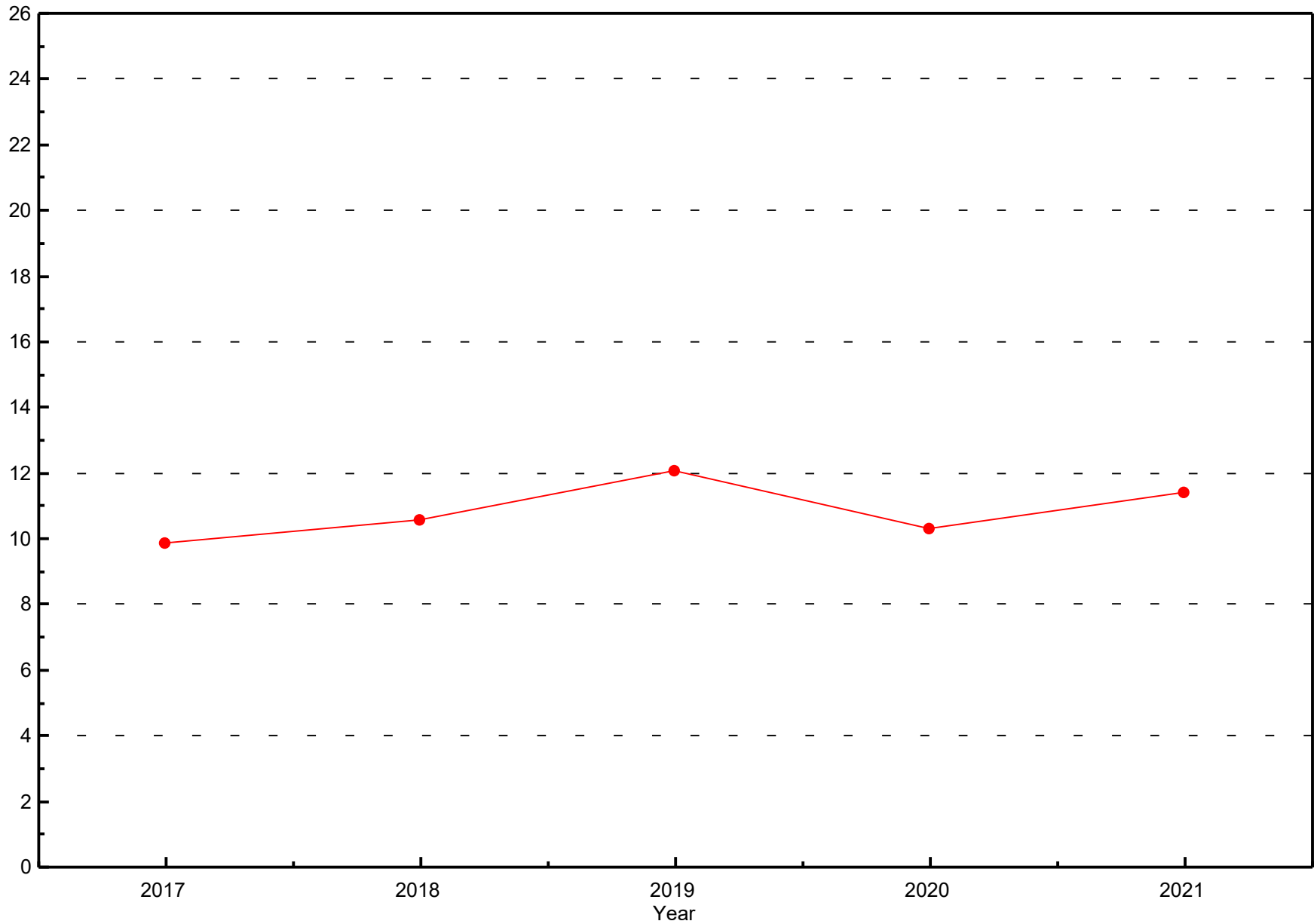
Wood Buffalo Environmental Association - Kirby North (AMS508)
Annual Summary for the Year 2021
Oxides of Nitrogen (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum	% of Data in Each Concentration Range			
				1-Hour Value	24-Hour Value	0 - 40	41 - 80	81 - 159	>159
January	90	635	2.7	31.5	6.4	100.0	0.0	0.0	0.0
February	100	638	2.4	24.0	4.9	100.0	0.0	0.0	0.0
March	100	705	1.4	8.4	3.3	100.0	0.0	0.0	0.0
April	100	683	2.2	197.8	23.4	99.3	0.4	0.0	0.3
May	100	706	0.7	9.6	1.6	100.0	0.0	0.0	0.0
June	100	653	1.1	7.5	2.6	100.0	0.0	0.0	0.0
Annual	98	4020	1.7	197.8	23.4	99.9	0.1	0.0	0.1



Yearly Averages

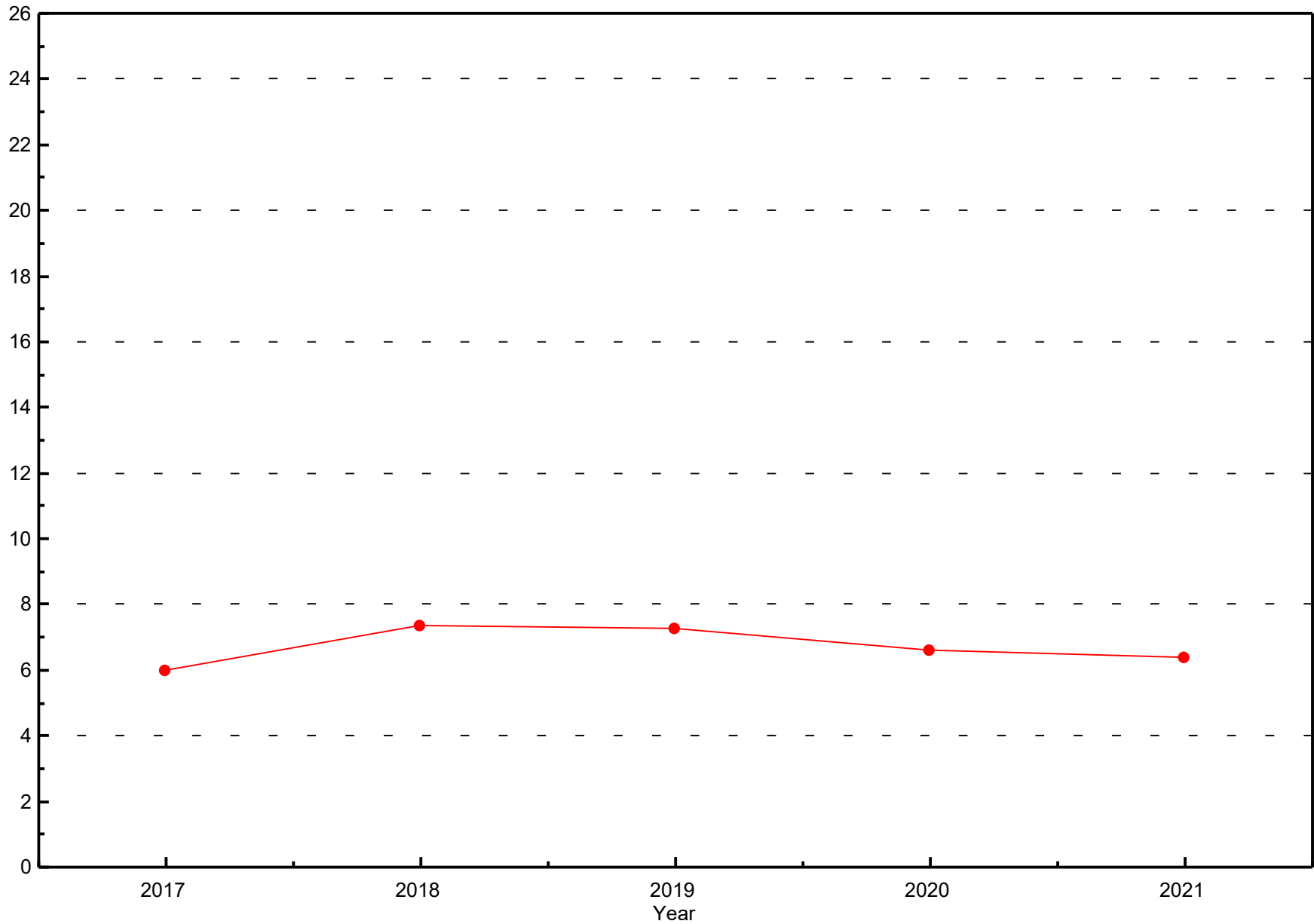
Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter (2017 to 2021)





Yearly Averages

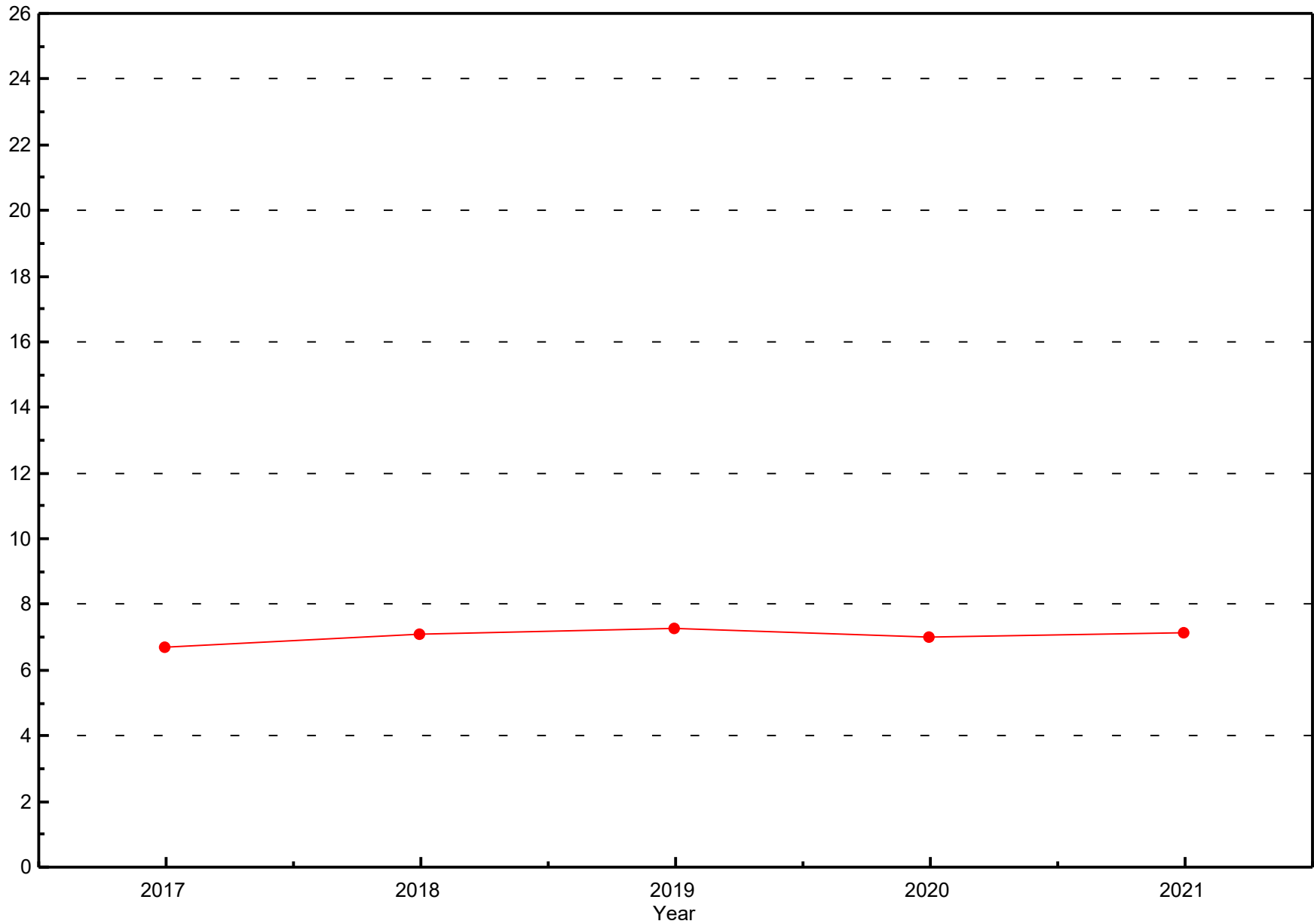
Nitrogen Oxides (NO_x) - ppb
Buffalo Viewpoint (2017 to 2021)





Yearly Averages

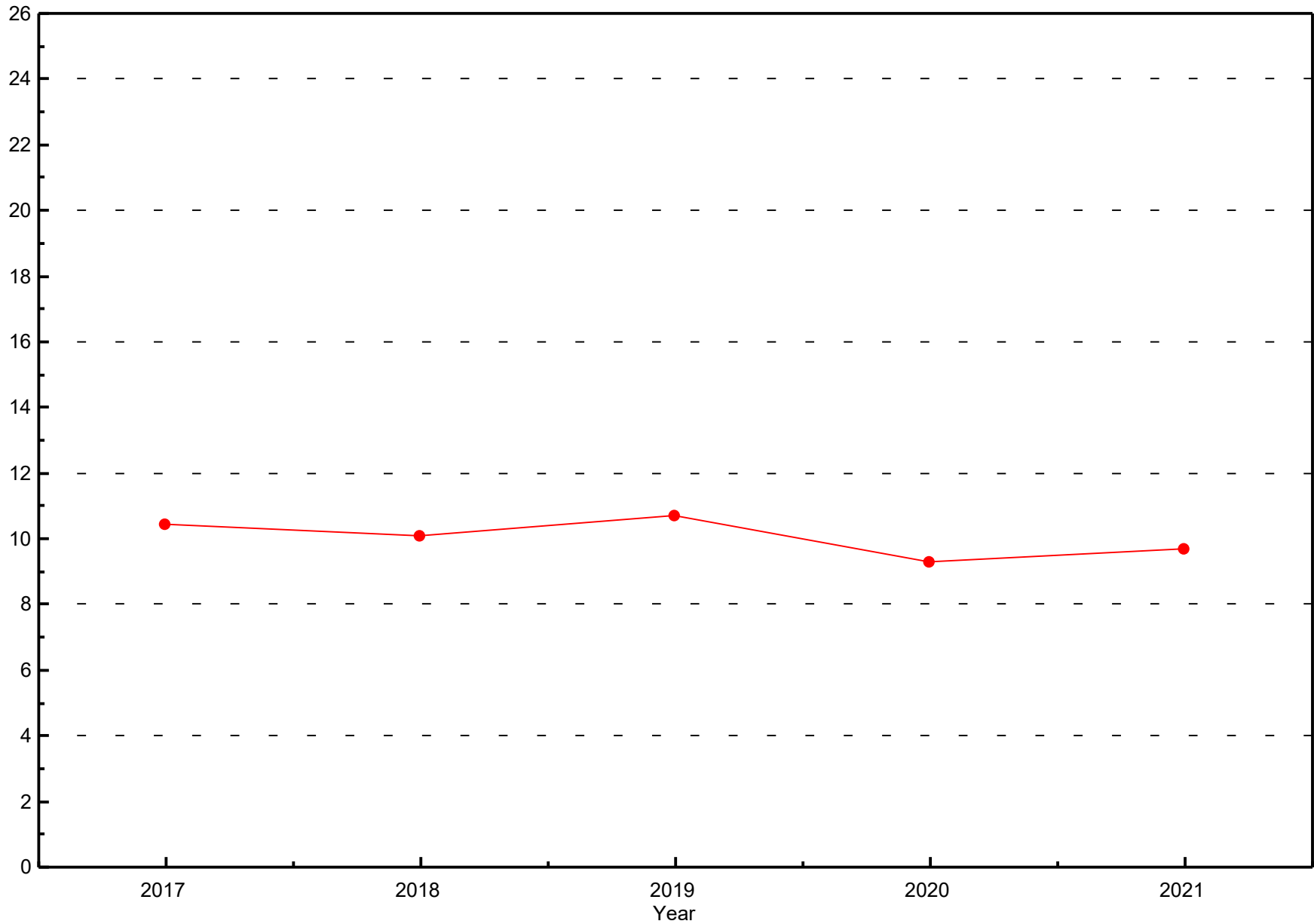
Nitrogen Oxides (NO_x) - ppb
Patricia McInnes (2017 to 2021)





Yearly Averages

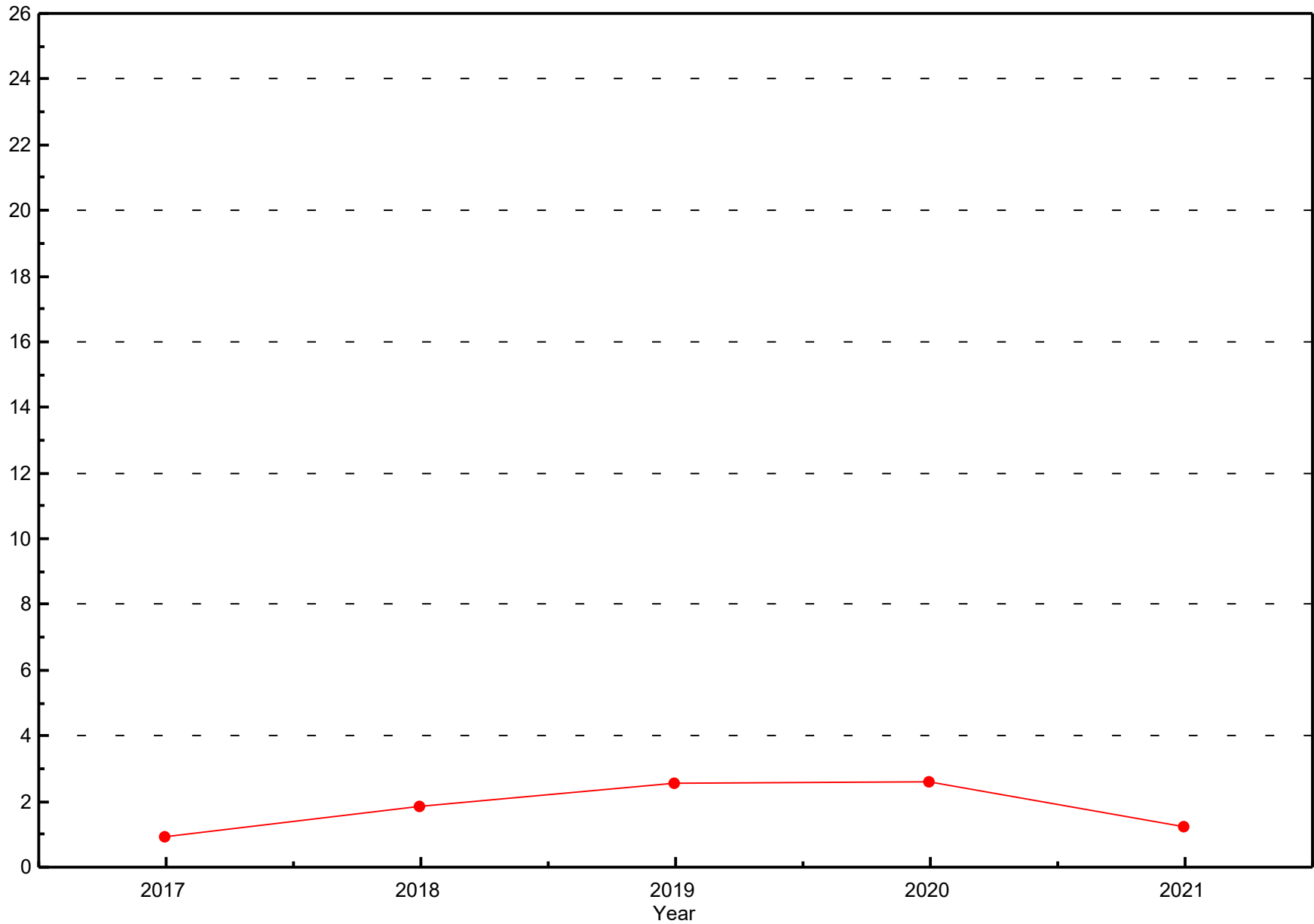
Nitrogen Oxides (NO_x) - ppb
Athabasca Valley (2017 to 2021)





Yearly Averages

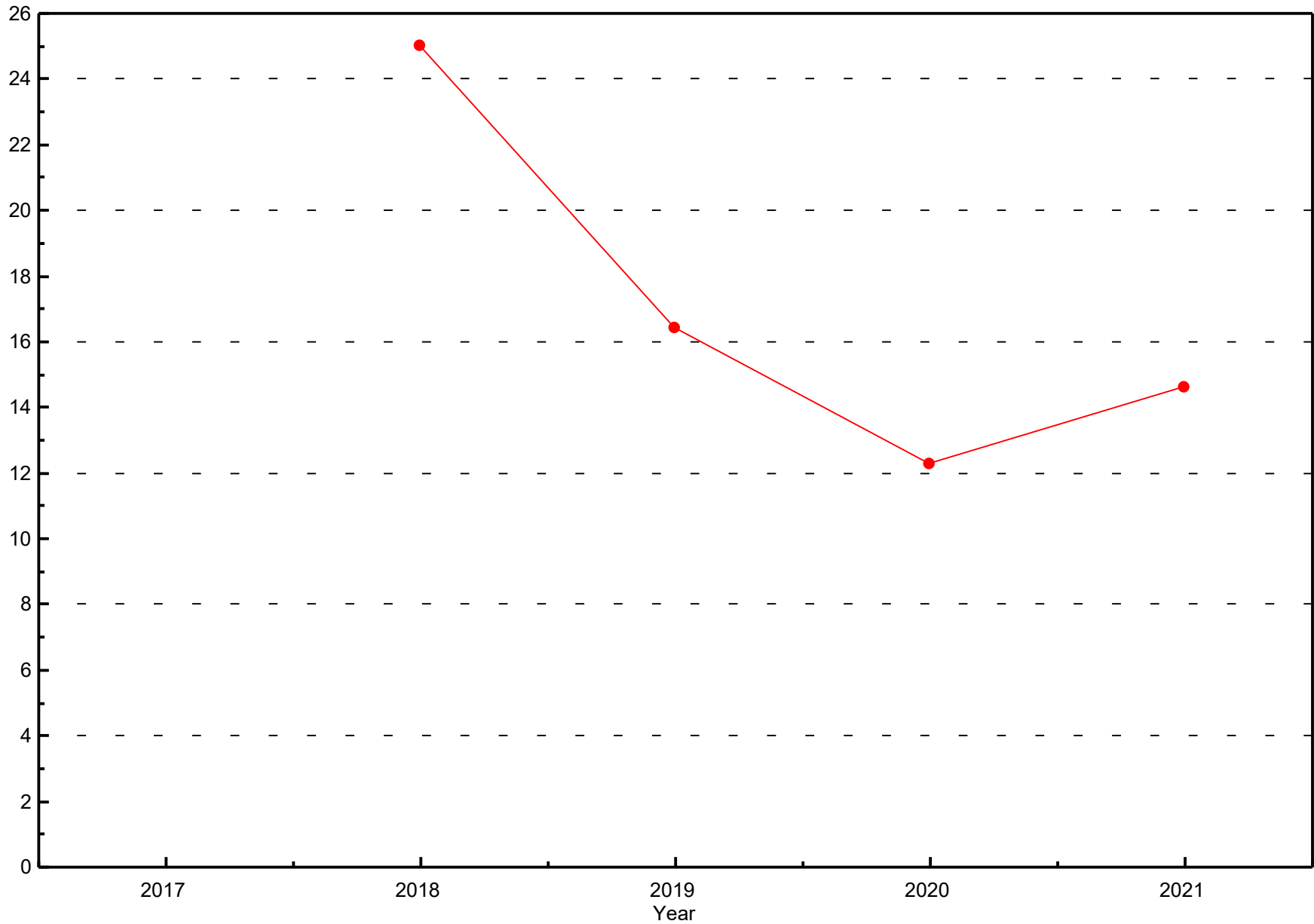
Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan (2017 to 2021)





Yearly Averages

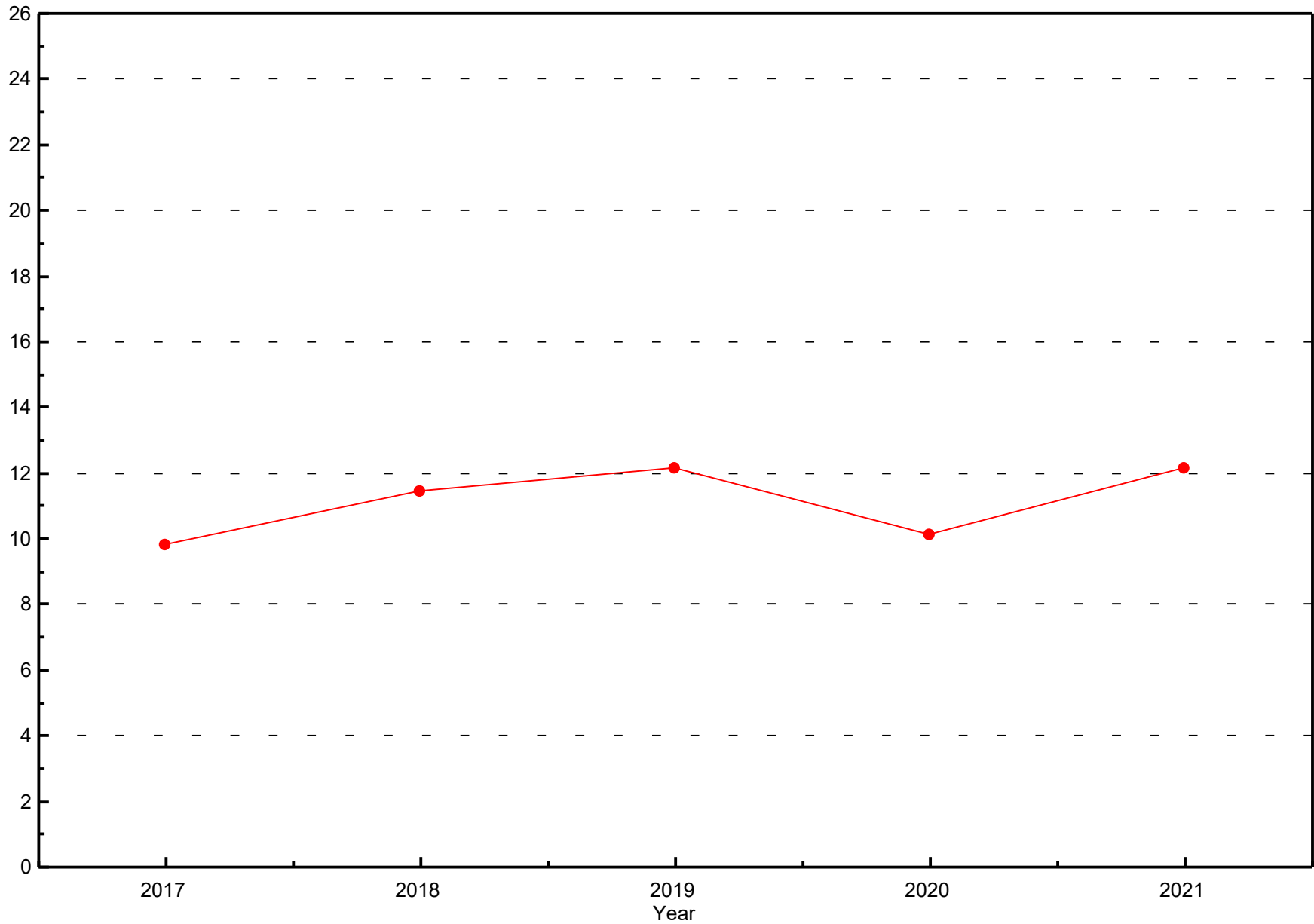
Nitrogen Oxides (NO_x) - ppb
Barge Landing (2017 to 2021)





Yearly Averages

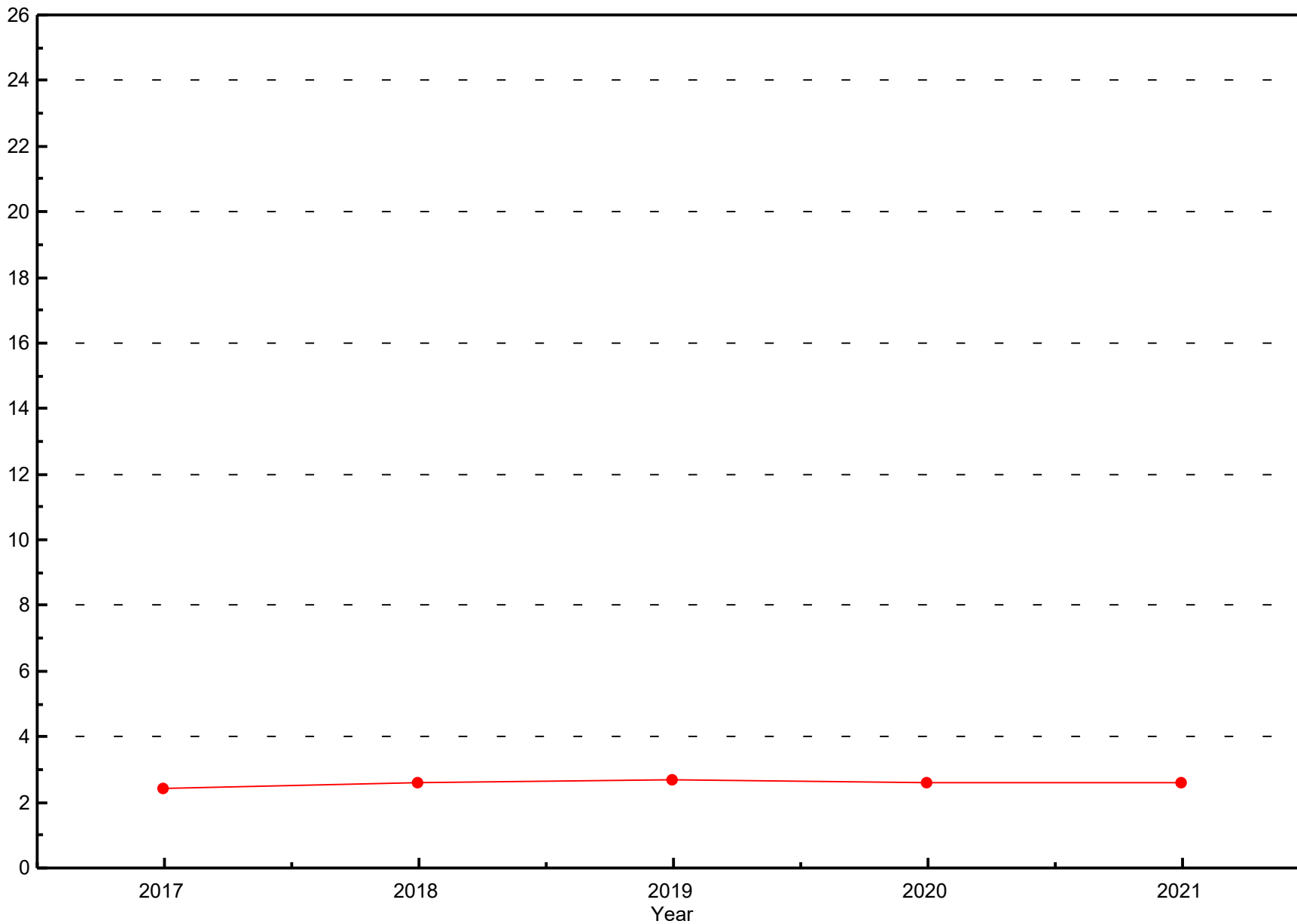
Nitrogen Oxides (NO_x) - ppb
Fort McKay South (2017 to 2021)





Yearly Averages

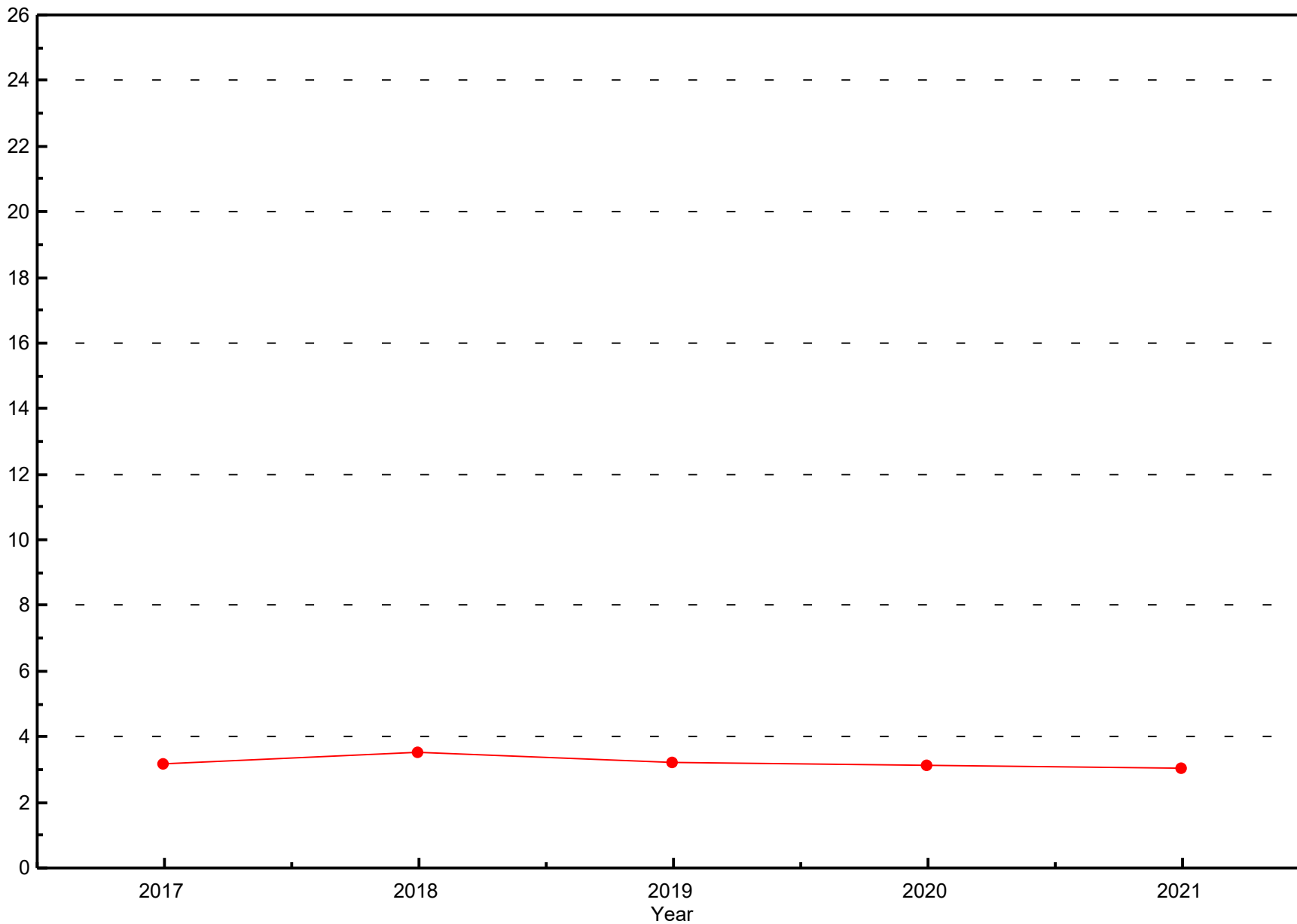
Nitrogen Oxides (NO_x) - ppb
Anzac (2017 to 2021)





Yearly Averages

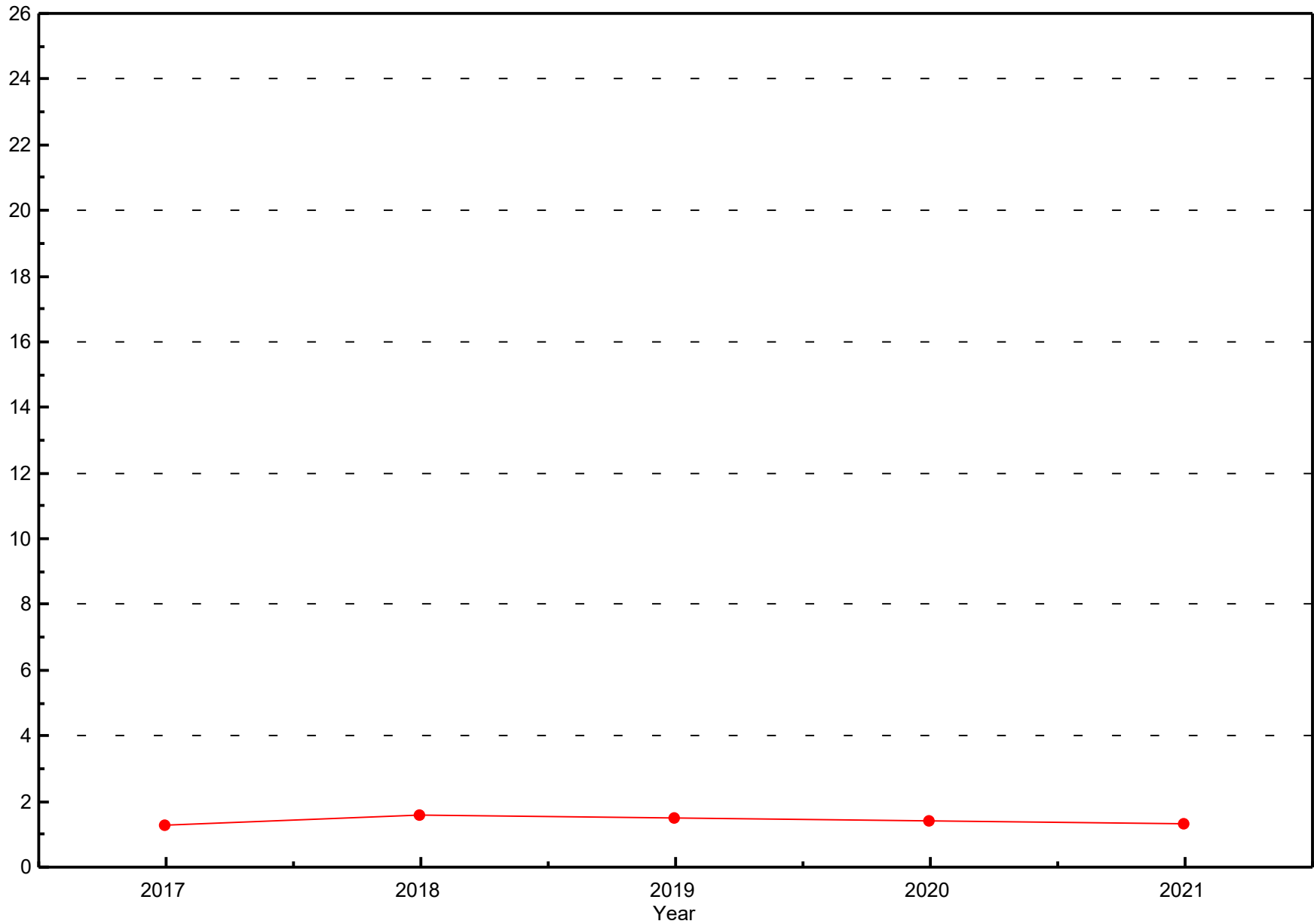
Nitrogen Oxides (NO_x) - ppb
Wapasu (2017 to 2021)





Yearly Averages

Nitrogen Oxides (NO_x) - ppb
Stony Mountain (2017 to 2021)

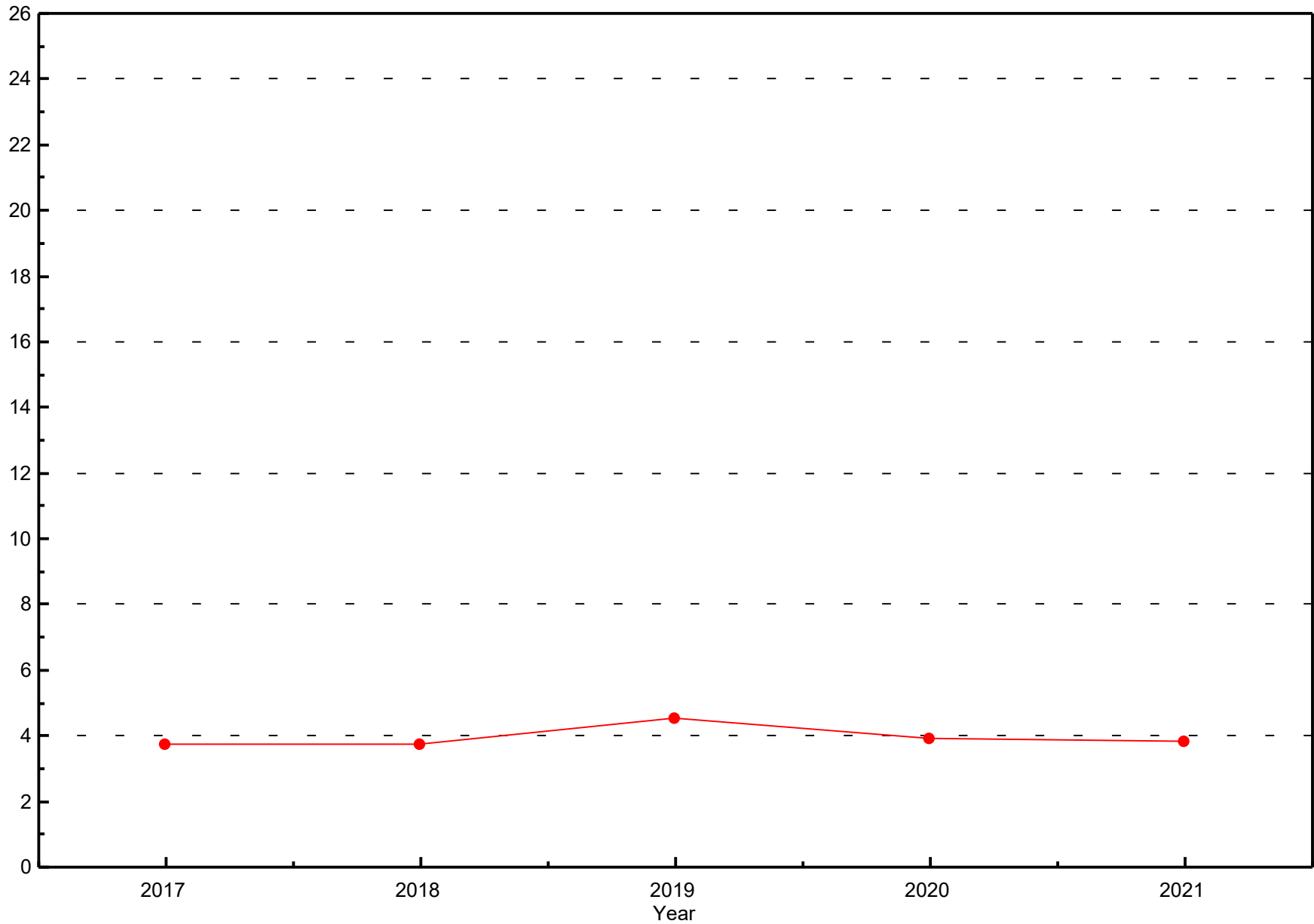




Yearly Averages

Nitrogen Oxides (NO_x) - ppb

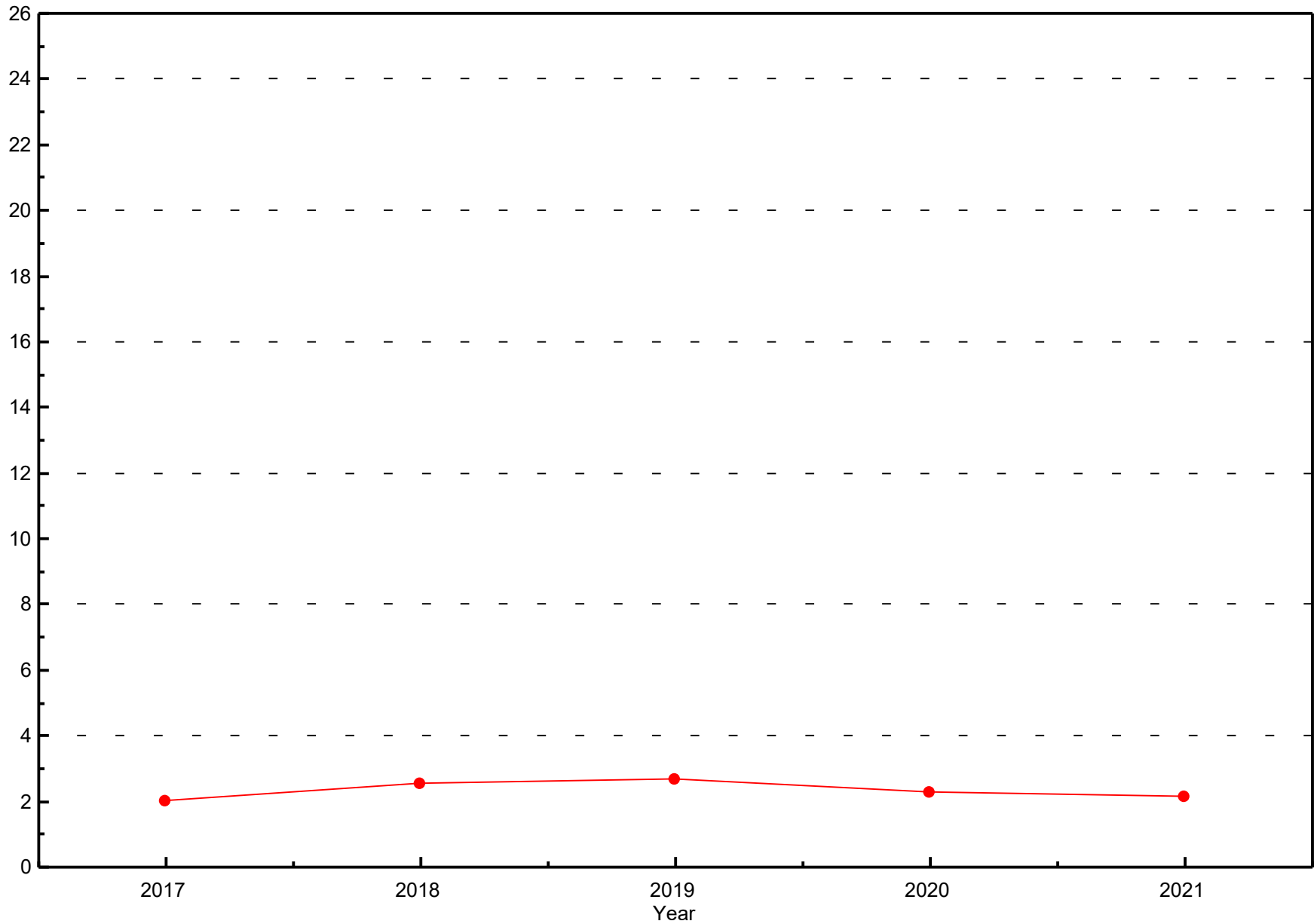
Firebag (2017 to 2021)





Yearly Averages

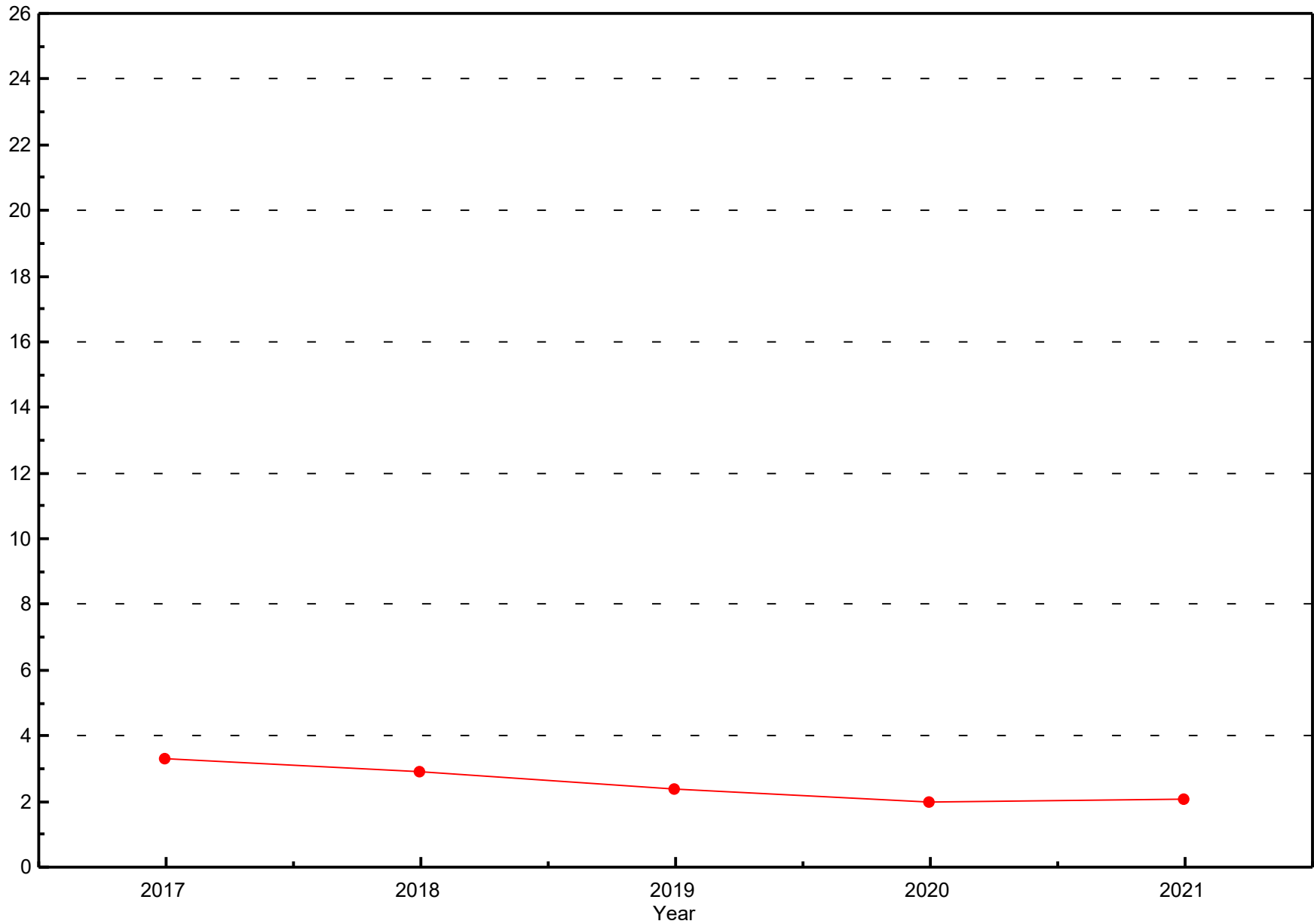
Nitrogen Oxides (NO_x) - ppb
Mackay River (2017 to 2021)





Yearly Averages

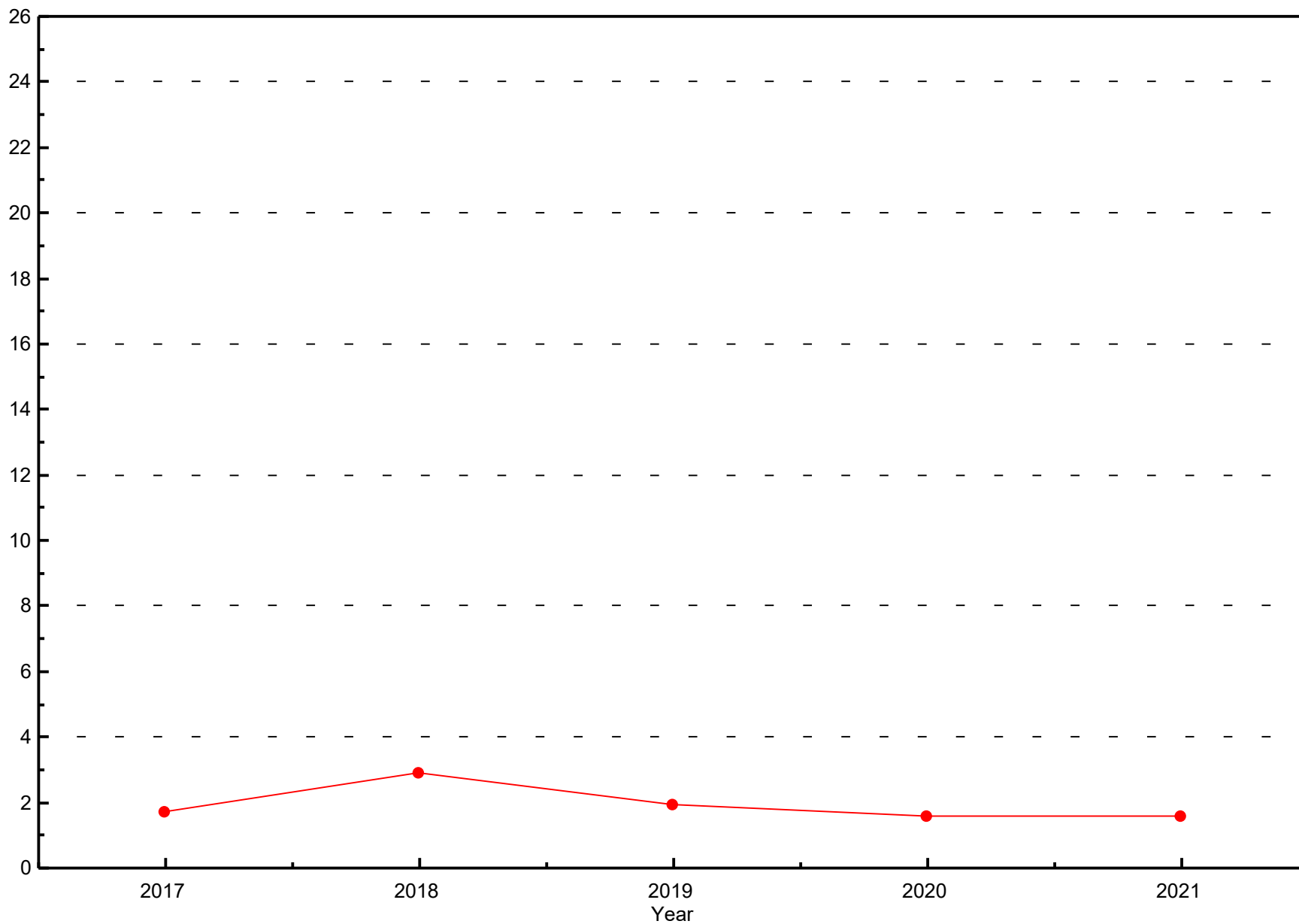
Nitrogen Oxides (NO_x) - ppb
Conklin (2017 to 2021)





Yearly Averages

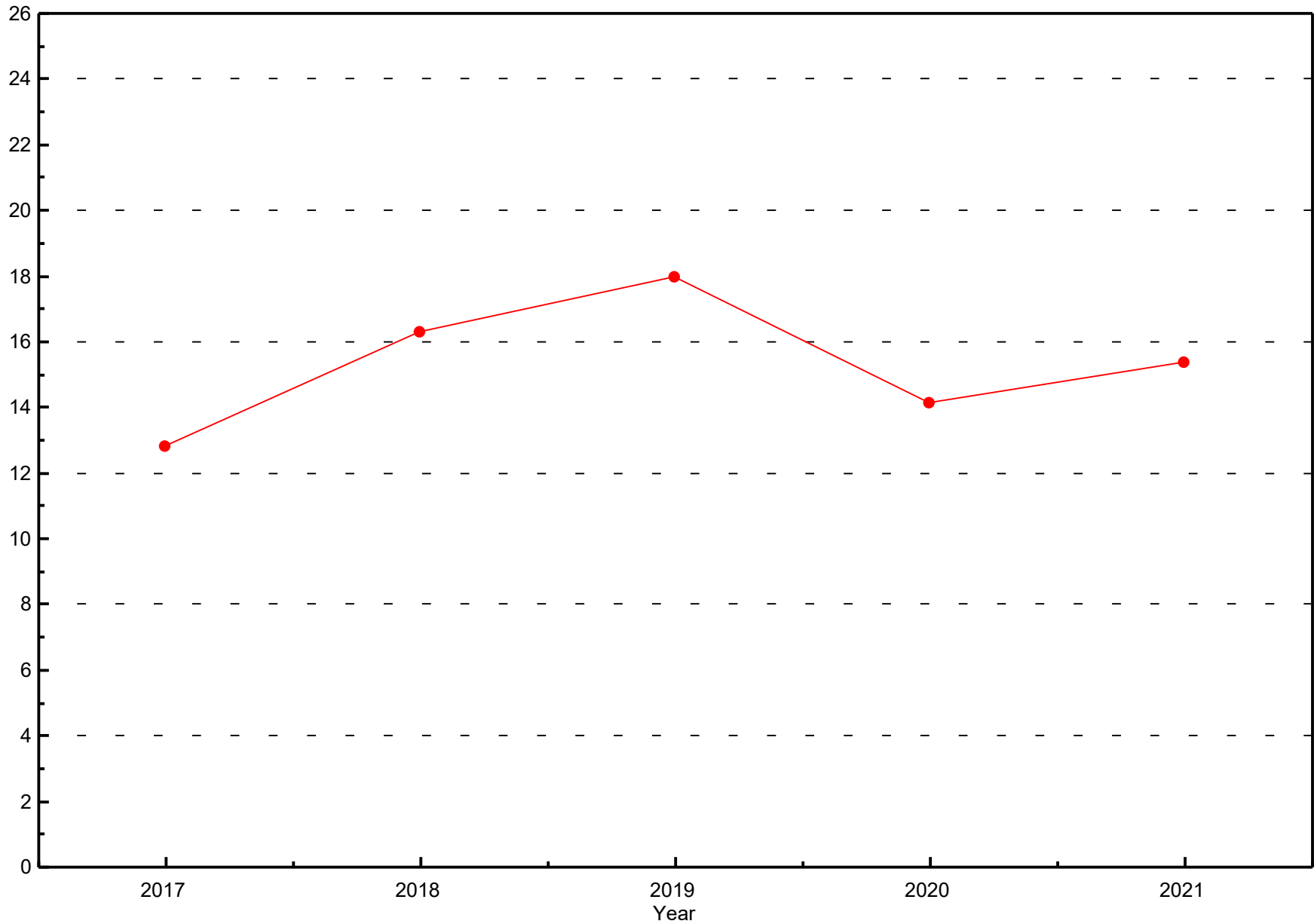
Nitrogen Oxides (NO_x) - ppb
Janvier (2017 to 2021)





Yearly Averages

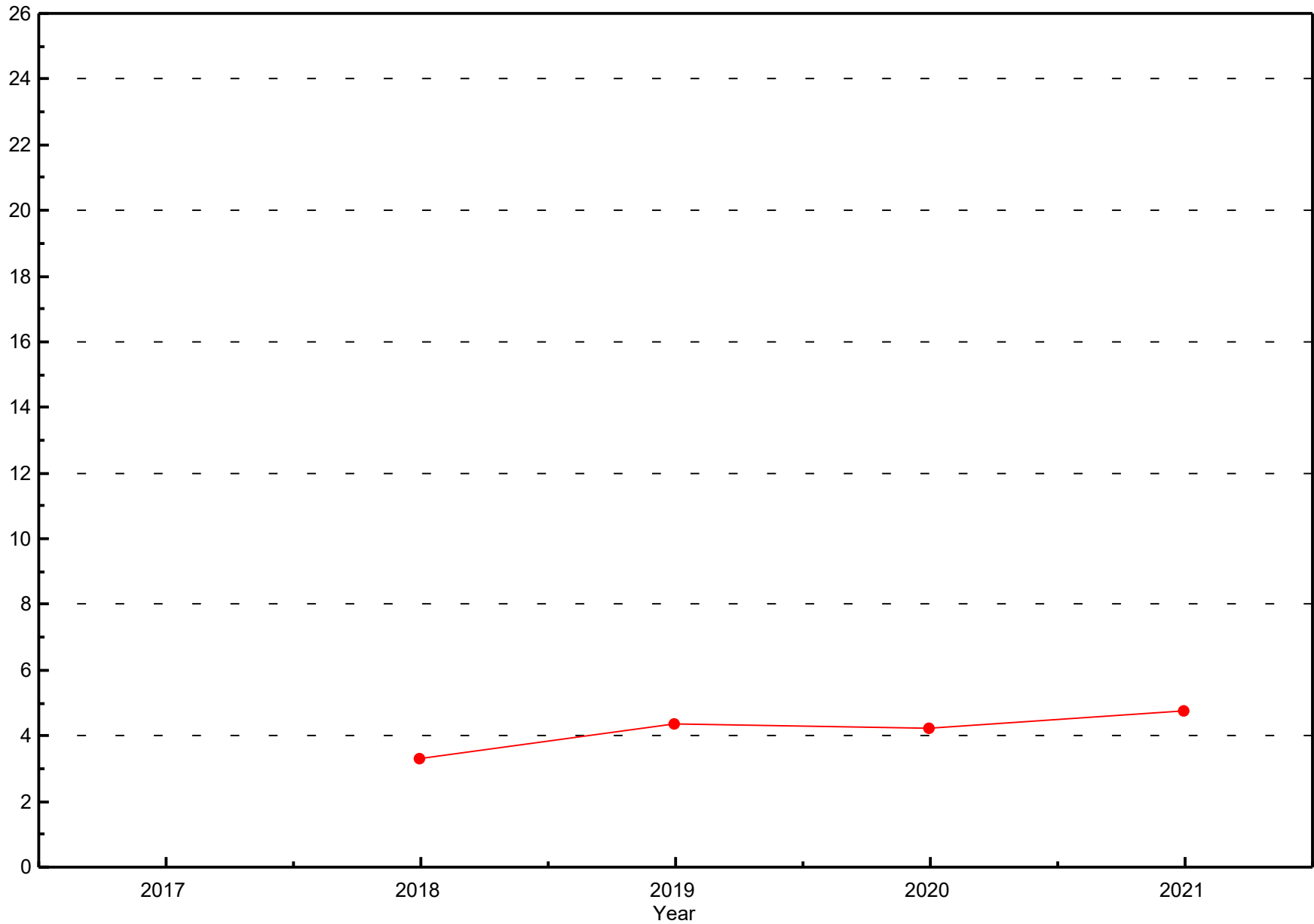
Nitrogen Oxides (NO_x) - ppb
Fort Hills (2017 to 2021)





Yearly Averages

Nitrogen Oxides (NO_x) - ppb
Christina Lake (2017 to 2021)

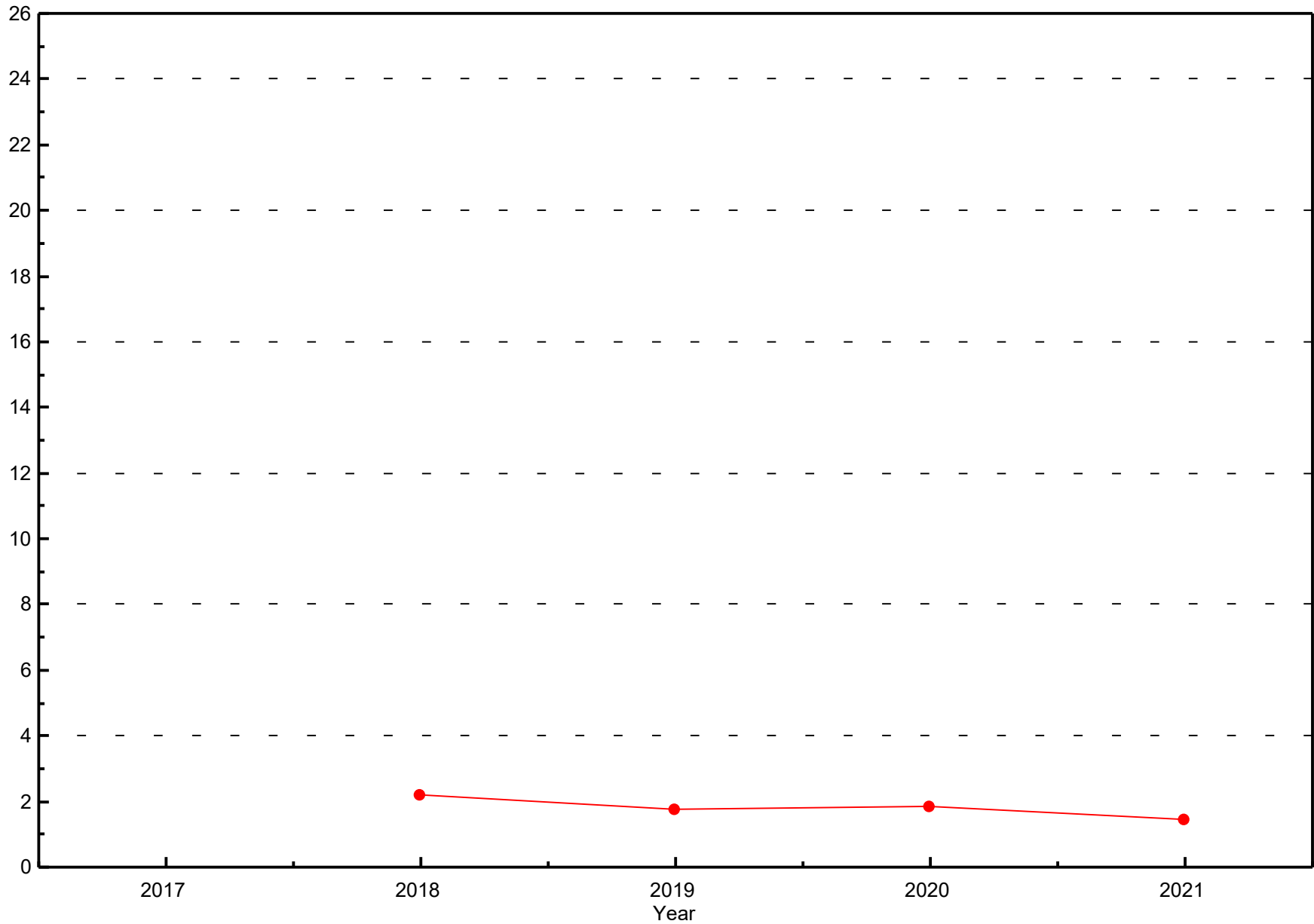




Yearly Averages

Nitrogen Oxides (NO_x) - ppb

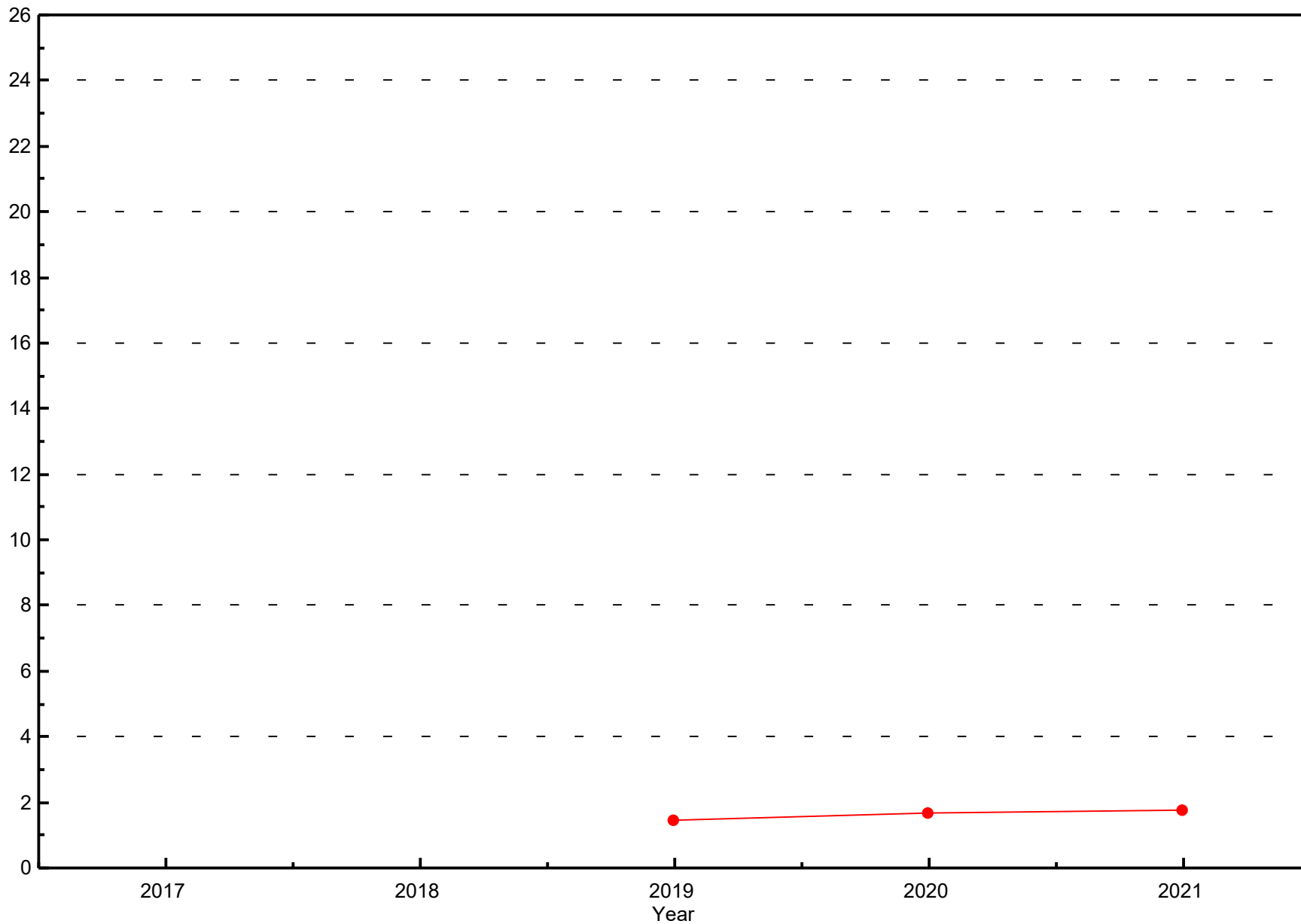
Jackfish 2/3 (2017 to 2021)





Yearly Averages

Nitrogen Oxides (NO_x) - ppb
Surmont 2 (2017 to 2021)

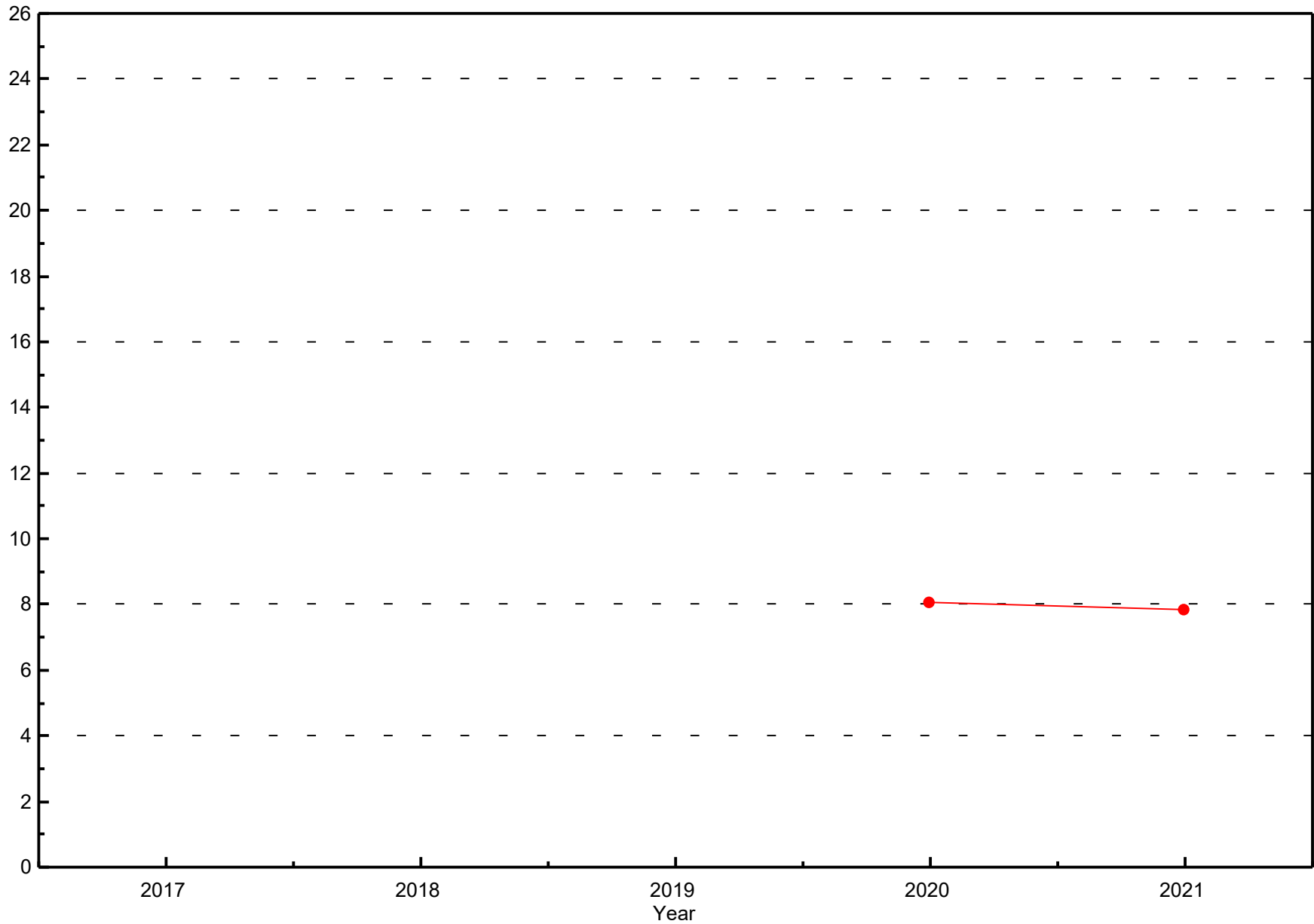




Yearly Averages

Nitrogen Oxides (NO_x) - ppb

Ells River (2017 to 2021)

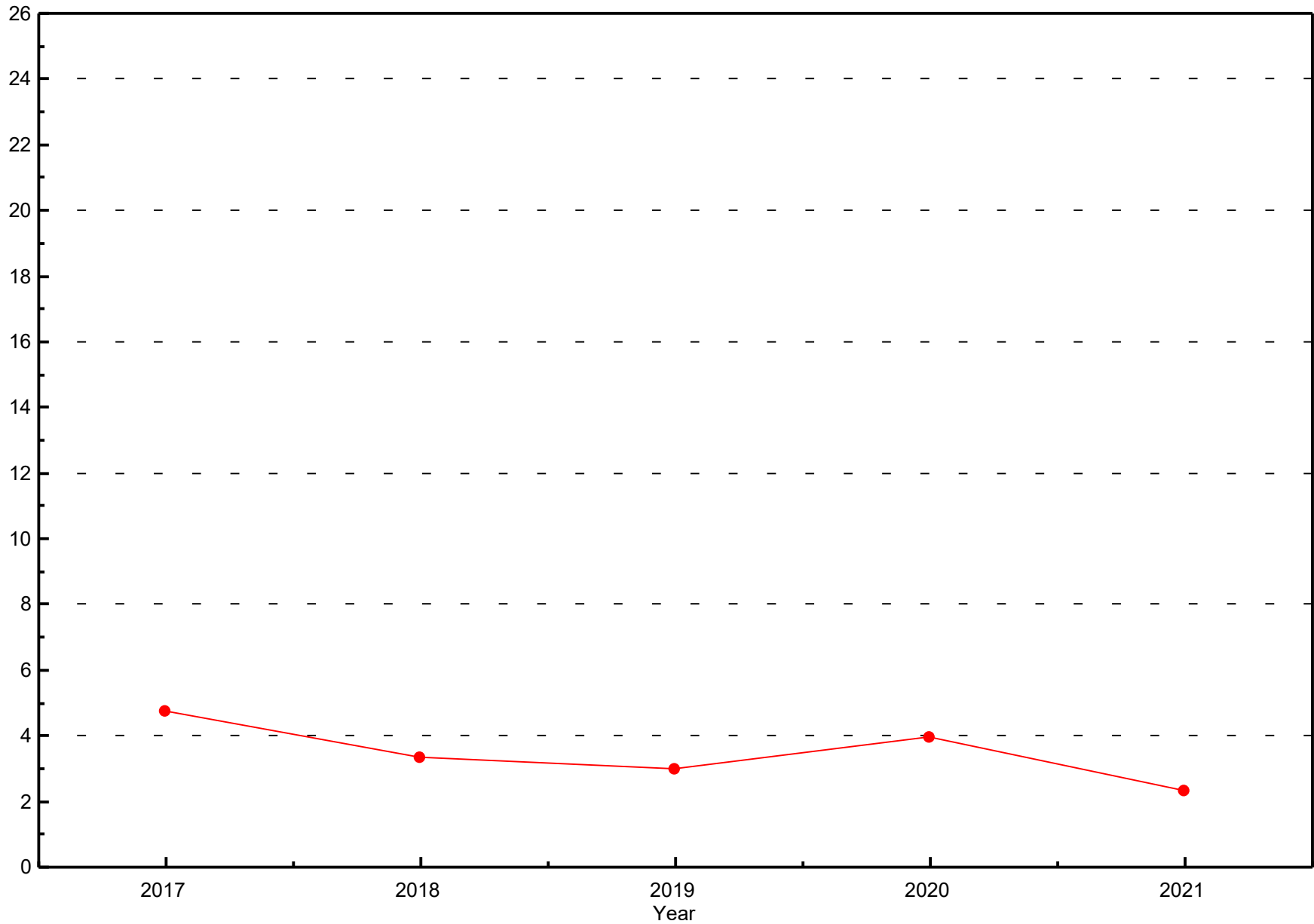




Yearly Averages

Nitrogen Oxides (NO_x) - ppb

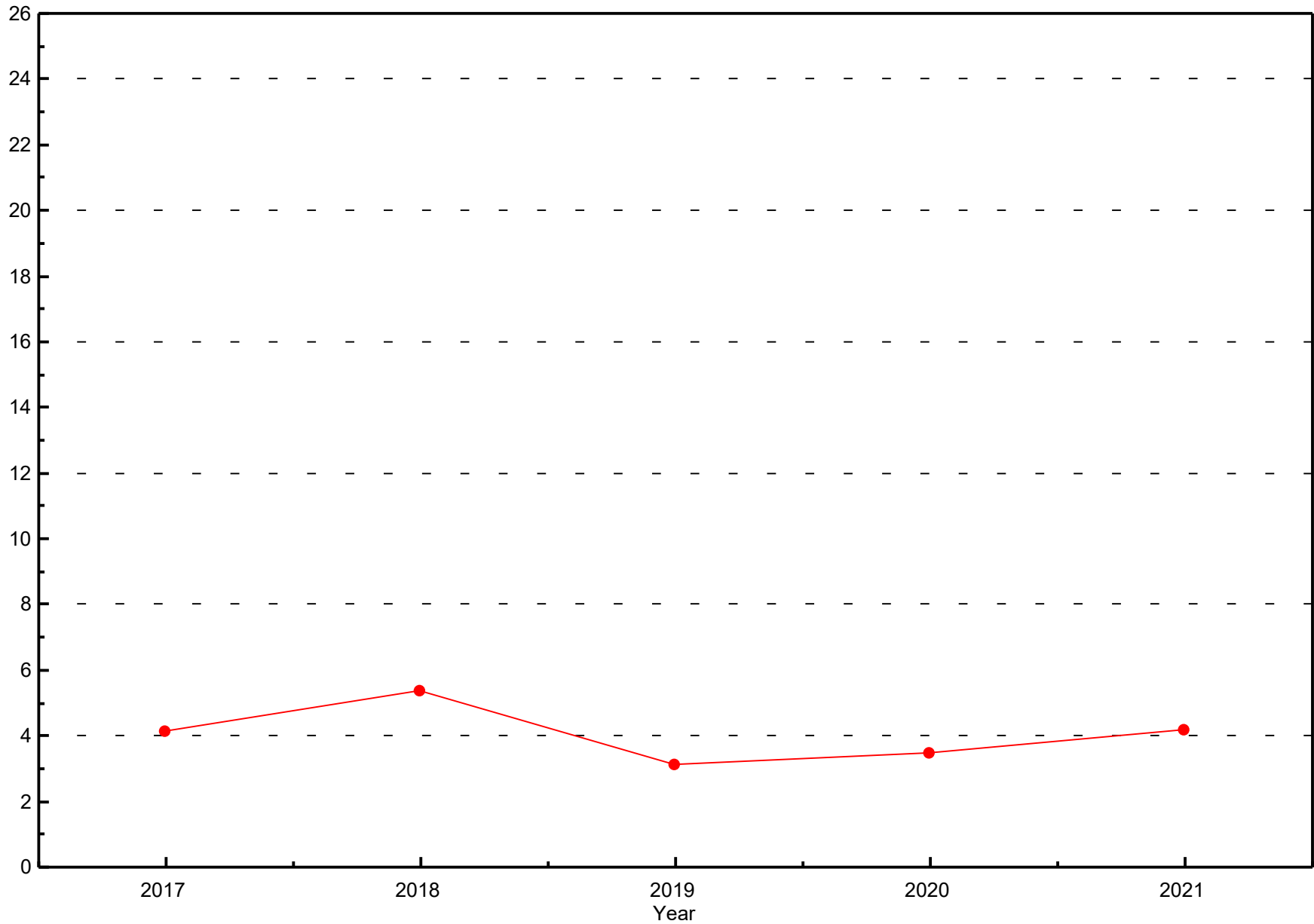
Leismer (2017 to 2021)





Yearly Averages

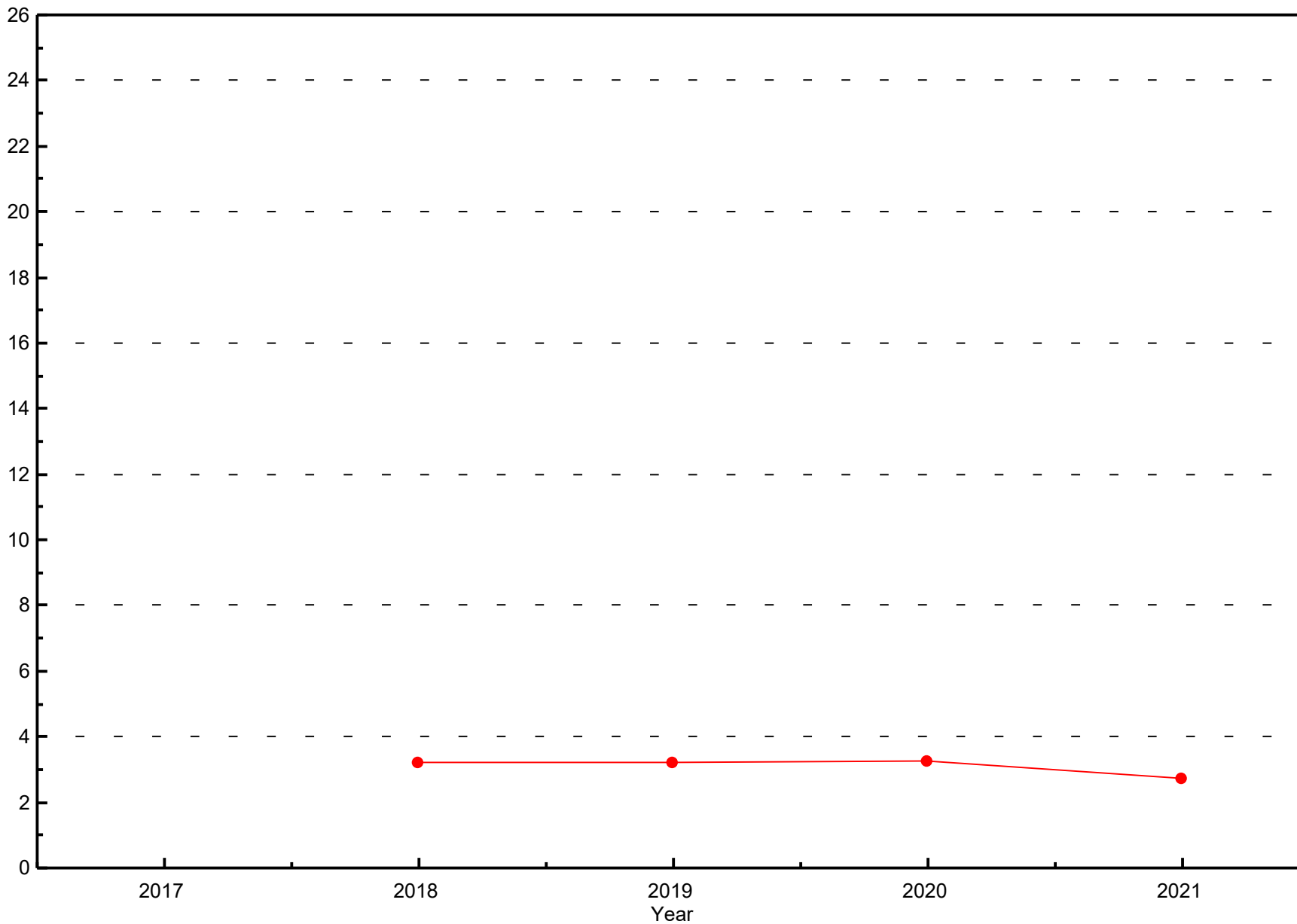
Nitrogen Oxides (NO_x) - ppb
Sawbones Bay (2017 to 2021)





Yearly Averages

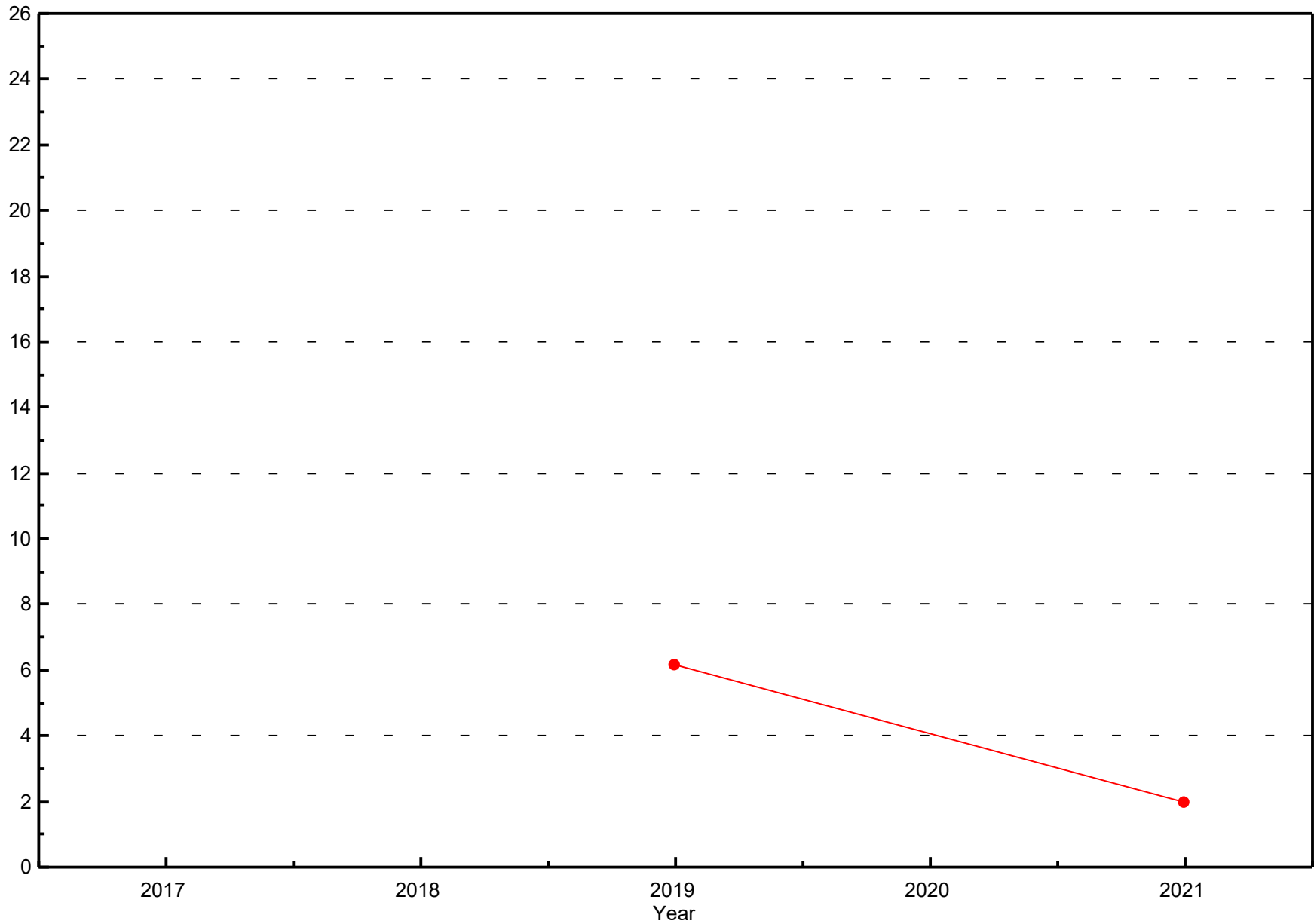
Nitrogen Oxides (NO_x) - ppb
Jackfish 1 (2017 to 2021)





Yearly Averages

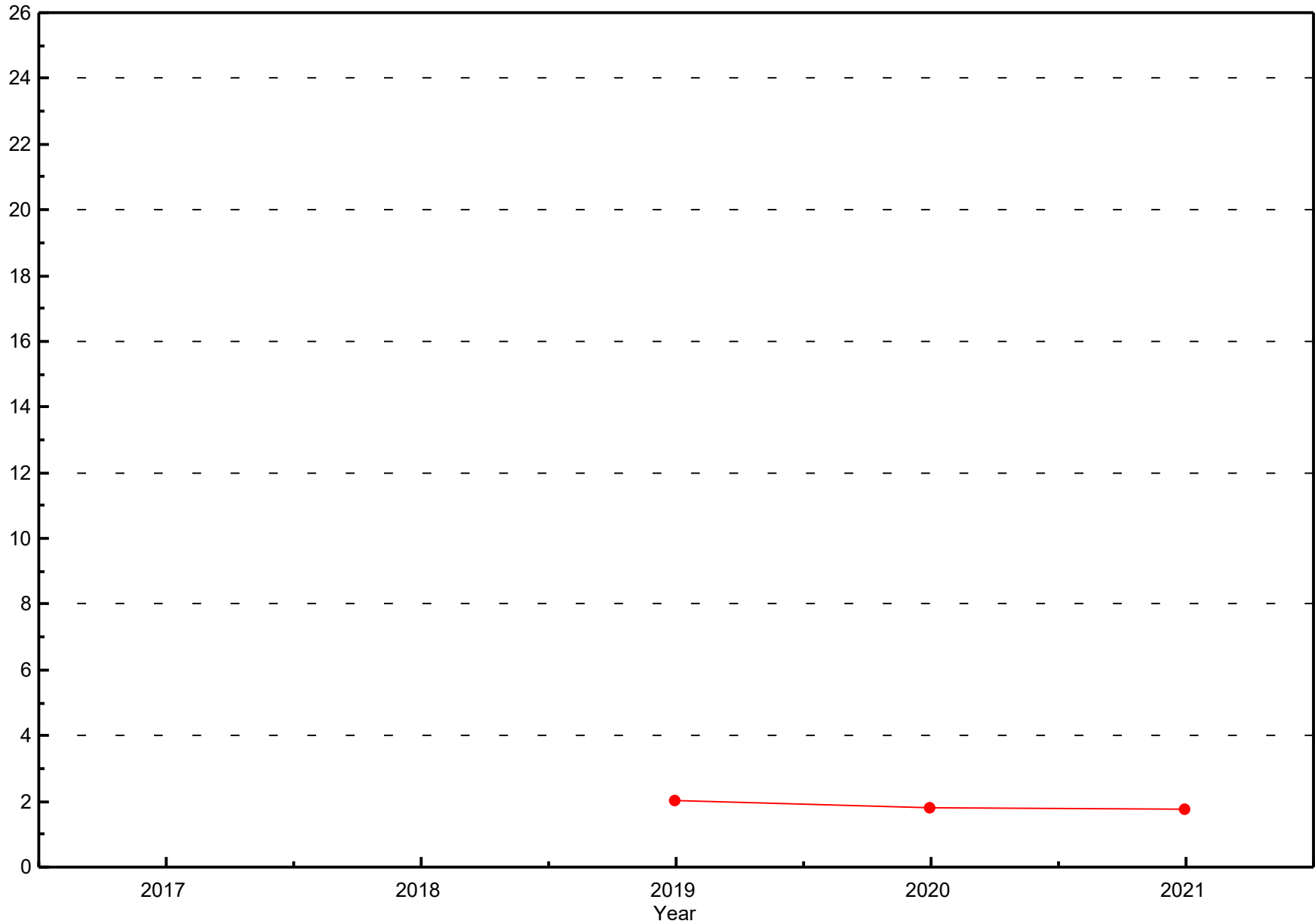
Nitrogen Oxides (NO_x) - ppb
Kirby South (2017 to 2021)





Yearly Averages

Nitrogen Oxides (NO_x) - ppb
Kirby North (2017 to 2021)





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM ANNUAL REPORT

OZONE ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Ozone (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value
January	100	709	15.5	40.6	0	31.0
February	100	639	18.9	41.4	0	31.0
March	100	708	27.6	52.2	0	38.2
April	100	686	29.2	52.7	0	43.0
May	99	706	30.5	54.7	0	44.6
June	100	685	23.7	57.3	0	37.5
July	100	708	22.8	101.7	2	43.6
August	100	708	19.6	67.5	0	30.6
September	100	690	15.5	41.3	0	26.7
October	99	705	17.5	37.0	0	27.4
November	100	686	11.8	38.0	0	24.6
December	100	707	12.6	35.4	0	29.7
Annual	100	8337	20.4	101.7	2	44.6



Wood Buffalo Environmental Association - Buffalo Viewpoint (AMS04)
Annual Summary for the Year 2021
Ozone (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value
January	100	709	22.2	42.2	0	35.5
February	100	640	23.8	41.6	0	38.3
March	100	709	32.6	51.5	0	41.9
April	100	684	31.0	51.5	0	47.5
May	100	710	32.0	50.5	0	43.6
June	99	680	25.9	53.1	0	39.3
July	100	707	26.7	101.9	3	45.5
August	100	709	24.5	58.0	0	38.7
September	100	687	20.9	44.0	0	33.6
October	100	709	23.9	39.2	0	34.9
November	100	687	20.1	40.5	0	34.5
December	100	710	18.0	36.3	0	33.5
Annual	100	8341	25.1	101.9	3	47.5



Wood Buffalo Environmental Association - Patricia McInnes (AMS06)
Annual Summary for the Year 2021
Ozone (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value
January	100	708	21.3	43.7	0	34.7
February	100	639	23.8	43.5	0	40.1
March	100	708	34.7	53.5	0	42.8
April	99	679	34.3	54.8	0	48.5
May	100	707	35.5	55.1	0	45.6
June	99	678	29.7	70.0	0	43.0
July	100	704	27.8	65.5	0	46.7
August	100	707	25.4	58.1	0	37.6
September	100	684	21.9	45.1	0	33.8
October	100	707	24.0	40.1	0	35.6
November	100	684	20.3	41.7	0	36.1
December	100	710	19.7	38.7	0	28.8
Annual	100	8315	26.6	70.0	0	48.5



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)
Annual Summary for the Year 2021
Ozone (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value
January	100	709	18.2	38.3	0	29.0
February	100	640	19.9	38.9	0	31.7
March	99	700	29.0	50.8	0	37.6
April	100	684	31.2	53.2	0	40.9
May	99	702	33.2	52.1	0	42.2
June	100	687	26.8	74.3	0	39.1
July	100	709	25.6	66.4	0	43.5
August	100	709	22.7	58.3	0	37.2
September	100	687	18.0	42.4	0	29.3
October	99	706	19.9	39.8	0	29.7
November	100	687	15.3	38.5	0	28.5
December	100	710	15.4	34.1	0	24.8
Annual	100	8330	23.0	74.3	0	43.5



Wood Buffalo Environmental Association - Fort Chipewyan (AMS08)
Annual Summary for the Year 2021
Ozone (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value
January	100	709	32.0	41.3	0	38.8
February	100	641	30.7	42.5	0	36.9
March	99	701	37.8	54.4	0	46.4
April	100	687	37.4	56.4	0	50.4
May	100	710	36.1	61.9	0	51.4
June	91	615	27.6	46.2	0	36.1
July	69	488	27.5	62.2	0	42.5
August	100	708	26.7	58.2	0	42.2
September	100	684	22.3	42.1	0	33.6
October	100	707	23.3	37.4	0	31.5
November	100	686	22.8	35.9	0	30.5
December	100	710	25.4	34.3	0	31.2
Annual	96	8046	29.2	62.2	0	51.4



Wood Buffalo Environmental Association - Fort McKay South (AMS13)
Annual Summary for the Year 2021
Ozone (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value
January	100	709	13.5	35.5	0	29.5
February	95	610	17.9	37.9	0	26.9
March	100	707	24.5	48.1	0	34.0
April	100	685	26.2	48.3	0	37.0
May	99	703	28.5	50.1	0	40.5
June	100	686	23.8	63.8	0	36.5
July	100	707	23.4	106.0	3	40.2
August	100	708	20.4	65.0	0	28.7
September	100	685	13.5	39.9	0	23.7
October	90	633	13.9	35.9	0	20.1
November	100	686	11.3	38.1	0	26.8
December	100	710	11.5	35.2	0	23.1
Annual	99	8229	19.1	106.0	3	40.5



Wood Buffalo Environmental Association - Anzac (AMS14)
Annual Summary for the Year 2021
Ozone (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value
January	100	709	26.6	42.0	0	38.3
February	100	638	27.4	43.2	0	40.4
March	100	709	36.2	50.4	0	43.5
April	100	687	35.1	50.9	0	46.5
May	100	708	34.4	51.7	0	44.7
June	100	686	28.7	55.7	0	40.1
July	100	709	25.6	71.0	0	46.9
August	100	709	23.1	53.6	0	36.7
September	100	686	20.9	41.5	0	32.1
October	99	701	23.9	39.1	0	33.2
November	99	683	23.0	40.2	0	37.2
December	100	708	22.8	38.9	0	30.2
Annual	100	8333	27.3	71.0	0	46.9



Wood Buffalo Environmental Association - Wapasu (AMS17)
Annual Summary for the Year 2021
Ozone (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value
January	100	709	29.8	45.3	0	41.6
February	100	640	30.3	46.5	0	41.8
March	100	709	39.8	56.5	0	48.9
April	100	686	38.9	57.4	0	51.6
May	100	710	37.8	58.8	0	49.9
June	100	687	30.3	60.6	0	46.6
July	100	709	28.6	76.5	1	50.5
August	99	704	25.4	67.2	0	41.3
September	98	672	21.3	44.3	0	34.9
October	100	710	25.2	39.8	0	33.9
November	100	686	23.8	40.0	0	32.8
December	100	710	24.5	36.6	0	31.8
Annual	100	8332	29.7	76.5	1	51.6



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Ozone (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value
January	100	709	33.0	43.7	0	41.5
February	100	640	33.7	46.8	0	43.3
March	100	710	40.9	55.8	0	48.0
April	100	683	41.5	55.0	0	49.4
May	100	706	37.7	53.9	0	47.8
June	99	680	30.3	53.5	0	42.6
July	98	695	27.3	62.8	0	47.0
August	99	702	25.2	51.8	0	38.3
September	100	684	25.0	45.5	0	34.3
October	95	676	28.2	40.3	0	36.7
November	100	682	26.0	42.6	0	37.1
December	77	547	28.5	40.5	0	33.6
Annual	97	8114	31.5	62.8	0	49.4



Wood Buffalo Environmental Association - Conklin (AMS21)
Annual Summary for the Year 2021
Ozone (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value
January	99	706	28.2	42.0	0	38.8
February	100	640	30.5	47.1	0	44.2
March	97	688	38.6	55.7	0	45.8
April	100	686	35.9	55.3	0	48.0
May	100	708	33.7	55.3	0	41.5
June	100	686	29.3	55.6	0	45.0
July	100	709	27.1	67.3	0	50.1
August	100	710	24.2	55.2	0	40.0
September	100	684	23.8	47.7	0	35.2
October	100	709	23.6	40.0	0	31.2
November	100	687	22.8	42.2	0	36.3
December	100	709	25.5	40.4	0	31.6
Annual	100	8322	28.6	67.3	0	50.1



Wood Buffalo Environmental Association - Janvier (AMS22)
Annual Summary for the Year 2021
Ozone (ppb) Average

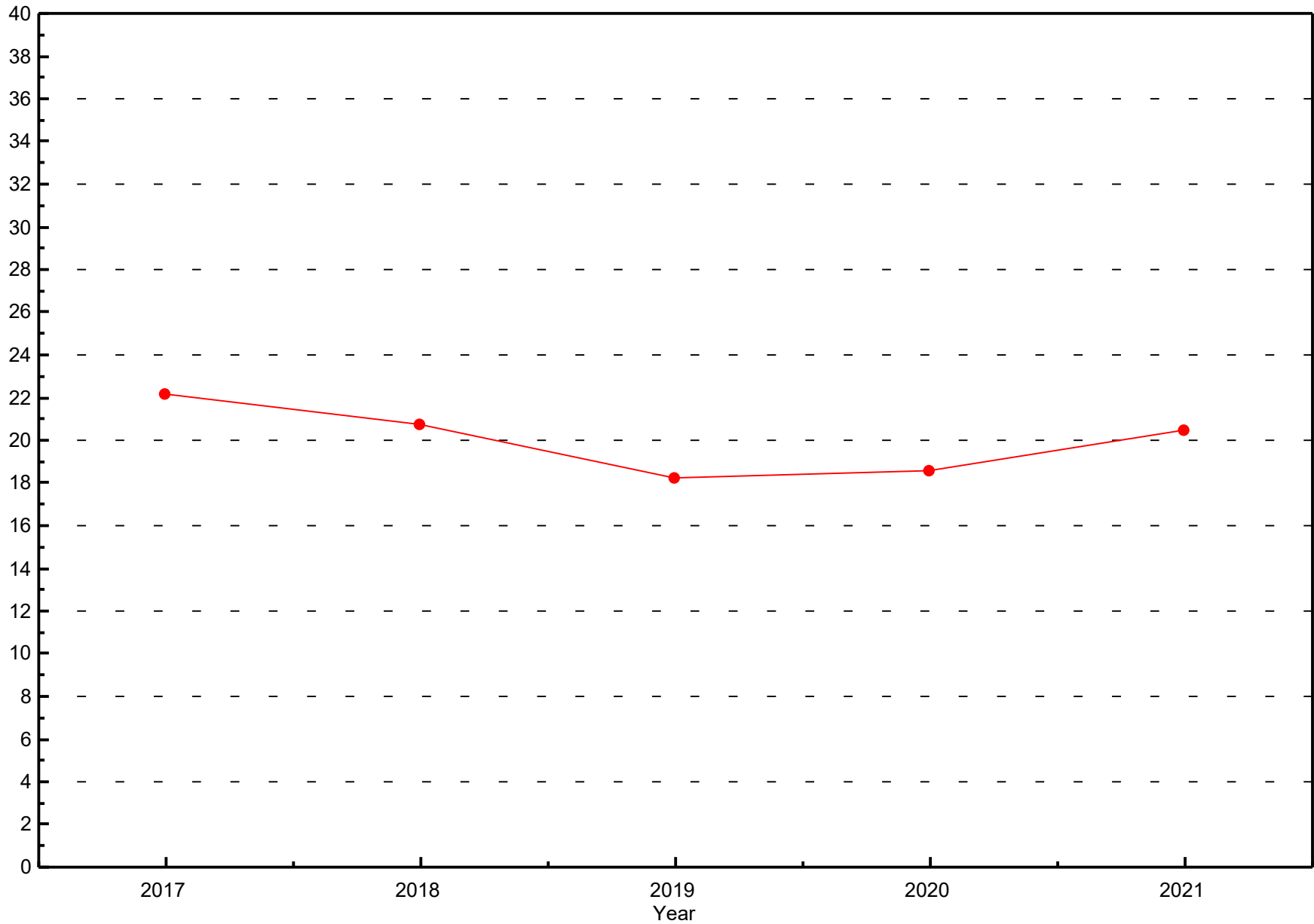
Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value
January	76	540	31.0	43.7	0	39.7
February	97	621	31.3	46.2	0	43.7
March	100	710	40.1	55.4	0	47.2
April	100	685	39.2	56.5	0	47.5
May	100	707	36.9	58.2	0	46.4
June	99	683	28.6	55.5	0	41.5
July	100	708	25.6	69.4	0	49.1
August	99	706	22.5	58.7	0	34.6
September	100	684	22.5	44.4	0	31.6
October	100	707	26.7	43.3	0	34.3
November	100	684	24.9	44.3	0	37.4
December	100	707	26.9	41.5	0	33.2
Annual	97	8142	29.6	69.4	0	49.1



Yearly Averages

Ozone (O₃) - ppb

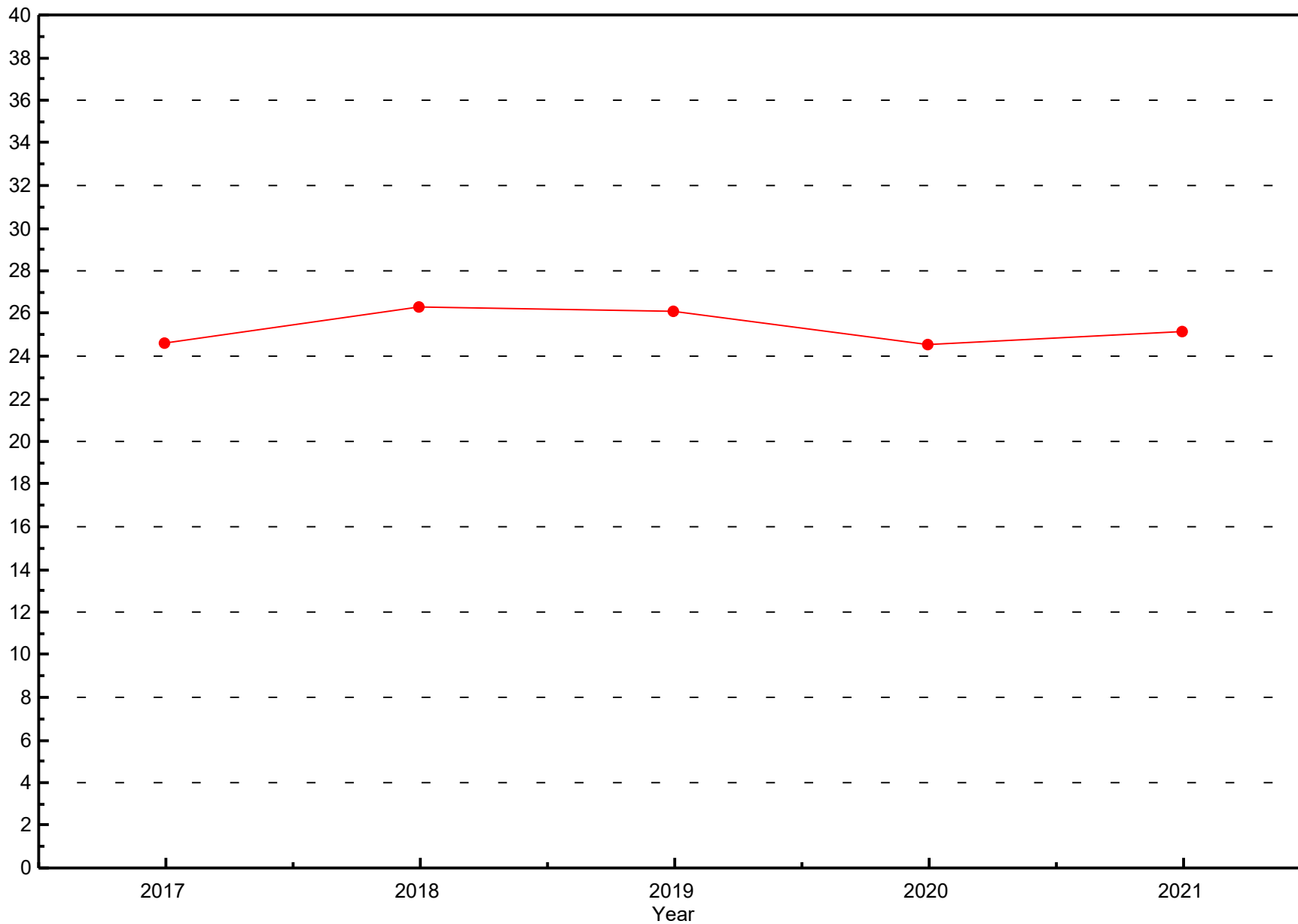
Fort McKay - Bertha Ganter (2017 to 2021)





Yearly Averages

Ozone (O₃) - ppb
Buffalo Viewpoint (2017 to 2021)

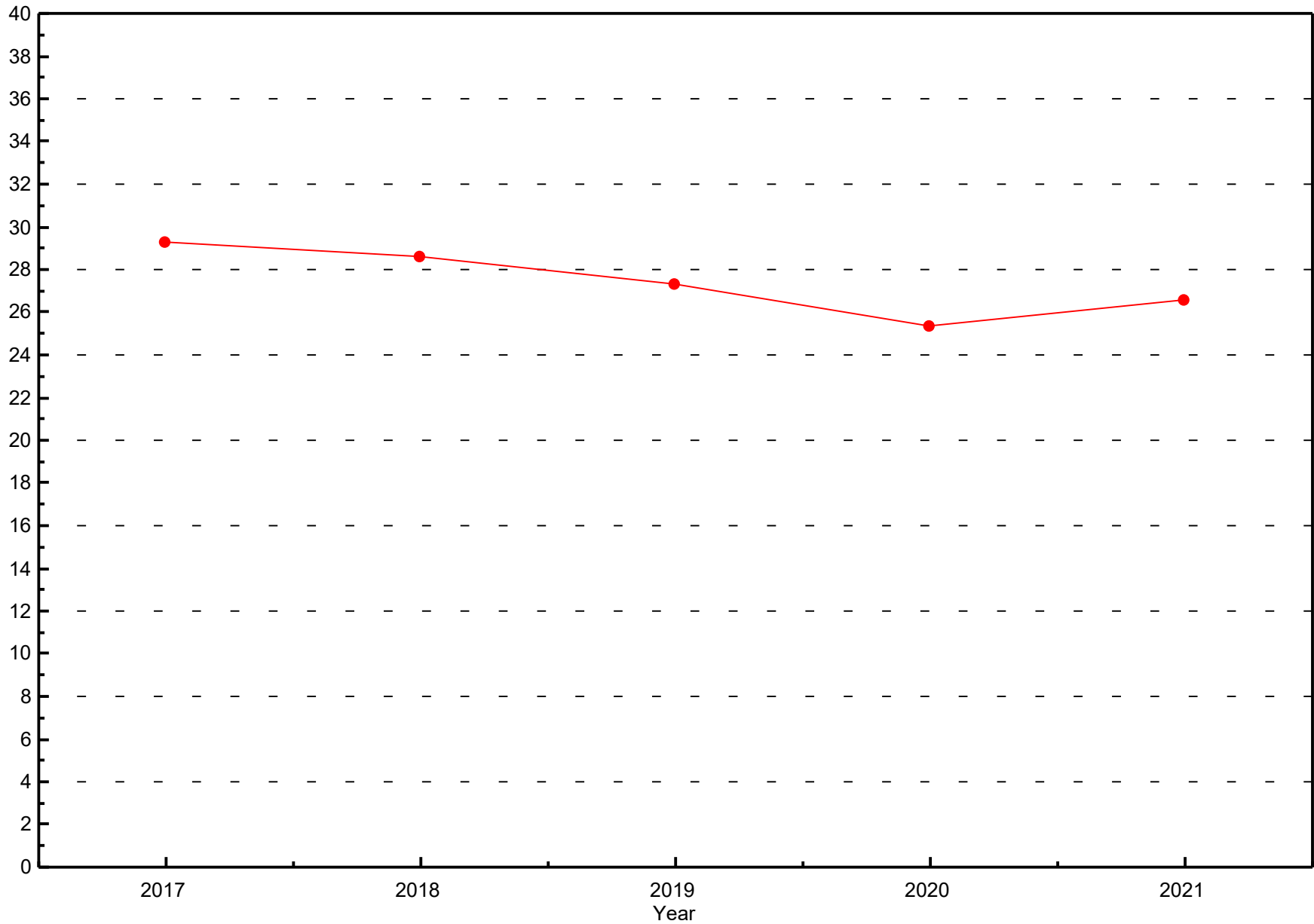




Yearly Averages

Ozone (O₃) - ppb

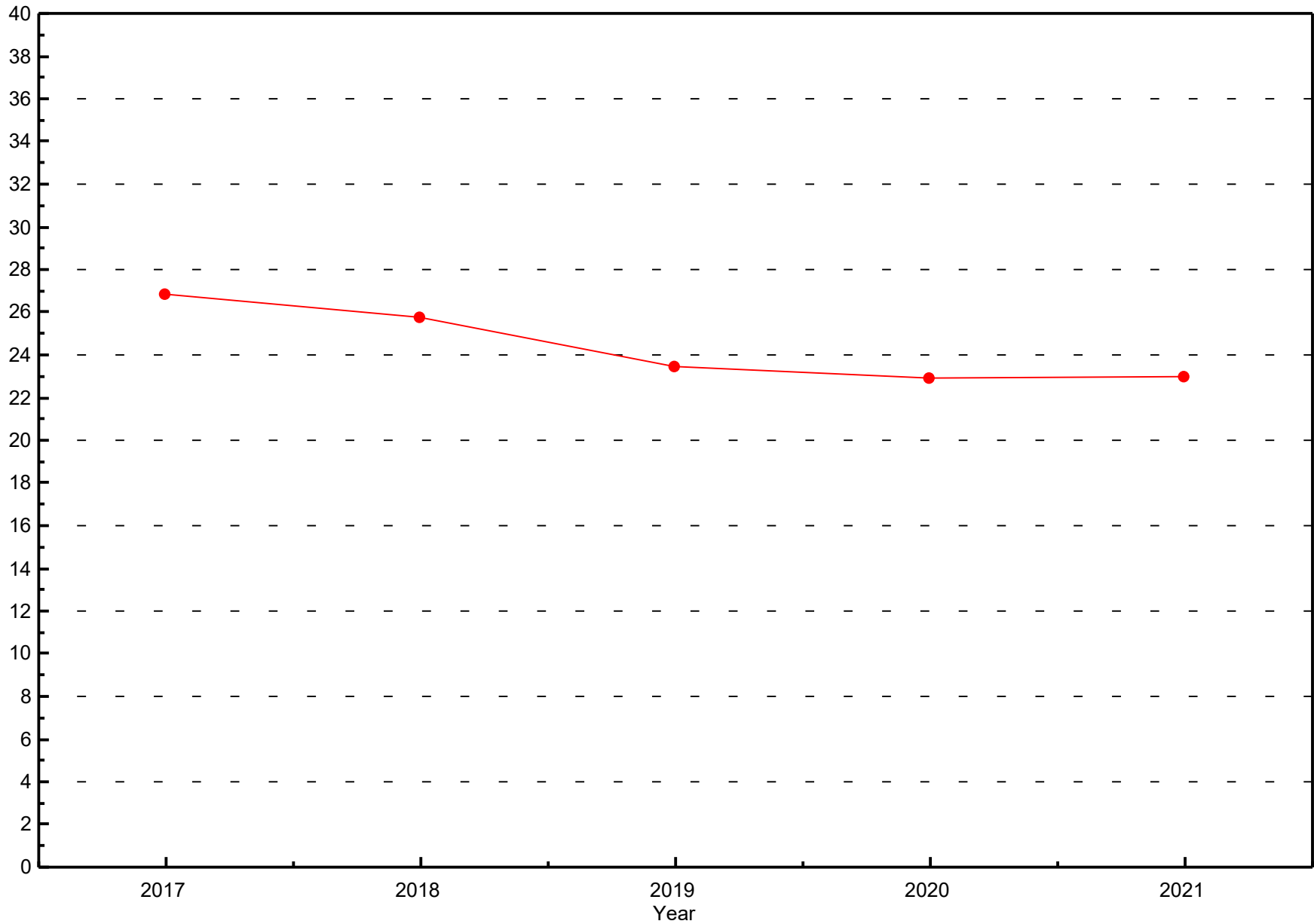
Patricia McInnes (2017 to 2021)





Yearly Averages

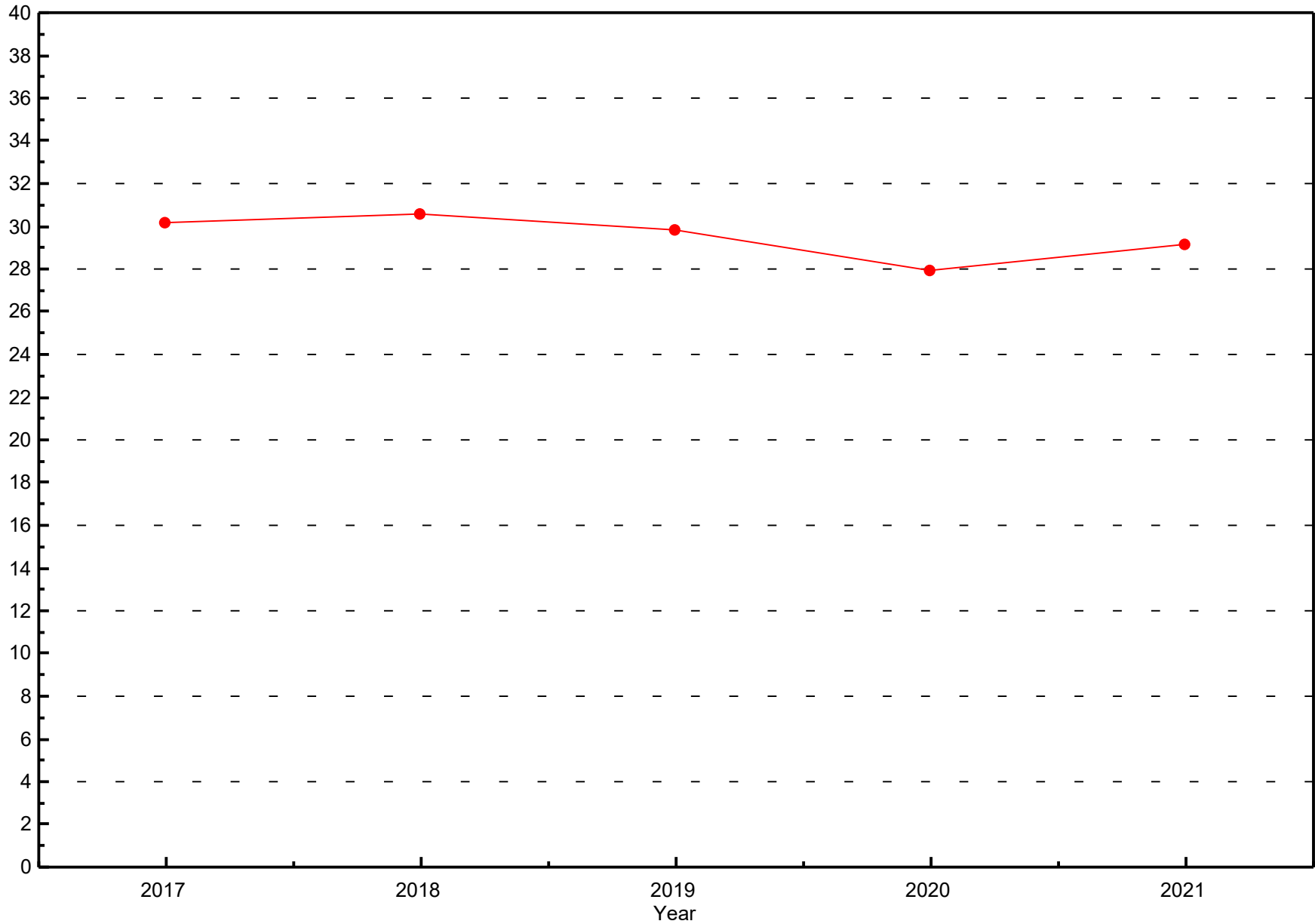
Ozone (O₃) - ppb
Athabasca Valley (2017 to 2021)





Yearly Averages

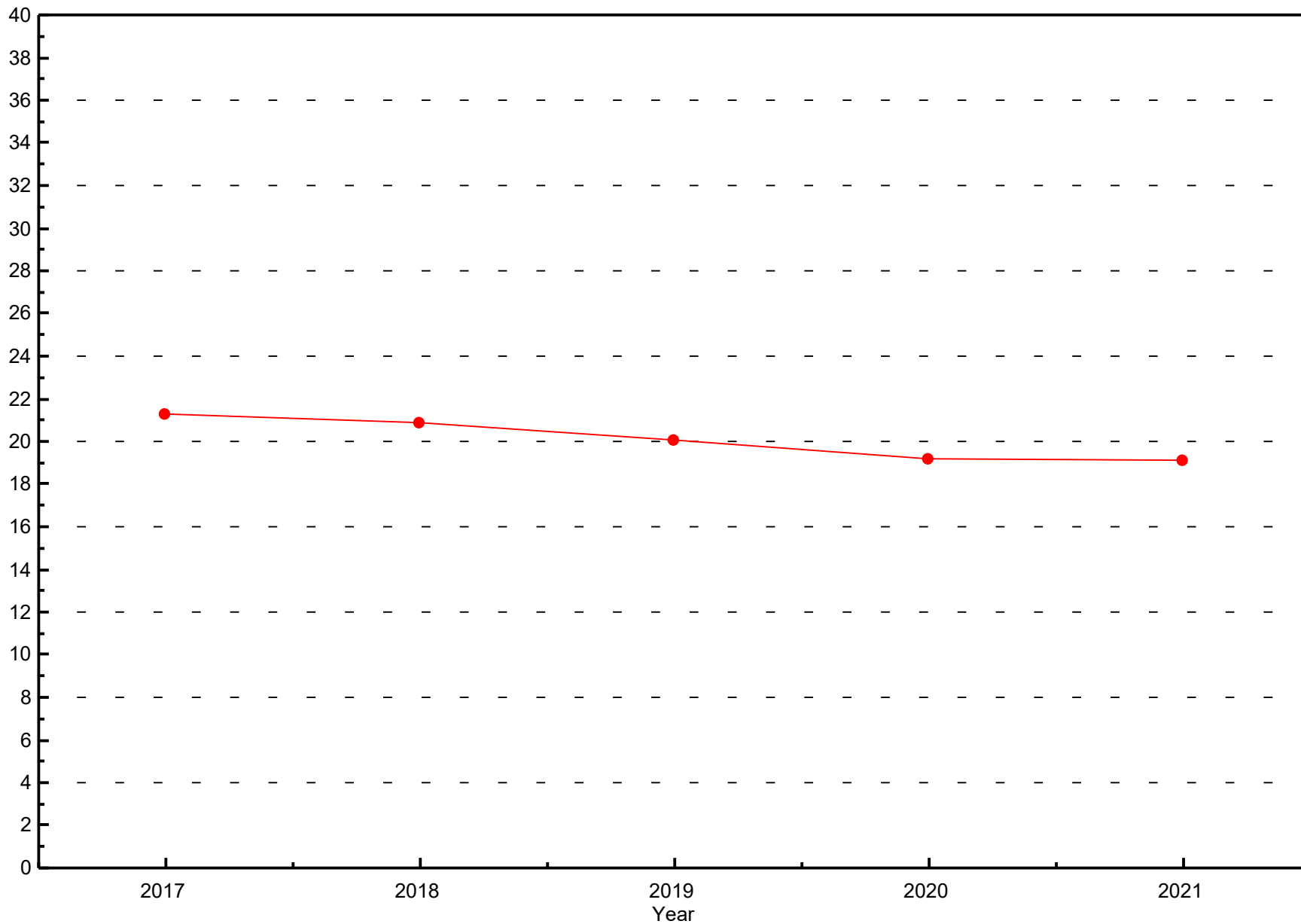
Ozone (O₃) - ppb
Fort Chipewyan (2017 to 2021)





Yearly Averages

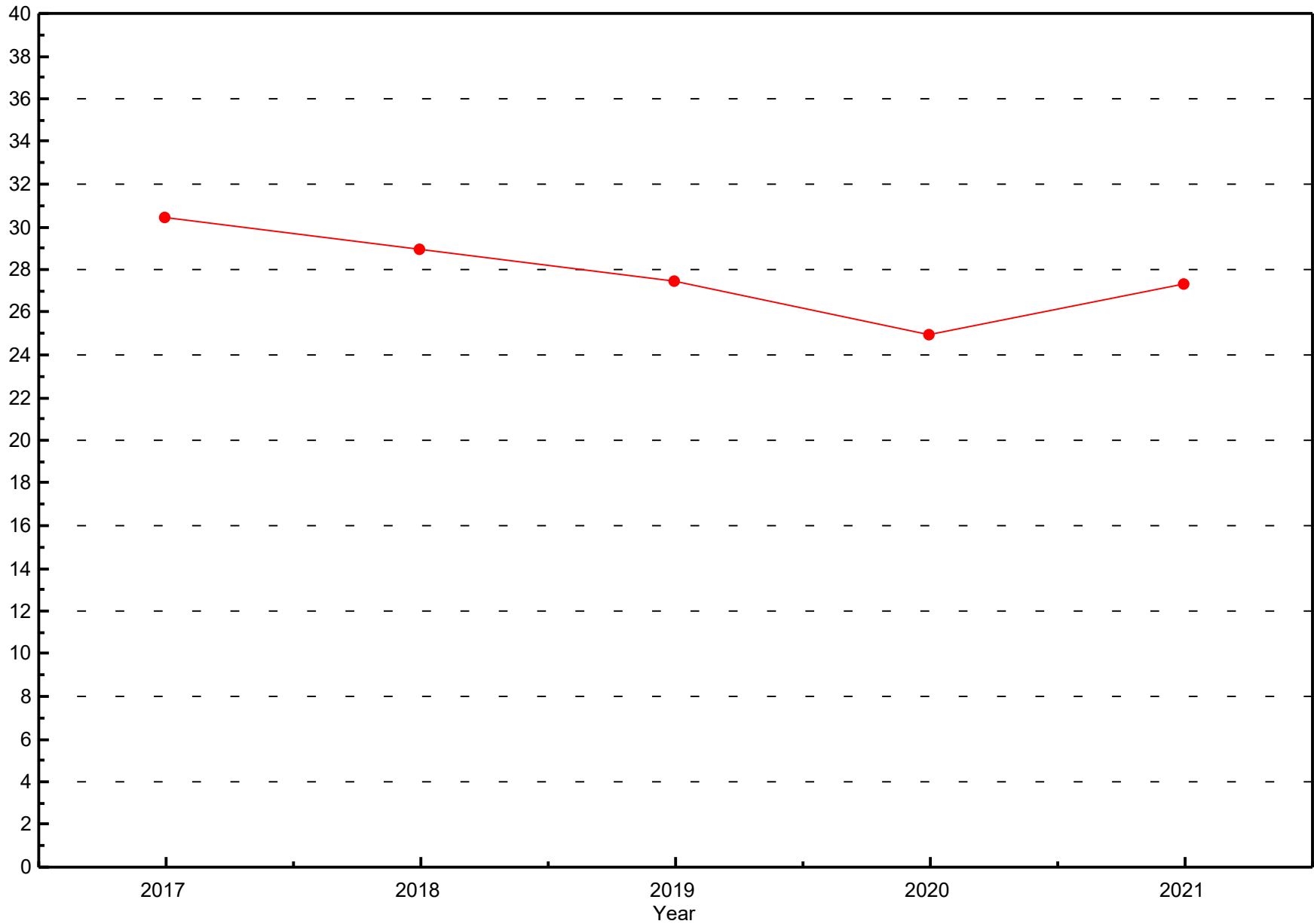
Ozone (O₃) - ppb
Fort McKay South (2017 to 2021)





Yearly Averages

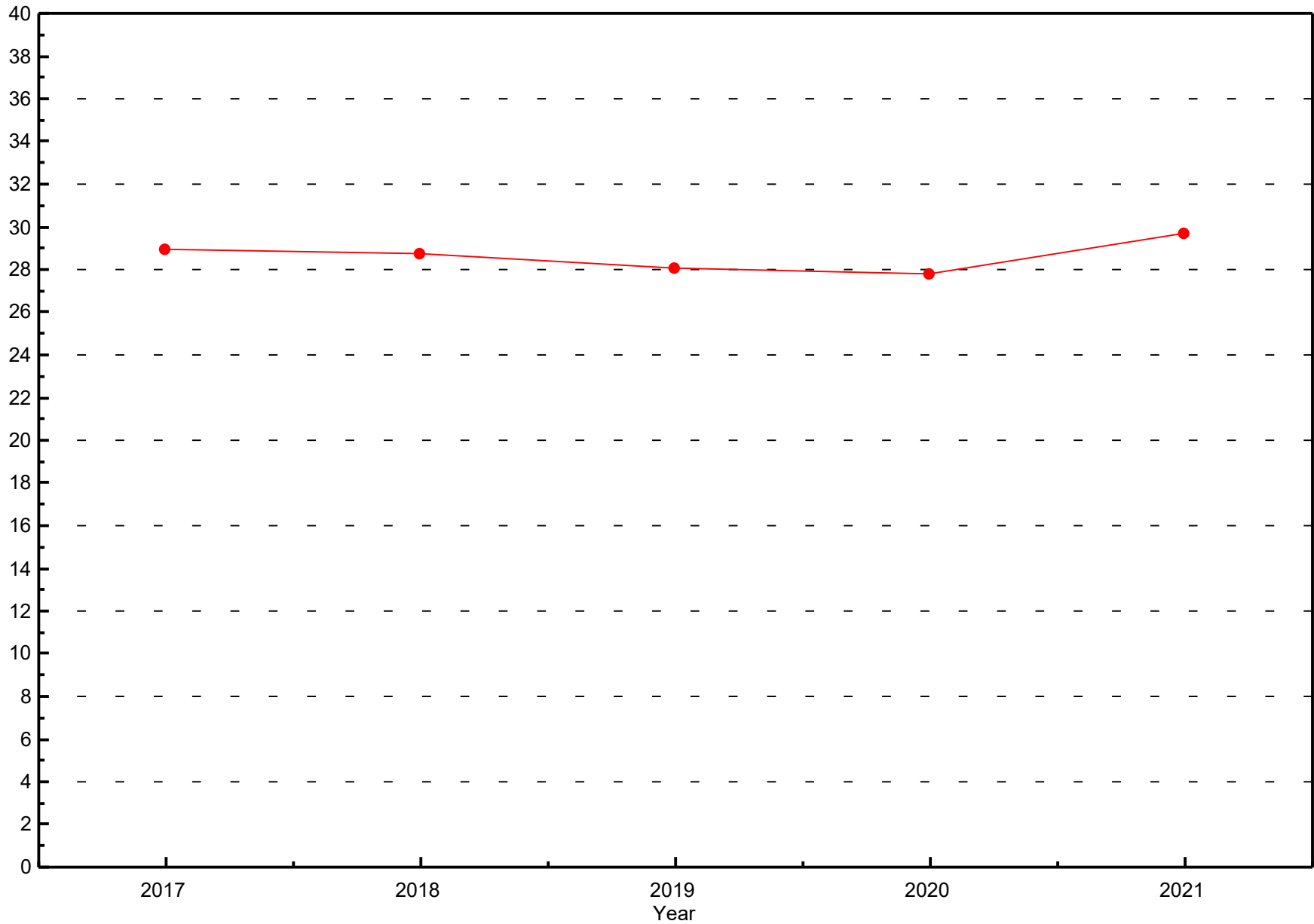
Ozone (O₃) - ppb
Anzac (2017 to 2021)





Yearly Averages

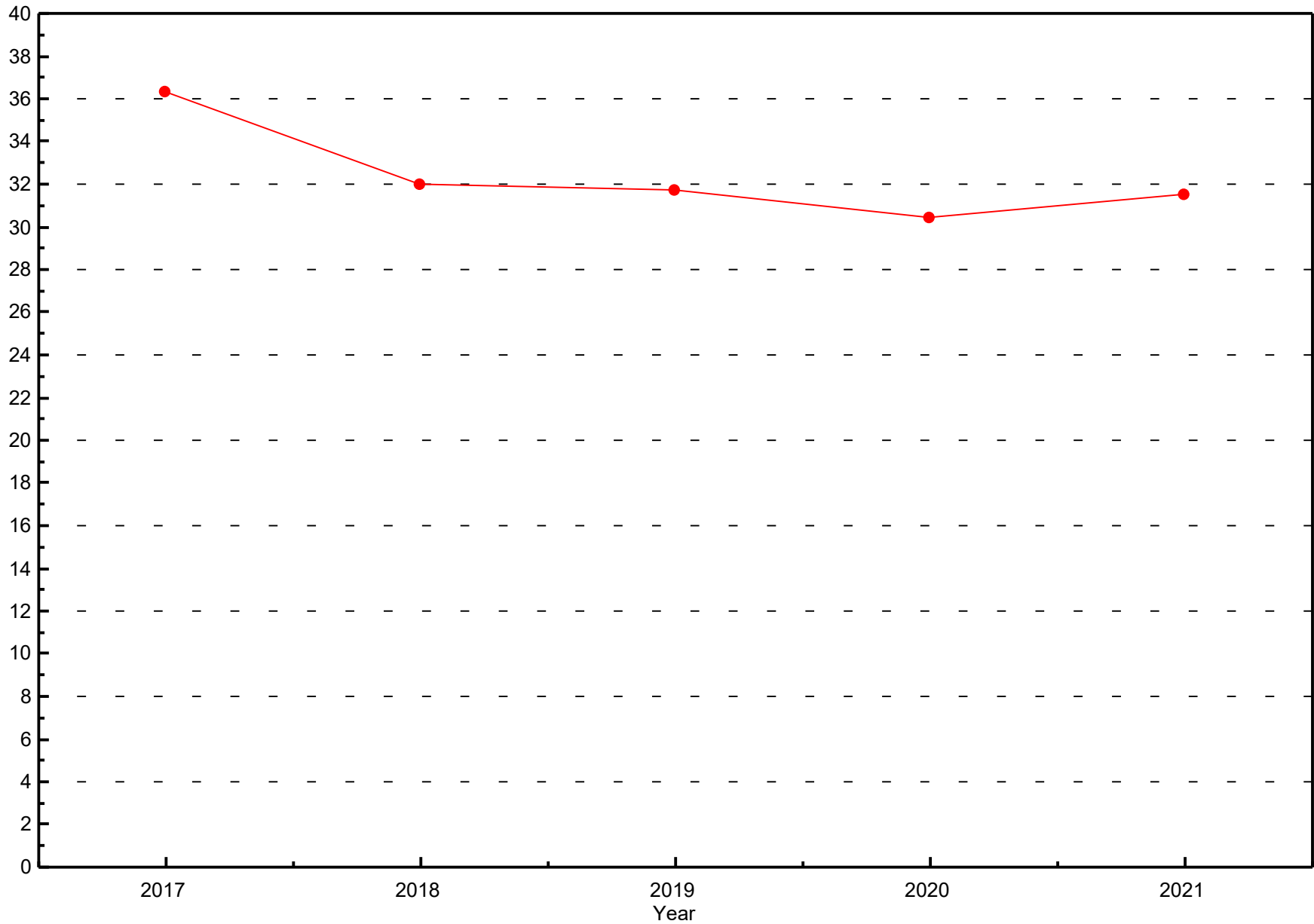
Ozone (O₃) - ppb
Wapasu (2017 to 2021)





Yearly Averages

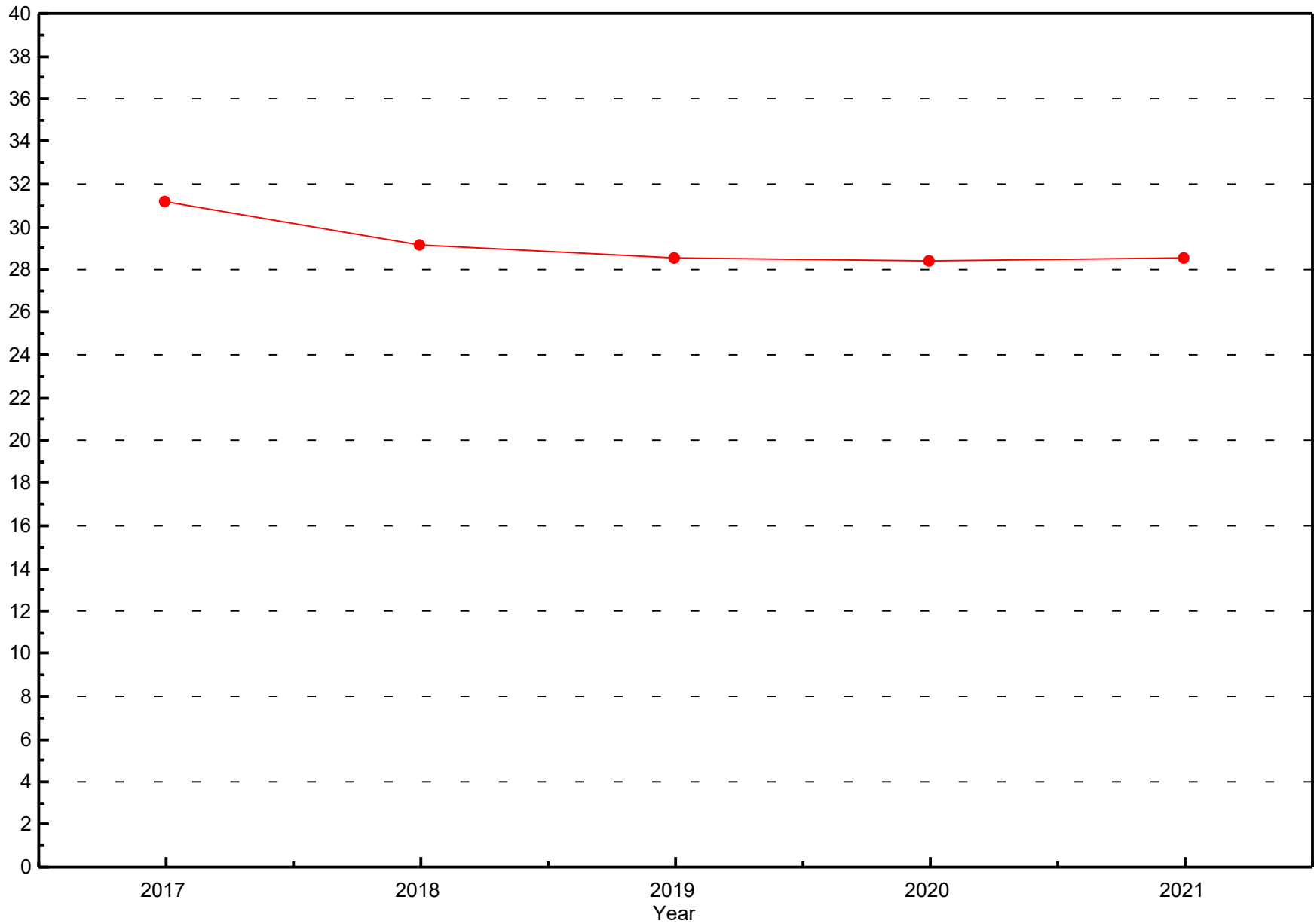
Ozone (O₃) - ppb
Stony Mountain (2017 to 2021)





Yearly Averages

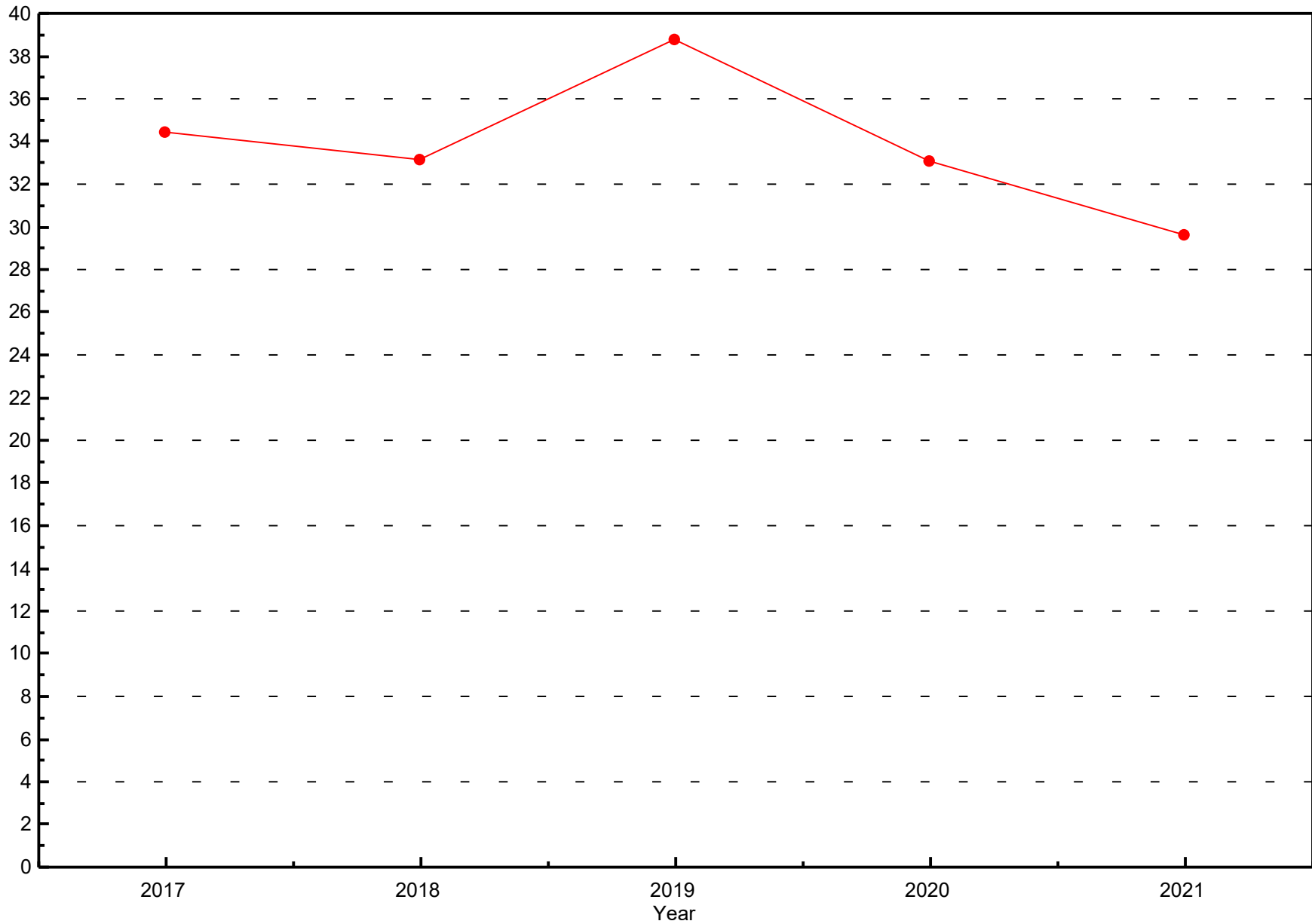
Ozone (O₃) - ppb
Conklin (2017 to 2021)





Yearly Averages

Ozone (O₃) - ppb
Janvier (2017 to 2021)





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

TOTAL HYDROCARBONS ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	
				1-Hour Value	24-Hour Value
January	100.0	707.0	2.3	4.0	2.7
February	100.0	639.0	2.2	3.6	2.8
March	99.9	707.0	2.1	3.6	2.4
April	99.7	682.0	2.0	2.8	2.3
May	99.3	704.0	2.0	2.5	2.1
June	99.7	685.0	2.0	3.0	2.5
July	94.2	667.0	2.1	3.7	2.6
August	99.2	703.0	2.2	4.3	2.5
September	99.9	685.0	2.2	4.7	2.8
October	95.8	674.0	2.1	3.4	2.5
November	99.6	682.0	2.2	4.2	2.9
December	99.9	708.0	2.3	3.7	2.7
Annual	98.9	8243.0	2.1	4.7	2.9



Wood Buffalo Environmental Association - Mildred Lake (AMS02)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100.0	709.0	2.3	4.7	3.2
February	99.4	634.0	2.2	4.8	2.8
March	98.9	700.0	2.2	4.4	3.0
April	100.0	686.0	2.1	7.7	2.7
May	100.0	710.0	2.1	4.5	2.2
June	100.0	685.0	2.1	5.7	2.4
July	100.0	709.0	2.1	4.5	2.4
August	94.8	671.0	2.2	4.3	2.7
September	98.8	677.0	2.2	7.1	2.7
October	98.1	696.0	2.1	4.1	2.3
November	100.0	683.0	2.2	4.5	2.9
December	100.0	709.0	2.3	4.8	2.7
Annual	99.2	8269.0	2.2	7.7	3.2



Wood Buffalo Environmental Association - Buffalo Viewpoint (AMS04)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100.0	710.0	2.2	5.0	2.5
February	96.6	618.0	2.1	3.4	2.5
March	100.0	710.0	2.1	7.2	3.0
April	99.4	682.0	2.1	3.0	2.2
May	99.9	708.0	2.1	3.6	2.2
June	99.2	680.0	2.1	2.6	2.3
July	100.0	710.0	2.1	3.0	2.3
August	95.4	677.0	2.1	4.0	2.7
September	99.7	684.0	2.1	2.9	2.3
October	99.9	708.0	2.1	3.5	2.3
November	99.9	686.0	2.1	3.6	2.5
December	100.0	710.0	2.2	3.8	2.5
Annual	99.2	8283.0	2.1	7.2	3.0



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Maximum		Maximum 24-Hour Value
			Mean Value	1-Hour Value	
January	98.9	701.0	2.1	7.3	2.8
February	99.4	636.0	2.2	8.0	3.0
March	99.2	702.0	2.1	5.7	2.8
April	86.9	592.0	2.0	5.1	2.6
May	95.8	679.0	2.0	3.8	2.2
June	80.0	548.0	2.1	4.0	2.3
July	43.3	305.0	2.0	3.3	2.3
August	27.6	192.0	2.1	3.1	2.3
September	100.0	686.0	2.2	5.1	3.1
October	98.0	696.0	2.2	7.4	2.9
November	91.9	630.0	2.2	5.6	2.6
December	99.7	707.0	2.2	5.3	3.0
Annual	84.9	7074.0	2.1	8.0	3.1



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Total Hydrocarbons_2 (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	92.5	654.0	2.3	8.0	3.2
February	85.3	544.0	2.3	8.9	3.4
March	98.0	696.0	2.1	7.1	3.0
April	86.3	591.0	2.2	6.6	2.9
May	100.0	709.0	2.3	4.7	2.6
June	96.0	657.0	2.3	5.1	2.5
July	97.9	693.0	2.3	4.7	2.8
August	95.2	674.0	2.3	6.8	2.7
September	100.0	686.0	2.4	5.7	3.3
October	98.0	696.0	2.3	7.9	3.0
November	94.3	451.0	2.4	5.9	2.9
Annual	94.8	7051.0	2.3	8.9	3.4



Wood Buffalo Environmental Association - Patricia McInnes (AMS06)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100.0	710.0	2.1	2.8	2.4
February	100.0	640.0	2.0	2.5	2.2
March	100.0	710.0	2.0	2.5	2.2
April	99.9	684.0	2.0	2.3	2.0
May	96.8	685.0	2.0	2.3	2.0
June	96.7	662.0	2.0	3.2	2.1
July	100.0	708.0	2.0	3.3	2.3
August	83.5	583.0	2.0	2.8	2.3
September	99.4	681.0	2.0	2.6	2.1
October	99.9	708.0	2.0	2.6	2.1
November	99.6	683.0	2.1	3.4	2.3
December	96.6	686.0	2.1	2.7	2.2
Annual	97.7	8140.0	2.0	3.4	2.4



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	
				1-Hour Value	24-Hour Value
January	99.5	705.0	2.0	3.4	2.5
February	99.7	638.0	1.9	2.4	2.1
March	99.6	705.0	1.9	2.6	2.2
April	97.8	671.0	1.8	2.4	1.9
May	96.2	678.0	1.9	2.3	2.0
June	98.8	677.0	2.1	3.1	2.2
July	95.2	674.0	2.1	2.8	2.4
August	91.5	649.0	2.1	2.9	2.3
September	98.5	675.0	2.1	4.2	2.4
October	99.5	705.0	2.2	3.2	2.4
November	100.0	687.0	2.1	3.8	2.6
December	100.0	707.0	2.2	3.0	2.3
Annual	98.0	8171.0	2.0	4.2	2.6



Wood Buffalo Environmental Association - Barge Landing (AMS09)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	99.5	702.0	2.2	4.9	2.7
February	89.1	567.0	2.1	3.5	2.6
March	99.2	701.0	2.1	3.5	2.5
April	99.0	678.0	2.1	2.8	2.2
May	97.9	694.0	2.0	2.7	2.1
June	99.2	679.0	2.1	2.9	2.2
July	99.6	706.0	2.1	3.0	2.3
August	76.8	537.0	2.2	3.2	2.4
September	99.4	683.0	2.3	4.4	3.0
October	98.1	695.0	2.2	3.8	2.6
November	100.0	686.0	2.3	4.8	2.9
December	99.7	707.0	2.3	3.3	2.6
Annual	96.5	8035.0	2.2	4.9	3.0



Wood Buffalo Environmental Association - Lower Camp (AMS11)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	92.7	657.0	2.4	4.4	2.9
February	99.7	638.0	2.3	5.5	2.8
March	99.6	706.0	2.3	4.2	2.8
April	90.1	614.0	2.1	4.8	2.3
May	90.6	639.0	2.0	3.3	2.1
June	75.4	513.0	2.1	3.3	2.4
July	55.8	391.0	2.0	3.0	2.3
August	50.5	342.0	2.0	2.9	2.2
September	99.9	685.0	2.2	3.9	2.4
October	100.0	709.0	2.2	3.5	2.5
November	99.4	682.0	2.2	3.4	2.5
December	89.0	631.0	2.3	3.5	2.6
Annual	86.8	7207.0	2.2	5.5	2.9



Wood Buffalo Environmental Association - Fort McKay South (AMS13)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100.0	708.0	2.3	4.2	2.9
February	100.0	638.0	2.2	3.9	2.8
March	99.9	707.0	2.2	3.7	2.5
April	100.0	683.0	2.1	3.0	2.4
May	99.2	702.0	2.0	3.4	2.1
June	99.9	683.0	2.1	3.0	2.4
July	99.6	703.0	2.2	3.2	2.6
August	99.7	706.0	2.2	3.6	2.4
September	99.6	681.0	2.2	3.2	2.4
October	99.9	709.0	2.1	3.0	2.4
November	79.2	537.0	2.3	5.7	3.1
December	99.6	707.0	2.3	3.7	2.8
Annual	98.1	8164.0	2.2	5.7	3.1



Wood Buffalo Environmental Association - Anzac (AMS14)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	98.8	699.0	2.1	3.9	2.4
February	99.4	636.0	2.1	2.4	2.2
March	99.6	705.0	2.0	2.5	2.1
April	96.3	659.0	2.0	2.3	2.0
May	99.9	709.0	2.0	2.3	2.0
June	99.9	683.0	2.0	2.3	2.1
July	99.7	707.0	2.0	2.5	2.2
August	98.5	698.0	2.0	2.4	2.1
September	98.1	673.0	2.0	2.3	2.1
October	98.5	698.0	2.1	2.3	2.2
November	99.4	682.0	2.0	2.4	2.2
December	99.2	703.0	2.0	2.5	2.2
Annual	98.9	8252.0	2.0	3.9	2.4



Wood Buffalo Environmental Association - Wapasu (AMS17)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100.0	707.0	2.2	3.1	2.4
February	100.0	641.0	2.1	2.6	2.3
March	98.3	696.0	2.1	2.7	2.3
April	99.9	685.0	2.2	2.5	2.3
May	97.0	688.0	2.2	2.5	2.3
June	100.0	687.0	2.2	2.7	2.3
July	100.0	710.0	2.2	2.8	2.4
August	99.9	709.0	2.3	2.9	2.4
September	83.9	573.0	2.2	2.9	2.4
October	100.0	710.0	2.2	2.9	2.3
November	99.9	682.0	2.2	3.0	2.4
December	100.0	709.0	2.3	2.8	2.5
Annual	98.2	8197.0	2.2	3.1	2.5



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100.0	707.0	2.0	2.3	2.2
February	100.0	638.0	2.0	2.2	2.1
March	99.7	705.0	2.0	2.1	2.0
April	100.0	683.0	1.9	2.0	2.0
May	95.8	679.0	2.0	2.0	2.0
June	80.7	553.0	2.0	2.1	2.0
July	94.0	663.0	2.0	2.2	2.1
August	99.1	701.0	1.9	2.1	2.0
September	98.1	669.0	2.0	2.1	2.0
October	100.0	707.0	1.9	2.1	2.0
November	99.6	682.0	2.0	2.2	2.1
December	77.2	544.0	2.0	2.2	2.1
Annual	95.3	7931.0	2.0	2.3	2.2



Wood Buffalo Environmental Association - Firebag (AMS19)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100.0	708.0	2.2	3.0	2.3
February	100.0	639.0	2.2	2.7	2.4
March	99.6	705.0	2.2	2.5	2.2
April	100.0	685.0	2.2	2.5	2.3
May	99.6	704.0	2.1	2.5	2.2
June	99.3	682.0	2.2	3.1	2.3
July	99.6	707.0	2.2	3.0	2.3
August	95.8	680.0	2.2	3.5	2.4
September	98.1	674.0	2.2	2.7	2.3
October	99.9	708.0	2.2	2.7	2.3
November	100.0	687.0	2.2	2.7	2.3
December	100.0	709.0	2.2	2.6	2.4
Annual	99.3	8288.0	2.2	3.5	2.4



Wood Buffalo Environmental Association - Mackay River (AMS20)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	99.7	706.0	2.2	2.9	2.5
February	100.0	640.0	2.3	2.9	2.5
March	99.9	708.0	2.2	2.7	2.4
April	100.0	685.0	2.1	2.5	2.2
May	99.7	707.0	2.2	2.7	2.3
June	100.0	686.0	2.2	2.7	2.3
July	100.0	709.0	2.2	3.1	2.4
August	99.7	707.0	2.2	3.3	2.5
September	100.0	686.0	2.2	3.0	2.3
October	99.9	708.0	2.2	2.9	2.4
November	99.7	683.0	2.3	3.5	2.5
December	100.0	709.0	2.4	2.9	2.6
Annual	99.9	8334.0	2.2	3.5	2.6



Wood Buffalo Environmental Association - Conklin (AMS21)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100.0	709.0	2.1	2.5	2.3
February	100.0	639.0	2.1	2.4	2.3
March	100.0	709.0	2.0	2.4	2.1
April	98.8	677.0	2.0	2.4	2.0
May	99.9	709.0	2.0	2.5	2.1
June	99.9	686.0	2.0	3.2	2.3
July	100.0	701.0	2.1	3.3	2.3
August	99.9	702.0	2.0	3.1	2.4
September	98.1	674.0	2.1	2.8	2.2
October	89.1	629.0	2.1	2.4	2.2
November	100.0	687.0	2.1	2.3	2.2
December	100.0	710.0	2.1	2.2	2.2
Annual	98.8	8232.0	2.1	3.3	2.4



Wood Buffalo Environmental Association - Janvier (AMS22)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Maximum		Maximum 24-Hour Value
			Mean Value	1-Hour Value	
January	98.8	700.0	2.0	2.3	2.1
February	98.1	626.0	2.0	2.2	2.1
March	99.6	706.0	1.9	2.4	2.0
April	99.0	679.0	1.9	2.1	1.9
May	90.3	637.0	1.9	2.1	2.0
June	91.3	623.0	2.0	2.5	2.2
July	99.3	704.0	2.0	2.4	2.2
August	98.5	697.0	2.0	2.6	2.1
September	93.3	640.0	2.0	2.2	2.0
October	99.7	707.0	2.0	2.3	2.0
November	99.7	683.0	2.0	3.0	2.1
December	99.6	706.0	2.0	2.6	2.1
Annual	97.3	8108.0	2.0	3.0	2.2



Wood Buffalo Environmental Association - Fort Hills (AMS23)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	96.4	682.0	2.3	5.9	3.0
February	100.0	639.0	2.2	5.3	2.7
March	99.7	705.0	2.1	9.6	2.9
April	98.8	675.0	2.1	5.8	2.6
May	99.9	708.0	2.1	5.2	2.5
June	99.9	686.0	2.2	6.9	2.5
July	99.9	708.0	2.1	5.2	2.4
August	99.9	708.0	2.1	5.2	2.6
September	100.0	686.0	2.2	5.6	2.6
October	100.0	709.0	2.1	4.9	2.4
November	99.4	682.0	2.2	5.9	2.7
December	93.3	659.0	2.3	5.7	3.5
Annual	98.9	8247.0	2.2	9.6	3.5



Wood Buffalo Environmental Association - Surmont 2 (AMS29)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100.0	707.0	2.1	2.8	2.6
February	98.7	629.0	2.2	2.9	2.5
March	97.6	692.0	2.1	2.5	2.2
April	99.4	681.0	2.0	2.3	2.1
May	95.6	673.0	2.2	2.6	2.4
June	99.9	686.0	2.3	2.5	2.4
July	100.0	708.0	2.3	3.0	2.4
August	99.9	709.0	2.3	2.7	2.4
September	100.0	686.0	2.3	2.6	2.4
October	99.7	706.0	2.3	2.7	2.4
November	99.7	684.0	2.3	2.5	2.4
December	100.0	709.0	2.3	2.6	2.4
Annual	99.2	8270.0	2.2	3.0	2.6



Wood Buffalo Environmental Association - Ells River (AMS30)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100.0	707.0	2.1	3.9	2.6
February	94.9	605.0	2.2	3.4	2.7
March	98.1	695.0	2.1	4.9	2.9
April	99.9	685.0	2.0	2.6	2.2
May	99.2	701.0	2.0	2.8	2.1
June	100.0	687.0	2.1	3.7	2.6
July	99.7	707.0	2.1	3.9	2.5
August	97.2	688.0	2.1	3.6	2.4
September	100.0	687.0	2.1	3.8	2.3
October	99.9	708.0	2.0	5.6	2.5
November	100.0	687.0	2.1	6.7	2.9
December	100.0	709.0	2.2	4.1	2.7
Annual	99.1	8266.0	2.1	6.7	2.9



Wood Buffalo Environmental Association - Kirby South (AMS507)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
September	99.4	649.0	2.3	4.0	2.6
October	100.0	707.0	2.3	4.1	2.5
November	100.0	683.0	2.3	2.8	2.5
December	92.2	649.0	2.4	4.8	2.9
Annual	97.9	2688.0	2.3	4.8	2.9



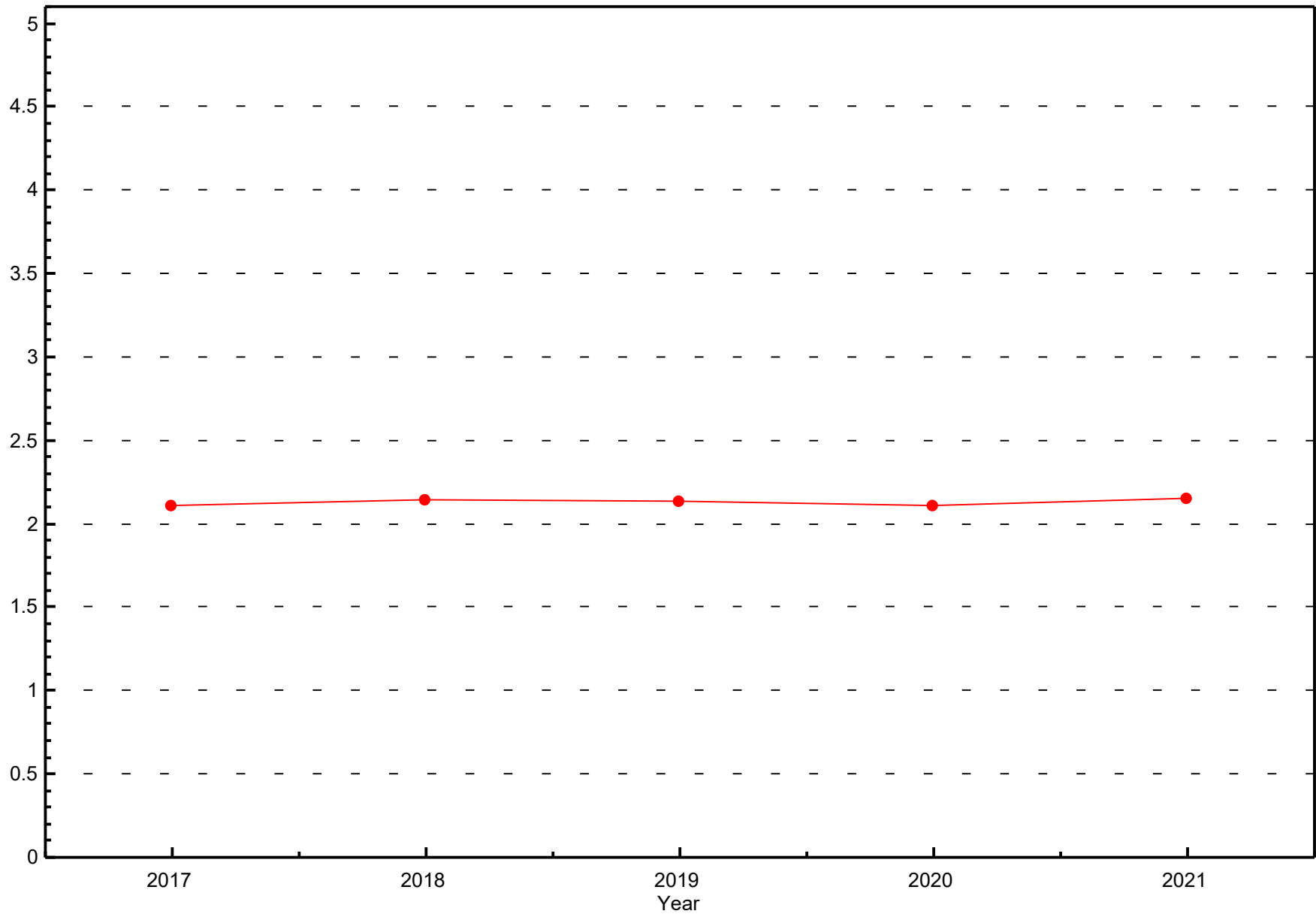
Wood Buffalo Environmental Association - Kirby North (AMS508)
Annual Summary for the Year 2021
Total Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	93.4	659.0	2.3	2.8	2.6
February	99.1	632.0	2.3	3.4	2.8
March	100.0	705.0	2.2	2.7	2.4
April	82.9	567.0	2.2	2.5	2.3
May	99.9	706.0	2.2	2.6	2.2
June	100.0	654.0	2.2	2.8	2.3
Annual	95.9	3923.0	2.2	3.4	2.8



Yearly Averages

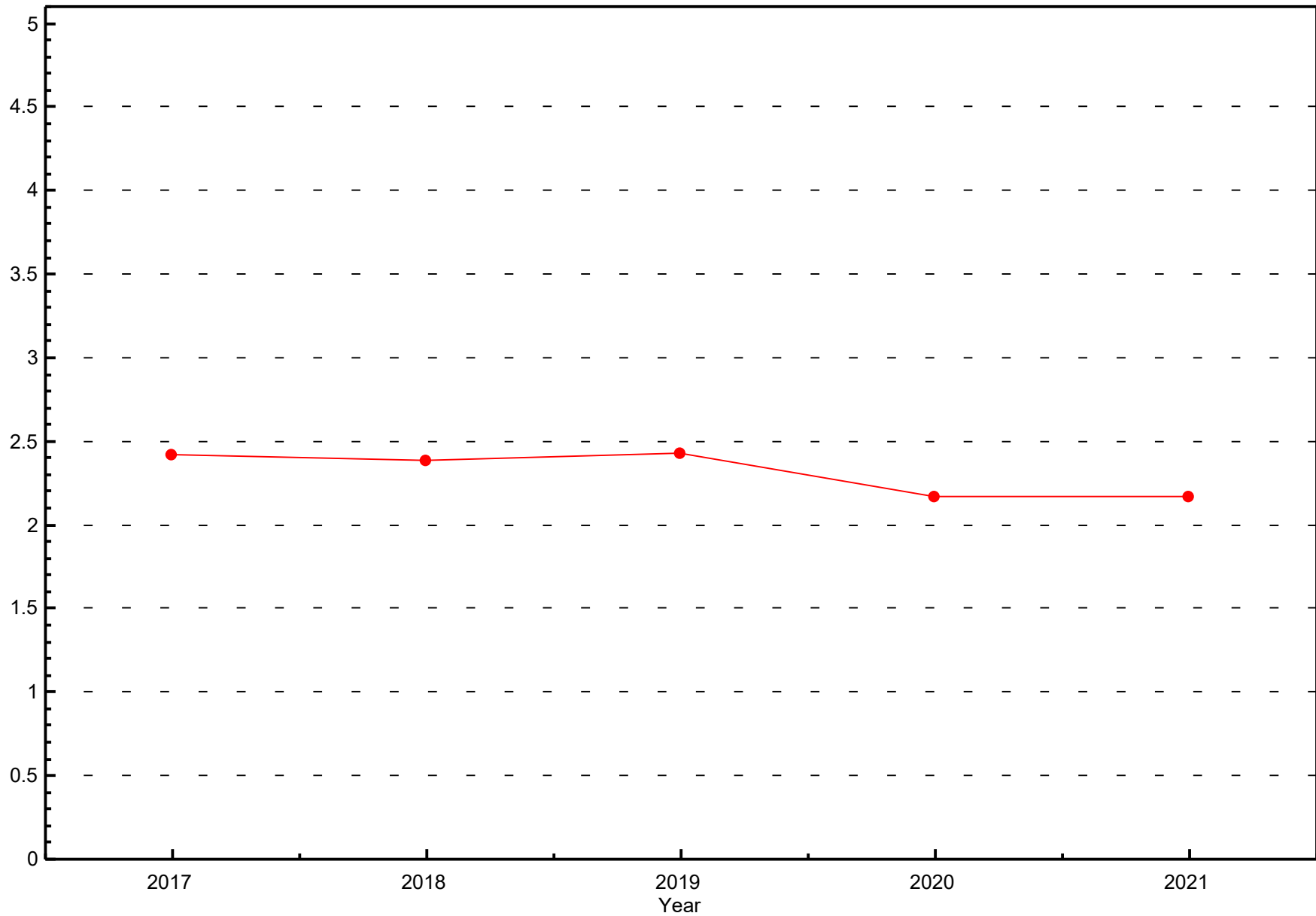
Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter (2017 to 2021)





Yearly Averages

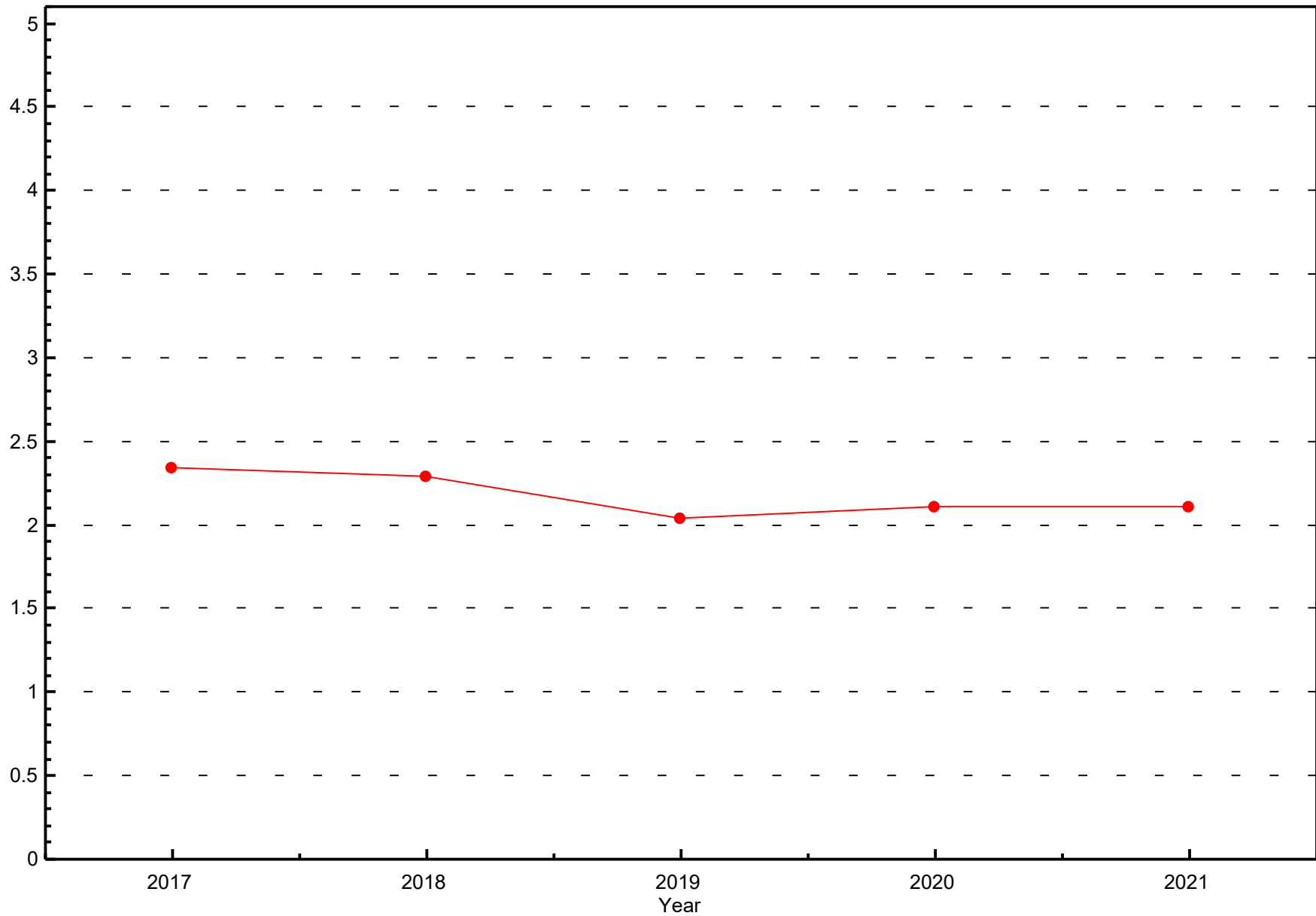
Total Hydrocarbons (THC) - ppm
Mildred Lake (2017 to 2021)





Yearly Averages

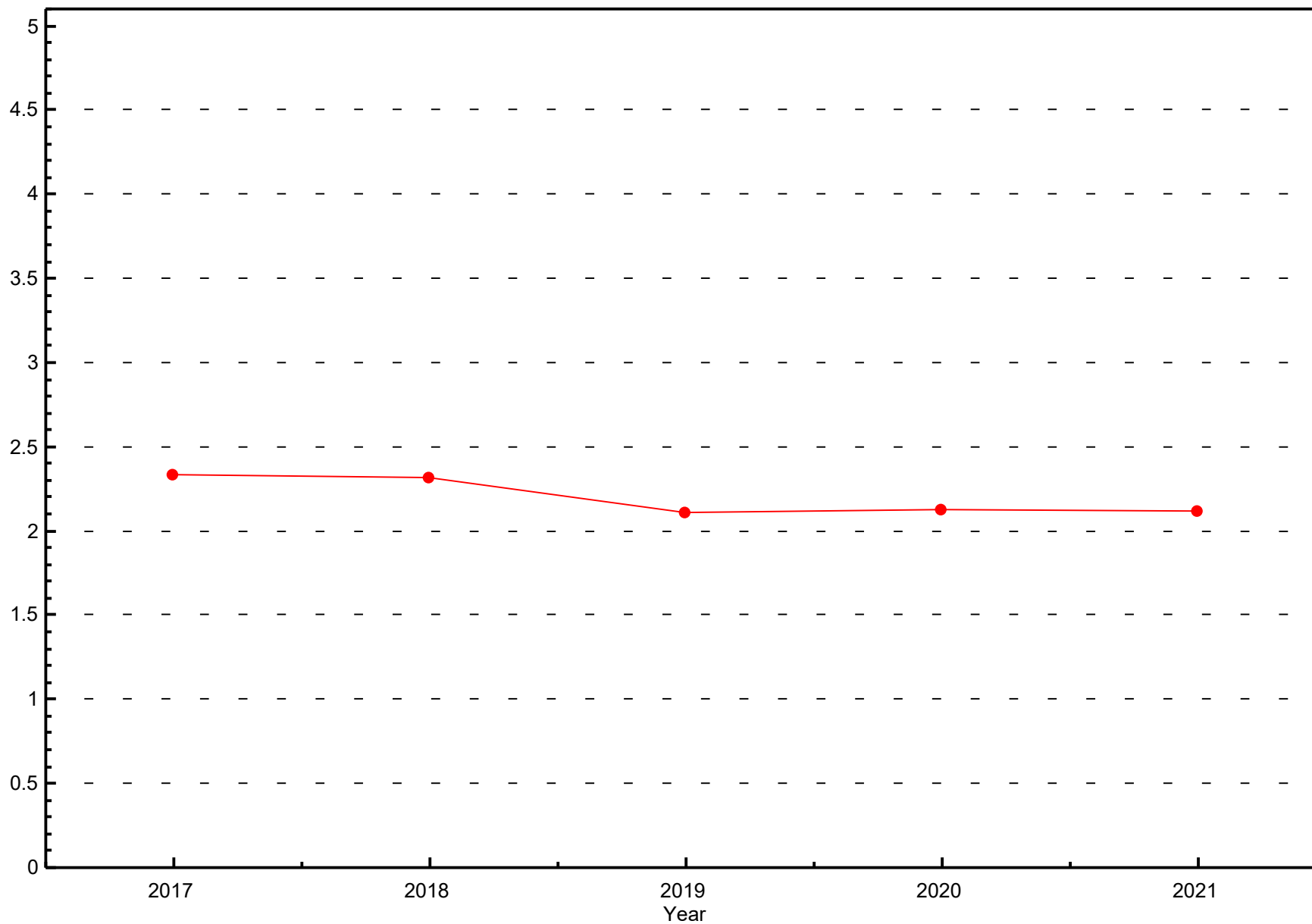
Total Hydrocarbons (THC) - ppm
Buffalo Viewpoint (2017 to 2021)





Yearly Averages

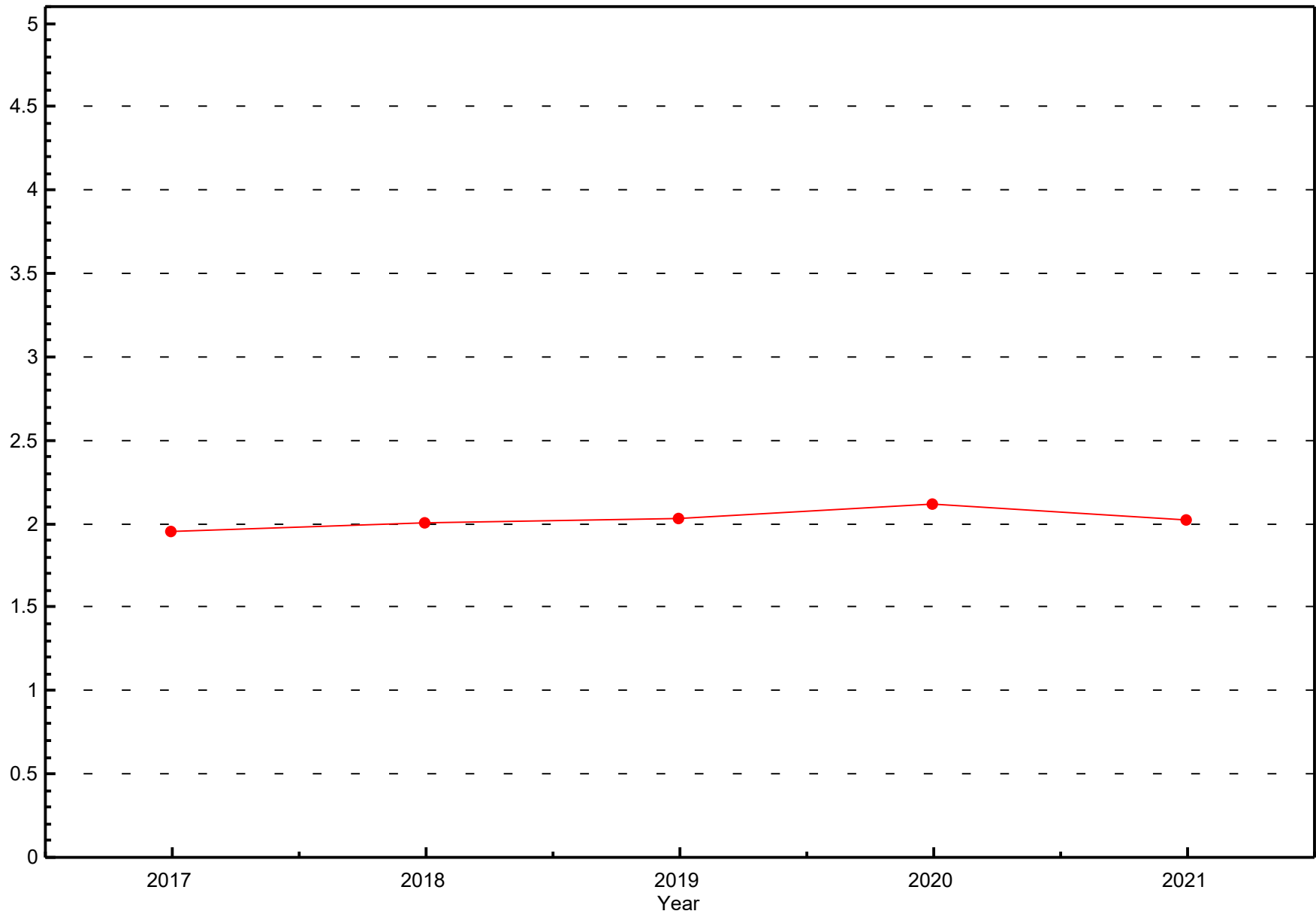
Total Hydrocarbons (THC) - ppm
Mannix (2017 to 2021)





Yearly Averages

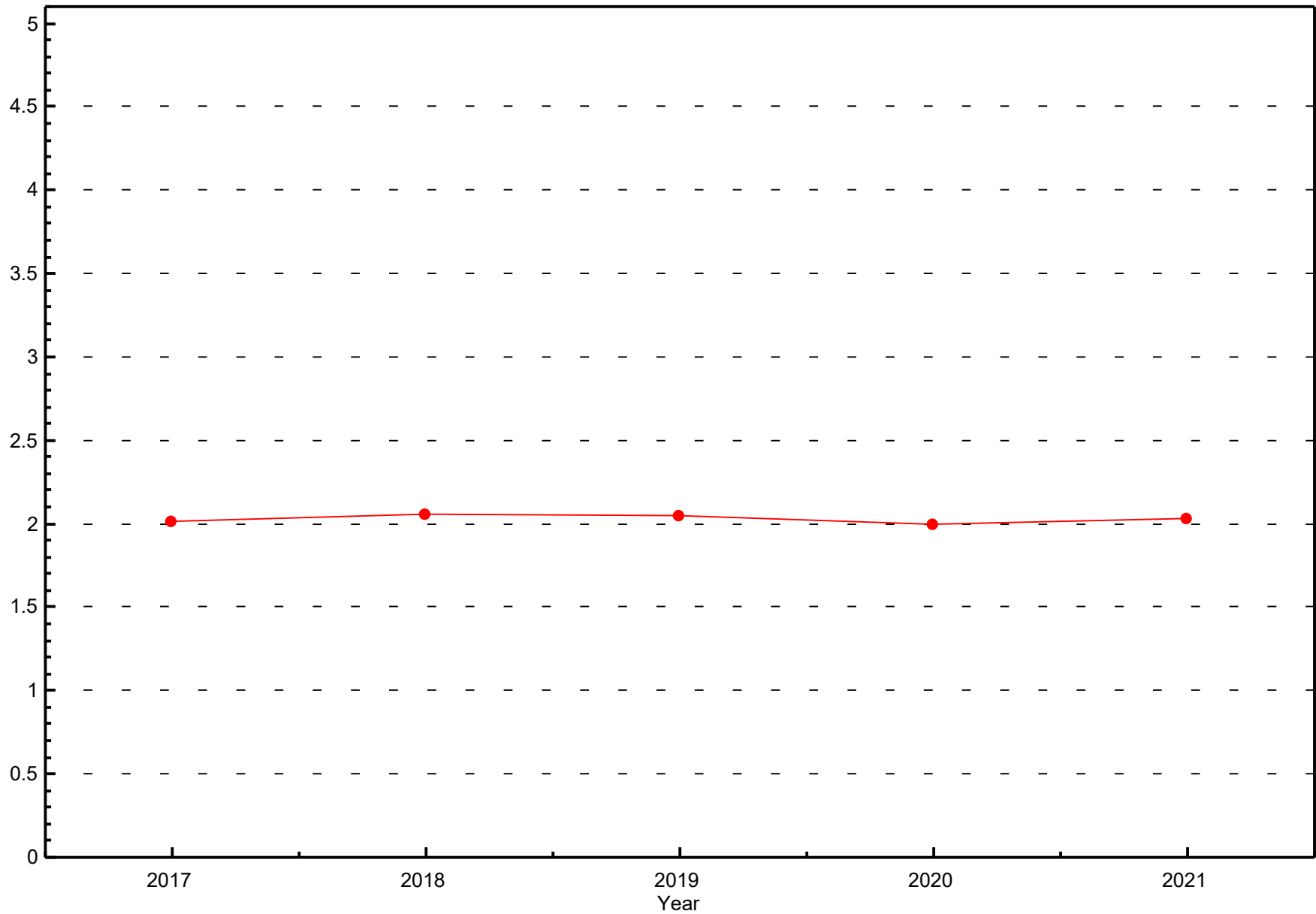
Total Hydrocarbons (THC) - ppm
Patricia McInnes (2017 to 2021)





Yearly Averages

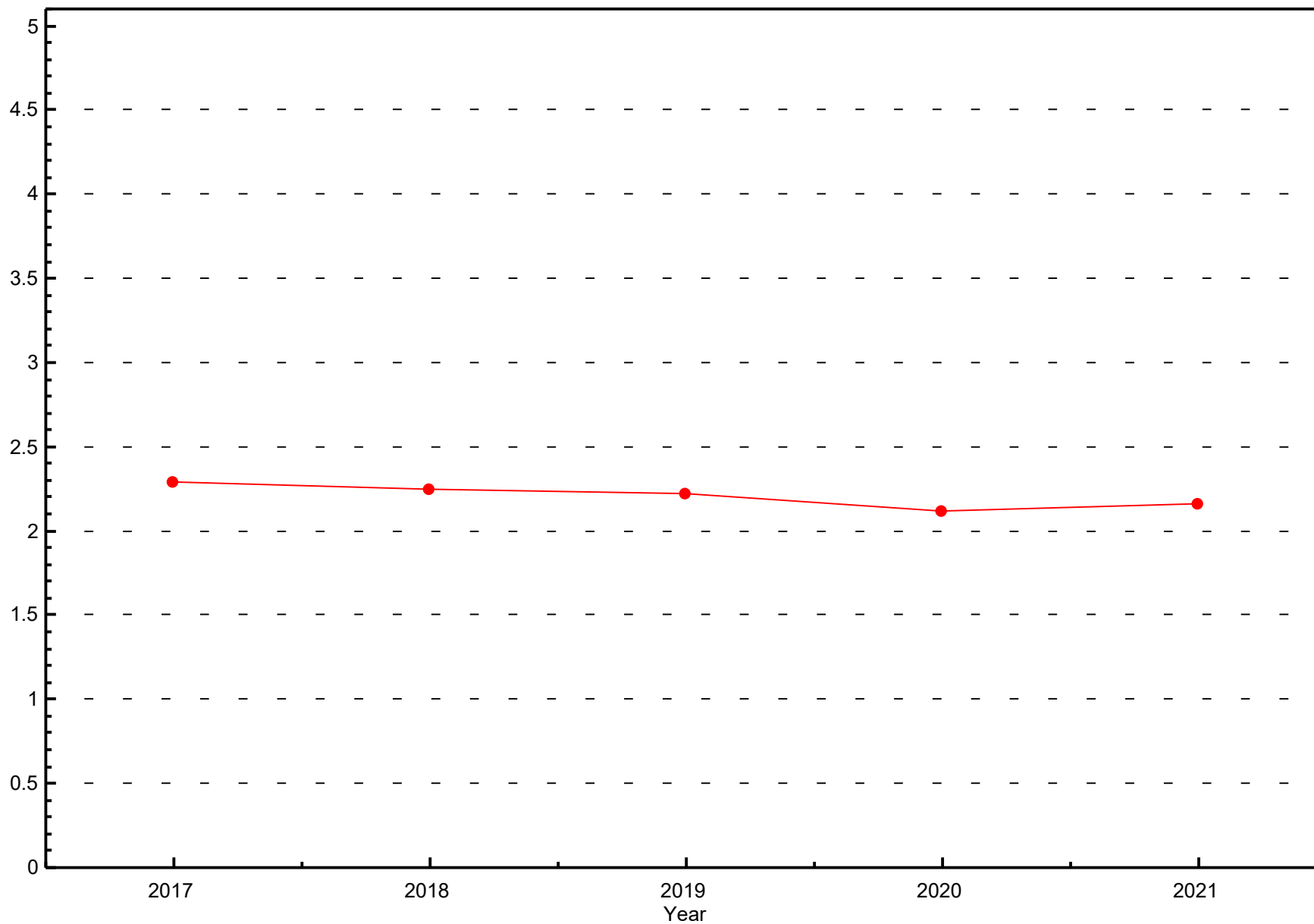
Total Hydrocarbons (THC) - ppm
Athabasca Valley (2017 to 2021)





Yearly Averages

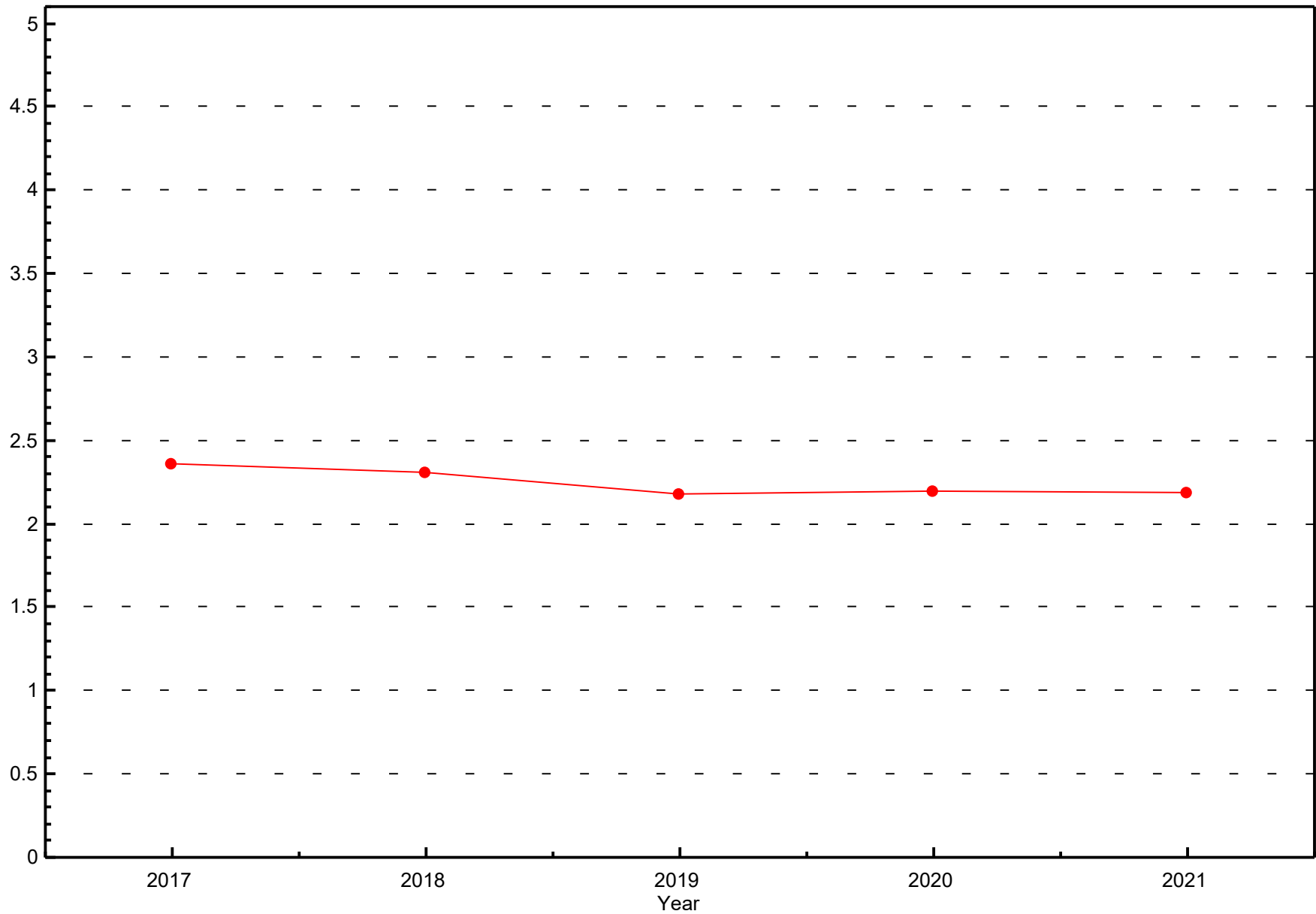
Total Hydrocarbons (THC) - ppm Barge Landing (2017 to 2021)





Yearly Averages

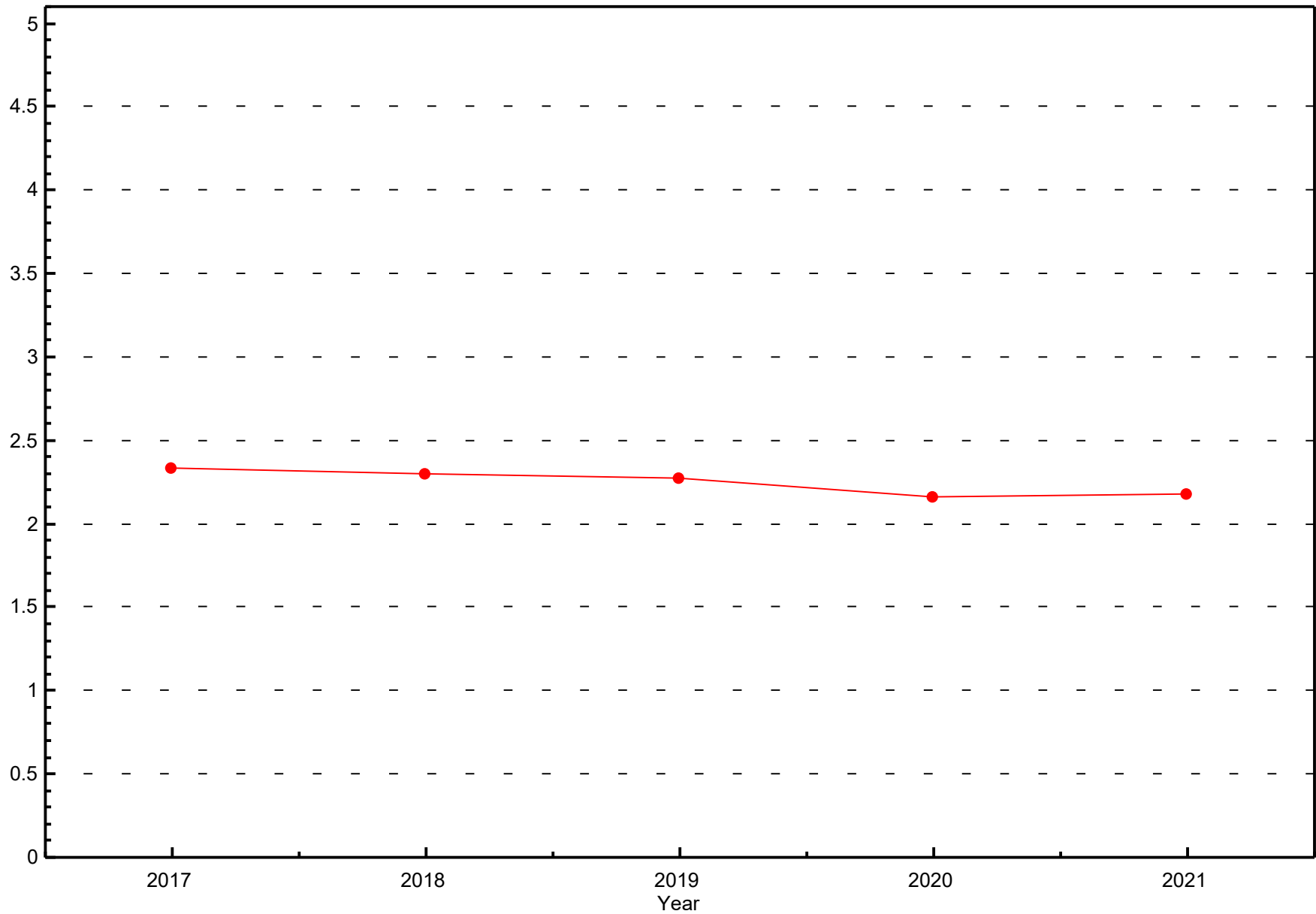
Total Hydrocarbons (THC) - ppm
Lower Camp (2017 to 2021)





Yearly Averages

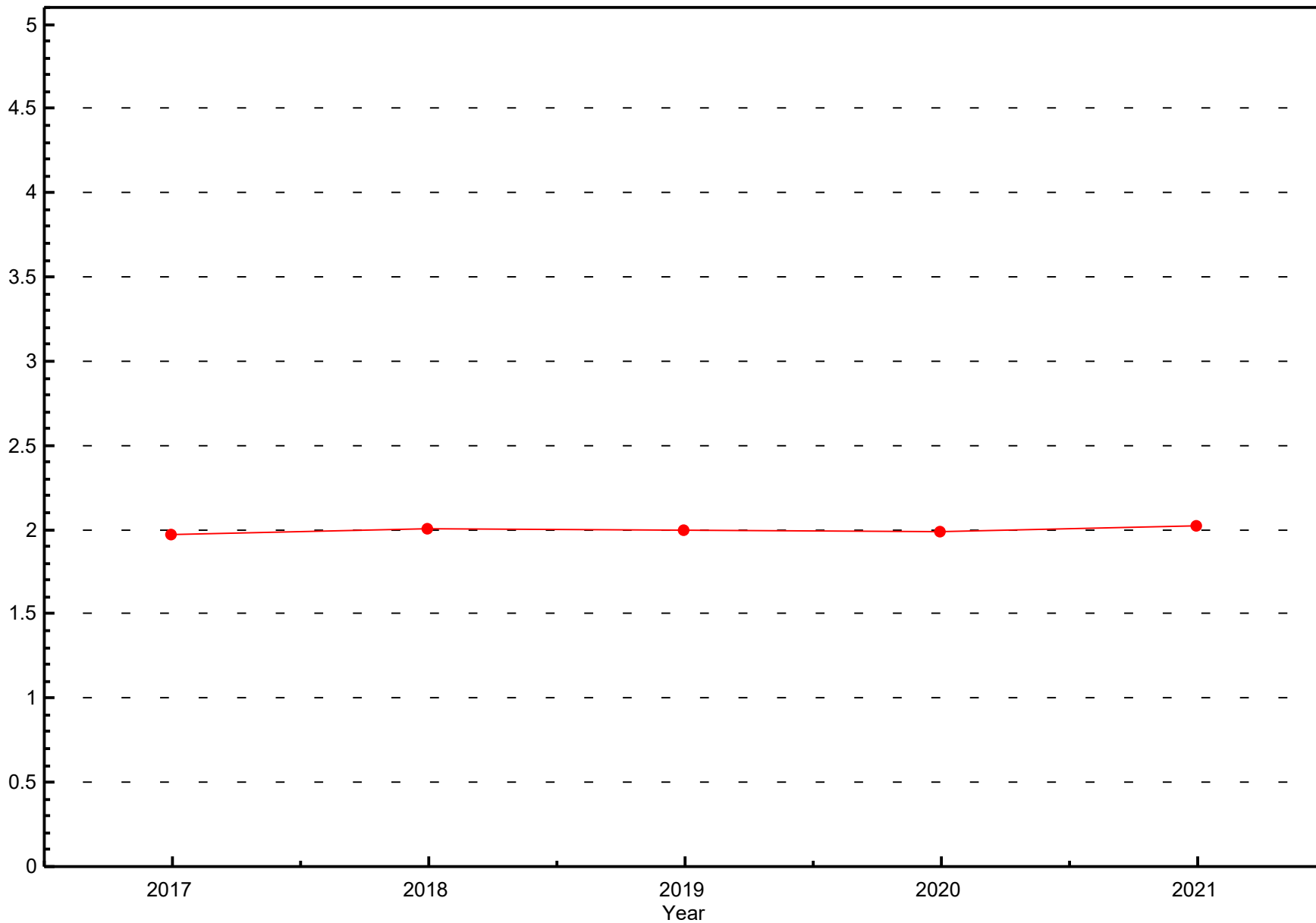
Total Hydrocarbons (THC) - ppm
Fort McKay South (2017 to 2021)





Yearly Averages

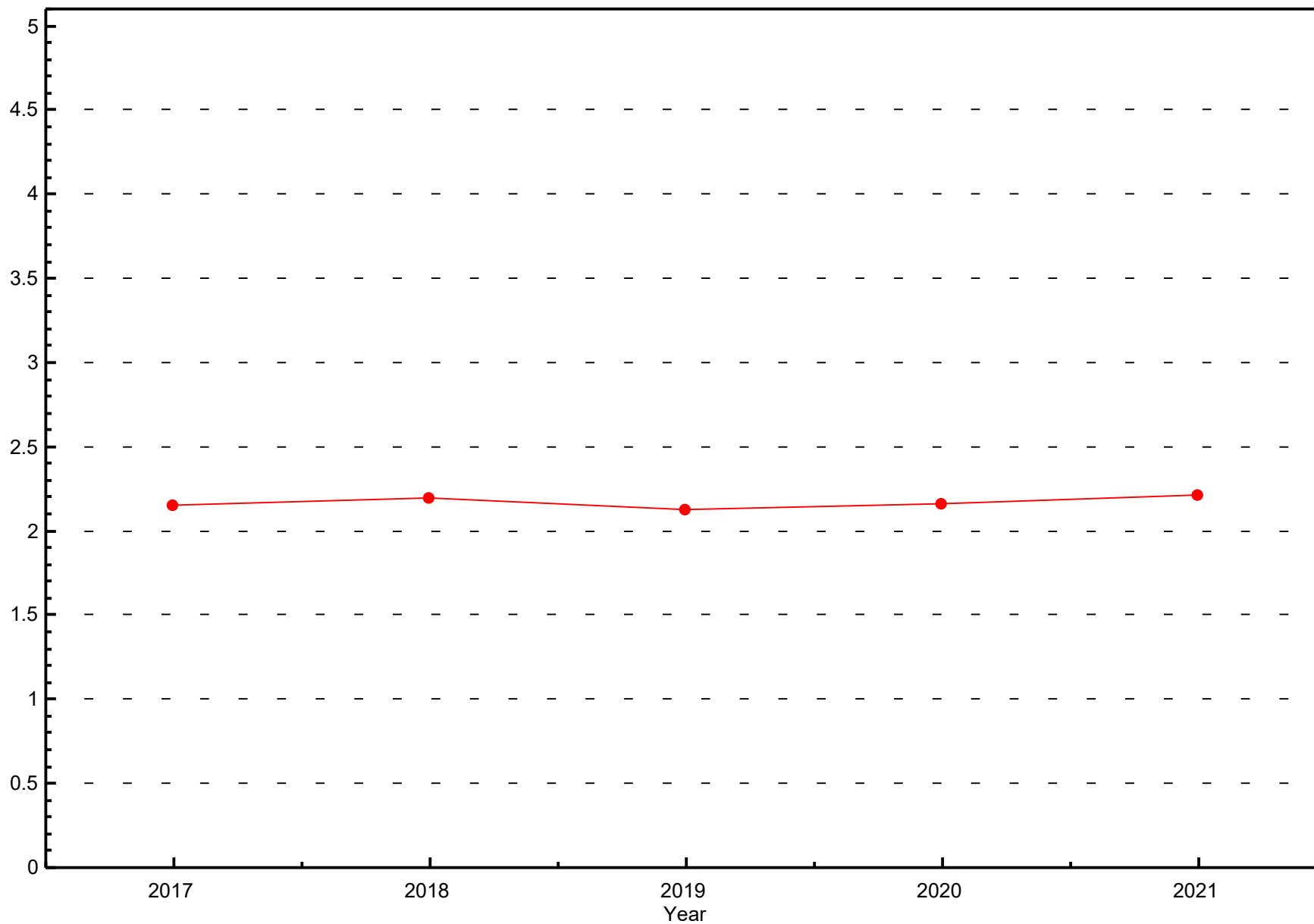
Total Hydrocarbons (THC) - ppm Anzac (2017 to 2021)





Yearly Averages

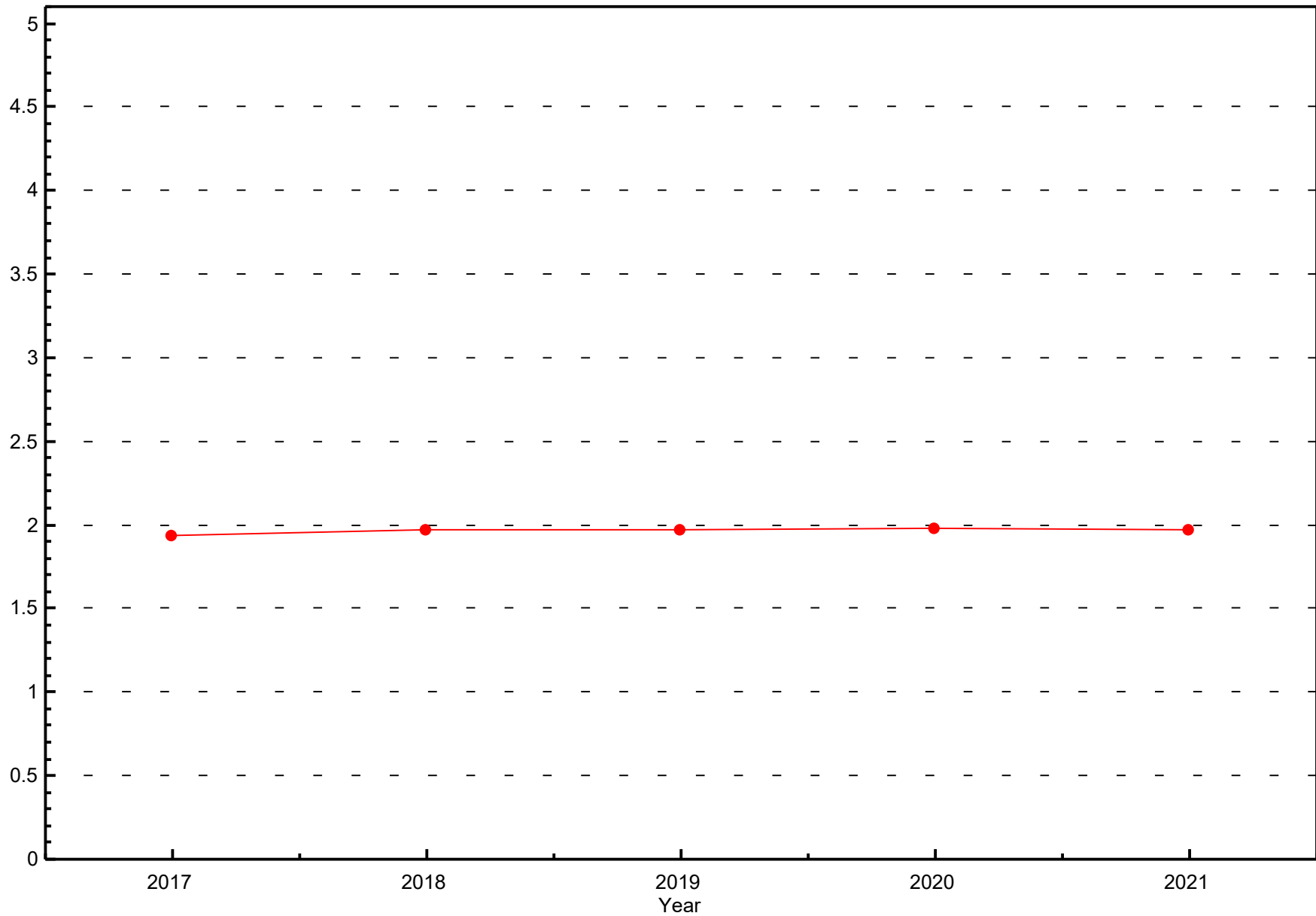
Total Hydrocarbons (THC) - ppm Wapasu (2017 to 2021)





Yearly Averages

Total Hydrocarbons (THC) - ppm
Stony Mountain (2017 to 2021)

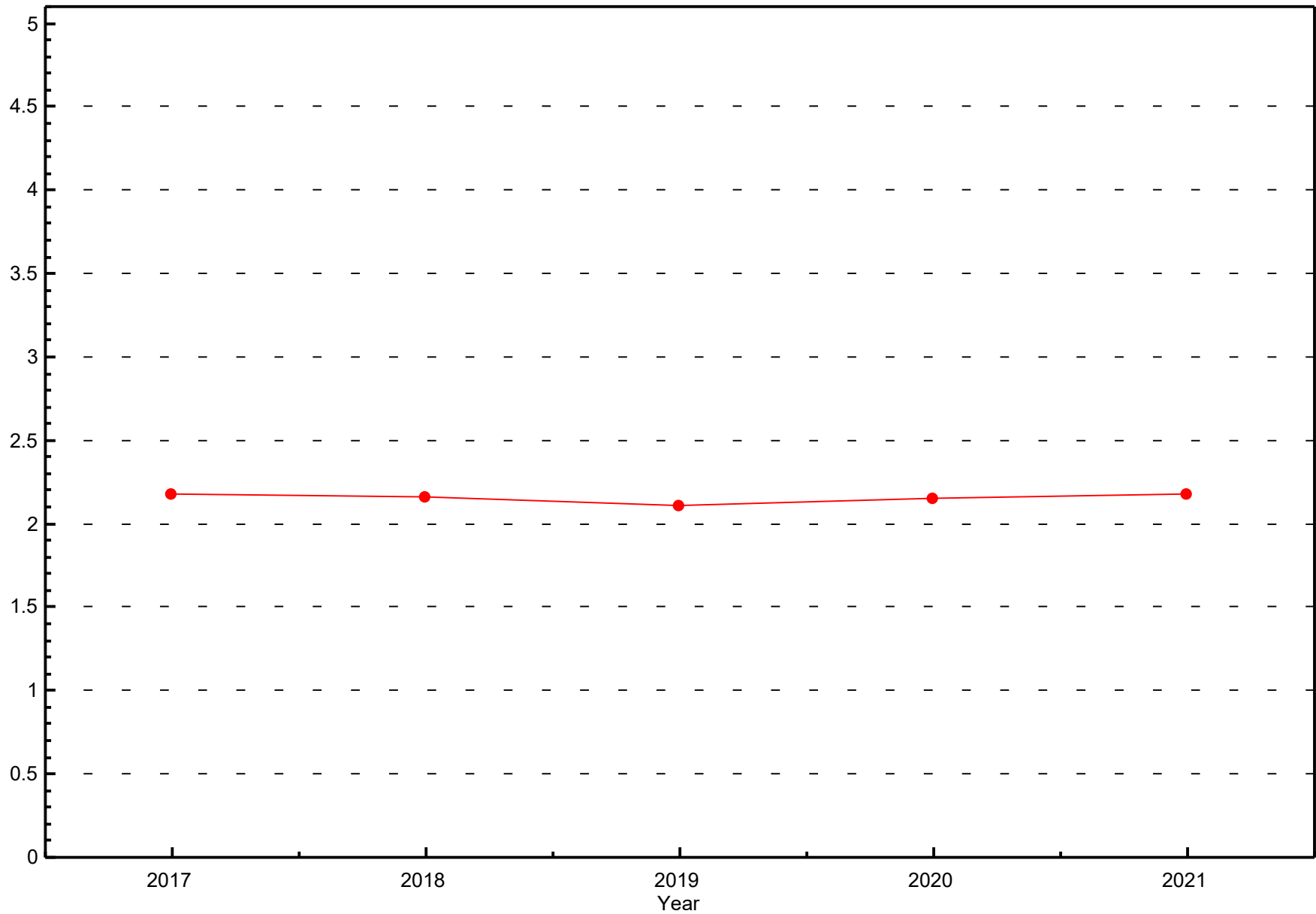




Yearly Averages

Total Hydrocarbons (THC) - ppm

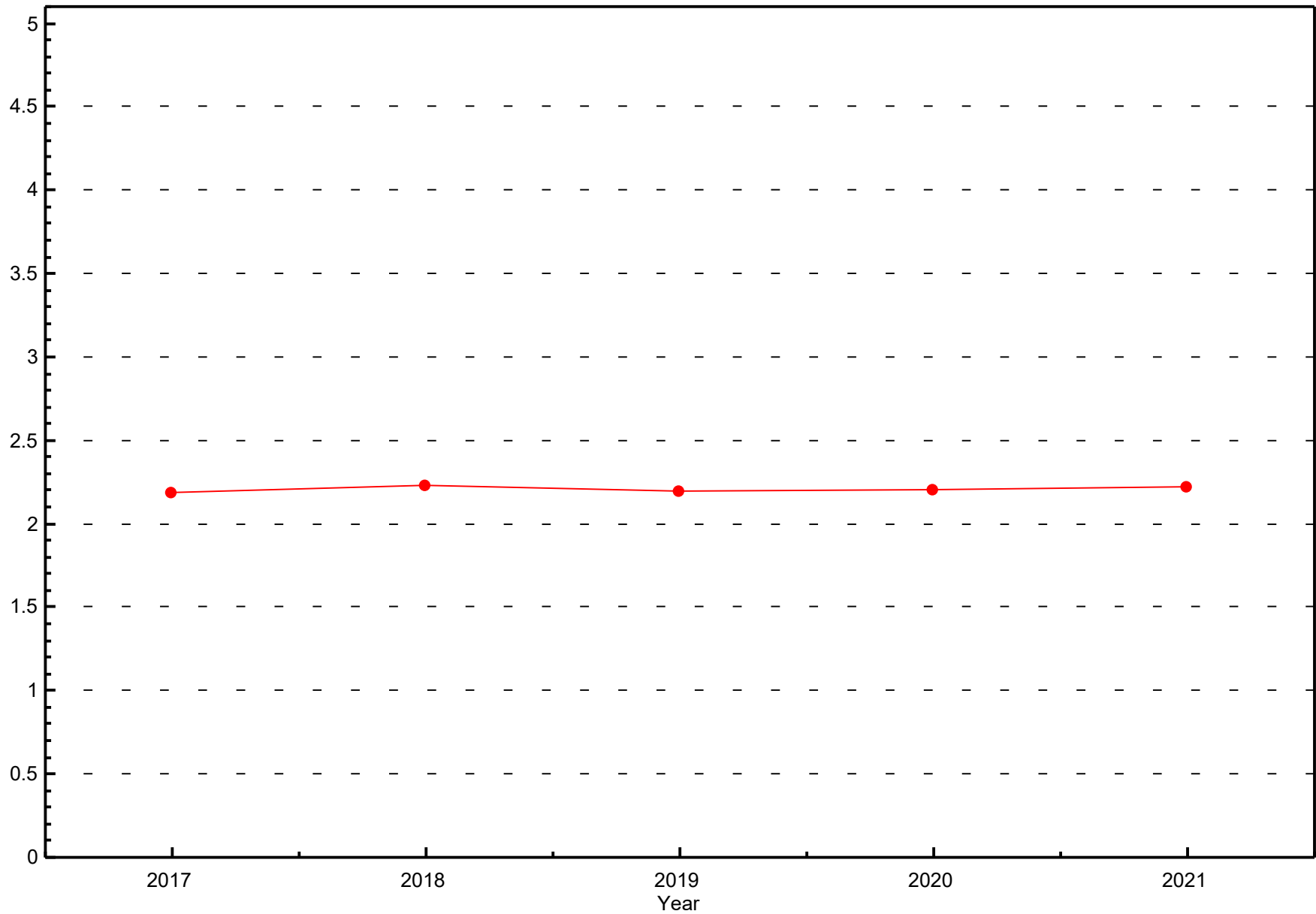
Firebag (2017 to 2021)





Yearly Averages

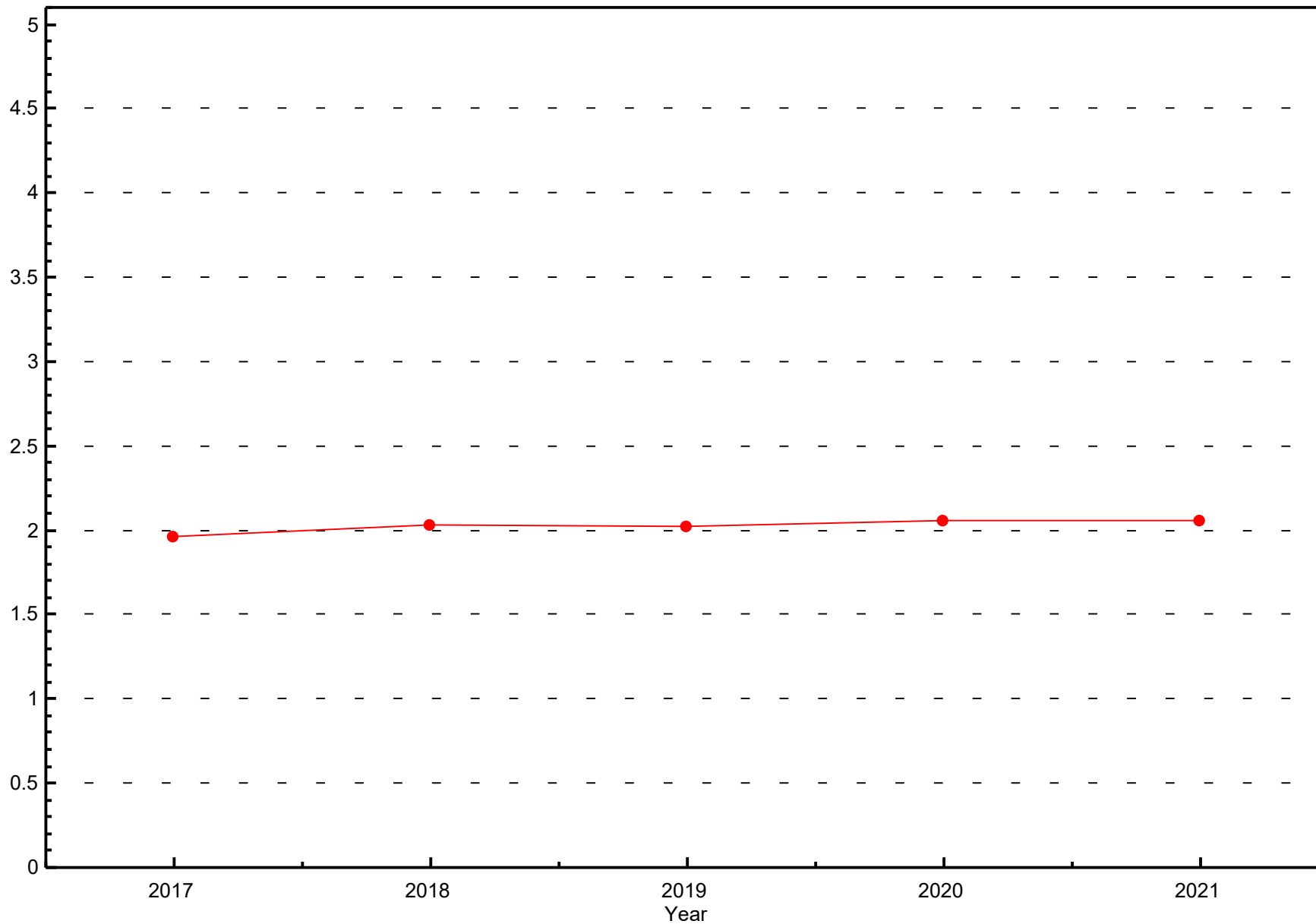
Total Hydrocarbons (THC) - ppm
Mackay River (2017 to 2021)





Yearly Averages

Total Hydrocarbons (THC) - ppm
Conklin (2017 to 2021)

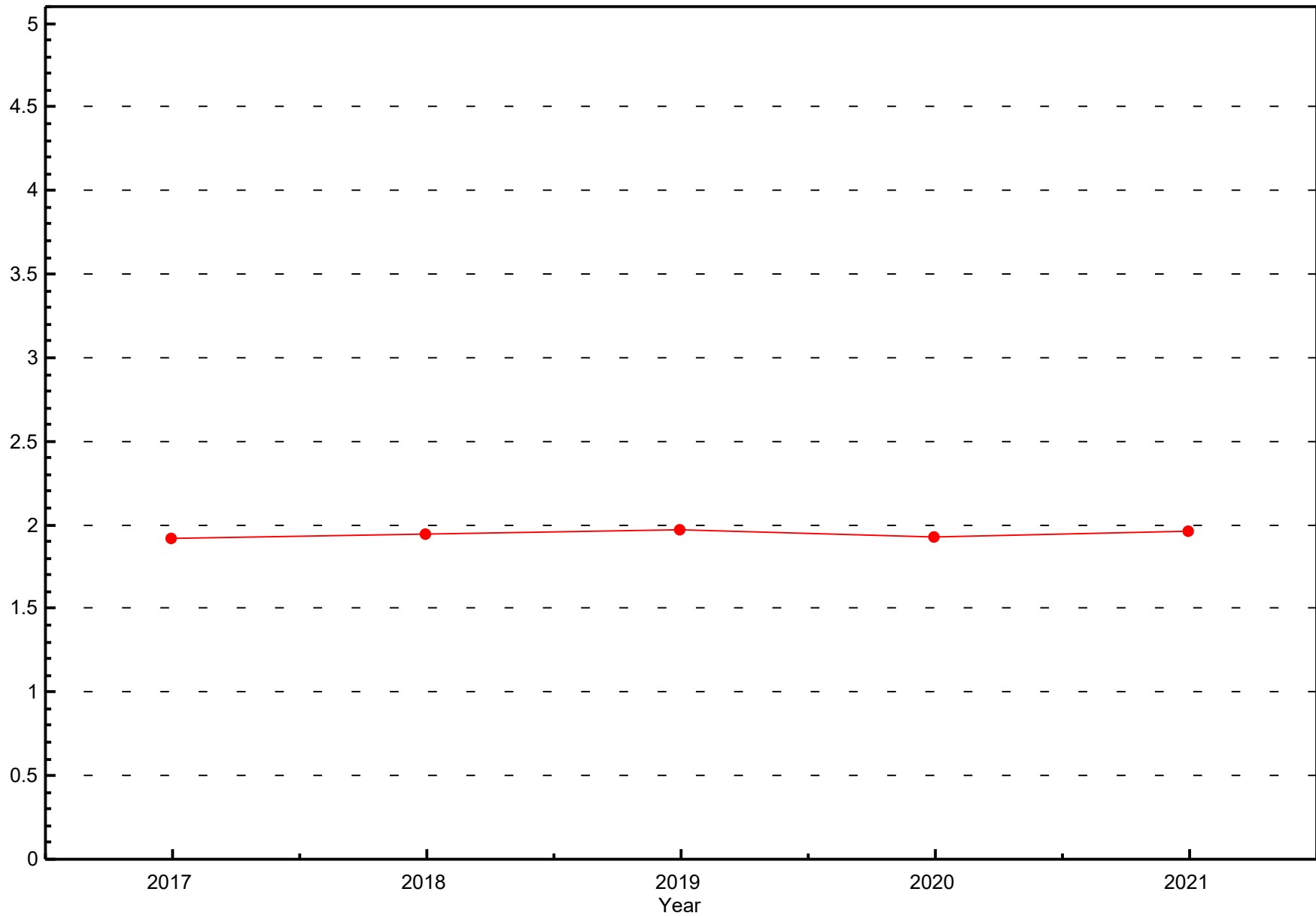




Yearly Averages

Total Hydrocarbons (THC) - ppm

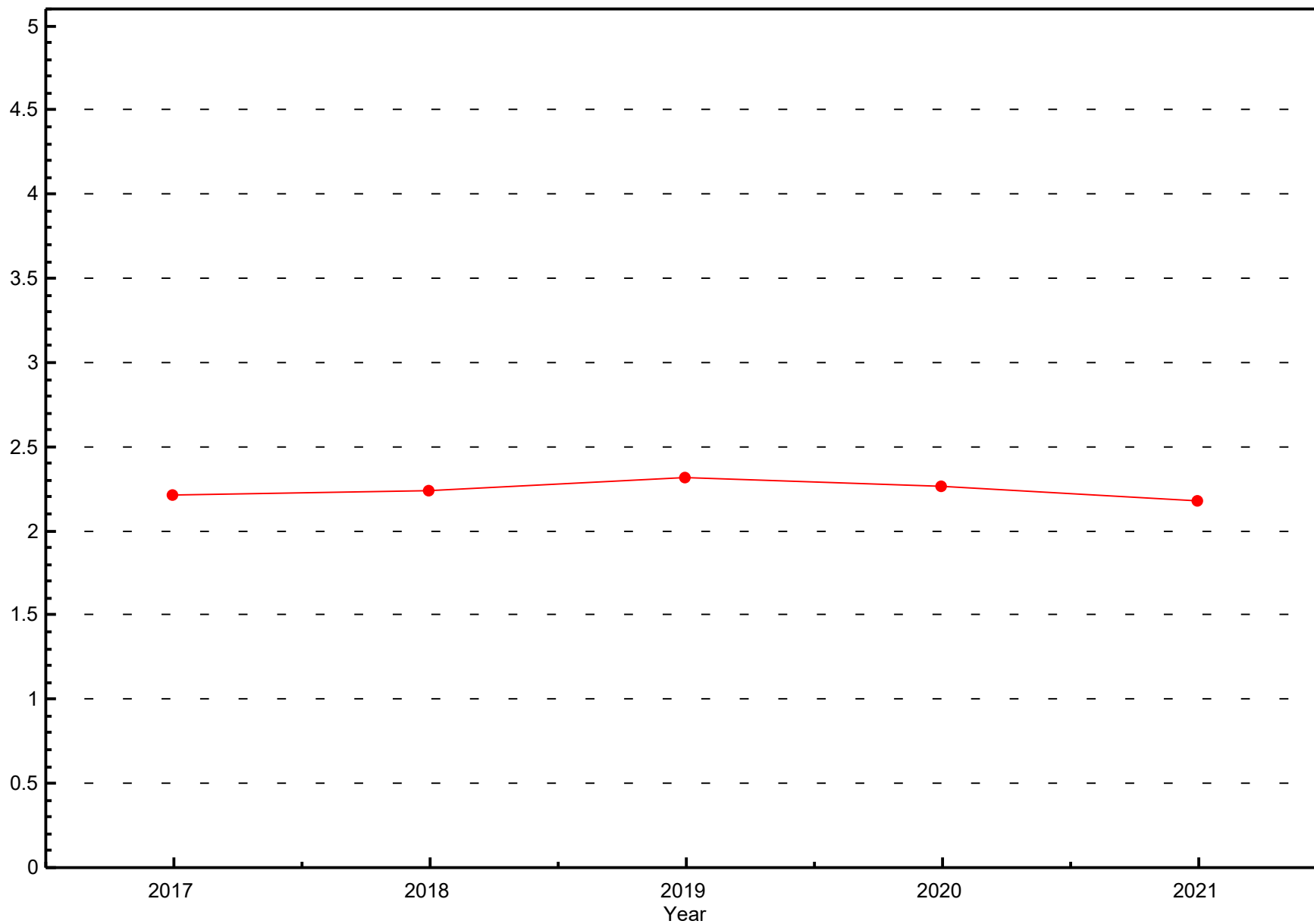
Janvier (2017 to 2021)





Yearly Averages

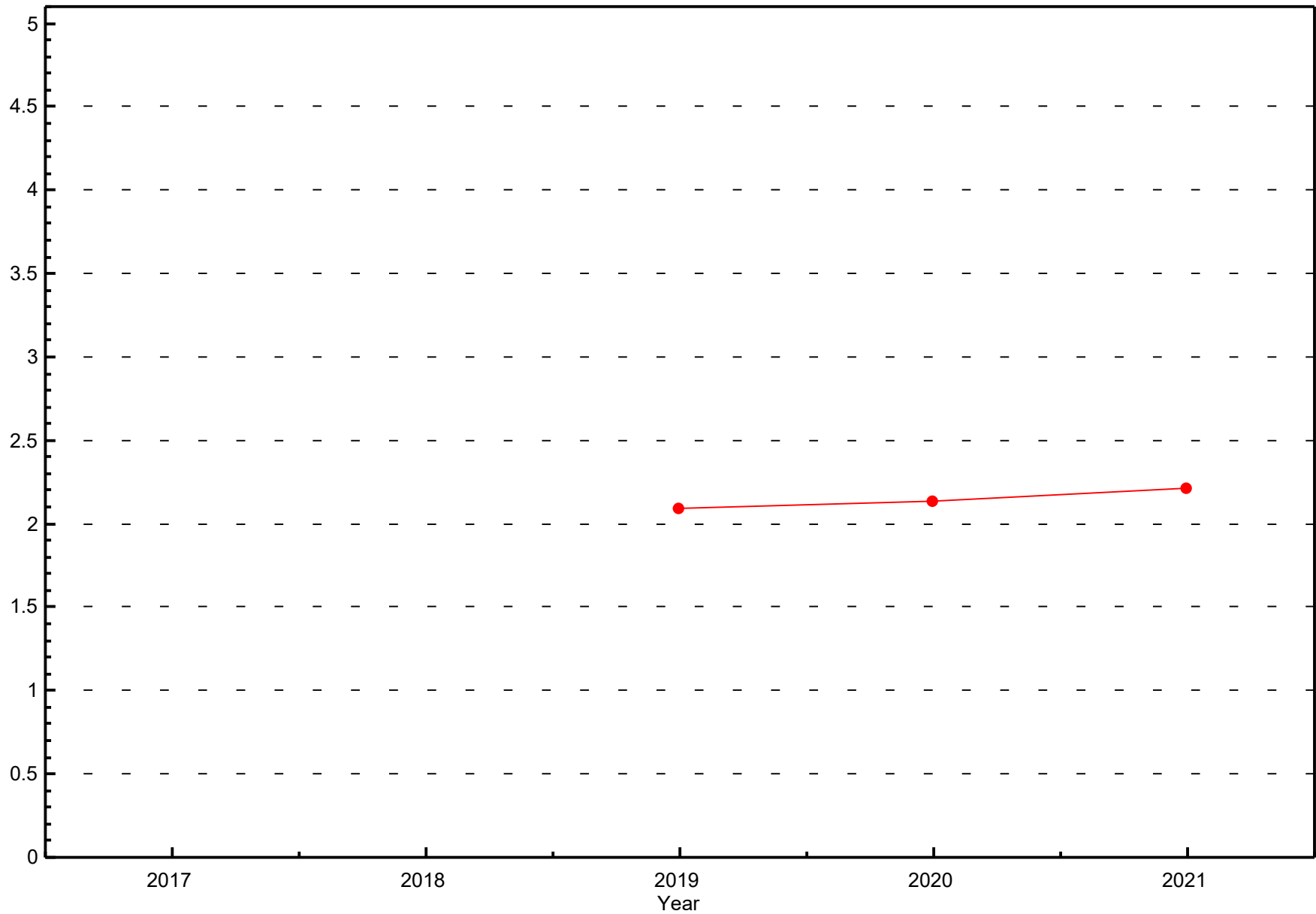
Total Hydrocarbons (THC) - ppm
Fort Hills (2017 to 2021)





Yearly Averages

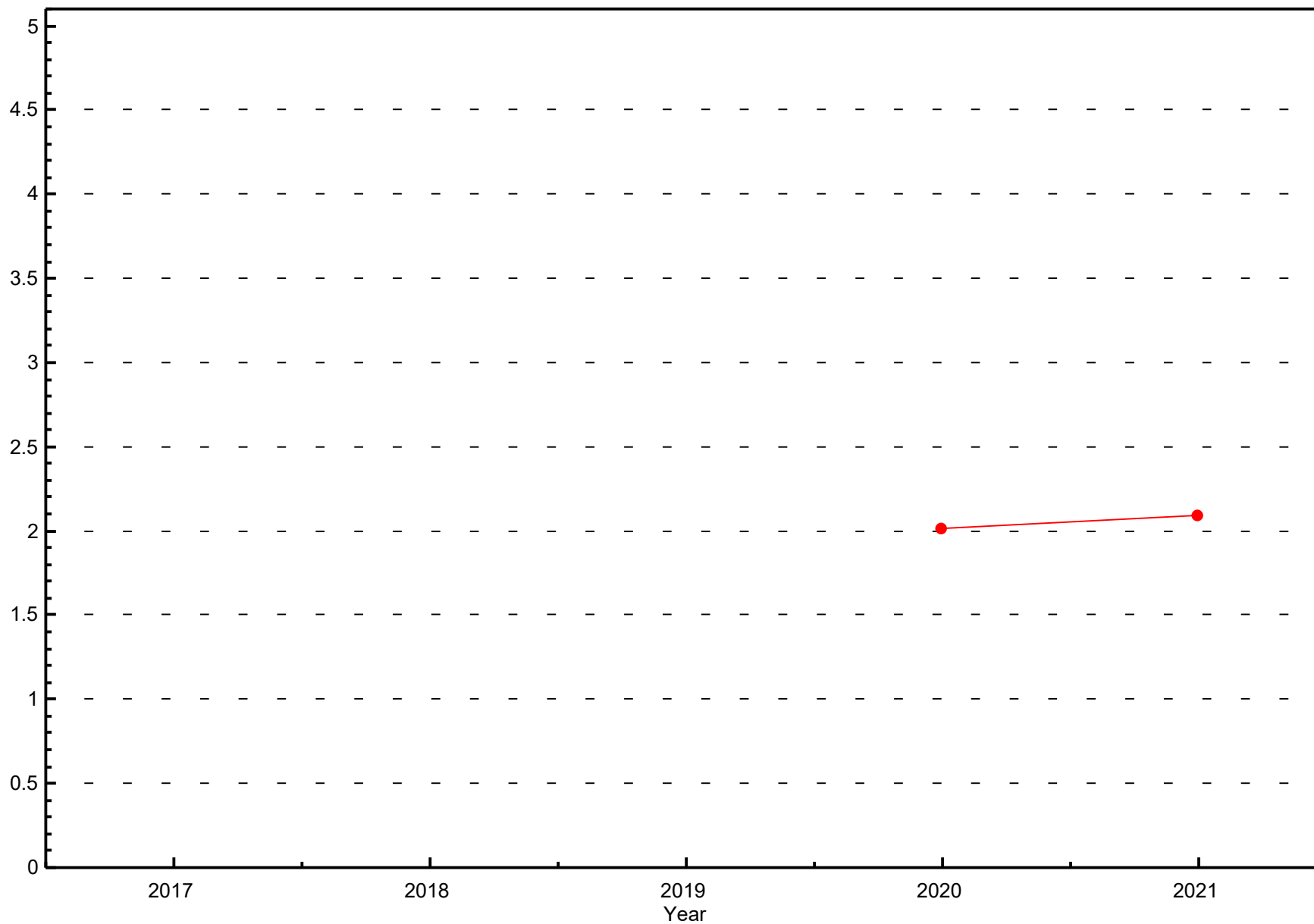
Total Hydrocarbons (THC) - ppm
Surmont 2 (2017 to 2021)





Yearly Averages

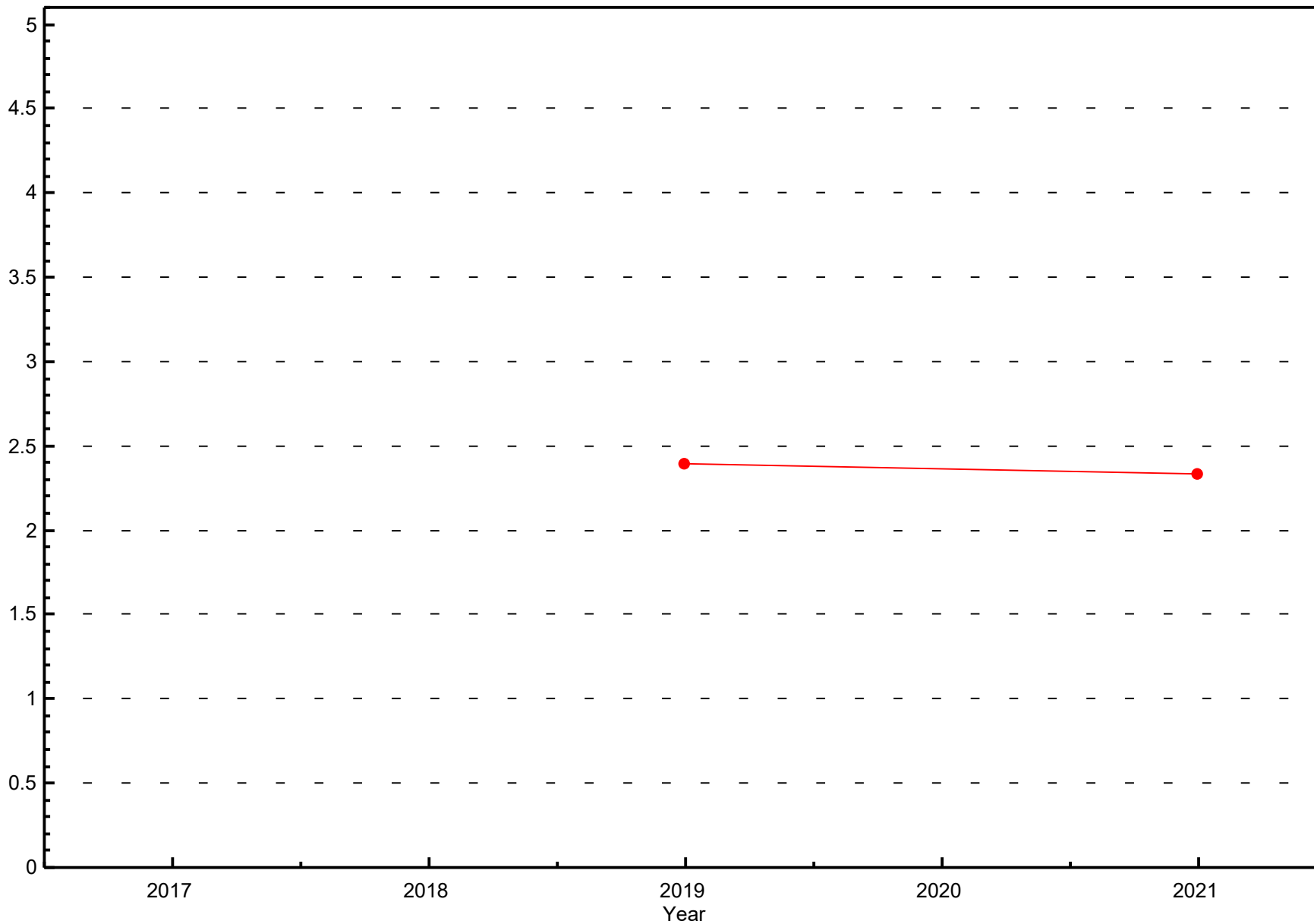
Total Hydrocarbons (THC) - ppm Ells River (2017 to 2021)





Yearly Averages

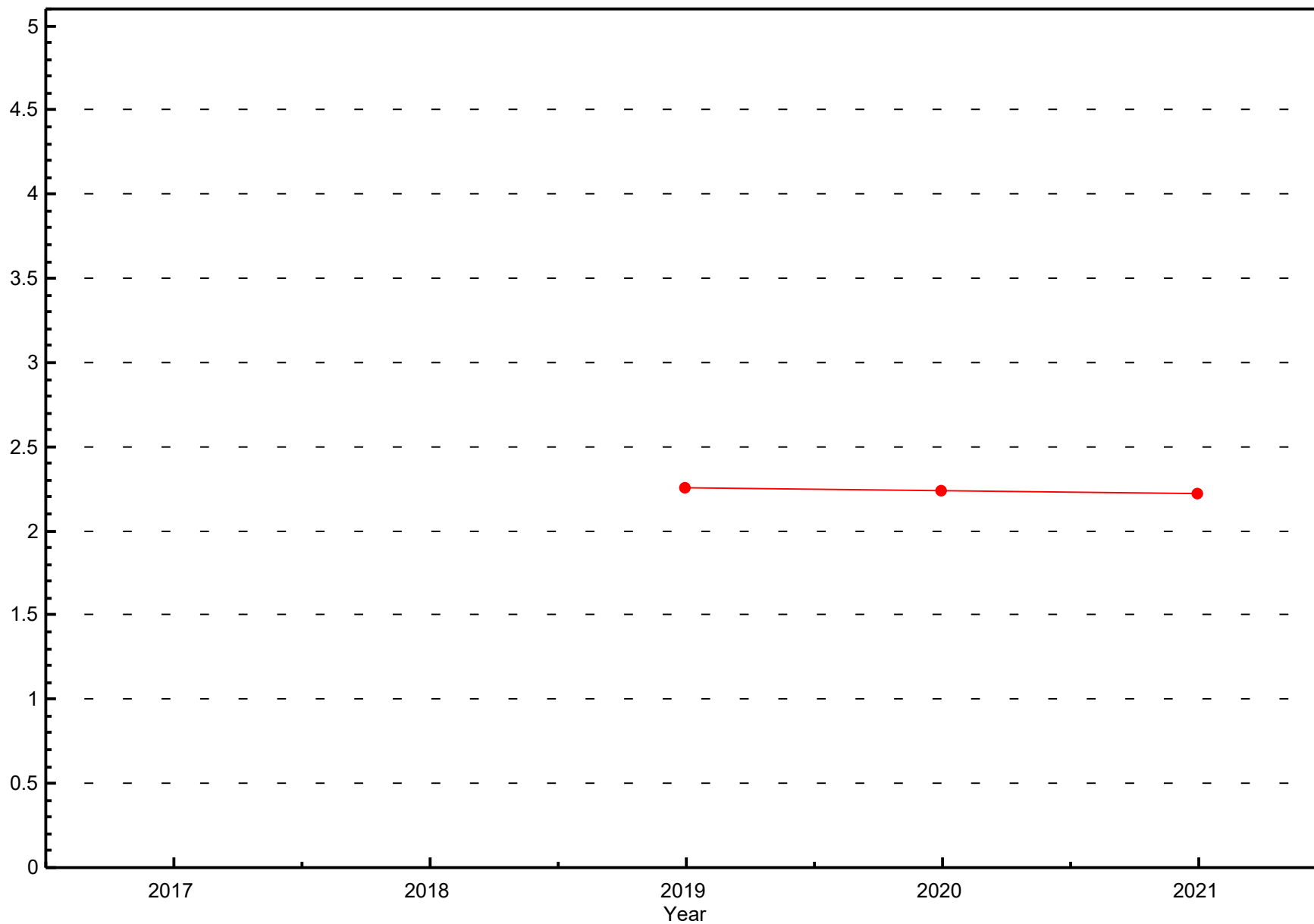
Total Hydrocarbons (THC) - ppm
Kirby South (2017 to 2021)





Yearly Averages

Total Hydrocarbons (THC) - ppm Kirby North (2017 to 2021)





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

NON-METHANE HYDROCARBONS ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100	707	0.0629	0.5788	0.1916
February	100	639	0.0307	0.5425	0.1928
March	100	707	0.0288	0.4613	0.1619
April	100	682	0.0261	0.3476	0.1452
May	99	704	0.0257	0.3587	0.0868
June	100	685	0.0820	0.6073	0.3884
July	94	667	0.0950	0.9367	0.4360
August	99	703	0.1292	0.9112	0.2929
September	100	685	0.1390	1.2681	0.4120
October	96	674	0.0567	0.6461	0.1844
November	100	682	0.0549	0.7799	0.2770
December	100	708	0.0283	0.4787	0.1241
Annual	99	8243	0.0633	1.2681	0.4360



Wood Buffalo Environmental Association - Mildred Lake (AMS02)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100	709	0.0739	0.8928	0.3627
February	99	634	0.0330	0.8829	0.1887
March	99	700	0.0500	1.5114	0.3707
April	100	686	0.0397	3.1388	0.2628
May	100	710	0.0247	1.0739	0.1116
June	100	685	0.0543	2.1864	0.2059
July	100	709	0.0516	1.2061	0.1907
August	95	671	0.0368	1.2421	0.2629
September	99	677	0.0501	1.9283	0.1824
October	98	696	0.0184	0.7827	0.1040
November	100	683	0.0330	1.1428	0.2722
December	100	709	0.0097	0.7634	0.0988
Annual	99	8269	0.0396	3.1388	0.3707



Wood Buffalo Environmental Association - Buffalo Viewpoint (AMS04)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100	710	0.0060	0.3555	0.0421
February	97	618	0.0049	0.2810	0.0449
March	100	710	0.0091	0.9066	0.1632
April	99	682	0.0029	0.2040	0.0298
May	100	708	0.0019	0.1962	0.0300
June	99	680	0.0075	0.2092	0.0783
July	100	710	0.0102	0.1860	0.0733
August	95	677	0.0085	0.3269	0.1453
September	100	684	0.0020	0.1947	0.0197
October	100	708	0.0023	0.3303	0.0285
November	100	686	0.0042	0.3267	0.0657
December	100	710	0.0020	0.1519	0.0245
Annual	99	8283	0.0051	0.9066	0.1632



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	99	701	0.0258	0.6475	0.0845
February	99	636	0.0279	0.5425	0.1377
March	99	702	0.0269	0.9328	0.1828
April	87	592	0.0344	1.0670	0.1926
May	96	679	0.0271	0.4893	0.0888
June	80	548	0.0429	0.6800	0.1826
July	43	305	0.0394	0.8163	0.2239
August	28	192	0.0592	0.6205	0.2079
September	100	686	0.0776	2.1923	0.5119
October	98	696	0.0524	2.9735	0.5132
November	92	630	0.0345	0.7928	0.1970
December	100	707	0.0264	0.4328	0.1001
Annual	85	7074	0.0382	2.9735	0.5132



Wood Buffalo Environmental Association - Patricia McInnes (AMS06)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100	710	0.0077	0.2848	0.0434
February	100	640	0.0013	0.1537	0.0108
March	100	710	0.0020	0.2633	0.0205
April	100	684	0.0003	0.0397	0.0022
May	97	685	0.0004	0.0764	0.0033
June	97	662	0.0034	0.1353	0.0395
July	100	708	0.0043	0.2439	0.0397
August	83	583	0.0015	0.1568	0.0248
September	99	681	0.0014	0.1343	0.0080
October	100	708	0.0007	0.0893	0.0070
November	100	683	0.0039	0.3061	0.0613
December	97	686	0.0010	0.0757	0.0059
Annual	98	8140	0.0023	0.3061	0.0613



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	99	705	0.0143	0.3262	0.0856
February	100	638	0.0033	0.3938	0.0411
March	100	705	0.0086	0.7017	0.1333
April	98	671	0.0016	0.2384	0.0148
May	96	678	0.0038	0.2220	0.0393
June	99	677	0.0330	0.3001	0.1529
July	95	674	0.0325	0.5202	0.1829
August	92	649	0.0298	0.4280	0.1238
September	98	675	0.0255	0.4002	0.1128
October	99	705	0.0282	0.6398	0.1531
November	100	687	0.0340	0.8459	0.2459
December	100	707	0.0161	0.2958	0.0788
Annual	98	8171	0.0193	0.8459	0.2459



Wood Buffalo Environmental Association - Barge Landing (AMS09)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	99	702	0.0037	0.4068	0.0448
February	89	567	0.0036	0.3830	0.0370
March	99	701	0.0050	0.7047	0.0831
April	99	678	0.0006	0.1941	0.0084
May	98	694	0.0027	0.4313	0.0335
June	99	679	0.0018	0.2735	0.0263
July	100	706	0.0039	0.6493	0.0597
August	77	537	0.0388	0.6914	0.1315
September	99	683	0.0486	0.7741	0.3034
October	98	695	0.0379	0.9240	0.1732
November	100	686	0.0558	0.9445	0.2840
December	100	707	0.0413	0.6905	0.1529
Annual	96	8035	0.0202	0.9445	0.3034



Wood Buffalo Environmental Association - Lower Camp (AMS11)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	93	657	0.1220	1.0951	0.3029
February	100	638	0.0636	1.1301	0.2249
March	100	706	0.0870	1.5327	0.3007
April	90	614	0.0416	1.4928	0.1188
May	91	639	0.0088	0.5208	0.0663
June	75	513	0.0352	0.5793	0.1824
July	56	391	0.0155	0.4768	0.0506
August	51	342	0.0172	0.4051	0.0437
September	100	685	0.0330	1.1246	0.1422
October	100	709	0.0246	0.2078	0.0729
November	99	682	0.0286	0.2107	0.0895
December	89	631	0.0239	0.5794	0.0663
Annual	87	7207	0.0441	1.5327	0.3029



Wood Buffalo Environmental Association - Fort McKay South (AMS13)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100	708	0.0663	0.5179	0.1934
February	100	638	0.0462	0.3141	0.1465
March	100	707	0.0413	0.3944	0.1317
April	100	683	0.0329	0.4103	0.1204
May	99	702	0.0342	0.3239	0.0753
June	100	683	0.0774	0.3780	0.2266
July	100	703	0.1039	0.5817	0.2620
August	100	706	0.0784	0.3913	0.1918
September	100	681	0.0558	0.4056	0.1380
October	100	709	0.0440	0.3343	0.1132
November	79	537	0.0540	0.4761	0.1859
December	100	707	0.0329	0.7818	0.1298
Annual	98	8164	0.0557	0.7818	0.2620



Wood Buffalo Environmental Association - Anzac (AMS14)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	99	699	0.0163	0.4925	0.1175
February	99	636	0.0050	0.1485	0.0409
March	100	705	0.0033	0.1184	0.0175
April	96	659	0.0098	0.0915	0.0181
May	100	709	0.0113	0.0994	0.0336
June	100	683	0.0010	0.1598	0.0097
July	100	707	0.0009	0.2315	0.0127
August	99	698	0.0009	0.2323	0.0208
September	98	673	0.0000	0.0143	0.0006
October	99	698	0.0003	0.0829	0.0058
November	99	682	0.0003	0.1382	0.0060
December	99	703	0.0003	0.0607	0.0036
Annual	99	8252	0.0041	0.4925	0.1175



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100	707	0.0000	0.0112	0.0010
February	100	638	0.0002	0.0528	0.0030
March	100	705	0.0001	0.0257	0.0012
April	100	683	0.0001	0.0138	0.0006
May	96	679	0.0000	0.0112	0.0010
June	81	553	0.0023	0.1790	0.0246
July	94	663	0.0022	0.2115	0.0500
August	99	701	0.0027	0.2713	0.0385
September	98	669	0.0000	0.0087	0.0004
October	100	707	0.0001	0.0182	0.0012
November	100	682	0.0001	0.0287	0.0014
December	77	544	0.0001	0.0169	0.0012
Annual	95	7931	0.0007	0.2713	0.0500



Wood Buffalo Environmental Association - Conklin (AMS21)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100	709	0.0019	0.1525	0.0155
February	100	639	0.0009	0.0955	0.0083
March	100	709	0.0002	0.0633	0.0029
April	99	677	0.0001	0.0180	0.0009
May	100	709	0.0025	0.1688	0.0181
June	100	686	0.0158	0.3404	0.1552
July	100	701	0.0269	0.3956	0.1525
August	100	702	0.0183	0.2069	0.1210
September	98	674	0.0011	0.0528	0.0051
October	89	629	0.0014	0.1126	0.0193
November	100	687	0.0012	0.0879	0.0224
December	100	710	0.0004	0.0449	0.0039
Annual	99	8232	0.0060	0.3956	0.1552



Wood Buffalo Environmental Association - Janvier (AMS22)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	99	700	0.0004	0.1208	0.0053
February	98	626	0.0002	0.0284	0.0021
March	100	706	0.0001	0.0454	0.0035
April	99	679	0.0000	0.0130	0.0006
May	90	637	0.0001	0.0337	0.0015
June	91	623	0.0047	0.1899	0.0629
July	99	704	0.0083	0.1888	0.0666
August	99	697	0.0048	0.2074	0.0739
September	93	640	0.0001	0.0099	0.0007
October	100	707	0.0001	0.0563	0.0026
November	100	683	0.0006	0.1789	0.0098
December	100	706	0.0010	0.5383	0.0234
Annual	97	8108	0.0017	0.5383	0.0739



Wood Buffalo Environmental Association - Fort Hills (AMS23)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	96	682	0.0845	0.6431	0.2420
February	100	639	0.0582	0.8298	0.1972
March	100	705	0.0534	1.3567	0.1800
April	99	675	0.0460	0.8436	0.2483
May	100	708	0.0510	1.8160	0.3064
June	100	686	0.1103	1.7943	0.2833
July	100	708	0.0759	0.8633	0.1896
August	100	708	0.0704	0.9935	0.3076
September	100	686	0.0864	1.0460	0.2547
October	100	709	0.0416	0.7980	0.1236
November	99	682	0.0469	0.7938	0.2426
December	93	659	0.0560	0.5900	0.2539
Annual	99	8247	0.0650	1.8160	0.3076



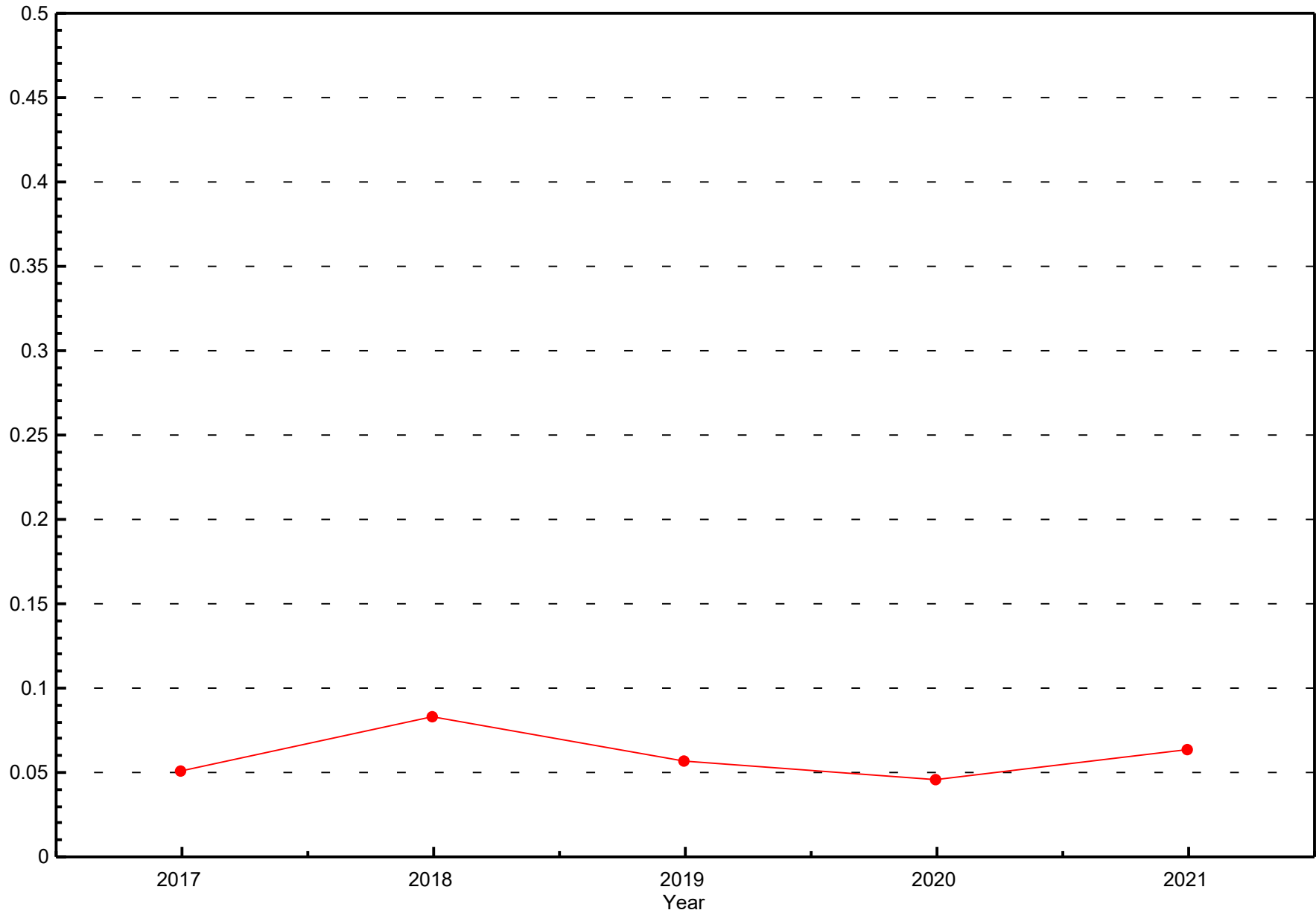
Wood Buffalo Environmental Association - Ells River (AMS30)
Annual Summary for the Year 2021
Non Methane Hydrocarbons (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100	707	0.0459	0.3585	0.1637
February	95	605	0.0486	0.4109	0.1990
March	98	695	0.0322	0.6908	0.2317
April	100	685	0.0271	0.3970	0.1602
May	99	701	0.0202	0.6111	0.0932
June	100	687	0.0660	0.7347	0.2780
July	100	707	0.0612	0.5637	0.2633
August	97	688	0.0349	0.5768	0.1659
September	100	687	0.0353	0.5143	0.1095
October	100	708	0.0121	0.8916	0.1137
November	100	687	0.0261	0.5294	0.1254
December	100	709	0.0207	1.0561	0.1797
Annual	99	8266	0.0357	1.0561	0.2780



Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter (2017 to 2021)

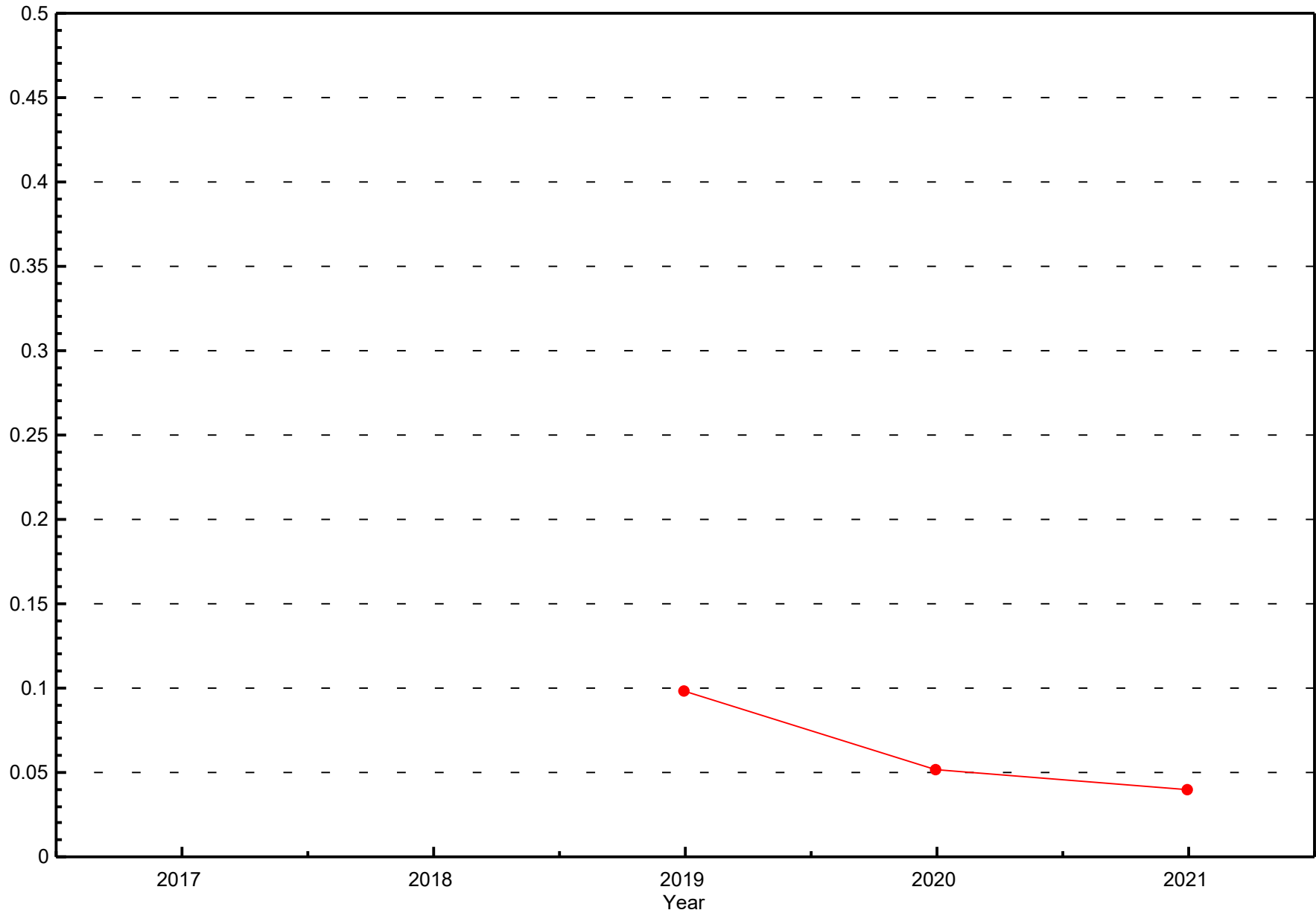




Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Mildred Lake (2017 to 2021)

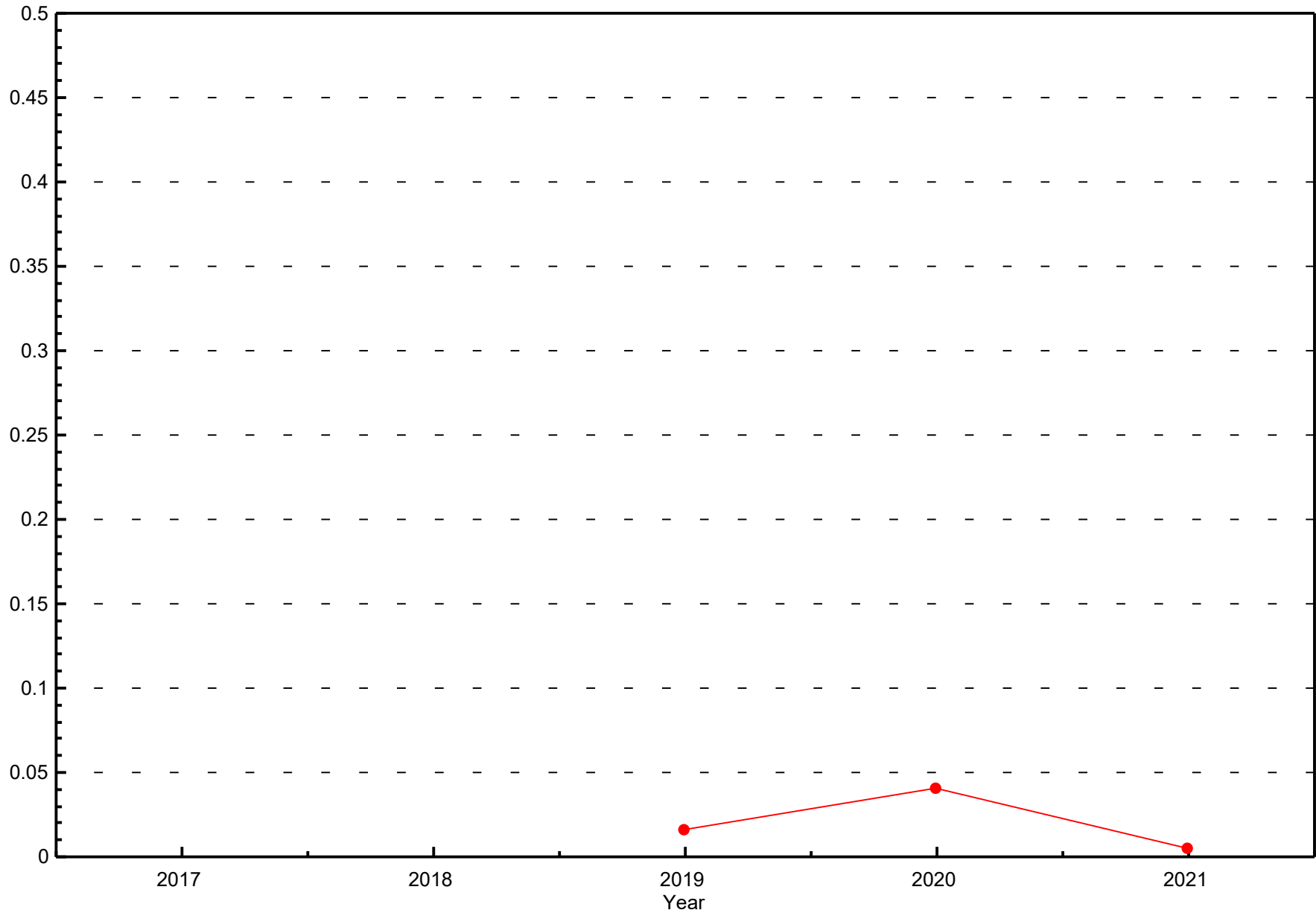




Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Buffalo Viewpoint (2017 to 2021)

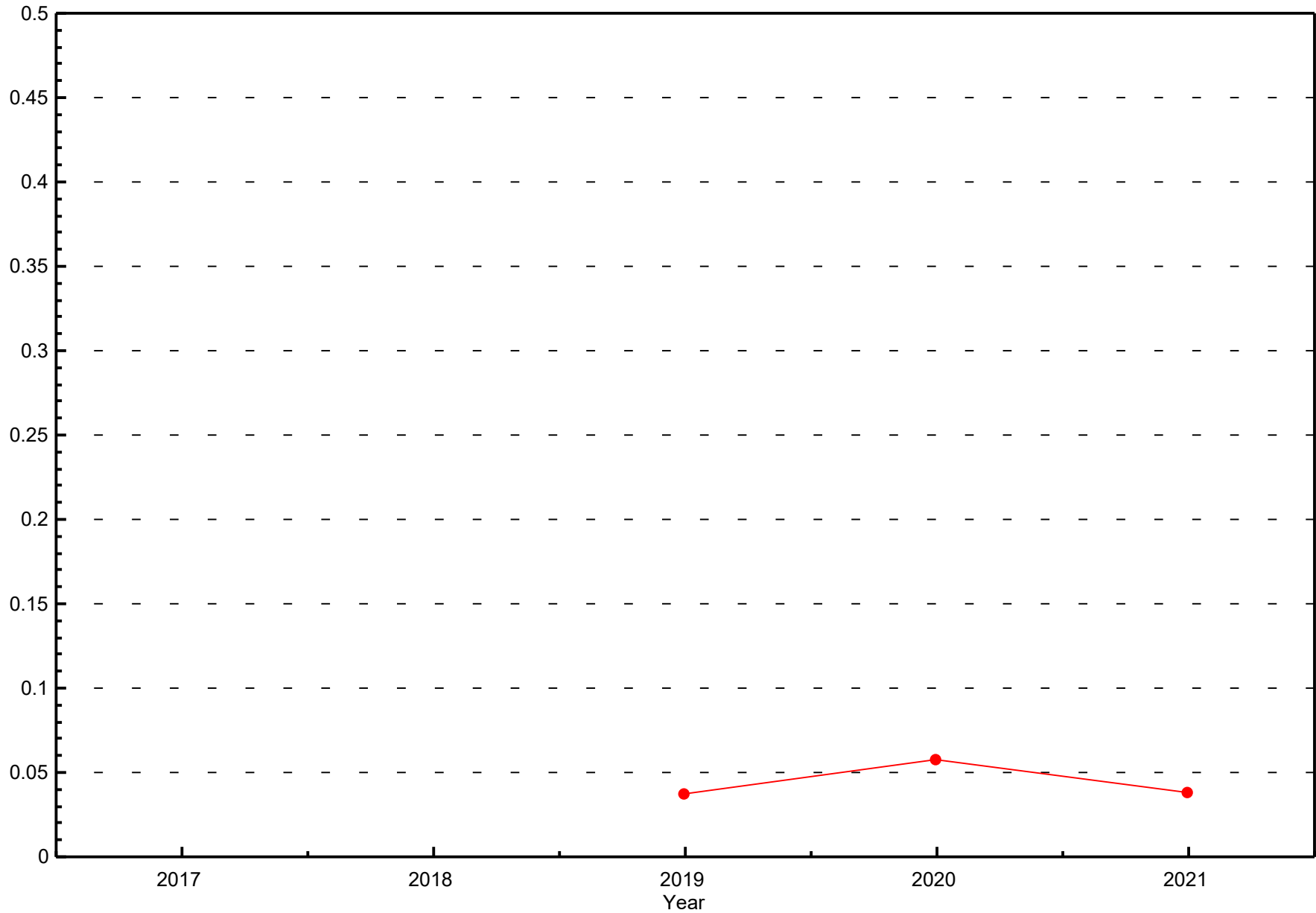




Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Mannix (2017 to 2021)

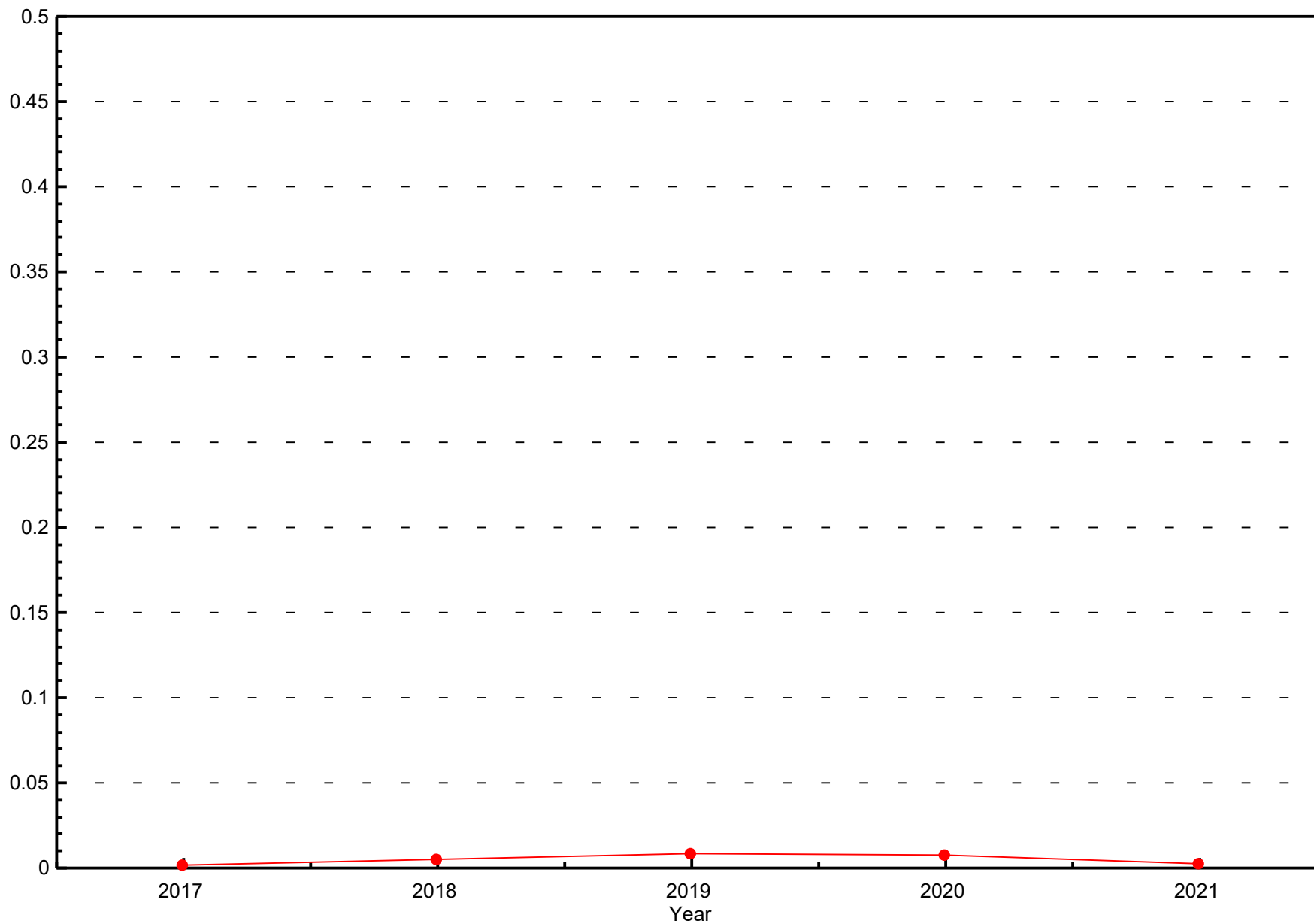




Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm

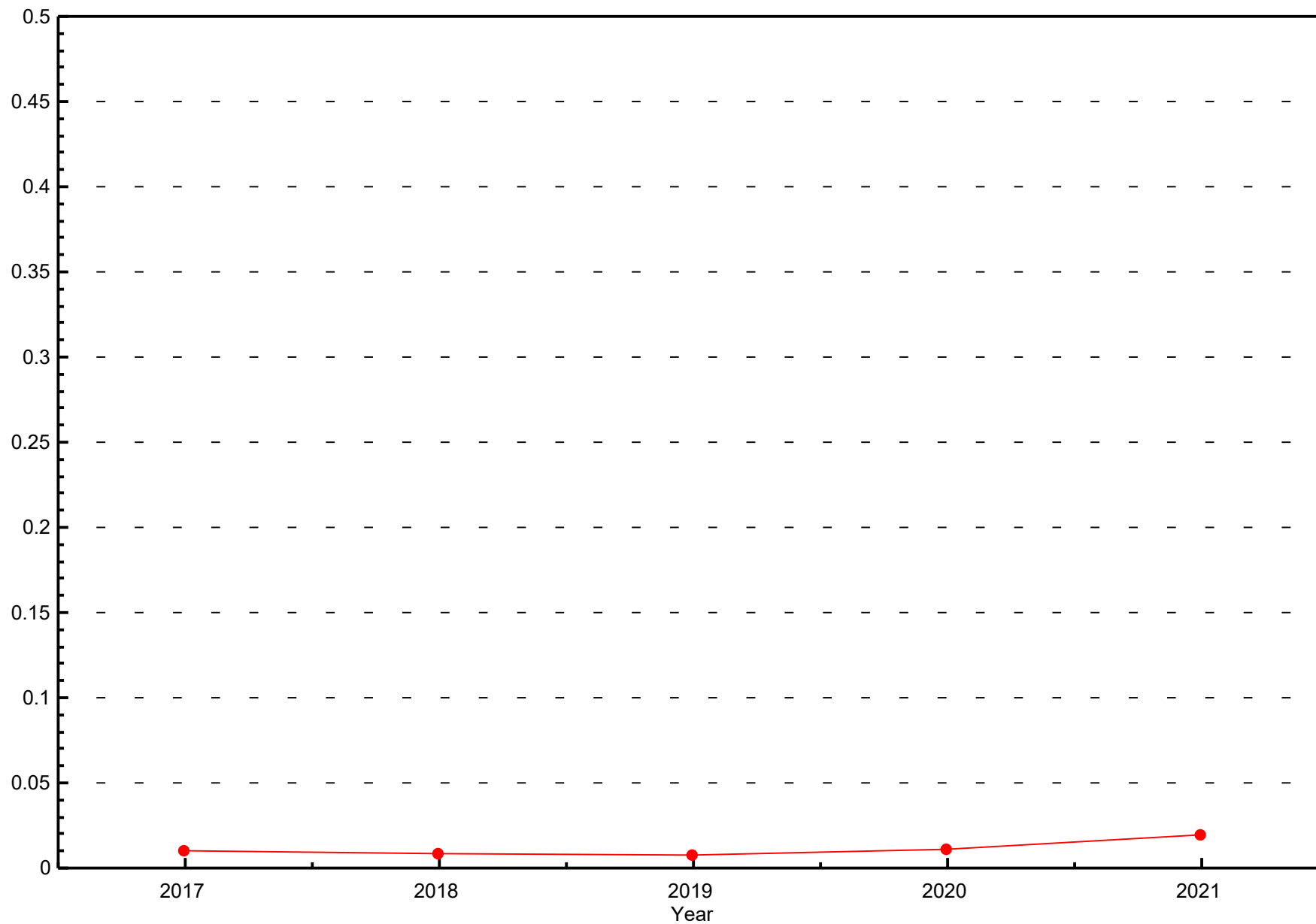
Patricia McInnes (2017 to 2021)





Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm Athabasca Valley (2017 to 2021)

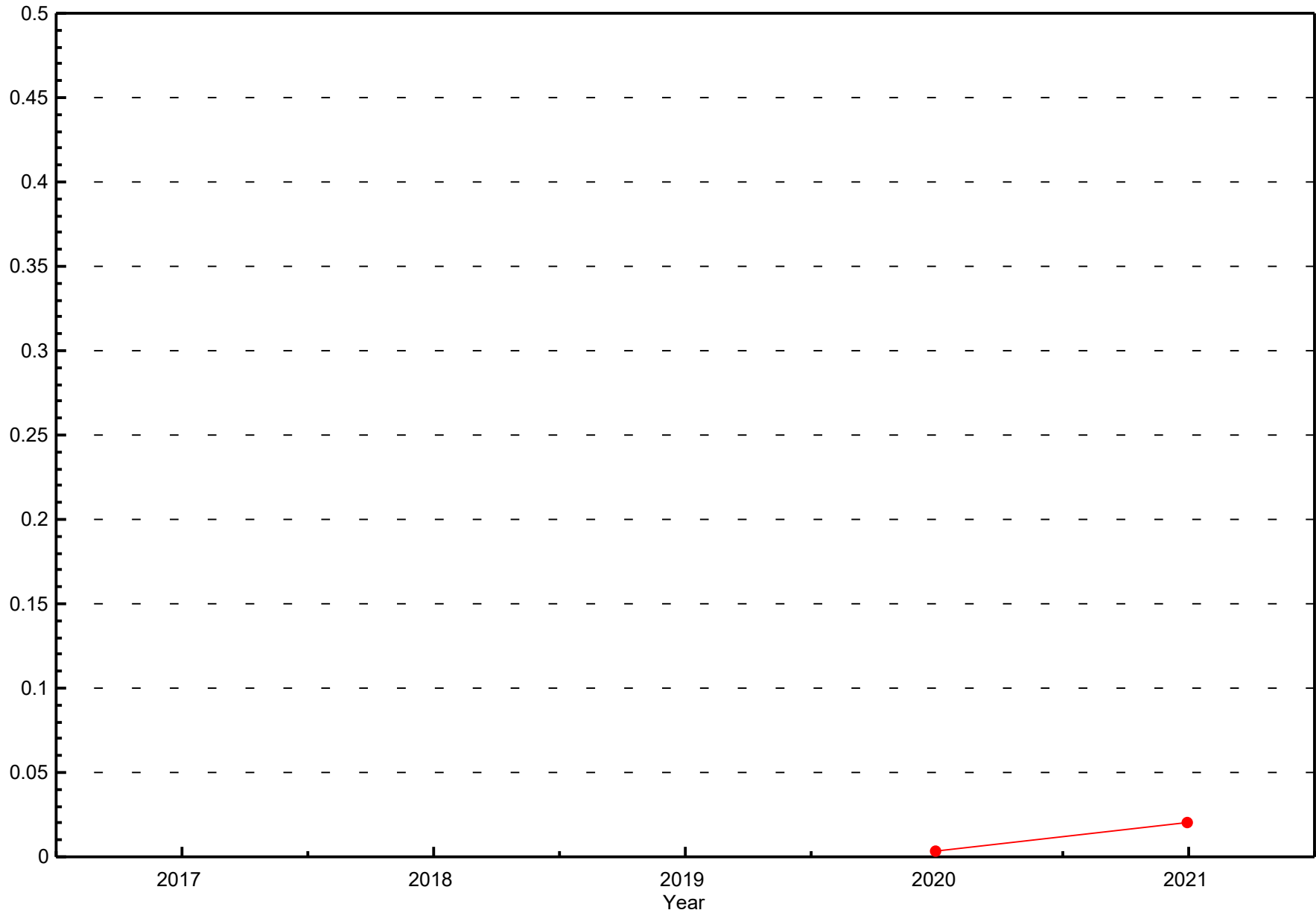




Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Barge Landing (2017 to 2021)

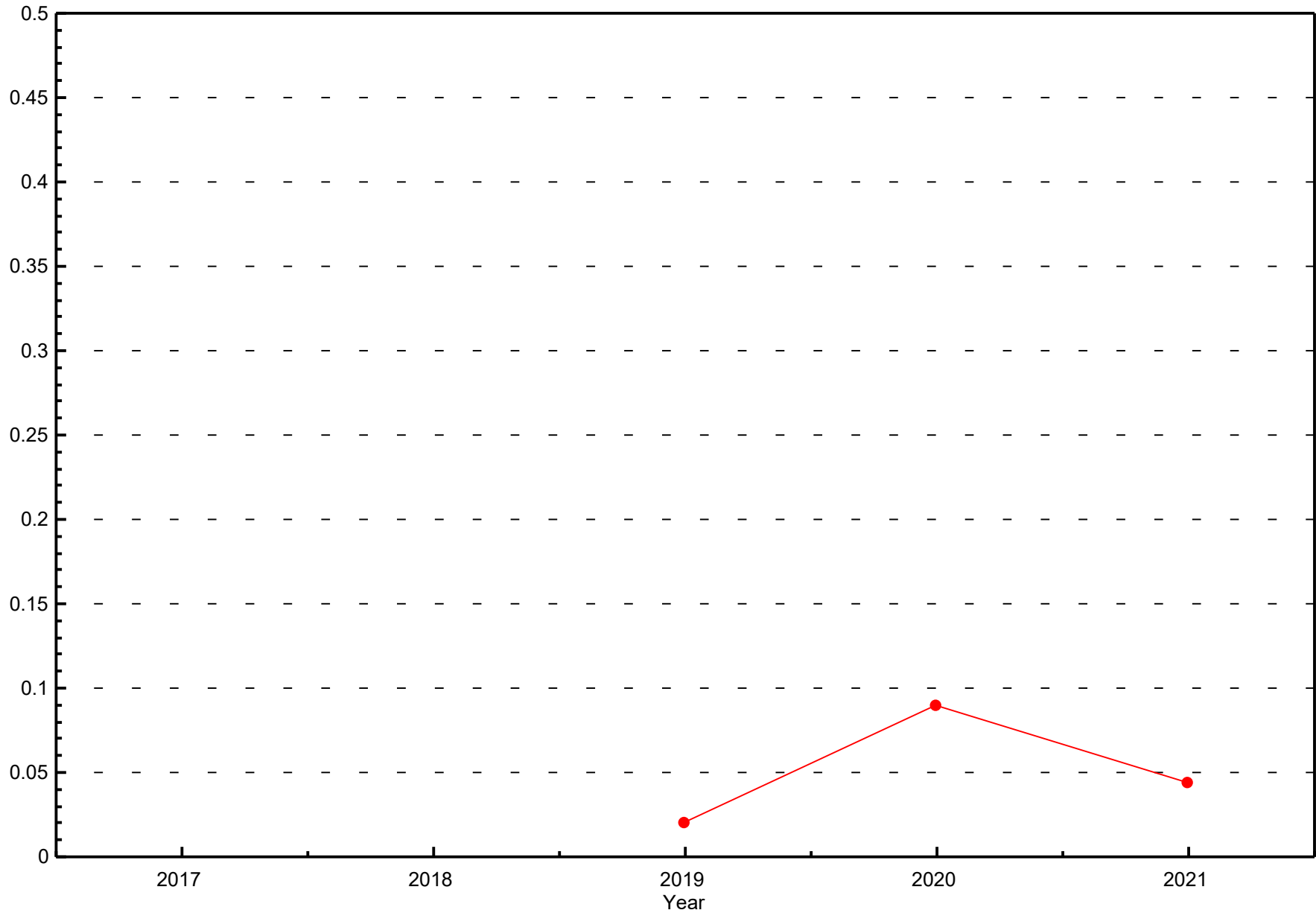




Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Lower Camp (2017 to 2021)

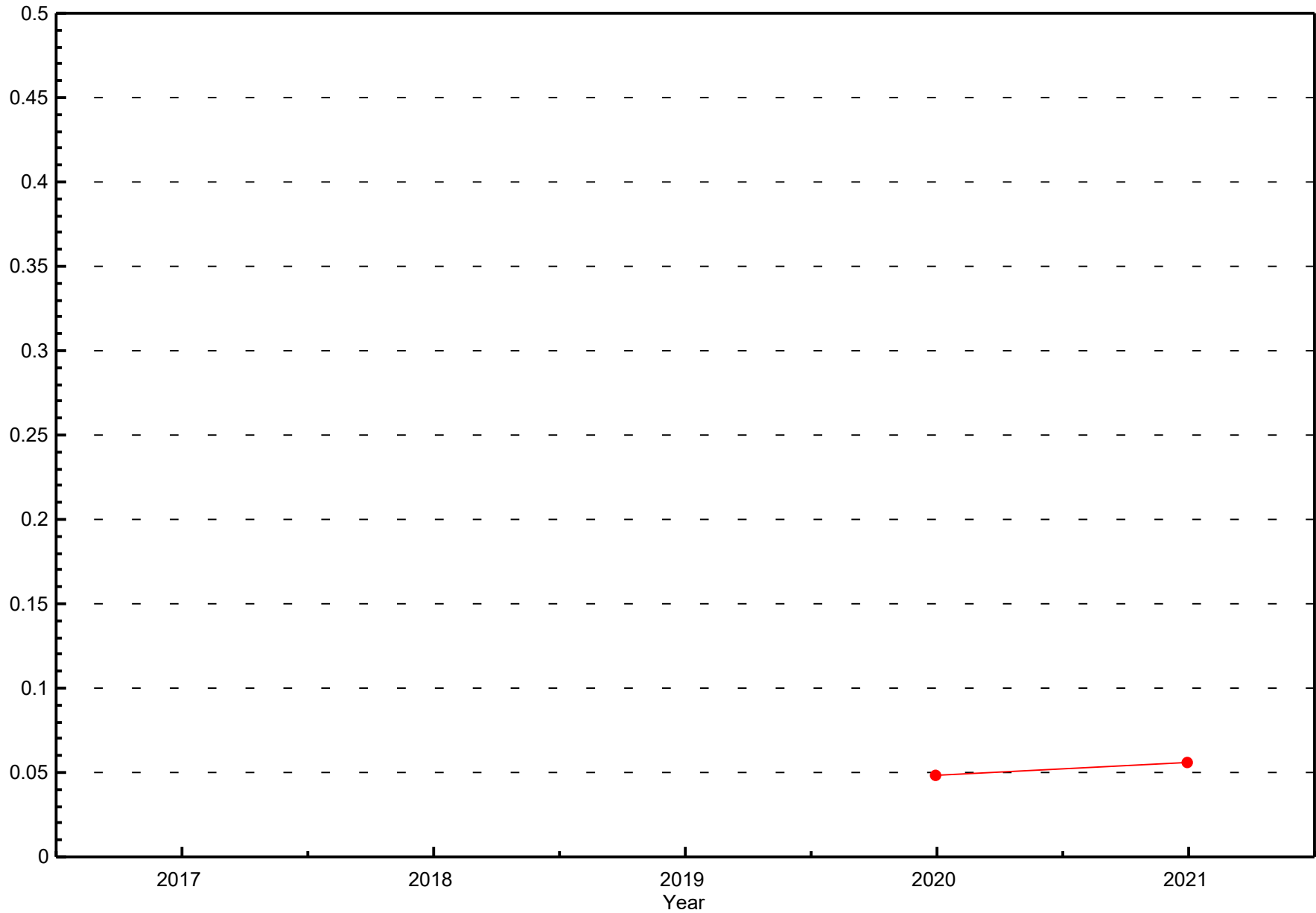




Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay South (2017 to 2021)

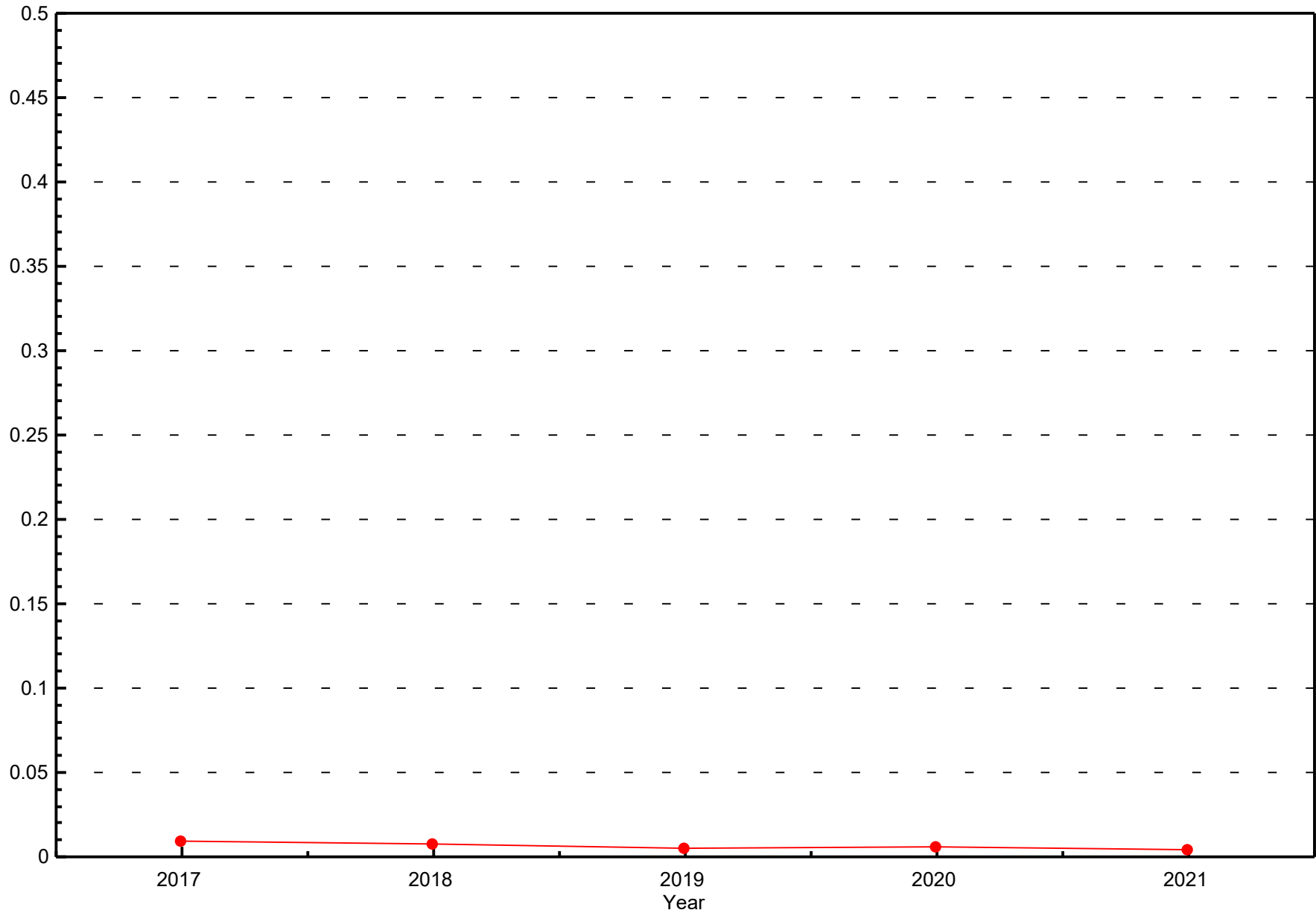




Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Anzac (2017 to 2021)

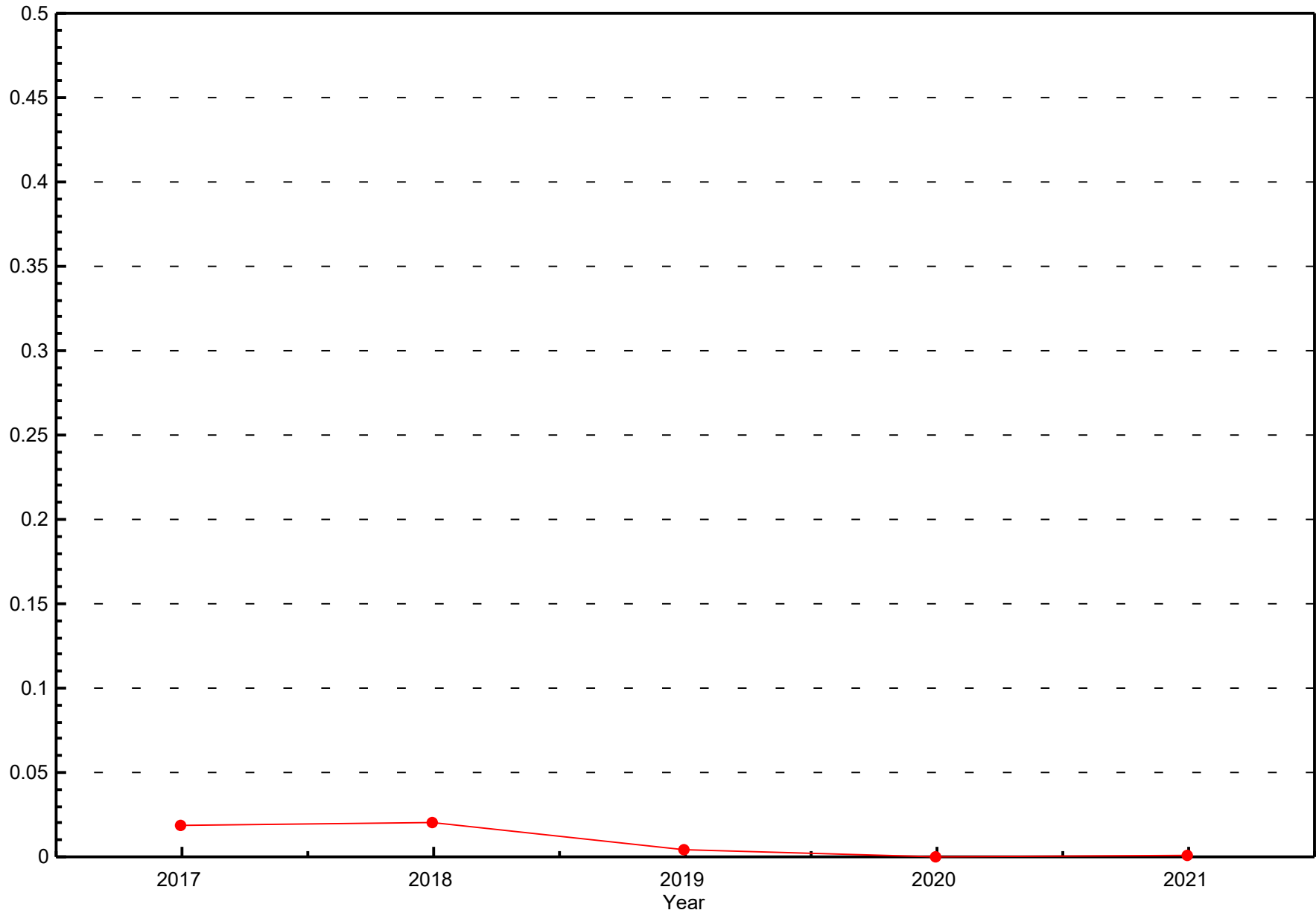




Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Stony Mountain (2017 to 2021)

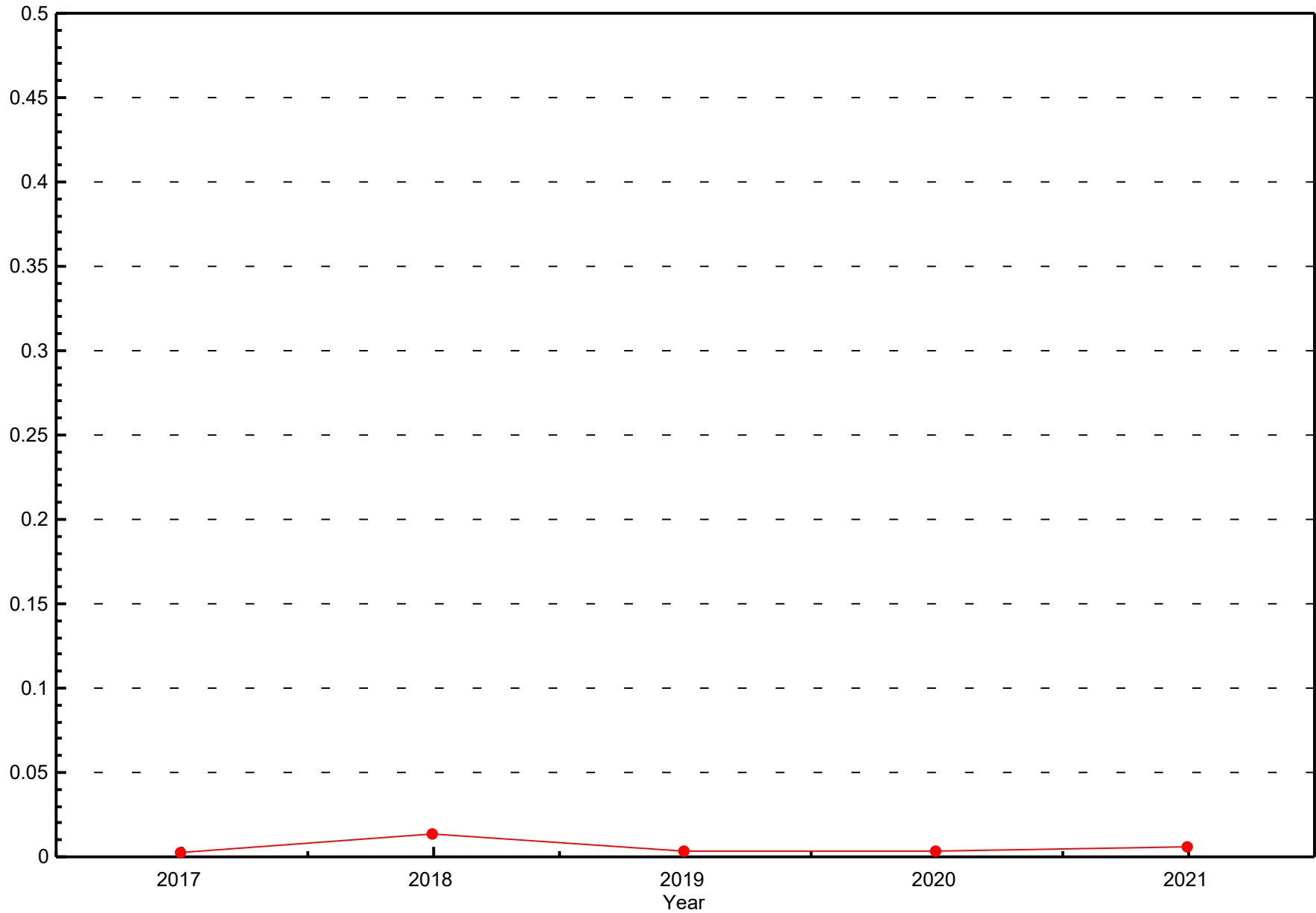




Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Conklin (2017 to 2021)

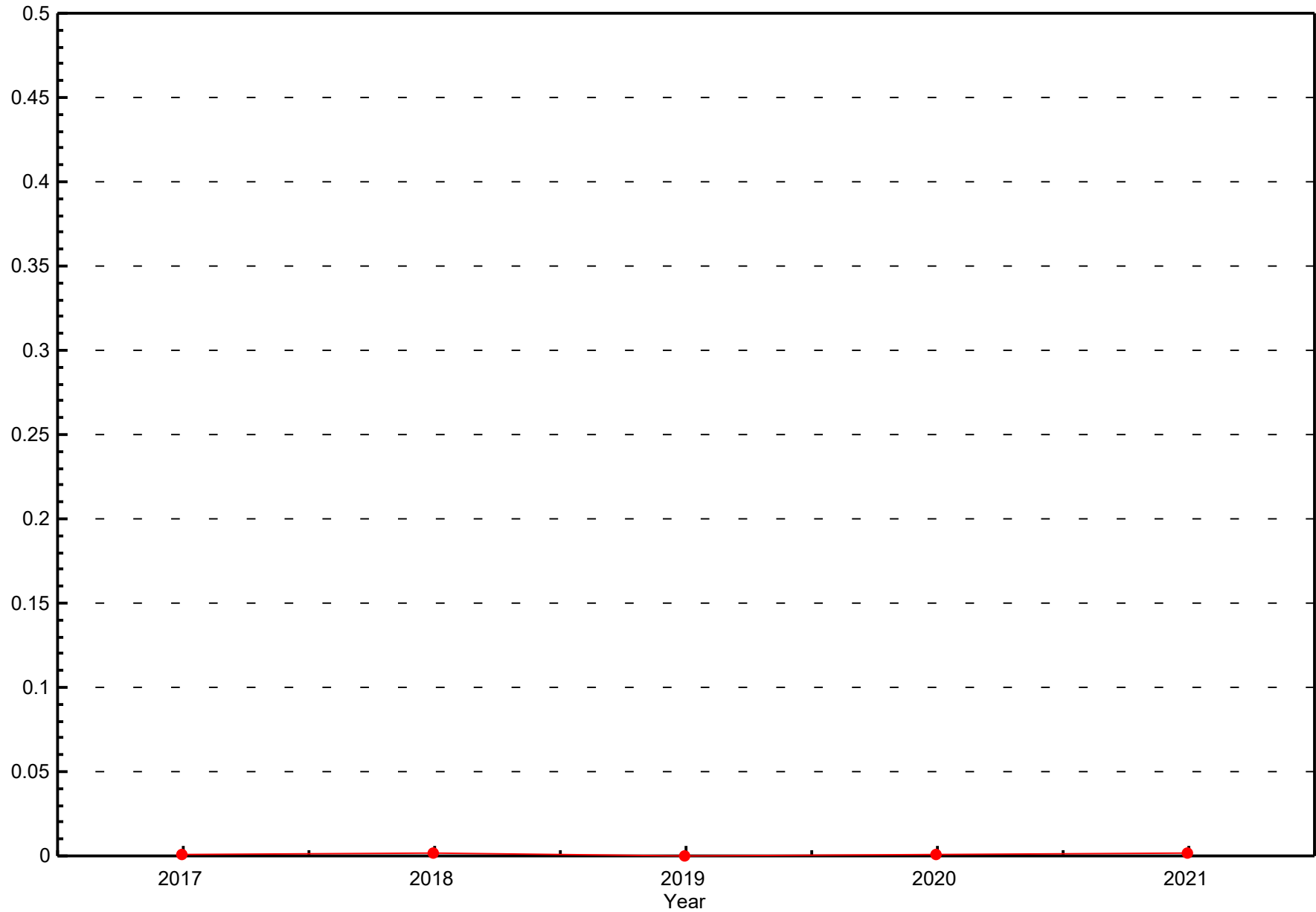




Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Janvier (2017 to 2021)

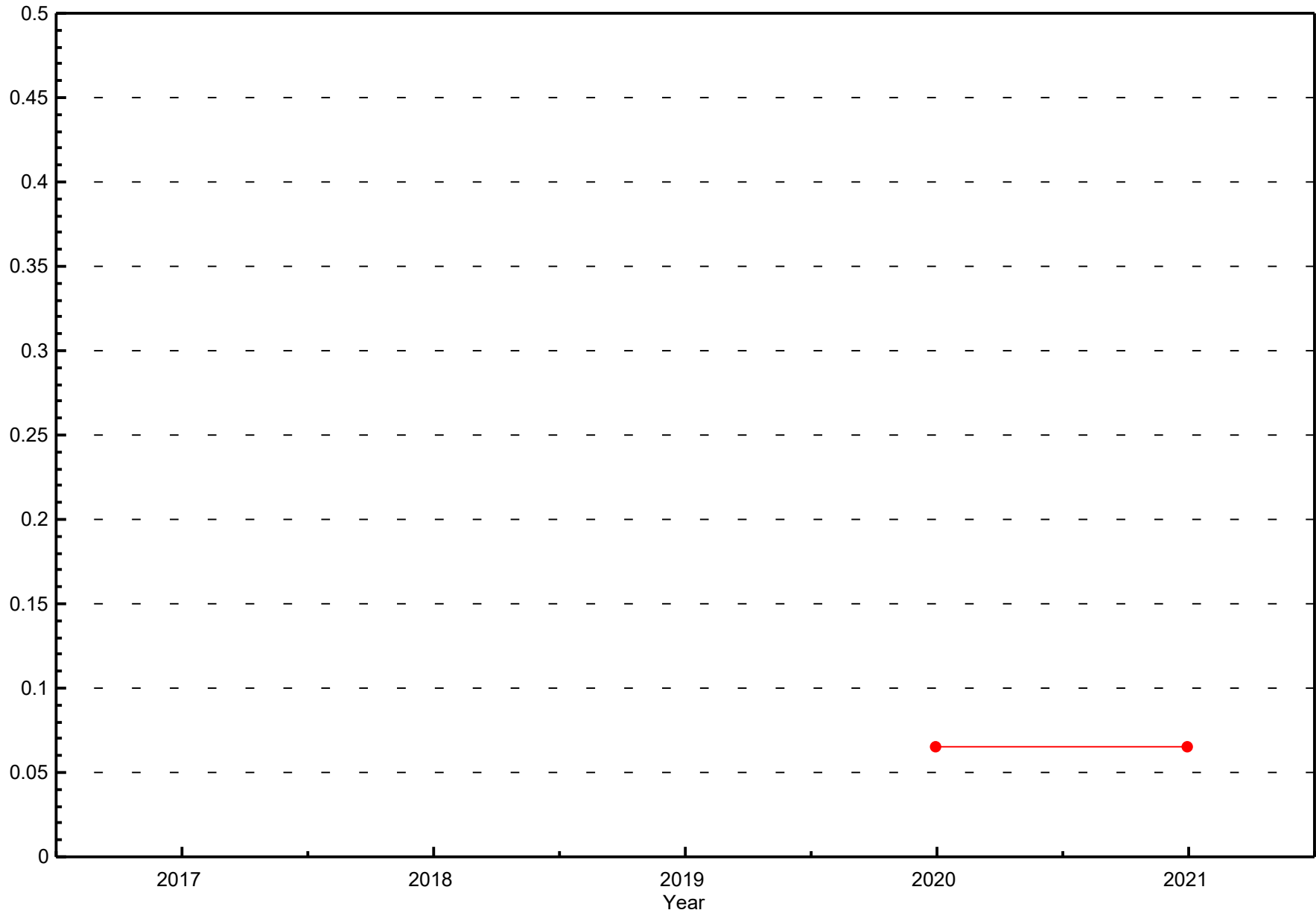




Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Fort Hills (2017 to 2021)

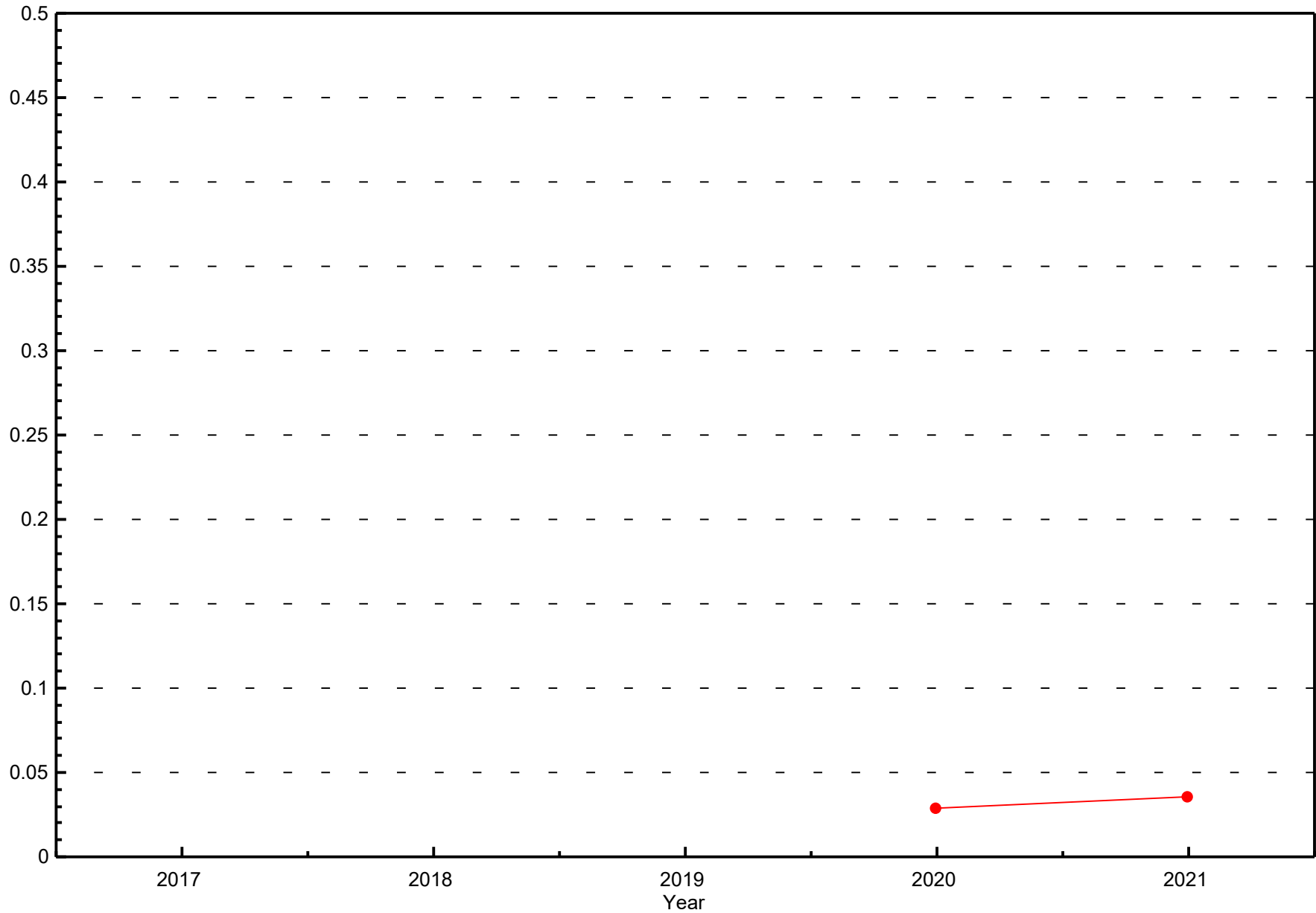




Yearly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Ells River (2017 to 2021)





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM ANNUAL REPORT

METHANE ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	707	2.1953	3.6677	2.5264
February	100	639	2.1624	3.1760	2.5585
March	100	707	2.0965	3.2666	2.3137
April	100	682	2.0150	2.4551	2.1385
May	99	704	1.9604	2.2854	2.0413
June	100	685	1.9055	2.5971	2.0914
July	94	667	1.9729	2.7273	2.1872
August	99	703	2.1106	3.4986	2.2443
September	100	685	2.1057	3.4557	2.3901
October	96	674	2.0809	2.7643	2.2975
November	100	682	2.1944	3.4368	2.5927
December	100	708	2.2376	3.5830	2.5400
Annual	99	8243	2.0867	3.6677	2.5927



Wood Buffalo Environmental Association - Mildred Lake (AMS02)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	709	2.2722	4.2394	2.8397
February	99	634	2.1824	3.9316	2.6492
March	99	700	2.1340	3.7850	2.6396
April	100	686	2.0717	4.8942	2.4070
May	100	710	2.0498	3.4045	2.1539
June	100	685	2.0797	4.4604	2.3047
July	100	709	2.0704	3.4534	2.2019
August	95	671	2.1246	3.6897	2.4521
September	99	677	2.1379	6.1652	2.4868
October	98	696	2.0404	3.5173	2.2430
November	100	683	2.1904	4.1400	2.6323
December	100	709	2.2661	4.7468	2.7079
Annual	99	8269	2.1349	6.1652	2.8397



Wood Buffalo Environmental Association - Buffalo Viewpoint (AMS04)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	710	2.1735	4.6594	2.4948
February	97	618	2.1427	3.2589	2.4220
March	100	710	2.0991	6.3398	2.8499
April	99	682	2.0654	2.8207	2.2134
May	100	708	2.0650	3.3580	2.2174
June	99	680	2.0788	2.5592	2.2003
July	100	710	2.0822	2.9142	2.2366
August	95	677	2.0940	3.6810	2.5477
September	100	684	2.0883	2.8643	2.2798
October	100	708	2.0519	3.3820	2.2269
November	100	686	2.1059	3.4269	2.4121
December	100	710	2.1744	3.8214	2.4561
Annual	99	8283	2.1016	6.3398	2.8499



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	99	701	2.1029	7.0076	2.7344
February	99	636	2.1226	7.4698	2.8554
March	99	702	2.0346	4.8088	2.5901
April	87	592	2.0081	4.3458	2.3883
May	96	679	2.0001	3.4424	2.1626
June	80	548	2.0408	3.2918	2.1571
July	43	305	1.9871	2.4815	2.1233
August	28	192	2.0201	2.4748	2.1154
September	100	686	2.1135	4.1536	2.5382
October	98	696	2.0987	5.8328	2.5682
November	92	630	2.1269	5.3143	2.4019
December	100	707	2.1994	5.1053	2.9160
Annual	85	7074	2.0804	7.4698	2.9160



Wood Buffalo Environmental Association - Patricia McInnes (AMS06)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	710	2.0815	2.6718	2.3405
February	100	640	2.0409	2.5400	2.1621
March	100	710	2.0085	2.4320	2.2137
April	100	684	1.9857	2.2313	2.0451
May	97	685	1.9607	2.2557	2.0170
June	97	662	1.9601	3.1157	2.0354
July	100	708	2.0224	3.1355	2.2507
August	83	583	2.0153	2.8100	2.2390
September	99	681	2.0117	2.5064	2.1324
October	100	708	2.0202	2.5368	2.1498
November	100	683	2.0555	3.0873	2.2869
December	97	686	2.0861	2.6857	2.2143
Annual	98	8140	2.0210	3.1355	2.3405



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	99	705	2.0170	3.4396	2.4805
February	100	638	1.9262	2.2956	2.0609
March	100	705	1.8848	2.2973	2.0963
April	98	671	1.8455	2.3616	1.9307
May	96	678	1.8556	2.1314	1.9575
June	99	677	2.0509	2.9703	2.1856
July	95	674	2.0694	2.5749	2.2199
August	92	649	2.0623	2.6505	2.1738
September	98	675	2.0700	3.8465	2.3429
October	99	705	2.1238	2.7237	2.2348
November	100	687	2.1126	3.0170	2.3230
December	100	707	2.1479	2.9323	2.2640
Annual	98	8171	2.0147	3.8465	2.4805



Wood Buffalo Environmental Association - Barge Landing (AMS09)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	99	702	2.1475	4.5232	2.6125
February	89	567	2.1040	3.3487	2.5271
March	99	701	2.0892	3.2181	2.4599
April	99	678	2.0818	2.7952	2.1856
May	98	694	2.0429	2.5488	2.1080
June	99	679	2.0635	2.8693	2.2201
July	100	706	2.1303	2.9560	2.3018
August	77	537	2.1563	3.1380	2.3226
September	99	683	2.2103	3.6088	2.6767
October	98	695	2.1932	3.0984	2.4531
November	100	686	2.1996	3.8977	2.6420
December	100	707	2.2186	3.1134	2.4960
Annual	96	8035	2.1368	4.5232	2.6767



Wood Buffalo Environmental Association - Lower Camp (AMS11)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	93	657	2.2646	3.9410	2.7516
February	100	638	2.2573	4.3807	2.5854
March	100	706	2.1714	3.5211	2.5285
April	90	614	2.0612	3.5459	2.2094
May	91	639	2.0171	3.0018	2.0965
June	75	513	2.0313	2.7889	2.2324
July	56	391	2.0153	2.6643	2.2059
August	51	342	1.9947	2.7018	2.1145
September	100	685	2.1421	3.8107	2.3663
October	100	709	2.1434	3.4815	2.3954
November	99	682	2.1720	3.2916	2.4591
December	89	631	2.2554	3.1627	2.5334
Annual	87	7207	2.1395	4.3807	2.7516



Wood Buffalo Environmental Association - Fort McKay South (AMS13)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	708	2.2517	4.0795	2.6949
February	100	638	2.1622	3.6851	2.6397
March	100	707	2.1502	3.5796	2.4241
April	100	683	2.1042	2.9078	2.2931
May	99	702	1.9893	3.0547	2.0732
June	100	683	2.0233	2.7930	2.2175
July	100	703	2.0802	2.8414	2.2950
August	100	706	2.0800	3.4683	2.2215
September	100	681	2.0962	2.9109	2.3070
October	100	709	2.0795	2.7743	2.3140
November	79	537	2.2336	5.2556	2.9274
December	100	707	2.2704	3.5411	2.6795
Annual	98	8164	2.1248	5.2556	2.9274



Wood Buffalo Environmental Association - Anzac (AMS14)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	99	699	2.0419	3.3912	2.3112
February	99	636	2.0554	2.3186	2.1332
March	100	705	2.0036	2.3468	2.0521
April	96	659	1.9778	2.1863	2.0476
May	100	709	1.9397	2.2178	1.9730
June	100	683	2.0079	2.2696	2.0651
July	100	707	2.0280	2.4081	2.1559
August	99	698	2.0369	2.3616	2.1035
September	98	673	2.0483	2.2712	2.1009
October	99	698	2.0644	2.3475	2.1515
November	99	682	2.0174	2.3938	2.1639
December	99	703	2.0360	2.4658	2.1534
Annual	99	8252	2.0212	3.3912	2.3112



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	707	1.9896	2.2614	2.1580
February	100	638	1.9930	2.2108	2.1433
March	100	705	1.9702	2.1371	2.0381
April	100	683	1.9313	2.0439	1.9688
May	96	679	1.9769	2.0348	1.9954
June	81	553	1.9627	2.0548	1.9964
July	94	663	1.9663	2.1353	2.0664
August	99	701	1.9039	2.0346	1.9896
September	98	669	1.9602	2.0685	2.0004
October	100	707	1.9450	2.1303	2.0286
November	100	682	2.0181	2.2008	2.1116
December	77	544	2.0079	2.1795	2.1005
Annual	95	7931	1.9679	2.2614	2.1580



Wood Buffalo Environmental Association - Conklin (AMS21)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	709	2.0605	2.4726	2.2889
February	100	639	2.0690	2.4187	2.2608
March	100	709	2.0289	2.3906	2.1258
April	99	677	1.9995	2.3898	2.0450
May	100	709	2.0184	2.4746	2.0873
June	100	686	1.9937	2.9311	2.1842
July	100	701	2.0862	3.2014	2.2635
August	100	702	2.0246	3.0434	2.3358
September	98	674	2.0641	2.8170	2.2044
October	89	629	2.0666	2.3986	2.1732
November	100	687	2.0814	2.3278	2.2233
December	100	710	2.1112	2.2458	2.2298
Annual	99	8232	2.0502	3.2014	2.3358



Wood Buffalo Environmental Association - Janvier (AMS22)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	99	700	1.9735	2.2183	2.1270
February	98	626	1.9663	2.2083	2.1037
March	100	706	1.9466	2.3641	2.0120
April	99	679	1.8882	2.0808	1.9099
May	90	637	1.9161	2.0679	1.9734
June	91	623	2.0151	2.3912	2.0951
July	99	704	1.9971	2.3578	2.1006
August	99	697	1.9462	2.5820	2.0839
September	93	640	1.9697	2.2112	2.0457
October	100	707	1.9624	2.3418	2.0287
November	100	683	1.9752	2.8500	2.0582
December	100	706	2.0057	2.2375	2.0944
Annual	97	8108	1.9635	2.8500	2.1270



Wood Buffalo Environmental Association - Fort Hills (AMS23)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	96	682	2.2154	5.4898	2.7573
February	100	639	2.1483	4.8893	2.5853
March	100	705	2.0951	8.2402	2.7616
April	99	675	2.0256	4.9108	2.3798
May	100	708	2.0152	3.3423	2.1659
June	100	686	2.0480	5.3323	2.2517
July	100	708	2.0709	4.3271	2.2522
August	100	708	2.0745	4.7018	2.4367
September	100	686	2.1251	4.7467	2.4394
October	100	709	2.0858	4.1053	2.2439
November	99	682	2.1569	5.6314	2.4747
December	93	659	2.2763	5.1048	3.2361
Annual	99	8247	2.1102	8.2402	3.2361



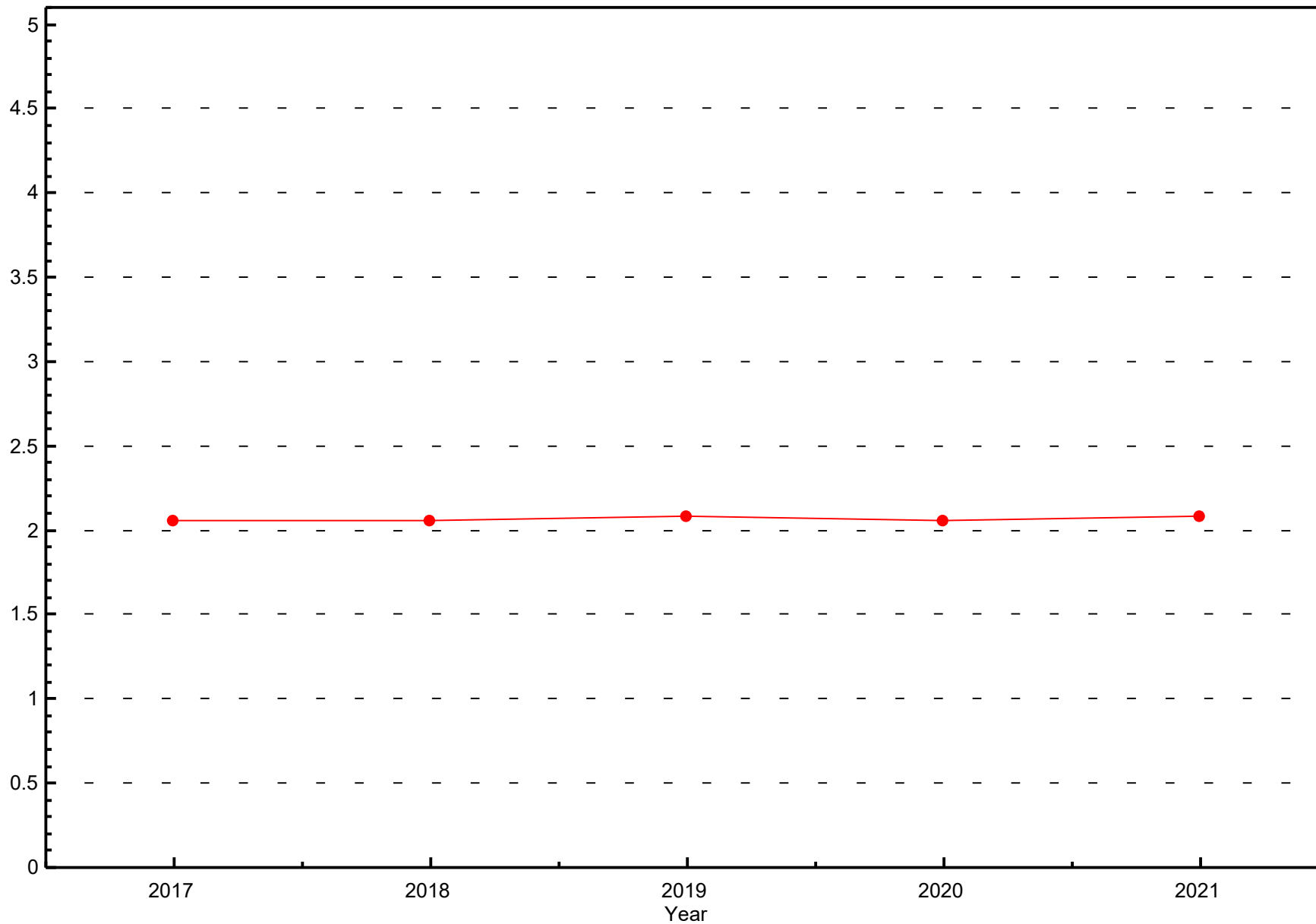
Wood Buffalo Environmental Association - Ells River (AMS30)
Annual Summary for the Year 2021
Methane (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100	707	2.0618	3.6550	2.4594
February	95	605	2.1451	3.0923	2.5039
March	98	695	2.0658	4.3095	2.7147
April	100	685	1.9553	2.3144	2.0828
May	99	701	1.9664	2.7329	2.0840
June	100	687	2.0074	3.2057	2.2780
July	100	707	2.0534	3.4452	2.3158
August	97	688	2.0243	3.2212	2.2398
September	100	687	2.0245	3.3354	2.2250
October	100	708	2.0162	4.7198	2.4356
November	100	687	2.1183	6.1850	2.7556
December	100	709	2.1934	4.0177	2.6424
Annual	99	8266	2.0519	6.1850	2.7556



Yearly Averages

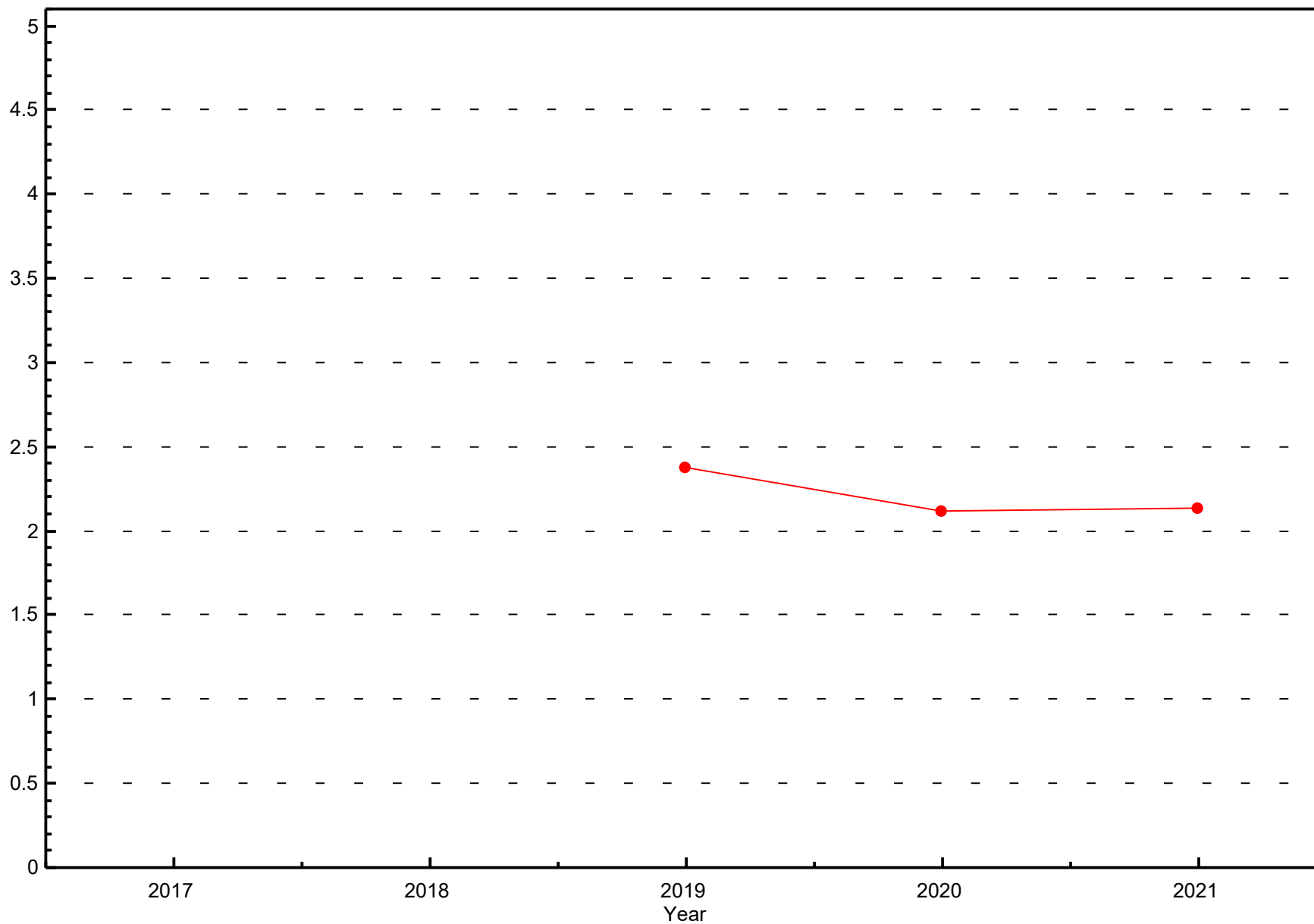
Methane (CH₄) - ppm
Fort McKay - Bertha Ganter (2017 to 2021)





Yearly Averages

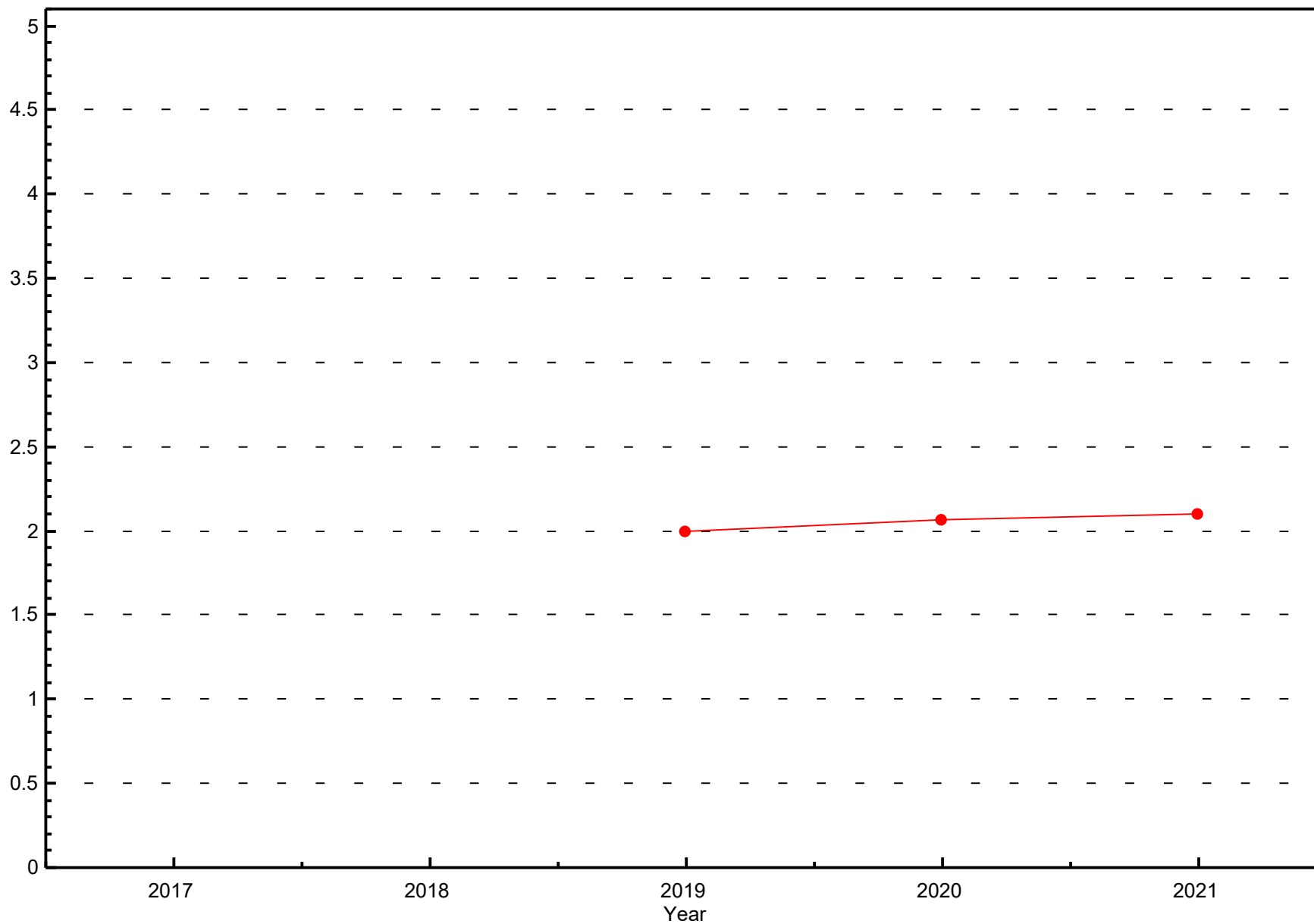
Methane (CH₄) - ppm
Mildred Lake (2017 to 2021)





Yearly Averages

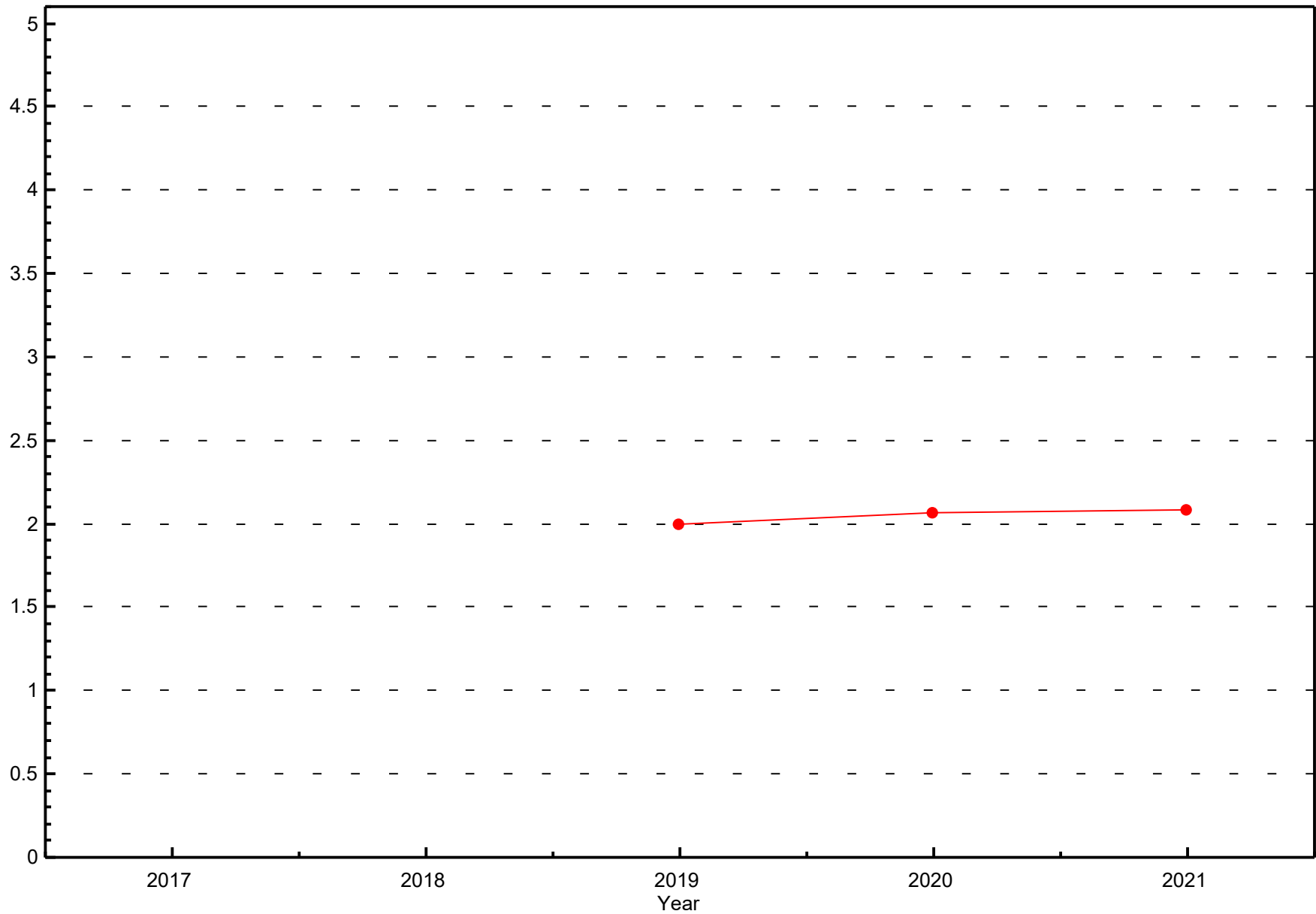
Methane (CH₄) - ppm
Buffalo Viewpoint (2017 to 2021)





Yearly Averages

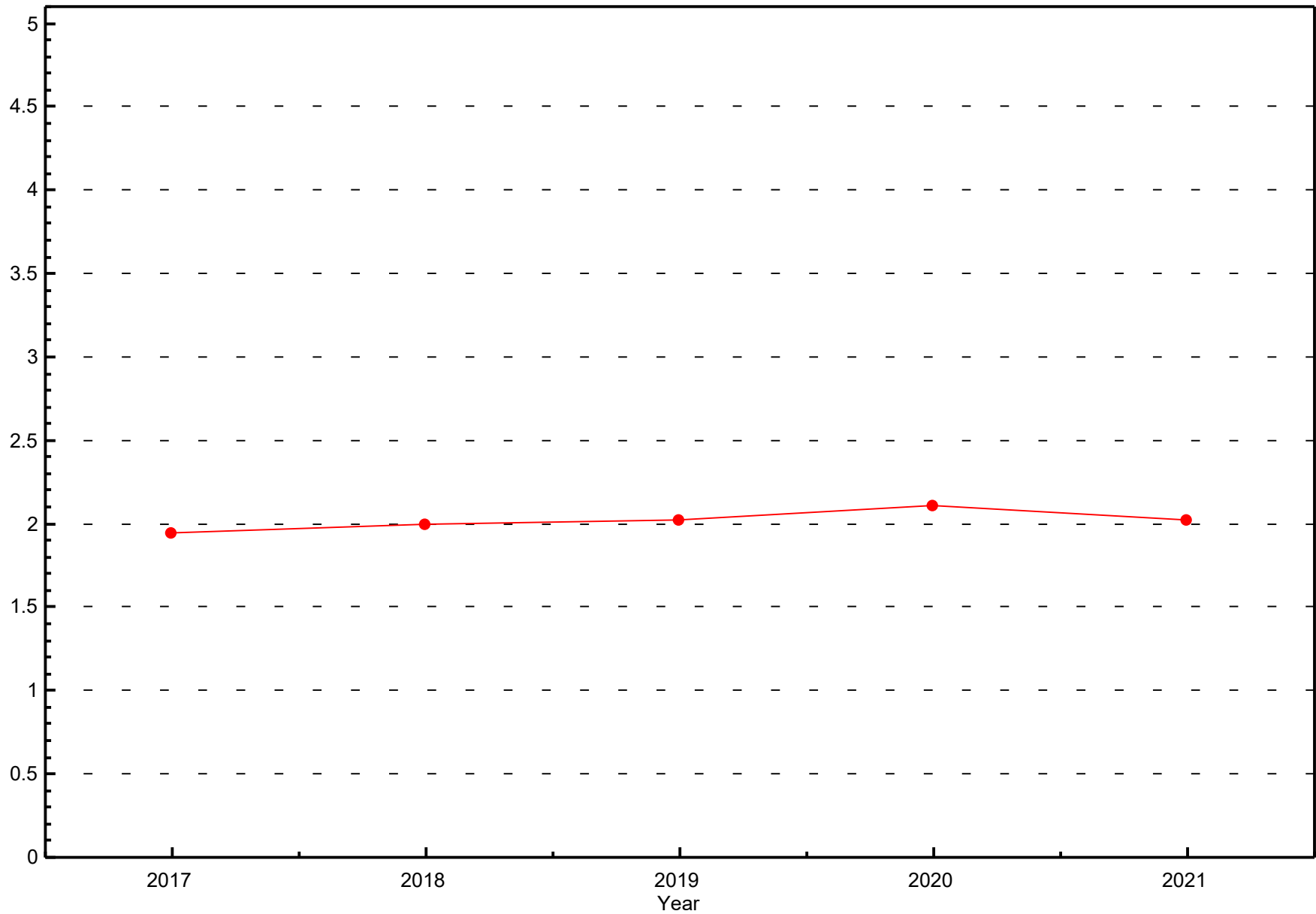
Methane (CH₄) - ppm
Mannix (2017 to 2021)





Yearly Averages

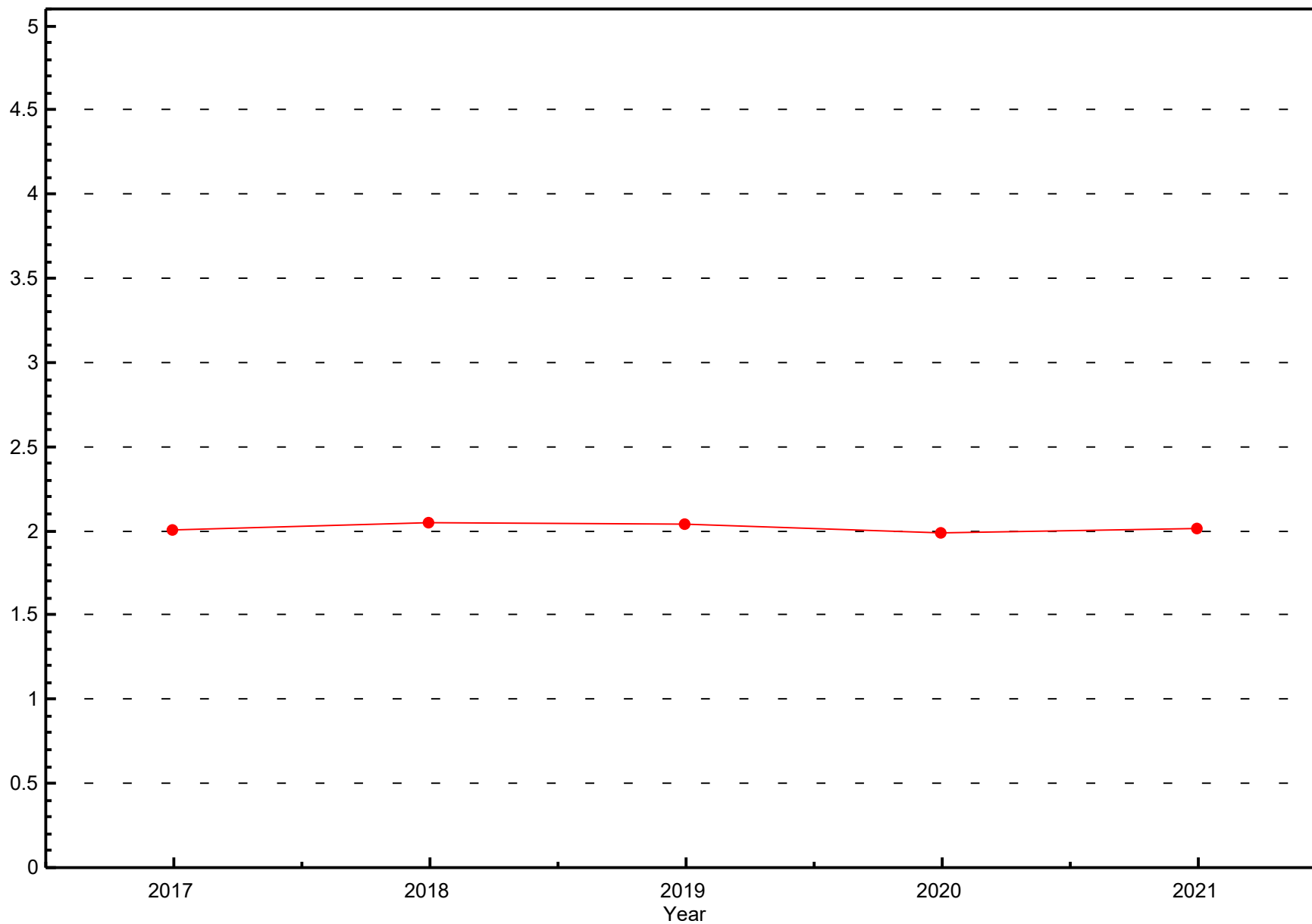
Methane (CH₄) - ppm
Patricia McInnes (2017 to 2021)





Yearly Averages

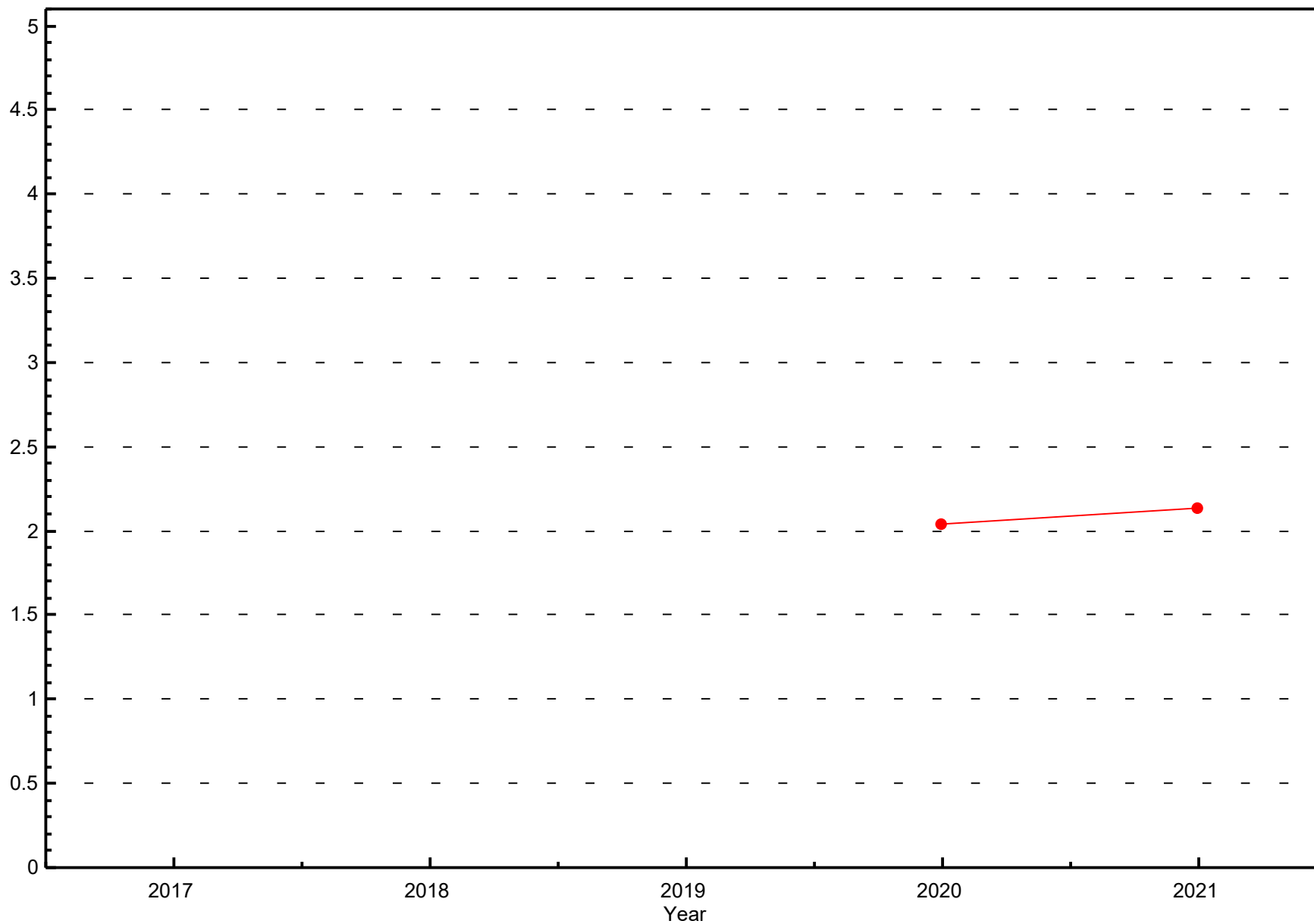
Methane (CH₄) - ppm
Athabasca Valley (2017 to 2021)





Yearly Averages

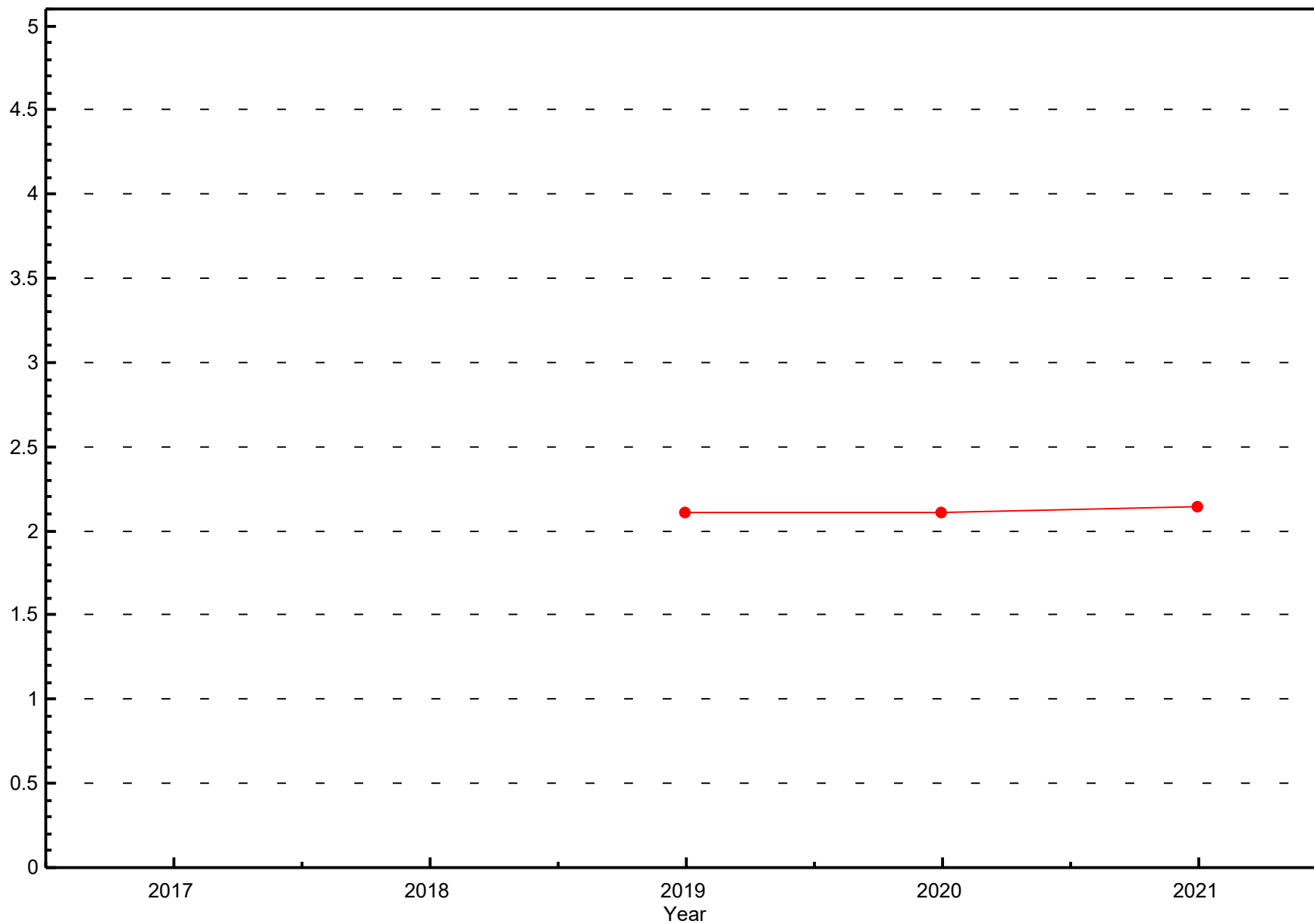
Methane (CH₄) - ppm
Barge Landing (2017 to 2021)





Yearly Averages

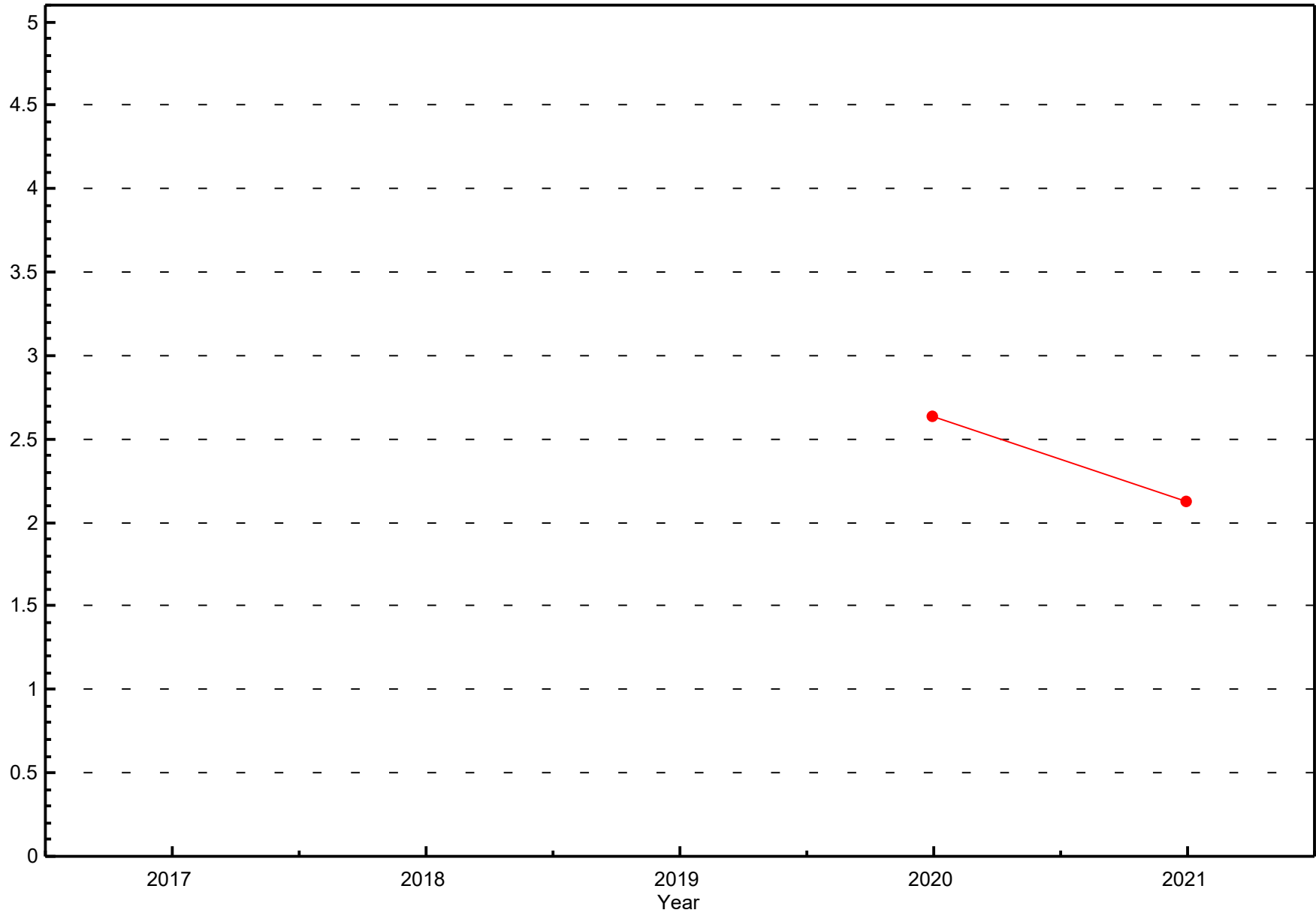
Methane (CH₄) - ppm
Lower Camp (2017 to 2021)





Yearly Averages

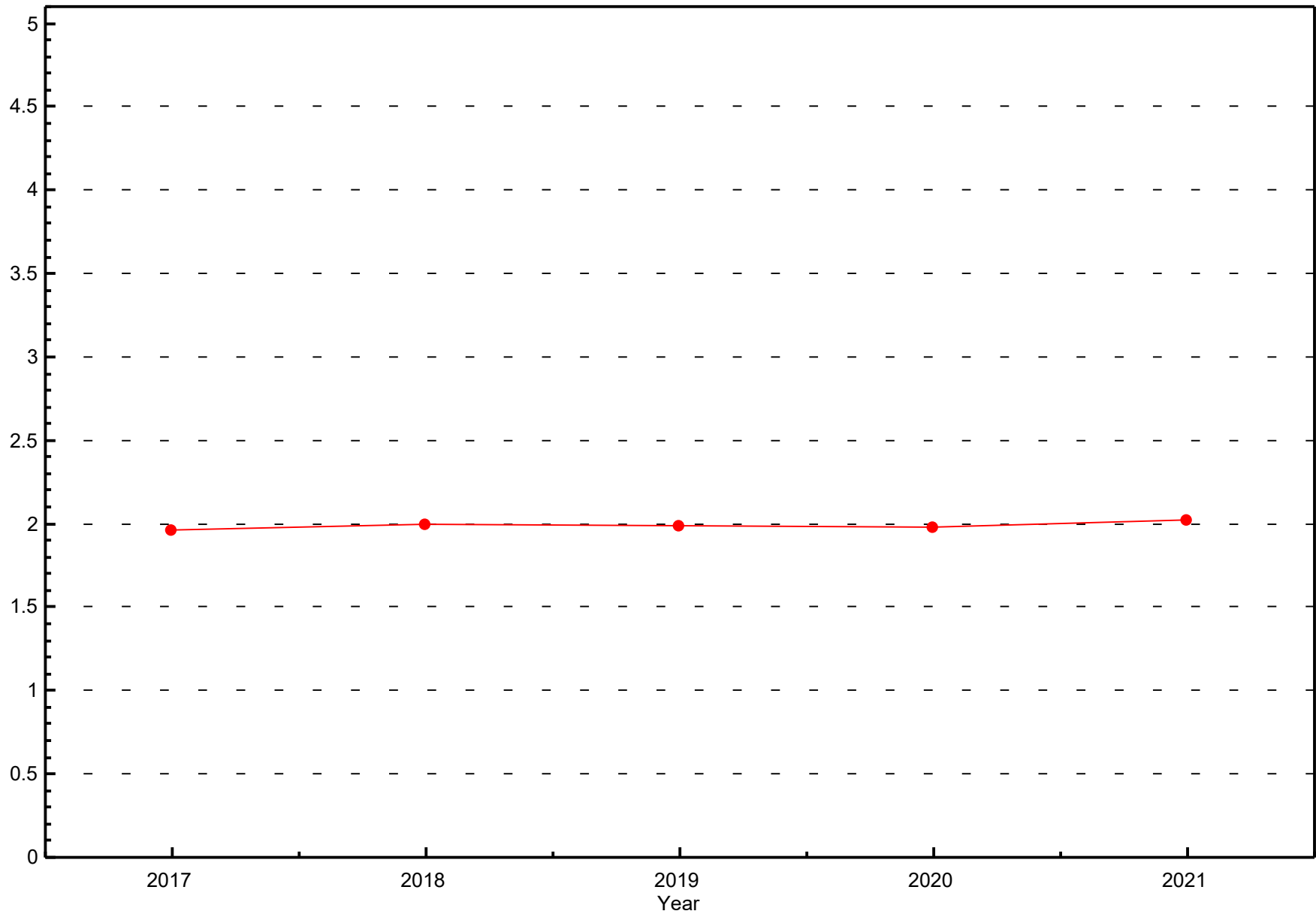
Methane (CH₄) - ppm
Fort McKay South (2017 to 2021)





Yearly Averages

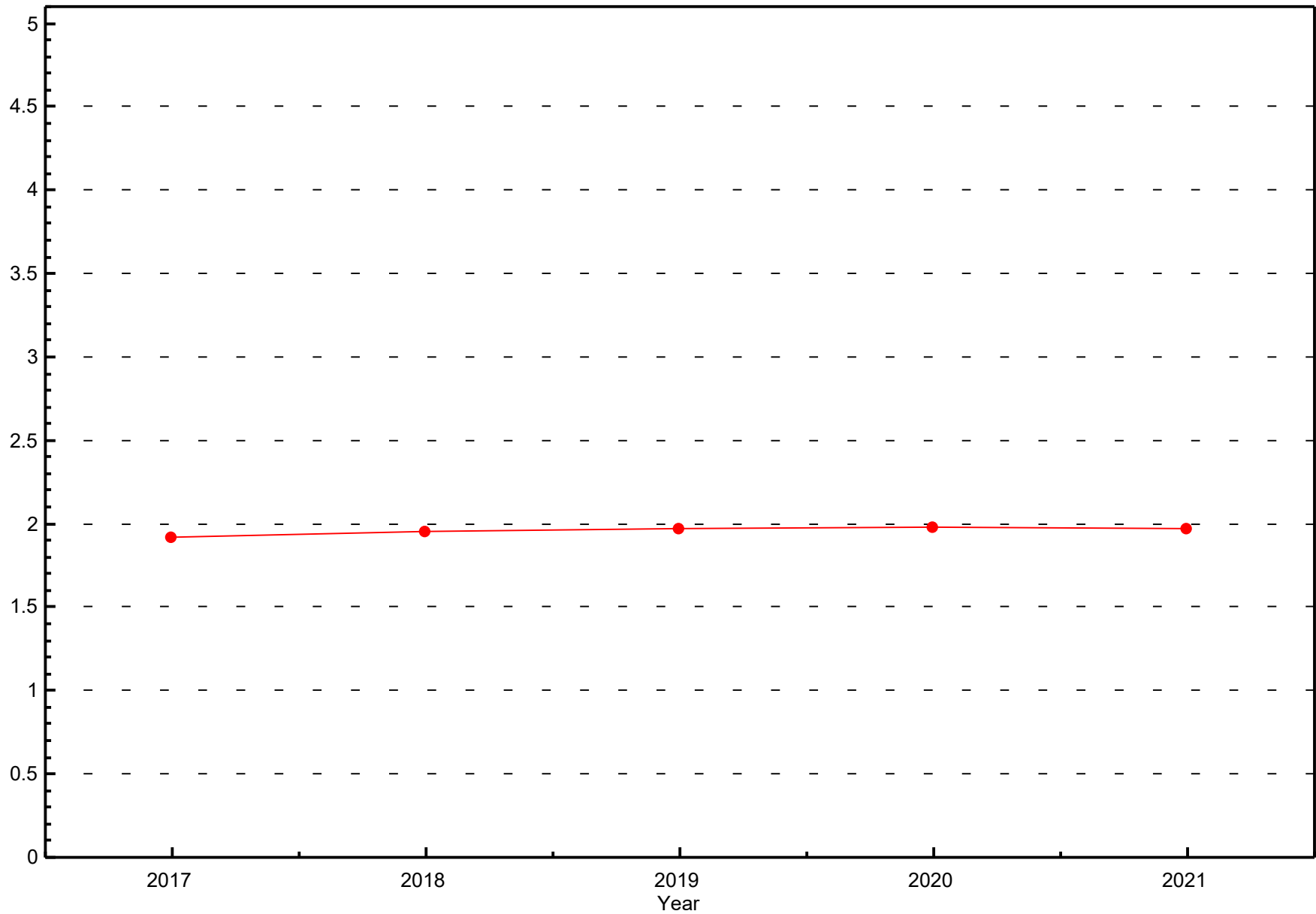
Methane (CH₄) - ppm
Anzac (2017 to 2021)





Yearly Averages

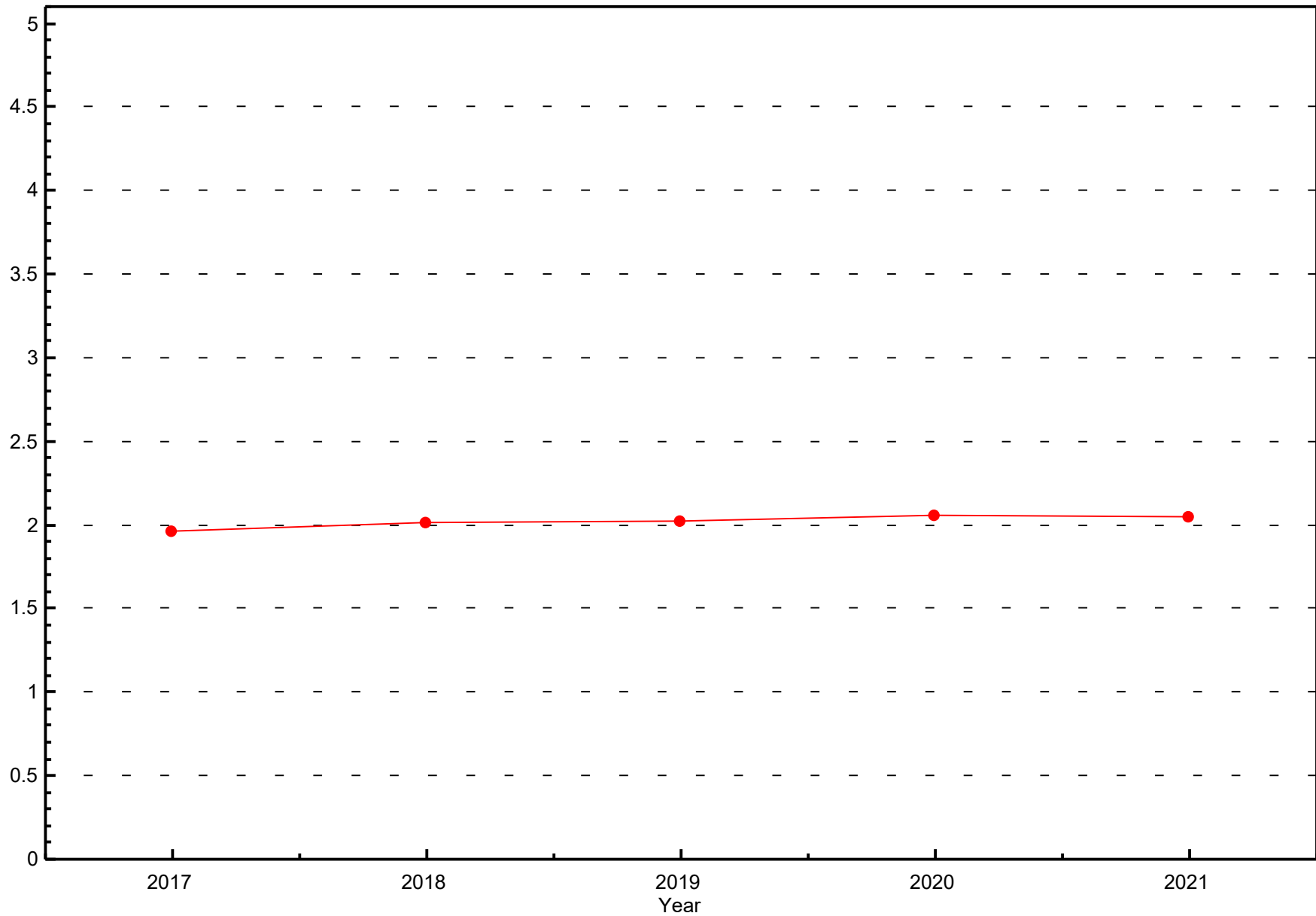
Methane (CH₄) - ppm
Stony Mountain (2017 to 2021)





Yearly Averages

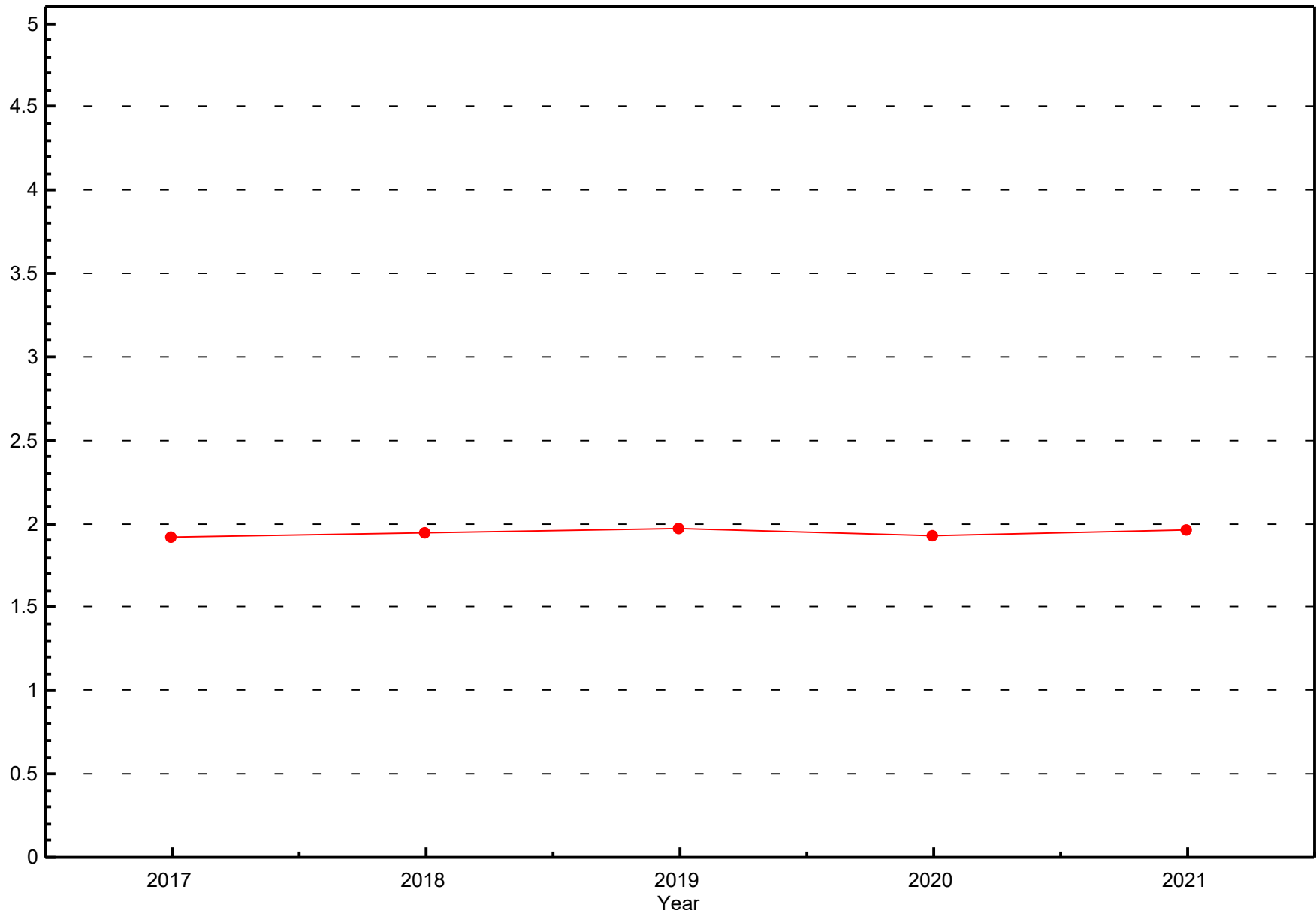
Methane (CH₄) - ppm
Conklin (2017 to 2021)





Yearly Averages

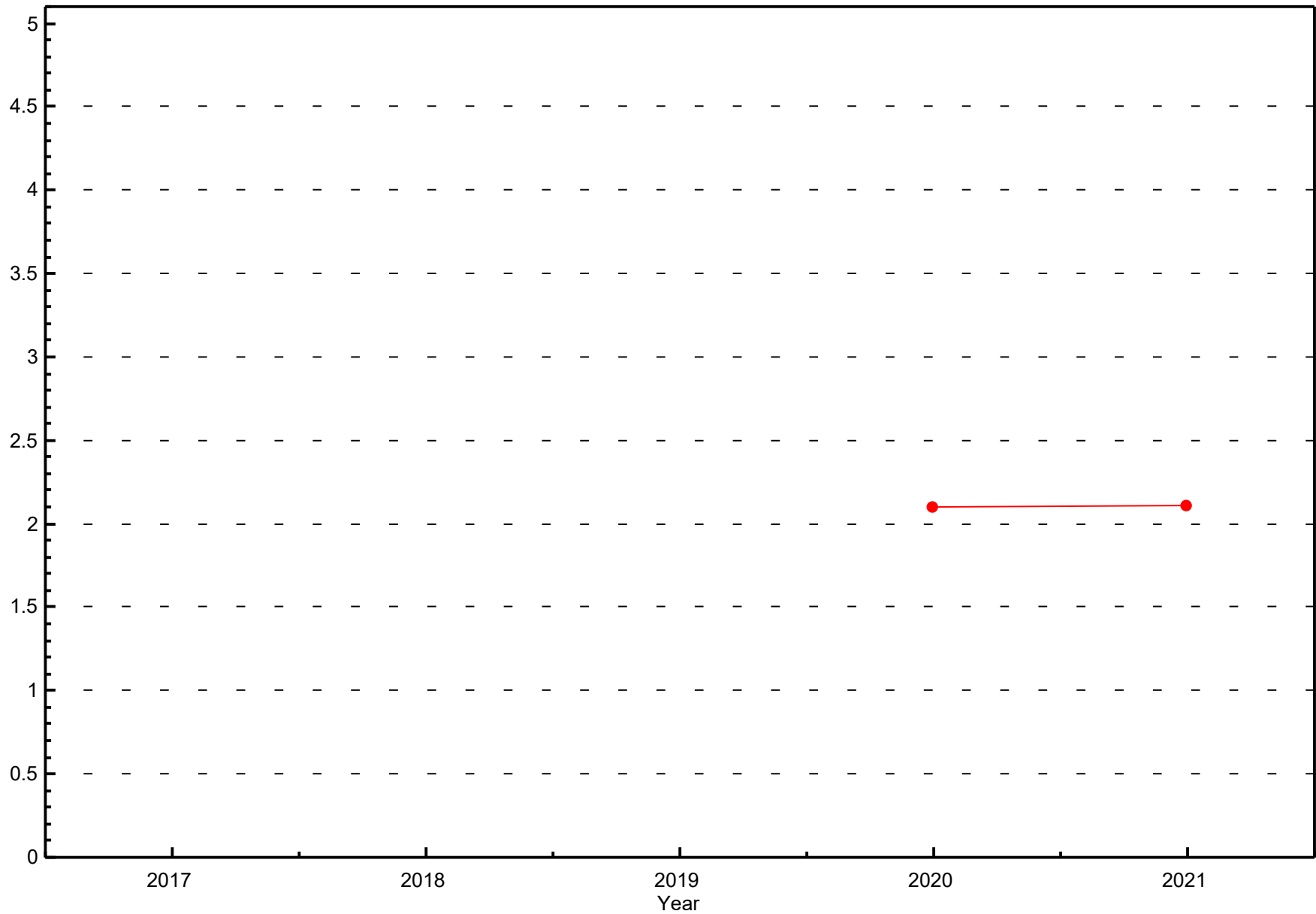
Methane (CH₄) - ppm
Janvier (2017 to 2021)





Yearly Averages

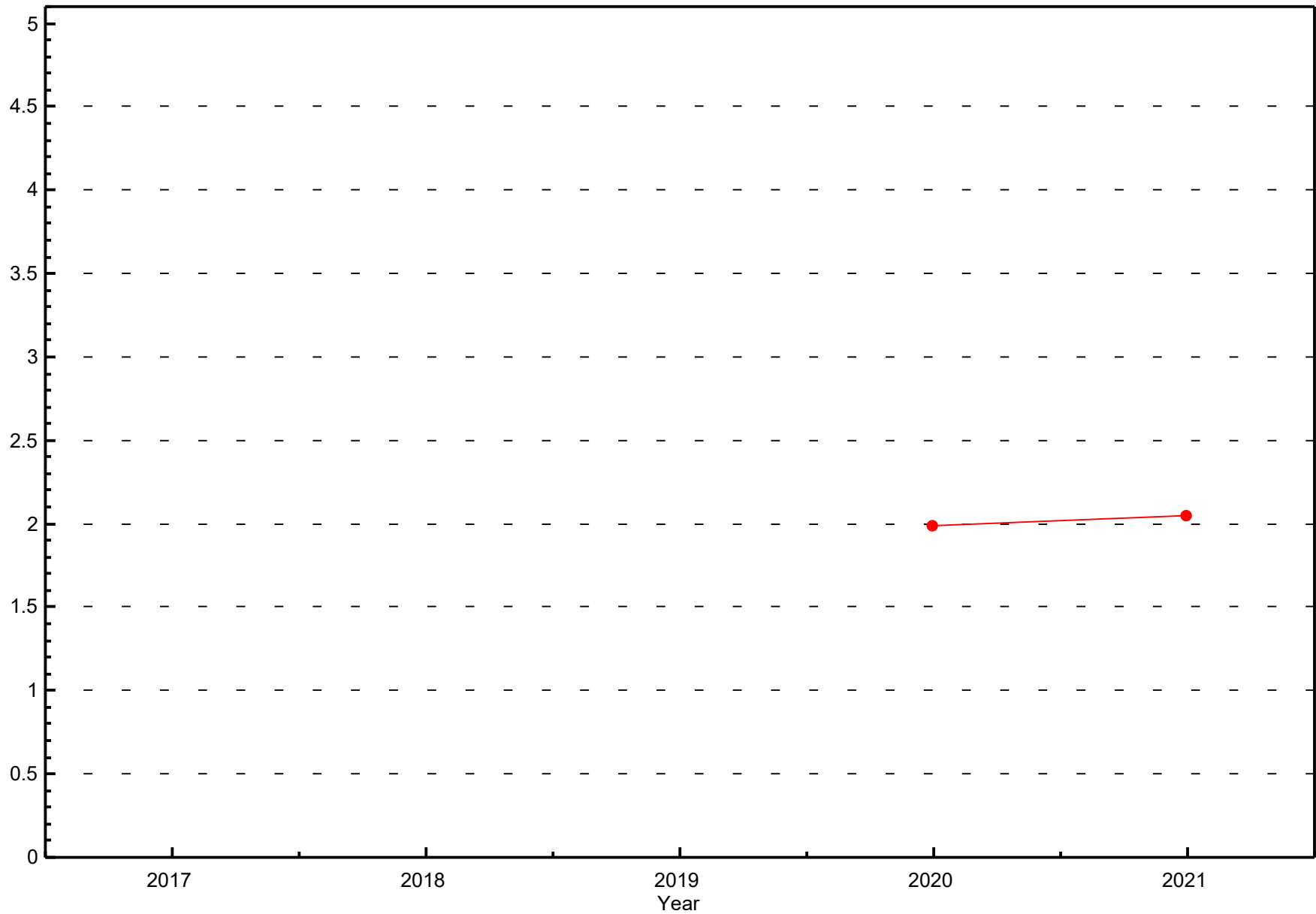
Methane (CH₄) - ppm
Fort Hills (2017 to 2021)





Yearly Averages

Methane (CH₄) - ppm
Ells River (2017 to 2021)





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

CARBON MONOXIDE ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Carbon Monoxide (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100	709	0.2	0.8	0.3
February	100	639	0.2	0.5	0.3
March	100	709	0.2	0.4	0.3
April	100	686	0.2	0.5	0.3
May	99	704	0.2	0.7	0.3
June	100	685	0.3	0.4	0.4
July	100	709	0.4	1.0	0.8
August	100	708	0.4	0.6	0.5
September	99	677	0.3	0.6	0.4
October	99	704	0.2	0.5	0.3
November	100	686	0.2	0.4	0.3
December	95	675	0.2	0.4	0.3
Annual	99	8291	0.3	1.0	0.8



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)
Annual Summary for the Year 2021
Carbon Monoxide (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	710	0.2	0.6	0.3
February	100	641	0.2	0.4	0.2
March	100	708	0.2	0.5	0.2
April	100	684	0.1	0.4	0.2
May	99	704	0.1	0.3	0.2
June	100	686	0.1	0.3	0.2
July	100	708	0.2	0.9	0.6
August	100	709	0.2	0.4	0.3
September	100	686	0.2	1.5	0.3
October	99	705	0.2	0.8	0.3
November	100	686	0.2	0.6	0.3
December	100	710	0.2	0.5	0.2
Annual	100	8337	0.2	1.5	0.6



Wood Buffalo Environmental Association - Fort Chipewyan (AMS08)
Annual Summary for the Year 2021
Carbon Monoxide (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	711	0.1	0.2	0.1
February	100	641	0.1	0.3	0.2
March	100	707	0.1	0.5	0.2
April	100	687	0.1	0.1	0.1
May	100	710	0.0	0.1	0.1
June	100	687	0.0	0.1	0.1
July	100	709	0.1	0.7	0.5
August	100	709	0.0	0.3	0.2
September	100	685	0.0	0.4	0.1
October	100	707	0.0	0.1	0.1
November	100	686	0.1	0.3	0.1
December	100	710	0.1	0.4	0.2
Annual	100	8349	0.1	0.7	0.5



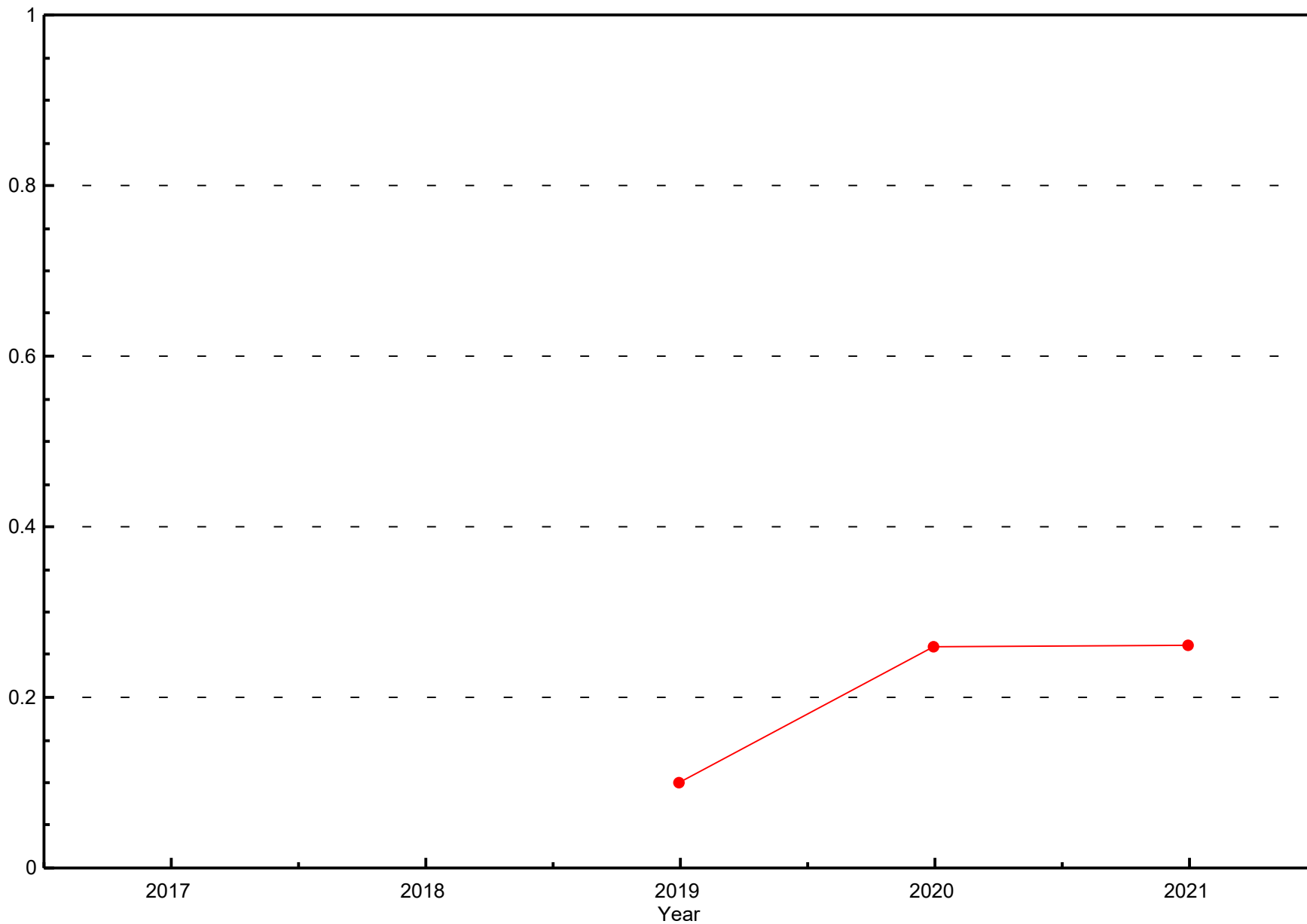
Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Carbon Monoxide (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	709	0.2	0.2	0.2
February	100	641	0.2	0.2	0.2
March	100	710	0.2	0.3	0.3
April	100	686	0.1	0.3	0.3
May	100	708	0.2	0.3	0.3
June	99	673	0.2	0.5	0.4
July	97	684	0.3	1.4	0.8
August	88	625	0.3	0.6	0.5
September	96	659	0.2	0.4	0.3
October	100	708	0.2	0.2	0.2
November	100	683	0.2	0.3	0.2
December	77	547	0.2	0.3	0.2
Annual	96	8033	0.2	1.4	0.8



Yearly Averages

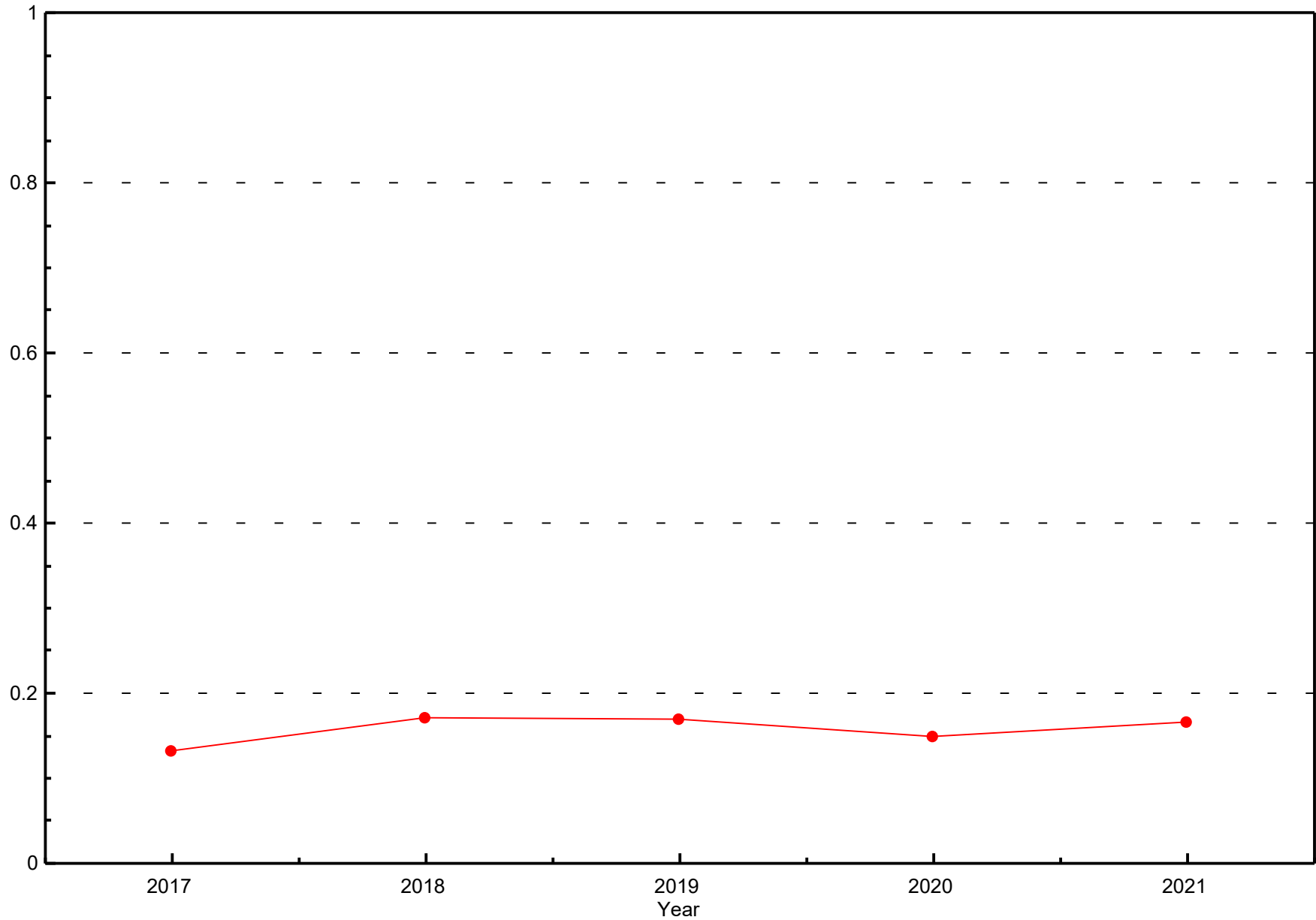
Carbon Monoxide (CO) - ppm
Fort McKay - Bertha Ganter (2017 to 2021)





Yearly Averages

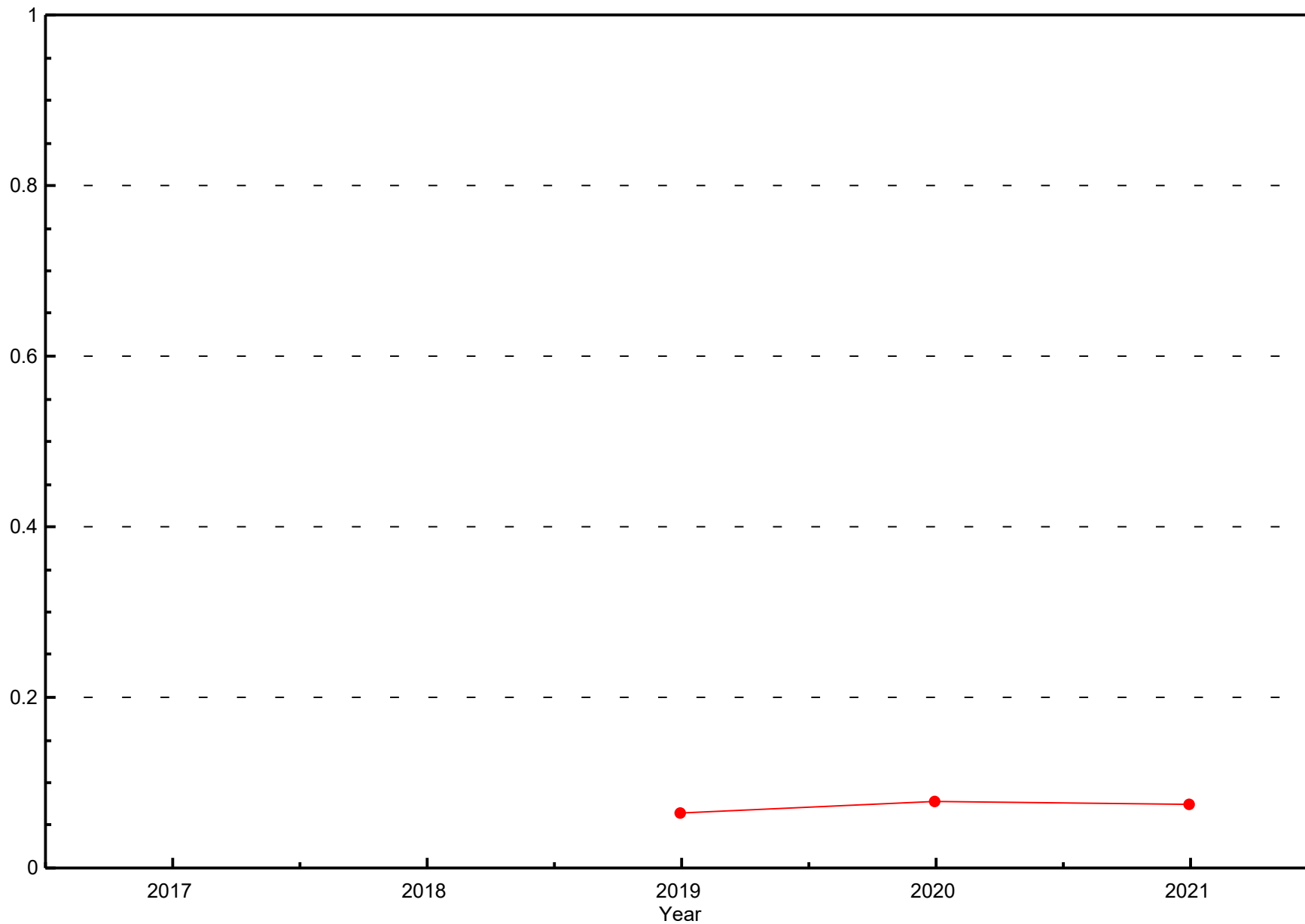
Carbon Monoxide (CO) - ppm
Athabasca Valley (2017 to 2021)





Yearly Averages

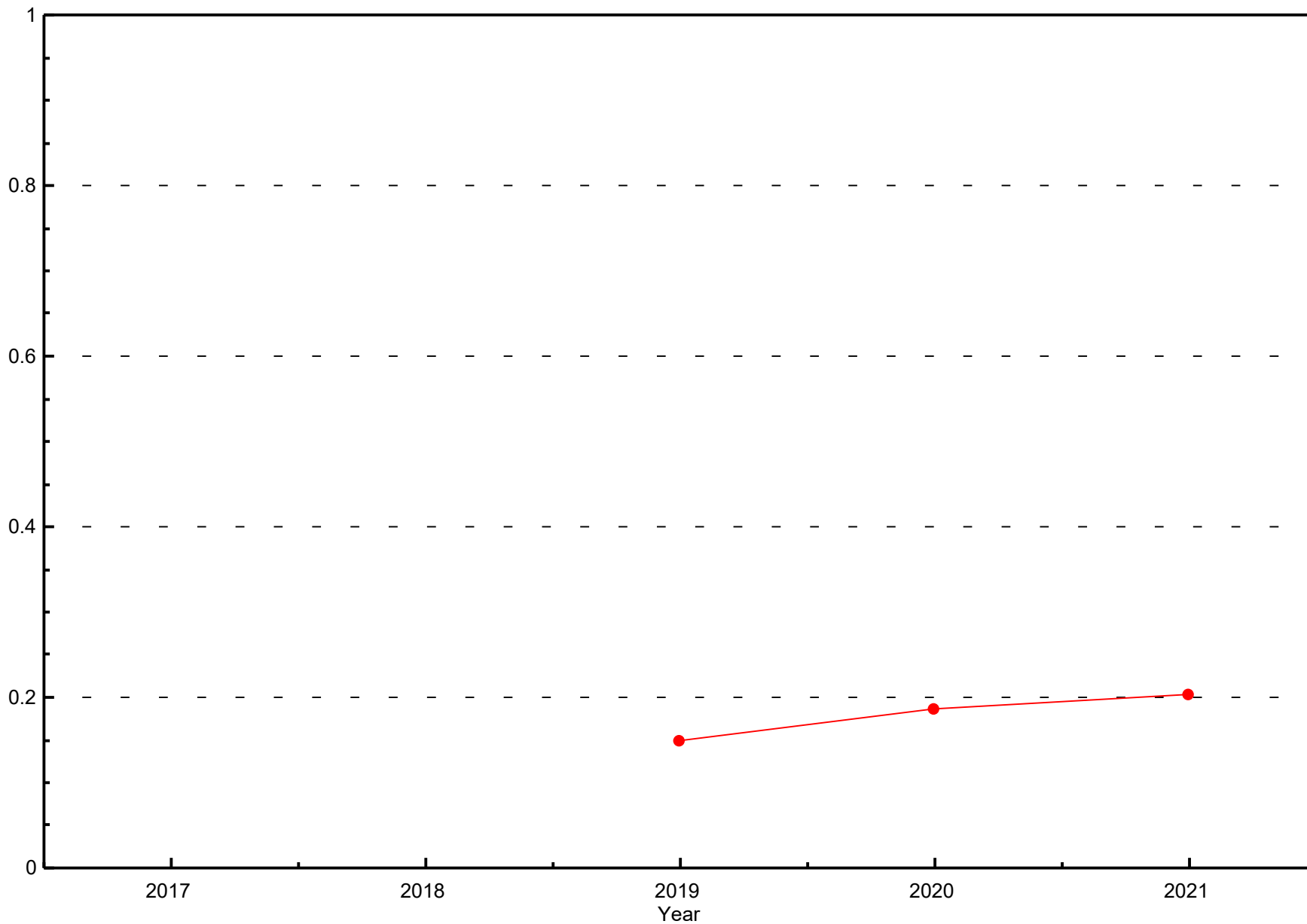
Carbon Monoxide (CO) - ppm
Fort Chipewyan (2017 to 2021)





Yearly Averages

Carbon Monoxide (CO) - ppm
Stony Mountain (2017 to 2021)





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

CARBON DIOXIDE ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Carbon Dioxide (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	709	435.8	469.0	450.6
February	100	639	433.7	594.5	451.9
March	100	709	434.4	463.5	442.6
April	100	685	432.2	461.1	440.5
May	99	704	430.1	477.0	438.5
June	100	685	434.7	534.5	451.1
July	100	708	429.4	544.7	452.7
August	99	704	426.7	546.3	452.4
September	98	670	436.4	520.7	462.8
October	100	707	430.3	489.8	446.9
November	100	684	435.4	469.5	453.2
December	100	707	436.7	483.8	460.3
Annual	100	8311	433.0	594.5	462.8



Wood Buffalo Environmental Association - Fort Chipewyan (AMS08)
Annual Summary for the Year 2021
Carbon Dioxide (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	709	415.2	442.5	422.5
February	100	638	413.0	425.2	422.0
March	100	708	413.2	451.9	421.4
April	100	685	411.3	420.1	416.1
May	99	705	408.9	418.1	413.2
June	100	686	402.9	426.0	412.1
July	100	709	396.2	429.9	408.8
August	100	707	397.8	436.7	412.5
September	100	684	397.2	434.9	408.7
October	100	706	406.8	426.6	418.2
November	100	685	419.3	443.1	435.9
December	100	710	432.0	451.2	443.2
Annual	100	8332	409.5	451.9	443.2



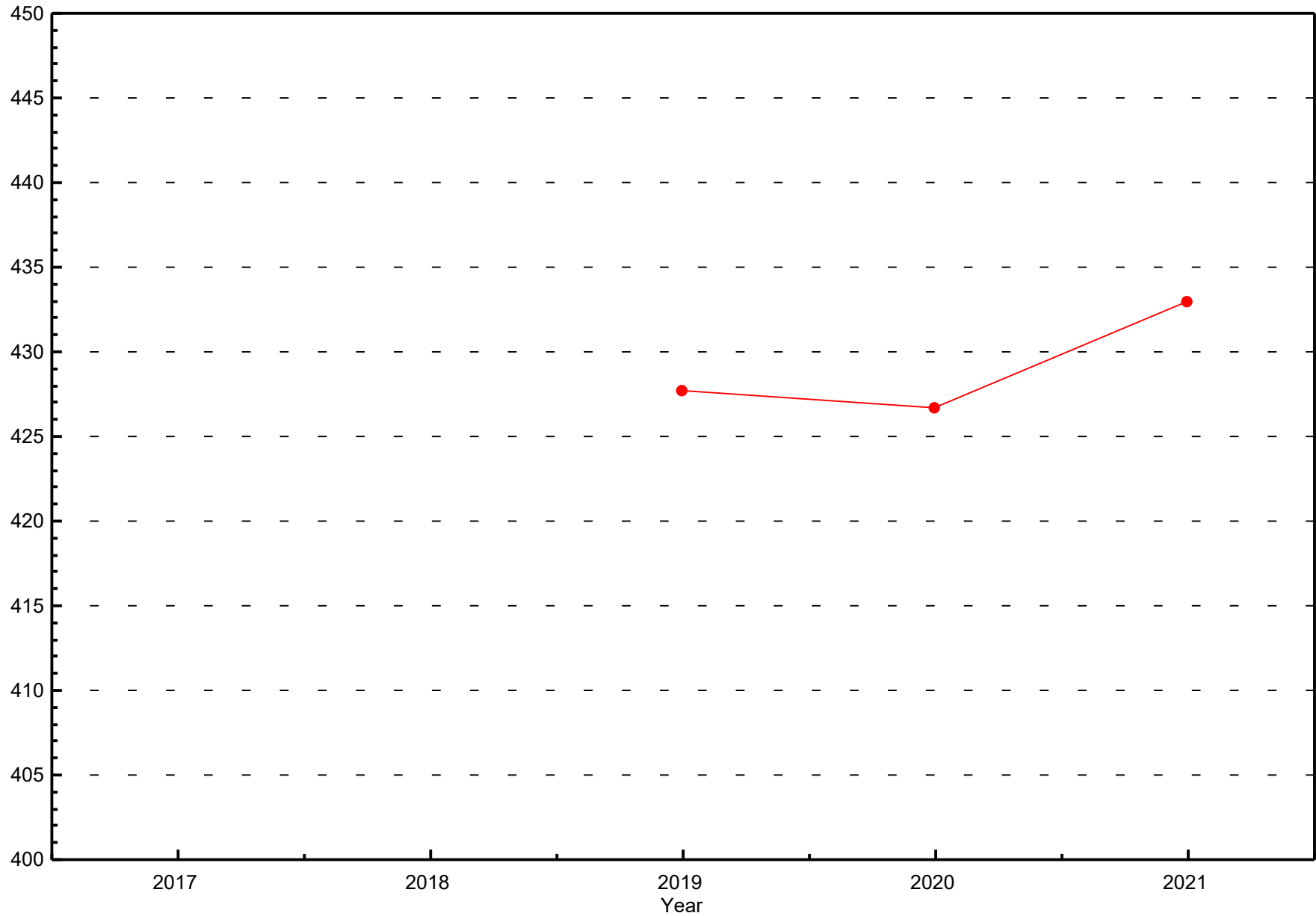
Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Carbon Dioxide (ppm) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	709	434.8	449.2	443.2
February	100	640	435.8	452.8	442.0
March	100	708	437.7	447.5	442.6
April	100	683	433.0	447.8	441.0
May	100	708	429.4	446.7	432.7
June	100	683	429.7	455.8	436.0
July	100	709	423.7	479.6	441.4
August	88	627	426.4	485.9	445.4
September	100	686	431.7	462.3	448.0
October	100	706	435.2	455.1	446.1
November	98	670	440.1	459.3	455.3
December	77	547	442.3	455.9	448.7
Annual	97	8076	433.2	485.9	455.3



Yearly Averages

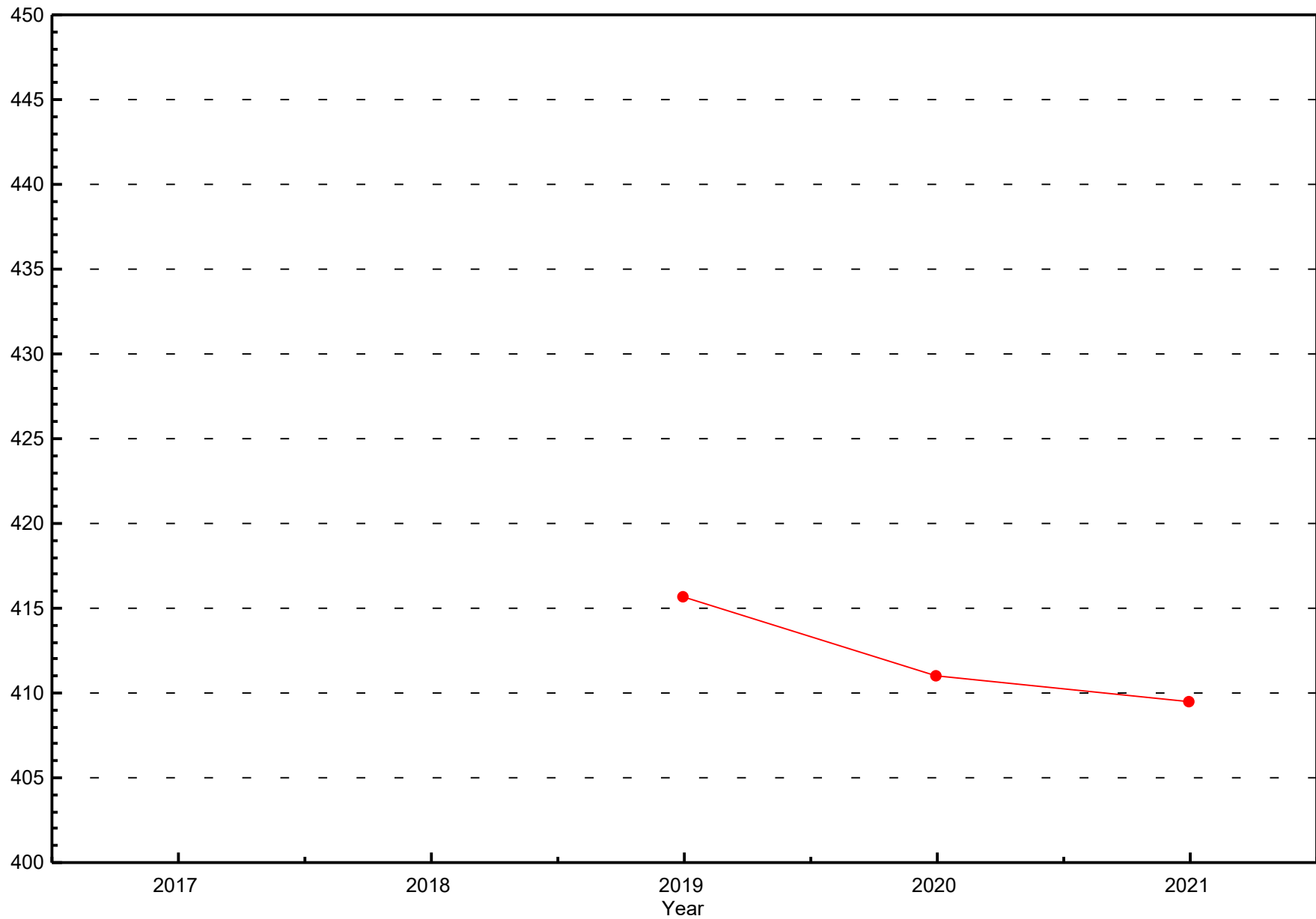
Carbon Dioxide (CO₂) - ppm
Fort McKay - Bertha Ganter (2017 to 2021)





Yearly Averages

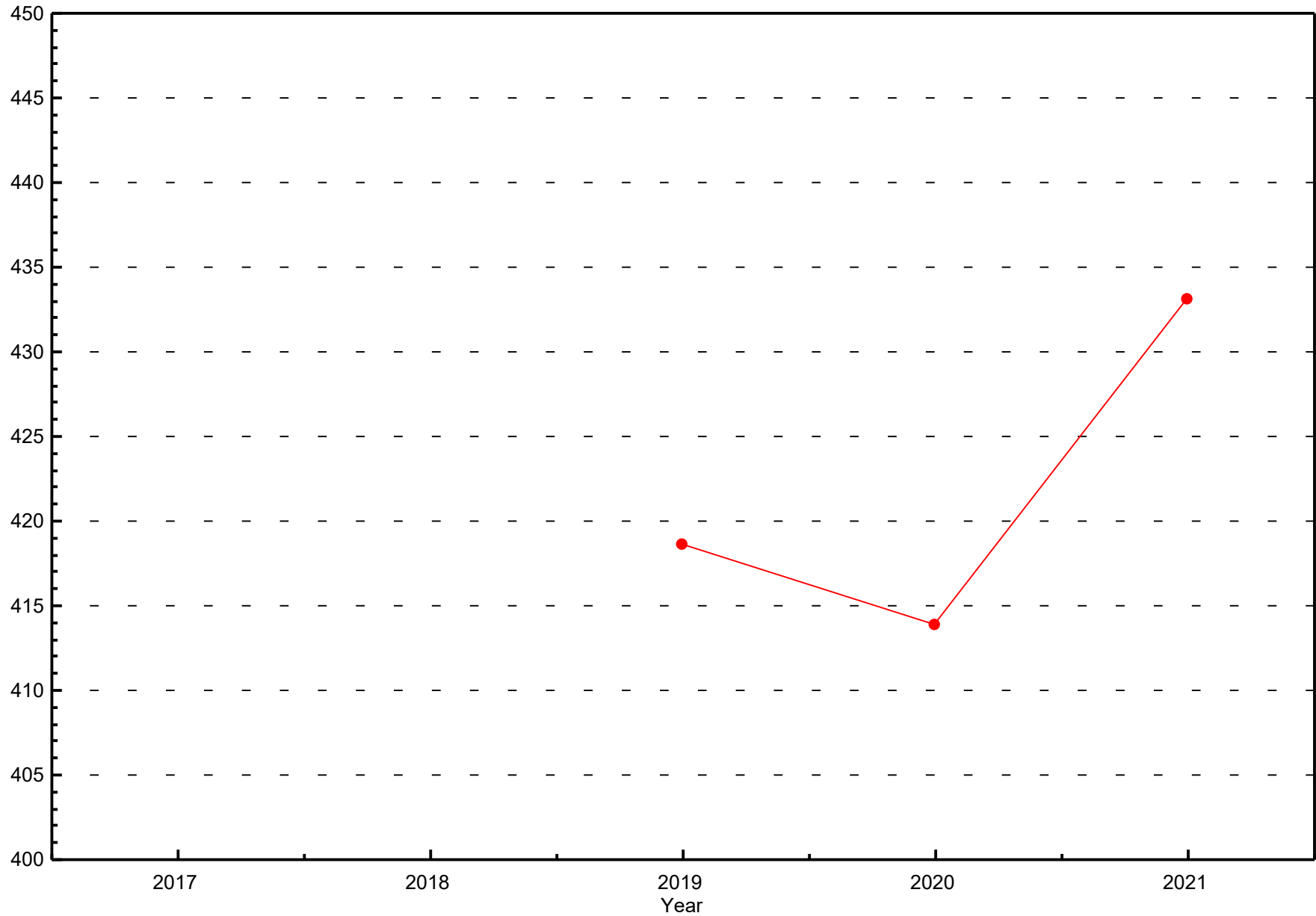
Carbon Dioxide (CO₂) - ppm
Fort Chipewyan (2017 to 2021)





Yearly Averages

Carbon Dioxide (CO₂) - ppm
Stony Mountain (2017 to 2021)





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM ANNUAL REPORT

AMMONIA ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Ammonia (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range		
							0 - 1000	1001 - 2000	> 2000
January	95	667	0.0	0.0	0	0.0	100.0	0.0	0.0
February	91	572	0.0	0.0	0	0.0	100.0	0.0	0.0
March	96	670	0.0	0.0	0	0.0	100.0	0.0	0.0
April	96	649	0.0	0.0	0	0.0	100.0	0.0	0.0
May	92	647	0.0	0.0	0	0.0	100.0	0.0	0.0
June	92	617	0.0	0.0	0	0.0	100.0	0.0	0.0
July	79	548	0.0	0.0	0	0.0	100.0	0.0	0.0
August	92	637	0.0	0.0	0	0.0	100.0	0.0	0.0
September	92	616	0.0	0.0	0	0.0	100.0	0.0	0.0
October	94	651	0.0	0.0	0	0.0	100.0	0.0	0.0
November	96	647	0.0	0.0	0	0.0	100.0	0.0	0.0
December	96	661	0.0	0.0	0	0.0	100.0	0.0	0.0
Annual	92	7582	0.0	0.0	0	0.0	100.0	0.0	0.0



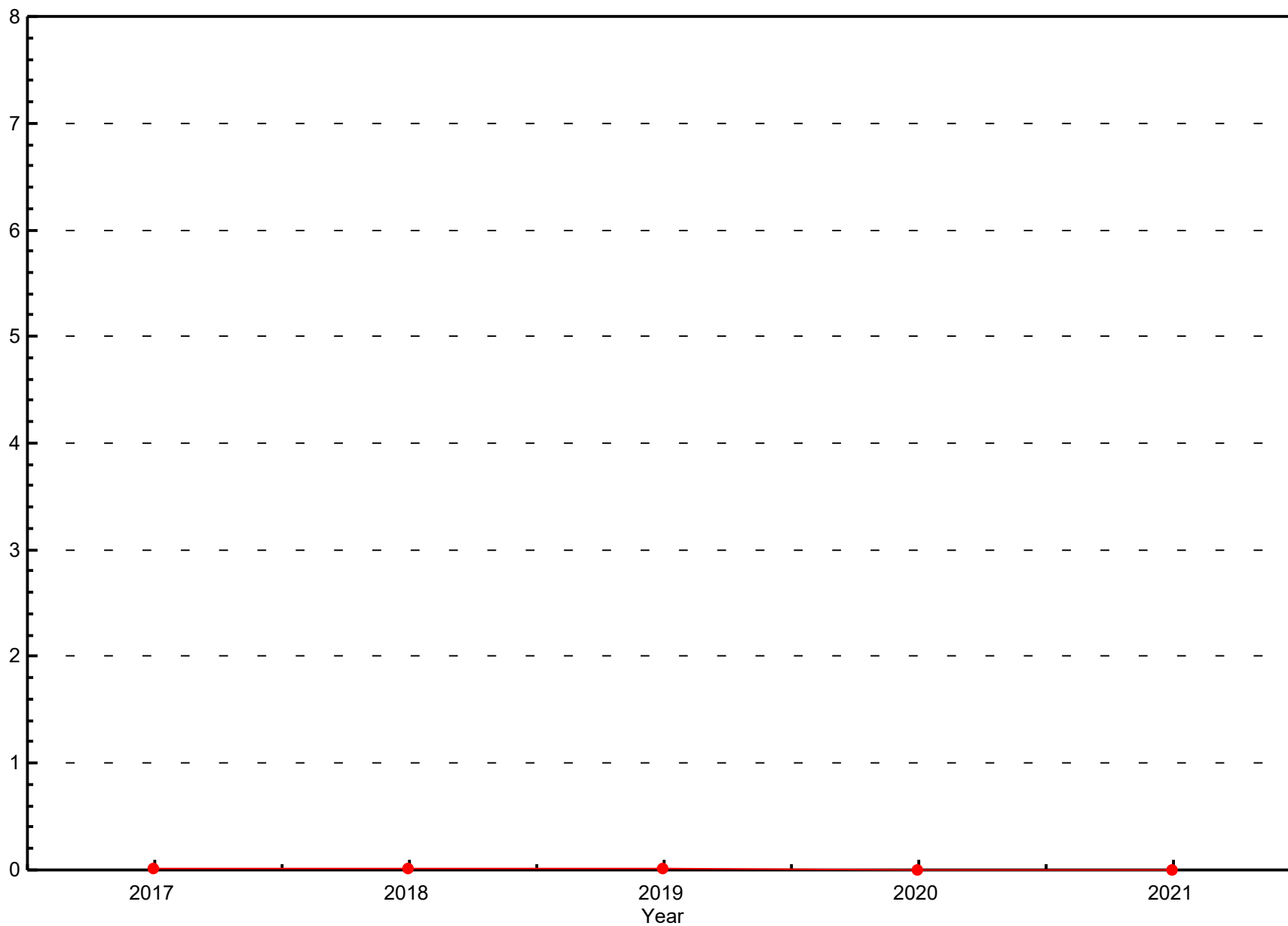
Wood Buffalo Environmental Association - Patricia McInnes (AMS06)
Annual Summary for the Year 2021
Ammonia (ppb) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	% of Data in Each Concentration Range		
							0 - 1000	1001 - 2000	> 2000
January	94	655	0.0	0.0	0	0.0	100.0	0.0	0.0
February	95	595	0.0	0.0	0	0.0	100.0	0.0	0.0
March	89	614	0.0	0.0	0	0.0	100.0	0.0	0.0
April	87	572	0.0	0.0	0	0.0	100.0	0.0	0.0
May	91	631	0.0	12.1	0	0.0	100.0	0.0	0.0
June	86	564	0.0	0.0	0	0.0	100.0	0.0	0.0
July	84	576	0.7	24.8	0	10.4	100.0	0.0	0.0
August	87	601	0.0	0.0	0	0.0	100.0	0.0	0.0
September	90	605	0.0	0.0	0	0.0	100.0	0.0	0.0
October	90	628	0.0	12.7	0	0.6	100.0	0.0	0.0
November	90	600	0.3	20.5	0	2.6	100.0	0.0	0.0
December	96	670	0.0	0.0	0	0.0	100.0	0.0	0.0
Annual	90	7311	0.1	24.8	0	10.4	100.0	0.0	0.0



Yearly Averages

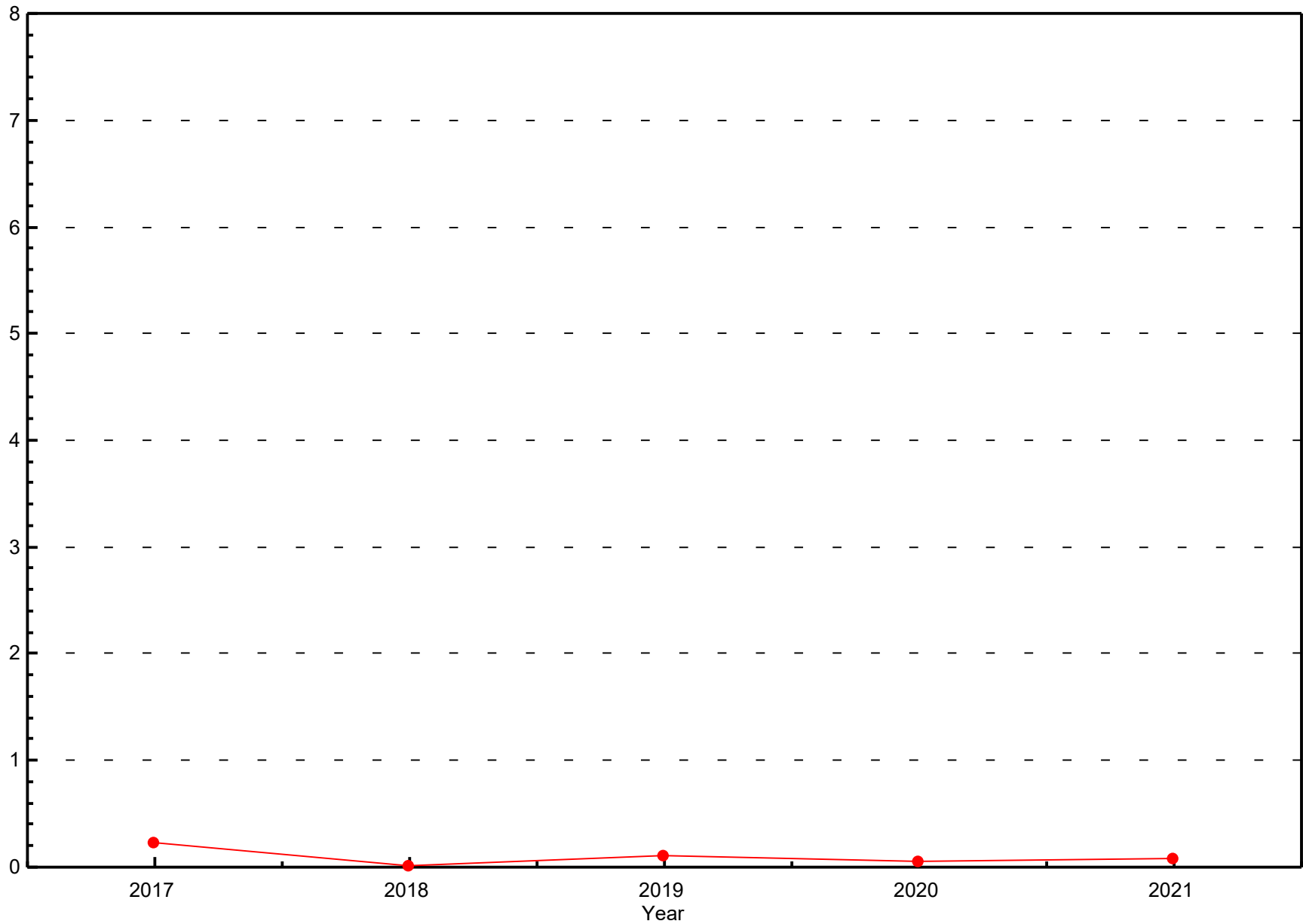
Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter (2017 to 2021)





Yearly Averages

Ammonia (NH₃) - ppb
Patricia McInnes (2017 to 2021)





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

PARTICULATE MATTER 2.5 ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
					1-Hour Objective		24-Hour Objective	0 - 5	6 - 10	11 - 20	21 - 30	>30
January	100	744	7.9	228.4	7	42.4	2	53.0	26.9	16.3	1.8	2.2
February	100	671	6.4	52.5	0	13.7	0	56.3	30.3	12.4	0.9	0.2
March	100	742	6.2	29.1	0	10.6	0	54.5	32.8	12.1	0.7	0.0
April	100	718	7.1	41.8	0	14.0	0	47.2	36.8	12.5	2.7	0.8
May	97	721	7.2	68.1	0	27.4	0	44.5	41.8	11.1	1.1	1.5
June	100	717	7.2	27.5	0	15.7	0	48.3	31.0	19.8	1.0	0.0
July	100	742	18.6	142.2	17	97.0	4	22.5	25.9	22.8	10.4	18.5
August	99	740	10.0	47.5	0	27.5	0	38.1	29.9	19.1	9.7	3.2
September	99	708	4.9	35.3	0	10.9	0	67.7	26.6	4.8	0.9	0.1
October	100	743	6.7	54.7	0	13.7	0	43.3	44.0	10.0	2.2	0.5
November	100	718	6.1	35.8	0	12.2	0	54.7	33.0	11.1	0.8	0.3
December	100	742	5.9	120.2	1	12.5	0	60.5	31.3	7.7	0.3	0.3
Annual	100	8706	7.9	228.4	25	97.0	6	48.9	32.6	13.4	2.7	2.4



Wood Buffalo Environmental Association - Buffalo Viewpoint (AMS04)
Annual Summary for the Year 2021
Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
					1-Hour Objective		24-Hour Objective	0 - 5	6 - 10	11 - 20	21 - 30	>30
January	100	744	5.8	167.3	3	36.9	1	67.1	20.3	10.8	1.1	0.8
February	100	672	5.4	32.3	0	14.3	0	66.8	22.8	9.4	0.9	0.2
March	100	743	4.6	35.8	0	8.7	0	74.0	22.8	3.0	0.1	0.1
April	100	719	6.2	66.0	0	15.6	0	59.1	32.3	6.7	1.1	0.8
May	100	743	6.9	149.9	2	38.7	1	58.4	31.8	7.4	0.7	1.8
June	99	714	7.7	59.4	0	17.8	0	42.0	35.6	19.6	2.1	0.7
July	100	744	19.9	172.1	20	94.8	6	18.2	27.4	23.8	9.8	20.8
August	100	743	11.3	59.2	0	31.5	2	32.3	37.0	14.9	8.2	7.5
September	100	720	5.6	33.2	0	12.7	0	62.1	29.6	7.6	0.6	0.1
October	96	715	5.5	27.5	0	10.3	0	60.4	31.9	7.1	0.6	0.0
November	100	720	4.7	26.4	0	12.7	0	67.2	27.9	4.2	0.7	0.0
December	100	743	5.2	30.2	0	10.5	0	65.4	28.8	5.4	0.4	0.0
Annual	100	8720	7.4	172.1	25	94.8	10	56.0	29.0	10.0	2.2	2.8



Wood Buffalo Environmental Association - Patricia McInnes (AMS06)

Annual Summary for the Year 2021

Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
					0 - 5		6 - 10	11 - 20	21 - 30	>30		
January	100	742	6.5	67.3	0	18.9	0	55.1	25.9	16.3	1.9	0.8
February	100	671	6.0	36.8	0	13.9	0	58.9	28.5	10.7	1.8	0.2
March	100	743	4.7	15.7	0	8.0	0	72.5	24.2	3.2	0.0	0.0
April	100	720	5.5	51.2	0	12.4	0	68.9	25.0	3.9	1.5	0.7
May	100	742	5.2	28.2	0	10.7	0	71.6	23.3	4.6	0.5	0.0
June	100	719	5.8	23.8	0	13.3	0	60.9	29.8	8.6	0.7	0.0
July	100	743	16.8	138.0	18	76.3	5	24.8	30.4	17.8	11.3	15.8
August	96	716	9.7	46.8	0	27.7	0	41.8	31.7	13.6	7.0	6.0
September	98	703	4.2	31.8	0	9.8	0	75.8	19.5	4.6	0.0	0.1
October	98	728	3.8	16.4	0	6.6	0	81.3	16.2	2.5	0.0	0.0
November	100	717	4.9	29.7	0	10.7	0	65.6	29.0	4.7	0.7	0.0
December	97	718	5.4	36.9	0	10.1	0	62.7	30.9	5.9	0.3	0.3
Annual	99	8662	6.6	138.0	18	76.3	5	61.4	26.3	8.1	2.2	2.0



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)

Annual Summary for the Year 2021

Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Number of Values		Number of Values		% of Data in Each Concentration Range				
				Maximum 1-Hour Value	Exceeding 1-Hour Objective	Maximum 24-Hour Value	Exceeding 24-Hour Objective	0 - 5	6 - 10	11 - 20	21 - 30	>30
January	100	743	7.6	69.7	0	21.3	0	45.1	31.5	20.7	2.4	0.3
February	100	672	8.3	53.6	0	23.8	0	38.0	41.1	17.4	1.8	1.8
March	100	744	7.3	31.8	0	12.8	0	39.0	43.3	16.7	0.9	0.1
April	100	719	6.3	29.6	0	11.0	0	47.4	43.4	8.6	0.6	0.0
May	100	742	4.9	24.2	0	12.4	0	72.9	24.1	2.8	0.1	0.0
June	100	720	6.2	23.1	0	13.4	0	52.2	36.4	10.8	0.6	0.0
July	100	743	17.3	146.3	17	84.1	4	22.8	31.5	17.4	11.6	16.8
August	100	744	9.3	42.7	0	26.6	0	39.9	35.6	12.8	7.0	4.7
September	98	707	4.5	19.7	0	10.3	0	72.6	23.8	3.7	0.0	0.0
October	99	740	4.8	30.1	0	8.7	0	72.6	22.4	4.2	0.8	0.0
November	100	720	5.2	27.0	0	12.0	0	63.1	29.7	6.3	1.0	0.0
December	100	743	5.1	34.0	0	11.6	0	68.8	27.7	3.2	0.0	0.3
Annual	100	8737	7.3	146.3	17	84.1	4	52.9	32.4	10.4	2.3	2.0



Wood Buffalo Environmental Association - Fort Chipewyan (AMS08)
Annual Summary for the Year 2021
Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
					0 - 5		6 - 10	11 - 20	21 - 30	>30		
January	100	743	2.7	14.2	0	10.0	0	87.2	10.8	2.0	0.0	0.0
February	100	671	3.4	33.8	0	7.5	0	90.3	8.5	0.6	0.5	0.2
March	100	742	3.9	60.9	0	10.6	0	91.1	6.6	1.2	0.7	0.4
April	100	719	3.0	10.7	0	6.1	0	96.0	3.8	0.3	0.0	0.0
May	100	743	2.9	10.6	0	6.3	0	95.4	4.4	0.1	0.0	0.0
June	100	718	3.7	17.4	0	12.7	0	85.1	11.7	3.2	0.0	0.0
July	100	743	11.4	121.1	5	59.4	3	47.5	18.6	20.5	5.5	7.9
August	100	743	6.8	71.3	0	36.6	1	62.5	20.2	11.2	4.0	2.2
September	100	718	3.0	43.9	0	16.7	0	93.0	4.9	1.1	0.3	0.7
October	100	739	2.6	13.2	0	6.5	0	93.9	5.7	0.4	0.0	0.0
November	100	719	3.8	16.5	0	9.8	0	76.9	20.2	2.9	0.0	0.0
December	100	743	3.6	11.8	0	7.7	0	84.3	15.1	0.7	0.0	0.0
Annual	100	8741	4.2	121.1	5	59.4	4	83.4	10.9	3.7	0.9	1.0



Wood Buffalo Environmental Association - Barge Landing (AMS09)
Annual Summary for the Year 2021
Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
					1 - 10		11 - 20	21 - 30	>30	0 - 5	6 - 10	11 - 20
January	100	739	8.4	269.1	10	80.5	2	64.8	21.8	7.0	3.8	2.6
February	100	670	8.3	36.1	0	20.1	0	44.3	28.5	22.2	4.6	0.3
March	99	739	9.1	35.8	0	16.0	0	28.2	42.0	25.6	3.8	0.5
April	100	719	8.0	144.3	1	20.0	0	40.2	41.0	13.9	3.5	1.4
May	98	730	9.4	130.0	3	36.1	1	27.7	48.1	19.2	2.6	2.5
June	100	718	8.5	29.2	0	17.4	0	37.3	32.9	26.7	3.1	0.0
July	100	743	18.1	148.6	17	96.0	4	23.0	24.4	24.6	11.3	16.7
August	89	659	8.6	217.4	2	22.8	0	49.0	30.2	12.9	6.5	1.4
September	100	716	5.0	30.8	0	9.0	0	64.0	28.8	5.6	1.4	0.3
October	100	743	5.8	48.8	0	14.4	0	57.9	32.4	7.5	1.4	0.8
November	100	717	5.7	22.8	0	12.4	0	52.9	37.8	8.9	0.4	0.0
December	100	743	6.8	29.8	0	13.0	0	48.9	37.4	12.9	0.8	0.0
Annual	99	8636	8.5	269.1	33	96.0	7	55.3	33.9	9.3	1.1	0.4



Wood Buffalo Environmental Association - Fort McKay South (AMS13)

Annual Summary for the Year 2021

Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
					1		1	0 - 5	6 - 10	11 - 20	21 - 30	>30
January	100	742	6.3	93.3	1	30.8	1	64.0	20.8	12.7	0.9	1.6
February	100	672	5.2	18.8	0	13.8	0	66.7	25.9	7.4	0.0	0.0
March	100	742	5.4	26.3	0	9.4	0	64.7	27.9	7.0	0.4	0.0
April	98	707	5.5	27.5	0	10.5	0	58.6	34.9	5.7	0.9	0.0
May	99	739	6.6	36.9	0	15.7	0	44.7	44.1	10.4	0.5	0.3
June	100	719	8.2	33.9	0	19.6	0	43.0	29.4	23.5	3.8	0.4
July	100	744	20.3	161.3	19	108.3	6	19.2	26.2	24.5	8.9	21.2
August	99	738	10.7	57.5	0	30.9	1	36.6	28.7	19.9	9.6	5.2
September	99	710	5.0	25.7	0	10.2	0	63.9	31.6	3.8	0.7	0.0
October	100	743	5.4	26.5	0	9.9	0	55.9	38.2	5.0	0.9	0.0
November	100	719	4.8	18.6	0	10.0	0	65.5	30.3	4.2	0.0	0.0
December	100	740	4.3	22.4	0	8.4	0	79.6	17.7	2.4	0.3	0.0
Annual	100	8715	7.4	161.3	20	108.3	8	54.9	29.7	10.7	2.3	2.5



Wood Buffalo Environmental Association - Anzac (AMS14)
Annual Summary for the Year 2021
Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Number of Values		Number of Values		% of Data in Each Concentration Range				
				Maximum 1-Hour Value	Exceeding 1-Hour Objective	Maximum 24-Hour Value	Exceeding 24-Hour Objective	0 - 5	6 - 10	11 - 20	21 - 30	>30
January	100	743	4.4	52.0	0	13.1	0	73.4	16.0	10.0	0.5	0.1
February	100	669	4.0	19.8	0	11.6	0	80.6	16.1	3.3	0.0	0.0
March	100	742	3.6	19.8	0	7.3	0	89.5	9.6	0.9	0.0	0.0
April	100	719	3.5	21.4	0	5.4	0	91.2	8.3	0.3	0.1	0.0
May	100	741	3.8	120.6	1	10.2	0	91.1	8.0	0.7	0.1	0.1
June	100	718	5.3	23.8	0	12.7	0	65.7	26.7	7.4	0.1	0.0
July	100	742	17.8	148.2	20	82.7	6	27.0	28.6	16.4	8.9	19.1
August	100	741	9.6	52.7	0	31.3	1	48.0	26.5	11.3	7.8	6.3
September	100	717	3.5	19.9	0	7.7	0	87.6	10.0	2.4	0.0	0.0
October	99	737	3.3	39.7	0	5.9	0	89.2	10.5	0.1	0.1	0.1
November	97	696	3.8	51.3	0	11.8	0	79.9	17.8	1.6	0.3	0.4
December	100	741	4.4	24.0	0	10.9	0	78.1	19.4	2.3	0.1	0.0
Annual	100	8706	5.6	148.2	21	82.7	7	74.5	16.6	5.0	1.6	2.3



Wood Buffalo Environmental Association - Wapasu (AMS17)
Annual Summary for the Year 2021
Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 5	6 - 10	11 - 20	21 - 30	>30
January	100	742	3.9	20.4	0	14.6	0	77.6	13.9	8.5	0.0	0.0
February	100	671	3.2	12.7	0	9.4	0	90.8	8.2	1.0	0.0	0.0
March	100	743	3.6	22.7	0	6.4	0	89.4	10.4	0.1	0.1	0.0
April	97	697	3.5	21.9	0	6.4	0	91.3	7.8	0.9	0.1	0.0
May	100	743	3.7	16.0	0	6.7	0	87.2	12.0	0.8	0.0	0.0
June	100	719	5.9	22.6	0	13.6	0	61.8	25.0	12.8	0.4	0.0
July	100	743	15.8	152.4	18	93.4	5	28.7	23.4	26.2	8.9	12.8
August	97	721	10.5	67.5	0	41.0	3	52.0	22.3	8.6	8.7	8.3
September	98	706	3.7	39.4	0	6.7	0	86.0	12.6	1.1	0.0	0.3
October	100	743	3.5	18.2	0	6.9	0	85.5	13.9	0.7	0.0	0.0
November	100	718	3.6	14.6	0	6.6	0	81.9	16.6	1.5	0.0	0.0
December	100	743	4.1	82.4	1	11.5	0	84.0	13.2	2.3	0.1	0.4
Annual	99	8689	5.5	152.4	19	93.4	8	75.9	15.1	5.5	1.6	1.9



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 5	6 - 10	11 - 20	21 - 30	>30
January	100	742	4.5	25.1	0	15.0	0	72.6	13.2	12.9	1.2	0.0
February	100	667	3.5	19.7	0	12.7	0	87.7	8.3	4.1	0.0	0.0
March	100	742	3.2	13.1	0	8.2	0	89.4	9.2	1.5	0.0	0.0
April	100	717	3.2	8.1	0	5.8	0	92.6	7.4	0.0	0.0	0.0
May	100	741	3.5	10.4	0	4.9	0	94.2	5.8	0.0	0.0	0.0
June	100	718	4.7	17.9	0	12.5	0	70.3	25.1	4.6	0.0	0.0
July	100	743	20.3	194.0	34	95.1	7	26.9	25.3	21.0	8.2	18.6
August	99	736	10.3	68.7	0	36.9	3	51.9	21.2	11.0	5.7	10.2
September	100	717	3.1	15.0	0	7.9	0	91.6	7.0	1.4	0.0	0.0
October	100	743	3.3	17.1	0	8.9	0	83.9	14.0	2.2	0.0	0.0
November	100	717	4.0	17.7	0	9.8	0	74.2	22.9	2.9	0.0	0.0
December	100	743	4.2	21.7	0	10.4	0	77.9	18.3	3.6	0.1	0.0
Annual	100	8726	5.7	194.0	34	95.1	10	77.7	19.2	3.1	0.1	0.0



Wood Buffalo Environmental Association - Conklin (AMS21)
Annual Summary for the Year 2021
Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 5	6 - 10	11 - 20	21 - 30	>30
January	100	743	5.5	39.8	0	19.4	0	65.1	18.6	14.1	1.9	0.3
February	100	672	4.3	22.1	0	15.1	0	80.1	13.2	6.3	0.5	0.0
March	100	743	4.1	19.7	0	7.5	0	79.1	18.3	2.6	0.0	0.0
April	100	720	5.4	110.3	1	11.9	0	72.1	19.7	6.1	1.5	0.6
May	100	742	6.3	120.8	2	16.0	0	68.3	21.8	6.6	1.8	1.5
June	100	719	6.1	95.8	1	15.1	0	63.0	26.4	7.9	1.7	1.0
July	100	743	21.1	193.3	34	93.8	7	23.8	25.2	22.5	8.3	20.2
August	100	743	10.5	78.2	0	31.8	1	42.1	28.9	13.1	8.6	7.3
September	100	718	4.1	34.7	0	7.9	0	81.9	14.2	3.6	0.1	0.1
October	97	722	4.9	74.2	0	17.1	0	74.8	19.0	3.9	1.3	1.1
November	97	698	5.2	39.4	0	12.7	0	65.9	24.8	8.3	0.9	0.1
December	100	743	5.0	72.5	0	13.6	0	72.7	21.0	5.3	0.5	0.5
Annual	100	8706	6.9	193.3	38	93.8	8	65.4	21.1	8.5	2.3	2.7



Wood Buffalo Environmental Association - Janvier (AMS22)
Annual Summary for the Year 2021
Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Number of Values		Number of Values		% of Data in Each Concentration Range				
				Maximum 1-Hour Value	Exceeding 1-Hour Objective	Maximum 24-Hour Value	Exceeding 24-Hour Objective	0 - 5	6 - 10	11 - 20	21 - 30	>30
January	100	743	6.5	31.3	0	18.5	0	60.3	17.8	18.8	2.8	0.3
February	100	671	5.0	50.3	0	13.8	0	75.7	17.1	6.3	0.5	0.5
March	100	742	5.1	75.9	0	11.1	0	71.2	22.9	5.3	0.3	0.4
April	100	719	6.0	122.0	2	26.4	0	64.5	30.9	2.9	0.6	1.1
May	100	741	5.2	21.9	0	8.4	0	65.2	31.9	2.7	0.3	0.0
June	100	718	7.0	19.8	0	14.9	0	39.8	43.0	17.1	0.0	0.0
July	100	742	24.1	213.4	37	91.2	8	15.8	24.1	23.1	10.7	26.4
August	100	741	13.8	91.7	1	46.3	5	28.1	35.6	16.5	5.8	14.0
September	100	717	4.9	36.7	0	11.3	0	73.8	20.2	5.9	0.0	0.1
October	100	742	5.6	93.4	1	12.3	0	64.3	28.7	5.4	0.9	0.7
November	100	718	5.8	24.5	0	13.2	0	58.9	29.7	11.1	0.3	0.0
December	100	742	6.0	30.0	0	15.6	0	57.7	34.1	5.9	2.3	0.0
Annual	100	8736	8.0	213.4	41	91.2	13	60.7	30.3	7.6	1.1	0.3



Wood Buffalo Environmental Association - Fort Hills (AMS23)
Annual Summary for the Year 2021
Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
					1-Hour Objective		24-Hour Objective	0 - 5	6 - 10	11 - 20	21 - 30	>30
January	100	744	9.1	224.4	5	52.5	2	50.0	24.6	18.8	3.4	3.2
February	100	672	7.7	48.8	0	18.3	0	48.4	28.0	20.4	2.7	0.6
March	97	725	7.4	47.0	0	16.6	0	53.0	24.1	19.2	3.3	0.4
April	100	716	5.6	49.0	0	13.3	0	66.3	23.3	8.0	1.5	0.8
May	100	743	6.3	46.0	0	13.7	0	59.1	29.7	7.8	2.7	0.7
June	97	696	7.1	50.1	0	17.5	0	54.0	25.4	18.3	2.0	0.3
July	100	744	20.0	163.7	21	100.4	4	21.6	25.5	23.9	9.4	19.5
August	100	742	10.5	56.8	0	30.7	2	42.1	27.5	15.2	10.0	5.3
September	100	718	5.2	41.1	0	10.5	0	69.2	23.4	5.0	2.0	0.4
October	100	742	8.3	137.8	5	24.3	0	53.8	27.5	11.7	3.0	4.0
November	97	695	5.2	35.5	0	12.5	0	61.9	31.7	5.8	0.6	0.1
December	93	690	5.2	20.6	0	9.8	0	63.2	29.9	6.8	0.1	0.0
Annual	99	8627	8.2	224.4	31	100.4	8	53.3	26.7	13.5	3.5	3.1



Wood Buffalo Environmental Association - Surmont 2 (AMS29)

Annual Summary for the Year 2021

Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
					1		7	0 - 5	6 - 10	11 - 20	21 - 30	>30
January	100	742	3.6	19.0	0	10.6	0	79.4	15.4	5.3	0.0	0.0
February	100	670	3.2	17.0	0	10.5	0	92.1	6.4	1.5	0.0	0.0
March	100	743	3.2	9.4	0	6.2	0	91.1	8.9	0.0	0.0	0.0
April	100	718	4.9	100.1	1	15.2	0	79.0	15.3	3.6	0.7	1.4
May	99	733	4.3	63.3	0	10.9	0	86.0	9.6	3.0	0.6	1.0
June	100	719	4.5	21.5	0	9.9	0	75.2	23.1	1.4	0.3	0.0
July	100	743	16.3	133.8	10	65.8	5	27.6	28.7	18.2	10.9	14.7
August	100	742	9.7	94.3	1	30.4	2	53.4	22.0	10.5	7.6	6.6
September	100	719	3.5	29.0	0	7.6	0	88.2	10.0	1.7	0.1	0.0
October	100	742	2.9	43.5	0	7.2	0	93.4	6.1	0.1	0.1	0.3
November	100	717	3.3	48.1	0	9.1	0	85.6	13.1	0.7	0.1	0.4
December	100	743	3.7	16.3	0	8.9	0	86.3	12.3	1.5	0.0	0.0
Annual	100	8731	5.3	133.8	12	65.8	7	77.8	14.4	4.1	1.7	2.1



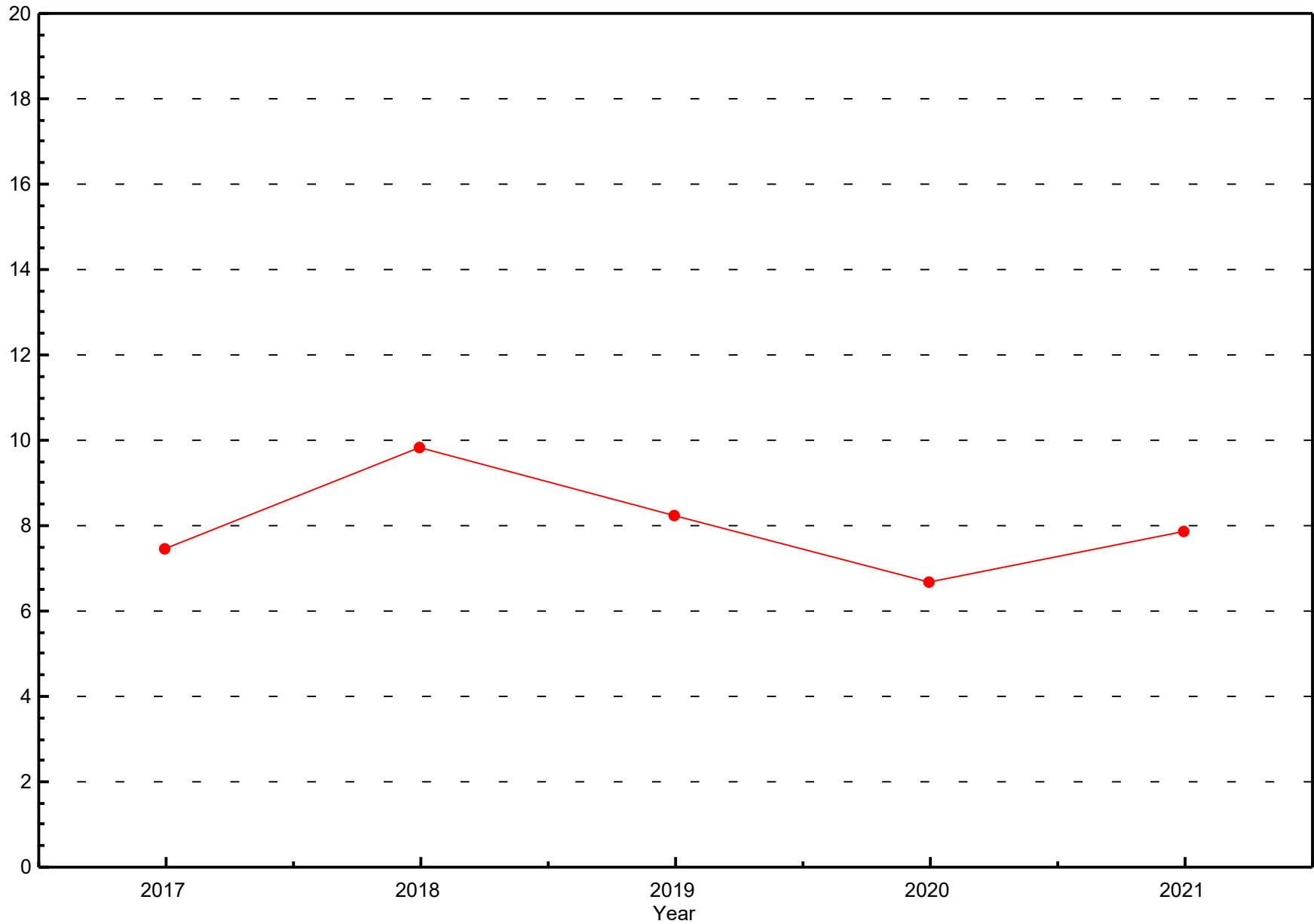
Wood Buffalo Environmental Association - Ells River (AMS30)
Annual Summary for the Year 2021
Particulate Matter 2.5 (ug/m³) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Number of Values Exceeding 1-Hour Objective	Maximum 24-Hour Value	Number of Values Exceeding 24-Hour Objective	% of Data in Each Concentration Range				
								0 - 5	6 - 10	11 - 20	21 - 30	>30
January	100	743	4.7	26.0	0	16.9	0	72.5	19.0	7.3	1.2	0.0
February	100	672	4.4	18.6	0	12.2	0	75.3	20.1	4.6	0.0	0.0
March	100	743	4.2	20.1	0	8.7	0	75.6	20.7	3.6	0.0	0.0
April	100	718	4.6	33.8	0	10.9	0	73.8	21.5	4.5	0.1	0.1
May	99	740	4.7	24.1	0	8.1	0	72.6	24.9	2.4	0.1	0.0
June	100	719	6.0	25.7	0	15.7	0	59.4	26.8	12.9	0.8	0.0
July	100	742	16.9	135.4	15	89.7	4	29.3	23.9	21.8	7.8	17.3
August	100	743	8.0	44.4	0	25.3	0	52.9	25.6	12.9	6.6	2.0
September	100	719	3.7	22.4	0	9.2	0	80.4	17.4	2.1	0.1	0.0
October	100	742	3.4	19.9	0	6.8	0	83.7	14.4	1.9	0.0	0.0
November	100	718	4.0	18.4	0	7.8	0	78.6	19.2	2.2	0.0	0.0
December	97	720	3.7	26.8	0	8.6	0	84.6	13.5	1.5	0.4	0.0
Annual	100	8719	5.7	135.4	15	89.7	4	69.8	20.6	6.4	1.5	1.7



Yearly Averages

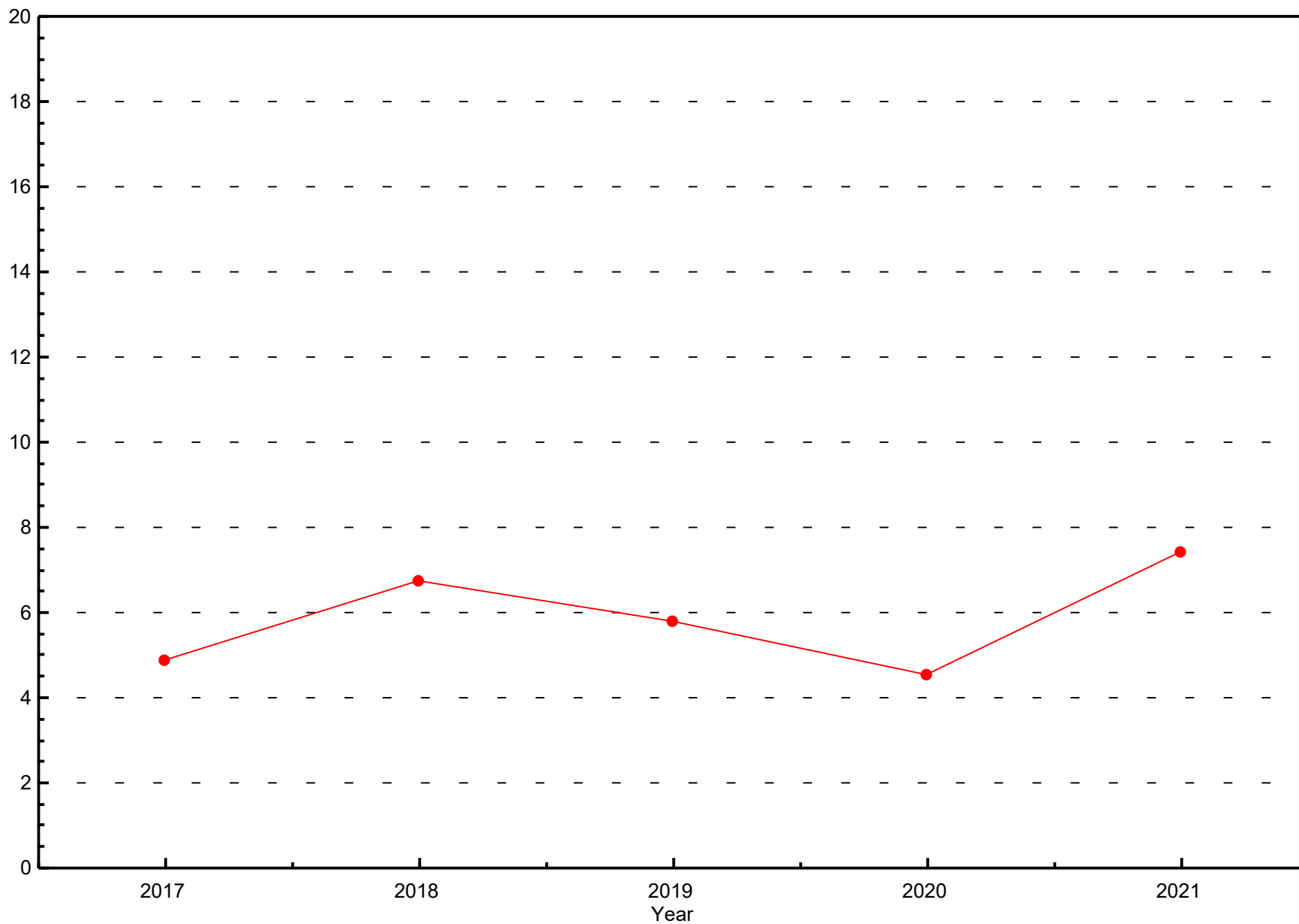
Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort McKay - Bertha Ganter (2017 to 2021)





Yearly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Buffalo Viewpoint (2017 to 2021)

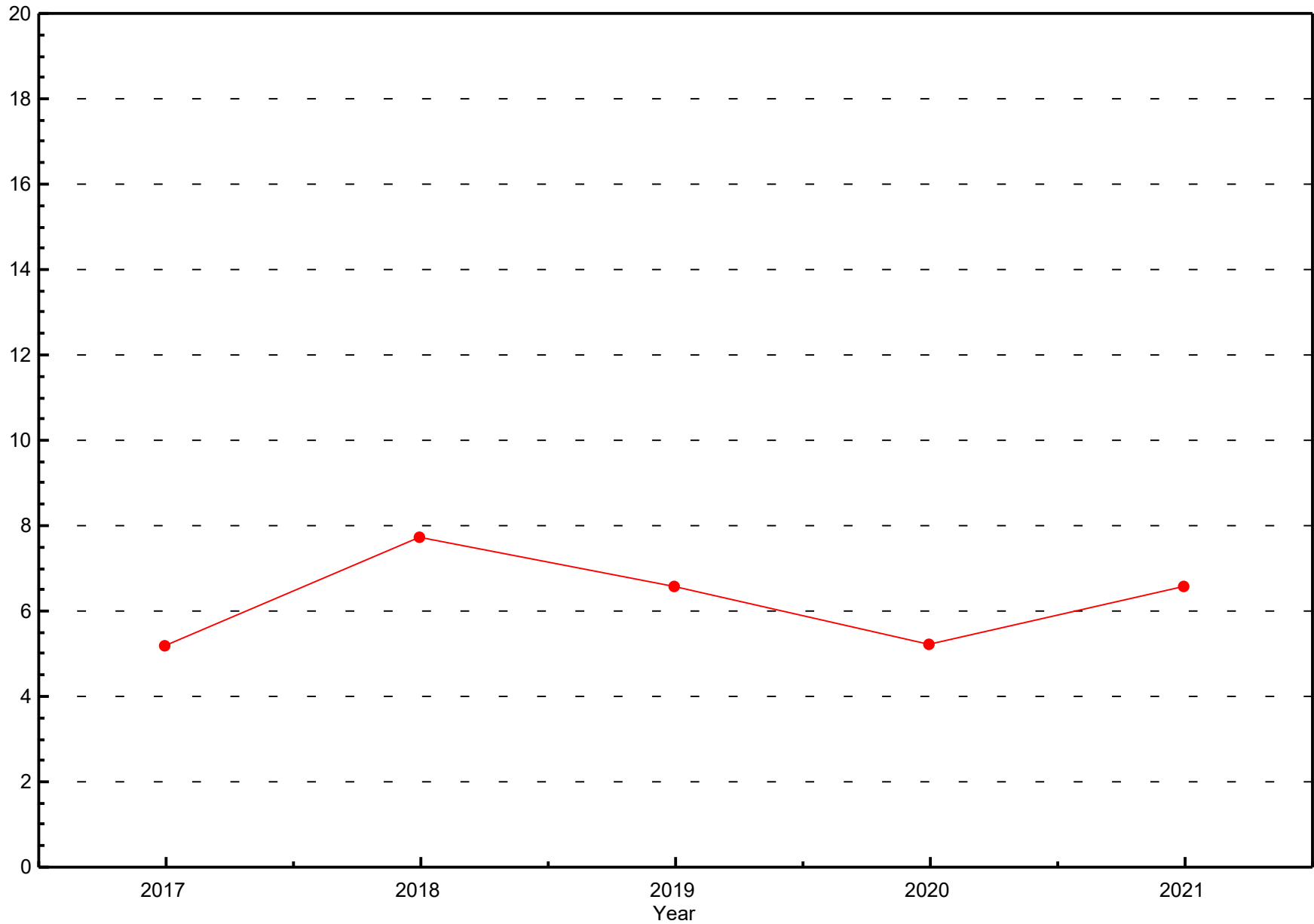




Yearly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$

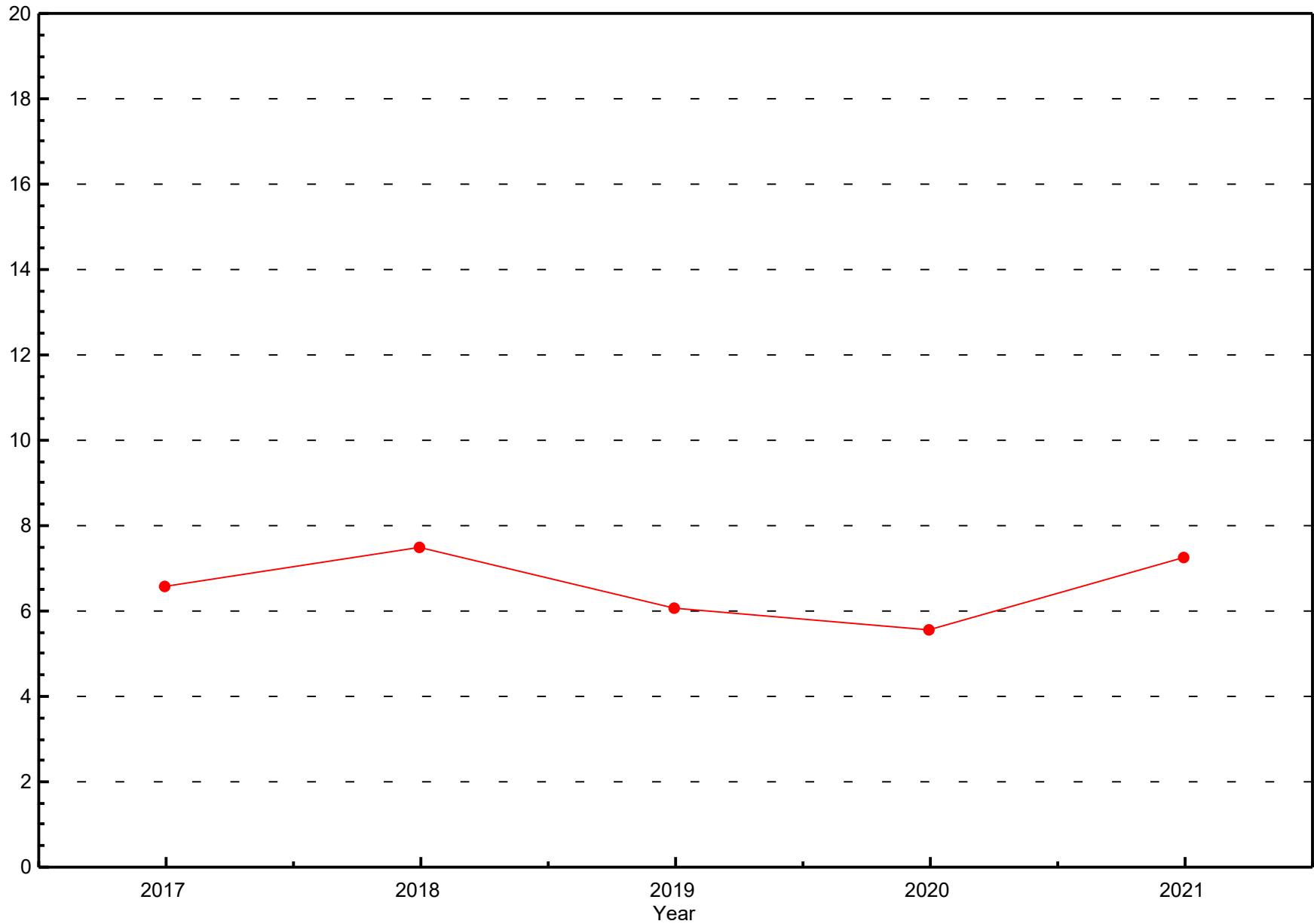
Patricia McInnes (2017 to 2021)





Yearly Averages

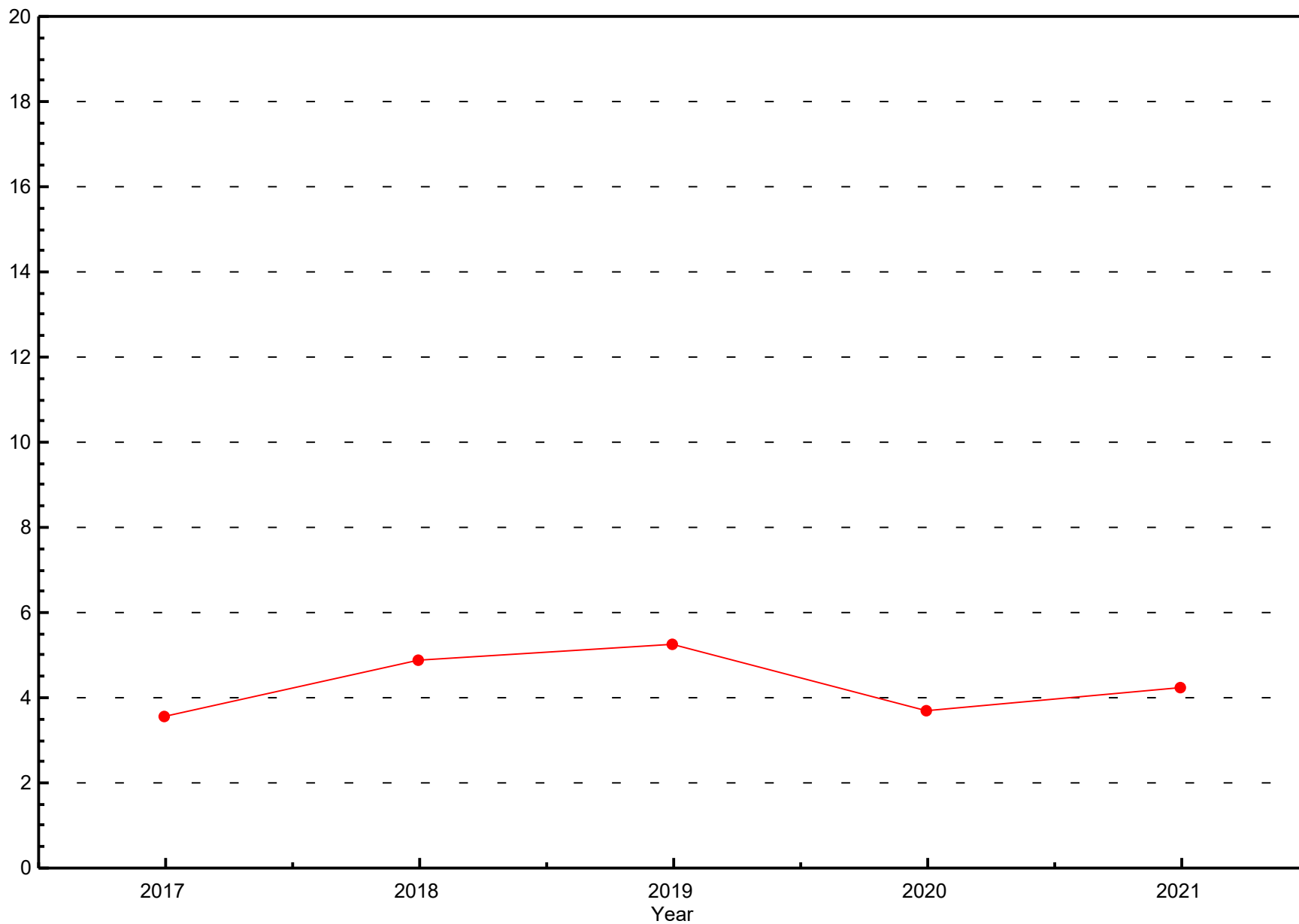
Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Athabasca Valley (2017 to 2021)





Yearly Averages

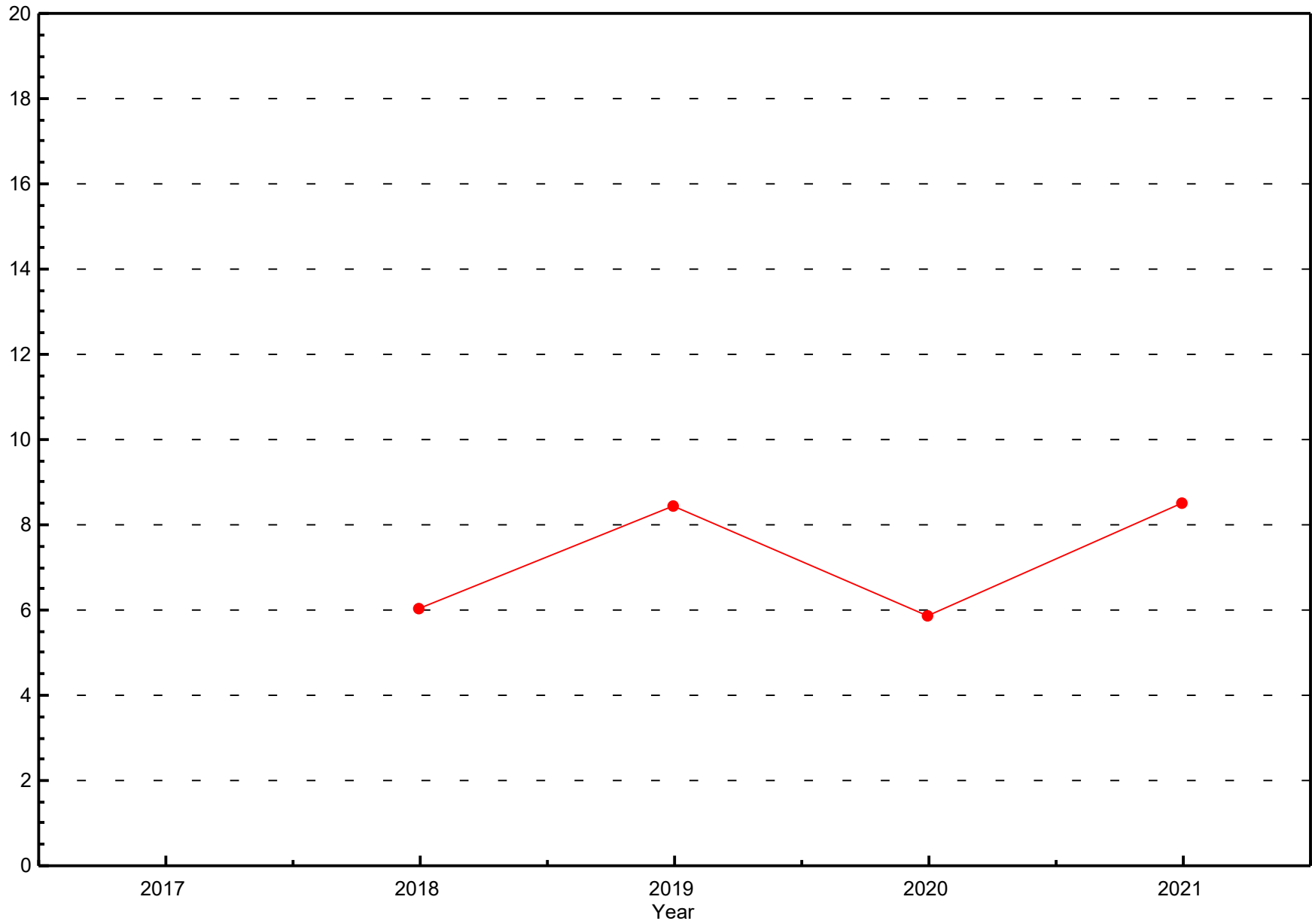
Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort Chipewyan (2017 to 2021)





Yearly Averages

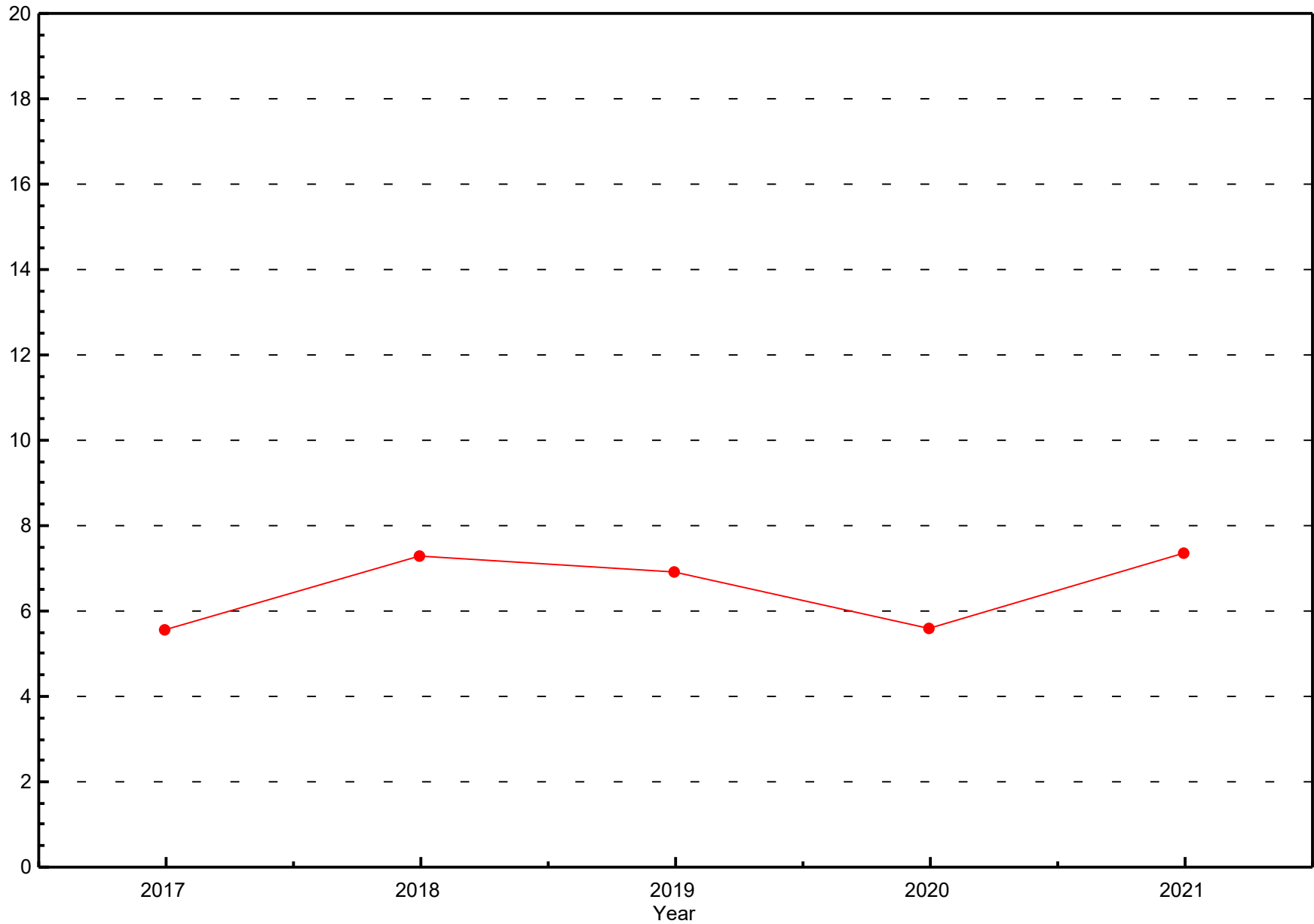
Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Barge Landing (2017 to 2021)





Yearly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort McKay South (2017 to 2021)

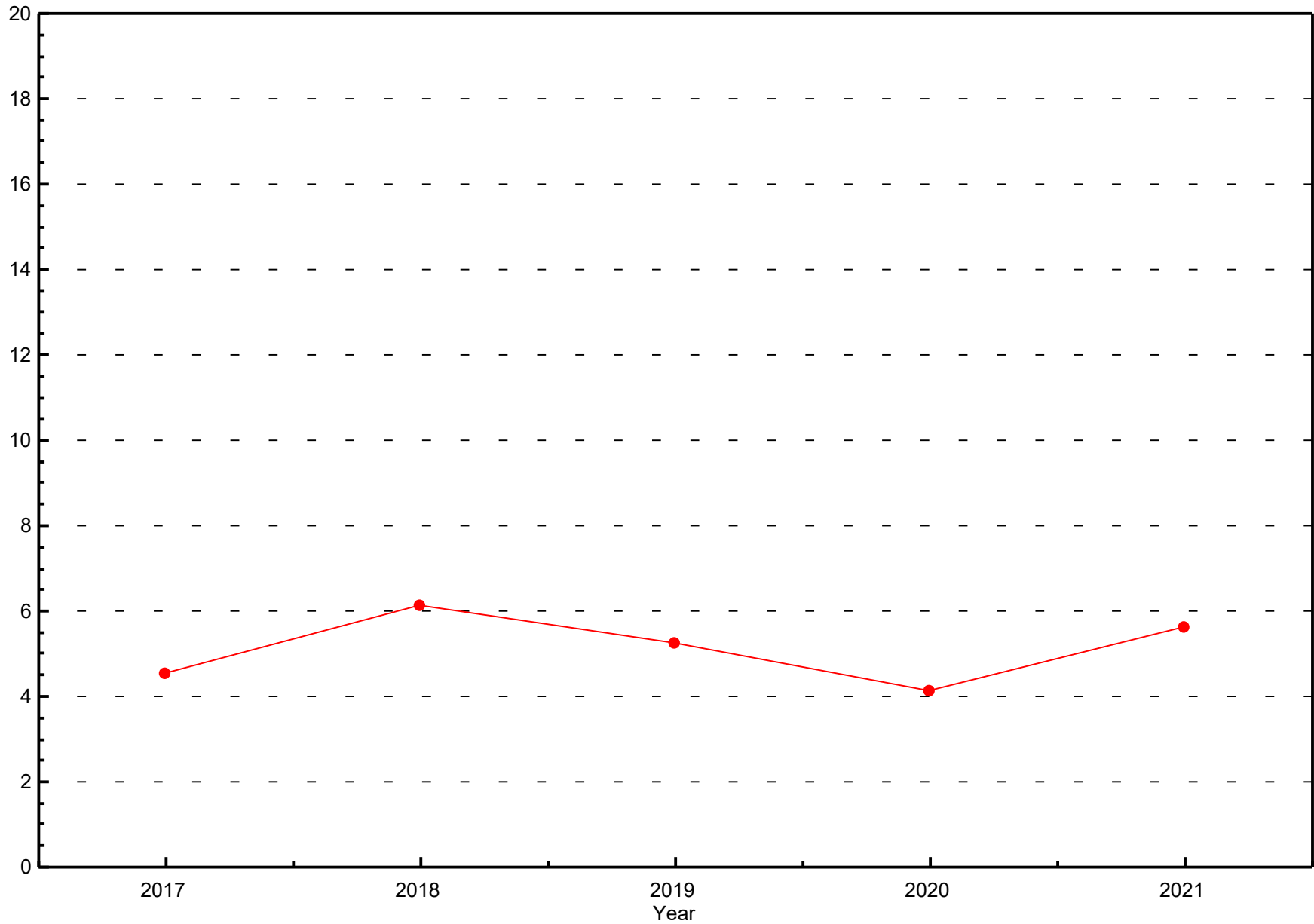




Yearly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$

Anzac (2017 to 2021)

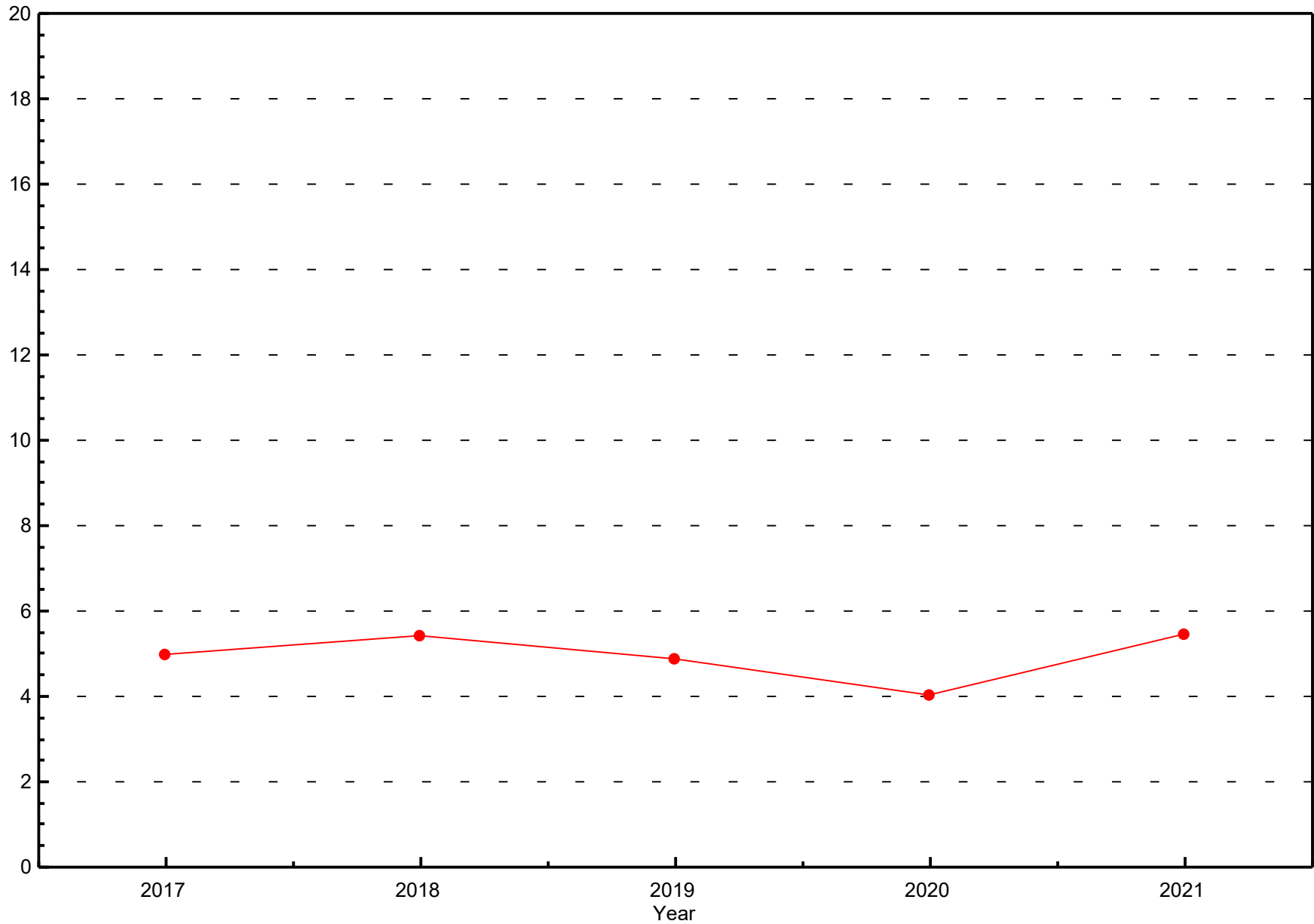




Yearly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$

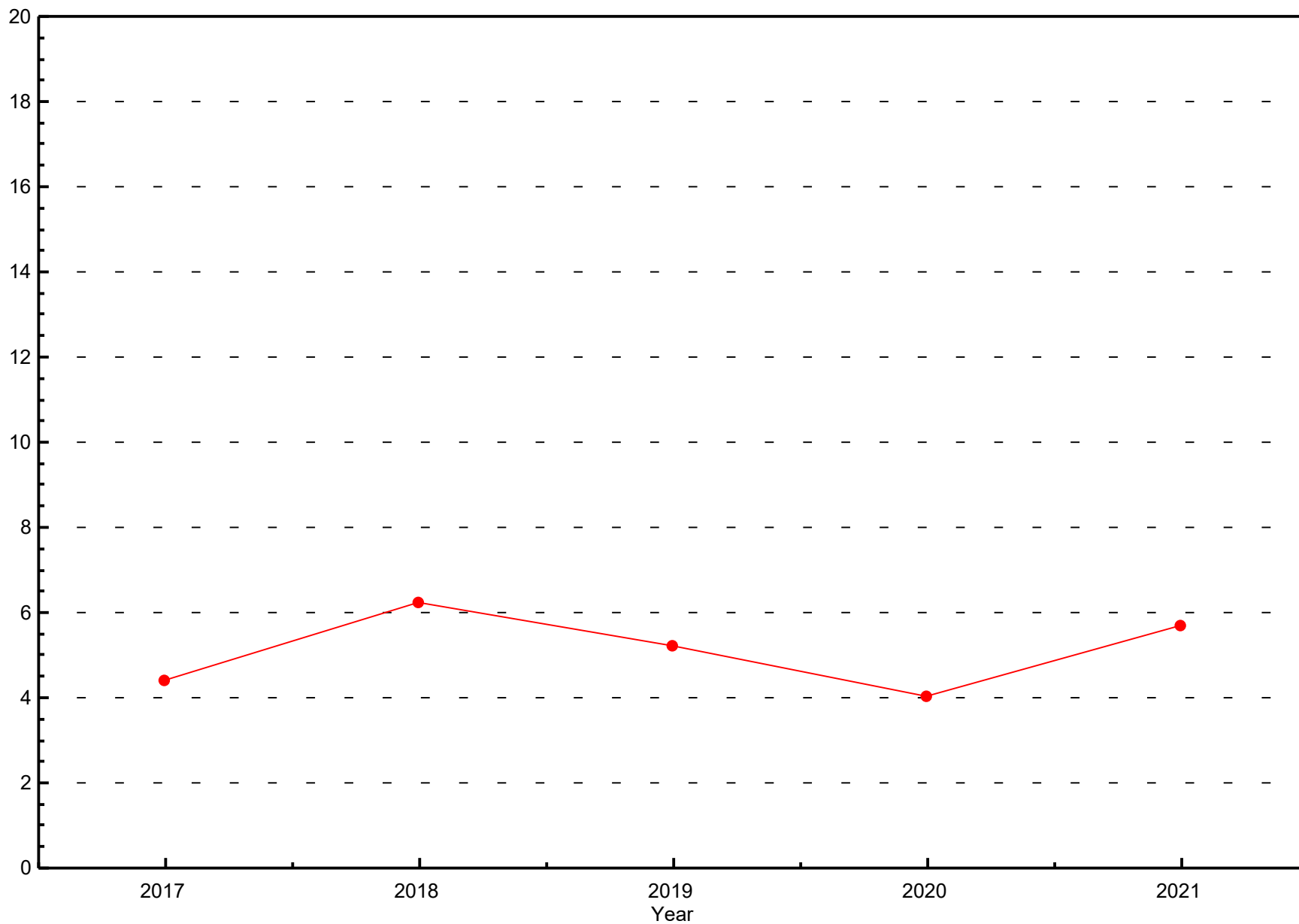
Wapasu (2017 to 2021)





Yearly Averages

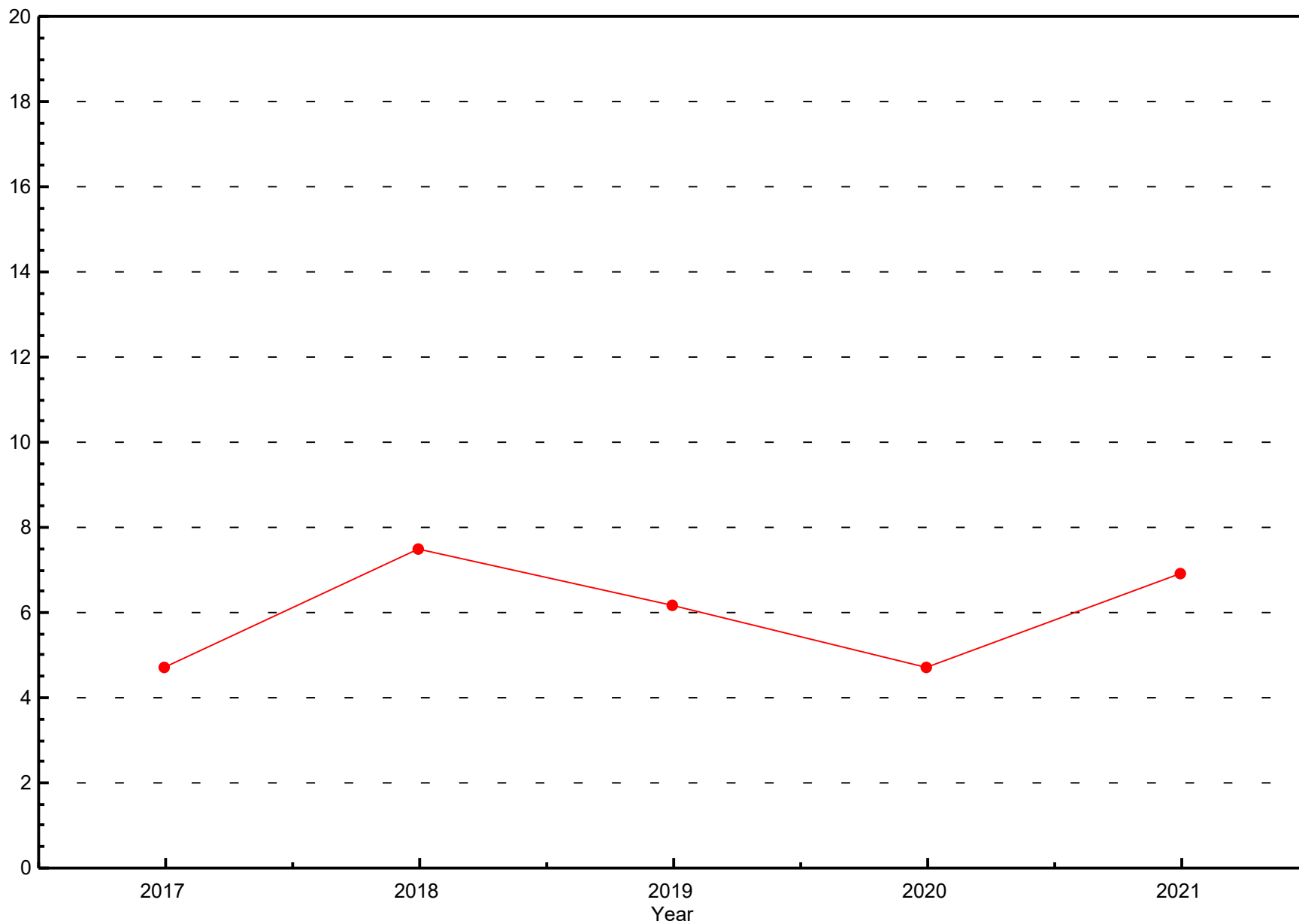
Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Stony Mountain (2017 to 2021)





Yearly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Conklin (2017 to 2021)

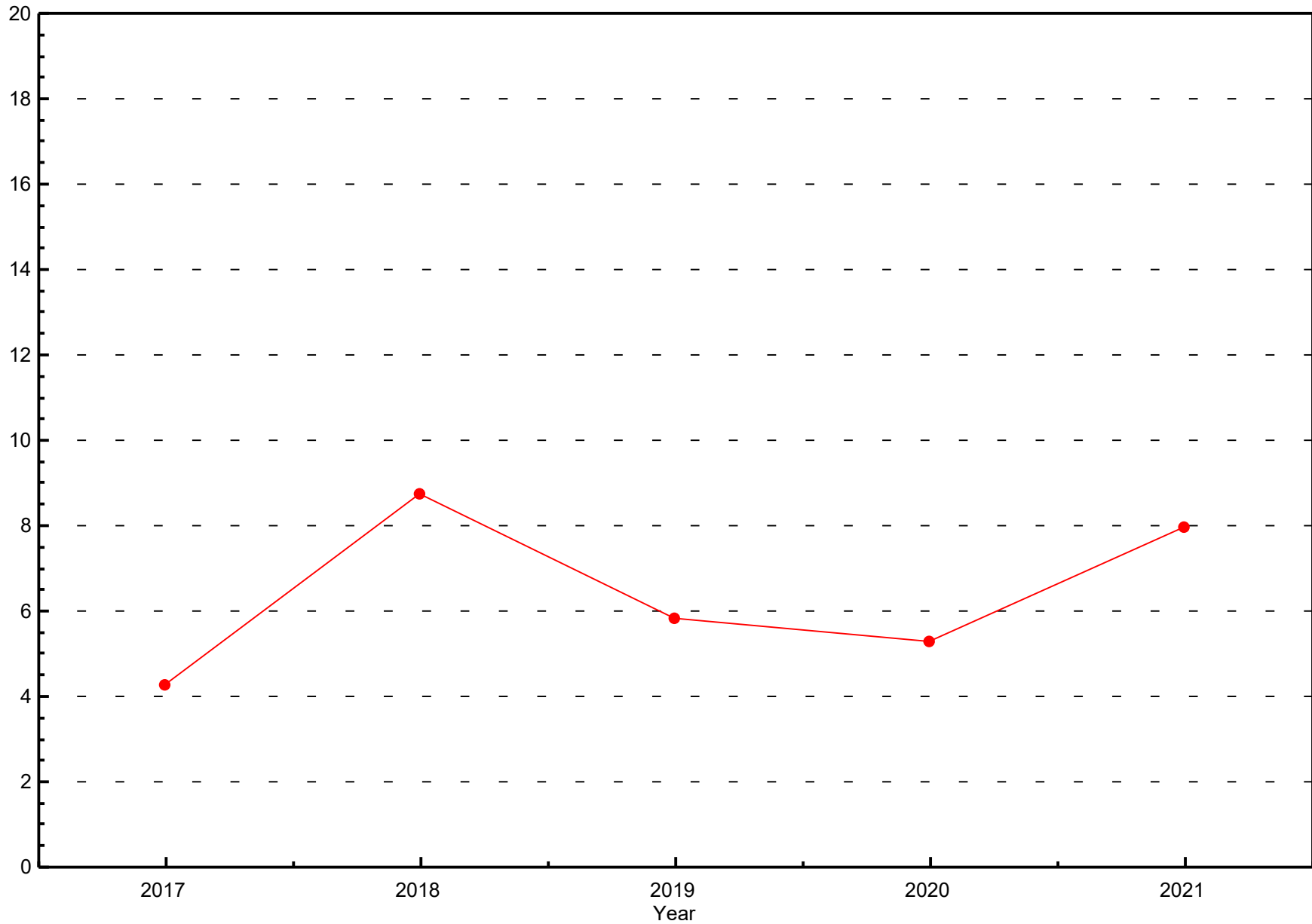




Yearly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$

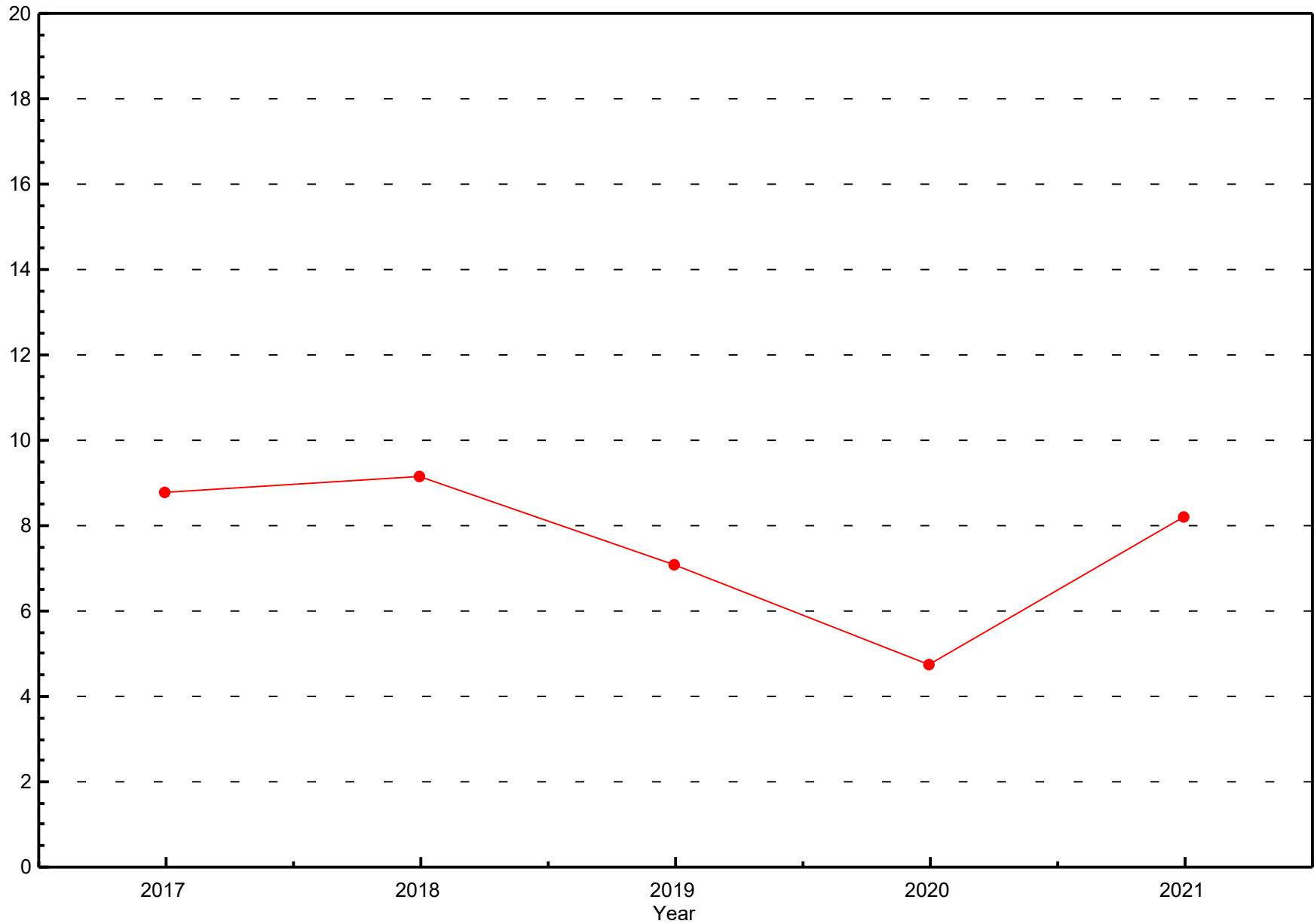
Janvier (2017 to 2021)





Yearly Averages

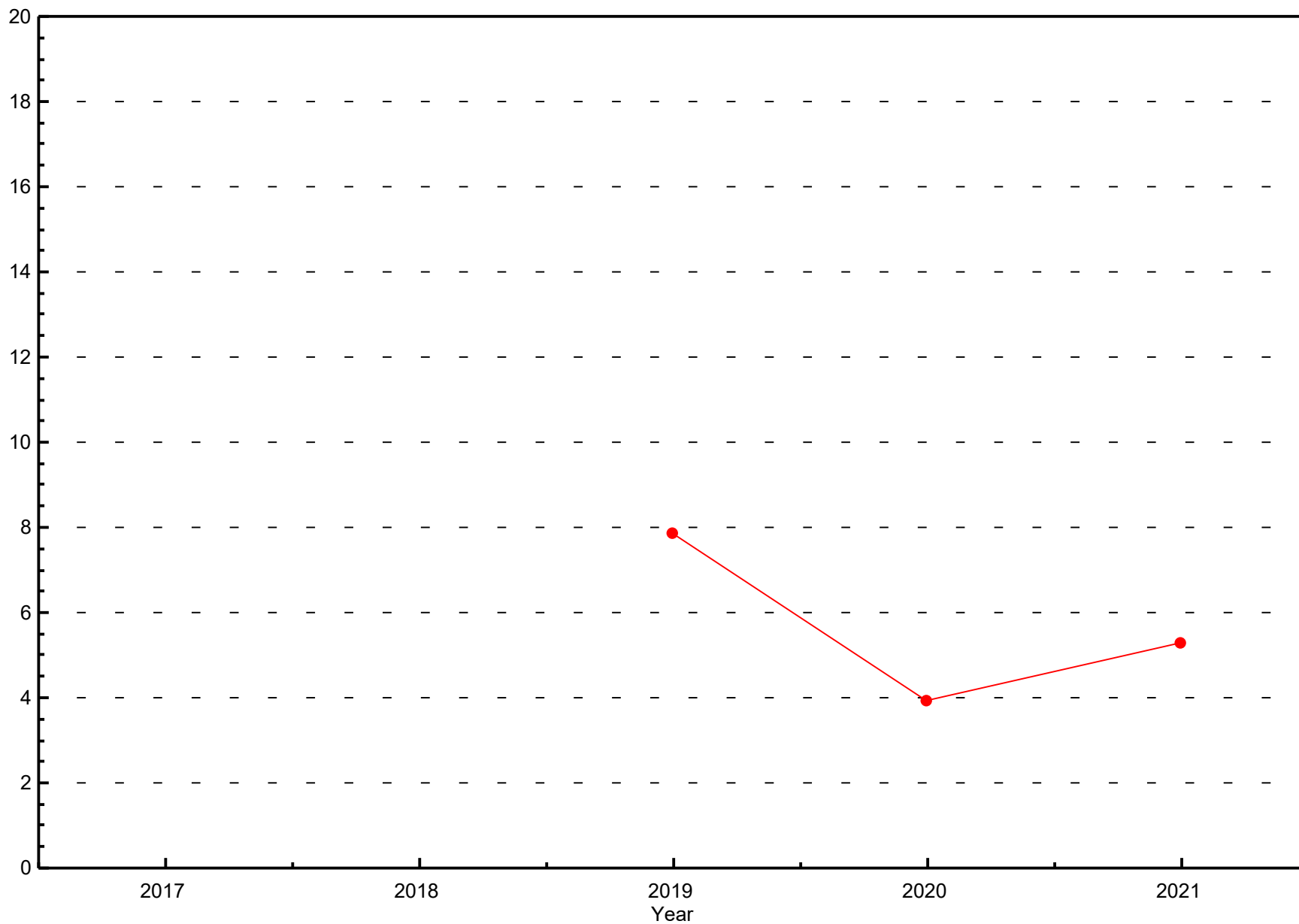
Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort Hills (2017 to 2021)





Yearly Averages

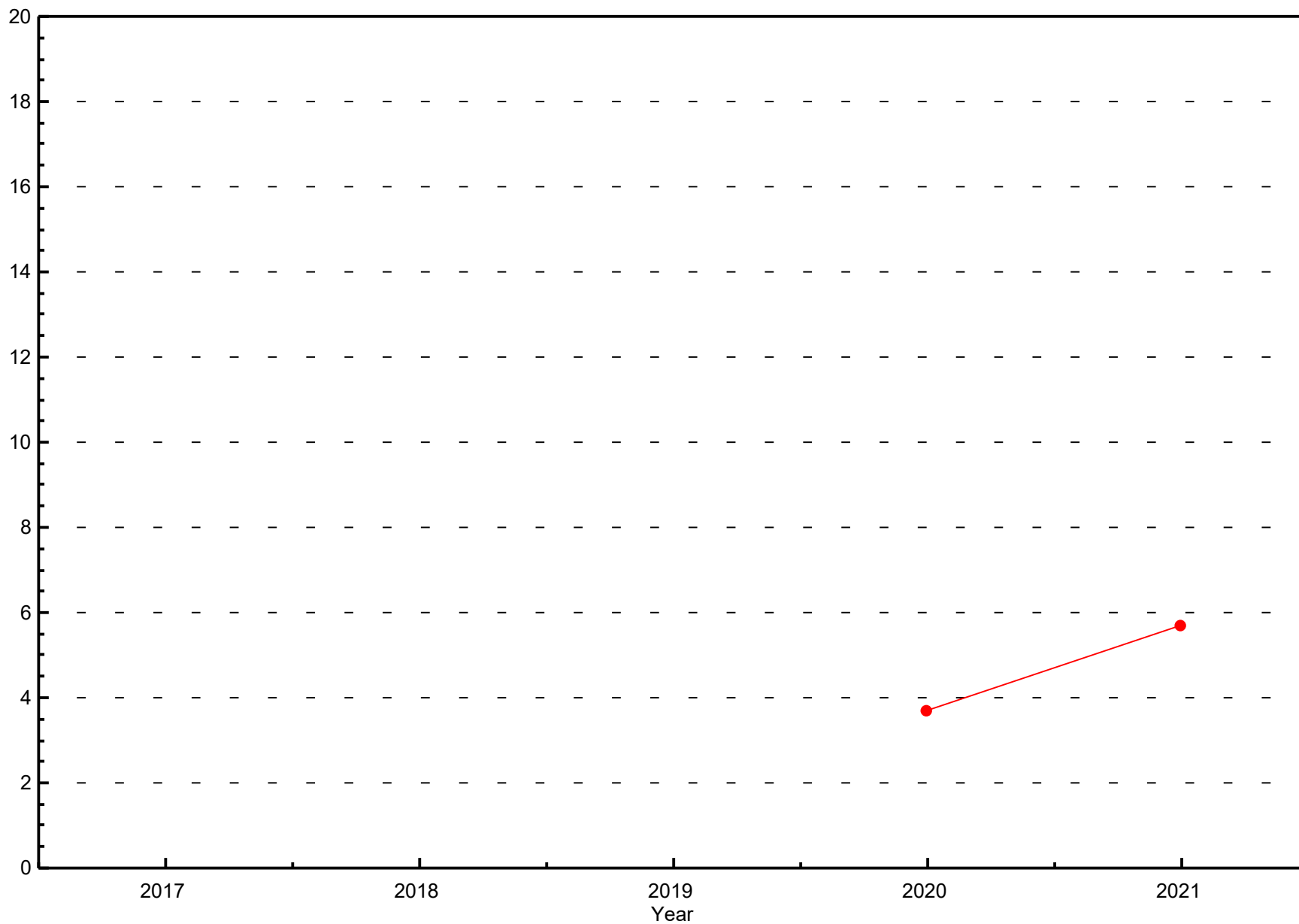
Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Surmont 2 (2017 to 2021)





Yearly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Ells River (2017 to 2021)





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

AMBIENT TEMPERATURE ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Bertha Ganter - Fort McKay (AMS01)
Annual Summary for the Year 2021
Ambient Temperature 2m (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-36.5	3.5	-30.5	-0.5	-12.6
February	100	672	-42.6	4.5	-36.3	-1.1	-19.8
March	100	744	-25.2	14.4	-15.3	5.7	-5.3
April	100	720	-14.1	20.2	-8.5	11.2	1.8
May	100	744	-8.0	25.3	0.6	19.5	10.3
June	100	720	3.1	40.9	9.6	32.5	18.7
July	100	744	8.3	38.0	10.9	31.4	19.4
August	100	744	1.6	34.0	9.5	24.7	16.4
September	100	720	-1.2	25.3	5.9	18.9	11.7
October	100	744	-7.4	17.6	-1.7	11.7	4.5
November	100	720	-25.7	8.4	-19.4	2.4	-5.6
December	100	744	-37.4	-4.8	-33.2	-9.5	-22.4
Annual	100	8760	-42.6	40.9	-36.3	32.5	1.6



Wood Buffalo Environmental Association - Bertha Ganter - Fort McKay (AMS01)
Annual Summary for the Year 2021
Ambient Temperature 10m (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-35.6	4.1	-29.5	0.3	-12.0
February	100	672	-41.2	4.6	-35.6	-0.5	-19.4
March	100	744	-23.2	14.6	-14.9	6.8	-4.9
April	100	720	-13.3	19.7	-8.4	11.2	1.9
May	100	744	-6.4	24.9	0.5	19.7	10.4
June	100	720	4.1	40.4	9.7	32.7	18.9
July	100	744	9.2	37.6	10.9	31.6	19.5
August	100	744	2.4	33.1	9.5	25.3	16.7
September	100	720	-0.4	24.9	6.4	19.1	12.0
October	100	744	-6.7	17.7	-1.2	12.5	5.0
November	100	718	-24.8	8.3	-19.3	2.6	-5.1
December	93	695	-36.4	-4.0	-32.7	-8.6	-22.2
Annual	99	8709	-41.2	40.4	-35.6	32.7	2.0



Wood Buffalo Environmental Association - Mildred Lake (AMS02)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-32.2	4.7	-28.9	0.1	-11.6
February	100	672	-39.3	4.4	-34.8	0.4	-19.2
March	99	738	-22.0	13.4	-15.1	6.4	-4.6
April	100	720	-12.7	20.4	-8.6	11.0	1.9
May	100	744	-6.7	25.0	0.4	19.9	10.5
June	100	720	3.0	40.5	9.5	32.7	19.0
July	100	744	8.0	38.1	9.8	32.0	19.6
August	100	743	3.7	33.4	10.1	26.2	16.9
September	100	720	0.0	24.8	5.5	18.9	12.2
October	100	744	-5.2	17.5	-1.1	12.1	5.0
November	100	720	-25.3	8.2	-18.2	3.3	-4.7
December	100	744	-36.4	-1.9	-32.7	-8.0	-21.4
Annual	100	8753	-39.3	40.5	-34.8	32.7	2.1



Wood Buffalo Environmental Association - Lower Camp Meterological Tower (AMS03)
Annual Summary for the Year 2021
Ambient Temperature 45 m (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-32.8	5.7	-28.8	1.0	-11.5
February	100	672	-39.1	5.2	-35.0	1.3	-18.8
March	100	744	-21.3	15.6	-14.5	7.1	-4.1
April	100	720	-12.3	20.0	-8.2	11.2	2.2
May	100	744	-4.9	24.6	0.6	20.3	10.8
June	100	720	5.5	40.4	10.1	33.4	19.4
July	100	744	8.9	37.9	10.3	32.2	19.9
August	100	744	4.2	33.4	10.1	26.1	17.3
September	100	720	1.7	24.9	6.2	19.4	12.7
October	100	744	-4.1	17.4	-0.7	13.3	5.7
November	100	720	-23.5	8.7	-17.6	2.9	-4.2
December	98	731	-36.2	-1.6	-32.5	-7.9	-21.4
Annual	100	8747	-39.1	40.4	-35.0	33.4	2.5



Wood Buffalo Environmental Association - Lower Camp Meterological Tower (AMS03)
Annual Summary for the Year 2021
Ambient Temperature 100 m (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-30.9	5.7	-28.0	1.6	-10.7
February	100	672	-38.2	5.1	-34.1	1.4	-18.7
March	100	744	-19.6	15.6	-15.2	7.9	-4.0
April	100	720	-13.1	18.9	-8.9	11.0	2.0
May	100	744	-4.7	23.9	-0.2	20.0	10.3
June	100	720	5.3	39.6	9.4	33.3	19.2
July	100	744	8.7	37.2	9.8	32.3	19.6
August	100	744	3.8	32.3	9.5	26.6	17.1
September	100	720	1.3	24.4	5.9	19.3	12.5
October	100	744	-4.2	16.7	-0.4	13.3	5.6
November	100	720	-22.5	8.9	-17.8	4.2	-4.1
December	98	731	-33.9	-1.6	-31.3	-7.8	-20.9
Annual	100	8747	-38.2	39.6	-34.1	33.3	2.5



Wood Buffalo Environmental Association - Buffalo Viewpoint (AMS04)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-32.3	5.3	-28.9	0.5	-11.6
February	100	672	-42.6	4.8	-36.5	0.8	-19.1
March	100	744	-24.8	15.7	-14.9	6.7	-4.4
April	100	720	-12.6	20.1	-8.2	10.7	2.0
May	100	744	-5.6	25.1	0.4	19.7	10.3
June	100	720	4.2	40.1	9.3	32.2	18.8
July	100	744	8.4	37.9	9.7	31.1	19.3
August	100	744	3.8	33.6	9.9	25.7	16.6
September	100	720	-0.8	24.8	5.4	18.3	12.0
October	100	744	-5.8	17.6	-1.0	12.2	4.8
November	100	720	-24.3	9.0	-18.4	3.0	-4.8
December	100	744	-37.8	-1.8	-32.6	-7.9	-21.5
Annual	100	8760	-42.6	40.1	-36.5	32.2	2.0



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Ambient Temperature 2 m (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-32.6	4.8	-28.5	-0.1	-11.6
February	100	672	-40.3	4.4	-34.9	0.2	-19.0
March	100	744	-20.1	13.8	-14.5	6.1	-4.3
April	100	720	-12.9	20.8	-8.0	11.0	2.2
May	100	744	-5.5	25.2	0.6	19.3	10.6
June	100	720	4.4	40.5	9.4	31.6	18.7
July	100	744	8.8	38.3	10.0	30.5	19.3
August	100	744	3.8	33.6	10.1	25.6	16.5
September	100	720	0.0	24.6	5.2	18.0	11.8
October	100	744	-5.9	17.3	-2.2	11.4	4.5
November	100	720	-23.7	8.7	-17.9	3.2	-4.7
December	100	744	-35.1	-1.7	-32.0	-8.1	-21.2
Annual	100	8760	-40.3	40.5	-34.9	31.6	2.0



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Ambient Temperature 20 m (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-31.3	5.8	-27.9	1.2	-10.9
February	100	672	-39.7	4.8	-34.2	1.1	-18.7
March	100	744	-19.4	14.8	-14.9	7.3	-3.9
April	100	720	-13.1	19.2	-8.8	10.8	2.1
May	100	744	-3.7	24.2	0.0	19.8	10.4
June	100	720	6.1	39.6	9.6	32.8	19.1
July	100	744	9.3	37.1	10.1	31.7	19.5
August	100	744	4.0	32.7	10.0	26.3	16.9
September	100	720	0.3	24.1	5.8	18.7	12.3
October	100	744	-4.5	16.9	-0.8	12.7	5.2
November	100	720	-22.8	9.0	-17.9	3.7	-4.3
December	100	744	-33.7	-1.7	-31.4	-7.6	-20.8
Annual	100	8760	-39.7	39.6	-34.2	32.8	2.4



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Ambient Temperature 45 m (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-30.6	5.9	-27.9	1.6	-10.6
February	100	672	-39.6	4.8	-33.9	1.3	-18.7
March	100	744	-19.6	14.8	-15.2	7.6	-3.9
April	100	720	-13.3	18.7	-9.1	11.1	2.0
May	100	744	-3.9	23.9	-0.3	19.8	10.1
June	100	720	6.1	39.1	9.3	32.8	19.1
July	100	744	9.4	36.7	9.9	31.8	19.4
August	100	744	3.9	32.3	9.7	26.3	16.9
September	100	720	0.2	23.8	5.7	18.7	12.3
October	100	744	-4.3	16.6	-0.5	12.9	5.2
November	100	720	-22.7	8.8	-18.0	4.2	-4.2
December	100	744	-33.3	-1.7	-31.1	-7.3	-20.6
Annual	100	8760	-39.6	39.1	-33.9	32.8	2.4



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Ambient Temperature 75 m (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-30.4	5.7	-28.0	1.9	-10.4
February	100	672	-36.3	4.6	-33.1	1.4	-18.7
March	100	744	-19.8	14.7	-15.5	7.9	-4.0
April	100	720	-13.7	18.3	-9.5	11.4	1.8
May	100	744	-4.3	23.5	-0.7	19.5	9.8
June	100	720	5.9	38.6	9.0	32.7	18.9
July	100	744	9.0	36.3	9.6	31.7	19.1
August	100	744	3.9	31.9	9.4	26.6	16.7
September	100	720	0.3	23.7	5.5	18.6	12.2
October	100	744	-4.1	16.2	-0.4	13.0	5.2
November	100	720	-22.2	9.3	-18.1	4.8	-4.2
December	100	744	-32.4	-1.5	-30.6	-6.8	-20.4
Annual	100	8760	-36.3	38.6	-33.1	32.7	2.3



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Ambient Temperature 90 m (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-30.4	5.7	-28.0	2.1	-10.2
February	100	672	-35.6	4.6	-32.9	1.4	-18.7
March	100	744	-19.8	14.8	-15.6	8.0	-4.0
April	100	720	-13.9	18.2	-9.6	11.5	1.8
May	100	744	-4.4	23.5	-0.7	19.6	9.8
June	100	720	5.9	38.6	8.9	32.8	18.9
July	100	744	8.9	36.2	9.6	31.8	19.2
August	100	744	4.1	31.8	9.4	26.8	16.8
September	100	720	0.9	23.6	5.5	18.7	12.3
October	100	744	-3.9	16.1	-0.2	13.1	5.3
November	100	720	-22.1	9.5	-18.0	5.0	-4.2
December	100	744	-32.0	-1.1	-30.4	-6.5	-20.3
Annual	100	8760	-35.6	38.6	-32.9	32.8	2.3



Wood Buffalo Environmental Association - Patricia McInnes (AMS06)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-33.9	4.9	-29.3	0.5	-11.3
February	100	672	-40.6	5.9	-34.4	1.3	-18.9
March	100	744	-23.8	15.8	-13.8	6.7	-3.9
April	100	720	-12.6	20.3	-8.1	10.6	2.1
May	100	744	-7.9	25.1	0.3	19.6	10.2
June	100	720	4.5	39.9	9.5	32.2	18.9
July	100	744	7.8	37.8	9.9	31.7	19.2
August	100	744	2.6	33.5	10.0	25.6	16.6
September	100	720	-0.6	25.0	4.8	18.3	11.7
October	100	744	-8.5	16.9	-2.4	11.7	4.5
November	100	720	-23.9	11.4	-18.2	3.6	-4.6
December	100	744	-36.7	-1.9	-32.6	-7.7	-21.0
Annual	100	8760	-40.6	39.9	-34.4	32.2	2.1



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-34.8	5.7	-29.5	-0.1	-12.1
February	100	672	-40.2	6.5	-34.9	1.1	-18.8
March	100	744	-22.5	16.5	-13.4	4.8	-3.9
April	100	720	-11.3	20.3	-7.2	10.9	2.5
May	100	744	-5.3	25.7	1.2	20.2	11.2
June	100	720	5.3	40.8	11.0	32.9	19.4
July	100	744	9.4	38.9	11.2	31.5	19.9
August	100	744	5.3	33.6	10.9	25.1	17.4
September	100	720	-0.6	26.0	6.2	18.7	12.5
October	100	744	-5.5	18.0	-1.1	12.0	5.3
November	100	720	-22.9	8.3	-17.5	2.4	-4.3
December	100	744	-37.2	-2.0	-33.0	-8.9	-21.5
Annual	100	8760	-40.2	40.8	-34.9	32.9	2.4



Wood Buffalo Environmental Association - Fort Chipewyan (AMS08)
Annual Summary for the Year 2021
Ambient Temperature 2m (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-33.3	3.8	-30.3	0.3	-14.0
February	100	672	-40.4	-0.5	-37.4	-5.4	-22.3
March	100	744	-23.8	7.9	-19.8	3.0	-9.6
April	100	720	-16.7	13.7	-12.6	6.5	-2.8
May	100	744	-6.3	22.1	-3.8	16.7	5.6
June	100	720	5.8	38.4	9.4	30.3	16.4
July	100	744	7.5	32.2	10.7	27.3	18.7
August	100	744	6.0	33.0	8.5	26.8	16.3
September	100	720	2.2	23.8	4.8	19.0	11.5
October	100	744	-2.1	15.4	-0.6	12.0	4.5
November	100	720	-27.0	5.5	-21.2	2.5	-6.4
December	100	744	-36.1	-8.5	-32.9	-11.8	-23.5
Annual	100	8760	-40.4	38.4	-37.4	30.3	-0.3



Wood Buffalo Environmental Association - Barge Landing (AMS09)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-35.2	3.0	-30.1	-0.4	-12.3
February	100	672	-42.4	4.3	-36.3	-0.8	-19.7
March	100	742	-23.6	14.9	-15.4	6.6	-5.1
April	100	720	-13.6	20.3	-8.4	11.2	1.9
May	100	744	-7.1	25.6	0.7	19.7	10.4
June	100	720	4.0	41.5	9.7	32.8	19.0
July	100	744	8.6	39.2	10.6	31.9	19.6
August	89	662	2.2	34.5	9.8	25.8	16.4
September	95	686	-1.0	25.7	5.9	18.9	11.7
October	100	744	-7.1	18.2	-1.9	12.1	4.7
November	100	720	-25.4	9.5	-19.2	2.6	-5.3
December	100	744	-37.1	-4.8	-33.4	-9.5	-22.2
Annual	99	8642	-42.4	41.5	-36.3	32.8	1.5



Wood Buffalo Environmental Association - Lower Camp (AMS11)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-36.6	5.4	-31.4	-0.5	-12.5
February	100	672	-40.6	4.6	-36.4	0.6	-19.5
March	100	744	-24.5	14.8	-15.2	6.0	-4.6
April	100	720	-12.3	20.7	-7.9	10.7	1.9
May	100	744	-5.5	25.2	0.8	19.5	10.8
June	100	720	5.0	41.6	10.3	33.1	19.2
July	100	744	9.3	39.0	10.5	31.6	19.9
August	93	695	3.2	33.2	10.2	25.3	17.0
September	100	720	1.3	25.0	6.0	19.1	12.5
October	100	744	-5.3	18.0	-1.6	12.6	5.3
November	100	719	-24.6	8.8	-17.6	2.2	-4.5
December	98	731	-38.1	-1.9	-34.1	-9.2	-22.1
Annual	99	8697	-40.6	41.6	-36.4	33.1	2.0



Wood Buffalo Environmental Association - Fort McKay South (AMS13)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-36.9	4.3	-32.1	-1.4	-13.3
February	100	672	-43.9	4.4	-37.5	-0.9	-20.3
March	100	744	-27.6	14.2	-16.1	5.2	-5.8
April	100	720	-16.4	20.7	-8.7	11.2	1.4
May	100	744	-9.5	25.9	0.4	19.2	10.0
June	100	720	0.7	41.3	9.4	32.1	18.4
July	100	744	6.1	39.0	10.5	30.2	19.0
August	100	744	-0.5	33.9	8.9	24.0	15.9
September	100	720	-2.7	25.1	5.3	18.5	11.3
October	100	744	-8.4	18.2	-3.1	10.4	3.9
November	100	720	-27.5	8.6	-20.0	2.1	-6.2
December	100	744	-39.2	-3.7	-34.4	-10.3	-23.1
Annual	100	8760	-43.9	41.3	-37.5	32.1	1.0



Wood Buffalo Environmental Association - Anzac (AMS14)
Annual Summary for the Year 2021
Ambient Temperature 2m (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-34.1	6.3	-28.7	3.0	-10.1
February	100	672	-41.1	4.9	-34.5	1.3	-18.9
March	100	744	-23.3	15.7	-14.8	7.6	-3.7
April	100	720	-14.4	18.4	-9.4	10.4	1.3
May	100	744	-8.4	23.6	-0.8	18.2	9.4
June	100	720	2.1	38.8	8.6	32.2	18.0
July	100	744	6.4	36.2	9.5	30.2	18.4
August	100	744	0.8	32.2	8.6	24.6	15.8
September	100	720	-1.5	24.1	3.4	18.0	11.3
October	100	744	-6.9	16.1	-2.6	11.1	4.1
November	100	720	-25.0	12.5	-18.6	4.3	-4.4
December	100	744	-37.2	-0.4	-31.9	-5.5	-20.4
Annual	100	8760	-41.1	38.8	-34.5	32.2	1.9



Wood Buffalo Environmental Association - Wapasu (AMS17)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-31.9	2.3	-29.2	0.4	-11.1
February	100	672	-44.5	2.1	-37.4	-1.3	-20.3
March	100	744	-26.9	14.2	-17.1	7.4	-5.4
April	100	720	-19.9	17.1	-11.2	10.0	0.2
May	100	744	-8.3	23.9	-1.8	17.7	8.7
June	100	720	-1.4	39.3	7.8	32.4	17.5
July	100	744	5.6	36.2	8.7	30.7	17.9
August	100	744	-2.1	32.1	6.1	25.3	15.2
September	97	696	-0.2	22.8	3.0	17.8	10.6
October	100	744	-6.8	15.6	-2.4	10.5	3.9
November	100	720	-28.8	10.2	-18.8	4.2	-5.3
December	100	744	-37.0	-4.1	-33.5	-6.2	-22.0
Annual	100	8736	-44.5	39.3	-37.4	32.4	0.9



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Ambient Temperature 2m (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-32.3	5.0	-28.9	1.0	-9.1
February	100	672	-37.4	5.8	-31.3	0.5	-17.7
March	100	744	-20.3	14.7	-12.6	6.7	-2.5
April	100	720	-12.4	19.4	-7.8	12.3	2.1
May	100	744	-6.3	22.3	-1.8	17.5	9.2
June	100	720	2.7	36.1	8.1	29.0	17.4
July	100	744	7.7	33.7	8.4	28.1	17.9
August	100	744	3.8	32.4	7.3	25.0	15.4
September	100	720	-0.6	22.5	3.6	16.2	11.1
October	100	744	-6.7	16.0	-2.5	11.4	4.0
November	100	720	-22.6	13.3	-17.7	5.6	-4.2
December	100	744	-34.4	3.7	-30.9	-4.7	-19.0
Annual	100	8760	-37.4	36.1	-31.3	29.0	2.2



Wood Buffalo Environmental Association - Firebag (AMS19)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-32.0	1.7	-29.6	-0.5	-11.7
February	100	672	-41.8	1.5	-36.7	-1.8	-20.8
March	100	744	-22.6	12.1	-17.5	6.0	-6.2
April	100	720	-17.3	15.1	-11.9	9.2	-0.5
May	100	744	-7.2	22.5	-2.6	17.5	7.8
June	100	720	3.3	37.9	7.1	31.7	17.1
July	94	697	6.3	34.8	8.3	29.9	17.3
August	100	744	2.6	30.0	6.8	24.8	14.9
September	100	720	1.0	22.0	2.5	16.8	10.3
October	100	744	-5.9	14.6	-2.5	10.4	3.4
November	100	720	-26.3	9.3	-19.1	4.1	-5.8
December	100	744	-35.6	-4.3	-31.9	-7.4	-22.2
Annual	99	8713	-41.8	37.9	-36.7	31.7	0.3



Wood Buffalo Environmental Association - MacKay River (AMS20)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-35.1	5.3	-30.5	-0.3	-11.2
February	100	672	-42.5	5.0	-35.4	0.6	-19.0
March	100	744	-25.7	15.1	-14.9	6.4	-4.5
April	100	720	-14.1	20.1	-9.3	9.8	1.2
May	100	744	-9.5	24.0	-0.4	18.4	9.1
June	100	720	0.1	38.8	8.1	31.8	17.8
July	100	744	4.0	36.8	8.4	30.0	18.0
August	100	744	-1.3	32.9	8.7	24.5	15.3
September	100	720	-2.6	24.3	3.8	18.1	10.7
October	100	744	-9.8	16.5	-4.6	11.2	3.5
November	100	720	-26.3	11.4	-19.0	3.3	-5.4
December	100	744	-38.4	-1.8	-34.3	-5.6	-21.8
Annual	100	8760	-42.5	38.8	-35.4	31.8	1.3



Wood Buffalo Environmental Association - Conklin (AMS21)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-39.2	6.0	-31.7	1.7	-10.4
February	100	672	-45.8	6.7	-37.0	1.3	-19.1
March	100	744	-23.0	14.9	-12.2	6.3	-3.1
April	100	720	-11.8	19.9	-7.1	11.8	1.5
May	100	744	-10.8	23.5	-1.1	17.3	8.6
June	100	718	-1.4	36.8	7.7	30.1	17.2
July	100	744	5.0	34.4	9.2	28.9	17.7
August	100	744	-0.4	32.6	7.6	22.2	15.1
September	100	720	-2.4	23.1	3.4	16.6	10.7
October	100	744	-9.7	16.7	-4.1	10.1	3.1
November	100	720	-25.2	13.0	-17.6	3.1	-4.5
December	100	744	-40.7	4.3	-32.5	-4.4	-19.7
Annual	100	8758	-45.8	36.8	-37.0	30.1	1.5



Wood Buffalo Environmental Association - Janvier (AMS22)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-37.8	5.9	-30.2	1.1	-10.0
February	100	672	-42.0	6.2	-34.1	1.4	-18.1
March	100	744	-20.2	16.1	-12.6	6.9	-2.5
April	100	720	-11.7	20.9	-7.2	12.0	2.4
May	100	744	-7.5	23.9	-1.0	17.5	9.8
June	100	720	1.7	37.3	9.4	29.9	17.8
July	100	744	8.7	34.6	9.8	29.2	18.3
August	100	744	2.7	32.4	8.1	23.2	15.7
September	100	720	-1.4	23.7	3.9	16.6	11.2
October	100	743	-7.5	17.1	-2.6	10.9	4.1
November	100	720	-24.6	11.9	-17.9	3.6	-4.1
December	100	744	-35.7	2.5	-31.5	-5.0	-19.4
Annual	100	8759	-42.0	37.3	-34.1	29.9	2.2



Wood Buffalo Environmental Association - Fort Hills (AMS23)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-35.3	3.7	-30.5	-1.1	-12.6
February	100	672	-40.7	4.0	-35.9	-2.5	-20.1
March	100	743	-23.6	12.1	-16.9	6.0	-5.8
April	100	718	-13.2	19.2	-8.7	10.3	1.4
May	100	744	-5.6	24.0	0.3	19.3	10.0
June	100	720	5.4	39.0	9.9	31.4	18.8
July	100	744	9.1	37.1	11.1	30.8	19.5
August	100	744	4.3	33.8	10.0	26.2	16.8
September	100	720	-0.1	24.2	6.2	18.7	12.0
October	100	744	-4.8	17.1	-1.2	11.9	4.7
November	100	719	-25.1	7.8	-19.5	2.5	-5.5
December	93	695	-36.3	-4.4	-32.7	-9.9	-22.2
Annual	99	8707	-40.7	39.0	-35.9	31.4	1.7



Wood Buffalo Environmental Association - Waskow ohci Pimatisiwin (AMS25)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-36.4	3.8	-31.2	-0.9	-12.8
February	100	672	-43.2	4.5	-36.7	-1.3	-20.0
March	100	744	-26.0	13.8	-15.4	5.6	-5.4
April	100	720	-14.2	20.5	-8.4	11.2	1.7
May	100	744	-7.8	25.4	0.8	19.5	10.4
June	100	720	2.5	40.6	9.8	31.8	18.6
July	100	744	8.2	38.2	11.0	30.7	19.3
August	100	744	1.9	33.8	9.7	24.6	16.3
September	100	720	-1.1	25.0	6.1	18.7	11.6
October	100	744	-7.3	17.8	-2.2	11.4	4.3
November	100	720	-26.2	8.8	-19.6	2.5	-5.7
December	100	744	-38.0	-4.7	-33.7	-9.6	-22.6
Annual	100	8760	-43.2	40.6	-36.7	31.8	1.4



Wood Buffalo Environmental Association - Christina Lake (AMS26)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-35.0	6.0	-28.8	1.9	-8.8
February	100	672	-42.1	6.7	-33.6	1.8	-17.7
March	100	744	-19.6	14.3	-12.0	6.4	-2.2
April	100	720	-12.1	19.4	-7.2	12.2	2.2
May	100	744	-8.8	22.8	-0.7	17.8	9.2
June	100	720	3.0	36.1	9.3	30.0	18.0
July	100	744	7.5	33.5	10.2	28.9	18.6
August	100	744	1.3	32.2	8.3	23.4	16.0
September	100	720	-1.6	22.4	4.1	17.1	11.3
October	100	744	-8.4	16.4	-2.6	11.4	4.2
November	100	720	-22.3	13.1	-16.7	3.5	-3.7
December	100	744	-37.6	4.5	-31.1	-3.9	-18.7
Annual	100	8760	-42.1	36.1	-33.6	30.0	2.5



Wood Buffalo Environmental Association - Jackfish 2/3 (AMS27)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-32.8	4.6	-29.1	0.2	-9.2
February	100	670	-36.2	5.6	-31.6	0.8	-18.0
March	100	744	-19.4	13.8	-12.5	5.7	-2.7
April	100	719	-12.7	19.1	-7.9	11.2	1.7
May	100	744	-7.3	22.3	-2.1	17.0	8.8
June	97	696	3.4	35.4	8.3	29.0	17.5
July	100	744	8.3	33.3	9.0	28.1	17.9
August	100	742	3.8	32.4	7.2	24.5	15.3
September	100	720	-0.7	21.7	3.2	16.2	10.7
October	100	744	-7.5	15.5	-3.9	10.5	3.5
November	100	720	-22.6	13.1	-17.5	5.0	-4.4
December	100	743	-33.5	3.1	-31.3	-4.3	-19.1
Annual	100	8730	-36.2	35.4	-31.6	29.0	1.9



Wood Buffalo Environmental Association - Surmont 2 (AMS29)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-32.7	4.9	-28.8	0.8	-10.1
February	100	672	-42.8	4.2	-35.0	0.6	-18.8
March	100	744	-23.9	15.6	-14.3	5.9	-3.5
April	100	720	-13.5	19.5	-8.9	10.4	1.3
May	100	744	-9.5	23.4	-1.1	17.5	8.9
June	100	720	-0.6	37.8	8.4	30.8	17.5
July	100	744	7.0	34.9	8.9	28.7	17.7
August	100	744	-0.1	32.5	8.2	23.2	15.3
September	100	720	-2.3	23.3	3.1	17.0	10.8
October	100	743	-7.9	16.1	-3.3	10.6	3.4
November	100	720	-25.1	12.7	-19.1	2.6	-4.8
December	100	744	-37.7	-1.1	-31.9	-5.4	-20.5
Annual	100	8759	-42.8	37.8	-35.0	30.8	1.5



Wood Buffalo Environmental Association - Ells River (AMS30)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-37.4	3.1	-31.4	-0.7	-12.6
February	100	672	-42.4	4.2	-36.5	-1.7	-20.2
March	100	744	-25.1	14.2	-16.0	5.9	-5.6
April	100	720	-15.2	19.1	-8.6	11.1	1.4
May	100	744	-8.0	24.9	0.3	19.3	10.0
June	100	720	2.9	40.4	9.8	32.3	18.7
July	100	744	7.6	38.3	10.9	30.7	19.2
August	100	744	2.7	33.6	9.6	24.9	16.3
September	100	720	-1.6	24.8	6.2	18.4	11.5
October	100	744	-8.4	17.4	-1.9	11.6	4.2
November	100	720	-26.7	8.5	-19.9	2.5	-5.7
December	100	744	-38.0	-5.0	-33.4	-9.1	-22.5
Annual	100	8760	-42.4	40.4	-36.5	32.3	1.4



Wood Buffalo Environmental Association - Leismer (AMS501)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
October	100	744	-6.7	15.3	-3.4	10.0	3.3
November	100	720	-25.0	11.9	-18.6	4.1	-4.8
December	100	744	-36.1	3.0	-31.5	-5.0	-19.8
Annual	100	2208	-36.1	17.6	-31.5	10.0	-6.8



Wood Buffalo Environmental Association - Sawbones Bay (AMS505)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
July	100	744	7.5	34.3	9.6	28.5	18.3
August	100	741	1.8	32.6	8.0	24.0	15.8
September	100	720	-1.5	23.3	3.3	17.1	11.1
October	100	744	-7.5	15.8	-3.6	11.1	3.9
November	100	720	-22.2	12.5	-17.2	3.5	-4.2
December	100	744	-34.9	3.2	-31.2	-4.6	-19.2
Annual	100	4413	-34.9	34.3	-31.2	28.5	4.3



Wood Buffalo Environmental Association - Jackfish 1 (AMS506)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-32.4	4.6	-28.9	0.1	-9.2
February	100	672	-38.1	5.2	-31.9	0.7	-17.9
March	100	744	-20.7	14.6	-12.5	5.8	-2.4
April	100	720	-12.4	19.6	-7.7	11.9	2.0
May	100	744	-7.1	23.0	-1.8	17.0	9.1
June	100	720	3.1	37.0	8.6	29.3	17.5
July	100	744	8.2	34.2	9.4	28.5	18.2
August	100	744	3.3	32.6	7.7	24.9	15.6
Annual	100	5832	-38.1	37.0	-31.9	29.3	4.4



Wood Buffalo Environmental Association - Kirby South (AMS507)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
July	100	744	8.3	32.7	9.4	27.6	17.8
August	100	744	3.0	31.6	7.6	24.9	15.4
September	100	717	-0.9	21.2	3.7	16.0	10.6
October	100	744	-7.3	14.8	-4.0	10.5	3.4
November	100	720	-21.4	13.5	-17.4	5.2	-4.6
December	100	744	-34.1	2.8	-31.5	-4.4	-19.1
Annual	100	4413	-34.1	32.7	-31.5	27.6	3.9



Wood Buffalo Environmental Association - Kirby North (AMS508)
Annual Summary for the Year 2021
Ambient Temperature (°C) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	-32.5	4.4	-28.9	-0.4	-9.5
February	100	672	-37.2	6.2	-31.8	0.7	-18.2
March	100	744	-19.3	13.5	-12.6	5.8	-3.0
April	100	720	-12.3	18.6	-7.7	11.0	1.7
May	100	744	-7.6	22.0	-1.8	17.1	8.8
June	100	690	1.9	34.5	7.7	28.5	16.6
Annual	100	4314	-37.2	34.5	-31.8	28.5	-0.5



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

RELATIVE HUMIDITY ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Bertha Ganter - Fort McKay (AMS01)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	48	94	61	89	78
February	100	672	40	91	56	85	68
March	100	744	22	97	47	84	63
April	100	720	13	97	39	73	54
May	100	744	13	99	28	94	51
June	100	720	18	98	38	92	61
July	100	744	19	99	36	84	65
August	100	744	21	98	56	90	69
September	100	720	30	99	51	97	76
October	100	744	23	99	46	97	66
November	100	720	43	98	61	96	81
December	100	744	62	90	67	84	75
Annual	100	8760	13	99	28	97	67



Wood Buffalo Environmental Association - Mildred Lake (AMS02)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	52	93	62	91	78
February	100	672	42	91	55	82	70
March	99	738	26	96	49	80	63
April	100	720	15	96	39	73	55
May	100	744	16	100	30	97	52
June	100	720	21	99	36	92	59
July	100	744	20	100	33	88	64
August	99	740	27	100	49	93	67
September	98	706	33	100	51	97	75
October	97	719	27	100	46	90	64
November	100	720	35	100	59	96	81
December	100	744	61	94	69	89	78
Annual	99	8711	15	100	30	97	67



Wood Buffalo Environmental Association - Lower Camp Meterological Tower (AMS03)
Annual Summary for the Year 2021
Relative Humidity 45 m (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	48	93	59	91	77
February	100	672	42	87	53	77	69
March	100	744	22	93	46	78	61
April	100	720	14	93	37	70	53
May	100	744	15	99	28	93	50
June	100	720	17	99	35	91	57
July	100	744	17	99	33	85	63
August	100	744	26	99	52	91	66
September	100	720	32	100	49	96	73
October	100	744	24	100	41	95	62
November	100	720	29	99	59	93	79
December	98	731	59	93	68	86	77
Annual	100	8747	14	100	28	96	66



Wood Buffalo Environmental Association - Lower Camp Meterological Tower (AMS03)
Annual Summary for the Year 2021
Relative Humidity 100 m (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	47	94	59	91	76
February	100	672	38	89	53	78	69
March	100	744	20	93	40	80	59
April	100	720	14	93	36	71	51
May	100	744	15	99	28	92	50
June	100	720	17	97	32	90	55
July	100	744	17	98	30	84	61
August	100	744	26	99	45	90	64
September	100	720	32	100	49	94	71
October	100	744	24	100	39	95	61
November	100	720	24	100	52	95	77
December	98	731	60	93	68	87	77
Annual	100	8747	14	100	28	95	64



Wood Buffalo Environmental Association - Buffalo Viewpoint (AMS04)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	49	94	64	90	78
February	100	672	40	90	55	80	70
March	100	744	20	97	43	82	62
April	100	720	15	97	36	74	54
May	100	744	16	99	29	96	52
June	100	720	19	98	36	92	59
July	100	744	19	98	35	87	65
August	100	744	29	98	51	93	68
September	100	720	32	99	51	96	75
October	100	744	25	100	44	98	64
November	100	720	29	99	57	95	81
December	100	744	60	92	69	88	78
Annual	100	8760	15	100	29	98	67



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Relative Humidity 2 m (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	53	93	61	90	77
February	100	672	40	90	52	82	69
March	100	744	24	99	47	82	62
April	100	720	14	98	37	73	53
May	100	744	14	100	28	97	50
June	97	696	21	99	41	93	60
July	97	722	21	100	39	85	65
August	93	691	31	100	51	79	68
September	92	663	35	100	54	94	75
October	97	718	26	100	46	89	64
November	100	720	36	100	61	96	79
December	100	744	63	91	69	85	76
Annual	98	8578	14	100	28	97	66



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Relative Humidity 20 m (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	48	93	60	90	75
February	100	672	38	90	51	77	68
March	100	744	21	95	42	79	59
April	100	720	14	97	35	72	50
May	100	744	15	98	27	92	49
June	100	720	18	96	33	90	54
July	100	744	18	97	31	81	61
August	100	744	27	97	46	89	64
September	100	720	31	99	50	93	71
October	100	744	24	100	40	98	61
November	100	720	26	98	55	93	77
December	100	744	58	92	69	87	78
Annual	100	8760	14	100	27	98	64



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Relative Humidity 45 m (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	49	96	61	90	74
February	100	672	39	91	51	78	69
March	100	744	20	98	40	80	58
April	100	720	14	100	34	72	51
May	99	733	15	96	27	84	48
June	99	714	18	98	33	92	54
July	100	742	18	99	30	82	61
August	100	742	28	100	45	90	64
September	95	684	31	100	50	92	69
October	96	712	24	100	40	88	59
November	99	713	24	100	54	95	77
December	100	744	59	92	68	88	77
Annual	99	8664	14	100	27	95	63



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Relative Humidity 75 m (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	49	95	58	90	74
February	100	672	37	92	51	79	69
March	100	744	20	96	38	82	58
April	100	720	15	98	33	74	51
May	100	744	15	100	27	93	49
June	100	720	17	97	31	92	53
July	100	744	18	97	29	82	60
August	100	744	27	99	41	90	63
September	100	720	31	99	48	93	70
October	100	744	24	99	39	96	60
November	100	720	23	99	52	95	77
December	100	744	59	92	68	89	77
Annual	100	8760	15	100	27	96	63



Wood Buffalo Environmental Association - Mannix (AMS05)
Annual Summary for the Year 2021
Relative Humidity 90 m (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	49	94	56	89	73
February	100	672	36	91	50	79	68
March	100	744	20	95	37	81	58
April	100	720	15	95	32	73	50
May	100	744	15	98	27	92	49
June	100	720	18	96	31	91	53
July	100	744	18	95	29	81	60
August	100	744	26	98	40	89	62
September	100	720	31	98	48	93	69
October	100	744	24	98	38	95	59
November	100	720	23	98	51	94	76
December	100	744	59	92	67	89	77
Annual	100	8760	15	98	27	95	63



Wood Buffalo Environmental Association - Patricia McInnes (AMS06)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	46	95	64	90	76
February	100	672	38	92	54	78	67
March	100	744	21	97	43	81	60
April	100	720	15	96	37	73	53
May	100	744	15	98	28	93	51
June	100	720	18	97	36	92	56
July	100	744	18	98	32	84	63
August	100	744	26	98	50	90	66
September	100	720	32	99	52	94	73
October	100	744	24	99	42	95	63
November	100	720	26	97	60	93	79
December	100	744	58	91	68	89	77
Annual	100	8760	15	99	28	95	65



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	47	89	56	86	74
February	100	672	35	87	49	78	64
March	100	744	21	96	47	78	60
April	100	720	18	93	37	71	53
May	100	744	14	97	27	88	49
June	100	720	17	94	37	88	58
July	100	744	18	96	38	80	64
August	100	744	26	98	53	88	67
September	100	720	32	98	51	93	73
October	100	744	24	98	47	94	62
November	100	720	28	97	60	92	77
December	100	744	52	89	63	82	72
Annual	100	8760	14	98	27	94	64



Wood Buffalo Environmental Association - Fort Chipewyan (AMS08)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	58	97	70	92	80
February	100	672	31	91	55	89	71
March	100	744	37	94	55	86	70
April	100	720	27	97	46	87	65
May	100	744	22	98	35	94	64
June	100	720	29	98	49	89	65
July	100	744	27	97	49	90	68
August	100	744	24	96	48	84	69
September	100	720	37	98	58	96	80
October	100	744	35	98	52	96	72
November	100	720	36	98	59	97	82
December	100	744	67	88	71	84	77
Annual	100	8760	22	98	35	97	72



Wood Buffalo Environmental Association - Barge Landing (AMS09)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	47	95	62	91	80
February	100	672	45	92	61	87	72
March	100	742	22	98	46	85	64
April	100	720	15	98	40	74	55
May	100	744	15	99	30	95	52
June	100	720	18	98	38	93	61
July	100	744	19	99	35	84	64
August	89	662	23	99	52	89	68
September	95	686	30	100	50	98	75
October	100	744	23	100	45	98	65
November	100	720	40	98	61	96	81
December	100	744	61	90	68	84	75
Annual	99	8642	15	100	30	98	68



Wood Buffalo Environmental Association - Lower Camp (AMS11)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	55	92	64	90	79
February	100	672	43	88	59	80	70
March	100	744	22	97	51	81	65
April	100	720	16	96	40	74	58
May	100	744	16	99	31	92	54
June	100	720	18	98	40	90	62
July	100	744	19	99	40	86	67
August	93	695	30	99	59	91	72
September	100	720	33	99	50	96	76
October	100	744	26	99	45	94	67
November	100	719	35	98	65	92	81
December	98	731	60	92	69	87	77
Annual	99	8697	16	99	31	96	69



Wood Buffalo Environmental Association - Fort McKay South (AMS13)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	50	93	63	90	80
February	100	672	42	93	62	87	71
March	100	744	24	98	50	83	66
April	100	720	14	96	41	73	56
May	100	744	14	99	31	94	53
June	100	720	17	98	40	92	62
July	100	744	19	98	41	84	66
August	100	744	25	98	59	90	70
September	100	720	31	99	51	97	78
October	100	744	25	99	49	97	68
November	100	720	44	98	71	97	84
December	100	744	66	91	70	86	78
Annual	100	8760	14	99	31	97	69



Wood Buffalo Environmental Association - Anzac (AMS14)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	42	99	56	92	76
February	100	672	40	95	55	80	70
March	100	744	18	99	42	85	61
April	100	720	21	100	38	85	57
May	100	741	18	100	32	93	53
June	98	709	19	100	32	93	59
July	99	737	23	100	36	88	66
August	99	740	30	100	51	91	70
September	95	685	34	100	52	95	73
October	99	739	27	100	41	92	64
November	97	700	29	100	57	96	79
December	100	744	58	97	72	92	80
Annual	99	8675	18	100	32	96	67



Wood Buffalo Environmental Association - Wapasu (AMS17)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	47	94	60	88	78
February	100	672	39	97	51	91	70
March	100	744	22	95	42	89	62
April	100	720	15	97	37	79	55
May	98	730	15	100	29	89	52
June	99	710	19	100	33	96	59
July	99	735	21	100	32	96	66
August	100	744	26	100	47	88	71
September	90	646	33	100	53	99	78
October	100	744	26	100	46	94	67
November	100	720	34	100	54	99	83
December	100	744	69	95	72	90	80
Annual	99	8653	15	100	29	99	68



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	42	96	55	91	75
February	100	672	42	95	56	86	70
March	100	744	22	95	42	86	58
April	100	720	16	97	30	92	50
May	100	744	14	99	29	98	54
June	100	720	22	100	37	95	61
July	100	744	24	100	39	96	67
August	100	744	30	100	51	92	72
September	100	720	32	100	50	95	72
October	100	744	22	99	44	92	63
November	100	720	35	97	54	96	77
December	100	744	49	97	67	87	76
Annual	100	8760	14	100	29	98	66



Wood Buffalo Environmental Association - Firebag (AMS19)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	52	95	64	90	80
February	100	672	43	97	54	90	74
March	100	744	26	95	45	91	65
April	100	720	20	98	40	82	58
May	100	744	16	99	31	98	55
June	100	720	20	98	33	95	60
July	94	697	19	99	31	96	68
August	99	735	27	99	42	89	70
September	99	716	36	99	55	99	79
October	100	744	29	99	45	95	68
November	100	720	37	99	55	98	83
December	100	744	70	93	72	88	79
Annual	99	8700	16	99	31	99	70



Wood Buffalo Environmental Association - MacKay River (AMS20)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	51	96	64	88	78
February	100	672	33	96	53	81	67
March	100	744	20	97	44	82	60
April	100	720	16	97	37	75	55
May	100	744	15	99	31	97	54
June	100	720	20	99	34	95	60
July	100	744	19	98	34	93	66
August	100	744	26	99	52	92	69
September	100	720	32	100	51	97	76
October	100	744	26	99	44	95	66
November	100	720	23	98	53	97	81
December	100	744	61	91	66	88	76
Annual	100	8760	15	100	31	97	67



Wood Buffalo Environmental Association - Conklin (AMS21)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	42	97	57	88	75
February	100	672	36	96	57	86	69
March	100	744	21	96	50	84	61
April	100	720	14	99	39	93	57
May	97	725	14	100	33	98	57
June	89	639	21	100	36	90	59
July	100	744	21	99	36	94	69
August	100	744	30	99	51	89	73
September	100	720	31	99	52	94	74
October	100	744	22	99	51	90	68
November	100	720	32	97	57	96	78
December	100	744	48	97	68	86	76
Annual	99	8660	14	100	33	98	68



Wood Buffalo Environmental Association - Janvier (AMS22)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	44	93	58	84	73
February	100	672	37	93	55	79	67
March	100	744	18	93	43	82	57
April	100	720	15	96	30	89	51
May	100	744	14	97	30	94	53
June	100	720	19	97	40	91	62
July	100	744	23	97	38	91	69
August	100	744	29	98	53	89	73
September	100	720	30	98	53	96	74
October	100	743	18	97	46	86	65
November	100	720	33	96	58	93	76
December	100	744	53	94	65	84	73
Annual	100	8759	14	98	30	96	66



Wood Buffalo Environmental Association - Fort Hills (AMS23)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	41	94	61	89	77
February	100	672	40	92	53	86	68
March	100	743	23	97	49	86	64
April	100	718	14	96	39	73	55
May	100	744	14	100	32	93	51
June	100	718	21	100	42	92	60
July	96	716	22	99	38	81	63
August	94	699	22	100	50	75	65
September	99	711	31	100	53	98	76
October	100	744	24	101	50	98	68
November	100	719	44	99	60	96	83
December	93	695	57	91	68	87	76
Annual	98	8623	14	101	32	98	67



Wood Buffalo Environmental Association - Waskow ohci Pimatisiwin (AMS25)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	50	93	64	90	79
February	100	672	41	92	58	87	71
March	100	744	24	98	48	84	65
April	100	720	13	98	40	73	55
May	100	744	14	98	30	93	52
June	100	720	19	98	41	92	62
July	100	744	21	99	39	84	66
August	100	744	20	99	58	90	71
September	100	720	31	100	51	98	78
October	100	744	24	100	47	98	68
November	100	720	47	99	66	98	83
December	100	744	63	92	71	86	78
Annual	100	8760	13	100	30	98	69



Wood Buffalo Environmental Association - Christina Lake (AMS26)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	41	97	53	88	74
February	100	672	42	95	55	84	70
March	100	744	24	94	47	85	59
April	100	720	18	96	34	90	54
May	100	744	16	98	34	95	56
June	100	720	22	97	36	91	58
July	100	744	24	98	38	90	64
August	100	744	31	98	46	86	68
September	100	720	29	99	51	91	71
October	100	744	25	98	44	86	64
November	100	720	36	97	56	95	76
December	100	744	46	96	66	86	76
Annual	100	8760	16	99	34	95	66



Wood Buffalo Environmental Association - Jackfish 2/3 (AMS27)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	46	98	58	92	77
February	100	670	42	96	59	90	74
March	100	744	22	98	46	89	61
April	100	719	17	99	32	95	54
May	95	705	15	100	30	88	54
June	89	638	21	100	38	77	57
July	78	581	23	100	38	90	60
August	80	596	29	100	50	90	68
September	100	720	30	100	54	97	73
October	100	744	26	98	46	91	66
November	100	720	37	97	53	97	79
December	100	743	47	96	70	88	77
Annual	95	8324	15	100	30	97	67



Wood Buffalo Environmental Association - Surmont 2 (AMS29)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	49	94	56	91	77
February	100	672	42	94	56	82	70
March	100	744	19	98	49	84	62
April	100	720	18	98	39	91	56
May	100	744	18	99	33	95	57
June	100	720	20	99	36	93	61
July	100	744	21	99	39	92	69
August	100	744	29	99	49	92	73
September	100	720	32	100	53	98	75
October	100	743	28	100	44	94	68
November	100	720	35	99	57	95	81
December	100	744	64	97	69	90	78
Annual	100	8759	18	100	33	98	69



Wood Buffalo Environmental Association - Ells River (AMS30)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	51	94	63	88	77
February	100	672	41	91	56	87	67
March	100	744	17	97	42	85	61
April	100	720	16	96	39	75	54
May	100	744	16	97	29	92	51
June	100	720	18	98	38	92	59
July	100	744	18	98	38	84	64
August	100	744	26	98	53	88	67
September	100	720	30	98	50	98	75
October	100	744	23	98	45	97	65
November	100	720	28	97	58	96	81
December	100	744	57	90	65	83	73
Annual	100	8760	16	98	29	98	66



Wood Buffalo Environmental Association - Leismer (AMS501)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
October	100	744	19	99	47	94	66
November	100	720	32	98	61	96	80
December	100	744	55	97	72	89	79
Annual	100	2208	19	99	47	96	75



Wood Buffalo Environmental Association - Sawbones Bay (AMS505)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
July	100	744	22	99	38	90	65
August	100	741	25	99	50	86	68
September	100	720	29	99	50	93	72
October	100	744	24	98	48	88	66
November	100	720	32	97	60	95	78
December	100	744	53	97	71	87	78
Annual	100	4413	22	99	38	95	71



Wood Buffalo Environmental Association - Jackfish 1 (AMS506)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	48	100	60	91	77
February	100	672	46	100	59	89	74
March	100	744	21	100	47	86	60
April	100	720	16	100	31	97	53
May	94	697	13	99	31	89	52
June	93	673	21	99	40	92	59
July	100	744	24	99	40	93	67
August	100	744	28	99	49	89	71
Annual	98	5738	13	100	31	97	64



Wood Buffalo Environmental Association - Kirby South (AMS507)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
July	100	744	23	99	39	96	65
August	100	744	28	100	47	93	69
September	100	717	28	99	56	96	73
October	100	744	26	98	45	92	66
November	100	720	35	97	52	96	79
December	100	744	46	93	69	87	76
Annual	100	4413	23	100	39	96	71



Wood Buffalo Environmental Association - Kirby North (AMS508)
Annual Summary for the Year 2021
Relative Humidity (%) Average

Month	Operational Time (%)	Number of Data	1-hr Min	1-hr Max	24-hr Min	24-hr Max	Average
January	100	744	46	97	63	91	77
February	100	672	38	95	58	89	72
March	100	744	24	97	47	85	61
April	100	720	19	97	32	92	53
May	100	744	14	99	28	98	55
June	100	690	22	99	42	94	61
Annual	100	4314	14	99	28	98	63



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

BAROMETRIC PRESSURE ANNUAL 2020

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2021



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)
Annual Summary for the Year 2021
Barometric Pressure (inHg) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	
				1-Hour Value	24-Hour Value
January	100	744	29.0	29.4	29.3
February	100	672	29.1	29.9	29.7
March	100	744	28.9	29.5	29.3
April	100	720	29.1	29.7	29.7
May	100	744	29.1	29.4	29.4
June	100	720	28.9	29.3	29.2
July	100	744	29.0	29.4	29.3
August	100	744	28.9	29.2	29.1
September	100	720	28.8	29.2	29.0
October	100	744	28.9	29.4	29.4
November	100	720	28.9	29.5	29.3
December	100	744	28.9	29.5	29.4
Annual	100	8760	29.0	29.9	29.7



Wood Buffalo Environmental Association - Barge Landing (AMS09)
Annual Summary for the Year 2021
Barometric Pressure (inHg) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	744	28.9	29.3	29.2
February	100	672	29.0	29.8	29.6
March	100	742	28.8	29.4	29.3
April	100	720	29.0	29.6	29.6
May	100	744	29.0	29.3	29.3
June	100	720	28.8	29.2	29.1
July	100	744	28.9	29.3	29.2
August	92	681	28.8	29.1	29.1
September	100	720	28.7	29.1	28.9
October	100	744	28.8	29.3	29.3
November	100	720	28.8	29.4	29.2
December	100	744	28.8	29.4	29.3
Annual	99	8695	28.9	29.8	29.6



Wood Buffalo Environmental Association - Lower Camp (AMS11)
Annual Summary for the Year 2021
Barometric Pressure (inHg) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
December	98	731	29.0	29.6	29.5
Annual	98	731	29.0	29.6	29.5



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

SOLAR RADIATION ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Solar Radiation (W/m²) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	
				1-Hour Value	24-Hour Value
January	100	744	21.5	274.6	51.2
February	100	672	51.9	430.6	96.2
March	100	744	118.4	584.0	191.2
April	100	720	175.7	693.4	267.9
May	100	744	227.5	812.2	318.6
June	100	720	217.3	796.9	312.5
July	100	744	203.0	756.5	301.8
August	100	744	172.8	711.6	226.6
September	100	720	98.6	594.4	175.5
October	100	744	69.0	438.4	124.5
November	100	720	29.7	350.0	75.2
December	100	744	12.1	253.8	40.8
Annual	100	8760	116.9	812.2	318.6



Wood Buffalo Environmental Association - Fort Chipewyan (AMS08)
Annual Summary for the Year 2021
Solar Radiation (W/m²) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	
				1-Hour Value	24-Hour Value
January	100	744	26.8	320.8	65.7
February	100	672	75.3	563.4	115.7
March	100	744	144.6	745.8	230.6
April	100	720	215.8	857.1	323.5
May	100	744	271.3	922.5	365.4
June	100	720	278.5	960.4	382.2
July	100	744	259.4	894.2	366.7
August	100	744	199.2	828.5	307.7
September	100	720	107.6	679.6	227.3
October	100	744	71.3	509.1	143.0
November	100	720	22.3	297.7	63.2
December	100	744	17.7	223.9	36.9
Annual	100	8760	141.2	960.4	382.2



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Solar Radiation (W/m²) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	
				1-Hour Value	24-Hour Value
January	100	744	25.9	284.4	51.4
February	100	672	57.1	527.0	121.9
March	100	744	137.7	726.3	200.4
April	100	720	205.9	891.5	288.2
May	100	744	240.9	986.8	370.2
June	100	720	251.1	1010.1	354.5
July	100	744	229.6	934.7	352.2
August	100	744	187.2	837.8	282.4
September	100	720	130.7	738.5	225.3
October	100	743	84.9	580.3	151.6
November	100	720	33.6	380.4	78.2
December	100	744	14.9	276.7	40.3
Annual	100	8759	133.7	1010.1	370.2



Wood Buffalo Environmental Association - Ells River (AMS30)
Annual Summary for the Year 2021
Solar Radiation (W/m²) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	
				1-Hour Value	24-Hour Value
January	100	744	27.8	311.8	60.3
February	100	672	60.9	462.7	102.4
March	100	744	128.0	658.9	199.4
April	100	720	192.9	804.6	296.4
May	100	744	246.2	884.3	341.6
June	100	720	237.0	967.6	337.7
July	100	744	225.4	866.3	332.0
August	100	744	186.3	799.2	263.7
September	100	720	108.4	668.7	191.6
October	100	744	73.5	495.1	132.8
November	100	720	26.4	335.4	61.7
December	100	744	15.3	199.0	32.0
Annual	100	8760	127.7	967.6	341.6



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

PRECIPITATION ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Precipitation Collector (mm) Average

Month	Operational Time (%)	Number of Data	Total Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	744	14.8	1.7	6.5
February	100	672	7.8	0.7	2.3
March	100	744	14.6	1.8	2.7
April	100	718	7.8	1.0	2.9
May	99	740	44.2	7.4	26.9
June	100	720	58.3	3.8	14.0
July	100	744	40.3	6.1	10.8
August	100	744	73.5	15.2	40.2
September	100	720	33.4	2.8	11.0
October	100	744	10.1	2.6	7.0
November	100	718	27.5	1.4	6.3
December	100	744	28.6	1.8	7.0
Annual	100	8752	360.9	15.2	40.2



Wood Buffalo Environmental Association - Wapasu (AMS17)
Annual Summary for the Year 2021
Precipitation Collector (mm) Average

Month	Operational Time (%)	Number of Data	Total Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	741	18.4	1.3	6.0
February	100	672	12.8	0.9	3.5
March	100	744	15.7	1.5	4.0
April	100	719	12.6	1.5	4.6
May	100	744	30.8	4.3	16.9
June	100	720	58.9	4.7	22.9
July	100	744	74.1	17.0	19.9
August	100	744	77.3	15.5	15.5
September	99	713	68.0	5.3	13.0
October	100	742	13.0	2.2	6.0
November	100	720	26.2	1.2	5.4
December	100	744	17.0	1.4	6.2
Annual	100	8747	424.8	17.0	22.9



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Precipitation Collector (mm) Average

Month	Operational Time (%)	Number of Data	Total Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	744	20.4	2.2	9.5
February	51	344	27.3	1.7	14.7
March	100	744	16.3	2.0	6.1
April	100	719	17.2	2.2	8.3
May	100	744	47.5	3.8	26.9
June	100	720	84.6	16.8	37.9
July	100	744	39.5	3.9	10.9
August	99	739	49.5	18.0	19.9
September	100	720	24.7	3.1	13.2
October	100	742	14.1	2.9	6.6
November	100	720	31.2	2.3	9.8
December	100	744	22.4	1.0	4.8
Annual	96	8425	418.9	24.1	37.9



Wood Buffalo Environmental Association - Mackay River (AMS20)
Annual Summary for the Year 2021
Precipitation Collector (mm) Average

Month	Operational Time (%)	Number of Data	Total Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	744	12.0	1.2	3.0
February	100	670	17.3	2.0	5.0
March	100	744	18.6	2.0	3.8
April	98	706	14.4	1.4	3.1
May	63	470	40.1	5.3	18.7
June	100	720	73.3	6.8	15.3
July	100	744	57.3	10.7	33.7
August	100	744	66.7	10.8	20.2
September	100	720	58.2	3.9	23.9
October	100	744	14.0	2.8	8.9
November	100	720	32.9	1.8	5.7
December	45	336	14.8	1.5	4.4
Annual	92	8062	419.6	10.8	33.7



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

SURFACE WETNESS ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
Annual Summary for the Year 2021
Surface Wetness (% of range) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	744	1.8	57.2	8.4
February	100	672	0.6	42.3	11.6
March	100	742	0.6	92.9	16.1
April	100	720	1.2	60.4	13.2
May	100	744	2.5	65.2	25.4
June	100	720	5.7	64.2	27.4
July	100	744	3.7	61.2	16.3
August	100	744	7.4	75.2	24.9
September	100	720	9.9	66.4	31.0
October	100	744	3.6	69.5	21.7
November	100	718	2.5	88.8	22.5
December	100	744	1.9	5.6	4.1
Annual	100	8756	3.5	92.9	31.0



Wood Buffalo Environmental Association - Fort Chipewyan (AMS08)
Annual Summary for the Year 2021
Surface Wetness (% of range) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	744	0.9	35.3	4.0
February	100	672	0.3	1.8	1.0
March	100	744	0.1	5.6	1.2
April	100	720	0.8	48.1	10.6
May	100	744	1.2	32.0	7.2
June	100	720	1.3	40.5	12.8
July	100	744	0.9	23.7	9.8
August	100	744	1.3	27.7	6.4
September	100	720	5.4	53.7	13.2
October	100	744	1.5	28.1	11.0
November	100	720	1.8	85.5	39.0
December	100	744	0.5	1.8	1.5
Annual	100	8760	1.3	85.5	39.0



Wood Buffalo Environmental Association - Anzac (AMS14)
Annual Summary for the Year 2021
Surface Wetness (% of range) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum 1-Hour Value	Maximum 24-Hour Value
January	100	744	0.2	1.2	0.6
February	100	672	0.0	2.5	0.3
March	100	744	0.1	18.1	2.3
April	100	720	0.4	27.9	5.1
May	100	744	0.4	21.9	2.7
June	100	720	0.3	8.4	3.7
July	100	744	0.4	16.4	3.8
August	100	744	0.6	25.1	3.5
September	100	720	1.7	23.7	8.2
October	100	744	0.6	23.6	5.9
November	100	720	0.3	16.6	2.0
December	100	744	0.1	1.0	0.4
Annual	100	8760	0.4	27.9	8.2



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
Annual Summary for the Year 2021
Surface Wetness (% of range) Average

Month	Operational Time (%)	Number of Data	Mean Value	Maximum	Maximum
				1-Hour Value	24-Hour Value
January	100	744	2.3	51.4	7.8
February	100	672	1.9	52.3	7.5
March	100	744	1.1	43.6	8.9
April	100	719	1.2	65.6	21.9
May	99	739	2.4	69.7	22.3
June	100	720	3.9	61.3	23.2
July	100	744	2.9	51.4	13.9
August	100	744	4.1	40.0	11.8
September	100	720	4.2	51.6	19.2
October	100	744	2.1	42.1	16.6
November	100	720	1.4	15.1	6.8
December	96	713	1.4	27.1	2.4
Annual	100	8723	2.4	69.7	23.2



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

VERTICAL WIND SPEED ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Lower Camp Met Tower (AMS03)
 Annual Summary for the Year 2021
 Vertical Wind Speed 45m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< -10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-1.5 - -10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.8 - -1.4	0.01	0.02	0.00	0.00	0.00	0.05	0.00	0.01	0.17	0.06	0.00	0.00	0.23	0.13	0.17	0.06		0.91
-0.6 - -0.7	0.32	0.14	0.02	0.01	0.00	0.02	0.06	0.14	0.14	0.07	0.02	0.06	0.44	0.20	0.40	0.10		2.14
-0.4 - -0.5	0.85	0.21	0.07	0.01	0.01	0.02	0.05	0.39	0.29	0.14	0.05	0.25	0.91	0.57	0.76	0.47		5.04
0 - -0.3	7.07	2.12	0.47	0.18	0.15	0.21	1.02	2.84	0.84	0.41	0.53	1.67	2.89	1.45	2.00	4.34		28.19
0 - 0.3	6.79	4.36	1.06	0.68	0.69	1.18	5.40	7.97	2.34	1.00	1.48	2.62	2.29	0.98	1.32	5.03		45.18
0.4 - 0.5	0.15	0.36	0.09	0.02	0.05	0.16	2.92	4.56	0.72	0.33	0.31	0.78	0.21	0.08	0.08	0.08		10.90
0.6 - 0.7	0.07	0.05	0.02	0.01	0.01	0.06	1.33	2.55	0.39	0.09	0.06	0.34	0.09	0.00	0.00	0.02		5.10
0.8 - 1.4	0.01	0.02	0.00	0.01	0.01	0.00	0.71	1.38	0.15	0.00	0.02	0.10	0.00	0.03	0.02	0.01		2.49
1.5 - 10	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.06
> 10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Totals	15.27	7.28	1.73	0.93	0.92	1.70	11.53	19.84	5.04	2.10	2.47	5.82	7.05	3.43	4.75	10.12		100.00

Total Number of Valid Hours 8708
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Lower Camp Met Tower (AMS03)
 Annual Summary for the Year 2021
 Vertical Wind Speed 100m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< -10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-1.5 - -10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.07	0.00	0.00	0.20
-0.8 - -1.4	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.05	0.25	0.78	0.83	0.35	0.00	2.37
-0.6 - -0.7	0.18	0.06	0.01	0.00	0.01	0.00	0.00	0.01	0.02	0.02	0.00	0.08	0.35	0.47	0.68	0.25	0.00	2.15
-0.4 - -0.5	0.63	0.07	0.02	0.01	0.00	0.00	0.03	0.02	0.06	0.00	0.03	0.18	0.58	0.46	0.82	0.66	0.00	3.58
0 - -0.3	4.17	1.08	0.28	0.12	0.03	0.01	0.18	0.35	0.56	0.23	0.24	1.01	1.45	1.16	1.43	3.96	0.00	16.26
0 - 0.3	7.18	3.23	0.98	0.63	0.48	0.51	1.31	2.13	2.74	1.66	1.22	2.64	1.78	0.76	0.83	2.31	0.00	30.39
0.4 - 0.5	1.22	0.61	0.30	0.18	0.22	0.55	1.43	2.58	1.06	0.62	0.49	1.43	0.39	0.10	0.08	0.22	0.00	11.49
0.6 - 0.7	0.40	0.25	0.08	0.12	0.09	0.26	1.66	2.26	0.62	0.31	0.67	1.22	0.15	0.07	0.05	0.10	0.00	8.31
0.8 - 1.4	0.25	0.16	0.05	0.05	0.07	0.39	4.37	4.82	0.55	0.40	1.59	1.99	0.22	0.07	0.06	0.03	0.00	15.08
1.5 - 10	0.00	0.00	0.01	0.00	0.01	0.09	6.34	2.46	0.07	0.06	0.55	0.45	0.07	0.00	0.05	0.01	0.00	10.17
> 10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	14.09	5.47	1.74	1.10	0.92	1.82	15.33	14.63	5.74	3.30	4.80	9.05	5.25	3.99	4.88	7.90	0.00	100.00

Total Number of Valid Hours 8689
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Mannix (AMS05)
 Annual Summary for the Year 2021
 Vertical Wind Speed 20m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< -10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-1.5 - -10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
-0.8 - -1.4	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.83	1.07	0.24	0.23	0.22	0.09	0.09	2.93
-0.6 - -0.7	0.31	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.53	1.29	1.33	0.45	0.57	0.33	0.44	0.44	5.30
-0.4 - -0.5	1.63	0.16	0.00	0.00	0.01	0.00	0.00	0.00	0.76	1.21	1.72	2.25	1.94	1.61	1.00	1.33	1.33	13.62
0 - -0.3	7.17	4.18	0.20	0.10	0.22	0.20	0.87	4.56	3.82	1.37	0.90	2.33	4.78	2.78	2.48	3.96	3.96	39.92
0 - 0.3	0.55	2.11	1.38	0.67	0.68	0.57	10.46	12.22	0.37	0.10	0.05	0.02	0.13	0.15	0.25	0.29	0.29	30.00
0.4 - 0.5	0.00	0.13	0.20	0.34	0.29	0.30	3.29	1.57	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.03	6.17
0.6 - 0.7	0.00	0.02	0.03	0.08	0.20	0.34	0.65	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40
0.8 - 1.4	0.00	0.00	0.00	0.05	0.05	0.40	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65
1.5 - 10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
> 10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	9.71	6.62	1.80	1.24	1.44	1.81	15.44	18.42	4.99	3.42	4.79	7.02	7.54	5.34	4.28	6.15	6.15	100.00

Total Number of Valid Hours 8706
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Mannix (AMS05)
 Annual Summary for the Year 2021
 Vertical Wind Speed 45m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< -10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-1.5 - -10	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.21	0.29
-0.8 - -1.4	1.81	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.38	0.07	0.39	0.67	1.52	5.29	5.29
-0.6 - -0.7	1.81	0.56	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.02	0.43	1.34	0.70	1.00	0.71	1.26	7.86	7.86
-0.4 - -0.5	3.03	1.56	0.01	0.02	0.01	0.00	0.03	0.00	0.01	0.76	2.15	2.90	2.89	1.59	0.99	1.31	17.29	17.29
0 - -0.3	2.66	3.50	0.89	0.22	0.31	0.21	0.84	0.50	1.71	2.44	1.82	2.19	3.17	1.88	1.66	1.53	25.52	25.52
0 - 0.3	0.48	0.80	0.89	0.74	0.62	0.44	3.71	3.75	2.88	0.48	0.29	0.28	0.18	0.24	0.31	0.35	16.43	16.43
0.4 - 0.5	0.08	0.07	0.12	0.27	0.22	0.23	3.62	3.16	1.09	0.10	0.02	0.02	0.03	0.00	0.02	0.07	9.13	9.13
0.6 - 0.7	0.00	0.09	0.02	0.07	0.20	0.37	3.43	3.68	0.44	0.00	0.01	0.02	0.00	0.05	0.00	0.01	8.39	8.39
0.8 - 1.4	0.00	0.00	0.02	0.03	0.05	0.82	3.09	5.32	0.28	0.00	0.01	0.00	0.00	0.00	0.00	0.00	9.62	9.62
1.5 - 10	0.00	0.00	0.00	0.00	0.00	0.16	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.18
> 10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	9.94	6.99	1.95	1.35	1.41	2.24	14.75	16.41	6.41	3.81	4.77	7.13	7.05	5.16	4.37	6.26	100.00	100.00

Total Number of Valid Hours 8678
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Mannix (AMS05)
 Annual Summary for the Year 2021
 Vertical Wind Speed 75m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< -10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-1.5 - -10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.8 - -1.4	0.15	0.15	0.00	0.00	0.01	0.00	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.06	1.09
-0.6 - -0.7	0.34	0.32	0.01	0.00	0.01	0.01	1.61	0.01	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.29	2.65
-0.4 - -0.5	0.69	0.53	0.09	0.00	0.09	0.01	2.29	0.03	0.00	0.07	0.01	0.03	0.01	0.01	0.06	0.52	4.47	
0 - -0.3	2.91	3.82	0.90	0.24	0.44	0.28	5.14	0.52	0.13	1.22	1.25	0.79	0.31	0.20	0.53	1.74	20.41	
0 - 0.3	3.45	2.91	1.26	0.79	0.64	0.53	2.88	4.01	2.22	2.86	3.45	4.03	2.79	1.47	1.96	2.14	37.38	
0.4 - 0.5	0.79	0.35	0.20	0.19	0.23	0.19	0.43	2.74	1.81	0.39	0.50	1.23	1.97	1.09	0.90	0.46	13.45	
0.6 - 0.7	0.49	0.19	0.06	0.03	0.08	0.23	0.28	2.47	1.57	0.09	0.13	0.58	1.39	1.02	0.53	0.20	9.33	
0.8 - 1.4	0.54	0.12	0.09	0.05	0.05	0.47	0.23	3.88	2.08	0.08	0.12	0.36	0.94	1.18	0.41	0.24	10.83	
1.5 - 10	0.01	0.00	0.00	0.00	0.01	0.15	0.05	0.08	0.02	0.00	0.00	0.01	0.01	0.02	0.00	0.01	0.38	
> 10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Totals	9.38	8.38	2.62	1.30	1.56	1.88	13.61	13.74	7.84	4.71	5.45	7.03	7.44	5.01	4.40	5.66	100.00	

Total Number of Valid Hours 8639
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Mannix (AMS05)
 Annual Summary for the Year 2021
 Vertical Wind Speed 90m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< -10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-1.5 - -10	0.01	0.00	0.00	0.00	0.00	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.8 - -1.4	0.21	0.09	0.01	0.00	0.00	0.15	0.95	0.01	0.00	0.01	0.02	0.00	0.04	0.02	0.02	0.33	1.87	
-0.6 - -0.7	0.40	0.16	0.00	0.00	0.01	0.09	0.58	0.01	0.00	0.07	0.01	0.05	0.01	0.04	0.11	0.54	2.08	
-0.4 - -0.5	0.71	0.40	0.07	0.00	0.05	0.15	1.06	0.02	0.00	0.26	0.26	0.26	0.14	0.09	0.29	0.88	4.64	
0 - -0.3	3.18	2.86	0.83	0.16	0.34	0.39	2.03	0.48	0.78	2.80	3.67	3.81	2.57	1.16	1.52	2.00	28.56	
0 - 0.3	2.86	3.48	1.52	0.83	0.68	1.16	3.14	2.58	3.61	1.42	1.46	2.73	4.24	2.78	1.77	1.25	35.51	
0.4 - 0.5	0.86	0.50	0.22	0.15	0.15	0.29	1.51	2.22	1.67	0.16	0.26	0.35	0.57	0.76	0.37	0.27	10.32	
0.6 - 0.7	0.51	0.34	0.08	0.07	0.14	0.22	1.39	2.62	1.13	0.06	0.02	0.13	0.11	0.28	0.09	0.13	7.32	
0.8 - 1.4	0.91	0.23	0.12	0.06	0.08	0.55	2.10	3.90	0.61	0.07	0.05	0.04	0.09	0.11	0.11	0.14	9.15	
1.5 - 10	0.05	0.00	0.00	0.00	0.00	0.16	0.08	0.12	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.05	0.48	
> 10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Totals	9.70	8.07	2.85	1.27	1.45	3.19	12.88	11.96	7.81	4.86	5.74	7.36	7.77	5.24	4.29	5.57	100.00	

Total Number of Valid Hours 8564
 Total Number of Hours 8760



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

WIND SPEED AND DIRECTION ANNUAL 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association - Fort McKay - Bertha Ganter (AMS01)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2.21	1.30	1.16	1.17	0.98	0.93	1.52	3.24	5.58	3.92	2.99	2.99	3.45	3.47	2.60	2.91	40.40
6 - 11	5.36	2.76	0.87	0.44	0.21	0.25	1.31	6.75	7.40	1.92	1.65	2.45	1.82	2.33	1.49	2.44	39.44
12 - 19	4.13	1.30	0.02	0.00	0.00	0.03	0.74	4.14	1.54	0.45	0.31	0.37	0.30	0.94	1.31	1.25	16.82
20 - 28	1.42	0.06	0.00	0.00	0.00	0.02	0.22	0.28	0.18	0.01	0.00	0.00	0.00	0.14	0.46	0.32	3.11
29 - 38	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.22
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	13.32	5.41	2.06	1.61	1.18	1.24	3.78	14.40	14.71	6.30	4.95	5.80	5.56	6.88	5.87	6.92	100.00

Total Number of Valid Hours 8702
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Mildred Lake (AMS02)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2.18	1.61	1.25	1.08	1.06	0.97	1.36	2.28	3.13	2.49	1.32	0.95	0.67	0.56	0.87	1.27	23.05
6 - 11	6.72	2.50	0.94	0.39	0.40	0.95	4.43	8.50	4.53	2.61	2.82	1.92	1.86	2.10	1.66	3.75	46.08
12 - 19	5.32	1.44	0.09	0.02	0.08	0.81	4.14	3.10	1.03	0.31	1.74	1.35	2.20	1.58	1.53	1.36	26.12
20 - 28	1.27	0.17	0.00	0.00	0.00	0.14	0.64	0.06	0.24	0.02	0.03	0.29	0.41	0.40	0.44	0.41	4.53
29 - 38	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.22
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	15.65	5.73	2.28	1.49	1.54	2.88	10.57	13.93	8.93	5.44	5.92	4.51	5.17	4.66	4.50	6.80	100.00

Total Number of Valid Hours 8720
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Lower Camp Met Tower (AMS03)
 Annual Summary for the Year 2021
 Wind Speed 45m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	4.08	1.62	0.80	0.75	0.73	1.07	1.86	2.01	1.30	0.68	0.93	0.79	0.78	0.90	1.63	4.81	24.74
6 - 11	6.33	2.02	0.69	0.17	0.16	0.51	4.32	6.29	1.08	0.57	0.64	1.41	1.45	0.73	1.00	3.80	31.18
12 - 19	3.53	2.70	0.23	0.01	0.02	0.09	4.00	8.23	2.07	0.59	0.60	2.12	2.72	1.16	1.25	1.23	30.55
20 - 28	1.22	0.84	0.01	0.00	0.00	0.03	1.29	2.71	0.60	0.26	0.26	1.22	1.70	0.52	0.82	0.28	11.75
29 - 38	0.13	0.10	0.00	0.00	0.00	0.00	0.07	0.54	0.00	0.00	0.03	0.23	0.32	0.11	0.06	0.00	1.60
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.05	0.08	0.01	0.00	0.00	0.20
Totals	15.27	7.28	1.73	0.93	0.92	1.70	11.53	19.84	5.04	2.10	2.47	5.82	7.05	3.43	4.75	10.12	100.00

Total Number of Valid Hours 8708
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Lower Camp Met Tower (AMS03)
 Annual Summary for the Year 2021
 Wind Speed 100m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1.06	0.91	0.53	0.51	0.45	0.71	1.00	0.97	0.94	0.77	0.81	0.64	0.68	0.76	0.86	0.85	12.45
6 - 11	3.44	1.57	0.69	0.45	0.38	0.69	3.23	3.99	2.42	1.29	1.14	1.16	0.73	0.58	1.13	3.12	26.00
12 - 19	4.99	1.90	0.48	0.13	0.08	0.31	4.29	6.42	1.12	0.62	1.09	2.26	1.06	0.74	1.32	2.91	29.73
20 - 28	3.05	0.86	0.03	0.02	0.00	0.06	3.29	2.69	1.17	0.48	1.30	3.14	1.60	1.15	1.09	0.75	20.70
29 - 38	1.25	0.17	0.00	0.00	0.01	0.05	2.87	0.52	0.09	0.14	0.44	1.45	0.90	0.67	0.45	0.25	9.25
> 38	0.29	0.06	0.00	0.00	0.00	0.00	0.64	0.03	0.00	0.00	0.02	0.39	0.29	0.10	0.02	0.01	1.86
Totals	14.09	5.47	1.74	1.10	0.92	1.82	15.33	14.63	5.74	3.30	4.80	9.05	5.25	3.99	4.88	7.90	100.00

Total Number of Valid Hours 8689
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Buffalo Viewpoint (AMS04)
Annual Summary for the Year 2021
Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1.77	2.45	1.12	0.49	0.46	0.71	1.85	3.08	1.69	0.76	0.52	0.52	0.46	1.25	1.23	1.33	19.69
6 - 11	6.24	3.76	1.14	0.27	0.14	1.61	7.68	13.59	3.27	1.74	1.44	0.84	0.74	1.36	1.55	1.61	46.99
12 - 19	7.19	3.11	0.00	0.00	0.03	0.84	1.93	1.33	0.74	0.84	1.09	2.32	1.77	1.01	1.99	0.35	24.54
20 - 28	4.00	0.41	0.00	0.00	0.00	0.27	0.03	0.00	0.03	0.05	0.00	0.49	0.82	0.14	0.49	0.46	7.19
29 - 38	1.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.16	0.03	0.00	0.05	1.44
> 38	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
Totals	20.51	9.72	2.26	0.76	0.63	3.43	11.50	18.01	5.72	3.41	3.05	4.20	3.95	3.79	5.26	3.81	100.00

Total Number of Valid Hours 3671
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Mannix (AMS05)
 Annual Summary for the Year 2021
 Wind Speed 20m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	0.87	0.87	0.55	0.51	0.64	0.62	1.00	1.37	0.96	0.87	0.78	0.80	1.00	0.95	0.99	1.05	13.84
6 - 11	3.26	2.32	0.98	0.64	0.51	0.61	5.62	9.21	2.63	1.50	1.71	2.39	1.72	1.73	1.65	2.62	39.11
12 - 19	3.65	2.72	0.23	0.09	0.26	0.52	6.60	7.51	1.19	0.93	1.61	2.23	2.95	1.40	1.31	1.65	34.87
20 - 28	1.59	0.63	0.05	0.00	0.02	0.07	2.15	0.33	0.20	0.10	0.68	1.22	1.46	1.13	0.33	0.69	10.64
29 - 38	0.32	0.06	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.01	0.01	0.33	0.37	0.13	0.00	1.44
> 38	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.03	0.00	0.00	0.00	0.10
Totals	9.71	6.62	1.80	1.24	1.44	1.81	15.44	18.42	4.99	3.42	4.79	7.02	7.54	5.34	4.28	6.15	100.00

Total Number of Valid Hours 8706
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Mannix (AMS05)
 Annual Summary for the Year 2021
 Wind Speed 45m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	0.52	0.43	0.44	0.40	0.48	0.53	0.63	0.52	0.59	0.43	0.43	0.37	0.41	0.55	0.48	0.63	7.85
6 - 11	1.90	1.42	0.85	0.62	0.56	0.59	2.42	2.55	1.59	1.08	0.83	1.04	1.21	1.05	1.44	1.98	21.13
12 - 19	3.46	3.05	0.59	0.31	0.25	0.90	6.18	8.40	2.42	1.38	1.57	2.67	2.50	1.47	1.30	1.96	38.42
20 - 28	2.64	1.74	0.06	0.01	0.10	0.21	4.92	4.84	1.49	0.80	1.49	2.10	2.09	1.22	0.83	1.08	25.60
29 - 38	1.12	0.28	0.01	0.00	0.00	0.01	0.60	0.10	0.32	0.12	0.44	0.71	0.65	0.75	0.24	0.52	5.87
> 38	0.31	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.24	0.20	0.12	0.07	0.08	1.13
Totals	9.94	6.99	1.95	1.35	1.41	2.24	14.75	16.41	6.41	3.81	4.77	7.13	7.05	5.16	4.37	6.26	100.00

Total Number of Valid Hours 8678
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Mannix (AMS05)
 Annual Summary for the Year 2021
 Wind Speed 75m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	0.46	0.34	0.45	0.34	0.43	0.45	0.56	0.50	0.47	0.25	0.45	0.27	0.38	0.37	0.44	0.51	6.67
6 - 11	1.64	1.15	0.79	0.50	0.73	0.93	2.20	1.97	1.30	1.04	0.86	0.73	0.98	0.89	1.18	1.39	18.27
12 - 19	2.94	2.69	1.01	0.45	0.36	0.47	5.07	4.98	2.20	1.56	1.48	2.05	2.11	1.22	1.19	1.83	31.60
20 - 28	2.57	2.96	0.32	0.01	0.05	0.02	4.82	4.64	2.72	1.37	1.72	2.38	2.77	1.49	1.12	1.23	30.20
29 - 38	1.24	0.98	0.05	0.00	0.00	0.00	0.97	1.64	1.15	0.45	0.85	1.18	0.91	0.85	0.30	0.54	11.11
> 38	0.52	0.27	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.03	0.09	0.42	0.29	0.20	0.16	0.16	2.15
Totals	9.38	8.38	2.62	1.30	1.56	1.88	13.61	13.74	7.84	4.71	5.45	7.03	7.44	5.01	4.40	5.66	100.00

Total Number of Valid Hours 8639
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Mannix (AMS05)
 Annual Summary for the Year 2021
 Wind Speed 90m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	0.44	0.30	0.46	0.26	0.34	0.51	0.32	0.46	0.40	0.33	0.35	0.23	0.36	0.33	0.42	0.43	5.93
6 - 11	1.44	1.04	0.84	0.47	0.49	0.98	1.58	1.55	1.32	0.95	0.90	0.67	0.83	0.86	1.04	1.16	16.10
12 - 19	2.87	2.51	1.11	0.50	0.49	1.10	3.84	4.10	2.07	1.48	1.58	1.72	1.96	1.07	1.05	1.76	29.22
20 - 28	2.73	3.00	0.39	0.05	0.13	0.55	5.35	3.96	2.55	1.39	1.74	2.53	2.71	1.67	1.16	1.31	31.20
29 - 38	1.45	1.00	0.06	0.00	0.00	0.05	1.74	1.88	1.44	0.67	1.07	1.70	1.51	0.97	0.41	0.67	14.61
> 38	0.77	0.21	0.00	0.00	0.00	0.00	0.06	0.01	0.05	0.05	0.11	0.50	0.40	0.34	0.21	0.25	2.94
Totals	9.70	8.07	2.85	1.27	1.45	3.19	12.88	11.96	7.81	4.86	5.74	7.36	7.77	5.24	4.29	5.57	100.00

Total Number of Valid Hours 8564
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Patricia McInnes (AMS06)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	0.83	0.41	0.61	0.45	0.81	1.17	1.51	1.85	2.33	1.61	1.19	0.90	1.04	1.36	1.21	0.93	18.21
6 - 11	3.41	1.42	0.89	0.86	1.21	3.48	4.91	3.32	3.76	4.11	4.17	2.22	1.15	1.87	2.21	4.40	43.38
12 - 19	2.98	1.08	0.14	0.08	0.37	4.68	1.49	0.36	1.19	1.15	3.82	2.45	2.00	1.80	1.65	3.34	28.58
20 - 28	1.61	0.17	0.00	0.00	0.12	0.78	0.20	0.08	0.28	0.17	0.56	1.03	1.17	1.07	0.50	1.01	8.75
29 - 38	0.23	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.26	0.20	0.06	0.02	0.22	1.06
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01
Totals	9.07	3.10	1.64	1.39	2.50	10.11	8.10	5.61	7.55	7.06	9.79	6.87	5.58	6.15	5.59	9.91	100.00

Total Number of Valid Hours 8681
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Athabasca Valley (AMS07)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1.74	1.00	0.70	0.99	1.82	2.61	4.13	3.53	2.74	2.01	2.23	1.93	1.36	1.28	1.49	1.79	31.33
6 - 11	2.80	0.77	0.17	0.38	0.90	2.30	11.54	3.34	0.85	1.62	2.99	1.41	0.56	0.57	1.68	5.37	37.26
12 - 19	1.60	0.39	0.08	0.07	0.23	1.28	5.64	0.67	0.53	0.40	1.84	2.23	1.06	1.08	1.45	4.52	23.05
20 - 28	0.43	0.06	0.00	0.00	0.05	0.10	0.34	0.01	0.03	0.01	0.34	0.59	1.41	0.93	0.76	2.03	7.10
29 - 38	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.38	0.28	0.09	0.28	1.21
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.05
Totals	6.62	2.22	0.95	1.44	2.99	6.29	21.65	7.55	4.15	4.05	7.40	6.29	4.82	4.14	5.47	13.99	100.00

Total Number of Valid Hours 8701
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Fort Chipewyan (AMS08)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	0.53	0.54	0.26	0.33	0.77	0.49	0.36	0.39	0.38	0.58	0.60	0.44	0.55	0.55	0.80	1.02	8.58
6 - 11	2.05	0.83	1.00	1.78	3.59	1.59	1.02	1.19	1.09	1.40	1.94	2.18	2.86	3.55	4.19	4.06	34.31
12 - 19	0.87	0.69	1.23	2.52	5.98	1.88	1.55	1.50	1.67	1.20	1.26	2.10	3.44	3.32	3.93	2.49	35.63
20 - 28	0.02	0.14	1.01	3.41	4.30	1.49	1.08	0.72	1.29	0.22	0.10	0.63	1.01	0.36	1.19	0.25	17.22
29 - 38	0.00	0.00	0.23	1.10	1.32	0.30	0.28	0.22	0.33	0.01	0.00	0.11	0.01	0.00	0.00	0.00	3.91
> 38	0.00	0.00	0.00	0.13	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
Totals	3.47	2.19	3.72	9.27	16.18	5.75	4.27	4.02	4.77	3.41	3.90	5.45	7.87	7.78	10.12	7.81	100.00

Total Number of Valid Hours 8727
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Barge Landing (AMS09)
 Annual Summary for the Year 2021
 Wind Speed 10m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2.96	3.12	2.56	2.52	2.11	2.72	4.11	3.83	3.04	2.82	2.52	2.26	1.19	1.77	2.56	5.11	45.21
6 - 11	4.87	5.62	2.26	0.75	0.04	0.70	4.33	7.49	4.85	2.21	2.44	2.22	0.97	1.15	1.69	2.48	44.08
12 - 19	2.28	1.49	0.02	0.00	0.00	0.40	0.85	0.34	0.54	0.38	0.93	1.49	0.32	0.38	0.42	0.50	10.33
20 - 28	0.16	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.02	0.00	0.00	0.00	0.38
29 - 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	10.27	10.25	4.85	3.28	2.15	3.81	9.30	11.66	8.42	5.40	5.90	6.16	2.50	3.30	4.67	8.09	100.00

Total Number of Valid Hours 5034
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Barge Landing (AMS09)
Annual Summary for the Year 2021
Wind Speed 20m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1.21	0.83	0.86	0.89	0.26	0.49	0.66	1.21	1.35	1.69	1.35	1.44	1.06	1.38	1.75	1.92	18.36
6 - 11	3.53	1.78	1.09	1.24	0.63	0.75	2.18	5.72	9.22	5.14	4.22	3.02	2.24	1.47	1.87	5.11	49.21
12 - 19	1.84	1.95	0.95	0.23	0.03	0.06	1.75	5.29	4.40	1.52	1.84	2.90	1.58	0.86	0.72	0.86	26.77
20 - 28	0.43	0.34	0.03	0.00	0.00	0.00	0.20	0.92	0.32	0.11	0.17	1.06	0.40	0.46	0.46	0.23	5.14
29 - 38	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.23	0.09	0.00	0.00	0.52
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	7.01	4.94	2.93	2.36	0.92	1.29	4.80	13.13	15.28	8.47	7.58	8.59	5.52	4.25	4.80	8.13	100.00

Total Number of Valid Hours 3481
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Lower Camp (AMS11)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1.71	1.39	1.24	1.01	1.53	2.68	3.17	0.98	0.78	0.45	0.46	0.79	1.59	4.57	5.37	3.24	30.97
6 - 11	2.90	1.05	0.34	0.23	0.34	2.04	11.43	2.87	0.90	0.49	0.96	1.81	1.42	1.75	3.43	3.95	35.90
12 - 19	3.65	0.88	0.15	0.01	0.10	1.80	6.28	0.65	0.16	0.23	0.61	3.30	2.58	1.17	1.23	1.48	24.29
20 - 28	1.26	0.17	0.00	0.00	0.00	1.39	1.83	0.00	0.00	0.00	0.14	0.80	0.69	0.97	0.34	0.25	7.85
29 - 38	0.14	0.03	0.00	0.00	0.00	0.10	0.36	0.00	0.00	0.00	0.00	0.17	0.12	0.03	0.00	0.01	0.97
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01
Totals	9.66	3.53	1.73	1.25	1.97	8.00	23.07	4.51	1.84	1.17	2.18	6.87	6.42	8.50	10.37	8.94	100.00

Total Number of Valid Hours 8634
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Fort McKay South (AMS13)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2.62	1.63	0.85	0.62	0.49	0.60	1.10	2.20	4.87	4.83	4.47	5.16	2.82	2.47	2.93	2.97	40.65
6 - 11	4.71	3.50	0.92	0.07	0.12	0.38	1.71	4.01	5.55	3.02	2.20	2.98	2.24	1.76	1.67	2.23	37.06
12 - 19	4.18	2.55	0.03	0.00	0.00	0.02	0.82	3.36	2.32	0.79	1.08	1.09	0.21	0.48	0.70	1.02	18.68
20 - 28	1.61	0.36	0.00	0.00	0.00	0.00	0.08	0.48	0.46	0.06	0.02	0.06	0.05	0.00	0.01	0.13	3.31
29 - 38	0.29	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	13.41	8.06	1.81	0.69	0.61	1.00	3.72	10.05	13.20	8.70	7.77	9.29	5.32	4.72	5.32	6.35	100.00

Total Number of Valid Hours 8689
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Anzac (AMS14)
Annual Summary for the Year 2021
Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	0.60	0.62	0.50	0.44	0.66	0.74	1.28	1.63	1.13	1.16	0.99	0.98	0.93	0.83	0.74	0.64	13.87
6 - 11	1.45	0.97	0.61	0.89	1.04	2.39	3.80	5.14	3.73	2.58	2.64	2.89	4.29	4.97	2.99	2.27	42.65
12 - 19	0.83	0.33	0.12	0.44	0.31	1.55	4.23	3.02	1.60	0.93	0.89	2.33	5.16	5.97	4.78	2.22	34.73
20 - 28	0.29	0.00	0.00	0.00	0.01	0.10	0.64	0.56	0.18	0.08	0.17	0.93	1.65	1.47	1.25	0.83	8.16
29 - 38	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.17	0.13	0.14	0.06	0.60
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	3.18	1.92	1.23	1.78	2.02	4.77	9.96	10.35	6.64	4.75	4.69	7.20	12.20	13.38	9.91	6.02	100.00

Total Number of Valid Hours 8385
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Wapasu (AMS17)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1.58	2.16	1.88	1.26	1.36	1.59	2.70	2.46	2.30	1.39	0.94	0.69	0.64	0.85	1.02	1.37	24.20
6 - 11	4.99	2.67	1.26	0.56	0.36	1.00	3.06	8.53	8.36	3.60	3.63	2.01	1.10	1.32	1.28	3.97	47.70
12 - 19	2.88	0.62	0.16	0.05	0.05	0.45	2.96	5.44	1.73	1.42	3.28	1.73	0.38	0.57	0.45	3.03	25.21
20 - 28	0.27	0.06	0.00	0.00	0.00	0.00	0.94	0.58	0.00	0.02	0.29	0.26	0.02	0.03	0.02	0.40	2.89
29 - 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	9.72	5.51	3.30	1.86	1.77	3.05	9.66	17.02	12.39	6.44	8.14	4.68	2.15	2.78	2.78	8.77	100.00

Total Number of Valid Hours 8604
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
 Annual Summary for the Year 2021
 Wind Speed 10m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1.54	1.16	1.23	1.33	1.44	1.51	1.45	1.54	2.10	1.83	1.68	1.91	2.11	2.53	2.78	2.60	28.73
6 - 11	2.14	2.25	1.61	0.84	1.24	1.69	2.68	2.56	4.43	9.39	5.16	4.37	7.53	4.84	3.16	1.51	55.39
12 - 19	0.43	0.29	0.17	0.10	0.10	0.59	0.52	0.88	1.29	3.51	1.55	1.40	2.33	1.57	0.71	0.21	15.64
20 - 28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.00	0.01	0.14	0.01	0.00	0.00	0.24
29 - 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	4.11	3.70	3.00	2.26	2.78	3.79	4.65	4.97	7.83	14.78	8.38	7.70	12.12	8.94	6.65	4.32	100.00

Total Number of Valid Hours 7156
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Stony Mountain (AMS18)
 Annual Summary for the Year 2021
 Wind Speed 20m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	0.38	1.27	0.83	0.32	0.89	0.38	0.19	0.25	0.06	0.64	0.57	0.57	0.45	0.57	0.76	0.38	8.54
6 - 11	1.08	2.04	2.23	2.48	0.51	0.51	0.32	1.46	2.55	3.44	3.18	2.55	4.59	5.29	2.80	1.34	36.37
12 - 19	0.76	0.64	0.06	0.70	0.32	0.06	0.51	2.23	4.08	5.54	7.07	6.37	7.01	5.67	5.86	0.70	47.58
20 - 28	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.38	0.76	2.80	0.25	0.96	1.08	0.25	0.57	0.00	7.13
29 - 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.25	0.00	0.00	0.38
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	2.23	3.95	3.12	3.50	1.72	0.96	1.08	4.33	7.45	12.42	11.08	10.45	13.25	12.04	10.00	2.42	100.00

Total Number of Valid Hours 1570
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Firebag (AMS19)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	0.70	0.84	0.66	0.46	0.45	0.54	0.40	0.78	0.83	0.81	0.65	0.54	0.63	0.57	0.60	0.75	10.21
6 - 11	2.68	2.01	1.15	0.78	0.57	1.10	1.70	2.07	2.38	2.76	2.47	2.38	1.44	1.47	1.88	2.60	29.44
12 - 19	3.68	1.71	0.57	0.46	0.34	1.44	1.83	4.11	4.81	4.91	3.92	2.92	1.68	1.41	1.97	3.70	39.45
20 - 28	1.75	0.34	0.06	0.06	0.00	0.47	1.53	3.20	2.01	1.77	1.60	1.64	0.42	0.35	0.60	2.41	18.22
29 - 38	0.23	0.04	0.00	0.00	0.00	0.01	0.28	0.80	0.35	0.16	0.05	0.23	0.06	0.04	0.08	0.36	2.68
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	9.03	4.94	2.44	1.76	1.35	3.56	5.74	10.96	10.38	10.41	8.70	7.71	4.22	3.84	5.14	9.83	100.00

Total Number of Valid Hours 8292
 Total Number of Hours 8760



Wood Buffalo Environmental Association -MacKay River (AMS20)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1.28	1.91	2.12	1.12	1.01	1.61	4.29	5.15	3.52	2.50	2.66	3.04	2.66	2.13	1.59	1.42	38.03
6 - 11	1.47	3.16	3.32	0.72	0.64	2.89	3.22	2.41	7.03	5.35	3.31	3.48	4.26	3.53	2.25	1.67	48.70
12 - 19	0.42	1.45	0.51	0.02	0.02	1.11	0.39	0.22	1.04	1.25	0.60	0.89	0.98	1.38	1.72	0.93	12.94
20 - 28	0.00	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.06	0.05	0.34
29 - 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	3.17	6.68	5.96	1.86	1.67	5.61	7.91	7.78	11.59	9.10	6.57	7.43	7.93	7.06	5.61	4.06	100.00

Total Number of Valid Hours 8639
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Conklin (AMS21)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2.96	1.53	1.05	0.93	0.85	1.33	2.56	5.52	7.16	4.18	2.10	1.44	1.31	1.91	3.05	3.96	41.85
6 - 11	2.23	2.21	0.87	0.54	0.43	1.11	1.82	1.54	2.72	5.09	5.30	3.63	2.20	3.81	4.88	3.81	42.20
12 - 19	1.22	0.66	0.13	0.00	0.03	0.07	0.82	0.86	1.41	1.41	1.96	1.74	1.29	1.11	0.89	1.80	15.41
20 - 28	0.19	0.02	0.00	0.00	0.00	0.00	0.03	0.00	0.08	0.00	0.01	0.03	0.10	0.01	0.00	0.06	0.54
29 - 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	6.58	4.43	2.05	1.47	1.31	2.52	5.24	7.92	11.38	10.69	9.37	6.84	4.90	6.85	8.82	9.63	100.00

Total Number of Valid Hours 8627
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Janvier (AMS22)
 Annual Summary for the Year 2021
 Wind Speed 10m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2.21	4.21	2.91	2.16	1.76	1.90	3.13	4.08	5.77	6.40	3.39	1.90	1.18	0.93	1.20	1.15	44.28
6 - 11	1.15	6.72	2.78	1.18	1.12	0.61	0.85	1.01	2.29	10.89	5.76	2.61	2.93	3.28	1.17	0.58	44.90
12 - 19	0.16	1.63	0.43	0.11	0.14	0.16	0.02	0.13	0.80	1.54	1.09	0.77	2.35	1.12	0.05	0.10	10.59
20 - 28	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.19	0.02	0.00	0.00	0.24
29 - 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	3.52	12.57	6.12	3.45	3.02	2.67	4.00	5.21	8.86	18.82	10.25	5.28	6.65	5.34	2.41	1.82	100.00

Total Number of Valid Hours 6254
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Janvier (AMS22)
 Annual Summary for the Year 2021
 Wind Speed 20m (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2.74	3.94	1.07	0.99	0.69	0.77	0.77	1.24	2.44	3.34	2.61	1.84	1.07	0.60	1.03	1.28	26.42
6 - 11	2.14	4.58	1.71	0.90	0.81	1.46	2.01	1.71	3.43	12.21	14.78	3.04	2.23	2.48	1.80	1.11	56.40
12 - 19	0.39	0.56	0.21	0.51	0.04	0.17	0.64	0.77	1.46	3.25	3.43	1.16	1.67	1.24	0.73	0.26	16.49
20 - 28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.26	0.13	0.09	0.09	0.00	0.64
29 - 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.04
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	5.27	9.08	3.00	2.40	1.54	2.40	3.43	3.73	7.32	18.89	20.81	6.30	5.14	4.41	3.64	2.66	100.00

Total Number of Valid Hours 2335
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Fort Hills (AMS23)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1.50	1.13	0.72	0.64	0.70	0.77	1.38	1.90	2.07	1.73	0.93	0.91	0.96	1.19	1.37	1.80	19.70
6 - 11	4.06	3.70	1.57	0.67	0.38	1.02	3.49	6.65	5.94	3.99	1.69	0.82	0.80	0.90	1.10	1.64	38.43
12 - 19	3.56	4.96	1.10	0.18	0.01	0.08	1.56	4.44	4.31	3.60	2.42	0.82	0.92	0.97	0.90	0.96	30.79
20 - 28	1.68	2.27	0.08	0.00	0.00	0.00	0.11	1.02	0.56	0.70	1.10	0.45	0.27	0.32	0.35	0.34	9.24
29 - 38	0.51	0.45	0.00	0.00	0.00	0.00	0.00	0.06	0.11	0.08	0.15	0.20	0.06	0.02	0.00	0.01	1.65
> 38	0.07	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.19
Totals	11.38	12.60	3.47	1.49	1.09	1.87	6.53	14.07	12.99	10.10	6.30	3.21	3.02	3.40	3.72	4.75	100.00

Total Number of Valid Hours 8463
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Waskow ohci Pimatisiwin (AMS25)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	3.07	2.39	2.00	1.82	1.57	2.00	5.71	11.12	5.40	3.07	2.85	3.96	4.92	3.78	3.45	3.93	61.04
6 - 11	4.41	2.92	0.84	0.12	0.00	0.60	4.89	4.40	1.06	1.25	1.98	1.82	1.28	1.72	1.78	3.19	32.25
12 - 19	2.05	0.50	0.00	0.00	0.00	0.00	0.20	0.32	0.09	0.17	0.28	0.22	0.15	0.60	0.88	0.95	6.43
20 - 28	0.19	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.29
29 - 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	9.72	5.83	2.83	1.94	1.57	2.60	10.79	15.84	6.54	4.50	5.12	6.00	6.35	6.10	6.13	8.15	100.00

Total Number of Valid Hours 8618
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Christina Lake (AMS26)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	0.19	0.16	0.54	0.81	1.11	1.48	1.64	2.23	2.77	2.43	1.19	0.37	0.44	0.21	0.18	0.13	15.88
6 - 11	0.57	1.68	2.55	1.70	1.63	1.56	1.78	2.08	4.14	5.92	4.89	5.52	1.25	0.96	0.82	0.41	37.47
12 - 19	0.89	2.89	1.16	0.52	0.50	0.70	1.20	1.99	2.83	2.35	3.67	5.04	3.44	2.47	3.57	1.43	34.65
20 - 28	0.44	0.68	0.14	0.01	0.11	0.14	0.17	0.46	0.92	0.26	0.70	0.95	1.12	1.50	2.75	0.86	11.20
29 - 38	0.05	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.07	0.14	0.21	0.18	0.78
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.02
Totals	2.14	5.49	4.39	3.04	3.36	3.87	4.79	6.77	10.70	10.96	10.46	11.89	6.31	5.28	7.55	3.01	100.00

Total Number of Valid Hours 8730
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Jackfish 2/3 (AMS27)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1.76	2.07	1.81	1.81	1.11	1.26	1.36	1.98	3.88	2.79	1.86	2.00	1.93	1.38	1.60	1.98	30.59
6 - 11	1.41	2.46	2.17	1.51	1.30	0.74	1.45	2.65	5.87	7.78	8.03	8.20	5.01	4.00	3.16	1.93	57.69
12 - 19	0.15	0.21	0.25	0.09	0.13	0.06	0.15	0.07	0.26	0.78	2.45	3.87	1.86	0.73	0.18	0.06	11.29
20 - 28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.33	0.08	0.00	0.00	0.00	0.43
29 - 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	3.32	4.74	4.23	3.41	2.54	2.06	2.96	4.70	10.01	11.35	12.37	14.40	8.89	6.12	4.94	3.97	100.00

Total Number of Valid Hours 8742
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Surmont 2 (AMS29)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2.06	1.68	0.97	1.12	2.56	5.11	3.54	2.55	2.02	3.19	6.29	7.28	5.40	3.53	2.75	2.75	52.81
6 - 11	2.00	0.61	0.19	0.35	1.80	6.22	2.72	0.80	0.20	0.16	0.63	5.25	7.28	4.12	2.98	5.28	40.59
12 - 19	0.07	0.00	0.00	0.00	0.37	0.58	0.08	0.00	0.00	0.00	0.05	0.95	2.41	0.97	0.26	0.76	6.50
20 - 28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.04	0.00	0.00	0.09
29 - 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	4.13	2.29	1.16	1.47	4.74	11.91	6.35	3.34	2.22	3.36	6.97	13.48	15.15	8.65	5.99	8.79	100.00

Total Number of Valid Hours 8553
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Ells River (AMS30)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1.67	1.09	0.97	0.79	0.56	0.70	0.76	1.24	1.99	3.06	2.23	1.92	2.46	2.50	1.94	1.76	25.64
6 - 11	2.30	3.93	1.69	0.99	0.49	0.44	1.07	2.94	6.88	6.19	4.76	3.95	1.74	2.12	1.20	0.92	41.60
12 - 19	1.05	4.78	2.19	0.34	0.05	0.05	0.65	2.59	2.64	1.36	1.90	2.14	0.72	1.07	1.13	1.20	23.83
20 - 28	0.62	2.76	0.72	0.00	0.00	0.01	0.12	0.74	0.43	0.20	0.14	0.24	0.13	0.15	0.41	0.59	7.25
29 - 38	0.31	0.92	0.07	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.01	1.44
> 38	0.03	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
Totals	5.99	13.67	5.63	2.12	1.09	1.20	2.59	7.55	11.94	10.80	9.02	8.25	5.06	5.88	4.73	4.48	100.00

Total Number of Valid Hours 8601
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Leismer (AMS501)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1.81	0.81	0.95	0.59	0.59	0.99	1.67	2.35	4.74	3.88	2.30	2.12	3.21	2.12	0.72	1.31	30.16
6 - 11	1.94	1.22	0.50	0.95	3.70	2.30	2.98	3.16	2.89	3.97	1.17	1.31	4.65	4.56	1.63	2.39	39.32
12 - 19	0.68	0.14	0.09	0.00	1.44	1.81	2.66	1.94	0.81	0.50	0.14	0.36	1.85	5.10	3.66	3.39	24.56
20 - 28	0.27	0.00	0.00	0.00	0.00	0.00	0.18	0.09	0.00	0.00	0.00	0.00	0.09	1.99	1.49	1.13	5.24
29 - 38	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.27	0.00	0.59
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.14
Totals	4.74	2.17	1.53	1.53	5.73	5.10	7.49	7.54	8.44	8.35	3.61	3.79	9.80	14.18	7.77	8.22	100.00

Total Number of Valid Hours 2215
 Total Number of Hours 8760



Wood Buffalo Environmental Association -Sawbones Bay (AMSS05)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1.11	1.25	1.41	1.91	1.68	1.48	1.09	2.11	2.29	1.16	0.77	0.52	0.52	0.84	0.89	0.91	19.93
6 - 11	1.45	2.43	0.98	0.91	1.34	2.38	1.88	6.92	6.56	4.11	2.07	0.91	1.63	3.79	1.91	1.29	40.57
12 - 19	0.70	0.43	0.09	0.11	0.36	1.04	1.63	3.75	2.47	2.36	3.27	3.72	4.97	4.52	2.02	0.77	32.24
20 - 28	0.09	0.00	0.00	0.00	0.00	0.00	0.11	0.23	0.16	0.11	0.45	0.70	1.86	1.82	0.64	0.14	6.31
29 - 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.14	0.45	0.18	0.07	0.05	0.91
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.05
Totals	3.36	4.11	2.47	2.93	3.38	4.90	4.72	13.01	11.49	7.74	6.58	5.99	9.49	11.15	5.52	3.16	100.00

Total Number of Valid Hours 4405
 Total Number of Hours 8760



Wood Buffalo Environmental Association -Jackfish 1(AMS506)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1.87	1.29	1.41	0.93	0.88	1.11	2.11	3.58	10.57	7.22	6.04	3.04	2.31	3.70	5.36	2.27	53.67
6 - 11	4.25	1.14	0.46	0.25	0.45	1.00	1.72	2.90	6.47	4.23	2.37	0.50	0.22	1.66	6.50	6.14	40.26
12 - 19	0.76	0.18	0.00	0.00	0.02	0.17	0.80	0.27	0.33	0.02	0.00	0.00	0.00	0.00	0.91	2.14	5.59
20 - 28	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.48
29 - 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	6.93	2.62	1.87	1.18	1.34	2.27	4.63	6.77	17.37	11.46	8.41	3.53	2.52	5.36	12.77	10.96	100.00

Total Number of Valid Hours 6029
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Kirby South (AMS507)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	0.73	0.66	0.71	0.62	0.91	1.01	0.66	0.50	0.50	0.30	0.34	0.71	0.57	0.43	0.46	0.30	9.41
6 - 11	1.64	1.53	1.23	2.51	2.67	1.07	1.26	0.87	1.46	3.93	6.78	7.81	2.88	4.25	2.49	1.44	43.83
12 - 19	0.96	0.55	0.73	1.05	0.89	0.34	0.78	1.51	2.99	4.29	4.20	4.45	4.80	5.14	2.81	2.58	38.08
20 - 28	0.16	0.07	0.16	0.14	0.05	0.05	0.07	0.23	0.43	0.37	0.23	0.37	1.10	2.08	1.37	0.43	7.29
29 - 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.71	0.14	0.09	1.35
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.05
Totals	3.49	2.81	2.83	4.32	4.52	2.47	2.76	3.11	5.39	8.89	11.56	13.34	9.75	12.65	7.26	4.84	100.00

Total Number of Valid Hours 4378
 Total Number of Hours 8760



Wood Buffalo Environmental Association - Kirby North (AMS508)
 Annual Summary for the Year 2021
 Wind Speed (km/h) Average

Wind Speed (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	0.58	0.58	0.75	0.51	0.42	0.51	0.47	0.56	0.96	1.54	0.70	0.58	0.14	0.33	0.16	0.72	9.51
6 - 11	2.68	2.35	1.84	1.03	1.40	1.05	1.35	2.68	6.09	7.83	3.61	1.87	1.00	1.26	3.03	2.49	41.57
12 - 19	1.70	2.31	2.45	0.61	0.47	0.70	1.31	2.10	4.66	4.64	5.46	3.45	1.52	2.17	3.66	2.40	39.59
20 - 28	0.47	0.75	0.77	0.02	0.00	0.05	0.28	0.02	0.65	0.14	0.40	1.07	0.68	0.91	1.26	0.91	8.37
29 - 38	0.00	0.21	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.37	0.19	0.02	0.02	0.93
> 38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02
Totals	5.43	6.20	5.85	2.17	2.28	2.31	3.40	5.36	12.36	14.15	10.17	7.04	3.73	4.85	8.14	6.55	100.00

Total Number of Valid Hours 4289
 Total Number of Hours 8760



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM ANNUAL REPORT

WIND ROSES ANNUAL 2021

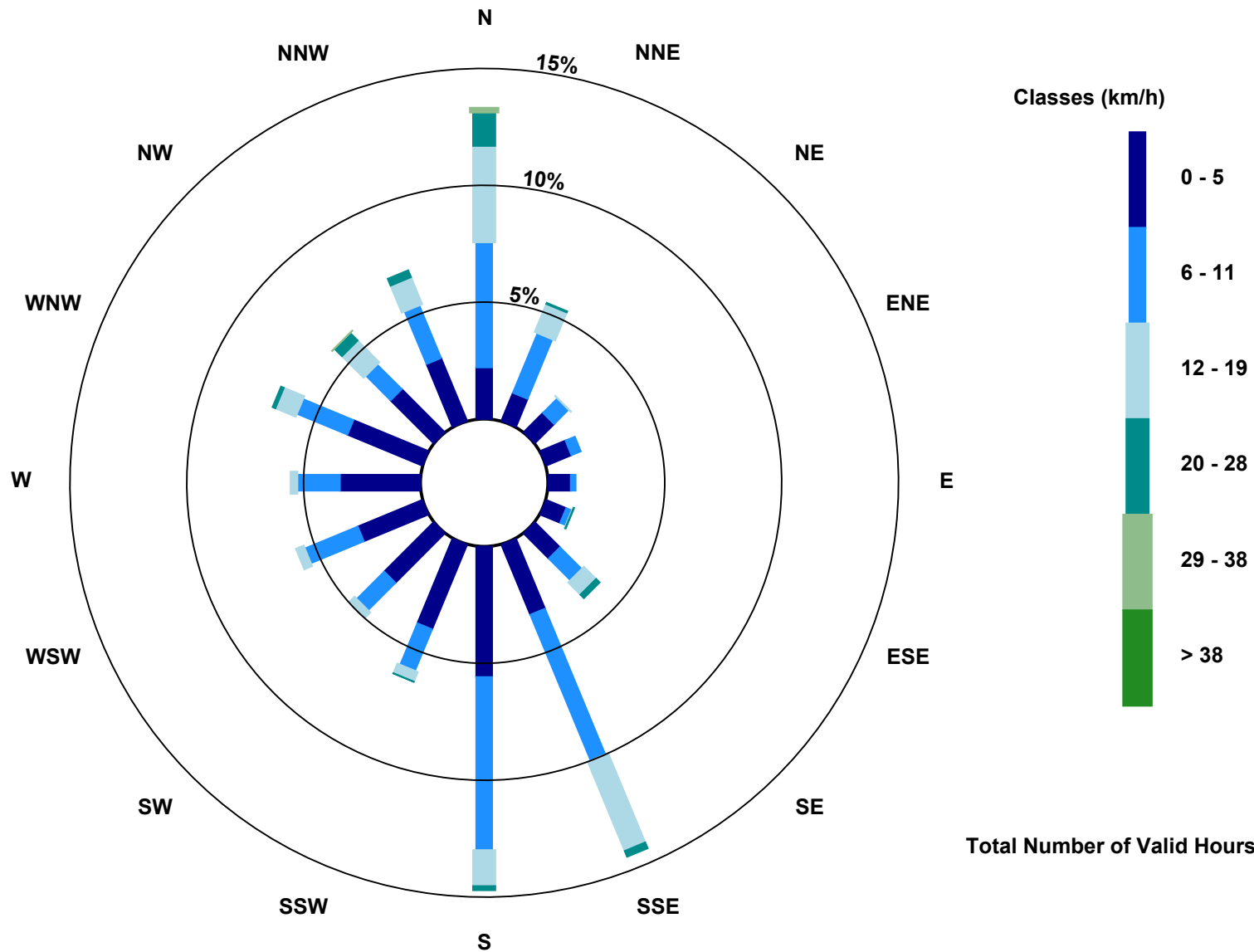
Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association
Wind Rose 2021

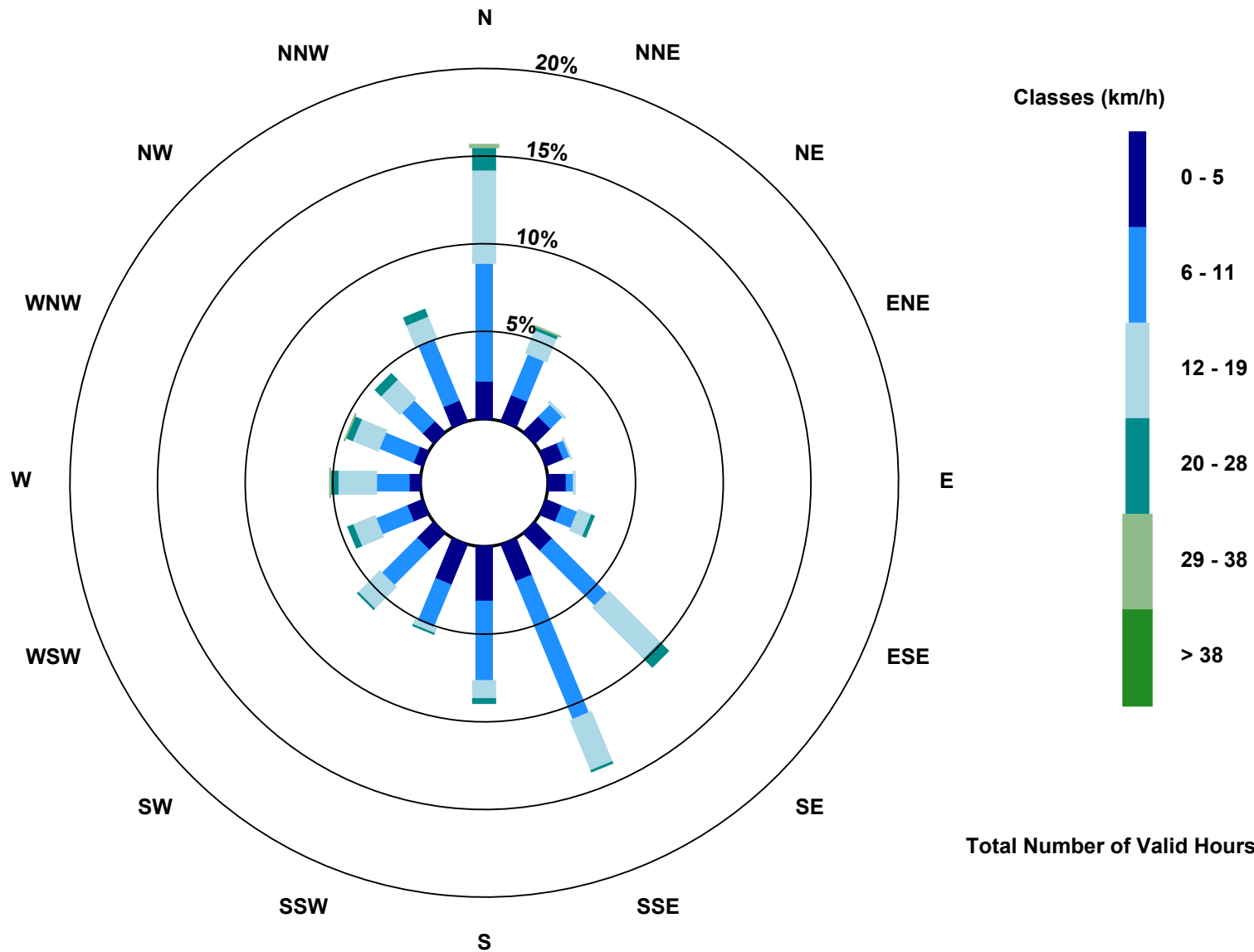
Wind Speed (WS) - km/h
Fort McKay - Bertha Ganter





Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed (WS) - km/h
Mildred Lake

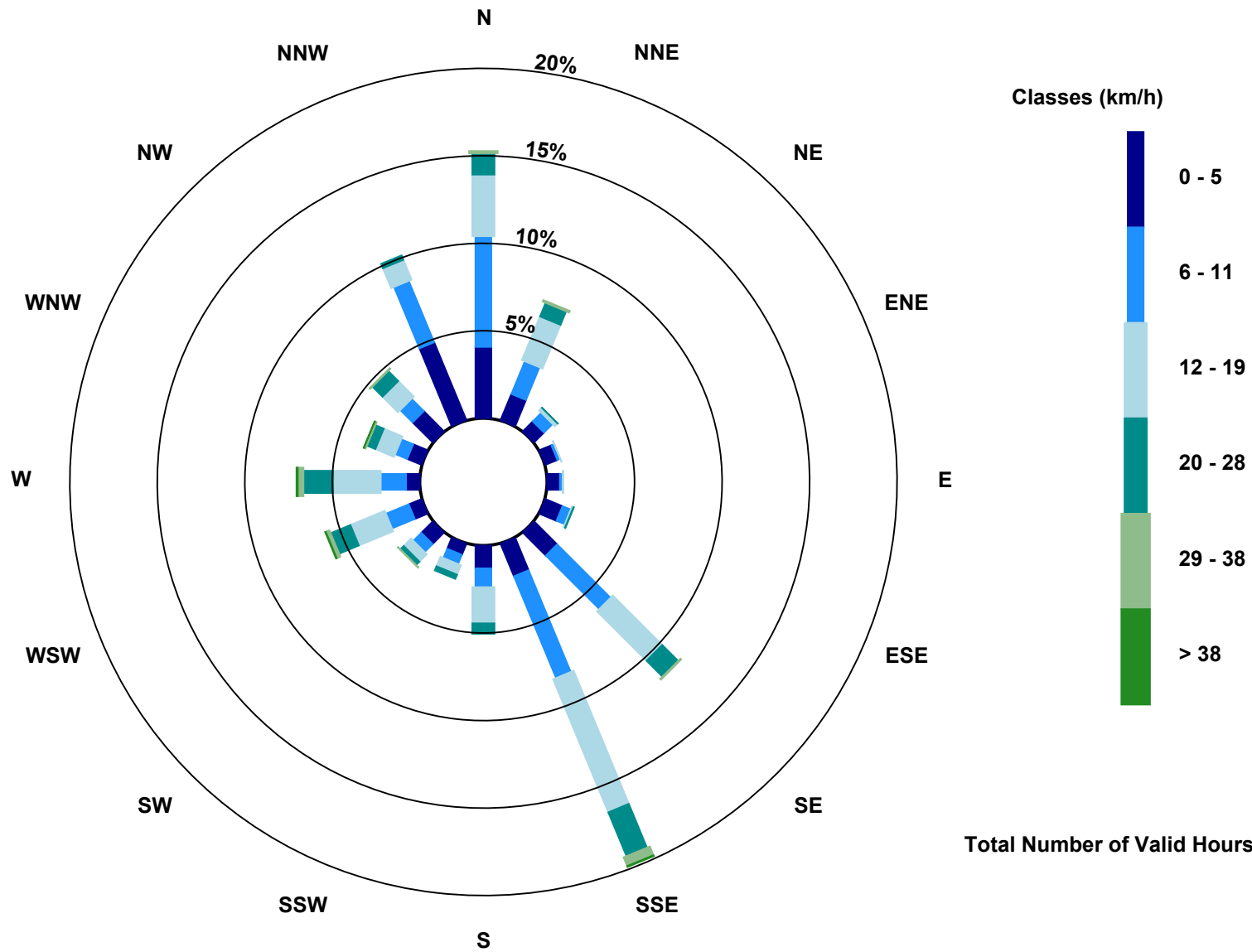


Total Number of Valid Hours: 8720



Wood Buffalo Environmental Association
Wind Rose 2021

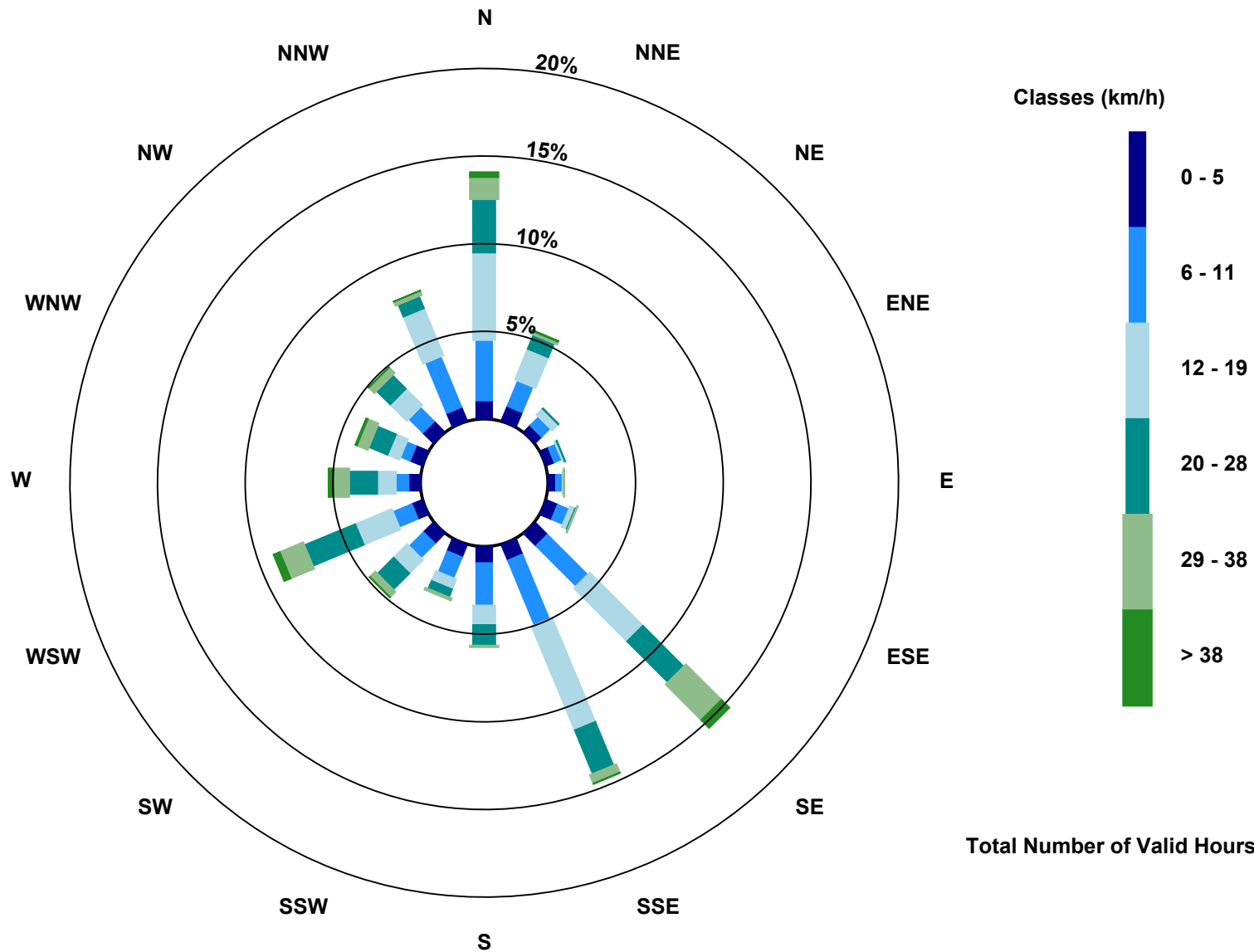
Wind Speed 45 m (WS45m) - km/h
Lower Camp Met Tower





Wood Buffalo Environmental Association
Wind Rose 2021

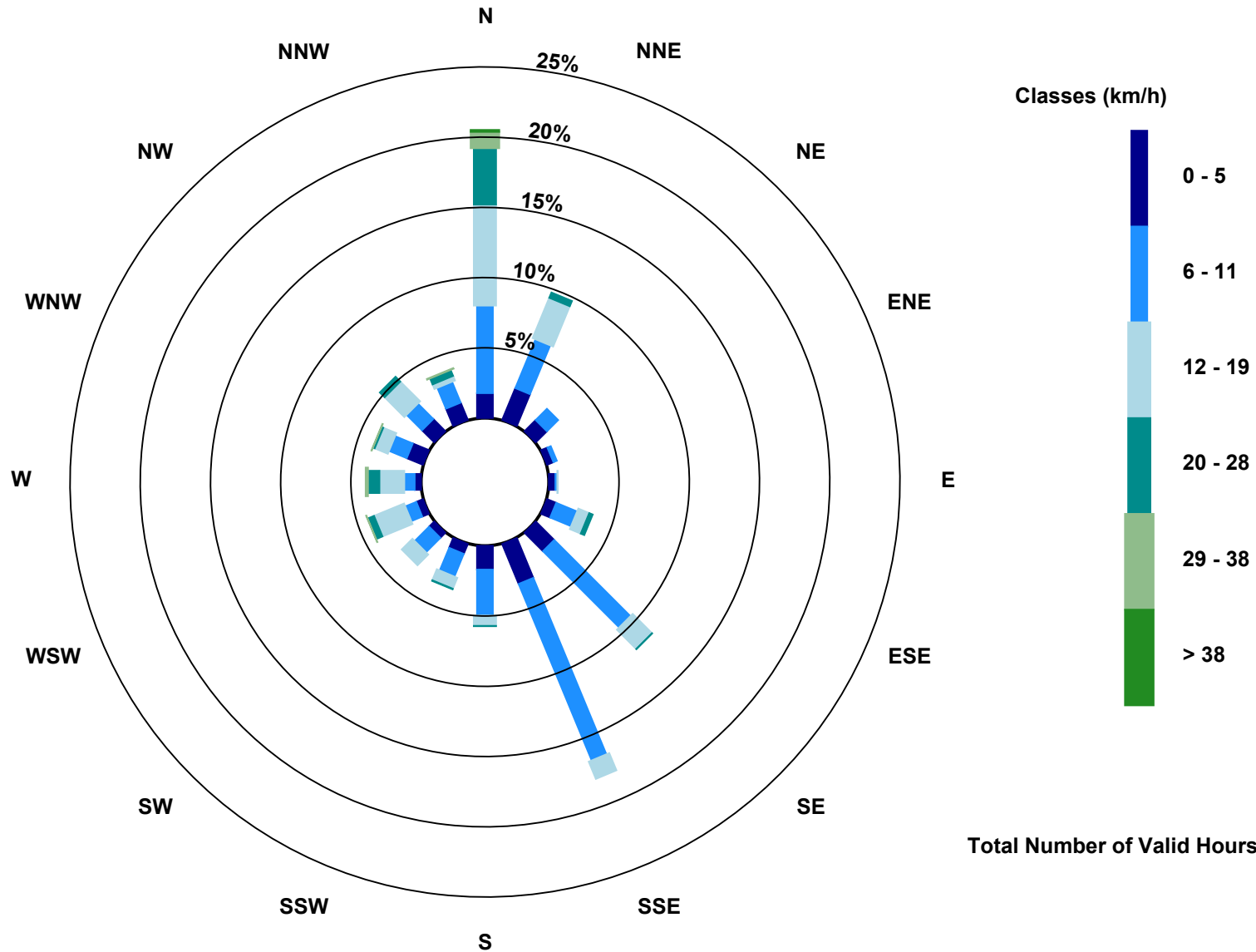
Wind Speed 100 m (WS100m) - km/h
Lower Camp Met Tower





Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed (WS) - km/h
Buffalo Viewpoint

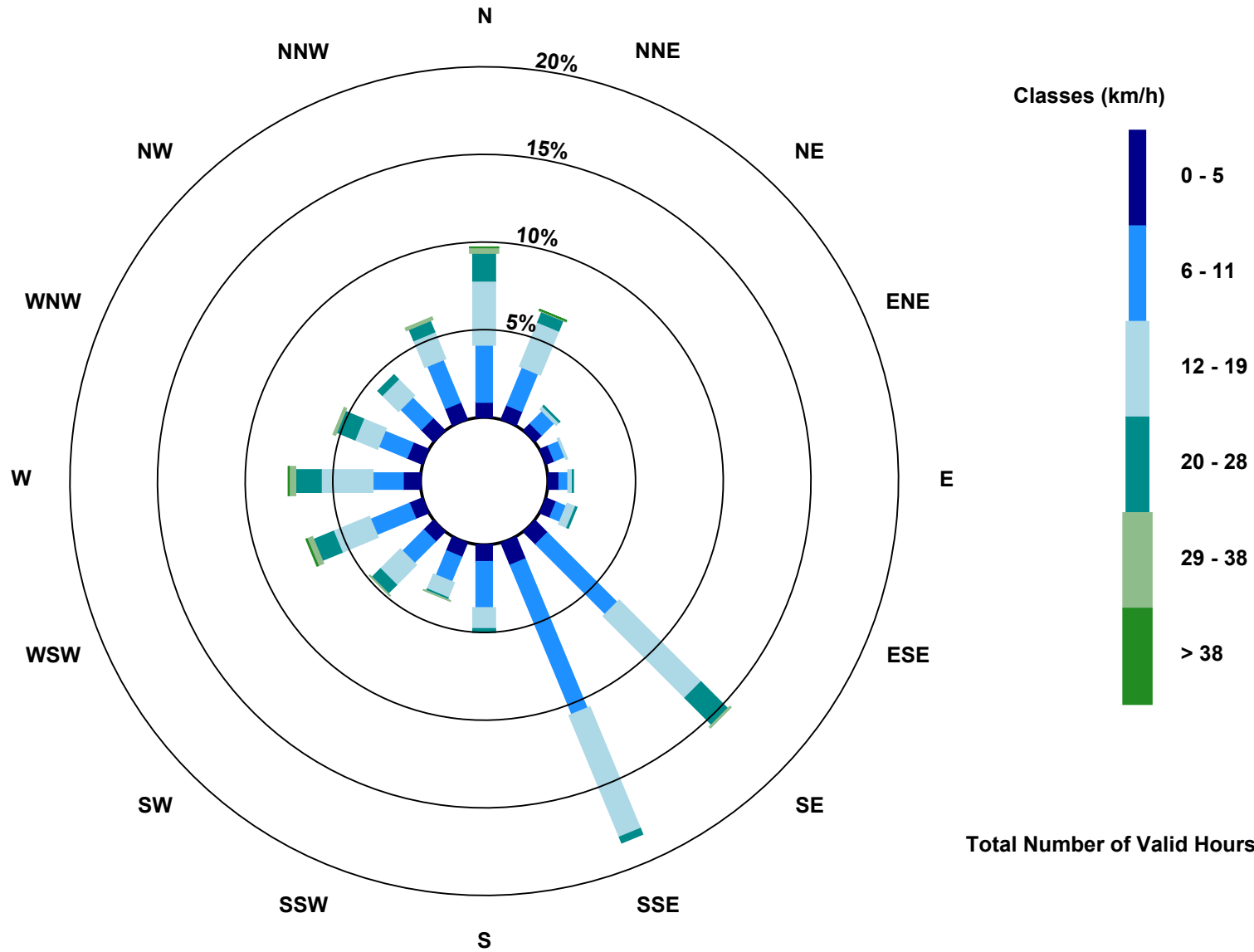


Total Number of Valid Hours: 3671



Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed 20 m (WS20m) - km/h
Mannix

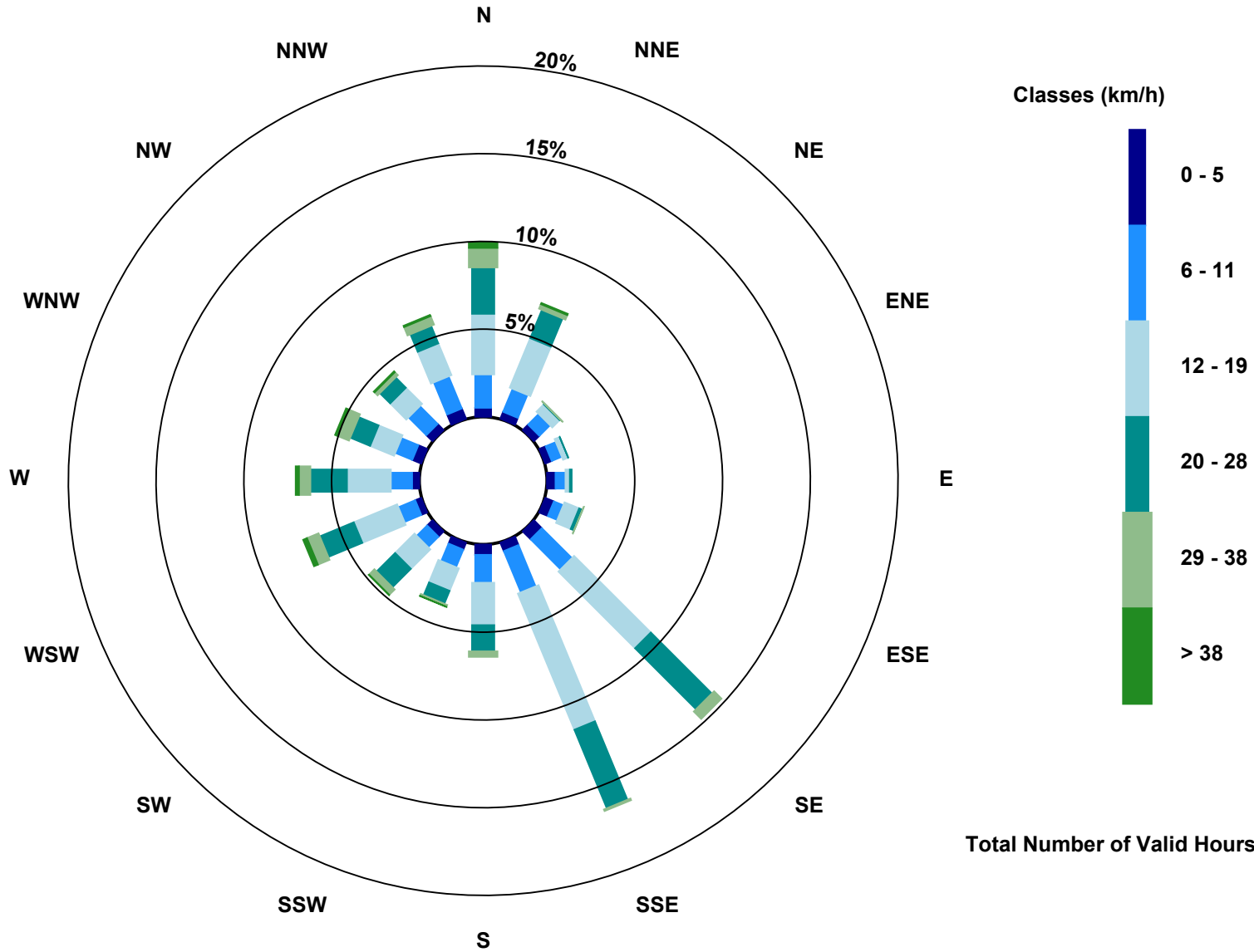


Total Number of Valid Hours: 8706



Wood Buffalo Environmental Association
Wind Rose 2021

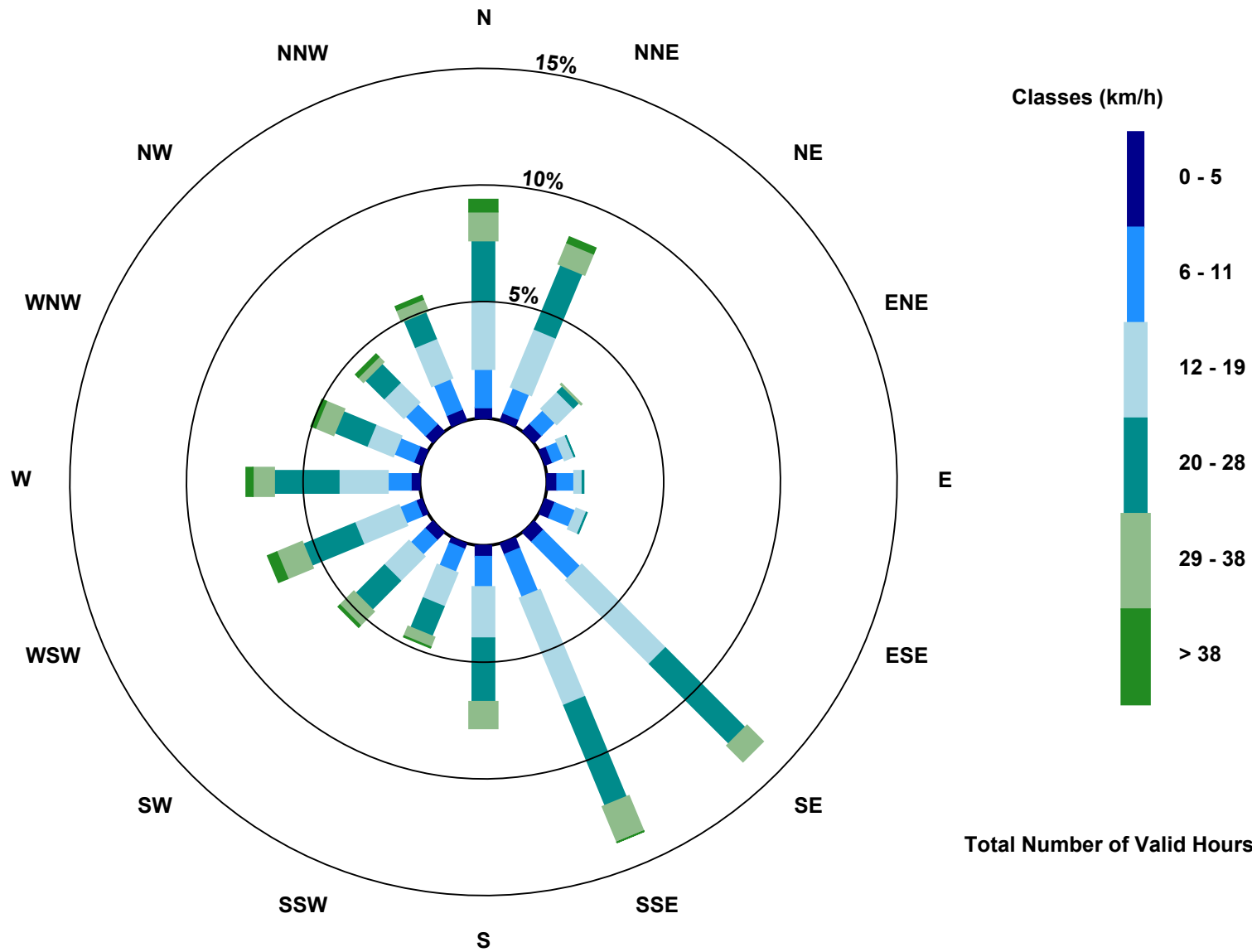
Wind Speed 45 m (WS45m) - km/h
Mannix





Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed 75 m (WS75m) - km/h
Mannix

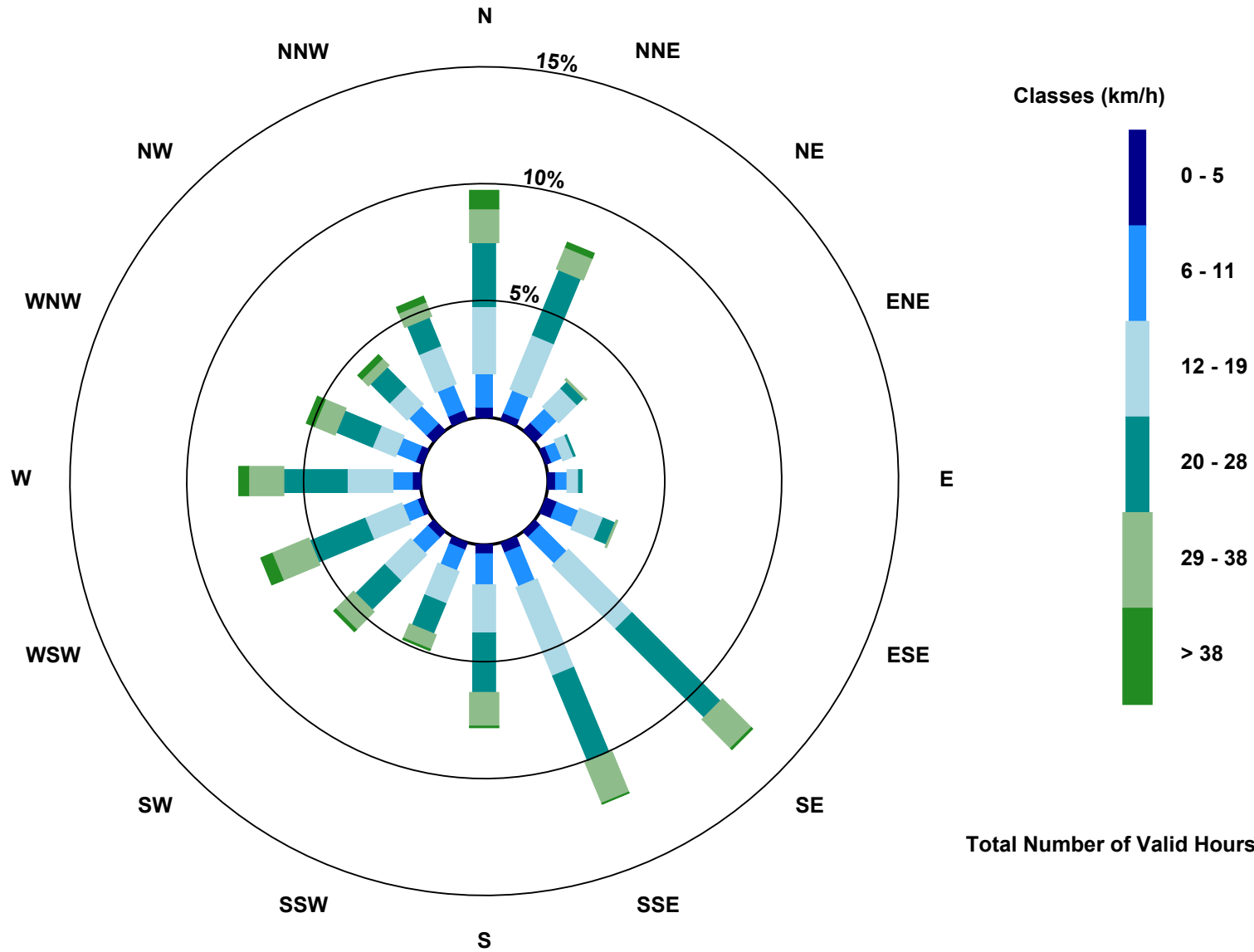


Total Number of Valid Hours: 8639



Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed 90 m (WS90m) - km/h
Mannix

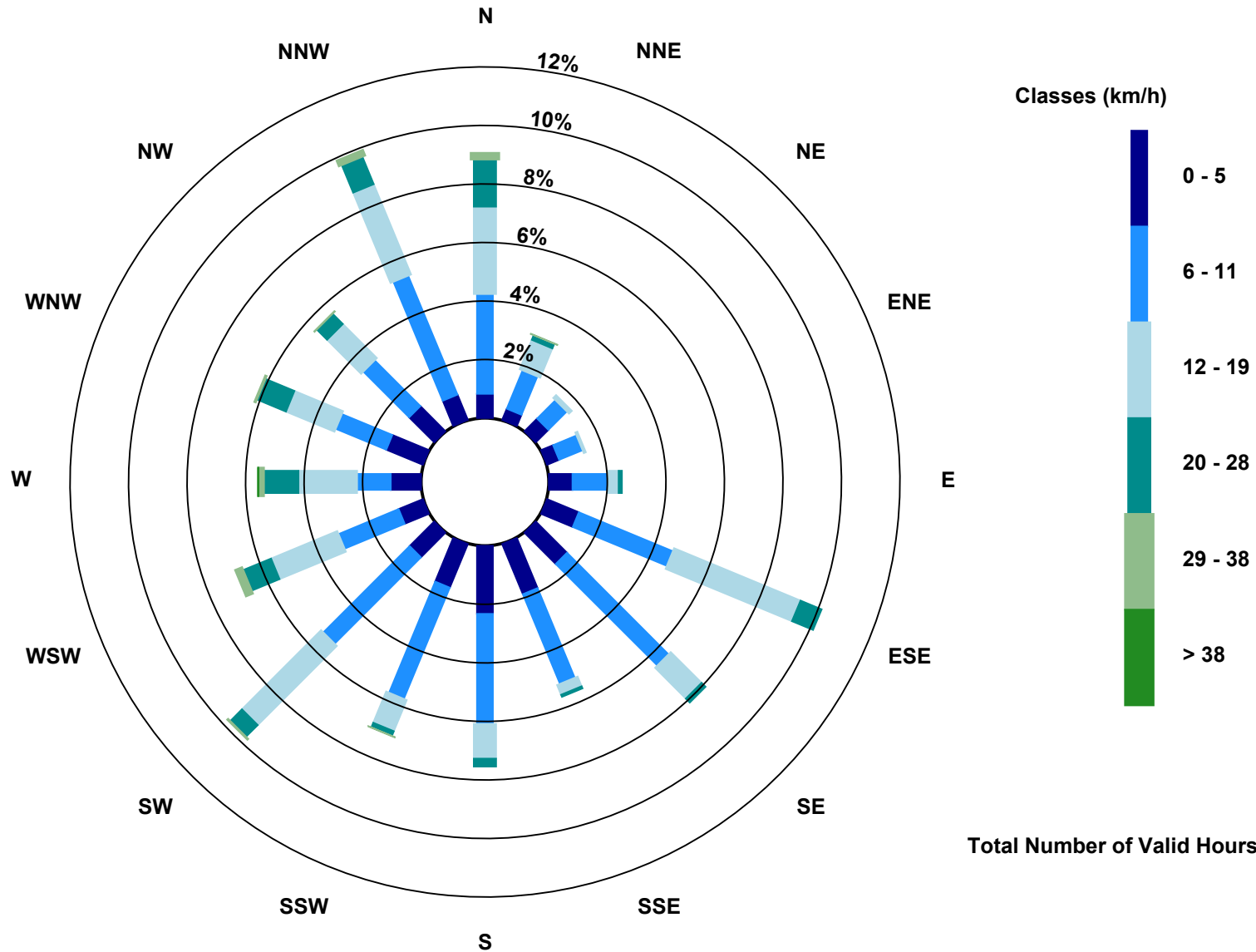


Total Number of Valid Hours: 8564



Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed (WS) - km/h
Patricia McInnes

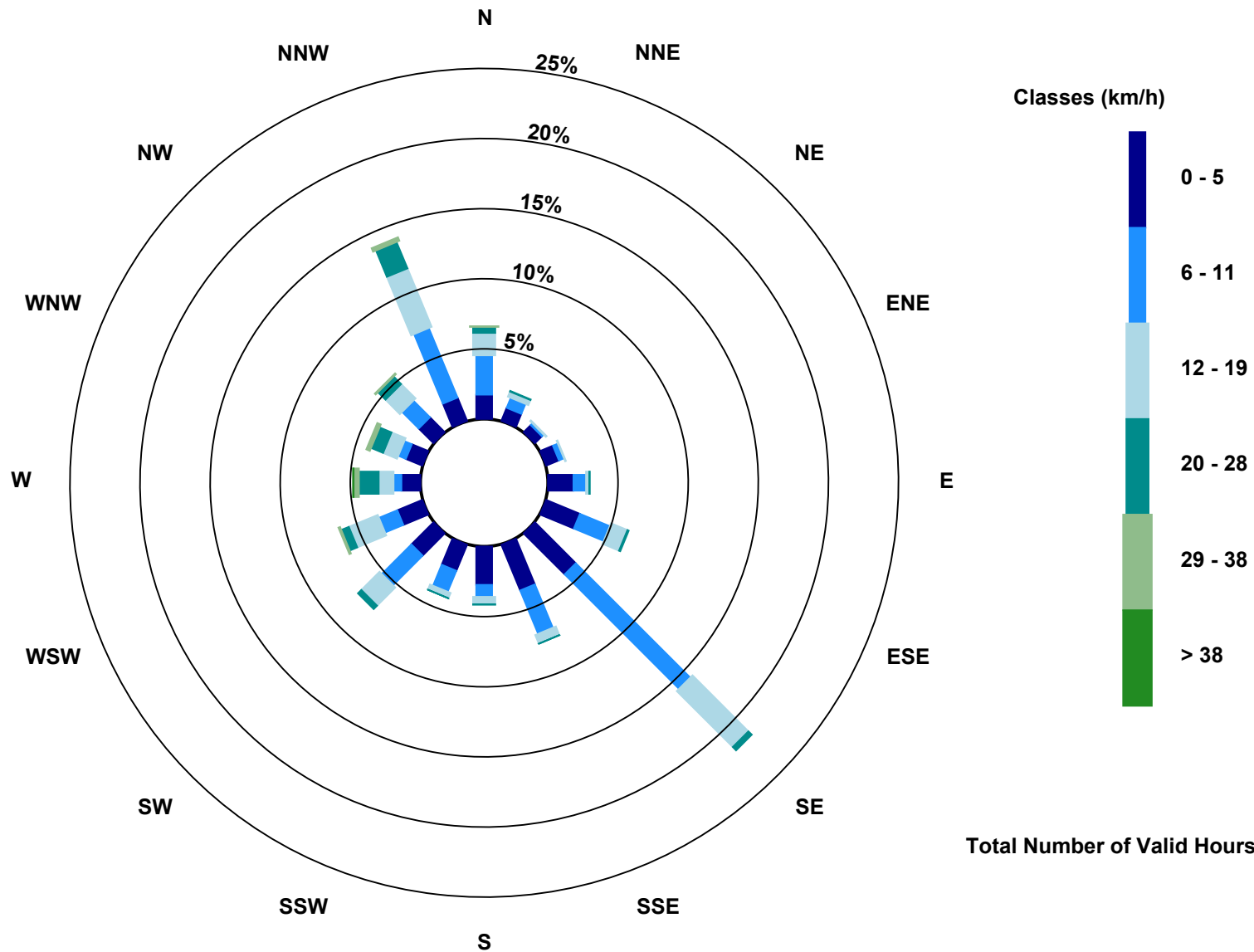


Total Number of Valid Hours: 8681



Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed (WS) - km/h
Athabasca Valley

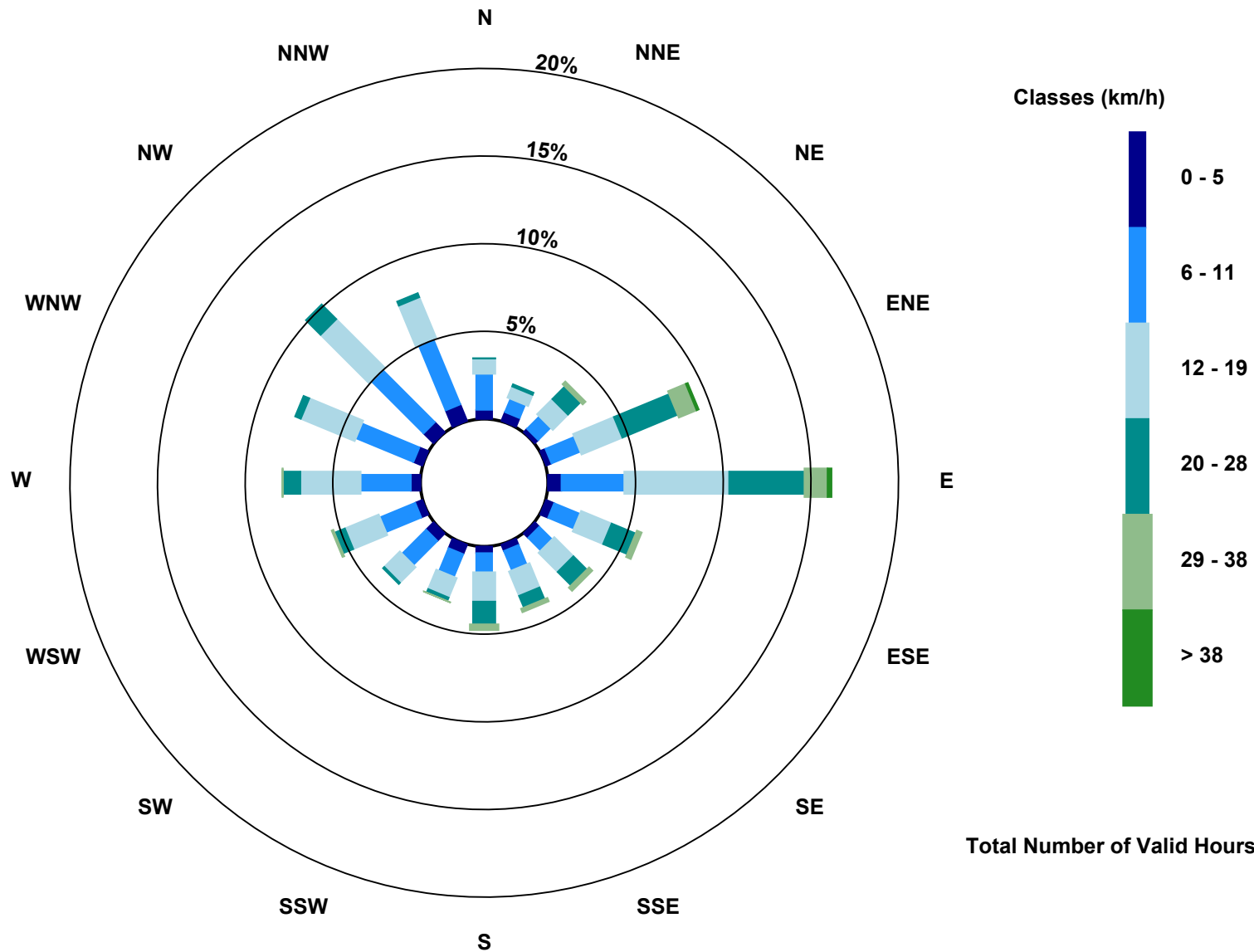


Total Number of Valid Hours: 8701



Wood Buffalo Environmental Association
Wind Rose 2021

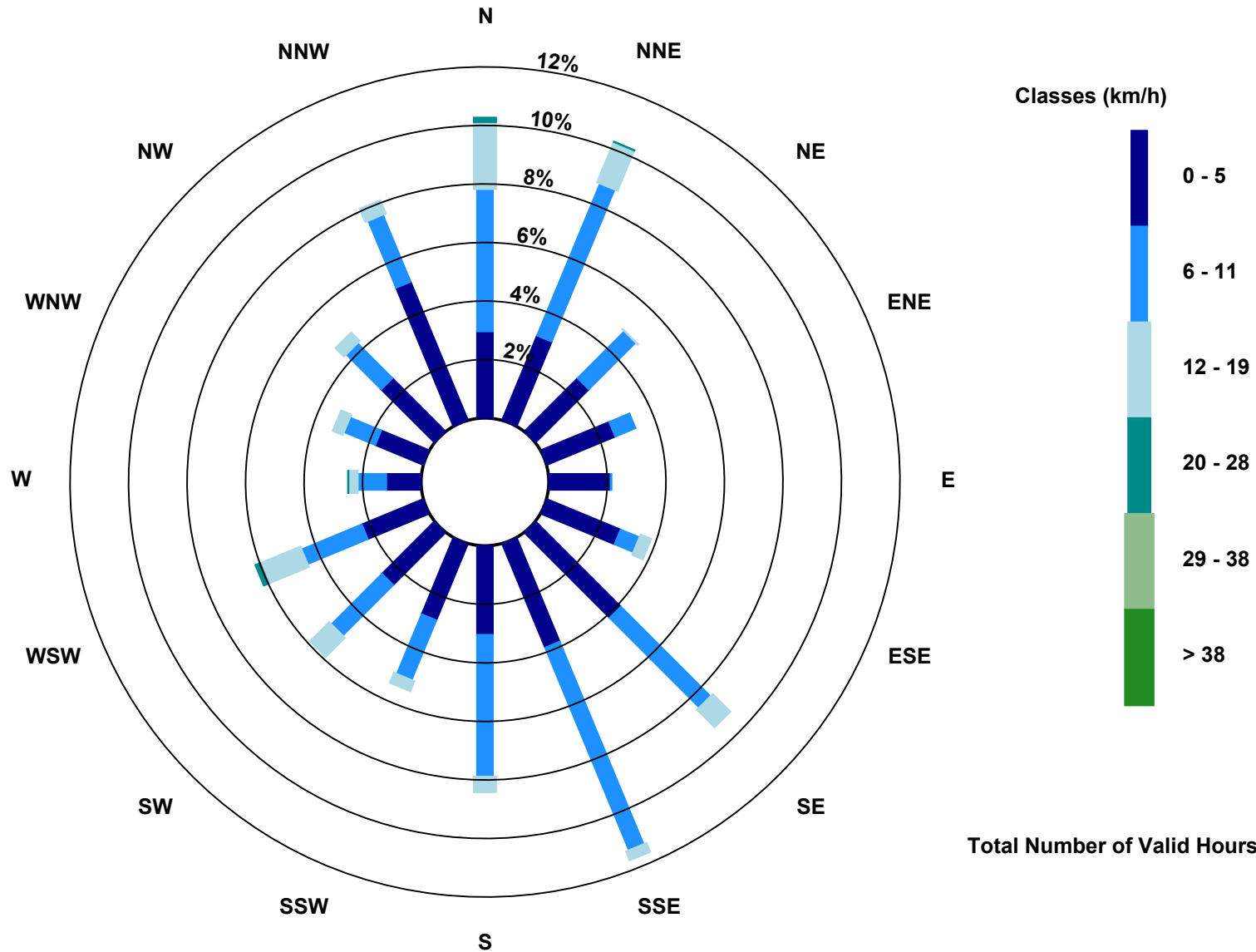
Wind Speed (WS) - km/h
Fort Chipewyan





Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed (WS) - km/h
Barge Landing

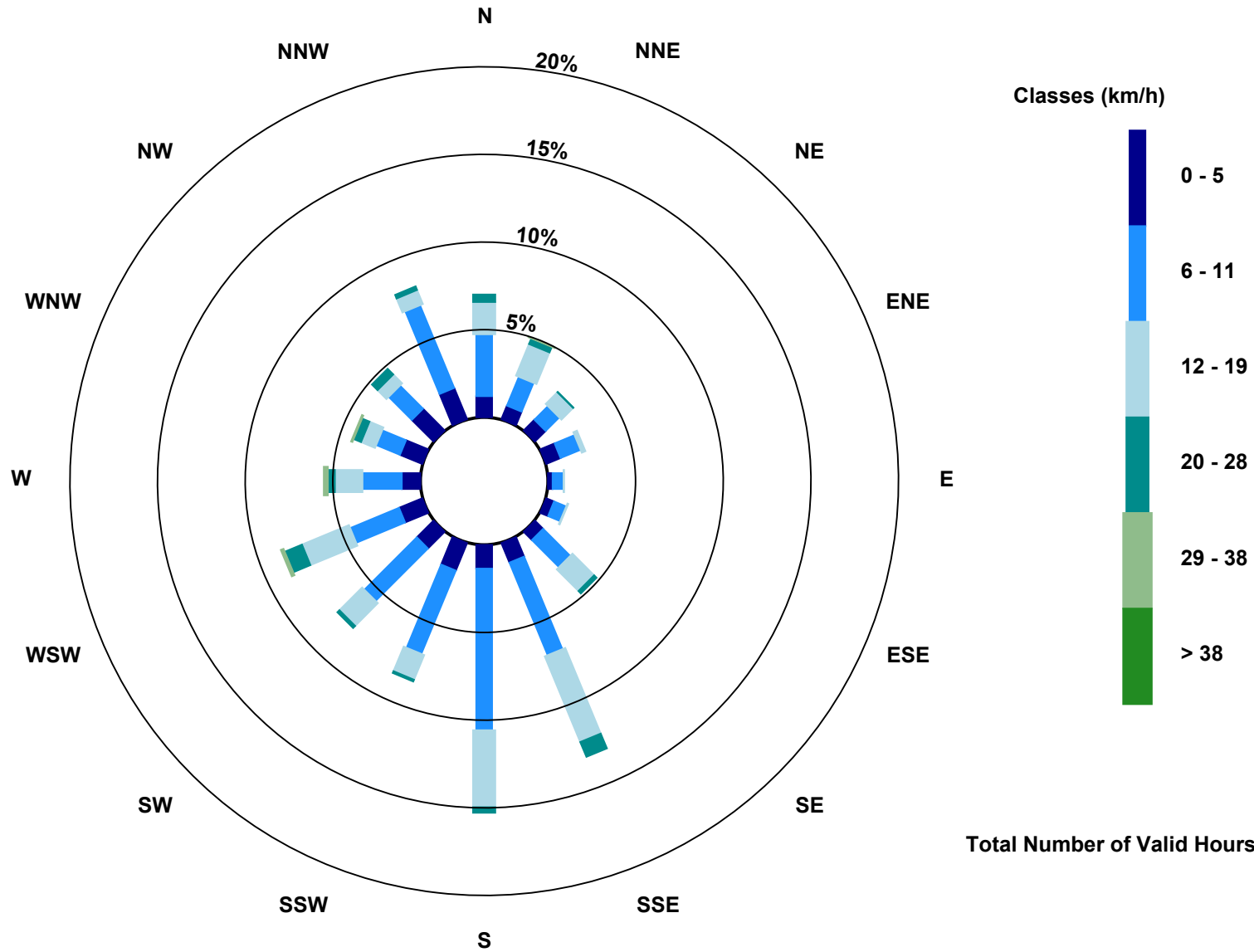


Total Number of Valid Hours: 5034



Wood Buffalo Environmental Association
Wind Rose 2021

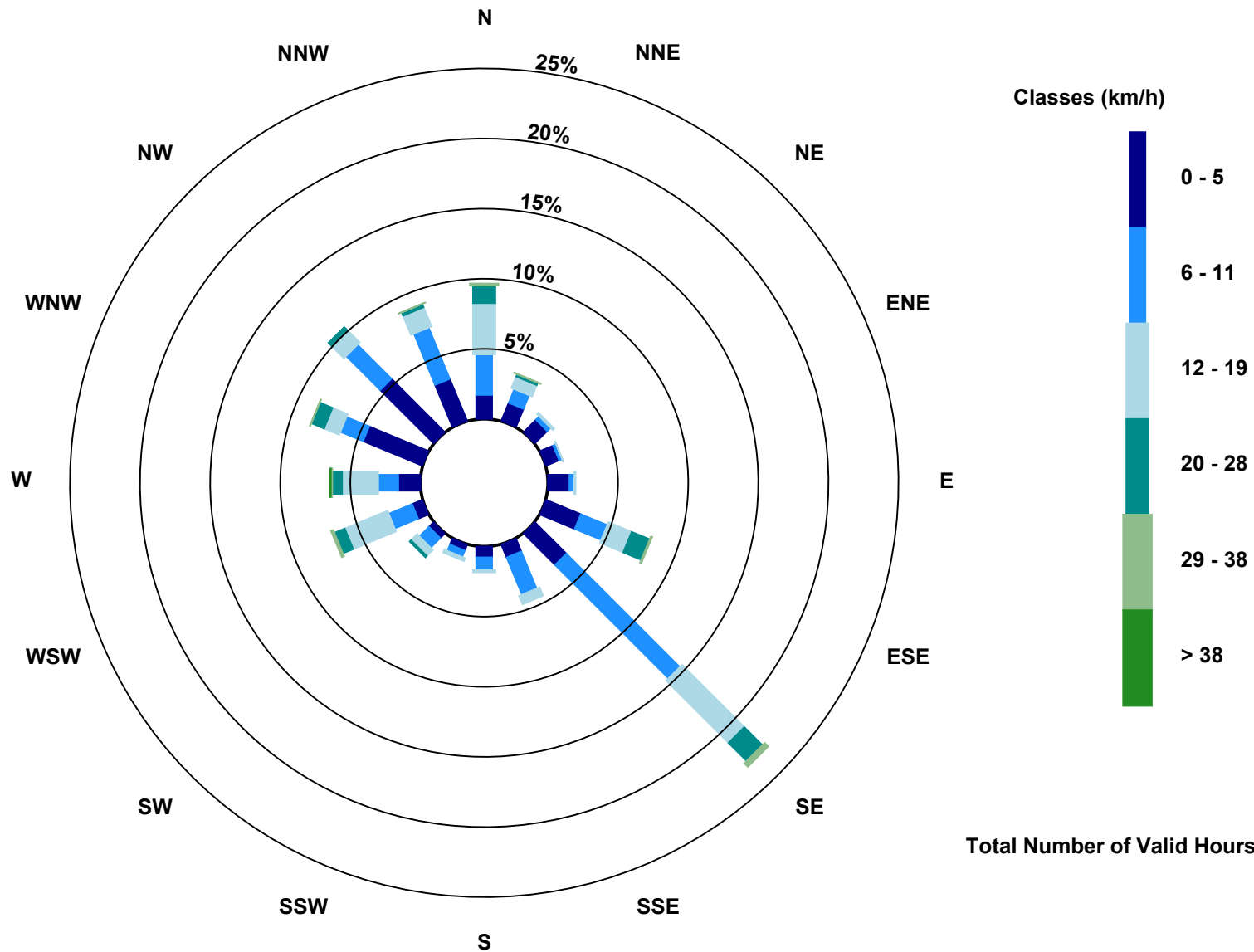
Wind Speed 20 m (WS20m) - km/h
Barge Landing





Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed (WS) - km/h
Lower Camp

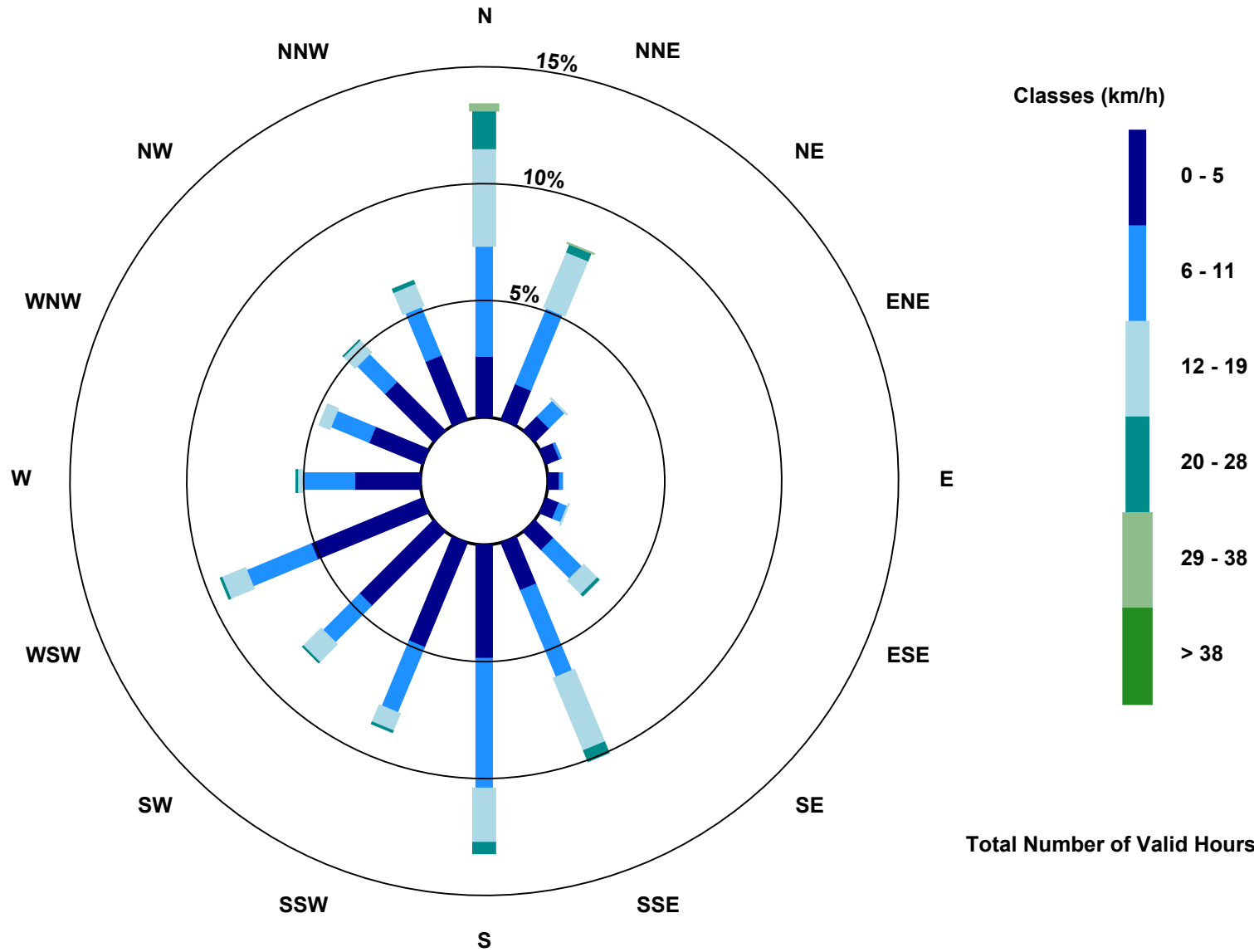


Total Number of Valid Hours: 8634



Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed (WS) - km/h
Fort McKay South

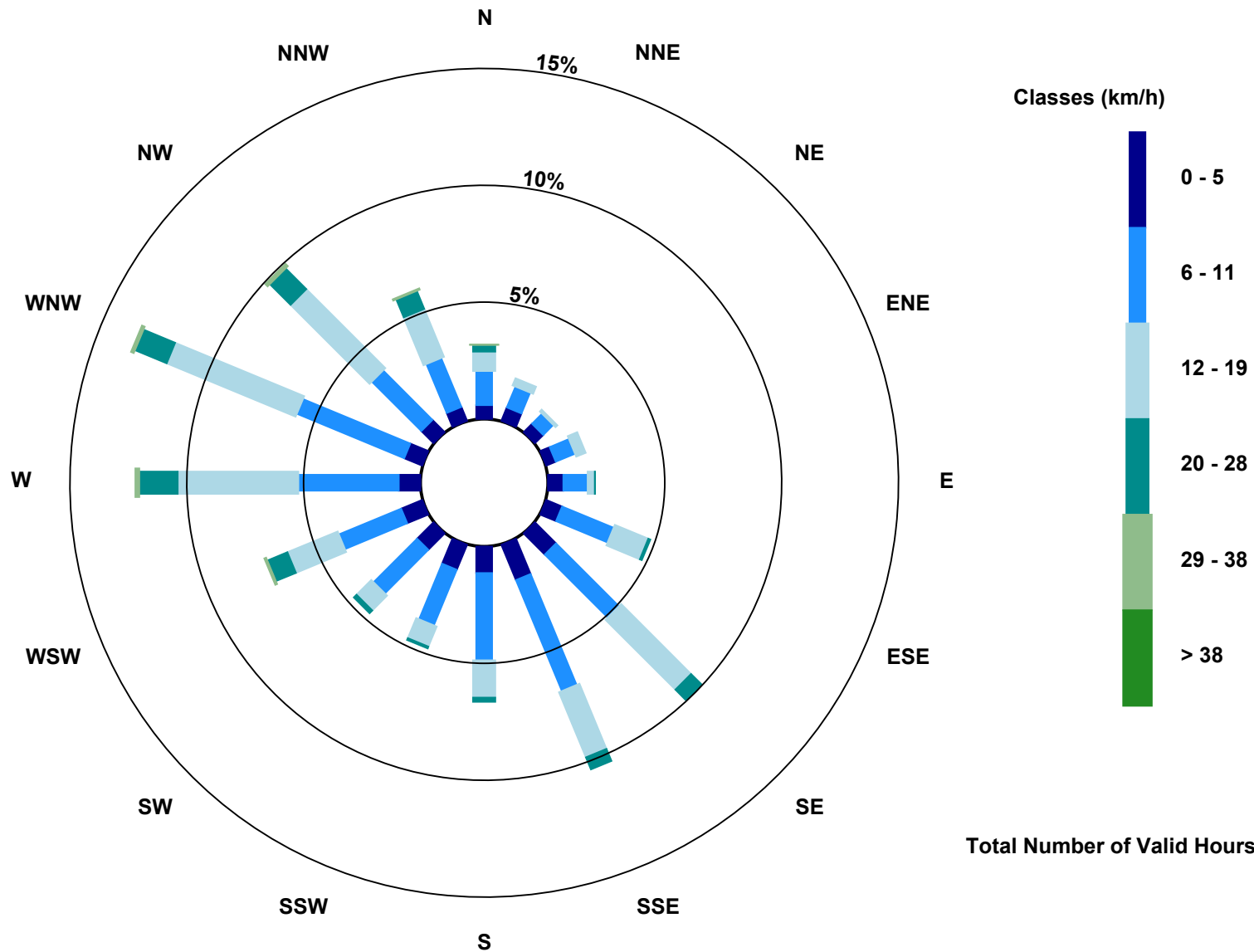


Total Number of Valid Hours: 8689



Wood Buffalo Environmental Association
Wind Rose 2021

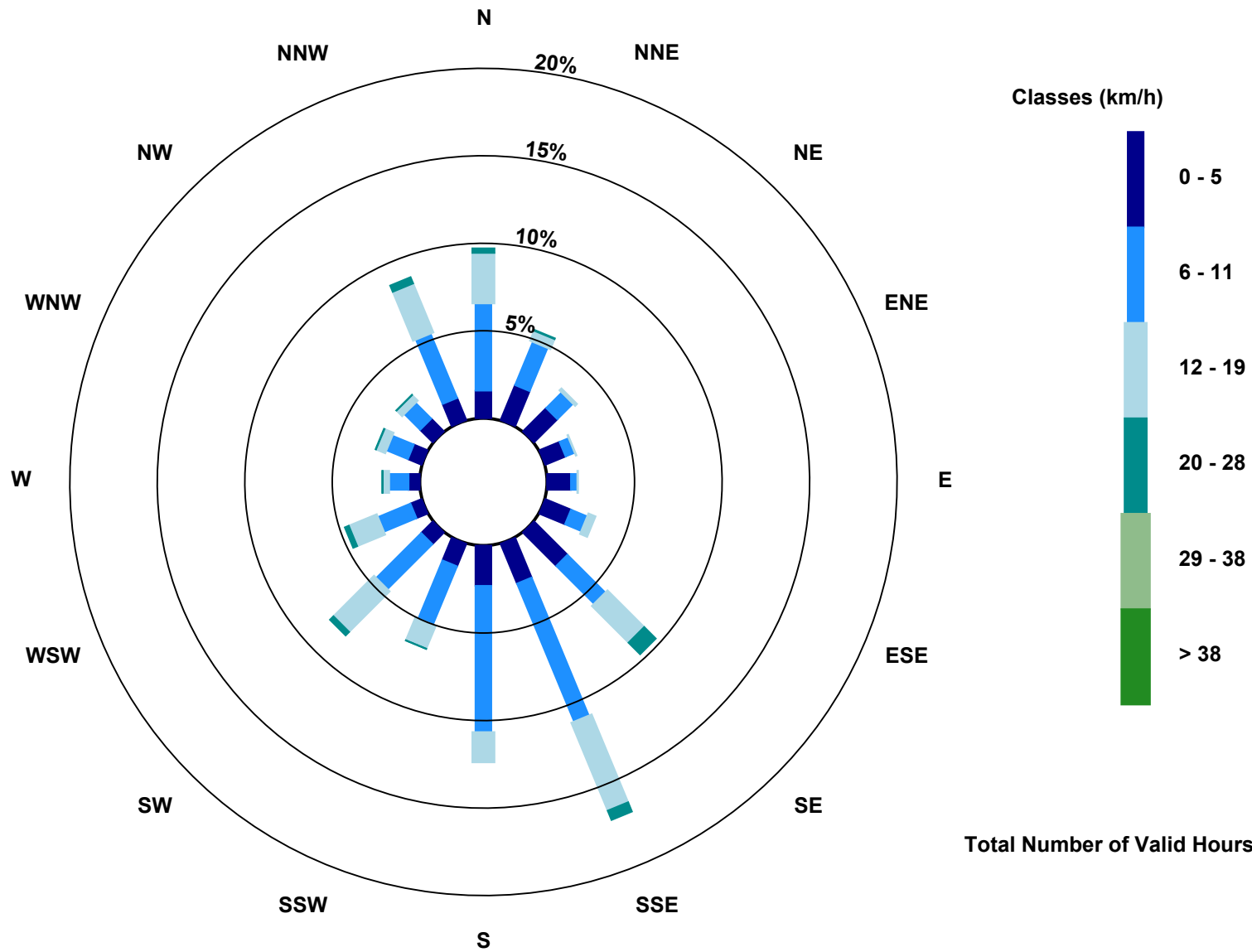
Wind Speed (WS) - km/h
Anzac





Wood Buffalo Environmental Association
Wind Rose 2021

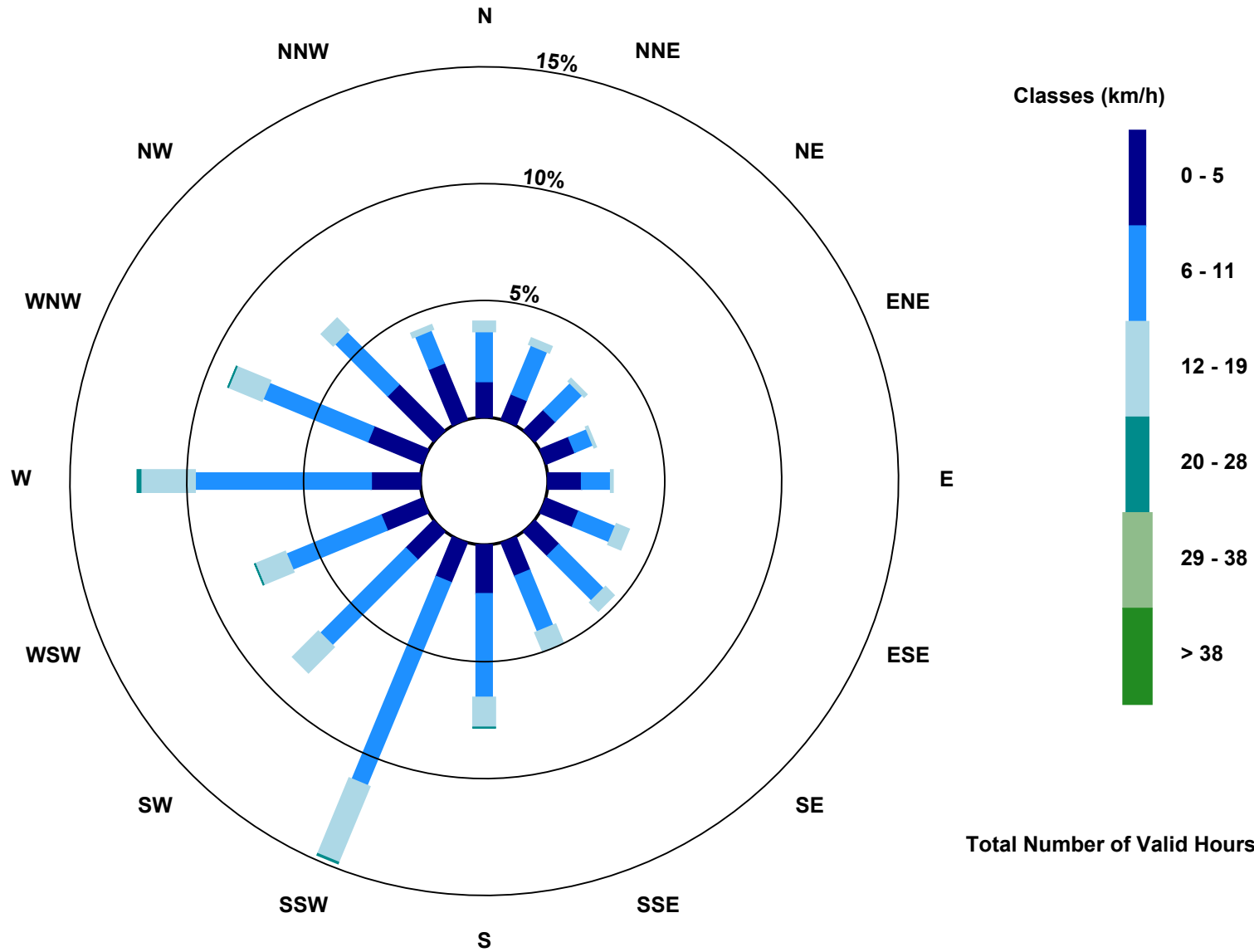
Wind Speed (WS) - km/h
Wapasu





Wood Buffalo Environmental Association
Wind Rose 2021

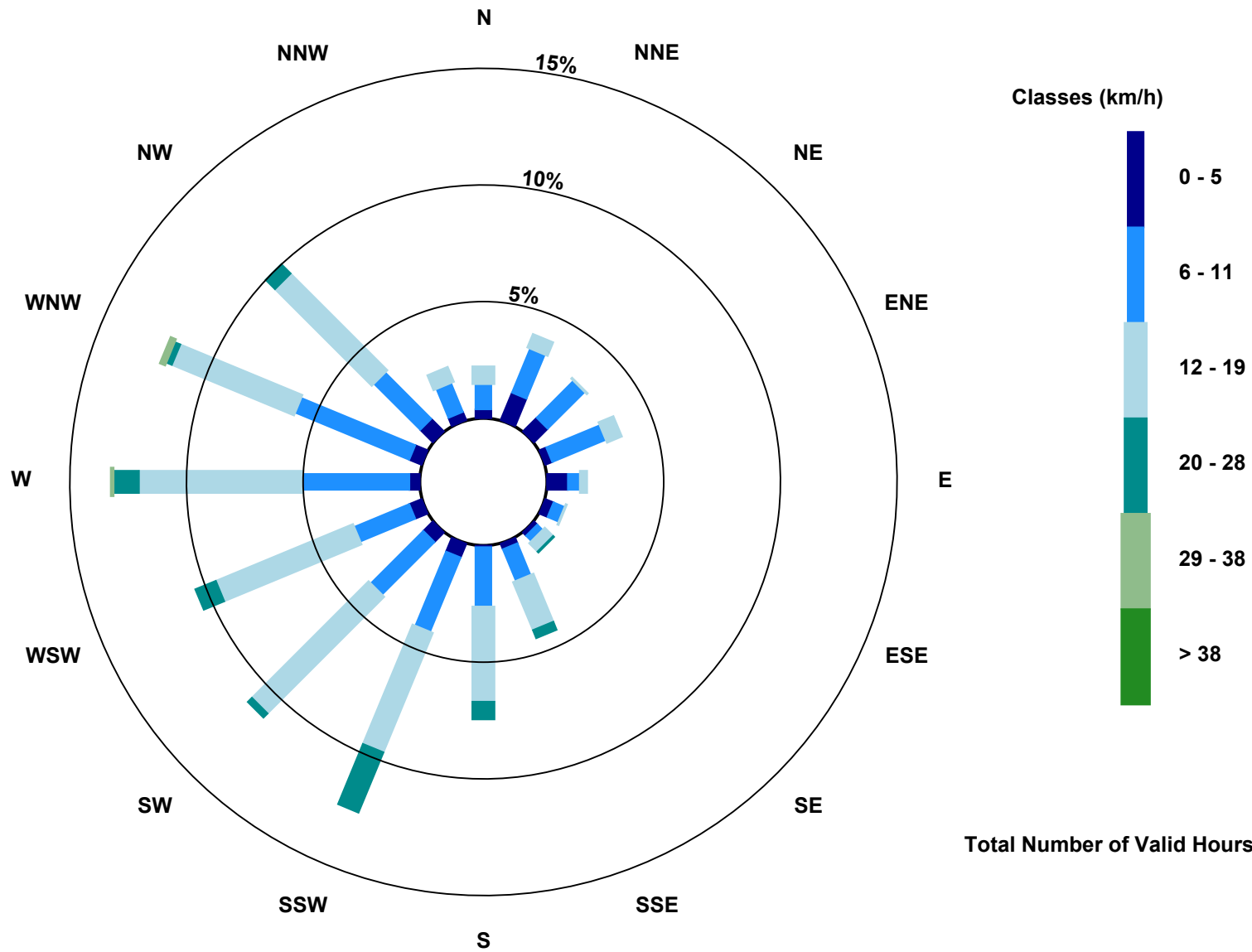
Wind Speed (WS) - km/h
Stony Mountain





Wood Buffalo Environmental Association
Wind Rose 2021

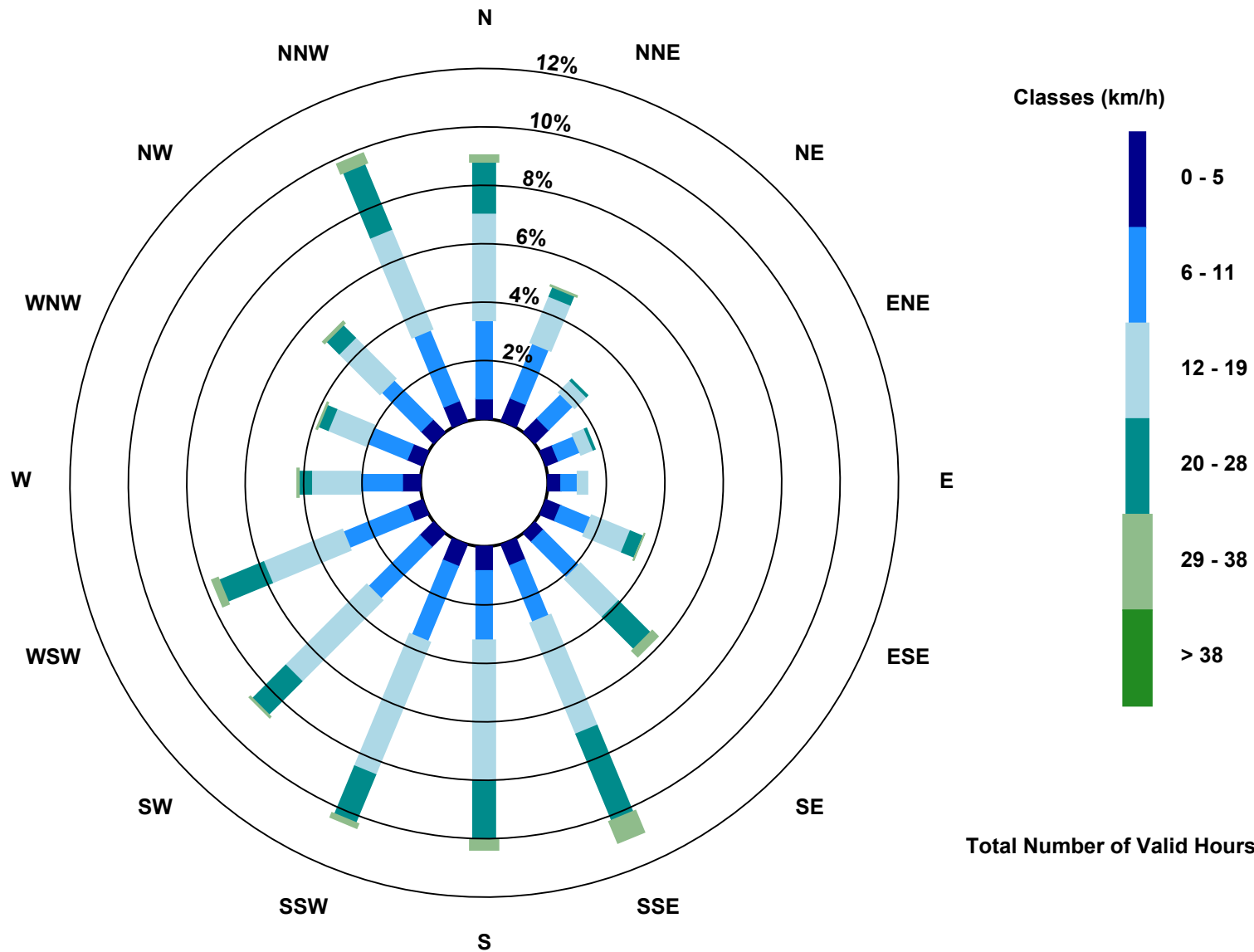
Wind Speed 20 m (WS20m) - km/h
Stony Mountain





Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed (WS) - km/h
Firebag

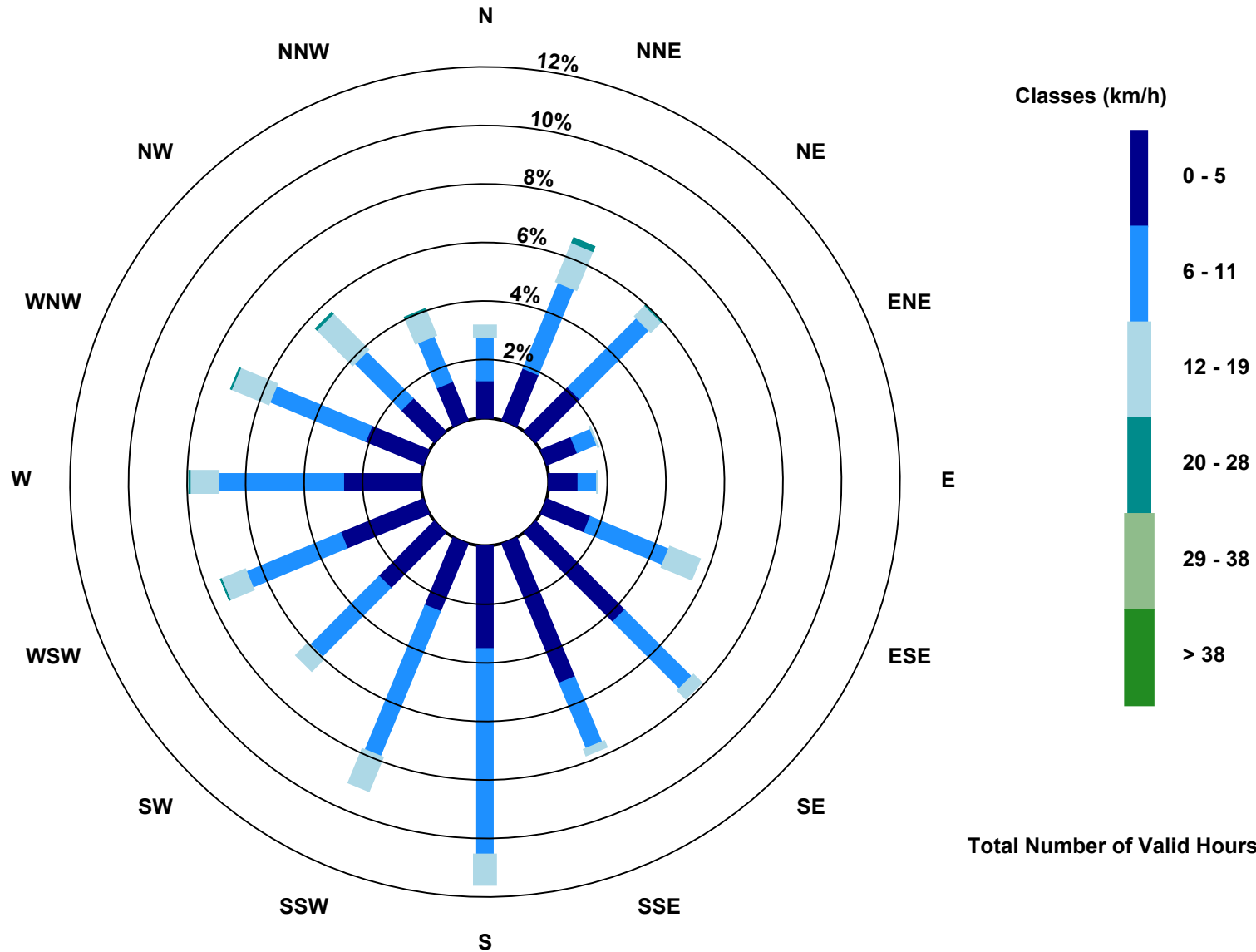


Total Number of Valid Hours: 8292



Wood Buffalo Environmental Association
Wind Rose 2021

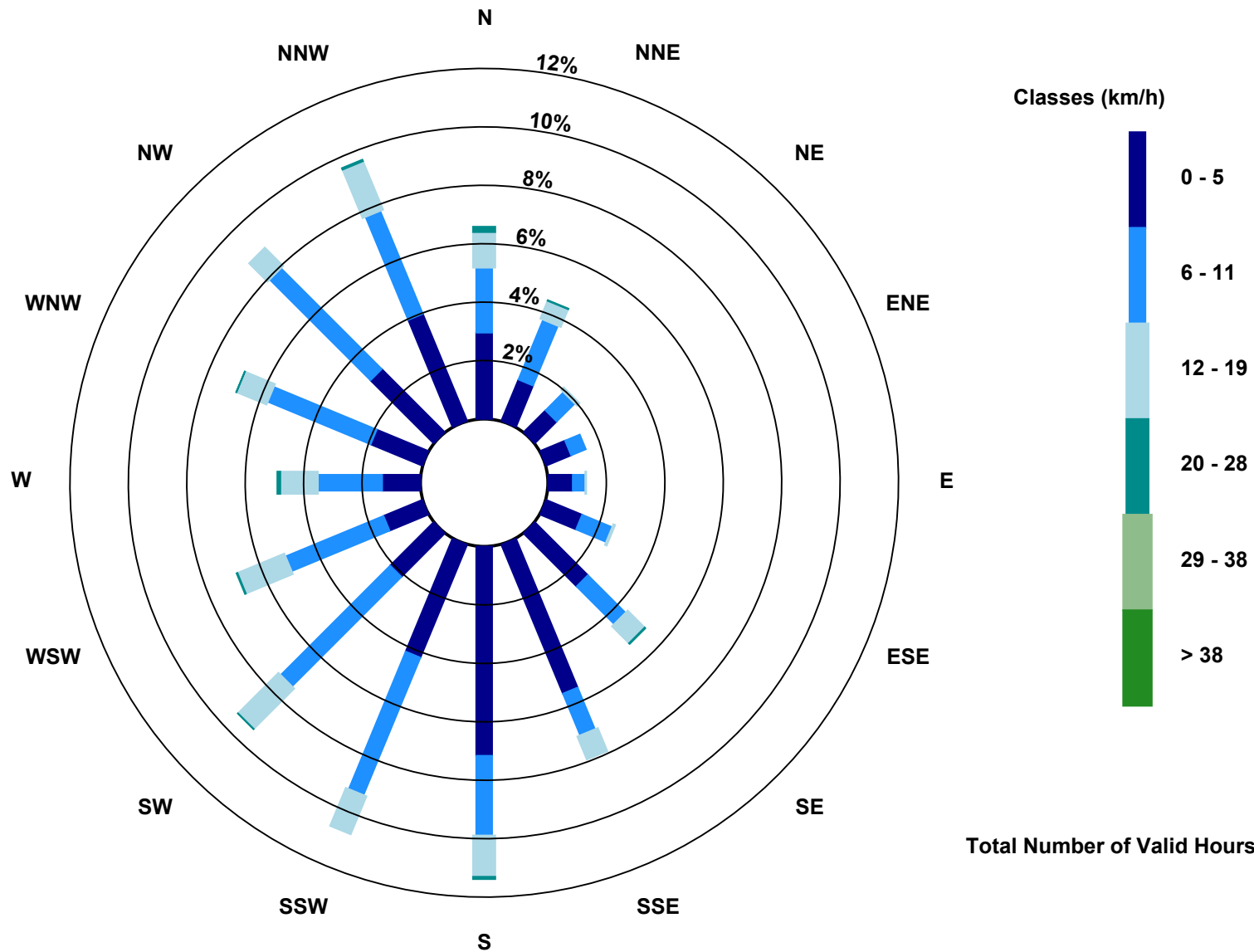
Wind Speed (WS) - km/h
Mackay River





Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed (WS) - km/h
Conklin

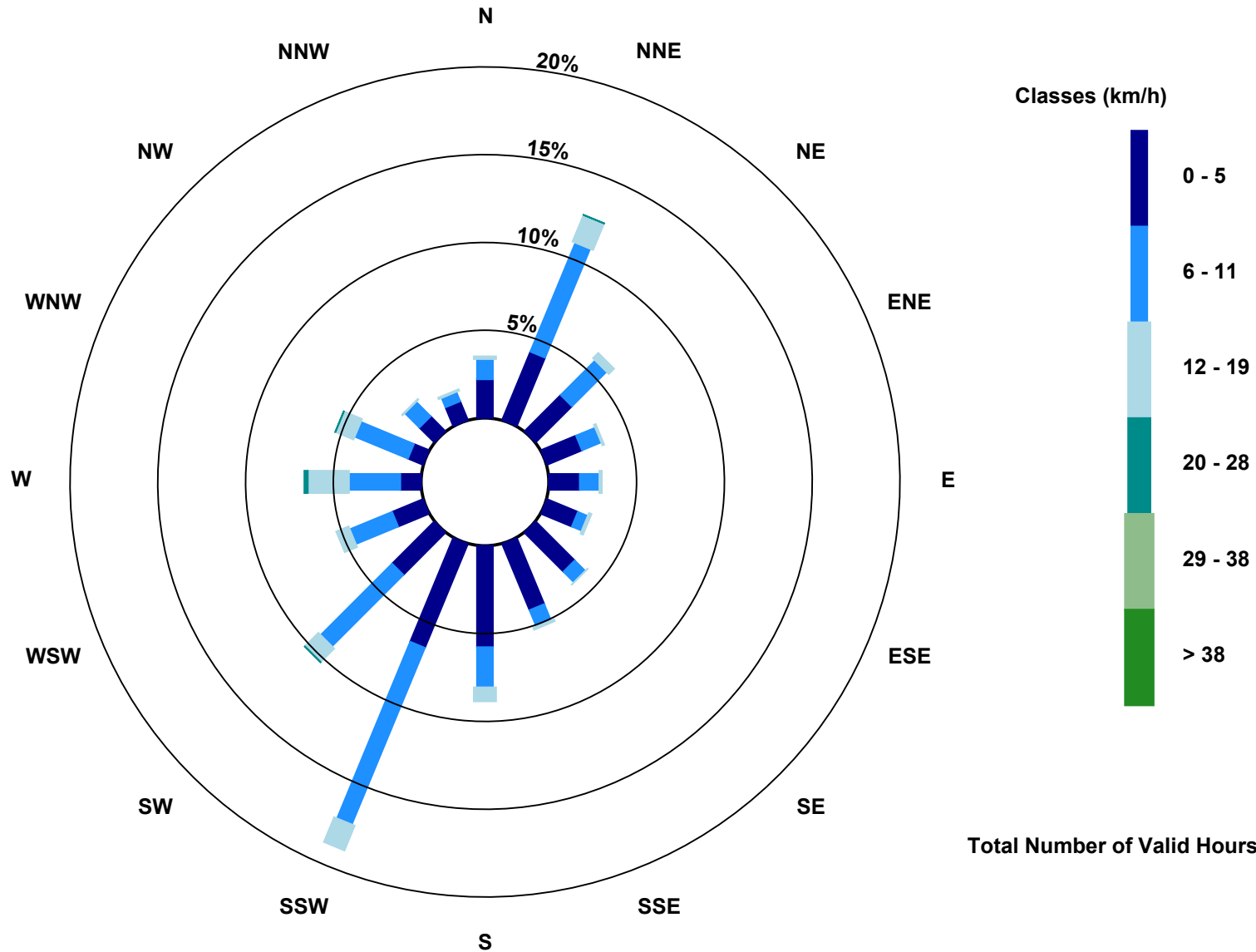


Total Number of Valid Hours: 8627



Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed (WS) - km/h
Janvier

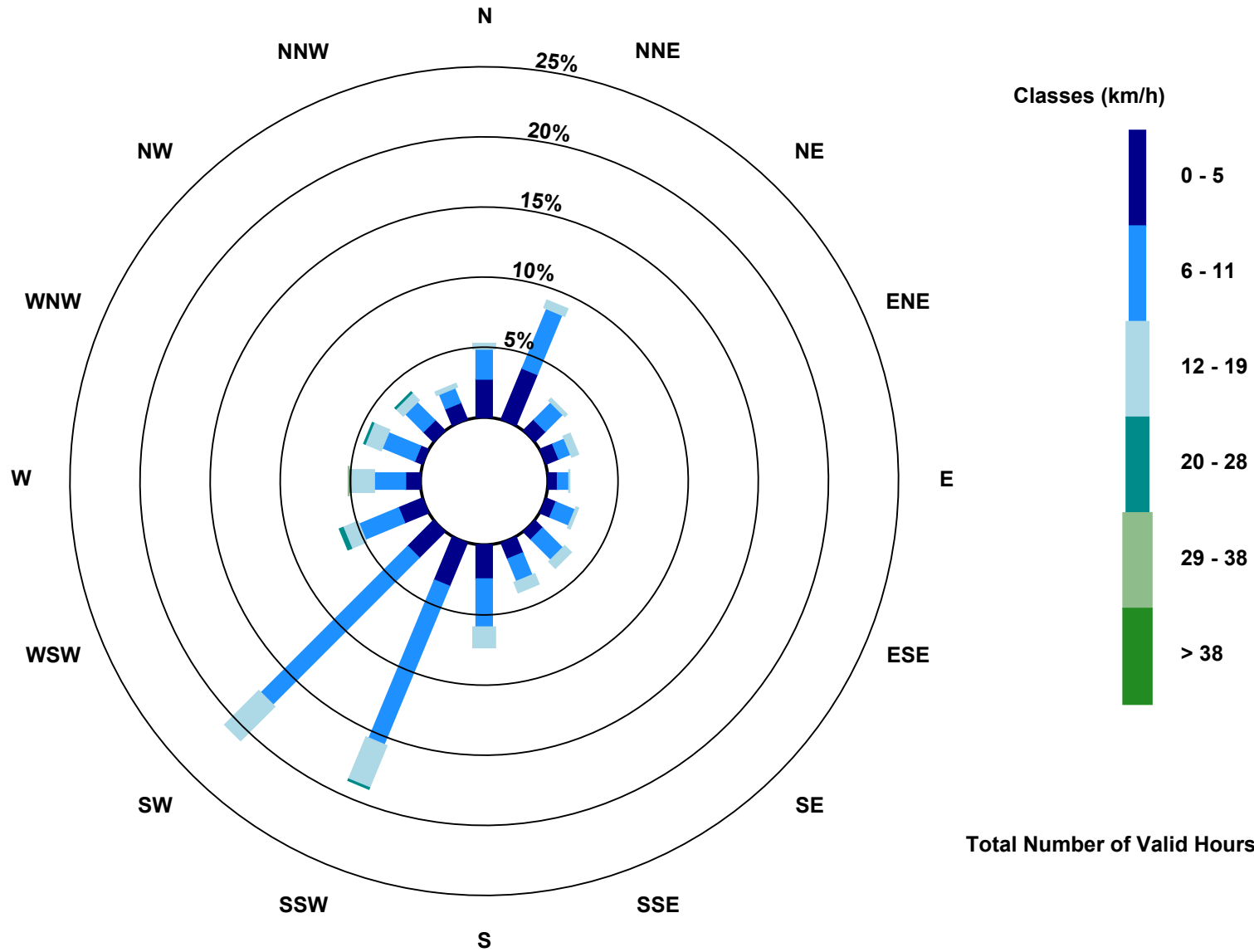


Total Number of Valid Hours: 6254



Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed 20 m (WS20m) - km/h
Janvier

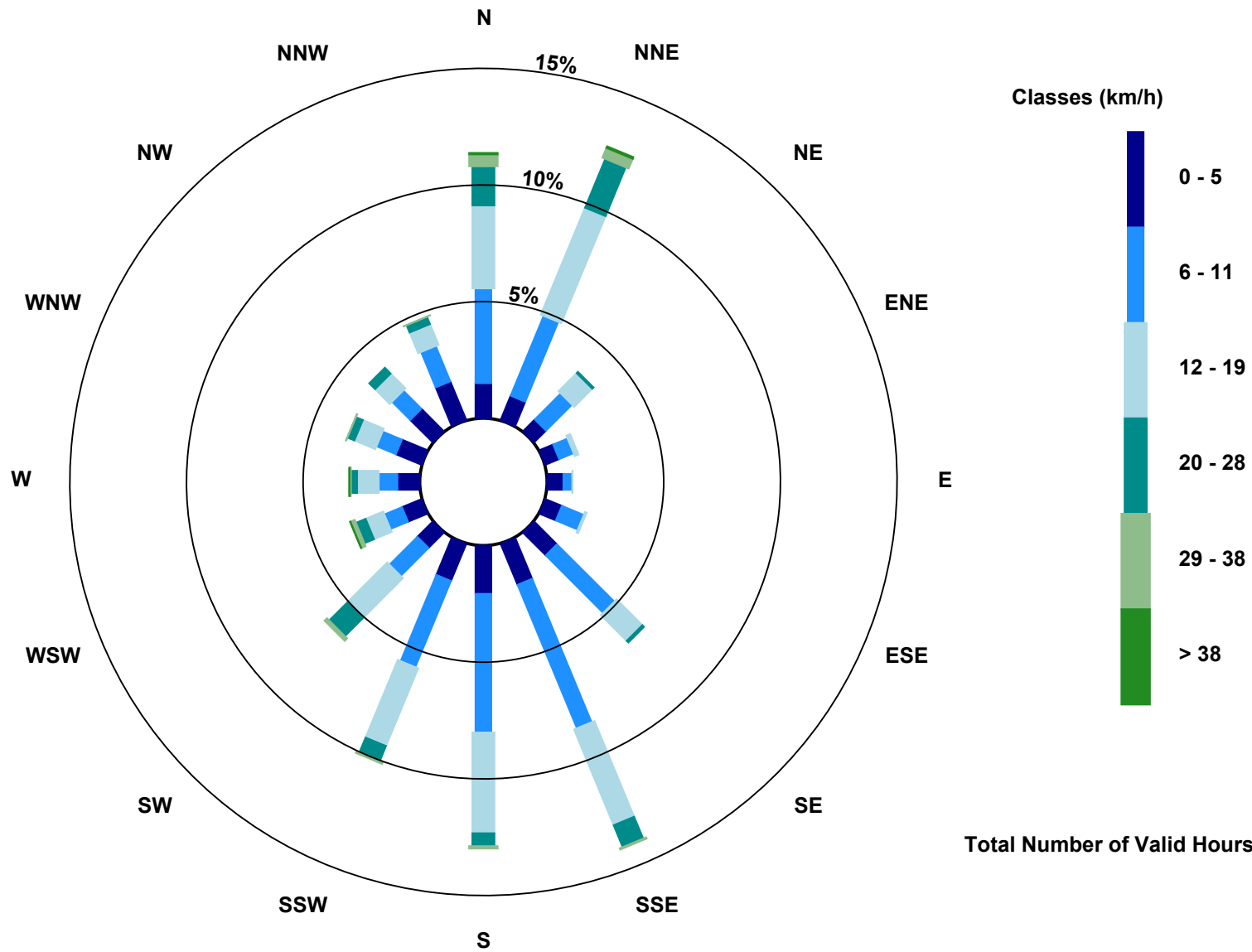


Total Number of Valid Hours: 2335



Wood Buffalo Environmental Association
Wind Rose 2021

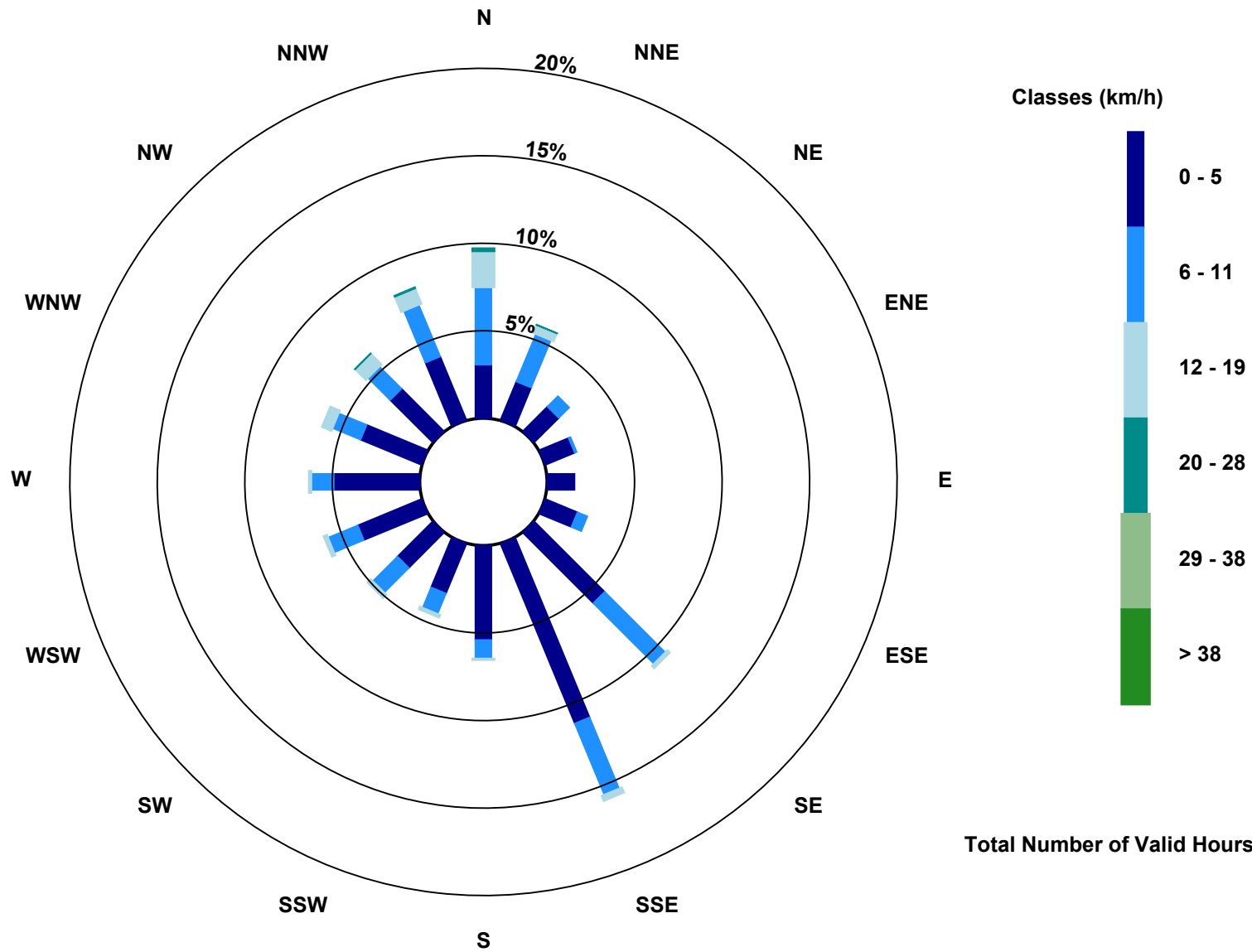
Wind Speed (WS) - km/h
Fort Hills





Wood Buffalo Environmental Association
Wind Rose 2021

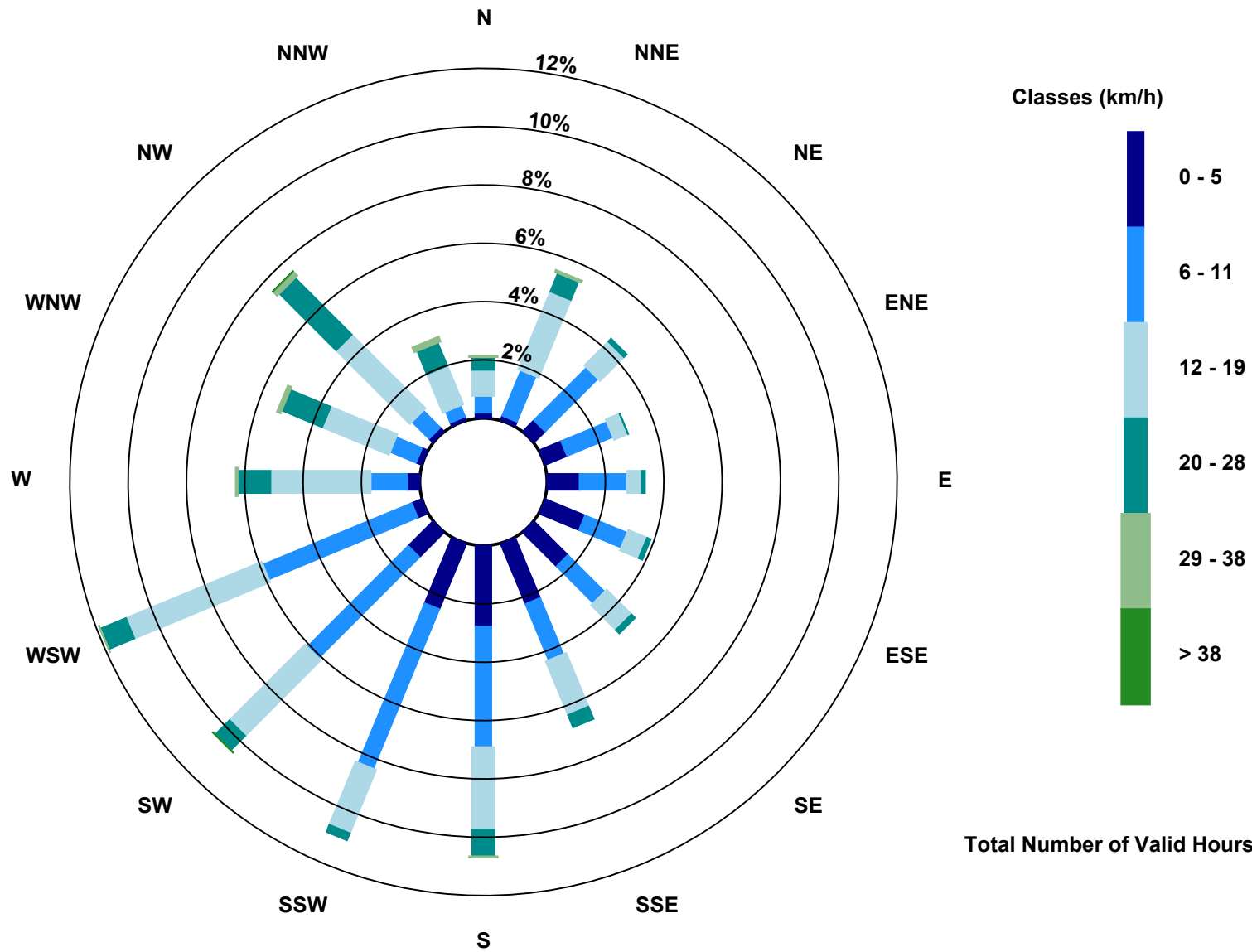
Wind Speed (WS) - km/h
Waskow ohci Pimatisiwin





Wood Buffalo Environmental Association
Wind Rose 2021

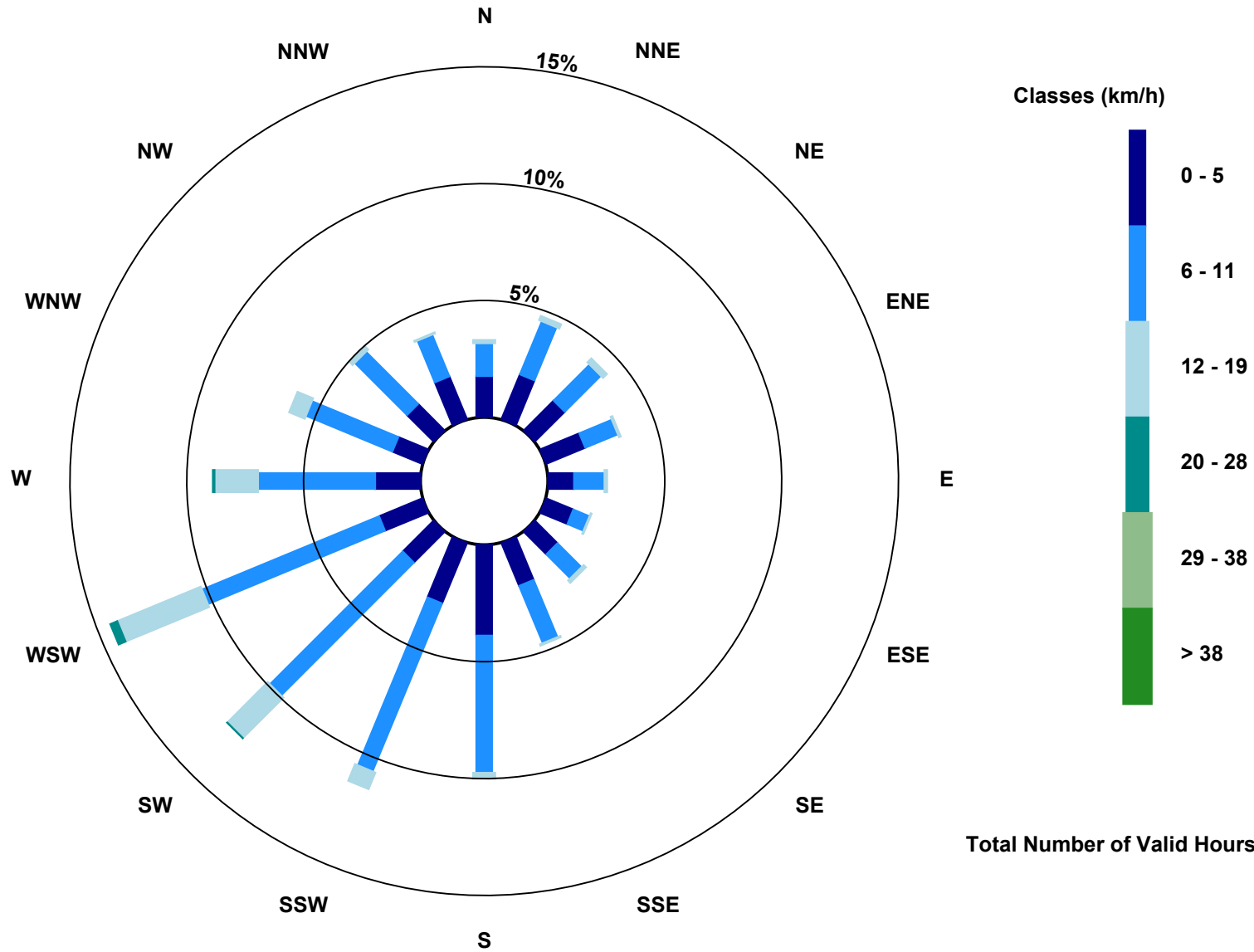
Wind Speed (WS) - km/h
Christina Lake





Wood Buffalo Environmental Association
Wind Rose 2021

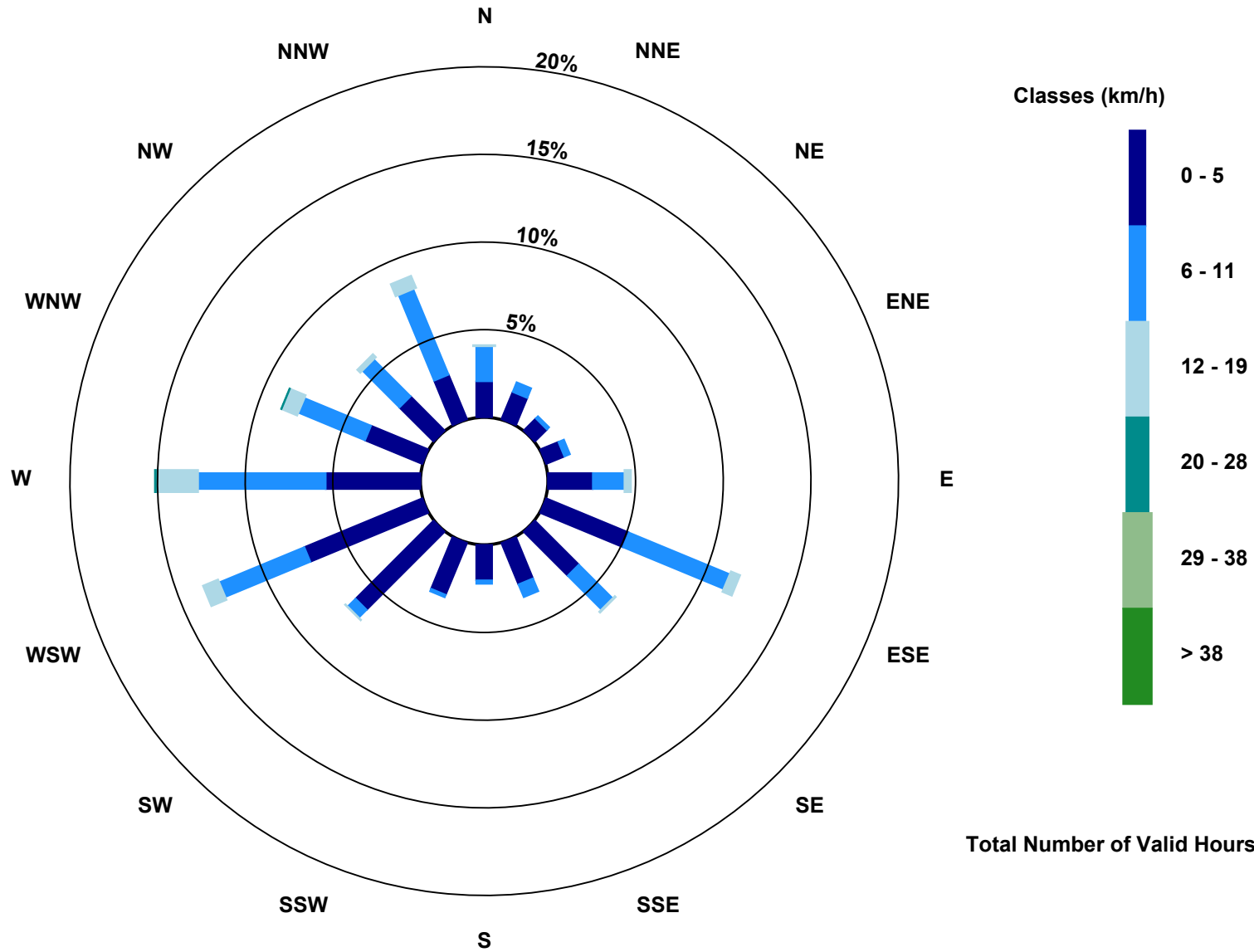
Wind Speed (WS) - km/h
Jackfish 2/3





Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed (WS) - km/h
Surmont 2

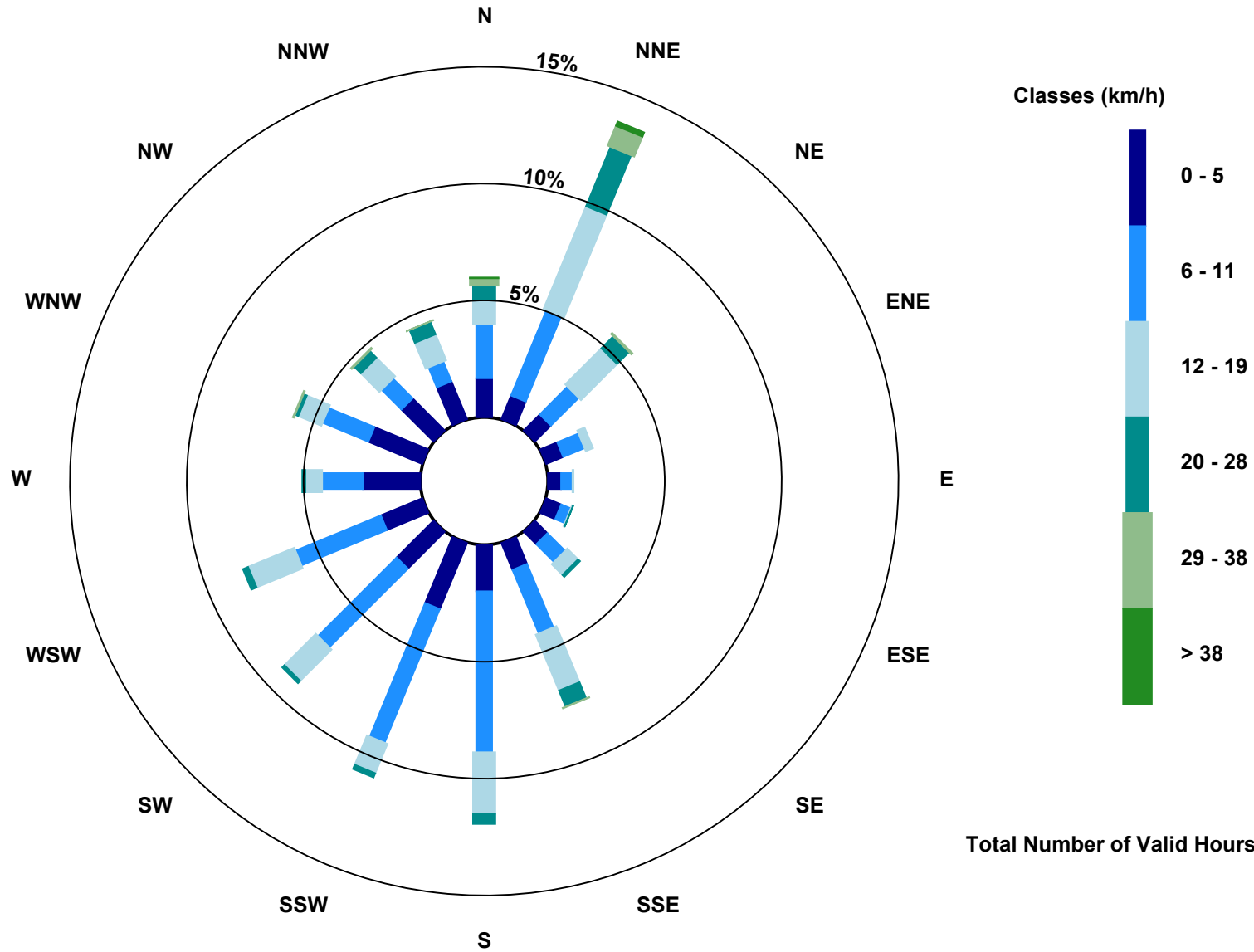


Total Number of Valid Hours: 8553



Wood Buffalo Environmental Association
Wind Rose 2021

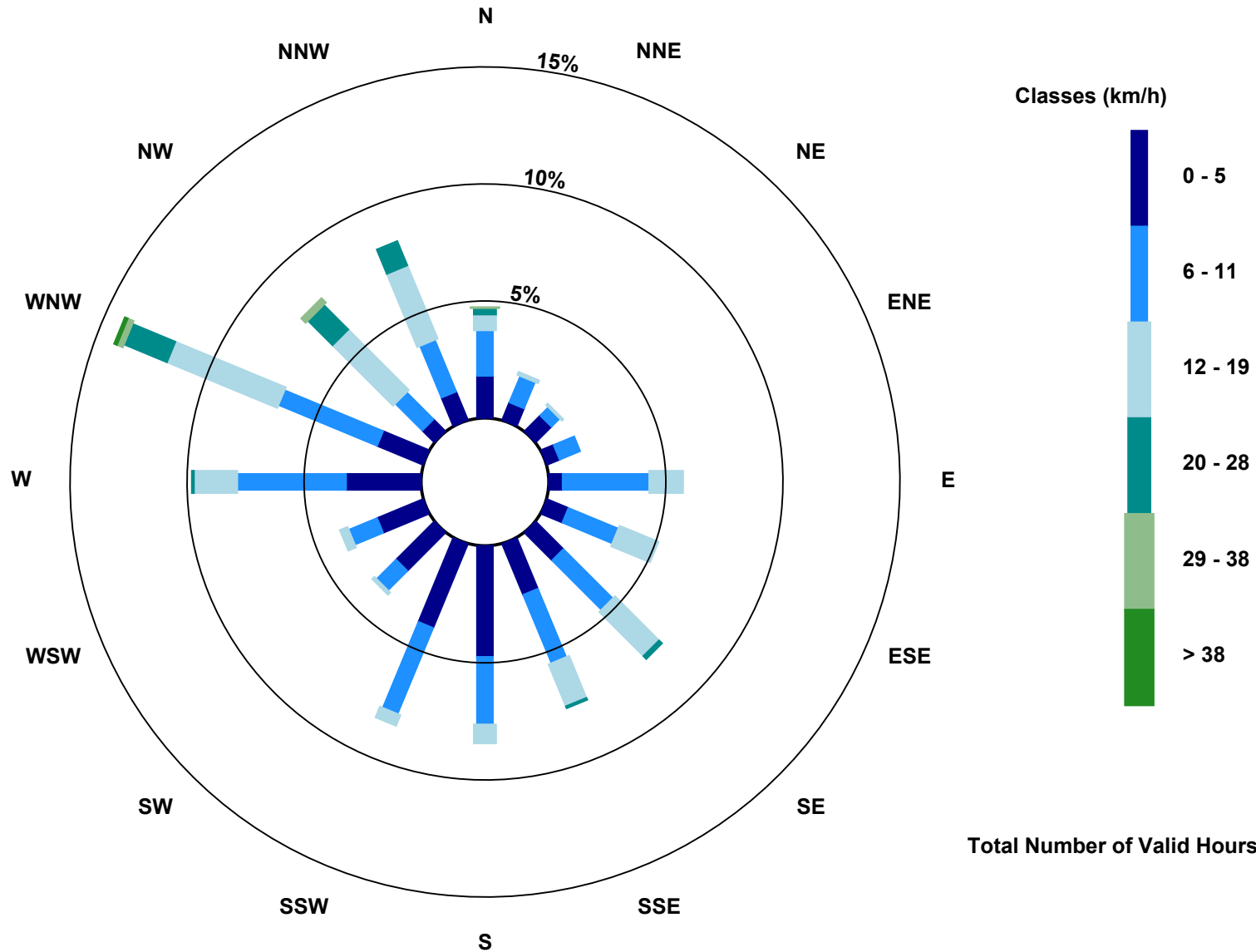
Wind Speed (WS) - km/h
Ells River





Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed (WS) - km/h
Leismer

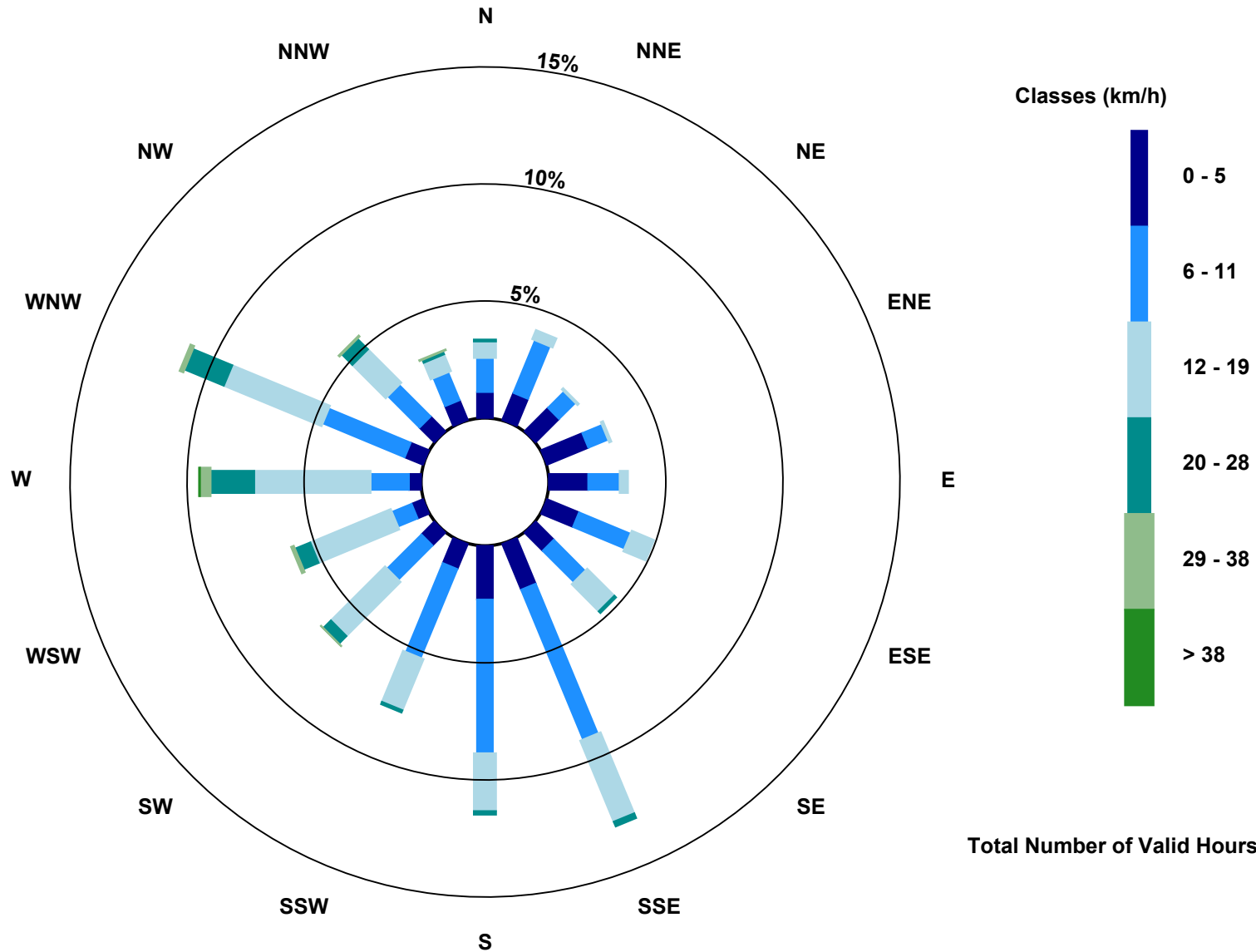


Total Number of Valid Hours: 2215



Wood Buffalo Environmental Association
Wind Rose 2021

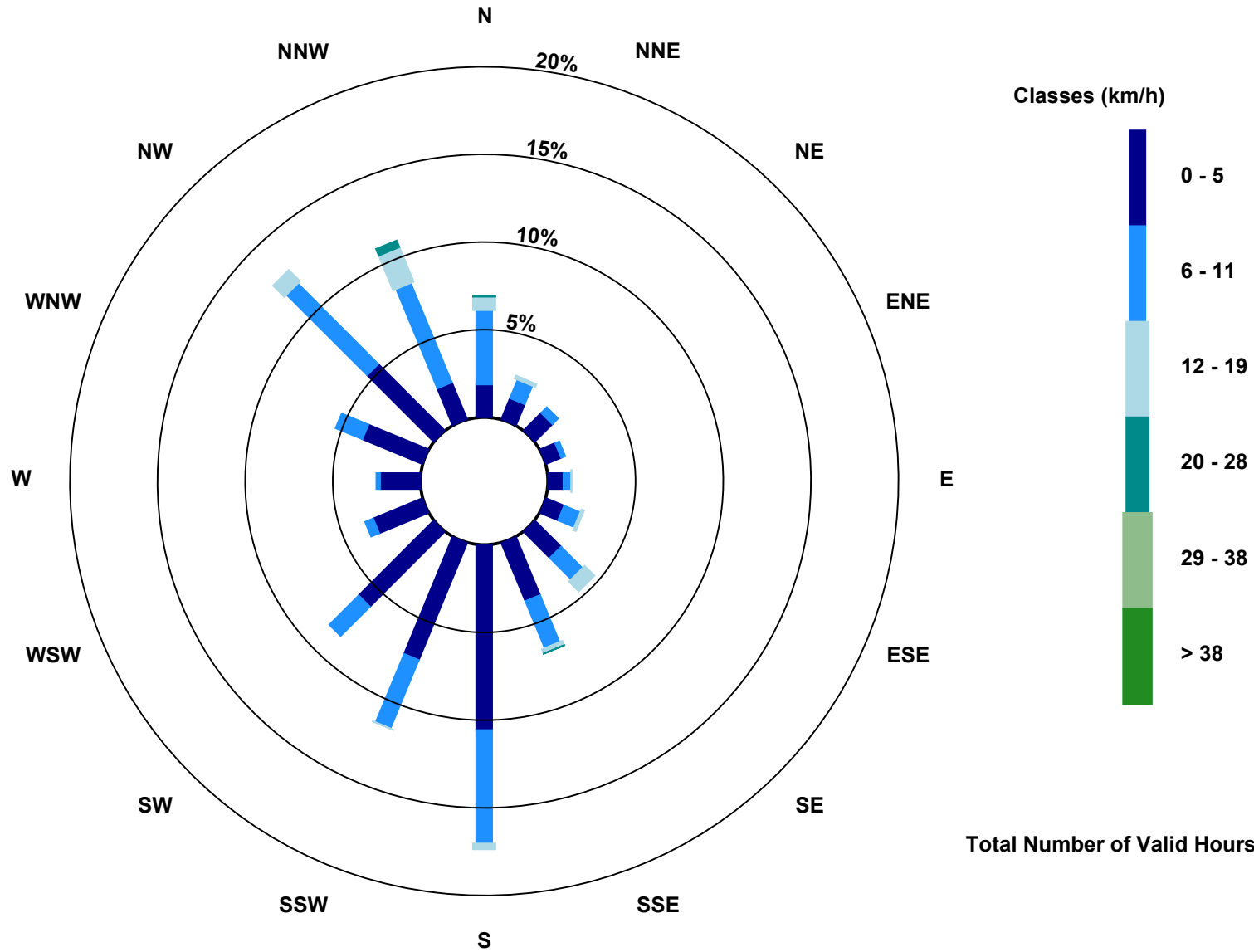
Wind Speed (WS) - km/h
Sawbones Bay





Wood Buffalo Environmental Association
Wind Rose 2021

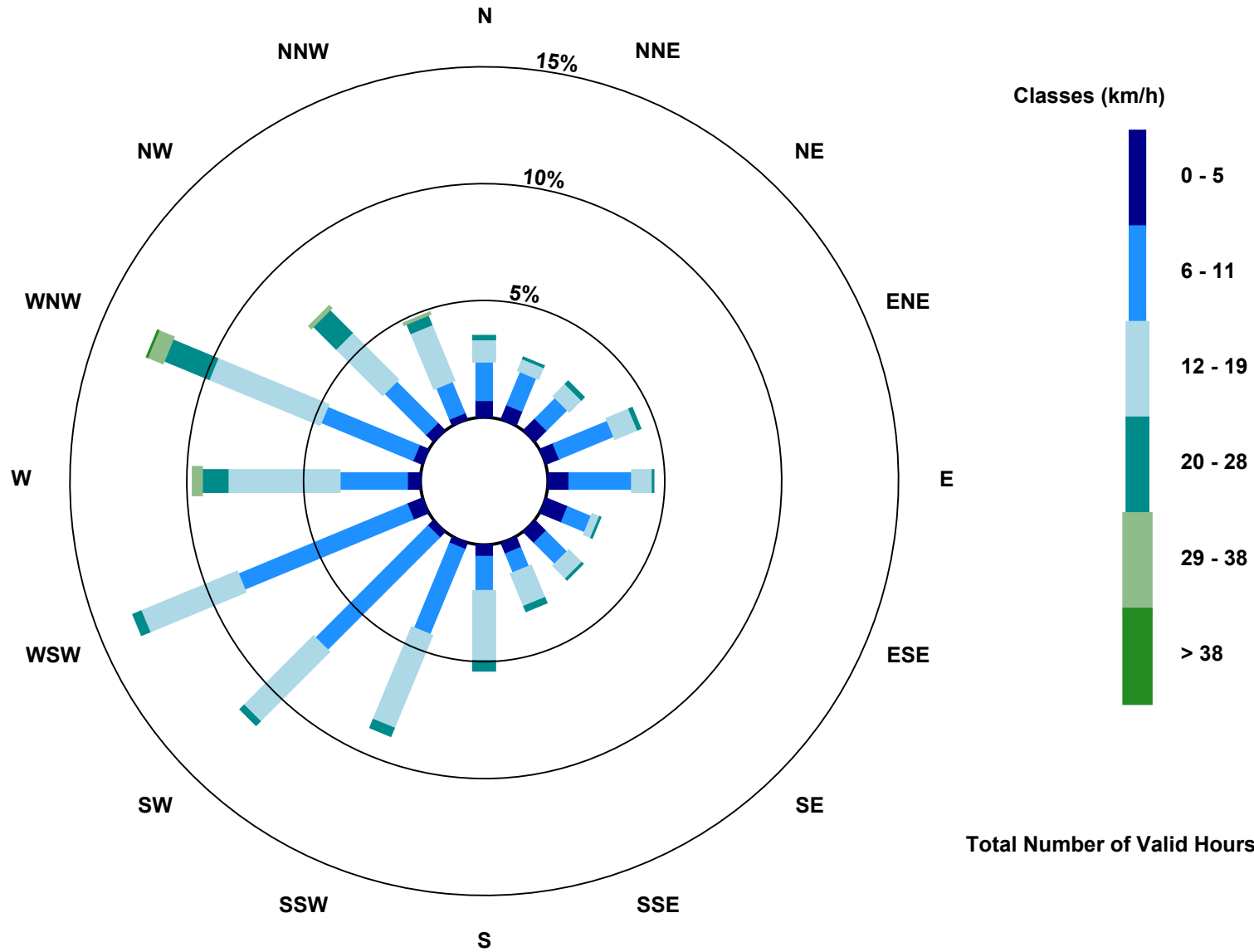
Wind Speed (WS) - km/h
Jackfish 1





Wood Buffalo Environmental Association
Wind Rose 2021

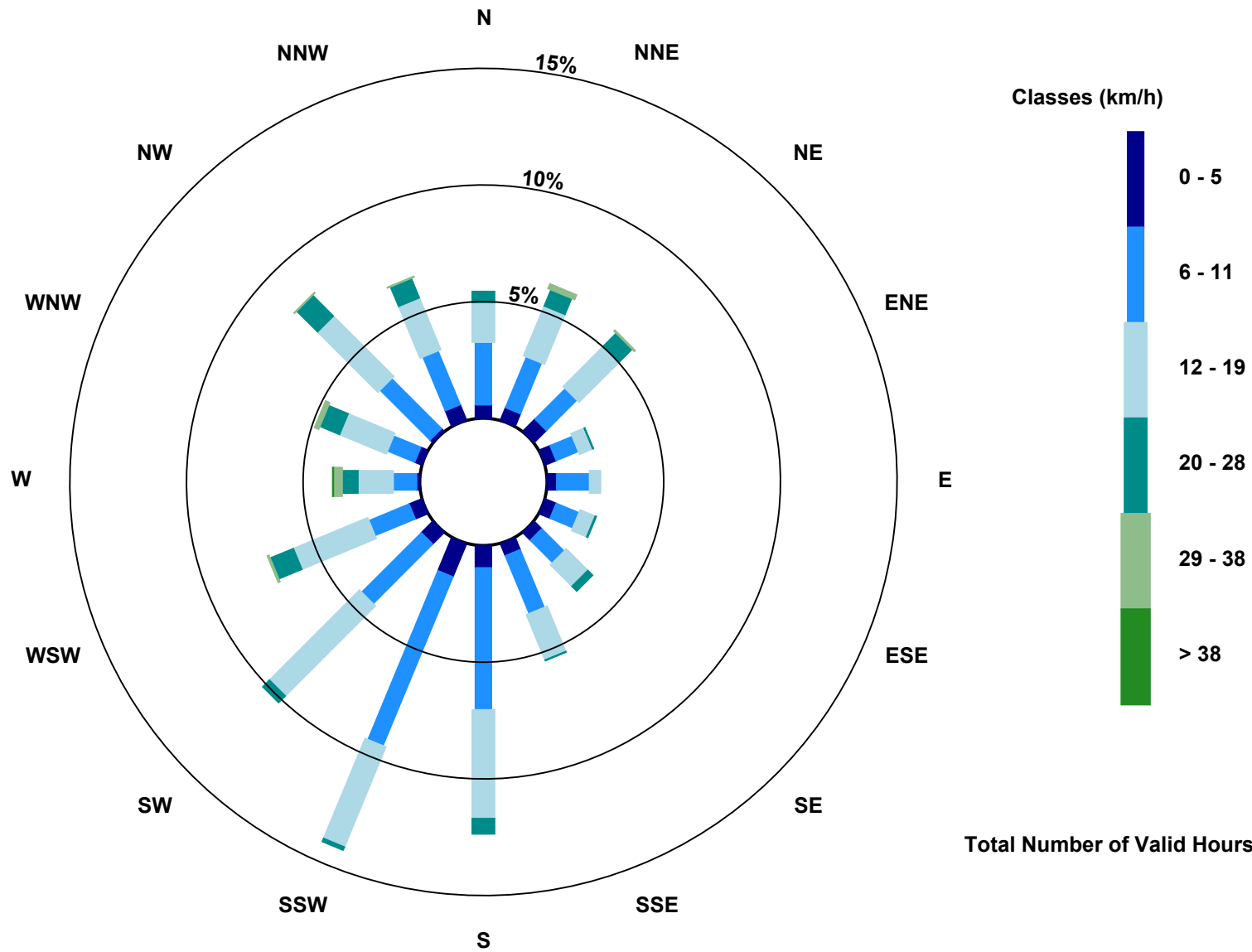
Wind Speed (WS) - km/h
Kirby South





Wood Buffalo Environmental Association
Wind Rose 2021

Wind Speed (WS) - km/h
Kirby North





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

APPENDIX I: AAAQO EXCEEDANCES 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Wood Buffalo Environmental Association
Air Quality Events List 2021

Type	Site	Parameter	Date/Time	Reference	Period	Reported	Final	status
AAAQO	AMS02 Mildred Lake	H2S	Jan 14, 2021 23:00	375194	1-hr	11	9.8	nae
AAAQO	AMS04 Buffalo Viewpoint	PM2.5	Jan 30, 2021 24:00	375634	24-hr	37	36.9	exc
AAAQO	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jan 30, 2021 24:00	375633	24-hr	42	42.4	exc
AAAQO	AMS23 Fort Hills	PM2.5	Jan 30, 2021 24:00	375636	24-hr	53	52.5	exc
AAAQO	AMS09 Barge Landing	PM2.5	Jan 30, 2021 24:00	375635	24-hr	79	80.5	exc
AAAQO	AMS09 Barge Landing	PM2.5	Jan 30, 2021 18:00	375635	1-hr	95	94.7	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jan 30, 2021 19:00	375634	1-hr	141	140.6	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jan 30, 2021 19:00	375635	1-hr	154	153.9	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jan 30, 2021 20:00	375633	1-hr	95	95.2	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jan 30, 2021 20:00	375635	1-hr	258	264.9	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jan 30, 2021 20:00	375634	1-hr	167	167.3	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jan 30, 2021 21:00	375636	1-hr	96	96.4	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jan 30, 2021 21:00	375635	1-hr	236	235.7	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jan 30, 2021 21:00	375634	1-hr	136	135.9	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jan 30, 2021 22:00	375636	1-hr	189	189.2	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jan 30, 2021 22:00	375635	1-hr	226	225.8	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jan 30, 2021 22:00	375633	1-hr	87	87.4	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jan 30, 2021 23:00	375635	1-hr	269	269.1	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jan 30, 2021 23:00	375633	1-hr	106	106.3	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jan 30, 2021 23:00	375636	1-hr	224	224.4	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jan 30, 2021 24:00	375636	1-hr	167	166.8	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jan 30, 2021 24:00	375635	1-hr	250	250.4	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jan 30, 2021 24:00	375633	1-hr	228	228.4	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jan 30, 2021 24:00	375681	1-hr	93	93.3	exc
AAAQO	AMS09 Barge Landing	PM2.5	Jan 31, 2021 24:00	375658	24-hr	51	50.8	exc
AAAQO	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jan 31, 2021 24:00	375657	24-hr	37	36.7	exc
AAAQO	AMS13 Fort McKay South	PM2.5	Jan 31, 2021 24:00	375659	24-hr	31	30.8	exc
AAAQO	AMS23 Fort Hills	PM2.5	Jan 31, 2021 24:00	375660	24-hr	39	39.4	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jan 31, 2021 01:00	375658	1-hr	213	212.9	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jan 31, 2021 01:00	375660	1-hr	153	153.1	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jan 31, 2021 01:00	375657	1-hr	112	111.8	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jan 31, 2021 02:00	375658	1-hr	169	168.6	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jan 31, 2021 03:00	375657	1-hr	90	90.3	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jan 31, 2021 03:00	375658	1-hr	108	107.6	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jan 31, 2021 04:00	375657	1-hr	85	85.0	exc
AAAQO	AMS11 Lower Camp	H2S	Feb 11, 2021 06:00	375953	1-hr	15	-	ret
AAAQO	AMS506 Jackfish 1	H2S	Feb 14, 2021 02:00	376054	1-hr	20	-	ret
AAAQO	AMS506 Jackfish 1	H2S	Feb 14, 2021 03:00	376054	1-hr	14	-	ret
AAAQO	AMS506 Jackfish 1	H2S	Feb 14, 2021 04:00	376054	1-hr	10	-	ret
AAAQO	AMS11 Lower Camp	H2S	Feb 21, 2021 14:00	376278	1-hr	12	12.4	exc
AAAQO	AMS11 Lower Camp	H2S	Mar 2, 2021 21:00	376586	1-hr	14	14.5	exc
AAAQO	AMS11 Lower Camp	H2S	Mar 3, 2021 18:00	376613	1-hr	17	16.4	exc
AAAQO	AMS11 Lower Camp	H2S	Mar 3, 2021 19:00	376613	1-hr	10	10.3	exc
AAAQO	AMS20 Mackay River	H2S	Mar 20, 2021 18:00	377147	1-hr	10	9.9	nae
AAAQO	AMS20 Mackay River	H2S	Mar 20, 2021 20:00	377147	1-hr	16	16.1	exc
AAAQO	AMS11 Lower Camp	H2S	Mar 28, 2021 07:00	377359	1-hr	10	10.0	nae
AAAQO	AMS11 Lower Camp	H2S	Apr 5, 2021 21:00	377608	1-hr	15	15	exc
AAAQO	AMS11 Lower Camp	H2S	Apr 9, 2021 19:00	377773	1-hr	17	17	exc
AAAQG	AMS29 Surmont 2	PM2.5	Apr 14, 2021 21:00	377907	1-hr	100	100.1	exc
AAAQO	AMS23 Fort Hills	TRS	Apr 19, 2021 21:00	378056	1-hr	11	10.6	exc
AAAQG	AMS09 Barge Landing	PM2.5	Apr 21, 2021 15:00	379226	1-hr	144	144.0	late
AAAQG	AMS22 Janvier	PM2.5	Apr 25, 2021 14:00	378267	1-hr	122	122.0	exc
AAAQG	AMS22 Janvier	PM2.5	Apr 25, 2021 17:00	378267	1-hr	94	93.5	exc
AAAQG	AMS21 Conklin	PM2.5	Apr 25, 2021 21:00	378266	1-hr	110	110.3	exc
AAAQG	AMS21 Conklin	PM2.5	May 3, 2021 23:00	378553	1-hr	121	120.8	exc
AAAQG	AMS21 Conklin	PM2.5	May 5, 2021 23:00	378622	1-hr	107	107.2	exc
AAAQO	AMS11 Lower Camp	SO2	May 9, 2021 24:00	378731	1-hr	176	176.1	exc
AAAQO	AMS11 Lower Camp	SO2	May 10, 2021 01:00	378732	1-hr	187	186.7	exc
AAAQG	AMS09 Barge Landing	PM2.5	May 20, 2021 03:00	379120	1-hr	92	91.9	exc
AAAQO	AMS04 Buffalo Viewpoint	PM2.5	May 24, 2021 24:00	379209	24-hr	39	38.7	exc
AAAQO	AMS05 Mannix	H2S	May 24, 2021 24:00	379210	24-hr	3	2.9	nae
AAAQO	AMS09 Barge Landing	PM2.5	May 24, 2021 24:00	379211	24-hr	36	36.1	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	May 24, 2021 08:00	379209	1-hr	104	103.6	exc



Wood Buffalo Environmental Association
Air Quality Events List 2021

Type	Site	Parameter	Date/Time	Reference	Period	Reported	Final	status
AAAQG	AMS09 Barge Landing	PM2.5	May 24, 2021 10:00	379211	1-hr	87	86.9	exc
AAAQG	AMS09 Barge Landing	PM2.5	May 24, 2021 11:00	379211	1-hr	130	130.0	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	May 24, 2021 11:00	379209	1-hr	150	149.9	exc
AAAQG	AMS14 Anzac	PM2.5	May 29, 2021 22:00	379394	1-hr	121	120.6	exc
AAAQO	AMS02 Mildred Lake	H2S	Jun 2, 2021 09:00	379484	1-hr	11	10.2	exc
AAAQG	AMS21 Conklin	PM2.5	Jun 2, 2021 22:00	379585	1-hr	96	95.8	exc
AAAQO	AMS05 Mannix	H2S	Jun 9, 2021 02:00	379769	1-hr	11	10.3	exc
AAAQO	AMS02 Mildred Lake	H2S	Jun 18, 2021 24:00	380145	1-hr	16	15.2	exc
AAAQO	AMS02 Mildred Lake	H2S	Jun 19, 2021 01:00	380146	1-hr	18	17.2	exc
AAAQO	AMS01 Bertha Ganter - Fort McKay	O3	Jul 2, 2021 12:00	380774	1-hr	102	101.7	exc
AAAQO	AMS04 Buffalo Viewpoint	O3	Jul 2, 2021 13:00	380775	1-hr	102	101.9	exc
AAAQO	AMS13 Fort McKay South	O3	Jul 2, 2021 13:00	380777	1-hr	103	106.0	exc
AAAQO	AMS17 Wapasu	O3	Jul 2, 2021 14:00	380779	1-hr	75	76.5	exc
AAAQO	AMS22 Janvier	PM2.5	Jul 9, 2021 24:00	381015	24-hr	42	42.2	exc
AAAQO	AMS14 Anzac	PM2.5	Jul 9, 2021 24:00	381012	24-hr	36	36.1	exc
AAAQO	AMS29 Surmont 2	PM2.5	Jul 9, 2021 24:00	381016	24-hr	31	30.9	exc
AAAQO	AMS04 Buffalo Viewpoint	PM2.5	Jul 9, 2021 24:00	381011	24-hr	30	30.2	exc
AAAQO	AMS18 Stony Mountain	PM2.5	Jul 9, 2021 24:00	381013	24-hr	32	32.1	exc
AAAQO	AMS21 Conklin	PM2.5	Jul 9, 2021 24:00	381014	24-hr	35	34.7	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 9, 2021 20:00	381014	1-hr	107	107.2	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 9, 2021 21:00	381014	1-hr	91	91.0	exc
AAAQO	AMS17 Wapasu	PM2.5	Jul 10, 2021 24:00	381036	24-hr	29	29.3	exc
AAAQO	AMS22 Janvier	PM2.5	Jul 10, 2021 24:00	381037	24-hr	38	38.4	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 10, 2021 06:00	381036	1-hr	88	87.7	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 10, 2021 07:00	381036	1-hr	86.0	85.6	exc
AAAQO	AMS17 Wapasu	PM2.5	Jul 15, 2021 24:00	381285	24-hr	30	29.6	exc
AAAQO	AMS18 Stony Mountain	PM2.5	Jul 15, 2021 24:00	381286	24-hr	34	34.1	exc
AAAQO	AMS21 Conklin	PM2.5	Jul 15, 2021 24:00	381287	24-hr	33	32.6	exc
AAAQO	AMS22 Janvier	PM2.5	Jul 15, 2021 24:00	381288	24-hr	43	43.0	exc
AAAQO	AMS09 Barge Landing	PM2.5	Jul 15, 2021 24:00	381289	24-hr	32	32.1	exc
AAAQO	AMS06 Patricia McInnes	PM2.5	Jul 15, 2021 24:00	381283	24-hr	31	30.5	exc
AAAQO	AMS13 Fort McKay South	PM2.5	Jul 15, 2021 24:00	381284	24-hr	39	39.4	exc
AAAQO	AMS04 Buffalo Viewpoint	PM2.5	Jul 15, 2021 24:00	381282	24-hr	43	42.5	exc
AAAQO	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 15, 2021 24:00	381281	24-hr	32	32.2	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 15, 2021 15:00	381284	1-hr	100	99.7	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 15, 2021 15:00	381282	1-hr	87	87.2	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 15, 2021 15:00	381281	1-hr	81	80.5	exc
AAAQG	AMS30 Eils River	PM2.5	Jul 15, 2021 16:00	381303	1-hr	86	86.3	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 15, 2021 16:00	381284	1-hr	154	153.6	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 15, 2021 16:00	381289	1-hr	124	124.0	exc
AAAQO	AMS04 Buffalo Viewpoint	PM2.5	Jul 15, 2021 16:00	381282	1-hr	172	172.1	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 15, 2021 16:00	381281	1-hr	129	128.9	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 15, 2021 17:00	381283	1-hr	92	91.7	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 15, 2021 17:00	381300	1-hr	87	86.8	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 15, 2021 18:00	381283	1-hr	88	88.0	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 15, 2021 21:00	381288	1-hr	175	174.8	exc
AAAQO	AMS18 Stony Mountain	PM2.5	Jul 15, 2021 23:00	381286	1-hr	90	89.9	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 15, 2021 23:00	381287	1-hr	83	82.6	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 16, 2021 24:00	381429	1-hr	86	86.5	exc
AAAQO	AMS22 Janvier	PM2.5	Jul 17, 2021 24:00	381420	24-hr	81	81.3	exc
AAAQO	AMS29 Surmont 2	PM2.5	Jul 17, 2021 24:00	381380	24-hr	53.0	53.3	exc
AAAQO	AMS21 Conklin	PM2.5	Jul 17, 2021 24:00	381379	24-hr	94	93.8	exc
AAAQO	AMS18 Stony Mountain	PM2.5	Jul 17, 2021 24:00	381378	24-hr	95	95.1	exc
AAAQO	AMS14 Anzac	PM2.5	Jul 17, 2021 24:00	381377	24-hr	49	49.4	exc
AAAQO	AMS13 Fort McKay South	PM2.5	Jul 17, 2021 24:00	381376	24-hr	35	34.5	exc
AAAQO	AMS07 Athabasca Valley	PM2.5	Jul 17, 2021 24:00	381375	24-hr	56	56.0	exc
AAAQO	AMS06 Patricia McInnes	PM2.5	Jul 17, 2021 24:00	381374	24-hr	53	52.6	exc
AAAQO	AMS04 Buffalo Viewpoint	PM2.5	Jul 17, 2021 24:00	381373	24-hr	41	41.0	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 17, 2021 01:00	381420	1-hr	99	99.3	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 17, 2021 02:00	381420	1-hr	83	83.1	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 17, 2021 06:00	381377	1-hr	113.0	113.3	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 17, 2021 07:00	381377	1-hr	93	93.3	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 17, 2021 08:00	381374	1-hr	80	80.5	exc



Wood Buffalo Environmental Association
Air Quality Events List 2021

Type	Site	Parameter	Date/Time	Reference	Period	Reported	Final	status
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 17, 2021 08:00	381375	1-hr	89	89.5	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 17, 2021 09:00	381420	1-hr	90	89.5	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 17, 2021 09:00	381373	1-hr	120	120.2	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 17, 2021 09:00	381379	1-hr	136	136.4	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 17, 2021 09:00	381378	1-hr	121	121.3	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 17, 2021 09:00	381375	1-hr	128	128.4	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 17, 2021 09:00	381374	1-hr	127	127.3	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 17, 2021 10:00	381373	1-hr	110	109.9	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 17, 2021 10:00	381374	1-hr	138	138.0	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 17, 2021 10:00	381420	1-hr	89	89.3	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 17, 2021 10:00	381379	1-hr	152	151.6	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 17, 2021 10:00	381378	1-hr	166	166.3	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 17, 2021 10:00	381375	1-hr	146	146.3	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 17, 2021 11:00	381376	1-hr	82	82.4	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 17, 2021 11:00	381378	1-hr	153	153.2	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 17, 2021 11:00	381379	1-hr	153	153.0	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 17, 2021 11:00	381373	1-hr	92	92.0	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 17, 2021 11:00	381374	1-hr	119	119.1	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 17, 2021 11:00	381375	1-hr	133	132.6	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 17, 2021 12:00	381373	1-hr	88	88.1	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 17, 2021 12:00	381379	1-hr	165	165.4	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 17, 2021 12:00	381378	1-hr	176	175.9	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 17, 2021 12:00	381374	1-hr	102	101.6	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 17, 2021 12:00	381375	1-hr	110	109.7	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 17, 2021 12:00	381420	1-hr	94	94.1	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 17, 2021 13:00	381377	1-hr	84	83.9	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 17, 2021 13:00	381374	1-hr	90	90.1	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 17, 2021 13:00	381420	1-hr	130	130.4	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 17, 2021 13:00	381379	1-hr	168	167.7	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 17, 2021 13:00	381378	1-hr	178	178.3	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 17, 2021 13:00	381375	1-hr	90	89.9	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 17, 2021 14:00	381377	1-hr	108	108.1	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 17, 2021 14:00	381378	1-hr	132	131.6	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 17, 2021 14:00	381379	1-hr	137	137.1	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 17, 2021 14:00	381420	1-hr	178	177.8	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 17, 2021 15:00	381377	1-hr	110	110.4	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 17, 2021 15:00	381378	1-hr	150	149.8	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 17, 2021 15:00	381420	1-hr	213	213.4	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 17, 2021 15:00	381379	1-hr	167	167.2	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 17, 2021 16:00	381420	1-hr	131	131.2	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 17, 2021 16:00	381379	1-hr	193	193.3	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 17, 2021 16:00	381378	1-hr	194	194.0	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 17, 2021 17:00	381379	1-hr	178	178.3	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 17, 2021 17:00	381378	1-hr	167	166.5	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 17, 2021 17:00	381420	1-hr	80	80.3	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 17, 2021 18:00	381378	1-hr	128	127.7	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 17, 2021 18:00	381379	1-hr	114	113.7	exc
AAAQO	AMS23 Fort Hills	TRS	Jul 17, 2021 18:00	381370	1-hr	10	10.5	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 17, 2021 19:00	381379	1-hr	85	85.3	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 17, 2021 19:00	381378	1-hr	95	94.5	exc
AAAQO	AMS21 Conklin	PM2.5	Jul 18, 2021 24:00	381395	24-hr	82	82.1	exc
AAAQO	AMS22 Janvier	PM2.5	Jul 18, 2021 24:00	381421	24-hr	91	91.2	exc
AAAQO	AMS30 Ells River	PM2.5	Jul 18, 2021 24:00	381398	24-hr	31	30.6	exc
AAAQO	AMS29 Surmont 2	PM2.5	Jul 18, 2021 24:00	381397	24-hr	49	49.3	exc
AAAQO	AMS18 Stony Mountain	PM2.5	Jul 18, 2021 24:00	381394	24-hr	80	79.8	exc
AAAQO	AMS14 Anzac	PM2.5	Jul 18, 2021 24:00	381393	24-hr	44	44.0	exc
AAAQO	AMS13 Fort McKay South	PM2.5	Jul 18, 2021 24:00	381392	24-hr	31	30.5	exc
AAAQO	AMS23 Fort Hills	PM2.5	Jul 18, 2021 24:00	381396	24-hr	38	38.3	exc
AAAQO	AMS22 Janvier	PM2.5	Jul 18, 2021 10:00	381421	1-hr	83	82.7	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 18, 2021 11:00	381421	1-hr	89	89.0	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 18, 2021 12:00	381421	1-hr	81	80.7	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 18, 2021 12:00	381394	1-hr	86	86.0	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 18, 2021 13:00	381394	1-hr	82	82.3	exc



Wood Buffalo Environmental Association
Air Quality Events List 2021

Type	Site	Parameter	Date/Time	Reference	Period	Reported	Final	status
AAAQG	AMS22 Janvier	PM2.5	Jul 18, 2021 13:00	381421	1-hr	90	90.2	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 18, 2021 14:00	381421	1-hr	109	108.6	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 18, 2021 15:00	381421	1-hr	115	115.0	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 18, 2021 15:00	381395	1-hr	81	81.1	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 18, 2021 15:00	381394	1-hr	80	80.2	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 18, 2021 16:00	381421	1-hr	119	118.7	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 18, 2021 16:00	381394	1-hr	86	85.6	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 18, 2021 16:00	381395	1-hr	85	85.4	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 18, 2021 17:00	381395	1-hr	88	87.6	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 18, 2021 17:00	381394	1-hr	92	91.6	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 18, 2021 17:00	381421	1-hr	132	132.4	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 18, 2021 18:00	381421	1-hr	128	127.6	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 18, 2021 18:00	381395	1-hr	88	88.4	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 18, 2021 18:00	381394	1-hr	93	92.6	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 18, 2021 19:00	381421	1-hr	123	122.7	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 18, 2021 19:00	381395	1-hr	89	88.8	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 18, 2021 19:00	381394	1-hr	93	92.8	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 18, 2021 20:00	381421	1-hr	131	130.5	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 18, 2021 20:00	381394	1-hr	94	93.9	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 18, 2021 20:00	381395	1-hr	105	104.9	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 18, 2021 21:00	381394	1-hr	115	114.8	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 18, 2021 21:00	381395	1-hr	125	125.4	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 18, 2021 21:00	381421	1-hr	145	145.2	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 18, 2021 22:00	381396	1-hr	95	94.9	exc
AAAQG	AMS29 Surmont 2	PM2.5	Jul 18, 2021 22:00	381397	1-hr	89	89.3	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 18, 2021 22:00	381421	1-hr	147	146.7	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 18, 2021 22:00	381395	1-hr	125	124.5	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 18, 2021 22:00	381394	1-hr	121	121.2	exc
AAAQG	AMS29 Surmont 2	PM2.5	Jul 18, 2021 23:00	381397	1-hr	88	88.1	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 18, 2021 23:00	381396	1-hr	86	86.3	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 18, 2021 23:00	381395	1-hr	123	123.3	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 18, 2021 23:00	381421	1-hr	148	147.8	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 18, 2021 23:00	381394	1-hr	124	123.6	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 18, 2021 24:00	381421	1-hr	135	135.2	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 18, 2021 24:00	381395	1-hr	120	120.1	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 18, 2021 24:00	381393	1-hr	84	84.1	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 18, 2021 24:00	381394	1-hr	122	122.0	exc
AAAQG	AMS29 Surmont 2	PM2.5	Jul 18, 2021 24:00	381397	1-hr	93	93.4	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 19, 2021 01:00	381693	1-hr	125	125.2	exc
AAAQG	AMS29 Surmont 2	PM2.5	Jul 19, 2021 01:00	381695	1-hr	104	104.1	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 19, 2021 01:00	381691	1-hr	114	113.5	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 19, 2021 01:00	381689	1-hr	82	82.4	exc
AAAQO	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 24:00	381682	24-hr	97	97.0	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 19, 2021 01:00	381692	1-hr	117	117.0	exc
AAAQO	AMS505 Sawbones Bay	H2S	Jul 19, 2021 01:00	381404	1-hr	24	-	ret
AAAQO	AMS29 Surmont 2	PM2.5	Jul 19, 2021 24:00	381695	24-hr	66	65.8	exc
AAAQO	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 24:00	381683	24-hr	95	94.8	exc
AAAQO	AMS06 Patricia McInnes	PM2.5	Jul 19, 2021 24:00	381684	24-hr	76	76.3	exc
AAAQO	AMS07 Athabasca Valley	PM2.5	Jul 19, 2021 24:00	381685	24-hr	84	84.1	exc
AAAQO	AMS08 Fort Chipewyan	PM2.5	Jul 19, 2021 24:00	381686	24-hr	46	46.3	exc
AAAQO	AMS09 Barge Landing	PM2.5	Jul 19, 2021 24:00	381687	24-hr	96	96.0	exc
AAAQO	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 24:00	381688	24-hr	108	106.3	exc
AAAQO	AMS14 Anzac	PM2.5	Jul 19, 2021 24:00	381689	24-hr	83	82.7	exc
AAAQO	AMS17 Wapasu	PM2.5	Jul 19, 2021 24:00	381690	24-hr	93	93.4	exc
AAAQO	AMS18 Stony Mountain	PM2.5	Jul 19, 2021 24:00	381691	24-hr	76	75.7	exc
AAAQO	AMS21 Conklin	PM2.5	Jul 19, 2021 24:00	381692	24-hr	74	74.1	exc
AAAQO	AMS22 Janvier	PM2.5	Jul 19, 2021 24:00	381693	24-hr	76	77.0	exc
AAAQO	AMS30 Ells River	PM2.5	Jul 19, 2021 24:00	381563	24-hr	90	89.7	exc
AAAQO	AMS23 Fort Hills	PM2.5	Jul 19, 2021 24:00	381558	24-hr	100	100.4	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 19, 2021 02:00	381689	1-hr	93	92.8	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 19, 2021 02:00	381691	1-hr	115	115.0	exc
AAAQG	AMS29 Surmont 2	PM2.5	Jul 19, 2021 02:00	381695	1-hr	88	87.9	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 19, 2021 02:00	381693	1-hr	118	117.6	exc



Wood Buffalo Environmental Association
Air Quality Events List 2021

Type	Site	Parameter	Date/Time	Reference	Period	Reported	Final	status
AAAQG	AMS21 Conklin	PM2.5	Jul 19, 2021 02:00	381692	1-hr	118	117.7	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 19, 2021 03:00	381692	1-hr	113	112.5	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 19, 2021 03:00	381689	1-hr	87	86.6	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 19, 2021 03:00	381691	1-hr	119	119.0	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 19, 2021 03:00	381693	1-hr	115	115.1	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 19, 2021 04:00	381689	1-hr	95	95.5	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 04:00	381690	1-hr	88	88.2	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 19, 2021 04:00	381691	1-hr	113	113.1	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 19, 2021 04:00	381692	1-hr	120	119.6	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 19, 2021 04:00	381693	1-hr	118	118.2	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 05:00	381690	1-hr	99	98.7	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 19, 2021 05:00	381692	1-hr	122	122.5	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 19, 2021 05:00	381691	1-hr	116	116.5	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 19, 2021 05:00	381689	1-hr	101	101.3	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 19, 2021 05:00	381685	1-hr	81	81.5	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 19, 2021 05:00	381693	1-hr	122	121.7	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 19, 2021 06:00	381693	1-hr	129	128.8	exc
AAAQO	AMS505 Sawbones Bay	SO2	Jul 19, 2021 06:00	381403	1-hr	248	-	ret
AAAQG	AMS21 Conklin	PM2.5	Jul 19, 2021 06:00	381692	1-hr	116	116.4	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 19, 2021 06:00	381691	1-hr	117	116.6	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 06:00	381690	1-hr	94	94.3	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 19, 2021 06:00	381689	1-hr	102	101.9	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 06:00	381683	1-hr	81	80.6	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 07:00	381688	1-hr	88	88.0	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 19, 2021 07:00	381689	1-hr	102	102.5	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 07:00	381690	1-hr	112	112.1	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 07:00	381687	1-hr	80	80.1	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 19, 2021 07:00	381692	1-hr	111	111.3	exc
AAAQG	AMS29 Surmont 2	PM2.5	Jul 19, 2021 07:00	381695	1-hr	123	122.9	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 19, 2021 07:00	381693	1-hr	175	174.8	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 19, 2021 07:00	381691	1-hr	113	113.4	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 08:00	381682	1-hr	94	94.4	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 08:00	381683	1-hr	90	90.5	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 19, 2021 08:00	381684	1-hr	87	86.8	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 08:00	381687	1-hr	96	96.3	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 19, 2021 08:00	381689	1-hr	113	113.3	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 08:00	381688	1-hr	103	103.2	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 19, 2021 08:00	381691	1-hr	108	108.4	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 19, 2021 08:00	381692	1-hr	110	110.4	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 08:00	381558	1-hr	82	81.8	exc
AAAQG	AMS29 Surmont 2	PM2.5	Jul 19, 2021 08:00	381695	1-hr	134	133.8	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 19, 2021 08:00	381693	1-hr	152	151.6	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 08:00	381690	1-hr	123	122.5	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 09:00	381687	1-hr	112	112.4	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 09:00	381682	1-hr	107	106.9	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 09:00	381683	1-hr	115	114.8	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 19, 2021 09:00	381684	1-hr	98	98.1	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 19, 2021 09:00	381685	1-hr	88	88.1	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 09:00	381688	1-hr	127	127.3	exc
AAAQG	AMS30 Eils River	PM2.5	Jul 19, 2021 09:00	381563	1-hr	99	99.2	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 09:00	381690	1-hr	124	124.4	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 19, 2021 09:00	381691	1-hr	100	100.2	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 19, 2021 09:00	381692	1-hr	99	98.6	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 09:00	381558	1-hr	105	105.4	exc
AAAQG	AMS29 Surmont 2	PM2.5	Jul 19, 2021 09:00	381695	1-hr	128	128.0	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 19, 2021 09:00	381693	1-hr	111	110.8	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 19, 2021 09:00	381689	1-hr	138	138.5	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 10:00	381682	1-hr	126	126.4	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 10:00	381683	1-hr	140	139.5	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 19, 2021 10:00	381684	1-hr	112	112.4	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 19, 2021 10:00	381685	1-hr	104	103.7	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 10:00	381687	1-hr	128	128.4	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 10:00	381688	1-hr	153	153.1	exc



Wood Buffalo Environmental Association
Air Quality Events List 2021

Type	Site	Parameter	Date/Time	Reference	Period	Reported	Final	status
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 10:00	381690	1-hr	119	119.5	exc
AAAQG	AMS18 Stony Mountain	PM2.5	Jul 19, 2021 10:00	381691	1-hr	89	89.1	exc
AAAQG	AMS21 Conklin	PM2.5	Jul 19, 2021 10:00	381692	1-hr	88	88.2	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 10:00	381558	1-hr	123	123.2	exc
AAAQG	AMS29 Surmont 2	PM2.5	Jul 19, 2021 10:00	381695	1-hr	116	115.8	exc
AAAQG	AMS30 Ells River	PM2.5	Jul 19, 2021 10:00	381563	1-hr	117	117.3	exc
AAAQG	AMS22 Janvier	PM2.5	Jul 19, 2021 10:00	381693	1-hr	84	85.0	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 19, 2021 10:00	381689	1-hr	148	148.2	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 19, 2021 11:00	381685	1-hr	140	140.4	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 11:00	381682	1-hr	136	135.6	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 11:00	381683	1-hr	147	146.6	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 19, 2021 11:00	381684	1-hr	127	127.4	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 11:00	381687	1-hr	141	141.2	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 11:00	381558	1-hr	129	128.9	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 19, 2021 11:00	381689	1-hr	140	140.4	exc
AAAQG	AMS29 Surmont 2	PM2.5	Jul 19, 2021 11:00	381695	1-hr	93	92.8	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 11:00	381688	1-hr	159	158.9	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 11:00	381690	1-hr	130	130.3	exc
AAAQG	AMS30 Ells River	PM2.5	Jul 19, 2021 11:00	381563	1-hr	125	124.9	exc
AAAQG	AMS30 Ells River	PM2.5	Jul 19, 2021 12:00	381563	1-hr	135	135.4	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 12:00	381558	1-hr	142	142.2	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 12:00	381690	1-hr	131	131.3	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 19, 2021 12:00	381689	1-hr	125	125.3	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 12:00	381688	1-hr	161	161.3	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 12:00	381687	1-hr	149	148.6	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 19, 2021 12:00	381685	1-hr	144	143.8	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 19, 2021 12:00	381684	1-hr	131	131.4	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 12:00	381683	1-hr	146	145.8	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 12:00	381682	1-hr	142	142.2	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 13:00	381682	1-hr	140	139.9	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 13:00	381683	1-hr	144	144.0	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 19, 2021 13:00	381684	1-hr	127	127.5	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 19, 2021 13:00	381685	1-hr	138	137.9	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 13:00	381558	1-hr	164	163.7	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 13:00	381688	1-hr	155	155.1	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 19, 2021 13:00	381689	1-hr	113	112.8	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 13:00	381690	1-hr	141	140.7	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 13:00	381687	1-hr	140	139.9	exc
AAAQG	AMS30 Ells River	PM2.5	Jul 19, 2021 13:00	381563	1-hr	133	133.1	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 19, 2021 14:00	381685	1-hr	127	126.5	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 14:00	381682	1-hr	128	128.0	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 14:00	381683	1-hr	140	140.1	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 19, 2021 14:00	381684	1-hr	117	117.1	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 14:00	381688	1-hr	149	149.3	exc
AAAQG	AMS14 Anzac	PM2.5	Jul 19, 2021 14:00	381689	1-hr	85	84.9	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 14:00	381690	1-hr	152	152.4	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 14:00	381558	1-hr	149	149.0	exc
AAAQG	AMS30 Ells River	PM2.5	Jul 19, 2021 14:00	381563	1-hr	126	125.8	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 14:00	381687	1-hr	132	131.7	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 15:00	381682	1-hr	135	135.4	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 15:00	381683	1-hr	141	140.6	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 19, 2021 15:00	381684	1-hr	116	116.1	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 19, 2021 15:00	381685	1-hr	125	125.0	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 15:00	381687	1-hr	132	132.1	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 15:00	381688	1-hr	154	154.3	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 15:00	381690	1-hr	122	121.8	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 15:00	381558	1-hr	138	138.3	exc
AAAQG	AMS30 Ells River	PM2.5	Jul 19, 2021 15:00	381563	1-hr	122	121.9	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 16:00	381682	1-hr	135	135.4	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 16:00	381683	1-hr	127	126.6	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 19, 2021 16:00	381684	1-hr	112	111.8	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 19, 2021 16:00	381685	1-hr	114	114.3	exc
AAAQG	AMS30 Ells River	PM2.5	Jul 19, 2021 16:00	381563	1-hr	125	124.8	exc



Wood Buffalo Environmental Association
Air Quality Events List 2021

Type	Site	Parameter	Date/Time	Reference	Period	Reported	Final	status
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 16:00	381688	1-hr	155	155.0	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 16:00	381690	1-hr	115	115.3	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 16:00	381558	1-hr	133	132.8	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 16:00	381687	1-hr	136	136.3	exc
AAAQG	AMS06 Patricia McInnes	PM2.5	Jul 19, 2021 17:00	381684	1-hr	95	95.3	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 17:00	381682	1-hr	125	125.3	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 17:00	381683	1-hr	115	115.2	exc
AAAQG	AMS07 Athabasca Valley	PM2.5	Jul 19, 2021 17:00	381685	1-hr	91	91.1	exc
AAAQG	AMS30 Ells River	PM2.5	Jul 19, 2021 17:00	381563	1-hr	121	120.7	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 17:00	381688	1-hr	142	141.9	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 17:00	381690	1-hr	118	118.4	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 17:00	381558	1-hr	136	136.3	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 17:00	381687	1-hr	127	127.1	exc
AAAQG	AMS30 Ells River	PM2.5	Jul 19, 2021 18:00	381563	1-hr	108	108.4	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 18:00	381558	1-hr	127	127.5	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 18:00	381690	1-hr	109	108.8	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 18:00	381688	1-hr	126	125.5	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 18:00	381687	1-hr	115	115.2	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 18:00	381683	1-hr	114	113.7	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 18:00	381682	1-hr	112	111.6	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 19:00	381682	1-hr	105	105.3	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 19:00	381687	1-hr	109	108.8	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 19:00	381683	1-hr	106	106.2	exc
AAAQG	AMS17 Wapasu	PM2.5	Jul 19, 2021 19:00	381690	1-hr	87	86.6	exc
AAAQG	AMS30 Ells River	PM2.5	Jul 19, 2021 19:00	381563	1-hr	101	101.3	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 19:00	381558	1-hr	115	114.7	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 19:00	381688	1-hr	120	119.9	exc
AAAQG	AMS04 Buffalo Viewpoint	PM2.5	Jul 19, 2021 20:00	381683	1-hr	93	93.0	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 20:00	381687	1-hr	104	104.1	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 20:00	381682	1-hr	103	103.3	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 20:00	381558	1-hr	106	105.9	exc
AAAQG	AMS30 Ells River	PM2.5	Jul 19, 2021 20:00	381563	1-hr	97	96.9	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 20:00	381688	1-hr	119	118.9	exc
AAAQG	AMS30 Ells River	PM2.5	Jul 19, 2021 21:00	381563	1-hr	97	96.8	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 21:00	381558	1-hr	107	106.8	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 21:00	381688	1-hr	111	111.2	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 21:00	381687	1-hr	95	94.7	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 21:00	381682	1-hr	100	100.5	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 19, 2021 22:00	381682	1-hr	91	90.9	exc
AAAQG	AMS08 Fort Chipewyan	PM2.5	Jul 19, 2021 22:00	381686	1-hr	80	80.4	exc
AAAQG	AMS13 Fort McKay South	PM2.5	Jul 19, 2021 22:00	381688	1-hr	97	97.0	exc
AAAQG	AMS30 Ells River	PM2.5	Jul 19, 2021 22:00	381563	1-hr	92	92.1	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 19, 2021 22:00	381558	1-hr	95	94.9	exc
AAAQG	AMS09 Barge Landing	PM2.5	Jul 19, 2021 22:00	381687	1-hr	82	82.4	exc
AAAQG	AMS08 Fort Chipewyan	PM2.5	Jul 19, 2021 23:00	381686	1-hr	121	121.1	exc
AAAQG	AMS08 Fort Chipewyan	PM2.5	Jul 19, 2021 24:00	381686	1-hr	118	118.3	exc
AAAQO	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 20, 2021 24:00	381682	24-hr	51	50.5	exc
AAAQO	AMS04 Buffalo Viewpoint	PM2.5	Jul 20, 2021 24:00	381683	24-hr	47	46.8	exc
AAAQO	AMS13 Fort McKay South	PM2.5	Jul 20, 2021 24:00	381688	24-hr	53	53.4	exc
AAAQO	AMS14 Anzac	PM2.5	Jul 20, 2021 24:00	381689	24-hr	40	40.2	exc
AAAQO	AMS17 Wapasu	PM2.5	Jul 20, 2021 24:00	381690	24-hr	39	38.9	exc
AAAQO	AMS18 Stony Mountain	PM2.5	Jul 20, 2021 24:00	381691	24-hr	45	45.1	exc
AAAQO	AMS22 Janvier	PM2.5	Jul 20, 2021 24:00	381693	24-hr	43	43.4	exc
AAAQO	AMS30 Ells River	PM2.5	Jul 20, 2021 24:00	381564	24-hr	50	50.4	exc
AAAQO	AMS06 Patricia McInnes	PM2.5	Jul 20, 2021 24:00	381684	24-hr	41	41.4	exc
AAAQO	AMS07 Athabasca Valley	PM2.5	Jul 20, 2021 24:00	381685	24-hr	39	38.8	exc
AAAQO	AMS08 Fort Chipewyan	PM2.5	Jul 20, 2021 24:00	381686	24-hr	59	59.4	exc
AAAQO	AMS09 Barge Landing	PM2.5	Jul 20, 2021 24:00	381687	24-hr	50	50.0	exc
AAAQO	AMS23 Fort Hills	PM2.5	Jul 20, 2021 24:00	381560	24-hr	58	57.6	exc
AAAQO	AMS08 Fort Chipewyan	PM2.5	Jul 20, 2021 01:00	381686	1-hr	108	107.6	exc
AAAQO	AMS29 Surmont 2	PM2.5	Jul 20, 2021 24:00	381695	24-hr	32	32.2	exc
AAAQO	AMS21 Conklin	PM2.5	Jul 20, 2021 24:00	381692	24-hr	42	41.7	exc
AAAQG	AMS08 Fort Chipewyan	PM2.5	Jul 20, 2021 02:00	381686	1-hr	91	91.0	exc



Wood Buffalo Environmental Association
Air Quality Events List 2021

Type	Site	Parameter	Date/Time	Reference	Period	Reported	Final	status
AAAQO	AMS07 Athabasca Valley	PM2.5	Jul 21, 2021 24:00	381685	24-hr	32	32.2	exc
AAAQO	AMS08 Fort Chipewyan	PM2.5	Jul 21, 2021 24:00	381686	24-hr	32	31.9	exc
AAAQO	AMS09 Barge Landing	PM2.5	Jul 21, 2021 24:00	381687	24-hr	39	38.8	exc
AAAQO	AMS04 Buffalo Viewpoint	PM2.5	Jul 21, 2021 24:00	381683	24-hr	39	39.3	exc
AAAQO	AMS01 Bertha Ganter - Fort McKay	PM2.5	Jul 21, 2021 24:00	381682	24-hr	41	40.7	exc
AAAQO	AMS06 Patricia McInnes	PM2.5	Jul 21, 2021 24:00	381684	24-hr	33	33.2	exc
AAAQO	AMS13 Fort McKay South	PM2.5	Jul 21, 2021 24:00	381688	24-hr	44	44.0	exc
AAAQO	AMS23 Fort Hills	PM2.5	Jul 21, 2021 24:00	381562	24-hr	58	57.9	exc
AAAQO	AMS17 Wapasu	PM2.5	Jul 21, 2021 24:00	381690	24-hr	30	30.3	exc
AAAQO	AMS18 Stony Mountain	PM2.5	Jul 21, 2021 24:00	381691	24-hr	31	31.1	exc
AAAQO	AMS21 Conklin	PM2.5	Jul 21, 2021 24:00	381692	24-hr	31	31.1	exc
AAAQO	AMS22 Janvier	PM2.5	Jul 21, 2021 24:00	381693	24-hr	40	40.0	exc
AAAQO	AMS30 Ells River	PM2.5	Jul 21, 2021 24:00	381565	24-hr	44	44.4	exc
AAAQO	AMS14 Anzac	PM2.5	Jul 21, 2021 24:00	381689	24-hr	33	33.3	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 21, 2021 02:00	381562	1-hr	95	95.4	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 21, 2021 06:00	381562	1-hr	86	85.8	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 31, 2021 05:00	382030	1-hr	94	93.9	exc
AAAQG	AMS23 Fort Hills	PM2.5	Jul 31, 2021 23:00	382030	1-hr	80	80.1	exc
AAAQO	AMS23 Fort Hills	PM2.5	Aug 2, 2021 24:00	382008	24-hr	31	30.7	exc
AAAQO	AMS17 Wapasu	PM2.5	Aug 3, 2021 24:00	382282	24-hr	38	37.5	exc
AAAQO	AMS13 Fort McKay South	PM2.5	Aug 3, 2021 24:00	382290	24-hr	31	30.9	exc
AAAQO	AMS22 Janvier	PM2.5	Aug 3, 2021 24:00	382286	24-hr	34	33.7	exc
AAAQO	AMS18 Stony Mountain	PM2.5	Aug 3, 2021 24:00	382284	24-hr	30	29.6	exc
AAAQO	AMS22 Janvier	PM2.5	Aug 4, 2021 24:00	382286	24-hr	46	46.3	exc
AAAQO	AMS21 Conklin	PM2.5	Aug 4, 2021 24:00	382288	24-hr	32	31.8	exc
AAAQO	AMS18 Stony Mountain	PM2.5	Aug 4, 2021 24:00	382284	24-hr	37	36.9	exc
AAAQO	AMS505 Sawbones Bay	PM2.5	Aug 5, 2021 24:00	382159	24-hr	-	-	ret
AAAQO	AMS29 Surmont 2	PM2.5	Aug 5, 2021 24:00	382287	24-hr	30	30.0	exc
AAAQO	AMS22 Janvier	PM2.5	Aug 5, 2021 24:00	382286	24-hr	43	42.9	exc
AAAQO	AMS18 Stony Mountain	PM2.5	Aug 5, 2021 24:00	382284	24-hr	32	32.4	exc
AAAQO	AMS17 Wapasu	PM2.5	Aug 5, 2021 24:00	382282	24-hr	34	33.8	exc
AAAQO	AMS14 Anzac	PM2.5	Aug 5, 2021 24:00	382283	24-hr	31	31.3	exc
AAAQO	AMS04 Buffalo Viewpoint	PM2.5	Aug 5, 2021 24:00	382278	24-hr	32	31.5	exc
AAAQO	AMS04 Buffalo Viewpoint	PM2.5	Aug 6, 2021 24:00	382278	24-hr	30	29.8	exc
AAAQO	AMS08 Fort Chipewyan	PM2.5	Aug 6, 2021 24:00	382280	24-hr	37	36.6	exc
AAAQO	AMS23 Fort Hills	PM2.5	Aug 6, 2021 24:00	382204	24-hr	30	30.4	exc
AAAQO	AMS17 Wapasu	PM2.5	Aug 6, 2021 24:00	382282	24-hr	41	41.0	exc
AAAQO	AMS04 Buffalo Viewpoint	H2S	Aug 6, 2021 06:00	382161	1-hr	10	9.7	nae
AAAQO	AMS505 Sawbones Bay	H2S	Aug 11, 2021 06:00	382339	1-hr	-	-	ret
AAAQO	AMS22 Janvier	PM2.5	Aug 14, 2021 24:00	382568	24-hr	35	34.5	exc
AAAQO	AMS29 Surmont 2	PM2.5	Aug 14, 2021 24:00	382517	24-hr	30	30.4	exc
AAAQG	AMS29 Surmont 2	PM2.5	Aug 14, 2021 04:00	382517	1-hr	94	94.3	exc
AAAQG	AMS22 Janvier	PM2.5	Aug 14, 2021 12:00	382518	1-hr	92	91.7	exc
AAAQO	AMS22 Janvier	PM2.5	Aug 15, 2021 24:00	382569	24-hr	33	33.2	exc
AAAQG	AMS09 Barge Landing	PM2.5	Aug 29, 2021 21:00	383012	1-hr	217	217.4	exc
AAAQG	AMS09 Barge Landing	PM2.5	Aug 29, 2021 22:00	383012	1-hr	178	178.0	exc
AAAQO	AMS02 Mildred Lake	H2S	Sep 12, 2021 21:00	383413	1-hr	12	12.0	exc
AAAQG	AMS23 Fort Hills	PM2.5	Oct 10, 2021 19:00	384482	1-hr	107	107.0	exc
AAAQG	AMS23 Fort Hills	PM2.5	Oct 11, 2021 19:00	384483	1-hr	85	85.0	exc
AAAQG	AMS23 Fort Hills	PM2.5	Oct 13, 2021 05:00	384503	1-hr	80	80.0	exc
AAAQG	AMS22 Janvier	PM2.5	Oct 14, 2021 01:00	384575	1-hr	93	93.0	exc
AAAQG	AMS23 Fort Hills	PM2.5	Oct 16, 2021 17:00	384695	1-hr	131	131.0	exc
AAAQG	AMS23 Fort Hills	PM2.5	Oct 16, 2021 19:00	384695	1-hr	138	138.0	exc
AAAQO	AMS17 Wapasu	H2S	Oct 30, 2021 02:00	385104	1-hr	-	-	ret
AAAQO	AMS17 Wapasu	H2S	Oct 30, 2021 03:00	385104	1-hr	-	-	ret
AAAQO	AMS11 Lower Camp	H2S	Nov 2, 2021 18:00	385207	1-hr	11	11.0	exc
AAAQO	AMS05 Mannix	H2S	Nov 22, 2021 11:00	385765	1-hr	-	-	ret
AAAQG	AMS17 Wapasu	PM2.5	Dec 11, 2021 12:00	386331	1-hr	82	82.0	exc
AAAQG	AMS01 Bertha Ganter - Fort McKay	PM2.5	Dec 29, 2021 20:00	386707	1-hr	120	120.0	exc



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

**APPENDIX II:
SUMMARY OF MONTHLY OPERATIONAL
TIMES BELOW 90 PERCENT
AND NON-COMPLIANCES
2021**

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022

Date Reported	AEP Reference Number	Reporting Period	Location	Brief Description	Issue	Remedial Action
24-Feb-21	376238	January	Janvier	The ozone analyzer at Janvier operated less than 90% of January 2021 due to a suspected issue with the UV light detector.	On January 2, 2021, the daily spans exceeded the 10% threshold. Throughout the first week of January, troubleshooting was conducted to identify the source of the failed span response. The cause is suspected to be an issue with the UV light detector in the O3 analyzer.	The analyzer was replaced with a backup unit on January 8 so that the analyzer could be brought back to the WBEA Centre for repair.
24-Feb-21	376240	February	Stony Mountain	The precipitation collector at Stony Mountain operated less than 90% of February 2021 due to overaccumulation of snow and resultant ice build-up inside the precipitaiton collector.	Overaccumulation of snow and resultant ice build-up inside the precipitation collector resulted in the recording of erroneous precipitation values. Data was flagged from the last known valid response to precipitation as observed and documented by a WBEA Field Technician, on February 3, 2021 until February 17, 2021.	The precipitation collector bucket was thawed and emptied on February 17, 2021
30-Mar-21	377231	February	Jackfish 1	The hydrogen sulfide analyzer at Jackfish 1 operated less than 90% of February 2021 due to a series of three different issues.	<ul style="list-style-type: none"> – Sample pump failure on February 13 through 16 interrupted the normal operations of the H2S analyzer for 81hours. On February 16, a replacement sample pump was installed, and a subsequent calibration was completed. – Following the installation of the new sample pump, it was identified that the SO2 scrubber was not operating within criteria. The SO2 scrubber was replaced on February 17 and was left to stabilize overnight. On February 18, the H2S analyzer was calibrated and was found to be operating within criteria. Downtime associated with scrubber replacement resulted in a further 42 hours of downtime. – On February 20 through 23, the Jackfish 1 AMS station temperature dropped, affecting the H2S analyzer for 65hours. During a station visit on February 23, the thermal fuse in the HVAC unit was found to be blown, preventing the heater from operating. The fuse was replaced, and normal operations resumed on February 23 at 14:00. 	N/A
30-Mar-21	377232	February	Surmont 2	The hydrogen sulfide analyzer at Surmont 2 operated less than 90% of February 2021 due to a depleted hydrator.	On February 15, the daily span for the H ₂ S analyzer at Surmont 2 failed to meet criteria. A remotely triggered span on February 16 revealed a similar response. An on-site investigation on February 17 revealed a depleted hydrator. Maintenance was conducted to fill the hydrator and complete a subsequent analyzer calibration. Data was flagged as invalid from the last known valid response on February 14 until normal operations resumed on February 17, 2021, at 16:00 MST. This incident resulted in 87 hours of invalid data.	The hydrator was filled on February 17.
30-Mar-21	377233	February	Barge Landing	The total hydrocarbons analyzer at Barge Landing operated less than 90% of February 2021 due to the installation of an incorrect carrier gas.	Routine maintenance was conducted on February 19 to replace a depleted cylinder of carrier gas for the NMHC analyzer. The February 20 daily system check showed that all spans for this analyzer were outside AMD daily span target criteria. A station visit by the on-call technician on February 20 revealed that a helium cylinder had been mistakenly installed as the carrier gas for the NMHC analyzer. The helium cylinder was disconnected, and on February 21, a replacement nitrogen cylinder was installed, and the NMHC analyzer was replaced with a backup analyzer. The affected NMHC analyzer has been brought to the WBEA Centre for precautionary testing. Data was flagged as invalid from the last known valid response before the helium cylinder was installed on February 19, 2021 until normal operations resumed on February 22, 2021 at 15:00 MST. This incident resulted in 71 hours of invalid data.	WBEA will implement improved cylinder storage and identification practices to mitigate the risk of future occurrences of this issue.

Date Reported	AEP Reference Number	Reporting Period	Location	Brief Description	Issue	Remedial Action
26-Apr-21	378169	March	Anzac	The NO2 analyzer at Anzac operated less than 90% of March 2021 due to a human error during the monthly calibration.	On March 11, the mixed calibration gas cylinder was replaced with a cylinder composed of NO and NOx only. This cylinder includes a small amount of NO2, creating a small difference in concentration between NO and NOx. The difference between NO and NOx was not captured on the calibration sheet, which affected the calculations of the GPT portion of the calibration. Following the identification of this issue, the calibration sheet was updated to include the correct NO and NOx concentration values, which revealed that the calibration had failed to meet AMD criteria. On March 16, the analyzer was recalibrated using the correct values. Data was invalidated from the initial calibration on March 11 until re-calibration on March 16, resulting in 114 hours of invalid data. Normal analyzer operations resumed at 12:00 on March 16.	The analyzer was re-calibrated on March 16.
27-Apr-21	378308	March and April	Patricia McInnes	The ammonia analyzer at Patricia McInnes operated less than 90% of March and April 2021 due poor linearity following planned maintenance.	There were three issues associated with the operation of the NH3 analyzer, contributing to 82 hours of downtime in March, and a minimum of 81 hours of downtime in April: - The NH3 analyzer requires additional time to stabilize to ambient conditions following daily spans at the range required by the AMD, which is expected for this type of analyzer. Data following the daily spans have been reported as invalid for 48 hours in March, and 54 hours in April, to date. - Maintenance on March 24 to re-run the daily zero span check resulted in 3 hours of invalid data. - Following planned maintenance on March 30, the NH3 analyzer did not meet calibration criteria for linearity. The multi-point as found calibration had been within calibration criteria. Data was flagged from the beginning of the maintenance period until the analyzer was replaced with a backup unit, on April 2 at 16:00 MST. This incident resulted in 31 hours flagged as maintenance in March and 27 hours in April.	The analyzer was replaced with a backup unit on April 2.

Date Reported	AEP Reference Number	Reporting Period	Location	Brief Description	Issue	Remedial Action
11-May-21	378572	April	Kirby North	The total hydrocarbons analyzer at Kirby North operated less than 90% of April due to failure of the zero air generator.	During the daily system check on April 5, the THC baseline was observed to be elevated. A site visit on April 8 to address the elevated baseline revealed an issue with the zero air generator (ZAG). The ZAG was replaced with a backup unit, and a subsequent calibration was performed to bring the analyzer into compliance with AMD criteria. Data was flagged from the last valid daily zero/span on April 4 until the calibration following the ZAG replacement, resulting in 107 hours of invalid data. Regular operations resumed on April 8 at 17:00 MST. Additionally, the signal from the THC analyzer failed to communicate with the data logger on April 16. A follow-up site visit on April 17 required the analyzer power to be cycled to re-establish communications with the data logger, resulting in 14 additional hours of invalid data.	This incident was reviewed at a technical workshop on April 26 to provide training to staff on how to better identify instances of zero air generator failure.
28-May-21	379261	April	Mannix	The total hydrocarbons analyzer at Mannix operated less than 90% of April due to a combination of factors.	There were three issues associated with the operations of the NMHC analyzer, contributing to 93 hours of downtime: <ul style="list-style-type: none"> – Unstable operation due to negative baseline dips on April 3 through April 8 resulted in 45 hours of invalid data. – Maintenance on April 16 to replace the calibration gas resulted in 4 hours of invalid data. – Fluctuating station temperatures from April 23 to April 27 resulted in 44 hours of invalid data. 	N/A
10-Jun-21	379616	May	Mackay River	The precipitation collector at Mackay River operated less than 90% of May due to a tripped GFI plug.	On May 12, a WBEA Field Technician identified that the outlet supplying power to the precipitation collector was tripped. The breaker was reset, with power resuming on May 12 at 10:00 MST. During the data validation process, it was identified that the power outage began on April 30, resulting in a total of 274 hours of invalid data in May.	The breaker was reset on May 12.
10-Jun-21	379617	May	Anzac	The wind speed and wind direction sensor at Anzac operated less than 90% of May due to the sensor becoming misaligned.	During a monthly visual field inspection on May 7 to verify the performance of the sensor, a WBEA Field Technician found that the wind direction sensor was not aligned to true North. A calibration on May 12 confirmed the misalignment. The sensor orientation was corrected, and sensor operation was verified that day. During the data validation process, a comparison of wind direction data with nearby stations was used to determine that the sensor became misaligned on April 30. The wind speed and wind direction data at Anzac AMS was invalidated for 275 hours in May.	The sensor orientation was corrected on May 12.
10-Jun-21	379618	May	Fort Hills	The wind speed and wind direction sensor at Fort Hills operated less than 90% of May due to the sensor reporting erroneous values.	During the data validation process, a comparison of wind direction data with nearby stations revealed that the sensor response was not consistent with regional wind patterns beginning on May 5. On May 14, a WBEA Technician visually inspected the sensor and identified that the sensor had experienced water damage to the electrical circuit board due to the sensor cover becoming ajar from its housing. The Technician replaced the sensor and completed a subsequent audit of the system to verify sensor performance. The wind speed and wind direction data at Fort Hills AMS were invalidated for 204 hours in May.	The sensor was replaced on May 14.
22-Jul-21	381580	June and July	Jackfish 2/3	The relative humidity sensor at Jackfish 2/3 operated less than 90% of June and July due to periodic sensor over-ranging.	During routine daily system checks, it was identified that the RH measurements were over-ranging periodically, with the output signal of the sensor displaying values beyond 100%. On June 16, a WBEA Field Technician attempted to replace the sensor, however, upon installation the replacement sensor was non-operational. Therefore, the original sensor was reinstalled the following day. The relative humidity sensor data at Jackfish 2/3 AMS was invalidated for 82 hours in June, and has been invalidated for 163 hours in July, to date.	The sensor was replaced on August 17.
22-Jul-21	381581	June and July	Lower Camp	The methane and non-methane hydrocarbon analyzer at Lower Camp air monitoring station operated less than 90% of June and July due to station temperature fluctuations.	The HVAC unit in the air monitoring station failed to maintain a consistent temperature during elevated ambient temperatures in June and July. The fluctuating internal station temperature affected the analyzer response, resulting in periodic data loss. This issue was discovered during the data validation process.	The Lower Camp air monitoring station was replaced on August 24, 2021. The replacement air monitoring station is expected to have improved temperature stability.

Date Reported	AEP Reference Number	Reporting Period	Location	Brief Description	Issue	Remedial Action
22-Jul-21	381582	June	Stony Mountain	The methane and non-methane hydrocarbon analyzer at Stony Mountain air monitoring station operated less than 90% of June due to a collapsed baseline.	On June 13, a daily system check revealed a collapsed baseline on the CH ₄ channel. On June 14, a WBEA Technician arrived at the station to investigate the source of the issue. The Technician completed several troubleshooting steps, however was unable to resolve the collapsed baseline. As no operational CH ₄ and NMHC analyzers were available to replace the broken unit, the analyzer was removed from service and brought back to the WBEA Centre for repair.	The analyzer was replaced with a backup unit on June 18.
26-Jul-21	381708	June and July	Patricia McInnes	The ammonia analyzer at Patricia McInnes operated less than 90% of June and July due to slow recovery following daily spans.	The NH ₃ analyzer requires additional time to stabilize to ambient conditions following daily spans at the range required by the AMD, which is expected for this type of analyzer. Data following the daily spans have been reported as invalid for 86 hours in June, and 101 hours in July, to date.	The WBEA plans to seek permission for a variance from the AEP Director regarding the frequency of daily zero/span checks or alternate solutions to minimize downtime.
26-Jul-21	381709	July	Fort Chipewyan	The ozone analyzer at Fort Chipewyan air monitoring station operated less than 90% of July due to instability in analyzer response.	Beginning in late June, the output signal of the O ₃ analyzer began indicating instability in analyzer response. On July 2 and 3, the O ₃ measurements were inconsistent with ambient readings comparable to the ozone analyzers in the WBEA network, and the daily QA checks failed to meet operational criteria. Technicians were deployed on June 5 to replace the O ₃ lamp. Lamp replacement briefly resolved the instability, however on July 7, the unstable response was resumed. On July 12, the analyzer was replaced with a backup unit and the original analyzer was brought to the WBEA Centre for further troubleshooting and repair.	A replacement analyzer was installed on July 12.
27-Jul-21	381740	June	Conklin	The relative humidity sensor at Conklin operated less than 90% of June due to periodic sensor over-ranging.	During routine daily system checks, it was identified that the RH measurements were over-ranging periodically, with the output signal of the sensor displaying values beyond 100%. On June 25, a WBEA Field Technician replaced the sensor, however, the replacement sensor also displayed values beyond 100%. On June 29, a second replacement sensor was installed, with normal operations resuming following installation of the replacement sensor. RH data at Conklin AMS was invalidated for 81 hours in June.	The sensor was replaced on June 29.

Date Reported	AEP Reference Number	Reporting Period	Location	Brief Description	Issue	Remedial Action
25-Aug-21	382631	July	Bertha Ganter Fort McKay	The ammonia analyzer at Bertha Ganter Fort McKay operated less than 90% of July due to sample pump failure and slow recovery following daily spans.	There were two issues associated with the operation of the NH3 analyzer, contributing to 154 hours of downtime in July: - The NH3 analyzer requires additional time to stabilize to ambient conditions following daily spans at the range required by the AMD, which is expected for this type of analyzer. Data following the daily spans have been reported as invalid for 55 hours in July. - The daily QA check on July 5 and 6 failed to meet operational criteria due to a degrading sample pump. On July 7, a WBEA Technician conducted maintenance to replace the sample pump. During monthly validation for the reporting, data was invalidated back to the last good span, on July 4, resulting in 75 hours of invalid data. The maintenance to replace the sample pump and complete a subsequent calibration resulted in an additional 24 hours of invalid data.	The WBEA plans to seek permission for a variance from the AEP Director regarding the frequency of daily zero/span checks or alternate solutions to minimize downtime.
25-Aug-21	382632	August	Patricia McInnes	The methane and non-methane hydrocarbon analyzer at Patricia McInnes air monitoring station operated less than 90% of August due to the analyzer failing to adequately capture the methane peak.	This instrument is a semi-continuous gas chromatogram which depends upon the instrument capturing methane and non-methane peak response. Depending on routine instrument operations, the methane peak may shift out of the optimal data capture window. Field maintenance conducted on August 5th did not resolve the unstable operation. Subsequent maintenance to replace the actuator was conducted on August 9th. Following the actuator replacement, the analyzer was left flagged until a subsequent calibration could be completed the following day. Data was invalidated for 97 hours this reporting period, with normal operations resuming at 12:00 MST on August 10.	The actuator was replaced and a subsequent calibration was completed on August 9 th and 10 th .
25-Aug-21	382633	August	Lower Camp	The methane and non-methane hydrocarbon analyzer at Lower Camp air monitoring station operated less than 90% of June and July due to station temperature fluctuations.	The HVAC unit in the air monitoring station failed to maintain a consistent station temperature during above average seasonal temperatures in August. During routine daily system checks, it was identified that the fluctuating internal station temperature affected the analyzer response, resulting in periodic data loss. Temporary HVAC systems were installed in an effort to stabilize the station temperature.	The Lower Camp air monitoring station was replaced in August 2021. The replacement air monitoring station is expected to have improved temperature stability.
25-Aug-21	382634	July	Firebag	The wind speed and direction sensor operated less than 90% of July due to a cup becoming disconnected.	During daily system checks on July 26, a WBEA Technician observed the wind speed signal to be inconsistent with the normal operations of the sensor. A response plan was initiated, and a site visit was planned for the earliest opportunity on July 29. During the site visit, a WBEA Technician visually inspected the sensor and identified that the cup assembly was disconnected from the wind speed sensor due to loosened cup arms. The Technician replaced the sensor and completed a subsequent calibration of the system to verify the sensor performance. The wind speed and wind direction data at Firebag AMS were invalidated for 89 hours in July 2021.	The sensor was replaced on July 29.

Date Reported	AEP Reference Number	Reporting Period	Location	Brief Description	Issue	Remedial Action
25-Aug-21	382635	August	Ells River	The wind speed and direction sensor operated less than 90% of August due to a cup becoming disconnected.	During daily system checks on August 16, a WBEA Technician observed the wind speed signal to be inconsistent with the normal operations of the sensor. A response plan was initiated, and a station visit was planned for the same day. A visual inspection revealed that the cup assembly had disconnected from the wind speed sensor due to loosened cup arms. The Technician replaced the sensor and completed a subsequent calibration of the system to verify the sensor performance. Upon routine data validation, a comparison of Ells River data with nearby stations revealed that the Ells River wind direction sensor had begun failing on August 12. Therefore, the wind speed and wind direction data at Ells River AMS have conservatively been invalidated for 95 hours in August 2021.	The sensor was replaced on August 16.
25-Aug-21	382636	August	Jackfish 2/3	The relative humidity sensor at Jackfish 2/3 operated less than 90% of June and July due to periodic sensor over-ranging.	During routine daily system checks, it was identified that the RH measurements were over-ranging periodically, with the output signal of the sensor displaying values beyond 100%. The relative humidity sensor data was invalidated during periods of time when measurements were found to be inconsistent with other comparable RH sensors in the WBEA ambient network. Therefore, RH data at Jackfish 2/3 AMS has been invalidated for 143 hours in August, to date. The relative humidity sensor was replaced on August 17, with normal operations resuming at 14:00 MST.	The sensor was replaced on August 17.
1-Sep-21	382920	August	Patricia McInnes	The ammonia analyzer at Patricia McInnes operated less than 90% of August due to slow recovery following daily spans.	The AMD specifies the range at which the daily spans and monthly calibration are conducted on the NH3 analyzer. The NH3 analyzer requires additional time to stabilize to ambient conditions following daily spans and routine monthly multipoint calibrations at the range required by the AMD. Requiring additional time for stabilization after exposure to the high concentrations of NH3 gas required for daily spans and monthly calibration is a normal response of the NH3 analyzer. Data for two to five hours following the daily spans and monthly calibration have been reported as invalid for a total of 81 hours so far.	The WBEA plans to seek permission for a variance from the AEP Director regarding the frequency of daily zero/span checks or alternate solutions to minimize downtime.
28-Sep-21	383880	August	Stony Mountain	The carbon monoxide and carbon dioxide analyzers at Stony Mountain operated less than 90% of August due to the failure of the analyzers to recover to ambient conditions following a power outage.	Following a brief power outage on August 19, the CO and CO2 analyzers failed to return to normal operating conditions. The output signal of the CO analyzer flat lined, and the daily span response and subsequent calibration of the CO2 analyzer indicated that the analyzer was operating outside of AMD criteria.	The analyzers were reset and recalibrated on August 23.
28-Sep-21	383881	August	Barge Landing	Several air quality analyzers at Barge Landing operated less than 90% of August due to the replacement of the station shelter.	Replacement of Barge Landing AMS was required due to its advanced age, which had resulted in costly maintenance and safety concerns. During the week of August 2, the monitoring station shelter was replaced as part of planned monitoring network maintenance and upgrades. Maintenance associated with the station replacement resulted in 63 to 99 hours of invalid data. Following the station replacement, additional maintenance to the NMHC and NO2 analyzer interrupted each analyzer for 69 and 92 hours, respectively. Additional downtime was also required for the wind speed and wind direction sensor. Following notification from AEP auditors that the Barge Landing wind speed and wind direction sensor was not within AMD siting criteria, WBEA replaced the 10-meter wind speed and wind direction sensor at Barge Landing AMS with a wind speed and wind direction sensor at the 20-meter elevation.	N/A

Date Reported	AEP Reference Number	Reporting Period	Location	Brief Description	Issue	Remedial Action
28-Sep-21	383882	September	Wapasu	The total hydrocarbons analyzer at Wapasu operated less than 90% of September due to station temperature fluctuations.	Following a station power outage, the breaker which controls the HVAC unit became tripped. Elevated station temperatures were identified on September 5th, and a WBEA Technician responded the same day. However, following the reset of the breaker, the HVAC unit continued to be non-functional. A plan was developed to have a HVAC contractor assess the unit, and a site visit on September 15 revealed a failed compressor. The failed component was replaced, and normal HVAC system operations resumed. From September 5th through 15th, the fluctuating internal station temperature affected the THC analyzer response, resulting in periodic data loss.	The failed HVAC component was replaced on September 15.
8-Oct-21	384384	September	Bertha Ganter Fort McKay	Monthly Routine Multi-point Calibration was not Completed for Ozone (O3) Analyzer at Bertha Ganter - Fort McKay Air Monitoring Station (AMS) in September 2021.	On October 7, 2021, during a compilation of network calibration summaries, it was identified that the monthly O3 calibration was not completed in September 2021, with the last calibration having been completed on August 4, 2021. The WBEA Technician responded promptly and conducted a monthly multi-point calibration the same day.	The analyzer was calibrated as soon as becoming aware of the non-compliance.
22-Oct-21	384876	October	Firebag	The wind speed and direction sensor operated less than 90% of July due to a cup becoming disconnected.	During daily system checks on October 6, a WBEA Technician observed the wind speed signal to be inconsistent with the normal operations of the sensor. A response plan was initiated, and a site visit was planned for the earliest opportunity on October 13. During the site visit, a WBEA Technician visually inspected the sensor and identified that the cup assembly was disconnected from the wind speed sensor due to loosened cup arms.	The Technician replaced the sensor and completed a subsequent calibration of the system to verify the sensor performance.
12-Nov-21	385511	October	Conklin	The THC/NMHC/CH4 analyzer at Conklin air monitoring station (AMS) operated less than 90% of October 2021 due to collapsed baseline.	This instrument is a semi-continuous gas chromatograph which requires the CH4 and NMHC peaks to remain within the data capture windows. Beginning on October 7th, these peaks shifted outside of the optimal data capture windows, therefore, the captured data was invalidated. This shift may occur during routine instrument operations or may be due to an issue with the instrument. Field maintenance conducted on October 7th did not resolve the issue, therefore, the analyzer was replaced, and the zero-air generator (ZAG) was replaced on October 9th and 10th. After the analyzer was calibrated to verify its performance, normal operations resumed at 13:00 MST on October 10th.	This incident was reviewed at a technical workshop to provide training to staff on how to better identify instances of zero air generator failure.
2-Dec-21	386068	Novmeber	Fort McKay South	The THC/NMHC/CH4 analyzer at Fort McKay South air monitoring station (AMS) operated less than 90% of November 2021 due to collapsed baseline.	This instrument is a semi-continuous gas chromatograph which requires the CH ₄ and NMHC peaks to remain within the data capture windows. Beginning on November 7 th , these peaks shifted outside of the optimal data capture windows, therefore, the captured data was invalidated. This shift may occur during routine instrument operations or may be due to an issue with the instrument. Field maintenance conducted on November 12 th did not resolve the issue, therefore, the analyzer was replaced on November 12 th and left in stabilization mode until next day. After the analyzer was calibrated to verify its performance, normal operations resumed at 15:00 MST on November 13 th . The data validation procedure for the November reporting period, conducted in December, determined that 150 hours of data was invalidated for this reporting period.	This incident was reviewed at a technical workshop to provide training to staff on how to better identify instances of unstable/shift in baseline response.
20-Jan-22	387235	December 2021 and January 2022	Stony Mountain	All gaseous air quality analyzers at Stony Mountain air monitoring station (AMS) operated less than 90% for December 2021 and January 2022 due to a broken sample glass manifold.	The glass sample manifold assembly was discovered to be broken during a routine calibration visit on January 11, 2022, preventing the analyzers from sampling ambient air. The manifold assembly was replaced on January 12, 2022. During the data validation process, a review of sample manifold diagnostics indicates that the break occurred on December 25, 2022. Data for all gaseous analyzers including CO, CO ₂ , NO ₂ , O ₃ , SO ₂ , THC/NMHC/CH ₄ , and TRS at Stony Mountain AMS was invalidated for 170 hours for December 2021 and ≥ 280 hours for January 2022.	This incident was reviewed at a technical workshop to provide training to staff on how to better identify instances of change in manifold pressure.

Date Reported	AEP Reference Number	Reporting Period	Location	Brief Description	Issue	Remedial Action
20-Jan-22	387236	December	Lower Camp	The THC/NMHC/CH4 analyzer at Lower Camp air monitoring station (AMS) operated less than 90% of December 2021 due to station power outages and hydrogen generator failure.	There were two issues associated with the operation of the NMHC analyzer, resulting in 82 hours of invalid data: –Multiple power outages at the station on December 2 through 4 affected the normal operations of the THC/NMHC/CH4 analyzer for 14 hours. –Following the power outage on December 3, the hydrogen generator failed to recover. Performance issues with the hydrogen generator (support equipment to the analyzer) were identified on December 6 and were resolved that day. Following the maintenance of the hydrogen generator, the analyzer was calibrated to verify its performance. Failure of the hydrogen generator affected the normal operations of the THC/NMHC/CH4 analyzer for 68 hours.	This incident was reviewed at a technical workshop to provide training to staff on how to better identify instances of unstable/shift in baseline response.
20-Jan-22	387238	December	Mannix	The 90-meter elevation WS/WD/VWS at Mannix AMS operated less than 90% for December 2021 due to ice fog interfering.	Multiple instances of flat-line periods in the sensors' output signal were attributed to ice fog interfering with the sonic sensors, and data from those events were invalidated. During the data validation process, WS/WD/VWS data at Mannix AMS was invalidated for a total of 90 hours.	n/a
20-Jan-22	387239	December 2021 and January 2022	Mackay River	The precipitation collector at Mackay River air monitoring station (AMS) operated less than 90% for December 2021 and January 2022 because of overaccumulation of snow.	Overaccumulation of snow and resultant ice build-up inside the precipitation collector resulted in the recording of inaccurate precipitation values. The precipitation collector bucket was thawed and emptied on January 21, 2022, with normal operations resuming at 13:50 MST. During the data validation process, a comparison of precipitation collector data with a nearby site was used to determine that the sensor began to read inaccurate readings on December 15, 2021. The Precipitation Collector data at MacKay River AMS was invalidated for 408 hours for December 2021 and 493 hours for January 2022.	This incident was reviewed at a technical workshop to provide training to staff on how to better identify instances of inaccurate reading events.
24-Jan-22	387335	December	Meg Energy	The H2S analyzer at Meg Energy air monitoring station (AMS) operated less than 90% of December due to station temperature fluctuation and power outages.	There were three issues associated with the operation of the H2S analyzer, resulting in 96 hours of invalid data: –On December 5 through 16, the Jackfish 1 AMS station temperature dropped, affecting the H2S analyzer for 54 hours. –A power interruption on December 24 and 25 resulted in 16 hours of downtime for the H2S analyzer. Following the recovery of the power at the station, the HVAC unit failed to maintain a stable operating temperature within the air monitoring station. Station temperature fluctuations from December 24 and 25 resulted in an additional 23 hours of downtime for the H2S analyzer. –The daily QA check on December 25 through 27 failed to meet operational criteria due to an error in the data logger program. Maintenance was conducted on December 27 to reinitiate the daily QA check, causing a further 3 hours of invalid data.	n/a
28-Oct-22	406184	June 2021 to October 2022	Buffalo Viewpoint	The wind speed and wind direction (WS/WD) sensor at Buffalo Viewpoint AMS operated less than 90% for the month of June 2021 through to the month of October 2022, due to wind direction sensor misalignment.	On October 6, during the annual audit of the WS/WD sensor, it was found that the sensor was not aligned with each set point used to calibrate the instrument. A new, functioning sensor was installed that day. The previous annual audit, completed on June 3, 2021, had concluded that the instrument was in excellent working condition (average correction factor 1.003) and the sensor had no other maintenance conducted since that audit. Further investigation of the faulty sensor determined the internal components were not moving in unison, as designed, due to a loose set screw, which led to inaccurate wind direction readings. The misalignment was non-uniform, ranging from 15 to 23 degrees, depending on the conditions, and was undetectable during monthly field visual checks and data validation.	A new, functioning wind direction sensor was installed during the annual audit in 2022.



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
ANNUAL REPORT

APPENDIX III: 2012-2017 WBEA DATA COMPARED TO LARP TRIGGERS AND LIMITS 2021

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

March 2022



Comparison of WBEA NO₂ 2011 to 2021 Data With LARP Triggers and Limits (all data as ppb)

LARP Index	Year	Air Monitoring Stations														
		AMS01 Bertha Ganter	AMS04 Buffalo Viewpoint	AMS06 Patricia McInnes	AMS07 Athabasca Valley	AMS08 Fort Chipewyan	AMS09 Barge Landing	AMS12* Millennium Mine	AMS13 Fort McKay South	AMS14 Anzac	AMS15 Horizon	AMS16 Muskeg River	AMS17 Wapasu	AMS18 Stony Mountain	AMS19 Firebag	AMS20 Mackay River
NO ₂ Annual average	2021	8	5	5	7	1	10		8	2			3	1	3	2
	2020	7	5	5	7	2	8		6	2	9		2	1	3	2
	2019	8	5	5	8	2	10		7	2	9		3	1	4	2
	2018	8	5	5	7	1	15		7	2	7	9	3	1	3	2
	2017	7	5	5	7	1			7	2	5	10	3	1	3	2
	2016	7		6	7	1			6	2	6	9	3	1	3	3
	2015	6		5	8	2		11	5	2	5	9	3	1	4	
	2014	8		6	11	1		12	7	3	7	12	6		4	
	2013	8		6	10	1		13	7	3	7	12				
	2012	7		6	9	1		13	7	3	6	11				
	2011	7		6	11	1		15	6	3	5	12				
NO ₂ hourly 99th Percentile	2021	33	32	30	30	11	37		30	15			17	8	20	22
	2020	31	31	29	29	12	35		28	18	41		17	7	23	22
	2019	35	33	29	32	12	43		32	16	41		18	7	28	22
	2018	33	30	28	30	10	36		32	15	36	39	17	8	20	20
	2017	33	27	29	32	9			31	14	31	38	17	6	20	18
	2016	28		27	30	11			26	17	30	36	16	8	18	23
	2015	30		28	33	13		43	27	14	33	37	19	8	24	
	2014	33		29	48	11		43	31	18	34	40	21		23	
	2013	35		31	38	9		43	33	19	39	40	25			
	2012	34		29	34	11		42	31	15	36	40				
	2011	34		30	39	13		50	32	20	33	41				
LARP Index	Year	Air Monitoring Stations														
NO ₂ Annual average	2021	AMS21 Conklin	AMS22 Janvier	AMS23 Fort Hills	AMS24 Surmont	AMS26 Christina Lake	AMS27 Jackfish 2/3	AMS29 Surmont 2	AMS30 Ells River	AMS500 Christina Lake	AMS501 Leismer	AMS502 Surmont	AMS505 Sawbones Bay	AMS506 Jackfish 1	AMS507 Kirby South	AMS508 Kirby North
	2020	2	1	9		3	1	2	6		2		3	2	1	1
	2019	2	1	8		3	1	1	6		3		3	2	1	1
	2018	2	1	10	5	3	1	1			2		2	2	4	1
	2017	2	2	9	2	2	2			4	2		4	2		
	2016	2	1	8	2					3	3	3	3			
	2015	1								3	2	2				
	2014									3	2	3				
	2013									5	2	5				
	2012									5	5	5				
	2011											8				
NO ₂ hourly 99th Percentile	2021	10	8	39		16	7	11	32				18	12	11	7
	2020	10	9	39		13	8	13	30				18	13	6	6
	2019	11	8	44	19	16	7	9					15	11	22	6
	2018	13	10	42	13	10	7			23	15	17	22	19		
	2017	12	8	40	12					17	23	13	17			
	2016	8								18	10	18				
	2015										9	22				
	2014									32	8	22				
	2013									17	41	45				
	2012											36				
	2011															

Data Collection less than 12 months	NO ₂ Annual average	Limit	24	NO ₂ hourly 99th Percentile	Level 4 Trigger	92
	Level 3 Trigger	16	Level 3 Trigger		62	
	Level 2 Trigger	8	Level 2 Trigger		30	



Comparison of WBEA SO₂ 2011 to 2021 Data With LARP Triggers and Limits (all data as ppb)

LARP Index	Year	Air Monitoring Stations																	
		AMS01 Bertha Ganter	AMS02 Mildred Lake	AMS04 Buffalo Viewpoint	AMS05 Mannix	AMS06 Patricia McInnes	AMS07 Athabasca Valley	AMS08 Fort Chipewyan	AMS09 Barge Landing	AMS11 Lower Camp	AMS12* Millennium Mine	AMS13 Fort McKay South	AMS14 Anzac	AMS15 Horizon	AMS16 Muskeg River	AMS17 Wapasu	AMS18 Stony Mountain	AMS19 Firebag	
SO ₂ Annual average	2021	1	2	1	2	1	1	0	1	2		1	0		1	0	1	0	1
	2020	1	2	1	3	1	1	0	1	3		1	1	1	1	0	1	0	1
	2019	1	1	1	2	1	1	0	1	2		1	1	1	1	0	1	0	1
	2018	1	2	1	2	1	1	0	1	2		1	1	1	1	1	0	1	1
	2017	1	2	1	2	1	1	0		3		1	0	1	1	1	0	0	1
	2016	1	2	1	3	1	1	0		3		1	1	1	1	1	1	0	1
	2015	1	2	1	2	1	1	0		2	1	1	0	1	1	1	0	1	1
	2014	1	2	1	2	1	1	0		1	1	1	1	1	1	1	1	1	1
	2013	1	2	1	2	1	1	0		1	1	1	1	1	1	1	2		1
	2012	1	2	1	2	1	1	0		1	1	1	1	1	1	1			
	2011	2	3	1	2	1	1	0		2	1	1	1	1	1				
SO ₂ hourly 99th Percentile	2021	13	27	16	25	11	9	4	11	28		14	6			11	3	12	
	2020	15	33	19	39	15	9	4	14	32		15	6			13	4	12	
	2019	11	15	11	23	9	8	3	7	26		10	4			9	3	8	
	2018	12	22	14	24	10	7	3	7	30		10	6			9	3	11	
	2017	16	27	14	34	10	7	3		42		16	5			13	0	0	
	2016	15	29	14	36	12	11	5		43		15	5			12	2	12	
	2015	14	26	9	31	10	9	2		27	14	14	5			10	11	12	
	2014	15	28	10	32	12	9	3		16	19	17	6			15	16	13	
	2013	16	22	16	31	14	10	4		16	14	17	9			15	20		
	2012	17	32	13	28	11	8	4		21	15	18	9			16	20		
	2011	17	45	22	29	13	10	4		26	16	17	6			13	13		

LARP Index	Year	Air Monitoring Stations																
		AMS20 MacKay River	AMS21 Conklin	AMS22 Janvier	AMS23 Fort Hills	AMS24 Surmont	AMS25 Waskow ohci Pimatisiwin	AMS 26 Christina Lake	AMS 27 Jackfish 2/3	AMS29 Surmont 2	AMS30 Ells River	AMS500 Christina Lake	AMS 501 Leismer	AMS 502 Surmont	AMS 505 Sawbones Bay	AMS 506 Jackfish 1	AMS 507 Kirby South	AMS 508 Kirby North
SO ₂ Annual average	2021	1	0	0	1		1	2	1	0	1		1		2	1	1	1
	2020	1	0	0	1		1	3	1	1	1		1		2	2		1
	2019	1	0	0	1	2	1	2	1	2			1		2	1	1	0
	2018	1	0	0	1	1	1	1	1			1	1		1	1		
	2017	0	1	1	0	0	1					1	1		1			
	2016	1	0									1	1		1			
	2015												1		1			
	2014											1	1		1			
	2013											0	0		1			
	2012														2			
	2011														3			
SO ₂ hourly 99th Percentile	2021	11	3	2	10		12	24	5	4	12		16		21	17	13	6
	2020	12	3	3	9		14	35	6	5	9		14		27	26		6
	2019	8	2	2	7	12	9	24	6	12			13		33	12	10	2
	2018	8	3	2	8	6	10	20	5				10		16	8	8	8
	2017	9	2	2	7	6	9					16	18		15			
	2016	8	1									9	6		7			
	2015												7		11			
	2014												7		7			
	2013												4		9			
	2012												3		13			
	2011														26			

SO₂ Annual average
 Limit 8
 Level 3 Trigger 5
 Level 2 Trigger 3

SO₂ hourly 99th Percentile
 Level 4 Trigger 36
 Level 3 Trigger 24
 Level 2 Trigger 12

Data Collection less than 12 months



End of Report - Volume 1